Englobe
Soils Materials Environment

Environmental Services of Public Works and Government Services Canada (PWGSC)

TECHNICAL SPECIFICATIONS GROUNDWATER CATCHMENT

SEPTEMBER 2020

Management of Drinking Water Supply Works Distributed over 5 Border Crossings in Quebec

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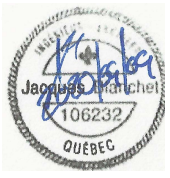

Notice to Reader

Englobe Corp. (Englobe) has been mandated by the Environmental Services of Public Works and Government Services Canada (PWGSC) to prepare and sign a technical specification document for a Call for tenders as part of the Management project of the drinking water supply works distributed over five (5) border crossings in Quebec.

This document includes the complete specifications for the call for tenders associated to the achievement of the work on the various targeted sites.

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This specification document includes:

- The identification of the project;
- The localization of the wells to seal and new wells to build;
- The general plan of the existing withdrawal setup of the Chartierville and Stanhope border crossings;
- The sealing diagrams of the wells in Saint-Bernard-de-Lacolle (Road 15), Frelighsburg, Woburn, Stanhope and Chartierville;
- The development plans of the new wells (Stanhope and Chartierville);
- The connection plans of the two (2) new wells;
- The price schedule;
- The documents and access permits.

1 Scope of Work

The Environmental Services of Public Works and Government Services Canada (PWGSC) require specialized hydrogeology services on behalf of the Canada Border Services Agency (CBSA).

The study is part of the management of drinking water supply works distributed over border crossings in Quebec.

In a first phase, two (2) new groundwater supply wells supplying the Stanhope and Chartierville border crossings with drinking water shall be built in compliance with applicable regulations.

In a second phase, the two (2) newly built wells shall be connected and the two (2) newly abandoned wells in Stanhope and Chartierville shall be sealed.

Finally, it is planned to seal three (3) abandoned wells present at the location of the following border crossings: Saint-Bernard-de-Lacolle (Road 15), Frelighsburg and Woburn. However, depending on the budget available, these activities shall be considered optional as part of this mandate.

2 General Information

2.1 General Points and Interpretation

2.1.1 General Points

This technical specification document defines the technical requirements related to the sealing, development and connection of several pumping wells, the electrical work and underground piping installation.

The general contractor will remain in charge of achieving all the work and coordination of the work performed by its subcontractors.

All required work shall comply with the layouts, details and specifications described in the current specific clauses and with the associated plans.

❖ Equipment and Workforce

The contractor or his/her subcontractors will oversee the mobilization and demobilization of their equipment and staff on the sites for the connection work of the drinking water supply wells. The contractor shall provide qualified workforce, possessing the necessary permits and equipment for the work.

❖ Materials

To avoid delays, all materials shall be available on the site at the beginning of work. The contractor shall perform the work with the materials described in the plans and specifications. The use of materials not identified in the plans and/or specifications shall require prior approval by the project engineer and the client. In addition, the contractor shall provide the equipment and materials for all excavation and backfilling work required as part of the work requested in the bid documents. The installation and the connection of the materials, pipes and accessories shall be performed in compliance with the manufacturer's requirements.

❖ Precedence of Documents

The technical plans and clauses of the specification document take precedence over any other document. If the contractor notices an inconsistency between the plans and specifications and the other documents of the current call for tenders, he/she is required to bring it to the attention of the engineer/project manager and the client.

❖ Confined Space

The contractor shall plan for work in confined space at the Stanhope border crossing, specifically for the vertical extension work of the pipes toward the surface (ground elevation of the shed) and at the Saint-Bernard-de-Lacolle border crossing as part of the removal of the pumping equipment in place.

❖ Controlled Work

Controlled work are planned for plumbing and electricity inside the shed where the supply well currently stands in Stanhope. For this work, services from professionals with an appropriate licence from the *Régie du bâtiment du Québec* (RBQ) will be required.

2.1.2 Interpretation of the Documents

In the event where any ambiguity or a difference identified between the various parts of the call for tenders' documents, the contractor shall refer to the engineer (Englobe) who will decide on the interpretation to give in collaboration with the PWGSC's representative, and the contractor shall comply.

2.1.3 Documents/Elements to Provide upon Achievement of the Work

At the end of the work, the contractor shall submit the drill logs, all technical documents, the operational instructions and the manufacturers documentation associated with the pipes, connections, equipment, etc. These technical documents shall mention the characteristics of the materials, sizes (length, diameter) and the types of material used.

Leak tests shall be conducted on the pipes and fittings – old and new – under the supervision of the Ministry's representative. The contractor must pass the leak tests and provide results upon completion of the work.

2.1.4 Materials Storage and Handling, and Access to the Site

The contractor shall control the access to the work site and manage the storage and safe handling of the materials on the site, as well he/she shall properly indicate their location on the site.

On all the sites, the contractor shall put fences around the work areas during work and prohibit field access to the public.

Regarding work that will be performed inside one or several buildings of any of the border crossings, at all times a commissionaire will be required. PSPC shall be advised 72 h before the work that will require accessing inside buildings.

2.1.5 Work Schedule

Prior to starting the work, the contractor shall propose a work schedule to the engineer and client that limits interruptions to the water distribution services. Water distribution interruptions shall be planned on both sites (Stanhope and Chartierville) during the connection of the new wells to the existing network. **Unless advised otherwise, the water distribution shall not exceed six (6) or seven (7) consecutive hours**.

2.2 Localization of the Work

2.2.1 Site Visit

The bidder shall ensure that he/she has sufficient knowledge of the site before submitting his/her bid. Insufficient knowledge of the sites where work will occur shall not give rise to any claims by the contractor

The following paragraphs describe the localization of the work as part of the current mandate and they shall be read jointly with the figures included in Appendix 1 and photos included in Appendix 2.

2.2.2 Saint-Bernard-de-Lacolle Border Crossing (Road 15)

The Saint-Bernard-de-Lacolle border crossing (Road 15) is located at 501 Highway 15 in Saint-Bernard-de-Lacolle. It is located in the *Montérégie* region, approximately 15 km to the southwest of the urban area of Saint-Bernard-de-Lacolle.

The well that shall be sealed is within an underground manhole located on a grassy surface surrounded by parking lots. This well is accessible to the machinery that will be used for the work.

Figure 1 in Appendix 1 illustrates the location of the well to seal at the Saint-Bernard-de-Lacolle border crossing (Road 15).

2.2.3 Frelighsburg Border Crossing

The Frelighsburg border crossing is located at 193 Road 237 in Frelighsburg. It is located in the *Montérégie* region, approximately 5 km to the south of the urban area of Frelighsburg.

The well that shall be sealed is located in a grassy area (aboveground well), approximately 75 m below the access road to the border crossing. The access road is grassy as well. This well is accessible to the machinery that will be used for the work.

Figure 2 in Appendix 1 illustrates the location of the well to seal at the Frelighsburg border crossing.

2.2.4 Woburn Border Crossing

The Woburn border crossing is located at 1020 Des Lignes Road. It is located in the *Estrie* region, approximately 5 km to the east of the urban area of Woburn.

The well that shall be sealed is located in a grassy area (aboveground well). This well is accessible to the machinery that will be used for the work.

Figure 3 in Appendix 1 illustrates the location of the well to seal at the Woburn border crossing.

2.2.5 Chartierville Border Crossing

The Chartierville border crossing is located at 165 Saint-Hyacinthe Street in Chartierville. It is located in the *Estrie* region, approximately 5 km to the south of the urban area of Chartierville.

The existing well that will have to be sealed after the development of the new wellis located in a grassy area (aboveground well), approximately 7.5 m south of the border crossing building, at the edge the parking lot. This well is accessible to the machinery that will be used for the work.

The new well will be located approximately 6 m to the south of the existing well, in a sector that is accessible to the machinery used for the work.

Figure 4 in Appendix 1 illustrates the location of the well to build at the Chartierville border crossing.

2.2.6 Stanhope Border Crossing

The Stanhope border crossing is located at 1000 Road 147 South in Stanhope. It is located in the *Estrie* region, approximately 7 km to the south of the urban area of Dixville.

The existing well that will have to be sealed once the new well will have been developed is located approximately 10 m to the north of the border crossing building, in an underground manhole protected by a shed.

The new well that shall be built will be located approximately 10 m to the north of the existing well, in a sector that is accessible to the machinery used for the work.

Figure 5 in Appendix 1 illustrates the location of the well to build at the Stanhope border crossing.

2.3 Description of the Work

2.3.1 Supervision of the Work

All work included in this mandate will be performed under the supervision of an Englobe' supervisor.

Supervision of the work by the project owner's representative to ensure proper execution of the work does not relieve the contractor from his/her responsibility with regards to damages or accidents and working method as well as his/her responsibility with respect to the provisions of the contract.

2.3.2 Well Sealing

All Saint-Bernard-de-Lacolle (Road 15), Frelighsburg and Woburn border crossings are equipped with wells that are no longer in use. Hence, these wells shall be sealed in compliance with the best practices in order to comply with the regulations in force.

Following the commissioning of the new wells in Stanhope and Chartierville, the newly abandoned wells shall also be sealed in compliance with the best practices in order to comply with the regulations in force.

2.3.3 Drilling and Well Development

Currently, the Stanhope and Chartierville border crossings have access to drinking water through obsolete or non-compliant underground catchment wells. Hence, a new well shall be drilled, and developed in compliance with the best practices at these border crossings in order to comply with the regulations in force.

2.3.4 Well Connection

When new wells in Stanhope and Chartierville will be built, they shall be the subject of a hydrogeologic study (achievement of pumping tests and control of the groundwater quality), then they will be connected to the current distribution and treatment systems.

As part of this hydrogeologic study, the contractor will be in charge of the logistical portion of the work (supplying equipment required for the tests, test monitoring) whereas the supervisor (Englobe) will be in charge of interpreting the obtained field data and making recommendations accordingly.

2.4 Regulatory Framework

2.4.1 Applicable Laws, Regulations and Codes

The contractor shall perform the work in compliance with the applicable federal, provincial or municipal laws, regulations, codes, guides and standards.

Although work sites are on federal lands, all work shall be performed in compliance with the laws and regulations in force in the Province of Quebec.

2.4.1.1 Applicable Standards, Codes and Guides

Globally and not limited to, the latest version of the standards and codes edited by the following authorities apply to the current contract:

- National Building Code of Canada;
- National Plumbing Code of Canada;
- Canada Labour Code;
- *Construction Code* in Quebec;
- Standards of the *Bureau de normalisation du Québec* (BNQ);
- American National Standards Institute (ANSI);
- Canadian Standard Association (CSA);
- American Institute Steel Construction (AISC);
- Standards of the *Bureau des examinateurs électriciens* (BEE);
- Canadian Electrical Code and Modifications in Quebec (CEC);
- Canadian Electrical Manufacturers Association (CEMA);
- National Electrical Manufacturer's Association (NEMA);
- American Society for Testing and Material (ASTM);
- American Iron and Steel Institute (AISI);
- American Standard Association (ASA);
- Drinking water system components – lead content NSF/ANSI 372
- Canadian Government Specification Boards (CGSB);
- International Electrical Commission (IEC)
- American Water Work Association (AWWA);
- Workplace Hazardous Materials Information System (WHMIS);
- International Organization for Standardization (IOS);
- Applicable local codes and regulations, and municipal by-laws;
- *Code de plomberie du Québec*;
- *Cahier des charges et devis généraux du Québec* (CCDG);

- *Guide de conception des petites installations de production d'eau potable;*
- *Guide de conception des installations de production d'eau potable;*
- *Guide technique – Captage d'eau souterraine pour des résidences isolées;*
- *Guide d'intervention – Protection des sols et réhabilitation des terrains contaminés of the MELCC;*
- *Directive 001 sur les installations de distribution;*
- *Safety Code for the construction industry;*
- BNQ 1809-900/2019: Public Works – General Administrative Documents - Civil Engineering Works;
- BNQ 1809-300/2018: Construction – General Technical Clauses – Water and Sewer Pipes;
- BNQ 2560-114/2014: Civil Engineering Work – Aggregates.

When disagreements occur between the various codes and standards, the more stringent requirement of the code, regulation, standards and specifications of the project will apply. The equivalent standards suggested shall be equal or more stringent than the standards listed above.

2.4.1.2 Federal Regulations and Laws

The contractor shall comply with, but not be limited to, the latest applicable versions of the following federal laws and regulations:

- Fisheries Act;
- Transportation of Dangerous Goods Act;
- Canadian Environmental Protection Act;
- Canada Water Act;
- Canada Occupational Health and Safety Regulations.

2.4.1.3 Provincial Regulations and Laws

In the absence of federal regulations, or when specified in the current specification document, the contractor shall comply with, but not be limited to, the latest applicable versions of the following provincial laws and regulations:

- Act respecting occupational health and safety, L.R.Q. ChapterS-2.1;
- Environment Quality Act (EQA) (L.R.Q., c. Q-2);
- Water Withdrawal and Protection Regulation (WWPR) (Q-2, r. 35.2);
- Regulation respecting the quality of drinking water (RRQDW) (Q-2, r. 40);
- Regulation respecting private waterworks and sewer services (RRPWSS) (Q-2, r. 4.01);
- Regulation respecting hazardous materials (RRHM) (Q-2, r. 32).

The contractor shall obtain from the federal provincial and municipal authorities, the above-mentioned reference documents as well as any permits required to perform the work, and pay the cost related thereto.

2.4.2 Sealing of the Wells

The sealing of the wells at the Saint-Bernard-de-Lacolle (Road 15), Frelighsburg, Woburn, Chartierville and Stanhope border crossings shall be performed under section 20 of the WWPR. In addition, the methodology to properly perform the work is described in the section 4.2 of the *Guide technique – Captage d'eau souterraine pour des résidences isolées,* edited by the *Ministère du Développement durable, de l'Environnement et des Parcs* (MDDEP) in January 2008.

Work will be performed under the supervision of an Englobe supervisor.

2.4.3 Drilling and Development Work of the Wells

The construction of the wells at the Stanhope and Chartierville border crossings shall be performed under the WWPR.

Without be limited to, the materials used shall be suitable for drinking water supply systems (section 22 of the WWPR). In addition, pipe casings used shall have a nominal thickness of 4.78 mm in compliance with ASTM-53 Grade B or ASTM A-589 Grade B if it is made of steel or ASTM A-409 if it is made of stainless steel (section 23 of the WWPR).

If a well shall be built in rock, the casing must be anchored in bedrock to a depth of at least 60 cm. In addition, a drive shoe must be used (section 24 of the WWPR). Finally, if the rock surface is at located at a depth of less than 5 m, the work shall be sealed in compliance with section 19 of the WWPR.

Finally, if a well uses artesian pressure, a flow control system must be developed in compliance with section 26 of the Water Withdrawal and Protection Regulation.

Work will be performed under the supervision of an Englobe supervisor.

2.4.4 Connection of the Wells

Connection work of the wells shall be performed under applicable laws and regulations. The contractor shall comply with the requirements of the *Commission des normes, de l'équité, de la santé et de la sécurité du travail* (CNESST).

Unless specified otherwise, the excavation, connection and backfilling work shall be performed in compliance with the latest standards of the *Bureau de normalisation du Québec* (BNQ), *directive 001* of the *ministère de l'Environnement et de la Lutte contre les Changements Climatiques* (MELCC) and *Cahier des charges et devis généraux* (CCDG) of the ministère des Transports (MTQ).

Materials in contact with water such as pipes, seals, valves, etc. shall comply with the latest standards of the BNQ or American Water Works Association (AWWA), when the BNQ has no standards.

Work will be performed under the supervision of an Englobe' supervisor.

2.5 Health and Safety

Site-specific safety measures shall be applied to protect the users and workers of the concerned and adjacent properties, such as panels, tapes or fences, to delineate the work site.

In addition, by accepting this contract, the contractor accepts to take all the responsibilities normally attributed to the main contractor under the *Act respecting occupational health and safety*.

Before performing work, the contractor shall provide PWGSC with a health and safety (H&S) program that is specific to each task to perform. More particularly, the contractor shall:

- Regardless of the number of workers involved on the field, submit to the Ministry's representative for approval, a **study site-specific** safety planning (H&S plan including a procedure in case of an accident). The H&S plan shall present, but not be limited to, the risks associated with the work and mitigation measures to apply in order to reduce the risks and the severity of the consequences. **A general H&S plan showing elements that are non relevant to this mandate will be considered inappropriate**.
- Submit to the Ministry's representative a mechanical inspection permit for each machinery part used on the field.
- Ensure his/her workers received the necessary training and information to perform the work safely, and all required tools and protective equipment are available and used in compliance with the standards, laws and regulations.
- Comply at all times with the provisions of the *Act respecting occupational health and safety* and the Safety Code for the construction industry.
- Notify his/her workers that they may refuse any work involving a danger for their own health or safety.
- Delineate and barricade the work area, and control access.

If an unforeseen incident occurs, the contractor shall take all necessary measures, including stopping the work, to protect the health and safety of the workers and public, and communicate without delay with the Ministry's representative.

As a reminder, the contractor shall plan work in confined space at the Stanhope border crossing, specifically during the vertical extension work of the pipes toward the surface (ground elevation of the shed) and at the Saint-Bernard-de-Lacolle border crossing as part of the removal of the pumping equipment in place. All occupational health and safety (OHS) measures related to this type of work shall be considered by the contractor and a work in confined space permit shall be submitted to the contractor before starting the work.

In addition, an Englobe's field supervisor will ensure compliance with the defined safety code on field and assess risks continually.

2.6 Protection of the Environment

The work shall be performed in a way that respects the surrounding environment. Under no circumstances, the contractor shall perform work, circulate, store or discharge materials or liquids in a water course located in the vicinity.

Mitigation measures of the environmental impacts as well as good practices applicable to the work shall be implemented by the contractor. Here is a non-exhaustive list of the minimum measures to take:

- Do not perform maintenance of the machinery on the field.

- Proceed to maintenance and refuelling of the machinery more than 30 m from a water body, wetland, shores, and any other aquatic environment, on an impervious surface.
- Ensure to shut off all engines of equipment, machinery and vehicles when they are not used.
- Ensure machinery is in good condition, perform proper maintenance in appropriate locations and use machinery in a way to reduce risks of accidents or breakage to a minimum. To this end, before beginning the work, the contractor shall submit to the Ministry's representative a mechanical inspection permit for each machinery part used on the field.
- Waste generated by the work shall be disposed of properly, which excludes on site burial or incineration.
- Perform work between 8 am and 4 pm during weekdays.
- Adopt a working method reducing to a minimum dust emission.
- Maintain clean access roads and proceed to cleaning, if needed.
- No excavation work shall be performed in the vicinity of the drainage ditches and water courses during heavy rain events.
- Do not store fuel, oil or other hazardous materials or potentially environmentally harmful materials less than 30 m from a water body, wetland, shores, and any other aquatic environment.
- Any vehicle must be parked at more than 30 m from a water body, wetland, shores, and any other aquatic environment. The same applies to any temporary installation (toilet, site trailer, etc.).
- The contractor shall comply with the regulations in force related to handling, disposal and transport of hazardous materials.
- An environmental emergency measures plan shall be implemented by the contractor. It shall be available on site and communicated to all employees.
- At all times, have a response kit in case of an accidental hazardous material spill in order to limit the spill, and recover the contaminants discharged into the environment. Employees on the field must have received the necessary training to intervene in case of a spill.
- Take all means to stop an accidental spill, and rapidly limit the discharged product, then proceed to the recovering of the product and contaminated soils, and disposal as well as the restoration of the site.
- Water contaminated by an accidental spill must be confined and recovered or directly assumed by a company specialized in environment.
- Any spill occurring on the site must be declared.
- Report the incident to competent authorities, WPGSC's representative and the Transport Canada's Environment Officer responsible for the site as soon as possible.
- Contact Environment Canada's emergency services (1-866-283-2333) and Quebec Urgence Environnement (1-866-694-5454).

2.7 Underground Infrastructure

While preparing technical documents, Englobe and WPGSC worked diligently to plan the development of the new infrastructure in compliance with the location of potential existing underground infrastructure.

However, on each work site, the contractor shall be ultimately responsible for the localization of the public or private underground infrastructure likely to be present (Info-excavation, municipality, private locating company).

This task shall be performed prior to the mobilization of the equipment and employees on the sites. Any underground service breakage will be under the contractor's responsibility.

3 Sealing of Unused Wells

Firstly, for each well to seal, the contractor will be responsible for disconnecting the electric equipment and removing the pumping equipment on site (pump, pipes, etc.). Unless advised otherwise, these shall be given to the client and stored in a location predetermined by the client. Once equipment is removed, sealing work shall begin.

It should be noted that based on available budgets, the sealing work on unused wells shall be considered optional. One or several wells could be sealed as part of this mandate depending on the budgets granted.

3.1 General Methodology

The methodology that will be used as part of the sealing of the wells is the one described in the Section 4.2.1 of the MDDEP's *Guide technique – Captage d'eau souterraine pour des résidences isolées* du MDDEP (2008) and section 20 of the WWPR.

The steps associated with the sealing of the wells are the following:

1. Fill the well with fine to coarse sand free of contamination (the sand must meet the "< A" quality criteria of the MELCC's *Guide d'intervention – Protection des sols et réhabilitation des terrains contaminés*) down to 1 m below the casing base. The contractor shall provide a compliance proof of the quality of the sand that he/she projects to use and its origin.
2. Above the layer of sand, place an impervious material (mix of concrete/bentonite) on a 2 m thickness.
3. On the sealing impervious material layer, place a second layer of sand down to 3 m from the ground surface.
4. Above the second layer of sand, place an additional layer of sealing impervious material on a 2 m thickness.
5. Finally, a 1 m deep excavation shall be performed to access the steel casing. This casing must be cut off at 1 m from the ground surface, i.e.: the level of the second layer of sealing material. Then, a concrete plate must be placed at the location of the casing and the excavation must be filled with sand or filling materials (excavated soils) to level the soils based on the surrounding land's topography.

Figure B-9 of the Technical Guide indicates properly how to seal obsolete work.

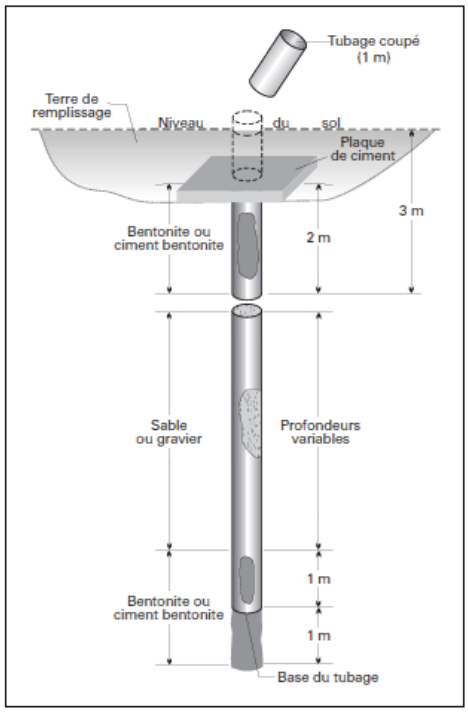


Figure B-9 : **Méthode d'obturation d'un puits tubulaire inutilisé**

3.2 Site-Specific Methodology

The following section presents, for each well to seal, the particularities for the achievement of the sealing work.

As previously mentioned, well sealing is optional as part of this contract.

3.2.1 Saint-Bernard-de-Lacolle Border Crossing (Road 15)

The well to seal at the Saint-Bernard-de-Lacolle (Road 15) border crossing is built inside a 2.7 m depth concrete manhole. At the surface, the opening of the manhole leading to the well has an approximate diameter of 0.91 m (3 ft). A first cylindrical concrete section, 0.91 m (3 ft) thick with respect to the ground, is in place. Then, a second square-shaped section (1.5 m side) is present down to the bottom, i.e.: 2.7 m depth. The casing of the well, showing a diameter of 150 mm (6 inch), is present at the bottom of the manhole. The length of the casing is 5.67 m, and since the depth of the well is unknown for bidding purposes, a depth of 75 m is assumed. It should be noted that the pumping equipment will have to be removed from inside a confined space.

Photographs 1 and 2 included in Appendix 2 show the well to seal at the Saint-Bernard-de-Lacolle (Road 15) border crossing.

Sealing steps specific to this well are the following:

1. Fill the well with clean sand to a depth of 6.7 m (filling on 68.3 m) with respect to the ground.
2. Add a mix of concrete/bentonite to a depth of 4.7 m with respect to the ground (2 m of sealing material).
3. Again, place clean (free of contamination) sand to a depth of 3 m (a thickness of 1.7 m).
4. Add a second layer of sealing material to 1 m from the surface.
5. Excavate the contours of the concrete manhole on 1 m depth to access it.
6. Remove the two (2) concrete cylinders at the surface of the manhole.
7. Install a concrete plate approximately 5 cm (2 inch) thick in a way to totally cover the diameter of the manhole (minimum diameter of 1.52 m (5 ft)).
8. Fill the excavation with clean sand or excavated material and level the land with respect to the surrounding topography.
9. Restore the landscape (compaction of the excavation, topsoil on a 15 cm thickness, and seeding or sodding).

Diagram 1 included in Appendix 1 illustrates the sealing details of the well to seal at the Saint-Bernard-de-Lacolle (Road 15) border crossing.

3.2.2 Frelighsburg Border Crossing

The well to seal at the Frelighsburg border crossing has a total depth of 112.8 m. The well is equipped with a 200 mm (8 inch) diameter steel casing to an estimated depth of 10 m with respect to the ground (the casing length is 200 mm (8 inch) and diameter is unknown). Between 10 and 112.8 m depth, the well would have a 152 mm (6 inch) diameter.

Photographies 3 and 4 included in Appendix 2 show the well to seal at the Frelighsburg border crossing.

Sealing steps specific to this well are the following:

1. Fill the well with clean sand to a depth of 11 m with respect to the ground (filling on 101.8 m).
2. Add a mix of concrete/bentonite to 9 m deep with respect to the ground (2 m of sealing material).
3. Again, place clean (free of contamination) sand on a 6 m thickness, i.e.: to a depth of 3 m with respect to the ground.
4. Add a second layer of sealing material to 1 m from the surface.
5. Excavate the contours of the well on 1 m depth to access it.
6. Cut off the steel casing at the impervious material upper level, i.e.: to a depth of 1 m with respect to the ground and remove the cut section.
7. Install a concrete plate with an approximate thickness of 5 cm (2 inch) in a way to totally cover the diameter of the well (minimum diameter of 254 mm (10 inch)).
8. Fill the excavation with clean sand or excavated material and level the land with respect to the surrounding topography.

9. Restore the landscape (compaction of the excavation, topsoil on 15 cm thickness, and seeding or sodding, and restoration of the grassy access road to the well).

Diagram 2 included in Appendix 1 illustrates the sealing details of the well to seal at the Frelighsburg border crossing.

3.2.3 Woburn Border Crossing

For bidding purposes, the well to seal at the Woburn border crossing has an estimated depth of 75 m; exact depth is unknown. The well is equipped with a steel casing, showing a diameter of 152 mm (6 inch), to an approximate depth of 2.7 m with respect to the ground.

Photographs 5 and 6 included in Appendix 2 show the well to seal at the Woburn border crossing.

Sealing steps specific to this well are the following:

1. Fill the well with clean sand to a depth of 3.7 m with respect to the ground (filling on 71.3 m).
2. Add a mix of concrete/bentonite to 1 m deep with respect to the ground (2.7 m of sealing material).
3. Excavate the contours of the well on 1 m depth to access it.
4. Cut off the steel casing at the upper level of the impervious material, i.e.: to a depth of 1 m with respect to the ground and remove the cut section.
5. Install a concrete plate with an approximate thickness of 5 cm (2 inch) in a way to totally cover the diameter of the well (minimum diameter of 200 mm (8 inch)).
6. Fill the excavation with clean sand or excavated material and level the land with respect to the surrounding topography.
7. Restore the landscape (compaction of the excavation, topsoil on 15 cm thickness, and seeding or sodding).

Diagram 3 included in Appendix 1 illustrates the sealing details of the well to seal at the Woburn border crossing.

3.2.4 Chartierville Border Crossing

For bidding purposes, the well to seal at the Chartierville border crossing has an estimated depth of 75 m; exact depth is unknown. The well is equipped with a steel casing, showing a diameter of 152 mm (6 inch), to an approximate depth of 3.2 m with respect to the ground.

Photographs 7 and 8 included in Appendix 2 show the well to seal at the Chartierville border crossing and photographs 9 and 10 respectively show the projected location of the new well to be performed and the location of the intake channel of the existing well.

Sealing steps specific to this well are the following:

1. Fill the well with clean sand to a depth of 4.2 m with respect to the ground (filling on 70.8 m).
2. Add a mix of concrete/bentonite to 1 m deep with respect to the ground (3.2 m of sealing material).
3. Excavate the contours of the well on 1 m depth to access it.
4. Cut off the steel casing at upper level of the impervious material, i.e.: to a depth of 1 m with respect to the ground and remove the cut section.
5. Install a concrete plate with an approximate thickness of 5 cm (2 inch) in a way to totally cover the diameter of the well (minimum diameter of 200 mm (8 inch)).
6. Fill the excavation with clean sand or excavated material and level the land with respect to the surrounding topography.
7. Restore the landscape (compaction of the excavation, topsoil on 15 cm thickness and seeding or sodding).

Diagram 4 included in Appendix 1 illustrates the sealing details of the well to seal at the Chartierville border crossing.

3.2.5 Stanhope Border Crossing

The well to seal at the Stanhope border crossing is built inside a room underneath the well service shed, approximately 2 m deep with respect to the ground. The depth of the well is estimated at 75 m for bidding purposes; exact depth is unknown. The well is equipped with a steel casing with a diameter of 152 mm (6 inch) to a depth of 16.5 m with respect to the ground (length of 14.5 m). It should be noted that the pumping equipment will have to be removed from inside a confined space.

Photographs 11 and 12 included in Appendix 2 show the location of the Stanhope border crossing whereas photographs 13 and 14 show the well to seal at the Stanhope border crossing. Finally, photographs 15 and16 respectively show the location of the new projected well and the talus in which the intake channel of the new well will be developed.

Sealing steps specific to this well are the following:

1. Fill the well with clean sand to a depth of 17.5 m with respect to the ground (filling on 57.5 m).
2. Add a mix of concrete/bentonite to 15.5 m deep with respect to the ground (2 m of sealing material).
3. Again, place clean (free of contamination) sand on a 11.5 m thickness, i.e.: to a depth of 4 m with respect to the ground.
4. Add a second layer of sealing material to 2 m from the surface.
5. Cut off the steel casing at the concrete slab level and remove the cut section.
6. Install a concrete plate, showing an approximate thickness of 5 cm (2 inch), in a way to totally cover the diameter of the well (minimum diameter of 200 mm (8 inch)).
7. Fill the room underneath the shed with concrete filling and place a ¾ inch thickness plywood.

Diagram 5 included in Appendix 1 illustrates the sealing details of the well to seal at the Stanhope border crossing.

3.3 Description of the Materials

Filling materials must meet the following particularities:

- The sand must be free of any type of contaminant (the sand must meet the "< A" quality criteria of the MELCC's *Guide d'intervention – Protection des sols et réhabilitation des terrains contaminés*).
- The sand used must not contain fine particles such as slit or clay.
- The sealing impervious material may be composed of pure bentonite or a mix of concrete-bentonite. If the contractor uses pure bentonite, he/she shall be sure to moisten it to ensure its sealing properties.
- The filling material at ground level must be topsoil on a minimum thickness of 15 cm, unless advised otherwise of other specific instructions (Stanhope border crossing).

Before achieving the work, the contractor shall submit the information regarding the origin and quality (physical and chemical) of the sand used to the Ministry's representative for approval purposes.

3.4 Restoration

The contractor is responsible for restoring the sites to their original condition following the completion of the work . Since the wells to seal at the Saint-Bernard-de-Lacolle (Road 15), Frelighsburg, Woburn and Chartierville border crossings are located in a grassy land, and seeding or sodding is required.

In the specific case of the Frelighsburg border crossing, the access to the well on a grassy sloped surface shall be restored as well. The general contractor should take the required protection measures to reduce the damage to this access during work.

4 Drilling of the New Pumping Wells

4.1 Drilling Equipment

The contractor shall provide all equipment required for the drilling and development of each well. The drilling equipment must include a “Foremost” type dual rotary drill rig or an equivalent device. The drilling equipment used shall be presented with the bid.

4.1.1 Chartierville Border Crossing

For drilling work purposes, access to water will be the responsibility of the contractor.

In addition, an immediate 3 m protection radius around the withdrawal site shall be performed by the contractor (for more details, refer to Section 7.8.3).

4.1.2 Stanhope Border Crossing

For drilling work purposes, access to water will be assumed by the contractor.

Furthermore, for the Stanhope border crossing, the new well will be performed on an asphalted parking lot, at the top of the talus (refer to Appendix 2). It is expected that a concrete slab, which thickness is estimated at 0.15 m (6 inch) is present at the subsurface. Hence, the contractor shall plan to remove the asphalt and saw the concrete slab before proceeding to the well drilling. In addition, a 4 m x 4 m fence with an access to the well to delineate the close protection area and three (3) bollards shall be installed by the contractor around the well (for more details, refer to Section 7.8.3).

4.2 Methodology

The new wells to drill (Stanhope and Chartierville) must have a diameter of 152.4 mm (6 inch) and they will both reach an approximative expected depth of 100 m.

4.2.1 Chartierville Border Crossing

The rock is expected at 4 m on the Chartierville site. The steel casing will be pressed down on 4 m into superficial deposits and anchored into the rock on a length of more than ± 0.6 m. If rock is encountered at less than 5 m depth with respect to the ground, as expected, a concrete collar with a 0.254 m (10 inch) diameter and 5 m depth shall be installed. The length of the steel casing with a 152.4 mm (6 in) diameter must allow for a well coping approximately 1 m above ground surface.

During drilling, soils must be sampled continuously with a 0.91 m (3 ft) interval until rock is reached. The objective is to obtain a detailed stratigraphy of the soils in place.

The drilling of the new well will stop once the required flow rate is reached, i.e.: 1 GUSPM. For bidding purposes, an approximated depth of 100 m is considered for the new well.

Diagram 6 included in Appendix 1 illustrates the expected development of the Chartierville well.

4.2.2 Stanhope Border Crossing

The rock is expected at 15 m on the Stanhope site. The steel casing will be pressed down on 15 m into superficial deposits and anchored into the rock on a length of ± 0.6 m. If rock is encountered at less than 5 m depth with respect to the ground, as expected, a concrete collar with a 0.254 m (10 inch) diameter and 5 m depth shall be installed. The length of the steel casing with a 152.4 mm (6 in) diameter must enable to perform a curb approximately 1 m above ground surface.

During the drilling, soils must be sampled continuously with a 0.91 m (3 ft) interval until rock is reached. The objective is to obtain a detailed stratigraphy of the soils in place

The drilling of the new well will stop once the required flow rate is reached, i.e.: 2 GUSPM. An approximated depth of 100 m is considered for the new well.

Diagram 7 included in Appendix 1 illustrates the expected development of the Stanhope well.

4.3 Description of the Materials and Workforce

The contractor shall provide qualified workforce, guarantee materials that will be used for the construction of the wells against any building defects and commit to replace any defective parts, when necessary.

Pipes used for the construction of the well must resist lateral pressures and corrosive action of the water. They must be made of a new material, good quality rate, clean and meeting the standards of the *American Society for Testing Materials (ASTM)* and the *American Petroleum Institute (API).*

5 Development of the New Wells

5.1 Verticality of the Drilling Equipment

Each well must be straight and vertical enough not to compromise the installation of the pumping equipment and future operations.

The contractor, under the supervision of the consultant's representative, shall conduct verticality and straightness assessments on each well. Regarding the verticality, the maximum deflection must be 0.6 %.

In the event these conditions are not met, the wells must be rebuilt at the contractor's costs (including professional fees or others), unless exempted by the Ministry's representative via a written notice.

5.2 Installation of the Collar

If the top of the rock is encountered at less than 5 m depth, the contractor shall seal the wells in compliance with the section 19 of the *Regulation respecting the quality of drinking water* by installing a concrete collar showing a thickness of 0.254 m on a minimum depth of 5 m.

Restoration of the ground surface to its original state around the facility after the drilling work shall be performed in a way to prevent still water, and water run-off toward the pumping wells in a 1 m radius around the latter in compliance with section 18 of the WWPR.

Here are the main steps for the installation of the concrete collar:

- Drill a minimum depth of 5 m in a 0.254 m diameter.
- Telescope the 0.152 m diameter casing and anchor it into the basement rock.
- Fill the annular space with a mix of concrete-bentonite.
- Remove the 0.254 m outside casing.

5.3 Development of the Wells

Once the wells are built, the contractor will proceed to the development of each well using air pressure injection during an estimated minimum period of 4 h per well. The duration of the development estimated at 4 h will be extended until a clear, free of particles water is obtained. The work supervisor will decide when to stop the development. It should be noted that this operation enables to remove the fine particles and fragments present in the well.

5.4 Desinfection of the Wells

Once the wells are built, any foreign substance must be removed, including tools, cables, all kinds of debris such as cement, oil, greases, grout mixture, etc. Pipings must be brushed to remove any undesirable constituent. Using alkalis could be required.

Then, each well must be disinfected twice:

- The first disinfection must be performed after the installation of the temporary pumping equipment, i.e.: before the pumping tests. It must be performed using a sodium hypochlorite solution 12 % (free chlorine) applied on all parts of the well. The chlorine solution mix and the water in the well must remain in contact for a minimal period of 8 h, and then be discharged via pumping. The quantity of solution required will be calculated by the contractor in a workmanlike manner (refer to *Groundwater and Wells, second edition*, by Fletcher G. Driscoll, Ph.D., published by Johnston Filtration Systems Inc, pages 620 to 624). The quantity of hypochlorite sodium is subject to the supervisor's approval.
- The second disinfection must be performed after the final connection of the well using a sodium hypochlorite solution 12 % (free chlorine) applied on all the system. The chlorine solution mix and the water in the well must remain in contact for a minimal period of 24 h. The quantity of solution required will be calculated by the contractor in a workmanlike manner (refer to *Groundwater and Wells, second edition*, by Fletcher G. Driscoll, Ph.D., published by Johnston Filtration Systems Inc, pages 620 to 624). The quantity of hypochlorite sodium is subject to the supervisor's approval.

5.4.1 Management of the Development and Pumping Water

The development and pumping water will be discharged into the environment at a sufficient distance to prevent the water table from recharging locally, and thus interfere with the interpretation of the pumping test. A minimum distance of 15 m will be required.

5.5 Restoration

Sites surrounding the new wells must be cleared of all debris, waste, pieces of casing and residues from drilling. The areas must be left as they were before the project. Concrete shall also be put back at the surface around the new well in Stanhope after the sawing and removal of the former concrete performed as part of the drilling work.

6 Pumping Test

Two (2) pumping tests will be conducted in each new well after their completion, and their depth has been precisely measured. The contractor shall notify the consultant before starting these tests. The first test will be a step-pumping test that will last for approximately 4 h (4 steps, 60 min each) for each well, which consists in pumping the well at various flows until drawdown has stabilized. The first flow pumped is the smaller one and it increases with the progression of the test. For each step, the flow is noted, and the drawdown generated by the pumping over time is measured. Then, the equipment must be left in place for the long-term, 72 h consecutive second tests.

6.1 Temporary Equipment

The contractor shall provide all equipment required for the pumping tests, including namely, but not limited to:

1. A submersible turbine pump with a capacity of 1 to 30 GUSPM (3.78 L/min to 113 L/min) for each well (Stanhope and Chartierville).
2. A digital flowmeter and a shut off valve to set the pumping flow. This equipment must be designed to instantly adjust the flow and ensure a variation of less than 2.5 % throughout the test.
3. A faucet installed at each well outlet that will enable groundwater sampling.
4. A discharge pipe long enough to discharge water at an approximate distance of 40 m from the new well in Chartierville and 60 m from the new well in Stanhope.

The contractor shall consider the pressure losses generated by the groundwater discharge pipe in order to reach the desired operation flow.

Before the pumping tests, the contractor will proceed to the disinfection of the materials introduced into the well, as specified in Section 5.4 of this specification document.

6.2 Temporary Electrical Connection

6.2.1 Chartierville Border Crossing

For the power supply of the pumping equipment, the contractor shall plan the installation of a generator on the site, and include the costs associated with the workforce and fuel required to ensure its continuous functioning throughout the step-pumping test and long-term tests.

6.2.2 Stanhope Border Crossing

For the power supply of the pumping equipment, the contractor shall plan the installation of a generator on the site and include the costs associated with the workforce and fuel required to ensure its continuous functioning throughout the step- pumping test and long-term tests.

6.3 Step Test

6.3.1 Chartierville Border Crossing

After the new well has been installed, a first step- pumping test with an approximate duration per well of 4 h (4 steps, 60 min each) will have to be conducted in the well. In addition to enabling the assessment of the performance of the well at different flows, this pumping test will also enable to select the optimum flow of the well for the long-term pumping test. The step flows will range between 1 and 30 GUSPM (3.78 L/min to 113.4 L/min).

The water level in the well will be monitored by the drilling contractor using a manual probe, based on the period selected by the site supervisor (Englobe), and the pumped water will be discharged as far as possible from the well, i.e.: approximately 40 m.

The contractor must provide the equipment dedicated to the water level measurement and provide the manual data resulting from the monitoring to the supervisor for analysis purposes.

In addition to the manual data, Englobe will provide an automatic pressure probe (logger) to measure the variation of the water level in the well during the tests. Measurements collected will be compared with the data collected manually by the contractor.

6.3.2 Stanhope Border Crossing

After the new well has been installed, a first step- pumping test with an approximate duration per well of 4 h (4 steps, 60 min each) will have to be conducted in the well. In addition to enabling the assessment of the performance of the well at different flows, this pumping test will also enable to select the optimum flow of the well for the long-term pumping test. The step flows will range between 1 and 30 GUSPM (3.78 L/min to 113.4 L/min).

The water level in the well will be monitored by the drilling contractor with a manual probe based on the period selected by the site supervisor (Englobe), and the pumped water will be discharged as far as possible from the well, i.e.: approximately 60 m.

The contractor will provide the equipment dedicated to the water level measurement and provide the manual data resulting from the monitoring to the supervisor for analysis purposes.

In addition to the manual data, Englobe will provide an automatic pressure probe (logger) to measure the variation of the water level in the well during the tests. Measurements collected will be compared with the data collected manually by the contractor.

6.4 Long-Term pumping Test

A pumping test with a minimum duration of 72 h, continuously, night and day, will be conducted using a constant flow in each well. The targeted flow will be determined based on the results of the previous step-pumping test and communicated to the contractor by the supervisor (Englobe). The contractor will be responsible for the smooth running of the test and he/she must ensure that someone is always present to ensure that operations go smoothly. The contractor will also be responsible for measuring the water levels in the wells using a manual probe throughout the test. He/she must also monitor the water level rebound for at least 200 minutes and/or upon reaching 80 % of the initial water level. The duration of the water level survey will be provided by the supervisor (Englobe).

The water pumped in the wells will be discharged at approximately 60 m from the well in Stanhope and 40 m from the well in Chartierville.

7 Connection of the Well

7.1 Phases of the Work

7.1.1 Chartierville Border Crossing

At the Chartierville border crossing, two (2) field work phases will have to be performed: a phase dedicated to the connection of the new well and a second that will consist in plugging the former well.

Phase 1 : Connection of the new well. The steps are the following:

- Perform a trench.
- Install the new piping.
- Connect the piping to the existing system (inside the building).
- Conduct tests.
- Install pumping equipment in the new well.
- Install electrical wiring and connect the pump.
- Backfill the trench.
- Repair asphalt in the impacted portion of the parking lot.
- Put back grass on the remaining portion of the work footprint.
- Proceed to the disinfection of the system.
- Install a enclosed protection area around the new well by installing a 6 m x 6 m fence minimum with an access to the well to delineate the close protection area (refer to drawing 0005 included in Appendix 1 (Approximate Location of the Well Sealing in Chartierville)).

Phase 2 : This second phase includes the disconnection of the former well and its sealing, which steps are described in Section 3.2.4.

Each working step must be approved by the field representative's project engineer (Englobe).

7.1.2 Stanhope Border Crossing

At the Stanhope border crossing, two (2) field work phases must be performed: a phase dedicated to the connection of the new well and a second that will consist in plugging the former well and confined space of the shed.

Phase 1 : Disconnection of the former well and connection of the new well. The steps are the following:

- Dig the trench between the new well and the former well located in the shed.
- Install new piping between the new well and the shed by drilling through the shed's foundation wall.
- Raise all piping coming from the new well, internal reservoir and fire fighting reservoir towards the surface (90 º elbows for each), as indicated on the plans.

- Perform connections (work under cost-plus contract*) by a certified plumber, as indicated on the plans. The connections shall be secured onto the shed's walls.
- Conduct tests.
- Install pumping equipment in the new well.
- Install electrical wiring and connect the new pump.
- Backfill the trench.
- Restore the impacted surfaces.
- Proceed to the disinfection of the system.
- Install an enclosed protection area around the new well by installing a 4 m x 4 m fence with an access to the well to delineate the close protection area. In the event where there is not enough space available to install such a fence, a smaller surface could be considered (refer to drawing 0004 included in Appendix 1 (Approximate Location of the Well Sealing in Stanhope)). In addition, it will be necessary to add standard bollards (a minimum of three (3)) to increase the well visibility and protection (refer to Section 7.8.3).

Phase 2 : This second phase includes the sealing of the former well (refer to Section 3.2.5), backfilling of the shed's confined space and protection of the new well, which steps are the following:

- Backfilling of the shed's confined space by:
  - protecting all pipings;
  - filling the hole with concrete filling;
  - installing a treated wood raised floor on the concrete filling. The floor framing will stand on the concrete filling and will be built with 2 inches X 6 inches treated wood planks, and covered with a ¾ inch treated wood plywood;
  - installing a heating system inside the shed according to the applicable standards.

7.1.3 Temporary Water Supply

The concerned border crossings' employees are supplied in drinking water by water fountains. Water from the wells is essentially used for the toilets and kitchens' faucets, but it is not consumed.

7.1.3.1 Chartierville Border Crossing

As part of the connection work of the new well to the current system (estimated duration: 6-7 h), the contractor must plan ten (10) buckets of water for the employees' toilet. Public toilets will be closed during connection work.

* Work for which payment to the contractor is equal to the expenses incurred as part of the work plus a specific amount for profits and general costs or an amount equalling to a certain percentage of the incurred expenses, according to the administrative clauses of the call for tenders.

7.1.3.2 Stanhope Border Crossing

As part of the connection work of the new well, it will not be necessary to plan a drinking water supply system for the border crossing's users. The internal reservoir of the system in place can ensure the border crossing's water needs during the connection. However, a test must be conducted before the disconnection of the current well to ensure it works properly in the absence of the well.

7.2 Materials (pipes, seals, fittings, etc.)

7.2.1 Type of Materials

Pipes must be made of high-density polyethylene (HDPE) in compliance with the requirements of the BNQ 3624-027 document for a pipe with a nominal diameter of 50 mm.

7.2.2 Compliance with Standards

Materials must comply with the latest standards applicable to drinking water. When such standards do not exist, materials complying with the manufacturer 'standards, and accepted by the MELCC could be used after prior acceptance by the project engineer and the client.

7.2.3 Features (size, production materials, etc.)

At the end of the work, the contractor shall provide all technical features of the discharge line (model or type, length, diameter, nominal capacity, production material, etc.) and all materials used for the connection.

7.3 New Pumping Equipment

The contractor shall provide all equipment required for the operation of the newly built wells (refer to list and description of equipment on Plans 0102 and 0103 included in Appendix 3).

Before commissioning, the contractor shall disinfect the materials introduced into the well, as specified in Section 5.4 of the current specification document.

The contractor shall provide all equipment required including, but not limited to:

1- Threaded check valve;

2- Chain and retaining ring;

3- Ring clamp;

4- Heat shrink splice kit;

5- Torsion absorber (shock absorber);

6- Safety line;

7- Cable tie;

8- Electrical cable;

9- Safety;

10- Copper slide;

11- Hose adaptor;

12- Lockable aluminium sealed cap;

13- Seal ring;

14- Brass nipple;

15- Sump pump with a capacity ranging between 0 and 30 GUSPM;

16- Drive shoe;

17- Discharge hose;

18- Electric line

7.4 Excavation

The owner commits to provide all available plans showing underground facilities.

However, the localization of the existing public or private utility facilities in the work area is under the responsibility of the contractor (refer to Section 2.7).

Prior to the excavation work, the contractor must remove movable accessories and equipment that may obstruct his/her work. Before removing and moving them, the contractor must have asked for an authorization from the site supervisor (Englobe) and obtained the client's approval. Accessories and equipment must be reinstalled at the same locations after the work, in proper functioning condition. The sites shall be restored to their initial condition or based on the client's guidelines.

In order to prepare the area to excavate, the contractor must clear the area of any waste or scrap, then remove topsoil, snow or ice, if applicable, based on the legislative provisions in force.

The contractor shall plan the asphalt removal at the Chartierville' site. The removal will be performed via levelling or cutting, based on the contractor's method.

At the Stanhope border crossing, the contractor shall plan for the removal of soils in a talus showing an approximate -27 % slope according to the survey performed on August 07,2020 or for the sawing of a concrete slab in order to perform its borehole and reconstruction of the concrete slab at the end of the work, as indicated in plans included in Appendix 3.

At the locations indicated on the plans or by the site supervisor, the contractor must excavate the soils in place. The contractor is responsible for putting aside reusable materials in a location approved by the client.

The contractor is responsible for disposing of any material deemed non-compliant for reuse by the supervisor at the locations approved by the MELCC. Samples and analyses could be required for these approvals, and they will be at the contractor's costs.

The contractor shall perform all excavations required for the connections or the replacement of the pipings and work planned as part of the contract by complying with the requirements of the BNQ 1809-300/2018 standard.

Regarding the existing public or private underground utility facilities, the contractor must take necessary means to protect and support them properly during their excavation. Any underground service breakage will be under the contractor's responsibility.

7.4.1 Typical Section of a Trench

The excavation slopes must meet the CNESST's requirements and any provisions included in the *Safety Code for the construction industry*.

The contractor must meet the sizes of the trench, as presented in the plans included in Appendix 3.

7.4.2 Extent and Depth of the Trench

The contractor must dig the trenches to the depths indicated on the plans, i.e.: at least 1.7 m with respect to ground surface, taking into consideration the base of the diameter of the piping. It should be noted that if it is not possible to reach this depth, a frost protection (polystyrene or other) for the piping shall be planned and installed by the contractor after confirmation by the project engineer (Englobe).

For each site, the contractor shall refer to the typical cross-section presented in the plans included in Appendix 3 for the width of the trench.

7.4.3 Execution of the Work

Before starting work, the contractor shall notify the engineer and the client for approval at least five (5) days in advance. The contractor must perform the work based on the layouts, levels and sizes indicated on the plans and the engineer's instructions, regardless of the nature of the soils observed. The contractor must perform all tasks in compliance with the requirements of the BNQ-1809-300 standard.

The contractor shall collect all required references to mark the parking spaces and lines at the parking lot of the Chartierville border crossing.

When required, the contractor shall proceed to the shoring of the excavations, namely near buildings, garages, physical obstacles, etc., and/or any other location deemed necessary on the field, in compliance with the section 9.1.12 of the BNQ-1809-300 document, in order to avoid any excavation less than 1 m from the mentioned buildings, and respect the working area planned for the work.

To this end, the contractor shall provide a shoring plan signed and sealed by an engineer, if required.

The contractor must maintain the bottom of the excavation dry, levelled and free of any loose, soft or organic substance.

7.4.4 Management of Materials (filling) and Excavation Water, and Protection of the Environment

The excavation materials could be reused for the backfilling operation after work is completed if they have been approved by the site supervisor.

The backfilling materials and topsoil that must be reused will be stockpiled on the site, at one or several locations indicated by the client.

Topsoil recovery must be performed in compliance with the CCDG.

Unacceptable or surplus materials will be transported outside the field at the contractor's costs and in compliance with the regulations in force.

The contractor is responsible for characterizing the disposed of materials.

The contractor is responsible for dewatering the excavations via pumping or any other mean (ditches or draining trenches, etc.) and water discharging, based on the applicable environmental standards.

In his/her bid, the contractor remains responsible for the calculation of the real volumes of excavated materials and backfilling materials.

7.5 Connection to the Existing System

The contractor shall confirm, before starting the work, that the products and materials he/she used comply with the requirements of the standards, which this contract documents refer to.

All materials (plastic, metals, etc.) and all products (faucets, valves, etc.) that will be in contact with drinking water must comply with the safety requirements of the products and materials in contact with drinking water, as specified in the BNQ-3660-950 document.

All plumber accessories containing metals and that are in contact with drinking water must comply with the requirements included in the NSF/ANSI 372 document.

The contractor must plan a plumber and electricity expert to perform the connection of the new pipings to the existing pipings, and the heating work described in the following section.

7.5.1 Connection to the Existing System at the Chartierville Border Crossing

At the Chartierville border crossing, the contractor will proceed to the installation of the new infrastructure (piping and wiring) from the new developed well to the existing building to be connected to the existing network inside the building, according to the Plan 0103 included in Appendix 3.

The contractor shall provide the plumber expert's plans showing the connection of the new piping and existing distribution network for approval.

7.5.2 Connection to the Existing System at the Stanhope Border Crossing

At the Stanhope border crossing (refer to Figure 5, Localization of the Site included in Appendix 1 and Plan 1, Current Condition included in Appendix 3), the contractor will proceed to the installation of the new infrastructure (piping and wiring) from the new developed well to the existing shed housing the current well and in which it will be connected to the existing network.

The presence of a fire fighting reservoir at this border crossing requires a specific installation in order to address the client's need. Like the current system, the newly installed system must be designed in a way piping from the pumping well directly fills the underground tank for the fire fighting back-up, which will then supply the building and its internal network. A valves system (developed in the existing shed) will enable by-passing the fire fighting reservoir to directly supply the building network from the pumping well, when needed.

Controlled Work

The contractor shall present the plumber expert's plans associated to the connections, valves systems and connecting pipings located inside the shed, as indicated on the plan, for approval before starting the work. The contractor must ensure that the plumber installations meet the standards of the *Construction Code* and *Safety Code*.

The contractor must ensure pipings, elbows and any other infrastructure are waterproof before placing the concrete filling. If a waterproofing issue is observed or a piping breakage or any other damage occurs following the installation of the concrete filling, the contractor shall solve the issue (s) and recast the filling concrete at his/her costs.

The projected infrastructure must meet the current need, but they must be raised to the ground level inside the shed. Aboveground infrastructure (valves, pipings, etc.) that will be raised to the surface must be secured to the shed's walls.

7.5.2.1 Backfilling of the Shed

The contractor shall backfill the shed, as presented on the plan. The backfilling must be performed using expansive filling concrete. The contractor shall present the mix formulations he/she plans to use for approval. The mix formulations must meet the specifications of the following table.

Table 1 Specification of the Filling Concrete

Compression Strenght (MPa)	Maximum Content in Concrete (kg/m^3)	Size of the Coarse Aggregates (mm)	Minimum Density of the Concrete (kg/m^3)
1.0	25	5-20	2,300

Concrete must contain at least 50 % of coarse aggregates.

The contractor shall plan a 24 h delay after installing the filling concrete and before undertaking a new task inside the shed.

The contractor shall take all necessary measures to protect the water piping and electric wires throughout the backfilling. If a pipe, an elbow or any other section of the plumber facilities are damaged, the contractor shall perform the required repair at his/her costs.

7.5.2.2 Plywood

The contractor shall install (or lay) a raised floor built with wood framing, and covered with ¾ inch plywood, as presented on the plan associated with the concrete filling and described in Section 7.1.2. The framing must meet the applicable provincial and/or federal standards.

7.5.2.3 Electricity inside the Shed

Controlled Work

The contractor shall present the electricity expert's plans associated to the electrical fittings, installation of a heating system, and any other element required for the smooth functioning of the facilities for approval before starting the work. The contractor must ensure that the electricity facilities meet the standards of the *Construction Code* and *Safety Code*.

7.5.3 Tests and Acceptance Criteria

All tests, measurements, inspections, verification, cleaning and disinfection that are required in this section must be performed by specialized firms under the authority and primary direction of an engineer from these firms, and a report signed by the latter shall be submitted to the supervising engineer.

All measuring instruments such as pressure gauges, chronometers, distortion measure devices, and any other instrument or device used by the specialized firm to make measurements must be calibrated at least once a year, and a calibration certificate must be submitted to the supervising engineer.

Before the commissioning, the contractor shall provide a plan that clearly illustrates the new drinking water pipings, all their accessories and connections as well as the portion of the existing network impacted by the work. This plan must indicate the areas of intervention on the drinking water pipings for the cleaning, rinsing, disinfecting and sampling work.

Following the installation of the aqueduct pipings, the contractor must ensure that the following tests and work are performed, as specified in the BNQ-1809-300 standard, and their results comply with the requirements of the latter:

- Leak test: Based on the type of piping installed, the test must be conducted according to the standards in force.
- Disinfection.

7.5.3.1 Acceptance

All the tests results, including the non-compliant results, must be recorded in a report produced and signed by the microbiologist of the accredited laboratory. This report must be submitted to the engineer to obtain a certificate that will be required upon the temporary acceptance of the work.

7.6 Power Supply of the New Wells

7.6.1 Installation and Covering of Cables

The contractor shall install electric cables at a depth of 950 mm below native soils and a red flagging tape at 450 mm above electric cables, as presented on the plan (refer to Appendix 3).

The electric cables must be placed on a base showing a 75 mm thickness of material complying with the requirements of the Quebec C*onstruction* Code, Chapter V, as presented in the plan.

The contractor shall cover the electric cables with a minimum thickness layer of 50 mm of material complying with the requirement of the Quebec C*onstruction* Code, Chapter V, as presented on the plan. A permanent marking with a “DANGER” tape must be put in place by the contractor above the electric cables for eventual future excavations.

7.7 Covering of the Piping

7.7.1 Materials, thickness and Base Making

The piping’s base must be composed of CG-15 type granular materials, complying with the requirements of the BQN 1809-300 standard. The base’s materials must be placed by layers not exceeding a 300 mm thickness, and compacted at least at 90 % from the reference value of the modified Proctor. The thickness of the base must be as uniform as possible.

The sizes of the base must meet the sizes presented on the plans.

The contractor shall meet the requirements of the BNQ 1809-300 standard.

7.7.2 Covering of the Piping

Down to 300 mm above the piping, the backfilling of the trench must be performed by layers not exceeding 300 mm before compaction using C-14 granular materials compacted at 90 % from the modified Proctor throughout the width of the trench.

The requirements associated with the covering material are the same as for the base covering.

7.8 Backfilling and Compaction

7.8.1 Backfilling

The contractor must backfill with the excavation materials (class B materials) if they have proven adequate and they are approved by the supervisor.

At the Chartierville border crossing, the contractor must provide type MG-112 materials on a thickness of 300 mm, and MG-20 type materials on a thickness of 200 mm to backfill the paving foundation, as presented on the plan.

7.8.2 Restoration of the Surfaces

7.8.2.1 Grassy Surfaces

Work consists in covering with rolled sod the surfaces initially covered with grass or adjacent to these surfaces, and that have been impacted by the work.

Work includes all the preparation and cleaning operations of the ground in place, seeding or sodding, including the provision and installation of topsoil, and maintenance of grassy surfaces. Work must comply with the Parts II and IV of the BNQ 0605-100 standard as well as the Section 19.3 (*Engazonnement*) of the CCDG.

7.8.2.2 Application of an Asphalt Overlay (thickness of 60 mm)

At the Chartierville border crossing, the contractor shall plan an asphalt overlay.

The asphalt layer must be applied at an ambient temperature of more than 5 °C.

Traffic is prohibited on the new applied asphalt until no distortion is observed on the paving surface. The contractor shall ensure that his/her employees do not walk on the newly applied asphalt.

At all times, the supervisor may collect, at the plant or on the field, the samples required for the quality control of the products.

The contractor shall present the mix formulations he/she plans to use for approval.

The mix formulations must meet the specifications of the following table.

Tableau 2 Asphat Specification

Type of Asphalt	Category of Asphalt	Features of the Aggregates	Use
ESG-14	PG 58H-34	2b2	Single layer

The aggregates' specified features, based on the type of mix, refer to the Tables 2, 3 and 4 of the BNQ 2560 114-I/2014 standard and to the Standard 4202 of the Section 4 (*Liants et enrobés*) described in the *Tome VII – Matériaux* of the collection *Normes – Ouvrages routiers* of the MTQ.

7.8.2.3 Short-Term Pavement Marking

Work consists in marking the parking lot with a short-term product in compliance with the MTQ's *Tome VII – Matériaux*.

The contractor shall ensure that the product used suits its purpose by considering the type of surface layer (asphalt), the texture of the surface layer and the other conditions of the surface.

The contractor carries out the marking based on the measurements indicated on the marking plans he/she has designed before erasing the lines and beginning of work.

After the marking work, if the supervisor observes non-compliances with respect to the marking plan, adjustments are made to the contractor's cost.

The width of the longitudinal marks shall range between 110 mm and 120 mm.

7.8.3 Protection of the New Catchment Works (Stanhope and Chartierville)

Since groundwater withdrawals at both border crossings have been established as a category 3, according to the WWPR, a squared wire mesh fence with 6 m (20 ft) length sides (Chartierville) and 4 m (Stanhope) will have to be centered around each well. The fence, corner posts and door shall have a minimum height of 1.8 m (6 ft). A double lockable access door shall be installed to cover the entire width of the fence (3 m centered on the well in Chartierville and 2 m centered on the well in Stanhope) on the southearn side (Stanhope) and on the southern side (Chartierville) and to allow a pickup truck to move back in the vicinity of the wells to perform work such as pump removing or any other activity requiring machinery. The door shall also give free access to the fence height when the latter is opened. For more details, please refer to drawings 004 and 005 included in Appendix 1.

All components of the fence must be made of galvanized steel.

Finally, a minimum of three (3) standard bollards must be installed around the Stanhope well in order to increase its visibility and safety.

8 Elevation Drawing

At the end of the work, the contractor is in charge of providing plans and cross-sections (elevation drawings) of the work for the Stanhope and Chartierville border crossings to the owner. The latter must have been accepted by the project engineer.

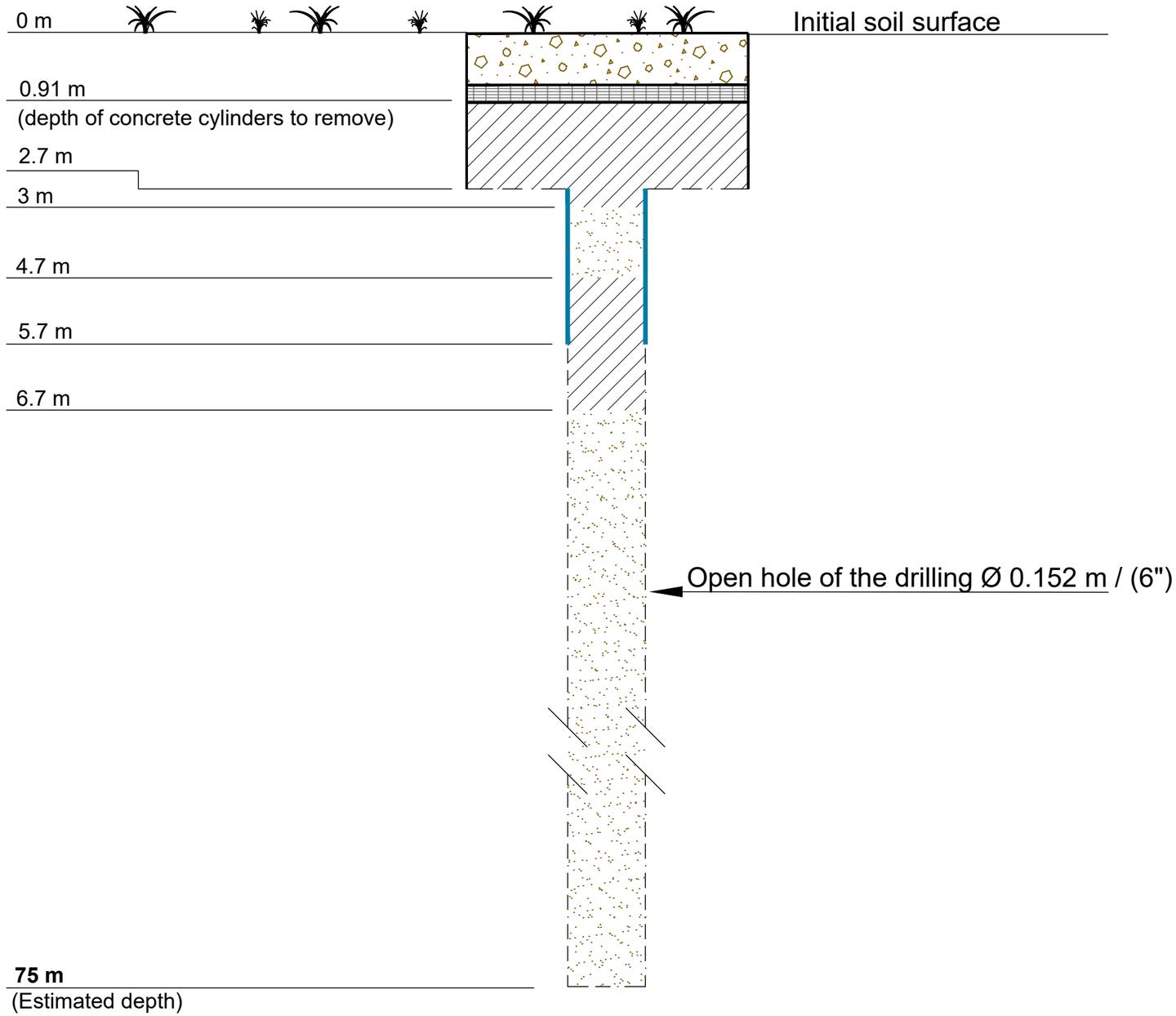
9 Authorization, Right of Way and Access Road

The bidding contractor shall consider that all the right of ways, access and authorizations required as part of the achievement of the work will be obtained from the client.

To that end, the contractor shall complete the work permit request and submit it at least 72 h before the work to the person in charge of H&S at BGIS (refer to document *Permis de notification de travail de tierce partie 2020* , included in Appendix 5).

Regarding work that will be performed in confined space, an additional form related to work in confined space permit must be completed on the day work are performed and approved by the person in charge of H&S at BGIS.

Appendix 1 Figures



NOTES:
The well detail is not to scale

LEGEND:

- Compliant sand or excavated materials
- Compliant sand
- Impervious material
- Concrete plate with Ø ≥ 1.5 m and a thickness of 0.05 m (2")
- Steel casing Ø 0.152 m

Seal

Scale

Client
Environmental Services
Public Works and
Government Services Canada (PWGSC)

Englobe Corp.
1309 Saint-Paul Blvd
Chicoutimi, Quebec
G7J 3Y2
418-698-6827

Project
Hydrogeologic Study
- Border Crossings
Client Ref.: R.050773.009
Saint-Bernard-de-Lacolle (Quebec)

Title
Well Sealing Detail
Saint-Bernard-de-Lacolle
Border Crossing (Road 15) Figure 1

Discipline: Hydrogeology		Prepared by: Annie-Pier Elliott, M.Sc.A.	Verified by: Annie-Pier Elliott, M.Sc.A.
Scale: No Scale		Drawned by: R. Careau	Approved by: S. Bouchand, geo. M.Sc.A
Date: 13-07-2020		Figure n°:	
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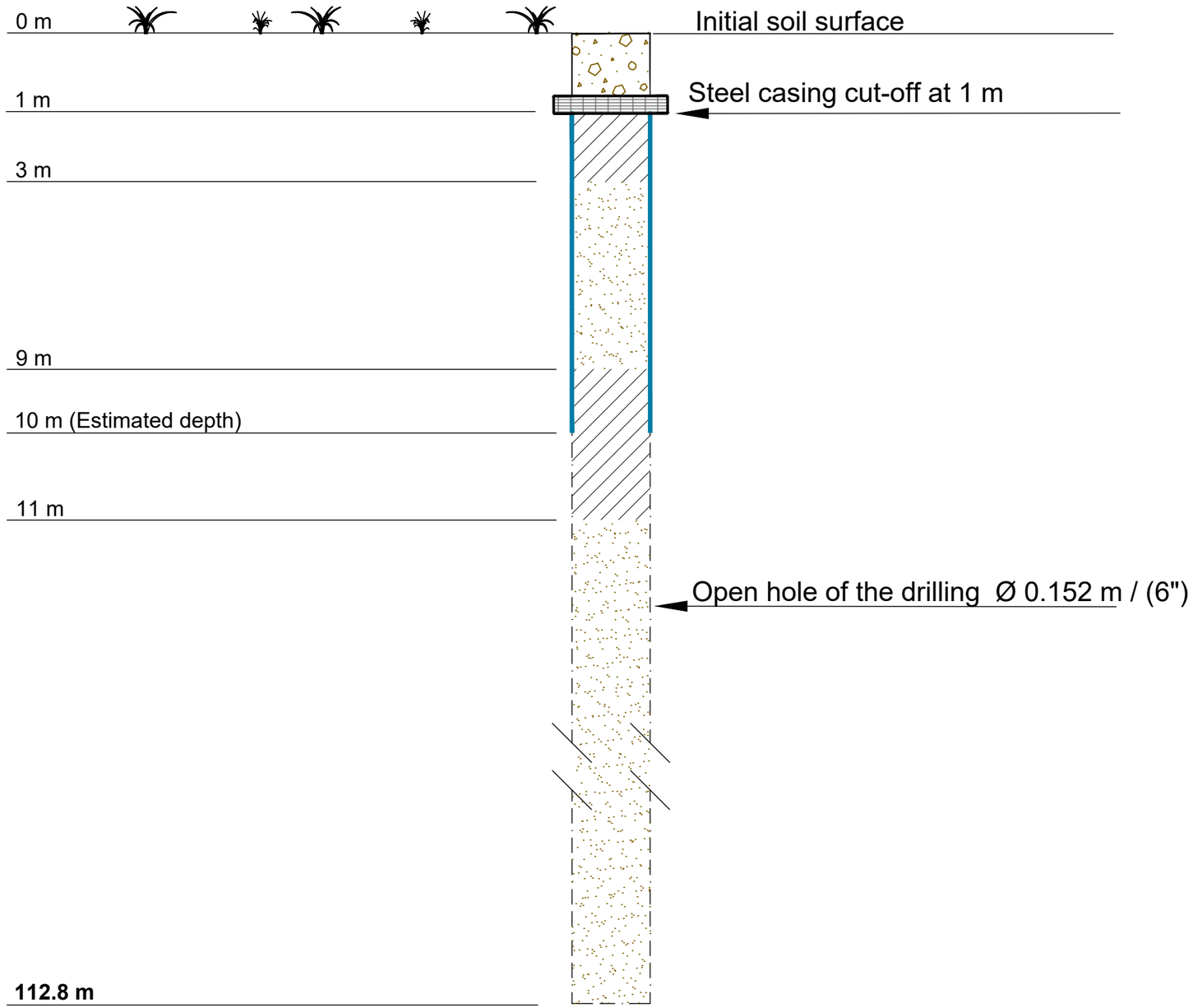

LEGEND:

- Compliant sand or excavated materials
- Compliant sand
- Impervious material
- Concrete plate with Ø ≥ 0.254 m and a thickness of 0.05 m (2")
- Steel casing Ø 0.2 m

NOTES:
The well detail is not to scale

Seal

Scale

Client
Environmental Services
Public Works and
Government Services Canada (PWGSC)

Englobe Corp.
1309 Saint-Paul Blvd
Chicoutimi, Quebec
G7J 3Y2
418-698-6827

Project
Hydrogeologic Study
- Border Crossings
Client Ref.: R.050773.009
Frelighsburg (Quebec)

Title
Well Sealing Detail
Frelighsburg
Border Crossing Figure 2

Discipline: Hydrogeology		Prepared by: Annie-Pier Elliott, M.Sc.A.	Verified by: Annie-Pier Elliott, M.Sc.A.
Scale: No Scale		Drawned by: R. Careau	Approved by: S. Bouchand, geo. M.Sc.A
Date: 13-07-2020		Figure n°:	
Page setup: 0002	Paper format: ANSI full bleed B (17.00 x 11.00 pouces)	Register n°:	

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0 1 2 3 4 5

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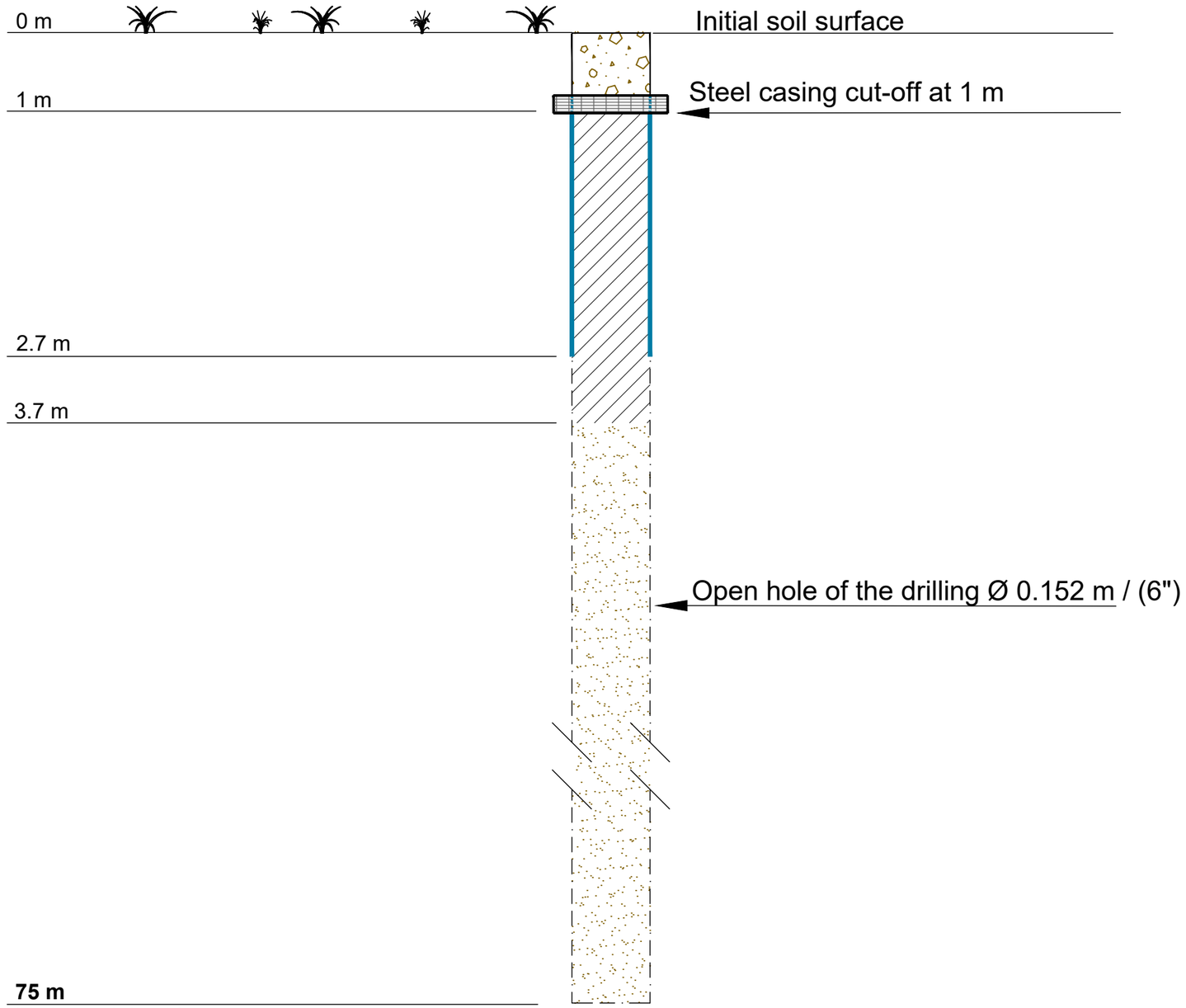

NOTES:
The well detail is not to scale

LEGEND:

- Compliant sand or excavated materials
- Compliant sand
- Impervious material
- Concrete plate with Ø ≥ 0.254 m and a thickness of 0.05 m (2")
- Steel casing Ø 0.152 m

Seal

Scale

Client
Environmental Services
Public Works and
Government Services Canada (PWGSC)

Englobe Corp.
1309 Saint-Paul Blvd
Chicoutimi, Quebec
G7J 3Y2
418-698-6827

Project
Hydrogeologic Study
- Border Crossings
Client Ref.: R.050773.009
Woburn (Quebec)

Title
Well Sealing Detail
Woburn Border Crossing Figure 3

Discipline: Hydrogeology		Prepared by: Annie-Pier Elliott, M.Sc.A.	Verified by: Annie-Pier Elliott, M.Sc.A.
Scale: No Scale		Drawned by: R. Careau	Approved by: S. Bouchand, geo. M.Sc.A
Date: 13-07-2020		Figure n°:	
Page setup: 0003	Paper format: ANSI full bleed B (17.00 x 11.00 pouces)	Register n°:	

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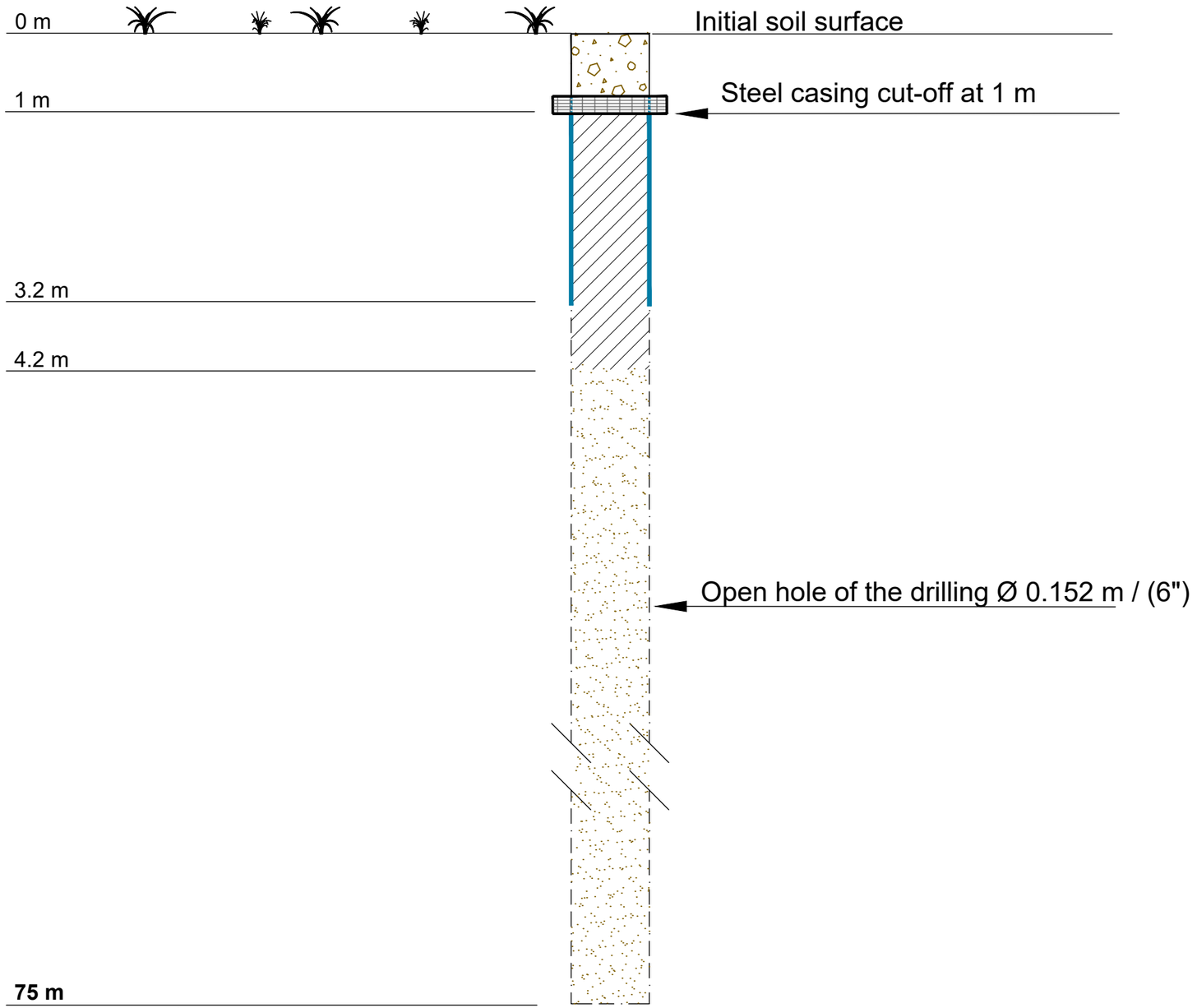

NOTES:
The well detail is not to scale

LEGEND:

- Compliant sand or excavated materials
- Compliant sand
- Impervious material
- Concrete plate with Ø ≥ 0.203 m and a thickness of 0.05 m (2")
- Steel casing Ø 0.152 m

Seal

Scale

Client
Environmental Services
Public Works and
Government Services Canada (PWGSC)

Englobe Corp.
1309 Saint-Paul Blvd
Chicoutimi, Quebec
G7J 3Y2
418-698-6827

Project
Hydrogeologic Study
- Border Crossings
Client Ref.: R.050773.009
Chartierville (Quebec)

Title
Well Sealing Detail
Chartierville Border Crossing Figure 4

Discipline: Hydrogeology		Prepared by: Annie-Pier Elliott, M.Sc.A.	Verified by: Annie-Pier Elliott, M.Sc.A.
Scale: No Scale		Drawned by: R. Careau	Approved by: S. Bouchand, geo. M.Sc.A
Date: 13-07-2020		Figure n°:	
Page setup: 0004	Paper format: ANSI full bleed B (17.00 x 11.00 pouces)	Register n°:	

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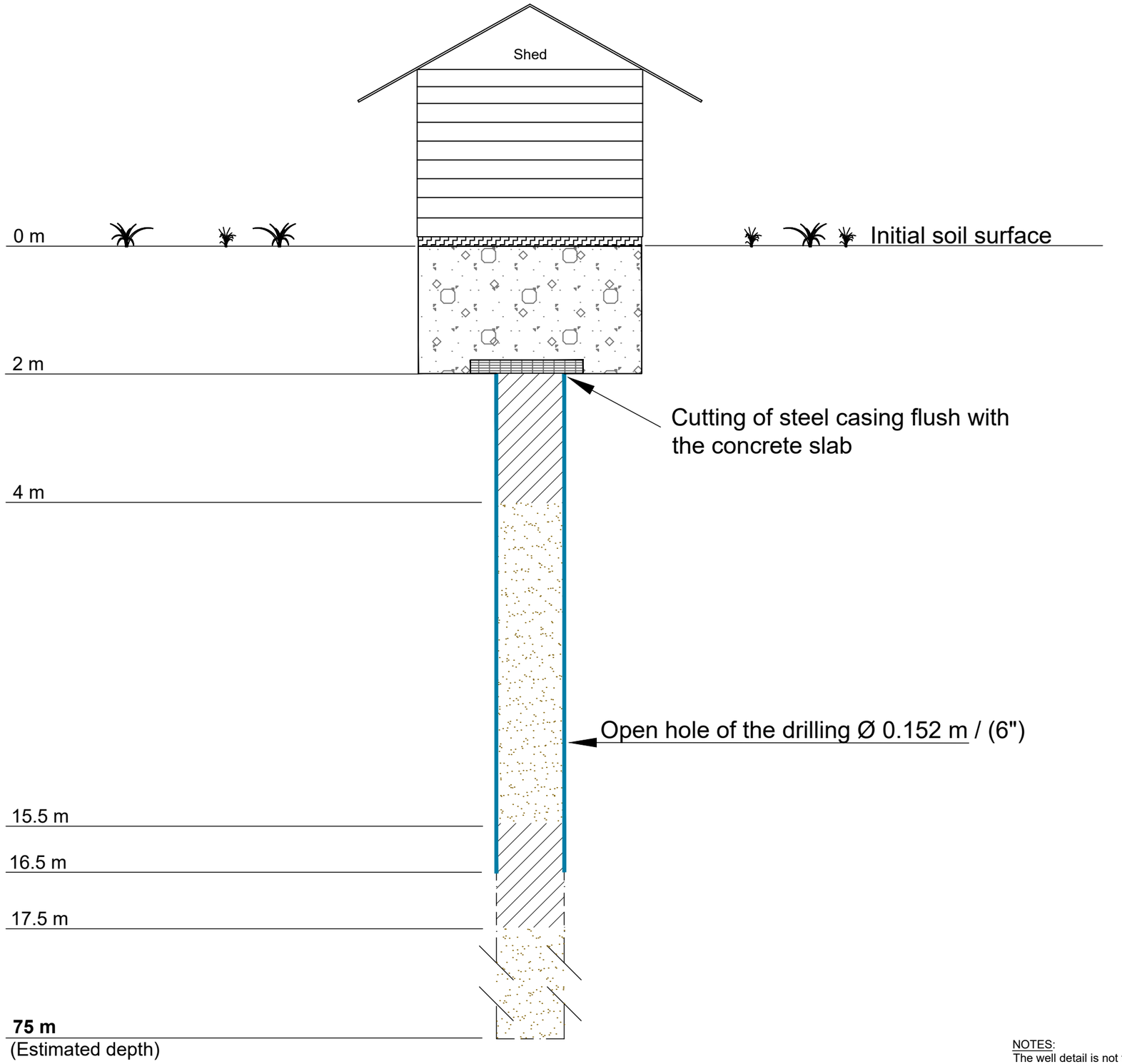

NOTES:
The well detail is not to scale

LEGEND:

- Concrete backfill
- Compliant sand
- Impervious material
- Concrete plate with Ø ≥ 0.203 m and a thickness of 0.05 m (2")
- Steel casing Ø 0.152 m
- 3/4" Plywood

Seal

Scale

Client
Environmental Services
Public Works and
Government Services Canada (PWGSC)

Englobe Corp.
1309 Saint-Paul Blvd
Chicoutimi, Quebec
G7J 3Y2
418-698-6827

Project
Hydrogeologic Study
- Border Crossings
Client Ref.: R.050773.009
Stanhope (Quebec)

Title
Well Sealing Detail
Stanhope Border Crossing Figure 5

Discipline: Hydrogeology		Prepared by: Annie-Pier Elliott, M.Sc.A.	Verified by: Annie-Pier Elliott, M.Sc.A.
Scale: No Scale		Drawned by: R. Careau	Approved by: S. Bouchand, geo. M.Sc.A
Date: 13-07-2020		Figure n°:	
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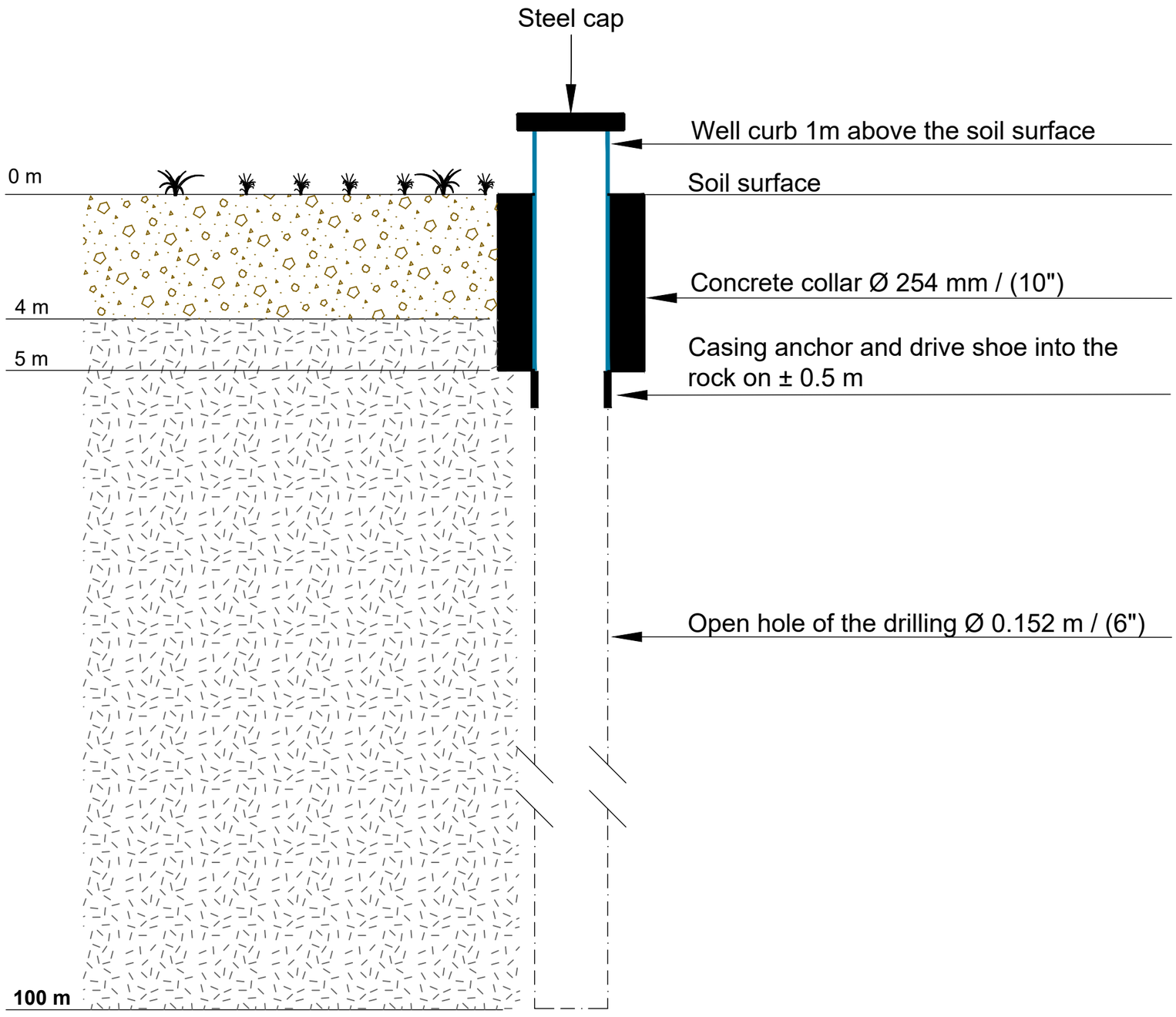

NOTES:
The well detail is not to scale

LEGEND:

- Surficial deposits
- Rock
- Steel casing Ø 0.152 m (Lenght including the well curb: 6.5m (6")

Seal

Scale

Client
Environmental Services
Public Works and
Government Services Canada (PWGSC)

Englobe Corp.
1309 Saint-Paul Blvd
Chicoutimi, Quebec
G7J 3Y2
418-698-6827

Project
Hydrogeologic Study
- Border Crossings
Client Ref.: R.050773.009
Chartierville (Quebec)

Title
Well Construction Detail
Chartierville Figure 6

Discipline: Hydrogeology		Prepared by: Annie-Pier Elliott, M.Sc.A.	Verified by: Annie-Pier Elliott, M.Sc.A.
Scale: No Scale		Drawned by: R. Careau	Approved by: S. Bouchand, geo. M.Sc.A
Date: 13-07-2020		Figure n°:	
Page setup: 0006	Paper format: ANSI full bleed B (17.00 x 11.00 pouces)	Register n°:	

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10 cm
0 1 2 3 4 5

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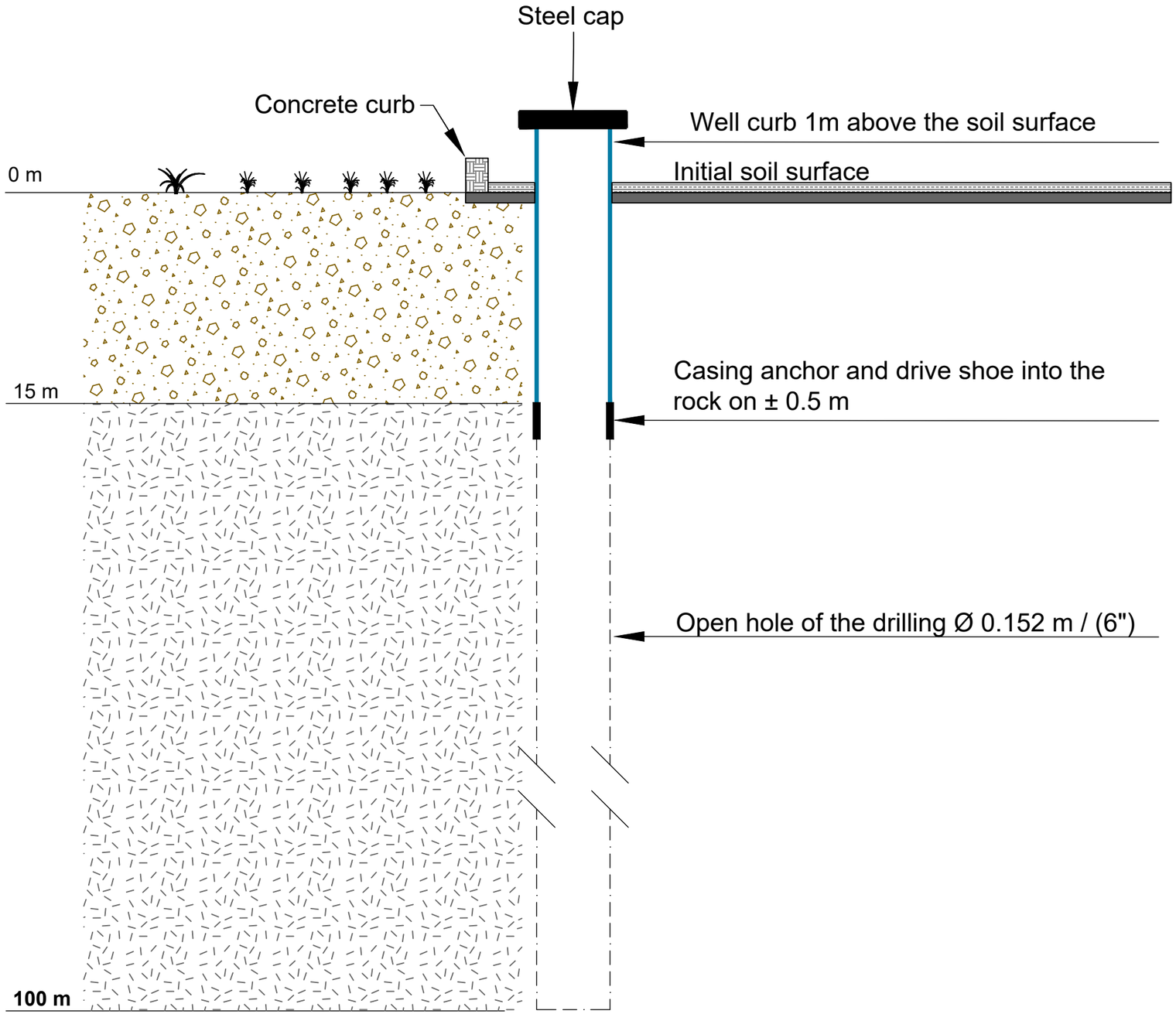

NOTES:
The well detail is not to scale

LEGEND:

- Surficial deposits
- Rock
- Steel casing Ø 0.152 m (Lenght including the well curb:16.5m (6")
- Asphalt
- Concrete curb
- Concrete slab with a thickness of 0.1524 m (6")

Seal

Scale

Client
Environmental Services
Public Works and
Government Services Canada (PWGSC)

Englobe Corp.
1309 Saint-Paul Blvd
Chicoutimi, Quebec
G7J 3Y2
418-698-6827

Project
Hydrogeologic Study
- Border Crossings
Client Ref.: R.050773.009
Stanhope (Quebec)

Title
Well Construction Detail
Stanhope Figure 7

Discipline: Hydrogeology		Prepared by: Annie-Pier Elliott, M.Sc.A.	Verified by: Annie-Pier Elliott, M.Sc.A.
Scale: No Scale		Drawned by: R. Careau	Approved by: S. Bouchand, geo. M.Sc.A
Date: 13-07-2020		Figure n°:	
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153	P-0021254	0-01-100	HD	D	0007	01

This document must be used jointly with the recommendations formulated in the geotechnical study report

Seal

Scale

0 10 20 30 40 50 62,5 m

1:1 250

Client

Environmental Services
Public Works and Government Services Canada (PWGSC)

Englobe Corp.
1309 Saint-Paul Blvd
Chicoutimi, Quebec
G7J 3Y2
418-698-6827

Project

Hydrogeologic Study- Border Crossings

Saint-Bernard-de-Lacolle (Quebec)

Title

Approximate Location of the Well Sealing at the Saint-Bernard-de-Lacolle Border Crossing (Road 15)
Google Earth Map Background

Discipline: Hydrogeology		Prepared by: Annie-Pier Elliott. M.Sc.A.	Verified by: Annie-Pier Elliott. M.Sc.A.
Scale: 1:1 250		Drawned by: K.DésyS. Bouchand. geo. M.Sc.A.	Approved by:
Date: 15/07/2020		Figure n°:	
Page setup: 0001	Paper format: ANSI full bleed B (17,00 x 11,00 pouces)	Register n°:	

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This document must be used jointly with the recommendations formulated in the geotechnical study report

Seal

Scale

0 5 10 15 20 30 37,5 m

1:750

Client

Environmental Services
Public Works and Government Services Canada (PWGSC)

Englobe Corp.
1309 Saint-Paul Blvd
Chicoutimi, Quebec
G7J 3Y2
418-698-6827

Project

Hydrogeologic Study- Border Crossings

Frelighsburg (Quebec)

Title

Approximate Location of the Well Sealing in Frelighsburg

Google Earth Map Background

Discipline: Hydrogeology		Prepared by: Annie-Pier Elliott, M.Sc.A.	Verified by: Annie-Pier Elliott, M.Sc.A.
Scale: 1:750		Drawned by: K.Désy	Approved by: S. Bouchand. M.Sc.A.
Date: 15/07/2020		Figure n°:	
Page setup: 0002	Paper format: ANSI full bleed B (17,00 x 11,00 pouces)	Register n°:	

Resp.	Projet	OTP	Projet/ Disc	Phase/ Type	Réf. élec. / No.Dessin	Rév.
153	P-0021254	0-01-100	GE	D	0002	01

LEGEND :

Well sealing in Woburn

This document must be used jointly with the recommendations formulated in the hydrogeological study report

Seal

Scale

0 5 10 15 20 30 37,5 m

1:750

Client

Environmental Services
Public Works and Government Services Canada (PWGSC)

Englobe Corp.
1309 Saint-Paul Blvd
Chicoutimi, Quebec
G7J 3Y2
418-698-6827

Project

Hydrogeologic Study-
Border Crossings

Woburn (Quebec)

Title

Approximate Location of the Well Sealing in Woburn

Google Earth Map Background

Discipline: Hydrogeology		Prepared by: Annie-Pier Elliott. M.Sc.A.	Verified by: Annie-Pier Elliott. M.Sc.A.
Scale: 1:750		Drawned by: K.Désy	Approved by: S. Bouchand. geo. M.Sc.A.
Date: 15/07/2020		Figure n°:	
Page setup: 0003	Paper format: ANSI full bleed B (17.00 x 11.00 pouces)	Register n°:	

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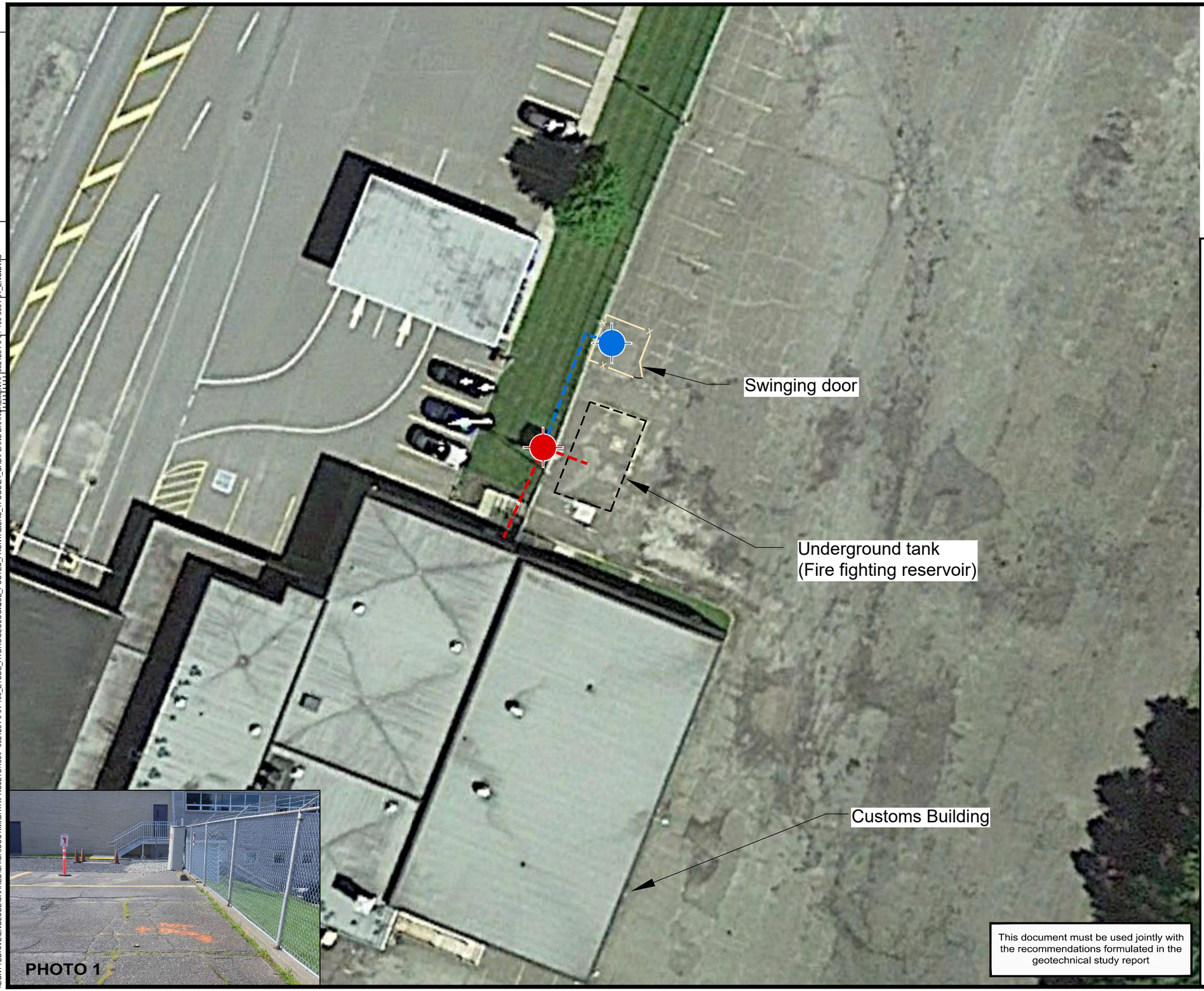

LEGEND :

- Existing well Stanhope
- Proposed well
- Existing connection
- Proposed connection
- Proposed fence 4 m × 4 m

Seal

Scale

0 2,5 5 7,5 10 15 20 25 m

1:500

Client

Environmental Services
Public Works and Government Services Canada (PWGSC)

Englobe Corp.
1309 Saint-Paul Blvd
Chicoutimi, Quebec
G7J 3Y2
418-698-6827

Project

Hydrogeologic Study-
Border Crossings

Stanhope (Quebec)

Title

Approximate Location of the Well Sealing in Stanhope

Google Earth Map Background

Discipline: Hydrogeology		Prepared by: Annie-Pier Elliott. M.Sc.A.	Verified by: Annie-Pier Elliott. M.Sc.A.
Scale: 1:500		Drawned by: K.Désy	Approved by: S. Bouchand. geo. M.Sc.A.
Date: 2020-09-03		Figure n°:	
Page setup: 0004	Paper format: ANSI full bleed B (17.00 x 11.00 Inches)	Register n°:	

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153	P-0021254	0-01-100	GE	D	0004	01

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This document must be used jointly with the recommendations formulated in the geotechnical study report

Seal

Scale

0 1 2 3 5 7,5 10 15 m

1:300

Client

Environmental Services
Public Works and Government Services Canada (PWGSC)

Englobe Corp.
1309 Saint-Paul Blvd
Chicoutimi, Quebec
G7J 3Y2
418-698-6827

Project

Hydrogeologic Study- Border Crossings

Chartierville (Quebec)

Title

Approximate Location of the Well Sealing in Chartierville

Google Earth Map Background

Discipline: Geotechnical		Prepared by: Annie-Pier Elliott. M.Sc.A.	Verified by: Annie-Pier Elliott. M.Sc.A.
Scale: 1:300		Drawned by: K.Désy	Approved by: S. Bouchand. geo. M.Sc.A.
Date: 2020-09-04		Figure n°:	
Page setup: 0005	Paper format: ANSI full bleed B (17.00 x 11.00 Inches)	Register n°:	

Resp.	Projet	OTP	Projet/ Disc	Phase/ Type	Réf. élec. / No.Dessin	Rév.
153	P-0021254	0-01-100	GE	D	0005	01

Appendix 2 Photographic Report

Photo 1: View toward south – Localization of the well to seal at the Saint-Bernard-de-Lacolle Crossing Border (Road 15).

Photo 2: View inside the well at Saint-Bernard-de-Lacolle (Road 15).

Photo 3: Aerial view – Localization of the well to seal and access road at the Frelishburg Crossing Border.

Photo 4: Closer view on the well in Frelishburg.

Photo 5: View to the south – Localization of the well to seal at the Woburn Crossing Border.

Photo 6: Closer view on the well in Woburn.

Photo 7: View to the northeast – Localization of the well to seal in Chartierville.

Photo 8: Closer view on the well in Chartierville.

Photo 9: View to the northeast – Localization of the new well projected at the Chartierville Crossing Border.

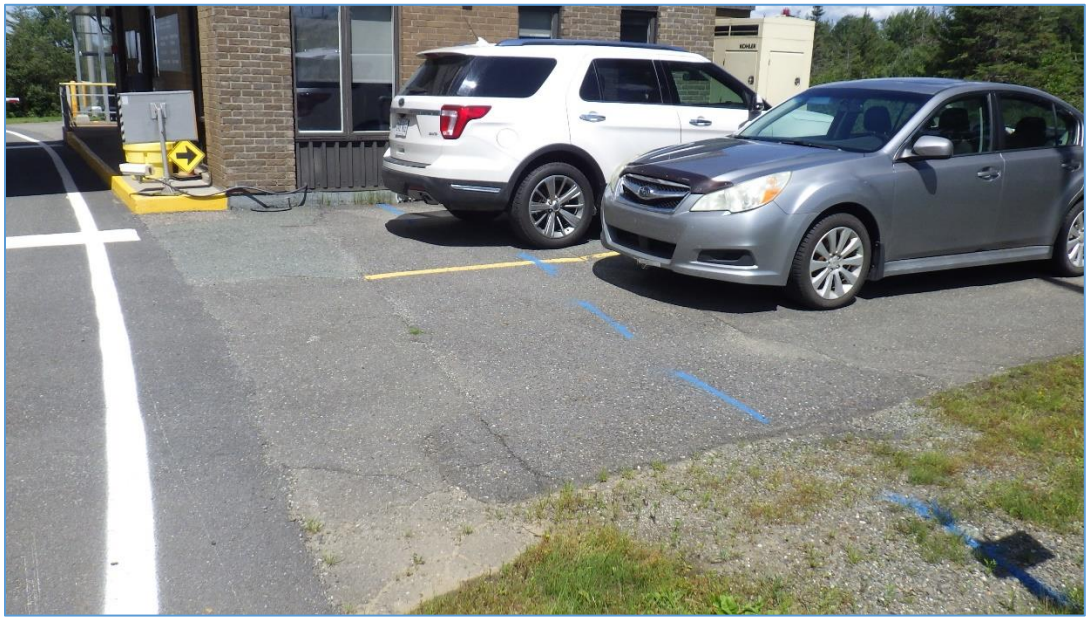

Photo 10: Pavement and asphalt to remove and replace after the installation of the piping at the Chartierville Crossing Border.

Photo 11: View to the east - Localization of the shed inside which is located the well to seal at the Stanhope Broder Crossing.

Photo 12: View to the east - Localization of the shed to backfill after the connection of the new well at the Stanhope Border Crossing.

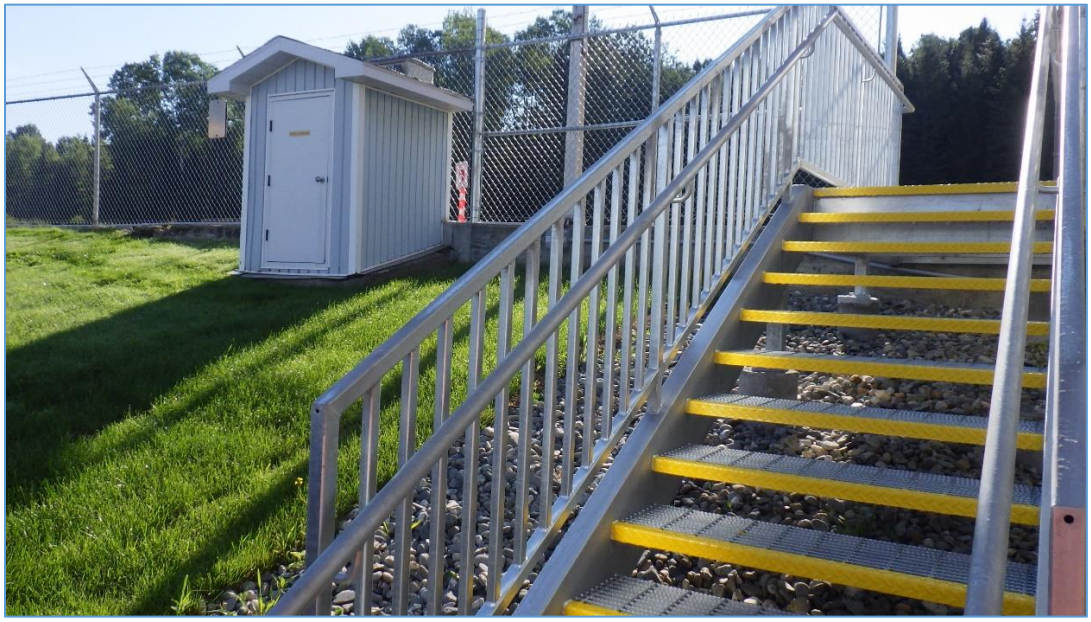

Photo 13: View to the east – Outside view of the shed to backfill after the connection of the new well at the Stanhope Border Crossing.

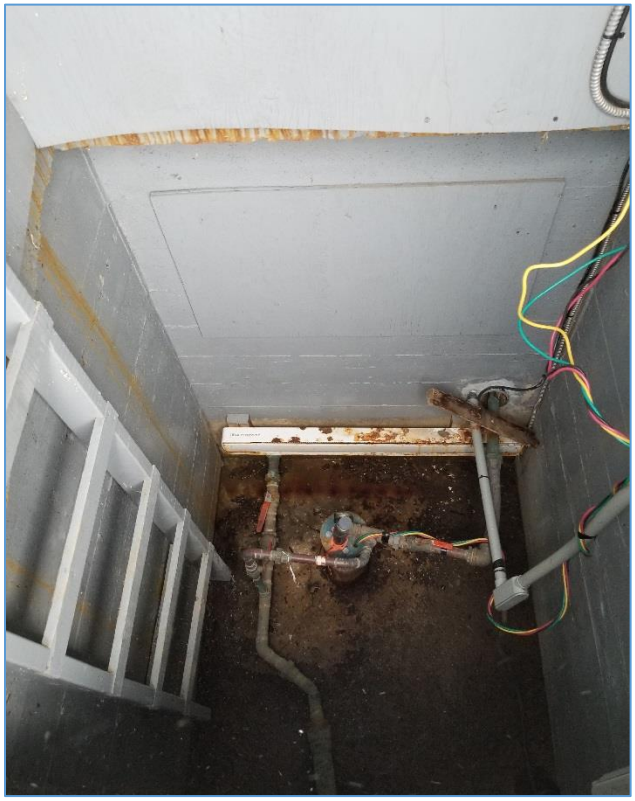

Photo 14: View of the well in Stanhope located inside the shed.

Photo 15: Localization of the new well projected at the Stanhope Border Crossing.

Photo 16: Localization of the talus in which the projected piping will be developed at the Stanhope Border Crossing.

Appendix 3 Plans

10 cm
5
4
3
2
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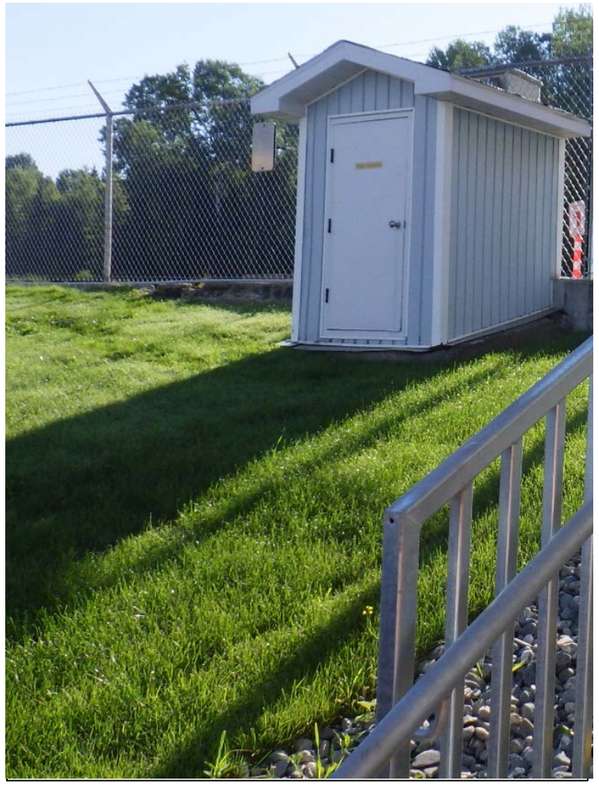
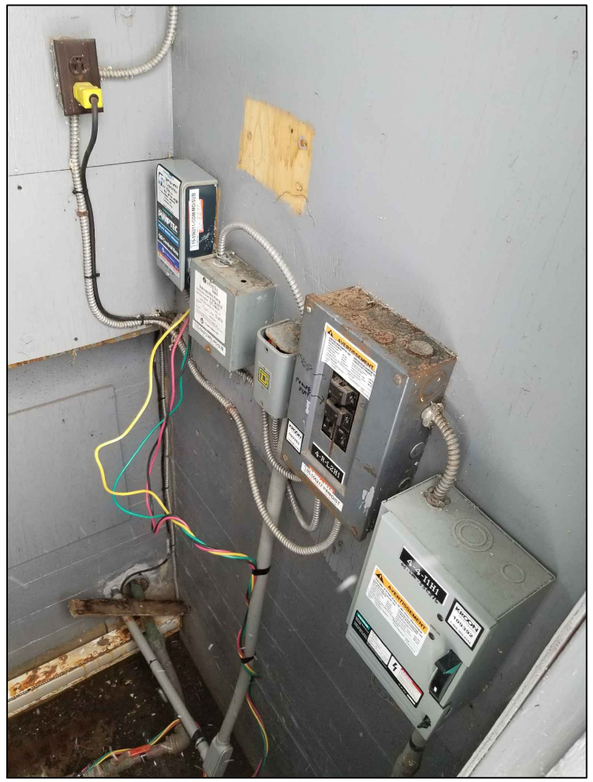
0

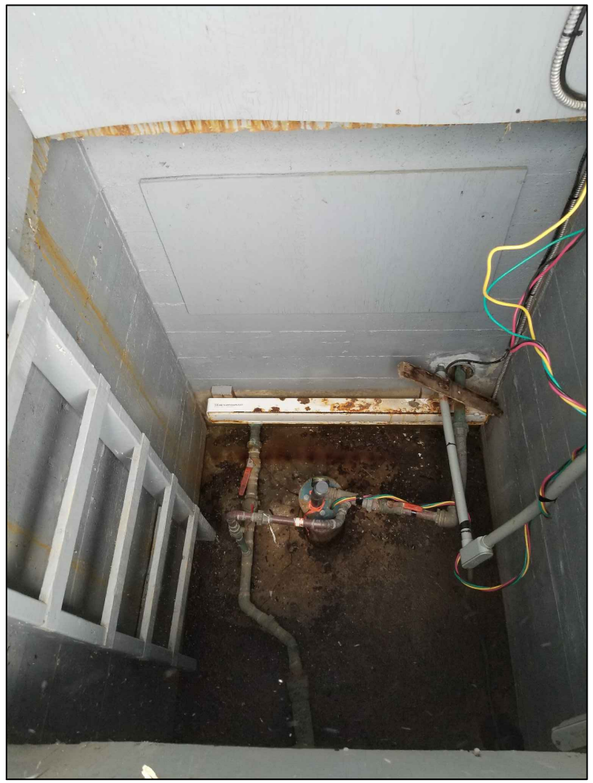
Current well' shed



Electrical panels and components inside the shed



Current well and plumbing inside the shed



NOTES :

1- Current well and connections are in confined space;
2- Plumbing and electricity entries and outlets, and electrical / heating equipment shall be adjusted to the future floor projected in the shed. (See Section 7.5.2)

Jacques Blanchet
106232
QUÉBEC

BID
THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION PURPOSES

Client
Canada Border Services Agency

Project
Technical Plans and Specifications for the Connection of a New Well Stanhope Site

Title
Current Condition

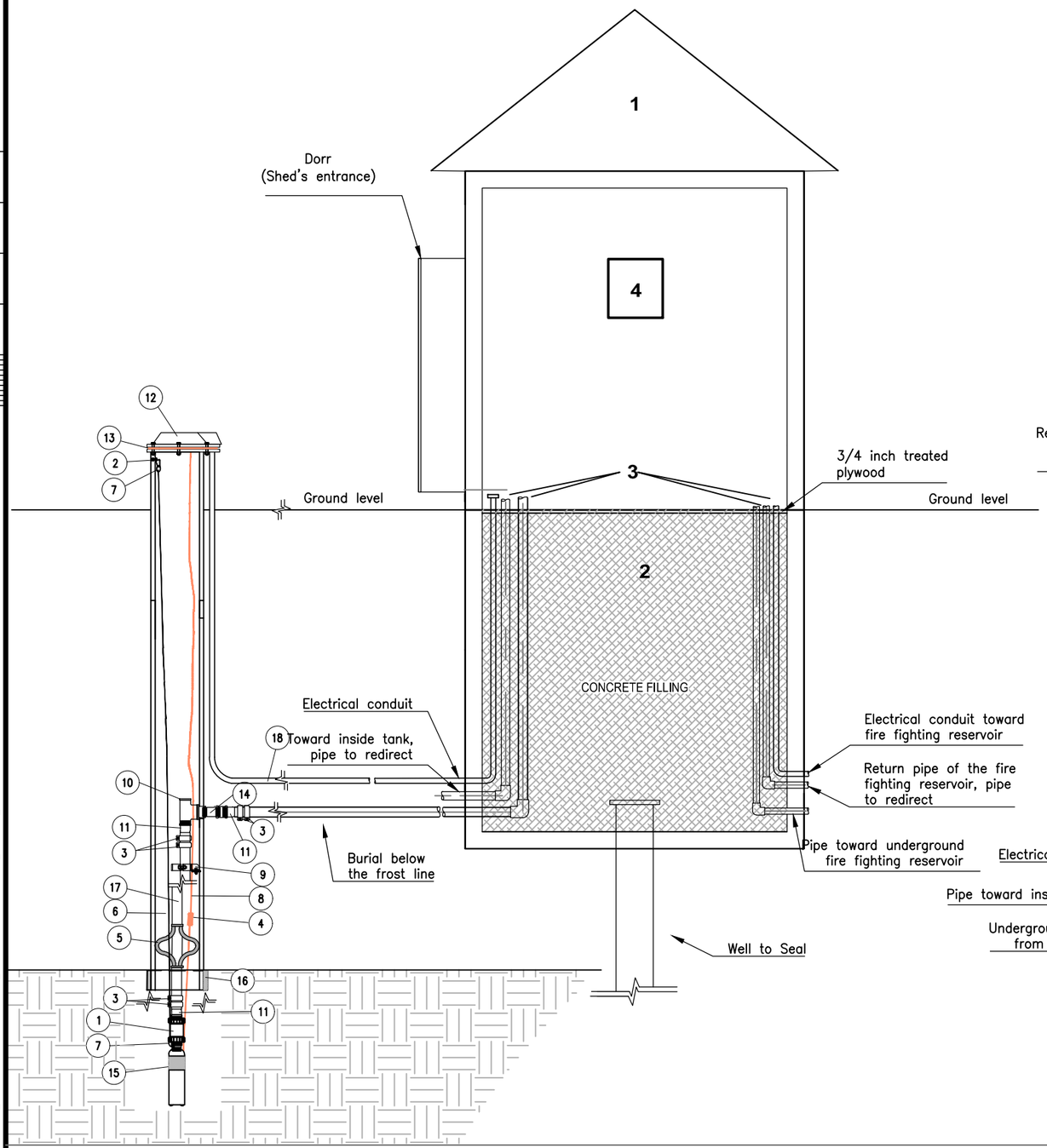
Englobe Corp.
505 du Parc-Technologique Boulevard
Suite 200
Québec (Quebec)
G1P 4S9
418-781-0191

Discipline : Geoenvironment		Prepared by : S.-T. Sow	Verified by : J. Blanchet, Eng.
Scale : Not to scale		Drawned by : M.-A. Girard	Approved by : S. Bouchand
Date : 2020-07-16		Figure no : 1 of 4	
Page Setup : 0101	Paper format : 11x17	Register no : —	

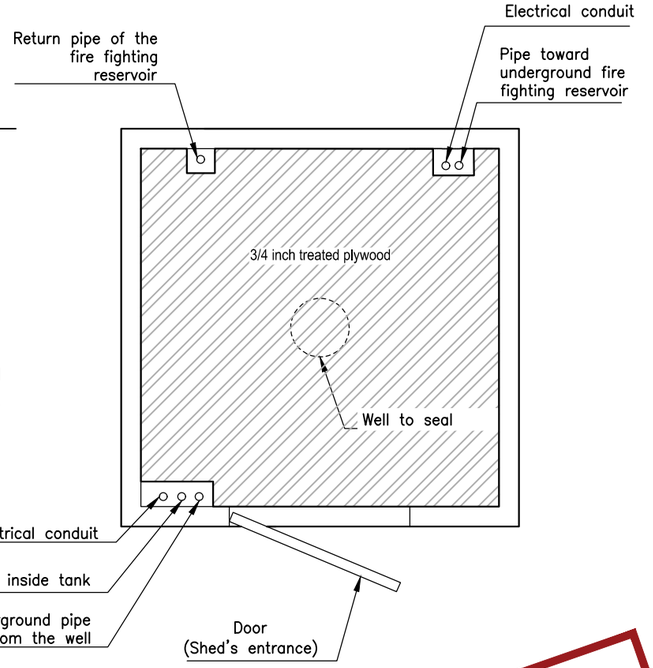
Resp.	Project	OTP	Project/ Disc	Phase/ Type	Elec. ref.. / Drawing no.	Rev.
153	P-0021254	0-01-100	EN	D	0101	01

P:\153\P-0021254_ÉTUDE HYDROGÉOLOGIQUE_POSTES FRONTALIERS\25_CAD\OTP_0-01-100\P-0021254-0-01-100-0002-00-EN.DWG

Profil View
Future Setup



Plan View
Future Setup



MATERIAL LIST

ITEM	QUANTITY	DESCRIPTION	MODEL	MARK
1		THREADED CHECK VALVE	—	—
2		CHAIN AND RETAINING RING	—	—
3		RING CLAMP	—	—
4		HEAT SHRINK SPLICE KIT	—	—
5		TORSION ABSORBER (SHOCK ABSORBER)	—	—
6		SAFETY LINE	—	—
7		CABLE TIE	—	—
8		ELECTRICAL WIRE	—	—
9		SAFETY	—	—
10		COOPER SLIDE	—	—
11		HOSE ADAPTATOR	—	—
12		LOCKABLE ALUMINIUM SEALED CAP	—	—
13		SEAL RING	—	—
14		BRASS NIPPLE	—	—
15		SUMP PUMP	—	—
16		DRIVE SHOE	—	—
17		DISCHARGE HOSE	—	—
18		ELECTRIC LINE	--	—

NOTES :

1- Shed not to scale, reproduced from photos.

2- Specification of the concrete filling - See Section 7.5.2.1

3- Extension of the piping - See Section 7.5.2

4- Plumbing and electrical works on a cost-plus contract basis - See Section 7.5.2

5- All equipment shall be provided and budgeted by the contractor.

Client

Canada Border Services Agency

Project

Technical Plans and Specifications for the Connection of a New Well Stanhope Site

Title

Connection and Installation of the New Well

Englobe Corp.

505 du Parc-Technologique Boulevard
Suite 200
Québec (Quebec)
G1P 4S9
418-781-0191

Jacques Blanchet 106232 QUÉBEC

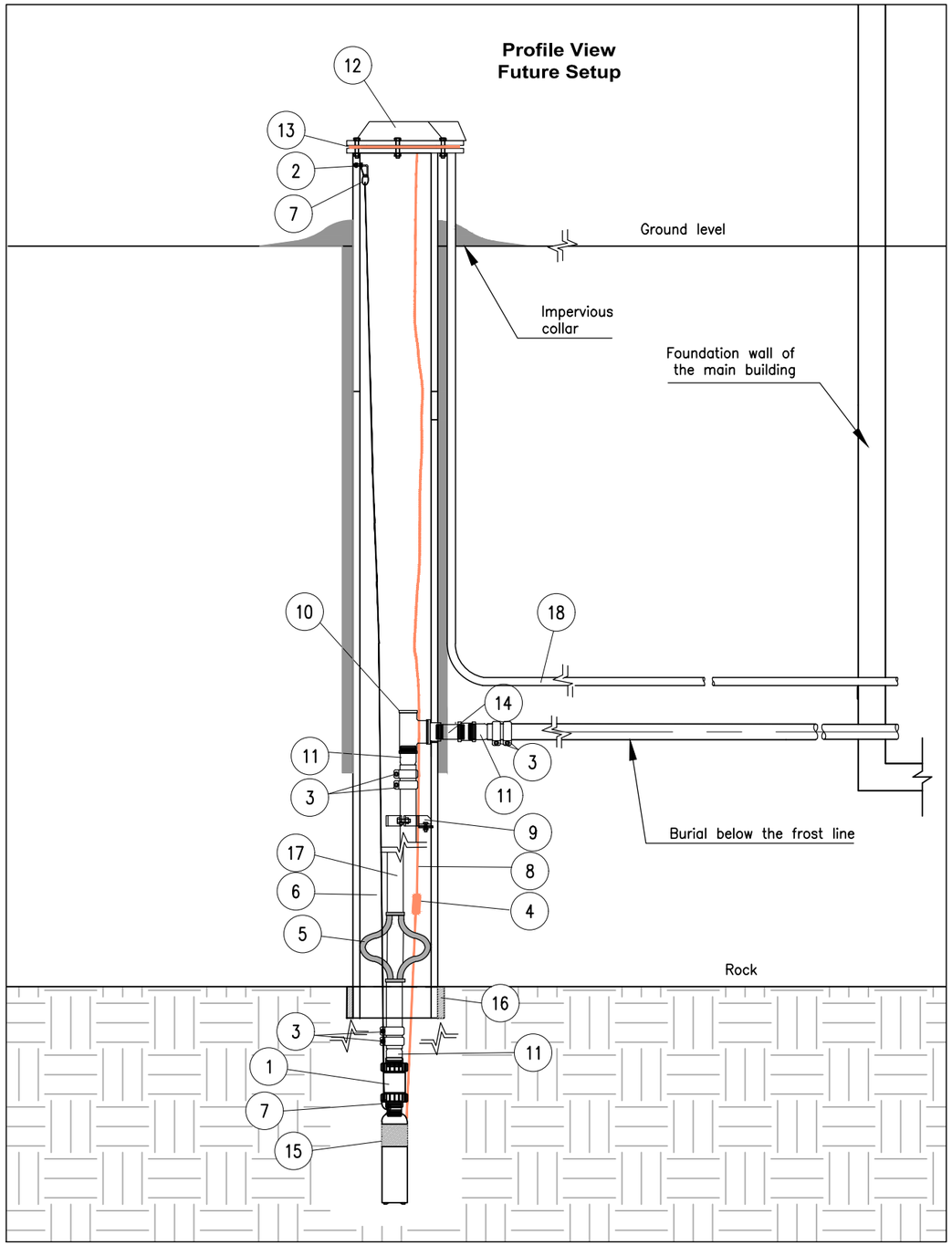
BID

THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION PURPOSES

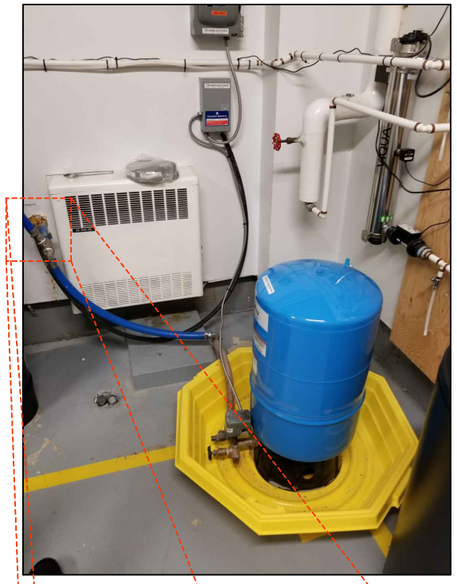
Discipline : Geoenvironment		Prepared by : S.-T. Sow	Verified by : J. Blanchet, Eng.
Scale : Not to scale		Drawned by : M.-A. Girard	Approved by : S. Bouchand
Date : 2020-07-16		Figure no :	2 of 4
Page Setup : 0102	Paper format : 11x17	Register no :	—

Resp.	Project	OTP	Project/ Disc	Phase/ Type	Elec. ref., / Drawing no.	Rev.
153	P-0021254	0-01-100	EN	D	0102	01

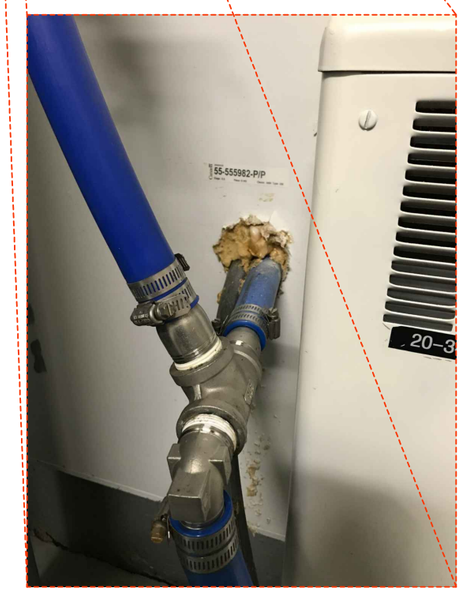
P:\153\P-0021254_ÉTUDE HYDROGÉOLOGIQUE_POSTES FRONTALIERS\25_CAD\OTP_0-01-100\P-0021254-0-01-100-0002-00-EN.DWG



Water entry and electric wiring setup inside the main building



Water entry and electric wiring inside the main building, PEHD pipe



MATERIAL LIST

ITEM	QUANTITY	DESCRIPTION	MODEL	MARK
1		THREADED CHECK VALVE	—	—
2		CHAIN AND RETAINING RING	—	—
3		RING CLAMP	—	—
4		HEAT SHRINK SPLICE KIT	—	—
5		TORSION ABSORBER (SHOCK ABSORBER)	—	—
6		SAFETY LINE	—	—
7		CABLE TIE	—	—
8		ELECTRICAL WIRE	—	—
9		SAFETY	—	—
10		COOPER SLIDE	—	—
11		HOSE ADAPTATOR	—	—
12		LOCKABLE ALUMINIUM SEALED CAP	—	—
13		SEAL RING	—	—
14		BRASS NIPPLE	—	—
15		SUMP PUMP	—	—
16		DRIVE SHOE	—	—
17		DISCHARGE HOSE	—	—
18		ELECTRIC LINE	—	—

NOTES :

1- All equipment shall be provided and budgeted by the contractor.

BID

THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION PURPOSES

Jacques Blanchet 106232 QUÉBEC

Client

Canada Border Services Agency

Project

Technical Plans and Specifications for the Connection of a New Well Chartierville Site

Title

Connection and Installation of the New Well

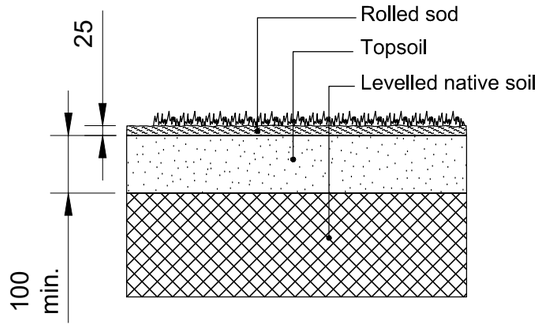
Englobe Corp.

505 du Parc-Technologique Boulevard
Suite 200
Québec (Quebec)
G1P 4S9
418-781-0191

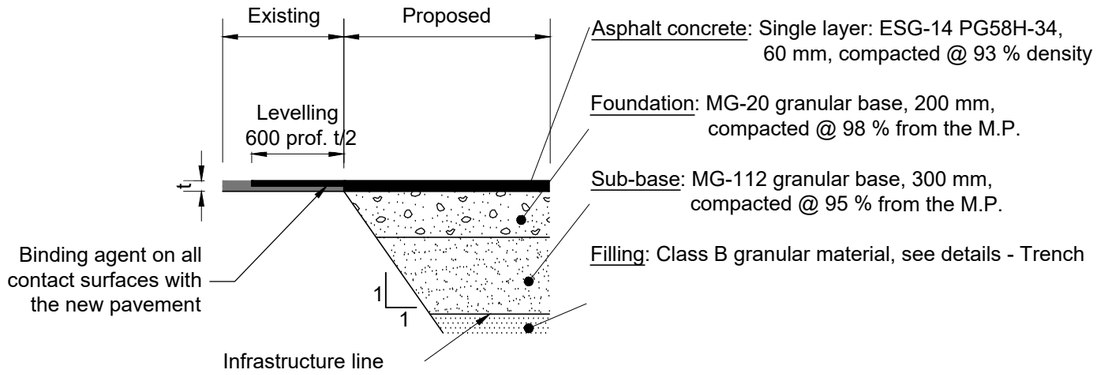
Discipline : Geoenvironment		Prepared by : S.-T. Sow	Verified by : J. Blanchet, Eng.
Scale : Not to scale		Drawned by : M.-A. Girard	Approved by : S. Bouchand
Date : 2020-07-16		Figure no : 3 of 4	
Page Setup : 0103	Paper format : 11x17	Register no : —	

Resp.	Project	OTP	Project/ Disc	Phase/ Type	Elec. ref.. / Drawing no.	Rev.
153	P-0021254	0-01-100	EN	D	0103	01

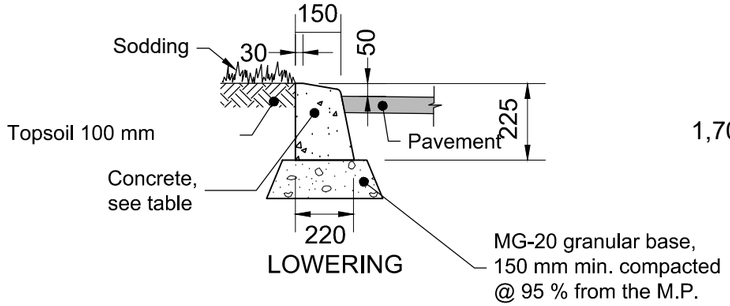
P:\153\P-0021254_ÉTUDE HYDROGÉOLOGIQUE_POSTES FRONTALIERS\25_CAD\OTP_0-01-100\P-0021254-0-01-100-0002-00-EN.DWG



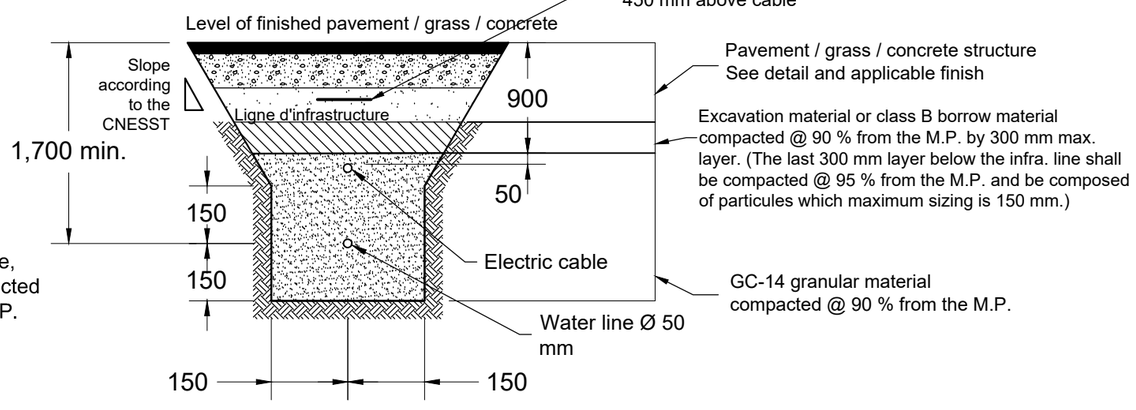
ROLLED SOD - CROSS-SECTION



PAVEMENT STRUCTURE - CROSS-SECTION (JUNCTION WITH THE EXISTING PAVEMENT)



TYPICAL DETAIL OF A CURB CASTED ON SITE (CHARTIERVILLE)



TYPICAL DETAIL OF A TRENCH

BID

THIS DOCUMENT SHALL NOT BE USED FOR CONSTRUCTION PURPOSES

NOTES:

1- Measurements are in millimeters
2- Drawings are not to scale
3- For the drawing PAVEMENT STRUCTURE - CROSS-SECTION, "T" refers to the thickness of the existing pavement. The contractor is in charge of identifying this thickmess and get approval by the supervisor.

Jacques Blanchet 106232 QUÉBEC

Client

Canada Border Services Agency

Project

Technical Plans and Specifications for the Connection of a New Well Chartierville and Stanhope Sites

Title

Typical Details

Englobe Corp.
505 du Parc-Technologique Boulevard
Suite 200
Québec (Quebec)
G1P 4S9
418-781-0191

Discipline : Geoenvironment		Prepared by : P. Grondin, CPI	Verified by : J. Blanchet, Eng.
Scale : Not to scale		Drawned by : M.-A. Girard	Approved by : S. Bouchand
Date : 2020-07-16		Figure no : 4 of 4	
Page Setup : 0104	Paper format : 11x17	Register no : —	

Resp.	Project	OTP	Project/ Disc	Phase/ Type	Elec. ref.. / Drawing no.	Rev.
153	P-0021254	0-01-100	EN	D	0104	01

P:\153\P-0021254_ÉTUDE HYDROGÉOLOGIQUE_POSTES FRONTALIERS\25_CAD\OTP_0-01-100\P-0021254-0-01-100-0002-00-EN.DWG

Appendix 4 Price Schedule

Price Schedule - TOTAL		
Items	**Description**	**Estimated Price**
A	Table 1: Sealing of the Well at the Saint-Bernard-de-Lacolle Border Crossing (Road 15)	- $
B	Table 2: Sealing of the Well at the Frelishburg Border Crossing	- $
C	Table 3: Sealing of the Well at the Woburn Border Crossing	- $
D	Table 4: Sealing of the Well at the Chartierville Border Crossing	- $
E	Table 5: Sealing of the Well at the Stanhope Border Crossing	- $
F	Table 6: Construction of the Well at the Chartierville Border Crossing	- $
G	Table 7: Construction of the Well at the Stanhope Border Crossing	- $
H	Table 8: Connection of the Well at the Chartierville Border Crossing	- $
I	Table 9: Connection of the Well at the Stanhope Border Crossing	- $
	Subtotal	- $
	GST (5%)	
	QST (9.975%)	
	TOTAL	- $

Price Schedule - A					
Table 1: Sealing of the Well at the Saint-Bernard-de-Lacolle Border Crossing (Road 15)					
Items	**Description**	**Estimated Quantity**	**Unit**	**Unit Cost**	**Price**
A.1	Mobilization and demobilization	1	Unit		- $
A.2	Removal of equipment (pump and piping) and electricity disconnection	1	Unit		- $
A.3	Filling with clean sand	75	$/LM		- $
A.4	Filling with impervious sealing material	4	$/LM		- $
A.5	Excavation on 1 m deep, removal of a concrete cylinder and installation of a concrete plate with a 1.52 m (5 ft) diameter and 0.3 m (1 ft) thickness	1	Unit		- $
A.6	Land reclamation (backfilling, compaction and seeding or ou sodding)	1	Unit		- $
				Subtotal	- $
				GST (5%)	
				QST (9.975%)	
				TOTAL	- $

GST Number:
TVQ Number:

Company Name

Signature of the Contractor's Representative

Price Schedule - B					
Table 2: Sealing of the Well at the Frelishburg Border Crossing					
Items	**Description**	**Estimated Quantity**	**Unit**	**Unit Cost**	**Price**
B.1	Mobilization and demobilization	1	Unit		- $
B.2	Removal of equipment (pump and piping) and electricity disconnection	1	Unit		- $
B.3	Filling with clean sand	109	$/LM		- $
B.4	Filling with impervious sealing material	4	$/LM		- $
B.5	Excavation on 1 m deep, sawing of the steel casing and installation of a concrete plate with a 254 mm (10 inch) diameter	1	Unit		- $
B.6	Land reclamation (backfilling, compaction and seeding or ou sodding)	1	Unit		- $
				Subtotal	- $
				GST (5%)	
				QST (9.975%)	
				TOTAL	

GST Number:
TVQ Number:

Company Name

Signature of the Contractor's Representative

Price Schedule - C					
Table 3: Sealing of the Well at the Woburn Border Crossing					
Items	**Description**	**Estimated Quantity**	**Unit**	**Unit Cost**	**Price**
C.1	Mobilization and demobilization	1	Unit		- $
C.2	Removal of equipment (pump and piping) and electricity disconnection	1	Unit		- $
C.3	Filling with clean sand	75	$/LM		- $
C.4	Filling with impervious sealing material	3	$/LM		- $
C.5	Excavation on 1 m deep, sawing of the steel casing and installation of a concrete plate with a 200 mm (8 inch) diameter	1	Unit		- $
C.6	Land reclamation (backfilling, compaction and seeding or ou sodding)	1	Unit		- $
				Subtotal	- $
				GST (5%)	
				QST (9.975%)	
				TOTAL	

GST Number:
TVQ Number:

Company Name

Signature of the Contractor's Representative

Price Schedule - D					
Table 4: Sealing of the Well at the Chartierville Border Crossing					
Items	**Description**	**Estimated Quantity**	**Unit**	**Unit Cost**	**Price**
D.1	Mobilization and demobilization	1	Unit		- $
D.2	Removal of equipment (pump and piping) and electricity disconnection	1	Unit		- $
D.3	Filling with clean sand	72	$/LM		- $
D.4	Filling with impervious sealing material	3,5	$/LM		- $
D.5	Excavation on 1 m deep, sawing of the steel casing and installation of a concrete plate with a 200 mm (8 inch) diameter	1	Unit		- $
D.6	Land reclamation (backfilling, compaction and seeding or ou sodding)	1	Unit		- $
				Subtotal	- $
				GST (5%)	
				QST (9.975%)	
				TOTAL	

GST Number:
TVQ Number:

Company Name

Signature of the Contractor's Representative

Price Schedule - E

Table 5: Sealing of the Well at the Stanhope Border Crossing

Items	Description	Estimated Quantity	Unit	Unit Cost	Price
E.1	Mobilization and demobilization	1	Unit		- $
E.2	Removal of equipment (pump and piping) and electricity disconnection	1	Unit		- $
E.3	Filling with clean sand	69	$/LM		- $
E.4	Filling with impervious sealing material	4	$/LM		- $
E.5	Sawing of the steel casing and installation of a concrete plate with a 200 mm (8 inch) diameter	1	Unit		- $
				Subtotal	- $
				GST (5%)	
				QST (9.975%)	
				TOTAL	

GST Number:
TVQ Number:

Company Name

Signature of the Contractor's Representative

Price Schedule - F

Table 6: Construction of the Well at the Chartierville Border Crossing

Items	Description	Estimated Quantity	Unit	Unit Cost	Price
F.1	Mobilization and demobilization	1	Unit		- $
F.2	Localization of underground infrastructure	1	Unit		- $
F.3	Drilling of soils - 152 mm (6 inch) diameter	4	m		- $
F.4	Drilling of rock - 152 mm (6 inch) diameter	96	m		- $
F.5	Steel casing - 152 mm (6 inch) diameter	6	m		- $
F.6	Concrete collar - 254 mm (10 inch) diameter	1	Unit		- $
F.7	Drive shoe	1	Unit		- $
F.8	Steel cap and padlock	1	Unit		- $
F.9	Development of the well	4	$/h		- $
F.10	Supplying, installation and deinstallation of the pumping equipment, generator and its operation, and monitoring of the smooth functioning of the pumping tests (drawdown and 72 h)	1	Unit		- $
				Subtotal	- $
				GST (5%)	
				QST (9.975%)	
				TOTAL	

GST Number:
TVQ Number:

Company Name

Signature of the Contractor's Representative

Price Schedule - G

Table 7: Construction of the Well at the Stanhope Border Crossing

Items	Description	Estimated Quantity	Unit	Unit Cost	Price
G.1	Mobilization and demobilization	1	Unit		- $
G.2	Localization of underground infrastructure	1	Unit		- $
G.3	Drilling of soils - 152 mm (6 inch) diameter	15	m		- $
G.4	Drilling of rock - 152 mm (6 inch) diameter	85	m		- $
G.5	Steel casing - 152 mm (6 inch) diameter	17	m		- $
G.6	Drive shoe	1	Unit		- $
G.7	Steel cap and padlock	1	Unit		- $
G.8	Development of the well	4	$/h		- $
G.9	Supplying, installation and deinstallation of the pumping equipment, generator and its operation, and monitoring of the smooth functioning of the pumping tests (drawdown and 72 h)	1	Unit		- $
				Subtotal	- $
				GST (5%)	
				QST (9.975%)	
				TOTAL	

GST Number:
TVQ Number:

Company Name

Signature of the Contractor's Representative

Price Schedule - H

Table 8: Connection of the Well at the Chartierville Border Crossing

Items	Description	Estimated Quantity	Unit	Unit Cost	Price
H.1	**General Conditions**				
H.1.1	Field organization, health and safety and installation of a protective fence around the well	1	Unit		- $
H.1.2	Immediate installation of a protective fence	1	Unit		- $
H.2	**Demolition**				
H.2.1	Pavement	20	m^2		- $
H.3	**Drinking Water Line**				
H.3.1	Stripping of vegetated areas	72	m^2		- $
H.3.2	Excavation and filling of test pits	30	LM		- $
H.3.3	Drinking water line, HDPE, 50 mm diameter (including fittings, valves, coating, tape, etc.)	30	LM		- $
H.3.4	Pompe submersible 1-5 HP (1 à 30 GUSPM)	1	Unit		- $
H.3.5	Connections, cleaning, disinfection, tests and commissioning including the electrical connection of the pumping system	1	Unit		- $
H.4	**Pavement Structure**				
H.4.1	Sub-base MG-112 (supplying, transport and installation)	15	m^2		- $
H.4.2	Road base MG-20 (supplying, transport and installation)	15	m^2		- $
H.4.3	**Asphalt - Single layer** ESG-14, PG 58H-34, including binding agent, total transport, installation and adjustment.	20	m^2		- $
H.5	**Reclamation of the Surfaces**				
H.5.1	Rolled sod (including top soil 150 mm)	72	m^2		- $
				Subtotal	- $
				GST (5%)	
				QST (9.975%)	
				TOTAL	

Note:

1. Refer to the technical specifications for the detailed description of the technical elements related to the different items of the schedule
2. Controlled work shall be evaluated based on hourly fees indicated in the Construction Decree

GST Number:

TVQ Number:

Company Name

Signature of the Contractor's Representative

Price Shcedule - I

Table 9: Connection of the Well at the Stanhope Border Crossing

Items	Description	Estimated Quantity	Unit	Unit Cost	Price
I.1	**General Conditions**				
I.1	Field organization, health and safety and installation of a protective fence around the well	1	Unit		- $
I.2	Immediate installation of a protective fence	1	Unit		- $
I.2	**Demolition**				
I.2.1	Demolition of a concrete slab 150 mm thick at the location of the new well	3	m^2		- $
I.3	**Drinking Water Line**				
I.3.1	Stripping of vegetated areas	30	m^2		- $
I.3.2	Excavation and filling of test pits	13	LM		- $
I.3.3	Drinking water line, HDPE, 50 mm diameter (including fittings, valves, coating, tape, etc.)	13	LM		- $
I.3.4	Pompe submersible 1-5 HP (1 à 30 GUSPM)	1	Forfait		- $
I.3.5	Connections, cleaning, disinfection, tests and commissioning, including the electrical connection of the pumping system	1	Unit		- $
I.3.6	Concrete filling 1.0 MPa (interior filling of the shed)	8	m^3		- $
I.3.7	Installation of an access flooring in the shed (wood structure and covered by a ¾ inch plywood)	1	Unit		- $
I.4	**Pavement Structure**				
I.4.1	Sub-base MG-112, supplying, installation and compaction	10	m^2		- $
I.4.2	Road base MG-20, supplying, installation and compaction	12	m^2		- $
I.4.3	Reconstruction of the concrete slab 35 MPa (150 mm thick)	3	m^2		- $
I.5	**Reclamation of the Surfaces**				
I.5.1	Rolled sod (including top soil 150 mm)	60	m^2		- $
I.6	**Electricity**				
I.6.1	Heating system (supplying, installation and electrical connection)	1	Unit		- $
				Subtotal	- $
				GST (5%)	
				QST (9.975%)	
				TOTAL	

Note:

1. Refer to the technical specifications for the detailed description of the technical elements related to the different items of the schedule
2. Controlled work shall be evaluated based on hourly fees indicated in the Construction Decree

GST Number:

TVQ Number:

Company Name

Signature of the Contractor's Representative

Appendix 5 Access Permit

THIRD PARTY WORK NOTIFICATION PERMIT

PURPOSE: To maintain a safe working environment for employees, building occupants, contractors and visitors.

INSTRUCTION:

1. Fill in all relevant fields completely. Forms with blank fields may be rejected.
2. E-mail the completed form to the email address listed for your region as per last page of this document.
3. Await BGIS approval and confirmation of work space allocation prior to commencement.
4. Retain a copy of the approved Third Party Work Notification Permit while on site.

NOTES:

To ensure timely approval, please submit this permit at least 48 business hours prior to the anticipated start.

Permits are issued for one-week time blocks only. Longer work periods requires multiple permits.

ANY change to the scope of work requires a new permit

Questions regarding the Work Notification Permit process can be sent to the region-specific email address below.

All incidents related to the worksite shall be reported immediately to BGIS.

LOCATION OF WORK:

Province / Territory: **City:**

Floor / Room Number:

Building (Name & Address):

PROJECT MANAGER (Third Party Buyer of Service):

Work Requested By:

Work Order # or Project # (If Applicable):

DATE & DURATION OF THE WORK (Any work scheduled for longer than a ONE week period will require subsequent Work Notification Permits)								
Schedule of Work		**Work hours**						
☐ Day Time	☐ After Hours	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Start Date								
End Date								
Provide a detailed description of the work to be conducted.								

WORK DESCRIPTION (DETAILED):

Will life safety systems be impacted (fire alarm or other)?

Will other building systems be impacted (HVAC, lighting, elevator, etc.)?

RISK ASSESSMENT

Please note that this risk assessment is intended only to prompt the form approver.
It is the responsibility of the party requesting /owning the work to ensure controls are in place and monitored.

	Yes / No	If yes, see associated controls
Requires access to a secure area where escort may be required?		
Requires access to confined or restricted space?		4
Requires work from heights?		4
Requires energy isolation? (LOTO - Lock Out/Tag Out is the isolation of energy from the system)		4
Requires Hot Work? *(Work that could produce a source of ignition, such as a spark or open flame. Examples of hot work include welding, cutting, grinding and the use of non-explosion proof electrical equipment.)*		2, 4, 5
Will life safety systems be impacted (fire alarm or other)?		5
Could generate noise, dust or odors?		
Requires obstruction of building access or egress?		
Involves electrical or mechanical disruption?		1, 4
Have asbestos & hazardous materials surveys been reviewed by those conducting work? (IMPORTANT)		3
Will asbestos / other hazardous materials be disrupted during work activities?		3
Involves working around or with hazardous chemicals?		
Work taking place at heritage site?		
Will loading dock access be required?		
Will freight elevator access be required?		

Controls

1. Shutdown notice required.
2. Hot Work Permit & Fire Watch required.
3. Review of asbestos & hazardous materials survey.
4. Additional High Hazard Permit (LOTO, Heights or Confined Space)
5. Notify Fire Department / Fire Alarm Monitoring Company

PERMIT HOLDER DETAILS

Company Name:

Contact Number:

PROJECT MANAGER REVIEW (Third Party Manager of Project))

Name of Reviewer:

Date of Review (dd/mm/yy): **Authorized?**

Comments:

Signature:

BGIS HEALTH & SAFETY REVIEW

Name of Reviewer:

Date of Review (dd/mm/yy): **Authorized?**

Comments:

Signature:

BGIS FACILITIES REVIEW

Name of Reviewer:

Date of Review (dd/mm/yy): **Authorized?**

Comments:

Signature:

EMAIL COMPLETED WORK NOTIFICATION PERMITS TO THE ADDRESS LISTED FOR YOUR REGION

Region	Region Description	Email Address
Atlantic Canada	Newfoundland, PEI, NB, NS	ATL-RP1workpermit@BGIS.com
Quebec	Quebec Other Than Gatineau	QC-RP1workpermit@BGIS.com
National Capital Area	Ottawa, Gatineau	NCA-RP1workpermit@BGIS.com
Ontario	Ontario Other Than Ottawa, Renfrew, Pakenham	ON-RP1workpermit@BGIS.com
Western Canada	Manitoba, Saskatchewan, Alberta	WEST-RP1workpermit@BGIS.com
Pacific Canada	British Columbia, Yukon	PAC-RP1workpermit@BGIS.com

IN CASE OF SITE EMERGENCY, CONTACT LOCAL EMERGENCY SERVICES AND BGIS