Vancouver Fraser Port Authority
100 The Pointe, 999 Canada Place
Vancouver, B.C. Canada V6C 3T4
portvancouver.com

November 25, 2020

Mr. Alan Li
Senior Project Engineer, Major Projects
Metro Vancouver
4730 Kingsway
Burnaby, BC V5H 0C6

Dear Mr. Li:

Re: **Greater Vancouver Water District – Project Permit No. 17-029 Annacis Water Supply Tunnel Amendment 01 Installation of Instrumentation and Monitoring**

Vancouver Fraser Port Authority (the port authority) has received a request on behalf of the Greater Vancouver Water District, to amend the scope of Project Permit PER No. 17-029 to permit the installation of instrumentation to monitor ground movement and protect infrastructure. This relates to the construction of the Annacis Water Supply Tunnel (AWST) under the Fraser River, between the City of New Westminster and the City of Surrey.

The scope of the amendment is to permit the installation of the following instrumentation to monitor ground movement and protect infrastructure throughout the construction period, and then decommissioned and removed at the end of the project:

- Vibrating Wire Piezometers (VPZs);
- Multi-point Borehole Extensometers (MPBXs);
- Utility Monitoring Points (UMPs), Settlement Monitoring Points on Ground Surface (SMPGs);
- Settlement Monitoring Points in Pavement (SMPPs);
- Track Monitoring Points (TMPs); and,
- Building Monitoring Points (BMPs)

The port authority has undertaken and completed a review of the requested amendment in accordance with the *Canada Marine Act*, section 5 of the Port Authorities Operations Regulations, and section 82 of the *Impact Assessment Act*.

As part of our review, the port authority considered additional information provided in the following supporting documents:

- Permit Application Cover letter dated July 15, 2020
- Drawing: VFPA – 0001 to VFPA - 0009, June 28, 2020
- Drawing S157 (monitoring frequency) dated June 30, 2020
- Geotechnical data package (subsurface data, instrumentation plans and details, level 1 settlement analysis and impact study) dated June 20, 2019
- All correspondence with the Greater Vancouver Water District from June 16, 2020 to November 24, 2020.

To meet the requirements of the *Impact Assessment Act*, the port authority posted a description of the requested amendment and notice of public participation to the Canadian Impact Assessment Registry and considered the factors set out in section 84. We concluded that the requested amendment is not likely to cause significant adverse environmental effects. We also determined that adverse impacts to Aboriginal or Treaty rights are not expected.

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This authorization does not affect the validity period of the existing permit. This amendment has been numbered PER 17-029-01 - please quote this reference number in any future correspondence.

Thank you for your cooperation throughout our review. Should you have any questions regarding this approval, please contact Tim Blair at 778-835-1833 or Tim.Blair@portvancouver.com.

Yours truly,

VANCOUVER FRASER PORT AUTHORITY

ORIGINAL COPY SIGNED

Chris Bishop, Manager of Planning

cc Samantha Taylor, Geological Engineer, Dynamic Earth Solutions Group
Catherine MacInnis, Senior Real Estate Specialist, Real Estate, VFPA
Donna Hargreaves, Compliance Monitoring and Enforcement Specialist, Environmental Programs, VFPA

encl (1) Project Permit PER No. 17-029

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PORT of vancouver	VANCOUVER FRASER PORT AUTHORITY PROJECT AND ENVIRONMENTAL REVIEW REPORT AND PERMIT
PER No.:	**17-029**
Tenant:	**Fraser Surrey Docks Limited Partnerships**
Project:	**Annacis Water Supply Tunnel – Safe Havens**
Project Location:	**11060 Elevator Road, Surrey**
VFPASID No.:	**SUR364**
Land Use Designation:	**Port Terminal**
Applicant/Permit Holder:	**Greater Vancouver Water District**
Category of Review:	**B**
Date of Approval:	**January 15, 2020**
Date of Expiry:	**December 31, 2025**

1 INTRODUCTION

The Vancouver Fraser Port Authority (the port authority), a federal port authority, manages lands under the purview of the *Canada Marine Act*, which imparts responsibilities for environmental protection. The port authority accordingly conducts project and environmental reviews of works and activities undertaken on these lands to ensure that the works and activities will not likely cause significant adverse environmental effects. This project and environmental review report and project permit (the Permit) documents the port authority's project and environmental review of PER No. 17-029: Annacis Water Supply Tunnel – Safe Havens (the Project) proposed by the Greater Vancouver Water District (the Applicant).

This project and environmental review was carried out to address the port authority's responsibilities under the *Canada Marine Act*, and to meet the requirements of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), as applicable. The proposed Project is not a CEAA 2012 "designated project" and an environmental assessment as described in CEAA 2012 is not required. However, the port authority authorization is required for the proposed Project to proceed and in such circumstances, where applicable, Section 67 of CEAA 2012 requires federal authorities to assure themselves that projects will not likely cause significant adverse environmental effects. This review provides that assurance. In addition, the port authority considers other interests, impacts and mitigations through the project and environmental review.

The project and environmental review considered the application along with supporting studies, assessments and consultations carried out or commissioned by the Applicant, as well as other information provided by the Applicant. In addition, this project and environmental review considered other information available to the port authority and other consultations carried out by the port authority. A full list of information sources germane to the review is provided in the following pages of this report.

This Permit is the authorizing document allowing the Applicant to proceed with the Project subject to the listed project and environmental conditions.

2 PROJECT DESCRIPTION

The Greater Vancouver Water District (GVWD) is proposing to construct a new 2.3 km water supply tunnel called the Annacis Water Supply Tunnel (AWST) under the Fraser River, between the City of New Westminster and the City of Surrey. The AWST will be one of five new water supply tunnel crossings in the region built to withstand a major earthquake. Construction of the AWST is anticipated to commence in 2020 and be completed in 2025. Once complete, the water main within the new tunnel will be connected to the region's drinking water system.

This new water supply tunnel will be excavated deep underground, in soil below the water table, using a tunnel-boring machine. The tunnel-boring machine will launch from a vertical entry shaft on the Surrey side of the Fraser

River and progress north, at approximately 40 – 50 metres below the riverbed, to the vertical exit shaft on the New Westminster side. Entry and exit shafts will be located outside the port authority jurisdiction in either Surrey or New Westminster.

Once the tunnel is drilled, a steel water main (4.5 metres in diameter and 2.3 kilometres long) will be installed inside the new tunnel and connected to underground valve chambers at each shaft site, connecting to the region's drinking water system.

At certain construction stages of tunneling, access to the front of the tunnel boring machine is required. This zone of improved ground is termed a *safe haven* and is constructed in front of the tunnel boring machine to allow workers to conduct inspections, cutterhead tool replacement, and maintenance and repairs.

A temporary safe haven is proposed within the port authority jurisdiction, on property currently leased by Fraser Surrey Docks Limited Partnership. The safe haven area, approximately 18 m x 10 m, is to be created through the stabilization or improvement of existing soils. No permanent works are required for development and use of the safe haven.

Two ground improvement techniques are currently being proposed to reinforce the soils at the safe haven: jet grouting and soil freezing. Both techniques involve drilling vertically oriented holes from the surface to the tunnel depth. The proposed ground improvement method will be determined at a later date.

Jet grouting involves vertical drilling, and the injection of a high pressure cement/air/water slurry from the surface, via drill pipe, into the soil. This is a construction process using a high kinetic energy jet of fluid to break up and loosen the ground and mix it with a slurry of grout. Jet grouting uses three physical processes separately or in combination:

- Very high-speed jet loosens the soil;
- Jetting fluid washes some of the soil to the surface; and,
- Slurry of cementitious grout adds a cement binder to the soil mix.

This method includes the following steps:

- drilling a small (150-200 mm diameter) hole to the required depth of 55 to 60m,
- Inserting a 70 – 100 mm drill string into the hole,
- Injecting cementitious grout at high pressure through one or more small (1-10 mm) nozzles on the base of the drill string,
- Raising and rotating the drill string slowly to form a column of soil cement.

During jetting, material in excess of the soil cement mix rises to the hole collar (to prevent the excess material fracturing and disturbing the surrounding ground). The excess material will be stored in containers as it emerges and will be removed from the site.

Once construction of the safe haven is complete, the drill string is removed and the remaining hole will be backfilled with cementitious grout with a bentonite plug near the surface. A block of inert cementitious material will remain at tunnel depth after decommissioning.

The soil freezing method involves vertical drilling, the insertion of hollow tubes from the surface into the ground, and the conveyance of a contained coolant (liquid nitrogen or brine) through the tubes, and back to the surface. Ground freezing converts pore water found in the soil into ice by continuously circulating cryogenic fluid (brine at a very cold temperature) within a closed system of small diameter, closed-end pipes installed in a pattern consistent with the shape of the area to be treated. The frozen pore water acts as a bonding agent, fusing together particles of soil or rock to significantly increase compressive strength and impart impermeability.

This method includes the following steps:

- Installing steel freeze pipes vertically in the soil and connected in series-parallel.

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- Pumping coolant down a drop tube to the bottom of the freeze pipe and then coolant flows back up, withdrawing heat from the surrounding soil.
- Ice forms around the pipes in the shape of vertical, elliptical cylinders once the soil temperature reaches 0 °C. The cylinders gradually enlarge with time and interconnect to form a continuous wall.

Once the frozen wall reaches design thickness, the freeze plant is typically operated at a reduced rate to maintain the condition.

This technique requires only limited physical penetration into the ground and propagates thermally, rather than by displacement. The ground remains largely undisturbed during freeze pipe installation and the frozen soil reverts to its original state once freezing is discontinued. The coolant will be continuously pumped from the drop tube until the tunnel boring machine has passed through. This would freeze the soil and provide sufficient reinforcement to conduct the proposed maintenance works in a safe manner. At that point all equipment, including piping, will be removed and the site will be restored to its original condition.

The work zone footprint on surface would be approximately 30 m x 50 m for equipment and material staging with this work.

In this project permit, the Project means the physical activities authorized by the port authority to be carried out pursuant to **PER No. 17-029**, as described below. All quantities and measurements are approximate.

2.1 Proposed Works

- Establishment of an approximately 1,500 m^2 (16,146 sq. ft.) “temporary workspace”, measuring approximately 30 m (98 ft.) x 50 m (164 ft.) in area. The “temporary workspace” is to be utilized for equipment and material staging;
- Creation of an underground tunnel-boring machine safe haven measuring approximately 18 m (60 ft.) x 10 m (32 ft.). Ground improvement of the safe haven to be realized via jet grouting or ground freezing through the stabilization or improvement of existing soils;
- Soil stabilization methods will involve drilling vertically oriented holes from the surface to the tunnel depth of approximately 55 m (180 ft.) to 60 m (197 ft.) below ground level;
- Construction of concrete encased tunnel containing one steel conveyance pipe, and soil infill;
- Installation of temporary lighting, signage and equipment required for reinforcing the soil for the safe haven; and
- All temporary lighting, signage and equipment will be removed from the site and the surface of the safe haven area will be restored to its original condition once the safe haven is no longer required.

The project cost of the works in the port authority jurisdiction for the tunnel-boring machine safe haven is approximately $6,750,000. The overall project budget for the Annacis Water Supply Tunnel project is approximately $450,000,000 and construction estimated to be approximately 5 years in duration, with construction commencing in late 2020 and ending in late 2025. Anticipated construction timeline for the safe haven is approximately 6 months and it is anticipated to commence in early 2021. All general construction and physical activities related to the Project are intended to be conducted from Monday to Saturday between the hours of 7:00 am to 8:00 pm.

A generator will be used on site to operate the grout/ground freezing pump during the construction of the safe haven. No other on-site energy consumption is proposed.

3 VANCOUVER FRASER PORT AUTHORITY INTERNAL REVIEWS

The following the port authority departments have undertaken and completed a review of these works and confirm that the proposal meets their requirements, subject to the listed project and environmental conditions.

☒ Planning ☒ Environmental Programs ☒ Engineering

☒ Marine Operations ☒ Public Engagement ☒ Transportation

☒ Indigenous Consultation

The proposed works are considered to be in keeping with the port authority Land Use Plan designation of Port Terminal. Areas designated Port Terminal are primarily intended for deep-sea and marine terminals that handle a variety of commodities, including autos, breakbulk, dry bulk, liquid bulk, and containers, as well as, cruise passengers. The Land Use Plan states that utility uses are permitted in all designations where compatible with the primary uses on the site.

In order to demonstrate compatibility of the proposal with the primary use of the site and to provide assurances to the port authority as landlord on potential impacts to the long term viability of the site, the Applicant was required to demonstrate whether or not the new infrastructure could potentially limit future development potential of this site for Port Terminal uses. GeoPentech, on behalf of the Applicant, provided a surface load analysis of 20 hypothetical load cases, representing a range of possible future uses, to evaluate potential impacts on the proposed AWST tunnel and watermain (the impact of estimated settlements on the steel pipe within the tunnel). GeoPentech concluded that a ground loading of 250kPa (5,200 psf) can be safely accommodated without causing excessive strain in the water supply steel piping. However, piled foundations deeper than 20m should be evaluated for potential impact on the water supply tunnel and, ideally, should not be located directly above the tunnel. The port authority Real Estate has been advised of the ground loading restrictions. The information has been reviewed and considered acceptable by Engineering.

The Applicant is in the process of securing all necessary utility crossing permits and agreements for the Project with various parties including the port authority, CN Rail, BNSF Railway Company and Fraser Surrey Docks.

Noise is expected during project construction activities. However, activities including the loading and unloading of materials at the temporary workspace and construction of the safe haven are expected to have minimal impacts as they are located in an existing industrial area. All construction activities will take place during regular construction hours of Monday to Saturday between 7:00 am to 8:00 pm.

All construction access for transport of materials and equipment to and from the site is anticipated to be truck-based. A Construction Traffic Management Plan has been prepared to minimize disturbances to businesses and residents in the surrounding communities of Surrey and New Westminster. The Traffic Management Plan also outlines access and parking procedures to minimize disturbance to FSD operations.

The two methods proposed for the construction of the safe haven do not require muck removal operations typically required during the construction of a shaft. During jet grouting operations, excess material emerging from the grout hole will be pumped into a holding container which is then transported off site via trucks. Excavated soil material is not planned to be stored on site.

Construction of the safe haven, depending on the methodology proposed is anticipated to generate approximately 8-16 vehicles per day including mobilization, construction and demobilization over a period of approximately six months. Vehicles would include b-train trucks, cement, hydrovac and crew vehicles.

The permit is valid for approximately 5 years, which is reflective of the construction phasing identified by the Applicant for the entire AWST project.

4 INDIGENOUS CONSULTATION

The port authority has reviewed the proposed works and determined that the project may have the potential to adversely impact Aboriginal or Treaty rights.

The following Indigenous groups were consulted:

- Katzie First Nation
- Kwantlen First Nation
- Kwikwetlem First Nation

- Musqueam First Nation
- Semiahmoo First Nation
- Tsawwassen First Nation
- Tsleil-Waututh First Nation
- People of the River Referral Office (PRRO) on behalf of the Nations associated with the Stó:lo Writ (Shxw'ow'hamel First Nation, Skawahlook First Nation and Soowahlie First Nation)
- Vancouver Island Nations (HTG): (Cowichan Tribes, Halalt First Nation, Lyackason First Nation, Penelakut Tribe, Stz'uminus First Nation).

The following consultation activities were conducted:

- Referral packages were sent between June 21, 2019 and July 25, 2019 and included the following:
  - a consultation letter
  - the permit application
  - an overview map
  - a project summary
- Follow-up actions/engagement

Below is a table summarizing comments received by the port authority and how they were considered as part of the project and environmental review.

Issue	Mitigations and Permit Conditions	Rationale
Concerns regarding impact to potential archaeological site	Conditions 32 and 34 have been added to the permit to ensure that an appropriately qualified archaeological monitor be present during ground disturbing activities with the potential to intrude into native soils and to carry out the project in accordance with the submitted Chance Find Procedure should an archaeological resource be encountered.	The application area is located in an area once utilized by Indigenous peoples and is in a medium to high archaeological potential when excavating in native soil. Conditions regarding archaeology, monitoring and reporting is anticipated to address Indigenous concerns regarding excavations in native soil.
Request for archaeological monitoring	Condition 32 has been added to the permit to ensure that an appropriately qualified archaeological monitor be present during ground disturbing activities with the potential to intrude into native soils	The application area is located in an area once utilized by Indigenous peoples and is in a medium to high archaeological potential when excavating in native soil. Condition 36 is anticipated to address Indigenous concerns regarding monitoring.

Issue	Mitigations and Permit Conditions	Rationale
Opportunity for Indigenous groups to monitor activities.	Condition 33 has been added to the permit requiring the Permit Holder to provide monitoring opportunities for interested Indigenous Groups.	The application area is located in an area once utilized by Indigenous peoples and is in a medium to high archaeological potential when excavating in native soil. Condition 37 is anticipated to address this request.
Request for any subsequent reports related to archaeology to be forwarded to Indigenous groups.	Proponent will be required to forward any subsequent reports relating to archaeology to interested Indigenous groups.	

Based on the record of consultation, the port authority is of the view that the duty to consult has been met.

5 EXISTING POLICIES OR GUIDELINES

The proposed works are in keeping with the the port authority Land Use Plan designation of Port Terminal, as described in Section 3 above.

6 NOTIFICATIONS

6.1 Municipal Notification

The proposed Project was assessed by the port authority to have minimal or no potential impacts to municipal interests. No permanent works are required for the development or use of the safe haven. As a result, no municipal notification was required to be conducted.

6.2 Tenant Notification

The proposed Project was assessed by the port authority to have potential impacts to tenant interests. A notification letter was sent to FSD on June 20, 2019, notifying them of the proposed Project. Fraser Surrey Docks had no comments. A consent agreement between Fraser Surrey Docks Limited Partnership and Greater Vancouver Water District, dated December 31, 2018 was received as part of the application submission.

6.3 Community Notification

The proposed Project was assessed by the port authority to have minimal or no potential impacts to community interests in the surrounding area either during construction or once the project is completed. Therefore, no community consultation or construction notification was required.

The Applicant has indicated that they will be distributing various construction communication materials to residents and businesses in New Westminster and Surrey prior to commencement of construction. Condition No.19 requires the Applicant to share final communications materials with the port authority and to confirm when they have been distributed.

7 INFORMATION SOURCES

The port authority has relied upon the following sources of information in its review of the Project.

- Application form and materials submitted by the Applicant on behalf of the tenant on April, 26, 2019.
- All Project correspondence from April 26, 2019 to December 17, day 2019.
- All plans and drawings labelled PER No.17-029-A to D.

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- "Annacis Water Supply Tunnel: An Archaeological Overview Assessment", January 15, 2018, Millennia Research Limited.
- "Metro Vancouver Annacis Water Supply Tunnel – Safe Havens Construction Environmental Management Plan", April 2019, Hemmera Envirochem Inc.
- "Archaeological Chance Find Procedure: Annacis Water Supply Tunnel Project", February 2019, Inlailawatash.
- "Fraser Surrey Docks Emergency Response Plan", 2015, Pacific Rim Stevedoring.
- "Engagement Summary Annacis Water Supply Tunnel Project", March 2019, Metro Vancouver
- "Consent Agreement from Fraser Surrey Docks for Temporary Work Space (Safe Haven Construction)", December 31, 2018 between Fraser Surrey Docks Limited Partnership and Greater Vancouver Water District.
- "Structural Analysis of AWST Watermain for Hypothetical Future Development at FSD" Technical Memo, November 1, 2019, prepared by Hatch.
- "Annacis Water Supply Tunnel – Potential FSD Future Development Load Surcharge", November 19, 2019, prepared by Hatch.
- "AWST – Supplementary Information for Safe Haven #1 (PER 17-029)" Technical Memo, dated November 27, 2019, prepared by Hatch

8 ENVIRONMENTAL REVIEW DECISION

In completing the environmental review, the port authority has reviewed and taken into account relevant information available on the proposed project, has considered the information and proposed mitigations provided by the Applicant and other information as listed elsewhere in this document, and concludes that with the implementation of proposed mitigation measures and conditions described in the project and environmental conditions section below, the Project is not likely to cause significant adverse environmental effects.

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ANDREA MACLEOD
MANAGER, ENVIRONMENTAL PROGRAMS

January 2, 2020
DATE OF DECISION

9 CONCLUSION

In completing the project and environmental review, the port authority concludes that with the implementation of proposed mitigation measures and conditions described in the project and environmental conditions section below, the Project has appropriately addressed all identified concerns.

PROJECT AND ENVIRONMENTAL REVIEW DECISION

Project Permit PER No. 17-029 is approved by:

ORIGINAL COPY SIGNED

CHRIS BISHOP
MANAGER, PLANNING

January 15, 2020
DATE OF APPROVAL

10 PROJECT AND ENVIRONMENTAL CONDITIONS

The port authority has undertaken and completed a review of the Project in accordance with the *Canada Marine Act* and Section 5 of the Port Authorities Operations Regulations and, as applicable, Section 67 of the *Canadian Environmental Assessment Act, 2012*.

If at any time the Greater Vancouver Water District (the Permit Holder) fails to comply with any of the project and environmental conditions set out in the project permit (the Permit) below, or if the port authority determines that the Permit Holder has provided any incomplete, incorrect or misleading information in relation to the Project, the port authority may, in its sole and absolute discretion, cancel its authorization for the Project or change the project and environmental conditions to which such authorization is subject.

Pursuant to Section 29 of the Port Authorities Operations Regulations, the port authority may also cancel its authorization for the Project, or change the project and environmental conditions to which such authorization is subject, if new information is made available to the port authority at any time in relation to the potential adverse environmental and other effects of the Project.

The following are the minimum conditions that must be followed by the Permit Holder to mitigate potential or foreseeable adverse environmental and other effects.

All the port authority Guidelines and Record Drawing Standards referenced in this document can be located at: https://www.portvancouver.com/development-and-permits/project-and-environmental-reviews/technical-guidelines/.

No.	GENERAL CONDITIONS
1.	The Permit Holder must have a valid lease, licence, or access agreement for the Project site prior to accessing the Project site or commencing construction or any other physical activities on the Project site. This Permit shall in no way limit any of the Permit Holder's obligations, or the port authority's rights, under such lease, licence, or access agreement.
2.	The Permit Holder shall at all times and in all respects, comply with and abide by all applicable statutes, laws, regulations and orders from time to time in force and effect, including all applicable environmental, labour and safety laws and regulations.
3.	This Permit in no way endorses or warrants the design, engineering, or construction of the Project and no person may rely upon this Permit for any purpose other than the fact that the port authority has permitted the construction of the Project, in accordance with the terms and conditions of this Permit.
4.	The Permit Holder shall indemnify and save harmless the port authority in respect of all claims, losses, costs, fines, penalties or other liabilities, including legal fees, arising out of: (a) any bodily injury or death, property damage or any loss or damage arising out of or in any way connected with the Project; and (b) any breach by the Permit Holder of its obligations under this Permit.
5.	The Permit Holder is responsible for locating all existing site services and utilities including any located underground. The Permit Holder is responsible for repair or replacement of any damage to existing site services and utilities, to the satisfaction of the port authority, that result from construction and operation of the Safe Haven.
6.	The Permit Holder shall undertake and deliver the Project to total completion in a professional, timely and diligent manner in accordance with applicable standards and specifications set out in the sections above entitled Project Description and Information Sources, including the attached plans and drawings numbered **PER No. 17-029-A to D**. The Permit Holder shall not carry out any other physical activities unless expressly authorized by the port authority.
7.	The Permit Holder shall cooperate fully with the port authority in respect of any review by the port authority of the Permit Holder's compliance with this Permit, including providing information and documentation in a timely manner, as required by the port authority. The Permit Holder is solely responsible for demonstrating the Permit Holder's compliance with this Permit.

8.	The Permit Holder shall review the Permit with all employees, agents, contractors, licensees and invitees working on the Project site, prior to such parties participating in any construction or other physical activities on the Project site. The Permit Holder shall be solely responsible for ensuring that all such employees, agents, contractors, licensees and invitees comply with this Permit.	
9.	The Permit Holder shall make available upon request by any regulatory authority (such as a Fishery Officer) a copy of this Permit.	
10.	Unless otherwise specified, the Permit Holder shall provide all plans, documents, and notices required under this Permit to the following email address: **per@portvancouver.com** and referencing **PER No.17-029**.	
11.	Unless otherwise specified, all plans, schedules, and other Project-related documentation that the Permit Holder is required to provide under this Permit must be to the port authority's satisfaction.	
12.	The port authority shall have unfettered access to environmental compliance documentation and the Project site at all times during construction without notice.	
13.	The Permit Holder must maintain and retain any records associated with, or produced by, actions or activities undertaken to achieve compliance or that indicate non-compliance with project permit conditions. These records must be made available at the request of the port authority.	
	CONDITIONS – PRIOR TO COMMENCING CONSTRUCTION OR ANY PHYSICAL ACTIVITIES	**SUBMISSION TIMING (business days)**
14.	The Permit Holder shall submit signed and sealed drawings for proposed works approved for construction by a professional engineer licensed to practice in the Province of British Columbia.	5 business days before commencing construction or any physical activities
15.	The Permit Holder shall provide the port authority with a copy of construction communications materials to residents and businesses in the City of Surrey and the City of New Westminster, and confirm when such materials have been distributed.	5 business days before distribution of materials
16.	The Permit Holder shall not dewater excavations unless a dewatering plan has been reviewed and accepted by the port authority. The dewatering plan shall include details on groundwater storage, methods of testing, parameters, applicable water quality standards, and the logistics of on-site discharge for water that meets applicable criteria.	20 business days before water disposal to the Fraser River
17.	The Permit Holder shall submit a construction parking and traffic management plan to the port authority's satisfaction. The Permit Holder shall carry out the Project in accordance with the construction parking and traffic management plan, and any subsequent amendments approved by the port authority.	20 business days before commencing construction or any physical activities
18.	The Permit Holder shall carry out the Project in accordance with the Chance Find Procedure, and any subsequent amendments approved by the port authority. The Permit Holder shall share the Procedure with Indigenous groups who have expressed interest in reviewing it.	30 business days before commencing construction or any physical activities
	CONDITIONS – DURING CONSTRUCTION OR ANY PHYSICAL ACTIVITIES	
19.	The Permit Holder shall notify the port authority upon commencement of construction, or any physical activities (e.g., mobilization to the Project site).	

20.	Prior to the commencing construction or any physical activities, the Permit Holder shall have in place a spill prevention, containment and clean-up plan for hydrocarbon products (including fuel, oil and hydraulic fluid) and any other deleterious substances. Appropriate spill containment and clean-up supplies shall be available on the Project site at all times and all personnel working on the Project shall be trained on the spill prevention, containment and clean-up plan. The Permit Holder shall carry out the Project in accordance with the spill prevention, containment and clean-up plan.
21.	All general construction and physical activities related to the Project shall be conducted from **Monday to Saturday** between the hours of **7:00 am and 8:00 pm**. No construction and physical activities shall take place on Sundays or holidays. These hours shall not be modified without prior approval of the port authority. To request permission to conduct activities outside these hours, the Permit Holder must submit a written request no less than 20 business days prior to the desired start date.
22.	The Permit Holder shall carry out the Project in accordance with the Construction Environmental Management Plan provided by the Permit Holder, and any subsequent amendments approved by the port authority.
23.	Without limiting the generality of permit condition #2, the Permit Holder shall not, directly or indirectly: (a) deposit or permit the deposit of a deleterious substance of any type in water frequented by fish in a manner contrary to Section 36(3) of the Fisheries Act; or (b) adversely affect fish or fish habitat in a manner contrary to Section 35(1) of the Fisheries Act.
24.	The Permit Holder shall maintain equipment in good mechanical condition and free of fluid leaks, invasive species, and noxious weeds.
25.	The Permit Holder shall dispose of any soils excavated from the project site that are not suitable for backfill at appropriate off-site facilities and maintain records of off-site disposal.
26.	Without limiting the generality of permit condition #2, if suspect contaminated materials are encountered, the Permit Holder shall contain, test and dispose of such materials at appropriate licensed off-site facilities and maintain records of off-site disposal. The port authority shall be notified of such activities and provided relevant documentation upon completion.
27.	Without limiting the generality of permit condition #2, materials brought onto the project site to be used for backfilling, site preparation, or other uses shall be from sources demonstrated to be clean and free of environmental contamination, invasive species and noxious weeds. The Permit Holder shall maintain records to verify this.
28.	During upland construction activities, the Permit Holder shall not conduct refueling or maintenance activities on nonroad equipment within 30 metres of any waterbody, or in an area where run-off may potentially reach surface waterbodies. Fuel and other hydrocarbon inventories shall not be stored in such areas, temporarily or otherwise.
29.	The Permit Holder shall conduct all activities involving the use of concrete, cement, mortars and other Portland cement or lime-containing construction materials in a manner that shall not deposit sediments, debris, concrete (cured or uncured), and concrete fines into the aquatic environment, either directly or indirectly. Water that has contacted uncured or partly cured concrete or Portland cement or lime-containing construction materials (such as the water that may be used for exposed aggregate wash-off, wet curing, equipment and truck washing) shall not be permitted to enter the aquatic environment. The Permit Holder shall provide containment facilities at the site for the wash-down water from concrete delivery trucks, concrete pumping equipment, and other tools and equipment, as required.
30.	The Permit Holder shall notify the port authority within two business days of any complaints received from the community and stakeholders during construction and indicate how the Permit Holder has responded to such complaints.

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31.	The Permit Holder shall remove all abandoned utilities and materials (i.e. piping and tubing etc.) associated with the construction and operation of the Safe Haven from the project site, both underground and aboveground. Any abandoned or decommissioned materials located within 2.0 metres of grade (minimum) shall be removed upon Project completion.	
32.	The Permit Holder shall ensure that an appropriately qualified archaeological monitor be on the Project site at all times during ground disturbing activities with the potential to intrude into native soils.	
33.	The Permit Holder shall provide opportunities for interested Indigenous groups to monitor and be present on the Project site at all times during ground disturbing activities with the potential to intrude into native soils. Subsequent reports relating to archaeology shall be forwarded to interested Indigenous groups.	
34.	If the Permit Holder encounters, expects to encounter, or should expect to encounter an actual or potential archaeological resource, the Permit Holder shall: a) Immediately stop any activities that may disturb the archaeological resource or the site in which it is contained (Site); b) Not move or otherwise disturb the archaeological resource or other remains present at the Site; c) Stake or flag the Site to prevent additional disturbances; and, d) Immediately notify the port authority by email and phone.	
35.	The Permit Holder may place temporary construction trailers on the Project site while this Permit remains in effect, provided that the Permit Holder does not connect such trailers to any underground utilities without the prior written consent of the port authority which may require, at the port authority's discretion, a the port authority Building Permit.	
	CONDITIONS – UPON COMPLETION	**SUBMISSION TIMING (Business Days)**
36.	The Permit Holder shall notify the port authority upon completion of the Project.	Upon substantial completion
37.	The Permit Holder shall submit an environmental monitoring summary report of the activities and observations of the Environmental Monitor referenced in the Construction Environmental Management Plan.	Within 40 business days of completion
38.	The Permit Holder shall provide record drawings in accordance with the port authority's Record Drawing Standards (available at: http://www.portvancouver.com/development-and-permits/project-and-environmental-reviews/technical-guidelines/), in both AutoCAD and Adobe (PDF) format to the port authority, including a Project site plan that clearly identifies the location of abandoned materials (i.e. piping, tubing etc.)_associated with the construction and operation of the Safe Haven.	Within 40 business days of completion
the port authority reserves the right to rescind or revise these conditions at any time that new information warranting this action is made available to the port authority.		
LENGTH OF PERMIT VALIDITY		
The Project must be completed no later than December 31, 2025.		

AMENDMENTS

- Details of any material proposed changes to the Project, including days and hours when construction and any physical activities will be conducted, must be submitted to the port authority for consideration of an amendment to this Permit.
- For an extension to the Expiry Date, the Permit Holder must apply in writing to the port authority no later than 30 days prior to that date.

Failure to apply for an extension as required may, at the sole discretion of the port authority, result in termination of this Permit.

CONTACT INFORMATION

Vancouver Fraser Port Authority
100 The Pointe, 999 Canada Place
Vancouver BC V6C 3T4 Canada

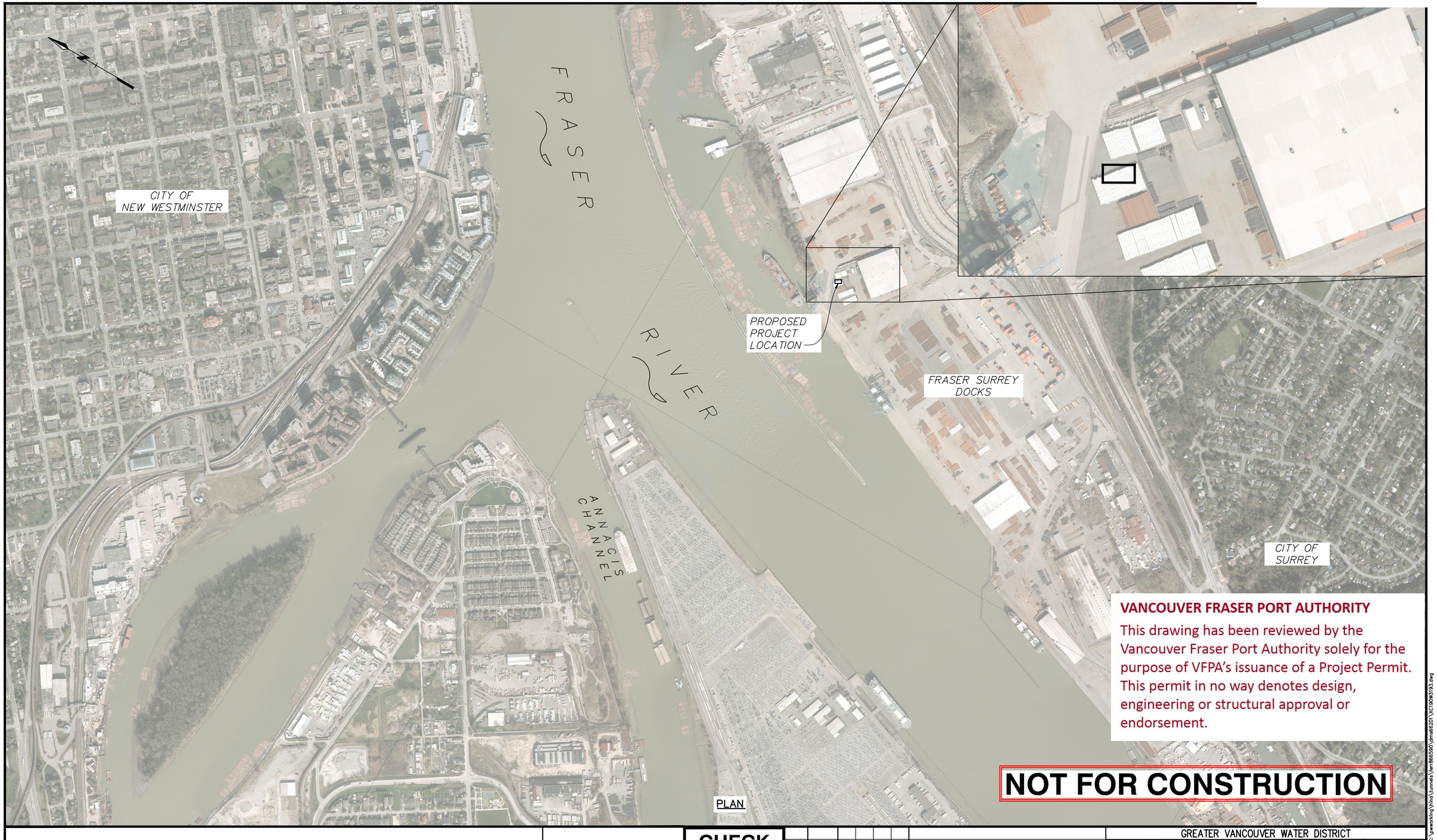
Project & Environmental Review
Tel.: 604-665-9047
Fax: 1-866-284-4271
Email: PER@portvancouver.com
Website: www.portvancouver.com

After normal business hours:

In the event of any land or marine construction incidents or concerns related to works carried out on-site under this permit, please contact the 24/7 Port Operations Centre 604-665-9086. In the event of an emergency requiring 'First Responders', please call 911 first

COPY

PER 17-029 A



VANCOUVER FRASER PORT AUTHORITY

This drawing has been reviewed by the Vancouver Fraser Port Authority solely for the purpose of VFPA's issuance of a Project Permit. This permit in no way denotes design, engineering or structural approval or endorsement.

NOT FOR CONSTRUCTION

HATCH

CHECK PRINT

THIS DRAWING HAS NOT BEEN APPROVED, AND MAY CONTAIN ERRORS AND OMISSIONS.

Professional Seal

Issue	Date	Desn	Dr'n	Chkd	App'd	Description
P2	JAN.10.20	MB	GF	DI	DZ	FOR INFORMATION
P1	OCT.19.18	MB	AC	DI	DZ	FOR INFORMATION

0 20 Bar is 20mm On Original Drawing. If Not On This Sheet, Adjust Scales Accordingly.

GREATER VANCOUVER WATER DISTRICT

Design: MB
Drawn: AC
Checked: DI
DZ Approved
DZ Manager

ANNACIS WATER SUPPLY TUNNEL
FRASER RIVER CROSSING

PROPOSED PROJECT
LOCATION PLAN

SCALE: 1:5000
DISTRICT FILE W-3193
DRAWING NUMBER X-C-190

SUPERSEDES PRINTS OF THIS DRAWING NUMBER WITH LETTERS PREVIOUS TO → P2

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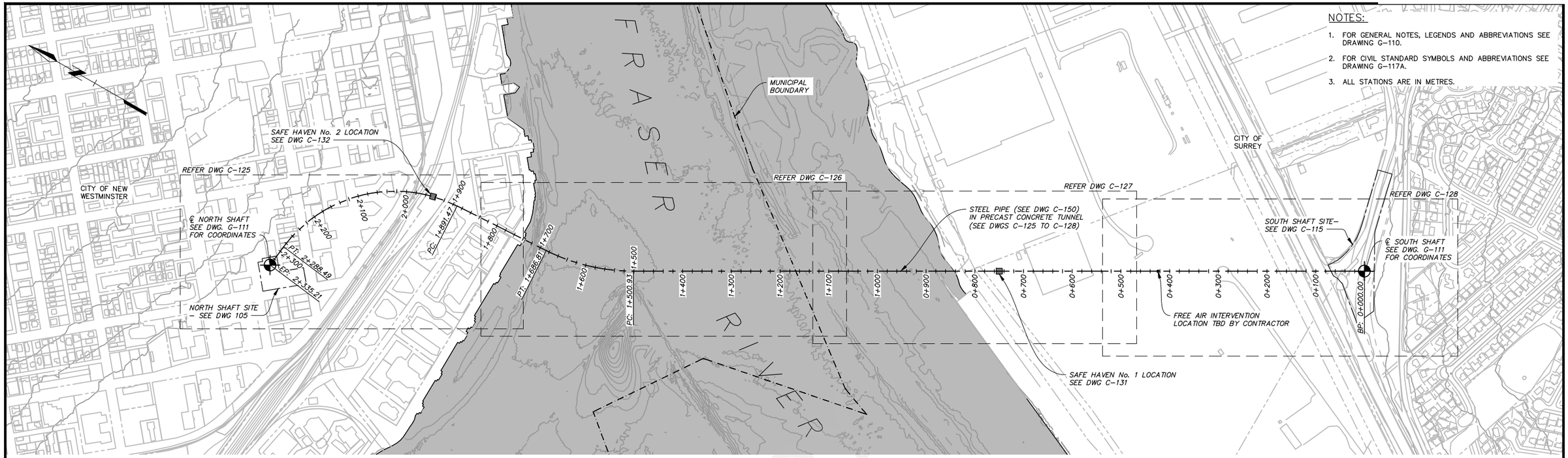
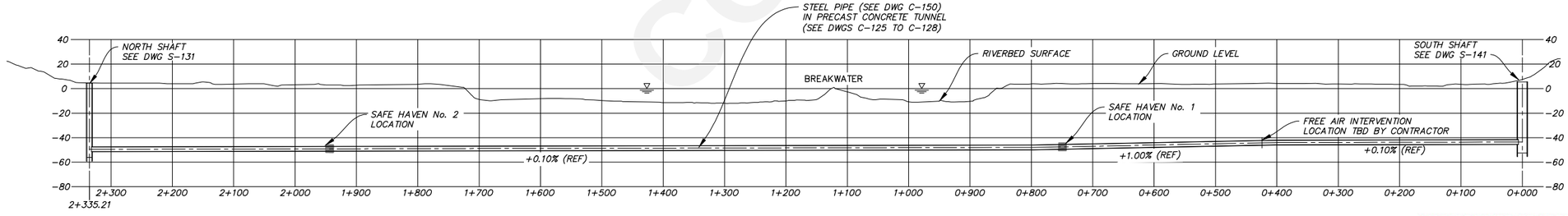


PLAN
1: 4000

NOTES:

1. FOR GENERAL NOTES, LEGENDS AND ABBREVIATIONS SEE DRAWING G-110.
2. FOR CIVIL STANDARD SYMBOLS AND ABBREVIATIONS SEE DRAWING G-117A.
3. ALL STATIONS ARE IN METRES.



PROFILE
HORIZ. – 1: 4000
VERT. – 1: 2000

VANCOUVER FRASER PORT AUTHORITY

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NOT FOR CONSTRUCTION

NOTES ON COORDINATE SYSTEM:

1. COORDINATES ARE IN A LOCAL GROUND-LEVEL SYSTEM. TO CONVERT TO GRID UTM ZONE 10 NAD83 (CSRS) – 4.0.0.BC.1.GVRD, FIRST APPLY A COORDINATE SHIFT (+5 300 000 NORTHING AND +400 000 EASTING) BEFORE APPLYING A COMBINED SCALE FACTOR (CSF) OF 0.9995993
2. ELEVATIONS ARE IN METRES AND REFER TO CVD28GVRD2005 – GEODETIC DATUM USING MONUMENT 89H6112, ELEVATION = 21.339 METRES (NEW WESTMINSTER); SFPR PRIMARY CONTROL STATION 96, ELEVATION=4.836 METRES (SURREY).
3. DATE OF SURVEY: ACCUMULATED DATA FROM 7 OCTOBER 2016 TO 1 APRIL 2019.
4. CONTRACTOR TO ASSUME EVERY HOUSE IS SERVICED BY SEWER, WATER, STORM, GAS, ELECTRICAL AND COMMUNICATIONS. ONLY STORM AND SANITARY ARE SHOWN ON DRAWINGS, CONTRACTOR IS TO CONTACT ALL THE UTILITIES TO OBTAIN MOST UP TO DATE RECORDS. ANY RECORDS THE DISTRICT HAS ARE INCLUDED IN THE APPENDICES.

HATCH

CHECK PRINT
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Professional Seal

WORK IN PROGRESS

Issue	Date	Desn	Dr'n	Chkd	Appd	Description
P3						**IN PROGRESS – PRE-BUILDING PERMIT DRAFT**
P2	OCT.04.18	MB	GF	DI	DZ	DETAIL DESIGN – 60% SUBMISSION
P1	JUN.15.18	MB	GF	DI	DZ	DETAIL DESIGN – 60% DRAFT SUBMISSION

0 20 Bar is 20mm On Original Drawing. If Not On This Sheet, Adjust Scales Accordingly.

GREATER VANCOUVER WATER DISTRICT

Design: MB
Drawn: DB
Checked: DI
DZ Approved
DZ Manager

ANNACIS WATER SUPPLY TUNNEL
FRASER RIVER CROSSING

TUNNEL PLAN & PROFILE
GENERAL ARRANGEMENT

SCALE: AS NOTED
DISTRICT FILE W-3193
DRAWING NUMBER C-121

SUPERSEDES PRINTS OF THIS DRAWING NUMBER WITH LETTERS PREVIOUS TO P3

xref files: C000AW3193.dwg C000BW3193.dwg C000EW3193.dwg C000FW3193.dwg C000JW3193.dwg C000LW3193.dwg

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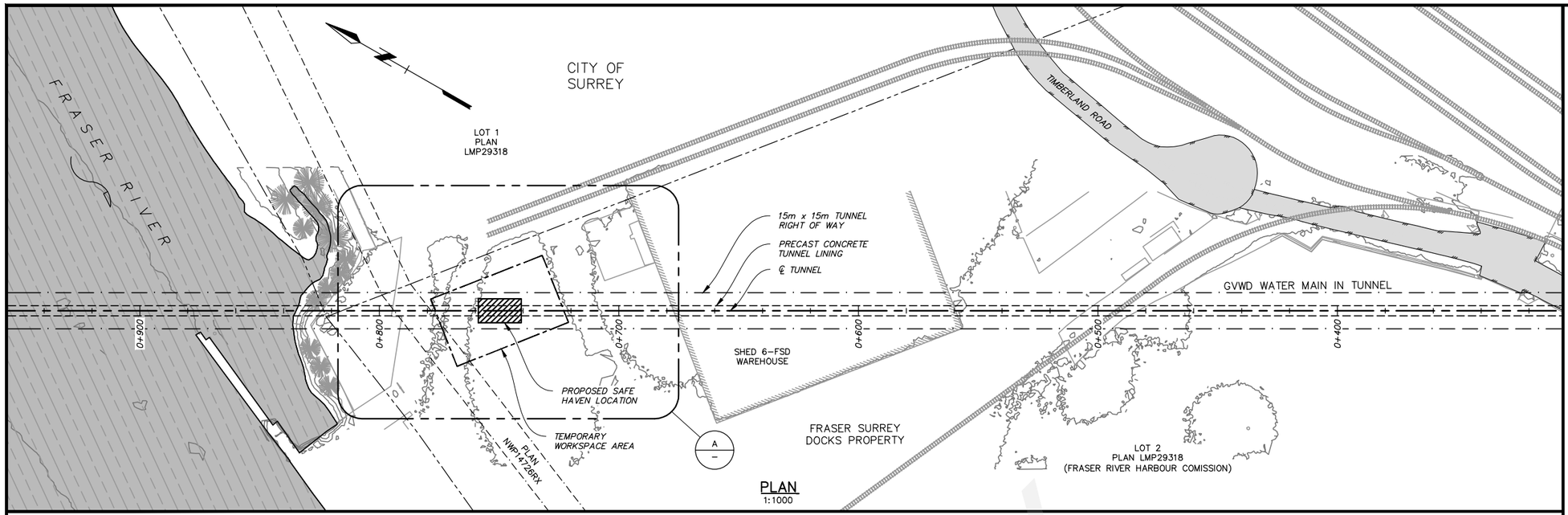
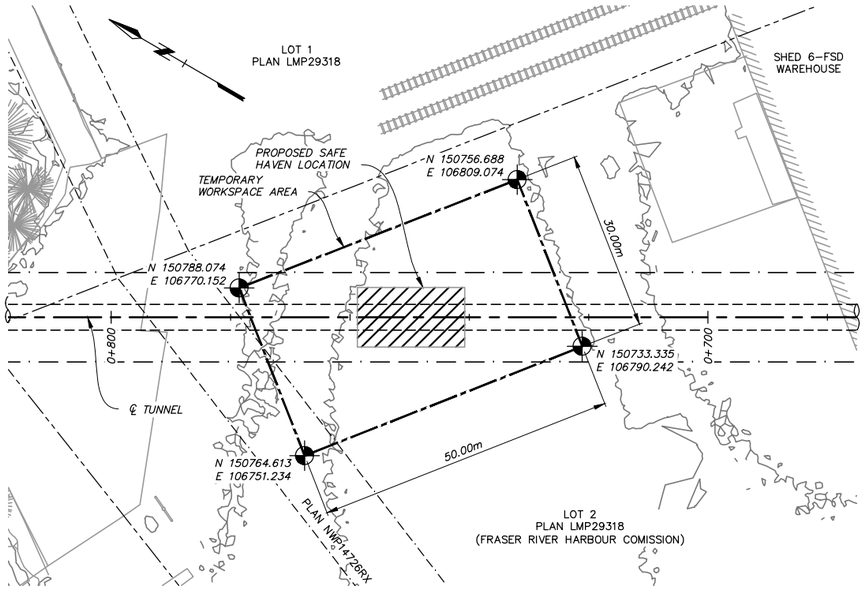
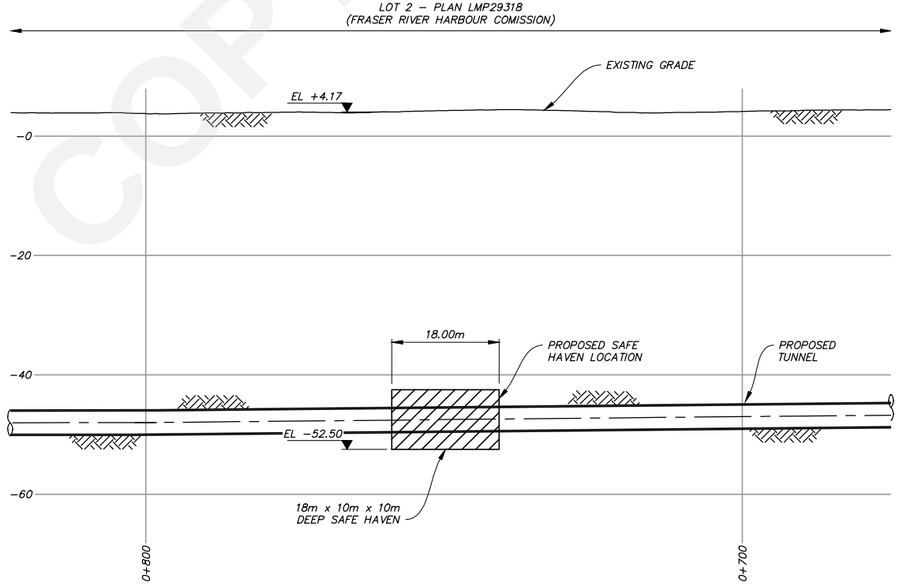


PLAN
1:1000



DETAIL A – PLAN – SAFE HAVEN No.1
1:500



PROFILE – SAFE HAVEN No.1
1:500 H

LEGEND

- EXISTING BUILDING
- EXISTING ROAD
- FRASER RIVER
- PROPERTY LIMIT
- PERMANENT EASEMENT

VANCOUVER FRASER PORT AUTHORITY

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NOT FOR CONSTRUCTION

NOTES ON COORDINATE SYSTEM:

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2. ELEVATIONS ARE IN METRES AND REFER TO GEODETIC DATUM CVD28GVRD USING MONUMENT SFPR PRIMARY CONTROL STATION 96, ELEVATION=4.836 METRES.
3. DATE OF SURVEY: ACCUMULATED DATA FROM 7 OCTOBER 2016 TO 1 APRIL 2019.

HATCH

CHECK PRINT

THIS DRAWING HAS NOT BEEN APPROVED, AND MAY CONTAIN ERRORS AND OMISSIONS.

Professional Seal

Issue	Date	Desn	Dr'n	Chkd	App'd	Description
P2	JAN.10.20	MB	GF	DI	DZ	FOR INFORMATION
P1	OCT.19.18	MB	AC	DI	DZ	FOR INFORMATION

0 20 Bar is 20mm On Original Drawing. If Not On This Sheet, Adjust Scales Accordingly.

GREATER VANCOUVER WATER DISTRICT

Design: MB
Drawn: GF
Checked: DI
DZ Approved
DZ Manager

ANNACIS WATER SUPPLY TUNNEL
FRASER RIVER CROSSING

PROPOSED PROJECT SITE PLAN & PROFILE

FRASER SURREY DOCKS PROPERTY

SCALE: AS NOTED
DISTRICT FILE W-3193
DRAWING NUMBER X-C-191

SUPERSEDES PRINTS OF THIS DRAWING NUMBER WITH LETTERS PREVIOUS TO → P2

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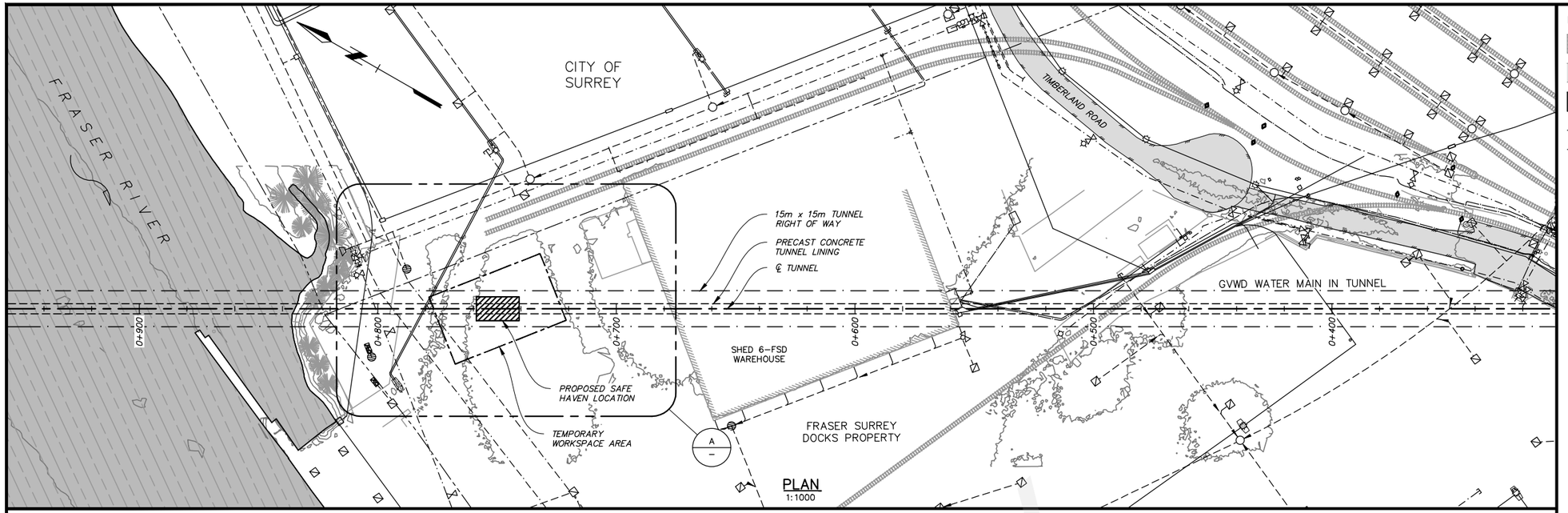
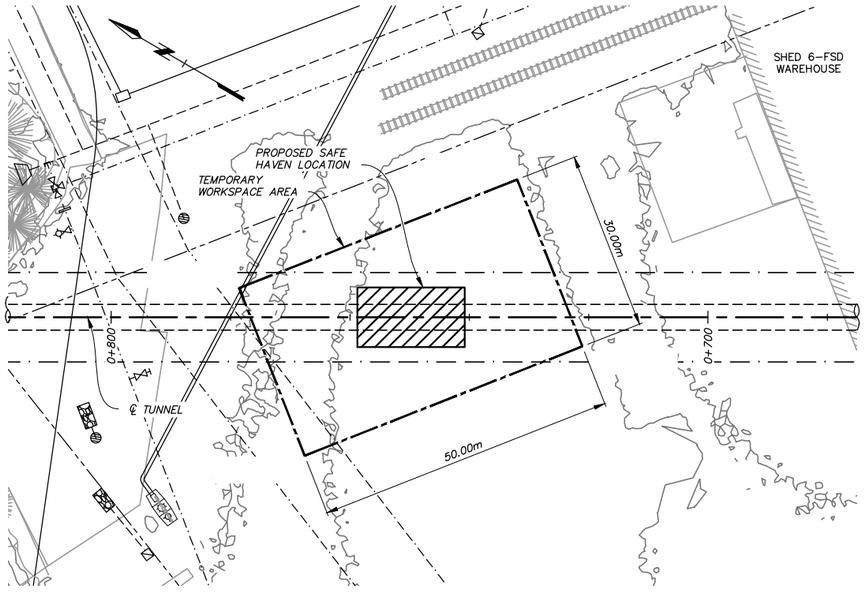


PLAN
1:1000



DETAIL A – PLAN – PROPOSED SAFE HAVEN
1:500

LEGEND

- EXISTING BUILDING
- EXISTING ROAD
- FRASER RIVER
- PROPERTY LIMIT
- PERMANENT EASEMENT
- EXISTING ELECTRICAL
- EXISTING WATER MAIN
- EXISTING STORM LINE
- LIGHT STAND
- FIRE HYDRANT
- WATER VALVE
- T
- STORM MANHOLE
- CATCH BASIN
- CATCH BASIN

VANCOUVER FRASER PORT AUTHORITY

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NOT FOR CONSTRUCTION

HATCH

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Professional Seal

Issue	Date	Desn	Dr'n	Chkd	Appd	Description
P2	JAN.10.20	MB	GF	DI	DZ	FOR INFORMATION
P1	OCT.19.18	MB	AC	DI	DZ	FOR INFORMATION

0 20 Bar is 20mm On Original Drawing. If Not On This Sheet, Adjust Scales Accordingly.

GREATER VANCOUVER WATER DISTRICT

Design: MB
Drawn: GF
Checked: DI
DZ Approved
DZ Manager

ANNACIS WATER SUPPLY TUNNEL
FRASER RIVER CROSSING

PROPOSED PROJECT SITE UTILITIES

FRASER SURREY DOCKS PROPERTY

SCALE: AS NOTED
DISTRICT FILE W-3193
DRAWING NUMBER X-C-193

SUPERSEDES PRINTS OF THIS DRAWING NUMBER WITH LETTERS PREVIOUS TO → P2

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