



PORT of  
**vancouver**

**PROJECT AND ENVIRONMENTAL REVIEW REPORT**  
**PER NO. 17-107**  
**PATTULLO BRIDGE REPLACEMENT**

Prepared for:  
Project and Environmental Review Committee

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		<b>VANCOUVER FRASER PORT AUTHORITY PROJECT AND ENVIRONMENTAL REVIEW REPORT</b>
<b>PER No.:</b>	<b>17-107</b>	
<b>Tenant:</b>	<b>BC Ministry of Transportation and Infrastructure</b>	
<b>Project:</b>	<b>Pattullo Bridge Replacement</b>	
<b>Project Location</b>	<b>New Westminster, BC</b>	
<b>VFPA SID No.:</b>	<b>SUR330-06101F-001</b>	
<b>Land Use Designation:</b>	<b>Port Water, Industrial, and Recreation</b>	
<b>Applicant(s):</b>	<b>BC Ministry of Transportation and Infrastructure</b>	
<b>Applicant Address:</b>	<b>1100 – 401 West Georgia Street, Vancouver, BC V6B 5A1</b>	
<b>Category of Review:</b>	<b>D</b>	
<b>Recommendation:</b>	<b>That PER No. 17-107 for Pattullo Bridge Replacement be approved.</b>	

## 1 INTRODUCTION

The Vancouver Fraser Port Authority (VFPA), a federal port authority, manages lands under the purview of the *Canada Marine Act*, which imparts responsibilities for environmental protection. VFPA 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 documents VFPA's project and environmental review of PER No. 17-107: Pattullo Bridge Replacement (the Project) proposed by the BC Ministry of Transportation and Infrastructure (the Applicant).

This project and environmental review was carried out to address VFPA'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, VFPA 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, VFPA 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 VFPA and other consultations carried out by VFPA. A full list of information sources germane to the review is provided in **Appendix B**.

This project and environmental review report is NOT a project authorization. It is a prerequisite to the issuance of a project permit (the Permit) and the conclusions described in this report require compliance with the conditions in the Permit.

### 1.1 VFPA Project and Environmental Review

Under the *Canada Marine Act*, VFPA is responsible for the administration, management and control of land and water within its jurisdiction. To effectively manage these responsibilities, VFPA

administers a permitting process to ensure all developments and activities meet applicable standards and minimize environmental and community impacts. The Project and Environmental Review process applies to all proposed physical works and activities on federal lands and waters partially or wholly within the Vancouver Fraser Port Authority's jurisdiction. Pursuant to VFPA's Project and Environmental Review process, the proposed Project has been classified as a Category D project (for further information, see <https://www.portvancouver.com/wp-content/uploads/2015/05/Project-Category-Process-Steps-Category-D.pdf>).

## 1.2 Harmonized Environmental Assessment Process

Based on the thresholds of a designated project as defined in the Regulations Designating Physical Activities under *CEAA, 2012*, the Project is not considered a designated project. However, the Project is proposed to occur on federal lands and waters managed by VFPA. Federal authorities defined under *CEAA, 2012* are required by section 67 of *CEAA, 2012* to determine whether projects on federal lands are likely to cause significant adverse environmental effects. VFPA as the responsible federal authority must make a determination of the significance of adverse environmental effects that may be caused by the Project, including potential effects on Aboriginal groups of any change that may be caused to the environment, pursuant to section 5(1)(c) of *CEAA, 2012*.

Pursuant to the Reviewable Projects Regulation under the British Columbia *Environmental Assessment Act* the Project meets the criteria of a shoreline modification project and therefore would require an Environmental Assessment Certificate in order to proceed.

To align each authority's respective reviews of the Project, on October 6, 2016, both VFPA and the British Columbia Environmental Assessment Office (EAO) agreed to a harmonized approach to the environmental assessment review process, including Aboriginal consultation. VFPA and EAO agreed that British Columbia's environmental assessment process, incorporating VFPA's federal requirements will meet the respective assessment requirements of both VFPA and British Columbia. In this harmonized approach, EAO acted as the lead agency and the VFPA and other relevant agencies were represented on the Advisory Working Groups.

The harmonized environmental assessment consisted of the following:

- Project Description: followed the legislative and regulatory requirements of both the Province and VFPA;
- Aboriginal Consultation: EAO and VFPA aligned consultation requirements and jointly identified the Aboriginal groups whose asserted and established interests, including treaty rights and lands which may be impacted by the proposed Project;
- Public Consultation: EAO and VFPA aligned public consultation requirements;
- Scope and procedures: EAO developed the scope of the EA which included VFPA's requirements and was issued to the Applicant in the section 11 order under the British Columbia *Environmental Assessment Act*;
- Advisory Working Groups: experts from VFPA and experts from relevant federal agencies participated in the review and commented on project materials and sufficiency of the environmental assessment;
- Valued Components, Application Information Requirements, and Advisory Working Group meetings: VFPA provided input into the selection of valued components pursuant to requirements under *CEAA, 2012* and provided comments and review on the Application and supplementary materials;
- Environmental Assessment Conclusions: the conclusions of the harmonized environmental review process, subject to any additional information required by VFPA, informed the VFPA Category D review of the Project and informed VFPA's section 67 determination pursuant to

the *CEAA, 2012*. On behalf of the Province of BC, the Minister of Environment and Climate Change Strategy and the Minister of Municipal Affairs and Housing made their own decision to grant an approval for the Project to proceed; and

- Should the Project be approved, EAO and VFPA agree to coordinate inspections regarding conditions attached to the Provincial approval, and VFPA will review and enforce applicable conditions on VFPA lands in addition to any conditions attached to the project permit.

## 2 PROJECT DESCRIPTION

### 2.1 Project Overview

The British Columbia (BC) Ministry of Transportation and Infrastructure (MOTI) is proposing the Pattullo Bridge Replacement Project to replace the existing Pattullo Bridge with a new four (4) lane bridge across the Fraser River to connect Columbia Street/East Columbia Street in New Westminister to King George Boulevard and Highway 17 in Surrey. The purpose of the Pattullo Bridge Replacement Project is to replace the existing Pattullo Bridge, which has reached the end of its feasible lifespan. The new bridge will be located immediately north and upstream of the existing bridge and Canadian National (CN) Rail Bridge, and will continue to link the communities of New Westminister and Surrey. The Pattullo corridor provides transportation for important goods and trade linkages between the Port of Vancouver Fraser River terminals, the Fraser River Trade Area, and adjacent communities. For the purposes of the VFPA Project and Environmental Review, the Project is defined as the construction of the new bridge and connecting infrastructure, and the demolition of the existing bridge and connecting infrastructure within VFPA jurisdiction.

The Project is proposed as a Design Build, and the final footprint will be defined during the final design stage. The preliminary design is shown in **Appendix A**. The new bridge will have a maximum of four (4) in-river piers, in comparison to the existing bridge which has six (6) in-river piers. The final location of the four proposed piers will be determined during the final design stage. The new bridge is proposed to meet current seismic and road design standards, and to include wider lanes for vehicles and dedicated lanes for pedestrians and cyclists. There is no proposed increase in traffic capacity for the new bridge. The new bridge will optimize the use of the existing road networks and travel patterns and will also include new connections to reduce traffic on local residential streets to access the river crossing. Constructing the new bridge parallel to the existing bridge also allows the existing bridge to continue operating. Following the commissioning of the new bridge, the existing bridge will be demolished and removed.

The Project footprint is bordered by both industrial and recreational land uses. On the north bank the Project is bounded by the Brunette Fraser Regional Greenway to the east, and the existing bridge to the west. The south bank of the Project is bound by industrial property to the east, and by the existing bridge and Brownsville Park to the west. On the south bank of the Fraser River, the proposed new spans will stretch over VFPA lands.

Between 2012 and 2014, TransLink, the City of New Westminister, and the City of Surrey, with participation from Metro Vancouver and the Province, led the Pattullo Bridge Strategic Review Process which assessed more than 25 alternatives to rehabilitate or replace the existing Pattullo Bridge. The strategic review considered different types of bridges, alternative routes, number of bridge lanes and community connections. These alternatives were assessed through broad consultation with potential bridge users, local residents, businesses, federal, provincial and municipal governments, and technical reviewers. The alternatives assessment considered the feasibility of each alternative to meet current seismic and road design standards, provide a safe and reliable crossing for vehicles, pedestrians and cyclists, and provide network connections in the City of New Westminister and the City of Surrey. Through the strategic review, the number of alternatives was reduced to six, all of which involved a multi-modal transportation connection. Further evaluation against a set of technical, environmental and economic objectives narrowed the list of options from six to two; one involving a new four-lane bridge, and the other involving a new six-lane bridge. Both options identified the current Fraser River crossing location as the preferred location for a new bridge. A new four-lane bridge replacement was selected as the preferred option because it was determined to be the more cost-effective of the two options.

## 2.2 Proposed Works

The proposed works include the following components and activities:

- Onshore improvements to meet seismic performance requirements for embankments and foundations;
- Installation of cofferdams including ground improvements and rip rap;
- Construction and use of temporary construction and demolition laydown areas;
- Constructing in-stream and onshore foundations;
- Constructing in-stream and onshore pile caps;
- Constructing bridge towers;
- Constructing piers for approach spans and ramps;
- Constructing the cable-stayed deck;
- Constructing approach span and ramp decks;
- Construction of stormwater collection and treatment facilities;
- Installation of relocated utilities;
- Installing barriers, hand rails, security fencing, suicide prevention barrier, lighting, structural health monitoring, and snow and ice management systems;
- Final paving and lane marking; and
- Demolition of the existing bridge and existing spans connecting King George Boulevard.

## 2.3 Associated Works Not Included In Scope

Physical Project components of the new bridge and associated connecting infrastructure will be situated in the City of New Westminster, over the Fraser River, and in the City of Surrey. Similar to the existing bridge, approaches for the new bridge will connect to McBride Boulevard in the City of New Westminster, and King George Boulevard in the City of Surrey. The VFPA Project and Environmental Review includes the components over the Fraser River crossing and approach spans over VFPA property on the south bank of the Fraser River.

The following is a summary of Project components that are not located with VFPA jurisdiction and therefore are not included in the scope of the VFPA review, but are assessed through the harmonized environmental assessment process:

- Access roads to and from the new bridge and McBride Boulevard, Royal Avenue, and East Columbia Street;
- Approach spans to connect roads in New Westminster to the in-stream components of the new bridge, including a direct ramp connections from East Columbia for both southbound and northbound bridge traffic;
- Roadway tie-ins to King George Boulevard;
- Connection between the new bridge and Highway 17;
- Reconstruction of Bridge Road to allow two-way traffic access to Old Yale Road;
- Grade separation between Old Yale Road and Highway 17; and
- Landscaping in New Westminster and beyond VFPA jurisdiction in Surrey.

## 2.4 Project Schedule and Phasing

The construction of the new bridge is proposed to begin in 2019, and take up to five (5) years to complete. The new bridge is expected to open to traffic in 2023; at which time the demolition and

removal of the existing bridge structures will begin. The demolition and removal of the existing bridge is expected to be completed by 2024.

### **2.4.1 Project Construction**

The proposed Project would utilize a design-build approach. As a result, some variation to Project plans between what has been authorized and the final design is anticipated. Variations to Project plans may require amendment to the Project Permit, VFPA building permits, or both. The application describes on-site and off-site project activities that will be undertaken during construction. Key Project activities are summarized below:

- Site preparation activities typically include collection of design-related data and work required before actual construction begins. Site preparation typically includes the following:
  - Surveying – Defining the extent of area where construction works will take place, and locating site access roads, temporary detours, utilities, property accesses, and sensitive areas;
  - Geotechnical investigations – Assessing existing ground conditions within the Project corridor, including confirmation of pile capacities. Locations needing ground improvements will be identified through compaction testing and by collecting soil core samples;
  - Erosion and sediment control measures – Establishing infrastructure to minimize soil erosion and prevent the release of sediments into watercourses during site preparation and other preconstruction activities; and
  - Staging and laydown areas – Establishing areas for the staging and/or storage of materials and/or heavy equipment such as cranes and construction materials. Wherever possible, staging and laydown areas will be located in previously disturbed areas within the Project Boundary.
- Temporary works:
  - Temporary lighting to facilitate construction during winter months or night work. Community notifications are proposed in advance of installation and use of lighting;
  - Temporary barging facilities to assist in the delivery of construction materials and minimize the use of regional and local roads. It is estimated that, on average, between three and five barge trips per week will be generated by the Project. Most of this barge traffic is assumed to be entering the Project boundary in an upstream direction from the mouth of the Fraser River as opposed to downstream from locations further up the river. This upstream barge traffic could be mainly using the south arm of the river but large barges are also known to use the north arm. All temporary barge facilities will be removed when no longer required;
  - Temporary bridges (trestles) from the north and south shores to the nearest instream construction locations. Temporary trestles would be removed after completion of construction; and
  - Installation of temporary in-stream enclosures (cofferdams) that would allow foundation construction activities to be separated from the Fraser River. Cofferdams would be removed once foundation construction is complete.
- Stormwater collection and treatment facilities
- Construction of the new bridge:



- Approach spans – Multi-span bridge structures (approach spans) will be provided to bring the roadway from existing at-grade elevations to the elevation required for the river crossing. In addition to the construction practices discussed in previous sections, the following methods could be expected for the construction of the approach spans:
  - Embankment construction – Embankments will be constructed to transition from at-grade roads to the roadway on the approach spans. Embankment construction typically requires ground improvements, placing of fill, installation of retaining walls and paving.
  - Foundation construction – Given the soft soils in Surrey, deep foundations, piles for example, will be required. Piles would be either driven or augured to the depth required by the design. In addition, the upper layers of the soils adjacent to the deep foundations in Surrey will need to be densified to provide the required seismic resistance.
  - Substructure installation – Pile caps and bridge piers (bridge substructure) will be used to transfer load between the bridge deck and the foundations. Bridge substructures are typically constructed using cast-in-place concrete although in some cases steel or precast concrete components might be used.
  - Deck construction – The approach span deck will likely consist of a concrete road deck supported by either precast concrete, cast-in-place concrete or steel girders. Girders would be erected using cranes and the concrete deck would typically be precast and/or cast-in-place concrete. A segmental precast concrete deck could also be used and installed with a launching gantry.
- River crossing – The river crossing will require a long span structure to cross the navigation channel and to place foundations in locations that minimize changes to river hydraulics. Work for the river crossing will be carried out using temporary trestles and barge mounted equipment. Typical construction methods include:
  - Foundations – Foundations for the river crossing will be similar in nature to those described above for the approach spans. Ground improvements may be required around each instream foundation to mitigate potential liquefaction and riprap may need to be placed around foundations to control scour. To control underwater noise, piles could either be driven through specially configured sleeves, within dewatered cofferdams, or drilled.
  - Substructures – Pile caps, piers and, in the case of cable stayed bridges, towers will be required to transfer loads from the bridge deck to the foundations. Substructure construction could include placing of cast-in-place concrete and/or installation of precast concrete and fabricated steel elements. A variety of cranes including barge mounted cranes and tower cranes are expected to be required for this construction.
  - Main span – A long span structure will be required to span the Navigation Protection Zone<sup>1</sup>, and to allow instream foundations and substructures to be placed such that changes to the river hydraulics are minimized. Depending on the final length of the

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<sup>1</sup> Navigation Protection Zones for the Project were established using the *Permanent Association of Waterborne Transport (PIANC): Approach Channel Guidelines Report No. 121-2014*. Two navigation channels have been identified for the Project: a 160 metre wide Main Channel and a 60 metre wide Secondary Channel (see Figure 1 in *Pattullo Bridge Replacement Project - Navigation Requirements*, MOTI, dated April 17, 2019)

main span, viable long span structures include cable stayed bridges and tied arches. Both of these bridge types will require erection of structural steel components using cranes or lifting hoists as well as construction of a concrete deck consisting of prefabricated and/or cast-in-place concrete.

- Sequencing and staging of bridge construction – Sequencing and staging of bridge construction will be influenced by the Contractor’s construction approach and will be determined in concert with design activities. The Contractor will provide plans for all elements of the Project, including temporary facilities, detours, and staging and laydown areas, which will be finalized through the design submission and review procedures established in the contract. All staging locations will be within the Project Boundary. Some staging areas will be moved over the course of construction as various work activities are completed and traffic is relocated.
- Utilities - A number of utilities located within the Project limits have been identified by the Applicant including those that are carried by the existing bridge. The Applicant is working with affected agencies to establish requirements for protection and relocations as required. Detailed utility relocation requirements will be finalized by the Applicant as part of the final design of the Project.

### **2.4.2 Project Operations**

The Project operations includes the operating bridge, traffic, and bridge maintenance activities. Operations and maintenance activities will be ongoing for the life of the new bridge.

Operations and maintenance activities associated with the operations of the new bridge include, but are not limited to:

- Routine operations, maintenance, and rehabilitation of the new bridge and approaches;
- Roadside maintenance, including signage;
- Drainage maintenance;
- Stormwater collection and treatment;
- Winter maintenance;
- Emergency maintenance;
- Traffic maintenance;
- Line marking; and
- Electrical asset maintenance.

All operational and maintenance activities will be carried out in accordance with established environmental best practices and defined performance measures, in a manner consistent with MOTI’s Environmental Best Practices for Highway Maintenance Activities (MOTI 2018). All contractors undertaking operations and maintenance activities for MOTI are required to provide an environmental management plan that includes:

- Processes to ensure best practices outlined in the Province’s manual, “Environmental Best Practices for Highway Maintenance Activities,” are followed when completing operational and maintenance activities; and
- Processes for obtaining and maintaining environmental permits and approvals, monitoring and reporting, performing environmental management plan quality audits, control of non-conforming services, corrective actions and opportunities for improvement and

environmental awareness and regulatory compliance training for the Contractor and subcontractors.

Regular highway inspections, including annual inspection of the new bridge by MOTI personnel, will be scheduled to ensure that maintenance issues are identified and addressed on a continuing and consistent basis. Maintenance activities will be scheduled at appropriate times of the year based on seasonal considerations. Ongoing drainage and roadside maintenance will be undertaken either throughout the year or as needed, based on seasonal requirements and appropriate in-stream work windows. Structure maintenance and traffic maintenance (e.g., signage and electrical assets) will be scheduled according to the requirements as identified during highway inspections.

All stormwater runoff from the new bridge will be collected and treated using methods such as biofiltration or mechanical treatment facilities before being released. Stormwater drainage infrastructure will not encroach on the air draft of the navigation channel, and dripline effects on the navigation channel will be minimized. Stormwater management infrastructure will adhere to best practices in BC and will be consistent with the concept of integrated stormwater management.

Potentially hazardous materials required to support operational and maintenance activities will be stored and managed in compliance with local, provincial and federal regulations and Workplace Hazardous Materials Information System (WHMIS) standards.

### **2.4.3 Demolition of the Existing Bridge**

When the new bridge is open to traffic, the existing bridge will be removed. Existing bridge removal will involve the sequential removal of span elements followed by removal of the piers. Removal will involve the following activities:

- Removal of the main span;
- Removal of the truss spans over the Fraser River, including anchoring of two (2) barges, intermittently for up to two months for truss removal;
- Removal of the approach spans in Surrey;
- Removal of six (6) existing in-river piers, such that any remaining portions that are retained to minimize potential impacts to the stability of the riverbed do not impede safe navigation;
- For pier removal a barge will be anchored at pier locations for up to five (5) months;
- Pier removal will be supported by a barge-mounted crane and a transport barge weekly;
- Removal of onshore substructures to finished grade separation; and
- Disposal of construction materials according to regulatory requirements, and recycling wherever feasible.

The Applicant will provide a removal plan that outlines specific procedures, including any traffic management plans that may be required to support disassembly and removal.

## **3 VANCOUVER FRASER PORT AUTHORITY DEPARTMENT REVIEWS**

The following VFPA departments have reviewed the application:

- Planning and Development (including Planning, Transportation, and Project Consultation);
- Engineering;

- Marine Operations; and
- Environmental Programs.

### 3.1 Planning

Planning has reviewed the application and has the following land use comments:

- The bridge spans three designations under the VFPA Land Use Plan. The west portion of the bridge crosses a Recreation designation, the centre section is designated Port Water, and the east portion crosses land and water designated Industrial. Some portions of the work area are outside of VFPA jurisdiction and as such are un-designated.
- The proposed transportation use is considered permissible under all land use designations, but is not a use that is specifically contemplated in the Land Use Plan. Given that the existing bridge supports regional and international trade, the limited effects that the construction of the new bridge would have on VFPA lands, and that the existing bridge will be removed following the commissioning of the new bridge (removing the impacts that the existing structure has on VFPA land and water), there are no outstanding concerns from a land use planning perspective. No amendments to the Land Use Plan are required as a result of this Project.

There are no buildings proposed in the application materials that comprise the schematic bridge design. Should any structures be proposed, for example to house stormwater treatment equipment, these would be subject to a review against the 2015 National Building Code.

Planning supports the recommendation to approve the Project subject to adherence to the listed project and environmental conditions in the Permit.

### 3.2 Engineering

VFPA Engineering provided advice to the Applicant in the pre-application stage, and reviewed the Application. The scope of the engineering review included technical feedback, utility relocation, design-build criteria, demolition requirements and preparation of associated engineering permit conditions that are suited to the nature of the Project.

The Applicant is required to safely locate, and remove all existing utilities from the existing bridge, from areas where densification is required to meet seismic requirements, and where new utilities will be installed. The Applicant is also responsible for locating all utilities within the construction footprint of the Project.

As a result of the design-build approach, where the construction methods and design details have yet to be finalized; conditions have been included in the permit requiring the submission of final layouts and engineering drawings, and construction (Condition No. 20 and No. 60) and demolition (Condition No. 62 and No. 98) plans. Engineering will review final drawings and plans as the plans are submitted to VFPA prior to each phase of the Project.

A standard permit condition requires that the Applicant is required to remove all structural elements, including superstructure and applicable substructures of the existing bridge (in water and upland). In this Project, given the potential for riverbed instability to result in risk to other nearby infrastructure, a permit condition (Condition No. 64) has been included such that VFPA will consider allowing portions of the existing bridge piers to be retained to prevent riverbed instability. The Applicant must provide an engineering analysis that describes the technical rationale for retaining portions of the in-river piers to the satisfaction of VFPA. However, for navigation protection, the retained portions of the existing bridge must be removed to 14.32 metres below

Geodetic Datum as per *Pattullo Bridge Replacement Project - Navigation Requirements*, MOTI, dated April 17, 2019. This will ensure and protect VFPA's future development and gateway infrastructure potential within VFPA's jurisdiction.

Engineering has reviewed the application and requires the following, in addition to the preceding:

- Submit signed and sealed BC certified engineer-stamped drawings for all proposed works prior to the commencement of construction. The Applicant is required to review the final design drawings produced by the Design- Builder, to ensure that they meet the Project performance criteria;
- The Permit Holder shall provide record drawings in accordance with VFPA'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 VFPA, including a Project site plan that clearly identifies the location of works; and
- During construction of the in-water piers, the Permit Holder is to ensure that mitigation measures are in place to minimize impact/damage, during pile driving, to existing infrastructure (i.e. existing foundation for New West Rail Bridge, for example); and

Engineering supports the recommendation to approve the Project subject to adherence to the listed project and environmental conditions in the Permit.

### 3.3 Transportation

Transportation provided input to the Applicant during the pre-application stage, as well as during the course of application review. This input related to traffic management, infrastructure protection, performance criteria, and technical input.

The Project proposes significant changes to the road network approaching the new bridge, as well as to connecting roadways which connect to VFPA lands. The construction of the new bridge may impact roadway access for a number of current VFPA tenants, and construction phasing details are not available at this time for review. As part of the design-build process, the Applicant has indicated that the selected contractor will be responsible for developing traffic management plans and will be required to adhere to commitments made through the harmonized environmental review process.

The Permit Holder has committed to maintain all existing traffic movements and the corresponding levels of service during normal business hours (restricted hours) for the duration of the Project, to the extent possible. During non-restricted hours, lane and road closures may be required to allow work, such as overhead bridge construction, to be carried out in a safe manner. Any road closures would be accompanied by a reasonable detour route to ensure access to properties and businesses is maintained at all times. Further details can be found in the Applicant's *Additional Information on Access to Public and Private Properties and Noise during Construction* document. As a result of the design-build approach, a condition has been included in the permit requiring the submission of a construction parking and traffic management plan (Condition No. 25), a demolition parking and traffic management plan (Condition No. 71), a construction staging Plan (Condition No. 26), and a Demolition Staging Plan (Condition No. 70) for VFPA review.

Due to the close-proximity between the proposed new bridge alignment and existing New Westminster Rail Bridge and the alignment spanning of existing rail corridors, the Project has the potential to impact have long-lasting implications for the surrounding rail network. Final design will demonstrate consideration for offset distance between bridge substructures and existing rail corridors to ensure that adequate rail clearance is maintained. The Applicant will include provisions in applicable Project agreements which ensures no bridge substructures will be installed within

established railway corridors. A permit condition (Condition No. 18) has been included to ensure all road/rail design conflicts, including future rail expansion plans, will be resolved between the Applicant and the impacted railways during the development of final design and railway agreement(s).

Transportation has reviewed the application and requires the Applicant to ensure the following:

- Submit a Construction Parking and Traffic Management Plan and a Demolition Parking and Traffic Management Plan to the satisfaction of VFPA that clearly demonstrates that VFPA tenants' access is maintained during construction and demolition;
- Submit a Construction Staging Plan and Demolition Staging Plan to the satisfaction of VFPA which includes a description of logistical process management for land based equipment staging and construction and demolition activities; and
- Submit signed and sealed BC certified engineer-stamped drawings for the new bridge alignment prior to the commencement of construction, which demonstrate that all bridge substructures are located outside of existing rail corridors. The Applicant is required to review the final design drawings produced by the Design-Builder, to ensure that they meet the Project performance criteria.

The Applicant has committed to continue to work with the VFPA towards management of Project-related traffic effects on access to VFPA managed lands, in order to mitigate any unforeseen impacts during the construction period, upon completion, and during demolition. Transportation supports the recommendation to approve the Project subject to adherence to the listed project and environmental conditions in the Permit.

### 3.4 Marine Operations

Marine Operations has provided input to the Applicant during the pre-application stage, as well as during the course of the review. This input was related to the protection of navigation within the Fraser River, review of the marine use assessment, and technical review of potential construction and demolition staging impacts.

The proposed project is located across an important marine commercial transportation corridor, supporting both deep-sea and domestic traffic. The construction and demolition components intend to use and stage marine equipment within and adjacent to navigation channels within the Fraser River. Construction and demolition have the potential to significantly affect marine users in the Fraser River. As a result of the design-build approach, the construction methodology for the marine works has yet to be finalised. The permit holder shall provide drawings for VFPA review and approval of the new bridge showing the Navigation Envelopes; which were are consistent with the Navigation Protection Zones outlined in *Pattullo Bridge Replacement Project - Navigation Requirements*, MOTI, dated April 17, 2019.

It is anticipated that significant works will take place in-River and within the navigation channels, requiring temporary restrictions on navigation that would be necessary to ensure the safety of all vessels transiting the narrower navigational channel. Due to the high concern of this, an assist tug of adequate size and power is available to render assistance, if requested, to any passing vessel and/or barges.

The proposed piers could result in an increase or decrease in average current velocities and scouring in the area of the new bridge. In addition, construction activities have the potential to affect local current velocities and flow distribution where trestle or other obstructions to river flow are introduced to the channel.

Marine Operations has reviewed the application and requires the Applicant to adhere to the following conditions:

- The permit holder shall submit drawings to VFPA for review & approval of the new bridge showing Navigation Envelopes (consistent with the Navigation Protection Zones identified in *Pattullo Bridge Replacement Project - Navigation Requirements*, MOTI, dated April 17, 2019);
- The Permit Holder must retain a Qualified Professional to develop a monitoring plan referring to sites identified by VFPA in the document "PBRP – Hydraulic Model – Identification of VFPA Key Nodes – 2016 -10-20";
- The Permit Holder shall continue to monitor and report changes to VFPA regarding potential adverse effects to current, river bed and foreshore as a result of the project, referencing the identification of "VFPA Key Nodes – 2016 -10-20". VFPA in cooperation with the Permit Holder shall determine what changes constitute an adverse effect;
- The Permit Holder shall provide a hydraulic model report, based on the final design which will be used to assess potential impacts to navigation, environment, and infrastructure; and
- The Permit Holder shall ensure an assist tug, of adequate size and power is available to render assistance.

Marine Operations supports the recommendation to approve the Project subject to adherence to the listed project and environmental conditions in the Project Permit.

## 4 STAKEHOLDER CONSULTATION

The proposed Project was assessed to have potential impacts to stakeholders and the local community, and consultation activities were determined to be required. The following sections describe the stakeholder and public consultation activities undertaken by VFPA and the Applicant as part of the Project and Environmental Review.

As part of the EAO process for the proposed Project, stakeholder consultation was undertaken by EAO and MOTI in 2018. In addition, as part of the EAO process, a Working Group was set up for the purposes of reviewing all relevant Environmental Assessment Certificate (EAC) application documentation and providing advice and comments to the EAO to assess the potential adverse effects associated with the proposed Project. This group included regional agencies such as Metro Vancouver and Fraser Health Authority, as well as local municipalities and federal agencies. VFPA concludes that consultation efforts led by EAO and the Proponent were appropriate and sufficient, and as such did not require, or conduct, additional stakeholder consultation.

### 4.1 Adjacent Tenant Consultation

The proposed Project was assessed by VFPA to have potential impacts to adjacent VFPA tenant operations. A referral letter was sent to the following VFPA tenants on August 27, 2018 notifying them of the proposed Project:

- Amix Marine Services Ltd.;
- Mainland Constructions Materials LLC Timberwest Forest Company;
- Pacific Custom Log Sorting Ltd.;
- Mill & Timber Products;
- GP Canada Gypsum Holding Limited;
- Schnitzer Steel Canada Ltd.;
- Lehigh Hanson Materials Limited;
- FortisBC Energy Inc.;
- Fraser River Pile & Dredge (GP) Inc.;
- No. 143 Cathedral Ventures Ltd;
- 0823069 BC Ltd.; and
- Seaspan.

Schnitzer Steel Canada Ltd. responded with concerns about the proposed new bridge alignment affecting road access to their facility for staff and customers. The comments related to aspects of the project (at-grade road connections) which are not within VFPA control. The comments were provided to MOTI and the EAO, who responded to Schnitzer Steel Canada Ltd., directly.

### 4.2 Marine Users Consultation

The proposed Project was assessed by VFPA to have potential impacts to marine users of this part of the Fraser River. The Applicant established a Marine Users Working Group, and a meeting was held on June 15<sup>th</sup>, 2016 for the Applicant to provide mariners an overview of the project and its rationale and to identify navigational issues. The members of the working group include:

- Fraser River Pilots;
- Pacific Pilotage Authority;
- Amix Marine Services;
- Catherwood Towing;
- Council of Marine Carriers;



- Forrest Marine Ltd.;
- Fraser River Pile and Dredge;
- Harken Towing;
- Hodder Towing;
- JJM Construction Ltd.;
- LaFarge Canada;
- Ledcor;
- MCTS Victoria;
- Mercury Launch & Tug LTD.;
- North Arm Transportation;
- Quadrant Towing;
- Quality Towing;
- Saam Smit Canada Inc.;
- Samson Tugboats;
- Seaspan;
- Tidal Transport;
- Trident Navigation Ltd.;
- Valley Towing Limited;
- Vancouver Pile Driving; and
- Council of Marine Carriers.

The Applicant was also required to consult directly with the Marine Users Working Group. The following table summarizes the key comments from the Marine Users Working Group and how the comments were considered as part of the Project and Environmental Review.

Issue	Mitigations and Permit Conditions	Rationale
Impact of construction activities including equipment staging and potential channel closures.	Conditions No. 31 and No. 32 of the Permit requires the Permit Holder to submit a Marine Construction and Staging Plan that identifies equipment locations and a Marine Communication Plan that outlines how construction updates will be communicated to marine users.	The Marine Construction and Staging plan and Marine Communications Plan will provide timely information about construction activities and allow marine users to plan accordingly.
How will marine users transit the area if there is a partial obstruction to the navigational channel.	Condition No. 55 of the Permit requires the Permit Holder to ensure an assist tug, of adequate size and power is available to render assistance.	The requirement for an adequately sized tug will ensure that the assistance vessel will be able to support the maneuvering of Project-related vessels.
Potential issues with communication between Marine Users, VFPA and the Applicant.	Condition No. 33 of the Permit requires the Permit Holder to establish a Marine Users working group for the purpose of communicating relevant in-water work activities.	The Marine Users Working Group will facilitate communication and transparency between the Permit Holder and marine users.

The establishment of a Marine Users Working Group will be a condition within the permit (Condition no. 33). The Marine Users Working Group will be required to stay in effect until demobilization of all construction works and activities.

### **4.3 Municipal and Regional Agency Consultation**

The proposed Project was assessed by VFPA to be of potential interest to regional and municipal agencies. Metro Vancouver, City of Surrey, and City of New Westminster participated in the Provincial environmental assessment and were represented on the Advisory Working Groups.

VFPA has reviewed the working group materials and related documents and is of the view that the Applicant has adequately addressed the concerns raised, or concerns will be addressed through authorizations and permits issued by these other agencies directly.

### **4.4 Federal and Provincial Agency Consultation**

The proposed Project was assessed by VFPA to be of potential interest to federal agencies. Transport Canada and Department of Fisheries and Oceans Canada participated in the provincial environmental assessment and were represented on the Advisory Working Groups.

VFPA has reviewed working group materials and related documents and is of the view that the Applicant has adequately addressed the concerns raised during the harmonized environmental assessment, or concerns will be addressed through authorizations issued by these other agencies directly.

## 5 PUBLIC CONSULTATION

### 5.1 Scope of Public Consultation

The Project was assessed by VFPA to have potential impacts to community interests in the surrounding area during construction, operation, and demolition phases, including increases in traffic, potential for navigation conflicts, potential environmental and health effects, and changes in access to marine users.

As a Category D Project, public consultation is required to be conducted by the Applicant. As part of the harmonized environmental assessment process, public consultation was conducted by the EAO and by the Applicant as described in section 5.2.

The Applicant was required to conduct a 20-business day preliminary comment period prior to submitting a complete application to VFPA. During the application review phase, the Applicant was also required to conduct a second 20-business day public comment period. The EAO required a third public comment period on the draft referral materials prior to referring final documents to Ministers for review.

### 5.2 Summary of Public Consultation – Preliminary Review

A description of the Project was posted on VFPA's website in November 2016 to notify the public of the preliminary review of the project. Details of the Applicant's preliminary comment period and public information session were posted on VFPA's website and links were provided to the EAO and the Applicant website for more information.

Public consultation and engagement activities were conducted by the EAO and the Applicant from June 26 to July 26, 2017 and included the following:

- Hosting a public information session on June 26 in New Westminster and June 27 in Surrey;
- Developing and distributing fact sheets (hard copies of Display Boards) with key information about the Project at the public information sessions;
- Placing advertisements in the New West Record and Surrey Now-Leader regarding the preliminary comment period and public information session;
- Providing an URL address, mailing address, and fax number for inquiries and submissions; and
- Posting all project-related materials and soliciting public comments on the EAO's website.

The public was able to provide feedback via online, mail and fax. Laptops with access to the online feedback form were also available for participants to submit input, at the public information session. A dedicated webpage for the proposed project was created by the EAO to inform the public and accept online feedback (<https://projects.eao.gov.bc.ca/p/pattullo-bridge-replacement/detail>).

The public information sessions were held at Sapperton Pensioners Hall, 318 Keary Street, New Westminster on June 26, 2017 between 5:00 p.m. and 8:00 p.m. and at Surrey City Hall, 13450-104 Avenue, Surrey on June 27, 2017 between 5:00 p.m. and 8:00 p.m. The public information session provided information about the project scope, design, environmental and other technical assessments. The Applicant had project and technical consultants available to answer questions from the public. Staff from the EAO and VFPA also attended.

During the consultation period, public participation was as follows:

- 15 people attended the public information session in New Westminster and 23 people attended the session in Surrey;
- 21 people completed the online feedback form; and
- VFPA received no comments via emails, letters or phone calls from the public.

Comments from the public were mainly related to the proposed road alignment, noise vibration, heritage value of the existing bridge, sufficiency of the proposed four-lane bridge, improvements for cyclists and pedestrians, and greenhouse gas emissions.

The Applicant provided a [Public Consultation Plan dated June 6, 2018](#) showing a detailed summary of the public consultation process as well as a table showing all public comments received and the Applicant's formal responses in a [Public Comments/Proponent Responses Tracking Table](#) dated June 6, 2018. VFPA has reviewed the documents and found them to be acceptable. These reports are posted on the EAO's website (<https://projects.eao.gov.bc.ca/p/pattullo-bridge-replacement/docs?folder=5>).

### **5.3 Summary of Public Consultation – Application Review**

A description of the Project and proposed works, and all supporting materials were posted to VFPA's website in August 2018 for public review and comment at the start of the VFPA Project and Environmental Review. Details of the Applicant's public information session were posted on VFPA's website and links were provided to the EAO and Applicant's website for more information.

Consultation and engagement activities were conducted by the EAO and the Applicant from September 6 to October 9, 2018 and included the following:

- Hosting a public information session on September 18 in Surrey and September 19 in New Westminster;
- Developing fact sheets (hard copies of Display Boards) with key information about the Project;
- Placing advertisements in the Surrey Now-Leader and New West Record regarding the public comment period and information session;
- Creating a feedback form to collect community input;
- Providing an URL address, mailing address and fax number for inquiries and submissions; and
- Posting all Project-related materials and soliciting public comments on the EAO's website.

The Applicant's public consultation period was from September 6 to October 9, 2018 and the public was able to provide feedback online, by mail and via fax. Laptops with access to the online feedback form were also available for use for participants to submit input at the public information session. A dedicated webpage for the proposed project was created by the EAO to inform the public and accept online feedback (<https://projects.eao.gov.bc.ca/p/pattullo-bridge-replacement/detail>).

The public information sessions were held at Bridgeview Elementary School, 12834-115a Avenue, Surrey on September 18, 2018 between 5:00 p.m. and 8:00 p.m. and Sapperton Pensioners Hall, 318 Keary Street, New Westminster between 5:00 p.m. and 8:00 p.m. The public information sessions provided information about the project scope, design, environmental and other technical assessments. The Applicant had project and technical consultants available to answer questions from the public. Staff from the EAO and VFPA also attended.

During the consultation period, public participation was as follows:

- 17 people attended the public information session in Surrey and 65 people attended the session in New Westminster;
- 12 people completed the online feedback form; and
- VFPA received no comments via emails, letters or phone calls from the public.

Comments from the public were mainly related to improvements for cyclists and pedestrians, road alignment and connections, and sufficiency of the proposed four-lane bridge.

The Applicant provided a [Public Consultation Report dated December 2018](#) showing a detailed summary of the public consultation process, all feedback received during the comment period as well as the Applicant’s formal responses. VFPA has reviewed the document and confirms that it meets the requirements of VFPA’s Project and Environmental Review process. This report is posted on the EAO’s website (<https://projects.eao.gov.bc.ca/p/pattullo-bridge-replacement/docs?folder=5>).

The following table summarizes the key issues relevant to the VFPA review that were raised by the public in both the preliminary and application review phases, and describes how the issues were considered by VFPA as part of the permit review.

Issue	Mitigations and Permit Conditions	Rationale
Impact of noise and potential ground vibrations from construction.	<p>Condition No. 37 of the Permit requires the Applicant to submit a Construction Environmental Management Plan (CEMP) to consider the impacts from construction activities and ways to mitigate those impacts.</p> <p>Conditions No. 22, No. 23 and No. 24 require the Applicant to submit a Construction Communications Plan, submit draft notice(s) to VFPA for review and to distribute notice(s) to residents and business prior to construction commencing.</p>	<p>The Applicant’s main mitigation measures to reduce noise during construction include project design, minimize potential effects through best management practices as part of the CEMP, DEMP and a Noise and Vibration Management Plan. Proposed mitigation measures have been applied for similar construction projects and are considered to be effective. Construction activities will occur from Monday to Saturday between 7:00 a.m. and 8:00 p.m. The Applicant will be required to notify residents in advance of any construction activities that would occur outside these hours.</p>
Impact of greenhouse gas emissions from the proposed bridge.	None required.	The proposed project is not expected to have an

		effect on regional air quality. For further discussion please refer to <b>Section 7.</b>
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VFPA has reviewed the record of public consultation and, provided that the mitigation measures and conditions outlined in the table above are included in the Permit in addition to what is included in the EAO's Schedule B Table of Conditions, is of the view that the Project has adequately addressed the concerns raised during public consultation.

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## 6 ABORIGINAL CONSULTATION

VFPA reviewed the proposed works and determined that the Project may have the potential to adversely impact Aboriginal or Treaty rights. Therefore, Aboriginal consultation was required.

The Project was subject to an environmental review through both provincial and federal processes, by the BC EAO and the VFPA. To align each authority's respective reviews of the Project, on October 6, 2016, both VFPA and the EAO agreed to a harmonized approach to the environmental assessment review process, including Aboriginal consultation. For the review of the proposed Project, VFPA delegated procedural aspects of Aboriginal consultation to the EAO, and the VFPA and other relevant agencies were represented on the appropriate Advisory Working Groups.

Under subsection 5(1)(c) of *CEAA, 2012*, VFPA must also consider, with respect to Aboriginal peoples, whether the proposed project will result in any change to the environment that may affect the health and socio-economic conditions, physical and cultural heritage, current use of lands and resources for traditional purposes, or any structure, site or thing of historical, archaeological, paleontological or architectural significance.

### 6.1 Scope of Aboriginal Consultation

As part of a harmonized approach to consultation, VFPA and the EAO aligned consultation requirements and jointly identified the Aboriginal groups whose asserted and established interests, including treaty rights and lands may be impacted by the Project. The level of consultation, as described in the Section 11 Order dated August 8, 2017, were listed in two schedules. Aboriginal groups identified in Schedule B were engaged at the deep end of the consultation spectrum and Schedule C listed Aboriginal groups engaged at the lower end of the consultation spectrum. As such, the following Aboriginal groups have been consulted.

#### Schedule B

- Cowichan Tribes;
- Halalt First Nation;
- Katzie First Nation;
- Kwantlen First Nation;
- Kwikweltem First Nation;
- Lake Cowichan First Nation;
- Lyackson First Nation;
- Musqueam Indian Band;
- Penelakut Tribe;
- Semiahmoo First Nation;
- Squamish Nation;
- Stz'uminus First Nation;
- Tsawwassen First Nation; and,
- Tseil-Waututh Nation.

#### Schedule C

- Sto:lo Nation and Tribal Council, via People of the River Referrals Office:
  - Soowahlie;
  - Shxw'ow'hamel First Nation;
  - Skawahlook First Nation; and,
- Seabird Island.

Below is a table summarizing the key issues raised by Aboriginal groups during the consultation process, and where applicable, how they were considered as part of the VFPA’s Project and Environmental Review process. Reference to the provincial Environmental Assessment Certificate (EAC) conditions is also noted where relevant.

Concerns, Issues, or Interests	VFPA Consideration/Response	Mitigations and Permit Conditions
<b>Current Use of Lands and Resources for Traditional Purposes</b>		
<p>Potential project related impacts to fish and fish habitat, particularly on sturgeon, eulachon, and salmon</p> <p>Opportunities for fish habitat enhancement and restoration</p>	<p>Mitigation measures to reduce effects to aquatic resources includes avoidance and minimization through Project design, avoiding breeding periods, establishing protective setbacks, conducting pre-construction surveys, least risk timing windows, and measures described in the CEMP, DEMP, Erosion and Sediment Control Plan, Lighting Plan, Vegetation Management Plan, Fish and Fish Habitat Monitoring and Mitigation Plan, Fish Habitat Offsetting Plan, and Wildlife and Wildlife Habitat Management Plan.</p> <p>VFPA is aware that additional fish studies by the Applicant have been scoped collaboratively with Aboriginal knowledge holders.</p> <p>Any works or activity with the potential to cause serious harm to fish, require an authorization under the <i>Fisheries Act</i> from Fisheries and Oceans Canada, prior to proceeding.</p>	<p>As per Condition No. 37, No. 66, and No. 41, VFPA will require the permit holder to submit a CEMP and DEMP, and a Fish and Fish Habitat Monitoring and Mitigation Plan for the Project, to VFPA’s satisfaction.</p> <p>Additionally, VFPA considers that the following EAO conditions have addressed the concern:</p> <ul style="list-style-type: none"> <li>• 8- Involvement of Indigenous Groups in Construction and Demolition Monitoring;</li> <li>• 9- Construction Environmental Management Plan;                         <ul style="list-style-type: none"> <li>◦ k) Noise and vibration</li> </ul> </li> <li>• 10- Demolition Environmental Management Plan;                         <ul style="list-style-type: none"> <li>◦ k) Noise and vibration</li> </ul> </li> <li>• 11- Fish and Fish Habitat Monitoring and Mitigation Plan;</li> <li>• 12- Fish and Wildlife Habitat Offsetting Plan; and</li> <li>• 18 – Engagement and Reporting.</li> </ul>
<p>Concern regarding underwater noise/acoustic effects on fish, fish habitat, migration, behavior and on fishing and Aboriginal fisheries</p>	<p>VFPA agrees with the EAO that physical injury, mortality or behavioral changes to fish could occur due to an increased exposure to underwater noise during construction and demolition.</p>	<p>Please see previous response. As per Condition No. 41, VFPA will require the permit holder to submit a Fish and Fish Habitat Monitoring and Mitigation Plan for the Project, to VFPA’s satisfaction.</p> <p>In addition, it is VFPA’s view that EAO condition no. 11- Fish</p>



Concerns, Issues, or Interests	VFPA Consideration/Response	Mitigations and Permit Conditions
	<p>Please see previous response for additional considerations and mitigation measures proposed.</p> <p>Further, to avoid or minimize that disruption to marine access to the area, including Aboriginal fisheries, a Marine and Fisheries Access Management Plan condition is proposed.</p>	<p>and Fish Habitat Monitoring and Mitigation Plan and condition no. 13 – Marine and Fisheries Access Management Plan addresses this concern.</p>
<p>Concern regarding project effects on First Nations’ rights to fish, including disturbances to Aboriginal fisheries</p>	<p>To address concerns around access and fishing, the Applicant will be required to develop a Marine and Fisheries Access Management Plan.</p>	<p>Please see previous response.</p>
<p>Concerns regarding changes to water flow and temperature, and impacts on fisheries and fishing</p>	<p>Effects on fish from changes in water temperature, lighting or shading from the proposed project are not anticipated.</p> <p>Conditions have been recommended to mitigation potential impacts, including a Fish and Fish Habitat Monitoring and Mitigation Plan and a plan for Involvement of Indigenous Groups in Construction and Demolition Monitoring.</p>	<p>VFPA will require the Permit Holder to submit a hydraulic model report to VFPA, as per Conditions No. 36 and No. 96.</p> <p>In addition, VFPA considers the following EAO conditions have addressed the concern:</p> <ul style="list-style-type: none"> <li>• 8 – Involvement of Indigenous Groups in Construction and Demolition Monitoring;</li> <li>• 11- Fish and Fish Habitat Monitoring and Mitigation Plan; and</li> <li>• 18 – Engagement and Reporting.</li> </ul>
<p>Cumulative effects of industry and commercial development on fish, fish habitat and fish populations</p> <p>Potential to compound existing negative impacts to key fish species, particularly, salmon, eulachon and sturgeon</p>	<p>While VFPA does not have a legislative requirement to explicitly consider cumulative effects, the past and current effects of development on the environment provide the context for environmental reviews. As part of the environmental assessment, cumulative effect conditions were considered by the EAO on the local or regional area in proximity to the proposed project that may contribute to current conditions.</p>	<p>VFPA will require the Permit Holder to submit a Fish and Fish Habitat Monitoring and Management Plan to VFPA, as per Condition No. 41.</p> <p>In addition, VFPA considers the following EAO conditions have addressed the concern:</p> <ul style="list-style-type: none"> <li>• 8 – Involvement of Indigenous Groups in Construction and Demolition Monitoring;</li> <li>• 11- Fish and Fish Habitat Monitoring and Mitigation Plan;</li> </ul>

Concerns, Issues, or Interests	VFPA Consideration/Response	Mitigations and Permit Conditions
		<ul style="list-style-type: none"> <li>• 12- Fish and Wildlife Habitat Offsetting Plan; and</li> <li>• 18 – Engagement and Reporting.</li> </ul>
<p>Impacts to terrestrial wildlife resulting from noise and light</p> <p>Potential project impacts to migratory birds and nesting birds, including duck, geese, bald eagle and blue heron</p> <p>Other wildlife of concern include screech owls, mink and otters</p>	<p>The proposed project is anticipated to have negligible effects on wildlife, including birds, mammals and amphibians.</p> <p>A Wildlife and Wildlife Habitat Management Plan, as part of the CEMP, and a Wildlife and Wildlife Habitat Management and Restoration Plan, as part of the DEMP, will be required by the Applicant. Additionally, the Applicant will be required to develop noise and vibration plans, as well as a Fish and Wildlife Habitat Offsetting Plan which would include identifying opportunities for habitat enhancement, including measures to incorporate wildlife and migratory bird habitat offsetting.</p>	<p>As per Conditions No. 37 and No. 66, VFPA will require the permit holder to submit a CEMP and DEMP, with component wildlife mitigation plans for the Project, to VFPA’s satisfaction.</p> <p>In addition, VFPA considers the following EAO conditions have addressed the concern:</p> <ul style="list-style-type: none"> <li>• 9 – Construction and Environmental Management Plan; <ul style="list-style-type: none"> <li>○ q) Wildlife and wildlife habitat management</li> </ul> </li> <li>• 10- Demolition Environmental Management Plan; <ul style="list-style-type: none"> <li>○ q) Wildlife and wildlife habitat management and restoration</li> </ul> </li> <li>• 12- Fish and Wildlife Habitat Offsetting Plan; and</li> <li>• 18 – Engagement and Reporting.</li> </ul>
<p>Potential impacts to vegetation, including disturbances to riparian areas, and potential impact to native species</p> <p>Concerns that changes to project area resulting from construction and demolition activities may disrupt or degrade areas used for plant gathering</p> <p>Request for opportunities to restore use of traditional plants and trees within the project area (in a culturally appropriate manner)</p>	<p>Due to residential and industrial development the vegetation in the project area is in small isolated patches.</p> <p>A condition for vegetation management will be required as part of the CEMP. Additionally, the DEMP would require mitigation measures for the protection of rare plant species and revegetation plans to seek to restore and enhance the potential of permeable surfaces of the site, and the requirement for restoration works would assist in ensuring harvesting values are restored wherever possible.</p>	<p>As per Conditions No. 37 and No. 66, VFPA will require the permit holder to submit a CEMP and DEMP, with component vegetation management plans for the Project, to VFPA’s satisfaction.</p> <p>In addition, VFPA considers the following EAO conditions have addressed the concern:</p> <ul style="list-style-type: none"> <li>• 9- Construction Environmental Management Plan; <ul style="list-style-type: none"> <li>○ p) Vegetation and invasive species management</li> </ul> </li> </ul>

Concerns, Issues, or Interests	VFPA Consideration/Response	Mitigations and Permit Conditions
		<ul style="list-style-type: none"> <li>• 10- Demolition Environmental Management Plan;                             <ul style="list-style-type: none"> <li>○ p) Vegetation and invasive species management</li> </ul> </li> <li>• 18 – Engagement and Reporting.</li> </ul>
<p>Concern regarding cumulative effects of industrialization on Aboriginal interests and/or Treaty rights</p>	<p>While VFPA does not have a legislative requirement to explicitly consider cumulative effects, the past and current effects of development on the environment provide the context for Project and Environmental Review. The environmental assessment considered cumulative effect conditions that exist today and included considerations of other activities or development in the local or regional area in proximity to the proposed project that may contribute to current conditions.</p>	<p>None required.</p>
<p><b>Physical and Cultural Heritage, and Archaeological Resources</b></p>		
<p>Concern regarding impacts to archaeological and cultural resources, specifically with respect to qiqéyt village site next to the Pattullo Bridge</p> <p>Request for protection of cultural heritage, including requirement for Aboriginal cultural/archaeological monitors be onsite during construction and demolition activities</p> <p>Request for commemoration/recognition of Indigenous cultural heritage at the qiqéyt village site</p>	<p>VFPA recognizes that the proposed project is located within an area of high cultural significance to Aboriginal groups.</p> <p>The Applicant has committed to use avoidance measures where possible, such as create defined no-work zones, conducting additional AIA work in the project area prior to construction and demolition.</p> <p>Additional mitigation measures include the development and implementation of a Cultural and Archaeological Resources Management Plan, involving Aboriginal groups in construction and demolition monitoring works, and the identification and planning</p>	<p>VFPA has included requirements for the Permit Holder to meet the following conditions for construction and demolition:</p> <ul style="list-style-type: none"> <li>• Conditions No. 49 and 89, the Permit Holder shall provide opportunities for interested Aboriginal groups to participate in archaeological monitoring; and</li> <li>• Conditions No. 27 and 72 the Permit Holder shall submit an Archaeological Chance Find Procedure.</li> </ul> <p>In addition, VFPA considers the following EAO conditions have addressed the concern:</p> <ul style="list-style-type: none"> <li>• 8 – Involvement of Indigenous Groups in</li> </ul>

Concerns, Issues, or Interests	VFPA Consideration/Response	Mitigations and Permit Conditions
	opportunities for cultural recognition, interpretation, education and commemoration of sites.	Construction and Demolition Monitoring; <ul style="list-style-type: none"> <li>• 15- Cultural and Archaeological Resources Management Plan;</li> <li>• 16- Indigenous Cultural Recognition Plan; and</li> <li>• 18- Engagement and Reporting.</li> <li>•</li> </ul>
Request that efforts be made to find the transformer stone <sup>2</sup> , and if found, it be reinstalled on the bank of the river	The Applicant has committed to working with Aboriginal groups to develop plans and protocols for working in areas with archaeological potential, including areas where the transformer stone could potential be located. Further consultation will be conducted should the transformer stone be found, including relocation.	Please see previous response.
Request for First Nations cultural orientation for contractor and workers	The Applicant has committed to working with interested Aboriginal groups to develop cultural awareness training/orientation for the contractor.	None required.
<b>Health and Socio-economic Conditions</b>		
Interested in economic development and procurement opportunities, including skills training and employment opportunities for Aboriginal people  Opportunities for environmental and archaeological monitoring	The Applicant is presently working with Aboriginal groups to identify procurement opportunities, including areas for training and employment of Aboriginal persons on the project. A condition has been proposed requiring the Applicant to develop an Indigenous Training, Employment and Procurement Plan, as well as a plan for Aboriginal groups to participate in monitoring opportunities.  VFPA encourages the Applicant to find employment, contracting and training opportunities for interested Aboriginal groups.	As per Condition No. 49 and No. 89, the Permit Holder shall provide opportunities for interested Aboriginal groups to participate in archaeological monitoring for all Project activities.

<sup>2</sup> A transformer stone is a significant cultural artifact.

Concerns, Issues, or Interests	VFPA Consideration/Response	Mitigations and Permit Conditions
<p>Concern about the project and impact on ability derive economic benefit in the project area (i.e. impact to Aboriginal/commercial fisheries)</p>	<p>VFPA recognizes that as a result of project activities access to key fishing sites may be reduced. This would only be temporary in nature, during construction and demolition, however to avoid or minimize that disruption to marine access to the area, the Applicant will be required to develop a Marine and Fisheries Access Management Plan.</p> <p>VFPA encourages the Applicant to find employment, contracting and training opportunities for interested Aboriginal groups.</p>	<p>As per Condition No. 41, VFPA will require the permit holder to submit a Fish and Fish Habitat Monitoring and Mitigation Plan for the Project, to VFPA’s satisfaction.</p> <p>In addition, VFPA considers the following EAO conditions have addressed the concern:</p> <ul style="list-style-type: none"> <li>• 13 – Marine and Fisheries Access Management Plan.</li> </ul>
<p>Concern regarding potential impacts to the emotional, psychological and physical linkages of Aboriginal groups due to Project-related effects, including identity (i.e. overall cultural health)</p> <p>Importance of cultural continuity for Aboriginal people</p>	<p>A condition is proposed requiring the Applicant to develop the following in consultation with Aboriginal groups:</p> <ul style="list-style-type: none"> <li>• Indigenous Cultural Recognition Plan;</li> <li>• Noise, vibration and light plan, as part of the CEMP and DEMP; and,</li> <li>• Involvement of Indigenous Groups in Construction and Demolition.</li> </ul> <p>Additionally, the Applicant has committed to rehabilitating and restoring the area, in consultation with Aboriginal groups.</p>	<p>As per Conditions No. 37 and No. 66, VFPA will require the permit holder to submit a CEMP and DEMP, with component management plans for the Project, to VFPA’s satisfaction.</p> <p>In addition, VFPA considers the following EAO conditions have addressed the concern:</p> <ul style="list-style-type: none"> <li>• 8 – Involvement of Indigenous Groups in Construction and Demolition Monitoring</li> <li>• 9- Construction Environmental Management Plan                         <ul style="list-style-type: none"> <li>○ j) Lighting Management, including but not limited to the means by which the potential attraction of birds will be mitigated</li> <li>○ k) Noise and vibration</li> <li>○ p) Vegetation and invasive species management</li> </ul> </li> </ul>

Concerns, Issues, or Interests	VFPA Consideration/Response	Mitigations and Permit Conditions
		<ul style="list-style-type: none"> <li>• 10- Demolition Environmental Management Plan                             <ul style="list-style-type: none"> <li>○ j) Lighting Management</li> <li>○ k) Noise and vibration</li> <li>○ p) Vegetation and invasive species management</li> </ul> </li> <li>• 16- Indigenous Cultural Recognition Plan</li> <li>• 18 – Engagement and Reporting</li> </ul>

## 6.2 Aboriginal Consultation Conclusions

VFPA, through its harmonized approach to consultation, with the EAO as the lead agency, has made a meaningful effort to consult with all potentially affected Aboriginal groups. Aboriginal groups have had an opportunity to participate in the iterative review and development of EAO conditions, including proposed changes to the EAO Report and conditions in the provincial Environmental Assessment Certificate. Further VFPA’s conditions compliment the conditions prescribed by the EAO. Based on the record of consultation, VFPA is of the view that the duty to consult has been met.

## 7 ENVIRONMENTAL REVIEW

To fulfill its responsibilities under the *Canada Marine Act* and *CEAA, 2012*, VFPA must first make a determination on the potential environmental effects of a proposed project on VFPA managed lands and waters before it can authorize those works to proceed. To make that determination, VFPA considers the residual effects of the Project, that is, the effects after mitigation measures have been taken into account. In addition, should a project be approved, VFPA includes additional environmental conditions in the project permit to further reduce the identified potential impacts.

The Project was also determined to be a shoreline modification project and subject to a review pursuant to the Reviewable Projects Regulation under the British Columbia *Environmental Assessment Act, SBC 2002, c. 43*. The Project is not subject to a federal environmental assessment, because the Project does not meet the definition of a designated project described in the Regulations Designating Physical Activities. However, the VFPA's Project and Environmental Review process applies to all proposed physical works on federal lands and waters partially or wholly within the VFPA.

The EAO and VFPA agreed to a harmonized approach to the environmental assessment of the Project with the EAO as the lead agency. The VFPA and other relevant federal departments were represented in the Advisory Working Group. Information gathered during the harmonized environmental assessment process is considered in the VFPA review of the Application for a Project Permit.

This section of the project and environmental review report summarizes VFPA's environmental review conducted for the Project, and provides the environmental review decision in **Section 7.3**. The environmental review also considered the information provided in the previous sections of this report.

### 7.1 Scope of Environmental Review

The environmental review includes consideration of the potential environmental effects of the proposed Project, taking into account mitigation measures to avoid or reduce those effects. This review considered the Project components and physical activities described in **Section 2**. The temporal scope of the review includes the Project site preparation and staging, construction of the new bridge, operation and maintenance of the new bridge, and demolition of the existing bridge within VFPA jurisdiction.

The provincially-led harmonized environmental assessment focused on 17 valued and intermediate components, and from accidents and malfunctions. The environmental components are aspects of the biophysical and socio-economic environment considered to have ecological, economic, social, cultural, archaeological, or historical significance. For a description of the EAO's methodology refer to the Assessment Report for the Pattullo Bridge Replacement Project (dated April 4, 2019 and available at:

[https://projects.eao.gov.bc.ca/api/document/5cc9cb146a15600025de9351/fetch/Pattullo\\_Bridge\\_Replacement\\_Project\\_Summary\\_Assessment\\_Report](https://projects.eao.gov.bc.ca/api/document/5cc9cb146a15600025de9351/fetch/Pattullo_Bridge_Replacement_Project_Summary_Assessment_Report)).

The environmental assessment evaluated the potential for the Project to result in significant adverse effects on these components. The assessment also considered how accidents and malfunctions and effects of the environment on the Project could affect these components. The assessment relied on the Application provided by the Applicant, supplemental materials, and consultation with the Working Group, Aboriginal groups and the public. For a summary of the

conclusions of the provincial environmental assessment refer to the Assessment Report for the Pattullo Bridge Replacement Project.

The VFPA Project and Environmental Review considered the potential adverse environmental and social effects of the Project on 13 environmental components (e.g., species with a special status, aquatic species and their habitat, recreational interests, etc.), and from accidents and malfunctions. The environmental components represent aspects of the biophysical and socio-economic environment that are considered to have ecological, economic, social, or cultural importance.

The VFPA's Project and Environmental Review took into consideration the Project location within an industrial and urban setting that is characterized by a high degree of development with a number of activities related to residential, commercial, industrial, marine shipping and navigation, public space, and transportation infrastructure. The environmental components assessed by VFPA are presented in **Section 7.2** and include the environmental effects listed in section 5(1) and 5(2) of *CEAA, 2012*.



## 7.2 Environmental Effects Summary

The following table summarizes the potential environmental effects of the project on the identified environmental components.

Environmental Component	Potential Adverse Effects?		Overview of Potential Adverse Effects, Mitigation Measures and residual Adverse Effects	Significant Residual Adverse Effects?	
	Yes	No		Yes	No
<p><b>Air Quality</b> Assessed as required under subsection 5(1) and 5(2) of <i>CEAA 2012</i></p>	■	□	<p>The Project has the potential to affect air quality during construction, operation, and demolition. This includes emissions from diesel-powered equipment used in construction and demolition, dust from equipment on unpaved surfaces, and emissions from vehicle traffic during operations.</p> <p>Mitigation measures to reduce effects to air quality will be outlined in the Construction Environmental Management Plan (CEMP) and Demolition Environmental Management Plan (DEMP) to include industry best management practices to control and minimize dust and other air emissions.</p> <p>The Applicant will develop and implement an air quality management plan as part of the CEMP (Condition No. 37) which includes verification that the mitigation measures perform as designed, operating procedures remain effective, and that the Project can demonstrate continuous improvement.</p> <p>The Project is not expected to have an effect on regional air quality. Future annual regional emissions of greenhouse gas (GHGs) will be lower than existing emissions due to ongoing improvements in the average fuel economy of the on-road fleet. The same is expected for regional smog-forming air pollutants.</p> <p>Residual adverse effects from Project-related air emissions on local regional air quality are predicted to be low in magnitude, limited in extent to the local study area (a 500 metre buffer of the Project boundary), daily during project construction and demolition. Residual effects are reversible as they are expected to cease after construction and demolition. With mitigation</p>	□	■

			measures and permit conditions, residual adverse effects on air quality are anticipated to be not significant.		
<p><b>Lighting</b> Assessed as required under subsection 5(1) and 5(2) of <i>CEAA 2012</i></p>	■	□	<p>Temporary construction lighting and operational street and navigational lighting could change the existing lighting conditions.</p> <p>Mitigation measures to minimize effects to of increased lighting include: project design, avoid floodlighting on piers, and by implementing best management practices as part of the CEMP, DEMP, and a Lighting Plan that will be developed by the Applicant (Conditions No. 37 and No. 66).</p> <p>With the proposed mitigation measures and permit conditions in place, the Project is not anticipated to result in residual adverse effects to lighting.</p>	□	■
<p><b>Noise and Vibration</b> Assessed as required under subsection 5(1) and 5(2) of <i>CEAA 2012</i></p>	■	□	<p>The Project has the potential to affect noise levels. The Project will create temporary, localized noise and vibration during construction and demolition, especially during pile installation. Project-related noise sources during operations will be directly related to vehicle traffic.</p> <p>Construction activities will primarily occur from Monday to Saturday between 7:00 a.m. and 8:00 p.m. The Applicant will be required to notify residents in advance of any construction activities that would occur outside these hours.</p> <p>Traffic volumes are not expected to increase significantly as a result of the Project. The realignment of the approach spans are expected to reduce operational traffic noise levels in adjacent communities.</p> <p>Key mitigation measures to reduce noise during construction and operations include project design, minimizing potential effects through best management practices as part of the CEMP, DEMP, and a Noise and Vibration Management Plan (Condition No. 37).</p>	□	■

			Residual effects from Project-related noise on local residents and marine users are predicted to be low in magnitude, limited in extent to the local Project area, and occur continuously in the short-term (i.e., limited to the construction and demolition phases). Residual effects are expected to cease with the completion of construction and demolition activities. With mitigation measures and permit conditions, residual adverse effects from noise are anticipated to be not significant.		
<p><b>Soils and Groundwater</b></p> <p>Assessed as required under subsection 5(1) and 5(2) of <i>CEAA 2012</i></p>	■	□	<p>Soil and groundwater quality may be affected by spills, disturbance of pre-existing contaminated soils, and accumulation of hydrocarbons and metals that could concentrate adjacent to roadways from vehicles, spills, and maintenance activities.</p> <p>Mitigation measures to reduce effects to soil quality and groundwater quality will be described in the CEMP, DEMP, Emergency Response and Spill Prevention Plan, Non-hazardous Waste Management Plan, and Erosion and Sediment Control Plan. Further contaminated sites investigation programs will be undertaken to identify potential for contaminated soils to be present. During excavations, if contaminated soils are encountered, the procedures and mitigation measures described in the CEMP and DEMP will be followed to adequately test, isolate, and dispose of contaminated materials (Conditions No. 37 and No. 66).</p> <p>With the proposed mitigation measures and permit conditions in place, the Project is not anticipated to result in residual adverse effects to soil quality and groundwater quality.</p>	□	■
<p><b>Sediments</b></p> <p>Assessed as required under subsection 5(1) and 5(2) of <i>CEAA 2012</i></p>	■	□	<p>The Project has the potential to affect sediment quality through various activities during construction, operation, and demolition, including:</p> <ul style="list-style-type: none"> <li>• Ground disturbance during construction may alter land conditions and water flow patterns, potentially increasing erosion and sedimentation or exposing pre-existing contaminated materials;</li> </ul>	□	■

			<ul style="list-style-type: none"> <li>• Construction and demolition of in-river piers may alter surface water flows (i.e., river hydraulics), cause riverbed scour, and change sediment deposition patterns in the Fraser River;</li> <li>• Disturbance of the riverbed by localized underwater excavation and placing of rip-rap around piers could affect the distribution of sediment loading in the Fraser River; and</li> <li>• Accidental spills have the potential to contaminate Fraser River sediments.</li> </ul> <p>Mitigation measures to reduce effects to sediment quality includes measures to reduce the potential for erosion and contamination of sediments described in the CEMP and DEMP, and requirement to model potential changes in localized sediment deposition caused by construction of the new bridge in the Hydraulic Model Report and review findings with VFPA (Conditions No 37, No. 66, and No. 36, respectively).</p> <p>With the proposed mitigation measures and permit conditions in place, the Project is not anticipated to result in residual adverse effects to sediments.</p>		
<p><b>Surface Water and Water Bodies</b></p> <p>Assessed as required under subsection 5(1) and 5(2) of <i>CEAA 2012</i></p>	<p>■</p>	<p>□</p>	<p>The Project has the potential to affect surface water and water bodies through various activities during construction, operation, and demolition, including:</p> <ul style="list-style-type: none"> <li>• Stormwater runoff during construction and demolition may increase debris, sediment and contamination;</li> <li>• Construction and demolition of in-river piers is predicted to alter surface water flows (i.e., river hydraulics), result in riverbed scour, and sediment deposition patterns in the Fraser River;</li> <li>• Disturbance of the riverbed during construction and demolition could increase turbidity; and</li> <li>• Accidental spills have the potential to contaminate surface water in the Fraser River.</li> </ul> <p>Drainage design criteria are being developed for the Project that will limit runoff volume from the Project site and generally</p>	<p>□</p>	<p>■</p>

			<p>maintain existing drainage patterns. Final Project design will follow applicable stormwater design standards and guidelines, including measures to capture and treat runoff from the new bridge.</p> <p>Mitigation measures to minimize effects to surface water and water bodies quality includes spill prevention and erosion protection measures described in the CEMP, DEMP (Conditions No. 37 and No. 66). A permit condition to monitor changes in localized scour and identify potential changes in river hydraulics and morphology will also reduce the potential for significant adverse effects.</p> <p>Residual effects from Project-related activities on surface water and water bodies are predicted to be low in magnitude, limited in extent to the local study area (a 500 metre buffer of the Project boundary), and occur continuously in the long-term. With mitigation measures and permit conditions residual adverse effects to surface water and water bodies are anticipated to be not significant.</p>		
<p><b>Terrestrial Vegetation and Wildlife</b></p> <p>Assessed as required under subsection 5(1) of <i>CEAA 2012</i></p>	<p>■ □</p>	<p>□</p>	<p>Vegetation currently present in the Project area is limited to small, isolated patches embedded within a matrix of industrial, residential patches and transportation corridors. Non-native and invasive species are prevalent throughout the Project area. No natural ecosystems or at-risk plant communities remain within the Project site. The majority of green spaces are landscaped, including the residual tree patches along Fraser River’s south shore. Unmanaged vegetation communities largely comprise grass and shrub meadows on undeveloped lots.</p> <p>Only small, marginal patches of wildlife habitat remain in the urbanized and industrialized study area. Migratory birds inhabiting the marginal habitat patches are low in abundance and diversity, and are primarily common species tolerant of human disturbance. There is potential for occurrences of species-at-risk in the Project area (discussed below).</p> <p>The Project will result in a permanent loss of 6.08 hectares of previously disturbed vegetation (grass/shrubs in undeveloped</p>	<p>□</p>	<p>■</p>

			<p>lots and ditches). Further habitat degradation is possible from compaction and disturbance from construction activities. Traffic pollution may have an adverse effect on plant species, however, rare plants in the Project area are currently exposed to this impacts and Project-related air emissions are not expected to increase exposure. Increased Project-related noise and light during construction could result in sensory disturbance to terrestrial wildlife causing habitat avoidance. There is also potential for direct mortality due to habitat removal, lighting effects and potential collisions with traffic.</p> <p>Mitigation measures to reduce effects to terrestrial vegetation and wildlife includes avoidance of effects through Project design, avoiding breeding periods, establishing protective setbacks, conducting pre-construction surveys (Conditions No. 43 and No. 74), and measures described in the CEMP, DEMP, Erosion and Sediment Control Plan, Lighting Plan, Vegetation Management Plan, and Wildlife and Wildlife Habitat Management Plan.</p> <p>Residual effects from Project-related activities on terrestrial vegetation and wildlife are predicted to be low in magnitude, limited in extent to the immediate vicinity of the Project footprint, and occur continuously in the long-term. With mitigation measures and permit conditions, residual adverse effects to terrestrial vegetation and wildlife are anticipated to be not significant.</p>		
<p><b>Species at-Risk</b></p> <p>Assessed as required under subsection 5(1) of <i>CEAA 2012</i></p> <p>Assessed under section 79 of <i>SARA</i>, as applicable</p>	<p>■</p>	<p>□</p>	<p>Federally listed species-at-risk with the potential to occur in the Project area include: Streambank lupine (endangered) and Vancouver Island beggarticks (special concern), common nighthawk (threatened), Pacific water shrew (endangered), and peregrine falcon (special concern). No critical habitat for listed species is present within the local study area. Low suitability habitat underneath the existing bridge is present for several species at-risk including: common nighthawk, Pacific water shrew, and peregrine falcon. There is no potential breeding habitat for great blue heron or amphibians, (e.g., western toads and red-legged frogs) in the local study area.</p>	<p>□</p>	<p>■</p>

		<p>Plant species at-risk have the potential to occur in the local study area, but have not been recorded in the Project footprint within VFPA jurisdiction. Construction can impact federally listed plant species at-risk during ground disturbance, including clearing, grubbing, and excavations. Mitigation measures to avoid effects to plant species-at-risk include avoidance and minimization through Project design, conducting pre-construction surveys, establishing protective setbacks for identified occurrences of species-at-risk, and additional measures described in the CEMP, DEMP (Conditions No. 37 and No. 66).</p> <p>Common nighthawk has the potential to occur in the local study area. Potential project-related effects to common nighthawk include loss of low suitability habitat, sensory disturbance. Mitigation measures to minimize effects to common nighthawk includes avoiding breeding periods and conducting pre-construction surveys (Conditions No. 43 and No. 74), establishing protective setbacks for common nighthawk occurrences, and additional measures described in the CEMP, DEMP (Conditions No. 37 and No. 66).</p> <p>Pacific water shrew has the potential to occur in the local study area. Potential project-related effects to Pacific water shrew include loss of low suitability habitat, sensory disturbance, and mortality due to collision with construction and demolition equipment. Mitigation measures to minimize effects to Pacific water shrew includes conducting pre-construction surveys, establishing protective setbacks for Pacific water shrew occurrences, and additional measures described in the CEMP, DEMP (Conditions No. 37 and No. 66).</p> <p>Peregrine falcon has the potential to occur in the local study area. Potential project-related effects to peregrine falcon include loss of low suitability habitat, sensory disturbance. Mitigation measures to minimize effects to peregrine falcon includes avoiding breeding periods and conducting pre-construction surveys (Conditions No. 43 and No. 74), establishing protective setbacks for peregrine falcon occurrences, and additional measures described in the CEMP, DEMP (Conditions No. 37 and No. 66).</p>		
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			With the proposed mitigation measures and permit conditions in place, the Project is not anticipated to result in residual adverse effects to species-at-risk.		
<p><b>Wetlands</b></p> <p>Assessed as required under subsection 5(1) and 5(2) of <i>CEAA 2012</i></p>	■	□	<p>Currently there are no wetland ecosystems that overlap with the local study area for vegetation. Based on Terrestrial Ecosystem Mapping, the Fraser River is the only watercourse in the local study area. However, there are three widened sections of the local ditch/channel network within the Project Boundary. The Project has the potential to degrade or eliminate sections of the local ditch/channel network.</p> <p>Project effects on the widened ditch/channel sections, which can potentially constitute wetland habitat for vegetation and wildlife, are expected to be low because the encroachment is minor and these anthropogenic waterbodies are currently disturbed.</p> <p>Mitigation measures to reduce effects to wetlands includes avoidance through Project design, implementation of erosion control measures and an emergency and spill response plan as part of the CEMP and DEMP (Conditions No. 37 and No. 66). The CEMP will include a vegetation management component to assess the potential net loss of wetland function and propose mitigation measures.</p> <p>With the proposed mitigation measures and permit conditions in place, the Project is not anticipated to result in residual adverse effects to wetlands.</p>	□	■
<p><b>Aquatic Resources</b></p> <p>Assessed as required under subsection 5(1) of <i>CEAA 2012</i></p>	■	□	<p>The Project is located in the freshwater, tidal portion of the lower Fraser River and adjacent to a number of small tributaries including the Pattullo Channel. The Project area has limited rearing, foraging, and holding habitats. However, this portion of the Fraser River is relatively deep and narrow, providing a constricted migratory corridor for a number of fish species to pass to these habitats upstream</p>	□	■



			<p>The Project has the potential to affect aquatic resources through a variety of activities during construction, operation, and demolition, including:</p> <ul style="list-style-type: none"> <li>• Physical injury or mortality to fish through crushing;</li> <li>• Project-related changes in water temperature from increased turbidity causing an alteration in fish habitat;</li> <li>• Project-related changes to ambient water quality affecting fish health;</li> <li>• Project-related changes to night-time light affecting fish and fish habitat;</li> <li>• Project-related increases to shading affecting fish and fish habitat;</li> <li>• Changes to aquatic and/or riparian habitat due to project footprint disturbance; and</li> <li>• Effects on fish through exposure to underwater noise during construction.</li> </ul> <p>Mitigation measures to minimize effects to aquatic resources includes implementation of erosion control measures and an emergency and spill response plan as part of the CEMP and DEMP (Conditions No. 37 and No. 66). The EAO and VFPA have also added a condition requiring the applicant to develop a Fish and Fish Habitat Monitoring and Mitigation Plan (Condition No. 41) which identifies methods for establishing protective least-risk timing windows, descriptions of specific measures for reducing potential effects to fish and plans for contingencies in the event that unanticipated effects to fish are identified.</p> <p>Residual effects from Project-related activities on aquatic resources are predicted to be low in magnitude, limited in extent to the immediate vicinity of the Project footprint, and occur continuously in the long-term. With mitigation measures and permit conditions, residual adverse effects to aquatic resources are anticipated to be not significant.</p>		
<p><b>Health and Socio-economic Conditions</b></p>	<p>■</p>	<p>□</p>	<p>The Project is a major construction undertaking in a built-up urban and industrial setting which includes extensive industrial, commercial, and residential areas.</p>	<p>□</p>	<p>■</p>

<p>Assessed as required under subsection 5(1) and 5(2) of <i>CEAA 2012</i></p>		<p>The Project is expected to enhance economic activity and existing businesses locally, regionally and provincially by improving motorized transport of goods and people through the lower mainland.</p> <p>The Project spans three designations under the VFPA Land Use Plan including Port Water, Industrial, and Recreation. The proposed transportation use is considered permissible under all land use designations.</p> <p>The Project has the potential to affect health and socio-economic conditions through a variety of activities during construction, operation, and demolition, including:</p> <ul style="list-style-type: none"> <li>• Potential effects to human health resulting from changes in air quality during construction and demolition;</li> <li>• Potential effects to human health resulting from changes from increased noise during construction and demolition;</li> <li>• Potential effects to human health due to exposure of aquatic contaminants;</li> <li>• Potential effects to community cohesion resulting from changes in neighborhood connectivity; and</li> <li>• Potential effects to changes in access to health, social, community, economic, or recreational services.</li> </ul> <p>Mitigation measures to minimize effects to health and socio-economic conditions includes developing a Construction and Demolition Communications Plans and provide notices for construction (Conditions No. 23, No. 24, No. 68 and No. 69), a Construction and Demolition Parking and Traffic Management Plans (Conditions No. 25 and No. 71), Construction and Demolition Staging Plans (Conditions No. 26 and No. 70), and commit to establishing and maintaining a Marine Users Working Group through construction and demolition (Conditions No. 33, No. 53 and No.76)</p> <p>With the proposed mitigation measures and permit conditions in place, the Project is not anticipated to result in residual adverse effects to health and socio-economic conditions.</p>		
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<p><b>Archaeological, Physical, and Cultural Heritage Resources</b></p> <p>Assessed as required under subsection 5(1) and 5(2) of <i>CEAA 2012</i></p>	<p>■</p>	<p>□</p>	<p>The Project is located in an area that has a long history of human habitation and therefore has very high archaeological potential. The Project has the potential to affect heritage resources through a variety of activities during construction, operation, and demolition, including:</p> <ul style="list-style-type: none"> <li>• Physical disturbance of heritage resources;</li> <li>• Changes to landscapes;</li> <li>• Changes to land use; and</li> <li>• Changes to Fraser River scour and deposition, and its effect on shoreline heritage resources.</li> </ul> <p>Mitigation measures to minimize effects to archaeological, cultural and heritage resources includes avoidance and minimization through Project design, avoiding known heritage resources where possible, establishing protective setbacks, conducting pre-construction surveys and additional Archaeological Impact Assessment fieldwork completed by a qualified professional (Condition No. 48), implementing a Chance Find Procedure and protocols for managing archaeological resources (Conditions No. 27, No. 51, and No. 72), providing opportunities for interested Aboriginal groups to participate in archaeological monitoring (Conditions No. 49 and No. 89), and measures described in the CEMP and DEMP (Conditions No. 37 and No. 66).</p> <p>The Applicant has committed to involving Aboriginal groups in the research, planning and execution of heritage assessments, management recommendations, a Heritage Management Policy, an Interpretive Plan, and a Project-specific Ancestral Remains Protocol.</p> <p>Residual effects from Project-related activities on archaeological, cultural and resources are predicted to be low to moderate in magnitude, limited in extent to the Project footprint, be permanent, irreversible, and occur continuously in the long-term. With mitigation measures and permit conditions, residual adverse effects to archaeological, cultural and resources are anticipated to be not significant.</p>	<p>□</p>	<p>■</p>
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<p><b>Current Use of Lands and Resources for Traditional Purposes</b></p> <p>Assessed as required under subsection 5(1) of <i>CEAA 2012</i></p>	<p>■</p>	<p>□</p>	<p>The Project area has been identified as a key resource area for a variety of use including fishing, hunting and trapping, gathering, and cultural practices. The South Arm of the Fraser River is an important waterway which is used by a number of Aboriginal groups to access lands and resources as part of traditional use activities.</p> <p>The Project has the potential to affect current use of lands and resources for traditional purposes through a variety of activities during construction, operation, and demolition, including:</p> <ul style="list-style-type: none"> <li>• Changes in navigation use and navigability of the Fraser River;</li> <li>• Changes in access to traditional fish harvesting areas;</li> <li>• Changes in resource availability (i.e., fish);</li> <li>• Changes in traditional fish harvesting environmental setting;</li> </ul> <p>To avoid or minimize that disruption to marine access to the area, the Applicant will develop and implement a Marine and Fisheries Access Management Plan (MFAMP) condition is proposed by the EAO and supported by VFPA. The MFAMP would include a description of measures to avoid, minimize or mitigate disruptions for members of Aboriginal groups, identification of travel corridors for Project-related vessels, as well as existing and traditional navigation routes, fishing areas, habitat areas, commercial shipping use, recreational and tourism use, and any associated timing windows, also including those identified and communicated by Aboriginal groups. The MFAMP would also include a description of construction and demolition activities and schedule, including staging and laydown areas, and potential interference with fishing access or navigation, communications and emergency preparedness procedures, monitoring measures, incorporation of traditional knowledge into the plan, actions to inform Aboriginal groups of the Project schedule, methods to coordinate activities, and methods to monitor the effects of marine-based activities on marine users, and a complaint resolution process and compensation regime. This plan would be developed in consultation with Aboriginal groups.</p>	<p>□</p>	<p>■</p>
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			<p>Residual effects from Project-related activities on current use of lands and resources for traditional purposes are predicted to be moderate in magnitude, limited in extent to the immediate vicinity of the Project footprint, and be temporary in the short-term (i.e. limited to construction and demolition phases). With mitigation measures and permit conditions, residual adverse effects to current use of lands and resources for traditional purposes are anticipated to be not significant.</p>		
<p><b>Accidents and malfunctions</b></p> <p>Assessed as required under the <i>Canada Marine Act</i></p>	<p>■</p>	<p>□</p>	<p>The new bridge will be designed in accordance with the Canadian Highway Bridge Design Code (CSA-S6-14), the BC Ministry of Transportation and Infrastructure (MOTI) supplement to CSA-S6-14, and other Project-specific requirements. Roadway design will focus on providing vehicle operational safety and efficiency by complying with the Transportation Association of Canada Geometric Design Guide for Canadian Roads (TAC 2017) and the BC Manual of Standard Traffic Signs and Pavement Markings (MoTI 2000). The replacement of the bridge and roadway improvements are expected to lower the risk of accidents and malfunctions during Project operations and maintenance relative to current conditions.</p> <p>There is potential for adverse environmental effects to occur as a result of an accident or malfunction. Accidents and malfunctions could include:</p> <ul style="list-style-type: none"> <li>• Spills of hazardous substances;</li> <li>• Structural failure of water management infrastructure during construction;</li> <li>• Damage to municipal utilities;</li> <li>• Failure of bridge component during operation; and</li> <li>• Marine vessel collision with bridge piers.</li> </ul> <p>Mitigation measures will be implemented to reduce potential adverse effects of an accident or malfunction including appropriate spill prevention, containment, contingency spill response, and emergency response planning, best practice measures in the CEMP and DEMP, and by Project design to minimize risk of potential collision.</p>	<p>□</p>	<p>■</p>

			With these mitigations in place, the residual adverse effect, if it occurs, is expected to be not significant. Remediation of any residual adverse effect is anticipated to be achievable.		
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Residual adverse effects (i.e., effects that remain after the consideration of mitigation measures) were identified for the following environmental components:

- Air quality;
- Noise and Vibration;
- Surface Water and Water Bodies;
- Terrestrial Wildlife and Vegetation;
- Aquatic Resources;
- Current Use of Lands and Resources for Traditional Purposes; and
- Archaeological, Physical, and Cultural Heritage resources.

Overall, the residual adverse effects of the Project on all environmental components are characterized as:

- Low to moderate in magnitude due to the potential to result in changes surface water and water bodies, aquatic resources, current use of lands and resources for traditional purposes, and heritage resources;
- Local in spatial extent because effects will be limited to the Project footprint and immediate vicinity;
- Short-term for the majority of potential effects since the interaction between the Project and the component will be removed following construction and demolition activities. However, some effects will be long-term in duration because the effects to surface water and water bodies, aquatic resources, health and socio-economic conditions, and heritage resources, will occur throughout the lifetime of the bridge or will be permanent.
- Intermittent in frequency because the effects will largely occur during construction and demolition phases, however potential effects to surface water and water bodies, and heritage resources may be continuous; and
- Following the implementation of mitigation measures, residual effects of the Project would predominantly be reversible following the conclusion of the construction and demolition phases, although limited potential effects may be permanent.

In conclusion, based on the above characterization of potential project-related effects, the mitigation measures proposed by the Applicant, conditions attached to the BC Environmental Assessment Certificate, and Project Permit conditions as a result of this Project and Environmental Review, the residual adverse effects of the Project are predicted to be not significant.

### 7.3 Environmental Review Decision

In completing the environmental review, VFPA 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 has considered other information as listed elsewhere in this document. In accordance with section 67 of *CEAA 2012*, VFPA concludes that with the implementation of proposed mitigation measures and permit conditions, the Project is not likely to cause significant adverse environmental effects.

*ORIGINAL COPY SIGNED*

**CARRIE BROWN**  
**DIRECTOR, ENVIRONMENTAL PROGRAMS**

2019-05-24

**DATE OF DECISION**

## 8 RECOMMENDATION

In completing the Project and Environmental Review, VFPA concludes that with the implementation of proposed mitigation measures, and adherence to the conditions attached to the BC Environmental Assessment Certificate and conditions described in the Permit, the Project has appropriately addressed all identified concerns.

It is the recommendation of staff that this application be approved subject to conformance with the conditions identified in the Environmental Assessment Certificate and those project and environmental conditions listed in Project Permit **PER No. 17-107**.



## **APPENDIX A Drawings**

**PER No.17-107-A Location Plan**

**PER No.17-107-B Reference Concept – Plan View**

**PER No.17-107-C Navigation Protection Zones**

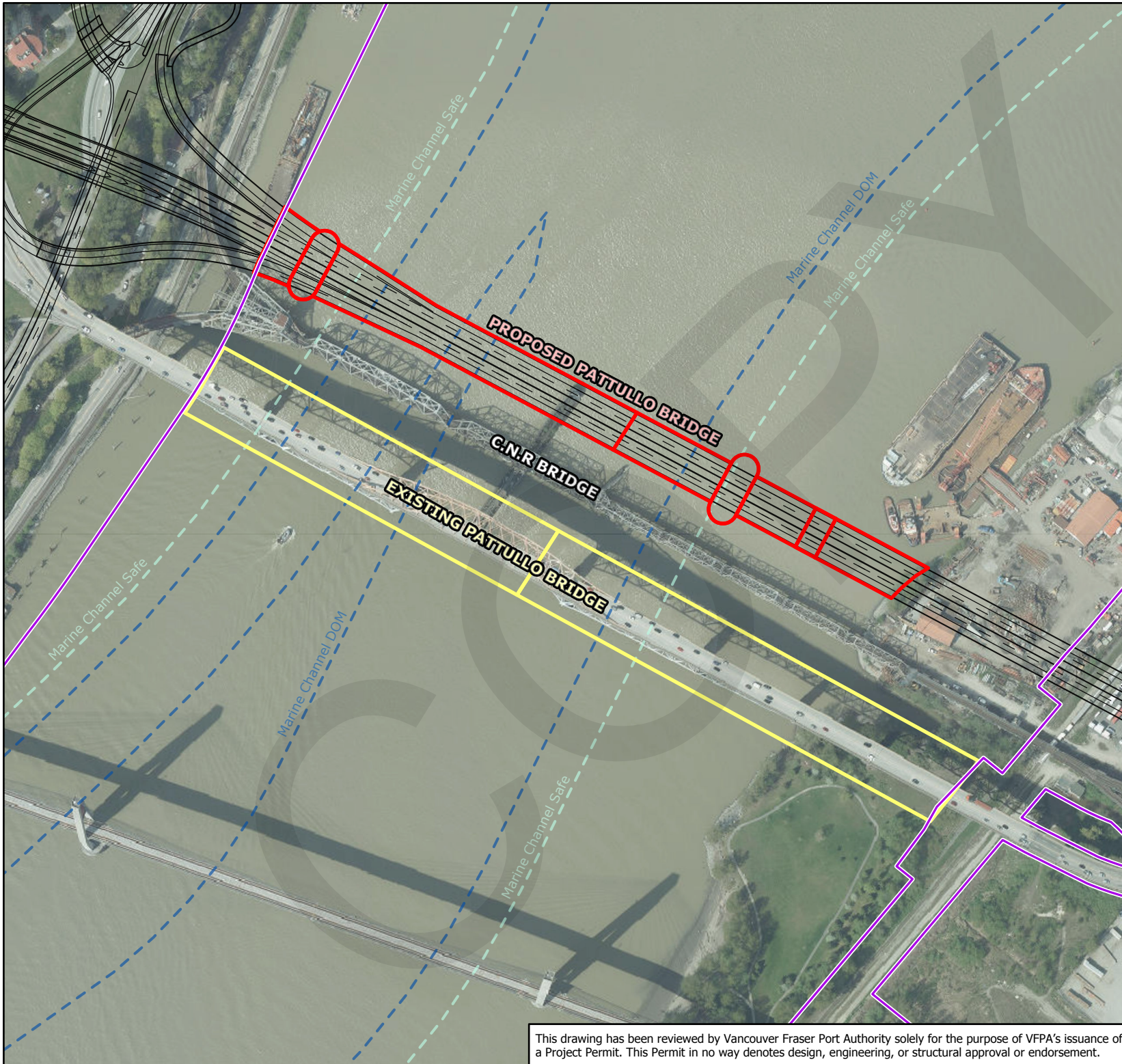
**PER No.17-107-D No Pier Zone**

**PER No. 17-107-E Reference Concept Pier Locations**

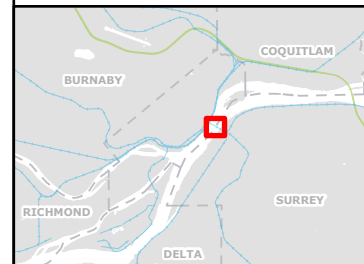
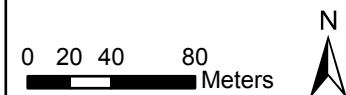
**PER No.17-107-F Reference Concept Existing Bridge Removal**

**PER 17-107**

**Pattullo Bridge Replacement Project**



- Existing Bridge
- Proposed New Bridge
- - - Future Road Alignment
- VFPA Jurisdiction
- Navigation Channels
- - - Marine Channel Safe
- - - Marine Channel DOM



VFPA Spatial Data Group  
 Prepared by: KC  
 April 30, 2019  
 Last updated: May 09, 2019  
 PLAN #G2019-039


This drawing has been reviewed by 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.

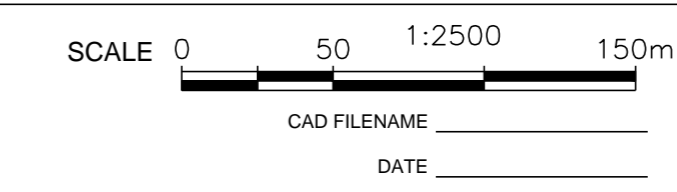


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RE: VANCOUVER FRASER PORT AUTHORITY  
 This drawing has been reviewed by the  
 Vancouver Fraser Port Authority solely for the  
 purpose of VFPA's issuance of a Project Permit.  
 This permit in no way denotes design,  
 engineering or structural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

SIGNATURE


**BRITISH COLUMBIA**  
 MINISTRY OF TRANSPORTATION  
 AND INFRASTRUCTURE

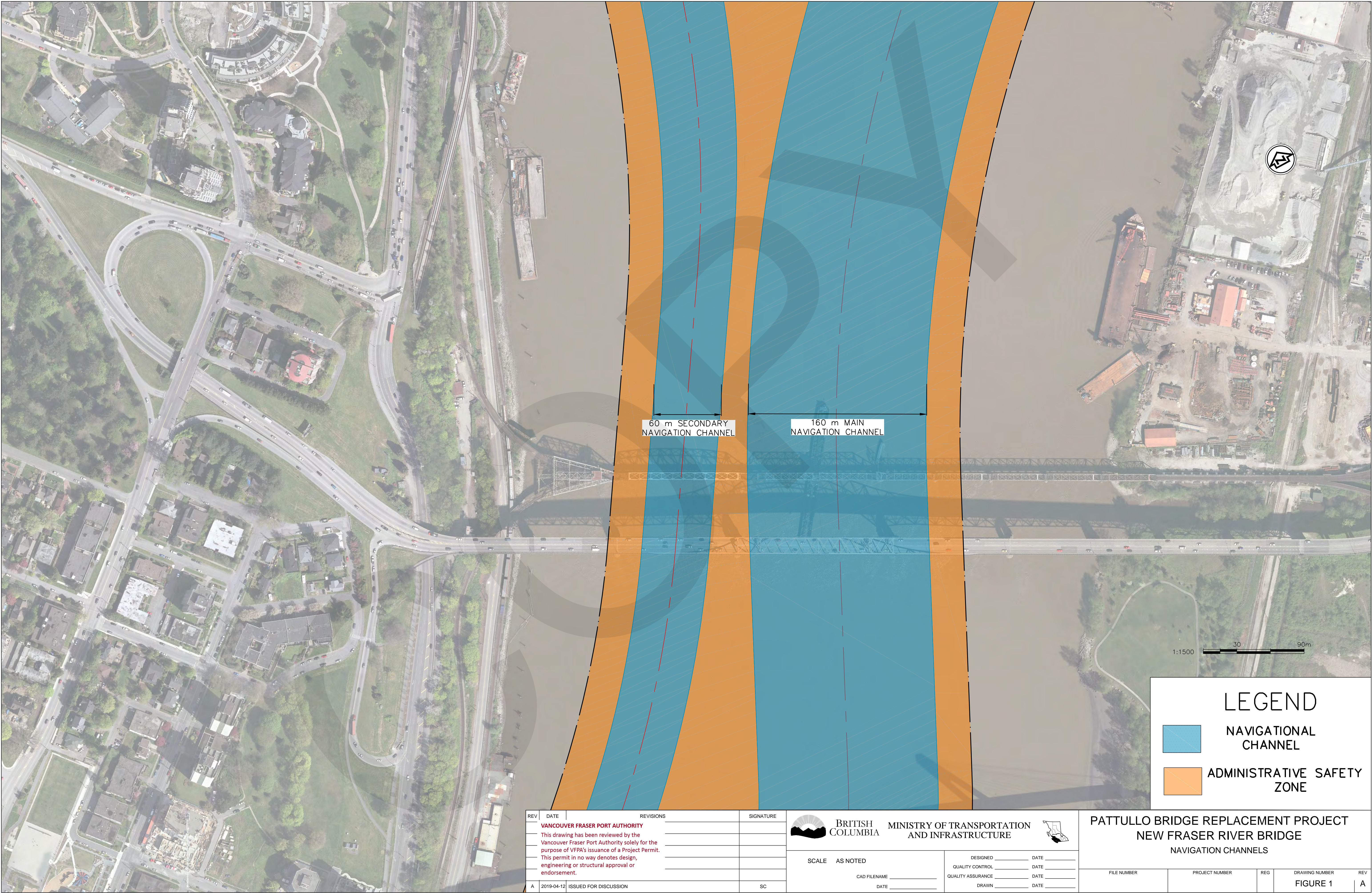


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 QUALITY CONTROL: \_\_\_\_\_ DATE: \_\_\_\_\_  
 QUALITY ASSURANCE: \_\_\_\_\_ DATE: \_\_\_\_\_  
 DRAWN: \_\_\_\_\_ DATE: \_\_\_\_\_

PATTULLO BRIDGE REPLACEMENT PROJECT			
EA REFERENCE CONCEPT			
LANING AND ROAD MARKINGS			
FILE NUMBER	PROJECT NUMBER	REV	DRAWING NUMBER
			SK-C-508
			1

1 2018-03-09 PRELIMINARY - ISSUED FOR EA

File: C:\pwworking\bc\p005223b\dms12407\SK-NW-040 Navigation Channels - Fig 1.dwg Save Date: Apr 12, 2019 9:56 AM Saved By: P005223B



60 m SECONDARY NAVIGATION CHANNEL

160 m MAIN NAVIGATION CHANNEL

1:1500 30 90m

**LEGEND**

- NAVIGATIONAL CHANNEL
- ADMINISTRATIVE SAFETY ZONE

REV	DATE	REVISIONS	SIGNATURE
A	2019-04-12	ISSUED FOR DISCUSSION	SC

**VANCOUVER FRASER PORT AUTHORITY**  
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**BRITISH COLUMBIA** MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

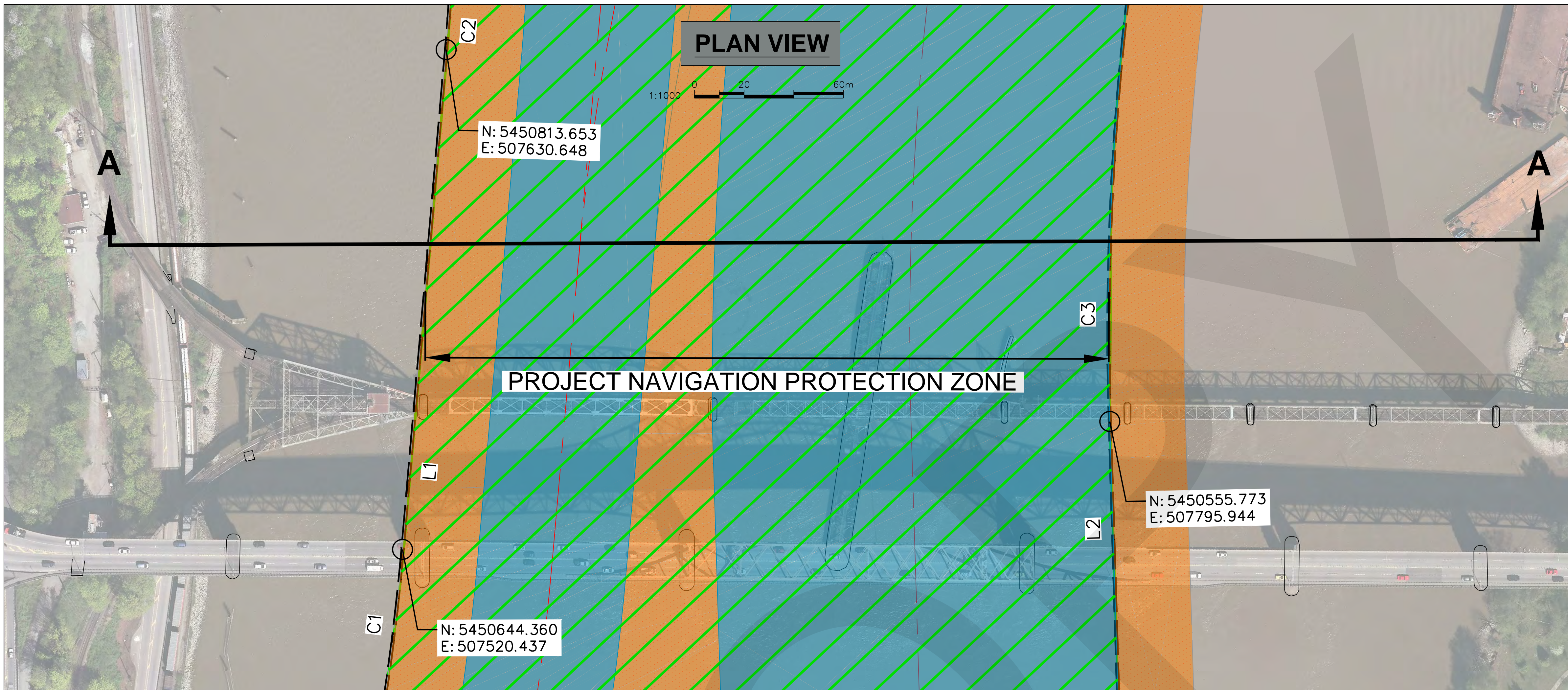
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 QUALITY ASSURANCE \_\_\_\_\_ DATE \_\_\_\_\_  
 DRAWN \_\_\_\_\_ DATE \_\_\_\_\_

**PATTULLO BRIDGE REPLACEMENT PROJECT**  
**NEW FRASER RIVER BRIDGE**  
 NAVIGATION CHANNELS

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
			FIGURE 1	A



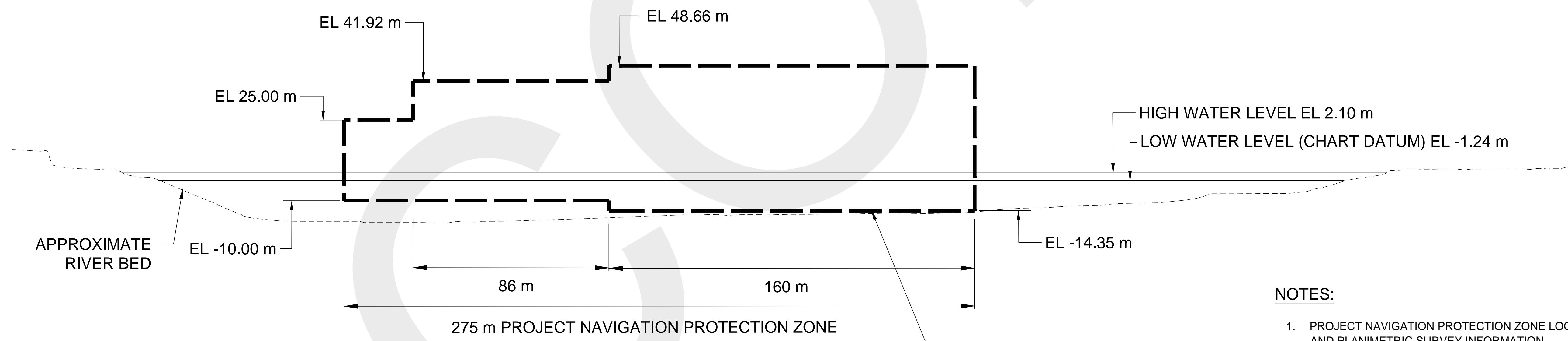
BOUNDARY LINE TABLE						
LINE	LENGTH	BEARING	Start Northing	Start Easting	End Northing	End Easting
L1	202.006	213° 03' 52"	5450813.653	507630.648	5450644.360	507520.437
L2	261.902	26° 20' 05"	5450321.051	507679.761	5450555.773	507795.944

BOUNDARY CURVE TABLE						
Curve #	Length	Radius	Start Northing	Start Easting	End Northing	End Easting
C1	238.455	939.740	5450644.360	507520.437	5450463.078	507366.511
C2	365.757	969.500	5451150.156	507768.360	5450813.653	507630.648
C3	688.007	1170.000	5450555.773	507795.944	5451050.269	508259.995

### LEGEND

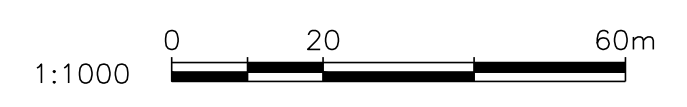
- NAVIGATIONAL CHANNEL
- ADMINISTRATIVE SAFETY ZONE
- NO PIER ZONE
- PROJECT NAVIGATION PROTECTION ZONE BOUNDARY



- NOTES:**
- PROJECT NAVIGATION PROTECTION ZONE LOCATED BASED ON AERIAL PHOTO AND PLANIMETRIC SURVEY INFORMATION.
  - ELEVATIONS ARE RELATIVE TO GSC DATUM OF 0.0 m
  - PROJECT NAVIGATION PROTECTION ZONE REPRESENTS THE HORIZONTAL AND VERTICAL CLEARANCES IN WHICH NO PERMANENT WORKS ARE PERMITTED.

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### SECTION A-A VIEW



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BRITISH COLUMBIA  
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

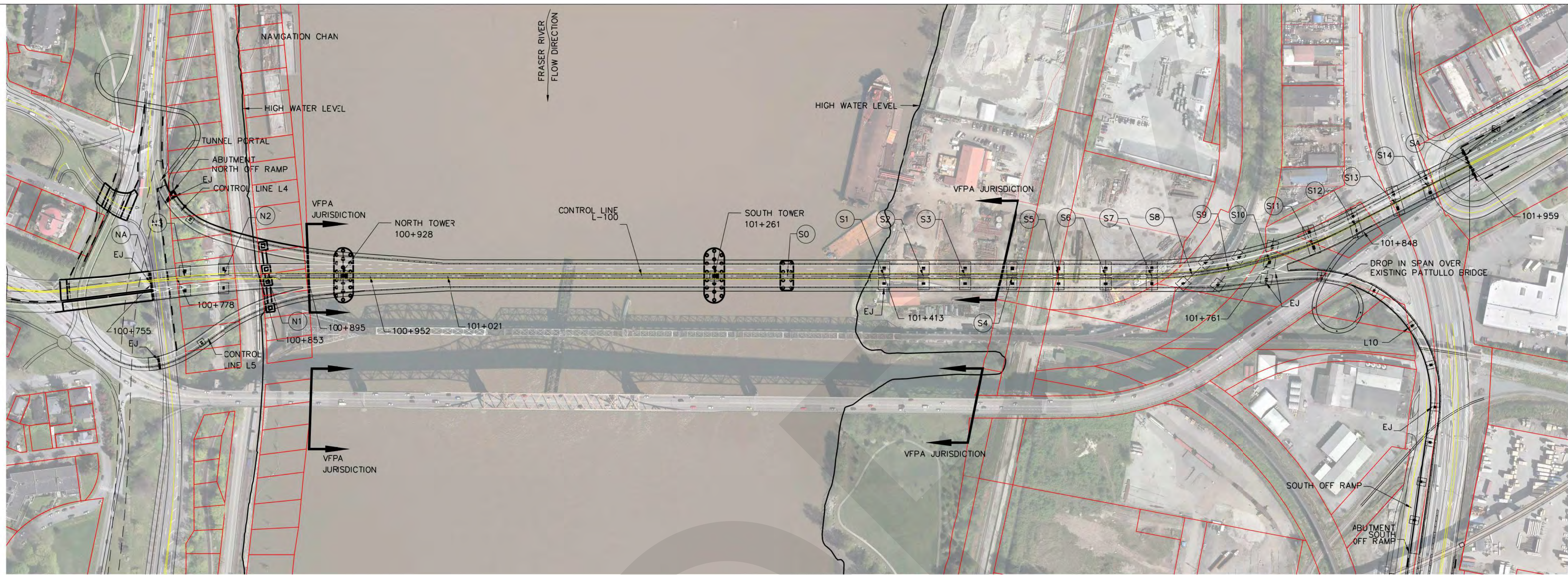
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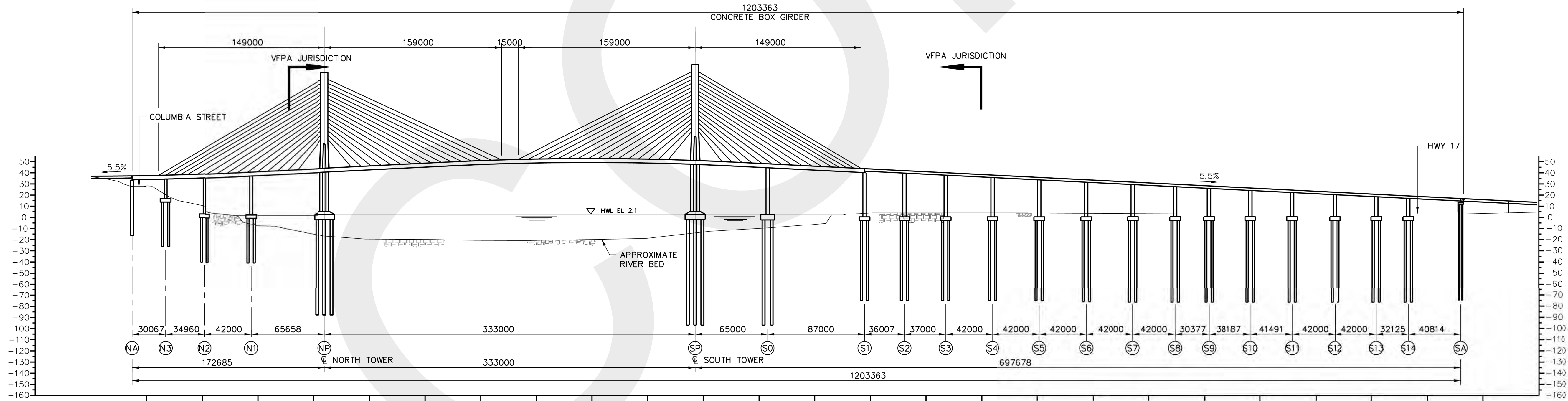
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 QUALITY ASSURANCE \_\_\_\_\_ DATE \_\_\_\_\_  
 DRAWN \_\_\_\_\_ DATE \_\_\_\_\_

**PATTULLO BRIDGE REPLACEMENT PROJECT**  
**NEW FRASER RIVER BRIDGE**  
 NAVIGATION CLEARANCE DRAWING

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
			FIGURE 2	A



PLAN  
1: 2000



PROFILE MAINLINE ALONG L-100 CONTROL LINE  
1: 2000

NOTES:  
REFER TO SHEET SK-C-509 FOR  
DETAILS OF NAVIGATION CLEARANCE.

REV	DATE	REVISIONS	SIGNATURE
1	2018-03-09	PRELIMINARY - ISSUED FOR EA	SC

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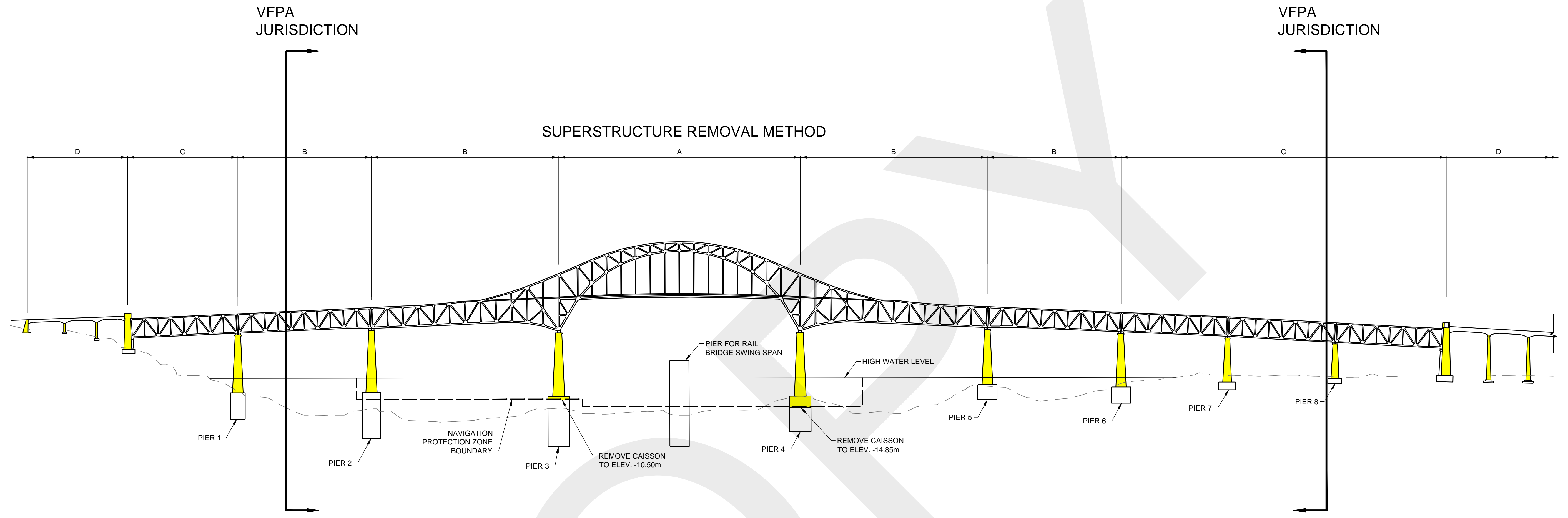
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 QUALITY ASSURANCE \_\_\_\_\_ E.H. DATE 2018-02-16  
 DRAWN \_\_\_\_\_ M.E.A. DATE 2018-02-16

**PATTULLO BRIDGE REPLACEMENT PROJECT**  
**EA REFERENCE CONCEPT**  
**SINGLE-PLANE CABLE-STAYED BRIDGE**  
 GENERAL ARRANGEMENT

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
			SK-S-047	1



**OVERALL ARRANGEMENT FOR REMOVAL**

**LEGEND**

SUBSTRUCTURE / FOUNDATION REMOVAL LIMITS

**SUPERSTRUCTURE REMOVAL METHOD:**

- A - ARCH SPAN, LOWER ENTIRE SPAN (WITH HANGER AND TIE AT DECK LEVEL) TO BARGE.
- B - STEEL TRUSS SPAN (OVER RIVER), LOWER ENTIRE SPAN TO BARGE.
- C - STEEL TRUSS SPAN (OVER LAND), REMOVE IN SECTIONS, CANTILEVERED FROM ADJACENT SPANS STARTING FROM ABUTMENT SIDE.
- D - CONCRETE GIRDER SPANS, LONGITUDINALLY SAW CUT THE DECK & GIRDER INTO MANAGEABLE SIZES & REMOVE BY CRANES.

**NOTES:**

1. FOR TRUSS AND ARCH SPANS, DECK AND STRINGERS ARE REMOVED IN ADVANCE BY MOBILE CRANES SETTING ON DECK LEVEL. REMOVAL METHODS SHOWN IN THIS PACKAGE ARE FOR TRUSS/ARCH MAIN MEMBER REMOVAL ONLY.
2. EXISTING STRUCTURE CONTAINS LEAD PAINT. PLEASE SEE SEPARATE MEMO FOR DETAILS.
3. AN ALTERNATIVE REMOVAL METHOD IS TO REMOVE THE STRUCTURE IN SECTIONS (PART OF A SPAN, DEPENDING ON LIFT CAPACITY) THIS METHOD IS SIMILAR TO THE REVERSE OF ORIGINAL CONSTRUCTION. TEMPORARY HARNESSSES ARE REQUIRED IF SUCH METHOD IS USED.
4. ALL SUBSTRUCTURES ARE REMOVED TO FOOTING LEVELS, EXCEPT PIERS 3 & 4. PIERS 3 AND 4 REQUIRE REMOVAL OF PART OF THE CAISSON, TO ELEVATIONS -10.50m AND -14.85m REPECTIVELY.
5. PIER 2 REMOVED TO FOOTING LEVEL. CAISSON EXTENDS INSIDE THE NAVIGATION PROTECTION ZONE BUT IS OUTSIDE THE SECONDARY NAVIGATION CHANNEL.

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REV	DATE	REVISIONS	SIGNATURE
1	2018-03-09	PRELIMINARY - ISSUED FOR EA	SC

**BRITISH COLUMBIA** MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

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 QUALITY CONTROL \_\_\_\_\_ DATE \_\_\_\_\_  
 QUALITY ASSURANCE \_\_\_\_\_ DATE \_\_\_\_\_  
 DRAWN \_\_\_\_\_ DATE \_\_\_\_\_

**PATTULLO BRIDGE REPLACEMENT PROJECT**  
**EA REFERENCE CONCEPT**  
 EXISTING BRIDGE DECOMMISSIONING  
 GENERAL ARRANGEMENT FOR REMOVAL

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
			SK-S-529	1

**APPENDIX B**  
**List of Information Sources**



**VFPA has relied on the following sources of information in the Project and Environmental Review of the Project:**

- Application form and materials submitted by Applicant on behalf of the Applicant on April 21, 2017;
- All Project correspondence from April 21, 2017 to May 16, 2019;
- All plans and drawings labelled PER No.17-107-A through PER No.17-107-E, and as submitted with the Application in April 2018
- Memo titled 'Pattullo Bridge Replacement Project – Hydraulic Model Nodes', October 20, 2016, VFPA Marine Operations;
- "Pattullo Bridge Replacement Project Valued Components Selection and Rationale Document", June 2017, Translink;
- "Pattullo Bridge Replacement Project Environmental Assessment Certificate Application", August, 2018, Ministry of Transportation and Infrastructure;
- Memo titled "Assessment of Underwater Excavation for the Pattullo Bridge Replacement Project", October 31, 2018, Ministry of Transportation and Infrastructure;
- Memo titled "Consideration of Alternatives in Developing the Reference Concept for the Pattullo Bridge Replacement Project", November 1, 2018, Ministry of Transportation and Infrastructure;
- Memo titled "Supplemental Information to support the effects assessment of the Social Determinants of Human Health Valued Component", November 8, 2018, Ministry of Transportation and Infrastructure;
- Memo titled "Supplemental Information related to the Human Health Risk Assessment sections of the Application", November 22, 2018, Ministry of Transportation and Infrastructure;
- Memo titled "Hydraulic Modelling Summary in Relation to Archaeological Concerns raised during the Heritage Sub-Committee Working Group meeting on October 31<sup>st</sup>, 2018", November 27, 2018, Ministry of Transportation and Infrastructure;
- Memo titled "No Build compared to Build Scenario Information", November 29, 2018, Ministry of Transportation and Infrastructure;
- Memo titled "Supplement to Air Quality Technical Data Report", December 3, 2018, Ministry of Transportation and Infrastructure;
- Memo titled "Initial Habitat Balance Sheet for the Pattullo Bridge Replacement Project", December 4, 2018, Ministry of Transportation and Infrastructure;
- Memo titled "Additional Information on Access to Public and Private Properties and Noise during Construction", December 13, 2018, Ministry of Transportation and Infrastructure;
- Memo titled "Supplemental Assessment of Temporary Laydown Areas and Marine Access", December 10, 2018, Ministry of Transportation and Infrastructure;
- Responses to public comments received during the September 6 – October 9, 2018 Environmental Assessment Public Comment Period of the Application for an Environmental Assessment Certificate, March 21, 2019, Ministry of Transportation and Infrastructure;
- Technical Working Group comments and responses on the Application for an Environmental Assessment Certificate, March 22, 2019, Ministry of Transportation and Infrastructure; and
- Letter titled Pattullo Bridge Replacement Project - Navigation Requirements, April 17, 2019, from Wendy Itagawa, Executive Director, Pattullo Bridge Replacement Project to Stephen Brown, Director Marine Operations, VFPA.
- Report titled "Assessment Report for the Pattullo Bridge Replacement Project (PBRP): With respect to the application by the British Columbia Ministry of Transportation and Infrastructure for and Environmental Assessment Certificate pursuant to the *Environmental Assessment Act*, S.B.C. 2002, c. 43," April 4, 2019, British Columbia Environmental Assessment Office.

**APPENDIX C**  
***Pattullo Bridge Replacement Project - Navigation  
Requirements, MOTI, dated April 17, 2019***

April 17, 2019

Via Email

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

Attention: Capt. Stephen Brown  
Interim Director Marine Operations and Safety, Harbour Master

Dear Capt. Brown,

**Re: Pattullo Bridge Replacement Project – Navigation Requirements**

The Pattullo Bridge Replacement Project is a priority for the Province and we are committed to continuing to work with our regulators to make sure their requirements are met. Navigation requirements as established by the Vancouver Fraser Port Authority (VFPA) and Transport Canada's Navigable Waters Protection Program (TC-NWPP) are critical to our project as these requirements define the final design of the bridge.

Through our engagement with VFPA and TC-NWPP, we have gained an understanding of the navigation requirements for the Pattullo Bridge Replacement Project. As discussed during our meeting on October 23, 2018, it is our understanding that the Project meets the navigational requirements of the VFPA and TC-NWPP.

The following provides our understanding of these requirements.

## 1. Navigation Protection Zones (NPZs)

### Horizontal Clearances

Navigation Protection Zones (NPZs) have been established using the *Permanent Association of Waterborne Transport (PIANC): Approach Channel Guidelines Report No 121–2014*. Two navigation channels have been identified for the segment of the Fraser River where the Project is located: a 160 m wide Main Channel and a 60 m wide Secondary Channel, as shown on the attached Figure 1.

### Vertical Clearances

- **Air draft** – air draft clearances were provided by the VFPA and need to be at least 48.66 m above Geodetic Datum (GSC) for the entire length of the 160 m wide channel. This includes a 2.0 m overhead clearance safety allowance above the navigation envelope. The clearance in the 60 m wide channel needs to be at least 41.92 m GSC. These clearances are shown on the attached Figure 2.

- **Channel depth** – Piers for the new bridge could have localized effects on river bed elevations resulting from scour, and it is anticipated that mitigation measures, which may include the installation of rip rap that is excavated into the river bed, would be required to address such effects. To ensure current and future navigation requirements are maintained, the placement of rip rap or permanent works to mitigate scour would need be below an elevation of -14.32 GSC within the NPZs.

## 2. Removal of the Existing Pattullo Bridge

The existing Pattullo Bridge will be demolished and moved off-site. In-stream piers will be removed to the deeper of the top of the existing riprap or the bottom of the Navigation Protection Zone Boundary (see attached Figure 2).

## 3. Additional Restrictions

Through our engagement with the VFPA, TC-NWPP and marine users, additional restrictions for the location of piers were identified. These restrictions preclude placing of bridge piers within:

- the Administrative Safety Zone on the north side of the Secondary Channel
- the Administrative Safety Zone in between the Main Channel and the Secondary Channel

These additional restrictions and the NPZs establish “No Pier Zones” that will guide the final design of the proposed new bridge and removal of the existing Pattullo Bridge.

The Project is seeking confirmation of the above navigation requirements from the VFPA and TC-WPP. If you have any questions or concerns, please do not hesitate to contact me.

Yours truly,

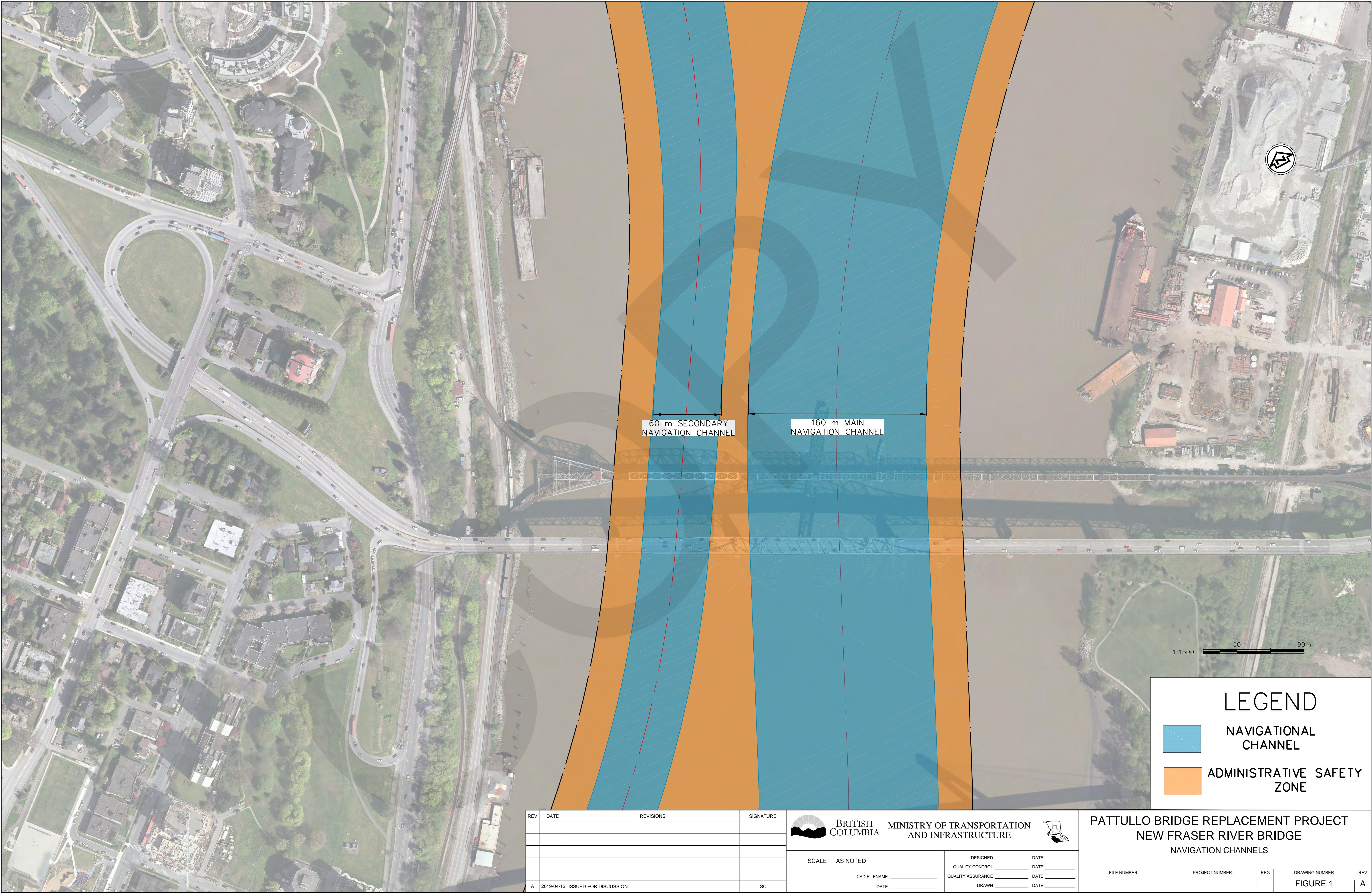


Wendy Itagawa, P.Eng.  
Executive Director, Pattullo Bridge Replacement Project  
BC Ministry of Transportation and Infrastructure

Cc: Lauren Matthias, Associate Project Director, Pattullo Bridge Replacement Project  
Joost Meyboom, Technical Director, Pattullo Bridge Replacement Project

Attachments: Drawing of Navigation Clearance  
Drawing of Navigation Channels

File: C:\pw\_working\bc\p005223b\dims12407\SK-NW-040 Navigation Channels - Fig 1.dwg Save Date: Apr 12, 2019 9:56 AM Saved By: P005223B



60 m SECONDARY NAVIGATION CHANNEL

160 m MAIN NAVIGATION CHANNEL

1:1500 30 90m

**LEGEND**

- NAVIGATIONAL CHANNEL
- ADMINISTRATIVE SAFETY ZONE

REV	DATE	REVISIONS	SIGNATURE
A	2019-04-12	ISSUED FOR DISCUSSION	SC

**BRITISH COLUMBIA** MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

SCALE AS NOTED

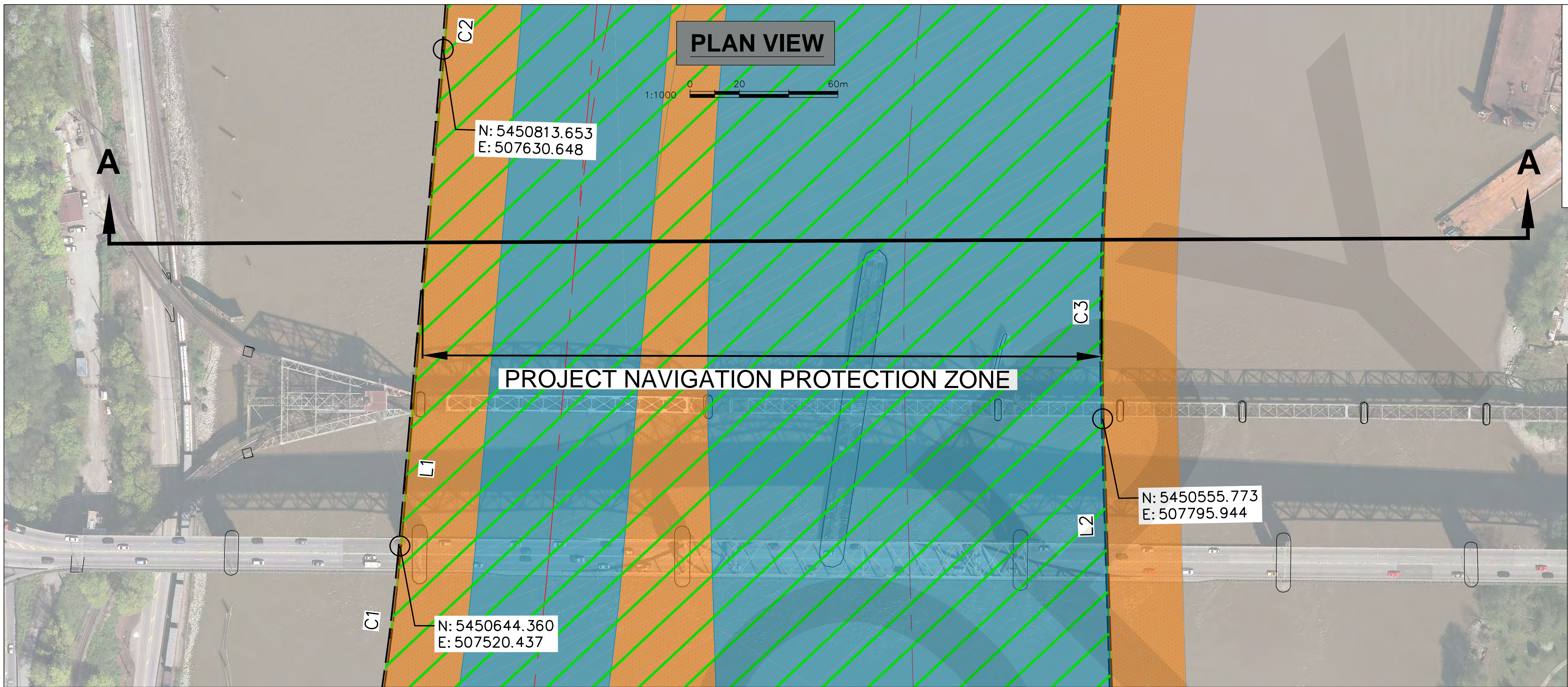
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 QUALITY ASSURANCE \_\_\_\_\_ DATE \_\_\_\_\_  
 DRAWN \_\_\_\_\_ DATE \_\_\_\_\_

**PATTULLO BRIDGE REPLACEMENT PROJECT**  
**NEW FRASER RIVER BRIDGE**  
 NAVIGATION CHANNELS

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
			FIGURE 1	A

File: C:\pw\_working\bc\p005223b\dms12407\SK-NW-041 Navigation Clearance - Fig 2.dwg Save Date: Apr 12, 2019 11:34 AM Saved By: P005223B



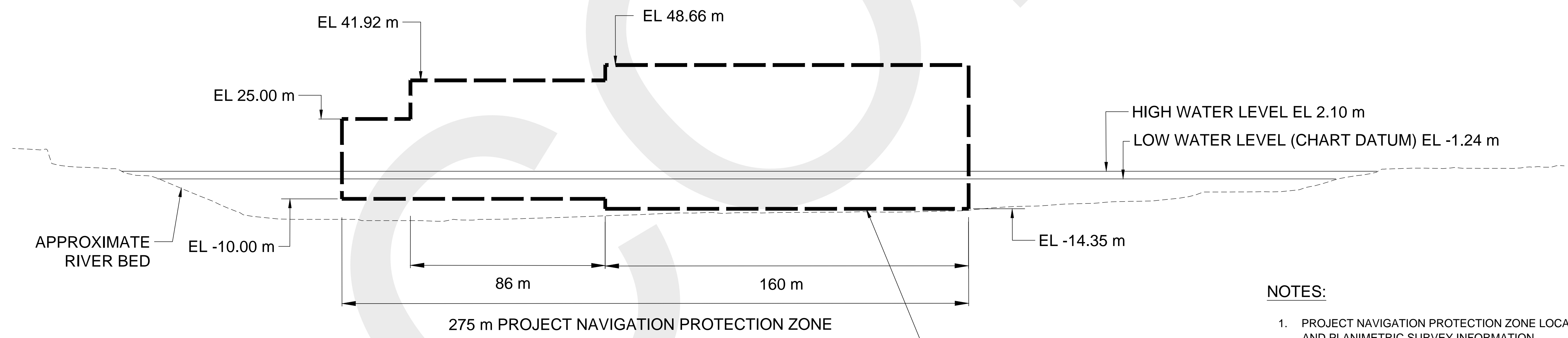
BOUNDARY LINE TABLE						
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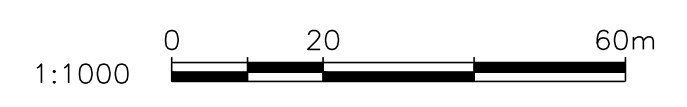
### LEGEND

- NAVIGATIONAL CHANNEL
- ADMINISTRATIVE SAFETY ZONE
- NO PIER ZONE
- PROJECT NAVIGATION PROTECTION ZONE BOUNDARY



- NOTES:**
- PROJECT NAVIGATION PROTECTION ZONE LOCATED BASED ON AERIAL PHOTO AND PLANIMETRIC SURVEY INFORMATION.
  - ELEVATIONS ARE RELATIVE TO GSC DATUM OF 0.0 m
  - PROJECT NAVIGATION PROTECTION ZONE REPRESENTS THE HORIZONTAL AND VERTICAL CLEARANCES IN WHICH NO PERMANENT WORKS ARE PERMITTED.

### SECTION A-A VIEW



REV	DATE	REVISIONS	SIGNATURE
A	2019-04-12	ISSUED FOR DISCUSSION	SC

BRITISH COLUMBIA  
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

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 QUALITY ASSURANCE: \_\_\_\_\_ DATE: \_\_\_\_\_  
 DRAWN: \_\_\_\_\_ DATE: \_\_\_\_\_

**PATTULLO BRIDGE REPLACEMENT PROJECT  
NEW FRASER RIVER BRIDGE  
NAVIGATION CLEARANCE DRAWING**

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
			FIGURE 2	A