Environmental Overview Assessment
Colquitz River Bridges Widening and Upgrades
Highway 1, Saanich, BC

PRESENTED TO

BC Ministry of Transportation and Infrastructure

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ACRONYMS & ABBREVIATIONS

Acronyms/Abbreviations	Definition
AQP	Appropriately Qualified Professional
BC	British Columbia
BC CDC	BC Conservation Data Centre
BC MOE	BC Ministry of Environment and Climate Change Strategy
BC MOF	BC Ministry of Forests
BC MFLNRO	BC Ministry of Forests, Lands and Natural Resource Operations
BEC	Biogeoclimatic Ecosystem Classification
BMP	Best Management Practices
CDF	Coastal Douglas-fir Biogeoclimatic Zone
CEMP	Construction Environmental Management Plan
CEAA	*Canadian Environmental Assessment Act*
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CRD	Capital Regional District
DFO	Fisheries and Oceans Canada
ECCC	Environment and Climate Change Canada
EMA	*Environmental Management Act*
EMBC	Emergency Management BC
EOA	Environmental Overview Assessment
ESC	Erosion and Sediment Control
HADD	Harmful Alteration, Disruption or Destruction of Fish Habitat
IAA	*Impact Assessment Act*
MBCA	*Migratory Birds Convention Act*
MOTI	BC Ministry of Transportation and Infrastructure
RAPP	Report all Poachers and Polluters
SAR	Species at Risk
SARA	*Species at Risk Act*
SOMC	Species of Management Concern
TDG	Transportation of Dangerous Goods
VCs	Valued Components
WSA	*Water Sustainability Act*

LIMITATIONS OF REPORT

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1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained by British Columbia (BC) Ministry of Transportation and Infrastructure (MOTI) to conduct an Environmental Overview Assessment (EOA) for the planned bridge widening, seismic retrofit and renewal of the north-bound and south-bound Colquitz River Bridges, located along Highway 1 within the District of Saanich, near Victoria, BC (herein referred to as the "Project").

The purpose of the EOA is to describe the Project, characterize existing environmental features, identify potential environmental impacts, present mitigation to minimize or avoid the identified impacts, assess if residual impacts will remain despite application of the presented mitigation, and facilitate regulatory submissions.

2.0 PROJECT DESCRIPTION

2.1 Project Location

The Project is located along the Trans-Canada Highway where it crosses the Colquitz River, in Saanich, BC (Figure1). The approximate geographic coordinates are 48.458190, -123.395063. The surrounding area is highly developed with the exception of the forested and riparian areas along the River. The Trans-Canada Highway crossing is comprised of two bridges designated as Bridge 01378 for the north-bound traffic and Bridge 02655 for the south-bound traffic.

2.2 Project Rationale and Components

The rationale for completing the Project is to support the widening of both the north-bound and south-bound bridges to accommodate bus lanes, as well as seismically upgrade both bridges to current industry standard. The scope of work for each respective bridge includes the following components:

North-bound Bridge (01378)

- Remove upper part of ballast wall at east abutment;
- Remove existing steel handrails, concrete curb and barriers;
- Mill existing concrete wearing surface and remove overhangs;
- Add new B1 Bent behind existing one;
- Demolish existing B1 Bent;
- Disconnect shear keys at both abutments;
- Extend bridge deck to top of ballast wall at ends of bridge;
- Widen bridge deck on both sides by 650 mm and add concrete overlay;
- Add new parapets and steel bicycle railing;
- Add bumpers at Piers B2 and B3;
- Add shear studs at B1, B2 and mid span between them;

- Add additional piles at east abutment;
- Relocate sidewalk; and
- Complete improvements to bridge deck drainage system.

South-bound Bridge (02655)

- Remove existing steel railings, concrete curb and parapet;
- Mill existing concrete wearing surface and remove overhangs;
- Partially remove existing wingwalls to allow room for deck extension at abutments;
- Install new pile and install new concrete column at south end of P1 Pier. This works will involve excavation around the existing P1 Pier;
- Widen existing pier cap at the south end of P1 Pier;
- Install new topping to existing foundation at P1 Pier;
- Extend footing stem at abutment ends and install new steel girder bearing at abutments and P1 Pier;
- Construct new overhangs;
- Construct new CIP parapets and steel railings;
- Widen bridge deck on both sides (215 mm on north side and 930 mm on south side) and construct new overlay;
- Construct new shear keys and plate diaphragm at P1 Pier; and
- Complete improvements to bridge deck drainage system.

In addition to the items listed above, traffic diversions will be required within the shoulders and medians of Highway 1 to facilitate construction. This will result in some trees requiring removal. There will also be improvements made to the bridge deck drainage system to treat/store stormwater runoff, whereby all south-bound and north-bound bridge deck stormwater will be captured and conveyed through an oil/grit separator before being released into a rain garden with overflow water being conveyed to the Colquitz River via a stormwater outfall during heavy rainfall events. Outfall construction will involve trenching to install a 300 mm PVC drainpipe from the rain garden to the bank of the Colquitz River. The outfall will feature a riprap splash pad large enough to reduce the energy of the water leaving the pipe. Outfall features will be installed above the wetted perimeter of the river. Finally, there is also ongoing discussion related to habitat enhancement opportunities within the riparian area of Colquitz River, which have not been finalized at this time. MOTI's Detailed Design Drawings are included in Appendix B of this EOA Report.

2.3 Project Schedule

Based on communication with MOTI, Tetra Tech understands the construction timeline as follows:

- Tender – Summer 2023
- Construction Start – Winter 2024
- Construction Completion – Fall 2026

3.0 METHODOLOGY

The EOA is based on a desktop review of existing information and two field reconnaissance's conducted on May 31, 2022 and January 26, 2023 to ground-truth environmental conditions within the Project area.

3.1 Desktop Study

Tetra Tech gathered existing relevant environmental and biophysical data related to the Project site and surrounding areas to determine known environmental conditions and potentially sensitive features in the Project area including nearby watercourses, fish occurrences and habitat, wildlife, and Species of Management Concern (SOMC).

For the purposes of this study, a SOMC includes any species that meets the following criteria:

- Assigned to the Red or Blue list by the British Columbia Conservation Data Centre (BC CDC), where Red listed species include indigenous species or subspecies that are candidates for Extirpated, Endangered or Threatened status and Blue-listed species include indigenous species or subspecies considered to be of Special Concern (BC CDC 2023a);
- Assessed as Special Concern, Threatened, or Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (Government of Canada 2021); or
- Listed as Special Concern, Threatened, or Endangered under the *Species At Risk Act* (SARA).

Background information was obtained from publicly available databases and mapping services such as:

- BC CDC – Species and Ecosystems Explorer (BC CDC 2023a);
  - Database search criteria for plant and wildlife SOMC included: Search Type: Plants or Animals; and Provincial Conservation Status: Red (Extirpated, Endangered or Threatened) or Blue (Special Concern); or COSEWIC-listed; or SARA-listed species; and Biogeoclimatic Zone: Coastal Douglas-fir (CDF); and Habitat Types: Anthropogenic, Forest, Riparian, Stream/River.
- BC CDC – Internet Mapping (iMap) Tool (BC CDC 2023b);
  - Area search for known occurrences of SOMC within a 1 km radius of the centre of the Project area. Both non-sensitive and masked-sensitive were queried. Non-sensitive occurrences are observations whose exact locations are provided in the mapping service. Masked-sensitive occurrences are observations whose exact location is not provided in the mapping service, rather, a general area is provided. To obtain the exact location of an occurrence, a regional biologist at the BC CDC must be contacted.
- BC Ministry of Environment and Climate Chance Strategy (BC MOE) – Habitat Wizard (BC MOE 2023a);
- BC MOE –Fisheries Inventories Data Query (BC MOE 2023b);
- Fisheries and Oceans Canada – Aquatic Species at Risk Map (DFO 2022);
- Government of Canada – Species at Risk (SAR) Public Registry (Government of Canada 2021);
- BC Ministry of Forest – Biogeoclimatic Ecosystem Classification (BEC) (BC MOF 1994); and
- Other publicly available records and information that may exist for the Project area.

Mapped results of the desktop study are provided on Figure 2.

3.2 Field Reconnaissance

On May 31, 2022, Tetra Tech biologists, Nigel Cavanagh and Lucas Hennecker, conducted a site visit in accordance with generally standardized field assessment protocols to ground-truth the desktop information and identify existing site features that will or may be affected by the Project. The areas assessed included three sections of the Colquitz River in the immediate Project area: underneath the south-bound bridge, underneath the north-bound bridge and the area between the two bridges. Vegetation, wildlife and or wildlife sign, and watercourses were identified and documented throughout the Project area.

The aquatic assessment of the Colquitz River was conducted following the methods outlined in the *Reconnaissance (1:20,000) Fish and Fish Habitat Inventory: Standards and Procedures* (RIC 2001) and modified for the scale of the Project. Aquatic characteristics recorded included visible substrates, channel morphology and pattern, bank shape and stability, instream cover, riparian vegetation and site modifications and/or disturbances. Based on the current characteristics present, observations were made on the overall quality of fish habitat.

On January 26, 2023, Tetra Tech biologist, Mr. Hennecker, returned to site to collect additional data, as detailed design had now reached 50% and potential impact as a result of the Project were now better understood. Items assessed included:

- Trees potentially requiring removal within the medians and shoulders of Highway 1, east and west of the Colquitz River Bridges;
- Trees potentially requiring removal within the riparian area of Colquitz River;
- A review of the configuration of both bridge decks drainage systems and opportunities for improvements;
- A review of the riparian area of Colquitz River, and the opportunities for habitat enhancement in the area; and
- A review of the south-bound bridge (02655) P1 Pier. The review was focused on the proximal distance from the existing pier to the Colquitz River, and what mitigation may be warranted for proposed works around the pier.

Representative photographs of conditions observed during the site visits are attached at the end of this EOA Report and photo locations / directions are provided on Figures 3 to 5.

4.0 RELEVANT ENVIRONMENTAL LEGISLATION

4.1 Municipal

The MOTI is not subject to municipal bylaws when working within MOTI rights of way, however, an intent of the Project is to meet relevant municipal bylaw objectives.

4.1.1 Tree Protection Bylaw, No. 9272, 2014

The District of Saanich's *Tree Protection Bylaw, 2014, No. 9272* regulates and prohibits the cutting, removal and damage of trees, sets fees and issues permits for the same, and outlines the requirement for replacement trees and the security for their provision and maintenance. Part 5 (Tree Cutting Permits), Section 19 stipulates "*a tree cutting permit to alter, cut, damage or remove a protected tree, other than a Significant tree, may be issued by the Director of Parks and Recreation in the following circumstances: j) where the removal of the protected tree is required for the installation of roads or services shown on an engineering drawing that has been approved by the Director of Engineering.*" The Bylaw goes on to note in Part 7 (Replacement Trees), Section 44 g) *for each tree*

altered, cut, damaged or removed under section 19 j) or k), three (3) replacement trees are required. As such, any trees requiring removal as a result of the Project should be replaced on 3:1 replacement to removal ratio.

4.1.2 Central Saanich Noise Suppression Bylaw No. 1, 1989

The District of Saanich's *Central Saanich Noise Suppression Bylaw No. 1, 1989* is a bylaw for the abatement and control of noise in the municipality. The Bylaw stipulates that "*no person shall make or cause to be made between the hours of 9:00 P.M. and 7:00 A.M. any continuous, persistent, or constantly repeated sound which disturbs or tends to disturb the quiet, peace, rest, enjoyment, comfort, or convenience of the neighborhood or of persons in the vicinity thereof*." Further, the Bylaw goes on to stipulate that "*no person shall carry on an industrial operation located within the I-1, Light Industrial Zone, in such a manner as to emit or cause, suffer, or permit the emission of any continuous, persistent, or constantly repeated sound resulting in a sound level measured on a sound level meter, at a point of reception in any zone, in excess of 60 decibels.*" As such, construction activities should be limited to 7:00 a.m. to 9:00 p.m. and noise thresholds should be limited to 60 decibels.

4.2 Provincial

4.2.1 BC Wildlife Act

The British Columbia (BC) *Wildlife Act* protects most vertebrate animals from direct harm or harassment except as allowed by regulation (e.g., hunting or trapping). Section 34 of the *Wildlife Act* specifically protects the nests of Eagles, Peregrine Falcons, Gyrfalcons, Osprey, Herons and Burrowing owls year-round. This means that a tree or other structure containing such a nest must not be felled, even outside of the breeding season. Section 34 of the *Wildlife Act* also protects the nests of all species of birds when birds or eggs are present in the nest. If a heron or raptor nest, active wildlife den, or species at risk habitat is identified within the project footprint, mitigation and/or compensation plans will need to be developed under the direction of the BC Ministry of Forests (BC MOF).

Vegetated areas within the Project footprint will provide habitat for breeding birds during the General Nesting Period, which extends from March 25 to August 17 for the region (Environment and Climate Change Canada [ECCC] 2018). To avoid harm to birds and their nests, tree and vegetation removal (including pruning activities) that may be required for the Project should be conducted outside of the General Nesting Period. If tree and vegetation removal cannot be avoided during the General Nesting Period, it can only occur following a pre-clearing nest survey conducted by an Appropriately Qualified Professional (AQP). It should be noted that certain raptor species may begin nesting prior to the General Nesting Period, as early as January.

It is Tetra Tech's understanding that the Project will not require construction works to be conducted within the Colquitz River. As such, a Fish Collection Permit and a General Wildlife Permit will not be required for the Project.

4.2.2 BC Water Sustainability Act

The BC *Water Sustainability Act* (WSA) is the main provincial statute regulating water resources in British Columbia. The WSA is administered by the BC MOF. Under the WSA, it is an offence to divert or use water, or alter a stream, without formal approval from the Province. The WSA defines "stream" as a natural watercourse or source of water supply, whether usually containing water or not, and a lake, river, creek, spring, ravine, swamp or gulch. "Stream" is used to describe any watercourse that is considered to be fish habitat, including channelized streams, and ditches that provide fish habitat. Under the WSA, the *Water Sustainability Regulation* addresses the requirements to allocate both ground and surface water and identifies the requirements for using water or making changes to a stream.

Authorized Changes per Section 11 of the WSA are typically used for low risk works that do not include permanent water diversion, can be completed in a short period of time, and have minimal impacts. For most *Authorized Changes,* notice must be made to the BC MOF 45 days prior to initiation of works. *Authorized Changes* must meet the requirements of the applicable section(s) of the *Water Sustainability Regulation* (WSR) and comply with any additional conditions set out by a habitat officer. Sections 39(1)(b) and 39(1)(r) of the WSR pertain to bridges, whereby Section 39(1)(b) details the conditions that must be met for *Authorized Changes* specific to clear span bridges and Section 39(1)(r) allows for the repair or maintenance of the superstructure of a bridge, other than the bridge's foundation. Proponents are not required to provide the BC MOF "Notice" when doing work on the superstructure of a bridge (per Section 38(1)). In addition, Section 39(1)(l) pertains to construction or maintenance of storm sewer outfalls and details conditions that must be met to be an *Authorized Change*.

Conversely, *Change Approvals*, issued under Section 11 of the WSA are written authorization required for complex works with substantial impacts.

Based on Tetra Tech's understanding of the Project and based on our assessment of the proposed activities, the Project meets the conditions of an *Authorized Change*, therefore a *Change Approval* is not required. As such, a *Notification* will be submitted to FrontCounter BC. The Reduced Risk Instream Work Window for fish within the Colquitz River is August 1 to September 15 due to the documented fish species within it.

4.2.3 BC Weed Control Act

The BC *Weed Control Act* defines a list of invasive plants as "noxious weeds" at the regional and provincial level. These species are non-native plants that create problems for agriculture and/or natural habitats. Private property owners and government agencies are required to control these species that occur on their property or jurisdiction. Contractors must ensure that any invasive species that are identified are controlled and not allowed to spread. Information related to the control and management of invasive species can be found on the Invasive Species Council of BC website (https://bcinvasives.ca/resources/publications/).

Under the *Weed Control Act*, Schedule A of the Weed Control Regulation designates 39 plant species as noxious weeds within all regions of the province (Table 4-1) and a further 28 are classified as noxious within the boundaries of specific regional districts. This Project is located in the Capital Regional District (CRD). There are additional noxious weeds listed for the CRD: Shiny Geranium *(Geranium lucidum)*, Policeman's Helmet *(Impatiens glandulifera)* and Black Knapweed *(Centaurea nigra).*

Table 4-1: Noxious Weeds Regulated in all Regions of Province

Annual Sow-thistle (*Sonchus oleraceus)*	Bohemian Knotweed (*Fallopia bohemica)*	Bur Chervil (*Anthriscus caucalis*)	Canada Thistle (*Cirsium arvense*)
Common Crupina (*Crupina vulgaris)*	Common Reed (*Phragmites australis subsp. australis*)	Common Toadflax (*Linaria vulgaris)*	Dalmatian Toadflax (*Linaria dalmatica*)
Dense Flowered Cordgrass (*Spartina densiflora)*	Diffuse Knapweed (*Centaurea diffusa*)	Dodder (*Cuscuta spp.*)	English Cordgrass (*Spartina angelica)*
Flowering Rush (*Butomus umbellatus*)	Garlic Mustard (*Alliaria petiolata*)	Giant Hogweed (*Heracleum mantegazzianum*)	Giant Knotweed (*Fallopia sachalinensis*)
Giant Mannagrass/Reed Sweetgrass (*Glyceria maxima*)	Gorse (*Ulex europaeus*)	Himalayan Knotweed (*Polygonum polystachyum*)	Hound's-tongue (*Cynoglossum officinale*)
Japanese Knotweed (*Fallopia japonica*)	Jointed Goatgrass (*Aegilops cylindrica*)	Leafy Spurge (*Euphorbia esula*)	Milk Thistle (*Silybum marianum*)
North Africa Grass (*Ventenata dubia*)	Perennial Sow-thistle (*Sonchus arvensis*)	Purple Loosestrife (*Lythrum salicaria*)	Purple Nutsedge (*Cyperus rotundus*)

Table 4-1: Noxious Weeds Regulated in all Regions of Province

Rush Skeletonweed (*Chondrilla juncea*)	Saltmeadow Cordgrass (*Spartina patens*)	Scentless Chamomile (Matricaria maritima)	Smooth Cordgrass (*Spartina alterniflora)*
Spotted Knapweed (*Centaurea stoebe*)	Tansy Ragwort (*Senecio jacobaea*)	Velvetleaf (*Abutilon theophrasti*)	Wild Oats (*Avena fatua*)
Yellow Flag Iris (*Iris pseudacorus*)	Yellow Nutsedge (*Cyperus esculentus)*	Yellow Starthistle (*Centaurea solstitialis*)	

4.2.4 BC Environmental Management Act

The BC *Environmental Management Act* (EMA) was enacted in July 2004 and combined the Waste Management Act and Environment Management Act. The EMA governs solid waste and manages introduction of waste into the environment by providing an authorization framework and environmental management tools to protect human health and environmental quality.

Under the *Waste Discharge Regulations* of the EMA, certain industries, trades, businesses and operations require authorization to discharge waste into the environment. However, even if an industry, trade, business or operation does not require an authorization, waste discharge must not cause pollution (EMA, Section 6 (4)).

The *Spill Reporting Regulations* of the EMA establishes a protocol for reporting the unauthorized release of substances into the environment as well as a schedule detailing reportable amounts for certain substances.

The *Hazardous Waste Regulations* of the EMA ensures that the generators, carriers and receivers of hazardous waste handle, store, transport, treat and dispose of hazardous waste in a safe manner. Hazardous wastes must be disposed of properly to ensure human health and environmental protection.

4.2.5 BC Heritage Conservation Act

The BC *Heritage Conservation Act* confers automatic protection upon archaeological and historic heritage sites that meet the definitions within section 13(2) of the Act. These include:

- All sites pre-dating AD1846;
- All sites of unknown age or origin which may pre-date AD1846;
- All burial places and rock art sites of historical or archaeological value; and
- All vessels or aircraft wrecked for two or more years.

All areas within the boundaries of a heritage site are protected under the *Act*, including areas without archaeological deposits or other kinds of heritage remains (e.g., land without archaeological deposits between several culturally modified trees at one site, or between several storage pits at one site).

Archaeological sites (both recorded and unrecorded) are protected under the *Heritage Conservation Act* and must not be altered or damaged without a site alteration permit from the Archaeology Branch. If an archaeological site is encountered during Project works, activities must be halted and the Minister's "Chance Find Management Guidelines" followed, which includes contacting the Archeology Branch at **250.953.3334** for direction.

4.3 Federal

4.3.1 Fisheries Act

The *Fisheries Act* is the main federal legislation providing protection for all fish, fish habitat, and water quality. The *Act* is administered federally by Fisheries and Oceans Canada (DFO) and Environment Canada. This *Act* provides protection against the 'death of fish, other than by fishing' and the 'harmful alteration, disruption or destruction of fish habitat' (HADD), unless authorized by DFO.

Fish habitat is defined as spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes. This definition indicates that a watercourse (which includes but is not limited to streams, ditches, ponds and wetlands), which provides water, food or nutrients to a fish-bearing stream, is considered fish habitat even if it does not contain fish and/or if it only has temporary or seasonal flows. The definition also indicates that not only the watercourse itself but also the vegetated stream side or riparian areas which provide nutrients and shade to the stream are considered fish habitat.

DFO encourages all project proponents to avoid and mitigate the impacts of projects to fish. As part of the professional reliance model, projects near water should be evaluated by an AQP and include documentation of common and site- and construction-specific measures and best practices to avoid or minimize impacts to fish and fish habitat. If a project cannot fulfill DFO's *Measures to Protect Fish and Fish Habitat* or the scope of the project is not entirely covered under DFO's *Codes of Practice,* proponents are asked to submit a Request for Review and DFO will work with the proponent to find additional ways to reduce those impacts. If the project cannot be designed to avoid a HADD, a *Fisheries Act Authorization* is required.

Based on Tetra Tech's understanding of the Project and based on our assessment of the proposed activities, it is unlikely that the Project will cause death of fish or HADD if, at a minimum, standard best management practices and mitigation as presented in Table 6-1 are implemented. However, given the sensitivity of the watercourse involved, a *Request for Review* will be submitted to DFO so they can provide their input on the proposed activities and their assessment of whether an *Authorization* will be required. The Reduced Risk Instream Work Window for fish within the Colquitz River is August 1 to September 15 due to the documented fish species within it.

4.3.2 Species at Risk Act

The *Species at Risk Act* (SARA) prohibits the killing, harming, harassing, capturing or taking of species at risk, or destruction of their critical habitats. Species are designated 'at risk' by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), an independent body of experts that assesses species according to a broad range of scientific data. The federal Cabinet then decides whether those species should receive legal protection under the *Act*.

The SARA protects listed mammals, reptiles, amphibians, molluscs, lepidopterans, and plants on federally managed areas, and migratory birds (as listed under the *Migratory Birds Convention Act* [MBCA]) and fish are protected in all jurisdictions within Canada. Species that are legally protected under SARA are those listed as Endangered or Threatened and are listed in Schedule 1 of the *Act*. Species listed as Special Concern and all species listed in Schedule 3, regardless of their status, are not legally protected by SARA. A permit is required when works either affect a migratory bird or aquatic species or its residence, that is listed as 'Endangered' or 'Threatened' or 'Extirpated' on Schedule 1 of SARA; or affect any Schedule 1 'Endangered' or 'Threatened' or 'Extirpated' species or its residence on federal land.

A SARA permit is required by anyone who undertakes a Project that could violate SARA's prohibitions including harming or capturing SAR listed under Schedule 1, and destruction of critical habitat. While this Project will not occur on federal land, it may incidentally impact SAR and/or critical habitat, and therefore, MOTI is responsible for ensuring compliance with the SARA.

There is proposed SARA Critical Habitat designation for Northern Painted Turtle – Pacific Coast Population along the riparian area of the Colquitz River (Figure 2). As the Critical Habitat is currently designated as 'proposed', there is no legal protection for this area. Suitable habitat for this species exists downstream of the Project area closer to the Gorge near the Admirals Bridge, however the potential for presence of Northern Painted Turtle – Pacific Coast Population at the Project site is considered to be low.

It is not expected that any rare plants, viable rare plant communities, or rare wildlife will be encountered in the work area during this Project. However, based on the location and habitat availability, a number of species at risk have been identified as having the potential to occur at the Project area (Section 5.6; Appendix C). Should a SARA-listed species or any other rare species be identified on site prior to or during works, ECCC and the BC Ministry of Environment and Climate Change Strategy (BC MOE) should be notified immediately for direction on appropriate action as measures employed would vary greatly with the species encountered, its sensitivity to the Project and its proximity to the works.

4.3.3 Migratory Birds Convention Act

The *Migratory Birds Convention Act* (MBCA) prohibits the disturbance or destruction of (1) a migratory bird, (2) the eggs of a migratory bird, (3) the occupied nests and shelters of any migratory bird, and (4) provides year-round protection to the unoccupied nests of the 18 bird species listed in Schedule 1 of the *Migratory Birds Regulations, 2022.* Under the *Regulation*, most unoccupied nests may be removed without a permit, unless it is a nest of a species listed in Schedule 1 of the *Regulation*, such as herons or Pileated Woodpecker, as these species tend to re-use their nests year after year. To destroy or disturb a nest of a bird listed in Schedule 1, the nest needs to be submitted to the online Abandoned Nest Registry, and the nest must be monitored to ensure it remains unused throughout the designated wait time set out in Schedule 1 for that species (between 1-3 years).

To protect birds and their nests, tree and vegetation removal should be conducted outside of the General Nesting Period for breeding birds, which occurs from March 25 to August 17 for most species in the region (ECCC 2018). If vegetation removal cannot be avoided during the general nesting period, pre-clearing nest surveys must be conducted by an AQP in advance of clearing to identify any breeding, nesting, roosting or rearing birds and determine the appropriate Best Management Practices, such as establishing work exclusion buffers around detected nests.

On the assumption that removal of nests is not required for this Project, there is no permit required under the MBCA.

5.0 EXISTING ENVIRONMENTAL CONDITIONS

The following sections describe the existing conditions within the Project area. Representative photographs are attached at the end of this EOA Report and photo locations / directions are provided on Figures 3, 4 and 5. Photographs 1 to 8 depict conditions observed during the May 2022 site visit and photographs 9 to 21 depict conditions observed during the January 2023 site visit.

5.1 Air Quality and Noise

Air quality is typically determined by the concentrations of pollutants in the atmosphere, which are, in turn, affected by the dispersion of pollutants from emission sources. The Project area is open to the outdoors and vehicles travelling along Highway 1 are the primary source to air emissions over most of the Project area. Other potential emission sources at or near the Project area may include commercial or industrial sources. Intermittent sources such as forest fires, fugitive dust from soil disturbances, paving or other construction activities may also contribute emissions.

Highway 1 is a busy traffic corridor and is the primary contributor to **noise** at the Project area. However, since the Project will involve the use of heavy machinery, such as an impact pile driver, construction activities should be limited to 7:00 a.m. to 9:00 p.m. and noise thresholds should be limited to 60 decibels as much as possible.

5.2 Soils and Landforms

The Project is located in the Eastern Vancouver Island ecoregion, which is part of the larger Pacific Maritime ecozone. The dominant soil development types are Podzolic soils (57%) developed on sand-textured parent material underlain by igneous rocks (CSSS 2020).

5.3 Vegetation

The Biogeoclimatic Ecosystem Classification (BEC) is a land classification system that groups similar ecosystems based on climate, soils and vegetation. This classification system was developed in British Columbia and is widely used as a framework for resource management as well as for scientific research. Vegetation of mature ecosystems is emphasized in BEC as it is considered the best indicator of the combined influence of the environmental factors affecting a site.

The Project lies within the Coastal Douglas-fir moist maritime (CDFmm) zone (BC CDC 2023b). The CDFmm occurs at low elevations (sea level – 150m) along southeast Vancouver Island from Bowser to Victoria and encompasses the Gulf Islands south of Cortes Island, and a short section along the Sunshine Coast near Halfmoon Bay. The moist maritime sub-region represents the mildest climate in Canada and generally experiences warm, dry summers and mild, wet winters. The CDFmm lies in the rain shadow of the Vancouver Island and Olympic mountains, which results in long growing seasons and pronounced water deficits in drier sites. Forests in this subzone are characterized by Douglas-fir *(Pseudotsuga menziesii),* grand-fir *(Abies grandis)*, and western redcedar *(Thuja plicata)*. The shrub and herb understory layers are dominated by salal *(Gaultheria shallon),* dull-Oregon grape *(Mahonia nervosa),* oceanspray *(Holodiscus discolor)* and Oregon beaked-moss *(Kindbergia oregana)* (BC MOF 1994).

During the May 2022 and January 2023 site visits, vegetation observed within the riparian area of Colquitz River around the bridges was typical of a mixed-wood riparian forest within the CDF zone. The mature mixed-wood forest at the Project area was dominated by bigleaf maple *(Acer macrophyllurn)*, with minor components of red alder (*Alnus rubra*), Douglas-fir and western redcedar. Himalayan blackberry *(Rubus armeniacus)* and oceanspray (*Holodiscus discolor var. discolor*) were the dominant species in the sparse shrub layer, while the herb layer was dominated by English ivy *(Hedera helix*), field bindweed (*Convolvulus arvensis*) and stinging nettle (*Urtica dioica*), and the fringe of the Colquitz River was dominated by reed canarygrass *(Phalaris arundinacea).* Ornamental species such as Hobblebush (*Viburnum* sp.*)* were planted along the walking trail that parallels the Colquitz River west of Burnside Road. Several Garry oak (*Quercus garryana var. garryana)* were also present adjacent to the walking trail, south of the south-bound bridge (Bridge 02655) with the nearest stem being approximately 10 m from P1 Pier. Table 5-1 below provides a full list of vegetation observed within the riparian area of the Colquitz River at the Project area.

Table 5-1: Vegetation Observed within Riparian Area of Colquitz River During May 2022 and January 2023 Site Visits

Common Name	Scientific Name	Provincial Status	BC *Weed Control Act*
Trees			
bigleaf maple	*Acer macrophyllum*	Yellow	-
red alder	*Alnus rubra*	Yellow	-
Pacific crab apple	*Malus fusca*	Yellow	-
shore pine	*Pinus contorta var. contorta*	Yellow	-
Douglas-fir	*Pseudotsuga menziesii*	Yellow	-
Garry oak	*Quercus garryana var. garryana*	Yellow	-
western redcedar	*Thuja plicata*	Yellow	-
Shrubs			
common hawthorn	*Crataegus monogyna var. monogyna*	Exotic	-
oceanspray	*Holodiscus discolor var. discolor*	Yellow	-
English holly	*Ilex aquifolium*	Exotic	-
dull Oregon-grape	*Mahonia nervosa*	Yellow	-
osoberry	*Oemleria cerasiformis*	Yellow	-
Himalayan blackberry	*Rubus armeniacus*	Exotic	-
hobblebush	*Viburnum* sp.	Exotic	-
Herbs and Grasses			
common burdock	*Arctium minus*	Exotic	-
lady fern	*Athyrium felix-femina var. cyclosorum*	Yellow	-
miner's lettuce	*Claytonia perfoliata*	Yellow	-
poison hemlock	*Conium maculatum*	Exotic	-
field bindweed	*Convolvulus arvensis*	Exotic	-
common horsetail	*Equisetum arvense*	Yellow	-
Robert's geranium	*Geranium robertianum*	Exotic	-
English ivy	*Hedera helix*	Exotic	-
reed canarygrass	*Phalaris arundinacea*	Exotic	-
sword fern	*Polystichum munitum*	Yellow	-
creeping buttercup	*Ranunculus repens*	Exotic	-
stinging nettle	*Urtica dioica*	Yellow	-

To accommodate construction of the Project, it is anticipated there may be some minor vegetation losses within the riparian area due to laydown areas, temporary workspaces, excavations to accommodate modifications to Pier P1 of the south-bound bridge (02655), the actual widening of the bridge decks, and to accommodate construction of the rain garden. Vegetation losses may include removal of shrub/herb layer, pruning of select trees, and in some cases, full removal of some select trees. Figure 4 shows locations where tree removal may be required, and the following provides a description of the specific trees potentially requiring removal:

- For the northeast quadrant of the north-bound bridge (01378), it is anticipated that one bigleaf maple directly adjacent to Bent 3 may need to be removed to accommodate construction. The stem of this tree is beneath existing bridge deck (Figure 4; photo 9).

- For the southeast quadrant of the north-bound bridge (01378), it is anticipated that two western redcedars and two bigleaf maples may need to be removed to accommodate construction. The stems of these trees are directly south of / within 2 m of the existing bridge deck. The tops of them are currently around the level of the existing bridge deck. Note that these trees are setback from the Colquitz River, adjacent to Interurban Road, however still within the 30 m riparian area (Figure 4; photo 10).
- For the southeast quadrant of the south-bound bridge (02655), it is anticipated that one shore pine may need to be removed to accommodate construction. The stem of this tree is beneath / directly south of the existing bridge deck. The top of it is currently near the level of the existing bridge deck. Note that this tree is setback from the Colquitz River, adjacent to Interurban Road, however still within the 30 m riparian area (Figure 4; photo 11).
- For the northeast quadrant of the south-bound bridge (02655), it is anticipated that one bigleaf maple may need to be removed to accommodate construction. The stem of this tree is approximately 0.5 m north of the bridge deck. The top of it is currently below the level of the existing bridge deck. Note that this tree is setback from the Colquitz River, adjacent to Interurban Road, however still within the 30 m riparian area (Figure 4; photo 12).
- To accommodate construction of the rain garden, it is anticipated that one bigleaf maple may need to be removed. Note that this tree is east of pedestrian path, however still within the 30 m riparian area (Figure 4; photo 9).

To offset some of the minor vegetation impacts within the riparian area of Colquitz River, and due to the abundance of invasive plants in the area, there is potential for riparian enhancement south of the south-bound bridge on the west bank of the Colquitz River as well as between the two bridge decks (Figure 4; photos 8 and 13 to 15). It is recommended that invasive plant species be removed from some or all of these areas and replanted with native trees, shrubs and herbs; an area of up to 1,336 m^2 in size. A list of potential native trees, shrubs and herbs is provided in Table 5-2 below.

Table 5-2: Native Trees, Shrubs and Herbs Proposed for Planting within the Riparian Enhancement Area of Colquitz River

Common Name	Scientific Name
Trees	
Pacific crab apple	*Malus fusca*
shore pine	*Pinus contorta var. contorta*
bitter cherry	*Prunus emarginata*
Garry oak	*Quercus garryana var. garryana*
Shrubs	
salal	*Gaultheria shallon*
oceanspray	*Holodiscus discolor var. discolor*
dull Oregon-grape	*Mahonia nervosa*
osoberry	*Oemleria cerasiformis*
baldhip rose	*Rosa gymnocarpa*
snowberry	*Symphoricarpos albus*
Herbs	
lady fern	*Athyrium felix-femina var. cyclosorum*
sword fern	*Polystichum munitum*

In addition to documenting vegetation, vegetation impacts and potential enhancement opportunities within the riparian area of Colquitz River, Tetra Tech also documented trees potentially requiring removal within the shoulders and medians of Highway 1 at the approaches to the Colquitz River Bridges. This assessment was split into six areas as shown on Figure 5. Table 5-3 below provides a list of trees species and quantities likely requiring removal within each area, as well as documents invasive plant species, if any, observed in each area. Representative photographs (photos 16 to 21) are attached at the end of the EOA, and photo locations / directions are shown on Figure 5.

Table 5-3: Trees Inventoried within the Medians and Shoulders of Highway 1 During the January 2023 Site Visit

Common Name	Scientific Name	Number of Trees to be Removed	General Comments / Invasive Pants Observed
Area 1			
-	-	-	▪ Several Garry oak and Pacific crab apple trees and shrubs were observed adjacent to the area and may require pruning. ▪ Himalayan blackberry and Scotch broom (*Cytisus scoparius*) were observed in the area.
Area 2			
Pacific crab apple	*Malus fusca*	8	▪ (2) additional black cottonwood and (1) additional Pacific crab apple in the area; however, technically did not meet the definition of a “tree” (<10 cm DBH). ▪ Himalayan blackberry and English ivy in the area.
black cottonwood	*Populus trichocarpa*	13	
Area 3			
-	-	-	▪ Himilayan blackberry and thistle species in the area.
Area 4			
-	-	-	▪ (2) Douglas-fir may require removal, near the east end of the area. ▪ (1) unknown tree may require removal, near the east end of the area, along Galloping Goose Trail. ▪ (12) black cottonwood may require removal, near the middle of the area where it jogs north. It was one large clump of 12 stems. ▪ (13) pacific crab apple may require removal, near the west end of the area. ▪ (5) pacific crab apple, (2) Garry oak and (1) bigleaf maple may need to be pruned. ▪ Scotch broom, English holly and Himalayan blackberry in the area.
Area 5			
maple species.	*Acer* sp.	5	▪ No invasive species observed in this area.
red alder	*Alnus rubra*	6	
hawthorn species	*Crataegus* sp.	6	
Pacific crab apple	*Malus fusca*	6	
ornamental cherry	*Prunus* sp.	6	
Area 6			
-	-	-	▪ Some red alders, maples and birch adjacent to the area which may need pruning. ▪ Scotch broom, English ivy and Himalayan blackberry in the area.

For works within the shoulders and medians of Highway 1, any trees requiring removal as a result of the Project should be replaced on a 3:1 replacement-to-removal ratio. Invasive plant species identified within each area should be managed according to industry standard best management practices for each individual species, as well as the mitigation measured outlined in Table 6-1 below should be followed.

During the site visits conducted, Tetra Tech did not observe any regulated invasive plants at or adjacent to the Project site. However, through review of InvasivesBC database and mobile application, Canada thistle (*Cirsium arvense*), gorse (*Ulex europaeus*), milk thistle (*Silybum marianum*), scentless chamomile (*Matricaria maritima*), and sow-thistle species (*Sonchus* sp.) were previously identified by others within the highway corridor at or immediately adjacent to the Project area (Government of BC 2023).

5.4 Wildlife

The CDF zone has an abundance of wildlife species, whose habitat is influenced by the mild, moist winters and warm dry summers, combined with the lowest snowfall amounts in terms of duration and amount compared to any other region in British Columbia. The diversity of wildlife species in the CDF is also influenced by the island nature of the region, as there will be less wildlife species compared to the mainland. This region generally provides habitat for many mammals as well as forest dependent birds, depending on site conditions (Nuszdorfer et.al 1991). The mature second-growth riparian forest in the Project area provides suitable habitat for a variety of species. The combination of mature forest and riparian areas provide food and cover elements to a wide range of wildlife species, from reptiles and amphibians to large and small mammals. The forested areas surrounding the Project location have potential to support ungulates such as Columbia black-tailed deer (*Odocoileus hemionus columbianus*), as well as large carnivores such as black bear (*Ursus americanus*) and cougar (*Puma concolor*), but they will likely not be present due to the high intensity of human traffic in the area. Mature deciduous and coniferous trees are often utilized by both songbirds and raptors for feeding and nesting. Mature trees also often form cavities that are used by various birds for nesting, as well as by bats for roosting and nursery colonies. The herb dominated understory, in conjunction with woody debris and abundant leaf litter, provides cover and foraging opportunities for small mammals such as rodents.

Riparian areas provide food, water and shelter for an abundance of wildlife and are typically considered sensitive ecosystems. Moist forests close to water are prime habitat for a variety of amphibian and reptile species. They also provide corridors for wildlife, which is especially important in developed or disturbed areas.

During the site visit by Tetra Tech field staff on May 31, 2022, two wildlife species were identified on-site. One great blue heron *(Ardea herodias fannini)* was observed in flight above the area surrounding the Project, and one American mink *(Neogale vison)* was observed in the vegetated riparian slopes underneath the north-bound bridge.

5.5 Fish and Aquatic Habitat

The Colquitz River (watershed code: 920-079700) is a third order stream within the Colquitz River watershed, which drains an area of 46 km^2 (BC MOE 2023b). This watercourse originates from Elk Lake and the northern highlands in the District of Saanich and then flows southwest for 9.5 km passing through areas of forest, agriculture, and increasingly urban regions before draining into Portage Inlet (Buchanan et.al 2009). Flow in the Colquitz River is the highest in the early summer months as well as October through January. The lowest flows / discharges occur February through early April, and August through September (Government of Canada 2023).

According to iMapBC and Habitat Wizard, twelve species of fish are known to occur in the Colquitz River (Table 5-4). Mapped fish occurrences were identified upstream and downstream of the Project area (Figure 2). Juvenile salmonid fry were observed below the north-bound bridge during the May 2022 site visit (Figure 3; photo 6).

Table 5-4. Fish Species Known to Occur Within the Colquitz River

Common Name	Scientific Name	BC-List	COSEWIC	SARA
Brown Catfish	*Ameiurus nebulosus*	Exotic	-	-
Chum Salmon	*Oncorhynchus keta*	No Status	-	-
Coastrange Sculpin	*Cottus aleuticus*	Yellow	-	-
Coho Salmon	*Oncorhynchus kisutch*	No Status	-	-
Coastal Cutthroat Trout	*Oncorhynchus clarkii*	Blue	-	-
Coastal Cutthroat Trout (anadromous)	*Oncorhynchus clarkia clarkii*	Blue	-	-
Largemouth Bass	*Micropterus salmoides*	Exotic	-	-
Prickly Sculpin	*Cottus asper*	Yellow	-	-
Pumpkinseed	*Lepomis gibbosus*	Exotic	-	-
Rainbow Trout	*Oncorhynchus mykiss*	Yellow	-	-
Smallmouth Bass	*Micropterus dolomieu*	Exotic	-	-
Threespine Stickleback	*Gasterosteus aculeatus*	Yellow	-	-

The section of the Colquitz River under the south-bound bridge within the Project Area was characterized by a relatively narrow channel with a sinuous meander pattern, a low gradient (3%) and a glide morphology. There were no islands in the assessed channel sections, and the channel appeared to be stable. The wetted width was 5.5 m, the water depth at the thalweg was 30 cm, the bankfull width was 7 m, and the bankfull depth was 105 cm. Substrates appeared to be dominated by sand (40%), cobbles (25%) and gravels (25%) and to a lesser extent boulders (5%) and fines (5%).

The section of the Colquitz River under the north-bound bridge within the Project Area was characterized by a relatively narrow channel with a sinuous meander pattern, a low gradient (3%) and a riffle-pool morphology. There were no islands in the assessed channel sections, and the channel appeared to be stable. The wetted width was 8.5 m, the water depth at the thalweg was 27 cm, the bankfull width was 10.3 m, and the bankfull depth was 62 cm. Substrates appeared to be dominated by cobbles (40%), gravels (30%) and sand (20%) and to a lesser extent boulders (10%).

The section between the north and south bridges was also assessed; and shared general characteristics with both the upstream and downstream sections. The wetted width was 6.5 m, the water depth at the thalweg was 23 cm, the bankfull width was 10 m, and the bankfull depth was 1 m. Substrates appeared to be dominated by cobbles (40%), gravels (30%) and sand (20%) and to a lesser extent fines (10%), trace boulders.

Riparian vegetation surrounding the assessed sections of the Colquitz River within the Project area consisted of mature mixed-wood forest with a patchy understory shrub layer. Crown closure above the watercourse varied between 10-25%, overstream vegetation was relatively low (10%). Instream vegetation consisting of filamentous green algae which was identified in the section under the north bridge, but in low quantities (5%). Instream cover was moderate and was provided by shallow pools, undercut banks and minor amounts of small woody debris in the channel. No culverts were identified within the assessed reaches of the watercourse.

Overall, habitat quality in the assessed section of the Colquitz River was considered to be important to critical for salmonids. This assessment was based on the habitat criteria outlined within the *Fish-stream Crossing Guidebook* (BC MFLNRO et al. 2012) whereby if high value spawning or rearing habitat is present, the habitat is considered critical. Spawning and rearing habitat features were noted, and rearing salmonids were observed below the north-bound bridge. Due to the presence of Cutthroat Trout in this watercourse, the Reduced Risk Instream Work Window is August 1 through September 15. A search using the Fisheries and Oceans Canada Aquatic Species at Risk Map did not show any critical habitat within 1km of the Project area (DFO 2022).

During the January 2023 site visit, Tetra Tech reviewed P1 Pier of the south-bound bridge and its proximal distance from the Colquitz River. Upon review, it was determined that the existing P1 Pier is approximately 14 m from the top of bank of the Colquitz River. It is Tetra Tech's understanding that the methods for completing works at this pier have not yet been finalized, however will likely involve some excavation and may involve impact hammer pile driving. Given the above, mitigation outlined in Table 6-1 below should be followed.

In addition, during the January 2023 site visit, Tetra Tech reviewed B1 Bent of the north-bound bridge and any potential drainage features in its vicinity. Upon review, it was determined that a catch basin is located downslope of this bent on Burnside Road, and likely drains directly into the Colquitz River. Given the above, mitigation outlined in Table 6-1 below should be followed.

Finally, during the January 2023 site visit, Tetra Tech also reviewed the bridge deck drainage systems on both the north and south-bound bridges. Upon review of the north-bound bridge, it appears as though drains on the bridge deck drain-out directly beneath the drain and are not conveyed through downspouts. For the south-bound bridge, it appears as though the drains on the bridge deck drain-out through downspouts and are released at two primary locations i.) at the east abutment and ii.) at P1 Pier, where water then appears to be conveyed west through a pipe and released directly into the Colquitz River. For both bridges, untreated bridge deck stormwater runoff is being released directly into the Colquitz River. To mitigate potentially contaminated water from being released into the Colquitz River, the following will be implemented at the Project site:

- For the north-bound bridge, install downspouts on the bridge deck superstructure at each drain and convey water to B2 Bent. From there, water would be conveyed down B2 Bent through downspouts and then through a buried drainpipe where it would pass through an oil/grit separator before being released into a rain garden on the east side of the pedestrian path. See Figure 4 for more details.
- For the south-bound bridge, water currently being conveyed through a downspout at P1 Pier would be redirected through a new buried drainpipe east towards Burnside Road, north underneath Burnside Road, and then west where it would pass through an oil/grit separator before being released into the same rain garden noted above, on the east side of the pedestrian path. See Figure 4 for more details.

Under typical rain events, water would infiltrate to the ground and be fully contained within the rain garden. However, under extreme rain events, once the rain garden reaches capacity, excess water would flow into an overflow drain with beehive grate and out through a buried drainpipe under the pedestrian path and into the Colquitz River. Outfall construction will involve trenching to install a 300 mm PVC drainpipe from the rain garden to the bank of the Colquitz River. The outfall will feature a riprap splash pad large enough to reduce the energy of the water leaving the drainpipe. Outfall features will be installed above the wetted perimeter of the river. The rain garden will be planted with native vegetation that is suitable for site conditions and typical for rain garden design. See Figure 4 for more details.

5.6 Species at Risk

Species provincially ranked as Red, Yellow, or Blue are considered to be a conservation priority, however there is no legislation providing formal protection, with the exception of those wildlife species specifically listed under the BC's *Wildlife Act* or listed under Schedule 1 of the federal *Species at Risk Act* (SARA). SARA protects listed mammals, reptiles, amphibians, molluscs, lepidopterans, and plants on federally managed areas, migratory songbirds (as listed under the *Migratory Birds Convention Act* [MBCA]) and fish in all areas in Canada. Species that are legally protected under SARA are those listed as Endangered or Threatened and are listed in Schedule 1 of the *Act*. Those species listed as Special Concern and all species listed in Schedule 3, regardless of their status, are not legally protected by SARA.

A review of the BC Species and Ecosystem Explorer identified a total of 128 plant or wildlife species of management concern (SOMC) that could occur within Anthropogenic, Forest, Riparian, or Stream/River habitats within the CDFmm zone (Appendix C). While a variety of species have the potential to occur within the region, the Project area itself does not necessarily support all the SOMC identified during the desktop search. The habitat requirements and known occurrences of each species was examined to determine the potential for presence at or in proximity to the Project site. Based on this assessment, 20 SOMC were identified with low, moderate or high potential to occur at the Project site (Table 5-5). Species with nil potential of being found at the Project site are not presented in Table 5-5, but can be found in Appendix C.

Table 5-5: Species of Management Concern with Moderate to High Potential to Occur on Site

Scientific Name	Common Name	Provincial Status	COSEWIC Status	SARA Status	Potential for Presence at Project
Amphibians & Reptiles					
Anaxyrus boreas	Western Toad	Yellow	Special Concern	1-SC (2018)	**Moderate** Found in riparian and upland areas around ponds, lakes, roadside ditches and slow-moving streams. Migrate between aquatic breeding sites and upland summer ranges. Potential habitat availability in nearby ditches, ponds or smaller tributaries to the Colquitz River.
Aneides vagrans	Wandering Salamander	Blue	Special Concern	1-SC (2018)	**Low - Moderate** Found in moist coniferous and mixed-wood forests, underneath tree bark, logs and rock crevices. Known occurrences within 10km of the Project. Suitable habitat in coniferous forests near the project area.
Chrysemys picta pop. 1	Northern Painted Turtle - Pacific Coast Population	Red	Threatened	1-T (2021)	**Low** Found in ponds, rivers, and lakes and anthropogenic water bodies. Prefer areas with fallen trees and other debris for basking. Known occurrences within 2km of the Project.
Rana aurora	Northern Red-legged Frog	Blue	Special Concern	1-SC (2005)	**Moderate** Found in the vicinity of stream banks, lakes, ponds and quiet water bodies, usually in damps woods or meadows near water. Migrate between aquatic breeding sites and upland summer ranges. Known occurrences within 5km of the Project.
Birds					
Ardea herodias fannini	Great Blue Heron, *fannini* subspecies	Blue	Special Concern	1-SC (2010)	**Moderate - High** Found in mixed-wood and coniferous forests and riparian areas near water, such as wetlands, lakes, marine and intertidal areas. Known occurrence within 1km of the

Scientific Name	Common Name	Provincial Status	COSEWIC Status	SARA Status	Potential for Presence at Project
					Project. A Great Blue heron was observed in flight near the bridge.
Butorides virescens	Green Heron	Blue	-	-	**Moderate - High** Found in riparian areas on the margins of ponds, streams and lakes, in both freshwater and brackish situations. Nests in trees and shrubs over water. Known occurrence within 1km of the project area.
Chordeiles minor	Common Nighthawk	Yellow	Special Concern	1-T (2010)	**Moderate** Found in open and semi-open areas in mountains or plains, including open mixed-wood forests. Nests on bare sites including gravel bars.
Hirundo rustica	Barn Swallow	Yellow	Special Concern	1-T (2017)	**Moderate** Found in open habitats frequently near water. Will nest in buildings, under bridges, or in caves or cliffs. Suitable habitat present near to the Project.
Nycticorax nycticorax	Black-crowned Night-heron	Red	-	-	**Low** Found in riparian areas on the margins of ponds, streams and lakes, in both freshwater and brackish situations. Roosts during the day in swampy woodlands. Nests in platforms made in trees and shrubs over near coastal marshes or marine islands.
Progne subis	Purple Martin	Blue	-	-	**Low** Found in open or partially open areas near towns. No suitable habitat is within the Project area, but there are known occurrences within 2km of the Project.
Mammals					
Mustela richardsonii anguinae	Ermine, *anguinae* subspecies	Blue	-	-	**Low - Moderate** Species is endemic to Vancouver Island. Found in Riparian areas, usually in proximity to river lakes and streams. No known occurrences are near the Project, but suitable habitat is present.
Myotis lucifugus	Little Brown Myotis	Blue	E	1-E (2014)	**Moderate** Widespread across all of BC. Habitats vary from arid grassland to coastal forests. Forage over water or in woodlands near water. Hibernate in caves and hollow trees. Suitable habitat present near to the Project.
Sorex navigator brooksi	Western Water Shrew, *brooksi* subspecies	Blue	-	-	**Moderate** Species is endemic to Vancouver Island. Found in Riparian areas,

Scientific Name	Common Name	Provincial Status	COSEWIC Status	SARA Status	Potential for Presence at Project
					usually in proximity to river lakes and streams. Known occurrences within 15km of the Project, suitable habitat is present.
Invertebrates					
Hemphillia glandulosa	Warty Jumping-slug	Red	Special Concern	1-SC (2005)	**Low - Moderate** Found in moist old and second growth forests as well as wooded riparian areas. Typically occur at low – mid elevations. Known occurrences on Vancouver Island but not near the Project. Suitable habitat is present in the Project area.
Nearctula sp. 1	Threaded Vertigo	Blue	Special Concern	1-SC (2012)	**Low – Moderate** Found in rich sites within mixed / deciduous forests with heavy leaf litter. Known occurrences within 3km of the Project.
Promenetus umbilicatellus	Umbilicate Sprite	Blue	-	-	**Moderate** Found in ponds, marshes and flooded margins of ephemeral streams. Typically, in areas with dense vegetation and mud bottoms. Known to exist in small rivers in the southern region of Vancouver Island
Plants					
Fraxinus latifolia	Oregon ash	Red	-	-	**Moderate** Found near rivers, streams, lakes, ponds, riparian areas and estuaries. Known occurrence within 5km of the Project. Suitable habitat in riparian area within the Project area.
Lomatium dissectum	fern-leaved desert-parsley	Red	-	-	**Low - Moderate** Found primarily in Garry Oak ecosystems, in open forested areas. Known occurrence within 1km of the Project. Suitable habitat may be near the Project area.
Syntrichia laevipila	twisted oak moss	Blue	Special Concern	1-SC (2005)	**Moderate** Found primarily in Garry oak ecosystems, on the bark of Gary oak and bigleaf maple trees. Known occurrences within 2km of the Project. Suitable habitat is present in the Project area on Garry oak or bigleaf maple trees.
Woodwardia fimbriata	giant chain fern	Blue	-	-	**Low - Moderate** Found near rivers, streams, in riparian areas and on rock / sparely vegetated rock. Known occurrence within 10 km of the Project. Suitable habitat present in the riparian area within Project area.

The BC CDC Internet Mapping tool identified two known occurrences of a listed ecosystem (i.e., Garry oak / California brome (*Quercus garryana / Bromus carinatus*) ecosystem) within 1 km of the Project area (Figure 2). One of these occurrences extends to immediately south of the south-bound bridge to where Garry oak trees were observed during the site visits.

There is proposed SARA Critical Habitat designation for Northern Painted Turtle – Pacific Coast Population along the riparian area of the Colquitz River (Figure 2). As the Critical Habitat is currently designated as 'proposed', there is no legal protection for this area. Suitable habitat for this species exists downstream of the Project area closer to the Gorge near the Admirals Bridge, however the potential for presence of Northern Painted Turtle – Pacific Coast Population at the Project site is considered to be low.

In addition, the outer limit of one masked-sensitive species occurrence is located approximately 500 m west of the Project area (Object ID: 50317) (Figure 2). At this distance from the Project footprint, it is not anticipated to be affected by the Project.

6.0 POTENTIAL ENVIRONMENTAL IMPACTS

6.1 Valued Environmental Components

Following the review of existing environmental information, potential Valued Components (VCs) that could be affected were identified for this Project. Valued components are "environmental features that may be affected by a project and that have been identified to be of concern by the proponent, government agencies, Indigenous peoples or the public. The value of a component not only relates to its role in the ecosystem, but also to the value people place on it" (CEAA 2012). The *Canadian Environmental Assessment Act*, which was repealed on August 28, 2019 and replaced with the *Impact Assessment Act (IAA),* further defines VCs as a "Fundamental element of the physical, biological or socio-economic environment, including the air, water, soil, terrain, vegetation, wildlife, fish, birds and land use that may be affected by a designated project, and may be assessed in an environmental assessment" (CEAA 2012).

The VCs selected for this EOA were based largely on Tetra Tech's past experience with similar assessments. These VCs demonstrate ecological importance and/or value to the existing environment, the relative sensitivity of components to potential Project influences and their relative social, cultural, or economic importance.

Valued components for which there is potential for Project effects include:

- Air Quality and Noise
- Soil
- Surface Water Quality
- Terrestrial Flora and Fauna
- Fish and Fish Habitat.

Potential environmental impacts of the Project and general mitigation measures to minimize those effects are presented below in Table 6-1.

Table 6-1: Potential Effects Assessment and Associated Mitigation Measures Recommended for the Project

Potential Effect	Interaction	Mitigation	Residual Effect	Comment
The Project will conform to MOTI's Standard Specifications for Highway Construction, *Section 165, Specifications for Protection of the Environment,* unless otherwise stated in the Special Provisions of the Tender Package. The selected contractor will be required to prepare a Construction Environmental Management Plan (CEMP) to protect VCs with best management practices (BMPs) and mitigation measures specific to their activities. While general mitigation recommendations are made below, the CEMP must provide specific measures to minimize potential Project related effects. The CEMP must also be compliant with the MOTI Standard Specifications, contract Special Provisions, these mitigation measures outlined in this table and any conditions that may result from regulatory notifications.				
Air Quality and Noise				
Decreased ambient air quality.	Mobilizing equipment and people to and from site and use of equipment (generators, vehicles, etc.) during Project will contribute to air emissions.	▪ Mobilization should be planned and managed to maximize efficiency. ▪ Utilize well-maintained equipment operated at optimum loads. ▪ No burning of oils, rubber, tires and any other material should take place. ▪ Stationary emission sources (e.g., portable diesel generators, compressors, etc.), equipment and vehicles should be turned off when not in use. ▪ Vehicles or equipment producing excessive exhaust pollution should be repaired or replaced prior to being used on the Project.	Equipment will produce air emissions that contribute to decreased air quality.	▪ Air emissions produced by equipment used for the Project are expected to be within the limits of typical construction activities. ▪ Increases in air emissions anticipated to be temporary.
	Construction activities may result in decreased air quality due to dust/particulates created by soil disturbances, rip rap removal etc.	▪ Dust-generating activities should be minimized as much as possible during windy periods. ▪ If dust suppression is necessary, water should be used in a controlled manner (to avoid sediment mobilization).	Construction activities cause temporary increases in airborne particulate matter.	▪ Increases in particulate matter are anticipated to be temporary and localized.
Increase ambient noise levels.	Mobilization to and from site, increased human presence, use of equipment and construction activities contribute to increased noise.	▪ All equipment should be properly maintained to limit noise emissions and fitted with functioning exhaust and muffler systems. Machinery covers and equipment panels should be well fitted and remain in place to muffle noise. Bolts and fasteners should be tight to avoid rattling. ▪ Equipment should be operated at optimum loads. ▪ Engines and equipment should be turned off when not in use or reduced to idle. ▪ Personnel operating equipment or working in the vicinity of equipment will wear appropriate Personal Protective Equipment. ▪ As per the District of Saanich's *Central Saanich Noise Suppression Bylaw No. 1, 1989*, construction activities should be limited to 7:00 A.M. to 9:00 P.M. and noise thresholds should be limited to 60 decibels as much as possible.	Noise levels will be temporarily elevated during Project.	▪ Increased noise levels are expected to be temporary and within acceptable limits of typical equipment usage and construction activities. ▪ Noise levels are not expected to exceed *BC Occupational Health and Safety Regulations* for noise exposure levels. ▪ Because of the urban location of the Project area, noise exposure has potential to affect the general populations, as well as Project personnel.
Soils and Landforms				
Disturbance to ground surface (i.e., compaction and/or erosion).	Project activities include ground disturbance (i.e., vegetation clearing, excavations, and machinery access) Ground surface may be compacted by equipment, material laydown or other Project works. Exposed and loose soils disturbed by Project activities may be subject to erosion.	▪ Existing access routes (i.e., trails & roads) should be utilized where possible. ▪ If new access is required, a site that has been previously disturbed or is stable (hard surface) should be selected. ▪ Minimize the movement of equipment by planning work and situating in locations to maximize efficiency. ▪ Limit access and movement to only necessary personnel and equipment. ▪ Equipment and material laydown should be placed on a stable surface. ▪ The CEMP should identify erosion and sediment control measures specific to each Project component. General erosion and sediment control may include: – Halting works during periods of heavy precipitation; – Use of silt fencing; – Temporarily stabilizing ground surface with plastic sheeting, straw mulch, erosion control matting etc. ▪ Restore ground disturbances to pre-existing conditions at Project completion (e.g., recontour significant disturbances). ▪ Permanently stabilize disturbed sites with an appropriate seed mixture or restoration planting as soon as possible. ▪ Conduct works in dry weather and halting works during periods of inclement weather.	Temporary disturbances (excavation, compaction and/or erosion) to ground surface.	▪ Project occurs primarily within existing road right's-of-way / pedestrian path where soils have previously been disturbed. ▪ Potential disturbances are localized and are reversible with restoration.

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Potential Effect	Interaction	Mitigation	Residual Effect	Comment
Soil contamination.	Accidental spill or release of deleterious substances: ▪ Equipment with engines and/or hydraulics have a potential for leaks and spills (May include: diesel/gas, hydraulic fluids, lubricating oil, glycols.)	▪ The contractor must have a Spill Response plan in place as a component of their overall CEMP. ▪ All equipment should be in good operating condition, power washed, and free of leaks, excess oil, and grease prior to arriving at the Project area. ▪ Appropriately stocked spill kits should be available in the staging area and on all equipment. Trained personnel should be available to deploy spill kits. ▪ The refueling area (if one is required) should have a spill containment kit immediately accessible and personnel should be knowledgeable in its use. ▪ Two people should be present during refueling (one person conducting fueling/ready to stop spill source and one person ready to deploy spill containment). ▪ Equipment utilized should be placed within secondary containment capable of holding the full volume of fluids within the equipment in the event of a spill (e.g., place within a plastic or metal tray). Motorized equipment should be parked over a surface capable of containing leaks and minor spill (e.g., plywood, heavy plastic sheeting). ▪ Hydrocarbon and coolant storage, if required on site, should be within an impermeable containment facility capable of holding 125% of the storage tank contents. ▪ Small containers (i.e., jerry cans) should be stored in a secure location, protected from weather. These containers must be designed solely for the purpose of storing and pouring fuel and should not be more than 5 years old. Containers should not leak and should be sealed with a proper fitting cap or lid. ▪ If feasible, hydraulic fluids for on-site equipment should be biodegradable (i.e., vegetable based) in case of accidental loss of fluids. ▪ Hazardous materials should be labelled and disposed of according to the Workplace Hazardous Materials Information System criteria and the Transportation of Dangerous Goods (TDG) Regulations. ▪ Any spill of a substance that is toxic, polluting, or deleterious to life of reportable quantities will be immediately reported to Emergency Management BC (EMBC) 24-hour phone line at ***1-800-663-3456***	Soils exposed to deleterious substances.	▪ Although an accidental spill or release would have a high impact, it is considered to be unlikely to occur and would be an isolated event. ▪ This potential effect would be localized and is considered reversible with remediation effort (e.g., soil removal).
Surface Water Quality				
Changes to water quality because of accidental spill or release of deleterious substances (e.g., hydrocarbons, uncured concrete).	Equipment with engines and/or hydraulics have a potential for leaks and spills (May include: diesel/gas, hydraulic fluids, lubricating oil, glycols). Although no concrete work is required within the watercourse, uncured concrete or concrete wash water (specifically from works proposed at P1 Pier) could come in contact with the Colquitz River water resulting in increased pH.	▪ Measures to minimize the potential for an accidental spill of a harmful substance should be implemented (see “Soil Contamination” effect in *Soils and Landforms*, above). ▪ Equipment refueling and servicing should be undertaken greater than 30 m away from the Colquitz River or a catch basin. If a 30 m distance is not possible, a location as far as possible from the watercourse should be chosen and appropriate secondary containment established. Topographic features and slope should be considered. ▪ Use pre-cast concrete as much as possible. If cast-in-place is required, limit the amount as much as practicable. Concrete pouring should not occur within or immediately adjacent to open water (i.e., should be within an isolated area). Water quality monitoring (for pH) may be required downstream of the work area, based on conditions and approach. ▪ Stormwater coming in contact with concrete demolition debris from B1 Bent of north-bound bridge should be contained and not permitted to enter any nearby drainage feature, such as nearby catch basins. ▪ Any spill of a substance that is toxic, polluting, or deleterious to aquatic life of any volume will be immediately reported to Emergency Management BC (EMBC) 24-hour phone line at ***1-800-663-3456.*** ▪ Depending on environmental factors (e.g., precipitation and water infiltration to soil), water may accumulate quickly in the excavation at P1 Pier and require various degrees of intervention. If/when water accumulates in the excavation and needs to be removed, it should be pumped to an on-site water treatment system for treatment of pH (if it has come in contact with uncured concrete) and only released from site once it has been proven to meet BC MOE *Approved Water Quality Guidelines* for pH. Water with elevated pH should not be pumped or otherwise discharged directly into a catch basin or the Colquitz River.	Decreased water quality (i.e., contaminated water).	▪ Although an accidental spill or release would have a high impact and could spread beyond the immediate Project area, it is considered to be unlikely to occur and would be an isolated event. ▪ This potential effect would be contained with appropriately and timely implementation of the contractor’s Spill Response Plan and is considered partly reversible with remediation effort (e.g., sediment removal). ▪ Ultimately, following completion of the Project, with the installation of an oil/grit separator and a rain garden, the quality of water entering the Colquitz River that will be generated via runoff from the bridge during storm events will be improved relative to pre-construction conditions.
Changes to water quality because of introduction of materials during bridge	Construction activities require work over water. Objects may fall from work area on bridge into watercourse.	▪ Construction and demolition materials should be contained and not allowed to fall to the water surface. Potential means include: Suspend impervious tarps horizontally beneath the	Construction materials fall into watercourse below work area.	▪ Most construction materials are inert. ▪ It is not expected that substantial amounts of material would fall into the watercourse. It is

Table 6-1: Potential Effects Assessment and Associated Mitigation Measures Recommended for the Project

Potential Effect	Interaction	Mitigation	Residual Effect	Comment
superstructure works (i.e., materials falling into water from overhead).		bridge deck, suspend nets lined with impermeable tarps horizontally beneath the bridge deck.		likely this event would be limited to small quantities and to occasional occurrences.
Decreases to water quality because of increased turbidity.	Although no instream work is required within the watercourse, Project activities (specifically works proposed at P1 Pier and construction of a stormwater outfall) will disturb soils and sediments may mobilize towards the Colquitz River.	▪ The contractor must have a Project-specific Erosion and Sediment Control (ESC) Plan in place as a component of their overall CEMP. Recommended measures should be installed prior to starting Project work, specifically for works proposed at P1 Pier and installation of the stormwater outfalls. ▪ Conduct works in dry weather and halt works during periods of inclement weather. ▪ Operate equipment from a stable surface above the high-water mark and situate machinery to minimize track movement. ▪ For works occurring at P1 Pier and for the stormwater outfall installation, monitor turbidity levels in the Colquitz River to ensure compliance with BC MOE *Approved Water Quality Guidelines* for turbidity and total suspended solids. If turbidity levels in excess of the guideline occurs, all works must be halted, and the source of the input addressed prior to re-initiation of the works. ▪ Depending on environmental factors (e.g., precipitation and water infiltration to soil), water may accumulate quickly in the excavation at P1 Pier and require various degrees of intervention. If/when water accumulates in the excavation and needs to be removed, it should be pumped to an on-site water treatment system for treatment of turbidity and only released from site once it has been proven to meet BC MOE *Approved Water Quality Guidelines* for turbidity and total suspended solids. Water with elevated turbidity should not be pumped or otherwise discharged directly into a catch basin or the Colquitz River.	Temporary increase of total suspended solids (increased turbidity) in surface water.	▪ There is no instream works associated with the Project; however, works in proximity to the Colquitz River has the potential for sediment-laden water to be released into the watercourse (i.e., works related to outfall construction, works at P1 Pier of south-bound bridge and works at B1 Bent of north-bound bridge). ▪ Any turbidity increases are anticipated to be temporary and dissipate relatively quickly, so long as ESC measures are adequately maintained by the contractor. ▪ Ultimately, following completion of the Project, with the installation of an oil/grit separator and a rain garden, the quality of water entering the Colquitz River that will be generated via runoff from the bridge during storm events will be improved relative to pre-construction conditions.
Terrestrial Flora and Fauna				
Introduction or spread of non-native or invasive plant species.	Non-native or invasive plant seeds/fragments may be transported to Project area, spread within the site, or spread off-site from the Project area, on vehicles and equipment.	▪ All vehicles and equipment arriving to the Project should be inspected and cleaned so that plant materials are not being transported on to site. ▪ All vehicles and equipment leaving the Project site should be inspected so that plant materials are not being transported off the site. ▪ Invasive plants within the project footprint should be removed, disposed of appropriately, and replaced with up to 1,336 m^2 of native vegetation.	Introduction or spread of non-native or invasive plants.	▪ Introduction of new non-native or invasive plants by Project activities considered unlikely. ▪ Road right's-of-ways commonly contain invasive species. ▪ Restoration of areas where invasive plants are to be removed with native species is a component of the Project.
Disturbance or destruction of vegetation.	Project activities (e.g., equipment movement and gaining access to the work area, material laydown, construction works) may damage or destroy vegetation. Select trees will be removed from within the highway median to allow for traffic diversion during construction and from within the riparian zone of Colquitz River to accommodate the bridge widening.	▪ Avoid vegetation removal where possible. If possible, work around large trees instead of removing them. ▪ Where vegetation removal is necessary, clearly delineate work areas to minimize accidental disturbances. ▪ Use existing access routes (trails and roads) to move equipment and existing cleared areas to store materials. Avoid situating equipment or materials on vegetated surfaces. ▪ Disturbed areas should be revegetated with native trees, shrubs, herbs and grass species after Project works are complete. ▪ Implement restoration with native species following Project completion.	Individual specimens of vegetation may be disturbed or destroyed.	▪ Vegetation disturbances are anticipated to be limited to the medians and shoulders of Highway 1 as well as access routes around the bridges. ▪ Much of the Project occurs in previously disturbed areas, which contain mostly grass and herb vegetation. Access routes should be limited to previously cleared areas as much as possible. ▪ Sensitive plant species not anticipated to be present in Project area. ▪ Vegetation present in the road right's-of-way is subject to high levels of disturbance through routine vegetation management. ▪ Disturbances are expected to be temporary and reversible. ▪ Trees removed on the highway median will be replaced at a 1:1 ratio. ▪ Restoration within the riparian zone of Colquitz River will involve up to 1,336 m^2 of improved riparian function relative to that provided by the prolific invasive species currently present.

Table 6-1: Potential Effects Assessment and Associated Mitigation Measures Recommended for the Project

Potential Effect	Interaction	Mitigation	Residual Effect	Comment
Disturbance to wildlife (avoidance, harm, or mortality).	Mortality of individuals (i.e., vehicle collisions) during mobilization to or from site.	▪ Mobilization should occur in compliance with *BC Transportation Acts and Regulations.* Vehicles and equipment should be operated in a safe manner to minimize potential for wildlife mortality. ▪ Measures to reduce noise from Project activities should be implemented (see *Air Quality and Noise* above). ▪ Food should not be made available to wildlife at any time. ▪ Food, food waste and packaging should be stored appropriately and disposed of daily so as not to attract wildlife. Such wildlife attractants shall not be stored in the Project area overnight. – Off-site disposal of food scraps, food wrappers, pop cans, domestic waste, and other potential wildlife attractants should be conducted regularly. ▪ Report all dangerous human-wildlife interactions to the BC Conservation Officer Service via the Report All Poachers and Polluters (RAPP) hotline at **1-877-952-7277**. This includes the following incidents: – Accessing garbage or other human supplied food sources. – Instances where wildlife cannot be easily scared off. – When a bear, cougar or wolf is seen in an urban area. ▪ Feeding, harassment or destruction of any wildlife is strictly prohibited. Wildlife encountered at or near Project area should be allowed to passively disperse without undue harassment. ▪ Measures to minimize the potential for an accidental spill of a harmful substance should be implemented (see *Soils and Landforms*, above).	Mortality of individuals.	▪ Although mortality of wildlife would have a high impact, it is considered to be unlikely to occur (provided recommended mitigation measures are followed) and would be an isolated event.
	Avoidance behaviors from local wildlife, including SOMC, may occur as a result of increased noise and human presence from Project activities resulting in disruption or impediment to wildlife movement.		Wildlife exhibit avoidance behavior during Project.	▪ Project occurs in an area subject to frequent noise and human presence (i.e., traffic). Project activities are anticipated to be within acceptable limits of typical usage. ▪ Noise disturbances are limited spatially and temporally (i.e., occur in immediate area of the Project and infrequently for a short time). ▪ Human presence will be limited in number and time. ▪ Wildlife present are likely accustomed to human presence and will not be affected by the Project. Other species will likely return to area once Project activities are completed.
	Garbage and waste generated by the Project activities may attract local wildlife and lead to human-wildlife interactions.		Human-wildlife interactions occur.	▪ The Project is not expected to generate significant amounts of wildlife attractants. ▪ Interactions would be localized and temporary.
Direct or indirect harm to wildlife by accidental spill or release of a deleterious substance.	Local wildlife may be harmed or killed by an accidental spill of a harmful substance in Project area.	▪ See measures recommended in *Soils and Landforms* and *Surface Water Quality* above to minimize potential for an accidental spill.	Wildlife physically harmed by contact with a deleterious substance. Wildlife habitat quality affected by spill.	▪ Although a spill interaction would have a high impact, it is considered to be unlikely to occur and would be an isolated event. Because the spill would be cleaned immediately, it may also be considered a temporary effect.
Disturbance or destruction of habitat.	There is potential for loss or disturbance of bird nests, which are protected under the *Migratory Birds Convention Act* (MBCA) and the BC *Wildlife Act*, if vegetation clearing is required and occurs during the general bird nesting period. Unknown dens, burrows, or nests may be encountered or destroyed when completing Project works.	▪ Vegetation removal should be conducted outside of the General Nesting Period for Migratory Birds. Environment and Climate Change Canada suggests that the least risk window for all nesting birds using wetland, open and forested habitats in the A1 zone, which includes the Project area, is approximately August 17 to March 25. If vegetation removal is required outside of the least risk window (i.e., during the General Nesting Period), the area should be surveyed in advance of clearing by an Appropriately Qualified Professional (AQP) to identify any breeding, nesting, roosting or rearing birds and determine the appropriate BMPs. ▪ Pre-clearing surveys for Pileated Woodpecker nest cavities should be conducted by an AQP before trees are removed. If a Pileated Woodpecker nest cavity is found, the tree must be retained and submitted to ECCC's Abandoned Nest Registry. The nest cavity must be monitored for 36 months to determine if the nest is abandoned. ▪ The Project Manager and/or the Environmental Monitor should be notified if any nests, dens, burrows or wildlife interactions are encountered in the Project area.	Undetected nests, dens or burrows may be destroyed. Potential habitat or use of habitat may be altered.	▪ Vegetation disturbances are anticipated to be limited to the medians and shoulders of Highway 1 as well as access routes around the bridges. ▪ No nests were observed within the Project area during the site visits. *Although no active nests were identified in the active Project area during the site visits, there is potential for birds to nest prior to start of construction.* ▪ Project activities are temporary and are not anticipated to change the long-term habitat quality/potential use of the area.
Fish and Fish Habitat				
Direct harm or disturbance to fish because of underwater noise.	Given the proximity of P1 Pier of the south-bound bridge to the Colquitz River, pile driving activities may produce underwater noise that is harmful to fish.	▪ Pile driving should be timed to occur within the window of least risk for fish in the Project area. The Reduced Risk Instream Work Window for fish within the Colquitz River is August 1 to September 15. ▪ A Qualified Environmental Professional (QEP) should be retained as an Environmental Monitor to assess noise impacts during pile driving and provide adaptive management strategies as needed. This will include implementing a Hydroacoustic Impact Monitoring Plan to ensure peak underwater noise level are within acceptable limits. ▪ The following Hydroacoustic Impact Monitoring Plan should be followed during impact pile driving activities: ▪ The QEP shall be on site during impact pile driving activities that present a risk of death of fish to monitor for evidence of behavioral changes, injury, or death of fish and to complete hydroacoustic monitoring during such activities.	Fish may be exposed to sound at levels causing injury. Potential mortality of individuals.	▪ Sound levels produced are influenced by the method of pile driving, diameter of the pile, as well as properties of the substrates. Impact hammer is the most common method to install piles. ▪ Noise generated by pile driving is anticipated to be temporary. ▪ Since the pile driving activities are not directly within the water column, the effect is expected to be attenuated by the ground between the piling location and the river.

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Potential Effect	Interaction	Mitigation	Residual Effect	Comment
		▪ The QEP will monitor for fish for at least 10 minutes prior to the start of impact pile driving. Monitoring will be conducted from the shore. The area of the Colquitz River near the Project site will be inspected for evidence of a fish kill of any species and of any life stage. ▪ If fish are observed, a soft start procedure for pile driving will be employed whereby the initial driving will be low impact followed by increasing hammer energy to allow fish to disperse from the area. ▪ Sound levels within the Colquitz River adjacent to the pile driving activity are not to exceed 207 decibels. ▪ Hydroacoustic monitoring shall be conducted whenever the activity has the potential to exceed the defined sound levels (mentioned in the bullet above) and will be conducted throughout the duration of any such activities. ▪ Work must be halted if sound levels during monitoring exceed the defined threshold. The work will only resume after additional measures have been implemented to reduce sound levels below the threshold. ▪ If impacts to fish (i.e., fish kill) are observed, the Contractor must halt pile driving and report the occurrence to DFO immediately through the DFO-Pacific Observe, Record and Report phone line (toll free) at 1-800-465-4336. Pile driving will only resume after DFO has reviewed and approved additional mitigation measures and those measures are implemented to avoid and mitigate further impacts to fish.		
Direct or indirect harm to fish by accidental spill or release of a deleterious substance (e.g., hydrocarbons, uncured concrete).	Fish may be harmed or killed by physical contact with deleterious substance and/or because of habitat degradation.	▪ Measures to minimize the potential for an accidental spill of a harmful substance will be implemented (see Soils and Landforms and Surface Water Quality, above).	Fish may be exposed to contamination from spills which may harm/kill fish or cause fish to leave area.	▪ Although a spill interaction would have a high impact, it is considered to be unlikely to occur and would be an isolated event.
Direct or indirect harm to fish by increases in turbidity because of mobilized sediments from soil disturbances.	Increased sediments in water may harm or kill fish directly (e.g., gill abrasion, smothering of incubating eggs) or indirectly (e.g., reduced feeding/foraging).	▪ Erosion and sediment control measures will be implemented (see *Soils and Landforms* and *Surface Water Quality,* above).	Fish may be exposed to increased total suspended solids in water which may harm/kill fish or cause fish to leave area.	▪ There is no instream works associated with the Project; however, works in proximity to the Colquitz River has the potential for sediment-laden water to be released into the watercourse (i.e., works related to outfall construction, works at P1 Pier of south-bound bridge and works at B1 Bent of north-bound bridge). ▪ Any turbidity increases are anticipated to be temporary and dissipate relatively quickly, so long as ESC measures are adequately maintained by the contractor.
Disturbance or destruction of habitat. Removal of riparian vegetation.	Removal of riparian vegetation may alter existing aquatic habitat (i.e., reduce shade cover etc.).	▪ Riparian enhancement opportunities around Colquitz River through invasive species removal and planting of native trees, shrubs and herbs should be implemented (as per Table 5-2 above and Figure 4 attached).	Temporary disturbances to riparian vegetation.	▪ Riparian enhancement opportunities around Colquitz River through invasive species removal and planting of native trees, shrubs and herbs. ▪ Since there is minimal to no vegetation removal required within the riparian area of Colquitz River, and there is no instream works required for the Project, works are not anticipated to result in permanent changes to habitat quality or quantity. No death of fish or HADD is anticipated as a result of the Project.

7.0 CONCLUSION

The potential impacts of the Project were considered within the limits of typical, routine construction activities and are generally localized and temporary. It is anticipated that there will be ***no adverse residual environmental effects*** as a result of the Project activities provided the contractor develops and effectively implements a Project specific Construction Environmental Management Plan and industry standard BMPs and mitigation measures are applied. The Project will require limited mature tree removal; however, the installation of stormwater treatment infrastructure will result in improved quality of stormwater entering the Colquitz River and the removal and replacement of up to 1,336 m^2 of invasive plant species with native low growing tree species, shrubs and herbs will improve overall riparian habitat function relative to existing conditions.

8.0 CLOSURE

We trust this document meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully Submitted,
Tetra Tech Canada Inc.

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FIGURES

LEGEND

- Site Location
- Highway
- Main Road
- Local Road
- Resource/Recreational Road
- Ferry
- Railway
- Power Line
- Building
- Municipal Boundary
- Park
- Residential Area
- Contour (20 m)
- Watercourse
- Waterbody
- Wetland
- Wooded Area

NOTES
Base data source: CanVec 1:50,000.

STATUS
ISSUED FOR USE

ENVIRONMENTAL OVERVIEW ASSESSMENT
COLQUITZ RIVER BRIDGES WIDENING & UPGRADES
HIGHWAY 1, SAANICH, BC

Site Location Plan

PROJECTION	DATUM	CLIENT
UTM Zone 10	NAD83	BRITISH COLUMBIA Ministry of Transportation & Infrastructure

Scale: 1:50,000
1 0.5 0 1
Kilometres

FILE NO.
VENW03225-24_Fig01_SiteLocation.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-VANC	MRB	BB	LH	0

DATE
August 22, 2023

PROJECT NO.
ENW.VENW03225-24

TETRA TECH

Figure 1

G:\ENVIRONMENTAL\VENW\VENW03225-24\Maps\VENW03225-24_Fig01_SiteLocation.mxd modified 8/22/2023 by DARREN.SCHOULS

469500 470000 470500 471000 471500 472000

5368000

5367500

5367000

5366500

Northern Painted Turtle
Pacific Coast Population

McKenzie Ave

Swan Lake Creek

Hwy 17

Garry Oak / California Brome

Colquitz River

CDC Masked Occurrence

Burnside Rd W

Tillicum Rd

Site Location

Hwy 1

Garry Oak / California Brome

Northern Painted Turtle
Pacific Coast Population

Burnside Rd E

Fish Species Observed
Coastrange Sculpin (formerly Aleutian Sculpin)
Coho Salmon
Cutthroat Trout
Largemouth Bass
Pumpkinseed
Sculpin (General)
Stickleback (General)
Unidentifiable Trout - only fry <70mm in length

469500 470000 470500 471000 471500 472000

G:\ENVIRONMENTAL\VENW\VENW03225-24\Maps\VENW03225-24_Fig02_CDCSearches.mxd modified 8/22/2023 by DARREN.SCHOULS

LEGEND

- Site Location
- Fish Occurrence
- 1 km Search Area

SARA Critial Habitat (Status)

- Northern Painted Turtle Pacific Coast Population (Proposed)

CDC Species at Risk Occurrences

- Garry oak / California brome (Red-listed)
- CDC Masked Occurrence

Base Data

- Highway
- Main Road
- Local Road
- Watercourse / Waterbody

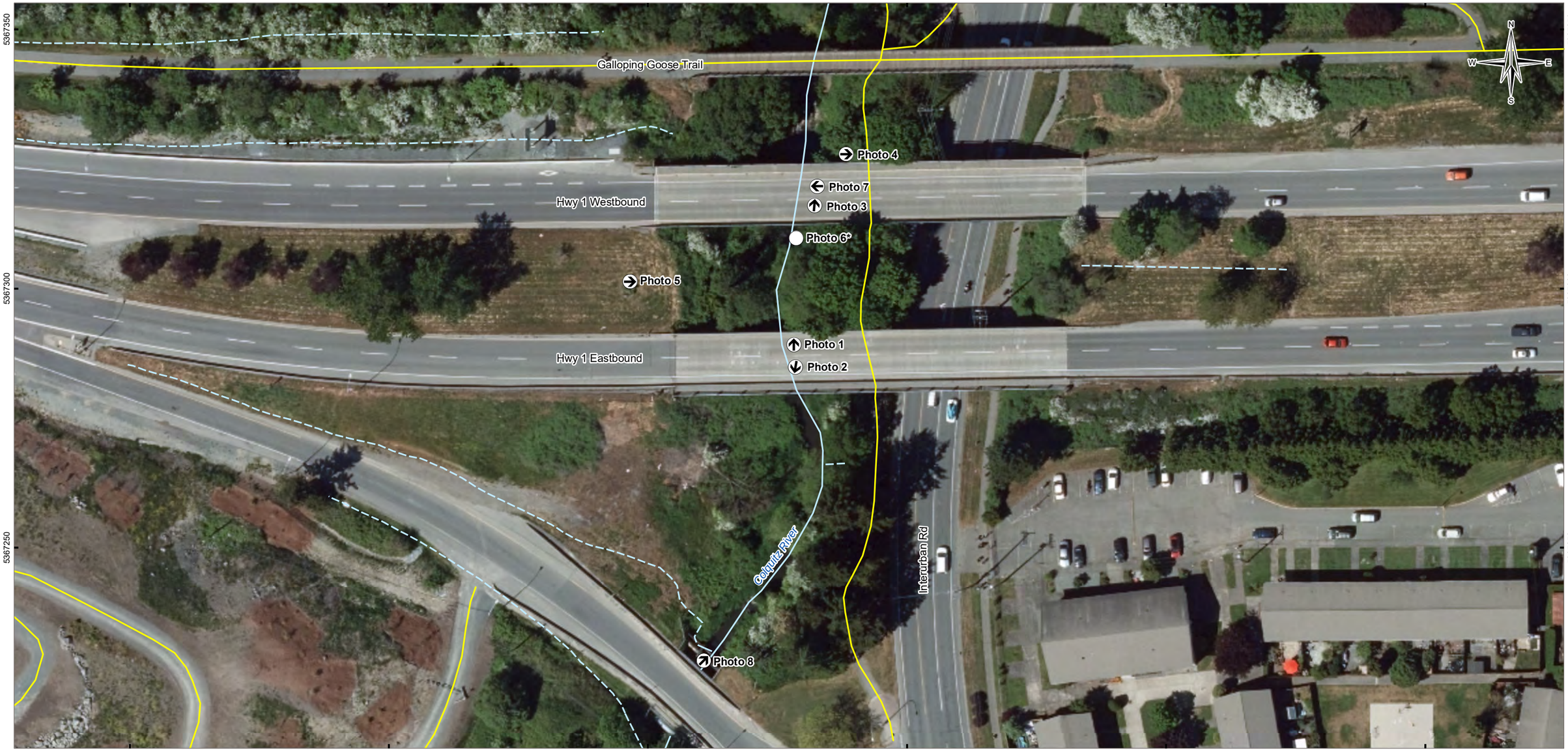
NOTES
Base data source:
CanVec 1:50,000 (2019)
Imagery from Saanich Data Catalogue (2021)
Fish occurrences, SARA habitat & CDC occurrences from DataBC (2022)

STATUS
ISSUED FOR USE

ENVIRONMENTAL OVERVIEW ASSESSMENT
COLQUITZ RIVER BRIDGES WIDENING & UPGRADES
HIGHWAY 1, SAANICH, BC

BC CDC Species at Risk Occurrences & Fish Presence

PROJECTION UTM Zone 10		**DATUM** NAD83		**CLIENT** British Columbia Ministry of Transportation & Infrastructure
Scale: 1:9,000 150 75 0 150 Metres				TETRA TECH
FILE NO. VENW03225-24_Fig02_CDCSearches.mxd				
OFFICE Tt-VANC	**DWN** DS	**CKD** SL	**APVD** SC	**REV** 0
DATE August 22, 2023	**PROJECT NO.** ENW.VENW03225-24			**Figure 2**



LEGEND

- Photo Location
- Ditch
- Watercourse
- Trail

NOTES
Base data source:
Imagery from Saanich Data Catalogue (2021)
Hydrology from Saanich Data Catalogue (2003)
Trails from Saanich Data Catalogue (2008)

* Photo 6 was taken looking straight down

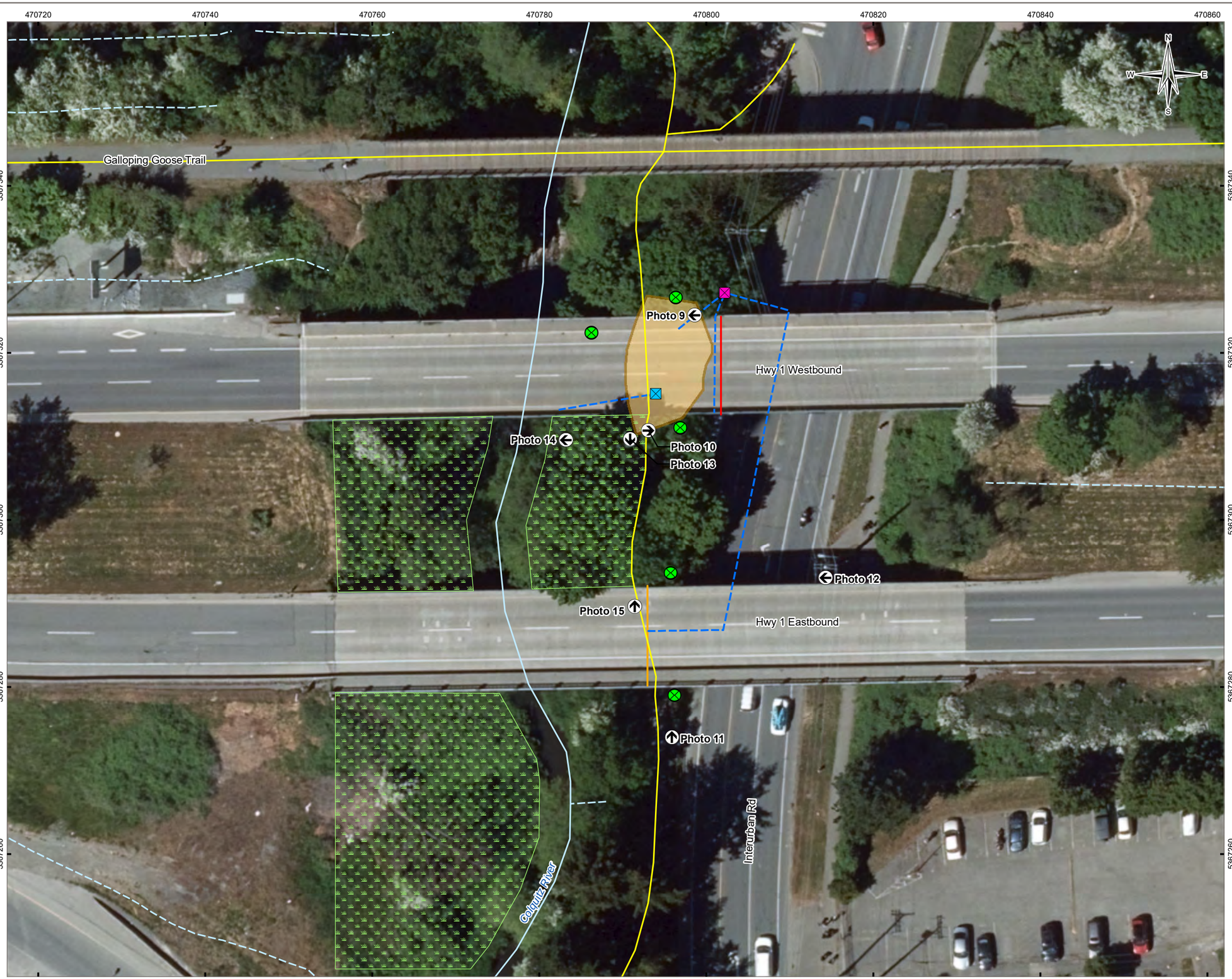
STATUS
ISSUED FOR USE

ENVIRONMENTAL OVERVIEW ASSESSMENT COLQUITZ RIVER BRIDGES WIDENING & UPGRADES HIGHWAY 1, SAANICH, BC

Project Site Location and Conditions

PROJECTION UTM Zone 10			**DATUM** NAD83		**CLIENT** BRITISH COLUMBIA Ministry of Transportation & Infrastructure
Scale: 1:750 15 7.5 0 15 Metres					TETRA TECH
FILE NO. VENW03225-24_Fig03_SitePlan.mxd					
OFFICE Tt-VANC	**DWN** DS/MB	**CKD** SL	**APVD** SC	**REV** 0	**Figure 3**
DATE August 22, 2023	**PROJECT NO.** ENW.VENW03225-24				

G:\ENVIRONMENTAL\VENW\VENW03225-24\Maps\VENW03225-24_Fig03_SitePlan.mxd modified 8/22/2023 by DARREN.SCHOULS



LEGEND

- Overflow Drain with Beehive Grate
- Oil Grit Separator
- Photo Location
- Potential Tree Removal
- Ditch
- Watercourse
- Trail
- Rain Garden
- Potential Riparian Enhancement Area (1336 m^2)

Proposed Drainage Features

- B2 Bent
- Buried Drain Pipe
- P1 Pier

NOTES
Base data source:
Imagery from Saanich Data Catalogue (2021)
Hydrology from Saanich Data Catalogue (2003)
Trails from Saanich Data Catalogue (2008)

STATUS
ISSUED FOR USE

ENVIRONMENTAL OVERVIEW ASSESSMENT COLQUITZ RIVER BRIDGES WIDENING & UPGRADES HIGHWAY 1, SAANICH, BC

Potential Vegetation Impacts and Enhancement Opportunities

PROJECTION UTM Zone 10	**DATUM** NAD83	**CLIENT** British Columbia Ministry of Transportation & Infrastructure
Scale: 1:450 — 8 4 0 8 Metres		TETRA TECH
FILE NO. VENW03225-24_Fig04_VegImpacts.mxd		
OFFICE Tt-VANC	**DWN** MRB / **CKD** BB / **APVD** LH / **REV** 0	**Figure 4**
DATE August 31, 2023	**PROJECT NO.** ENW.VENW03225-24	

G:\ENVIRONMENTAL\VENW\VENW03225-24\Maps\VENW03225-24_Fig04_VegImpacts.mxd modified 8/31/2023 by DARREN.SCHOULS

LEGEND

- Photo Location
- Clearing Limits
- Ditch
- Watercourse
- Trail

NOTES
Base data source:
Imagery from Saanich Data Catalogue (2021)
Hydrology from Saanich Data Catalogue (2003)
Trails from Saanich Data Catalogue (2008)

STATUS
ISSUED FOR USE

ENVIRONMENTAL OVERVIEW ASSESSMENT
COLQUITZ RIVER BRIDGES WIDENING & UPGRADES
HIGHWAY 1, SAANICH, BC

Vegetation Impacts within Medians and Shoulders of Highway 1

PROJECTION UTM Zone 10				**DATUM** NAD83	**CLIENT** BRITISH COLUMBIA Ministry of Transportation & Infrastructure
Scale: 1:1,600 30 15 0 30 Metres					TETRA TECH
FILE NO. VENW03225-24_Fig05_VegImpacts.mxd					
OFFICE Tt-VANC	**DWN** MRB	**CKD** BB	**APVD** LH	**REV** 0	**Figure 5**
DATE August 22, 2023	**PROJECT NO.** ENW.VENW03225-24				

G:\ENVIRONMENTAL\VENW\VENW03225-24\Maps\VENW03225-24_Fig05_VegImpacts.mxd modified 8/22/2023 by DARREN.SCHOULS

PHOTOGRAPHS

Photo 1	View of the Colquitz River looking upstream from below the south-bound bridge (Bridge 02655).
Photo 2	View of the Colquitz River looking downstream from below the south-bound bridge.
Photo 3	View looking upstream from below north-bound bridge (Bridge 01378). Bent #3 to the right in the photo was constructed below the high-water mark of the river.
Photo 4	View of pedestrian path on the east side of the Colquitz River. Burnside Road is above the crest of the slope. Vegetation in photo is a stand of predominantly bigleaf maple beside and between the two bridges.
Photo 5	Stand of trees between the two bridges.
Photo 6	Representative substrates within the Colquitz River below the north-bound bridge. Salmonid fry are present in this photo but they are indiscernible.
Photo 7	West bank of Colquitz River below north-bound bridge depicting some exotic vegetation (English ivy, reed canary grass, Himalayan blackberry). An American Mink (*Neogale vison*) was observed scurrying across this bank.
Photo 8	View upstream toward the south-bound bridge from the Highway 1 offramp onto Burnside Road – potential riparian enhancement area.
Photo 9	View of bigleaf maple directly adjacent to Bent 3 of the north-bound bridge that may need to be removed to accommodate construction, as well as one other bigleaf maple that may need to be removed to accommodate construction of the rain garden.
Photo 10	View of western redcedars and bigleaf maples directly south of the north-bound bridge that may need to be removed to accommodate construction.
Photo 11	View of shore pine beneath / directly south of the south-bound bridge that may need to be removed to accommodate construction.
Photo 12	View of bigleaf maple directly north of the south-bound bridge that may need to be removed to accommodate construction.
Photo 13	View of potential riparian enhancement area on the left bank of the Colquitz River.
Photo 14	View of potential riparian enhancement area on the right bank of the Colquitz River.
Photo 15	View of potential riparian enhancement area on the left bank of the Colquitz River.
Photo 16	View of north-bound shoulder, west of Colquitz River Bridge (Area 1).
Photo 17	View of centre median, west of Colquitz River Bridges (Area 2).
Photo 18	View of south-bound shoulder, west of Colquitz River Bridge (Area 3).
Photo 19	View of north-bound shoulder, east of Colquitz River Bridge (Area 4).
Photo 20	View of centre median, east of Colquitz River Bridges (Area 5).
Photo 21	View of south-bound shoulder, east of Colquitz River Bridge (Area 6).

Photo 1: View of the Colquitz River looking upstream from below the south-bound bridge (Bridge 02655).

Photo 2: View of the Colquitz River looking downstream from below the south-bound bridge.

Photo 3: View looking upstream from below north-bound bridge (Bridge 01378). Bent #3 to the right in the photo was constructed below the high-water mark of the river.

Photo 4: View of pedestrian path on the east side of the Colquitz River. Burnside Road is above the crest of the slope. Vegetation in photo is a stand of predominantly bigleaf maple beside and between the two bridges.

Photo 5: Stand of trees between the two bridges.

Photo 6: Representative substrates within the Colquitz River below the north-bound bridge. Salmonid fry are present in this photo but they are indiscernible.

Photo 7: West bank of Colquitz River below north-bound bridge depicting some exotic vegetation (English ivy, reed canary grass, Himalayan blackberry). An American Mink (*Neogale vison*) was observed scurrying across this bank.

Photo 8: View upstream toward the south-bound bridge from the Highway 1 offramp onto Burnside Road - potential riparian enhancement area.

Photo 9: View of bigleaf maple directly adjacent to Bent 3 of the north-bound bridge that may need to be removed to accommodate construction, as well as one other bigleaf maple that may need to be removed to accommodate construction of the rain garden.

Photo 10: View of western redcedars and bigleaf maples directly south of the north-bound bridge that may need to be removed to accommodate construction.

Photo 11: View of shore pine beneath / directly south of the south-bound bridge that may need to be removed to accommodate construction.

Photo 12: View of bigleaf maple directly north of the south-bound bridge that may need to be removed to accommodate construction.

Photo 13: View of potential riparian enhancement area on the left bank of the Colquitz River.

Photo 14: View of potential riparian enhancement area on the right bank of the Colquitz River.

Photo 15: View of potential riparian enhancement area on the left bank of the Colquitz River.

Photo 16: View of north-bound shoulder, west of Colquitz River Bridge (Area 1).

Photo 17: View of centre median, west of Colquitz River Bridges (Area 2).

Photo 18: View of south-bound shoulder, west of Colquitz River Bridge (Area 3).

Photo 19: View of north-bound shoulder, east of Colquitz River Bridge (Area 4).

Photo 20: View of centre median, east of Colquitz River Bridges (Area 5).

Photo 21: View of south-bound shoulder, east of Colquitz River Bridge (Area 6).

APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

NATURAL SCIENCES

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

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The Professional Document is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the Document, if required, may be obtained upon request.

1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by persons other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary investigation and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL ISSUES

The ability to rely upon and generalize from environmental baseline data is dependent on data collection activities occurring within biologically relevant survey windows.

It is incumbent upon the Client and any Authorized Party, to be knowledgeable of the level of risk that has been incorporated into the project design or scope, in consideration of the level of the environmental baseline information that was reasonably acquired to facilitate completion of the scope.

1.8 NOTIFICATION OF AUTHORITIES

TETRA TECH professionals are bound by their ethical commitments to act within the bounds of all pertinent regulations. In certain instances, observations by TETRA TECH of regulatory contravention may require that regulatory agencies and other persons be informed. The client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

APPENDIX B

MOTI DESIGN DRAWINGS

BRITISH COLUMBIA

Ministry of Transportation and Infrastructure

PROJECT NO. 16786-0001

HIGHWAY No. 1

COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

ISSUED FOR ENVIRONMENTAL PERMITTING - SEPT. 1, 2023

DRAFT

IAN PILKINGTON, CHIEF ENGINEER

DIGITALLY SEALED & SIGNED TENDER DRAWING PACKAGE
FOR SIGNATURES, REFER TO TENDER DRAWING PACKAGE APPROVAL FORM

ENGINEERING DIRECTOR

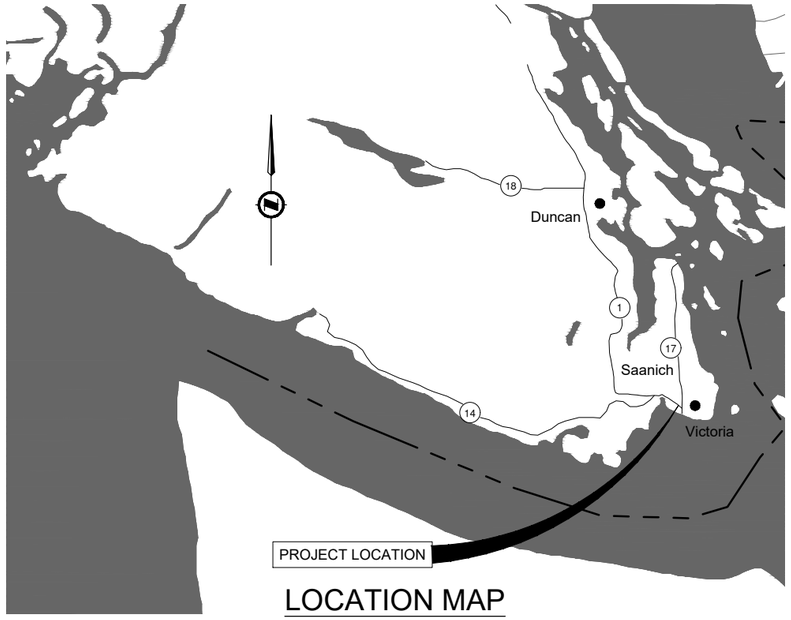
DATE

REGIONAL EXECUTIVE DIRECTOR

DATE

DRAWING NUMBER: R1-1060-000

REV



LOCATION MAP
N.T.S.

DRAWING INDEX

PROVINCE OF BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION & INFRASTRUCTURE

SOUTH COAST REGION

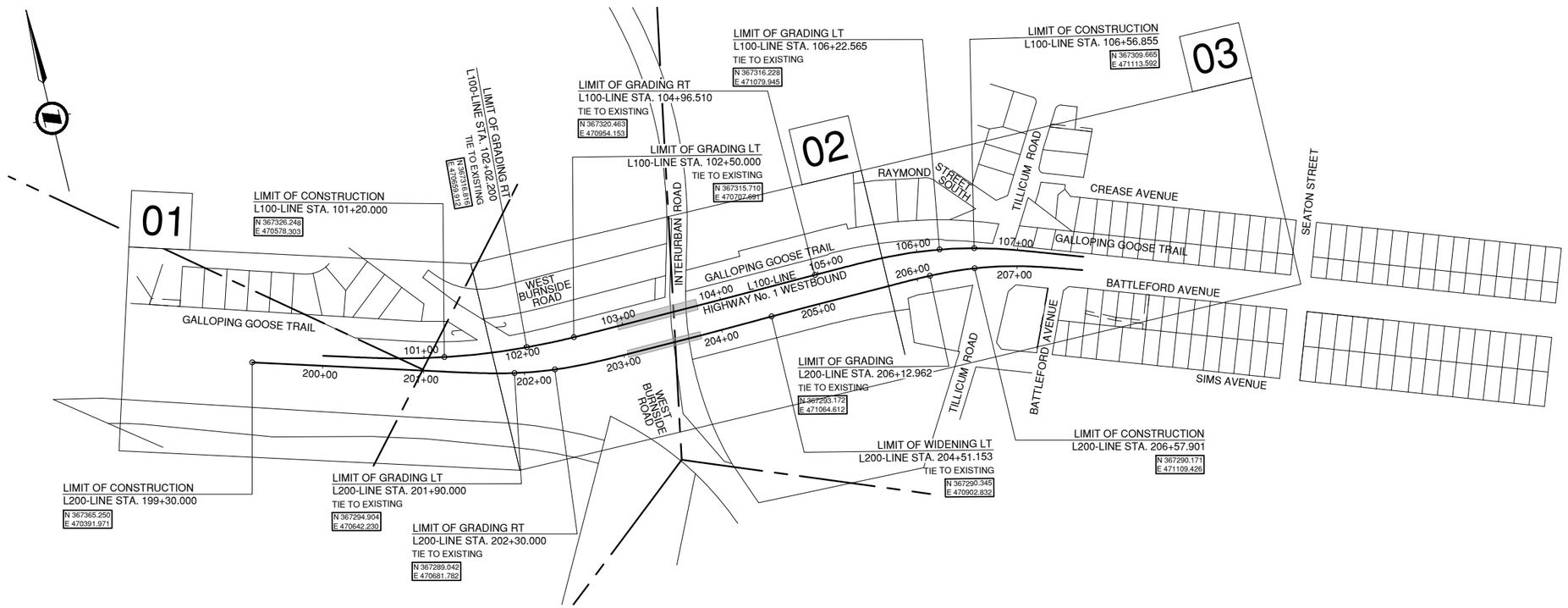
PROJECT NO. 16786-0001

HIGHWAY No. 1

COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

L100-LINE (WESTBOUND HIGHWAY No. 1)
STA. 101+20.000 - STA. 106+56.855
0.54 km
LANDMARK KILOMETRE INVENTORY SEGMENT 0402
km 2.49 to km 1.95

L200-LINE (EASTBOUND HIGHWAY No. 1)
STA. 199+30.000 - STA. 206+57.901
0.73 km
LANDMARK KILOMETRE INVENTORY SEGMENT 0403
km 0.36 to km 1.09



KEY PLAN
SCALE 1:2500

ISSUED FOR ENVIRONMENTAL PERMITTING - SEPT. 1, 2023

BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

KEY PLAN
HIGHWAY NO. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

BINNIE
The people behind your infrastructure.

R.F. BINNIE & ASSOCIATES LTD.
300 - 4940 Canada Way,
Burnaby, BC V5G 4K6
TEL 604 420 1721
BINNIE.com

SCALE AS SHOWN

CAD FILENAME 000KP-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
FILE NUMBER 22-0393

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	SEPT. 2023
QUALITY CONTROL	M.C.	SEPT. 2023
QUALITY ASSURANCE	M.C.	SEPT. 2023
DRAWN	J.T.	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-001	

Sep. 1, 2023 - 08:54 AM P:\302\22-0393\00. CAD Files\00-ColquitzBridges\Drawing Production\000_CoverKeyPlan\Layers\000KP-ColquitzBridges_22-0393

Date: September 15th, 2022			Origin: GCM85407-79H8832							
Project: Saanich Topographic Surveys - Colquitz & Tillicum			Tack Point: P15010-22		ACSF: 0.999611					
Horizontal Datum: UTM 10N NAD83(CSRS) 3.0.0.BC.1.CRD			Vertical Datum: CGVD28 HT2_0							
Point ID	**Local**		**Orthometric Height**		**UTM**		**Ellipsoidal Height**	**C.S.F.**	**Class**	**Type**
	Northing	**Easting**	**CGG2013a**	**HT2_0**	**Northing**	**Easting**				
TACK POINT	367283.794	470974.076	-	-	5367283.794	470974.076	-	-	TACK POINT	
P323469-79H8718	367183.435	471417.088	-	17.293	5367183.474	471416.915	-1.136	0.999610	Project	GCM
G992115-79H8825	367211.144	470795.643	-	4.374	5367211.172	470795.712	-14.017	0.999613	Project	GCM
85407-79H8832	367364.946	470824.281	-	6.342	5367364.914	470824.339	-12.052	0.999612	Corridor	GCM
P283580-79H8740	367096.420	471662.298	-	22.919	5367096.493	471662.030	4.476	0.999609	Project	GCM
S15063-22	367343.711	470887.245	-	14.107	5367343.688	470887.279	-	-	Project	Nail/Spike
P15061-22	367381.453	470301.761	-	12.901	5367381.415	470302.023	-5.460	0.999612	Project	Rebar
P15060-22	367176.992	470802.402	-	4.616	5367177.034	470802.469	-	-	Project	Nail/Spike
S15057-22	367207.061	470764.702	-	4.210	5367207.091	470764.784	-	-	Project	Nail/Spike
S15055-22	367369.964	470751.816	-	9.439	5367369.930	470751.903	-	-	Project	Nail/Spike
P15050-22	367326.328	470853.088	-	11.739	5367326.312	470853.135	-6.656	0.999611	Project	Rebar
P15049-22	367362.771	470822.901	-	6.407	5367362.740	470822.960	-	-	Project	Nail/Spike
S15048-22	367298.560	470913.735	-	11.669	5367298.554	470913.759	-	-	Project	Wood Hub
S15046-22	367322.719	470745.521	-	12.703	5367322.704	470745.610	-	-	Project	Nail/Spike
S15045-22	367281.696	470833.876	-	11.664	5367281.697	470833.931	-	-	Project	Nail/Spike
S15042-22	367332.724	470826.723	-	7.036	5367332.705	470826.780	-	-	Project	Nail/Spike
P15039-22	367317.717	470581.640	-	13.800	5367317.703	470581.793	-4.578	0.999611	Project	Rebar
P15037-22	367281.522	470687.173	-	13.865	5367281.523	470687.284	-4.520	0.999611	Project	Rebar
P15035-22	367373.486	470433.225	-	12.897	5367373.451	470433.436	-5.473	0.999612	Project	Rebar
S15033-22	367293.403	470818.127	-	5.304	5367293.399	470818.188	-	-	Project	Nail/Spike
P15024-22	367359.355	470672.869	-	14.911	5367359.325	470672.986	-	-	Project	Nail/Spike
P15010-22	367283.794	470974.076	-	12.444	5367283.794	470974.076	-5.959	0.999611	Project	Rebar
S15005-22	367270.462	470810.782	-	4.958	5367270.467	470810.845	-	-	Project	Nail/Spike
P15003-22	367366.083	470600.829	-	16.239	5367366.051	470600.974	-	-	Project	Nail/Spike
S9192-22	367300.820	471182.016	-	17.109	5367300.813	471181.935	-	-	Project	Nail/Spike

Point ID	**Local**		**Orthometric Height**		**UTM**		**Ellipsoidal Height**	**C.S.F.**	**Class**	**Type**
	Northing	**Easting**	**CGG2013a**		**Northing**	**Easting**				
S9191-22	367345.827	471040.352	-	15.483	5367345.803	471040.326	-	-	Project	Nail/Spike
S9185-22	367278.060	471042.519	-	13.808	5367278.062	471042.493	-	-	Project	Nail/Spike
S9181-22	367340.068	471177.016	-	19.464	5367340.047	471176.937	-	-	Project	Nail/Spike
S9180-22	367340.069	471177.013	-	19.466	5367340.047	471176.935	-	-	Project	Nail/Spike
P9179-22	367306.187	471056.972	-	15.026	5367306.179	471056.940	-3.382	0.999611	Project	Rebar
S9178-22	367271.149	471136.857	-	15.625	5367271.154	471136.794	-	-	Project	Nail/Spike
S9177-22	367401.756	471206.422	-	24.875	5367401.710	471206.332	-	-	Project	Nail/Spike
S9175-22	367278.755	471072.805	-	14.700	5367278.757	471072.767	-	-	Project	Nail/Spike
S9173-22	367158.819	471484.621	-	19.190	5367158.868	471484.422	-	-	Project	Nail/Spike
S9170-22	367222.384	471305.892	-	13.913	5367222.408	471305.763	-	-	Project	Nail/Spike
S9159-22	367115.365	471607.911	-	22.402	5367115.430	471607.664	-	-	Project	Nail/Spike
S9158-22	367204.528	471356.850	-	14.690	5367204.559	471356.701	-	-	Project	Nail/Spike
S9157-22	367274.093	471105.933	-	15.091	5367274.097	471105.882	-	-	Project	Nail/Spike
P9156-22	367321.888	471133.375	-	16.980	5367321.873	471133.313	-1.433	0.999610	Project	PK Nail
S9155-22	367143.146	471628.063	-	21.630	5367143.201	471627.808	-	-	Project	Nail/Spike
P9154-22	367261.458	471188.629	-	17.437	5367261.466	471188.545	-0.978	0.999610	Project	PK Nail
S9152-22	367285.196	471225.840	-	17.567	5367285.196	471225.742	-	-	Project	Nail/Spike
P9151-22	367260.014	471309.487	-	18.670	5367260.023	471309.356	0.247	0.999610	Project	Rebar
S9150-22	367134.925	471552.340	-	21.031	5367134.983	471552.115	-	-	Project	Nail/Spike
P9149-22	367179.784	471522.732	-	21.210	5367179.824	471522.519	2.775	0.999610	Project	Rebar
S9148-22	367161.404	471413.343	-	15.629	5367161.451	471413.172	-	-	Project	Nail/Spike
S9147-22	367216.421	471423.162	-	20.257	5367216.447	471422.987	-	-	Project	Nail/Spike
S9146-22	367240.405	471252.787	-	13.875	5367240.421	471252.678	-	-	Project	Nail/Spike
P9145-22	367317.921	470489.590	-	13.636	5367317.907	470489.779	-4.736	0.999611	Project	Wood Hub
S9127-22	367231.802	470754.155	-	4.561	5367231.822	470754.241	-	-	Project	Nail/Spike

All local coordinates are derived by first scaling from the Tack Point and then removing the millionth digit from the Northing

Notes:

* The CGG2013a Geoid uses the CGVD2013 vertical datum and the HT2_0 Geoid uses the CGVD28 vertical datum

* Corridor control can be derived from robust network adjustments using sources such as Mascot, active, and/or PPP for valid absolute accuracies.

* Project control originates from a corridor point and closes to a network confined within the specific project to provide survey grade relative accuracies.

* "name"static brass cap monuments-year. "G" static tag #-year. "K" multi epoch rtk. "P"closed total station traverse. "S" total station side shot

ISSUED FOR ENVIRONMENTAL PERMITTING - SEPT. 1, 2023

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SCALE N.T.S.

CAD FILENAME 000KP-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

SURVEY CONTROL POINTS

HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED M.C. DATE SEPT. 2023
QUALITY CONTROL M.C. DATE SEPT. 2023
QUALITY ASSURANCE M.C. DATE SEPT. 2023
DRAWN J.T. DATE SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-002	

LEGEND

AERIAL UTILITIES (EXISTING)

- Deadman
- Anchor / Guy Wire
- High Tension Pole
- High Tension Tower
- Power Guy Pole
- Power / Phone Guy Pole
- Power Poles
- Power Pole with Transformer
- Power / Phone Pole with Transformer
- Power / Phone Pole
- Telephone Pole
- Telephone Guy Pole
- Pedestal (B.C. Tel.) PED
- Telephone Booth

SURVEY (EXISTING)

- Bench Mark
- Standard Iron Pin OIP
- Lead Plug
- Wooden Post
- Witness Post WT
- Reference Point
- Monument
- Aluminum Post
- Angle Iron Post
- Standard Brass Cap Monument MON
- Concrete Post Monument MON
- Dominion Iron Post
- Unmarked Measured Point
- Rock Post Monument MON
- Non- Standard Round Iron Post
- Non-Standard Square Iron Post
- Detail Hub (etc.)
- Spot Elevation

DETAIL (EXISTING)

- Septic Field
- Concrete Pillar
- Guard Post
- Piling
- Gate Post GP
- Swamp
- Road Sign
- Well
- Tree
- Decorative Tree
- Delineator Post DP
- Flag Pole FP
- Mail Box MB
- Top of Bank

DRAINAGE (EXISTING)

- Catch Basin / Manhole
- Culvert Outlet CO
- Culvert Inlet CI
- Culvert Headwall
- Drainage Grate
- Manhole
- Catch Basin
- Culvert Kink
- Asphalt Spillway

METERS (EXISTING)

- Service Meter SV
- Water Meter WM
- Valve V
- Water valve WV
- Fire Hydrant FH
- Gas Valve GV
- Observation Well OW

UNDERGROUND (EXISTING)

- Filler Cap FC
- Fuel / Gas Pump FP
- Fuel Tank FT
- Septic Tank ST
- Underground Marker UM
- Breather / Vent Pipe BP

ELECTRICAL (EXISTING)

- Traffic Signal Control Box
- Electrical Outlet
- Junction Box JB
- Kiosk
- Lamp Standard LS
- Traffic Signal
- Traffic Counter

LEGAL LINETYPES (EXISTING)

- International Bdy.
- Section / District Bdy.
- Parcel Boundary / Old road R/W
- Quarter Section
- Easement
- Agricultural Land Reserve

MAN MADE FEATURES LINETYPES (EXISTING)

- Crown of Existing Road
- Edge of Pavement
- Concrete Barrier
- Dirt Road / Driveway
- Fence
- Gravel Road / Driveway
- Hedge / Bush / Tree Line
- Railway
- Retaining Wall
- Guard Rail
- Paint Lines - Solid
- Paint Lines - Dashed

UNDERGROUND UTILITIES LINETYPES (EXISTING)

- Gas Main G
- Oil OIL
- Sanitary Sewer Line SAN
- Storm / Sewer Drain S
- Electrical Cable UE
- Miscellaneous UG
- Telephone Cable UT
- Water Main W
- Culvert

OVERHEAD UTILITIES LINETYPES (EXISTING)

- High Tension Wire

HYDRAULIC LINETYPES (EXISTING)

- Creek / Ditch / Stream
- Edge of Water EW
- Major Catchment Boundary
- Sub-Catchment Boundary

GEOTECHNICAL (EXISTING)

- Pavement Core With Label PV07-01
- Test Pit With Label TP07-01
- Drill Hole With Label DH07-01

DRAINAGE (PROPOSED)

- Catch Basin
- Deck Drain
- Manhole
- Asphalt Spillway
- Ditch Inlet Structure
- Ditch Block DB
- Cleanout CO
- Asphalt Swale
- Special Ditching
- Culvert Outfall with Riprap Apron
- Culvert Headwall
- Riprap

SIGNS (PROPOSED)

- Road Sign (Single Pole)
- Road Sign (Double Pole)
- Post Mounted Delineator DP
- Commercial Message Sign
- Overhead Pole and Sign

LEGAL LINETYPES (PROPOSED)

- Highway Right of Way
- Easement L.T.C.

CONSTRUCTION DETAILS LINETYPES (PROPOSED)

- Berm
- Clearing and Grubbing
- Grubbing Only
- Pavement Sawcut Line
- Surplus Excavation Disposal Area
- Subgrade Pre-Build

SURFACE (PROPOSED)

- Centerline Alignment
- Edge of Pavement
- Concrete Barrier F
- Slope Stake Line C C/F
- Fence X X
- Retaining Wall
- Paint Lines - Solid
- Paint Lines - Dashed
- Trail

UNDERGROUND (PROPOSED)

- Gas Main G
- Oil OIL
- Sanitary Sewer Line SAN
- Storm / Sewer Drain S
- Electrical Cable UE
- Miscellaneous UG
- Telephone Cable UT
- Water Main W

PAVEMENT TREATMENT (PROPOSED)

- Pavement Removal
- Variable Depth Milling and 50mm Overlay
- Variable Depth Leveling Asphalt and 50mm Overlay

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DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

LEGEND

HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

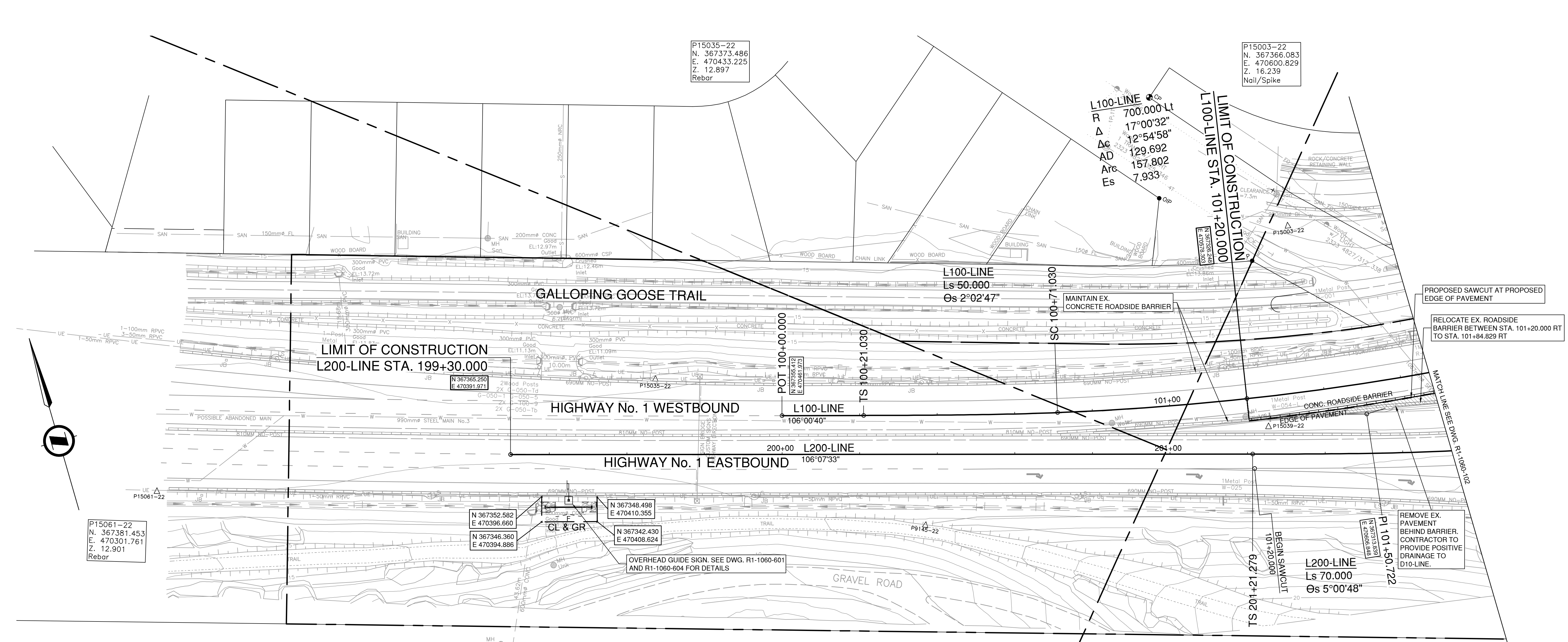
R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

PROFESSIONAL ENGINEER M. CARREIRA P-41601 BRITISH COLUMBIA

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE	SEPT. 2023
QUALITY CONTROL	M.C.	DATE	SEPT. 2023
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	S.C.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-003	

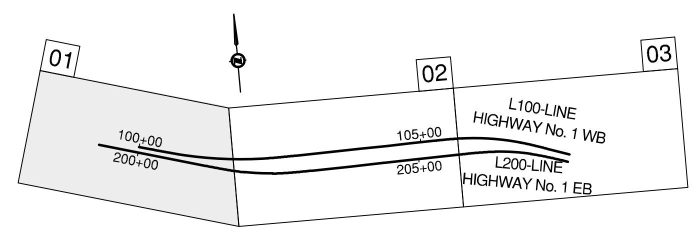


CONSTRUCTION NOTES:

1. CLEARING AND GRUBBING NOTES:
   - MEDIAN AREAS: CLEARING AND GRUBBING SHALL BE FROM EXISTING WESTBOUND EDGE OF PAVEMENT TO EXISTING EASTBOUND EDGE OF PAVEMENT UNLESS OTHERWISE SHOWN.
   - OTHER AREAS: CLEARING AND GRUBBING SHALL BE FROM OUTSIDE EDGE OF PAVEMENT TO THE CLEARING AND GRUBBING LINES.
2. UNDERGROUND UTILITIES AS SHOWN MAY BE INCOMPLETE OR INACCURATE. THE CONTRACTOR SHALL FIELD VERIFY UTILITY LOCATIONS PRIOR TO COMMENCING WORK. CONTRACTOR TO PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION.
3. EXISTING SIGN REMOVALS AND RELOCATIONS ARE SHOWN ON THE SIGNING AND PAVEMENT MARKING DRAWINGS.
4. EXISTING DRAINAGE FEATURE REMOVALS ARE SHOWN ON THE DRAINAGE PLANS.
5. EXISTING ELECTRICAL UTILITY REMOVALS AND RELOCATIONS ARE SHOWN ON THE ELECTRICAL DRAWINGS.
6. CADASTRAL INFORMATION IS NOT SHOWN FOR CLARITY. SEE RIGHT OF WAY ACQUISITION DRAWINGS FOR DETAILS.

LEGEND

PAVEMENT REMOVAL — VARIABLE DEPTH MILLING & 50mm OVERLAY — VARIABLE DEPTH LEVELING ASPHALT & 50mm OVERLAY



FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501	
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604	
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705	CLEARING AND GRUBBING TOTAL THIS SHEET: 0.0349 ha
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712	FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904

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MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

SCALE 0 5 1:500 25m

CAD FILENAME 100PL-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

PLAN

HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE	SEPT. 2023
QUALITY CONTROL	M.C.	DATE	SEPT. 2023
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	J.T.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-101	

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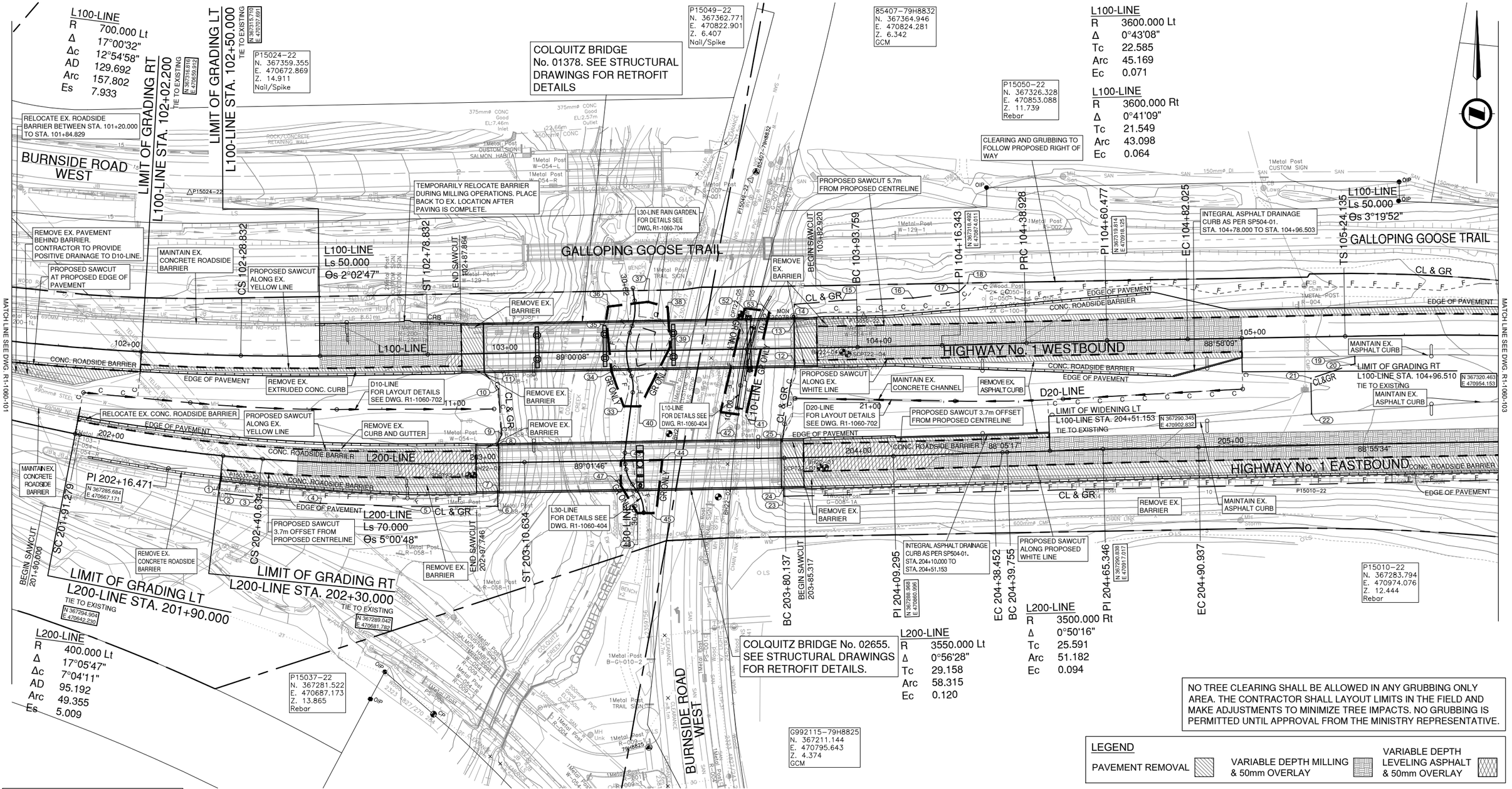

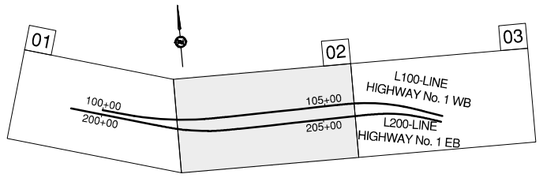

NO TREE CLEARING SHALL BE ALLOWED IN ANY GRUBBING ONLY AREA. THE CONTRACTOR SHALL LAYOUT LIMITS IN THE FIELD AND MAKE ADJUSTMENTS TO MINIMIZE TREE IMPACTS. NO GRUBBING IS PERMITTED UNTIL APPROVAL FROM THE MINISTRY REPRESENTATIVE.

LEGEND

PAVEMENT REMOVAL | VARIABLE DEPTH MILLING & 50mm OVERLAY | VARIABLE DEPTH LEVELING ASPHALT & 50mm OVERLAY

FOR CLEARING AND GRUBBING COORDINATES SEE DWG. R1-1060-103

FOR CONSTRUCTION NOTES SEE DWG. R1-1060-101

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501	
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604	GRUBBING ONLY TOTAL THIS SHEET: 0.0826 ha
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705	CLEARING AND GRUBBING TOTAL THIS SHEET: 0.7266 ha
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712	FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904

ISSUED FOR ENVIRONMENTAL PERMITTING - SEPT. 1, 2023

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DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

PLAN

HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE	SEPT. 2023
QUALITY CONTROL	M.C.	DATE	SEPT. 2023
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	J.T.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-102	

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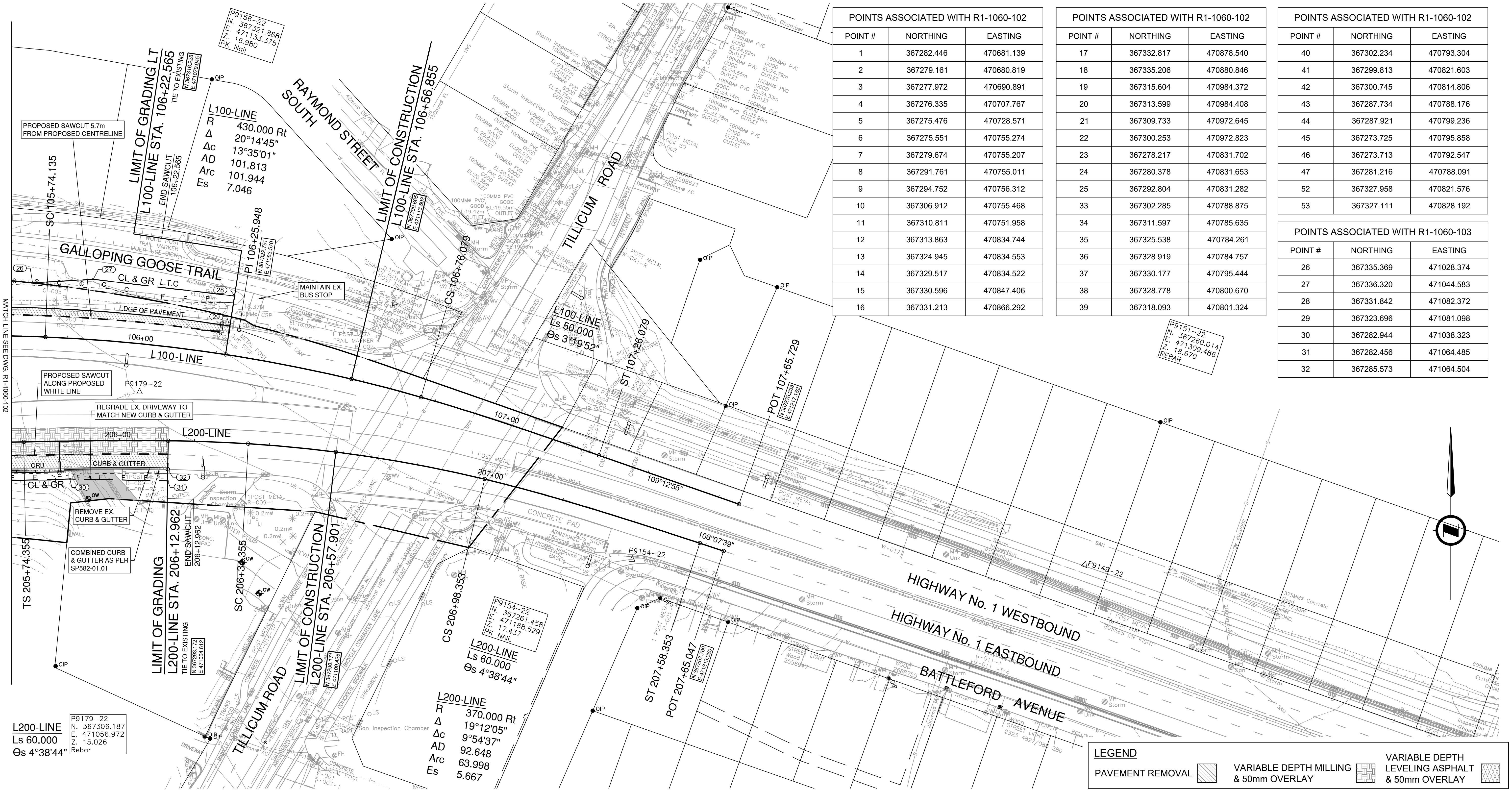


POINTS ASSOCIATED WITH R1-1060-102		
POINT #	NORTHING	EASTING
1	367282.446	470681.139
2	367279.161	470680.819
3	367277.972	470690.891
4	367276.335	470707.767
5	367275.476	470728.571
6	367275.551	470755.274
7	367279.674	470755.207
8	367291.761	470755.011
9	367294.752	470756.312
10	367306.912	470755.468
11	367310.811	470751.958
12	367313.863	470834.744
13	367324.945	470834.553
14	367329.517	470834.522
15	367330.596	470847.406
16	367331.213	470866.292

POINTS ASSOCIATED WITH R1-1060-102		
POINT #	NORTHING	EASTING
17	367332.817	470878.540
18	367335.206	470880.846
19	367315.604	470984.372
20	367313.599	470984.408
21	367309.733	470972.645
22	367300.253	470972.823
23	367278.217	470831.702
24	367280.378	470831.653
25	367292.804	470831.282
33	367302.285	470788.875
34	367311.597	470785.635
35	367325.538	470784.261
36	367328.919	470784.757
37	367330.177	470795.444
38	367328.778	470800.670
39	367318.093	470801.324

POINTS ASSOCIATED WITH R1-1060-102		
POINT #	NORTHING	EASTING
40	367302.234	470793.304
41	367299.813	470821.603
42	367300.745	470814.806
43	367287.734	470788.176
44	367287.921	470799.236
45	367273.725	470795.858
46	367273.713	470792.547
47	367281.216	470788.091
52	367327.958	470821.576
53	367327.111	470828.192

POINTS ASSOCIATED WITH R1-1060-103		
POINT #	NORTHING	EASTING
26	367335.369	471028.374
27	367336.320	471044.583
28	367331.842	471082.372
29	367323.696	471081.098
30	367282.944	471038.323
31	367282.456	471064.485
32	367285.573	471064.504

LEGEND

PAVEMENT REMOVAL
VARIABLE DEPTH MILLING & 50mm OVERLAY
VARIABLE DEPTH LEVELING ASPHALT & 50mm OVERLAY

FOR CONSTRUCTION NOTES SEE DWG. R1-1060-101

FOR PLANS SEE DWG. R1-1060-101 TO 103

FOR SPOT ELEVATIONS SEE DWG. R1-1060-501

FOR PROFILES SEE DWG. R1-1060-201 TO 204

FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604

FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305

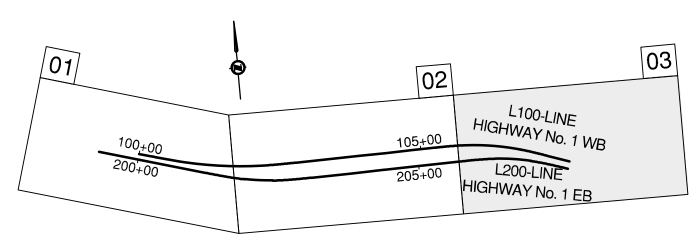
FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705

CLEARING AND GRUBBING TOTAL THIS SHEET: 0.0591 ha

FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404

FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712

FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904



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BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

SCALE 0 5 1:500 25m

CAD FILENAME 100PL-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

PLAN

HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

DESIGNED	M.C.	DATE	SEPT. 2023
QUALITY CONTROL	M.C.	DATE	SEPT. 2023
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	J.T.	DATE	SEPT. 2023

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-103	

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EXCAVATION m³	132	NIL	726		TOTAL: 858
EMBANKMENT m³	124	NIL	432		TOTAL: 556
STRIPPING m³	246	NIL	684		TOTAL: 930

L100-LINE (HIGHWAY No.1) - DESIGN SPEED 90 km/h WEST OF STA. 105+10.000
L100-LINE (HIGHWAY No.1) - DESIGN SPEED 70 km/h EAST OF STA. 105+10.000

FOR PLANS
SEE DWG. R1-1060-101 TO 103

FOR SPOT ELEVATIONS
SEE DWG. R1-1060-501

FOR PROFILES
SEE DWG. R1-1060-201 TO 204

FOR SIGNING AND PAVEMENT MARKINGS
SEE DWG. R1-1060-601 TO 604

FOR TYPICAL SECTIONS
SEE DWG. R1-1060-301 TO 305

FOR DRAINAGE PLANS AND DETAILS
SEE DWG. R1-1060-701 TO 705

FOR GEOMETRICS AND LANING
SEE DWG. R1-1060-401 TO 404

FOR STORM DRAIN PROFILES
SEE DWG. R1-1060-710 TO 712

FOR LANDSCAPE PLANS AND DETAILS
SEE DWG. R1-1060-901 TO 904

NOTES:

1. ELEVATIONS SHOWN ARE FINISHED GRADE UNLESS OTHERWISE STATED.
2. EMBANKMENT FIGURES SHOWN ARE COMPACTED QUANTITIES
3. EXCAVATION FIGURES SHOWN ARE NEAT LINE UNADJUSTED QUANTITIES
4. SAWCUT ELEVATIONS MAY NOT BE ACCURATE, VERIFY IN FIELD PRIOR TO CONSTRUCTION
5. MAINTAIN EXISTING UTILITIES. LOCATION AND ELEVATION OF EXISTING UTILITIES ARE APPROXIMATE ONLY. CONTRACTOR TO CONFIRM THE LOCATION OF THESE UTILITIES IN THE FIELD PRIOR TO CONSTRUCTION AND INFORM THE ENGINEER OF RECORD OF ANY DISCREPANCIES.

ISSUED FOR ENVIRONMENTAL PERMITTING - SEPT. 1, 2023

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BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION
AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

SCALE 0 10 H 1:1000 50m
0 1 V 1:100 5m

CAD FILENAME 200PR-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

L100-LINE PROFILE

HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

M. M. CARREIRA
45481
2023-09-01

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED M.C. DATE SEPT. 2023
QUALITY CONTROL M.C. DATE SEPT. 2023
QUALITY ASSURANCE M.C. DATE SEPT. 2023
DRAWN J.T. DATE SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-201	

Sep. 1, 2023 - 10:50 AM P:\2022\22-0393\00 - CAD Files\00-ColquitzBridges\DrawingProduction\200_Profiles\200PR-ColquitzBridges_22-0393

EXCAVATION m³	324	NIL	723	TOTAL: 1047
EMBANKMENT m³	145	NIL	211	TOTAL: 356
STRIPPING m³	333	NIL	315	TOTAL: 648

L200-LINE (HIGHWAY No.1) - DESIGN SPEED 90 km/h WEST OF STA. 204+60.000
L200-LINE (HIGHWAY No.1) - DESIGN SPEED 70 km/h EAST OF STA. 204+60.000

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712

FOR LANDSCAPE PLANS AND DETAILS
SEE DWG. R1-1060-901 TO 904

NOTES:

1. ELEVATIONS SHOWN ARE FINISHED GRADE UNLESS OTHERWISE STATED.
2. EMBANKMENT FIGURES SHOWN ARE COMPACTED QUANTITIES
3. EXCAVATION FIGURES SHOWN ARE NEAT LINE UNADJUSTED QUANTITIES
4. SAWCUT ELEVATIONS MAY NOT BE ACCURATE, VERIFY IN FIELD PRIOR TO CONSTRUCTION
5. MAINTAIN EXISTING UTILITIES. LOCATION AND ELEVATION OF EXISTING UTILITIES ARE APPROXIMATE ONLY. CONTRACTOR TO CONFIRM THE LOCATION OF THESE UTILITIES IN THE FIELD PRIOR TO CONSTRUCTION AND INFORM THE ENGINEER OF RECORD OF ANY DISCREPANCIES.

ISSUED FOR ENVIRONMENTAL PERMITTING - SEPT. 1, 2023

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BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

SCALE 0 10 H 1:1000 50m
0 1 V 1:100 5m

CAD FILENAME 200PR-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
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L200-LINE PROFILE
HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

M. M. CARREIRA # 45481 2023-09-01

MICHAEL CARREIRA
ENGINEER OF RECORD
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DRAWN J.T. DATE SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-202	

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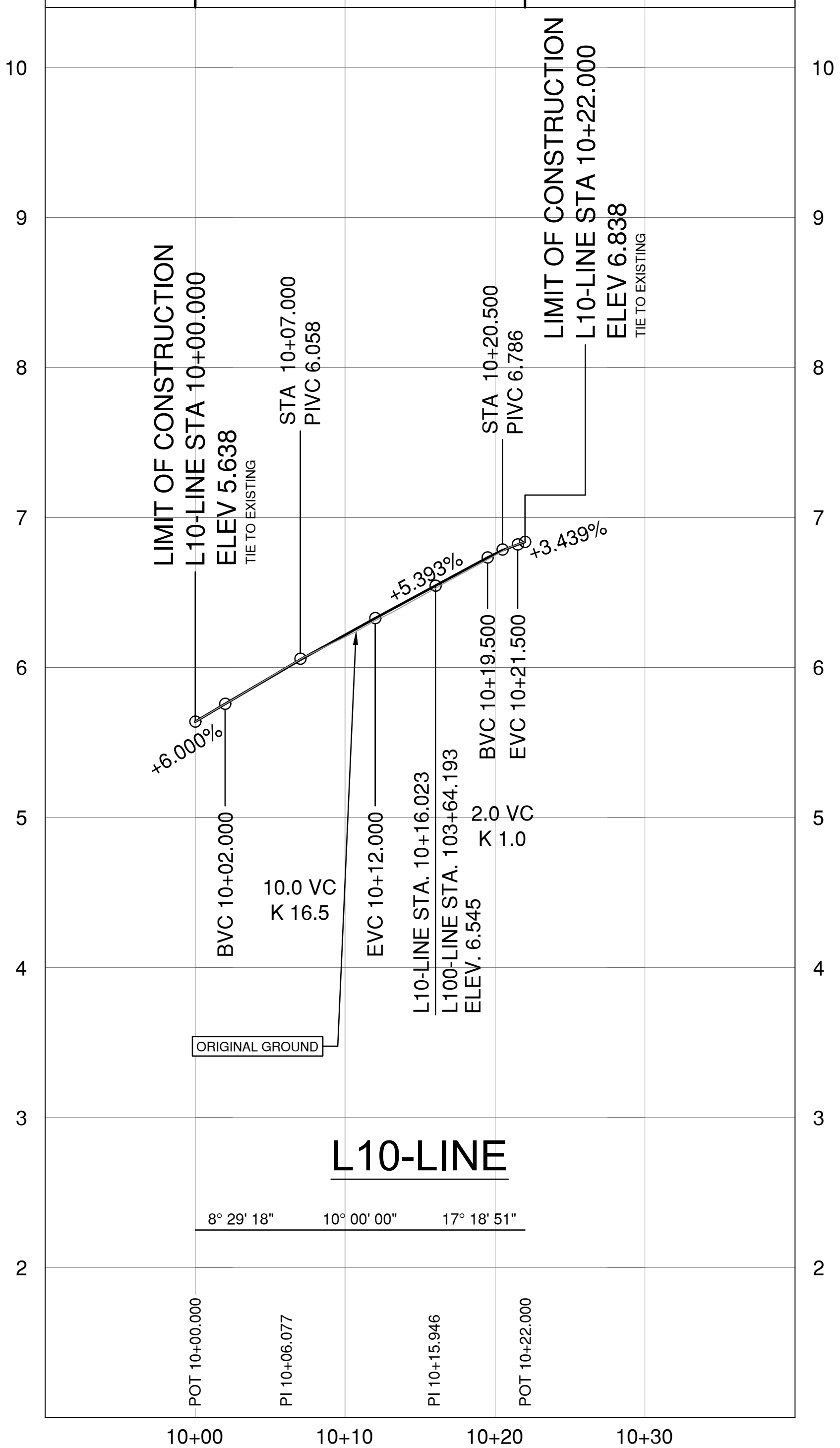
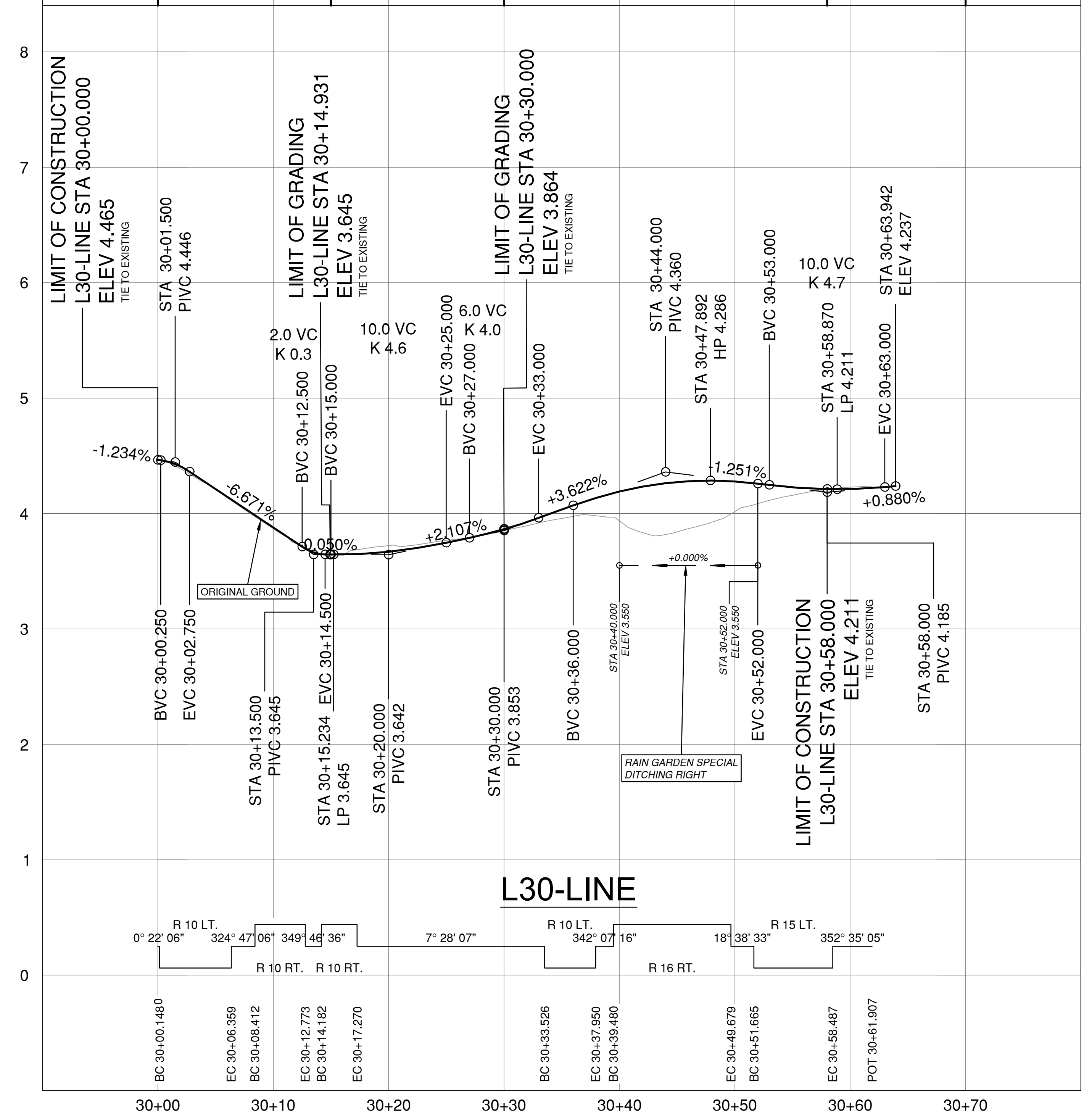
EXCAVATION m³	1	TOTAL: 1
EMBANKMENT m³	15	TOTAL: 15
STRIPPING m³	23	TOTAL: 23



EXCAVATION m³	0	NIL	45	TOTAL: 45
EMBANKMENT m³	10	NIL	47	TOTAL: 57
STRIPPING m³	13	NIL	62	TOTAL: 75



NOTES:

1. ELEVATIONS SHOWN ARE FINISHED GRADE.
2. EMBANKMENT FIGURES SHOWN ARE COMPACTED QUANTITIES.
3. EXCAVATION FIGURES SHOWN ARE NEAT LINE UNADJUSTED QUANTITIES.
4. LOCATION AND ELEVATION OF EXISTING UTILITIES ARE APPROXIMATE ONLY. CONTRACTOR TO CONFIRM THE LOCATION OF THESE UTILITIES IN THE FIELD PRIOR TO CONSTRUCTION AND INFORM THE ENGINEER OF RECORD OF ANY DISCREPANCIES.

FOR PLANS SEE DWG. R1-1060-101 TO 103

FOR SPOT ELEVATIONS SEE DWG. R1-1060-501

FOR PROFILES SEE DWG. R1-1060-201 TO 204

FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604

FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305

FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705

FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404

FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712

FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904

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SCALE 0 2 H 1:250 10m / 0 0.25 V 1:25 1m

CAD FILENAME 200PR-COLQUITZBRIDGES_22-0393.DWG
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BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

L10-LINE AND L30-LINE PROFILES

HIGHWAY No. 1

COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE NUMBER 1001128

MICHAEL CARREIRA
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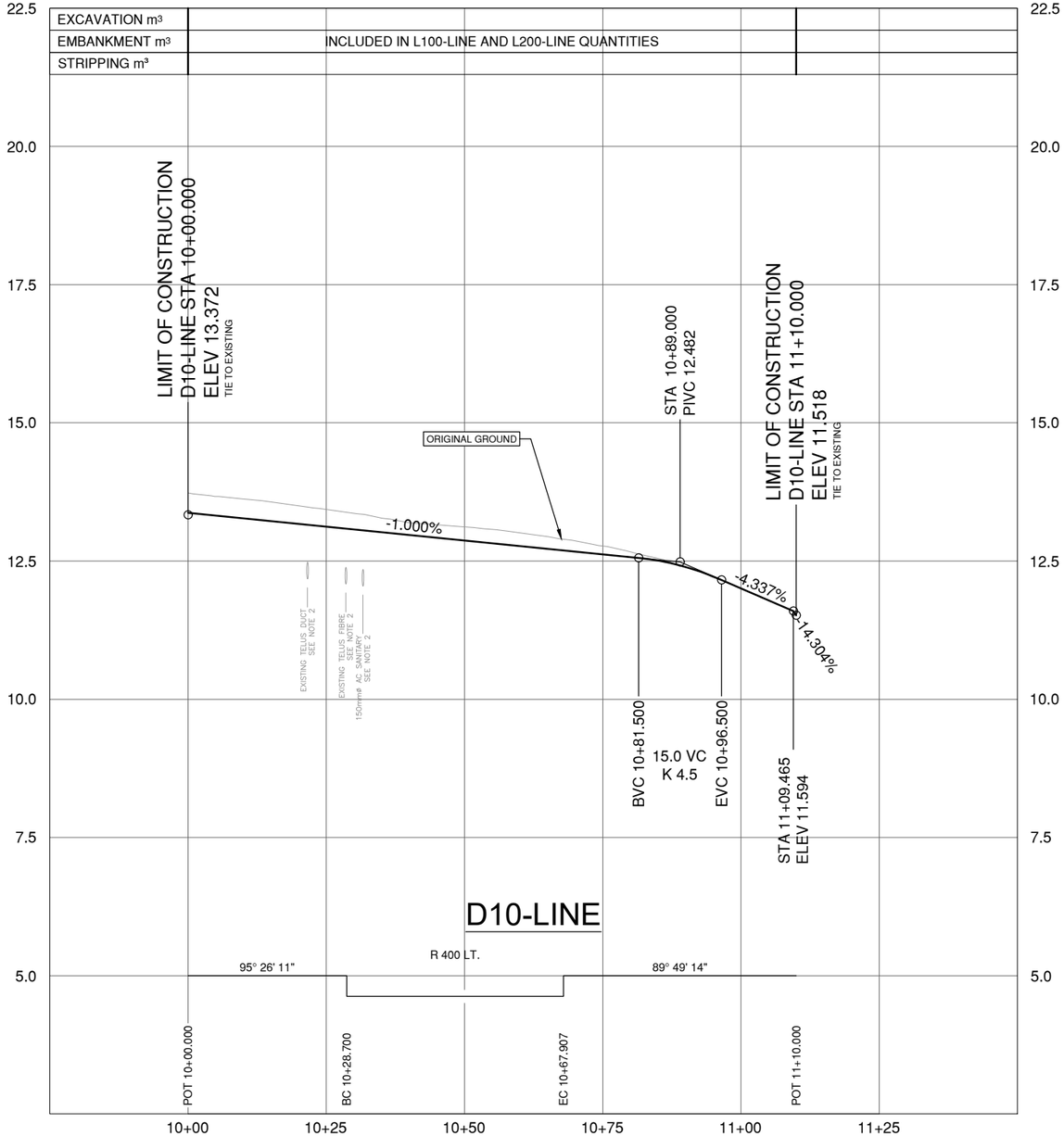
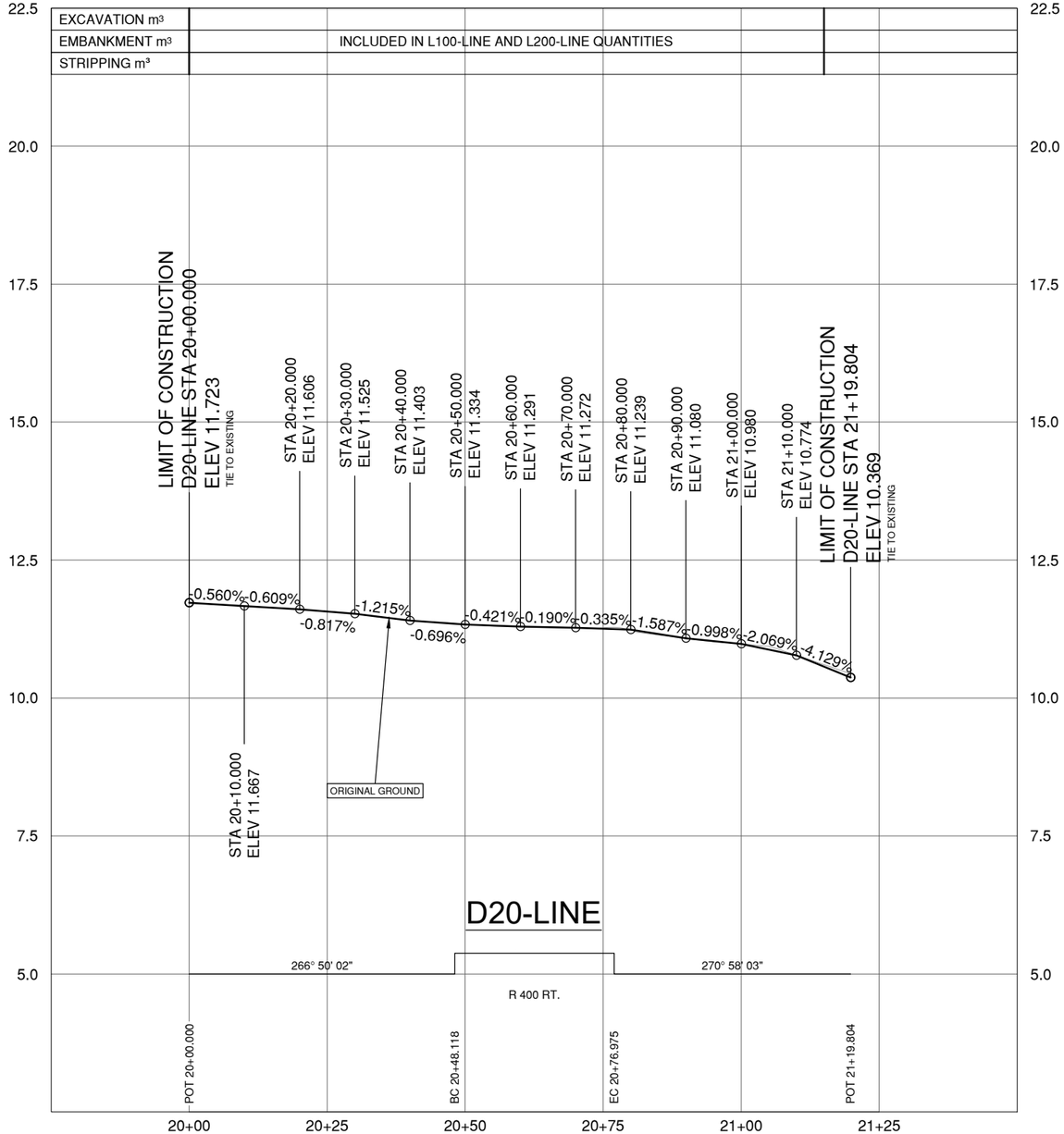
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	J.T.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-203	

EXCAVATION m³	
EMBANKMENT m³	INCLUDED IN L100-LINE AND L200-LINE QUANTITIES
STRIPPING m³	



EXCAVATION m³	
EMBANKMENT m³	INCLUDED IN L100-LINE AND L200-LINE QUANTITIES
STRIPPING m³	



NOTES:

1. ELEVATIONS SHOWN ARE FINISHED GRADE.
2. LOCATION AND ELEVATION OF EXISTING UTILITIES ARE APPROXIMATE ONLY. CONTRACTOR TO CONFIRM THE LOCATION OF THESE UTILITIES IN THE FIELD PRIOR TO CONSTRUCTION AND INFORM THE ENGINEER OF RECORD OF ANY DISCREPANCIES.

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501	
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604	
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705	
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712	FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904

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SCALE 0 5 H 1:500 25m
0 0.5 V 1:50 2.5m

CAD FILENAME 200PR-COLQUITZBRIDGES_22-0393.DWG
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BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

D10-LINE AND D20-LINE PROFILES

HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

MICHAEL CARREIRA
ENGINEER OF RECORD
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QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	N.B.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-204	

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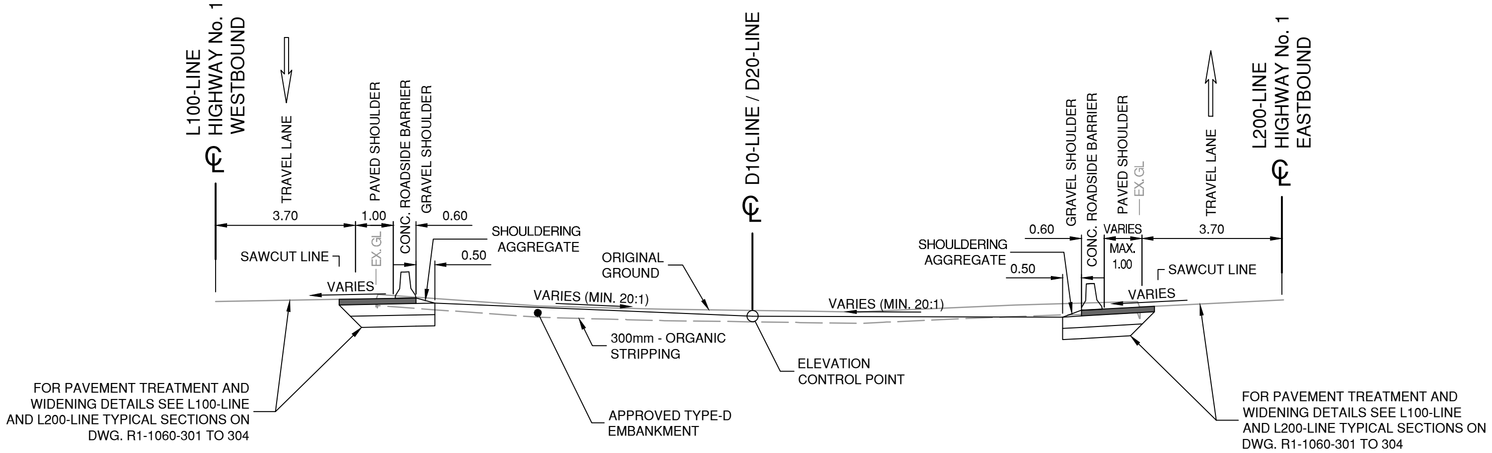
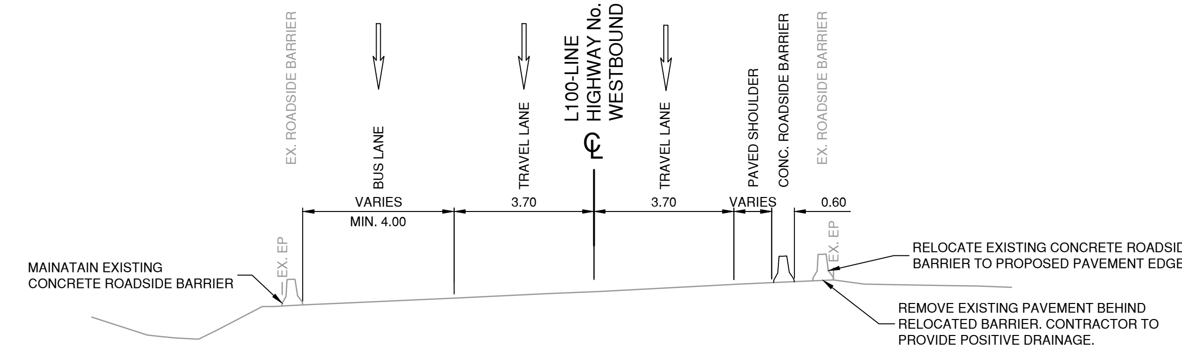


D10-LINE AND D20-LINE MEDIAN DITCH - TYPICAL SECTION

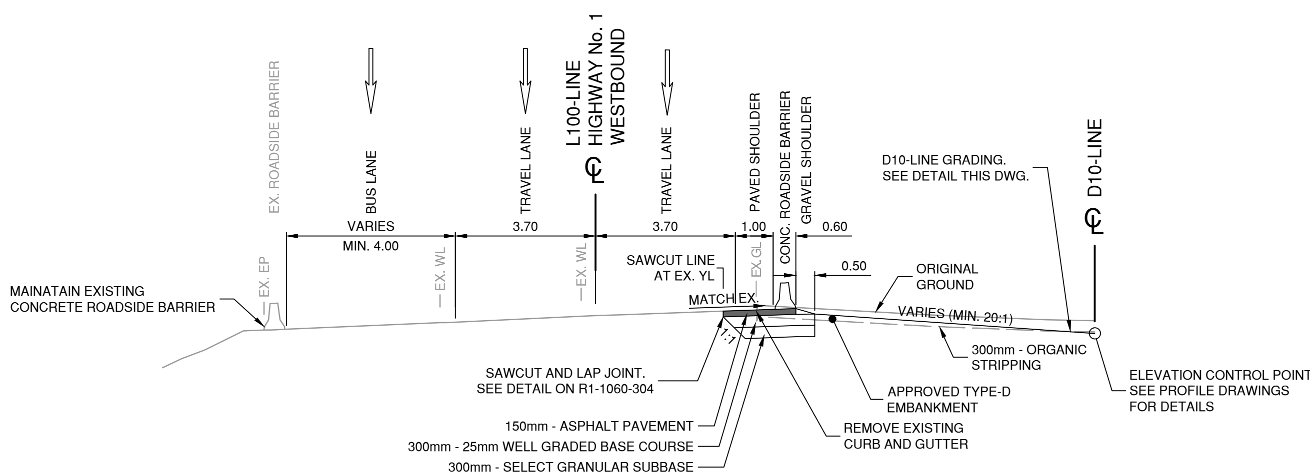
STA. 102+02.200 RT TO STA. 102+96.304 RT
STA. 103+76.769 RT TO STA. 104+96.510 RT
STA. 201+90.000 LT TO STA. 203+02.760 LT
STA. 203+83.254 LT TO STA. 204+51.153 LT



HIGHWAY No. 1 WESTBOUND (L100-LINE) - TYPICAL SECTION

MATCH EXISTING - ADJUST EX. BARRIER

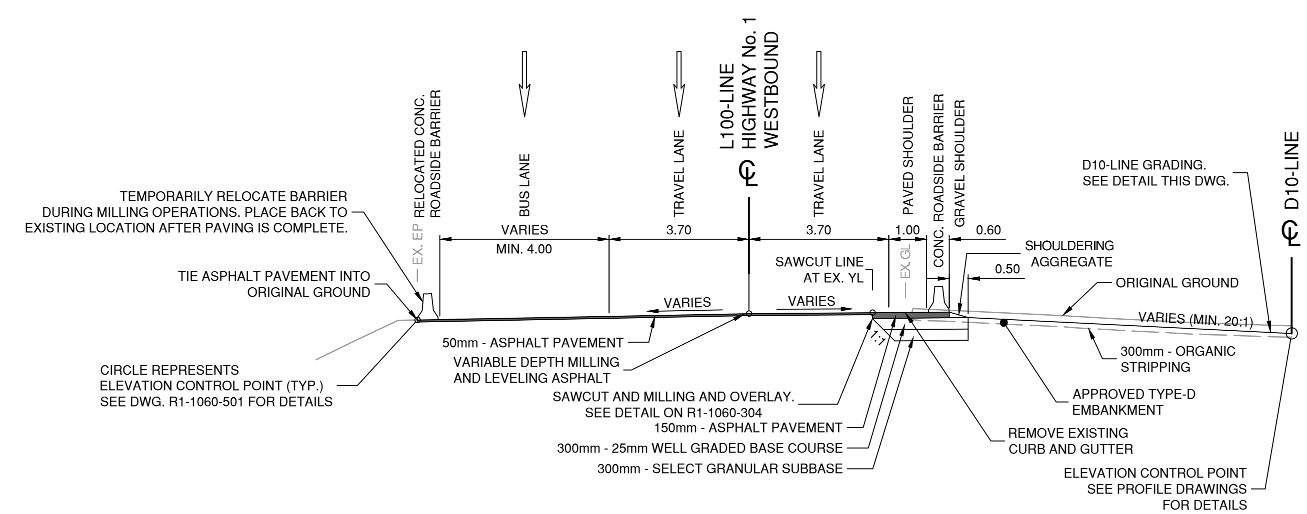
STA. 101+20.000 TO STA. 102+02.200



HIGHWAY No. 1 WESTBOUND (L100-LINE) - TYPICAL SECTION

SHOULDER WIDENING

STA. 102+02.200 TO STA. 102+50.000



HIGHWAY No. 1 WESTBOUND (L100-LINE) - TYPICAL SECTION

VARIABLE DEPTH MILLING AND OVERLAY WITH SHOULDER WIDENING

STA. 102+50.000 TO STA. 102+87.864

NOTES:

1. HYDROSEED ALL CUT AND FILL SLOPES.
2. SEE SS205 TABLE 205-D FOR RIPRAP NOMINAL THICKNESS.

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712

FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904

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BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

SCALE 0 1 1:100 5m

CAD FILENAME 300TS-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

TYPICAL SECTIONS
HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE NUMBER 1001128

MICHAEL CARREIRA
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DATE

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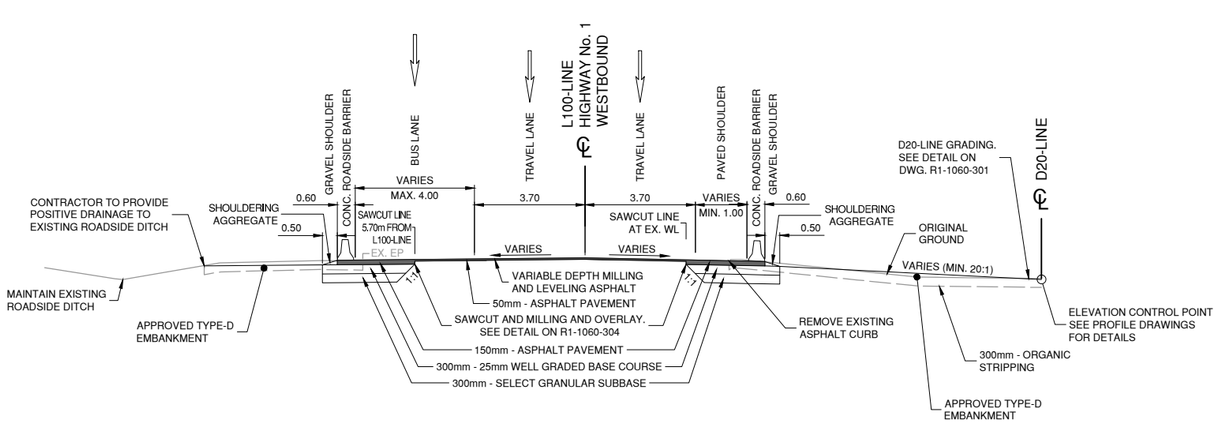
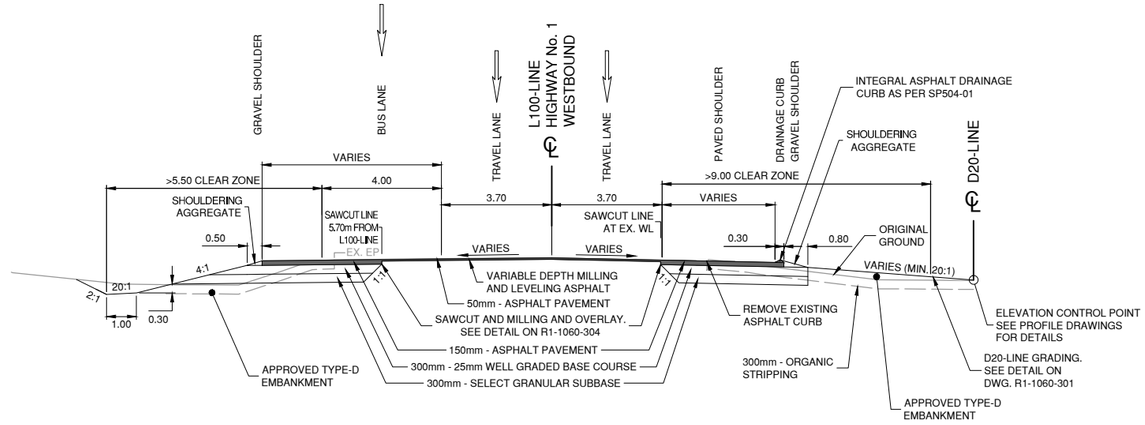
QUALITY CONTROL	M.C.	DATE	SEPT. 2023
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	N.B.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-301	

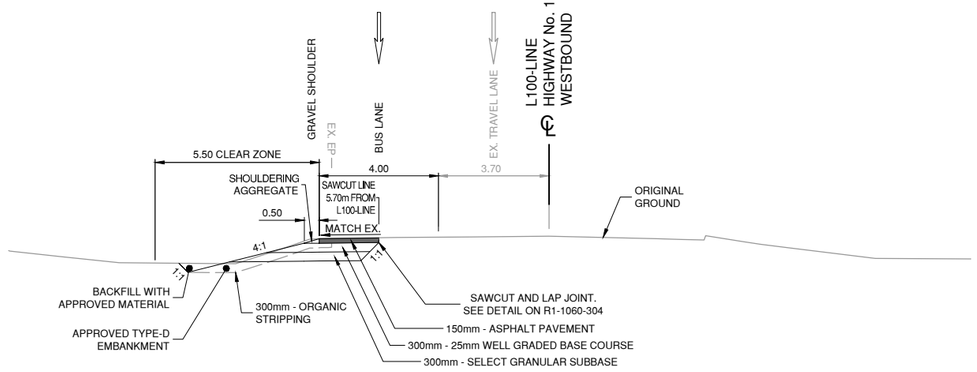
Sep. 1, 2023 - 03:46 PM P:\2022\22-0393\00 - CAD Files\00-ColquitzBridges\DrawingProduction\300_TypicalSections\300TS-ColquitzBridges_22-0393



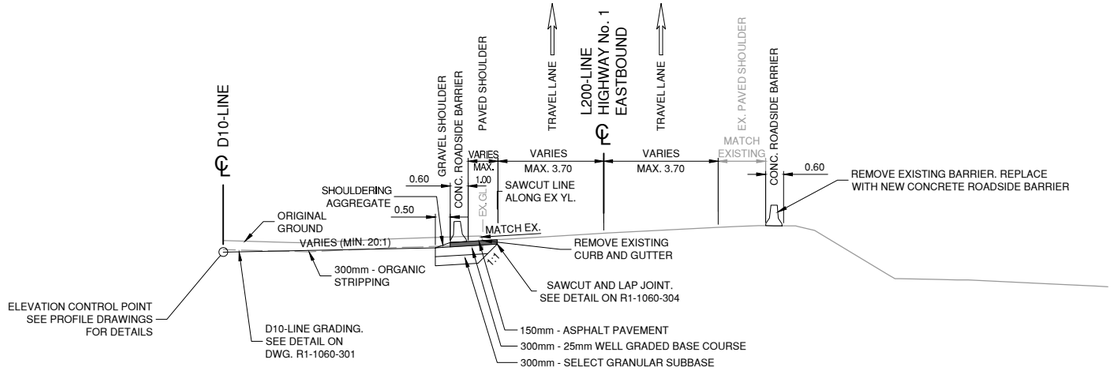
HIGHWAY No. 1 WESTBOUND (L100-LINE) - TYPICAL SECTION
SHOULDER WIDENING - BOTH SIDES - WITH BARRIER
STA. 103+82.931 LT TO STA. 104+73.000 LT
STA. 103+82.931 RT TO STA. 104+78.000 RT



HIGHWAY No. 1 WESTBOUND (L100-LINE) - TYPICAL SECTION
OPEN SHOULDER WIDENING - BOTH SIDES
STA. 104+73.000 LT TO STA. 104+96.510 LT
STA. 104+78.000 RT TO STA. 104+96.510 RT



HIGHWAY No. 1 WESTBOUND (L100-LINE) - TYPICAL SECTION
OPEN SHOULDER WIDENING - LT ONLY
STA. 104+96.510 TO STA. 106+22.565



HIGHWAY No. 1 EASTBOUND (L200-LINE) - TYPICAL SECTION
SHOULDER WIDENING - LT ONLY
STA. 201+90.000 TO STA. 202+30.000

NOTES:
1. HYDROSEED ALL CUT AND FILL SLOPES.
2. SEE SS205 TABLE 205-D FOR RIPRAP NOMINAL THICKNESS.

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501	
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604	
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705	
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712	FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904

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CAD FILENAME 300TS-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
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REV	DATE	REVISIONS	SIGNATURE

BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

TYPICAL SECTIONS
HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

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MICHAEL CARREIRA
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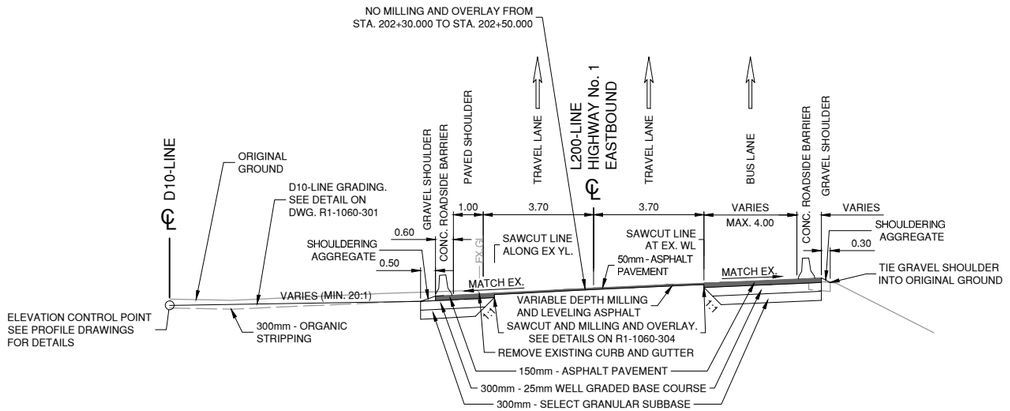
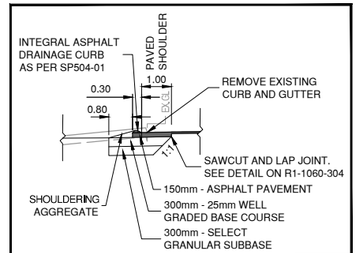
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	N.B.	DATE	SEPT. 2023

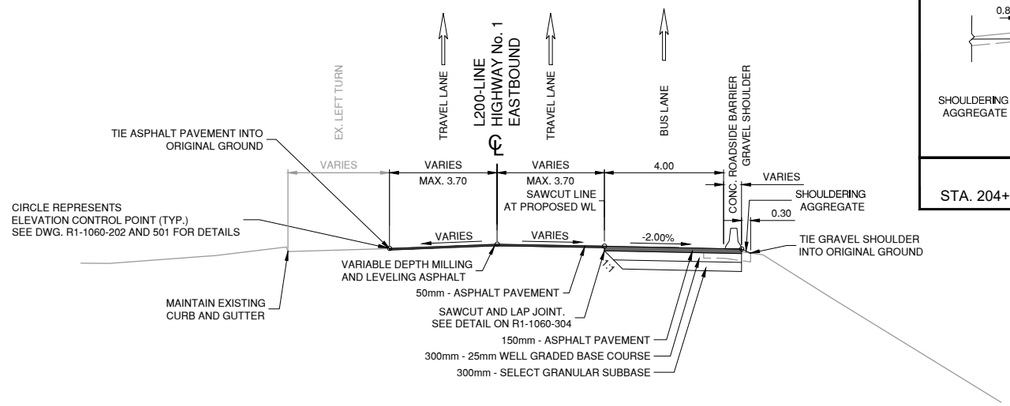
PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-302	



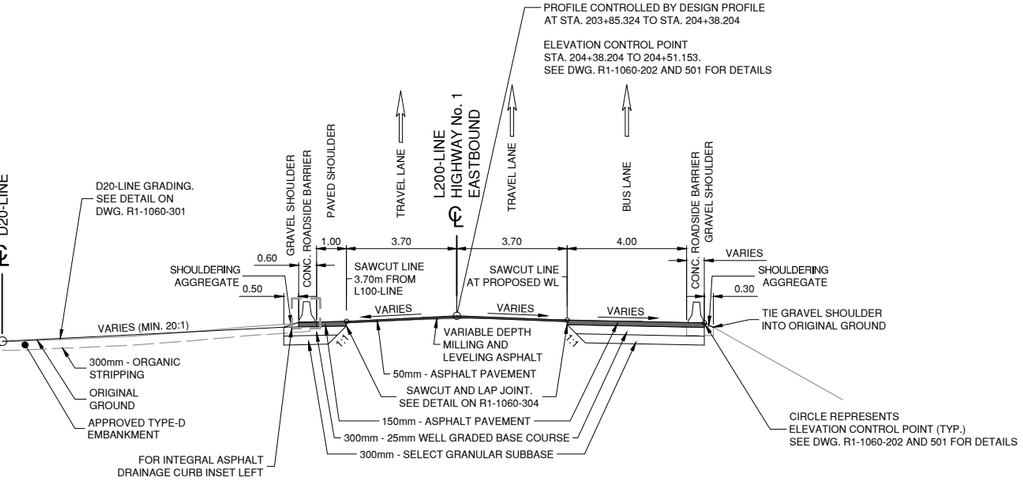
HIGHWAY No. 1 EASTBOUND (L200-LINE) - TYPICAL SECTION
SHOULDER WIDENING AND OVERLAY - BOTH SIDES - WITH BARRIER
STA. 202+30.000 TO STA. 202+97.761



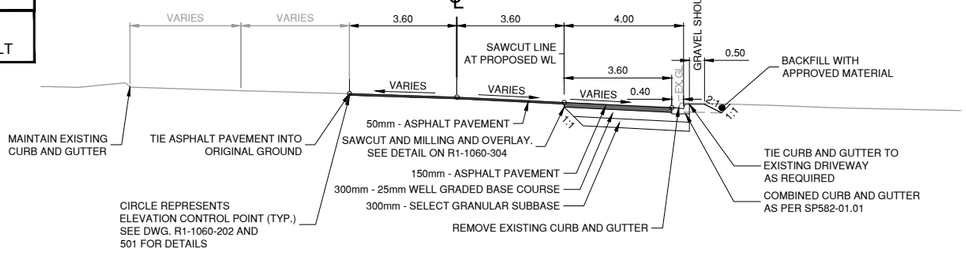
INSET
STA. 204+10.000 LT TO STA. 204+51.153 LT



HIGHWAY No. 1 EASTBOUND (L200-LINE) - TYPICAL SECTION
BUS LANE WIDENING
STA. 204+51.153 TO STA. 205+85.000



HIGHWAY No. 1 EASTBOUND (L200-LINE) - TYPICAL SECTION
CROWN ADJUSTMENT WITH WIDENING - BOTH SIDES
STA. 203+85.305 TO STA. 204+51.153



HIGHWAY No. 1 EASTBOUND (L200-LINE) - TYPICAL SECTION
CROWN ADJUSTMENT WITH CURB AND GUTTER
STA. 205+85.000 TO STA. 206+12.962

NOTES:

1. HYDROSEED ALL CUT AND FILL SLOPES.
2. SEE SS205 TABLE 205-D FOR RIPRAP NOMINAL THICKNESS.

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712
FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904	

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SCALE 0 1 1:100 5m

CAD FILENAME 300TS-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

TYPICAL SECTIONS
HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

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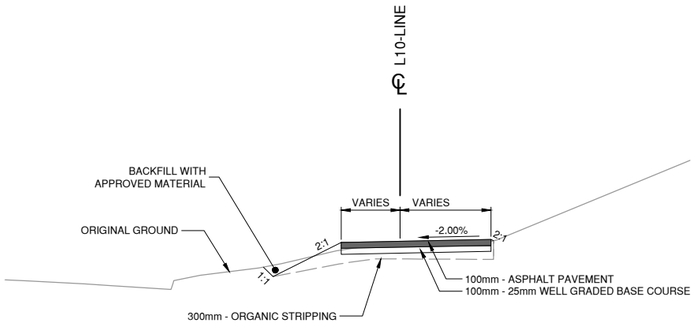
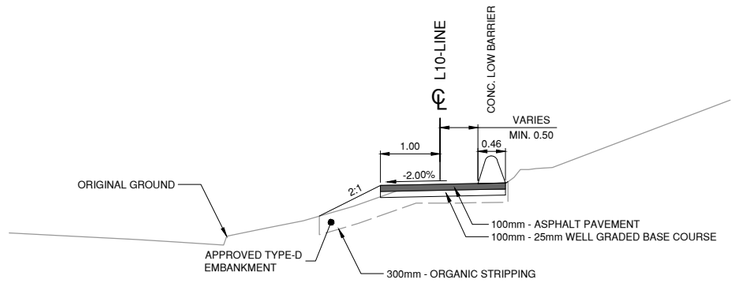
QUALITY ASSURANCE	M.C.	DATE SEPT. 2023
DRAWN	N.B.	DATE SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-303	



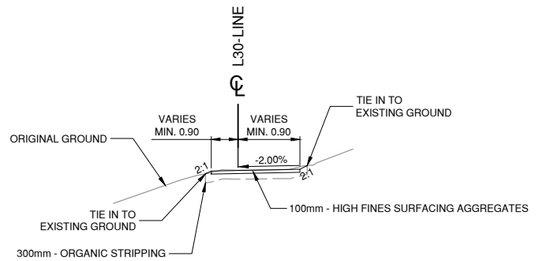
BURNSIDE ROAD EAST ASPHALT PAVEMENT SIDEWALK (L10-LINE)
TYPICAL SECTION
STA. 10+00.000 TO STA. 10+07.609

0 0.5 1:50 2.50m



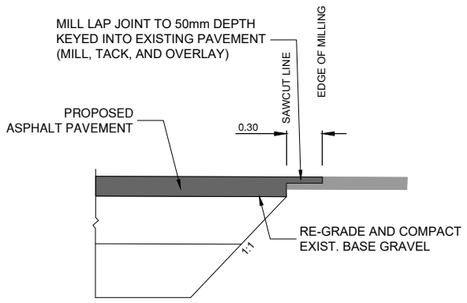
BURNSIDE ROAD EAST ASPHALT PAVEMENT SIDEWALK (L10-LINE)
TYPICAL SECTION
STA. 10+07.609 TO STA. 10+21.005

0 0.5 1:50 2.50m



BURNSIDE ROAD WEST GRAVEL SIDEWALK (L30-LINE)
TYPICAL SECTION
STA. 30+00.000 TO STA. 30+14.931
STA. 30+30.000 TO STA. 30+40.000
STA. 30+52.000 TO STA. 30+58.000

0 1 1:100 5m



PAVEMENT SAWCUT AND LAP JOINT DETAIL

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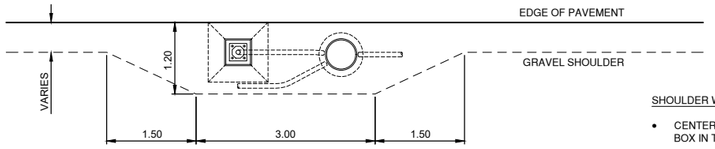
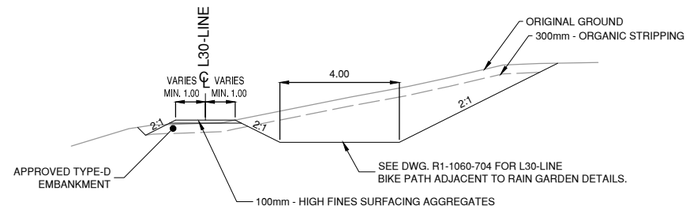


GRAVEL SHOULDER WIDENING AT LUMINAIRES
N.T.S.

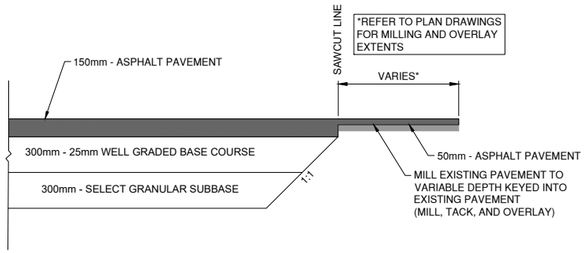
SHOULDER WIDENING NOTES:

- CENTER LUMINAIRE BASE AND JUNCTION BOX IN THE MIDDLE OF THE WIDENING.
- SEE ELECTRICAL DRAWINGS FOR LOCATION OF LUMINAIRE BASES AND JUNCTION BOXES.
- WIDENING IS FOR TYPES A, B AND C CONCRETE BASES. INCREASE WIDENING AS PER SP635-1.4.4. FOR OTHER BASES, EXCEPT FOR TYPE L1. TYPE L1 BASES WIDENING TO BE AS PER SP635-1.4.5.



BURNSIDE ROAD WEST GRAVEL SIDEWALK (L30-LINE)
RAIN GARDEN TYPICAL SECTION
STA. 30+40.000 TO STA. 30+52.000

0 1 1:100 5m



PAVEMENT SAWCUT AND MILLING, OVERLAY DETAIL
(SEE PLANS FOR LOCATIONS)

0 0.25 1:25 1.25m

NOTES:

1. HYDROSEED ALL CUT AND FILL SLOPES.
2. SEE SS205 TABLE 205-D FOR RIPRAP NOMINAL THICKNESS.

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712
FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904	

ISSUED FOR ENVIRONMENTAL PERMITTING - SEPT. 1, 2023

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BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

SCALE AS SHOWN
CAD FILENAME 300TS-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

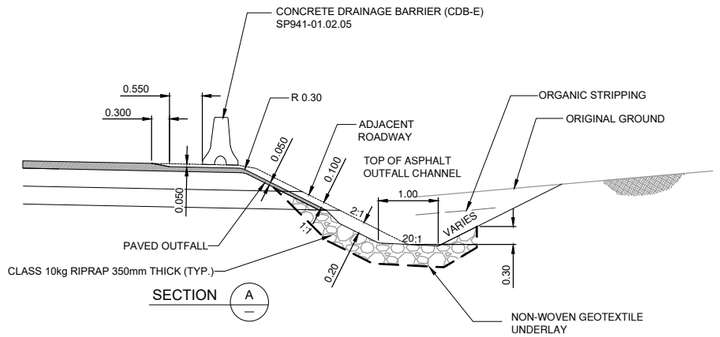
TYPICAL SECTIONS
HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

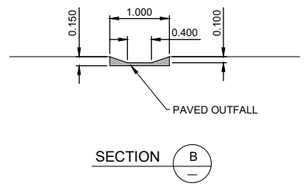
R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE NUMBER 1001128

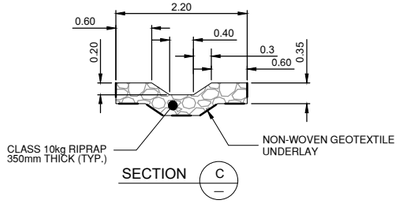
MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

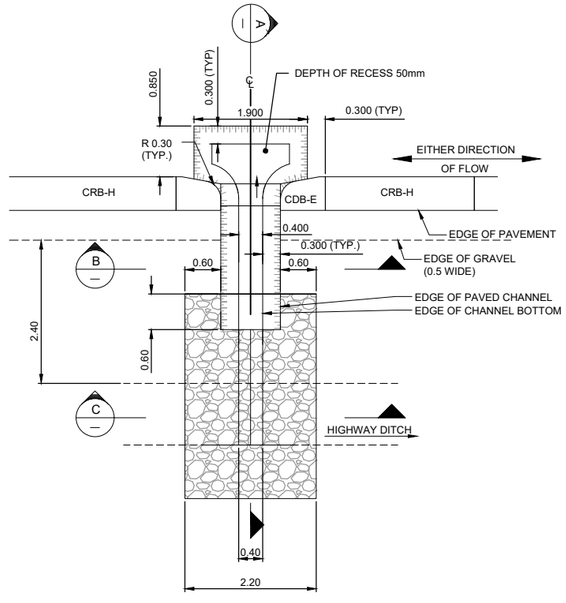
DESIGNED	M.C.	SEPT. 2023
QUALITY CONTROL	M.C.	SEPT. 2023
QUALITY ASSURANCE	M.C.	SEPT. 2023
DRAWN	N.B.	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-304	



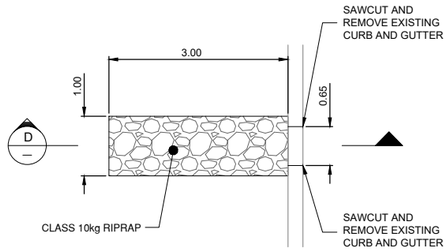


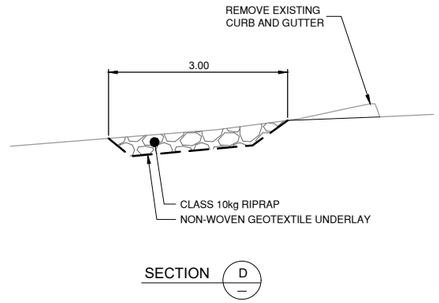




PAVED OUTFALL AT BARRIER - PLAN

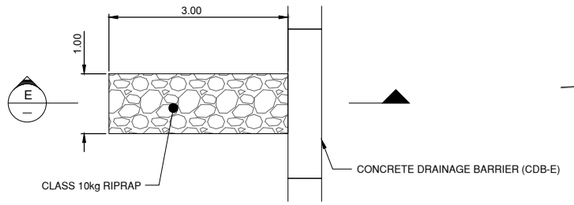
LOCATIONS AS SHOWN ON PLAN DRAWINGS

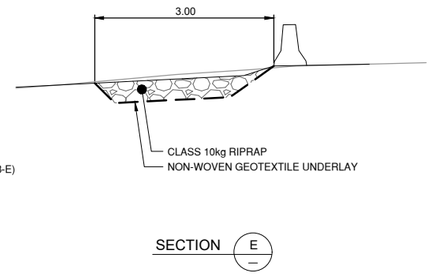




ASPHALT SPILLWAY AT MEDIAN - EXISTING CURB

LOCATIONS AS SHOWN ON PLAN DRAWINGS





ASPHALT SPILLWAY AT MEDIAN - BEHIND CRB

LOCATIONS AS SHOWN ON PLAN DRAWINGS

NOTES:

1. HYDROSEED ALL CUT AND FILL SLOPES.
2. SEE SS205 TABLE 205-D FOR RIPRAP NOMINAL THICKNESS.

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501	
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604	
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705	
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712	FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904

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DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

TYPICAL SECTIONS

HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

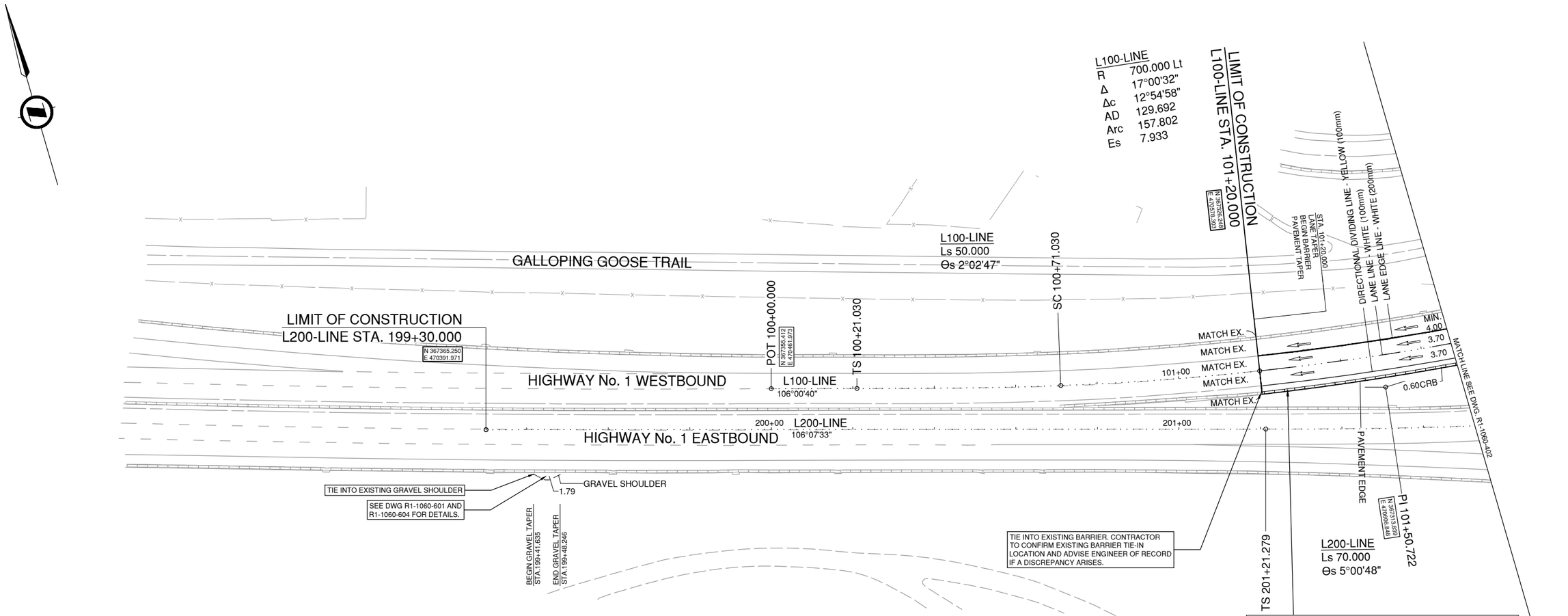
R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE NUMBER 1001128

M. M. CARREIRA # 41401 PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE	SEPT. 2023
QUALITY CONTROL	M.C.	DATE	SEPT. 2023
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	N.B.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-305	



NOTE:

1. SEE DWG. R1-1060-304 FOR GRAVEL SHOULDER WIDENING DETAILS.

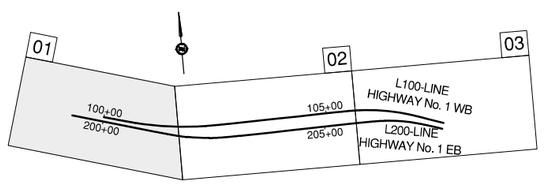
L200-LINE (HIGHWAY No.1) - DESIGN SPEED 90 km/h WEST OF STA. 204+60.000
L200-LINE (HIGHWAY No.1) - DESIGN SPEED 70 km/h EAST OF STA. 204+60.000

L100-LINE (HIGHWAY No.1) - DESIGN SPEED 90 km/h WEST OF STA. 105+10.000
L100-LINE (HIGHWAY No.1) - DESIGN SPEED 70 km/h EAST OF STA. 105+10.000

DESIGN VEHICLE WB-20

NOTE: HOLLOW ARROW INDICATES DIRECTION OF TRAVEL ONLY

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712
	FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904



ISSUED FOR ENVIRONMENTAL PERMITTING - SEPT. 1, 2023

BARRIER COMPONENTS
STA. 101+20.000 RT TO STA. 102+87.864 RT
STA. 102+59.591 RT TO STA. 102+79.564 RT (SLOTTED)

TYPE	No. OF UNITS	DESCRIPTION
CRB-H	28	NEW
CRB-E	28	NEW
CRB-H (SLOTTED)	4	NEW
CRB-H (SLOTTED)	4	NEW
CMB-E	1	NEW
CDB-E	1	NEW
CTB-2H	1	NEW
BPT	1	NEW

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CAD FILENAME 400GL-COLQUITZBRIDGES_22-0393.DWG
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BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

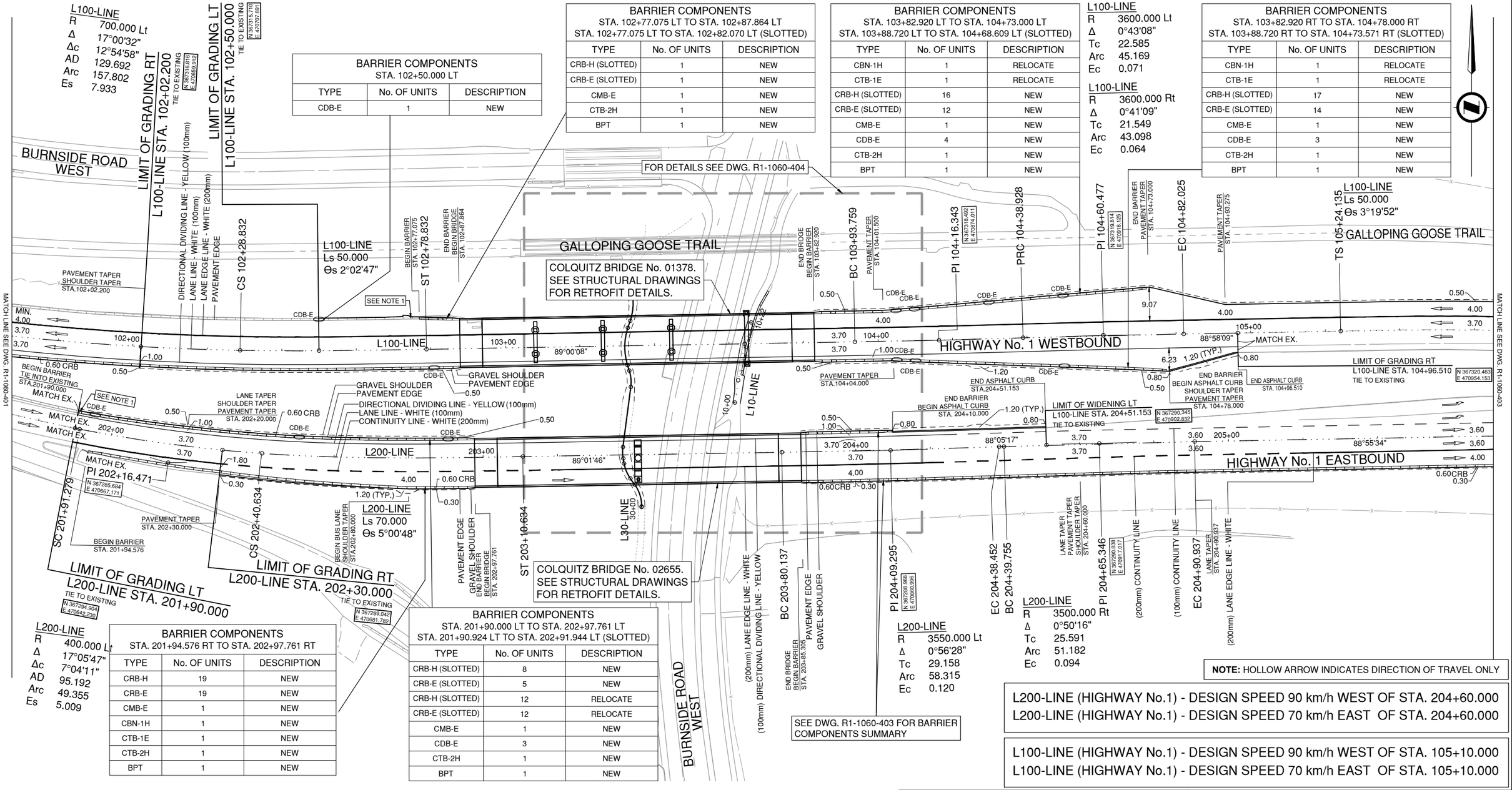
GEOMETRICS AND LANING
HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE	SEPT. 2023
QUALITY CONTROL	M.C.	DATE	SEPT. 2023
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	S.C.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-401	



BARRIER COMPONENTS
STA. 102+50.000 LT

TYPE	No. OF UNITS	DESCRIPTION
CDB-E	1	NEW

BARRIER COMPONENTS
STA. 102+77.075 LT TO STA. 102+87.864 LT
STA. 102+77.075 LT TO STA. 102+82.070 LT (SLOTTED)

TYPE	No. OF UNITS	DESCRIPTION
CRB-H (SLOTTED)	1	NEW
CRB-E (SLOTTED)	1	NEW
CMB-E	1	NEW
CTB-2H	1	NEW
BPT	1	NEW

BARRIER COMPONENTS
STA. 103+82.920 LT TO STA. 104+73.000 LT
STA. 103+88.720 LT TO STA. 104+68.609 LT (SLOTTED)

TYPE	No. OF UNITS	DESCRIPTION
CBN-1H	1	RELOCATE
CTB-1E	1	RELOCATE
CRB-H (SLOTTED)	16	NEW
CRB-E (SLOTTED)	12	NEW
CMB-E	1	NEW
CDB-E	4	NEW
CTB-2H	1	NEW
BPT	1	NEW

BARRIER COMPONENTS
STA. 103+82.920 RT TO STA. 104+78.000 RT
STA. 103+88.720 RT TO STA. 104+73.571 RT (SLOTTED)

TYPE	No. OF UNITS	DESCRIPTION
CBN-1H	1	RELOCATE
CTB-1E	1	RELOCATE
CRB-H (SLOTTED)	17	NEW
CRB-E (SLOTTED)	14	NEW
CMB-E	1	NEW
CDB-E	3	NEW
CTB-2H	1	NEW
BPT	1	NEW

BARRIER COMPONENTS
STA. 201+94.576 RT TO STA. 202+97.761 RT

TYPE	No. OF UNITS	DESCRIPTION
CRB-H	19	NEW
CRB-E	19	NEW
CMB-E	1	NEW
CBN-1H	1	NEW
CTB-1E	1	NEW
CTB-2H	1	NEW
BPT	1	NEW

BARRIER COMPONENTS
STA. 201+90.000 LT TO STA. 202+97.761 LT
STA. 201+90.924 LT TO STA. 202+91.944 LT (SLOTTED)

TYPE	No. OF UNITS	DESCRIPTION
CRB-H (SLOTTED)	8	NEW
CRB-E (SLOTTED)	5	NEW
CRB-H (SLOTTED)	12	RELOCATE
CRB-E (SLOTTED)	12	RELOCATE
CMB-E	1	NEW
CDB-E	3	NEW
CTB-2H	1	NEW
BPT	1	NEW

SEE DWG. R1-1060-403 FOR BARRIER COMPONENTS SUMMARY

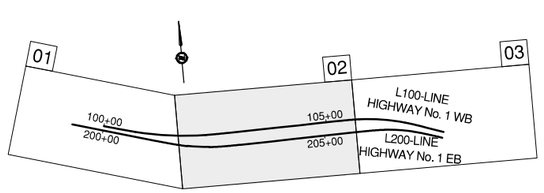
NOTE: HOLLOW ARROW INDICATES DIRECTION OF TRAVEL ONLY

L200-LINE (HIGHWAY No.1) - DESIGN SPEED 90 km/h WEST OF STA. 204+60.000
L200-LINE (HIGHWAY No.1) - DESIGN SPEED 70 km/h EAST OF STA. 204+60.000

L100-LINE (HIGHWAY No.1) - DESIGN SPEED 90 km/h WEST OF STA. 105+10.000
L100-LINE (HIGHWAY No.1) - DESIGN SPEED 70 km/h EAST OF STA. 105+10.000

NOTES:

1. TIE INTO EXISTING BARRIER. CONTRACTOR TO CONFIRM EXISTING BARRIER TIE-IN LOCATION AND ADVISE ENGINEER OF RECORD IF A DISCREPANCY ARISES.
2. SEE DWG. R1-1060-304 FOR GRAVEL SHOULDER WIDENING DETAILS.



FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712
	FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904

DESIGN VEHICLE WB-20

ISSUED FOR ENVIRONMENTAL PERMITTING - SEPT. 1, 2023

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CAD FILENAME 400GL-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

GEOMETRICS AND LANING

HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

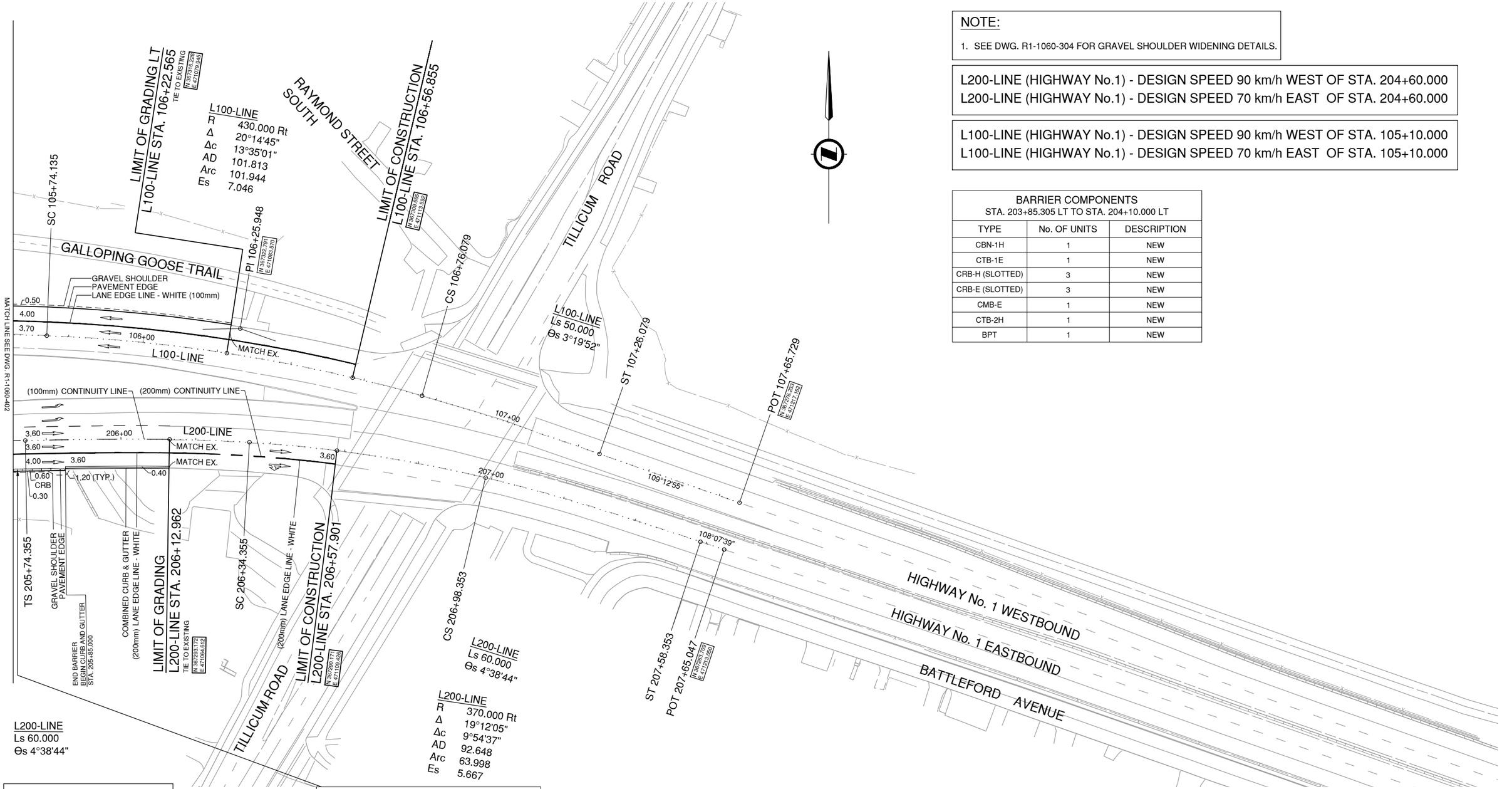
R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE	SEPT. 2023
QUALITY CONTROL	M.C.	DATE	SEPT. 2023
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	S.C.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-402	

Sep. 1, 2023 - 03:56 PM P:\2022\22-0393\10 - CAD Files\04-Colquitz\Bridges\Drawing\Production\400_Geometrics\Laning\400GL-ColquitzBridges_22-0393.dwg



MATCH LINE SEE DWG. R1-1060-402

NOTE:

1. SEE DWG. R1-1060-304 FOR GRAVEL SHOULDER WIDENING DETAILS.

L200-LINE (HIGHWAY No.1) - DESIGN SPEED 90 km/h WEST OF STA. 204+60.000
L200-LINE (HIGHWAY No.1) - DESIGN SPEED 70 km/h EAST OF STA. 204+60.000

L100-LINE (HIGHWAY No.1) - DESIGN SPEED 90 km/h WEST OF STA. 105+10.000
L100-LINE (HIGHWAY No.1) - DESIGN SPEED 70 km/h EAST OF STA. 105+10.000

BARRIER COMPONENTS
STA. 203+85.305 LT TO STA. 204+10.000 LT

TYPE	No. OF UNITS	DESCRIPTION
CBN-1H	1	NEW
CTB-1E	1	NEW
CRB-H (SLOTTED)	3	NEW
CRB-E (SLOTTED)	3	NEW
CMB-E	1	NEW
CTB-2H	1	NEW
BPT	1	NEW

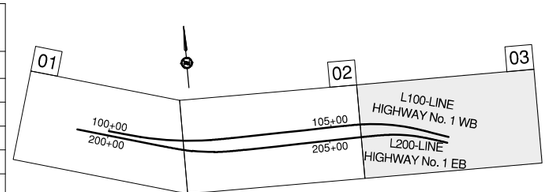
DESIGN VEHICLE WB-20

NOTE: HOLLOW ARROW INDICATES DIRECTION OF TRAVEL ONLY

FOR PLANS SEE DWG. R1-1060-101 TO 103
FOR SPOT ELEVATIONS SEE DWG. R1-1060-501
FOR PROFILES SEE DWG. R1-1060-201 TO 204
FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305
FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404
FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712
FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904

BARRIER COMPONENTS
STA. 203+85.305 RT TO STA. 205+85.000 RT

TYPE	No. OF UNITS	DESCRIPTION
CBN-1H	1	NEW
CTB-1E	1	NEW
CRB-H	38	NEW
CRB-E	38	NEW
CMB-E	1	NEW
CTB-2H	1	NEW
BPT	1	NEW



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DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

GEOMETRICS AND LANING

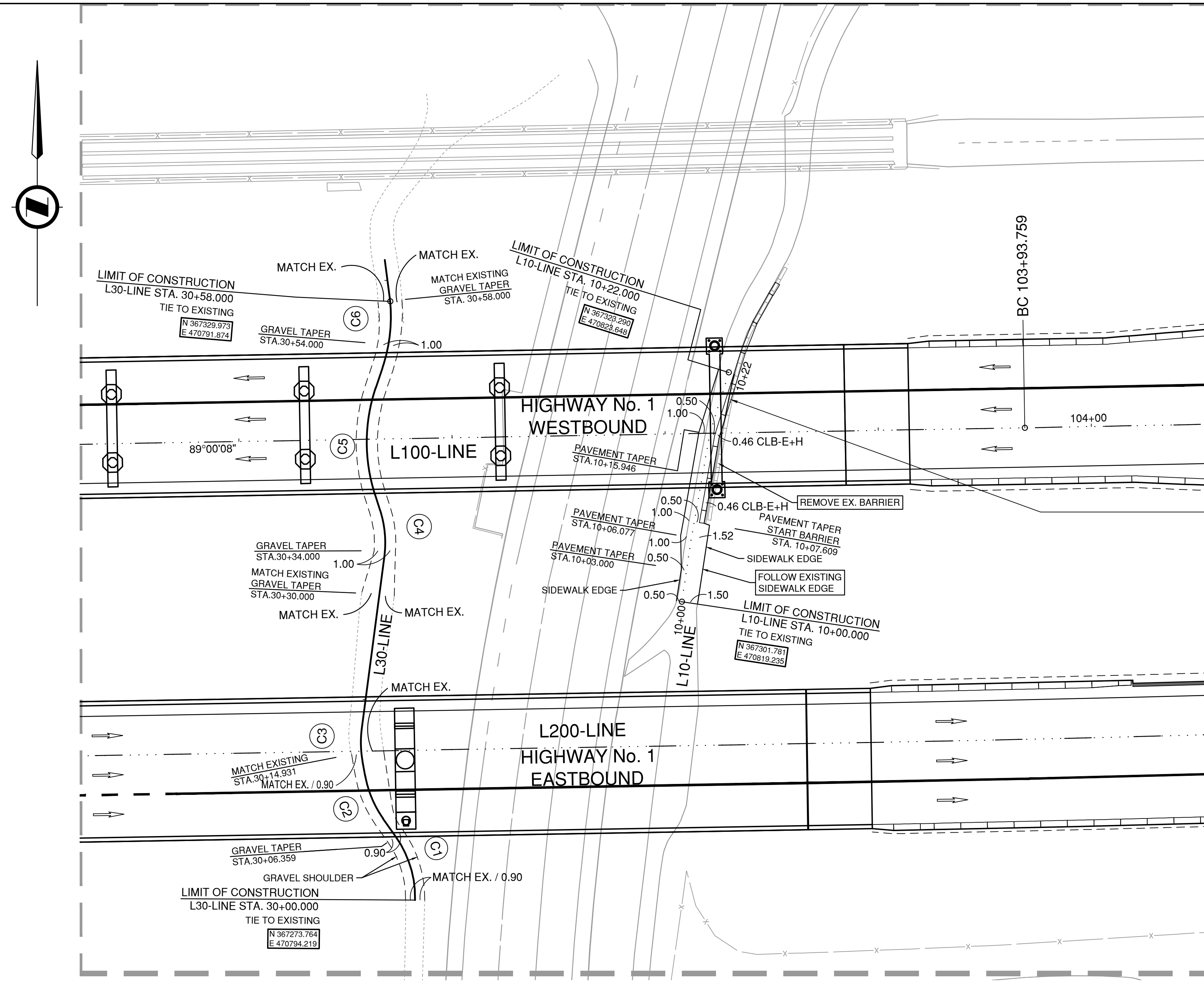
HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE	SEPT. 2023
QUALITY CONTROL	M.C.	DATE	SEPT. 2023
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	S.C.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-403	



L10-LINE AND L30-LINE PLAN

L10-LINE LAYOUT DATA	
BEARING IN 8° 29' 18"	BEARING IN 10° 00' 00"
PI 10+06.077	PI 10+15.946
N 367307.791 E 470820.132	N 367317.511 E 470821.846
BEARING OUT 10° 00' 00"	BEARING OUT 17° 18' 51"

BARRIER COMPONENTS

TYPE	No. OF UNITS	DESCRIPTION
CBN-1H	1	NEW
CBN-1E	1	NEW
CLB-E+H	7	NEW

L30-LINE CURVE DATA

1	2	3	4
BEARING IN 0° 22' 06"	BEARING IN 324° 47' 06"	BEARING IN 349° 46' 36"	BEARING IN 7° 28' 07"
R 10.000 Lt Δ 35°35'01" Tc 3.209 Arc 6.210 Es 0.502	R 10.000 Rt Δ 24°59'31" Tc 2.216 Arc 4.362 Es 0.243	R 10.000 Rt Δ 17°41'30" Tc 1.556 Arc 3.088 Es 0.120	R 10.000 Lt Δ 25°20'51" Tc 2.249 Arc 4.424 Es 0.250
BEARING OUT 324° 47' 06"	BEARING OUT 349° 46' 36"	BEARING OUT 7° 28' 07"	BEARING OUT 342° 07' 16"
PI 30+03.358	PI 30+10.628	PI 30+15.738	PI 30+35.774
N 367277.121 E 470794.240	N 367283.231 E 470789.928	N 367288.329 E 470789.009	N 367308.220 E 470791.616
BC 30+00.148	BC 30+08.412	BC 30+14.182	BC 30+33.526
EC 30+06.359	EC 30+12.773	EC 30+17.270	EC 30+37.950

L30-LINE CURVE DATA

5	6
BEARING IN 342° 07' 16"	BEARING IN 18° 38' 33"
R 16.000 Rt Δ 36°31'17" Tc 5.279 Arc 10.199 Es 0.848	R 15.000 Lt Δ 26°03'28" Tc 3.471 Arc 6.822 Es 0.396
BEARING OUT 18° 38' 33"	BEARING OUT 352° 35' 05"
PI 30+44.759	PI 30+55.136
N 367316.841 E 470788.835	N 367327.014 E 470792.267
BC 30+39.480	BC 30+51.665
EC 30+49.679	EC 30+58.487

NOTE: HOLLOW ARROW INDICATES DIRECTION OF TRAVEL ONLY

FOR PLANS
SEE DWG. R1-1060-101 TO 103

FOR SPOT ELEVATIONS
SEE DWG. R1-1060-501

FOR PROFILES
SEE DWG. R1-1060-201 TO 204

FOR SIGNING AND PAVEMENT MARKINGS
SEE DWG. R1-1060-601 TO 604

FOR TYPICAL SECTIONS
SEE DWG. R1-1060-301 TO 305

FOR DRAINAGE PLANS AND DETAILS
SEE DWG. R1-1060-701 TO 705

FOR GEOMETRICS AND LANING
SEE DWG. R1-1060-401 TO 404

FOR STORM DRAIN PROFILES
SEE DWG. R1-1060-710 TO 712

FOR LANDSCAPE PLANS AND DETAILS
SEE DWG. R1-1060-901 TO 904

ISSUED FOR ENVIRONMENTAL PERMITTING - SEPT. 1, 2023

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BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

SCALE 0 2 1:250 12m
CAD FILENAME 400GL-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

GEOMETRICS AND LANING

HIGHWAY No. 1

COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

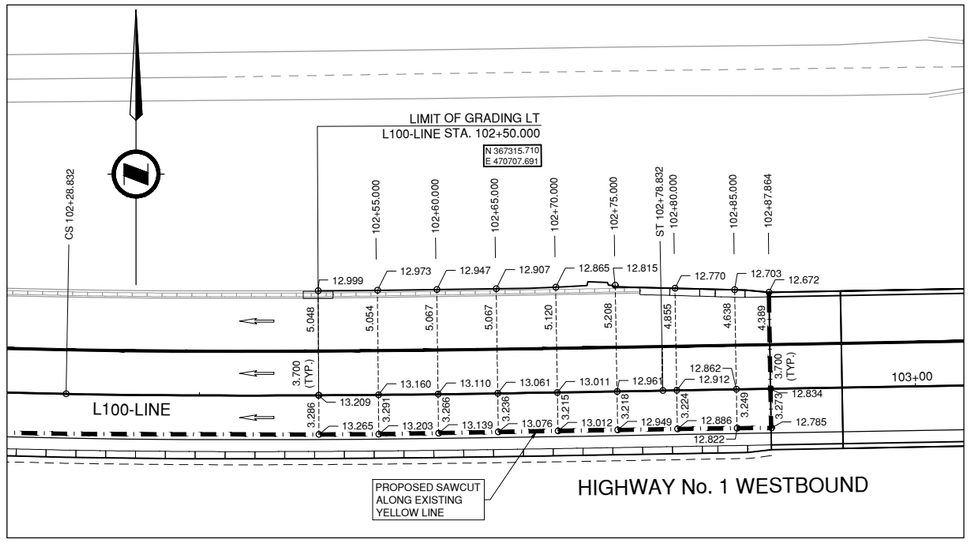
R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA M. M. CARREIRA # 45481 2023-09-01

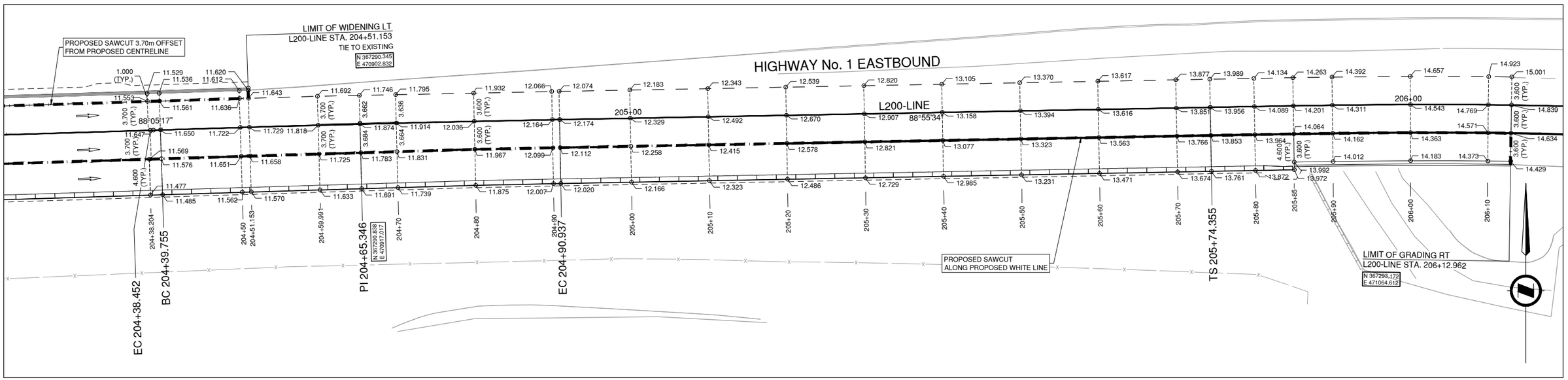
MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED M.C. DATE SEPT. 2023
QUALITY CONTROL M.C. DATE SEPT. 2023
QUALITY ASSURANCE M.C. DATE SEPT. 2023
DRAWN S.C. DATE SEPT. 2023

PROJECT NUMBER 16786-0001
REG 1
DRAWING NUMBER R1-1060-404
REV



L100-LINE SPOT ELEVATIONS
STA. 102+50.000 TO STA. 102+87.864



L200-LINE SPOT ELEVATIONS
STA. 204+38.204 TO STA. 206+12.962

SPOT ELEVATIONS TO BE CONFIRMED BEFORE CONSTRUCTION.

NOTES:

1. SPOT ELEVATIONS SHOWN ARE AT FINISHED GRADE PAVEMENT ELEVATION AT CENTRELINE, EDGE OF TRAVEL LANE, EDGE OF PAVEMENT, FACE OF DRAINAGE CURB AND LIP OF GUTTER UNLESS OTHERWISE NOTED. FOR CURVE DATA SEE GEOMETRICS AND LANING.
2. SPOT ELEVATIONS ARE SHOWN AT 5m INTERVALS ALONG THE L100-LINE AND AT 10m INTERVALS ALONG L200-LINE UNLESS OTHERWISE NOTED.
3. SEE GEOMETRICS AND LANING FOR OFFSETS TO EDGE OF PAVEMENT WHERE NOT SHOWN

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501	
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604	
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705	
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712	FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904

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SCALE 0 2 1:250 12m

CAD FILENAME 500SE-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-08-25
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

SPOT ELEVATIONS

HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

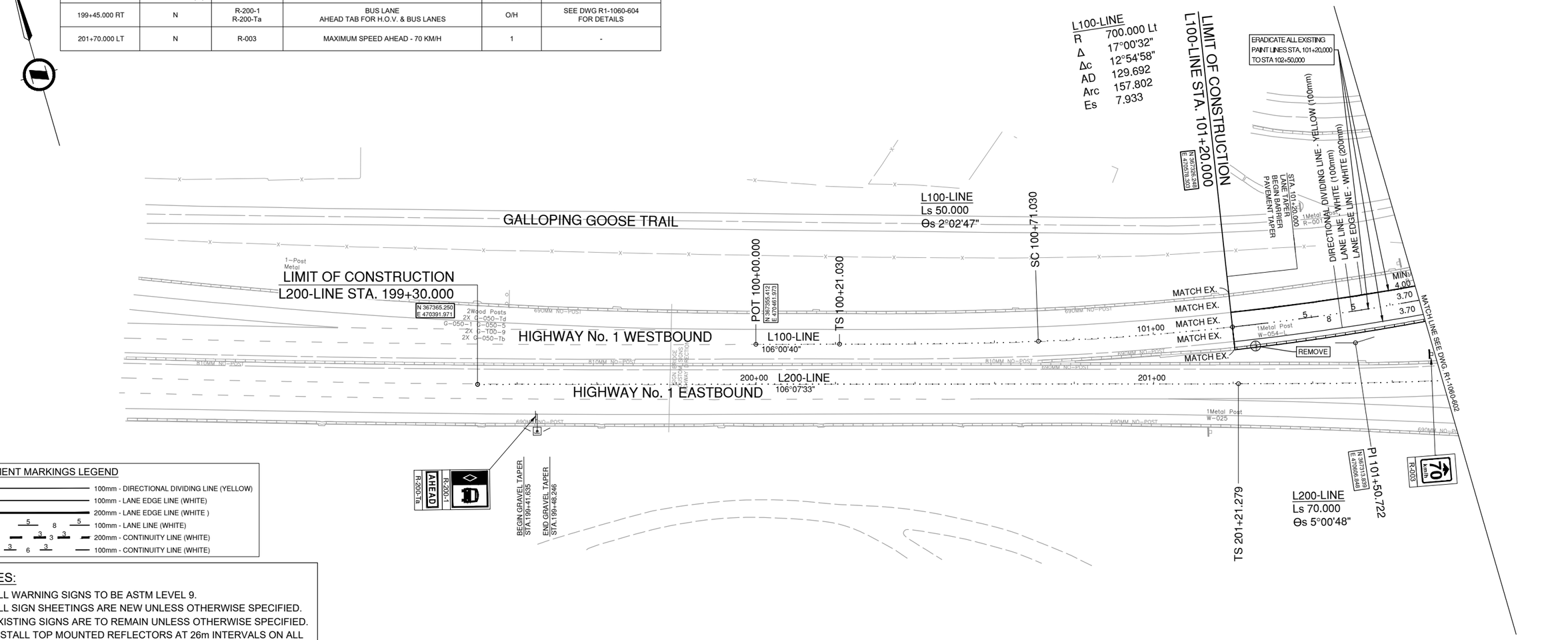
R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE	SEPT. 2023
QUALITY CONTROL	M.C.	DATE	SEPT. 2023
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	N.B.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-501	

SIGNS ASSOCIATED WITH DRAWING R1-1060-601					
SIGN LOCATION	NEW (N) OR RELOCATE (R)	SIGN BOARDS	SIGN BOARD DESCRIPTION	NUMBER OF POSTS	COMMENTS
199+45.000 RT	N	R-200-1 R-200-Ta	BUS LANE AHEAD TAB FOR H.O.V. & BUS LANES	O/H	SEE DWG R1-1060-604 FOR DETAILS
201+70.000 LT	N	R-003	MAXIMUM SPEED AHEAD - 70 KM/H	1	-



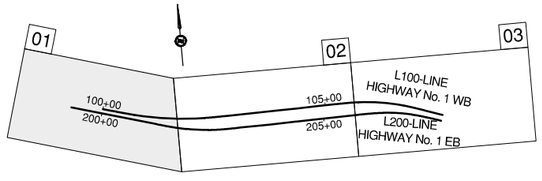
PAVEMENT MARKINGS LEGEND

- 100mm - DIRECTIONAL DIVIDING LINE (YELLOW)
- 100mm - LANE EDGE LINE (WHITE)
- 200mm - LANE EDGE LINE (WHITE)
- 100mm - LANE LINE (WHITE) — 5, 8, 5
- 200mm - CONTINUITY LINE (WHITE) — 3, 3, 3
- 100mm - CONTINUITY LINE (WHITE) — 3, 6, 3

NOTES:

1. ALL WARNING SIGNS TO BE ASTM LEVEL 9.
2. ALL SIGN SHEETINGS ARE NEW UNLESS OTHERWISE SPECIFIED.
3. EXISTING SIGNS ARE TO REMAIN UNLESS OTHERWISE SPECIFIED.
4. INSTALL TOP MOUNTED REFLECTORS AT 26m INTERVALS ON ALL BARRIERS. WHITE REFLECTORS SHOULD BE USED ON BARRIERS LOCATED ALONG THE SHOULDER AND YELLOW DOUBLE SIDED REFLECTORS FOR BARRIER LOCATED IN THE MEDIAN.
5. ALL PAVEMENT MARKINGS, RPM'S , DELINEATORS, BARRIER REFLECTORS AND SIGNING SHALL BE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE M.O.T.I. MANUAL OF STANDARD TRAFFIC SIGNS AND PAVEMENT MARKINGS.
6. REMOVE EXISTING DELINEATOR POSTS WITHIN LIMITS OF CONSTRUCTION.
7. THERMOPLASTIC PAINT MARKINGS SHALL BE USED FOR CROSS WALKS, STOP BARS, GORE CHEVRONS AND TURN ARROWS.
8. EXISTING GROUND CONDITIONS MAY MEET SP 635-1.4.4 REQUIREMENTS. MINSITRY REPRESENTATIVE TO REVIEW IN THE FIELD AND CONFIRM IF REQUIREMENTS ARE MET.

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712
FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904	



L200-LINE (HIGHWAY No.1) - DESIGN SPEED 90 km/h WEST OF STA. 204+60.000
L200-LINE (HIGHWAY No.1) - DESIGN SPEED 70 km/h EAST OF STA. 204+60.000

L100-LINE (HIGHWAY No.1) - DESIGN SPEED 90 km/h WEST OF STA. 105+10.000
L100-LINE (HIGHWAY No.1) - DESIGN SPEED 70 km/h EAST OF STA. 105+10.000

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CAD FILENAME 600SP-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

SIGNING AND PAVEMENT MARKINGS

HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

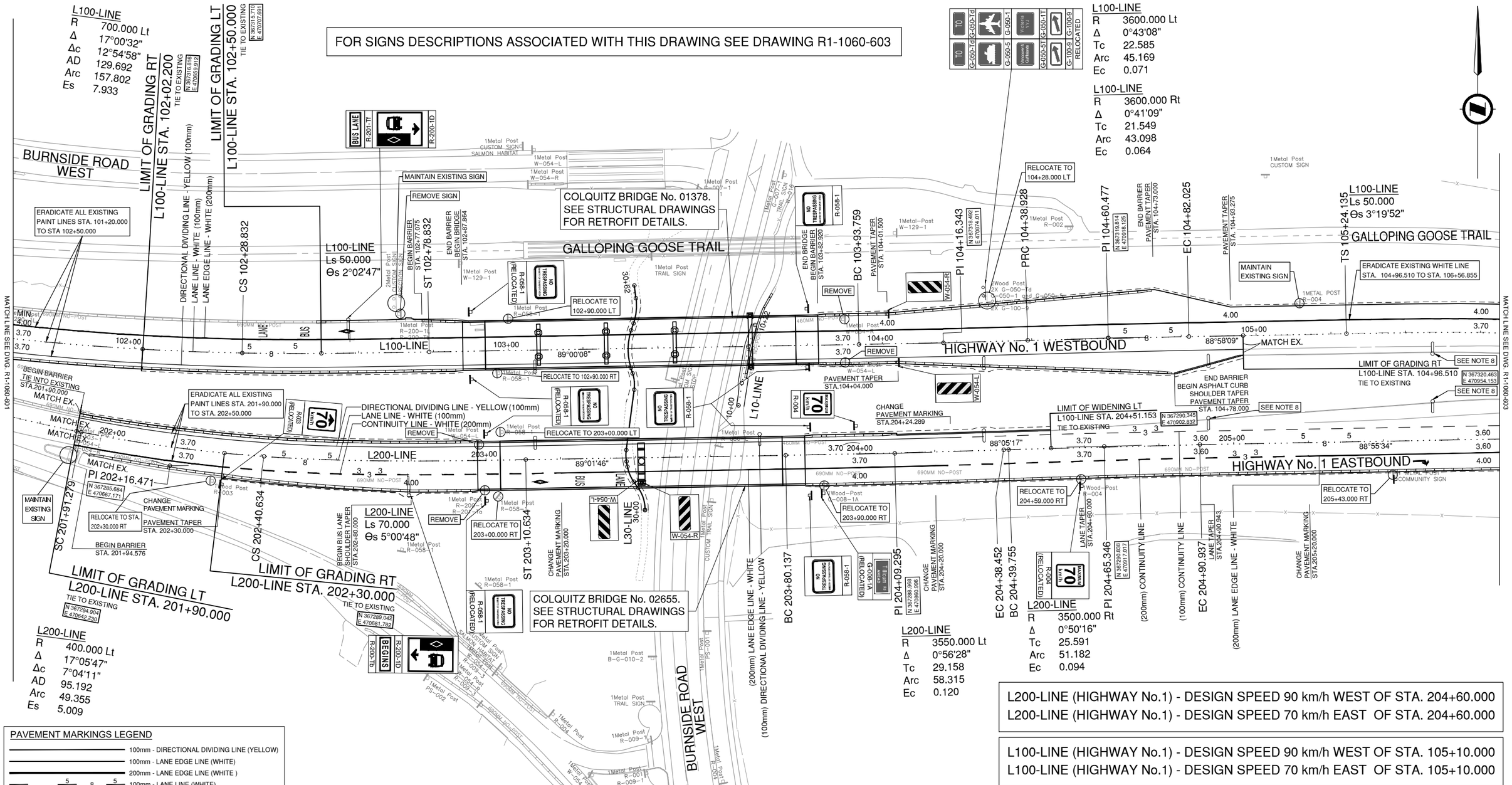
R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE NUMBER 1001128

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE	SEPT. 2023
QUALITY CONTROL	M.C.	DATE	SEPT. 2023
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	S.C.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-601	

Sep. 1, 2023 - 04:00 PM P:\2022\22-0393\10 - CAD Files\05-Colquitz Bridges\Drawing\Production\600 - Signage\Pavement Markings\600SP -Colquitz Bridges_22-0393



FOR SIGNS DESCRIPTIONS ASSOCIATED WITH THIS DRAWING SEE DRAWING R1-1060-603

L200-LINE (HIGHWAY No.1) - DESIGN SPEED 90 km/h WEST OF STA. 204+60.000
L200-LINE (HIGHWAY No.1) - DESIGN SPEED 70 km/h EAST OF STA. 204+60.000

L100-LINE (HIGHWAY No.1) - DESIGN SPEED 90 km/h WEST OF STA. 105+10.000
L100-LINE (HIGHWAY No.1) - DESIGN SPEED 70 km/h EAST OF STA. 105+10.000

PAVEMENT MARKINGS LEGEND

———	100mm - DIRECTIONAL DIVIDING LINE (YELLOW)
———	100mm - LANE EDGE LINE (WHITE)
━━━	200mm - LANE EDGE LINE (WHITE)
— 5 8 5 —	100mm - LANE LINE (WHITE)
▬ 3 3 3 ▬	200mm - CONTINUITY LINE (WHITE)
— 3 6 3 —	100mm - CONTINUITY LINE (WHITE)

FOR CONSTRUCTION NOTES SEE DWG. R1-1060-601

FOR PLANS
SEE DWG. R1-1060-101 TO 103

FOR SPOT ELEVATIONS
SEE DWG. R1-1060-501

FOR PROFILES
SEE DWG. R1-1060-201 TO 204

FOR SIGNING AND PAVEMENT MARKINGS
SEE DWG. R1-1060-601 TO 604

FOR TYPICAL SECTIONS
SEE DWG. R1-1060-301 TO 305

FOR DRAINAGE PLANS AND DETAILS
SEE DWG. R1-1060-701 TO 705

FOR GEOMETRICS AND LANING
SEE DWG. R1-1060-401 TO 404

FOR STORM DRAIN PROFILES
SEE DWG. R1-1060-710 TO 712

FOR LANDSCAPE PLANS AND DETAILS
SEE DWG. R1-1060-901 TO 904

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MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

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CAD FILENAME 600SP-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

SIGNING AND PAVEMENT MARKINGS
HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

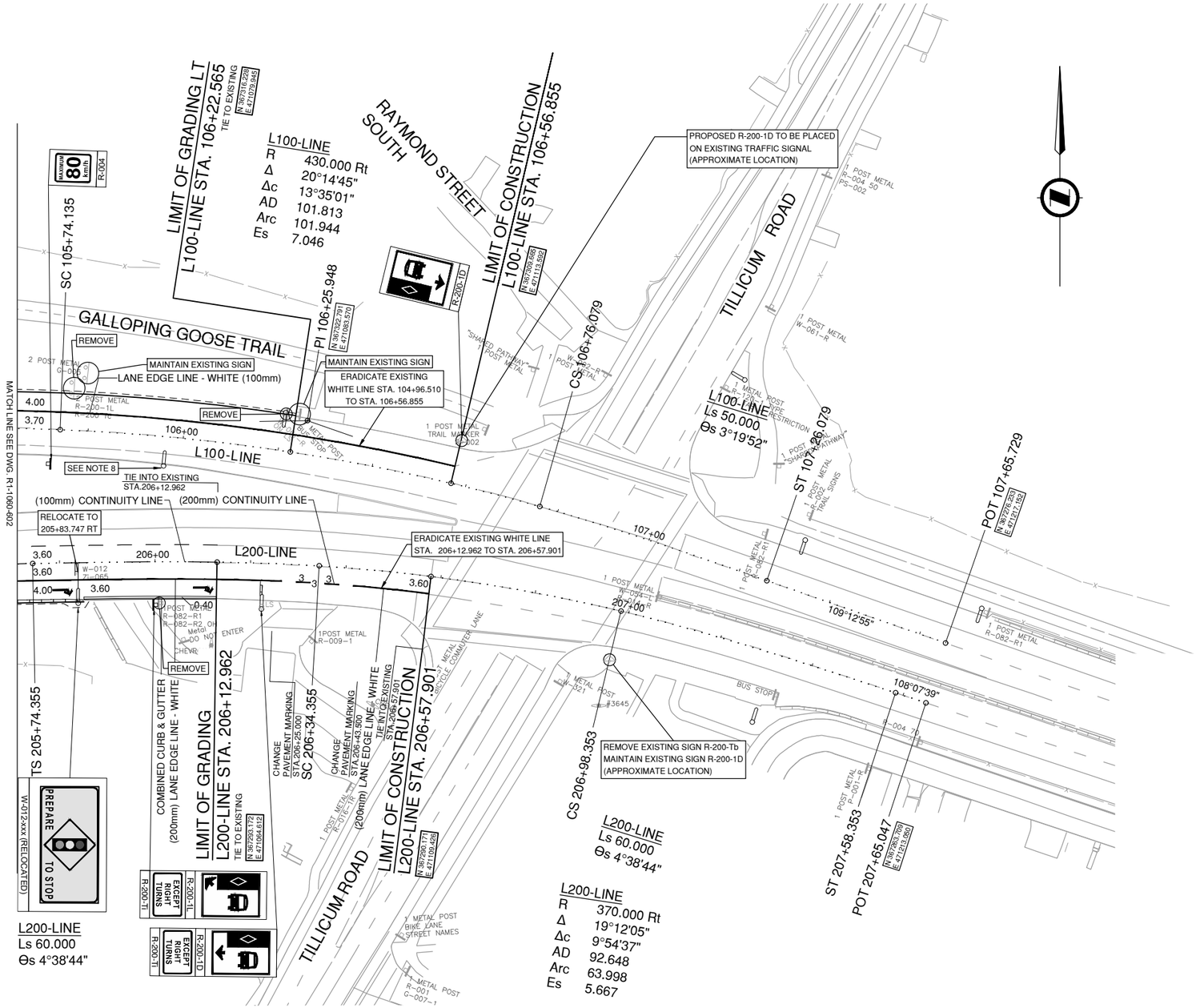
R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA
M. M. CARREIRA
45481
2023-09-01

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE	SEPT. 2023
QUALITY CONTROL	M.C.	DATE	SEPT. 2023
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	S.C.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-602	



SIGNS ASSOCIATED WITH DRAWING R1-1060-602					
SIGN LOCATION	NEW (N) OR RELOCATE (R)	SIGN BOARDS	SIGN BOARD DESCRIPTION	NUMBER OF POSTS	COMMENTS
102+57.251 LT	N	R-201-Tf R-200-1D	BUS LANE BUS LANE - DOWN ARROW	O/H	ON PROPOSED LUMINAIRE SEE DWG. TE-16023-5
102+90.000 LT	R	R-058-1	NO TRESPASSING	1	-
102+90.000 RT	R	R-058-1	NO TRESPASSING	1	-
103+80.000 LT	N	R-058-1	NO TRESPASSING	1	-
103+80.000 RT	N	R-058-1	NO TRESPASSING	1	-
104+01.500 LT	N	W-054-R	HAZARD MARKER - RIGHT	1	MOUNT ON BARRIER
104+04.000 RT	N	W-054-L	HAZARD MARKER - LEFT	1	MOUNT ON BARRIER
104+28.000 LT	R	2X G-050-Td G-050-1 G-050-5 2X G-050-Tc 2X G-100-9	2X WAYFINDING SERIES TAB: "TO" WAYFINDING SERIES: COMMERCIAL AIRPORT WAYFINDING SERIES: PASSENGER FERRY 2X WAYFINDING SERIES TAB: DOUBLE LINE DESTINATION 2X RIGHT ANGLED ARROW TAB	2	-
202+30.000 RT	R	R-003	MAXIMUM SPEED AHEAD - 70 KM/H	1	-
202+79.386 RT	N	R-200-1D R-200-Tb	BUS LANE - DOWN ARROW BEGINS TAB FOR H.O.V. & BUS LANES	1	ON PROPOSED LUMINAIRE SEE DWG. TE-16023-5
203+00.000 LT	R	R-058-1	NO TRESPASSING	1	-
203+00.000 RT	R	R-058-1	NO TRESPASSING	1	-
203+86.500 LT	N	R-058-1	NO TRESPASSING	1	-
203+86.500 RT	N	R-058-1	NO TRESPASSING	1	-
203+90.000 RT	R	G-008-1A	TILLICUM ROAD AHEAD - SIDE MOUNT	1	-
203+99.000 LT	N	R-004	MAXIMUM POSTED SPEED 70 KM/H	1	-
204+59.000 RT	R	R-004	MAXIMUM POSTED SPEED 70 KM/H	1	-
205+43.000 RT	R	-	COMMUNITY SIGN	1	-
30+07.009 RT	N	W-054-L	HAZARD MARKER - LEFT	0	MOUNT ON COLUMN
30+07.009 RT	N	W-054-R	HAZARD MARKER - LEFT	0	MOUNT ON COLUMN

SIGNS ASSOCIATED WITH DRAWING R1-1060-603					
SIGN LOCATION	NEW (N) OR RELOCATE (R)	SIGN BOARDS	SIGN BOARD DESCRIPTION	NUMBER OF POSTS	COMMENTS
105+72.000 RT	N	R-004	MAXIMUM POSTED SPEED 80 KM/H	1	-
106+57.000 LT	N	R-200-1D	BUS LANE - DOWN ARROW	O/H	ON EXISTING TRAFFIC SIGNAL OVER BUS LANE SEE DWG. TE-23001-2
205+83.747 RT	R	W-012-xxx ZI-065	PREPARE TO STOP (SIGNAL LIGHT GRAPHIC) RED LIGHT CAMERA	O/H	
206+00.000 RT	N	R-200-1L R-200-Ti	BUS LANE - DOWN ANGLED LEFT ARROW EXCEPT RIGHT TURNS TAB	1	-
206+22.580 RT	N	R-200-1D R-200-Ti	BUS LANE - DOWN ARROW EXCEPT RIGHT TURNS TAB	O/H	ON EXISTING LUMINAIRE

PAVEMENT MARKINGS LEGEND

- 100mm - DIRECTIONAL DIVIDING LINE (YELLOW)
- 100mm - LANE EDGE LINE (WHITE)
- 200mm - LANE EDGE LINE (WHITE)
- 100mm - LANE LINE (WHITE) (5 8 5)
- 200mm - CONTINUITY LINE (WHITE) (3 3 3)
- 100mm - CONTINUITY LINE (WHITE) (3 6 3)

L200-LINE (HIGHWAY No.1) - DESIGN SPEED 90 km/h WEST OF STA. 204+60.000
L200-LINE (HIGHWAY No.1) - DESIGN SPEED 70 km/h EAST OF STA. 204+60.000

L100-LINE (HIGHWAY No.1) - DESIGN SPEED 90 km/h WEST OF STA. 105+10.000
L100-LINE (HIGHWAY No.1) - DESIGN SPEED 70 km/h EAST OF STA. 105+10.000

FOR CONSTRUCTION NOTES SEE DWG. R1-1060-601

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501	
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604	
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705	
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712	FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904

ISSUED FOR ENVIRONMENTAL PERMITTING - SEPT. 1, 2023

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SCALE 0 5 1:500 25m
CAD FILENAME 600SP-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

BRITISH COLUMBIA
MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

SIGNING AND PAVEMENT MARKINGS
HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

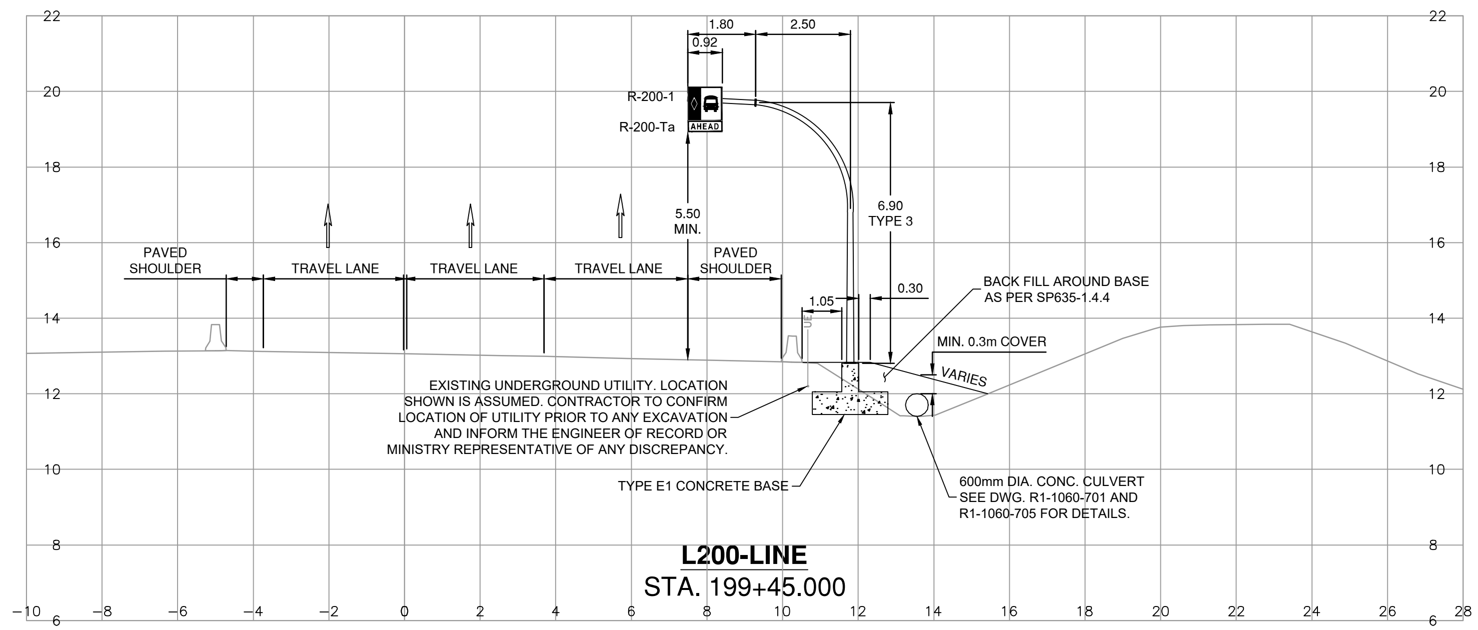
R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE SEPT. 2023
QUALITY CONTROL	M.C.	DATE SEPT. 2023
QUALITY ASSURANCE	M.C.	DATE SEPT. 2023
DRAWN	S.C.	DATE SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-603	

Sep. 1, 2023 - 04:07 PM P:\2022\22-0393\00 - CAD Files\05-Civil\Bridges\Drawings\Production\600_Signing\Pavement Markings\600SP-ColquitzBridges_22-0393



L200-LINE

STA. 199+45.000

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305	FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712

FOR LANDSCAPE PLANS AND DETAILS
SEE DWG. R1-1060-901 TO 904

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SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

SCALE 0 1 1:100 5m

CAD FILENAME 600GD-OH_XS-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-08-25
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

OVERHEAD SIGN DETAILS

HIGHWAY No. 1

COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

MICHAEL CARREIRA
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE	SEPT. 2023
QUALITY CONTROL	M.C.	DATE	SEPT. 2023
QUALITY ASSURANCE	M.C.	DATE	SEPT. 2023
DRAWN	J.T.	DATE	SEPT. 2023

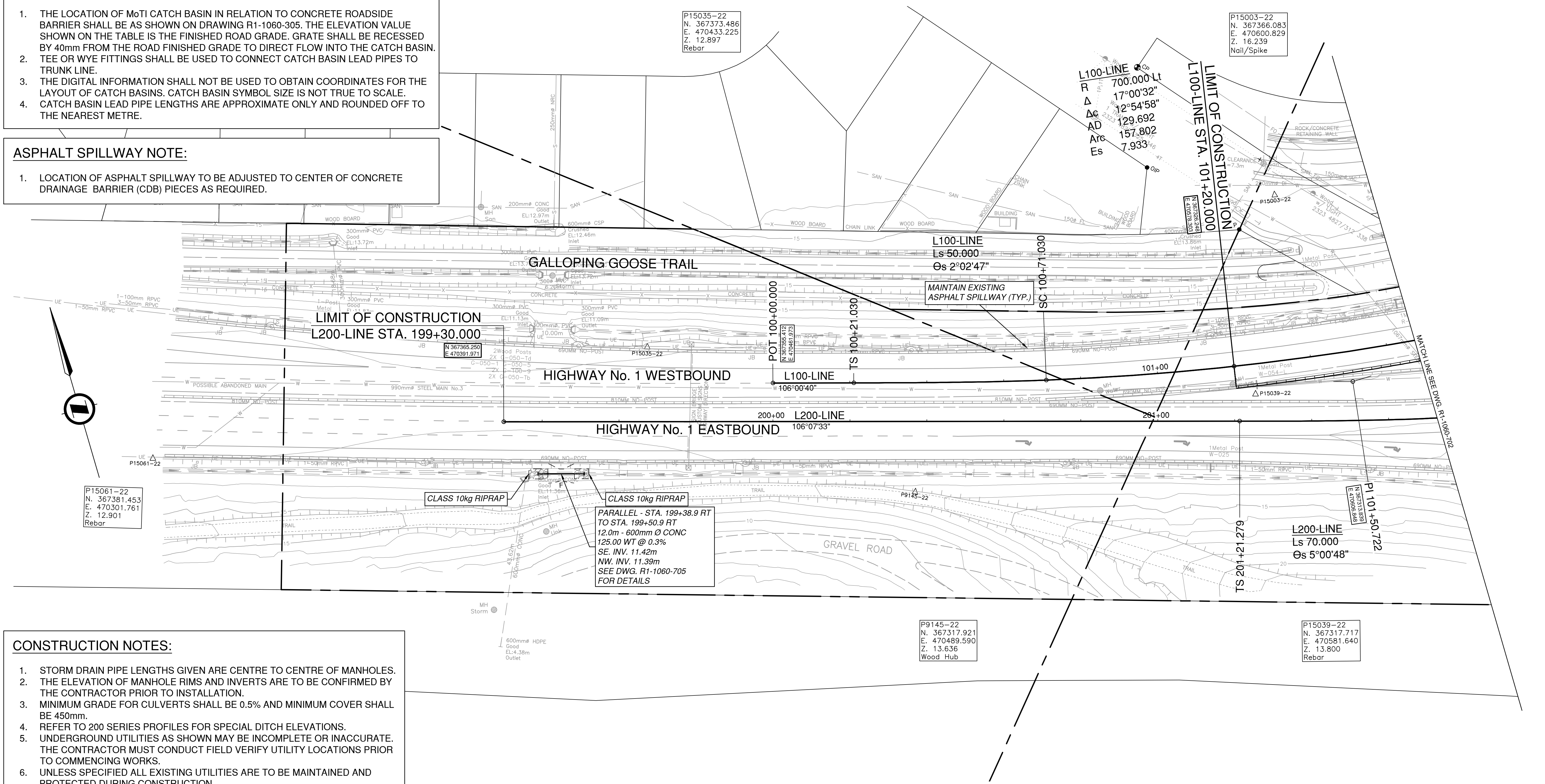
PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-604	

CATCH BASIN NOTES:

1. THE LOCATION OF MoTI CATCH BASIN IN RELATION TO CONCRETE ROADSIDE BARRIER SHALL BE AS SHOWN ON DRAWING R1-1060-305. THE ELEVATION VALUE SHOWN ON THE TABLE IS THE FINISHED ROAD GRADE. GRATE SHALL BE RECESSED BY 40mm FROM THE ROAD FINISHED GRADE TO DIRECT FLOW INTO THE CATCH BASIN.
2. TEE OR WYE FITTINGS SHALL BE USED TO CONNECT CATCH BASIN LEAD PIPES TO TRUNK LINE.
3. THE DIGITAL INFORMATION SHALL NOT BE USED TO OBTAIN COORDINATES FOR THE LAYOUT OF CATCH BASINS. CATCH BASIN SYMBOL SIZE IS NOT TRUE TO SCALE.
4. CATCH BASIN LEAD PIPE LENGTHS ARE APPROXIMATE ONLY AND ROUNDED OFF TO THE NEAREST METRE.

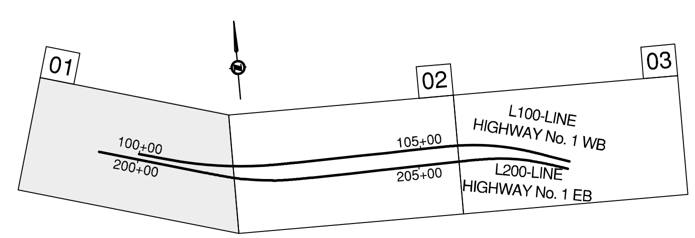
ASPHALT SPILLWAY NOTE:

1. LOCATION OF ASPHALT SPILLWAY TO BE ADJUSTED TO CENTER OF CONCRETE DRAINAGE BARRIER (CDB) PIECES AS REQUIRED.



CONSTRUCTION NOTES:

1. STORM DRAIN PIPE LENGTHS GIVEN ARE CENTRE TO CENTRE OF MANHOLES.
2. THE ELEVATION OF MANHOLE RIMS AND INVERTS ARE TO BE CONFIRMED BY THE CONTRACTOR PRIOR TO INSTALLATION.
3. MINIMUM GRADE FOR CULVERTS SHALL BE 0.5% AND MINIMUM COVER SHALL BE 450mm.
4. REFER TO 200 SERIES PROFILES FOR SPECIAL DITCH ELEVATIONS.
5. UNDERGROUND UTILITIES AS SHOWN MAY BE INCOMPLETE OR INACCURATE. THE CONTRACTOR MUST CONDUCT FIELD VERIFY UTILITY LOCATIONS PRIOR TO COMMENCING WORKS.
6. UNLESS SPECIFIED ALL EXISTING UTILITIES ARE TO BE MAINTAINED AND PROTECTED DURING CONSTRUCTION.
7. CONTRACTOR SHALL EXPOSE AND VERIFY THE LOCATION AND DEPTH OF THE EXISTING STORM SEWER AT THE TIE-IN POINTS PRIOR TO CONSTRUCTION.
8. REFER TO COLQUITZ RIVER BRIDGE #01378 & #02655 PACKAGE DRAWINGS FOR THE LAYOUT DETAILS OF DECK DRAINAGE.



FOR PLANS SEE DWG. R1-1060-101 TO 103
FOR SPOT ELEVATIONS SEE DWG. R1-1060-501
FOR PROFILES SEE DWG. R1-1060-201 TO 204
FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604
FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305
FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705
FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404
FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712
FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904

ISSUED FOR ENVIRONMENTAL PERMITTING - SEPT. 1, 2023

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BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

SCALE 0 5 1:500 25m

CAD FILENAME 700DD-COLQUITZBRIDGES_22-0393.DWG
DATE 2023-09-01
FILE NUMBER 22-0393

REV	DATE	REVISIONS	SIGNATURE

DRAINAGE PLAN

HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE
NUMBER 1001128

MARILOU ARISTON
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE	SEPT. 2023
QUALITY CONTROL	M.C.	DATE	SEPT. 2023
QUALITY ASSURANCE	M.A.	DATE	SEPT. 2023
DRAWN	S.C.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-701	

Sep. 1, 2023 - 02:46 PM P:\2022\22-0393\00 - CAD Files\00-ColquitzBridges\Drawing\Production\700_Drainage\Utilities\700DD-ColquitzBridges_22-0393

L100-LINE
R 700.000 Lt
Δ 17°00'32"
Δc 12°54'58"
AD 129.692
Arc 157.802
Es 7.933

LIMIT OF GRADING RT
L100-LINE STA. 102+02.200
TIE TO EXISTING
N 367316.818
E 470659.912

LIMIT OF GRADING LT
L100-LINE STA. 102+50.000
TIE TO EXISTING
N 367315.770
E 470707.691

P15024-22
N. 367359.355
E. 470672.869
Z. 14.911
Nail/Spike

P15049-22
N. 367362.771
E. 470822.901
Z. 6.407
Nail/Spike

85407-79H8832
N. 367364.946
E. 470824.281
Z. 6.342
GCM

P15050-22
N. 367326.328
E. 470853.088
Z. 11.739
Rebar

L100-LINE
R 3600.000 Lt
Δ 0°43'08"
Tc 22.585
Arc 45.169
Ec 0.071

L100-LINE
R 3600.000 Rt
Δ 0°41'09"
Tc 21.549
Arc 43.098
Ec 0.064

BURNSIDE ROAD WEST

STORMDRAIN PSD3-PRD1
4.9m - 250mmØ PVC @ 4.51%

STORMDRAIN PSD3-PRD2
11.9m - 250mmØ PVC @ 4.55%

STORMDRAIN PSD4-PRD3
7.9m - 250mmØ PVC @ 1.00%

MAINTAIN EXISTING ASPHALT SPILLWAY

INSTALL OIL AND GRIT SEPARATOR

PROVIDE LAWN BASIN AS PER MMCD STD S12

MAINTAIN EXISTING CULVERT

STORMDRAIN PSD4-PRD4
6.3m - 250mmØ PVC @ 1.00%

1.10m - 800mm Ø PVC PIPE w/ DOBNEY MH25 BEEHIVE GRATE OR APPROVED EQUIVALENT

REMOVE EXISTING CATCH BASIN

REMOVE EXISTING PAVEMENT BEHIND BARRIER. CONTRACTOR TO PROVIDE POSITIVE DRAINAGE TO D10-LINE.

L100-LINE
Ls 50.000
Os 2°02'47"

CS 102+28.832
ST 102+78.832
BC 103+93.759
PI 104+16.343
PRC 104+38.928
PI 104+60.477
EC 104+82.025
TS 105+24.135

L100-LINE
Ls 50.000
Os 3°19'52"

CONTRACTOR TO REGRADE EXISTING CHANNEL TO ENSURE POSITIVE DRAINAGE

INTEGRAL ASPHALT DRAINAGE CURB FROM STA. 104+78.000 TO STA. 104+96.510. SEE DWG. R1-1060-303 FOR DETAILS.

GALLOPING GOOSE TRAIL

MAINTAIN EXISTING LAWN BASIN

MAINTAIN EXISTING LAWN BASIN

HIGHWAY No. 1 WESTBOUND

HIGHWAY No. 1 EASTBOUND

STORMDRAIN PSD2-PRD2
14.2m - 300mmØ PVC @ 1.14%

LIMIT OF GRADING RT
L100-LINE STA. 104+96.510
TIE TO EXISTING
N 367320.463
E 470954.153

CONNECT PROPOSED STORM INTO EX. STORM SEWER.

MAINTAIN EXISTING CONCRETE CHANNEL

STORMDRAIN PSD3-PRD3
20.9m - 250mmØ PVC @ 4.52%

LIMIT OF WIDENING LT
L100-LINE STA. 204+51.153
TIE TO EXISTING
N 367290.345
E 470902.832

STORMDRAIN PSD1-PRD1
53.6m - 300mmØ PVC @ 1.00%

STORMDRAIN PSD1-PRD2
72.5m - 300mmØ PVC @ 2.11%

STORMDRAIN PSD2-PRD1
20.7m - 300mmØ PVC @ 1.14%

REMOVE EXISTING CATCH BASIN

REMOVE EXISTING CATCH BASIN

INTEGRAL ASPHALT DRAINAGE CURB FROM STA. 204+10.000 TO STA. 204+51.153. SEE DWG. R1-1060-303 FOR DETAILS.

REMOVE EXISTING CATCH BASIN

REMOVE EXISTING CATCH BASIN

RAIN GARDEN SEE DWG. R1-1060-704 FOR DETAILS.

REMOVE EXISTING CATCH BASIN

DECK DRAIN (TYP.)

ADJUST EX. MANHOLE

L200-LINE
Ls 70.000
Os 5°00'48"

SC 201+91.279
CS 202+40.634
ST 203+10.634
BC 203+80.137
PI 204+09.295
EC 204+38.452
BC 204+39.755
PI 204+65.346
EC 204+90.937

L200-LINE
R 3550.000 Lt
Δ 0°56'28"
Tc 29.158
Arc 58.315
Ec 0.120

L200-LINE
R 3500.000 Rt
Δ 0°50'16"
Tc 25.591
Arc 51.182
Ec 0.094

TIE CATCH BASIN LEAD INTO EXISTING MANHOLE.

STORMDRAIN PSD4-PRD2
38.7m - 250mmØ PVC @ 1.00%

STORMDRAIN PSD4-PRD1
8.2m - 250mmØ PVC @ 5.34%

L200-LINE
R 400.000 Lt
Δ 17°05'47"
Δc 7°04'11"
AD 95.192
Arc 49.355
Es 5.009

LIMIT OF GRADING LT
L200-LINE STA. 201+90.000
TIE TO EXISTING
N 367204.904
E 470642.230

LIMIT OF GRADING RT
L200-LINE STA. 202+30.000
TIE TO EXISTING
N 367289.042
E 470681.782

P15037-22
N. 367281.522
E. 470687.173
Z. 13.865
Rebar

P15010-22
N. 367283.794
E. 470974.076
Z. 12.444
Rebar

G992115-79H8825
N. 367211.144
E. 470795.643
Z. 4.374
GCM

MATCH LINE SEE DWG. R1-1060-701

MATCH LINE SEE DWG. R1-1060-703

D10-LINE CURVE DATA	
START 10+00.000	
N	367305.941
E	470644.435
BEARING IN 95° 26' 11"	
R	400.000 Lt
Δ	5°36'58"
Tc	19.619
Arc	39.207
Es	0.481
BEARING OUT 89° 49' 14"	
PI	10+48.319
N	367301.363
E	470692.536
BC	10+28.700
EC	10+67.907
END 10+67.907	
N	367301.557
E	470754.248

D20-LINE CURVE DATA	
START 20+00.000	
N	367306.866
E	470954.390
BEARING IN 266° 50' 02"	
R	400.000 Rt
Δ	4°08'01"
Tc	14.435
Arc	28.858
Es	0.260
BEARING OUT 270° 58' 03"	
PI	20+62.553
N	367303.411
E	470891.932
BC	20+48.118
EC	20+76.975
END 20+76.975	
N	367304.378
E	470834.676

REFER TO DWG. R1-1060-701 FOR CONSTRUCTION NOTES, CATCH BASIN NOTES, AND ASPHALT SPILLWAY NOTES.

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501	
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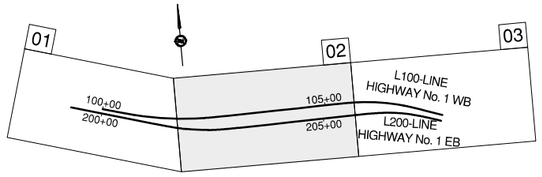

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BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

DRAINAGE PLAN

HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

R.F. BINNIE & ASSOCIATES LTD.
EGBC PERMIT TO PRACTICE NUMBER 1001128

2023-09-01
PROFESSIONAL ENGINEER
M. M. ARISTON
16786
PROVINCE OF BRITISH COLUMBIA

MARILOU ARISTON
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE	SEPT. 2023
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DRAWN	S.C.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-702	

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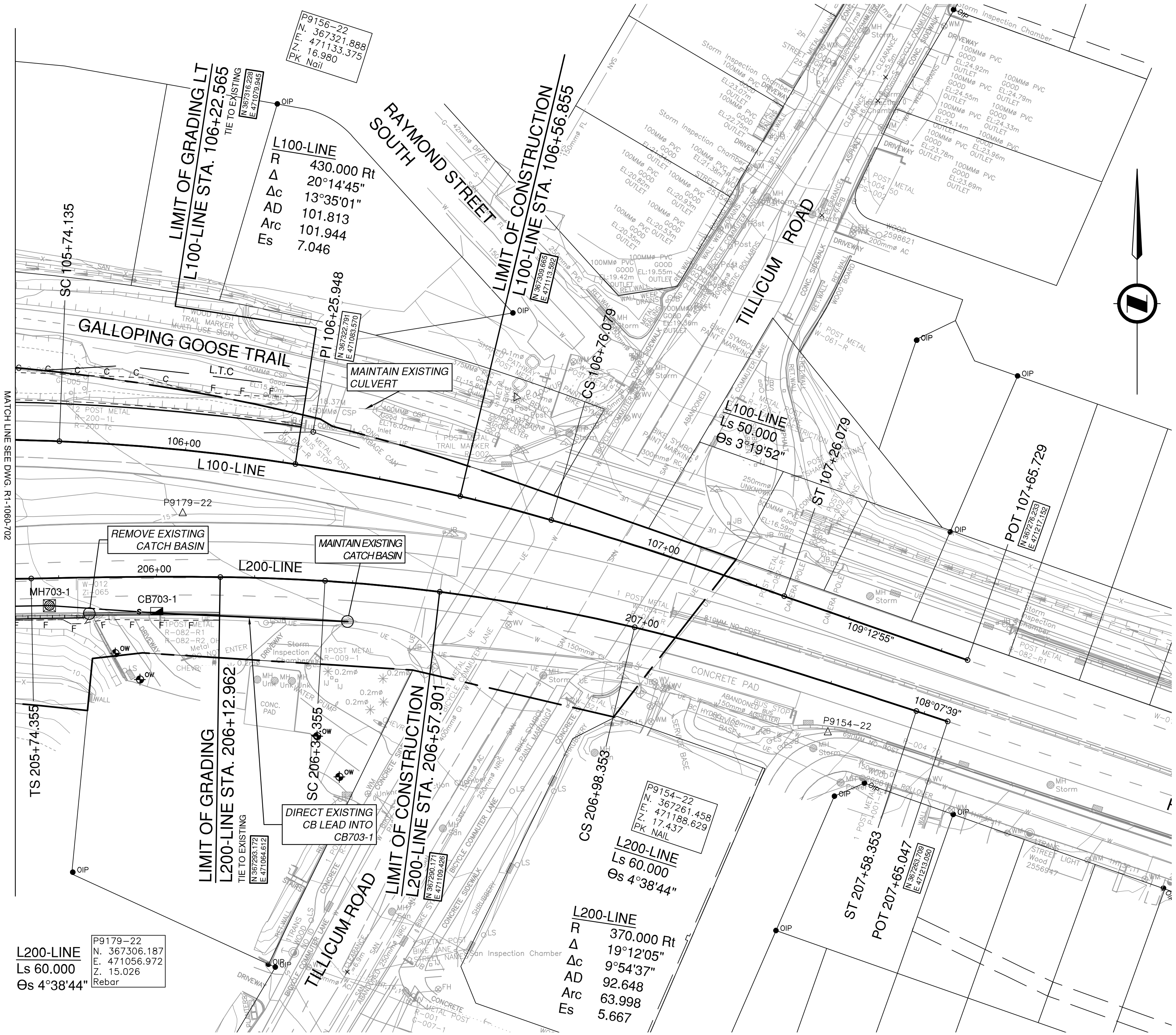

CATCH BASIN SUMMARY - DWG No. R1-1060-702

NAME	STATION	OFFSET (m)	RIM ELEV. (m)	INVERT (m)	CB LEAD	CB TYPE	GRATE TYPE
CB702-1	STA. 204+10.000	7.34 RT	11.51	10.61 E	25.1m - 200mm Ø PVC	SP582-02.01	SP582-05.02 – TYPE ' B' R
CB702-2	STA. 204+35.000	7.34 RT	11.45	10.31 E	17.0m - 250mm Ø PVC	SP582-02.02 WITH SP582-05.04	SP582-05.02 – TYPE 'B' L AND R
CB702-3	STA. 204+55.000	7.34 RT	11.58	10.68 N	1.7m - 200mm Ø PVC	SP582-02.01	SP582-05.02 – TYPE ' B' L
CB702-4	STA. 205+00.000	7.24 RT	12.15	11.25 N	2.3m - 200mm Ø PVC	SP582-02.01	SP582-05.02 – TYPE ' B' L
CB702-5	STA. 205+50.000	7.24 RT	13.21	12.31 N	1.8m - 200mm Ø PVC	SP582-02.01	SP582-05.02 – TYPE ' B' L

CATCH BASIN SUMMARY - DWG No. R1-1060-703

NAME	STATION	OFFSET (m)	RIM ELEV. (m)	INVERT (m)	CB LEAD	CB TYPE	GRATE TYPE
CB703-1	STA. 206+00.000	7.39 RT	14.13	13.23 W	22.0m - 200mm Ø PVC	SP582-02.02	SP582-05.02 – TYPE 'B' L

ASPHALT SPILLWAY SUMMARY - DWG No. R1-1060-702

NAME	STATION	SIDE	OUTFALL TYPE
AS702-1	STA. 102+50.0	LT	PAVED SPILLWAY AT BARRIER. SEE DWG. R1-1060-305 FOR DETAILS.
AS702-2	STA. 102+80.8	RT	PAVED SPILLWAY AT MEDIAN BEHIND CRB. SEE DWG. R1-1060-305 FOR DETAILS.
AS702-3	STA. 104+05.0	LT	PAVED SPILLWAY AT BARRIER. SEE DWG. R1-1060-305 FOR DETAILS.
AS702-4	STA. 104+04.9	RT	PAVED SPILLWAY AT MEDIAN BEHIND CRB. SEE DWG. R1-1060-305 FOR DETAILS.
AS702-5	STA. 104+10.0	LT	PAVED SPILLWAY AT BARRIER. SEE DWG. R1-1060-305 FOR DETAILS.
AS702-6	STA. 104+09.9	RT	PAVED SPILLWAY AT MEDIAN BEHIND CRB. SEE DWG. R1-1060-305 FOR DETAILS.
AS702-7	STA. 104+30.0	LT	PAVED SPILLWAY AT BARRIER. SEE DWG. R1-1060-305 FOR DETAILS.
AS702-8	STA. 104+49.9	LT	PAVED SPILLWAY AT BARRIER. SEE DWG. R1-1060-305 FOR DETAILS.
AS702-9	STA. 104+49.8	RT	PAVED SPILLWAY AT MEDIAN BEHIND CRB. SEE DWG. R1-1060-305 FOR DETAILS.
AS702-10	STA. 104+78.0	RT	PAVED SPILLWAY AT MEDIAN BEHIND CRB. SEE DWG. R1-1060-305 FOR DETAILS.
AS702-11	STA. 201+94.7	LT	PAVED SPILLWAY AT MEDIAN BEHIND CRB. SEE DWG. R1-1060-305 FOR DETAILS.
AS702-12	STA. 202+50.4	LT	PAVED SPILLWAY AT MEDIAN BEHIND CRB. SEE DWG. R1-1060-305 FOR DETAILS.
AS702-13	STA. 202+90.7	LT	PAVED SPILLWAY AT MEDIAN BEHIND CRB. SEE DWG. R1-1060-305 FOR DETAILS.
AS702-14	STA. 204+30.0	LT	PAVED SPILLWAY AT MEDIAN BEHIND CRB. SEE DWG. R1-1060-305 FOR DETAILS.
AS702-15	STA. 204+37.0	LT	PAVED SPILLWAY AT MEDIAN BEHIND CRB. SEE DWG. R1-1060-305 FOR DETAILS.

MANHOLE SUMMARY- DWG No. R1-1060-702

NAME	INVERTS (m)	RIM ELEV. (m)	COORDINATES	SIZE (mm)	DESCRIPTION
MH702-1	250mm Ø PVC INV = 10.14 W 300mm Ø PVC INV = 10.09 E	11.63	N: 367284.671 E: 470903.749	1050 Ø	AS PER SP582-03.01 RCMH TYPE B BASE
MH702-2	300mm Ø PVC INV = 10.56 E 300mm Ø PVC INV = 9.55 W 300mm Ø PVC INV = 9.50 N	12.30	N: 367285.973 E: 470957.333	1050 Ø	AS PER SP582-03.01 RCMH TYPE B BASE
MH702-3	300mm Ø PVC INV = 9.27 S 300mm Ø PVC INV = 9.27 E	11.73	N: 367306.663 E: 470956.940	1050 Ø	AS PER SP582-03.01 RCMH TYPE B BASE
MH702-4	250mm Ø PVC INV = 4.23 W 250mm Ø PVC INV = 4.23 N	5.48	N: 367287.001 E: 470802.394	1050 Ø	DOS SUPPLEMENTAL STANDARD DETAIL DWG S1SS
MH702-5	250mm Ø PVC INV = 3.85 S 250mm Ø PVC INV = 3.85 W	5.96	N: 367324.940 E: 470810.228	1050 Ø	DOS SUPPLEMENTAL STANDARD DETAIL DWG S1SS
MH702-6	250mm Ø PVC INV = 3.77 E 250mm Ø PVC INV = 3.77 W	6.06	N: 367324.615 E: 470802.368	1050 Ø	OIL AND GRIT SEPARATOR

MANHOLE SUMMARY- DWG No. R1-1060-703

NAME	INVERTS (m)	RIM ELEV. (m)	COORDINATES	SIZE (mm)	DESCRIPTION
MH703-1	200mm Ø PVC INV = 12.39 E 300mm Ø PVC INV = 12.08 W	13.88	N: 367287.349 E: 471029.755	1050 Ø	AS PER SP582-03.01 RCMH TYPE B BASE

REFER TO DWG. R1-1060-701 FOR CONSTRUCTION NOTES, CATCH BASIN NOTES, AND ASPHALT SPILLWAY NOTES.

FOR PLANS SEE DWG. R1-1060-101 TO 103

FOR SPOT ELEVATIONS SEE DWG. R1-1060-501

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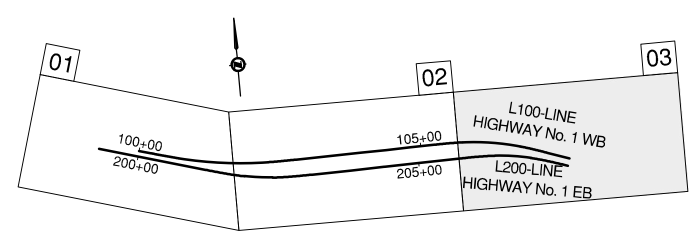

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2023-09-01 PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA M. M. ARISTON # 39758

MARILOU ARISTON
ENGINEER OF RECORD
DATE

DESIGNED	M.C.	DATE	SEPT. 2023
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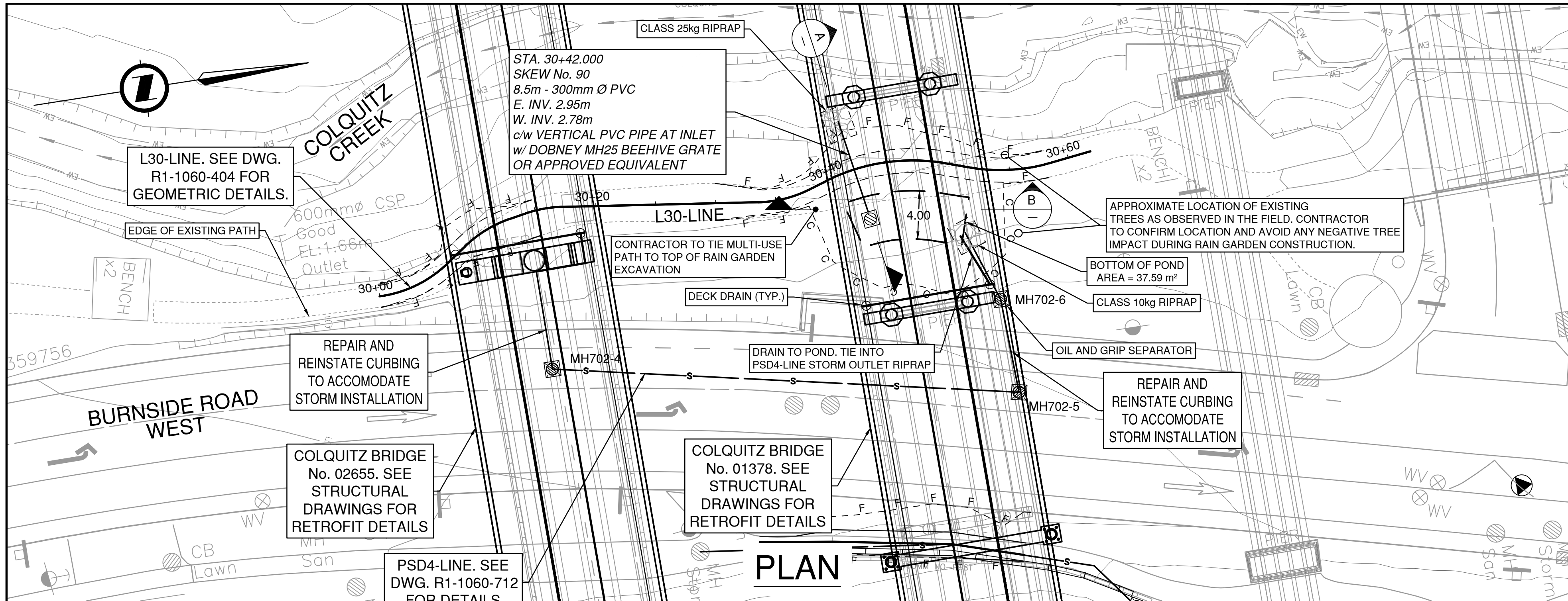
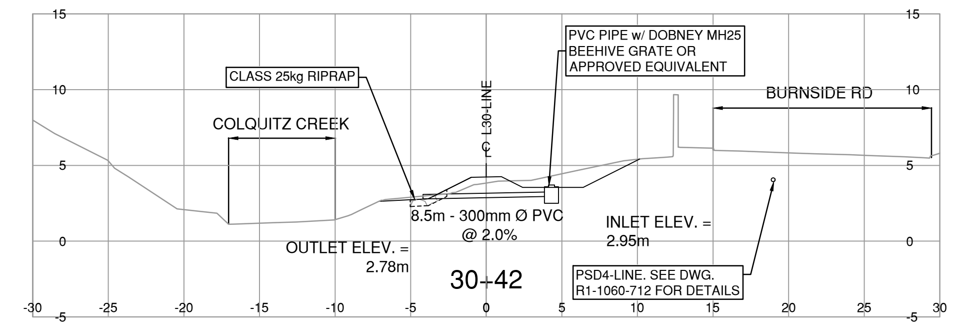


PLAN

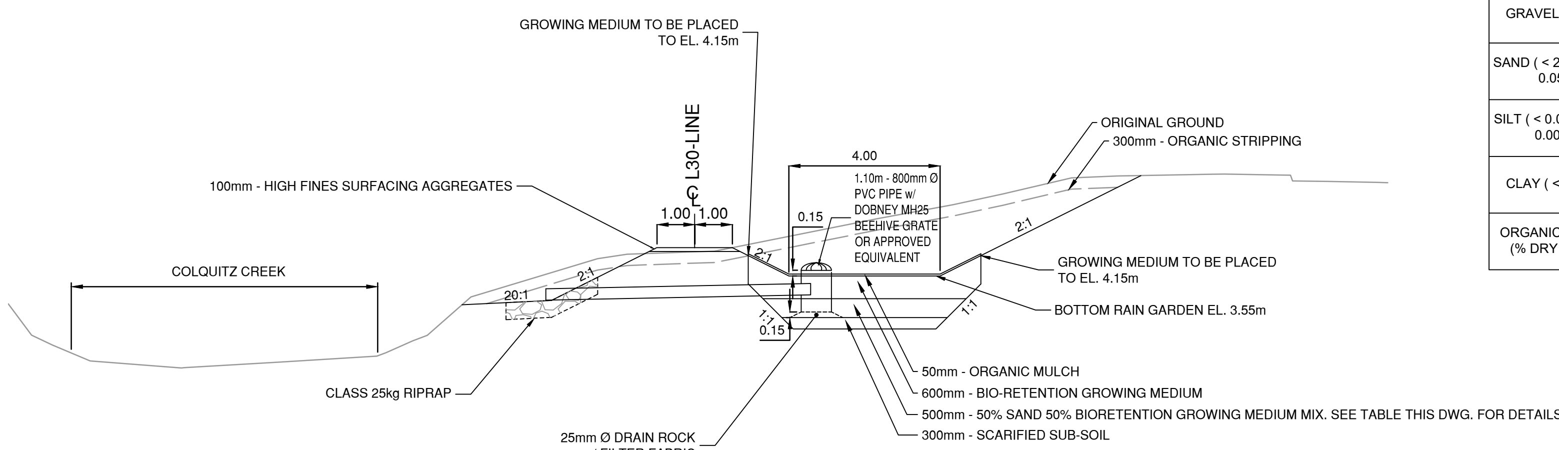
0 2 1:250 12m



L30-LINE OUTLET SECTIONS

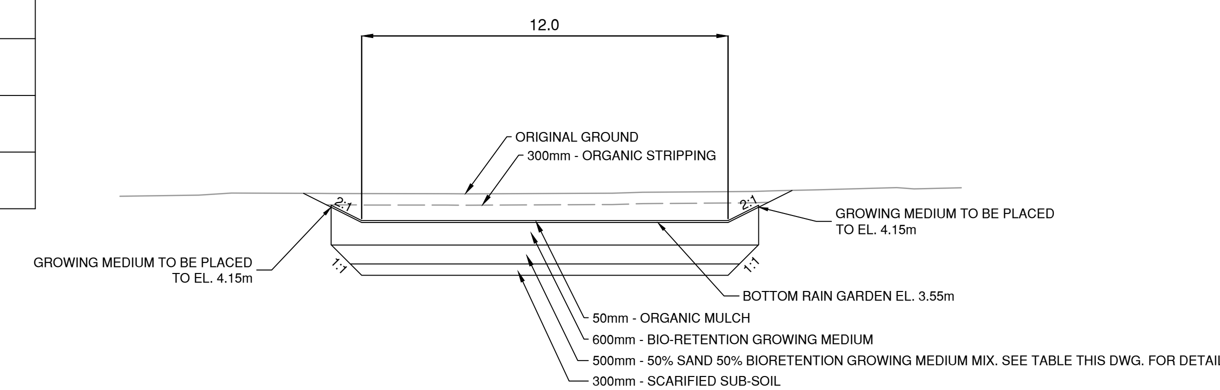
0 2 1:250 12m

BIO-RETENTION GROWING MEDIUM PROPERTIES	
PARTICLE SIZE CLASSES	PERCENT OF DRY WEIGHT MINERAL FRACTION (%)
GRAVEL (>2.5mm)	0
SAND (< 2.5mm AND > 0.05mm)	70 - 80
SILT (< 0.05mm AND > 0.002mm)	5 - 15
CLAY (< 0.002mm)	2 - 5
ORGANIC CONTENT (% DRY WEIGHT)	10 - 15



L30-LINE RAIN GARDEN
SECTION A-A

0 1 1:100 5m



L30-LINE RAIN GARDEN
SECTION B-B

0 1 1:100 5m

FOR PLANS SEE DWG. R1-1060-101 TO 103

FOR SPOT ELEVATIONS SEE DWG. R1-1060-501

FOR PROFILES SEE DWG. R1-1060-201 TO 204

FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604

FOR TYPICAL SECTIONS SEE DWG. R1-1060-301 TO 305

FOR DRAINAGE PLANS AND DETAILS SEE DWG. R1-1060-701 TO 705

FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404

FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712

FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904

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DATE 2023-09-01
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DRAINAGE PLAN
HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

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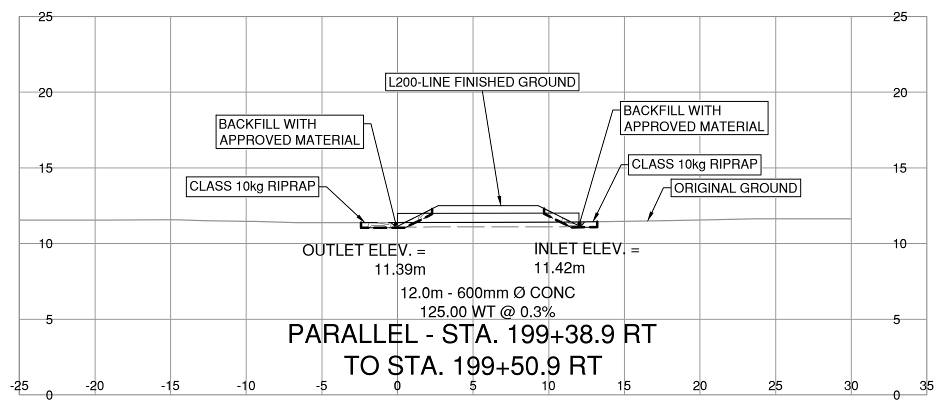
QUALITY ASSURANCE	M.A.	DATE	SEPT. 2023
DRAWN	S.C.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-704	



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TO STA. 199+50.9 RT

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501	
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604	
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FOR GEOMETRICS AND LANING SEE DWG. R1-1060-401 TO 404	FOR STORM DRAIN PROFILES SEE DWG. R1-1060-710 TO 712	FOR LANDSCAPE PLANS AND DETAILS SEE DWG. R1-1060-901 TO 904

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QUALITY ASSURANCE	M.A.	DATE	SEPT. 2023
DRAWN	J.T.	DATE	SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-705	

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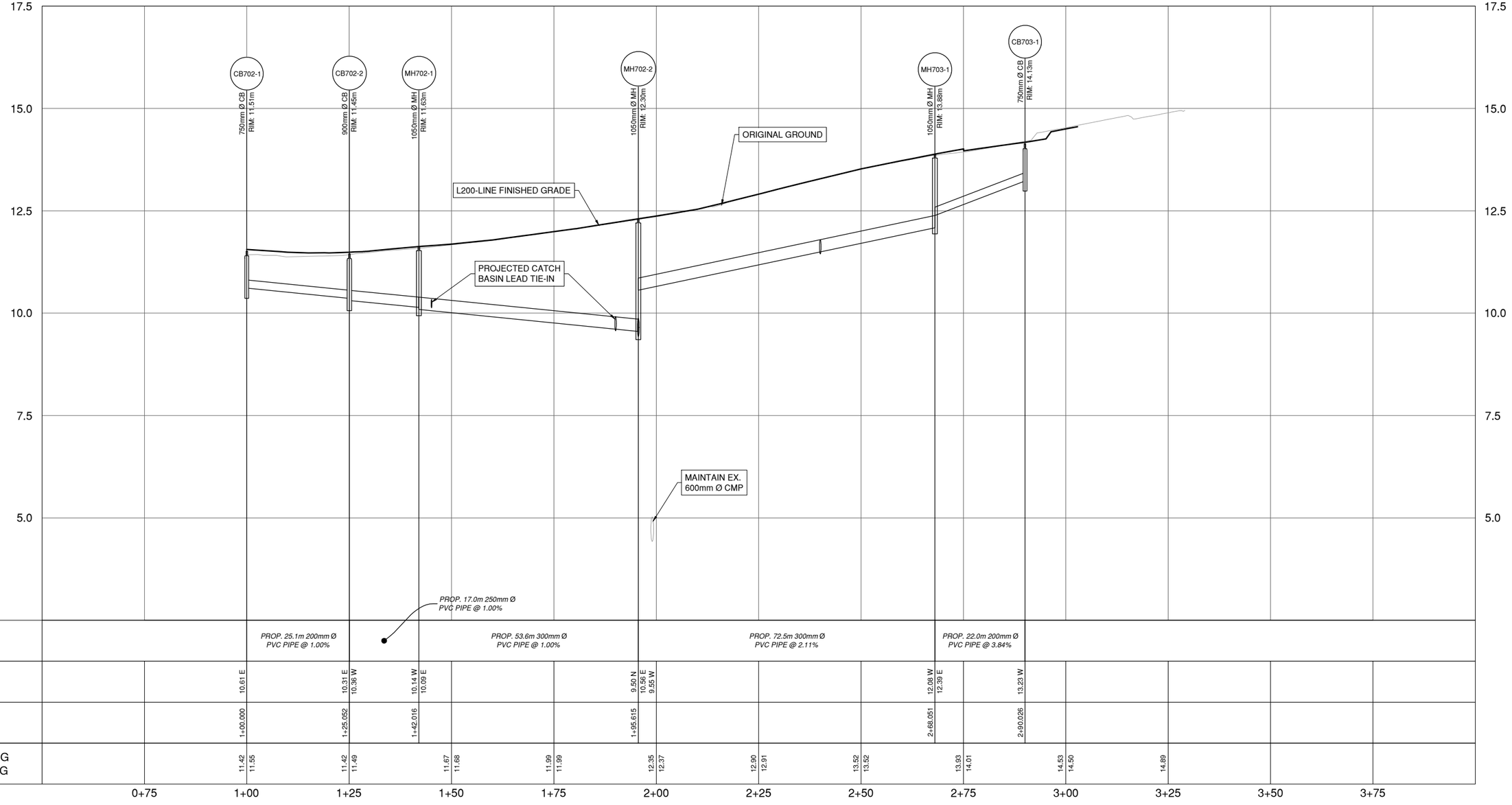

STORM DRAIN PROFILE - PSD1

REFER TO DWG. R1-1060-701 FOR CONSTRUCTION NOTES.

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501	
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604	
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STORM DRAIN PROFILES

HIGHWAY No. 1
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M. M. ARISTON
ENGINEER
PROFESSIONAL ENGINEER

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ENGINEER OF RECORD
DATE

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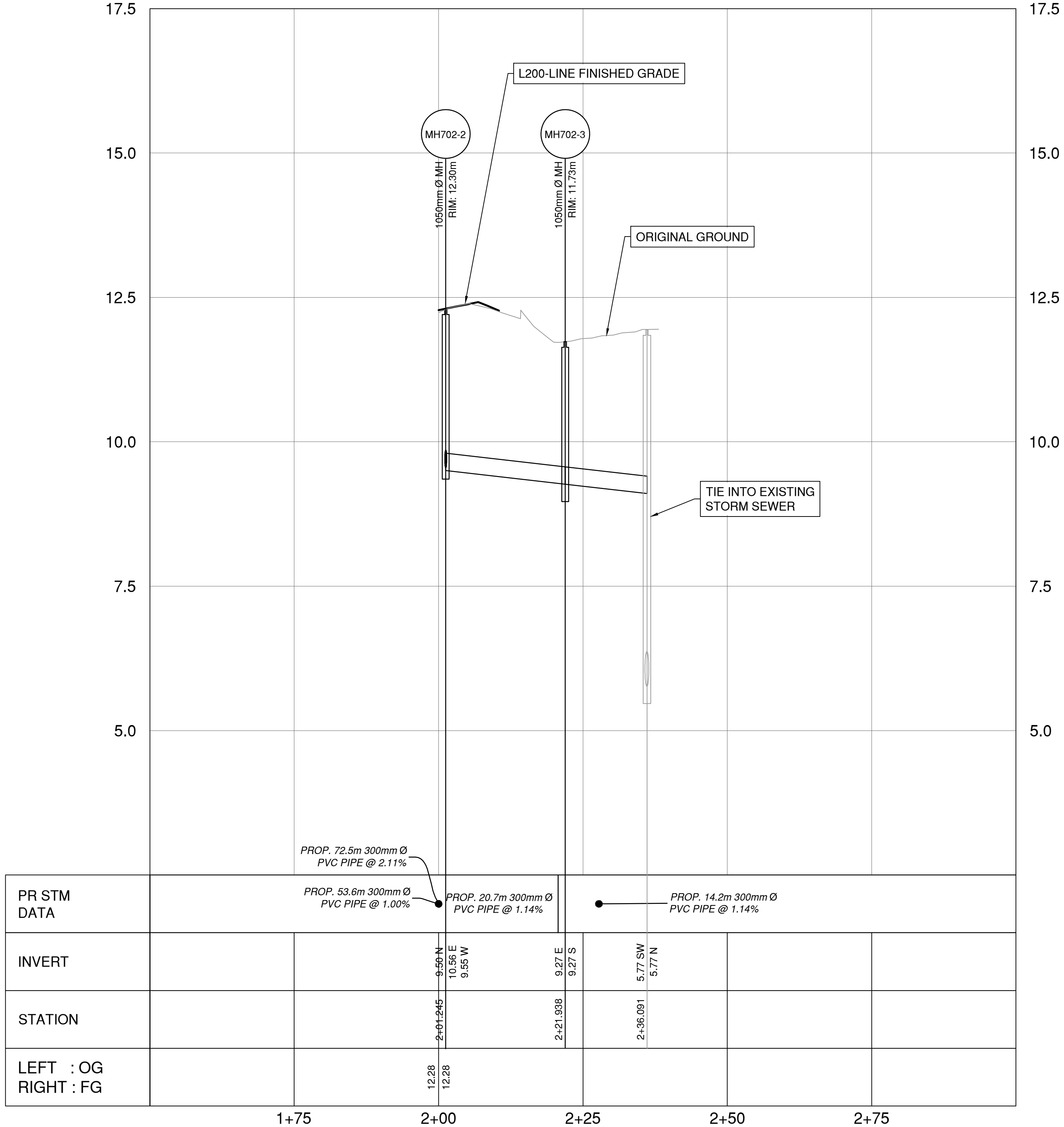
QUALITY CONTROL	M.C.	DATE SEPT. 2023
QUALITY ASSURANCE	M.A.	DATE SEPT. 2023
DRAWN	J.T.	DATE SEPT. 2023

PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-710	



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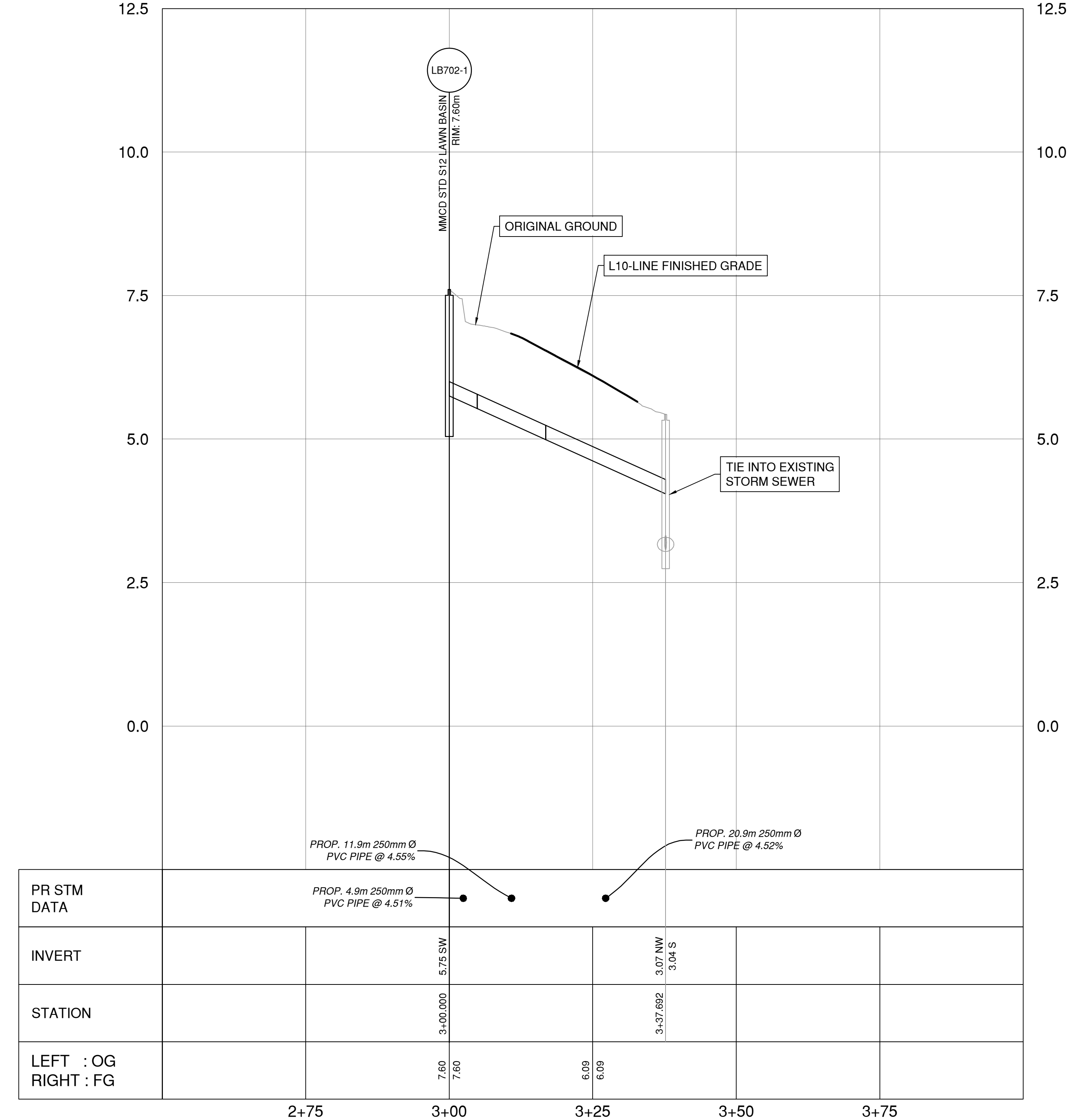

STORM DRAIN PROFILE - PSD3

REFER TO DWG. R1-1060-701 FOR CONSTRUCTION NOTES.

FOR PLANS SEE DWG. R1-1060-101 TO 103	FOR SPOT ELEVATIONS SEE DWG. R1-1060-501
FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604
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CAD FILENAME 700SP-COLQUITZBRIDGES_22-0393.DWG
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STORM DRAIN PROFILES
HIGHWAY No. 1
COLQUITZ BRIDGES RETROFIT AND BUS LANE EXTENSION

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PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-711	

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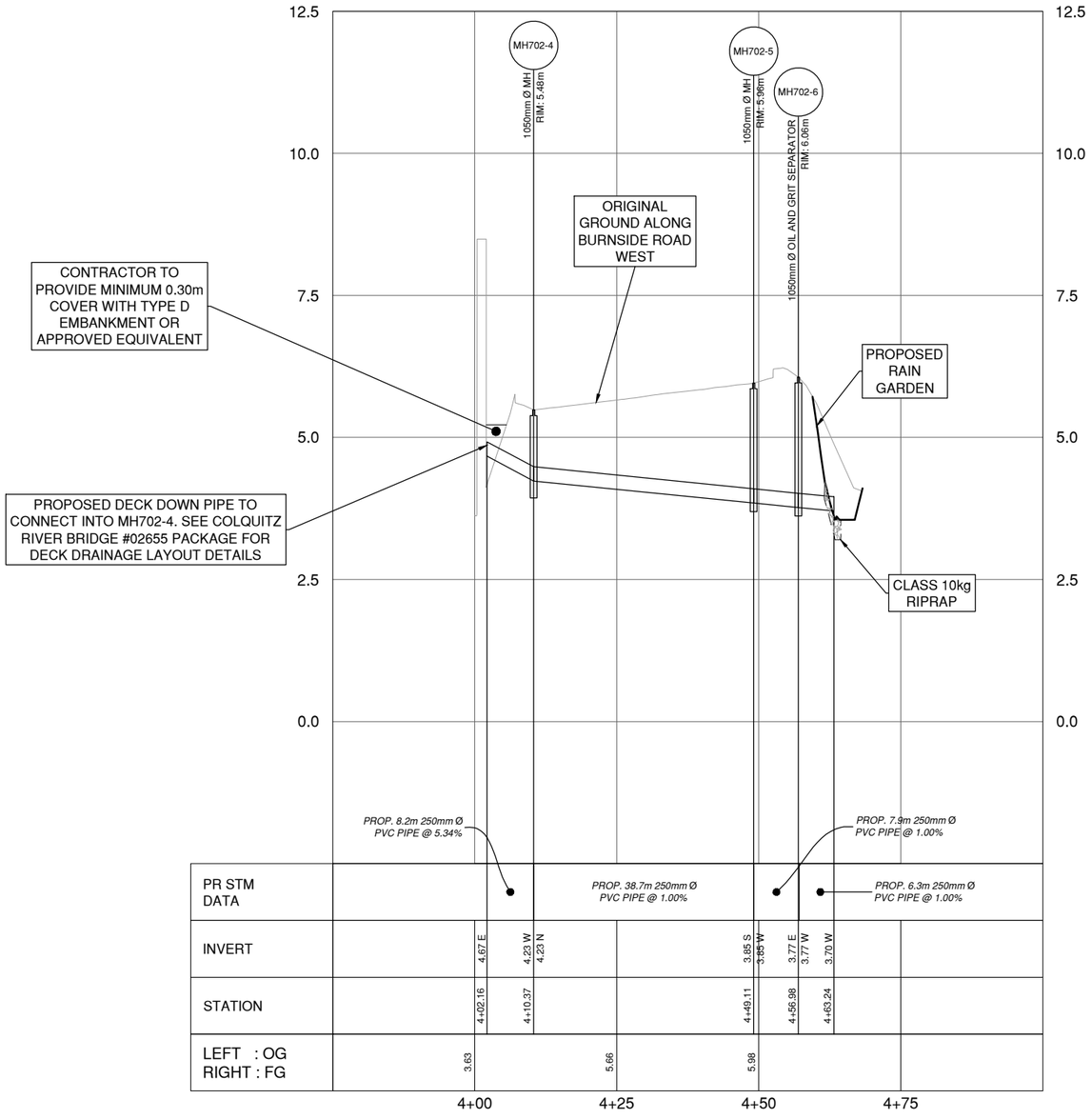

STORM DRAIN PROFILE - PSD4

REFER TO DWG. R1-1060-701 FOR CONSTRUCTION NOTES.

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FOR PROFILES SEE DWG. R1-1060-201 TO 204	FOR SIGNING AND PAVEMENT MARKINGS SEE DWG. R1-1060-601 TO 604	
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MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

STORM DRAIN PROFILE

HIGHWAY No. 1
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PROFESSIONAL ENGINEER
M. M. ARISTON
ENGINEERING
BRITISH COLUMBIA

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PROJECT NUMBER	REG	DRAWING NUMBER	REV
16786-0001	1	R1-1060-712	

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APPENDIX C

SPECIES AT RISK SEARCH RESULTS

BC Species and Ecosystems Explorer Search Results **128 records**

Close

Scientific Name	English Name	Biogeoclimatic Units	Provincial	BC List	Global	COSEWIC	SARA	Provincial FRPA	Land Use Objectives	CDC Mapped Locat	
										Public	Confiden
Accipiter gentilis laingi	Northern Goshawk, *laingi* subspecies	CDF CWH	S2 (2010)	Red	G5T2 (2016)	T	1-T (2003)	Y		Y	
Acipenser transmontanus	White Sturgeon	BG CDF CWH ICH IDF MS PP SBS	S2 (2018)	No Status	G4 (2002)	E/T	1-E				
Acipenser transmontanus pop. 4	White Sturgeon (Lower Fraser River Population)	CDF CWH IDF	S1S2 (2018)	Red	G4T2Q (2002)	T				Y	
Allium amplectens	slimleaf onion	CDFmm CWHxm	S3 (2019)	Blue	G4 (1988)					Y	
Allogona townsendiana	Oregon Forestsnail	CDF CMA CWH ESSF MH	S2 (2015)	Red	G3G4 (2010)	E	1-E (2005)			Y	Y
Anaxyrus boreas	Western Toad	BG BWBS CDF CWH ESSF ICH IDF PP SBS SWB	S4 (2022)	Yellow	G4 (2008)	SC	1-SC (2018)				
Aneides vagrans	Wandering Salamander	CDF CWH	S3 (2022)	Blue	G4 (2005)	SC	1-SC (2018)			Y	
Aphyllon pinorum	pine broomrape	CDFmm CWHmm CWHxm	S1S2 (2019)	Red	G4 (2016)					Y	
Aplodontia rufa	Mountain Beaver	CDF CWH ESSF MH MS	S4 (2015)	Yellow	G5 (2016)	SC	1-SC (2003)			Y	
Ardea herodias fannini	Great Blue Heron, *fannini* subspecies	CDF CWH	S3B,S4N (2022)	Blue	G5T4 (2016)	SC	1-SC (2010)	Y		Y	

Scientific Name	English Name	Biogeoclimatic Units	Provincial	BC List	Global	COSEWIC	SARA	Provincial FRPA	Land Use Objectives	CDC Mapped Locat	
										Public	Confiden
Asio flammeus	Short-eared Owl	BG BWBS CDF CWH ICH IDF MS PP SBPS SBS SWB	S3B,S1N (2022)	Blue	G5 (2016)	T	1-SC (2012)	Y		Y	
Athene cunicularia	Burrowing Owl	BG CDF IDF PP	S1B (2020)	Red	G4 (2016)	E	1-E (2003)	Y		Y	
Balsamorhiza deltoidea	deltoid balsamroot	CDFmm CWHxm	S2 (2019)	Red	G5 (1988)	E	1-E (2003)			Y	Y
Bartramia longicauda	Upland Sandpiper	BG BWBS CDF CWH ICH IDF SBPS SBS SWB	S2B (2022)	Red	G5 (2016)						
Botaurus lentiginosus	American Bittern	BG BWBS CDF CWH ICH IDF MS PP SBPS SBS	S3B,SNRN (2015)	Blue	G5 (2016)					Y	
Brachyramphus marmoratus	Marbled Murrelet	CDF CWH MH	S3 (2022)	Blue	G3 (2016)	T	1-T (2003)	Y		Y	
Buteo lagopus	Rough-legged Hawk	BAFA BG BWBS CDF CWH ESSF ICH IDF IMA MS PP SBPS SBS SWB	S3N (2015)	Blue	G5 (2016)	NAR					
Buteo swainsoni	Swainson's Hawk	BG BWBS CDF ICH IDF MS PP SBS	S2B (2022)	Red	G5 (2016)					Y	

Scientific Name	English Name	Biogeoclimatic Units	Provincial	BC List	Global	COSEWIC	SARA	Provincial FRPA	Land Use Objectives	CDC Mapped Locat	
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Butorides virescens	Green Heron	BG CDF CWH ICH IDF PP SBS	S3S4B (2015)	Blue	G5 (2016)					Y	
Callophrys johnsoni	Johnson's Hairstreak	CDF CMA CWH	S2? (2020)	Red	G3 (2017)	SC		Y		Y	
Callophrys mossii mossii	Moss' Elfin, *mossii* subspecies	CDF CWH	S2 (2021)	Red	G4T4 (2001)					Y	
Cardellina canadensis	Canada Warbler	BWBS CDF CWH	S3B (2022)	Blue	G5 (2016)	SC	1-T (2010)			Y	
Carex tumulicola	foothill sedge	CDFmm	S3S4 (2019)	Yellow	G4 (1985)	E	1-E (2010)			Y	
Carychium occidentale	Western Thorn	CDF CWH	S3 (2015)	Blue	G3G4 (2002)						
Cephalanthera austiniae	phantom orchid	CDFmm CWHdm CWHxm	S2 (2019)	Red	G4 (1990)	E	1-T (2003)			Y	
Cercyonis pegala incana	Common Wood-nymph, *incana* subspecies	CDF CWH	S2? (2021)	Red	G5T4T5 (2003)					Y	
Charadrius vociferus	Killdeer	BG BWBS CDF CWH ESSF ICH IDF MS PP SBPS SBS SWB	S3S5B (2022)	Blue	G5 (2016)						
Chordeiles minor	Common Nighthawk	BG BWBS CDF CWH ESSF ICH IDF MH MS PP SBPS SBS SWB	S3S5B (2022)	Blue	G5 (2016)	SC	1-T (2010)				
Chrysemys picta	Painted Turtle	BG CDF CWH ICH IDF MH PP SBS	S3 (2018)	No Status	G5 (2016)	T/SC	1-T/SC (2021)				

Scientific Name	English Name	Biogeoclimatic Units	Provincial	BC List	Global	COSEWIC	SARA	Provincial FRPA	Land Use Objectives	CDC Mapped Locat	
										Public	Confiden
Chrysemys picta pop. 1	Painted Turtle - Pacific Coast Population	CDF CWH MH	S1S2 (2018)	Red	G5T2Q (2007)	T	1-T (2021)			Y	Y
Claytonia washingtoniana	Washington springbeauty	CDFmm CWHdm CWHxm IDFww	S3 (2022)	Blue	G2G4 (2001)					Y	
Coccothraustes vespertinus	Evening Grosbeak	BG BWBS CDF CWH ESSF ICH IDF MH MS PP SBPS SBS SWB	S5 (2022)	Yellow	G5 (2016)	SC	1-SC (2019)				
Coccyzus americanus	Yellow-billed Cuckoo	BG CDF CWH ICH PP	SXB (2022)	Red	G5 (2016)						
Coenonympha california insulana	Common Ringlet, *insulana* subspecies	CDF CWH	S1 (2021)	Red	G5T3T4 (1998)					Y	
Contia tenuis	Common Sharp-tailed Snake	CDF CWH	S1S2 (2018)	Red	G5 (2016)	E/T	1-E (2003)			Y	Y
Contopus cooperi	Olive-sided Flycatcher	BWBS CDF CWH ESSF ICH IDF MH MS PP SBPS SBS SWB	S4B (2022)	Yellow	G4 (2016)	SC	1-T (2010)				
Corallorhiza maculata var. *ozettensis*	Ozette coralroot	CDFmm CWHxm	S3 (2018)	Blue	G5T3 (2019)						
Corynorhinus townsendii	Townsend's Big-eared Bat	BG CDF CWH ICH IDF PP	S3 (2022)	Blue	G4 (2016)					Y	Y
Cryptomastix devia	Puget Oregonian	CDF CWH	SX (2015)	Red	G2 (2017)	XT	1-XT (2005)				

Scientific Name	English Name	Biogeoclimatic Units	Provincial	BC List	Global	COSEWIC	SARA	Provincial FRPA	Land Use Objectives	CDC Mapped Locat	
										Public	Confiden
Cypseloides niger	Black Swift	BAFA BG CDF CMA CWH ESSF ICH IDF IMA MH MS PP SBPS SBS SWB	S2S4B (2022)	Blue	G4 (2016)	E	1-E (2019)				
Danaus plexippus	Monarch	BG CDF CWH ESSF ICH IDF MS PP	S1?B (2020)	Red	G4 (2015)	E	1-SC (2003)				
Dryopteris arguta	coastal wood fern	CDFmm	S3 (2019)	Blue	G5 (2011)	SC	1-SC (2003)			Y	
Epargyreus clarus	Silver-spotted Skipper	CDF CWH ESSF ICH IDF MH MS PP	S3 (2020)	Blue	G5 (2020)						
Epilobium torreyi	brook spike-primrose	CDFmm	SH (2019)	Red	G5 (1988)	E	1-E (2007)			Y	
Eremophila alpestris strigata	Horned Lark, *strigata* subspecies	CDF CWH	SXB (2019)	Red	G5T2 (2016)	E	1-E (2005)			Y	
Erynnis propertius	Propertius Duskywing	CDF CMA CWH MH	S2 (2020)	Red	G5 (2020)					Y	
Euchloe ausonides insulanus	Large Marble, *insulanus* subspecies	CDF CWH	SX (2021)	Red	G5T1 (2010)	XT	1-XT (2003)				
Euphagus carolinus	Rusty Blackbird	BG BWBS CDF CWH ESSF MS PP SBPS SBS SWB	S3S4B (2015)	Blue	G4 (2016)	SC	1-SC (2009)				
Eurybia radulina	rough-leaved aster	CDFmm CWHxm	S2 (2022)	Red	G4G5 (1988)					Y	Y

Scientific Name	English Name	Biogeoclimatic Units	Provincial	BC List	Global	COSEWIC	SARA	Provincial FRPA	Land Use Objectives	CDC Mapped Locat	
										Public	Confiden
Falco peregrinus anatum	Peregrine Falcon, *anatum* subspecies	BG BWBS CDF CWH IDF MS PP SBS	S2? (2011)	Red	G4T4 (2016)	NAR	1-SC (2012)				Y
Falco peregrinus pealei	Peregrine Falcon, *pealei* subspecies	CDF CWH	S3S4 (2019)	Blue	G4T3 (2016)	SC	1-SC (2003)				Y
Falco rusticolus	Gyrfalcon	BAFA BG BWBS CDF CWH ICH IDF SBPS SBS SWB	S3S4B,SNRN (2015)	Blue	G5 (2016)	NAR					Y
Fraxinus latifolia	Oregon ash	CDFmm CWHxm	S1S2 (2019)	Red	G5 (1990)					Y	
Glaucidium gnoma swarthi	Northern Pygmy-owl, *swarthi* subspecies	CDF CWH MH	S3S4 (2018)	Blue	G4G5T3T4Q (2019)			Y		Y	
Hemphillia dromedarius	Dromedary Jumping-slug	CDF CWH	S2 (2015)	Red	G3G4 (2005)	T	1-T (2005)			Y	
Hemphillia glandulosa	Warty Jumping-slug	CDF CWH	S2? (2015)	Red	G3G4 (2005)	SC	1-SC (2005)			Y	
Hesperia colorado oregonia	Western Branded Skipper, *oregonia* subspecies	CDF CWH MH	S2 (2021)	Red	G5T2 (2016)	E				Y	
Hirundo rustica	Barn Swallow	BAFA BG BWBS CDF CWH ESSF ICH IDF IMA MH MS PP SBPS SBS SWB	S4B (2022)	Yellow	G5 (2016)	SC	1-T (2017)				
Hosackia pinnata	bog bird's-foot lotus	CDFmm CWHmm	S2? (2019)	Red	G4G5 (2001)	E	1-E (2005)			Y	

Scientific Name	English Name	Biogeoclimatic Units	Provincial	BC List	Global	COSEWIC	SARA	Provincial FRPA	Land Use Objectives	CDC Mapped Locat	
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Hydroprogne caspia	Caspian Tern	BG BWBS CDF CWH ICH IDF PP SBS	S3B (2015)	Blue	G5 (2016)	NAR					
Icaricia saepiolus insulanus	Greenish Blue, *insulanus* subspecies	CDF CWH	SH (2021)	Red	G5TH (2018)	E	1-E (2003)				
Icteria virens	Yellow-breasted Chat	BG CDF CWH ICH IDF PP SBS	S2B (2018)	Red	G5 (2016)	E	1-E (2003)	Y		Y	Y
Juncus kelloggii	Kellogg's rush	CDFmm	S1S2 (2019)	Red	G3? (1990)	E	1-E (2005)			Y	Y
Larus californicus	California Gull	BG BWBS CDF CWH ICH IDF MS PP SBS	S1B,SNRN (2022)	Red	G5 (2016)						
Lasiurus cinereus	Hoary Bat	BG BWBS CDF CWH ICH IDF MS PP SBS	S3S4 (2022)	Blue	G3G4 (2016)						
Lepus americanus washingtonii	Snowshoe Hare, *washingtonii* subspecies	CDF CWH	S1 (2011)	Red	G5T3T5 (1996)					Y	
Limnanthes macounii	Macoun's meadow-foam	CDFmm CWHxm	S2? (2019)	Red	G2? (2020)	T	1-T (2006)			Y	Y
Limnodromus griseus	Short-billed Dowitcher	BG BWBS CDF CWH ICH IDF PP SWB	S2S3B (2015)	Blue	G5 (2016)					Y	
Limosa haemastica	Hudsonian Godwit	BWBS CDF CWH IDF MS SWB	S1B (2022)	Red	G4 (2016)	T				Y	

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Lithobates pipiens	Northern Leopard Frog	CDF ICH IDF PP	S1 (2021)	Red	G5 (2016)	E	1-E (2003)	Y		Y	
Lomatium dissectum	fern-leaved desert-parsley	CDFmm	S2 (2019)	Red	G4T4 (2003)					Y	
Lomatium papilioniferum	butterfly bearing lomatium	CDFmm CWHxm	S2 (2019)	Red	GNR	T	1-T (2011)			Y	
Lupinus oreganus var. *kincaidii*	Kincaid's lupine	CDFmm	SU (2019)	Unknown	G4T2 (2016)	XT	1-XT (2011)			Y	
Lupinus rivularis	streambank lupine	CDFmm CWHdm CWHxm	S1 (2019)	Red	G2G4 (2016)	E	1-E (2005)			Y	
Marah oregana	coast manroot	CDFmm	S1 (2019)	Red	G5 (1990)	E				Y	
Meconella oregana	white meconella	CDFmm CWHxm	S1S2 (2019)	Red	G2 (2020)	E	1-E (2006)			Y	
Megascops kennicottii kennicottii	Western Screech-Owl, *kennicottii* subspecies	CDF CWH MH	S2S3 (2017)	Blue	G4G5T4 (2016)	T	1-T (2005)			Y	
Melanerpes lewis	Lewis's Woodpecker	BG CDF CWH ICH IDF PP SBS	S2S3B (2022)	Blue	G4 (2016)	T	1-T (2012)	Y		Y	Y
Melanitta americana	Black Scoter	CDF CMA CWH MH	S3S4N (2015)	Blue	G5 (2016)						
Melanitta perspicillata	Surf Scoter	BG BWBS CDF CWH ICH IDF MS PP SBPS SBS SWB	S3B,S4N (2015)	Blue	G5 (2016)					Y	
Musculium partumeium	Swamp Fingernailclam	CDF CWH ESSF ICH	S2S4 (2015)	Blue	G5 (2015)						
Mustela frenata altifrontalis	Long-tailed weasel, *altifrontalis* subspecies	CDF CWH MH	SH (2011)	Red	G5TNR						
Mustela richardsonii anguinae	Ermine, *anguinae* subspecies	CDF CWH MH	S3 (2010)	Blue	G5T3 (2016)					Y	Y

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Myodes gapperi occidentalis	Southern Red-backed Vole, *occidentalis* subspecies	CDF CWH	S1 (2006)	Red	G5T5 (2016)					Y	
Myotis lucifugus	Little Brown Myotis	BG BWBS CDF CWH ESSF ICH IDF MH MS PP SBPS SBS SWB	S3S4 (2022)	Blue	G3G4 (2021)	E	1-E (2014)				
Nannopterum auritum	Double-crested Cormorant	BWBS CDF CWH ICH IDF PP SBPS SBS	S3S4 (2015)	Blue	G5 (2016)	NAR				Y	
Navarretia propinqua	near navarretia	CDFmm IDFdm IDFxh	S2S3 (2019)	Blue	G5 (1993)					Y	
Nearctula sp. 1	Threaded Vertigo	CDF CWH	S3 (2015)	Blue	G3G5 (2006)	SC	1-SC (2012)			Y	
Nycticorax nycticorax	Black-crowned Night-heron	BG CDF CWH ICH IDF PP	S1 (2022)	Red	G5 (2016)						
Ophiogomphus occidentis	Sinuous Snaketail	BAFA BG CDF CMA CWH ESSF ICH IDF IMA MH MS PP SBPS	S3 (2015)	Blue	G5 (2015)						

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Oreamnos americanus	Mountain Goat	BAFA BG BWBS CDF CMA CWH ESSF ICH IDF IMA MH MS PP SBPS SBS SWB	S3 (2015)	Blue	G5 (2016)						
Patagioenas fasciata	Band-tailed Pigeon	CDF CWH ICH IDF MS SBS	S3S4 (2022)	Blue	G4 (2016)	SC	1-SC (2011)				
Pelecanus erythrorhynchos	American White Pelican	BG BWBS CDF CWH ICH IDF MS PP SBPS SBS	S1B (2022)	Red	G4 (2016)	NAR		Y		Y	
Plagiobothrys tenellus	slender popcornflower	CDFmm	S1? (2019)	Red	G4G5 (1988)	T	1-T (2011)			Y	
Platanthera ephemerantha	white-lip rein orchid	CDFmm CWHvh	S3 (2019)	Blue	G3? (2012)					Y	
Pluvialis dominica	American Golden-Plover	BAFA BG BWBS CDF CWH ICH IDF MS PP SBS SWB	S3S4B (2015)	Blue	G5 (2016)						
Pooecetes gramineus affinis	Vesper Sparrow, *affinis* subspecies	CDF	S1B (2022)	Red	G5T3? (2022)	E	1-E (2007)			Y	
Pristiloma johnsoni	Broadwhorl Tightcoil	CDF CWH MH	S3 (2015)	Blue	G3 (2013)						
Progne subis	Purple Martin	BWBS CDF CWH ICH	S3S4B (2022)	Blue	G5 (2016)					Y	

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Promenetus umbilicatellus	Umbilicate Sprite	BG CDF IDF PP	S2S3 (2015)	Blue	G4 (2015)					Y	
Prophysaon coeruleum	Blue-grey Taildropper	CDF CWH	S2S3 (2015)	Blue	G3G4 (2010)	T	1-T (2019)			Y	
Pyrola aphylla	leafless wintergreen	CDFmm CWHmm CWHvm CWHxm IDFww	S3 (2019)	Blue	GNR					Y	
Rana aurora	Northern Red-legged Frog	CDF CWH MH	S3 (2022)	Blue	G4 (2015)	SC	1-SC (2005)	Y		Y	
Ranunculus alismifolius var. *alismifolius*	water-plantain buttercup	CDFmm	S1 (2019)	Red	G5T5 (1995)	E	1-E (2003)			Y	
Rubus lasiococcus	dwarf bramble	CDFmm CWHds CWHmm CWHxm ESSFmw MHmm	S3 (2019)	Blue	G5 (1990)					Y	
Sabulina pusilla	dwarf sandwort	CDFmm	S1 (2019)	Red	G3G5 (2004)	E	1-E (2005)			Y	
Sanicula bipinnatifida	purple sanicle	CDFmm CWHxm	S2 (2019)	Red	G5 (1990)	T	1-T (2003)			Y	
Sericocarpus rigidus	white-top aster	CDFmm CWHxm	S3 (2019)	Blue	G3 (2007)	SC	1-SC (2003)			Y	
Setophaga virens	Black-throated Green Warbler	BWBS CDF CWH ESSF ICH SBS	S3B (2015)	Blue	G5 (2016)			Y		Y	
Silene scouleri ssp. *scouleri*	coastal Scouler's catchfly	CDFmm	S1 (2019)	Red	G5T3T5 (2002)	E	1-E (2005)			Y	
Sorex navigator brooksi	Western Water Shrew, *brooksi* subspecies	CDF CWH	S2S3 (2018)	Blue	G5T2T3 (2019)			Y		Y	
Sorex rohweri	Olympic Shrew	CDF CWH	S2? (2015)	Red	G4G5 (2007)					Y	
Sorex trowbridgii	Trowbridge's Shrew	CDF CWH	S3 (2015)	Blue	G5 (2016)					Y	
Speyeria zerene bremnerii	Zerene Fritillary, *bremnerii* subspecies	CDF CWH	S2 (2013)	Red	G5T3T4 (1998)					Y	

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Sterna forsteri	Forster's Tern	BG BWBS CDF CWH ICH IDF PP	S1B (2022)	Red	G5 (2016)	DD				Y	
Sympetrum vicinum	Autumn Meadowhawk	CDF CWH	S3S4 (2015)	Blue	G5 (2015)					Y	
Synthliboramphus antiquus	Ancient Murrelet	CDF CWH	S2S3B,S4N (2022)	Blue	G4 (2016)	SC	1-SC (2006)	Y		Y	
Syntrichia laevipila	twisted oak moss	CDFmm	S3 (2015)	Blue	GNR	SC	1-SC (2005)			Y	Y
Tonella tenella	small-flowered tonella	CDFmm	S3 (2019)	Blue	G5 (1990)	E	1-E (2005)			Y	Y
Tramea lacerata	Black Saddlebags	CDF	S2 (2015)	Red	G5 (2016)					Y	
Tringa incana	Wandering Tattler	BWBS CDF CWH IDF SBS SWB	S3B (2015)	Blue	G4G5 (2016)						
Triteleia howellii	Howell's triteleia	CDFmm	S1 (2005)	Red	G4G5T3T4Q (2020)	E	1-E (2005)			Y	
Tyto alba	Barn Owl	BG BWBS CDF CWH ICH IDF PP	S3 (2022)	Blue	G5 (2016)	T	1-T (2018)				
Uropappus lindleyi	Lindley's microseris	CDFmm	S1S2 (2019)	Red	G5 (1990)	E	1-E (2010)			Y	
Viola howellii	Howell's violet	CDFmm CWHmm CWHxm MHmm	S1S2 (2019)	Red	G4 (1988)					Y	
Viola praemorsa var. *praemorsa*	yellow montane violet	CDFmm CWHxm	S1 (2019)	Red	G5T3T5 (2000)	E	1-E (2003)			Y	
Woodwardia fimbriata	giant chain fern	CDFmm CWHxm	S3 (2019)	Blue	G5 (1994)					Y	
Zeltnera muehlenbergii	Muhlenberg's centaury	CDFmm	S1 (2019)	Red	G5? (1996)	E	1-E (2010)			Y	

Search Criteria

Animals OR Plants
AND BC Conservation Status:Red (Extirpated, Endangered, or Threatened) OR Blue (Special Concern)
OR SARA Schedule 1 Status:True
OR COSEWIC Status:Endangered OR Threatened OR Special Concern
AND Habitat Types: Anthropogenic,Forest,Riparian,Stream/River
AND BGC Zone: CDF
Sort Order:Scientific Name Ascending

Notes

1. Citation: B.C. Conservation Data Centre. 2023. BC Species and Ecosystems Explorer. B.C. Minist. of Environ. Victoria, B.C. Available: https://a100.gov.bc.ca/pub/eswp/ (https://a100.gov.bc.ca/pub/eswp/) (accessed Feb 15, 2023).

2. The data contained in the Results Export in BCSEE are provided under the Open Government License - BC (http://www.data.gov.bc.ca/local/dbc/docs/license/OGL-vbc2.0.pdf).

3. We welcome your comments at cdcdata@gov.bc.ca.