East Porpoise Bay Road Sechelt Inlet Road Improvements

Environmental Overview Assessment

Prepared for:

BC Ministry of Transportation and Infrastructure

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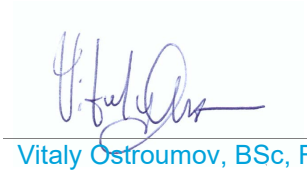

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1 Introduction

The BC Ministry of Transportation and Infrastructure (MoTI) is proposing roadway upgrades along a 770 m stretch of Sechelt Inlet Road (the Project Area) located within Sechelt Band Lands No. 2 (Shíshálh Nation lands), within the district of Sechelt, BC (refer to Drawing 678324-001).

Currently, the section of road is a two-way roadway without paved sidewalks (Photo 1, Appendix II) and five power pole mounted street lights along the northbound side of the road. At the request of MoTI, SNC-Lavalin Inc. (SNC-Lavalin) has prepared an Environmental Overview Assessment (EOA) to assess environmental constraints associated with the Project, including potential concerns and risks associated with terrestrial wildlife, vegetation, and aquatic resources. This document outlines the findings of the desktop review and field assessment.

1.1 Project Understanding

The scope of the proposed works includes replacement of asphalt via mill and overlay methodology. Specific locations along the linear alignment of the Project are defined in intervals, as follows:

- Intervals of +10 m are used to define specific locations along the alignment;
- A total of 77 intervals of 10 m exist along the Project alignment between 100+20 and 107+90. The Project begins at 100+27, on the western boundary of Sechelt Band Lands No. 2 at the intersection of Sechelt Inlet Road and Delta Road; and
- The Project terminates at 107+84, on the northeastern boundary of Sechelt Band Lands No. 2 at the intersection of Sechelt Inlet Road and Xenichen Avenue.

The construction works include:

- Installation of north and southbound sidewalks (1.5 m width) along the entirety of the Project alignment;
- Resurfacing of the length the primary road;
- Installation of retaining walls at two locations:
  - Approximately 65 m on the west side of Sechelt Inlet Road at Slim Street (between 101+60 and 102+30); and
  - Approximately 65 m on the east side of Sechelt Inlet Road at Xenichen Avenue (between 100+42 and 101+10).
- Soil excavation and removal (exact scope to be determined);
- Potential installation of streetlight fixtures on existing BC Hydro power poles; and
- Vegetation removal within the MoTI right-of-way (ROW).

All Project works will take place within the MoTI ROW.

1.2 Project Setting

The Project is located within the Coastal Western Hemlock biogeoclimatic Zone (CWH) within the Eastern Very Dry Maritime subzone (CWH xm1) (Pojar and MacKinnon 1994). The CWH biogeoclimatic zone receives high amounts of annual precipitation and has a cool mesothermal climate (Meidinger & Pojar, 1991). The representative vegetation community within this zone is comprised of Western Hemlock (Tsuga heterophylla), Douglas fir (*Pseudotsuga menziesii*), and Western red cedar (*Thuja plicata*) trees, with Amabilis fir (*Abies amabilis*) and yellow cedar (*Cupressus nootkatensis*) commonly occurring within the wetter reaches of the zone (Meidinger & Pojar, 1991). Average maximum annual rainfall is 4,386 mm per year, with the wettest month being December, and the average maximum annual snowfall is 841 cm per year, with snowfall occurring within three months of the year, on average (Meidinger & Pojar, 1991). The mean annual ambient air temperature within the zone is 10.5° C, with the average coldest annual temperature of -6.6° C and the average warmest annual temperature of 18.7° C (Meidinger & Pojar, 1991).

At a local scale, the Project runs along the southeast side of Porpoise Bay, located within Sechelt Inlet. It is bound by downtown Sechelt on the south, a mix of residential and commercial properties on the west and a mixture of rural and natural areas on the north end, including Porpoise Bay Provincial Campground.

1.3 Methodology

1.3.1 Desktop Review

Information and data were collected through a desktop review of available ecological and regulatory databases and search engines, including local, regional, and federal government sites, to document conditions within and around the Project footprint and adjacent land uses that may be affected by the Project. Information from the desktop research was compiled into a summary of the Project's baseline environmental setting by environmental component.

The environmental components reviewed during desktop study included the following:

- Site Topography and Soil;
- Vegetation;
- Wildlife and wildlife habitat;
- Fish, fish habitat and associated drainages; and
- Land use and contaminated sites.

Data sources evaluated in support of this overview assessment include:

- British Columbia Conservation Data Centre (BC CDC, 2021);
- iMap BC (BC Gov, 2021);
- Fish Inventory Data Queries (ENV, 2021);
- Species at Risk Public Registry (ECCC, 2021);
- Invasive Alien Plant Program (IAAP, 2021);
- BC Conservation Data Centre (CDC) Species & Ecosystems Explorer (BC CDC, 2021);

- BC Site Registry (ENV, 2021);
- Surficial Geology Mapping (Fulton, 1995); and
- Sunshine Coast Regional District (SCRD) mapping (SCRD, 2021).

1.3.1.1 BC CDC Search

The BC Conservation Data Centre's Species & Ecosystem Explorer (BC CDC, 2021) was used to identify species at risk with the potential to occur within 200 m of the Project Area. The following parameters were investigated:

- Vegetation: BC Blue-listed and Red-listed; species designated as special concern, threatened, or endangered in the *Species at Risk Act*[1] (SARA); species with potential to occur within 200 m of the Project Area;
- Ecological Communities: BC Blue-listed and Red-listed; species with potential to occur within 200 m of the Project Area; and
- Fish and wildlife: BC Blue-listed and Red-listed; species designated as special concern, threatened, or endangered in the *Species at Risk Act* (SARA); species with potential to occur within 200 m of the Project area.

1.3.2 Field Studies

Field surveys were conducted on March 10, 2021 to establish the existing biophysical resources of the Project Area and to provide photo documentation.

The Site visit consisted of a traverse along the Project alignment, with a focus on identifying and quantifying the following:

- Drainage features (e.g., streams, culverts, outfalls);
- Vegetation communities;
- Evaluation of fish and wildlife habitat;
- Evidence of wildlife habitation and/or use (e.g., burrows, nests, dens, tracks);
- Presence of species at risk; and
- Presence invasive vegetation.

Photo documentation is presented in Appendix II.

1.3.3 Limitations

Items not included in the scope of this EOA are as follows:

- Detailed field studies including species-specific surveys, plant sampling, fish sampling, fish habitat assessments or rare species investigations;

[1] *Species at Risk Act* (SARA), S.C. 2002, c. 29, last amended on October 6, 2020.

- Assessment of cumulative effects of the Project;
- Consultation with First Nations, stakeholders and the public; and
- SNC-Lavalin understands that the Project scope is currently being developed. If the scope changes significantly during subsequent planning stages, this EOA will be updated to reflect additional requirements, as applicable.

2 Baseline Conditions

2.1 Topography and Soil

The Project Area has an average elevation of 20 m above sea level (ASL). To the west, elevation reaches sea level at the shores of Porpoise Bay, located between 50 m and 100 m west of the Project Area at the closest points (between 100+20 and 105+00), and to the east topography increases in elevation to 40 m, creating an overall slope from the southeast to the northwest.

Surficial geology mapping indicates that the Site's surface consists of Till veneer (Tv), a thin layer less than 2 m in thickness (Fulton, 1995). Two (2) groundwater wells were identified within 500 m of the Site, within the same location. Wells No. 93084 and 93094, located approximately 400 m southeast of the Site, indicate a static water level of 29.9 m below ground surface (bgs). Table 1 below lists the subsurface lithology information from these wells:

Table 1: Lithology of Wells No. 93084 and 93094 (BC Well Search, 2021)

From (m bgs)	To (m bgs)	Observations
0	7.9	Compact silty fine sand
7.9	21.6	Compact silty sand, some layers of gravel and cobbles
21.6	26.2	Compact gravel and cobbles
26.2	29.9	Sand, some gravel
29.9	37.5	Wet sand, some gravel
37.5	49.7	Sand, some gravel layers

In general, regional surface water is inferred to flow form the higher elevation to the east towards the lower elevations to the west. During the site investigation, site topography was observed to vary along the alignment. Slightly higher elevations were observed between Kunut Avenue and Tsulich Drive, and at the roadway's intersection with Xenichen Avenue. The lowest elevation surface is located between Slim Street and Shetxwen Road.

2.2 Vegetation

The Project is located within the Coastal Western Hemlock Very Dry Maritime BEC zone (CWHxm1). Vegetation along the Project alignment includes trees and shrubbery adjacent to Sechelt Inlet Road along the western shoulder (Photo 2, Appendix II) and sporadically along the eastern shoulder. The vegetation along Sechelt Inlet Road is relatively isolated, serving to create barriers between Sechelt Inlet Road and the residential areas to the west the roadway. It is anticipated that some or all trees within the ROW will be removed as part of Project works.

2.2.1 Northbound ROW of Sechelt Inlet Road

Vegetation along the northbound ROW is limited to isolated trees on private property, including western red cedar (*Thuja plicata*) and Douglas fir (*Pseudotsuga menziesii*), grass species and salal (*Gaultheria shallon*) (Photo 3, Appendix II).

No tree removal is anticipated to take place along this section of the ROW. Vegetation disturbance is anticipated to be limited to grasses and small amounts of native shrubs (e.g., salal).

2.2.2 Southbound ROW of Sechelt Inlet Road

The western (southbound) ROW was observed to be densely vegetated along a narrow corridor between the roadway and residential properties to the west. The following count of tree species were documented within the ROW:

- Eleven (11) red alder (*Alnus rubra*);
- Thirty-six (36) western red cedar;
- One (1) western hemlock (*Tsuga heterophylla*);
- Thirty-six (36) Douglas fir;
- Seven (7) shore pine (*Pinus contorta*); and
- One (1) paper birch (*Betula papyrifera*).

Trees along this section were estimated to have a diameter-at-breast-height (DBH) ranging between 5 cm and 55 cm, with the majority of trees falling between 10 cm and 25 cm. The vegetated corridor has dense understory cover comprised primarily of salal, huckleberry (*Vaccinium membranaceum*), Oregon grape (*Mahonia aquifolium*),western red cedar and Douglas fir saplings, as well as abundant grass cover (Photo 4 and Photo 5, Appendix II).

It is anticipated that some or all trees within the southbound ROW will be removed during Project activities.

2.2.3 Vegetation Species and Ecological Communities at Risk

The CDC investigation identified 46 plant species at risk with the potential to occur within 500 m of the Site, including 16 provincially blue-listed species, 28 provincially red-listed species, 21 species designated as Endangered under SARA, four species designated as Special Concern under SARA and three species designated as Threatened under SARA (Table A1, Appendix I). In addition, 15 provincially blue-listed and 26 red-listed ecological communities were identified (Table A2, Appendix II). Refining this list based on existing environmental conditions, as well as results of the field investigation, suggest that no vegetation species or ecological communities of management concern occur within the Project Area.

2.2.4 Invasive Vegetation

The desktop review identified records of Japanese knotweed (*Fallopia japonica*) and bohemian knotweed (*Fallopia* x *bohemica*) (IAPP, 2021). Both Japanese and bohemian knotweed are defined as noxious weeds under Schedule 1 of the *BC Weed Control Act* and require management during works.

During the field investigation, English holly (*Ilex aquifolium*), English ivy (*Hedera helix*), Himalayan blackberry and scotch broom (*Cytisus scoparius*) were documented along the southbound ROW of Sechelt Inlet Road (Photo 6, Appendix II).

No invasive species were documented along the northbound ROW of Sechelt Inlet Road.

2.3 Wildlife

The Project Area represents low quality habitat for generalist species. The forested sections adjacent to Sechelt Inlet Road along the west section of the ROW, with its associated shrub layers, may represent suitable habitat for songbirds, coyote (*Canis latrans*), deer (*O. hemionus*), racoon (*Procyon lotor*), small mammals such as mice or the occasional black bear (*Ursus americanus*). Taller tree species with exposed branches may also act as perch sites for raptor species. The fragmented nature of the Site vegetation and high levels of disturbance from regular maintenance (vegetation trimming to accommodate the transmission line structures) and traffic noise significantly reduce the habitat quality for more sensitive wildlife species. No dens, mineral licks, stick nests or bat hibernacula sites were documented.

The following wildlife species were documented:

- American crow (*Corvus brachyrhynchos*);
- An inactive crow nest was documented outside of the MoTI ROW near the intersection of Sechelt Inlet Road and Slim Street, at marker 101+80 (Photo 7, Appendix II);
- Bald eagle (Haliaeetus leucocephalus);
- Red-breasted nuthatch (*Sitta canadensis*); and
- American robin (*Turdus migratorius*).

2.4 Aquatic Resources

The Project Area is located within 50 m of Porpoise Bay (Photo 13, Appendix II), which is a regionally important fish-bearing waterbody that supports ecologically significant species of management concern. Several fish-bearing watercourses, outside of the Project Area, flow into Porpoise Bay, including Cook Creek (1.2 km west of the Project Area), Irgens Creek (approximately 1.2 km north of the Project Area), Burton Creek (approximately 1.5 km north of the Project Area), Burnet Creek (approximately 1.6 km north of the Project Area), an unnamed creek (approximately 2 km north of the Project Area) and Angus Creek (approximately 2.5 km north of the Project Area). Additionally, Sechelt Marsh is located approximately 270 m west of the southwestern limits of the Project Area.

During the desktop and field investigation, no watercourses were identified within the Project Area. Potential effects to local aquatic resources, outside of the Project Area, are limited to surface water runoff from a limited number of topographically delineated surface drainages that direct water into catch basins and eventually Porpoise Bay.

The following evidence of drainage was documented:

- Catch basin along Sechelt Inlet Road, on the eastern side of the roadway, located in front of Columbia Fuels at 103+40 (Photo 8, Appendix II);
- Evidence of drainage flow along the western side of Sechelt Inlet Road (Photo 9 and Photo 10, Appendix II);
- A drainage pipe conveying water from a residential property onto Sechelt Inlet Road was documented on the eastern side of Sechelt Inlet Road at 100+90 (Photo 11, Appendix II); and

- Catch basin on Ikat Drive (via Tsulich Drive) – 1 catch basin approximately 60 m west of the Site (Photo 12, Appendix II).

The limited scope of proposed works, absence of watercourses, absence of connectivity to fish habitat within the Project Area and the expectation that existing water management infrastructure (e.g., catch basins and municipal water networks) will remain unaffected, suggests that impacts to fish and fish habitat will be negligible. As such, review of aquatic species and habitat will no longer be discussed in this report.

2.4.1.1 Species at Risk

A total of 153 candidate fish, wildlife and vegetation species, subspecies or populations were identified as legally designated or of conservation concern. Fish and wildlife taxa included in the CDC query results are the taxanomic classes vertebrates, invertebrates, amphibians, reptiles, birds and mammals. Refining this list of candidate species according to habitat suitability requirements resulted in six focal species potentially occurring within the Project Area (Table 2).

Table 2: Provincially and Federally Listed Species with the Potential to Occur within the Project Site

Common Name	Scientific Name	Provincial Status (CDC)	National Status (COSEWIC)	SARA Schedule	Habitat Requirements
Terrestrial Invertebrates					
Threaded vertigo	*Nearctula sp.*	Blue	Special Concern (2010)	Special Concern (2012)	Deciduous and mixed wood forests dominated by bigleaf maple with an understory of sword fern.
Amphibians					
Northern Red-Legged Frog	*Rana aurora*	Blue	Special Concern (2015)	Special Concern (2005)	Marshes, ponds, lake edges and slow streams.
Mammals					
Little Brown Myotis	*Myotis lucifugus*	Yellow	Endangered (2013)	Endangered (2014)	Tree cavities, buildings, rock crevices and small caves for roosting. Riparian areas and open forest for foraging.
Townsend's Big-Eared Bat	*Corynorhinus townsendii*	Blue	Not listed	Not listed	Coniferous and deciduous forests with caves, old mines and buildings for roosting.
Birds					
Band-tailed pigeon	*Patagioenas fasciata*	Blue	Special Concern (2008)	Special Concern (2011)	Intact low elevation coniferous forest with accessible mineral licks.
Western Screech Owl	*Megascops kennicottii*	Yellow	Threatened (2012)	Threatened	Moist coniferous and mixedwood forests, tree cavities for nesting.

The spatially limited and isolated nature of the vegetated sections of the Site (e.g., forested strips along the west side of Sechelt Inlet Rd) and the high level of anthropogenic disturbances significantly reduces habitat suitability for most wildlife species. Occurrences of species at risk are highly unlikely and impacts are anticipated to be nil.

2.4.2 General Habitat Suitability of the Project Area for Species at Risk

The threaded vertigo occurs in deciduous or mixed wood forests at low elevation sites and is typically found in association with bigleaf maple (*Acer macrophyllum*) trees with an understory of ferns (particularly sword fern) and shrubs that are characteristic of moist and rich sites (COSEWIC 2010). The snails are arboreal and are most often encountered on the trunks of bigleaf maple trees; they are patchily distributed within these stands. Existing known populations are located on the Sunshine Coast and Vancouver island (COSEWIC 2010). Bigleaf maple stands with an understory of sword fern do not occur within the Project Area and moist microhabitats that would support a population are limited or absent. Notwithstanding, threaded vertigo has been found near roadsides and recreational areas (COSEWIC 2010) and it's occurrence is considered probable or predictable on the Sunshine Coast; however, the absence of bigleaf maple stands with a sword fern dominated understory within the Project Area suggest that impacts to this species is expected to be negligible.

The northern red-legged frog requires standing water with submerged vegetation and of sufficient permanence for egg attachment, hatchling development and metamorphosis of tadpoles. While the likely presence of saturated topographical drainages could provide microhabitats suitable for migration, these areas do not hold water for breeding. No permanent or ephemeral ponds or wetlands are known to exist within the Project Area. Accordingly, this species is not considered further in this review.

The ecology of little brown myotis is poorly studied, but this bat species uses open forests and riparian areas for foraging while roosting sites include rock faces/crevices, loose bark and tree cavities (CDC 2021). The Townsend's big-eared bat is typically associated with mixed wood forests and commonly forms maternity and hibernation colonies (CDC 2021). While small amounts of disturbed coniferous vegetation occurs within the Project Area, the occurrence of these species is highly unlikely.

Band-tailed pigeon is a social and gregarious species that requires mature and continuous coniferous woodland in proximity to mineral licks that are used to supplement critical dietary nutrients. Western screech-owls are tolerant of human activity and often nest in residential areas or parks (Klinkenberg 2021). They are a secondary cavity nester, most commonly nesting in cavities excavated by woodpeckers, but will also use natural tree cavities and nest boxes (Cannings et al. 2017). The likelihood of these species occurring within the Project Area is unlikely.

2.5 Land Use and Contaminated Sites

The following land use information was available:

- The entirety of the Site is located within Shíshálh Nation lands (Sechelt Band Lands No. 2);
- The Site is located adjacent to an Agricultural Land Reserve (ALR) property on the northern side of the Project (5916 Sechelt Inlet Road);
- Several businesses exist along the Project alignment, including automotive businesses;
- The majority of properties along the west shoulder of Sechelt Inlet Road are residential in nature;

- One BC Site Registry entry and two Federal Contaminated Sites Inventory records exists within 500 m of the Project Area; and
- Large gravel/aggregate pits exist approximately 400 m west of the Project Area.

2.5.1 Adjacent Properties

Properties within 250 m of the Project Area were reviewed for current land use. Land uses listed under Schedule 2 of the BC CSR may be associated with elevated background levels of subsurface contaminants. Additional properties of interest beyond 250 m were also identified below in Table 3.

Table 3: Properties Adjacent to the Site

Direction	Properties	Notes
North	2 Automotive repair shops[1]: › 5916 Sechelt Inlet Road; and › 102-5520 Sechelt Inlet Crescent. ALR property (5916 Sechelt Inlet Road). Residential properties.	[1] – Automotive repair shops are classified under G-2 of Schedule 2 of the BC *Contaminated Sites Regulation*[2] (CSR).
East	Waterworks equipment retailer (8-5824 Sechelt Inlet Road). Towing service (5880 Sechelt Inlet Road)[2]. Fitness facility (5284 Sechelt Inlet Road). Fuel service station (5812 Sechelt Inlet Road)[3]. Gravel/aggregate lands (approx. 400 m east of the Site)[4].	[2] – Towing services may entail vehicle maintenance on-site, which is classified under G-2 of Schedule 2 of the BC CSR. [3] – Fuel service stations are classified under F-5 of Schedule 2 of the BC CSR. [4] – Beyond 250 m of the Site
South	Commercial retail outlets. Residential properties. Electrical substation (5608 Xenichen Avenue, approximately 400 m south of the Site)[5].	[5] – Beyond 250 m of the Site; Land use classified under B-4 of Schedule 2 of the BC CSR
West	Residential properties	-

Due to the presence of automotive-related businesses and a fuel service station in proximity to the Project, subsurface conditions may reflect elevated concentrations of contaminants such as hydrocarbons and metals, which are commonly associated with automotive and fuel-related land use. The probability of the land use at the substation located 400 m of the Site impacting the Project is not considered likely due to the distance between the Project and the substation.

The ALR property located adjacent to the Project Area on the north side is unlikely to be impacted by the proposed works as no ground disturbance activities are planned directly adjacent to this property.

2.5.2 Contaminated Sites

One BC Site Registry record was identified within 500 m of the Site (iMap, 2021):

- 5951 Sechelt Inlet Road (BC Site ID: 8346) – Located within a residential area approximately 200 m north of the Project.

[2] *Contaminated Sites Regulation* (CSR), B.C. Reg. 375/96, includes amendments up to B.C. Reg. 161/2020, February 1, 2021.

The nature of potential contamination at this location is unknown. This record is located 200 m away from and downslope of the Site. Therefore, the likelihood that contaminants associated with this record (if any) have migrated to the Site is considered low.

Two Federal Contaminated Site Inventory records were identified within 500 m of the Site (FCSI, 2021):

› One location containing two records located on the shore of Porpoise Bay. The records are designated as “Water Lot” (Site Number 00024421) and “Upland Portion” (Site Number 00021386) – Located within Porpoise Bay approximately 480 m west of the Site. This record indicates that remediation has been completed at this location.

The nature of potential contamination at this location is unknown. This record is located 480 m away from the Site at lower elevation (sea level). Therefore, the likelihood that contaminants associated with this record (if any) have migrated to the Site is considered low.

3 Regulatory Context

Wildlife Act

Wildlife in BC is protected from harm under the *Wildlife Act*[3] (WLA), except as allowed by regulation for such activities as hunting and trapping. The WLA falls under the jurisdiction of the Ministry of Forests, Lands, Natural Operations and Rural Development (FLNR) and extends to vertebrate animals including bird species not listed under the MBA (i.e., raptors, vultures, grouse, kingfishers, cormorants, and corvids). Implications of the WLA will be determined after pre-construction surveys are complete. A WLA salvage permit may be required if it is deemed that certain species need to be removed from the construction footprint to avoid disturbance and/or mortality. Although there is no timeline for the review of a salvage permit, there is a general 60-day review period following submission of a permit application. An application for a salvage permit includes a detailed salvage plan (including contingency measures and effectiveness monitoring), and First Nations consultation, which can be a lengthy process. A permit application review may be expedited through payment to Front Counter BC.

Species at Risk Act

Federally, SARA is enforced by DFO for aquatic species (i.e., fish, shellfish, crustacean, marine animal, or marine plants), and by Environment and Climate Change Canada (ECCC) for terrestrial species including freshwater turtles, amphibians, waterfowl, and plants. SARA prohibits the killing, harm, harassment, and capture of a species listed on Schedule 1 of SARA as extirpated, endangered, or threatened as per Sections 32 and 33 of SARA. Additional provisions are contained in SARA that prohibit the possession, collection, and trading of individual species, and damage or destruction of the residence of one or more individuals listed on Schedule 1 of SARA as extirpated, endangered, or threatened. Furthermore, the destruction of critical habitat of listed species as identified in the recovery strategy or action plan for that species is prohibited under Section 58(1) of SARA for aquatic species, migratory birds, and other listed species on federal land.

Migratory Birds Convention Act and Regulations

Environment and Climate Change Canada's (ECCC's) Canadian Wildlife Service (CWS) has jurisdiction over birds listed under the federal *Migratory Birds Convention Act*[4] (MBCA), which in the general area of the proposed Project includes insectivorous birds (i.e., warblers, flycatchers, hummingbirds, wrens, thrushes, vireos, nightjars, swallows, tanagers, woodpeckers, chickadees, and their allies), seed eaters (i.e., sparrows, finches, grosbeaks, tanagers), and water birds (i.e., shorebirds, gulls, waterfowl, and their allies). Some of these species are listed under SARA. MBCA prohibits injury, molestations, and destruction of migratory birds and their nests. Generally accepted work windows revolve around the breeding bird nesting periods which are defined by Environment Canada and are generally accepted at April 15 to August 31 for songbirds and January 15 to August 31 for raptors. If works cannot be conducted outside of these windows, bird nesting surveys and measures to protect active nests are required for vegetation removal and disturbance activities during the active nesting period.

[3] *Wildlife Act* (WLA) [RSBC 1996] Chapter 488.
[4] *Migratory Birds Convention Act* (MBCA), S.C. 1994, c. 22, last amended on December 12, 2017.

4 Potential Effects

Design modifications of the Project are anticipated to include the removal of existing roadway infrastructure and the excavation and grading of soil substrates to accommodate re-paving of Sechelt Inlet Drive and the addition of sidewalks on the north and southbound sides of the ROW. This will result in the loss of approximately 3,750 m^2 of heavily disturbed vegetation along the southbound section and approximately 1,500 m^2 of native shrubs and grasses along the northbound section of the ROW. These vegetated sections may represent marginal habitat for generalist wildlife species; however, impacts to species that may occur in these areas is expected to be nil.

The use of industrial equipment for construction and/or maintenance may also affect sediment and contaminant concentrations in downstream watercourses that are connected to municipal stormwater drains through the direct input of sediment or the degradation of soil in the surrounding areas that can potentially migrate into storm drains. This effect is primarily a concern during construction but can be effectively mitigated.

5 Mitigations and Recommendations

The following subsections outline recommendations and mitigation measures to be undertaken during subsequent stages of Project planning, design and implementation.

5.1 General Recommendations

5.1.1 Sensitive Timing Periods

The following sensitive periods were identified:

- The songbird nesting season in zone A1 occurs between March 16 and August 15 (ECCC, 2021);
- Project works such as vegetation clearing and tree removal, are recommended to take place outside of this period. If works are required within this period, bird nest surveys may be required;
- The regional least-risk window for fish for the South Coast Region occurs between August 1 and September 15 (BC MoE, 2006); and
- If feasible, conduct Project works within this period.

5.2 Soil

The road expansion is anticipated to involve excavation and placement of engineered fill material, resulting in some quantities of excess soil.

The following recommendations include measures outlined provincial legislation under the BC *Environmental Management Act*[5] (EMA).

- Excavated soils should be segregated into designated stockpiles, and soil stockpiles must be located at least 15 m from any catch basins;
- Specific stockpile locations should be determined in consultation with an EM; and
- Potentially contaminated and contaminated stockpiles should be stored on and covered with secured poly sheeting.

For work where soil removal must occur, the following practices will be followed:

- All soil management will be in compliance with the CSR;
- Best efforts should be made to re-use non-contaminated soil on site;
- No soil may be removed from site until an appropriate disposal facility has been identified and screened by the EM;

[5] *Environmental Management Act* (EMA), B.C. Reg. 161/2020 / effective February 1, 2021.

- Excavated material, surplus soil, new soil, non-contaminated and/or potentially contaminated soils from the Project site will be contained as stockpiles. Soils must be segregated into designated stockpiles, and soil stockpiles must be located at least 15 m from storm sewer drains, dry or wetted ditches, and all other water bodies, and
- The Project EM must be contacted prior to any off-site soil disposal.

5.2.1 Contaminated Sites

The following mitigations are recommended during Project implementation to address risks associated with potential contamination:

- All handling and disposal of contaminated materials should be conducted in adherence to the BC CSR;
- No soil may be removed from site until an appropriate disposal facility has been identified and screened by the EM; and
- If any suspect contaminated soil is encountered (E.g., dark colouration, exhibiting a hydrocarbon odour, and/or presenting a sheen on the surface of water in contact with the soil), contact the EM.

5.3 Vegetation

The following mitigation measures are recommended:

- Vegetation clearing and tree removal should be conducted outside of the songbird nesting period which occurs between March 16 and August 15 (ECCC, 2018);
- If vegetation clearing is planned within this period, a nesting bird survey must be conducted by a qualified professional no more than three days prior to vegetation removal activities;
- If an active nest is identified within the Project Area during construction activities, the Project EM should be notified immediately, and no work is to commence until further assessment/direction is received from the EM/ Qualified Environmental Professional (QEP).
- If, at any time, a vegetation species at risk is identified on the Site, immediately inform the Project EM and stop work until further assessment/direction is received from the EM/Qualified Environmental Professional;
- The contractor must take all precautions to prevent the introduction and spread of noxious weeds and invasive vegetation;
- Inspect vehicles and equipment for plant matter;
- Wash down all vehicles and equipment prior to entering and leaving the Site;
- Remove any noxious weeds and invasive plants encountered within MoTI right-of-way (ROW) and dispose accordingly;
- All noxious weed material must be placed into impermeable plastic bags and tightly secured;
- Remove noxious weeds by manual and hand methods. Do use machinery, burning or herbicides to control noxious weeds;

- All Noxious weed material must be disposed of at an approved facility. The contractor should arrange such a facility prior to the start of works; and
- Follow the Best Practices for Managing Invasive Plants on Roadsides (ISC & MoTI, 2019).

5.4 Wildlife

The following mitigation measures are recommended:

- Implement appropriate waste management and disposal practices;
- Prohibit feeding of wildlife;
- Report vehicle-wildlife collisions, install warning signs or impose reduced speed limits in areas where collisions may occur;
- Avoid unnecessary noise and other disruptions;
- The EM shall be notified of all wildlife observations on site;
- If any nests, dens or signs of wildlife are observed, ensure no disturbance occurs around the habitat and contact the EM immediately; and
- If, at any time, a wildlife species at risk is observed on-site, stop work immediately and notify the Project EM.

5.5 Water Quality

Due to the topography of the Site, the risk of sediment-laden water or deleterious substances flowing into Porpoise Bay exists. The following mitigations are recommended for the Project to protect water quality:

- If feasible, works should be planned to occur within the regional least-risk window for fish for the South Coast Region, occurring between **August 1 and September 15** (BC MoE, 2006);
- Install catch basin protection on any catch basins downslope of the Site. Catch basin protection can entail filter cloth, impermeable berms and/or specifically designed protection materials (e.g., catch basin "donut");
- Use erosion and sediment controls (ESC) along the western shoulder of the roadway (e.g., silt fencing, sandbag berms) during works in locations within which risk of runoff entering Porpoise Bay exists;
- The portion of the Site between 100+20 and 105+00 is within close proximity (between 50 and 100 m) to Porpoise Bay, upslope of Porpoise Bay. It is recommended that silt fencing and/or berms are implemented along the western boundary of the Project along this section of Sechelt Inlet Road during works if works are taking place during heavy precipitation or a risk of runoff flowing towards Porpoise Bay otherwise exists;
- The portion of the Site between 105+00 and 107+90 is between 100 m to 200 m from Porpoise bay, upslope of Porpoise Bay. It is recommended that additional silt fencing and/or berms are kept on hand in order to be implemented along the western boundary of the Project along this section of Sechelt Inlet Road if needed;
- All vehicles and machinery must be equipped with a spill kit;

- All storage of fuel and deleterious substances on-site must be held within industry-standard secondary containment capable of containing 110% of the fluids stored within the primary container;
- All on-site personnel must be adequately trained in spill prevention and spill response and must be capable of effectively utilizing on-site spill response materials;
- Avoid ground disturbance and asphalt works during heavy precipitation; and
- Develop and implement a spill response and reporting plan as part of the Project EMP.

5.5.1 Concrete Works

Concrete works are anticipated to be required for the entire length of the roadway improvement project. Concrete works have the potential to have adverse impacts on aquatic ecosystems from surface runoff containing uncured concrete materials by increasing turbidity and pH in aquatic habitats.

The following mitigations are recommended for all concrete-related works for the Project:

- Include concrete management plan into the Project EMP, including procedures for handling, monitoring, and emergency response. Include a plan for managing concrete wash-water;
- Avoid concrete works during high-precipitation events;
- Ensure concrete works are isolated from water at all times, such as precipitation or site runoff;
- Ensure that wash-water will be recycled or contained in a waterproof container and removed from site;
- Ensure that wash water is discharged directly to the Site surface or any drainage features (e.g., catch basins);
- Do not expose freshly poured concrete to rain or surface flows for at least 48 hours;
- Prevent any water that contacts uncured or partly cured concrete from directly entering the environment; and
- In the event of rainfall, concrete that has been recently poured should be covered with polyethylene sheets.

5.6 Air Quality

Construction activity has the potential to impact local air quality by the following:

- Emissions from vehicles and machinery; and
- Fugitive dust generated by ground disturbance and handling of soils.

The following mitigation measures are recommended to protect air quality during the Project:

- Implement air quality control mitigations into the Project EMP;
- Ensure equipment used for the Project is well-maintained in accordance to manufacturer specifications;
- Inspection vehicles and machinery for deficiencies, ensure issues are addressed prior to utilizing the machinery;
- Avoid idling of vehicles or equipment, where possible;

- Undertake dust suppression on Project traffic areas susceptible to dust, if required;
- Use environmentally acceptable dust suppressants. Do not use oil or chemical dust suppressants;
- Cover or wet down surfaces including soils exposed for extended periods of time, dry soil storage piles, and dry materials to prevent blowing dust; and
- Cover fine-grained materials during transport to prevent or mitigate the loss of material through wind exposure. Monitor the need for, and the effectiveness of, dust suppression measures.

6 Conclusions and Recommendations

It is likely that identified potential environmental effects can be successfully mitigated through Project planning, scheduling, design, the application of regulatory requirements and Best Management Practices (BMPs) and the recommended mitigations outlined in this document. This study did not identify any environmental concerns that cannot be adequately addressed by standard environmental BMPs and management.

It is recommended that a qualified EM is arranged to monitor works during sensitive periods (e.g., during songbird nesting season and/or during high-precipitation events). It is also recommended that an Environmental Management Plan is prepared for the Project in order to outline detailed and specific mitigation measures to be followed during construction.

7 References

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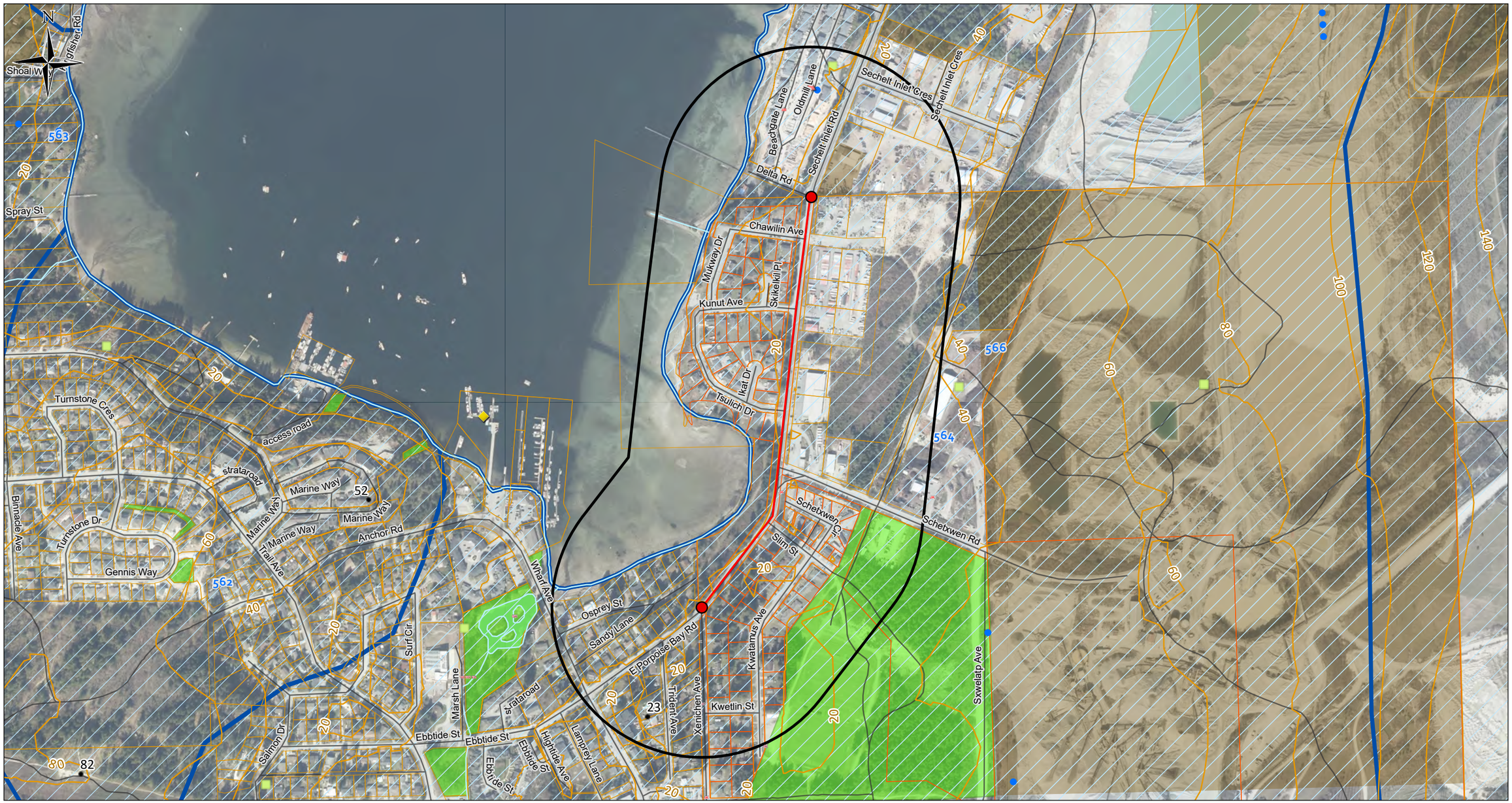
Drawings

- Drawing 002 – Site Plan
- Engineering Drawing



LEGEND

0 45 90 180 270 360 Meters

- Small Caps Feature Points
- Small Caps Feature Lines
- Small Caps Project Study Extents

TRIM Contours Points

- Spot Height

JK Invasive Alien Plant Site Label

- TRIM Contour Lines
- BC Environmental Remediation Sites
- Federal Contaminated Sites

Groundwater Wells - All

- Well

- BC Environmental Monitoring Locations
- Digital Road Atlas
- BC Water - Rivers, Creeks, Shorelines
- BC ParcelMap BC Parcel Fabric
- First Nation Reserve Parcels

BC Groundwater Aquifers by ID

- 562
- 563
- 564
- 566

- Local and Regional Greenspaces
- ALR Polygons

BC Water - Lake, Reservoir

- Lake - Definite

Site Label Text Invasive Alien Plant Site

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CLIENT NAME:	PROJECT LOCATION:
BC Hydro	Porpoise Bay Rd, Sechelt, Sunshine Coast, BC

Porpoise Bay Rd - Site Plan

BY: ECH	SCALE: 1:6,500	DATE: 2021-03-08	REF No:	REV:
CHK'D: VO	PROJ COORD SYS: NAD 1983 BC Environment Albers		678324-002	

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BRITISH COLUMBIA

Ministry of Transportation and Infrastructure

PROJECT NO. ?????

EAST PORPOISE BAY ROAD
SECHELT INLET ROAD IMPROVEMENTS

DIRECTOR, ENGINEERING DATE YYYY-MM-DD	REGIONAL DIRECTOR DATE YYYY-MM-DD

DRAWING NUMBER	REV
R1-NNN-000	PA

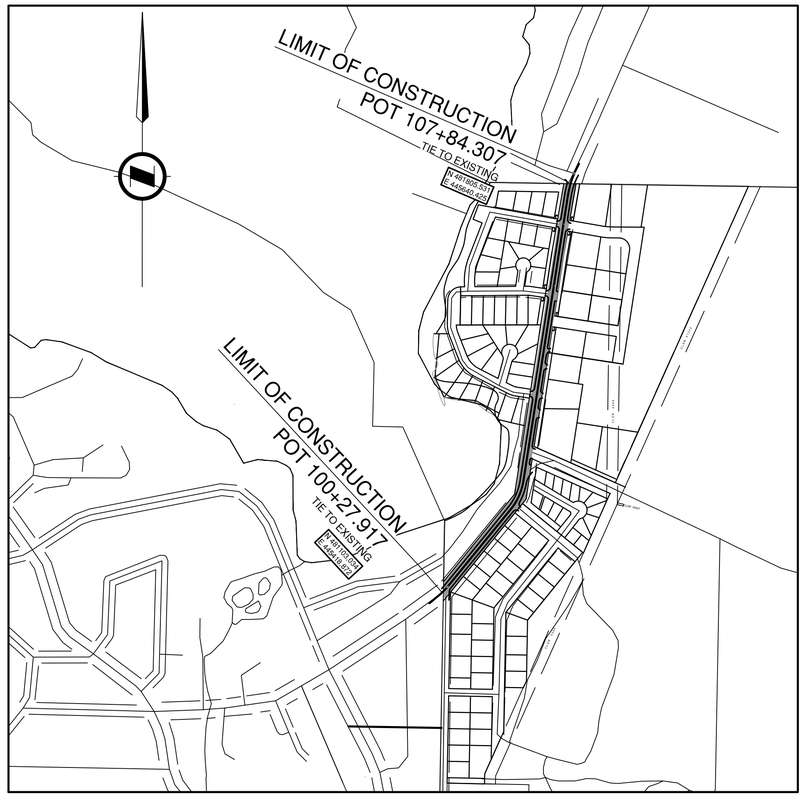
LOCATION MAP
N.T.S.

BRITISH COLUMBIA | Ministry of Transportation and Infrastructure

DRAWING INDEX	
R1-XXX-001	LOCATION MAP, KEY PLAN AND DRAWING INDEX
R1-XXX-101 to 102	PLAN
R1-XXX-201 to 202	PROFILE
R1-XXX-301 to 303	TYPICAL SECTIONS
R1-XXX-401 to 402	GEOMETRICS AND LANING
R1-XXX-601 to 602	SIGNAGE AND PAVEMENT MARKINGS
R1-XXX-701 to 702	DRAINAGE DESIGN AND UTILITY RELOCATION - PLAN
R1-XXX-721 TO 722	DRAINAGE DESIGN AND UTILITY RELOCATION - PROFILE
R1-XXX-721 TO 722	DRAINAGE DESIGN AND UTILITY RELOCATION - DETAILS

PROJECT No. XXXXX

E. PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS



KEY PLAN
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STA. 100+XXX TO 10O+XXXX
0.XX km

LANDMARK KILOMETRE INVENTORY
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km 19.59 TO km 21.29

GRADING & PAVING CONTRACT
50% FUNCTIONAL DESIGN

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

LOCATION MAP, KEY PLAN AND DRAWING INDEX

E. PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS

REFER TO TENDER DRAWING PACKAGE APPROVAL FORM	REFER TO TENDER DRAWING PACKAGE APPROVAL FORM
DIRECTOR, ENGINEERING	EXECUTIVE DIRECTOR, SOUTH COAST REGION
DATE 2021-01-04	DATE 2021-01-04

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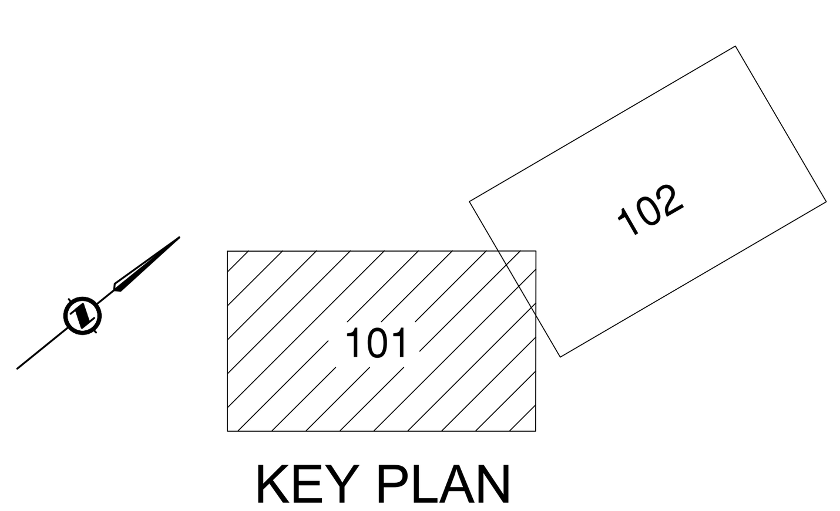

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PLOT DATE 2021-03-09

REV	DATE	REVISIONS	NAME
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MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
SOUTH COAST REGION
HIGHWAY ENGINEERING AND GEOMATICS

SENIOR DESIGNER
DATE 2021-01-27

DESIGNED	V. GIOREV	DATE	2021-01-27
QUALITY CONTROL	L. HE	DATE	2021-01-27
QUALITY ASSURANCE	R. WONG	DATE	2021-01-27
DRAWN	V. GIOREV	DATE	2021-01-27

PLAN

EAST PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS

STA. 100+41.018 TO 104+16.000

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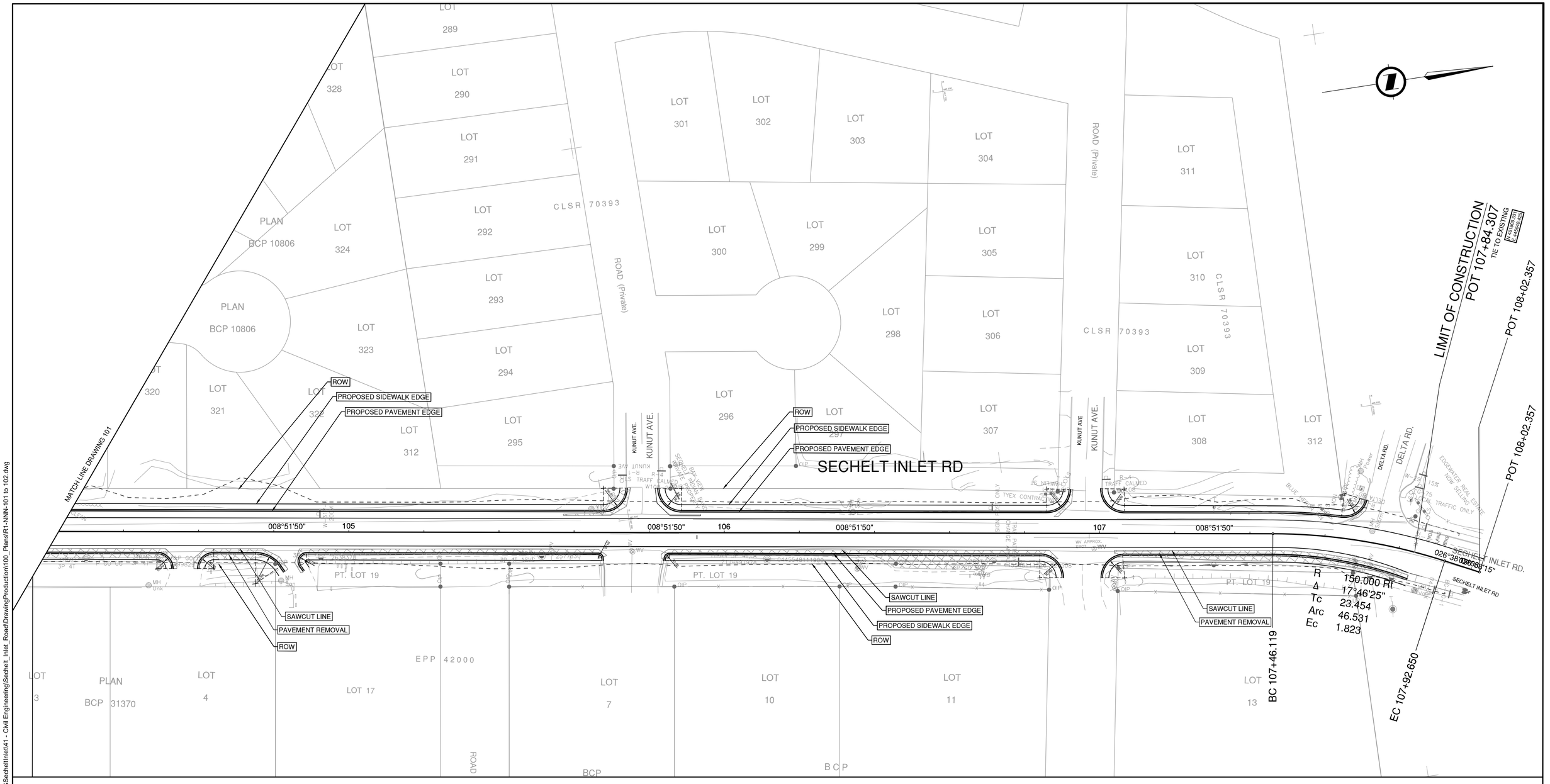

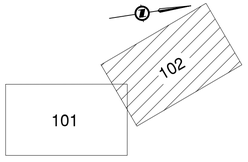

KEY PLAN

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CAD FILENAME R1-NNN-101 TO 102

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DRAWN V. GIOREV DATE 2021-01-27

PLAN

EAST PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS

STA. 104+16.000 TO 107+85.633

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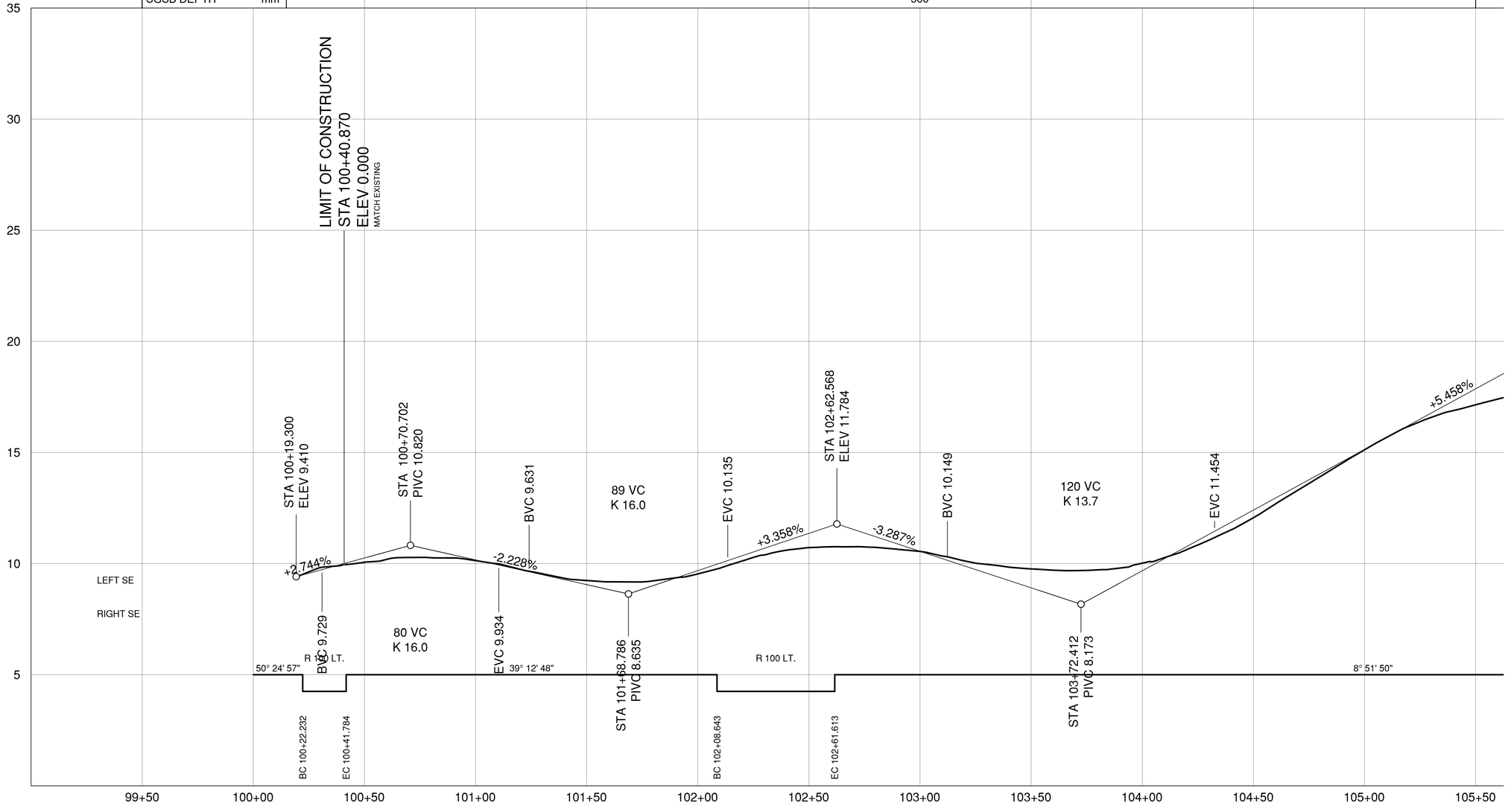

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PLOT DATE 2021-03-09

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DRAWN V. GIOREV DATE 2021-01-27

PROFILE

EAST PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS

STA. 100+41.018 TO 104+16.000

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PLOT DATE: 2021/03/09 \\sli0262\TxProject\DATA\678324-PorpoiseBay&SechelttInlet\41 - Civil Engineering\SechelI_Inlet_Road\DrawingProduction\200_Profiles\R1-NNN-201 to 202.dwg

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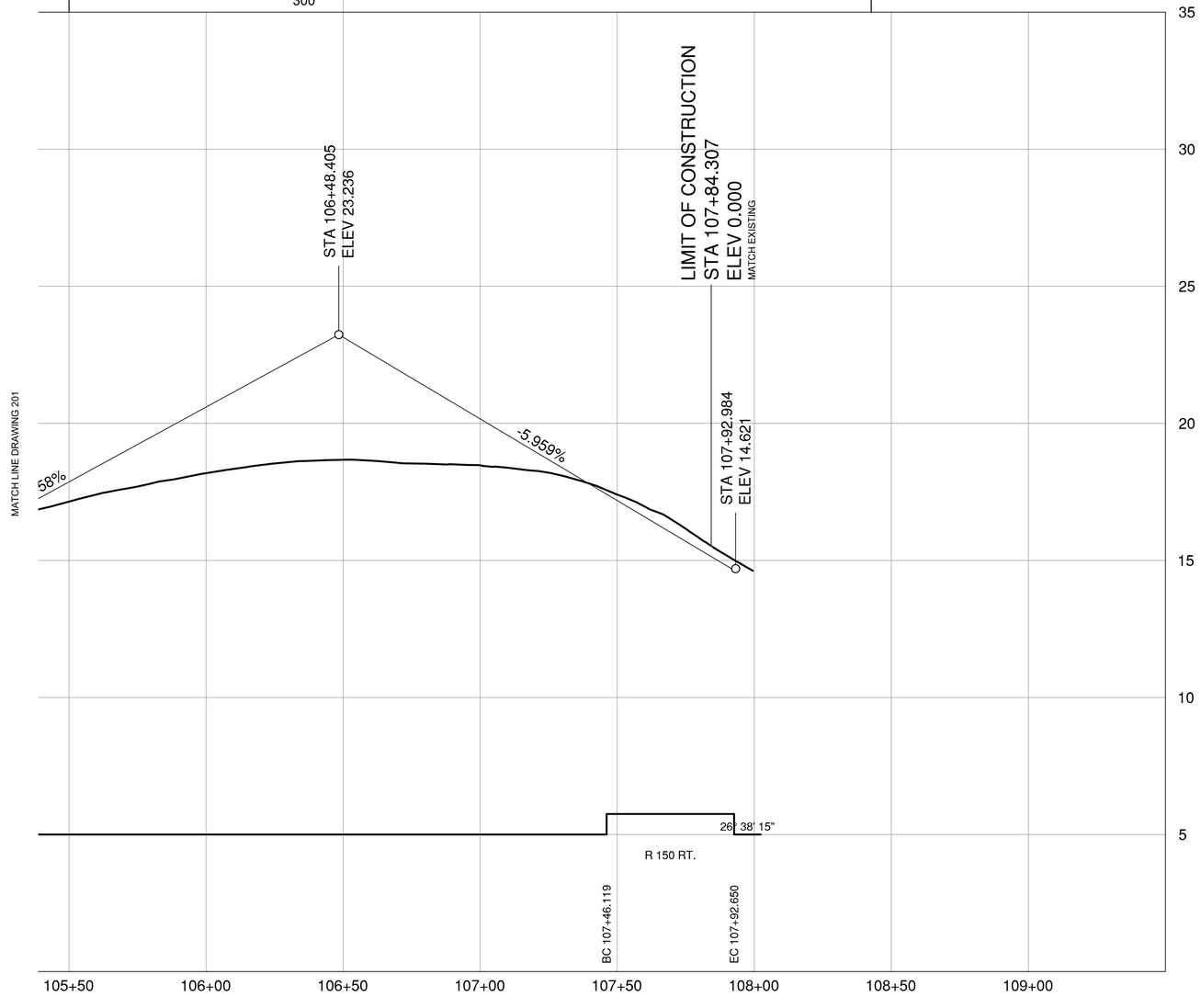

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DESIGN SPEED 50 km/h

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CAD FILENAME R1-NNN-201 TO 202

PLOT DATE 2021-03-09

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PROFILES

EAST PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS

STA. 104+16.000 TO 107+85.633

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
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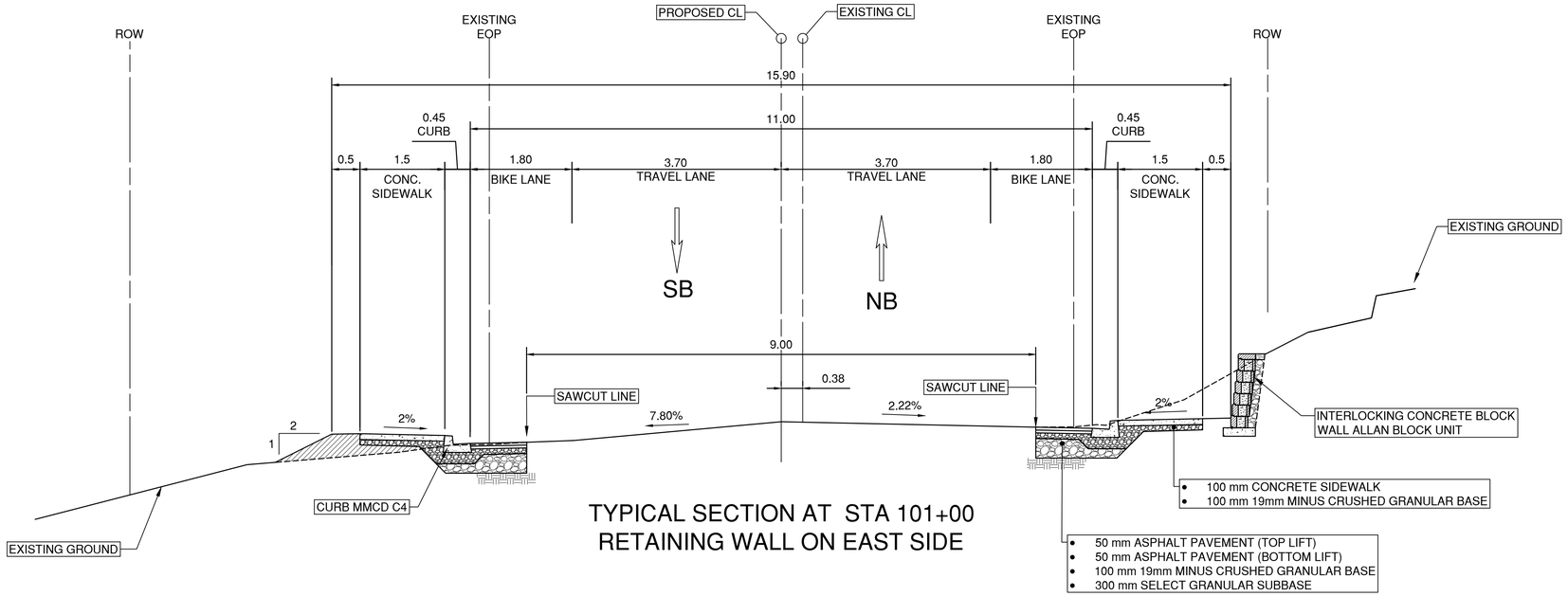

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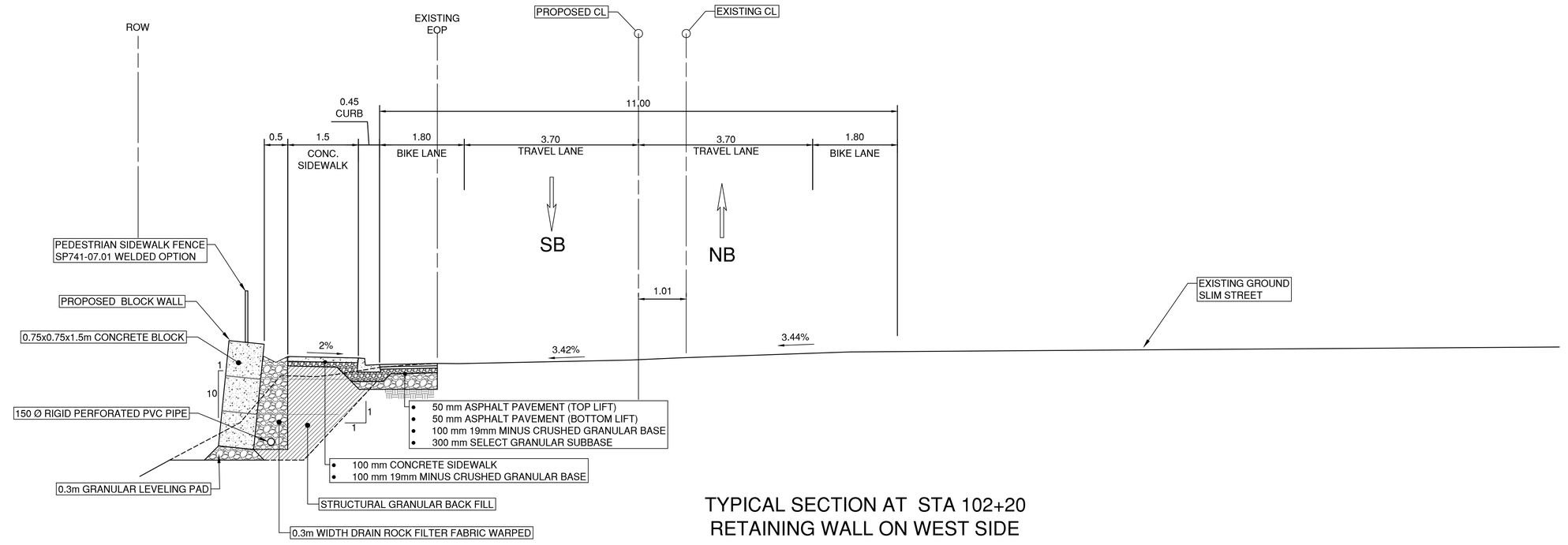

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RETAINING WALL ON WEST SIDE

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2021-02-28

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CAD FILENAME R1-NNN-301 TO 303
PLOT DATE 2021-03-09

REV	DATE	REVISIONS	NAME
PA	2021-01-27	ISSUED FOR 50% FUNCTIONAL DESIGN	L. HE

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

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DATE 2021-01-27

DESIGNED V. GIOREV DATE 2021-01-27
QUALITY CONTROL L. HE DATE 2021-01-27
QUALITY ASSURANCE R. WONG DATE 2021-01-27
DRAWN V. GIOREV DATE 2021-01-27

TYPICAL SECTION AT STA. 103+00 AND 102+20

EAST PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS

STA. 100+41.018 TO 107+85.633

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
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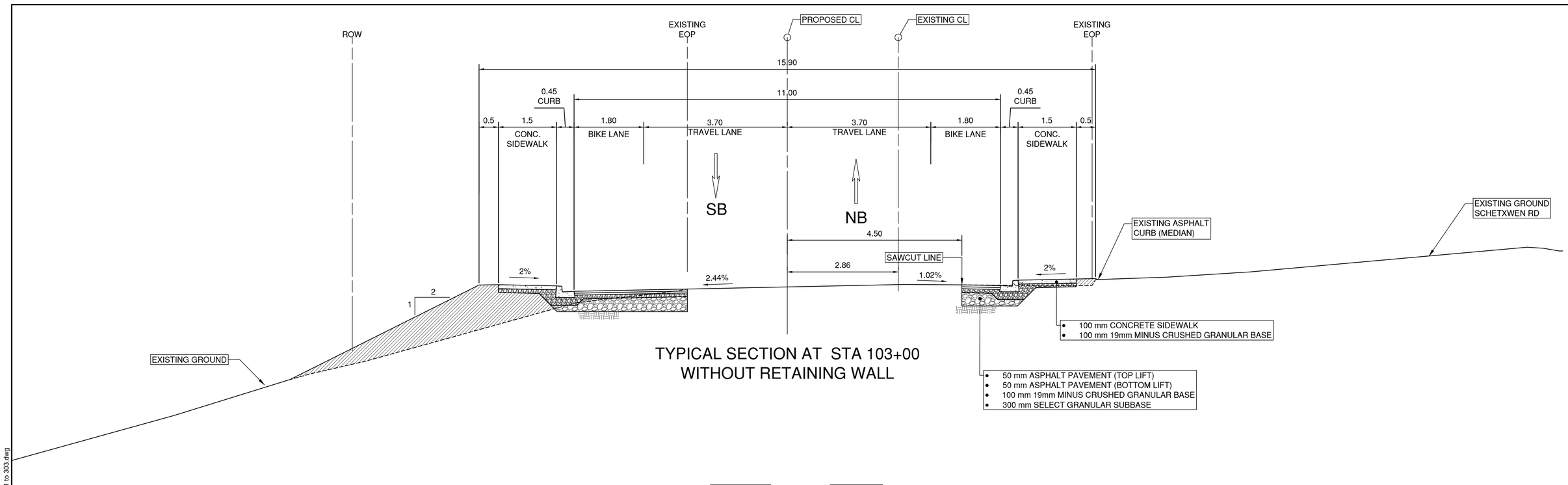
PLOT DATE: 2021/03/09 \\sli\026211\Project\DATA\678324-PorpoiseBay&SechelltInlet\41 - Civil Engineering\Sechelt_Inlet_Road\DrawingProduction\300_TypicalSections\R1-NNN-301 to 303.dwg



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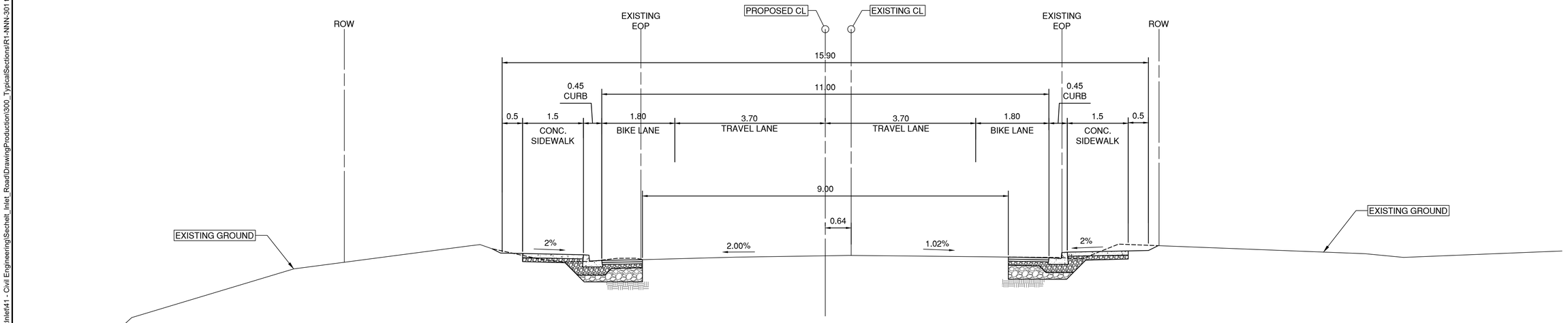

TYPICAL SECTION AT STA 106+30
WITHOUT RETAINING WALL

PRELIMINARY
FOR INFORMATION ONLY
2021-02-28

SNC-Lavalin Inc.
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V6E 0C5 | Canada

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CAD FILENAME R1-NNN-301 TO 303
PLOT DATE 2021-03-09

REV	DATE	REVISIONS	NAME
PA	2021-01-27	ISSUED FOR 50% FUNCTIONAL DESIGN	L. HE

BRITISH COLUMBIA

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

SENIOR DESIGNER
DATE 2021-01-27

DESIGNED V. GIOREV DATE 2021-01-27
QUALITY CONTROL L. HE DATE 2021-01-27
QUALITY ASSURANCE R. WONG DATE 2021-01-27
DRAWN V. GIOREV DATE 2021-01-27

TYPICAL SECTION AT STA. 10+00 AND 106+30

EAST PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS

STA. 100+41.018 TO 107+85.633

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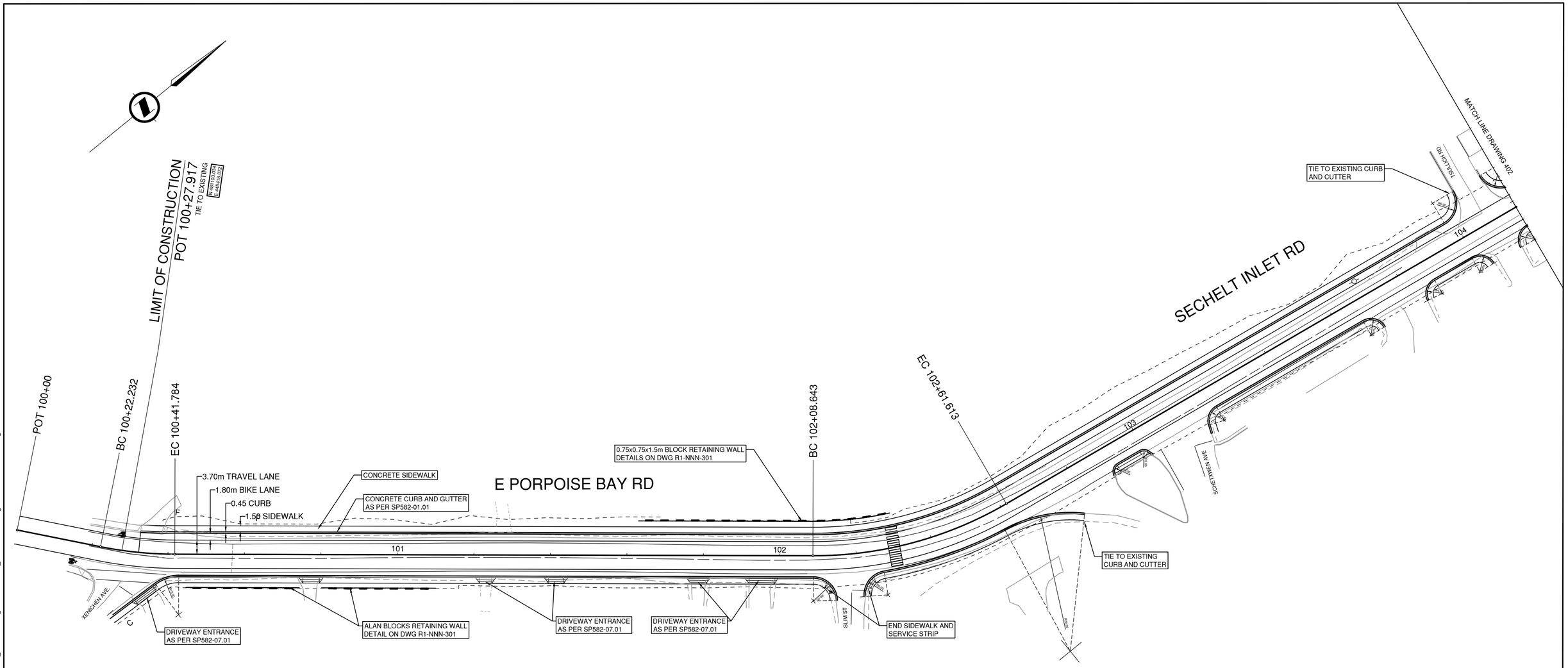

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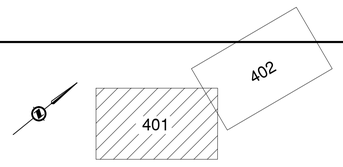

KEY PLAN

SNC-LAVALIN

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Vancouver | British Columbia
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2021-03-05

SCALE 0 5 1:500 25m

CAD FILENAME R1-NNN-401 TO 402
PLOT DATE 2021-03-09

REV	DATE	REVISIONS	NAME
PA	2021-01-27	ISSUED FOR 50% FUNCTIONAL DESIGN	L. HE

BRITISH COLUMBIA

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

SENIOR DESIGNER
DATE 2021-01-27

DESIGNED V. GIOREV DATE 2021-01-27
QUALITY CONTROL L. HE DATE 2021-01-27
QUALITY ASSURANCE R. WONG DATE 2021-01-27
DRAWN V. GIOREV DATE 2021-01-27

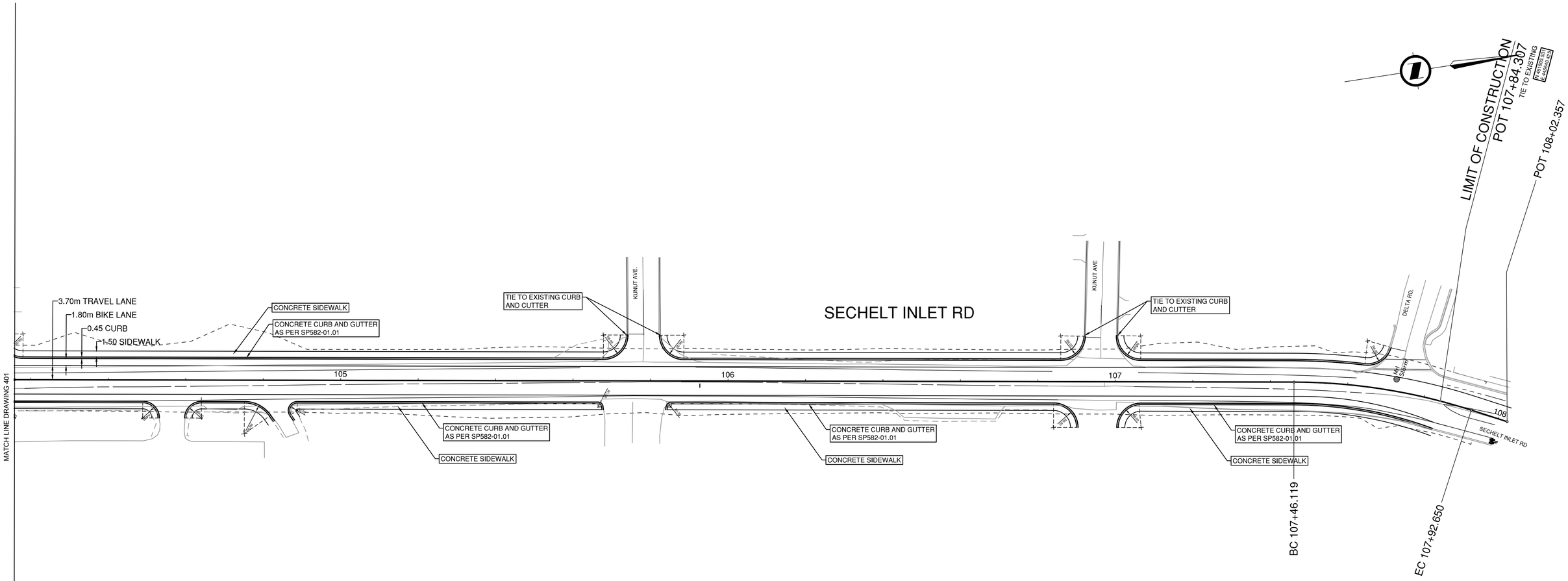
GEOMETRICS AND LANING

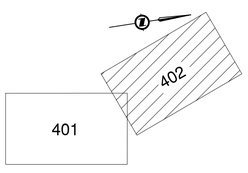
EAST PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS

STA. 100+41.018 TO 104+16.000

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
871CS0999	???????	1	R- NNN-401	PA

PLOT DATE: 2021/03/09 \\sli\02621\TxProject\DATA\678324-PorpoiseBay&Sechelt\nlet\41 - Civil Engineering\Sechelt_Inlet_Road\DrawingProduction\400_Geometrics\Laning\R1-NNN-401 to 402.dwg





KEY PLAN

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2021-03-05

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CAD FILENAME R1-NNN-401 TO 402
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GEOMETRICS AND LANING

EAST PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS

STA. 104+16.000 TO 107+85.633

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
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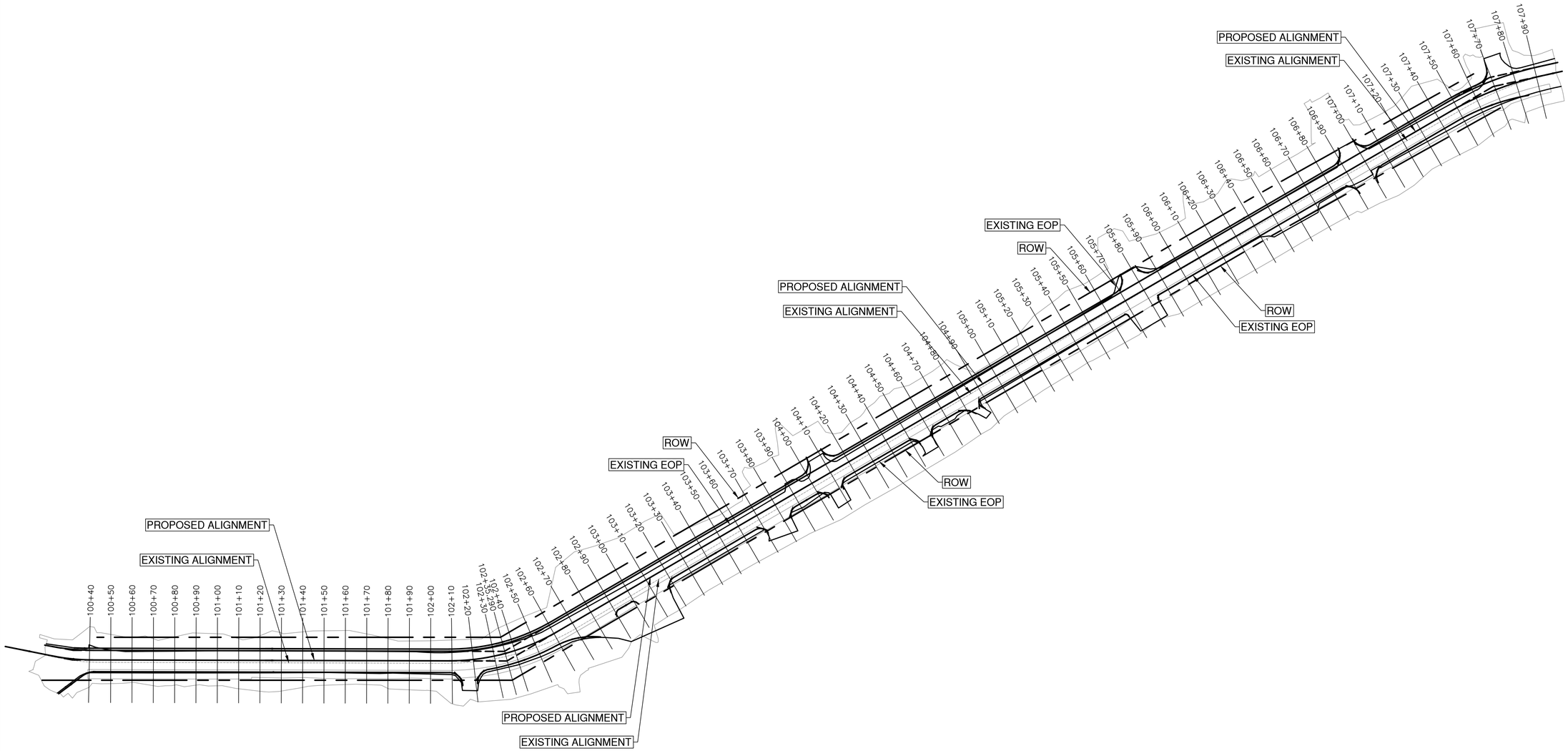

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CAD FILENAME CORRL100 - 678324
PLOT DATE 2021-03-09

REV	DATE	REVISIONS	NAME
A	2017-07-01		

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MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
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QUALITY ASSURANCE	R. WONG	DATE	2021-01-27
DRAWN	V. GIOREV	DATE	2021-01-27

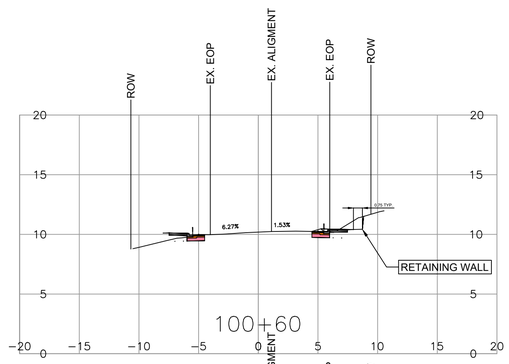
PLAN

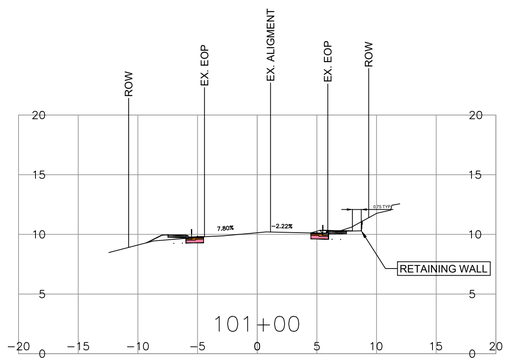
EAST PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS

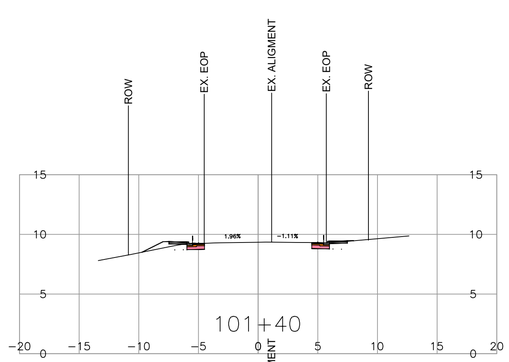
STA. 100+41.018 TO 107+85.633

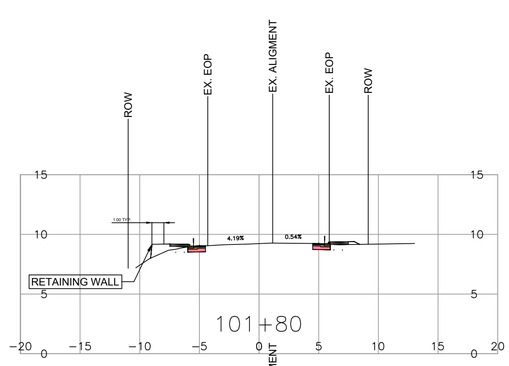
FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
871CS0999	???????	1	PLAN 0	PA

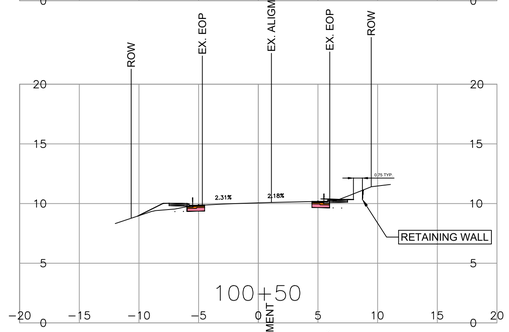
PLOT DATE: 2021/03/09 \\sli02621x\Project\DATA\678324-PorpoiseBay&Sechelt\Inlet\41 - Civil Engineering\Sechelt_Inlet_Road\DesignModel\03_Corridors\CORRL100 - 678324.dwg

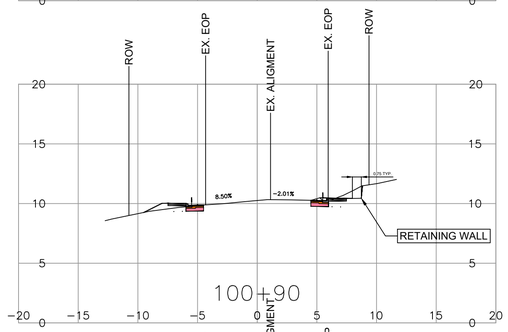


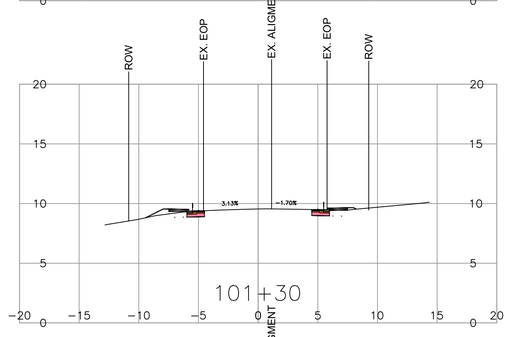


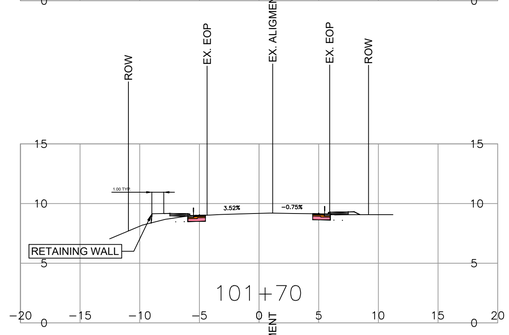


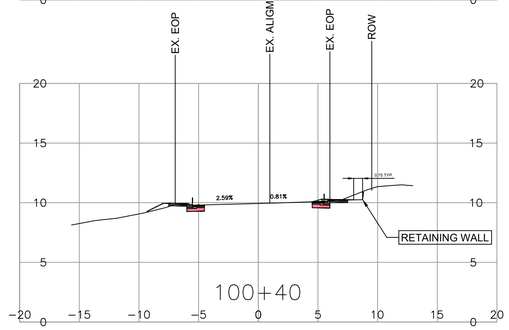


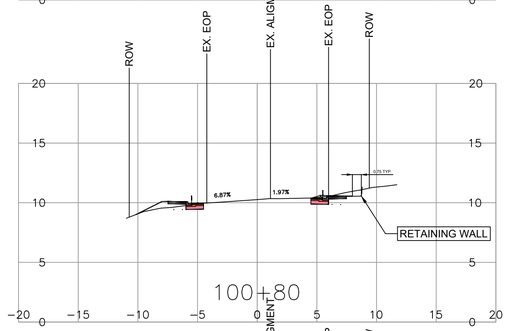


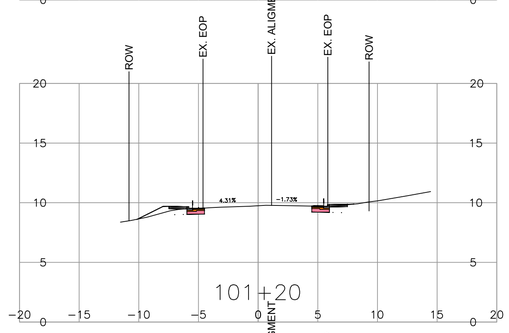


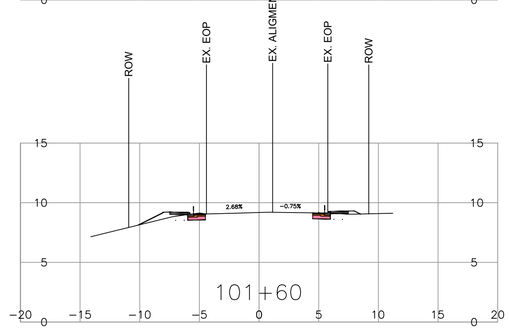


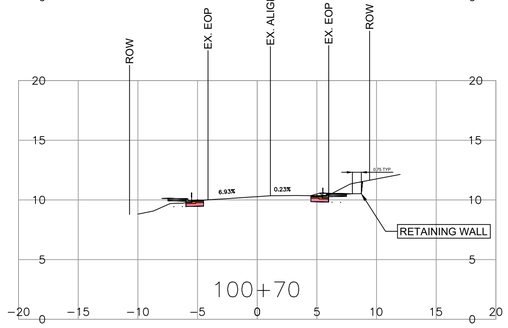


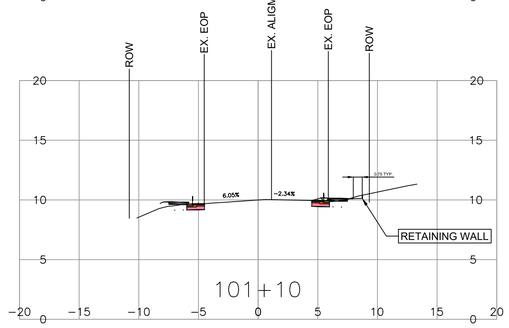


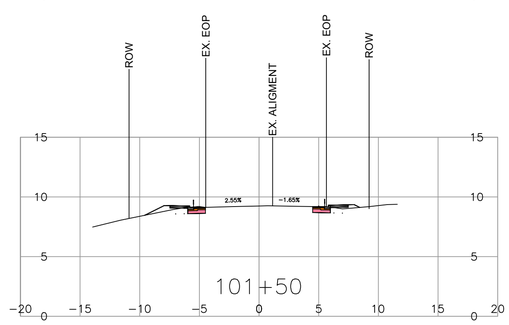












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CAD FILENAME CORRL100 - 678324
PLOT DATE 2021-03-09

REV	DATE	REVISIONS	NAME
A	2017-07-01		

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
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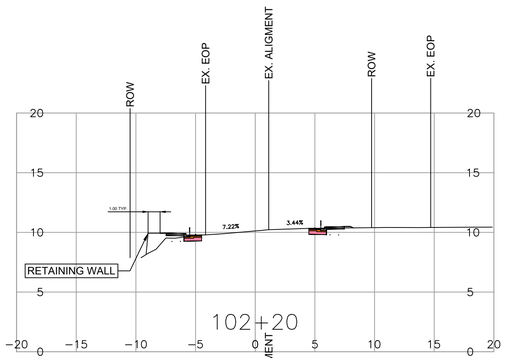
SECTIONS 1

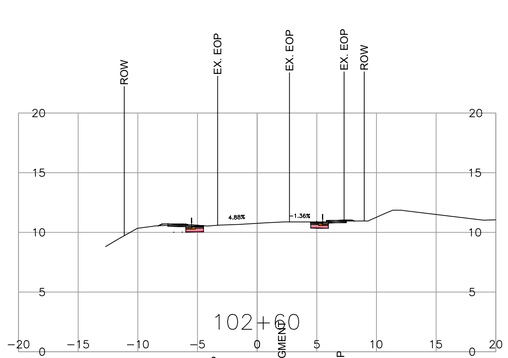
EAST PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS

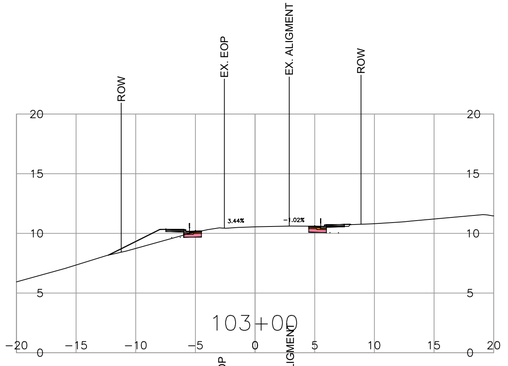
STA. 100+41.018 TO 107+85.633

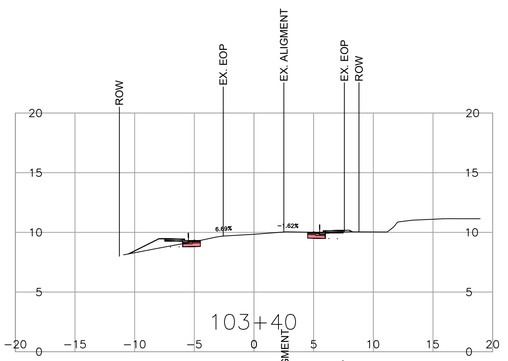
FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
871CS0999	???????	1	SECTIONS 1	PA

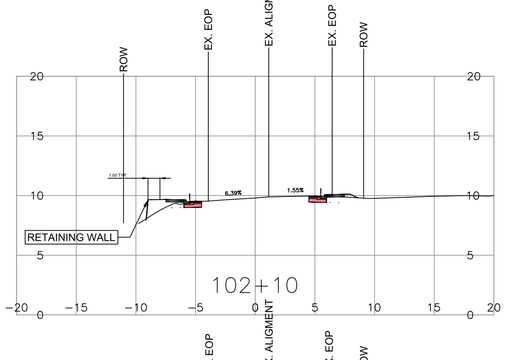
PLOT DATE: 2021/03/09 \\sli0262\1\Project\DATA\678324-PorpoiseBay&SechelInlet\41 - Civil Engineering\SechelI_Inlet_Road\DesignModel\03_Corridors\CORRL100 - 678324.dwg

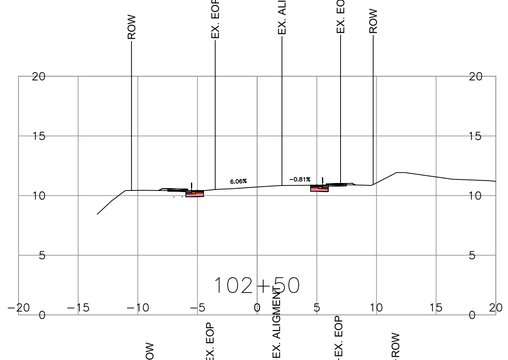


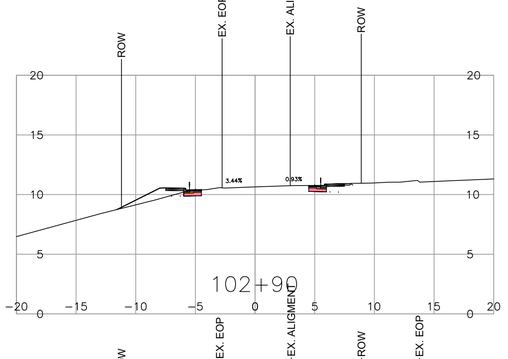


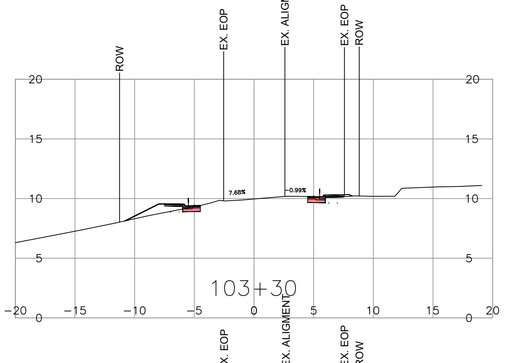


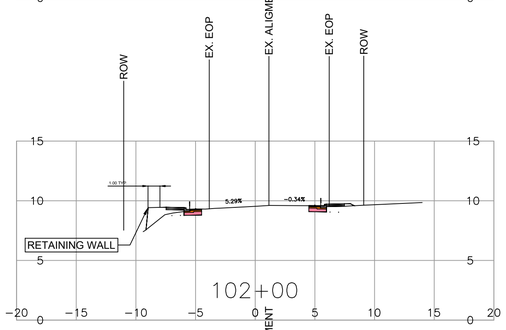


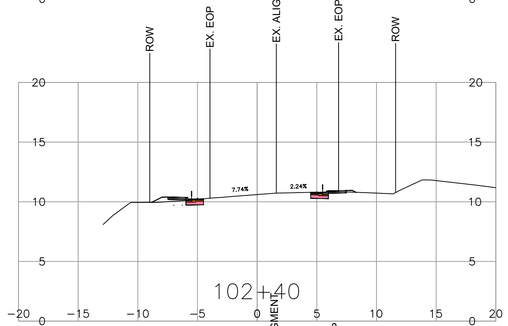


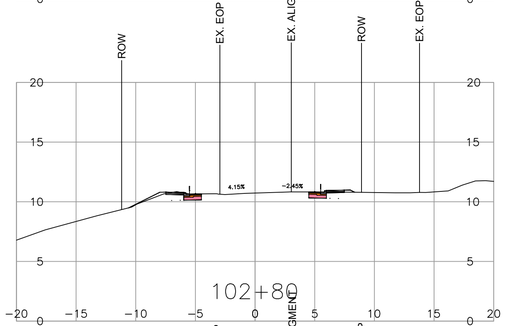


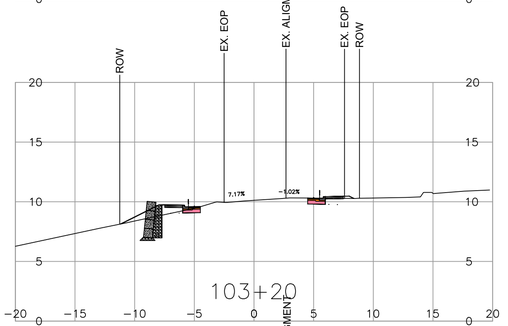


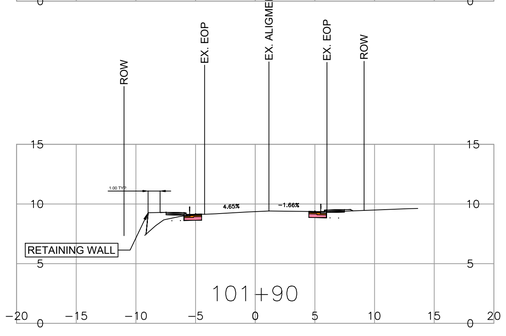


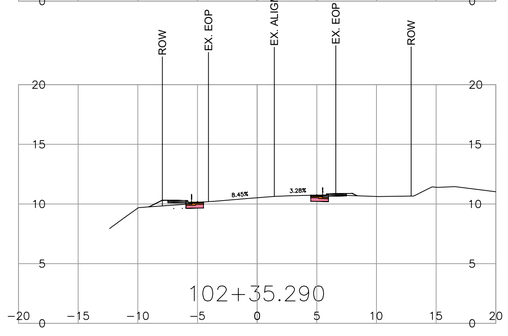


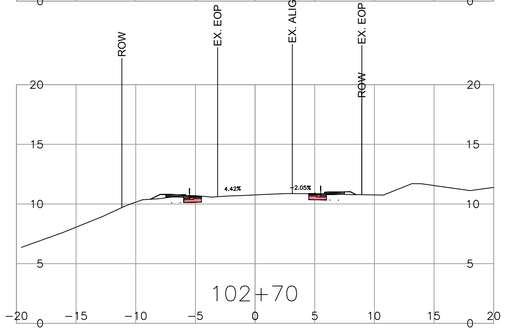


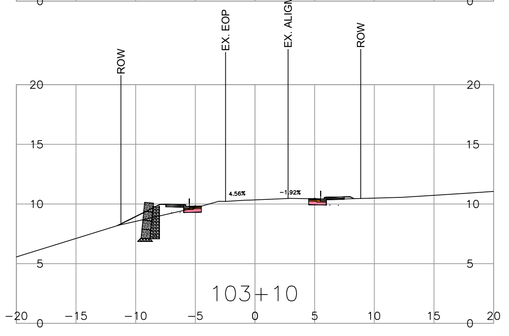












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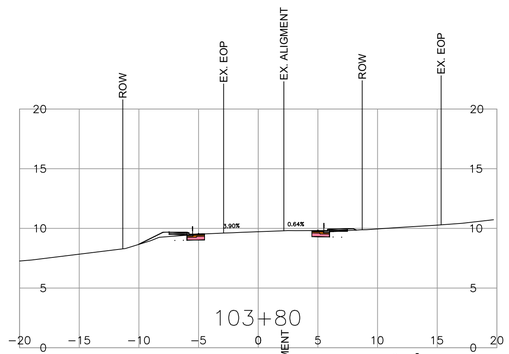
SECTIONS 2

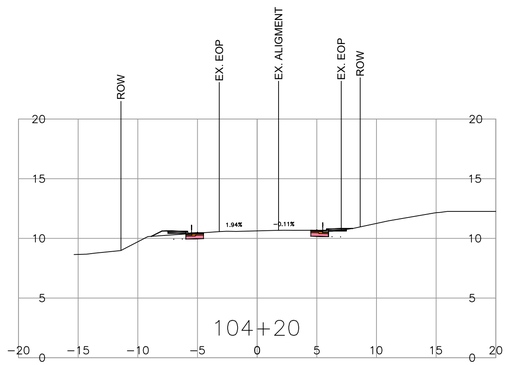
EAST PORPOISE BAY ROAD / SECHELT INLET ROA IMPROVEMENTS

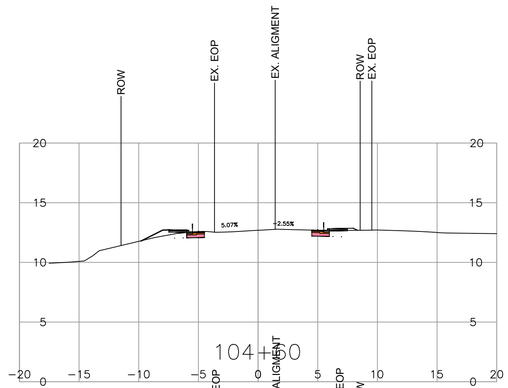
STA. 100+41.018 TO 107+85.633

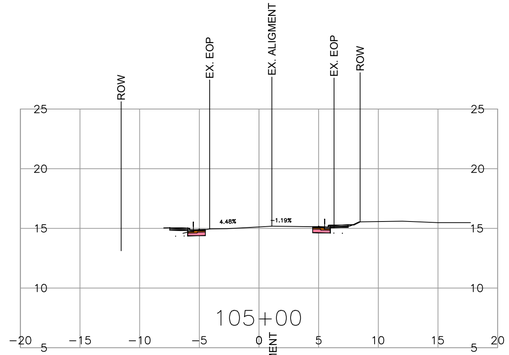
FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
871CS0999	???????	1	SECTIONS 2	PA

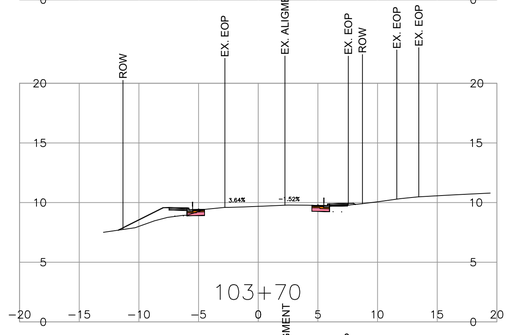
PLOT DATE: 2021/03/09 \\sli0262\TxProject\DATA\678324-PorpoiseBay&SecheltInlet\41 - Civil Engineering\Sechelt_Inlet_Road\Design\Model\03_Corridors\CORRL100 - 678324.dwg

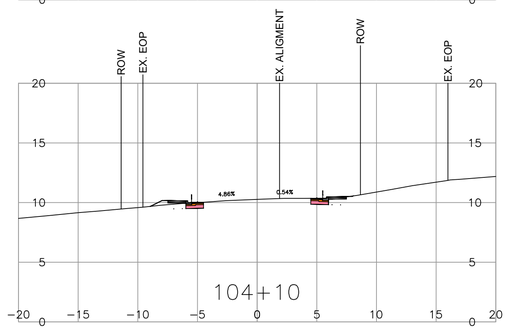


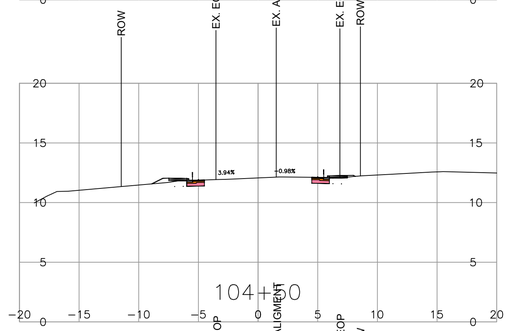


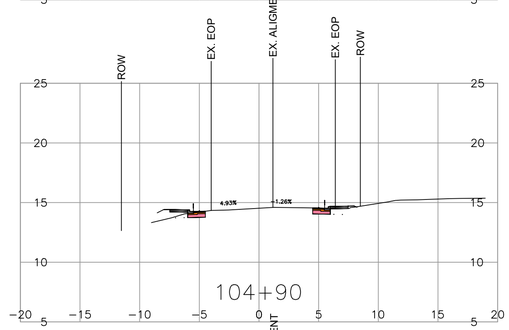


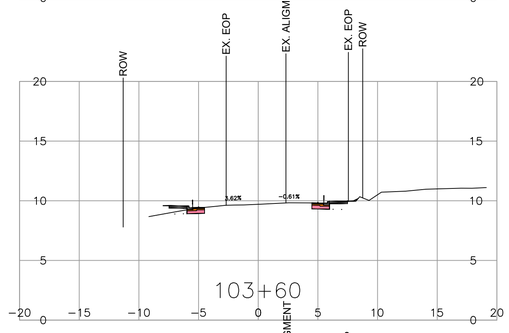


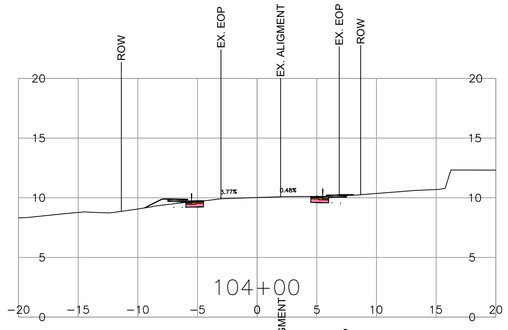


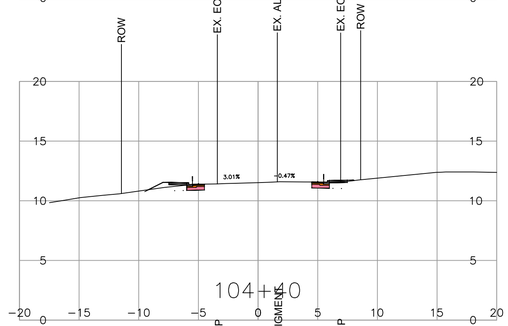


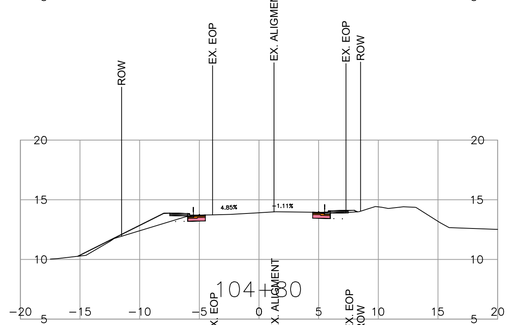


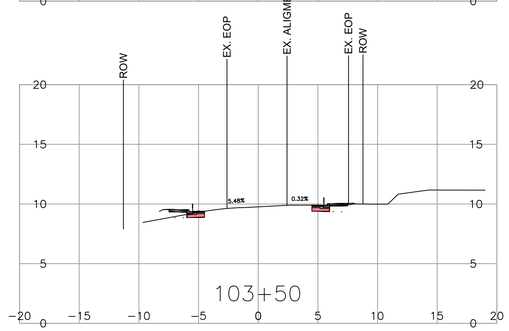


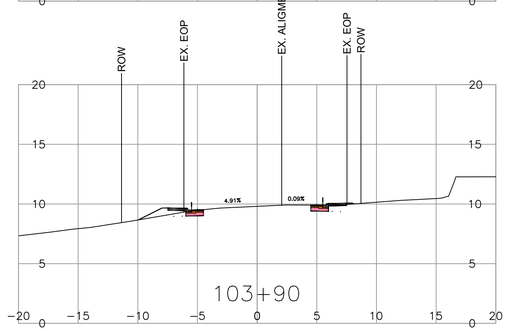


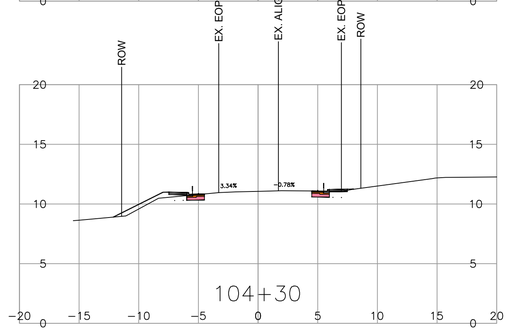


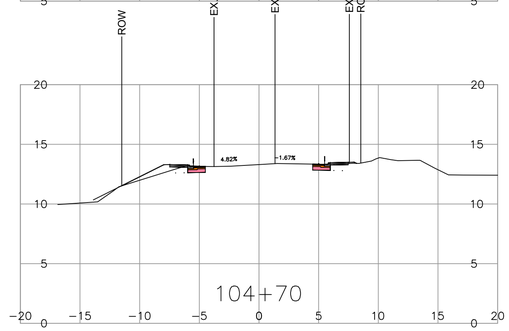












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SECTIONS 3

EAST PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS

STA. 100+41.018 TO 107+85.633

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
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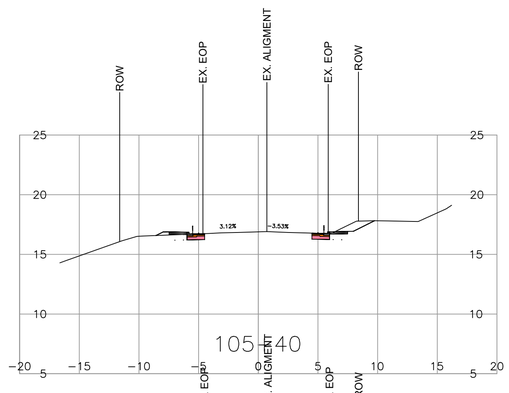

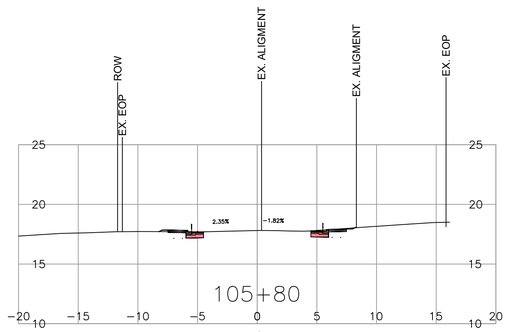

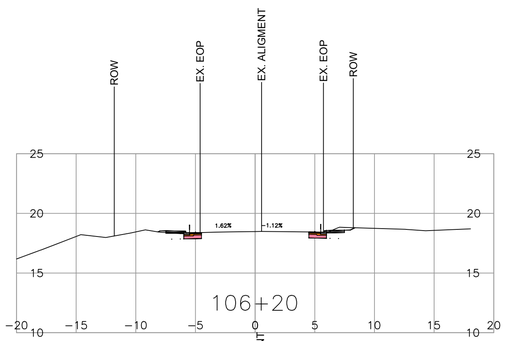

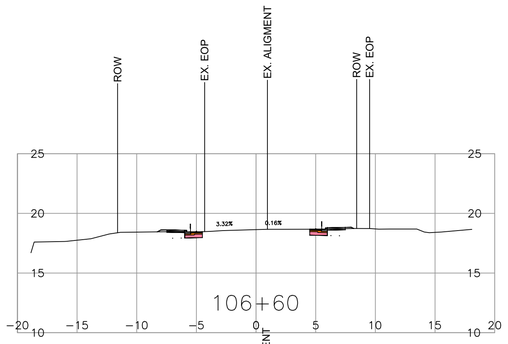

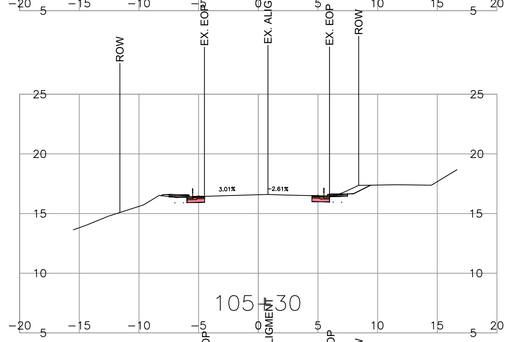

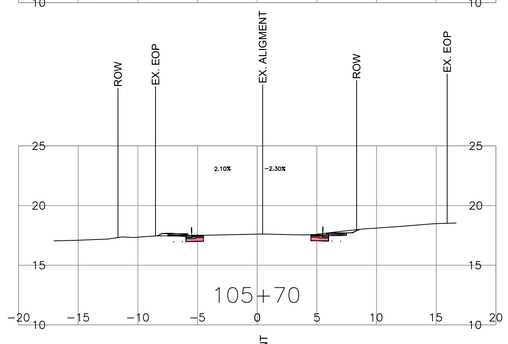

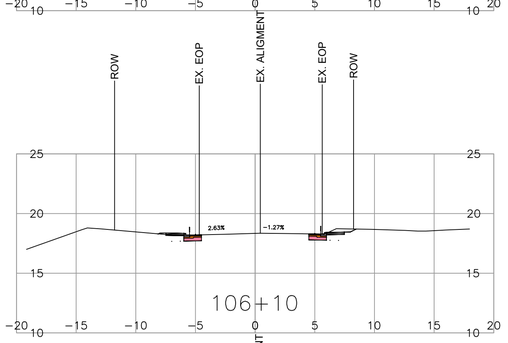

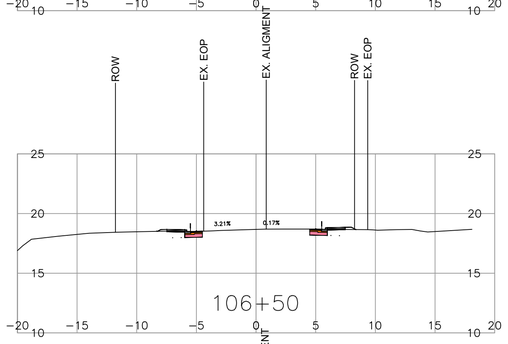

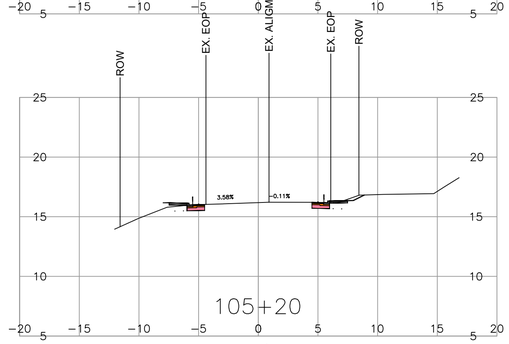

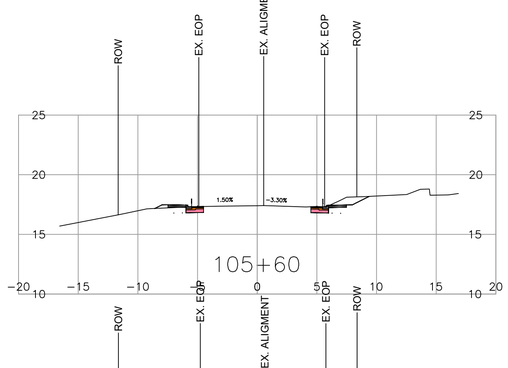

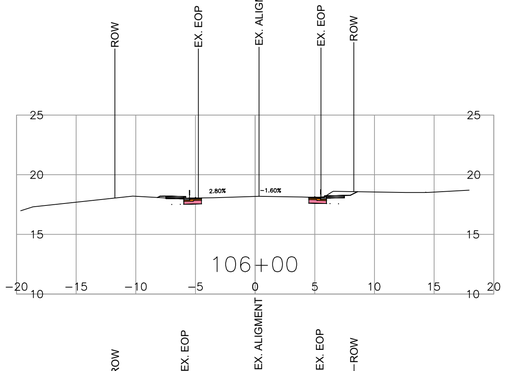

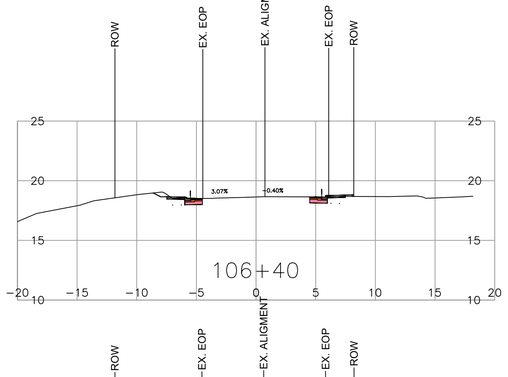

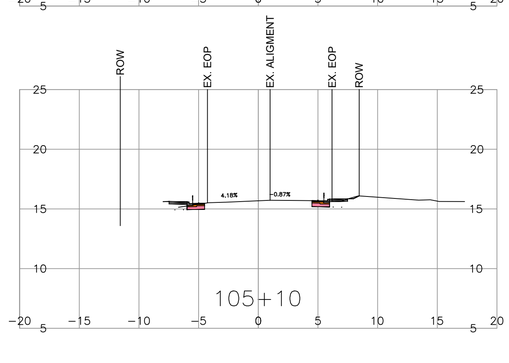

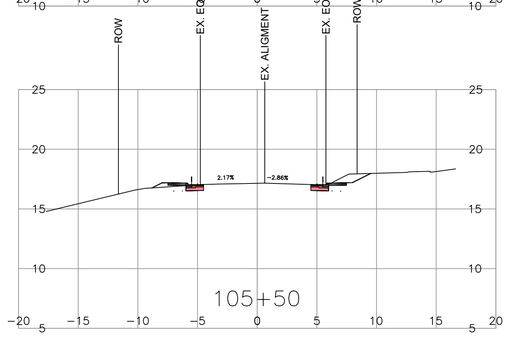

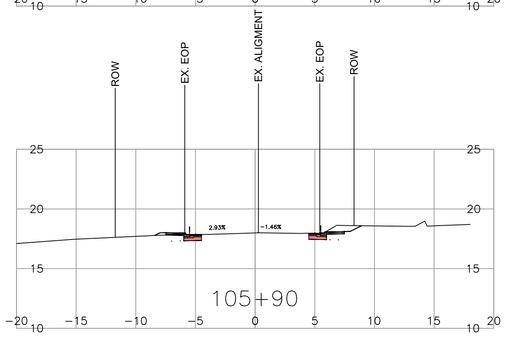

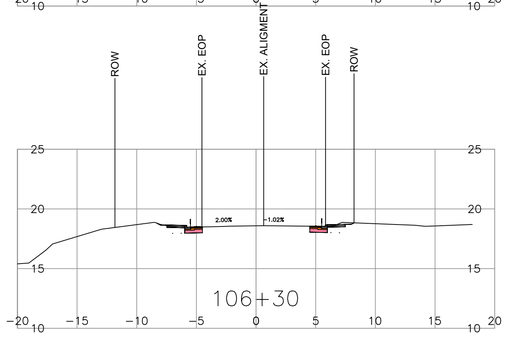

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SECTIONS 4

EAST PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS

STA. 100+41.018 TO 107+85.633

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
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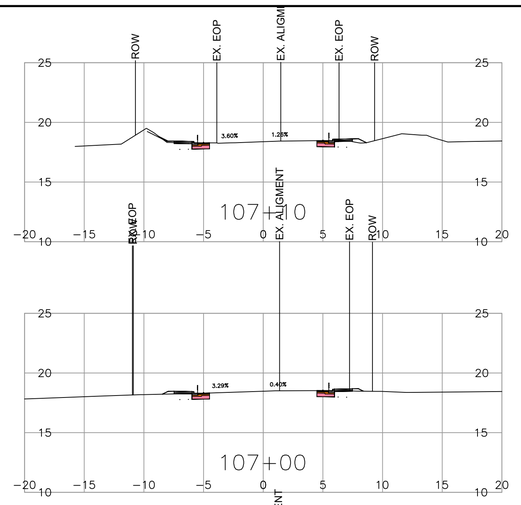

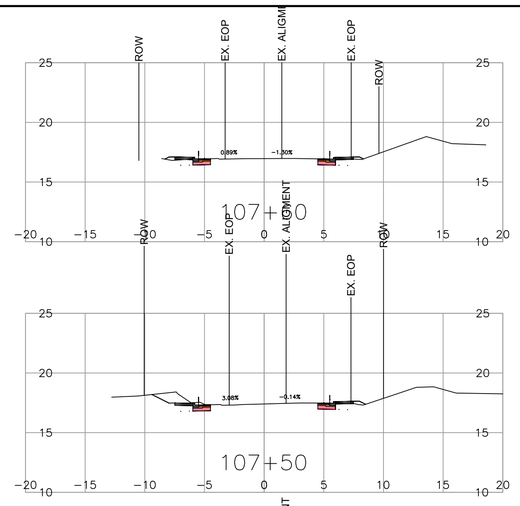

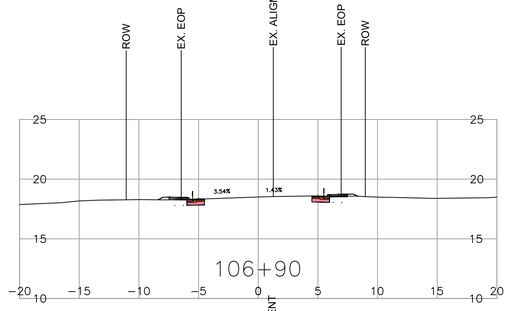

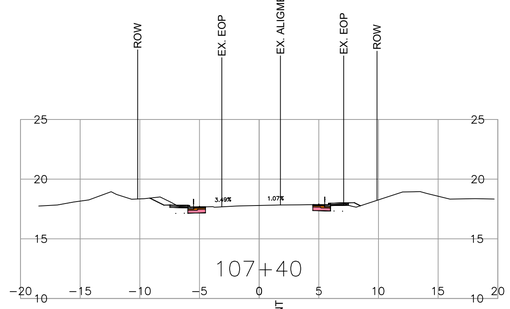

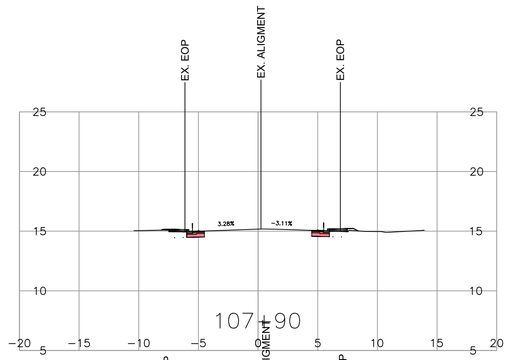

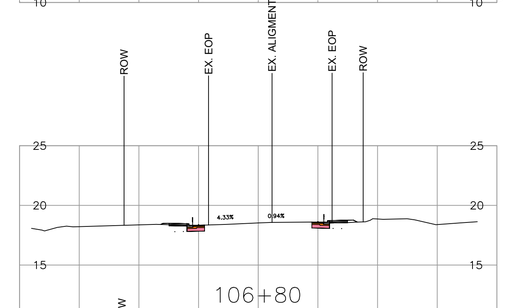

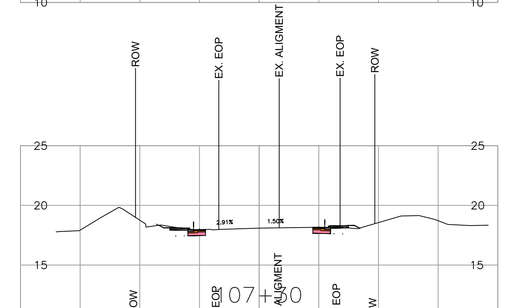

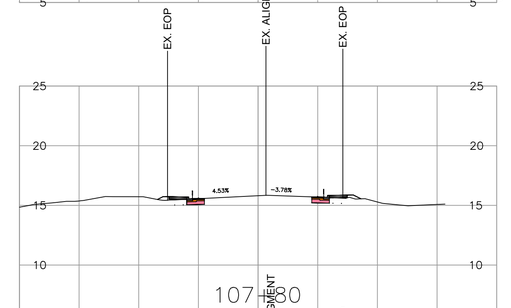

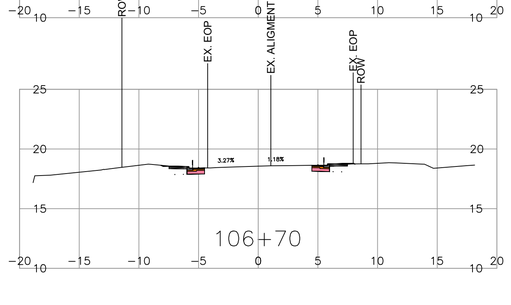

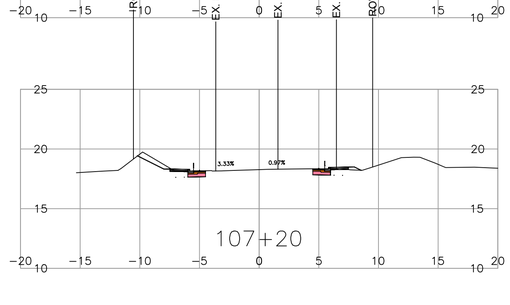

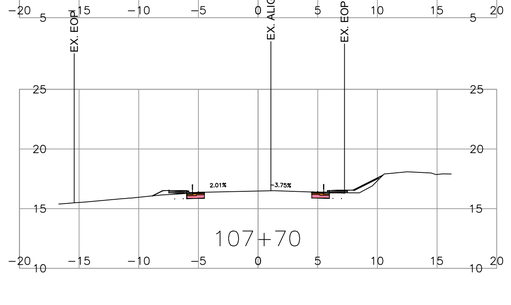

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SECTIONS 5

EAST PORPOISE BAY ROAD / SECHELT INLET ROAD IMPROVEMENTS

STA. 100+41.018 TO 107+85.633

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
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Appendix I

BC CDC Species at Risk

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Table A1: Plant Species at Risk with Potential to Occur Within 500 m of the Site (CDC, 2021)

Scientific Name	English Name	BC List	SARA Status
Abronia latifolia	Yellow sand-verbena	Blue	
Allium amplectens	Slimleaf onion	Blue	
Bartramia aprica	Rigid apple moss	Red	Endangered
Brotherella roellii	Roell's brotherella	Red	Endangered
Calystegia soldanella	Beach bindweed	Blue	
Camissonia contorta	Contorted-pod evening-primrose	Red	Endangered
Carex tumulicola	Foothill sedge	Yellow	Endangered
Castilleja levisecta	Golden paintbrush	Red	Endangered
Castilleja victoriae	Victoria's owl-clover	Red	Endangered
Claytonia washingtoniana	Washington springbeauty	Red	
Crassula connata	Erect pigmyweed	Blue	
Dryopteris arguta	Coastal wood fern	Blue	Special Concern
Entosthodon fascicularis	Banded cord-moss	Blue	Special Concern
Fabronia pusilla	Silver hair moss	Red	Endangered
Fissidens pauperculus	Poor pocket moss	Red	Endangered
Hosackia gracilis	Seaside bird's foot lotus	Red	Endangered
Lathyrus littoralis	Silky beach pea	Red	
Limnanthes macounii	Macoun's meadow-foam	Red	Threatened
Lomatium dissectum	Fern-leaved desert-parsley	Red	
Lupinus microcarpus var. microcarpus	Dense-flowered lupine	Red	Endangered
Lupinus oreganus var. kincaidii	Kincaid's lupine	Unknown	Extinct
Meconella oregana	White meconella	Red	Endangered
Microseris bigelovii	Coast microseris	Red	Endangered
Nuttallanthus texanus	Texas toadflax	Blue	
Orthocarpus bracteosus	Rosy owl-clover	Red	Endangered
Pinus albicaulis	Whitebark pine	Blue	Endangered
Plagiobothrys figuratus ssp. figuratus	Fragrant popcornflower	Red	Endangered
Polygonum paronychia	Black knotweed	Blue	
Polystichum californicum	California Sword-fern	Red	
Psilocarphus elatior	Tall woolly-heads	Red	Endangered
Pyrola aphylla	Leafless wintergreen	Blue	
Ranunculus alismifolius var. alismifolius	Water-plantain buttercup	Red	Endangered
Ranunculus californicus	California buttercup	Red	Endangered
Sabulina pusilla	Dwarf sandwort	Red	Endangered
Sanicula arctopoides	Bear's-foot sanicle	Red	Threatened
Sanicula bipinnatifida	Purple sanicle	Red	Threatened
Seligeria acutifolia	Acuteleaf small limestone moss	Red	
Sericocarpus rigidus	White-top aster	Blue	Special Concern
Silene scouleri ssp. scouleri	Coastal Scouler's catchfly	Red	Endangered

Table A1 (Cont'd): Plant Species at Risk with Potential to Occur Within 500 m of the Site (CDC, 2021)

Scientific Name	English Name	BC List	SARA Status
Sisyrinchium idahoense var. segetum	Idaho blue-eyed-grass	Red	
Syntrichia laevipila	Twisted oak moss	Blue	Special Concern
Trifolium depauperatum var. depauperatum	Poverty clover	Blue	
Trifolium dichotomum	Macrae's clover	Blue	
Triphysaria versicolor ssp. versicolor	Bearded owl-clover	Red	Endangered
Utricularia ochroleuca	Ochroleucous bladderwort	Blue	
Woodwardia fimbriata	Giant chain fern	Blue	

Table A2: Ecological Communities with Potential to Occur Within 500 m of the Project Area.

Scientific Name	Common Name	BC List
Carex sitchensis - Oenanthe sarmentosa	Sitka sedge - Pacific water-parsley	Blue
Eleocharis palustris Herbaceous Vegetation	common spike-rush Herbaceous Vegetation	Blue
Pinus contorta / Sphagnum spp. Very Dry Maritime	lodgepole pine / peat-mosses Very Dry Maritime	Blue
Populus trichocarpa - Alnus rubra / Rubus spectabilis	black cottonwood - red alder / salmonberry	Blue
Populus trichocarpa / Salix sitchensis	black cottonwood / Sitka willow	Blue
Rhododendron groenlandicum / Kalmia microphylla / Sphagnum spp.	Labrador-tea / western bog-laurel / peat-mosses	Blue
Schoenoplectus acutus Deep Marsh	hard-stemmed bulrush Deep Marsh	Blue
Selaginella wallacei / Cladina spp.	Wallace's selaginella / reindeer lichens	Blue
Thuja plicata - Picea sitchensis / Lysichiton americanus	western red cedar - Sitka spruce / skunk cabbage	Blue
Thuja plicata / Polystichum munitum - Lysichiton americanus	western red cedar / sword fern - skunk cabbage	Blue
Thuja plicata / Polystichum munitum Very Dry Maritime	western red cedar / sword fern Very Dry Maritime	Blue
Thuja plicata / Tiarella trifoliata Dry Maritime	western red cedar / three-leaved foamflower Dry Maritime	Blue
Thuja plicata / Tiarella trifoliata Very Dry Maritime	western red cedar / three-leaved foamflower Very Dry Maritime	Blue
Tsuga heterophylla / Buckiella undulata	western hemlock / flat-moss	Blue
Typha latifolia Marsh	common cattail Marsh	Blue
Arbutus menziesii / Arctostaphylos columbiana	arbutus / hairy manzanita	Red
Carex lasiocarpa - Rhynchospora alba	slender sedge - white beak-rush	Red
Carex lyngbyei Herbaceous Vegetation	Lyngbye's sedge herbaceous vegetation	Red
Carex macrocephala Herbaceous Vegetation	large-headed sedge Herbaceous Vegetation	Red
Deschampsia cespitosa - Sidalcea hendersonii	tufted hairgrass - Henderson's checker-mallow	Red
Deschampsia cespitosa ssp. beringensis - Hordeum brachyantherum	tufted hairgrass - meadow barley	Red
Distichlis spicata - Sarcocornia pacifica	seashore saltgrass - Pacific swampfire	Red
Festuca roemeri - Koeleria macrantha	Roemer's fescue - junegrass	Red

Table A2 (Cont'd): Ecological Communities with Potential to Occur Within 500 m of the Project Area.

Scientific Name	Common Name	BC List
Juncus arcticus - Plantago macrocarpa	arctic rush - Alaska plantain	Red
Leymus mollis ssp. mollis - Lathyrus japonicus	dune wildrye - beach pea	Red
Myrica gale / Carex sitchensis	sweet gale / Sitka sedge	Red
Picea sitchensis / Rubus spectabilis Dry	Sitka spruce / salmonberry Dry	Red
Picea sitchensis / Rubus spectabilis Very Dry Maritime	Sitka spruce / salmonberry Very Dry Maritime	Red
Populus tremuloides / Malus fusca / Carex obnupta	trembling aspen / Pacific crab apple / slough sedge	Red
Pseudotsuga menziesii / Polystichum munitum	Douglas-fir / sword fern	Red
Pseudotsuga menziesii - Tsuga heterophylla / Gaultheria shallon Dry Maritime	Douglas-fir - western hemlock / salal Dry Maritime	Red
Ruppia maritima Herbaceous Vegetation	beaked ditch-grass Herbaceous Vegetation	Red
Salix sitchensis - Salix lasiandra var. lasiandra / Lysichiton americanus	Sitka willow - Pacific willow / skunk cabbage	Red
Sarcocornia pacifica - Lysimachia maritima	American glasswort - sea-milkwort	Red
Sidalcea hendersonii Tidal Marsh	Henderson's checker-mallow Tidal Marsh	Red
Thuja plicata / Carex obnupta	western red cedar / slough sedge	Red
Thuja plicata / Lonicera involucrata	western red cedar / black twinberry	Red
Thuja plicata / Polystichum munitum Dry Maritime	western red cedar / sword fern Dry Maritime	Red
Thuja plicata / Rubus spectabilis	western red cedar / salmonberry	Red
Tsuga heterophylla - Pseudotsuga menziesii / Eurhynchium oreganum	western hemlock - Douglas-fir / Oregon beaked-moss	Red
Tsuga heterophylla - Thuja plicata / Struthiopteris spicant	western hemlock - western redcedar / deer fern	Red

Table A3: Fish, Wildlife and Invertebrate Species at Risk with Potential to Occur Within 500 m of the Project Area

Scientific Name	Common Name	BC List	SARA Status
Cypseloides niger	Black Swift	Blue	Endangered
Chrysemys picta pop. 1	Painted Turtle - Pacific Coast Population	Red	Endangered
Scapanus townsendii	Townsend's Mole	Red	Endangered
Myotis lucifugus	Little Brown Myotis	Yellow	Endangered
Chrysemys picta	Painted Turtle	No Status	Endangered / Special Concern
Ardea herodias fannini	Great Blue Heron, fannini subspecies	Blue	Special Concern
Asio flammeus	Short-eared Owl	Blue	Special Concern
Falco peregrinus pealei	Peregrine Falcon, pealei subspecies	Blue	Special Concern
Gulo gulo luscus	Wolverine, luscus subspecies	Blue	Special Concern
Nearctula sp. 1	Threaded Vertigo	Blue	Special Concern
Numenius americanus	Long-billed Curlew	Blue	Special Concern
Patagioenas fasciata	Band-tailed Pigeon	Blue	Special Concern

Table A3 (Cont'd): Fish, Wildlife and Invertebrate Species at Risk with Potential to Occur Within 500 m of the Project Area

Scientific Name	Common Name	BC List	SARA Status
Phalaropus lobatus	Red-necked Phalarope	Blue	Special Concern
Rana aurora	Northern Red-legged Frog	Blue	Special Concern
Salvelinus confluentus pop. 28	Bull Trout - South Coast Population	Blue	Special Concern
Synthliboramphus antiquus	Ancient Murrelet	Blue	Special Concern
Ursus arctos	Grizzly Bear	Blue	Special Concern
Falco peregrinus	Peregrine Falcon	No Status	Special Concern
Gulo gulo	Wolverine	No Status	Special Concern
Aechmophorus occidentalis	Western Grebe	Red	Special Concern
Danaus plexippus	Monarch	Red	Special Concern
Falco peregrinus anatum	Peregrine Falcon, anatum subspecies	Red	Special Concern
Gulo gulo vancouverensis	Wolverine, vancouverensis subspecies	Red	Special Concern
Anaxyrus boreas	Western Toad	Yellow	Special Concern
Ascaphus truei	Coastal Tailed Frog	Yellow	Special Concern
Charina bottae	Northern Rubber Boa	Yellow	Special Concern
Coccothraustes vespertinus	Evening Grosbeak	Yellow	Special Concern
Brachyramphus marmoratus	Marbled Murrelet	Blue	Threatened
Contopus cooperi	Olive-sided Flycatcher	Blue	Threatened
Hirundo rustica	Barn Swallow	Blue	Threatened
Megascops kennicottii kennicottii	Western Screech-Owl, kennicottii subspecies	Blue	Threatened
Melanerpes lewis	Lewis's Woodpecker	Blue	Threatened
Megascops kennicottii	Western Screech-Owl	No Status	Threatened
Accipiter gentilis laingi	Northern Goshawk, laingi subspecies	Red	Threatened
Chordeiles minor	Common Nighthawk	Yellow	Threatened
Aeronautes saxatalis	White-throated Swift	Blue	N/A
Botaurus lentiginosus	American Bittern	Blue	N/A
Branta bernicla	Brant	Blue	N/A
Buteo lagopus	Rough-legged Hawk	Blue	N/A
Butorides virescens	Green Heron	Blue	N/A
Calcarius pictus	Smith's Longspur	Blue	N/A
Callophrys eryphon sheltonensis	Western Pine Elfin, sheltonensis subspecies	Blue	N/A
Cervus elaphus roosevelti	Roosevelt Elk	Blue	N/A
Corynorhinus townsendii	Townsend's Big-eared Bat	Blue	N/A
Cygnus columbianus	Tundra Swan	Blue	N/A
Epargyreus clarus	Silver-spotted Skipper	Blue	N/A
Falco rusticolus	Gyrfalcon	Blue	N/A
Glaucidium gnoma swarthi	Northern Pygmy-owl, swarthi subspecies	Blue	N/A
Larus californicus	California Gull	Blue	N/A
Limnodromus griseus	Short-billed Dowitcher	Blue	N/A
Oncorhynchus clarkii clarkii	Cutthroat Trout, clarkii subspecies	Blue	N/A
Ophiogomphus occidentis	Sinuous Snaketail	Blue	N/A
Pinicola enucleator carlottae	Pine Grosbeak, carlottae subspecies	Blue	N/A

Table A3 (Cont'd): Fish, Wildlife and Invertebrate Species at Risk with Potential to Occur Within 500 m of the Project Area

Scientific Name	Common Name	BC List	SARA Status
Pluvialis dominica	American Golden-Plover	Blue	N/A
Progne subis	Purple Martin	Blue	N/A
Recurvirostra americana	American Avocet	Blue	N/A
Salvelinus confluentus	Bull Trout	Blue	N/A
Sorex trowbridgii	Trowbridge's Shrew	Blue	N/A
Thaleichthys pacificus	Eulachon	Blue	N/A
Tringa incana	Wandering Tattler	Blue	N/A
Bartramia longicauda	Upland Sandpiper	Red	N/A
Branta canadensis occidentalis	Canada Goose, occidentalis subspecies	Red	N/A
Lepus americanus washingtonii	Snowshoe Hare, washingtonii subspecies	Red	N/A
Nycticorax nycticorax	Black-crowned Night-heron	Red	N/A
Phalacrocorax penicillatus	Brandt's Cormorant	Red	N/A
Sterna forsteri	Forster's Tern	Red	N/A

Appendix II

Site Photos

Photo 1 Sechelt Inlet Road, facing northeast.

Photo 2 Typical representation of western side of Sechelt Inlet Road. Photo taken Photo taken at 100+90 near Sechelt Inlet Road and Xenichen Avenue, facing west.

Photo 3 East side of Sechelt Inlet Road is sparsely vegetated. Photo taken facing south.

Photo 4 Dense understory coverage observed in wooded area along the western side of Sechelt Inlet Road. Photo taken approximately 50 m north of the intersection with Kunut Avenue, facing northwest.

Photo 5 **Dense understory cover observed along western side of Sechelt Inlet Road. Photo taken facing west, approximately 40 m south of the intersection with Kunut Avenue.**

Photo 6 **Scotch Broom plant growing on the west side of Sechelt Inlet Road. Photo taken facing southwest.**

Photo 7 Inactive American crow nest located on the western side of Sechelt Inlet Road, near the intersection with Slim Street, at 101+80 (facing west)

Photo 8 Catch basin located on the western shoulder of Sechelt Inlet Road, in front of Columbia Fuels at 103+40. Photo taken facing northeast.

Photo 9 **Evidence of north to south drainage along the west side of Sechelt Inlet Road. Photo taken facing south near the intersection with Tsulich Drive at 104+60.**

Photo 10 **Surface drainage from Sechelt Inlet Road westwards down a gravel driveway approximately 3 meters south of the intersection with Tsulich Drive.**

Photo 11 **A drainage pipe observed conveying water from a residential property on the eastern side of Sechelt Inlet Road. Photo taken at 100+90 near Sechelt Inlet Road and Xenichen Avenue, facing east.**

Photo 12 **Catch basin located at Ikat Drive visibly receiving runoff from Sechelt Inlet Road via Tsulich Drive. Photo taken facing south.**

Photo 13 Porpoise Bay, visible from Sechelt Inlet Road. Photo taken at 101+80 near the intersection with Slim Street, facing northwest.

Photo 14 Western side of Sechelt Inlet Road, facing southeast. Photo taken north of the intersection with Kunut Avenue (visible in Photo).

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