Canal Road Realignment Project
Basic Impact Assessment

Prepared for:

Ministry of Transportation and Infrastructure
Suite 310 – 1500 Woolridge Street
Coquitlam, BC V3K 0B8

Project No. 103041-07

Prepared by:

Hemmera Envirochem Inc.
18th Floor, 4515 Central Boulevard
Burnaby, BC V5H 0C6
T: 604.669.0424
F: 604.669.0430
hemmera.com

October 18, 2023

TABLE OF CONTENTS

LIST OF TABLES (WITHIN TEXT)

LIST OF APPENDICES

FIGURES (APPENDED)

APPENDICES

1.0 PROJECT TITLE AND LOCATION

Canal Road Realignment, South Pender Island, Gulf Island National Park Reserve

2.0 PROPONENT INFORMATION

Parks Canada Project Manager:

Molly Clarkson, Resource Conservation Manager Gulf Islands National Park Reserve of Canada, 250-654-4076; *molly.clarkson@pc.gc.ca*

Sibylla Helms, Resource Management Officer Gulf Islands National Park Reserve of Canada, 250-6617246; *sibylla.helms@pc.gc.ca*

Project Plan/Design Company Project Manager:

Chad Bengert, Project Manager, McElhanney; 604-424-4834 (direct), 778-222-6738 (cell); *cbengert@mcelhanney.com*

Project Owner, Environmental Representative:

Leigh Holt, Senior Biologist, WSP Golder; 250-860-8424 x15851; *Leigh_Holt@golder.com*

3.0 PROPOSED PROJECT DATES

Planned commencement: 2023-03-01

Planned completion: 2023-11-30

4.0 NOTICES ON REGISTRY

Registry Title: MOTI (Ministry of Transportation and Infrastructure) - Canal Road Realignment, South Pender Island

Project notice posted on Registry: 2022-03-10

Reference Number: 83464

5.0 PROJECT FILE NUMBER (INTERNAL/REGISTRY)

GI21-11.

6.0 PROJECT DESCRIPTION

6.1 Project Objective

Following extreme rainfall events in November 2021 a section of Canal Road on South Pender Island experienced significant damage and is subject to potential landslide or slope failure (**Photo 1**). The current roadway is unstable and was not built for long-term sustainable use or current traffic volumes. The BC Ministry of Transportation and Infrastructure (MOTI) will realign a portion of Canal Road to provide a safe and stable roadway and to minimize the possibility of future failures occurring. The road realignment will be adjacent to the existing roadway.

6.2 Project Location

The Project is located on the north side of South Pender Island. The overall Project occurs within an existing provincial road right-of-way, within the Gulf Islands National Park Reserve (GINPR) and private property. The approximate latitude and longitude of the center of the site are 48°45'32"N 123°13'30"W, respectively. The western limit of construction is approximately 240m east of the intersection of Canal Road and Mt Norman Trail Access.

Project location and limits of construction are shown on Figure 1.

The length of the road to be reconstructed is approximately 412 m. Total area occupied by the Project is approximately 8,620 m^2 with 5,360 m^2 of new disturbances (e.g., slope excavation and new road surface). Approximately 4,650 m^2 of the Project occurs within the GINPR, with approximately 3,430 m^2 of that area being disturbed by the Project. The disturbance that will occur within the GINPR will primarily include clearing and grubbing and some slope reprofiling by excavation and/or controlled blasting.

6.3 Project Phases and Activities

Works included under this Project include:

- Mobilization and Demobilization of all personnel, equipment, materials, and other resources necessary to execute the Project;
- Provision of traffic signage and traffic control;
- Clearing and grubbing from the south edge of the existing asphalt;
- Slope reprofiling by excavation and/or controlled blasting on the slope face (south side of road);
- Construction of a two-lane road (approximately 6.1 m in width);
    - Includes excavation, grading and sloping, placing sub-base materials, compaction and paving (on new construction and transition to existing road);
- Construction of 0.6 m of paved shoulder and 0.6 m of gravel shoulder on the north side and south side of the newly constructed section of road;
- Construction of 3.0 m wide catchment ditch on the south side between road and toe of slope; and,
- Construction of a 44 m long retaining wall on south side of the road (Station 1002+91 to Station 1003+35).

The Project will be conducted using MOTI industry standard construction methods and best management practices (i.e., *2020 Standard Specifications for Highway Construction [*MOTI 2020*]).* The most recent design plans are included in Appendix 3.

6.4 Project Timing

The Project is anticipated to commence in March 2023, with construction being completed in November 2023. Project construction activities will be scheduled to avoid sensitive wildlife timing windows. Where construction activities cannot avoid this period, additional site-specific mitigation measures will be prescribed.

6.5 Project Alternatives

Alternative design options were considered for the route to minimize or eliminate impact to the adjacent GINPR. The three options that were developed and evaluated include:

- Concept 1 – Road realignment
- Concept 2 – Bridge along existing road alignment, and
- Concept 3 – Retaining wall along existing westbound edge of pavement.

Concept 1 was designed to shift the damaged section of the road away from the active landslide area to achieve target stability. This proposed alignment shifts the road completely off the existing roadway where pavement cracks are observed. This alignment results in encroachment into the Parks Canada right of way and into a small area of private property.

Concept 2 involves raising the road alignment above the slide area with a bridge built along the existing road alignment. While this concept has the least impact to environment and surrounding properties, it would require a complete shutdown of the roadway, in which there are no feasible alternative land detours available. The possibility of ferrying/barging people and goods from the north to the south part of the island was determined to be too costly.

Concept 3 involves constructing a retaining wall along the existing edge of pavement on the downslope side. While this option would allow one lane of traffic during construction, this option posed geotechnical risks associated with installation of the steel piles. Moreover, this option would require a large volume of concrete to be delivered to the Project site which could pose scheduling risks.

A Multi-Account Evaluation (MAE) was completed to evaluate the three concepts. Consideration was given to environmental / First Nation impacts, constructability, construction cost, construction schedule, geotechnical risk, Parks Canada / property impacts, maintenance / lifecycle costs, road geometry / safety, structural risk, and traffic impacts. As a result of the analysis, Concept 1 selected as the preferred option as it provided the best economical solution to remediate the active slide site while minimizing traffic impact. Concepts 2 and 3 were rejected as they would require a complete shutdown of the roadway, where alternative detours were not available or would be astronomically costly due to ferrying/barging people and goods from the north to the south part of the island.

7.0 EXISTING SITE CONDITIONS

A desktop review of existing information was conducted using publicly available databases and mapping services to characterize the vegetation, wildlife and wildlife habitat, aquatic resources, and fish and fish habitat at the Project site. A field visit was conducted on February 17, 2022 by Hemmera biologist Sarah Wyness, R.P.Bio. to ground truth the results of the desktop review. Representative photographs from the field visit are provided in Appendix A.

The GINPR is one of Canada's newest national parks and includes protected land on fifteen of British Columbia's Southern Gulf Islands. Beaumont / Mount Norman Park is part of the GINPR and is located on South Pender Island, adjacent to the Project site. Access to the Mount Norman trails is off Canal Road on the north end of South Pender Island.

South Pender Island is moderately (more than 50%) fragmented by rural residential development and agricultural land (BC Conservation Data Center 2014a). Development is relatively light, with little recent forest clearing, and more than 75% of natural or semi-natural vegetation (BC Conservation Data Center 2014a). Canal Road provides access to most areas on the north side of the island and connects South Pender Island to North Pender Island.

7.1 Vegetation

7.1.1 Desktop Study

The Project site is within the Coastal Douglas-fir Moist Maritime (CDF mm) subzone. Vegetation within the CDF mm subzone is typically dominated by Douglas-fir (*Pseudotsuga menziesii*), western redcedar (*Thuja plicata*), grand fir (*Abies grandis*), bigleaf maple (*Acer macrophyllum)*, western flowering dogwood (*Cornus nuttallii*), and mountain hemlock arbutus (*Arbutus menziesii)*. The understory is dominated by salal (*Gaultheria willon*), dull Oregon-grape (*Mahonia nervosa*), ocean spray (*Holodiscus discolor*) and *Kindbergia oregana.*

The Project site encompasses two provincially red-listed ecosystems, Grand Fir / Dull Oregon -grape and Douglas-fir / dull Oregon-grape. The Douglas-fir / dull Oregon-grape ecological community (Shape ID 65114) covers most of the Project area and is spread over much of South Pender Island. This coniferous forest is mostly comprised of young (70%), and mature (27%) Douglas-fir dominated forests, with components of old forest (~3%) and veteran trees (BC Conservation Data Center 2014a). Co-occurring tree species include grand fir, arbutus, western redcedar, bigleaf maple, and red alder (*Alnus rubra*) (BC Conservation Data Center 2014a).

The Grand Fir / Dull Oregon -grape ecosystem (Shape ID 109228) intersects the very western end of the Project area. It is comprised mostly young forest of deciduous and coniferous tree species, with portions of mature forest and a small area of veteran trees (BC Conservation Data Center 2014b). The typical vegetation associated with the Grand Fir / Dull Oregon-grape ecosystem includes western redcedar, red alder, Douglas-fir, bigleaf maple, and grand fir over an understory of red alder, salal (*Gaultheria willon*), dull Oregon-grape (*Mahonia nervosa*), trailing blackberry (*Rubus ursinus*), oceanspray, wall lettuce (*Lactuca muralis*), sweet-scented bedstraw (*Galium triflorum*), hairy honeysuckle (*Lonicera hispidula*), Alaska oniongrass (*Melica subulata*) and sword fern (*Polystichum munitum*) (BC Conservation Data Center 2014b).

To determine the potential for species at risk to occur in the vicinity of the Project an area-based search for vegetation species of management concern was conducted using British Columbia (BC) Conservation Data Centre's (CDC) Species and Ecosystems Explorer (BC CDC 2022). All occurrences of provincially and federally listed vegetation occurring in the Southern Gulf Island National Park Reserve were downloaded. This list was then reviewed to determine the likelihood of each species occurring in the Project area, based on distribution, known occurrences and habitat requirements, through a review of the CDC Internet Mapping tool, BC Species and Ecosystems Explorer, E-Flora BC: Electronic Atlas of the Flora of British Columbia, and Parks Canada's Biotics Web Explorer.

Species with distribution ranges outside the southern Gulf Islands or with habitat requirements clearly not available at or near the Project area (e.g., limestone cliffs or sandy beaches) were eliminated from further assessment. The remaining species are summarized in **Table 7.1**.

Critical habitat, as defined by SARA, is "the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or action plan for the species." Based on a search of the Critical Habitat for Federally Listed Species At Risk layer of iMap BC, there are no final or proposed areas of critical habitat in the Project area.

Table 7.1 Federally and Provincially Listed Vegetation Species Potentially Occurring in General Project Area

English Name	Scientific Name	BC List	COSEWIC	SARA Status	Known Occurrences near Project Area [1]	Potential to Occur[2]	Rationale for Occurrence Potential
banded cord-moss	*Entosthodon fascicularis*	Blue	Special Concern	Special Concern	No known occurrences on South Pender Island, however an occurrence on North Pender Island was recorded in 1997 on an earth hummock at, edge of seepage outcrop.	m	Grows on soil over rock, often amongst other mosses, plant litter, and bases of vascular plants, in open to semi-shaded habitats, in or adjacent to seasonally moist sites. Occurrence recorded on North Pender Island. Some suitable habitat (e.g., open forest with moss and plant litter) present.
twisted oak moss	*Syntrichia laevipila*	Blue	Special Concern	Special Concern	None	l	Typically found on the bark of trees, particularly mature oak trees (Quercus sp.), and in open habitats; rarely found on rocks. No suitable habitat present at site and no known occurrences.
coast manroot	*Marah oregana*	Red	Endangered		Two occurrences on southeast corner of South Pender Island (observed in pasture along margin of second-growth forest of Douglas fir, Western red cedar and red alder).	m	Prefers open woodlands and forest edges, grassy fields and hillsides. It can also be found along roadsides. In BC it is usually correlated with the distribution of Garry Oak. Although the site does not contain Garry Oak, some suitable habitat (e.g., open woodland) is present along the roadside, and occurrences have been noted on South Pender Island.
contorted-pod evening-primrose	*Camissonia contorta*	Red	Endangered	Endangered	None	l	Occurs on dry, sandy, open backshore and dune habitats. Habitat not present at site and no known occurrences near the site.
Erect Pigmyweed	*Crassula connata*	Blue			No known occurrences on South Pender Island, however several occurrences noted on southern tip of North Pender Island (near Oak Bluff Park).	l	Typically occupies wet to moist vernal pools on coastal bluffs, open, gravelly places, or on mossy rocks. While it is known to occur on North Pender Island, no suitable habitat is present at the site.
fern-leaved desert-parsley	*Lomatium dissectum*	Red			None Occurrences noted on Saltspring Island.	l	Occurs in dry grasslands, shrublands, talus and rocky slopes in the stCEMPe and montane zones. No suitable habitat on the site and no known occurrences near the site.
fragrant popcornflower	*Plagiobothrys figuratus* ssp. *figuratus*	Red	Endangered	Endangered	None	l	Occurs primarily in vernally wet soils and heavy clays, moist fields, wet meadows, and seeps. Outside of range (only site currently known is on Hornby Island) and no suitable habitat present at site.
Henderson's checker-mallow	*Sidalcea hendersonii*	Blue			No known occurrences on South Pender Island, however several occurrences noted on North Pender Island (in saline marsh near Medicine Beach and near Hamilton Beach).	l	Inhabits wet meadows, estuaries and tidal flats in the lowland zone. Occurrences noted on North Pender Island, but no suitable habitat at the site.
Howell's violet	*Viola howellii*	Red			None on Pender Island. Occurrence noted on Saltspring Island.	l/m	Found in moist shady areas of coniferous forests, and often along streams. Some observations on southern Vancouver Island associated with roadsides. Although no known occurrences have been recorded on Pender Island it has been observed nearby. Minimal habitat (e.g., roadside and coniferous forest) is present at the site.
leafless wintergreen	*Pyrola aphylla*	Blue			No known occurrences on Pender Island. Multiple occurrences noted on Saltpring Island (in mixedwood forests).	m	Occurs in mesic coniferous forests at low to moderate elevations. Although no known occurrences have been recorded on Pender Island it has been observed nearby. Some suitable habitat (e.g., mesic coniferous forest) is present at the site.
Lindley's microseris	*Uropappus lindleyi*	Red	Endangered	Endangered	No known occurrences on South Pender Island, however several occurrences note on the southern tip of North Pender Island and on Saturna Island (in grassland/herbaceous or coastal bluff areas).	l/m	Associated with Garry oak and associated ecosystems in the dry Coastal Douglas-fir zone. Occurs in sandstone cliffs, steep grassy slopes, and xeric, open deciduous or conifer forests on rocky slopes and cliffs. Occurrences have been noted near the site and some habitat qualities are present (e.g., open coniferous forest on rocky slope), though the site is likely moister than preferred and lacks the Garry oak association.
Macoun's meadow-foam	*Limnanthes macounii*	Red	Threatened	Threatened	None on Pender Island. Occurrences noted on Saltspring Island.	l	Occurs in wet depressions, vernal pools and seepage sites usually close to the shore of the Pacific Ocean. No known occurrences on Pender Island and no suitable habitat present at the site.

English Name	Scientific Name	BC List	COSEWIC	SARA Status	Known Occurrences near Project Area [1]	Potential to Occur[2]	Rationale for Occurrence Potential
Muhlenberg's centaury	*Zeltnera muehlenbergii*	Red	Endangered	Endangered	None	I	Usually found in two distinct habitat types in BC: vernal pools within a large meadow in a Garry oak woodland, and along the margins of a tidal saltgrass marshes, both of which experience seasonal flooding by rainwater or by the ocean. This species occurs in patches of open, bare, moist soil within its habitat types. Not known to occur at or near the site. No suitable habitat present at the site.
poverty clover	*Trifolium depauperatum* var. *depauperatum*	Blue			None	I	Typically found in low-elevation vernally wet to moist grassy sites (Grassland/Shrub / Meadows, vernal pools). No known observations at or near the site. No suitable habitat present at the site.
seaside bird's foot lotus	*Hosackia gracilis*	Red	Endangered	Endangered	None	I	Occurs in deep (> 20 cm), moderately well to well drained soils in dry to mesic meadows, or mesic open deciduous or coniferous woodland. No known observations at or near the site. No suitable habitat present at the site.
slender popcornflower	*Plagiobothrys tenellus*	Red	Threatened	Threatened	Several occurrences recorded on South Pender Island, including one at Mount Norman on a south-facing grassy bluff), and on southern tip of North Pender Island.	I	Occurs on dry, grassy slopes and coastal bluffs. Although occurrences have been noted proximate to the site, no suitable habitat is present.
small-flowered tonella	*Tonella tenella*	Blue	Endangered	Endangered	None on Pender Island. Several occurrences recorded on west side of Saltspring Island.	I	Occurs on west-facing slopes on gravelly rock outcrops or stable talus. No known occurrences on Pender Island and no suitable habitat present at the site.
Washington springbeauty	*Claytonia washingtoniana*	Blue			None on Pender Island. Occurrence noted on eastern Saturna Island in a moist seep in beachside forest.	I/m	Found in moist to mesic mossy rock outcrops and forests in the lowland and montane zones. Associated with Coastal bluffs and disturbed places with red alder and moss mats in boulders and cliffs of moist coastal forests. Although no known occurrences are recorded near the site, some suitable habitat may be present (e.g., moist coastal forest).
white meconella	*Meconella oregana*	Red	Endangered	Endangered	None on Pender Island. Several occurrences recorded on adjacent Gulf Islands.	I	Occurs in open rocky or grassy sites that have early spring seepage but dry out in the summer. No known observations on Pender Island. No suitable habitat present at site.
white-top aster	*Sericocarpus rigidus*	Blue	Special Concern	Special Concern	None	I	Typically occurs flat, open grasslands of lowlands with gravelly, glacial outwash soils. Can also occur in dry openings and meadows associated with Garry Oak and Douglas-fir woodlands where canopy cover ranges from almost absent to largely closed. No known observations on Pender Island. No suitable habitat present at site.
yellow montane violet	*Viola praemorsa* var. *praemorsa*	Red	Endangered	Endangered	None on Pender Island. Several occurrences noted on Saltspring Island.	I	Occurs in low-elevation, herb-dominated ecosystems of Garry Oak woodlands and grass-dominated meadows. It is shade intolerant and most microhabitats have little or no shrub cover but an abundant cover of herbaceous species. No known observations on Pender Island. No suitable habitat present at site.
coastal wood fern	*Dryopteris arguta*	Blue	Special Concern	Special Concern	None	I	Occurs on coastal wooded slopes under open forest canopies of Douglas fir, Garry oak and arbutus, and in shrub-dominated areas along rocky coastal bluffs. Usually occurs in the drier subzones of the CDFmm and is strongly associated with Garry oak ecosystems. No known occurrences on Pender Island or adjacent Gulf Islands, minimal suitable habitat characteristics present.
Idaho blue-eyed-grass	*Sisyrinchium idahoense* var. *segetum*	Red			None on South Pender Island, however once occurrence is noted on North Pender Island (in pasture on Old Bedwell Road)	I	Occurs in moist grassy meadows from near sea level into the lower mountain. It has also been found in roadside ditches. Although this species has been observed on North Pender Island, no suitable habitat is present at the site.
Ozette coralroot	*Corallorhiza maculata* var. *ozettensis*	Blue			None on Pender Island. Several occurrences recorded on adjacent Gulf Islands (all in coniferous forest).	m	Occurs in moist to dry forests in the lowland, stCEMPe and montane zones; frequent throughout BC, especially along the coast. No known occurrences on Pender Island but multiple observations on adjacent islands. Suitable habitat (e.g., moist coniferous forest) is present at the site.

English Name	Scientific Name	BC List	COSEWIC	SARA Status	Known Occurrences near Project Area [1]	Potential to Occur[2]	Rationale for Occurrence Potential
phantom orchid	*Cephalanthera austiniae*	Red	Endangered	Threatened	None on Pender Island. Two occurrences recorded on southwest Saltspring Island.	l	Occurs in dense, moist to mesic coniferous or mixedwood forests from sea level to 550 m. In BC it is typically found relatively undisturbed old growth, mature and occasionally older second growth forests on sites with sparse ground cover and thick leaf litter. It requires an intact underground fungal network. No known occurrences on Pender Island. No suitable habitat present at the site.
slimleaf onion	*Allium amplectens*	Blue			None on South Pender Island. However, several occurrences are recorded on North Pender Island and adjacent Gulf Islands.	l	Found in low elevation vernally moist rocky bluffs and meadows. It usually occurs in open, dry meadows associated with Garry oak ecosystems. Although occurrences have been noted on North Pender Island, no suitable habitat is present at the site.
white-lip rein orchid	*Platanthera ephemerantha*	Blue			None on Pender Island. Several occurrences recorded on adjacent Gulf Islands.	m	Occurs in dry to moist coniferous forest and forest margins at low elevations, Known occurrences on adjacent Gulf Islands. Suitable habitat (e.g., moist forest) present at the site.

[1] Recorded occurrences as per a search of the named species in E-FLORA BC: Electronic Atlas of the Flora of British Columbia (available at: https://ibis.geog.ubc.ca/biodiversity/eflora/) atlas page and interactive map or the CDC iMap, Species and Ecosystems at Risk layers.

[2] Potential to Occur rankings based on the following:

High (h): Species is expected to occur because observations have been made close to the Project Area (i.e., on South Pender Island) and/or the habitat available is equivalent to conditions where the species regularly occurs or has most of the qualities the species is known to require.

Moderate (m): Species may occur in because observations have been made near the Project Area (i.e., on North Pender Island, or adjacent Gulf Islands) and/or the habitat available is similar to conditions where the species regularly occurs or has some of the qualities the species is known to require.

Low (l): Species are unlikely to occur because no observations have been made near the Project Area (i.e., may occur on Vancouver Island or lower mainland but have not been recorded in southern Gulf Islands) and/or the habitat available is dissimilar to conditions where the species regularly occurs or does not have suitable environmental qualities.

7.1.2 Field Study

During the field visit, vegetation at the Project site was observed to be predominantly young coniferous forest (trees ranging approximately 0.10 to 0.30 m diameter at breast height (DBH)), with some mature trees present (approximately 0.5 m to 0.8 m DBH) (**Photo 2** and **Photo 3**). No veteran trees were observed. Vegetation observed at the site included Douglas fir, western red cedar, salal, moss, western sword fern, and ocean spray.

Mature western red cedar, Douglas fir, and big leaf maple trees were observed within the slide zone, with very limited understory vegetation comprised mainly of sword fern and patches of moss (**Photo 4**). The Project site was well shaded with high canopy closure at the slide location. Groundcover was predominantly moss, sword fern, salal, and decaying red alder. Some evidence of forest fire burns was observed.

Invasive plant species observed along the roadside, mostly on the north side, included common foxglove (*Digitalis purpurea*), common cat's-ear (*Hypochaeris radicata*), and scotch broom (*Cytisus scoparius*) (**Photo 5**). No evidence of invasive plant species was observed west of the roadway.

No SARA-listed vegetation was observed during the field visit. However, non-detection does not preclude absence; the field visit was not conducted during optimal vegetation survey season, nor was a species at risk-specific survey conducted.

7.2 Fish and Fish Habitat

7.2.1 Desktop Study

An unnamed watercourse is located approximately 30 m west of the western extent of the Project site, approximately 155 m east of the Mount Norman Trail Access (see Figure 1). Provincial mapping of this watercourse indicates that it is a first-order watercourse with its headwaters originating in GINPR, approximately 650 m from its marine confluence. The Fish Inventory Data Queries database and BC HabitatWizard online mapping tool did not contain any information regarding fish and fish habitat associated with the watercourse.

7.2.2 Field Study

The unnamed watercourse identified during the desktop study was observed during the field visit (**Photo 6**). Based on observations during the field visit, the watercourse flows through a culvert (approximately 0.6 m) beneath the existing road, and flows northeast, eventually discharging into the ocean (**Photo 7** and **Photo 8**). The watercourse is approximately 1.5 m wide with a gradient of approximately 50%. At the time of the field visit, the depth of the water was observed to be shallow (<0.1 m) with step-pool morphology. Banks were poorly defined, and substrates were dominated by gravels and cobbles.

Characteristics of the unnamed watercourse (e.g., shallow, first-order stream without a lake at the headwater and gradient greater than 20%) make it unlikely that fish are present in this watercourse. Gradients greater than 20% typically exclude presence of most fish species (BC Ministry of Forests 1998).

Current design plans do not include works within the wetted channel of the unnamed watercourse. However, the western limit of construction for the Project is approximately 30 m east of the unnamed watercourse. While design plans do not include work within the wetted channel, works will occur within the 30 m riparian buffer zone.

A ditch to channel roadside drainage was observed on the south side of Canal Road (**Photo 9**). The ditch was less than 0.3 m wide and extended through an existing 0.3-0.4 m diameter culvert with a perched outlet on the north side. The ditch was dry at the time of the field visit and was covered in grassy vegetation.

7.3 Terrestrial Wildlife

7.3.1 Desktop Study

A variety of wildlife have potential to be found at the Project site, including birds, mammals, reptiles, and amphibians. Because the majority of the Project site is within or adjacent to an active roadway, much of the wildlife use is likely transient and accustomed to traffic disturbances. However, the forested areas adjacent to the road right-of-way, such as the portions of the Project within GINPR, may provide suitable habitat for activities such as foraging, nesting and security.

There are 23 wildlife species listed under Schedule 1 of SARA and COSEWIC known to occur within GINPR. Based on a search of the Critical Habitat for Federally Listed Species at Risk Layer of iMap BC, there are no final or proposed areas of critical habitat at or near the Project site.

The same screening exercise that was performed for vegetation was conducted for terrestrial wildlife. **Table 7.2** summarizes the federally and provincially listed wildlife species potentially occurring in the Project area.

Table 7.2 Federally and Provincially Listed Wildlife Species Potentially Occurring in General Project Area

English Name	Scientific Name	BC List	COSEWIC	SARA Status	Known Occurrences near Project Area [1]	Potential to Occur[2]	Rationale for Occurrence Potential
Invertebrates							
Broadwhorl Tightcoil	*Pristiloma johnsoni*	Blue			None on Pender Island. Recorded sites in BC include Vancouver Island near Nanaimo and Duncan.	I/m	Found in leaf litter and under fallen debris, ferns and bushes of lower elevation coniferous forests with moist riparian ravines, valleys, or talus sites. No known occurrences near the site. Some suitable habitat present (e.g., leaf litter in lower elevation coniferous forest).
Evening Fieldslug	*Deroceras hesperium*	Red	Data Deficient		None on Pender Island. The species was last found at a single site in Comox, British Columbia in 1887.	I	Occupies moist habitats such as wet marshes, wet woodlands, fields, riverbanks and meadows. Needs high shade (from fog or canopy), high humidity and complete plant coverage. No reliable, recent records of species occurring in BC. No suitable habitat present at the site.
Oregon Forestsnail	*Allogona townsendiana*	Red	Endangered	Endangered	None on Pender Island. Only documented occurrence in BC is located in the lower Fraser Valley.	I	Found in low-elevation mixed-wood and deciduous forests, typically dominated by Bigleaf Maple; usually a dense cover of low herbaceous vegetation is present. Habitat requirements are poorly known but probably requires coarse woody debris, copious amounts of leaf litter, and both living and senescent vegetation. No known occurrences near the site. No suitable habitat present at the site.
Threaded Vertigo	*Nearctula* sp. 1	Blue	Special Concern	Special Concern	None on Pender Island. Recorded on Saturna Island, around Victoria and on the Sunshine Coast.	I	Found in moist mixed forest stands at low elevations, usually associated with big leaf maples and an understory of ferns and shrubs characteristic of moist, rich sites. This species is arboreal and is usually found in the grooved bark or moss mats of big leaf maples. No known occurrences on Pender Island and very limited occurrence on an adjacent Gulf Island. Habitat is minimally suitable (i.e., big leaf maple is present at the site but not abundant, site is conifer dominated).
Warty Jumping-slug	*Hemphillia glandulosa*	Red	Special Concern	Special Concern	None on Pender Island. Occurrences recorded across southern Vancouver Island, with the nearest observations noted upstream of Cowichan Bay.	I/m	Occupies moist forested habitats and riparian sites from low to middle elevations with abundant coarse woody debris, deep litter or moss layer, and shade provided by forest canopy. No known occurrence on Pender Island or adjacent Gulf Islands. Some suitable habitat characteristics are present; however, a deep litter or moss layer is lacking at the site.
Western Thorn	*Carychium occidentale*	Blue			Recorded at Magic Lake on North Pender Island. Occurrences recorded on Vancouver Island, near Duncan.	I/m	Requires year-round moist deep-litter sites that do not flood; found in low elevation forests in rich, relatively undisturbed leaf litter; usually dominated by Bigleaf maple. Nearly always found in moist hollows, near seeps or along riparian zones. Species has been recorded on North Pender Island. Some suitable habitat characteristics are present; however, the site is dominated by conifers and a deep layer of moist leaf litter is lacking.
Wrinkled Marshsnail	*Stagnicola caperata*	Blue			None. Limited occurrences in BC and only 1 historical occurrence on northern Vancouver Island (comox)	I	Found in ditches, shallow pools, vernal ponds, or in the spring-flooded margins of permanent-water habitats, and occasionally in large permanent lakes, rivers and swamps. No known occurrences in Gulf Islands. This species is considered a “freshwater snail”; the site likely does not provide sufficient aquatic/semi-aquatic characteristics to support this species.
Autumn Meadowhawk	*Sympetrum vicinum*	Blue			None in Gulf Islands. Nearest occurrences are mapped in lower mainland.	I	Found in, and around marshes, ponds and slow-moving streams with dense, emergent vegetation. No known occurrences in Gulf Islands. Watercourse located near the site but does not contain emergent vegetation.
Clodius Parnassian, *claudianus* subspecies	*Parnassius clodius claudianus*	Blue			None in Gulf Islands. Numerous records throughout Vancouver Island and southern BC.	I	Occurs occur in moist riparian habitats along low-elevation streams. No known occurrences in Gulf Islands. Limited habitat available near the site.
Clodius Parnassian, *pseudogallatinus* supspecies	*Parnassius clodius pseudogallatinus*	Blue			None in Gulf Islands. Numerous records throughout Vancouver Island and southern BC.	I	Occurs occur in moist riparian habitats along low-elevation streams. No known occurrences in Gulf Islands. Limited habitat available near the site.

English Name	Scientific Name	BC List	COSEWIC	SARA Status	Known Occurrences near Project Area [1]	Potential to Occur[2]	Rationale for Occurrence Potential
Johnson's Hairstreak	*Callophrys johnsoni*	Red	Special Concern		None in Gulf Islands. Numerous records throughout Vancouver Island and southern BC.	l	Primary habitat is older coniferous forests, especially those with Western Hemlock (*Tsuga heterophylla*) that are infected by dwarf mistletoe (*Arceuthobium tsugense*), which is its food source. No known occurrences in Gulf Islands. No suitable habitat (e.g., no food source) at site.
Moss' Elfin, *mossii* subspecies	*Callophrys mossii mossii*	Red			None on Pender Island. Several occurrences noted on Saltspring Island and Brackman Island (all on steep coastal bluffs).	l	Always found on dry, rocky or scree slopes where the larval foodplant, *Sedum sp*. (stonecrop family), grows. No known occurrences on Pender Island. No suitable habitat present at site.
Silver-spotted Skipper, *californicus* subspecies	*Epargyreus clarus californicus*	Red			None in southern Gulf Islands. Historical records in Victoria, Vancouver and Savary Island. Recent (2019) record on Cortes Island (northern Gulf Island).	l	Found in open areas at low to mid elevations, often in riparian habitats. Larval host plants are often perennial vetches of the genus *Lathyrus*. No known occurrences in Gulf Islands. Minimally suitable habitat present at site.
Western Bumble Bee	*Bombus occidentalis*	Blue	Threatened		None on Pender Island. Occurrence on Thetis Island. Multiple occurrences on Vancouver Island.	**m/h**	Found in a range of habitats, including mixed woodlands, farmlands, urban areas, montane meadows and into the western edge of the prairie grasslands. Requires habitat with abundant floral resources and suitable nesting sites (typically nests underground in abandoned rodent burrows or within hollows in decaying wood). No known occurrences on Pender Island or adjacent Gulf Islands, but generally well documented in the region. Suitable habitat present at the site.
Zerene Fritillary, *bremnerii* subspecies	*Speyeria zerene bremnerii*	Red			None on Pender Island. Several occurrences on Saltspring Island.	l	Typically occurs in mesic meadows with permanent springs, that have not been invaded by Scotch Broom. No known occurrences on Pender Island. No suitable habitat present at the site.
an earthworm	*Arctiostrotus perrieri*	Blue			None on Gulf Islands. Occurrences noted on Vancouver Island.	m	Found in mixed forests, typically associated with Garry oak ecosystems in BC and has been found in Cedar-Hemlock and Hemlock-Amabilis communities on Vancouver Island. No known occurrences in Gulf Islands. Suitable habitat (e.g., mixed forest) present at site, although lacking Garry oak characteristics.
Birds							
Ancient Murrelet	*Synthliboramphus antiquus*	Blue	Special Concern	Special Concern	Occurrences on South Pender Island, including one approximately 1 km east of the site.	***h***	Mostly offshore/pelagic in non-breeding season. In BC nests under mature canopies of Sitka spruce and western hemlock where undergrowth is scarce or absent; burrows into mossy slopes and establishes nesting chambers in tree root cavities or under fallen trees. Known occurrences on South Pender Island and close to site. Suitable nesting habitat near the site.
Bald Eagle	*Haliaeetus leucocephalus*	Yellow	Not at Risk		Numerous occurrences on Pender Island and adjacent Gulf Islands.	***h***	Usually nests in tall trees near water. Breeding habitat most commonly includes areas close to coastal areas, bays, rivers, lakes, reservoirs, or other bodies of water that reflect the general availability of primary food sources including fish, waterfowl, or seabirds. Well documented on Gulf Islands, including Pender Island. Suitable nesting and foraging habitat at or proximate to site.
Band-tailed Pigeon	*Patagioenas fasciata*	Blue	Special Concern	Special Concern	Occurrences on South Pender Island, including a 2007 observation in GINPR near Mt Norman.	***h***	In BC breeds in edges and openings in mature coniferous, mixed and deciduous forests, city yards and parks, wooded groves, open bushland, golf courses and orchards. Mineral sites are critical seasonal habitat as sources of sodium. Areas with flowering and berry-producing trees and shrubs provide foraging habitat. Known occurrences on South Pender Island and close to site. Suitable habitat present at the site.
Barn Owl	*Tyto alba*	Blue	Threatened	Threatened	None on Pender Island. One occurrence on Saltspring Island, numerous occurrences on adjacent Vancouver Island (near Duncan, Saanich)	l	Breed in open and partly open habitats (grassland, marsh, lightly grazed pasture, hayfields), often around human activity. Often utilize human structures for nesting. Forage in dense grass fields, saltmarsh, wet meadows, lightly grazed pastures, grass hayfields, and recently abandoned agricultural fields. No known occurrences on Pender Island. No suitable habitat present on site.

English Name	Scientific Name	BC List	COSEWIC	SARA Status	Known Occurrences near Project Area [1]	Potential to Occur[2]	Rationale for Occurrence Potential
Barn Swallow	*Hirundo rustica*	Yellow	Special Concern	Threatened	Multiple occurrences on Pender Island and adjacent southern Gulf Islands.	l	Found in open and partly open habitats, often near water. Nests in barns or other buildings, under bridges, in caves or cliff crevices, usually on vertical surface close to ceiling. Known occurrences on Pender Island but no suitable habitat present at the site.
Common Nighthawk	*Chordeiles minor*	Blue	Special Concern	Threatened	Two occurrences on North Pender Island and several on adjacent southern Gulf Islands.	l	Habitats include mountains and plains in open and semi-open areas: open coniferous forests, savanna, grasslands, fields, vicinity of cities and towns. Nesting occurs on the ground on a bare site in an open area, sometimes on flat gravel roofs of buildings. Known occurrences on Pender Island but minimal suitable habitat present at the site.
Evening Grosbeak	*Coccothraustes vespertinus*	Yellow	Special Concern	Special Concern	None on Pender Island. One occurrence on Galiano Island.	m	Found in coniferous (primarily spruce and fir) and mixed-wood second growth forest. Usually nests in dense foliage of deciduous tree or conifer, 2-21 m above ground. No known occurrences on Pender Island. Suitable habitat present at the site.
Golden Eagle	*Aquila chrysaetos*	Yellow	Not at Risk		None on Pender Island. Several occurrences on adjacent Gulf Islands.	l/m	Generally inhabit open and semi-open country such as prairies, sagebrush, arctic and alpine tundra, savannah or sparse woodland, and barren areas, especially in hilly or mountainous regions, in areas with sufficient mammalian prey base and near suitable nesting sites. Nests are most often on rock ledges of cliffs but sometimes in large trees, on steep hillsides, or on the ground. No known occurrences on Pender Island but have been observed on southern Gulf Islands. Nesting habitat available on the site.
Great Blue Heron, *fannini* subspecies	*Ardea herodias fannini*	Blue	Special Concern	Special Concern	Occurrence on North Pender Island and on adjacent Gulf Islands.	l/m	Nests colonially in tall Sitka spruce, western red cedar, western hemlock, pine, red alder and black cottonwood. Forage in shallow aquatic areas (such as: marine intertidal areas, estuaries, riparian areas, wetlands, freshwater lakes, and muskegs) that are close to nest site. Known occurrences on Pender Island. While nesting habitat is available at the site, foraging habitat is lacking.
Marbled Murrelet	*Brachyramphus marmoratus*	Blue	Threatened	Threatened	None in Gulf Islands.	l	Nests often are in mature/old growth coniferous forest near the coast: on large mossy horizontal branch, mistletoe infection, witches broom, or other structure providing a platform high in mature conifer. No known occurrences in southern Gulf Islands. Nesting habitat is minimal at the site.
Northern Goshawk, *laingi* subspecies	*Accipiter gentilis laingi*	Red	Threatened	Threatened	None in Gulf Islands.	l/m	Occupy extensive forests with large stands of mature trees and dense canopies, but with an open understory. Associated with old growth or mature (50+ year) second growth forest. No known occurrences in southern Gulf Islands. Suitable habitat (mature second growth) present at the site.
Northern Pygmy-owl, *swarthi* subspecies	*Glaucidium gnoma swarthi*	Blue			One occurrence on Saltspring Island. Most occurrences located on northern Vancouver Island.	l/m	Generally found in mature and second-growth forest. Tends to use forest edges rather than interior forest. Nests in woodpecker holes. No known occurrences on Pender Island (mostly occurs on northern Vancouver Island). Some habitat present at the site.
Olive-sided Flycatcher	*Contopus cooperi*	Yellow	Special Concern	Threatened	Multiple occurrences recorded on South Pender Island.	***h***	Have been recorded from throughout most forested areas of BC. Utilize various forest and woodland habitats: taiga, subalpine coniferous forest, mixed coniferous-deciduous forest, burned-over forest, spruce or tamarack bogs and other forested wetlands, and along the forested edges of lakes, ponds, and streams Most nesting sites contain dead standing trees, usually nest in conifers. Previous records near site, suitable breeding/foraging habitat present at site
Peregrine Falcon, *anatum* subspecies	*Falco peregrinus anatum*	Red	Not at Risk	Special Concern	Mapped known locations are confidential. However, the CDC notes that F.p.anatum has been introduced to the Gulf Islands.	l	Typically found in open tundra, moorlands, stCEMPe, and seacoasts, especially where there are suitable nesting cliffs, to mountains, open forested regions. No suitable habitat present at site.
Peregrine Falcon, *pealei* subspecies	*Falco peregrinus pealei*	Blue	Special Concern	Special Concern	Mapped known locations are confidential.	l	Found in coastal beaches, tidal flats, reefs, islands, marshes, estuaries and lagoons. Typically nests on ledges of rocky island cliffs, usually near seabird colonies. Known center of abundance is Haida Gwaii. No suitable habitat present at site.

English Name	Scientific Name	BC List	COSEWIC	SARA Status	Known Occurrences near Project Area [1]	Potential to Occur[2]	Rationale for Occurrence Potential
Purple Martin	*Progne subis*	Blue			Occurrences on North Pender Island and adjacent Gulf Islands.	l	Nesting colonies occur only in artificial nest boxes that have been erected in sheltered marine waters. Foraging birds occur over coastal mudflats, lakes, marshes, ponds, open fields, and forested habitats. No suitable habitat present at site.
Rough-legged Hawk	*Buteo lagopus*	Blue	Not at Risk		None in Gulf Islands.	l	Typically occurs in grasslands, field, marshes, sagebrush flats, and open cultivated areas. Usually nests on cliffs (typically) or in trees in forests with plenty of open ground. Sometimes nests on the ground or on man-made structures. No known occurrences on Gulf Islands. No suitable habitat present at site.
Vesper Sparrow, *affinis* subspecies	*Pooecetes gramineus affinis*	Red	Endangered	Endangered	None in Gulf Islands.	l	Found dry, open areas with short, sparse grass or herbaceous cover. Require structural diversity as taller perches are used for singing while open areas are used for foraging and nesting. Nesting occurs on ground. No known occurrences on Gulf Islands. No suitable habitat present at site.
Western Screech-Owl, *kennicottii* subspecies	*Megascops kennicottii kennicottii*	Blue	Threatened	Threatened	Occurrences on South Pender Island, including one approximately 1.5 km west of the site (last observed March 2021).	**h**	Found in a variety of coniferous and mixed forests, but is often associated with riparian zones with broadleaf maple or black cottonwood Known occurrences on South Pender Island and near the site. Suitable habitat present.
Mammals							
Hoary Bat	*Lasiurus cinereus*	Blue			None in Gulf Islands.	l/m	Habitat includes primarily deciduous and coniferous forests and woodlands, including areas altered by humans. Foraging habitat includes various open areas, including spaces over water and along riparian corridors. Roost sites are usually in foliage of large deciduous or coniferous trees, sometimes in rock crevices. No known occurrences in Gulf Islands. Suitable habitat present.
Little Brown Myotis	*Myotis lucifugus*	Blue	Endangered	Endangered	One occurrence noted on Saltspring Island.	**h**	Use a wide range of habitats such as dry open forests as well as wet riparian areas near open water. Often use human-made structures for resting and maternity sites, also use caves and hollow trees. Forage over water, along the margins of lakes and streams, or in woodlands near water. Known occurrences in GINPR. Suitable habitat at the site.
Townsend's Big-eared Bat	*Corynorhinus townsendii*	Blue			None on Pender Island. Occurrences noted on adjacent Gulf Islands.	l/m	Commonly occur in mesic habitats characterized by coniferous and deciduous forests. In BC maternity roosts are found in caves and buildings. Foraging habitat includes insect-rich riparian areas, wetlands, forest edges and open woodland. No known occurrences on Pender Island, limited occurrence on Gulf Islands. Forest habitat is available but generally lacking water features.
Yuma Myotis	*Myotis yumanensis*	Blue			Occurrence on southern tip of North Pender Island. Several occurrences on adjacent Gulf Islands.	l/m	Found in a wide variety of upland and lowland habitats, including riparian, desert scrub, moist woodlands, and forests, usually near open water. Foraging occurs over water or in open spaces over land. More associated with water than other bat species. Nursery colonies may form in buildings, caves, and mine tunnels, and under bridges. roosts are in caves, cliff crevices, bridges, buildings, and tunnels, abandoned cliff swallow nests and tree cavities. Known occurrence on Pender Island. Forest habitat is available but generally lacking water features.

English Name	Scientific Name	BC List	COSEWIC	SARA Status	Known Occurrences near Project Area [1]	Potential to Occur[2]	Rationale for Occurrence Potential
Reptiles							
Common Sharp-tailed Snake	*Contia tenuis*	Red	Threatened	Endangered	Occurrences on Pender Island and on adjacent Gulf Islands.	**h**	Occurs in low-elevation woodland habitats dominated by Douglas-fir, arbutus and/or Garry oak, often found in small openings on rocky outcrops and on warm hillsides. generally is found under logs, rocks, fallen branches, or other cover. Known occurrences on Pender Island. Suitable habitat present at the site.
Northern Painted Turtle - Pacific Coast Population	*Chrysemys picta* pop. 1	Red	Threatened	Endangered	BC Recovery Plan notes a Pender Island population unit with potential habitat, but no individuals found. Occurrences recorded on Saltspring Island.	l	Inhabits aquatic and terrestrial habitats year-round. Prefer warm, shallow, slow-moving or stagnant water with ample emergent and floating vegetation, which provides basking sites, foraging opportunities, and cover. Suitable nesting sites are characterized as having exposed soil with little vegetation on southfacing aspects, being on flat or gently sloping ground, and being located in areas of open canopy. Human-disturbed open areas often attract nesting female turtles. No known occurrences on Pender Island. Low suitability habitat present at site (lack of aquatic habitat).
Amphibians							
Northern Red-legged Frog	*Rana aurora*	Blue	Special Concern	Special Concern	Occurrences on Pender Island and on adjacent Gulf Islands.	**h**	Breed in shallow, littoral zones of lakes, temporary and permanent pools and wetlands, and bogs and fens of any size but in close proximity to forest. Regularly occurs in moist forests and meadows. Known to occur on Gulf Islands, suitable breeding habitat present at site (potholes, ditches). Terrestrial habitat commonly includes second-growth forests
Wandering Salamander	*Aneides vagrans*	Blue	Special Concern	Special Concern	No occurrences on Pender Island. Occurrences noted on Thetis Island and in Sidney.	m	Found in moist coniferous forests; in forest edge, forest clearings, talus, and burned over areas. Usually found under bark, in rotten logs, or in rock crevices. Requires large (greater than 20 inches in diameter) down logs of mid-decay classes with sloughing bark. Limited occurrences in Gulf Islands. Suitable habitat present at the site.
Western Toad	*Anaxyrus boreas*	Yellow	Special Concern	Special Concern	None in Gulf Islands.	m	Breed in shallow, littoral zones of lakes, temporary and permanent pools and wetlands, bogs and fens, and roadside ditches. Following breeding, adults may remain to forage in the marshy or riparian edges of breeding sites, or they may disperse several kilometres to foraging areas in other wetlands, riparian areas along streams, or upland sites. Terrestrial habitat includes grasslands, forests, shrub, marsh, and meadow habitats. Require loose soils to burrow for hibernation. No known occurrences in Gulf Islands. Suitable terrestrial habitat present at site.

[1] Recorded occurrences as per a search of the named species in the CDC iMap, Species and Ecosystems at Risk layers, CDC BC Species and Ecosystems Explorer Database, or distribution information provided by Nature Serve Explorer (https://explorer.natureserve.org) and COSEWIC Assessment and Status Reports.

[2] Potential to Occur rankings based on the following:

High (h): Species is expected to occur because observations have been made close to the Project Area (i.e., on South Pender Island) and/or the habitat available is equivalent to conditions where the species regularly occurs or has most of the qualities the species is known to require.

Moderate (m): Species may occur in because observations have been made near the Project Area (i.e., on North Pender Island, or adjacent Gulf Islands) and/or the habitat available is similar to conditions where the species regularly occurs or has some of the qualities the species is known to require.

Low (l): Species are unlikely to occur because no observations have been made near the Project Area (i.e., may occur on Vancouver Island or lower mainland but have not been recorded in southern Gulf Islands) and/or the habitat available is dissimilar to conditions where the species regularly occurs or does not have suitable environmental qualities.

The Parks Canada *Impact Assessment Pathway Decision* for the Project, approved January 27, 2022, contains information on natural resources occurring or potentially occurring on Parks Canada lands at the Project site (prepared by Morgan Davies, Resource Management Officer, on January 20, 2022). Based on this communication, the following species at risk have potential to occur at or near the Project site:

- There are records of two bird species at risk within 100-500 m of the site. Band-tailed pigeon (*Patagioenas fasciata*) (SARA Special Concern) was detected in 2009 and olive-sided flycatcher (*Contopus cooperi*) (SARA Threatened but recommended for down-listing to Special Concern in 2018) was detected 2009-2013 and 2016. There is potential for both species to breed and/or forage at the site.
- Potential nesting habitat for barn owl (*Tyto alba*) (SARA Threatened) and two subspecies of western screech-owl (*Megascops kennicottii kennicottii / M. kennicottii macfarlanei*) (SARA Threatened) exists at or adjacent to the site. Barn owls require open foraging habitat with an abundance of small mammal prey, and nearby protected cavity sites for nesting (Government of Canada 2011). Although the communication mentions two subspecies of western screech-owl, *M.kennicottii macfarlanei* are unlikely to occur at the Project site as they are found mostly in the BC Interior (BC Ministry of Environment 2016a). *M. kennicottii kennicottii* are found in coastal BC and are associated with mixed forests and are often found near streams. They use tree cavities for nests and roosts, almost always in trees larger than 25 cm diameter at breast height (COSEWIC 2012).
- A small number of bats, including little brown myotis (*Myotis lucifugus*) (SARA Endangered), have been detected in GINPR. Many bat species (including little brown myotis) preferentially roost in older forest stands (Barclay and Brigham 1996). Foraging habitat (forest edges, canopy openings, riparian areas etc. where insects congregate) and potential maternal colony habitat for little brown myotis exists within or adjacent to the site.
- Northern red-legged Frogs (*Rana aurora*) (SARA Special Concern) are very likely to occur at the site and may breed at the site. Adults in low elevation areas of coastal British Columbia may begin breeding in January or February (BC Ministry of Environment 2015). Breeding occurs in a variety of permanent and temporary freshwater bodies, including potholes, ponds, ditches, springs, marshes, margins of large lakes, and slow-moving portions of rivers (BC Ministry of Environment 2015). Terrestrial habitat commonly includes second-growth forests (BC Ministry of Environment 2015).
- Critical habitat for sharp-tailed snake (*Contia tenuis*) (SARA Endangered) has been identified on South Pender Island, near Greenburn Lake but not at the Project site. Sharp-tailed snake typically inhabit relatively open-canopy woodlands dominated by Douglas-fir, Arbutus, and/or Garry Oak within the Coastal Douglas-fir Biogeoclimatic Zone (COSEWIC 2009). They are often found near the forest edge or small openings on rocky outcrops and hillsides; occupied sites are usually south facing to provide thermoregulation and have shallow soils and leaf litter (COSEWIC 2009). Although not documented in the area, preferred habitat is available on the rocky slope adjacent to Canal Road at the Project site. Several cases of road-mortality have been observed on Pender Island (BC Conservation Data Centre 2014c).

7.3.2 Field Study

During the field visit, wildlife trails were observed running parallel with the road (**Photo 10**). A wildlife tree was also observed on the south side of the road near the east extent of the site (**Photo 11**), as well as bones from an unknown mammal, potentially a young deer (**Photo 12**). No SARA listed species were observed during the field visit.

7.4 Archaeological Resources

According to an Archaeological Impact Assessment (AIA) conducted by Wood Environment and Infrastructure Solutions, the Project is within the traditional territories or lands of traditional interest of the SENĆOŦEN- and Hul'qumi'num-speaking Nations of southeastern Vancouver Island, the Saanich Peninsula, the southern Gulf Islands, and the lower Fraser Delta. Presently, this includes (in alphabetical order) Cowichan Tribes, Halalt First Nation, Lyackson First Nation, Malahat First Nation, Pauquachin First Nation, Penelakut Tribe, Snuneymuxw First Nation, Semiahmoo First Nation, Stz'uminus First Nation, Tsartlip First Nation, Tsawout First Nation, Tsawwassen First Nation, Tseycum First Nation, and Ts'uubaa-asatx Nation (formerly known as Lake Cowichan First Nation) (Wood 2022). The Coast Salish people – the Saanich and the Songhees – have hunted and fished around Pender Island for thousands of years (Fitzsimmons 2016). Site specific archaeological features are not known from the Project site currently based on a simple desktop review using iMapBC.

The AIA conducted by Wood Environment and Infrastructure Solutions (Wood 2022) in the Project area determined that, based on the negative results of survey and subsurface testing, the likelihood of encountering archaeological materials and/or deposits is low. The AIA recommended that construction proceed under an Accidental Finds Protocol, which will dictate what happens in the event unanticipated cultural resources are encountered. Procedures for the handling of human remains are addressed in Parks Canada's Management Directive 2.3.1: *Human Remains, Cemeteries and Burial Grounds* (2000). Should the Project be redesigned to impact lands not inspected during the field program, additional archaeological studies may be required prior to construction. If unanticipated remains are discovered during construction, all work will be stopped, and MOTI and Parks Canada will be contacted immediately.

The AIA has been submitted to Parks Canada for review by Wood Environment and Infrastructure Solutions.

Consultation communication with Indigenous Nations conducted by MOTI (see Section 11.1) indicated concern for impacts to cultural or archaeological resources *potentially* present at the Project site but did not indicate any known archaeological resources.

7.5 Cultural and Heritage Resources

There are no heritage buildings, historical sites or other designated cultural features within the Project site that are protected under the *Canada National Parks Act* or the Parks Canada Cultural Resource Management Policy.

7.6 Visitor Experience

The Project area is adjacent to the Beaumont Park of the GINPR and is near the Mount Norman peak and trails. Beaumont Park is one of the most popular marine parks in the Gulf Islands. The park offers various recreational opportunities including camping, picnicking, fishing, paddling, swimming, and hiking. Walking trails connect the park with Mount Norman, the highest point on Pender Island.

Visitors to GINPR typically do not utilize the Project site for recreation. However, access to Mount Norman is via Canal Road and will temporarily be disrupted. Canal Road will remain open to traffic, but lane closures and traffic control will be required to conduct Project works. It is expected that there will be traffic delays throughout the Project. It is not anticipated that the new road alignment will be visible from the Mount Norman trail.

8.0 VALUED COMPONENTS LIKELY TO BE AFFECTED

Potential Valued Components (VCs) for the Project were identified using the *Effects Identification Matrix* (Appendix B) following a desktop review of environmental information and field visit using professional judgement, experience, and available best management practices. The VCs are elements of the natural or human environment that are present near the Project and would be subject to potential interactions with Project activities.

Valued components for which Project activities may have an effect include:

- Air Quality and Noise
- Soils and Landforms
- Surface Water
- Fish
- Vegetation (including ecosystems at risk)
- Terrestrial Wildlife (including birds, at-risk mammals, herptiles and amphibians, and invertebrates)
- Archaeological Resources (unidentified)
- Visitor Access and Experience

The geographic area assessed included the limits of construction for the Project (Figure 1) for all VCs. This study area was considered appropriate because of the limited scale of Project activities. Road construction activities, even those including slope excavation and blasting, are typically routine in nature and conducted using well-established best management practices that minimize Project impacts.

Assessment of effects are limited to the pre-construction (site preparation) and construction phases of the Project. Once construction is complete and Canal Road resumes operation, effects to the environment are expected to be similar to pre-Project conditions. No decommissioning of the Project is anticipated in the foreseeable future. Should decommissioning be required a separate Impact Assessment would be conducted.

The effects of the Project on natural or cultural resources are not expected to cause adverse effects to

- Indigenous peoples (e.g., physical and cultural heritage, current use of lands and resources for traditional purposes and any structure, site or thing that is of historical, archaeological, paleontological or architectural significance);
- Health, social and economic conditions of Indigenous and non-Indigenous peoples;
- Characteristics of the environment important to key visitor experience objectives; and
- A listed Species At Risk or their critical habitat.

No indirect effects from the Project are anticipated given that the tasks are of a routine nature and all will take place in or immediately adjacent to an existing transportation corridor. The natural environment in transportation right-of-ways is well understood and is considered to be previously disturbed.

No effects were identified during consultation with the affected Indigenous Nations.

9.0 EFFECTS ANALYSIS

9.1 Air Quality and Noise

1. Air quality may be impacted during construction of the Project because of emissions from vehicles, emissions from mobile equipment and generators.
2. Air quality may be negatively impacted by airborne particles or dust generated by construction activities such as grading and blasting.
3. Acoustic environment (noise levels) may be negatively impacted by construction activities such as equipment operation and blasting.

9.2 Soil and Landforms

1. Project activities such as grading, excavation and grubbing (stump pulling) may disturb and expose soils, and can lead to compaction, erosion, or sedimentation.
2. Accidental spills (e.g., chemicals, fuel, etc.) during construction contaminate soil and negatively impact soil quality.
3. Landforms will be permanently altered by the road realignment and excavation and/or blasting of the slope face on the south side of the road.

9.3 Surface Water

1. Accidental spills (e.g., chemicals, fuel, etc.) during construction may enter the unnamed watercourse and negatively affect water quality. Fish, if present, may be harmed or killed by physical contact with deleterious substance and/or because of habitat degradation.
2. Project activities may disturb soils that may mobilize to the unnamed watercourse. Sediment mobilization can negatively affect water quality (i.e., increased turbidity from sediment/soil disturbances during construction).

9.4 Fish

1. Aquatic life may be negatively affected in and downstream of the unnamed watercourse near the Project site should an accidental spill of harmful substance, or if substantial sediments enter the unnamed watercourse. Fish can be physically harmed (e.g., gill abrasion, chemical exposure) or experience degraded habitat quality.
2. Fish and aquatic wildlife (amphibians) may be negatively affected (e.g., physiological response, behavioural avoidance) by blasting activities that occur close to a watercourse.
3. Aquatic habitat may be destroyed or harmfully altered if construction activities occur within or adjacent to a watercourse (i.e., the riparian zone).

9.5 Vegetation

1. Provincial mapping has identified vegetation in the Project area as part of the provincially red-listed Grand Fir / dull Oregon-grape and Douglas-fir / dull Oregon-grape ecosystems. Project activities will affect (e.g., damage or destroy) some vegetation within the Project area. Because the Grand Fir / Dull Oregon grape ecosystem overlaps only the very western extent of the Project area it is not expected that the Project will have significant effects on this ecosystem. Vegetation removal will be minimal in this area as the change in road alignment and slope resurfacing does not

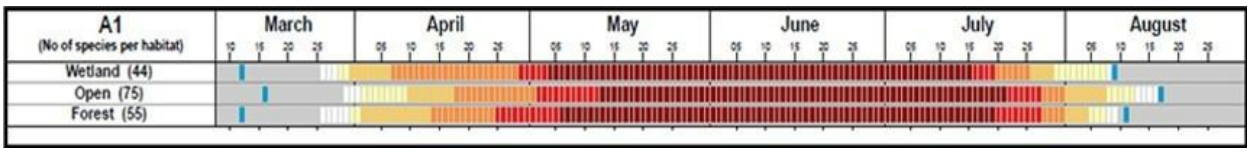
substantially begin until east of this area. Most vegetation impacts will occur within the Douglas-Fir / dull Oregon-grape ecosystem. Although this ecosystem is described as a “mature and climax” community, based on observations made during the field survey, this area is comprised of young forest with some mature trees present. While trees will be removed, mature forest (including any veteran trees, which were not observed during the field survey) will not be affected.

2. Project activities (e.g., clearing and blasting for new highway alignment, equipment movement, material laydown, construction works) will reduce the extent of existing vegetation in some areas. Vegetation clearing and tree felling, as well as slope excavation and blasting, will be required for the new road alignment.
3. Vegetation may be damaged by material laydown, equipment movement or personnel movement.
4. Vegetation in the immediate vicinity of the proposed Project may be affected by dust accumulation caused by construction activities.
5. An accidental spill of a harmful substance on site could affect surrounding vegetation.
6. While a variety of vegetation species at risk have the potential to occur within the region, based on distribution, known occurrences and habitat requirements no species were determined to have a high potential to occur at the site. Six species (banded cord-moss, coast manroot, leafless wintergreen, Ozette coralroot, slimleaf onion and white-lip rein orchid) have a moderate potential to occur at the site (see **Table 7.1**). While it is considered unlikely that vegetation species at risk will be encountered in the Project area there remains a possibility that, if present, they can be disturbed or destroyed by Project activities.
7. Colonization of non-native and/or invasive species may occur as a result of equipment not properly cleaned prior to coming to a site.
8. Occurrences of existing weeds and non-native, invasive species may be spread which may adversely affect the integrity of existing ecosystems and native vegetation. Invasive species identified at the Project site include invasive and non-native vegetation including, scotch broom, common foxglove, common cat’s-ear.

9.6 Wildlife

9.6.1 Birds

1. Avoidance behaviors from birds, including SAR, may occur as a result of increased noise, artificial lighting, blasting activities, and human presence from Project activities resulting in disruption or impediment to wildlife movement. During their breeding season, birds are particularly sensitive to noise disturbances and may desert their nests and young. Noise disturbance levels to birds vary, dependent on the pre-Project ambient levels, construction noise and energy produced, the bird species of concern and distance from the source. For migratory birds, noise disturbance can occur when noise is 10 dB above ambient in natural areas or when noise is greater than about 50 dB (ECCC 2019).
2. Vegetation removal and soil disturbance (especially the slope excavation) may result in disturbance or destruction of habitat. Project activities may overlap the nesting season (typically late March to mid-August in the region) and could impact nesting activities. According to ECCC (Government of Canada 2018), the nesting season for forested habitats in the A1 zone is approximately March 26 to August 9. Work conducted during the nesting season will require pre-construction nest sweep to identify bird nests that may be affected.



Additionally, Section 34 of the provincial *Wildlife Act* specifically protects the nests of Eagles, Peregrine Falcons, Gyrfalcons, Osprey, Herons, and Burrowing Owls year-round. Pre-construction nest sweeps for nests of some of these species may be required.

3. Bird mortality and physical injury has the potential to occur due to vegetation clearing and grubbing within the Project footprint during construction phase. Breeding birds, as well as their nests and eggs, are susceptible to these activities from the removal of vegetation, in the absence of appropriate mitigation to reduce risk. The habitat to be removed is likely to support protected bird species under the MBCA, therefore mortality to breeding birds is possible, with likelihood increasing during breeding season (i.e., spring and summer).
4. Lighting for construction at nighttime may increase the risk of stress or abandonment of already established nest sites.

9.6.2 At-risk Mammals (i.e., bats)

1. Vegetation clearing and grubbing has the potential to cause changes in habitat quality and quantity for at-risk mammals in the area by removing vegetation from the Project Area during the Construction Phase. At-risk mammals (i.e., bats) may be susceptible to these activities from the removal of roosting trees, in the absence of appropriate mitigation to reduce risk. Foraging habitat and potential maternal colony habitat for bats exists within or adjacent to the site.
2. Noise disturbance from vegetation clearing and grubbing and blasting activities can result in displacement of bats from roosts or foraging areas, increased susceptibility to predation, dysfunctional allocation of time and energy to vigilance behaviors and finding alternate roosts, and degradation to physiological condition and social order.
3. Lighting for construction at nighttime may increase the risk of stress or abandonment of already established roosting sites.
4. At-risk mammal mortality and physical injury have the potential to occur due to vegetation clearing and grubbing within the construction footprint. At-risk mammals (bats) are susceptible to these activities from the removal of roosting trees, in the absence of appropriate mitigation to reduce risk.

9.6.3 At-risk Herptiles and Amphibians

1. Mortality of herptiles and amphibians (i.e., road-kill) during mobilization or construction.
2. Blasting activities, vegetation clearing, and grubbing may result in mortality or physical injury or may cause changes in habitat quality and quantity for herptiles and amphibians, including species at risk. While critical habitat for sharp-tailed snake and northern red-legged frog has not been identified at the site, based on distribution, known occurrences and habitat requirements, there is high potential for these species to be present in the Project area, including roadside ditches and rotting stumps / nurse logs.

9.6.4 Invertebrates

1. Vegetation clearing and grubbing, may result in mortality or physical injury to invertebrates (including at risk species). Western bumble bee has moderate/high potential to be present on the forest floor or in rotting logs.

9.6.5 General

1. Avoidance behaviors from local wildlife, including species at risk, may occur as a result of increased noise, artificial lighting, blasting activities, and human presence from Project activities resulting in disruption or impediment to wildlife movement.
2. Mortality of individuals (i.e., road-kill) during mobilization or construction.
3. Local wildlife may be harmed or killed by an accidental spill of a harmful substance at the Project site. Wildlife may be physically harmed from physical contact with substance, become sick from ingesting substances after attempting to clean themselves or become sick by feeding in contaminated areas. An accidental spill may also cause habitat degradation or reduced ecosystem function that negatively affects wildlife.
4. Wildlife may experience a temporary decrease in air quality due to dust or air emissions by Project activities (e.g., ground disturbances, blasting, equipment operation).
5. Garbage and waste generated by the construction activities may attract local wildlife and lead to human-wildlife interactions.

9.7 Archaeological Resources (unidentified)

1. Unknown archaeological resources (e.g., previously unidentified artifacts or sites) may be affected (accidental damage or destruction) by Project activities such as excavation, vibrations during blasting activities, or reprofiling works.

9.8 Visitor Access and Experience

1. Traffic delays are likely to occur during the Project.
2. Visitors may experience temporary increased noise and vibration during equipment use and blasting activities.
3. Visitors may experience a temporary decrease of air quality because of increased dust or air emissions from equipment.
4. Viewscapes along Canal Road will be altered by the road realignment and slope reprofiling but viewscapes within GINPR are not expected to be significantly affected.

10.0 MITIGATION MEASURES

10.1 General

1. 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.
2. The Contractor will be required to prepare a Construction Environmental Management Plan (CEMP). The CEMP will be developed in accordance with industry best practices and will comply with all applicable federal and provincial legislation. The CEMP will include, but is not limited to:
    a. An Access Plan that will identify access routes, type of equipment used for various construction phases, and lay down areas in order to prevent/minimize disturbance to vegetation and soils. Lay down areas will occur on paved and/or hardened surfaces.
    b. Details on how the work limits will be marked and what procedures will be employed to ensure work outside these limits does not occur and to ensure that the environment is not impacted or damaged by workers or construction equipment beyond the work limits.
    c. An Erosion and Sediment Control Plan (ESCP) to prevent erosion and minimize sediment mobilization at the Project site. The ESCP will outline appropriate erosion and sediment control measures for the site and include a plan for dewatering, if required.
    d. A Spill Response Plan that will detail the containment, storage, security, handling and use of deleterious materials, disposal of empty containers, surplus product or waste generated in the application of these products. The Spill Response Plan will include a list of products and materials to be used or brought to the work site that are considered or defined as hazardous or toxic to the environment.
    e. An Emergency Response Plan that outlines procedures to follow in the case of an emergency (e.g., wildlife encounter, equipment malfunction/failure, fire or blasting incident).
    f. A Fire Prevention Plan which describes the fire prevention equipment (fire extinguishers etc.) and procedures on site in the event of a fire.
    g. A Reclamation Plan that outlines the vegetation species and restoration methods to be used to restore disturbed areas.
    h. Descriptions and photo keys of species at risk (vegetation and wildlife) with moderate or greater potential to occur at the site (see Table 7.1 and Table 7.2) so that all personnel can identify species. If a species at risk is encountered, all work will stop, and the EM will be contacted.
3. On-site monitoring is a key component of ensuring that the mitigations provided in this document and in the CEMP are implemented properly (e.g., appropriate location and correct installation) and function as intended. An appropriately qualified professional (AQP) will be retained as the Environmental Monitor (EM) to provide guidance on implementing the recommended measures and, if necessary, to develop additional mitigation measures if the need arises. The Contractor is responsible for undertaking environmental monitoring and follow up reporting of remediation works such that criteria in Parks Canada Approvals and the CEMP are being adhered to. For this Project full-time environmental monitoring by the EM is likely not necessary based on the observed site conditions and on the proposed Project works. On-site personnel can monitor the site daily, and the EM carry out inspections at regular intervals (as agreed upon by MOTI, Parks Canada, and the EM) as well as additional inspections in advance of predicted rainy periods, during heavy rains, and during key phases of site preparation and construction.

4. The EM will have the authority to halt any work that does not comply with regulatory requirements or causes adverse environmental impacts. Failure to comply with or observe environmental protection procedures may result in the work being suspended pending rectification of the problems.
5. All Project works will be conducted in accordance with all applicable legislation, regulations and/or approvals including, but not limited to, the Fisheries Act, Migratory Birds Convention Act, Species at Risk Act and Canada National Parks Act. Project activities are not anticipated to contravene any of these acts if appropriate mitigation is applied.
6. The Contractor must obtain all necessary permits prior to the commencement of Project activities (e.g., permits to salvage and relocate fish/wildlife).
7. It is expected that all staff and contactors will understand and comply with all National Park regulations while conducting activities within GINPR.

10.2 Spill Management and Hazardous Materials

1. The CEMP will contain a section specific to Spill Management. Spill response plans will include spill prevention and spill reporting requirements along with step-by-step procedures for responding to potential spill incidents.
2. All crew members on site will be briefed about the Spill Response Plan and made aware of the location and use of spill kits and containment devices.
3. Appropriately sized and stocked spill kits will be on site and each piece of equipment. The kits will be suitable for the quantities and types of material in use and stored at the site. They will be capable of dealing with 110% of the largest potential spill. All staff will be aware of their location(s) on site and trained in spill response procedures.
4. Stationary equipment will be placed within secondary containment capable of catching all of fluids in the event of a spill (e.g., place within a plastic or metal tray). Motorized equipment will be parked over a surface capable of containing leaks and minor spill (e.g., plywood, heavy plastic sheeting) or, at a minimum, parked over an impervious surface such as asphalt.
5. Hydrocarbon and coolant storage, if required on site, will be within an impermeable containment facility capable of holding 110% of the storage tank contents. This may be achieved through the use of double-walled storage tanks or constructing a containment berm out of durable material. These containment basins will be inspected daily for leaks and wear points, kept clean and any measurable rainwater removed and disposed of appropriately. If practical, the containment area will be covered to prevent infilling with rainwater. Where leaks and/or wear points are found, they will be repaired promptly to restore full containment.
6. Contractors will ensure that small containers (i.e., jerry cans) will be stored in a secure location, protected from weather. These containers must be designed solely for the purpose of storing and pouring fuel and will not be more than 5 years old. Containers must not leak and must be sealed with a proper fitting cap or lid.
7. The refueling area (if one is required) will be located at least 30 m from any watercourse, if possible. A spill containment kit immediately accessible and personnel will be knowledgeable in its use.
8. Two people will be present during refueling (one person conducting fueling/ready to stop spill source and one person ready to deploy spill containment).
9. Hydraulic fluids for on-site equipment will be biodegradable in case of accidental loss of fluids.

10. Hazardous materials must be labelled and disposed of according to the Workplace Hazardous Materials Information System criteria and the Transportation of Dangerous Goods (TDG) Regulations.
11. A spill of reportable quantities to ground, or of any amount to water, of a substance that is toxic, polluting, or deleterious to life will be immediately reported to Emergency Management BC (EMBC) 24-hour phone line at ***1-800-663-3456*** and to Parks Canada Dispatch ***1-877-852-3100*** and the EM.

10.3 Machinery and Equipment

1. Equipment and machinery will be in good operating condition, clean (power washed), free of leaks, excess oil and grease and non-native plant species. Equipment leaking or producing excessive exhaust will be repaired or replaced. Any detected leaks from equipment on site will be addressed immediately and absorbent pads will be used under equipment with chronic leaks. Equipment stored overnight will be stored on tarps with appropriate containment if required.
2. Machinery should be situated to minimize track movement.
3. Equipment servicing and maintenance will not occur on site.
4. Refueling of equipment will occur on land at least 30 m from any watercourse, where possible. Where 30 m is not possible, a location as far as possible from the watercourse will be chosen. Topographic features and slope will be considered. The refueling area will have a spill containment kit immediately accessible and personnel will be knowledgeable in its use.
5. Vehicles and equipment will be parked at least 10 m from any watercourse either on the road or on previously disturbed or hardened surfaces in order to avoid trampling roadside vegetation and compaction of soils.

10.4 Air Quality and Noise

1. Dust-generating activities will be minimized as much as possible during windy periods.
2. If dust suppression is necessary, water will be used in a controlled manner (to avoid sediment mobilization).
3. For dust control from all Project activities, only water that is free of waste and organic matter will be used. Chemical dust suppressants will not be used unless directed otherwise by designated Parks Canada staff, in accordance with Parks Canada health and safety and environmental policies.
4. No burning of oils, rubber, tires and any other material will take place on site.
5. Stationary emission sources (e.g., portable diesel generators, compressors, etc.) will be used only as necessary. Equipment and vehicles will be turned off when not in active use to reduce noise and air pollution.
6. All equipment, vehicles and stationary emission sources will be well-maintained and used at optimal loads to encourage minimal noise and air emissions. Stationary equipment will be located away from noise-sensitive areas.
7. Noise attenuation devices provided with certain equipment or tools will be used.
8. The Blaster of Record will ensure the blast zone is clear of people and wildlife prior to detonation. Materials to be blasted will be covered with suitable material (i.e., blast mats), if necessary, to control fly-rock.

9. To minimize noise and dust generation, blasting activities will be conducted according to industry BMPs and tender specifications. Contractors will determine appropriate charge size, pattern design and spacing to create efficient blasting and minimize frequency/size of detonation while accomplishing the task.
10. Blasting products that may produce high residual nitrogen concentrations (such as ammonium nitrate / fuel oil [ANFO]) will not be used, due to the potential production of toxic by-products (ammonia).

10.5 Soils and Landforms

1. Provide a briefing about the ESCP for all crew members on site and ensure they are aware of the mitigations.
2. Existing access routes and storage sites will be utilized where possible. Previously disturbed and stable (hard surface) are preferable.
3. Minimize the movement of equipment by planning work and situating in locations to maximize efficiency.
4. Plan Project activities to minimize soil handling and limit equipment movement over exposed soils and steep or unstable slopes prone to erosion.
5. Limit access and movement to only necessary personnel and equipment.
6. Schedule earthworks for dry weather whenever possible and halting works during periods of inclement weather (e.g., significant wind or rain).
7. Minimize the area of soil exposed at any one time by: phasing construction activities; retaining vegetation as much as possible; and, once construction works are completed, stabilize the exposed soils as soon as possible using temporary measures such as mulch, erosion sediment control blankets, hydroseeding, and/or plastic sheeting or planting long-term vegetation (if during the appropriate time of year).
8. Use erosion and sediment control products, including backing, that are made of 100% biodegradable materials (e.g., jute, sisal or coir fiber) when possible. Erosion and sediment control products will be selected to reduce potential for wildlife entanglement/attraction and prevent introduction of invasive alien species.
9. Avoid straw-based erosion control unless authorized by designated Parks Canada staff.
10. The use of hay is not permitted due to risk of introducing invasive species.
11. Erosion and sediment control measures, as described in the ESCP, should be installed prior to work starting and checked by the EM. Ensure additional erosion and sediment control materials are readily available on-site such as (but not limited to) rock, gravel, grass seed (mixture to be approved by Parks Canada and contain no invasive species), silt fencing, staking, polyethylene sheeting, etc. When significant rainfall is encountered, then additional measures may be required to minimize erosion and sedimentation potential.
12. Routinely inspect erosion and sediment control measures to ensure they are functioning as intended.
13. In the event of erosion and sediment control measure malfunction or of deleterious substance, including sediment, run off (current or impending), work shall stop until measures are adjusted to address the problem.

14. Minimize the length of time soils are exposed and complete work in one area before commencing work in another area.
15. If vegetation clearing is scheduled early due to restricted activity periods, maintain soil stability by delaying grubbing until just prior to construction activities.
16. Store excavated material and debris in a stable area above the high-water mark or active floodplain and, where possible, 30 m from drainage features and/or the top of steep slopes.
17. Protect excavated material from entering a waterbody (e.g., cover with erosion blankets or tarps, seed, or plant with native vegetation).
18. Maintain effective sediment and erosion control measures until complete revegetation of disturbed areas is achieved unless directed otherwise by designated Parks Canada staff.
19. Implement Reclamation Plans for the disturbed area immediately following completion on construction. Long delays between vegetation removal and revegetation should be avoided. Revegetation in smaller phases should be considered to minimize soil exposure.
20. Assess methods of bioengineering such as terracing, willow staking, or live pole drain systems where soils are steeper or remain unstable.
21. Avoid use of fertilizer to limit non-native vegetation growth and allow for local species to use available nutrients. Any use of compose, foreign soils, fertilizers, locally source mycorrhizae compost and soil amendments must be approved by designated Parks Canada staff.
22. Place and grade topsoil before winter.
23. Excavate, conserve, store and replace existing site topsoil unless otherwise directed by designated Parks Canada staff. Where possible, any backfill required during the project should reuse existing debris salvaged from other areas to reduce the possibility of the introduction of invasive species. Soil imports from other Project sites or outside of the protected heritage place is not generally recommended. However, if required, it must be approved by designated Parks Canada staff.
24. Salvage site topsoil using a “two lift” method and store topsoil and subsoil separately for improved reclamation success.
25. Compact backfill or allow it to settle to prevent depressions.
26. Replace topsoil to all areas immediately following fine grading. Unless otherwise directed, apply topsoil at a depth of 30- 50 mm, or at the depth of the original site conditions. Topsoil depths can be increased on gentler slopes and the surface should remain rough.
27. Do not compact topsoil by driving repeatedly over the site. Keep topsoil “rough and loose” or as directed by designated Parks Canada staff.
28. Where remaining soils are unstable due to steepness or soil characteristics, install erosion controls immediately or apply a hydraulic erosion control product to the target areas.

10.6 Staging and Laydown Sites

1. Identify key contacts and their respective roles and responsibilities prior to work starting and communicate this to all on-site workers.
2. Ensure all on-site staff attend a briefing with designated Parks Canada staff before beginning work at the site to review and explain mitigations.
3. Delineate the work zone by clearly marking with stakes, flagging tape or other means to limit active construction and define access and egress locations. Remove completely when the Project is completed.

4. Identify staging areas, material/equipment drop sites, and parking areas. Locate these areas within an existing disturbed footprint (e.g., roadways, gravel surface, previously disturbed areas with high resiliency) or other site as approved by designated Parks Canada staff.
5. Use existing roadways, trails, identified disturbed areas or other areas as approved by designated Parks Canada staff for site access.

10.7 Paving, Resurfacing and Grading

1. Do not grade or allow material to spill outside of the delineated work area, within 1 m of the forest drip line, or in a stream, waterbody, or wetland. Any material inadvertently falling outside the work limits will be removed promptly in a manner that does not damage vegetation or water quality.
2. Avoid grading following seed set if it is likely to spread seeds of non-native vegetation.
3. Paving should not be undertaken during steady rain to prevent entry of concrete, asphalt, or patching and sealing compounds directly or indirectly in water.
4. Minimize changes to the surface that could negatively affect infiltration and runoff characteristics and maintain effective surface drainage to limit direct runoff into surface waters.
5. Follow manufacturer guidelines and methods for proper use in the handling and application of sealants or other compounds.
6. Minimize application of seal coats or tack in wet conditions:
    a. Apply seal coats only to dry surfaces and not within 2 hr of rainfall
    b. Apply tack coats only if no rain is expected prior to covering the tack-coated surface with asphalt. If unforeseen rain arrives ensure runoff from recently seal coated surfaces are prevented from entering surface waters.
7. Undertake pavement marking pursuant to standard methods applied in the protected heritage place for control of paint products, both in transport and handling.
8. A plan for the transport and control of paint and hazardous products (e.g., application of paint, cleaning of equipment, containment and disposal of waste paint and cleaning products) must be approved by designated Parks Canada staff.

10.8 Surface Water and Fish

In addition, to the previously listed mitigation, the following measures will be applied to minimize the potential effects to surface water and fish:

1. Although instream works are not currently part of design plans, any work conducted in or within 30 m of the unnamed watercourse will be conducted during the period of least risk timing, if possible, to protect fish and amphibians, including their eggs, juveniles, spawning adults, and/or the organisms upon which they feed. The reduced risk timing window for all species on Vancouver Island is June 15 to September 15. No fish sampling was conducted in the unnamed stream but given its steep slope and shallow depths it is unlikely that fish are present.
2. Minimize disturbance to riparian vegetation. Should vegetation that contributes to fish habitat be removed, restore the vegetation as soon as possible. The 30 m riparian zone of the unnamed watercourse should be visibly marked (e.g., flagging tape) to distinguish the environmentally sensitive area.

3. Conduct blasting activities to meet or exceed the standards outlined in Department of Fisheries' and Ocean's (DFO's) "Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters" (Wright and Hopky 1998)
4. Maintain the natural hydrological regimes during all phases of activity where possible.
5. Restore the natural hydrological regime after construction if it has been disturbed.

10.9 Vegetation

In addition, to the previously listed mitigation, the following measures will be applied to minimize potential effects to vegetation:

1. Minimize vegetation clearing or disturbance as much as possible. The area(s) to be cleared will be clearly marked with highly visible materials (i.e., flagging tape, snow fencing) to ensure equipment operators are aware of the area they are to work in.
2. A vegetation species at risk survey is not recommended as no species were determined to have a high potential for occurrence. However, the EM may conduct a modified "intuitive meander" survey prior to vegetation disturbance as a part of their routine site inspections (e.g., the EM traverses the area to be cleared for a presence/no-detection type survey, focusing on high-value habitats for the vegetation species listed with moderate or greater potential, as per Table 7.1).
3. The CEMP will include identification/photo keys of species with moderate or greater potential to occur at the site (see Table 7.1). If a provincially or federally protected species is encountered, work will immediately stop and the EM will be informed. The EM will determine the appropriate course of action in consultation with Parks Canada.
4. Do not clear vegetation during high or extreme fire weather index without the approval of designated Parks Canada staff. Work may be delayed to prevent risk of wildfire.
5. Equipment operators will work carefully to ensure they do not cause mechanical damage to trees and other vegetation outside the designated clearing area.
6. Protect roots of trees to drip line to prevent disturbance or damage. Avoid traffic, dumping and storage of materials over the root zone.
7. When felling trees, take precautions to minimize damage to surrounding vegetation.
8. Avoid felling mature trees (diameter at breast height (DBH) >30 cm) where possible.
9. Mark danger trees and clearly establish "no-work" zones.
10. Adhere to all federal and provincial policies with regards to the transport of wood beyond park boundaries.
11. Set aside logs for use elsewhere if directed by the designated Parks Canada staff.
12. Vegetation debris shall not be disposed of in waterbodies.
13. Remove all vegetation debris as soon as possible from the work site, either by transporting off-site for disposal or as directed by the designated Parks Canada staff.
14. Convey logs and other salvage materials to storage sites without spreading debris or damaging standing trees or other features outside the marked clearing or storage limits. Do not skid material through wetlands, waterways or water bodies.
15. Minimize bare soil exposure (e.g., cover stockpiled material with tarps, plant locally occurring native species, cover with clean natural mulch/ground coverings) and restore all temporarily disturbed areas as quickly as possible to discourage invasive plants from establishing. The CEMP will contain

a Reclamation Plan that includes a list of native plants/seeds to be used (to be approved by MOTI and Parks Canada) as well as a description of the planting densities, methods etc. to be used, as appropriate for the species selected.

16. Unless otherwise directed, seed certificates must include both the common and scientific name following the CANADENSYS nomenclature system; indicate if the seed is a cultivar, ecovar, or wild native species; geographic origin (seed source); date of collection; method of seed storage; germination, viability and vigour; and indicate all other species occurring including agronomic, weed, and native species; and date of the analysis. The contact information for the Seed Supplier shall be included.
17. Broadcast seeding is the preferred method of seeding native seeds, where terrain and soil conditions permit.
18. Schedule construction so that seedings or planting can coincide with seasonal planting windows (i.e., spring or fall)
19. Where possible, salvage of native plants is preferred over purchase of commercial plugs or container stock.
20. Do not perform seeding under adverse field conditions such as frozen soils, excessively wet or dry soil, ice or standing water, heavy rain, or high winds.
21. Apply seed at a rate appropriate to the seed mixture, seeding method and existing vegetation conditions or as directed by the designated Parks Canada staff.
22. Do not seed on hardened (compacted), crusted or mechanically rutted surfaces.
23. Following broadcast seeding, rake soil to set seed in place and reduce foraging; this may be completed by hand or light harrow for larger areas
24. Protect seeded area against erosion or damage as appropriate for the specific site (e.g., erosion control blanket, hydro-mulching, mulching).
25. Some seeding procedures may have to be completed or repeated in subsequent years as per the Reclamation Plan (i.e., an 80% survival rate must be maintained for a period of 5 years).
26. In cases where mulching is necessary to assist with seed establishment, apply it immediately after seeding.
27. Mulch or chip vegetation only where the quantity of mulch will not cover underlying vegetation, prevent new native seedlings from sprouting, or cause soil or seed bank sterilization. Approval from designated Parks Canada staff for mulching/chipping will be determined based on reclamation objectives, non-native vegetation, and fire hazard mitigations.
28. Ensure live plants (e.g., transplants, plugs, container stock) are watered-in well and receive sufficient moisture until established, and through any periods of extended drought. Provide regular watering unless there is sufficient rainfall.
29. Schedule site inspections to monitor reclamation progress for an appropriate timeframe following construction to ensure establishment of vegetation. A 5-year monitoring period is recommended to ensure there is 80% survival rate. The contractor will be responsible for undertaking environmental monitoring and follow up reporting of remediation works for 1-year post-construction. MOTI will conduct annual monitoring for the following 4 years. In the event that 80% survival is not achieved, the reclamation plantings will be replaced.

10.10 Invasive Alien Species (terrestrial and aquatic)

1. Develop an appropriate approach to mitigate the establishment and/or spread of invasive alien species (IAS) on the site.
2. Train employees on identification, safe removal, and disposal of invasive and noxious weeds.
3. Wash all construction equipment from outside the Parks Canada protected heritage place prior to arrival to minimize risk of introducing IAS, noxious weeds and soils from off-site. Proof that equipment was washed outside the protected heritage place may be requested before equipment is permitted into the protected heritage place.
4. Control IAS in parking or staging areas as needed to reduce the spread of invasive plants or seeds.
5. Work in uninfested sites before moving to infested sites.
6. Ensure machinery already in the protected heritage place is in a clean condition and maintained free of IAS before moving to new sites, within or beyond the protected heritage place.
7. Use caution during loading of trucks and transport of any IAS and plant materials to minimize loss of materials (e.g., cover materials during transport).
8. Avoid mowing invasive plants after seed set if it is likely to spread seeds of non-native vegetation.
9. Soil, gravel, erosion and sediment control products or other applicable materials shall not be imported from outside the protected heritage place without approval from the designated Parks Canada staff.
10. Minimize ground disturbance, vegetation removal and bare soil exposure (e.g., cover stockpiled material with tarps, plant seeds or plants, cover with natural mulch/ground coverings).
11. Use clean fill (i.e., fresh crushed) to minimize potential introduction of invasive plants. Where possible, utilize materials salvaged from other areas of the site as fill.

10.11 Wildlife

In addition, to the previously listed mitigation, the following measures will be applied to minimize potential effects to wildlife:

1. Schedule work (i.e., vegetation clearing and blasting) to avoid sensitive wildlife periods (nesting, hibernation, breeding, etc.) as shown in **Table 10.1**.

Table 10.1 Environmental Timing Windows Table

<table>
<tr><th></th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>Jun</th><th>Jul</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>Fish</td><td colspan="6">AVOID INSTREAM WORK</td><td colspan="3">Least risk window for work in and around freshwater:
June 15 – Sept 15</td><td colspan="3">AVOID INSTREAM WORK</td></tr>
<tr><td>Birds</td><td colspan="2">Reduced risk for harm to birds</td><td colspan="5">AVOID VEGETATION REMOVAL
Bird Nesting Period:
Mid March - Mid August</td><td colspan="4">Reduced risk for harm to birds</td></tr>
<tr><td>Bats</td><td colspan="5">Bat in Hibernacula</td><td colspan="4">Bats Nursing Pups
Early May-Late August</td><td colspan="2">Reduced risk for harm to bats</td><td>Bat in Hibernacula</td></tr>
<tr><td>Sharp Tailed Snake</td><td colspan="2">Avoid disturbance of Hibernacula</td><td colspan="3">Reduced risk for harm to snake</td><td colspan="3">Peak: breeding, young</td><td colspan="2">Reduced risk for harm to snake</td><td>Avoid disturbance of Hibernacula</td></tr>
</table>

2. Where works are required to occur within sensitive wildlife periods an AQP will be required to assess the complexity of habitat, species presence, timing, and nature of work to determine if activities can be permitted without harm to sensitive wildlife. The AQP will develop a site-specific plan in consultation with Parks Canada and in accordance acceptable guidelines (e.g., Environment and Climate Change Canada (ECCC) and DRAFT - Conservation Measures to Minimize Impacts to Migratory Birds During the Nesting Period (Parks Canada 2021)).
3. Avoid vegetation removal that will affect trees used by birds (both migratory and non-migratory) and other wildlife (e.g., bats), while they are breeding, nesting, roosting, or rearing young.
    a. Environment Canada's General Regional Nesting Period for Vancouver Island, Zone A1 is approximately March 26 to August 9 (Government of Canada 2018; see figure in Section 9.6.1).
    b. Section 34 of the provincial *Wildlife Act* specifically protects the nests of Eagles, Peregrine Falcons, Gyrfalcons, Osprey, Herons, and Burrowing Owls year-round.
    c. The maternity period for bats when non-volant pups may be present in tree roosts typically occurs from early May to late August (BC Ministry of Environment 2016b).
4. If blasting or vegetation clearing is required during a sensitive period, a pre-disturbance survey must be conducted by an AQP to identify any breeding, nesting, roosting or rearing birds or any hibernating, roosting or maternal bats, and determine species-specific BMPs. Pre-disturbance migratory bird surveys will be conducted in accordance with Appendix 2: Breeding Activity Survey Guidance, provided in DRAFT - Conservation Measures to Minimize Impacts to Migratory Birds During the Nesting Period (Parks Canada 2021). Pre-disturbance bat survey methodology should be developed by an AQP but should generally follow the guidelines provided in Inventory Methods for Bats (MELP 1998).
5. A pre-disturbance survey for nests of bird species protected year-round by the BC Wildlife Act should be conducted (e.g., stick nest surveys for bald eagles).
6. In addition to conducting a pre-disturbance nest survey, trees felled during the nesting period may require a Restricted Activity Permit (RAP) from Parks Canada. The Contractor will consult with Parks Canada to determine the need for and specific requirements of a RAP.
7. If a nest or breeding activity is identified during the survey, the area must be left undisturbed with a suitably sized buffer. The size of the buffer will be established by the AQP, will be dependent on the site-specific conditions and will conform to the guidance provided in DRAFT - Conservation Measures to Minimize Impacts to Migratory Birds During the Nesting Period (Parks Canada 2021). The buffer will be maintained until the young have permanently left the vicinity of the nest. "Vicinity" will be defined by the AQP according to site- and species-specific conditions. The limits of the buffer will be flagged to clearly identify the area, especially in the direction of approaching construction activities.
8. The Contractor or person with primary responsibility for the site, is responsible to notify all personnel, including any sub-contractors, of the buffer zone, conduct activities as directed to minimize disturbance, and remain outside of its boundaries.
9. Continuous construction noise greater than 50 dB and sudden noise inside the no disturbance buffer for migratory and at-risk bird nests (as determined by the AQP) will be avoided during the breeding and nesting season. This will be subject to assessment and determination of the AQP based on site-specific conditions and individual species response.

10. If high impact construction activities cannot avoid the bat maternity period, then the AQP will develop a site-specific noise monitoring plan to monitor construction and ambient noise levels at potential bat receptors (e.g., dead or decaying large diameter tree(s), or bat roost boxes or manmade structures with evidence of bat use) in the vicinity of the high impact activity, if these features are present.
11. If bat maternity roosts are identify, blast monitoring will be conducted to ensure a sound concussion of less than 150 dB and shock wave is less than 15 p.s.i and the peak particle velocity is less than 15 mm/second during the bat maternity period. If this is not achievable, the EM will establish a setback of 2 kilometres from occupied significant roost sites (BC MoE 2016b).
12. The EM will monitor the area during construction to confirm the established buffer zone is effective. If there is evidence that buffer is ineffective (e.g., continued agitation/guarding behaviour, frequently leaving the nest) work must stop immediately and the buffer zone adjusted by the AQP. The buffer zone can only be removed upon confirmation from the EM and/or AQP that young have left the nest.
13. Where catchment ditch clearing or relocation is required, an AQP will inspect ditches with water for breeding amphibians. Schedule such clearing activities to avoid sedimentation during periods where larvae or eggs may be destroyed. If a salvage is required, a salvage protocol will be submitted and approved by Parks Canada and the salvage will be conducted by an AQP. The AQP is responsible for obtaining the appropriate permits (e.g., Amphibian salvage requires a General Wildlife Permit, issued through FrontCounter BC's Natural Resource Online Services).
14. Amphibians and snakes may be present in rotting stumps / nurse logs. The EM will inspect rotting stumps/nurse logs prior to removal for presence of amphibians and snakes. Salvage will be conducted as needed. If a salvage is required, a salvage protocol will be submitted and approved by Parks Canada and the salvage will be conducted by an AQP.
    a. A SARA Permit is required to authorize an activity affecting a listed wildlife species, any part of its critical habitat, or the residences of its individuals. Permits are required by those persons conducting activities affecting species listed on Schedule 1 of SARA as Extirpated, Endangered, or Threatened. Because common sharp-tailed snake (listed as *endangered)* a SARA Permit to authorize salvage is required.
    b. Salvage and relocation of wildlife species not covered in a SARA permit requires a *General Wildlife Permit,* issued through FrontCounter BC's Natural Resources Online Services.
15. Avoid felling wildlife trees. Leave snags and cavity trees in place during clearing activities as they provide nesting habitat.
16. When feasible, remove hazard trees outside of the nesting period. If this is not possible due to safety reasons, consider limbing the tree and leaving the trunk or park of the trunk for wildlife use.
17. Limit construction activities to the time between dawn and dusk to avoid the illumination of adjacent habitat. If construction timing restrictions are not possible:
    a. Use directional lighting to avoid light trespass into bird habitat.
    b. Preferably use low intensity energy saving lighting and consider use of motion or heat sensors to minimize illumination.
    c. Avoid use of bright white lights such as metal halide, halogen, fluorescent, mercury vapour and incandescent lamps (refer to the Parks Canada Guideline for the Protection of Dark Skies-Outdoor Lighting).
    d. Use retro reflective materials for signage rather than active lighting where possible.

18. Parks Canada will be notified immediately in the event of human-wildlife interactions, or activity or encounters with bears, cougars, or any species at risk. In the event of encounters with dens, litters, nests, carcasses (road kills), bear activity or wildlife encounters in or around the Project site, the EM and Departmental Representative will be immediately notified. Other wildlife-related encounters will be reported within 24 hours. Provide training for site personnel and subcontractor in reporting procedures of incidental wildlife observations and techniques for avoiding interactions with wildlife.
19. Feeding, harassment or destruction of any wildlife is strictly prohibited.
20. Wildlife encountered at or near the Project site will be allowed to passively disperse without undue harassment. Because of the potential for an encountered snake or amphibian species at risk (i.e., sharp-tailed snake, northern red-legged frog), notify the EM and delay work until advised otherwise.
21. Store all food, food waste, fuels, oils, lubricants, sanitary waste, and other wildlife attractants in sealed containers. Avoid mixing food waste with construction waste; collect waste regularly for regular off-site disposal.
22. Install wildlife crossing/roadkill prevention signage and other traffic calming measures (i.e., reduce speed signs, speed bumps, etc.) to inform visitors to reduce speed and mitigate the potential for roadkill.
23. Prior to blasting, “sweep” the work area and maintain a continuous watch for wildlife that may be present. If wildlife is present, stop work until the wildlife have passed through the area and/or have been hazed out of the area by the EM, representative of Parks Canada or appropriately qualified biologist. The sweep will be done as soon before blasting and as close to the blasting as can be safely achieved. Binoculars will be used where needed.
24. Minimize the time excavations remain open. Slope the sides to no greater than 1:1 and ensure that wildlife and humans can safely exit it. Cover or fence smaller excavations when left unattended to reduce the potential for wildlife injury.

10.12 Site Clean Up / General Waste Management

1. Clean tools and equipment outside of protected heritage places to prevent the release of wash water that may contain deleterious substances, unless otherwise directed by designated Parks Canada staff.
2. Remove all salvageable, non-combustible and non-hazardous materials and reuse or recycle it to the greatest extent possible.
3. Contain and remove all waste in a timely and approved manner and dispose of it at an approved disposal facility outside the protected heritage places unless otherwise directed.
4. Empty construction waste storage containers when 90% full. Provide lids for waste containers, ensure they are wildlife proof if there are attractants, and cover waste loads during transport (including waste containers and truck loads).
5. Separate on site any hazardous material and pollutants such as fuels and solvents. Dispose of contaminated materials at provincially or territorially certified disposal sites.
6. If present, service portable sanitary facilities on a regular basis and dispose of accumulated waste at a sanitary waste disposal facility. Provide adequately sized portable facilities and manage them to ensure waste is not discharged to the environment.
7. Collect waste materials created during the application or removal of protective coatings (e.g., sandblasting abrasives, paint particles, rust and grease) and retain them for disposal at appropriate locations.

10.13 Archaeological Resources (Unidentified)

1. Work with a Cultural Resource Management Advisor and specialists (e.g., archaeologists) to assess the impact of the work/Project to cultural resources and on cultural landscapes or character-defining viewscapes and identify necessary mitigation measures.
2. Cultural Resource Identification may be necessary for resources that have the potential to be cultural resources but have not been evaluated yet.
3. Work with a Parks Canada archaeologist to compare excavation plans to local archaeological resource inventories if available.
4. Complete an Archaeological Impact Assessment (AIA) prior to construction commencing to inform mitigation measures.
5. Develop and implement an Archaeological Accidental Finds Protocol or utilize the protocol developed by GINPR.
6. Should the Project be redesigned to impact lands not inspected during the field program, additional archaeological studies may be required prior to construction.
7. Have cultural monitors present during any ground disturbance activities. Presence of cultural monitors will be coordinated by MOTI.
8. If previously unknown artifacts or features are encountered, cease work in the immediate area, and notify the EM who will make appropriate notifications. Should the Accidental Find occur within GINPR, Parks Canada's Terrestrial Archaeology Section (PCTAR) will be notified. The PCTAR will provide advice and assessment of significance that will in turn determine what will be required to mitigate the chance find. The CRM Advisor at GINPR will also be notified of any Accidental Finds in the park reserve. Leave artifacts in place until a Parks Canada archaeologist and/or CRM staff has been consulted.

10.14 Visitor Access and Experience

Visitor access and experience will be temporarily disrupted during the Project. Implementing the mitigation measures to protect natural and cultural resources, as presented above, will contribute to the Project being completed efficiently which will minimize effects to this VC. In addition, the following mitigation should be applied:

1. Continuously review and update the "Traffic Control Plan" to reflect the current stage of construction.
2. Canal Road and Mount Norman Access Road will remain open throughout the Project, but lane closures and traffic control will be required. Provide measures for protection and diversion of traffic including provision of flagpersons, erection of barricades, erection of warning and directional signage (i.e., posted speed limits, speed bumps, etc.).
3. Provide a minimum of 24 hours notification for any lane closures.
4. Maintain access to property and trail head on Mount Norman Access Road, including overhead clearances for use by emergency response vehicles.

Changes to the viewscape with GINPR are anticipated to be unchanged. Changes to the viewscape along Canal Road as a result of a new road alignment and slope reprofiling on the south side of the road will be permanent and cannot be mitigated. However, these changes are not considered to represent a significant change from existing viewscape conditions.

11.0 OTHER CONSIDERATIONS

11.1 Indigenous Nations Consultation

Local Indigenous communities were engaged early in Project design; 13 First Nations/Treaty Associations with potential interest in the Project area were identified. Pender Island Indian Reserve #8, home to members of the Tsawout and Tseycum First Nations, is located approximately 1.7 km south of the Project site. On December 8, 2021, MOTI's Indigenous Relations Advisor, Morganne Franssen, provided an initial Project notification letter to local Indigenous Group describing the Project and inviting comment and participation. On December 23rd, an Environment, Archaeology and Geotechnical update letter was sent to Indigenous communities. MOTI's Archaeology consultant, Wood, also sent a Notice of Intent to local Indigenous Groups for their planned Archaeology Impact Assessment with a request for First Nation participants. Comments received from Indigenous communities have regarded only concern for impacts to cultural or archaeological resources potentially present at the Project site and requests to include Cultural Monitors during certain Project works. Tsawout First Nation and Malahat Nation have provided cultural monitoring during Geotech and environmental field investigation activities, to date.

The following Indigenous Nations have been consulted on the Project to date:

- Cowichan Tribes
- Halalt First Nation
- Lake Cowichan First Nation (Ts'uubaa-asatx Nation)
- Lyackson First Nation
- Malahat Nation
- Pauquachin First Nation
- Penelakut Tribe
- Semiahmoo First Nation
- Stz'uminus First Nation
- Tsartlip First Nation
- Tsawout First Nation
- Tsawwassen First Nation
- Tseycum First Nation

A 50% Detailed Design Letter was sent to the Nations on April 25, 2022. Only one response, from the Cowichan Tribe, was received. Cowichan Tribe requested that the identification of Culturally Modified Trees (CMT) in the arborist report be confirmed by an archaeologist and that they be copied on all archaeological reports. In addition, the Cowichan Tribe expressed that they required Indigenous Archaeological Monitor oversight during the Project construction.

In response, MoTI confirmed that the Tree Assessment has been reviewed by the Wood PLC's archaeologist and that the results of the AIA would be shared with the Nations. In addition, MOTI requested that the requirement for construction monitoring be confirmed following review of the AIA report by the Nations.

A 90% Detailed Design Letter was sent to the Nations on July 29, 2022. No responses were received. On September 2, 2022 a 100% Detailed Design and Pre-Tender Letter was sent to the Nations. No responses were initially received, and MOTI sent follow-up emails and phone calls. In general, no concerns were raised but responding Nations reiterated their requests to have cultural monitors on site during the Project.

Tsawout First Nation inquired about what would happen to the logs from the Project on October 6, 2022. Tsawout First Nation expressed interest in using the logs for cultural and firewood purposes. MOTI noted the interest, commented that inventory of trees was ongoing and will provide more details of wood availability as details are determined.

MOTI discussed provision of timber from the Project with WSANEC Leadership Council (Tsartlip and Tseycum) on October 28, 2022.

A Record of Consultation as of November 10, 2022 is attached (Appendix D). MOTI will continue to consult with Indigenous Nations throughout all phases of the Project, and will provide opportunity for involvement (e.g., monitoring) where possible.

11.2 Surveillance (Environmental Monitoring)

As per mitigation #3, a qualified environmental professional will be retained as the Environmental Monitor (EM) to provide guidance on implementing the recommended measures and, if necessary, to develop additional mitigation measures if the need arises. For this Project full-time environmental monitoring by the EM is likely not necessary based on the observed site conditions and on the proposed Project works. On-site personnel can monitor the site daily, and the EM carry out inspections at regular intervals (as agreed upon by MOTI, Parks Canada and the EM) as well as additional inspections in advance of predicted rainy periods, during heavy rains, and during key phases of site preparation and construction. The EM will be present for high-risk activities such as blasting, vegetation clearing and grubbing, and work in or around streams. The EM will be available via phone and/or email to respond to environmental incidents and provide guidance for enacting the requirements of the Project, including the CEMP.

Each monitoring event (both those conducted by the EM and any on-site representative) will be documented to record compliance with the Project requirements, as well as any areas of concern and incidents and actions taken to resolve them. Photographs will be taken as additional documentation.

11.3 Follow-up monitoring

The EM will conduct a final site visit to evaluate the effectiveness of mitigation measures implemented during the Project and to ensure that site conditions have been restored as close as reasonably possible, to pre-construction conditions.

The Contractor will be required to develop a restoration plan as part of their Construction Environmental Management Plan. MOTI will require them to use native species and provide habitat features where possible. At this time there is no anticipation of regulatory requirements for follow-up monitoring, however a 5-year monitoring period is recommended to ensure there is at least an 80% survival rate.

12.0 SIGNIFICANCE OF RESIDUAL ADVERSE EFFECTS

Residual adverse effects are negative effects that remain after taking into account "the implementation of technically and economically feasible mitigation measures" (CEAA 2016). For the purposes of this BIA, all effects identified in Section 9.0 were characterized and assessed for significance. Although it is expected that the measures provided in Section 10.0, as well as standard best management practices typically applied during construction and road building/maintenance projects, will appropriately minimize the potential Project-related effects it has been conservatively assumed that there remains a potential for the effect to occur.

Residual effects are characterized based on qualitative descriptions of five key criteria (**Table 12.1**).

Table 12.1 Residual Effects Criteria

Criteria	Rating Term	Definition
Magnitude	Negligible	Effect will produce no detectable change from baseline conditions.
	Low	Effect is within range of baseline conditions or natural variation.
	Moderate	Effect is at or slightly exceeds baseline conditions or the limits of natural variation.
	High	Effect will produce a notable change beyond baseline conditions or the upper or lower limits of natural variation.
Geographic Extent	Project Area	Effect is limited to the immediate Project area.
	Local	Effect includes the Project area and extends to an area immediately surrounding it (Project area + 1 km buffer).
	Regional	Effect has implications to Region (Project area + 5 km buffer).
	Broad	Effect has implications beyond Region.
Duration	Short Term	Effect present during Project activity or for a short period after (i.e., <3 months).
	Medium Term	Effect remains after Project activity is complete (i.e., multiple seasons or 3 months to 2 years).
	Long Term	Effect remains well beyond end of activities (i.e., >2 years).
Frequency	Once	Effect occurs once.
	Intermittent	Effect occurs more than once but without regularity.
	Continuous	Effect occurs continuously.
Reversibility	Non-reversible	Effect will not be reversed when activity ceases.
	Partially Reversible	Effect will be partially reversed when activity ceases.
	Reversible	Effect will be reversed when activity ceases.

Once the criteria are determined for the residual effect, significance is determined. While the Canadian Government provides some broad guidelines (under the previous *Canada Environmental Assessment Act* and the current *Impact Assessment Act)*, there is no prescribed methodology to determine significance.

A three-part matrix to standardize assessment of significance has been used. **Step 1** includes rating magnitude, geographic extent and duration. These three criteria were selected as the foundation for significance because if these occur at the low end of their ratings, other criteria are also likely to be low. As magnitude of impact increases, extent of an effect widens or persists for longer, the potential for significance increases.

Effects that are *Potentially Significant* based on magnitude, geographic extent and duration continue in **Step 2** where frequency and reversibility are considered. Effects that occur repeatedly and cannot be reversed are more likely to be significant than those that occur sporadically and are reversible. In this step, only effects that are reversible are considered Not Significant; all other effects are considered *Significant* and continue to Step 3.

Finally, in **Step 3**, the likelihood of occurrence for *Significant* residual effects is evaluated based on professional judgement and experience with similar past environmental effects. A proponent may consider *Significant* residual effects to be acceptable when the likelihood of it occurring is low.

Table 12.2 Significance Rating Criteria

Step 1: All residual effects included			
Impact Magnitude	**Geographic Extent**	**Duration**	**Significance**
Negligible	Any	Any Duration	Not Significant
Low	Any	Any Duration	Not Significant
Moderate	Project Area	Any Duration	Not Significant
	Local	Short-term	Not Significant
		Medium-term	Not Significant
		Long-term	*Potentially Significant*
	Regional	Short-term	Not Significant
		Medium-term	*Potentially Significant*
		Long-term	*Potentially Significant*
	Broad	Short-term	Not Significant
		Medium-term	*Potentially Significant*
		Long-term	*Potentially Significant*
High	Project Area	Short-term	Not Significant
		Medium-term	Not Significant
		Long-term	*Potentially Significant*
	Local	Short-term	Not Significant
		Medium-term	*Potentially Significant*
		Long-term	*Potentially Significant*
	Regional	Any Duration	*Potentially Significant*
	Broad	Any Duration	*Potentially Significant*

Step 2: *Potentially Significant* effects continue below		
Frequency	**Reversibility**	**Significance**
Once	Reversible	Not Significant
	Partially Reversible	*Significant*
	Non-Reversible	*Significant*
Intermittent	Reversible	Not Significant
	Partially Reversible	*Significant*
	Non-Reversible	*Significant*
Continuous	Reversible	Not Significant
	Partially Reversible	*Significant*
	Non-Reversible	*Significant*
Step 3: *Significant* effects continue below		
Likelihood	**Description**	
Low	Effect unlikely but could occur	
Medium	Effect likely but may not occur	
High	Effect will likely occur	

The characterization of effects, and their subsequent significance rating, are summarized below in **Table 12.3**. For *most* potential effects of the Project it is anticipated that there will be ***no significant adverse residual effects*** to natural resources (including species at risk), Indigenous rights as established by section 35 of the Constitution Act, 1982, or cultural resources a result of the proposed Project provided all mitigation measures discussed in this report, and typical best management practices for construction and road construction/maintenance, are followed. Negative effects were generally localized and/or short term.

Table 12.3 Significance Assessment of Permanent Alteration of Landscape

Interaction	Residual Effect	Step 1				Step 2			Step 3	Comment
		Magnitude	Geographical Extent	Duration	Significance	Frequency	Reversibility	Significance	Likelihood	
Air										
Operation of equipment and vehicles will generate air emissions.	Decreased air quality due to increased emissions from equipment.	Low	Project Area	Short term	Not significant	-	-	-	-	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 localized and temporary.
Activities such as blasting, clearing and grading (where soils are exposed) may generate dust and airborne particles.	Decreased air quality due to increase in airborne particles.	Low	Project Area	Short term	Not significant	-	-	-	-	Increases in particulate matter are anticipated to be temporary and localized.
Soils and Landforms										
Landforms will be permanently altered by the road realignment and excavation and/or blasting of the slope face on the south side of the road.	Permanent alteration of landscape.	Low	Project Area	Long term	Not significant	-	-	-	-	Permanent alteration occurs adjacent to an existing road right-of-way and will be similar to existing conditions (i.e., landscape will look similar to existing conditions).
Surface Water										
Equipment with engines and/or hydraulics have a potential for leaks and spills (May include: diesel/gas, hydraulic fluids, lubricating oil, glycols).	Decreased water quality due to spill or release of deleterious substances from equipment	High	Local	Medium term	*Potentially significant*	Once	Reversible	Not Significant	-	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.
Ground disturbance activities (e.g., blasting, clearing and grubbing, grading) may result in mobilization of sediments that can enter the unnamed watercourse.	Decreased water quality (e.g., increased turbidity/total suspended solids) due to introduction of sediments to watercourse.	Moderate	Local	Short term	Not significant	-	-	-	-	Sediment mobilization considered unlikely with application of mitigation (e.g., standard best management practices for construction and erosion and sediment control). Unnamed watercourse is located approximately 30 m west of the western extent of the Project. Mobilized sediments would likely settle or be trapped in vegetated roadside ditches).
Fish										
Accidental spills or release of deleterious substances (e.g., sediments, hydrocarbon products from equipment) may physically harm aquatic fish and aquatic wildlife, cause avoidance behaviour or alter habitat quality in and downstream of the unnamed watercourse west of the Project site.	Fish may be exposed to contamination from spills which may harm/kill fish or cause fish to leave area. Aquatic habitat quality may be reduced because of impacts to water quality or loss of aquatic/riparian vegetation.	High	Local	Medium term	*Potentially significant*	Once	Reversible	Not Significant	-	Although a spill interaction would have a high impact, it is considered to be unlikely to occur and would be an isolated event. Spills would be cleaned up immediately to minimize exposure.
Blasting activities may produce noise levels that are harmful to fish and aquatic wildlife (amphibians) and cause a physiological response or avoidance behaviour.	Fish and amphibians may leave area because of noise or be injured or killed by noise.	High	Local	Short term	Not significant	-	-	-	-	Fish are not known to be present in the unnamed watercourse. Mitigation includes surveying ditches with water and rotted logs and relocating amphibians prior to disturbance. Therefore, it is unlikely that amphibians will experience effects of blasting.
Aquatic habitat may be destroyed or harmfully altered if construction activities occur within or adjacent to a watercourse (i.e., the riparian zone).	Aquatic habitat is harmfully altered or destroyed by construction activities.	Moderate	Project Area	Short term	Not significant	-	-	-	-	No watercourses are present in the Project area. An unnamed watercourse is located approximately 30 m west of the western extent of the Project Area. Project activities are not anticipated to occur within the riparian area of the unnamed watercourse.

Interaction	Residual Effect	Step 1				Step 2			Step 3	Comment
		Magnitude	Geographical Extent	Duration	Significance	Frequency	Reversibility	Significance	Likelihood	
Vegetation										
Project activities (e.g. clearing and blasting for new highway alignment, equipment movement, material laydown, construction works) will reduce the extent of existing vegetation.	Vegetation will be disturbed or destroyed (including the red-listed Douglas-fir / dull Oregon-grape ecosystem).	Low	Project Area	Long Term	Not significant	-	-	-	-	The red-listed Grand Fir / dull Oregon-grape is overlaps only a very small portion of the western end of the Project area where activities will be minimal. The red-listed Douglas-fir / dull Oregon-grape ecosystem observed in the Project area was primarily young forest. Few mature trees were present, and no veteran trees were observed. No SAR vegetation was observed in the Project area during the field surveys. Vegetation disturbances/removal will be limited to the extent required for re-alignment works being conducted to maintain road safety.
Project activities may damage existing vegetation (e.g., material laydown, equipment or personnel movement may crush vegetation, dust generated by the Project may accumulate on vegetation).	Vegetation may be temporarily disturbed by Project activities.	Low	Project Area	Short Term	Not significant	-	-	-	-	Disturbances are expected to be temporary and vegetation is anticipated to recover within one growing season. Mitigation measures are anticipated to minimize potential for dust accumulation.
Accidental spills or release of deleterious substances (e.g., sediments, hydrocarbon products from equipment) may harmfully alter or destroy vegetation.	Vegetation may be exposed to deleterious substances and be harmed or destroyed.	High	Local	Medium term	*Potentially significant*	Once	Reversible	Not Significant	-	Although a spill interaction would have a high impact, it is considered to be unlikely to occur and would be an isolated event. Spills would be cleaned up immediately to minimize exposure. Vegetation is anticipated to recover within a growing season.
Occurrences of existing weeds and non-native, invasive species may be spread which may adversely affect the integrity of desirable vegetation. New non-native or invasive plant seeds/fragments may be transported to Project area on vehicles and equipment.	Introduction or spread of non-native or invasive plants.	Moderate	Local	Long Term	*Potentially significant*	Continuous	Reversible	Not Significant	-	Introduction of new non-native or invasive plants by Project activities considered unlikely with application of mitigation. Disturbed areas and road rights-of-way commonly contain invasive species. Three invasive species (foxglove, common cat's ear and Scotch broom) were identified in the Project area. Mitigation will be implemented to minize potential spread.
Wildlife										
(General)										
Mortality of individuals (i.e., road-kill) during mobilization or construction.	Mortality of individuals.	Low	Regional	Long Term	Not Significant	-	-	-	-	Although mortality of wildlife would have a high impact to the individual, it would likely have negligible effect at a population level. Increase in traffic due to the Project will be negligible compared to existing conditions in the region, therefore road-kill attributed to the Project would be minimal.
Accidental spills or release of deleterious substances (e.g., hydrocarbon products from equipment) may physically harm wildlife, cause avoidance behaviour or alter habitat quality in the Project area.	Wildlife may be exposed to contamination from spills which may harm/kill individuals or cause individuals to leave area. Habitat quality may be reduced because of impacts to water quality or loss of aquatic/riparian vegetation.	High	Local	Medium term	*Potentially Significant*	Once	Reversible	Not Significant	-	Although a spill interaction would have a high impact, it is considered to be unlikely to occur and would be an isolated event. Spills would be cleaned up immediately to minimize exposure. Although harm/death of wildlife would have a high impact to the individual, it would likely have negligible effect at a population level.

Interaction	Residual Effect	Step 1				Step 2			Step 3	Comment
		Magnitude	Geographical Extent	Duration	Significance	Frequency	Reversibility	Significance	Likelihood	
Garbage and waste generated by the Project activities may attract local wildlife and lead to human-wildlife interactions.	Human-wildlife interactions occur.	Low	Local	Short Term	Not Significant	-	-	-	-	The Project is not expected to generate significant amounts of wildlife attractants. Interactions would be localized and temporary.
Avoidance behaviours from local wildlife, including SAR, 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 behaviour during Project.	Low	Local	Short Term	Not Significant	-	-	-	-	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). Increased human presence will be limited in number and time. Wildlife will likely return to area once Project activities are completed.
Wildlife may experience a temporary decrease of air quality because of increased dust or emission from equipment.	Wildlife may experience temporary decreases in air quality when in close proximity to Project activities.	Moderate	Local	Short term	Not Significant	-	-	-	-	Air emissions and dust generation are anticipated to be minimal and temporary. Decreases in air quality are anticipated to be primarily limited to the immediate work areas. Wildlife are anticipated to avoid active work areas due to an increase in human activity and noise, and therefore are not expected to experience negative effects of decreased air quality.
(Birds, including at-risk species)										
Project activities will create a temporary increase in noise, artificial lighting, blasting activities, and human presence which can cause disruption or impediment to movement, or cause avoidance behaviour.	Birds may experience disruption or impediment to movement, or display avoidance behaviours.	Low	Project Area	Short Term	Not Significant	-	-	-	-	Disturbances will be temporary and will be timed to occur outside of sensitive periods to the greatest extent possible.
The Project requires vegetation removal and soil disturbance that may result in disturbance or destruction of habitat, including nests.	Undetected nests may be destroyed. Potential habitat or use of habitat may be altered.	Moderate	Project Area	Long Term	Not Significant	-	-	-	-	Application of mitigation such as timing works to occur outside of sensitive period and conducting pre-disturbance nest sweeps minimizes disturbance of nests. Habitat type present in the Project area (i.e., young forest) is widely available locally and regionally.
The Project requires vegetation removal and grubbing that could result in bird mortality and physical injury.	Birds could be killed or injured.	Low	Project Area	Long term	Not Significant	-	-	-	-	Although mortality would have a high impact to the individual, it would likely have negligible effect at a population level. Application of mitigation such as timing works to occur outside of sensitive period and conducting pre-disturbance nest sweeps minimizes presence of birds. Accidental mortality or injury is considered unlikely as birds are highly mobile and would likely leave the area during disturbances.
The Project may require nighttime work which may increase the risk of stress or abandonment of already established nest sites due to artificial lighting.	Birds may be disturbed or abandon nests.	Moderate	Project Area	Short term	Not Significant	-	-	-	-	Nighttime work will be conducted only as necessary. Artificial lighting use will be temporary.

Interaction	Residual Effect	Step 1				Step 2			Step 3	Comment
		Magnitude	Geographical Extent	Duration	Significance	Frequency	Reversibility	Significance	Likelihood	
(At-risk Mammals)										
The Project requires vegetation removal and grubbing that may result in changes to habitat quality or quantity for at-risk mammals (e.g., Roosting trees and/or foraging habitat for bats may be removed).	Reduced foraging habitat or loss of roosting trees.	Moderate	Project Area	Long term	Not Significant	-	-	-	-	The young forest present in the Project area is not ideal roosting habitat (prefer mature forest stands). Newly re-sloped rock face may provide new roosting opportunities. While the area of vegetation will be reduced by the Project, foraging habitat is not expected to be substantially affected as insects will still gather at the forest edge and along the road.
Project activities will create a temporary increase in noise (equipment operation, blasting) which can cause displacement of bats from roosts or foraging areas, increased susceptibility to predation, dysfunctional allocation of time and energy to vigilance behaviors and finding alternate roosts, and degradation to physiological condition and social order.	Bats may experience disruption, disturbance or displacement.	Low	Project Area	Short Term	Not Significant	-	-	-	-	Disturbances will be temporary and will be timed to occur outside of sensitive periods to the greatest extent possible.
The Project may require nighttime work which may increase the risk of stress or abandonment of already established roosting sites due to artificial lighting.	Bats may be disturbed or abandon roosts.	Moderate	Project Area	Short term	Not Significant	-	-	-	-	Nighttime work will be conducted only as necessary. Artificial lighting use will be temporary.
The Project requires vegetation removal and grubbing that could result in bat mortality and physical injury.	Bats could be killed or injured.	Low	Project Area	Long term	Not Significant	-	-	-	-	Although mortality would have a high impact to the individual, it would likely have negligible effect at a population level. Accidental mortality or injury is considered unlikely as bats are highly mobile and would likely leave the area during disturbances.
(At-risk Herptiles and Amphibians)										
Mortality of individuals (i.e., road-kill) during mobilization or construction.	Mortality of individuals.	Low	Regional	Long Term	Not Significant	-	-	-	-	Although mortality of herpetiles would have a high impact to the individual, it would likely have negligible effect at a population level. Increase in traffic due to the Project will be negligible compared to existing conditions in the region, therefore road-kill attributed to the Project would be minimal.
Blasting activities could cause changes in habitat quality and quantity for herptiles.	Loss or degradation of potential habitat.	Moderate	Project Area	Long Term	Not Significant	-	-	-	-	Overall loss or change to habitat is not anticipated as the slope is being shifted south, rather than being removed. Disturbances will occur during construction, but overall availability of potential habitat is expected to remain.
Vegetation clearing and grubbing may result in mortality or physical injury to amphibians	Mortality of individuals.	Low	Regional	Long Term	Not Significant	-	-	-	-	Although mortality of herptiles would have a high impact to the individual, it would likely have negligible effect at a population level. The EM will inspect nurse logs / rotting stumps as well as ditches with water for breeding amphibians and will conduct salvages as required.
Vegetation clearing and grubbing and disturbance to the roadside ditch could cause changes in habitat quality and quantity for amphibians	Loss or degradation of potential habitat.	Moderate	Project Area	Long Term	Not Significant	-	-	-	-	Overall loss or change to habitat is not anticipated as the roadside ditch is being shifted south, rather than being removed. Disturbances will occur during construction, but overall availability of potential habitat is expected to remain.

Interaction	Residual Effect	Step 1				Step 2			Step 3	Comment
		Magnitude	Geographical Extent	Duration	Significance	Frequency	Reversibility	Significance	Likelihood	
(Invertebrates)										
The Project requires vegetation removal and grubbing that could result in invertebrate mortality and physical injury.	Mortality of individuals	Low	Project Area	Long term	Not Significant					Although mortality would have a high impact to the individual, it would likely have negligible effect at a population level.
Archaeological Resources										
Unknown archaeological resources (e.g., previously unknown artifacts or sites) may be affected (accidental damage or destruction) by Project activities such as excavation, vibrations during blasting activities, or reprofiling works.	Accidental damage or destruction of previously unknown archaeological resources.	High	Project Area	Short term	Not Significant	-	-	-	-	Encountering an unknown archaeological resource is considered unlikely. An Accidental Finds Protocol will be enacted for the Project and will require an immediate stoppage of work should a resource be encountered.
Visitor Access and Experience										
Project will require traffic management (e.g., lane closure) which will cause traffic delays.	The public will experience traffic delays during the Project.	Low	Local	Short term	Not Significant	-	-	-	-	Traffic disruptions will be temporary.
Visitors may experience temporary increased noise and vibration during equipment use and blasting activities.	The public may experience temporary increases in noise and vibration.	Moderate	Local	Short term	Not Significant	-	-	-	-	Increases in noise and vibration are expected to be temporary and within the limits of typical construction activities.
Visitors may experience a temporary decrease of air quality because of increased dust or emission from equipment.	The public may experience temporary decreases in air quality when in close proximity to Project activities.	Moderate	Local	Short term	Not Significant	-	-	-	-	Air emissions and dust generation are anticipated to be minimal and temporary. Decreases in air quality are anticipated to be primarily limited to the immediate work areas where the public/visitors will be excluded for safety reasons.
To realign the road the Project requires vegetation removal and slope reprofiling along the south side of Canal Road.	Viewscapes will be altered by the road realignment and slope reprofiling.	Moderate	Project Area	Long term	Not Significant	-	-	-	-	Although the Project will permanently alter the landscape the effect is considered moderate since the viewscape from either Canal Road or GINPR will not be substantially different from existing conditions (i.e., it will be visually similar though shifted southward by approximately 25 m). The overall visual experience within Beaumont / Mount Norman Park of GINPR is not anticipated to be affected.

13.0 CONCLUSIONS

Taking into account implementation of mitigation measures outlined in the assessment, **the Project is not likely to cause significant adverse environmental effects** natural resources (including species at risk), Indigenous rights as established by section 35 of the Constitution Act, 1982, or cultural resources.

14.0 CLOSURE

Please feel free to contact the undersigned regarding any questions or further information that you may require.

Report prepared by:
Hemmera Envirochem Inc.

per: Andrea Au, B.Sc., BIT
Environmental Specialist
604.782.4569
Andrea.Au@hemmera.com

Report reviewed by:
Hemmera Envirochem Inc.

per: Shawneen Walker, B.Sc., R.P.Bio., P.Biol.
Senior Environmental Assessment & Permitting Lead
250.327.3022
Shawneen.Walker@hemmera.com

Report reviewed by:
Hemmera Envirochem Inc.

Robert McMahon, M.Sc.
Project Manager
236.514.2989
robert.mcmahon@ausenco.com

15.0 REFERENCES

Barclay and Brigham. 1996. Bats and Forests Symposium. Available at https://www.for.gov.bc.ca/hfd/pubs/docs/wp/wp23-1.pdf

BC Conservation Data Centre. 2014a. Occurrence Report Summary, Shape ID: 65114, Douglas-fir / dull Oregon-grape. BC Ministry of Environment. Available at http://maps.gov.bc.ca/ess/hm/cdc, (accessed Jan 25, 2022).

BC Conservation Data Centre. 2014b. Occurrence Report Summary, Shape ID: 109228, grand fir / dull Oregon-grape. BC Ministry of Environment. Available at http://maps.gov.bc.ca/ess/hm/cdc, (accessed Jan 25, 2022).

BC Conservation Data Centre. 2014c. Occurrence Report Summary, Shape ID: 101925, Common Sharp-Tailed Snake. BC Ministry of Environment. Available at http://maps.gov.bc.ca/ess/hm/cdc, (accessed Jan 27, 2022).

BC Ministry of Environment. 2016a. Recovery Plan for the Western Screech-owl, macfarlanei species (*Megascops kennicottii macfarlanei*) in British Columbia. Available at https://a100.gov.bc.ca/pub/eirs/finishDownloadDocument.do?subdocumentId=10476

BC Ministry of Environment. 2016b. Best Management Practices Guidelines for Bats in British Columbia. Available at https://a100.gov.bc.ca/pub/eirs/finishDownloadDocument.do?subdocumentId=10781

BC Ministry of Environment. 2015. Management Pan for the Northern Red-legged Frog in British Columbia. Available at https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/mp_northern_red-legged_frog_e_proposed.pdf

BC Ministry of Environment, Lands and Parks (MEL). 1998. Inventory Methods for Bats: Standards for Components of British Columbia's Biodiversity No. 20. Available at: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/nr-laws-policy/risc/bats.pdf

BC Ministry of Forests. 1998. Fish-Stream Identification Guidebook. Available at https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/fish-data-information/fishstream.pdf

BC Ministry of Transportation and Infrastructure (MOTI). 2020. 2020 Standard Specifications for Highway Construction, Vol 1 and 2. Available at https://www2.gov.bc.ca/gov/content/transportation/transportation-infrastructure/engineering-standards-guidelines/standard-specifications-for-highway-construction

COSEWIC. 2009. Assessment and Status Report on the Sharp-tailed Snake (*Contia tenuis*) in Canada. Available at https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/cosewic/sr_Sharp-tailed%20Snake_0810_e1.pdf

COSEWIC. 2012. COSEWIC assessment and status report on the Western Screech-Owl kennicottii subspecies Megascops kennicottii kennicottii and the Western Screech-Owl macfarlanei subspecies Megascops kennicottii macfarlanei in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 30 pp. Available at: https://www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_western_screech-owl_1012_e.pdf

Environment Canada. 2015. Recovery Strategy for Little Brown Myotis (Myotis lucifugus), Northern Myotis (Myotis septentrionalis), and Tri-colored Bat (Perimyotis subflavus) in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. ix + 110 pp

Fitzsimmons, A. 2016. Indigenous and Parks Canada Agency Perspectives on the Management of Gulf Islands National Park Reserve. Available at http://dspace.library.uvic.ca/bitstream/handle/1828/12523/Fitzsimmons_Andrew_MA_2020.pdf

Government of Canada. 2018. General Nesting Periods of Migratory Birds in Canada. Environment and Climate Change Canada (ECCC) - General Nesting Periods of Migratory Birds in Canada. Available at https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html

Government of Canada. 2011. Barn owl (*Tyto alba*): COSEWIC assessment and status report 2010. Available at https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/barn-owl-2010.html#_Toc306959633

Parks Canada. 2021. DRAFT Conservation Measures to Minimize Impacts to Migratory Birds During the Nesting Period. Provided by email (Sibylla Helms, July 13, 2021).

Parks Canada. 2017. Parks Canada National Best Management Practices for Working in or Around Waterbodies. Available at https://buyandsell.gc.ca/cds/public/2018/05/30/b251fef54705e09fd611687456767e6e/app_a-works_in_and_around_waterbodies_bmp-draft_april_04.pdf

Parks Canada. 2015. Parks Canada National Best Management Practices for Roadway, Highway, Parkway and Related Infrastructure. Available at http://parkscanadahistory.com/publications/best-practices-roads-e-2015.pdf

Wood Environment and Infrastructure Solutions. 2022. Archaeological Impact Assessment, South Pender Island, BC Project # VE21800.015. Prepared for Ministry of Transportation and Infrastructure.

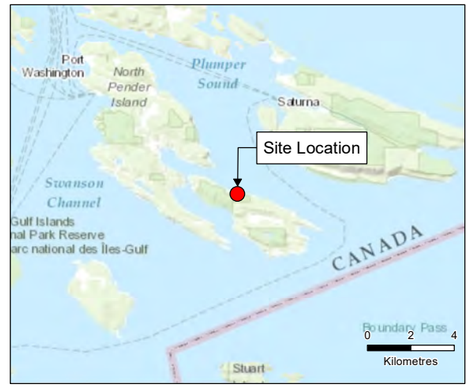
Wright, D.G. and G.E. Hopky. 1998. Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters. Canadian Technical Report of Fisheries and Aquatic Sciences 2017. Available at https://publications.gc.ca/collections/Collection/Fs97-6-2107E.pdf

FIGURE

Figure 1 Project Overview

Canal Road BIA
Canal Road, South Pender Island, BC

Project Overview



Legend

- Scotch broom
- Wildlife tree
- Existing Road Edge
- Proposed Road Edge
- Area of Impact
- Watercourse
- Property Line
- National Park Reserve

Notes

1. All mapped features are approximate and should be used for discussion purposes only.
2. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.

Sources

- Contains information licensed under the Open Government Licence - Province of British Columbia
- Aerial Image: ESRI World Imagery
- Inset Basemap: ESRI World Topographic Map

N

1:1,500

0 10 20 30 40 50
Metres

NAD 1983 UTM Zone 10N

Page Size: 11" x 17"

103041-07	Production Date: Apr 11, 2022	Figure 1

Hemmera An Ausenco Company

BRITISH COLUMBIA Ministry of Transportation and Infrastructure

Path: S:\Geomatics\Projects\103041\07\mxd\CanalRoadBIA\Fig1_103041_07_ProjectOverview_220411.mxd

APPENDIX A
Photographs

Photo 1 Canal Road - western limit of site with road failure observed. Photo taken looking east on February 17, 2022.

Photo 2 Representative photo of young coniferous forest upslope of Canal Road. Photo taken looking east on February 17, 2022.

Photo 3 Representative photo of coniferous forest observed upslope of Canal Road. Photo taken looking south on February 17, 2022.

Photo 4 Mature trees observed upslope of Canal Road. Photo taken looking north on February 17, 2022.

Photo 5 Scotch broom observed just east of existing culvert on north side of Canal Road. Photo taken looking northeast on February 17, 2022.

Photo 6 Unnamed watercourse that crosses Canal Road; looking upstream from the south side of Canal Road. Photo taken looking south on February 17, 2022.

Photo 7 Unnamed watercourse at culvert outlet on north side of Canal Road. Photo taken looking south on February 17, 2022.

Photo 8 Unnamed watercourse looking downstream from the north side of Canal Road; looking towards the confluence with the ocean. Photo taken looking north on February 17, 2022.

Photo 9 Roadside ditch observed on the south side of Canal Road. Photo taken on February 17, 2022.

Photo 10 Potential wildlife trail; parallels road, approximately 30 m south. Photo taken looking east on February 17, 2022.

Photo 11 Wildlife tree (decay class ~7) with visible holes. Photo taken looking south on February 17, 2022.

Photo 12 Wildlife bones, potentially a young deer, observed on the south side of Canal Road, near the east extent of the site. Photo taken February 17, 2022.

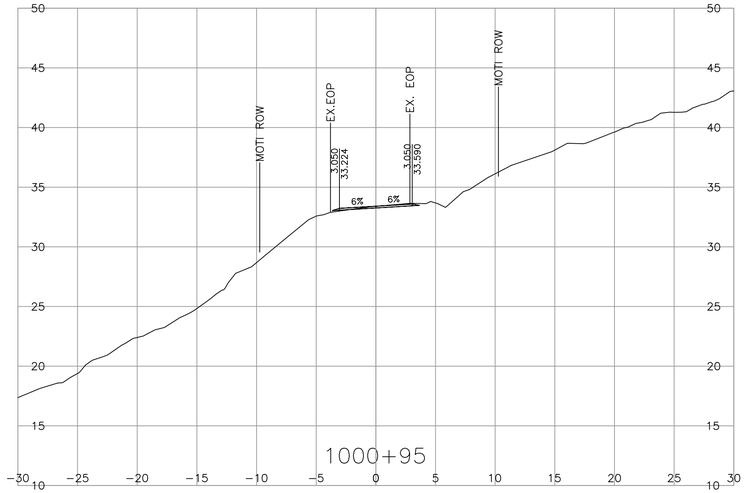
APPENDIX B

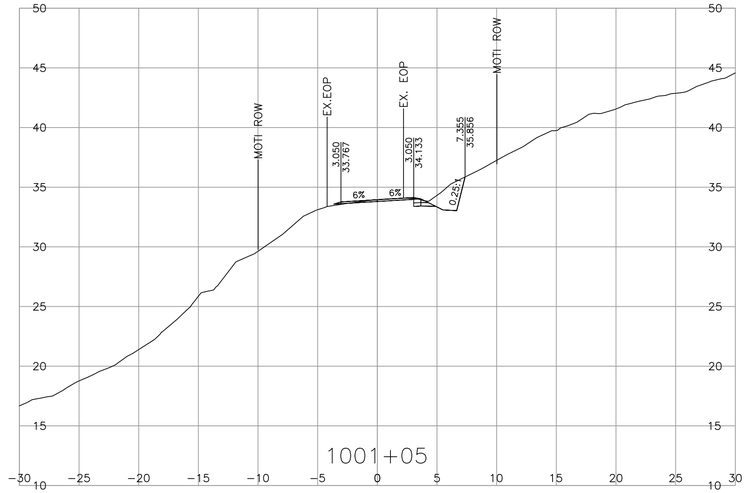
Effects Identification Matrix

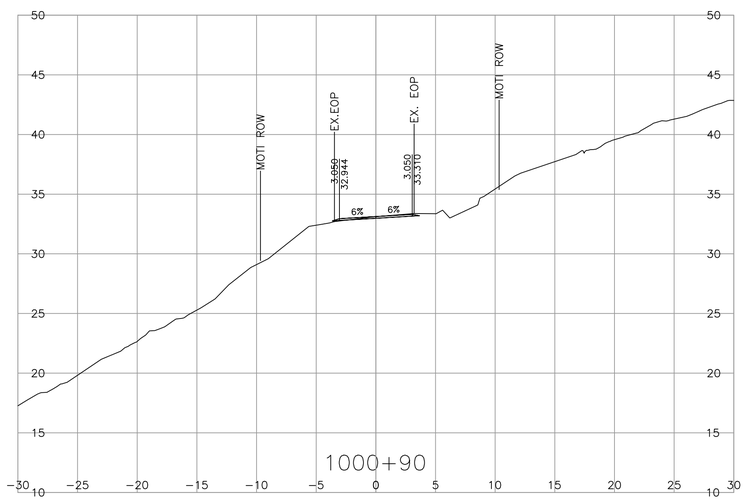
Table B.1 Direct Effects

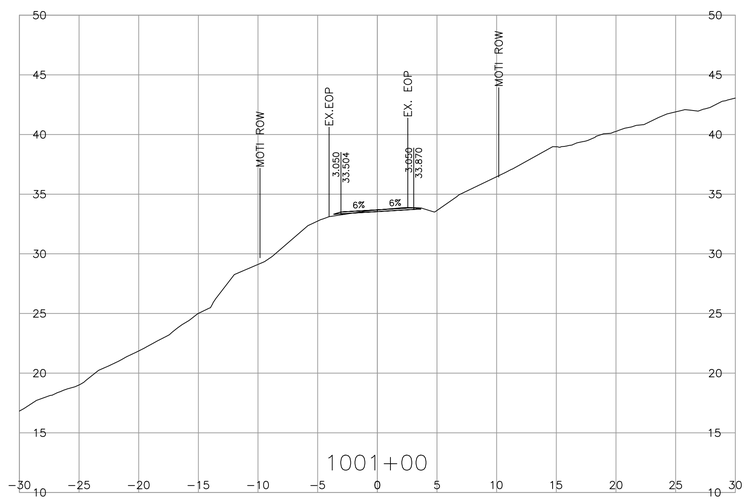
	Valued components potentially directly affected by the proposed project phases							
	Natural Resources						Cultural Resources	
	Air	Soil & Landforms	Surface Water	Fish	Vegetation	Terrestrial Wildlife	Archaeological Resources	Visitor Access and Experience
Supply and storage of materials		x	x		x	x	x	x
Vegetation clearing		x	x	x	x	x	x	x
Waste disposal						x		x
Blasting	x	x		x	x	x	x	x
Excavation		x	x	x	x	x	x	x
Grading		x	x	x	x	x	x	x
Backfilling		x					x	x
Use of machinery/generators	x	x				x	x	x
Transport of materials/ equipment	x	x				x	x	x
Use of chemicals/hazardous material	x	x	x	x	x	x	x	
Paving	x	x	x					x
Maintenance		x				x		x
Planting/Seeding					x	x	x	
Vehicle Traffic	x							

APPENDIX C
Design Drawings









SCALE			CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17
REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

SENIOR DESIGNER

DATE 2022-04-01

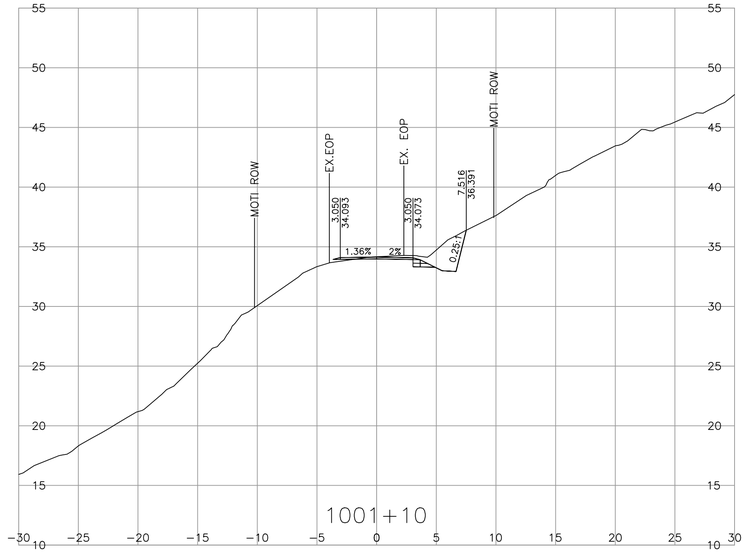
DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

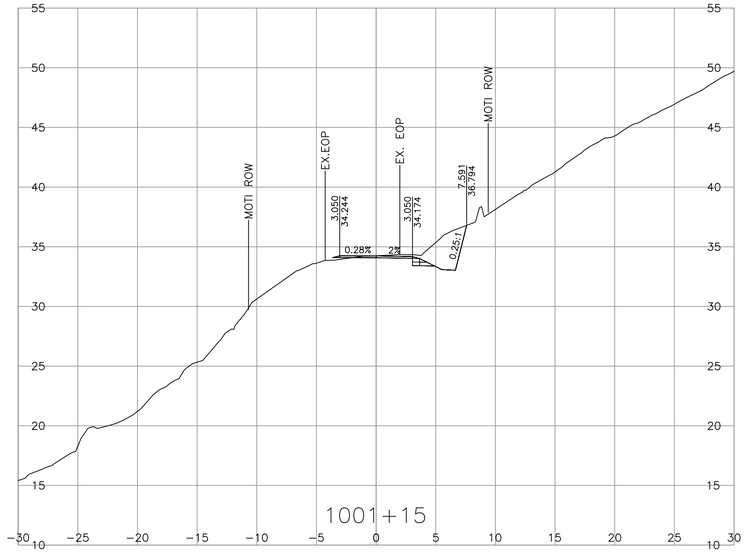
CROSS SECTIONS

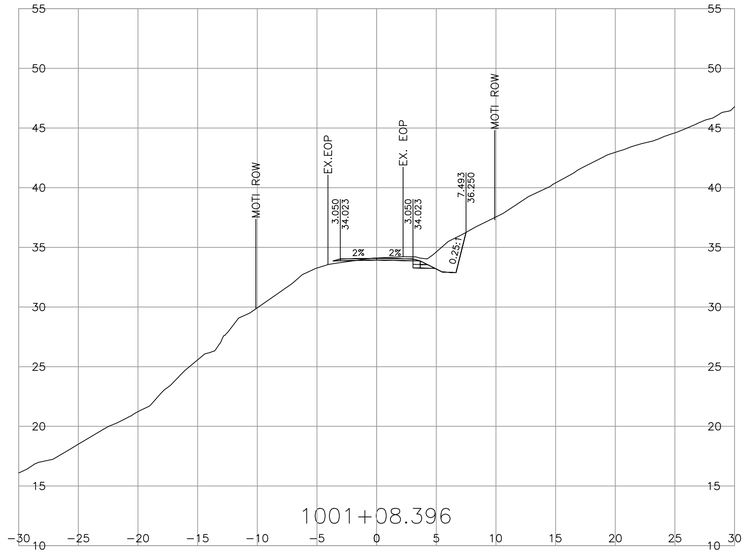
CANAL ROAD REMEDATION

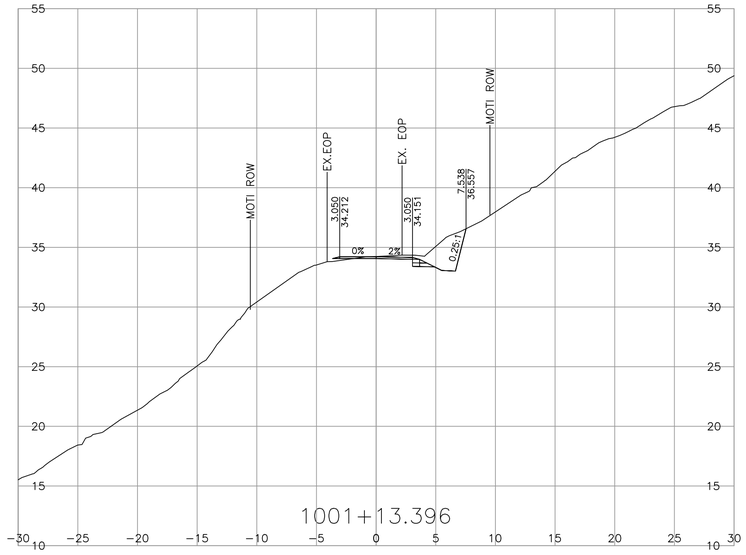
STA. 10+000.000 TO 20+000.000

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A









SCALE		CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17	
REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

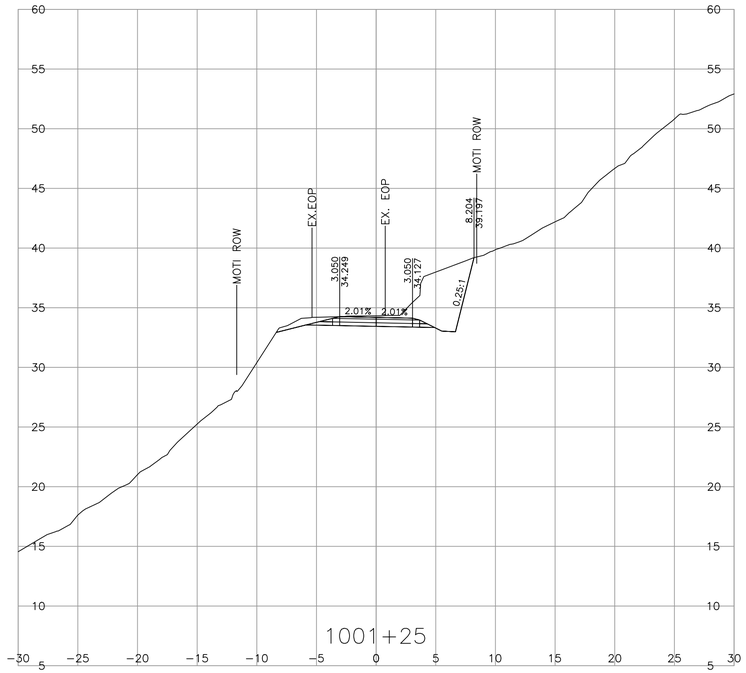
CROSS SECTIONS

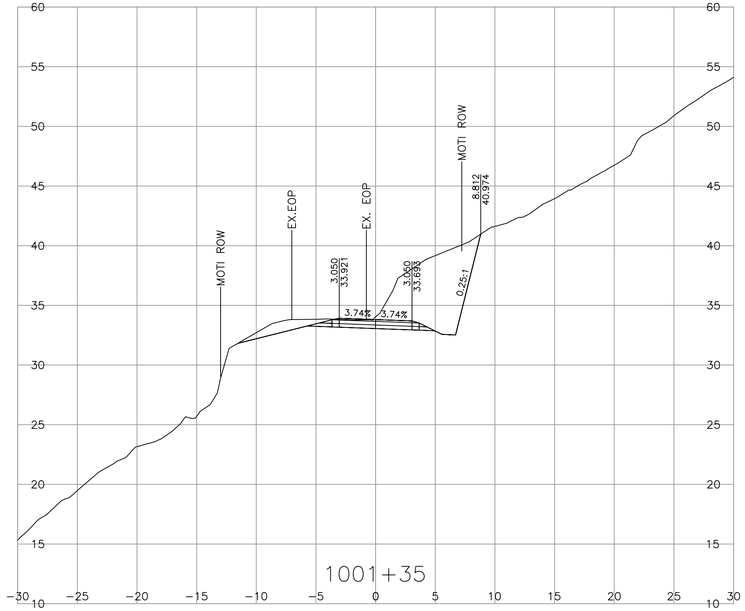
CANAL ROAD REMEDATION

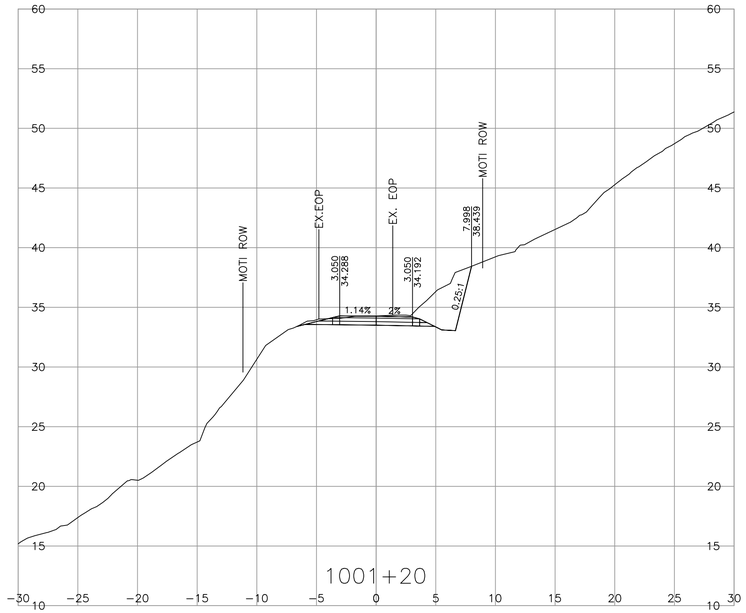
STA. 10+000.000 TO 20+000.000

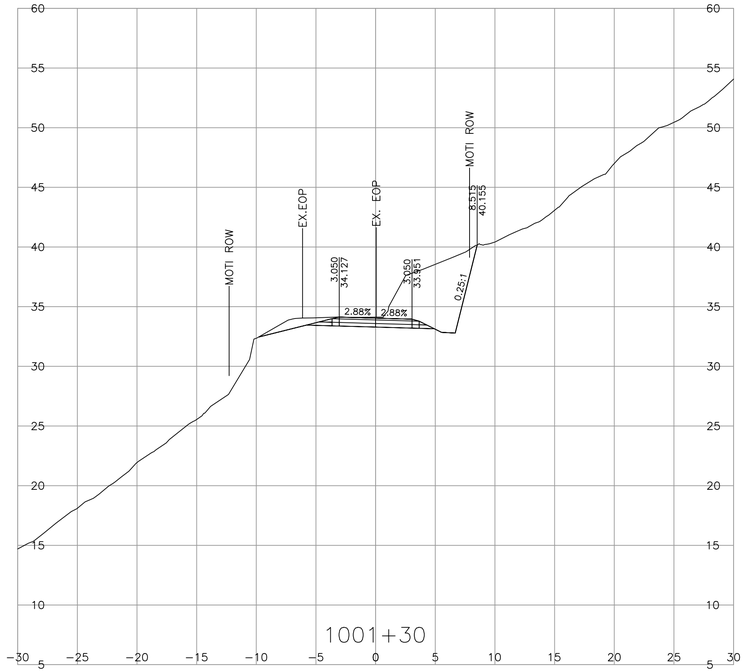
FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\2300_SketchDrawings\CROSS-SECTIONS.dwg









PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\X300_SketchDrawings\CROSS-SECTIONS.dwg

SCALE	CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17	

REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

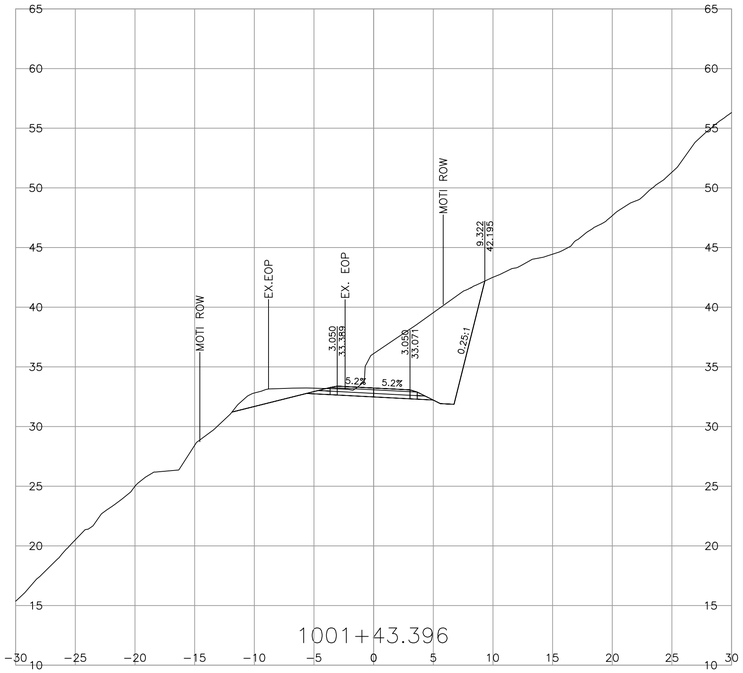
DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

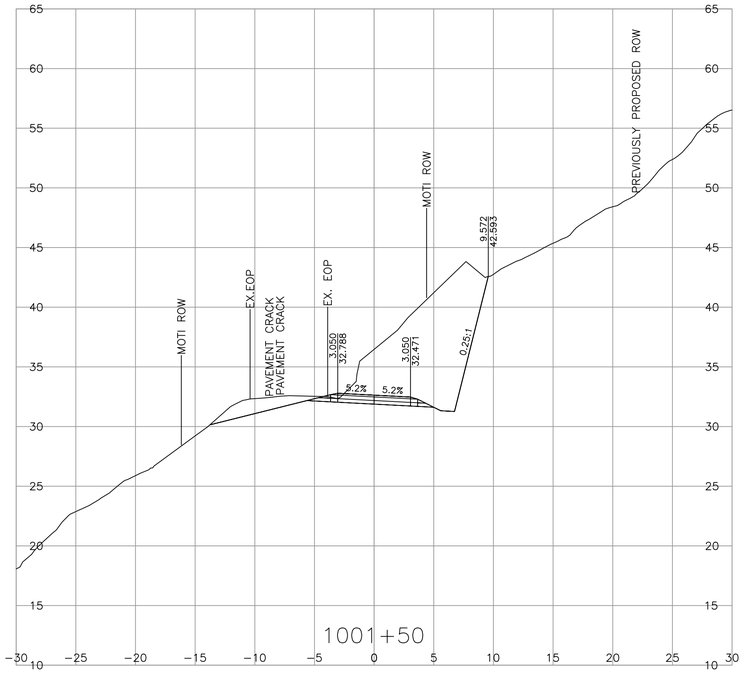
CROSS SECTIONS

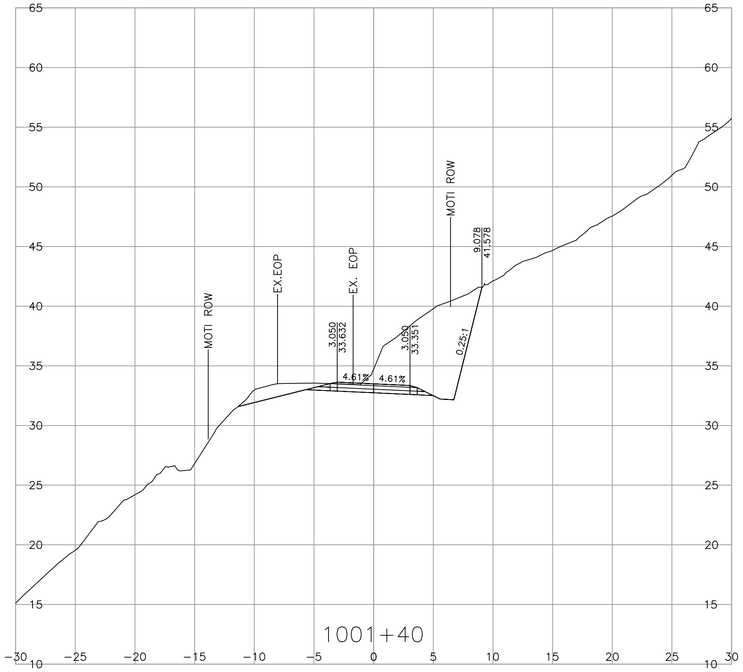
CANAL ROAD REMEDATION

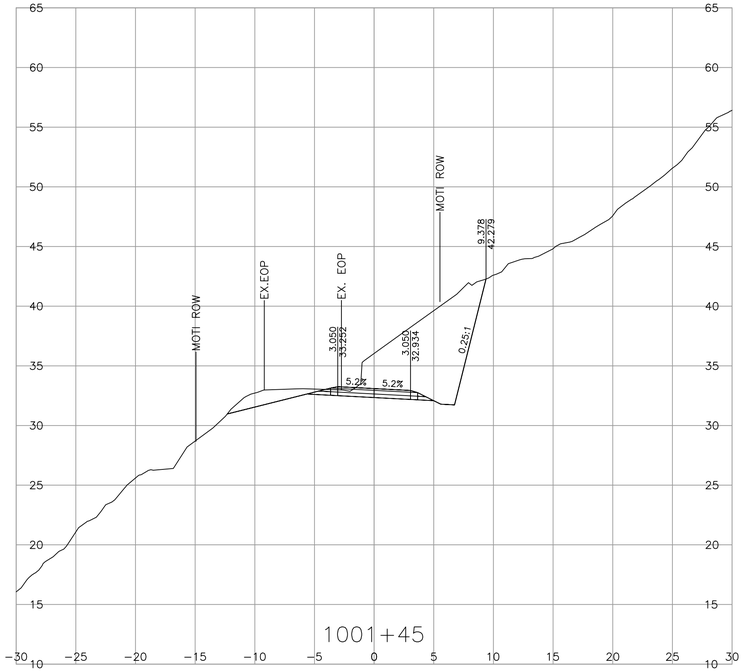
STA. 10+000.000 TO 20+000.000

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A









SCALE		CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17	
REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

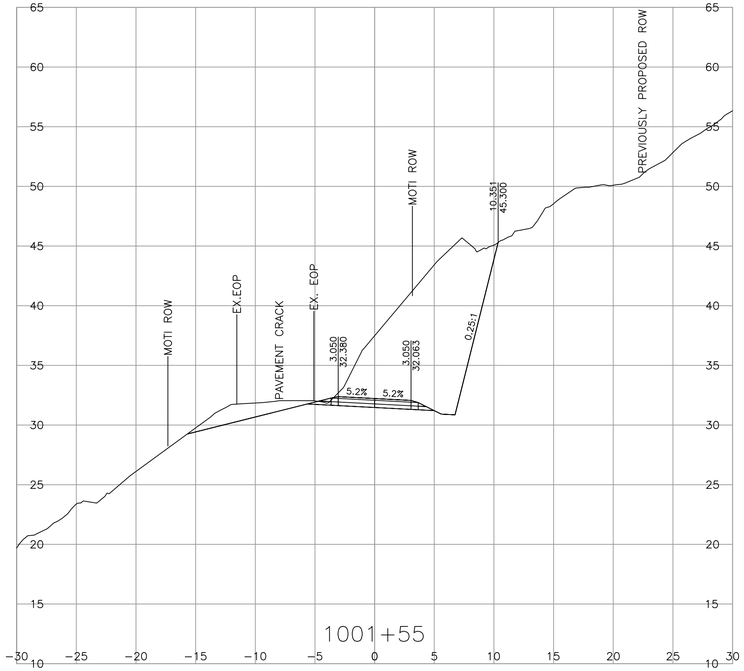
CROSS SECTIONS

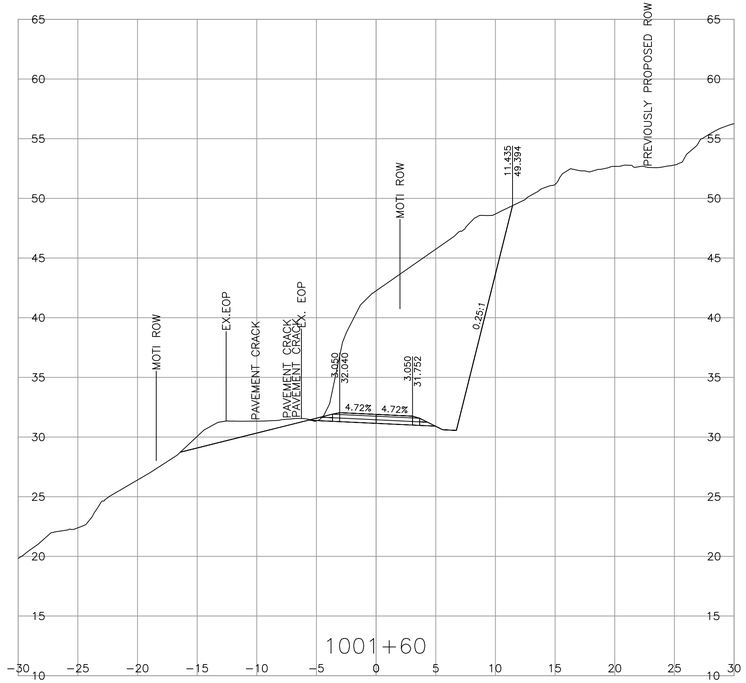
CANAL ROAD REMEDATION

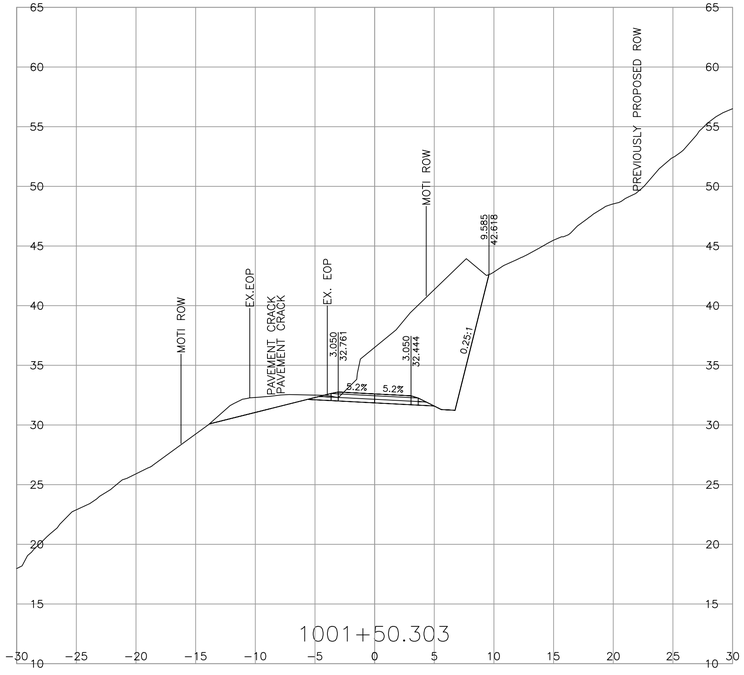
STA. 10+000.000 TO 20+000.000

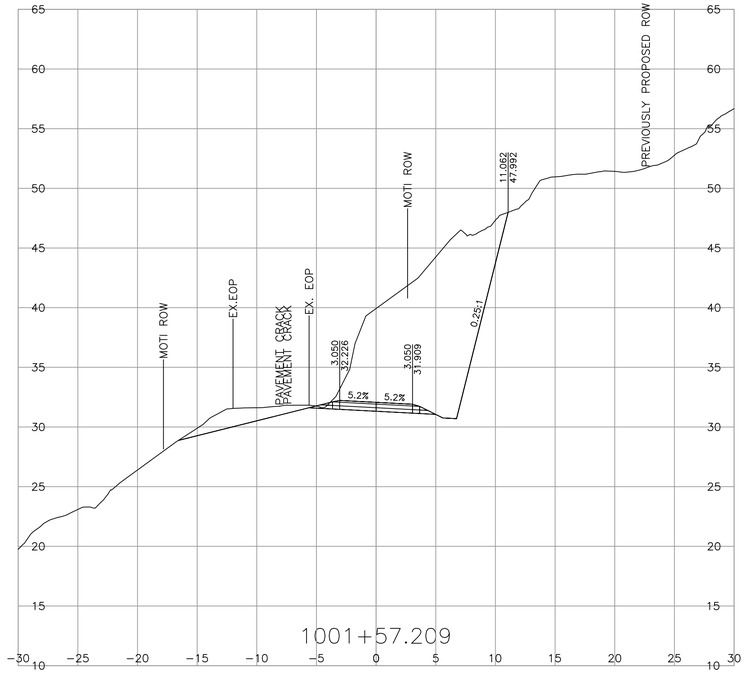
FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\Drawing\Production\2300_SketchDrawings\CROSS-SECTIONS.dwg









SCALE		CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17	
REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

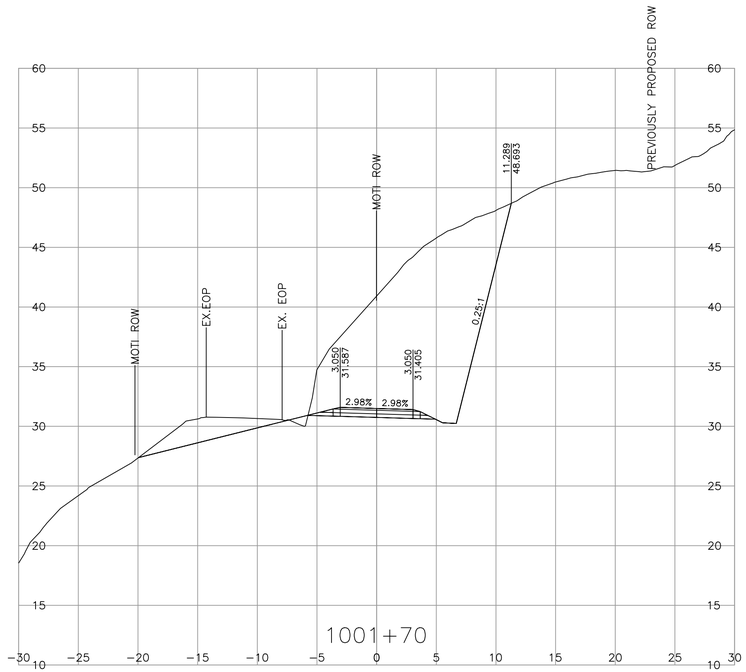
PLAN

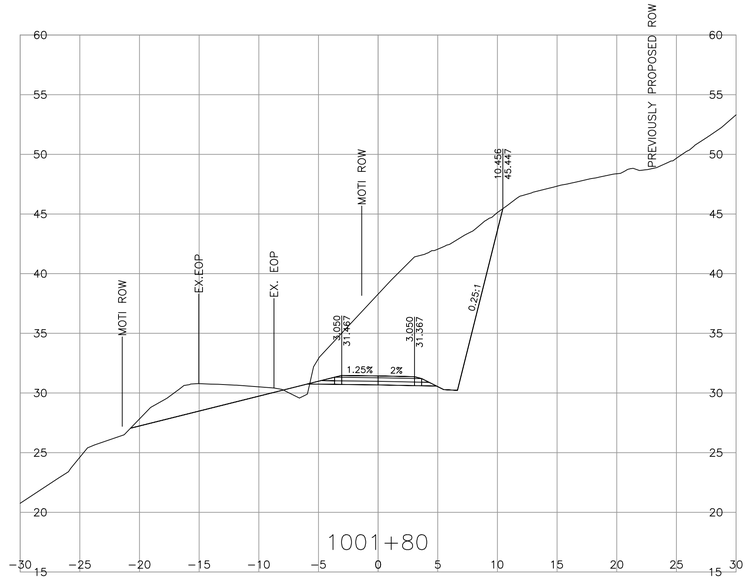
CANAL ROAD REMEDATION

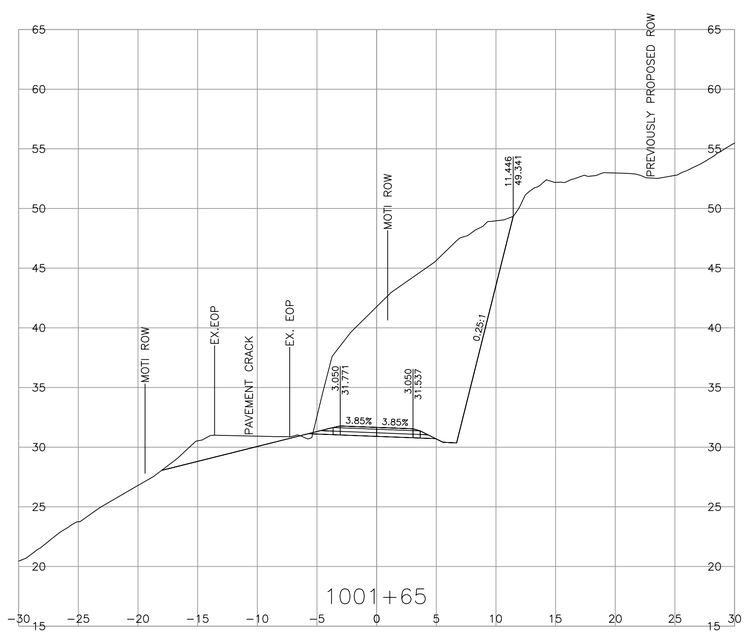
STA. 10+000.000 TO 20+000.000

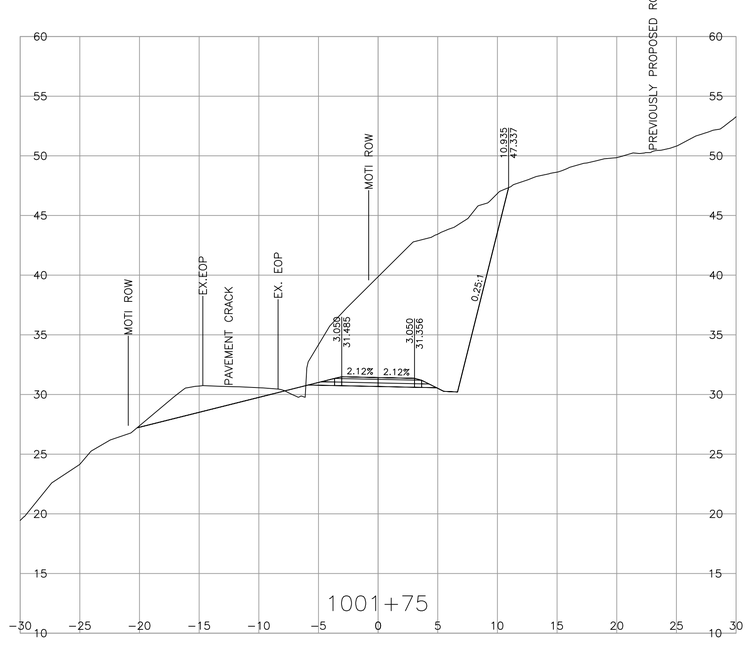
FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\2300_Sketch\Drawings\CROSS-SECTIONS.dwg









SCALE		CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17	
REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED	A. PAN	DATE 2022-04-01
QUALITY CONTROL	B. OYSTENSEN	DATE 2022-04-01
QUALITY ASSURANCE	J. PINTO	DATE 2022-04-01
DRAWN	G. HAROON	DATE 2022-04-01

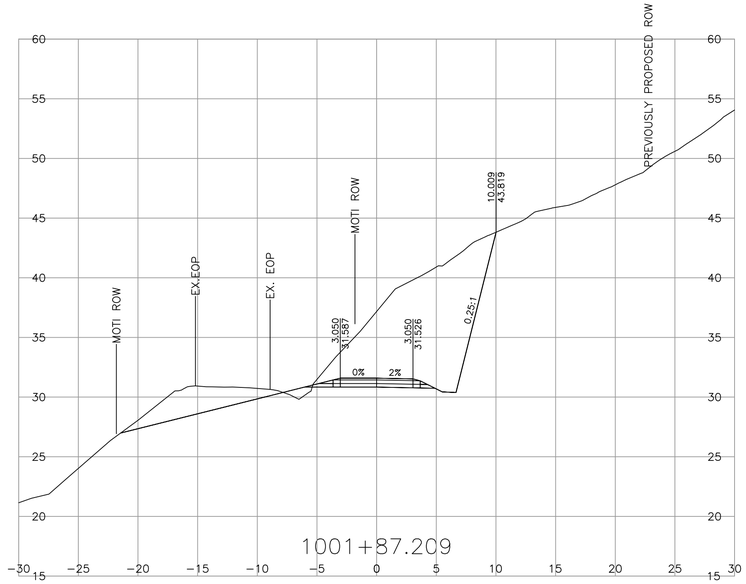
PLAN

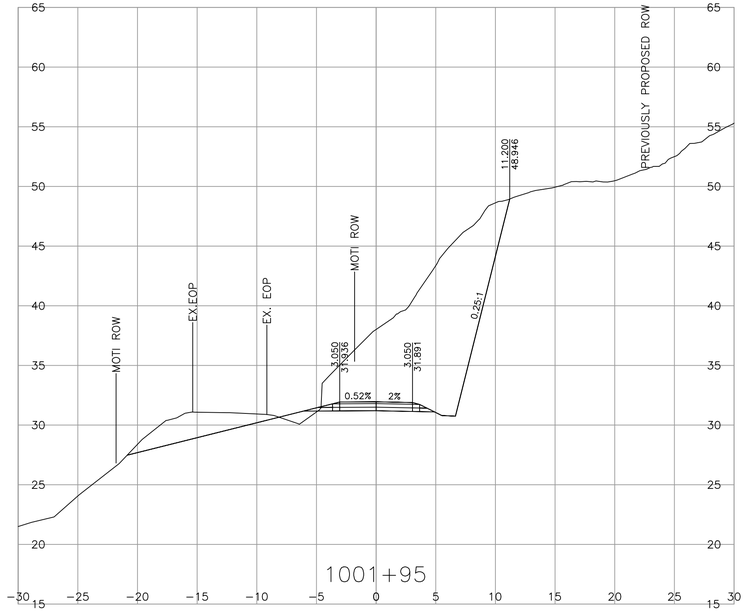
CANAL ROAD REMEDATION

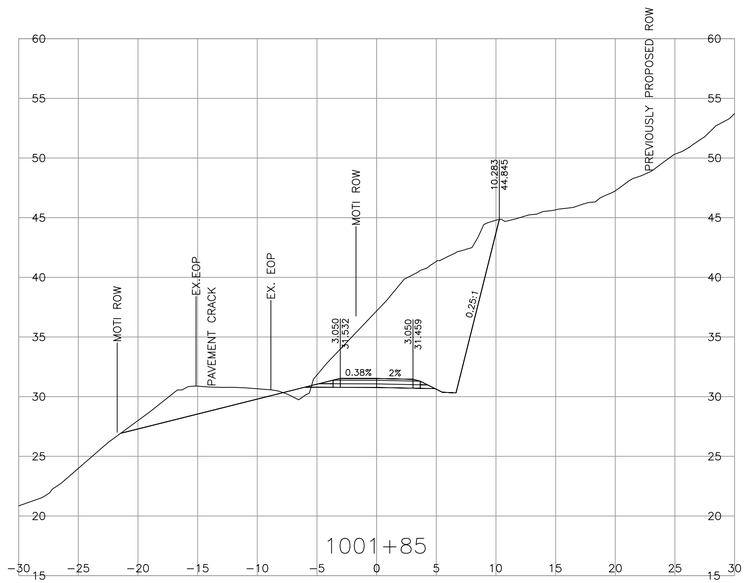
STA. 10+000.000 TO 20+000.000

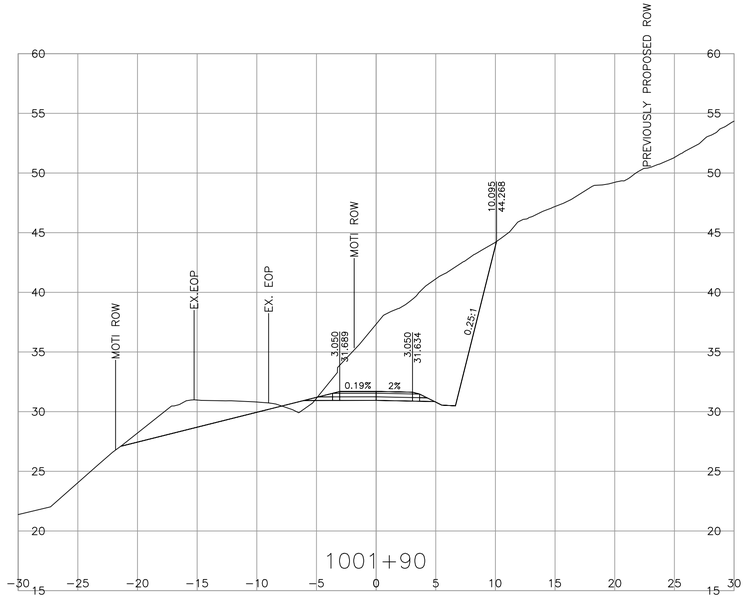
FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\2300_SketchDrawings\CROSS-SECTIONS.dwg









SCALE		CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17	
REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

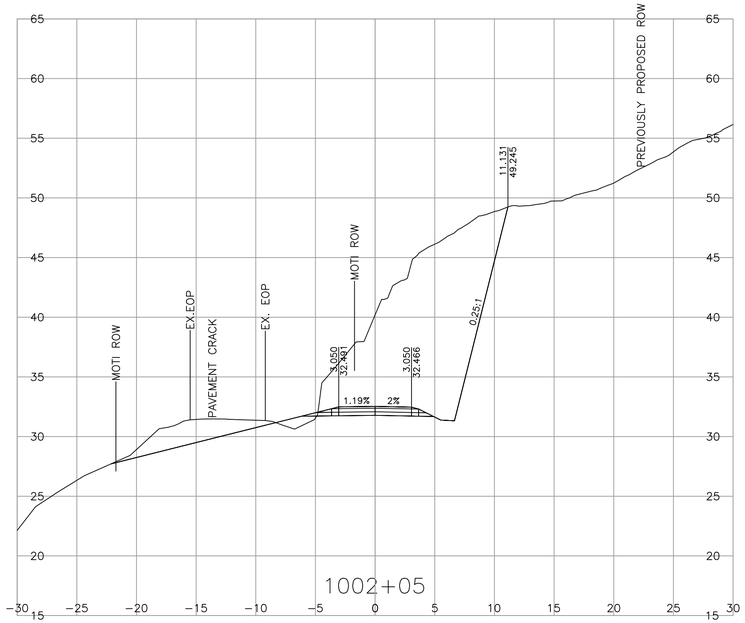
CROSS SECTIONS

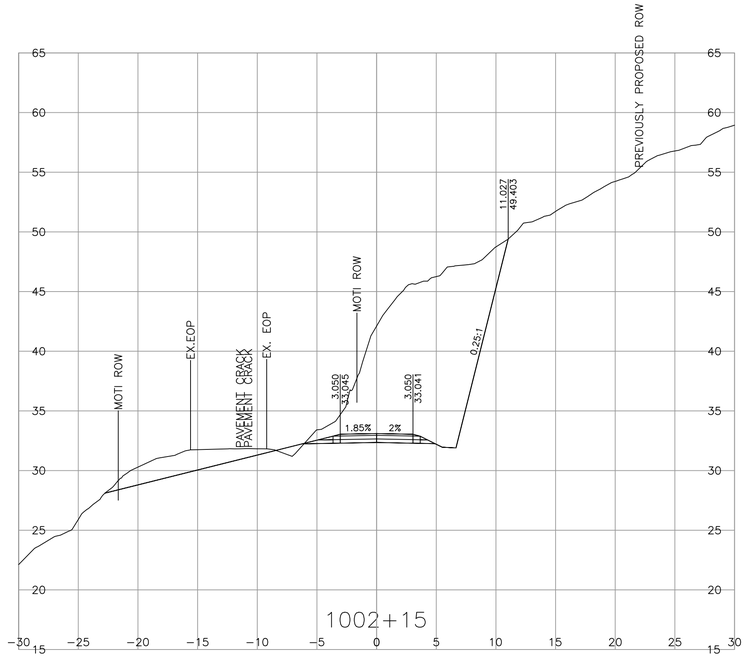
CANAL ROAD REMEDATION

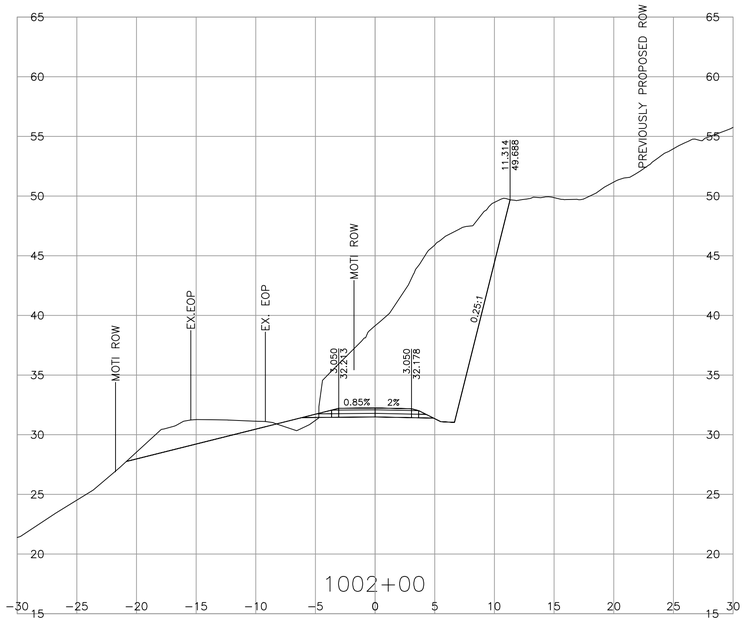
STA. 10+000.000 TO 20+000.000

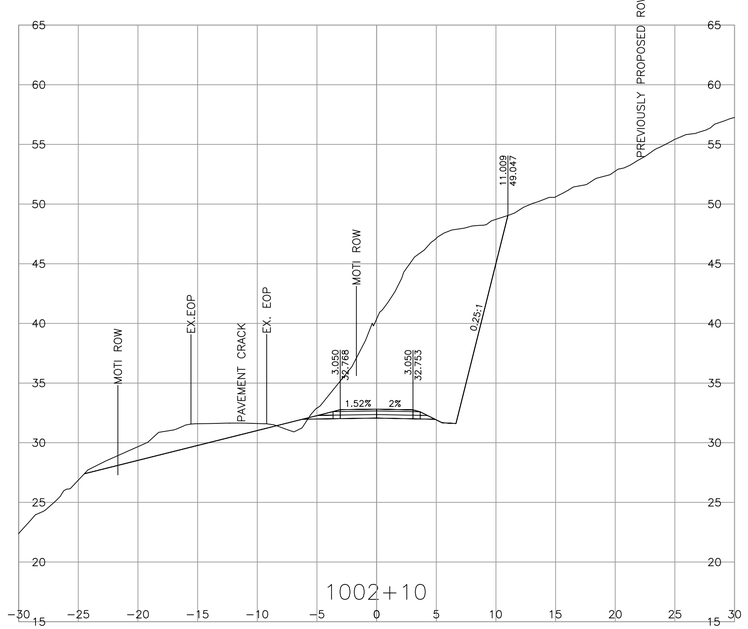
FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\Canalroad\Drawingproduction\2300_Sketchdrawings\CROSS-SECTIONS.dwg









SCALE			CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17
REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

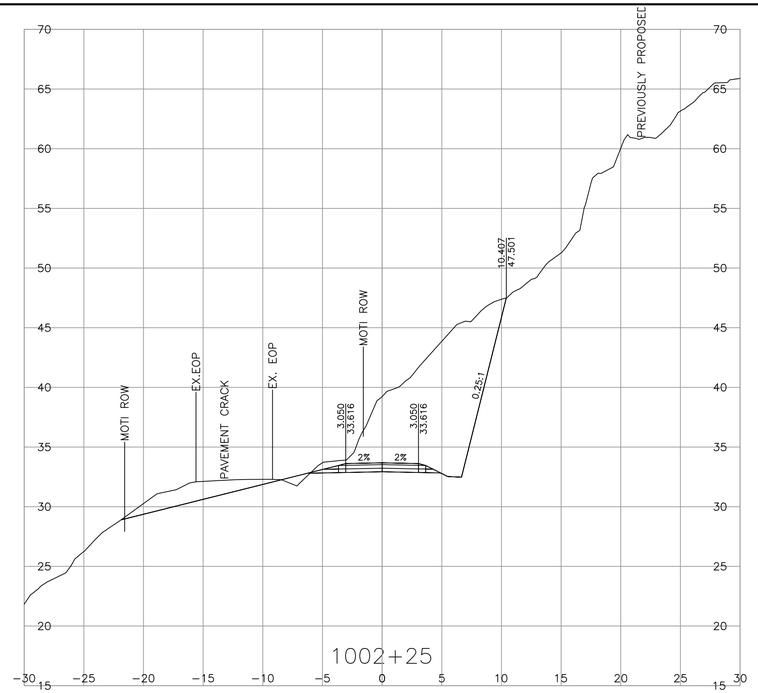
CROSS SECTIONS

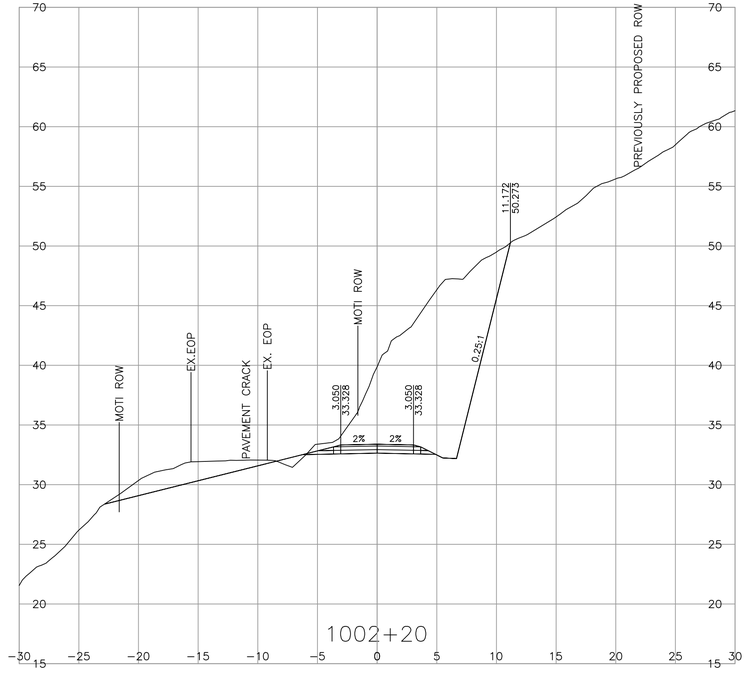
CANAL ROAD REMEDATION

STA. 10+000.000 TO 20+000.000

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\Drawing\Production\2300_Sketchdrawings\CROSS-SECTIONS.dwg





SCALE			CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17
REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

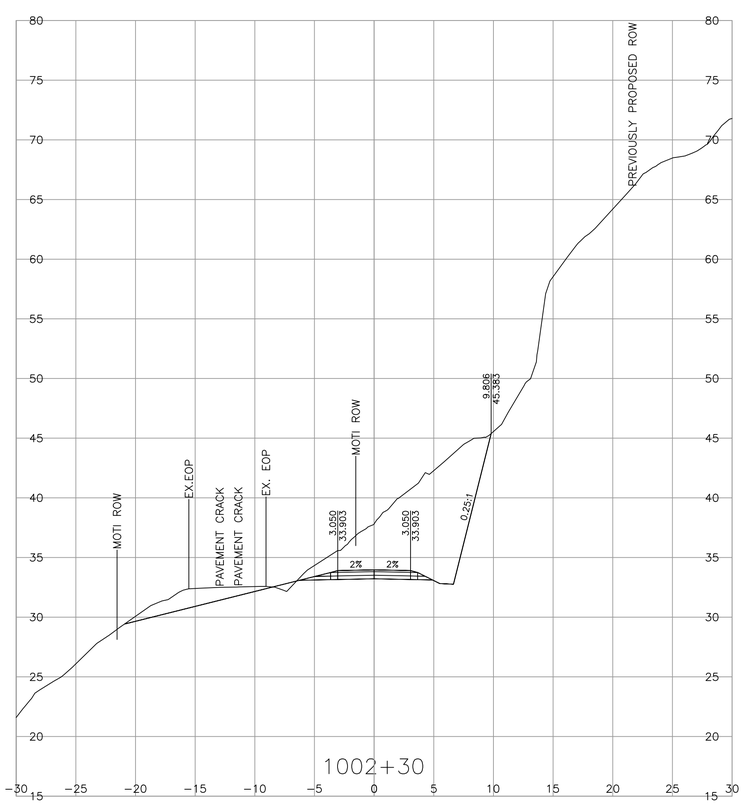
CROSS SECTIONS

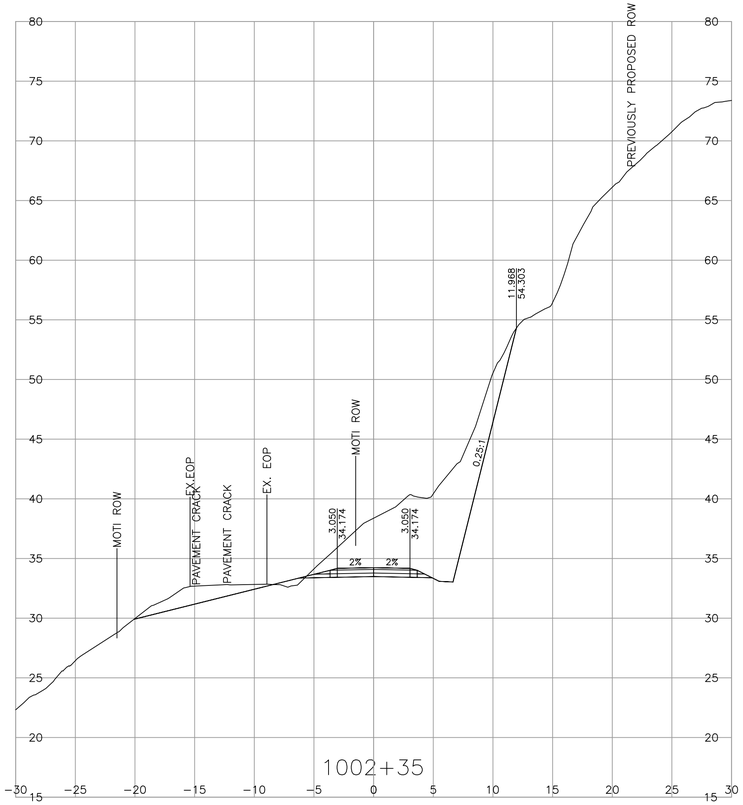
CANAL ROAD REMEDATION

STA. 10+000.000 TO 20+000.000

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\2300_Sketch\Drawings\CROSS-SECTIONS.dwg





SCALE			CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17
REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

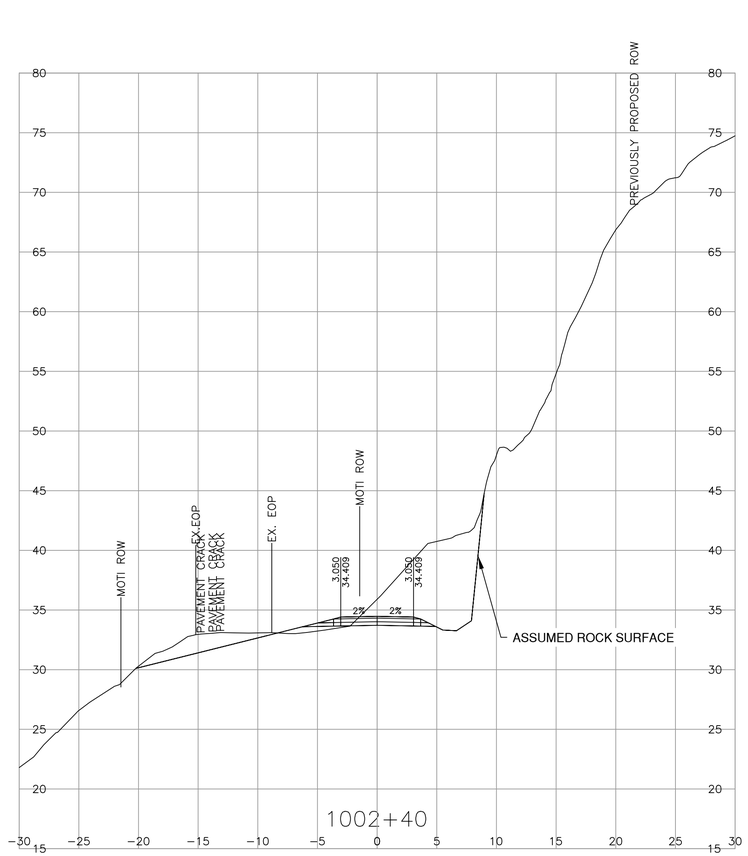
CROSS SECTIONS

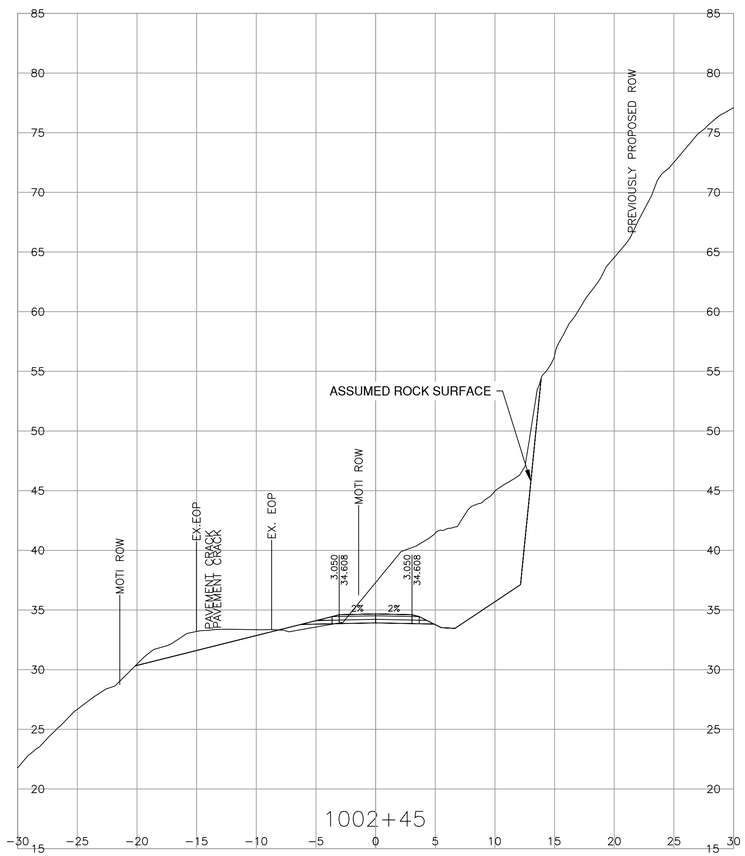
CANAL ROAD REMEDATION

STA. 10+000.000 TO 20+000.000

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\V2300_Sketch\Drawings\CROSS-SECTIONS.dwg





SCALE			CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17
REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

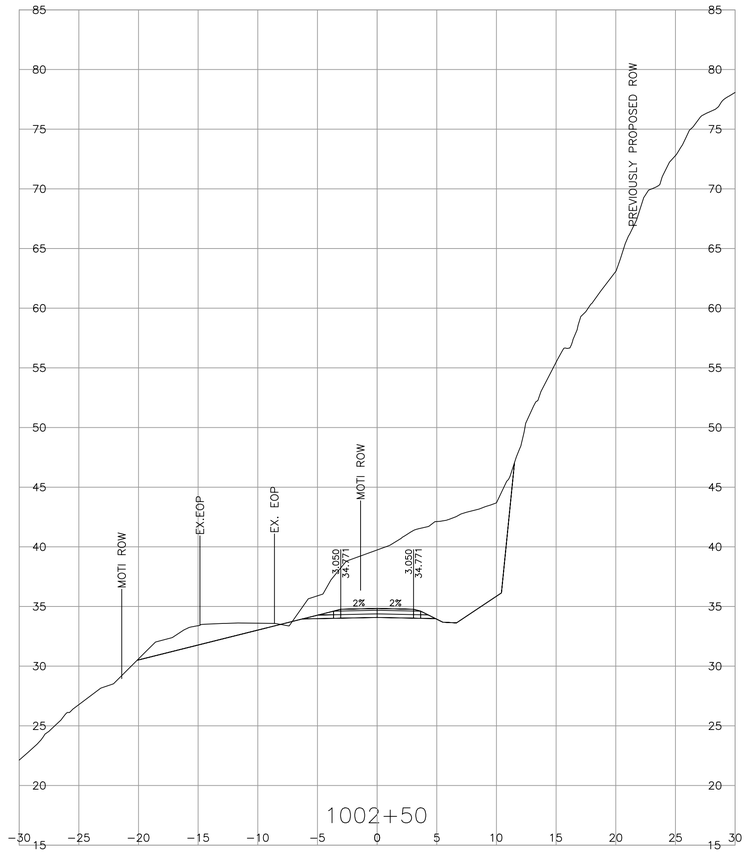
CROSS SECTIONS

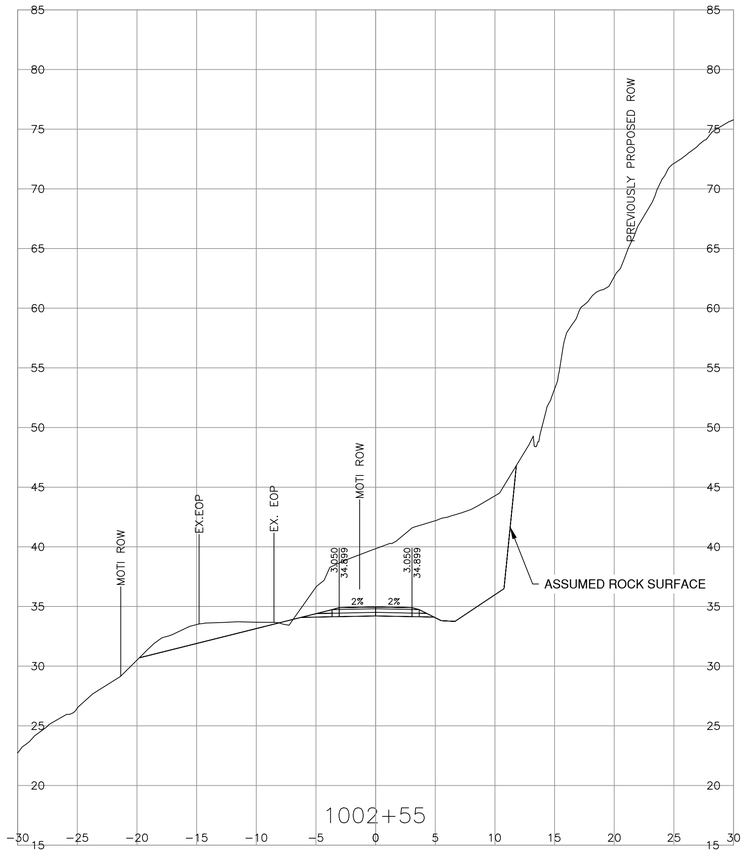
CANAL ROAD REMEDATION

STA. 10+000.000 TO 20+000.000

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\2000_SketchDrawings\CROSS-SECTIONS.dwg





PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\2300_SketchDrawings\CROSS-SECTIONS.dwg

SCALE

CAD FILENAME CROSS-SECTIONS
PLOT DATE 2022-03-17

REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

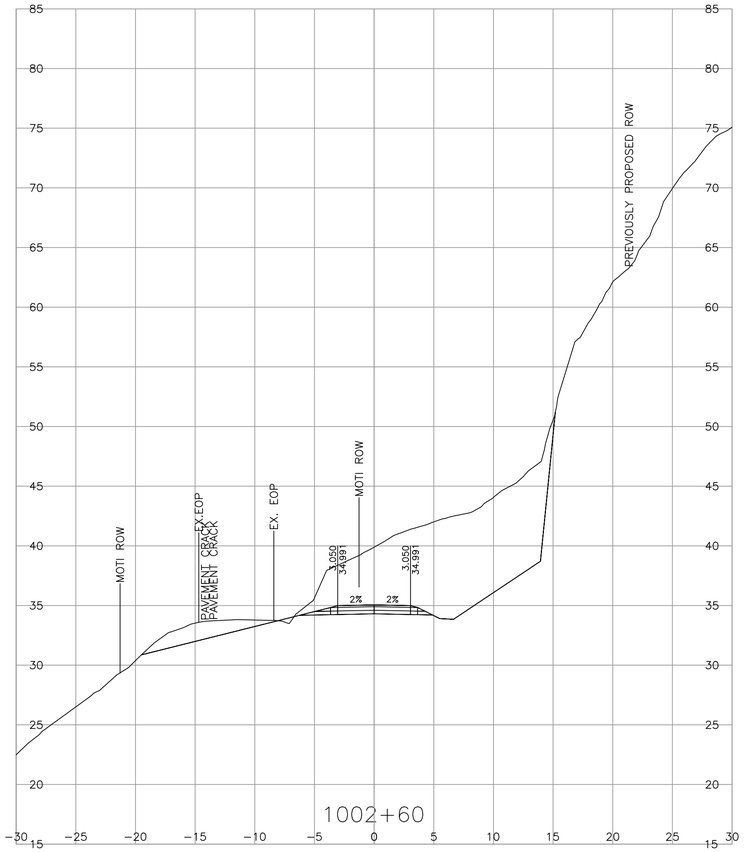
DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

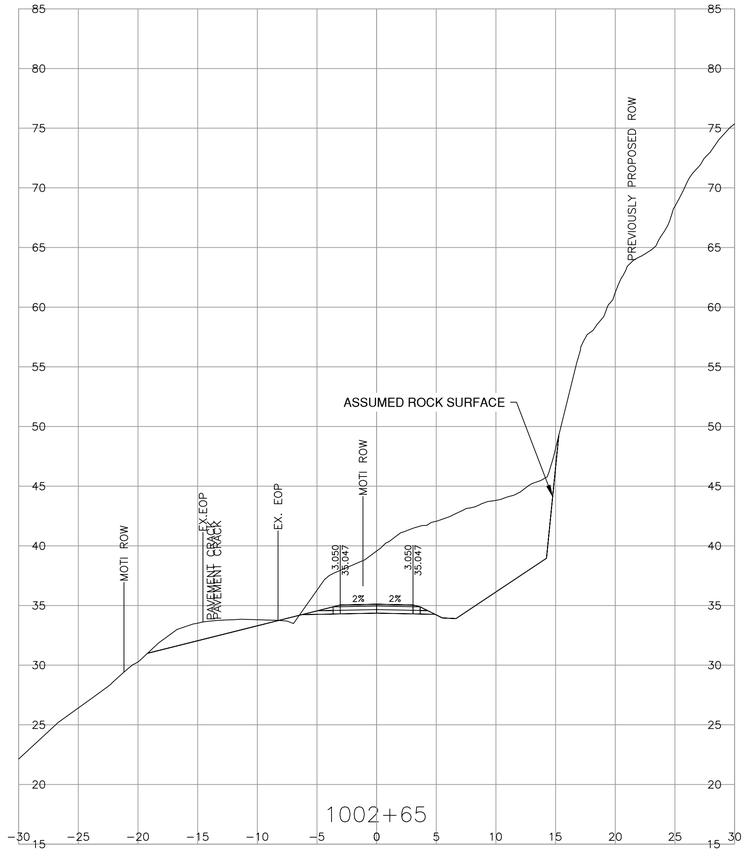
CROSS SECTIONS

CANAL ROAD REMEDATION

STA. 10+000.000 TO 20+000.000

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A





SCALE

CAD FILENAME CROSS-SECTIONS
PLOT DATE 2022-03-17

REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

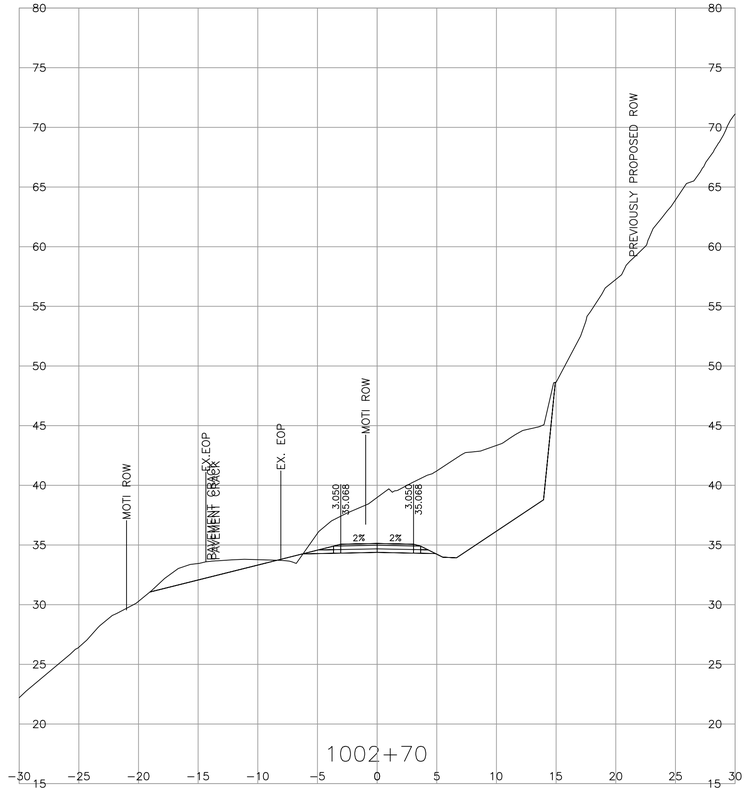
CROSS SECTIONS

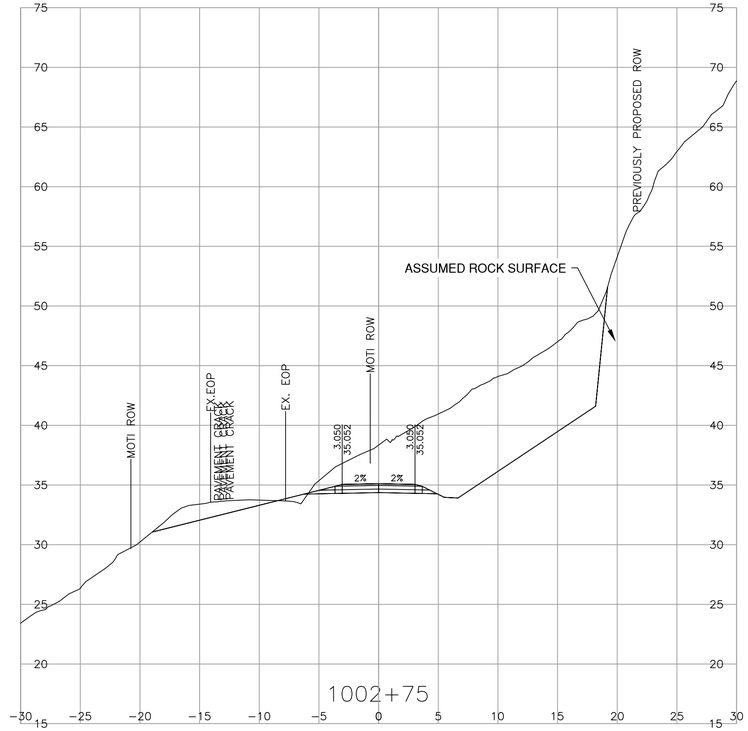
CANAL ROAD REMEDATION

STA. 10+000.000 TO 20+000.000

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\2300_SketchDrawings\CROSS-SECTIONS.dwg





PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\Drawingproduction\2300_Sketchdrawings\CROSS-SECTIONS.dwg

SCALE

CAD FILENAME CROSS-SECTIONS
PLOT DATE 2022-03-17

REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

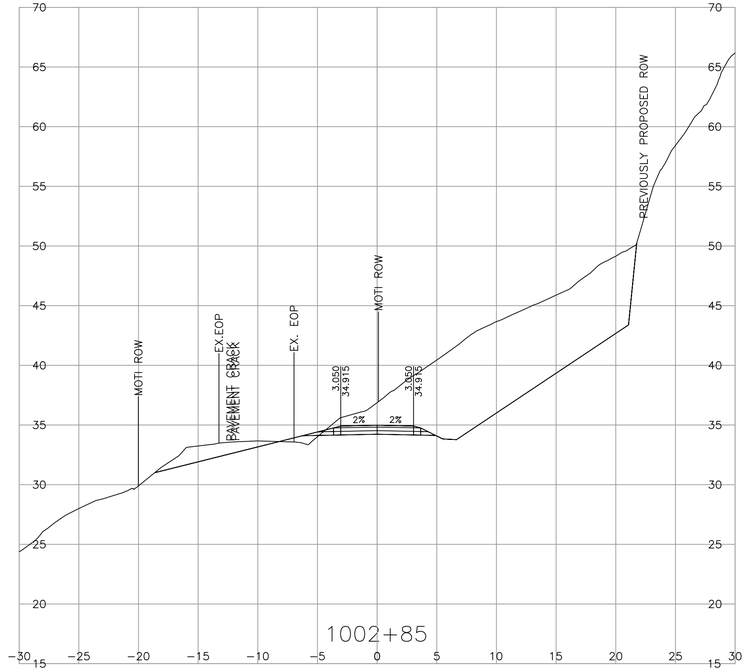
DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

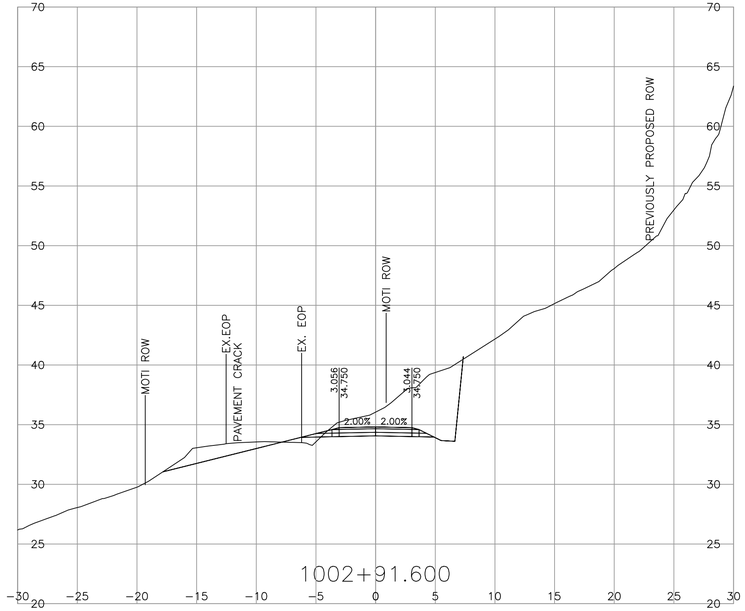
CROSS SECTIONS

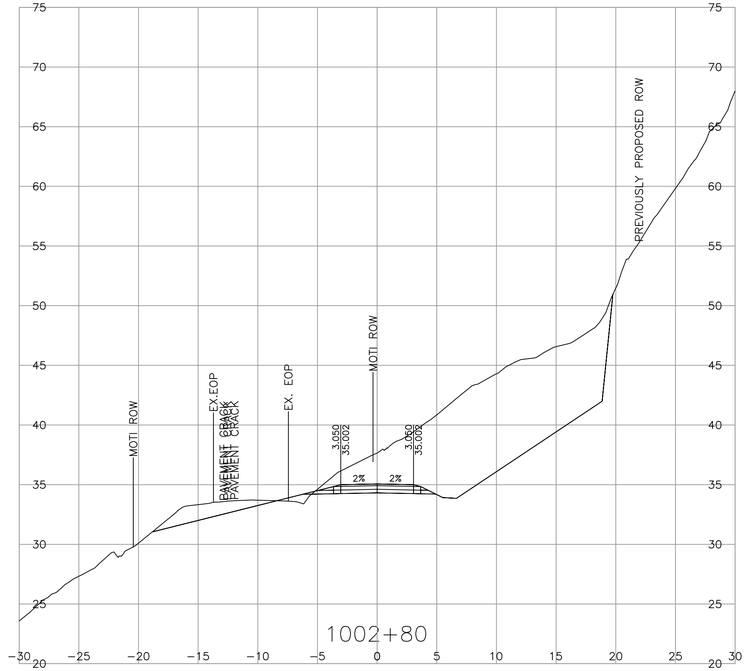
CANAL ROAD REMEDATION

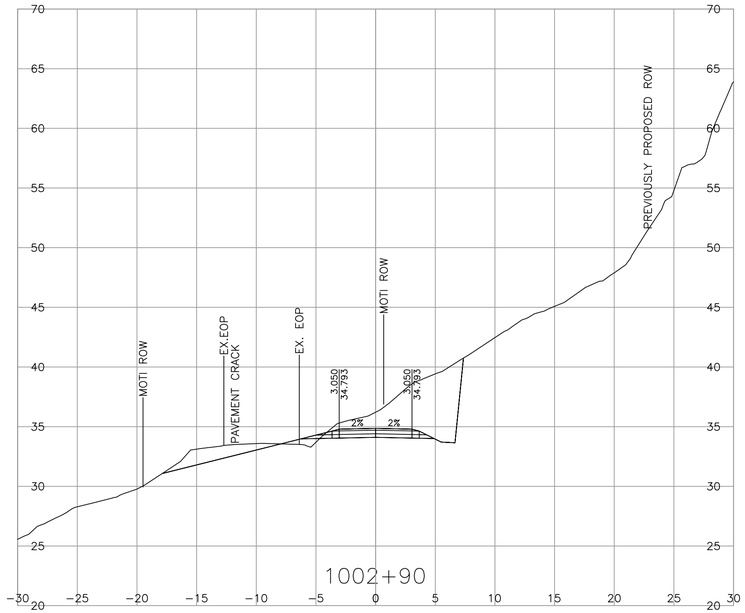
STA. 10+000.000 TO 20+000.000

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A









PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\2300_SketchDrawings\CROSS-SECTIONS.dwg

SCALE

CAD FILENAME CROSS-SECTIONS
PLOT DATE 2022-03-17

REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

SENIOR DESIGNER
DATE 2022-04-01

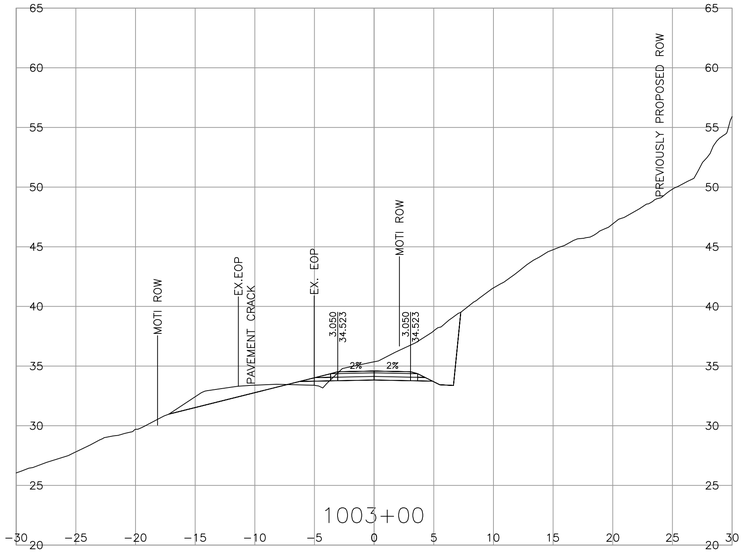
DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

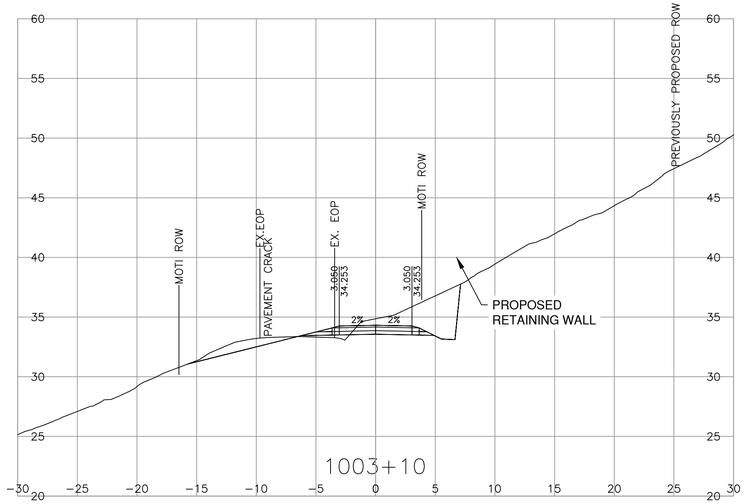
CROSS SECTIONS

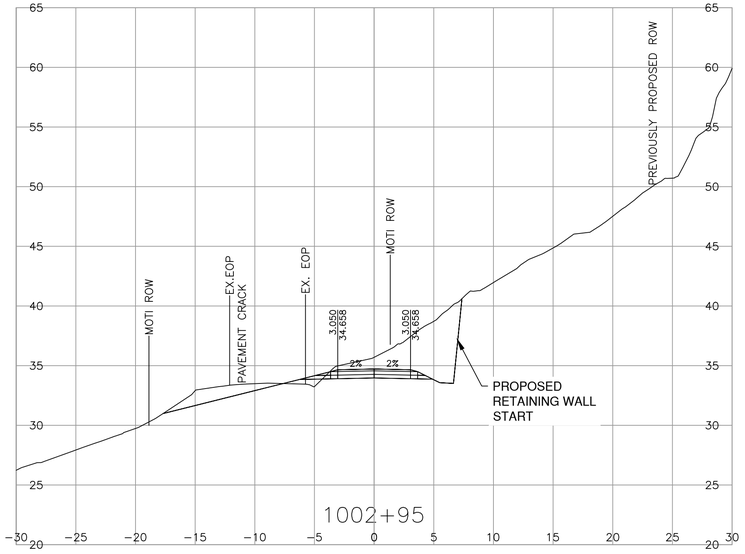
CANAL ROAD REMEDATION

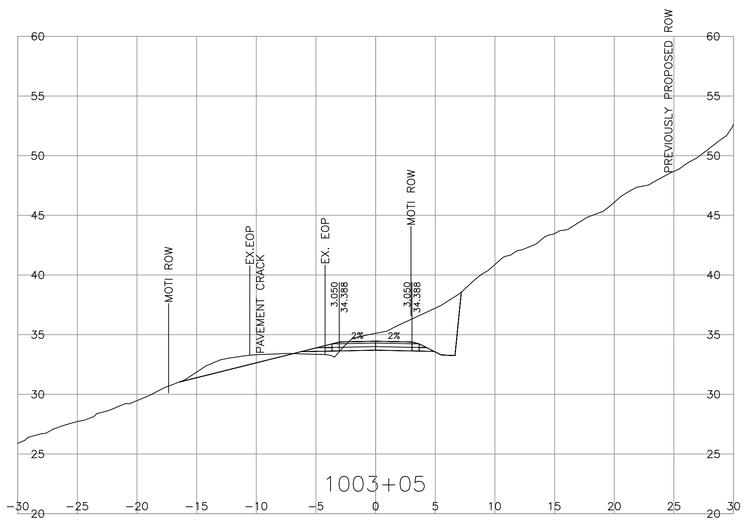
STA. 10+000.000 TO 20+000.000

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A









SCALE			CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17
REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

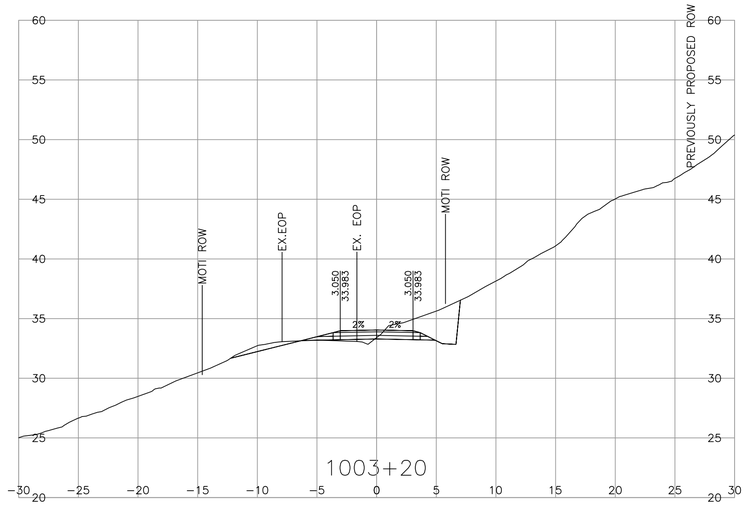
CROSS SECTIONS

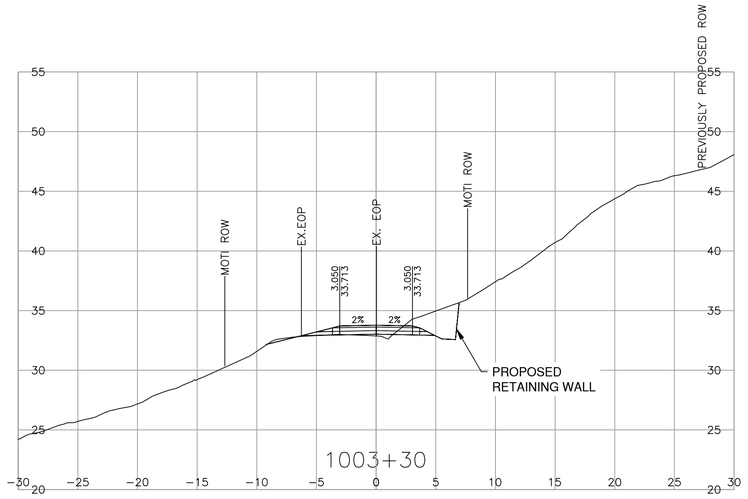
CANAL ROAD REMEDATION

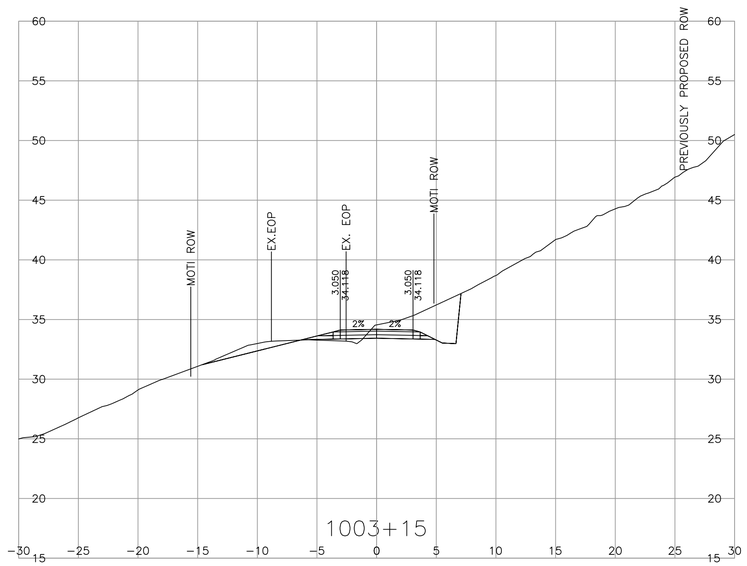
STA. 10+000.000 TO 20+000.000

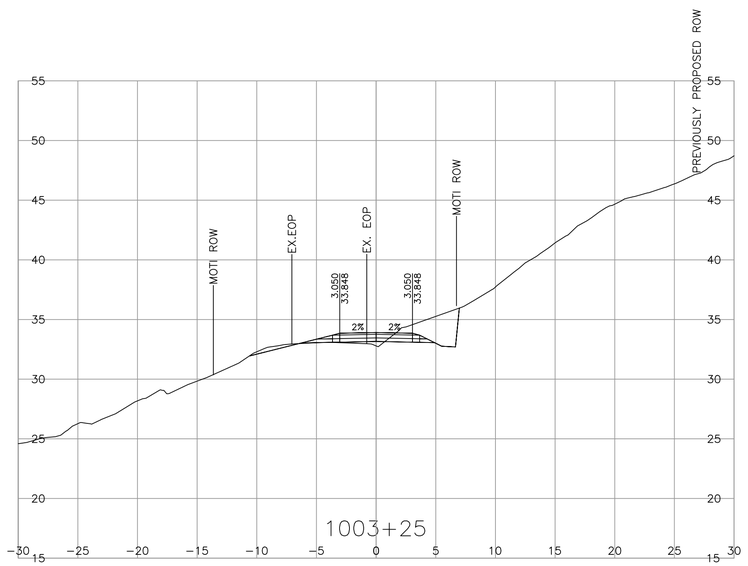
FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\X300_SketchDrawings\CROSS-SECTIONS.dwg









SCALE		CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17	
REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

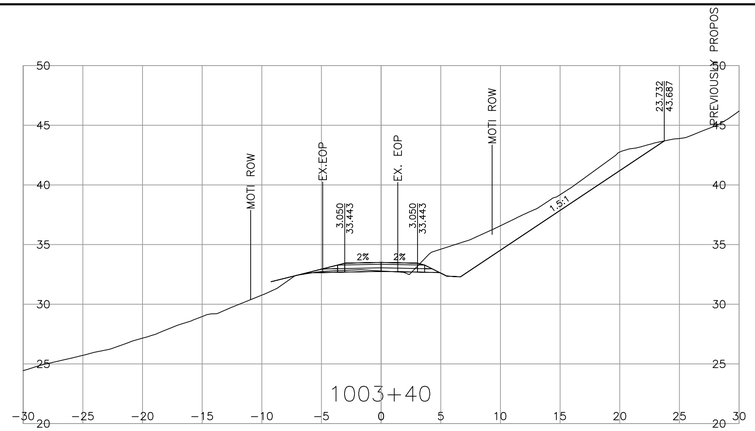
CROSS SECTIONS

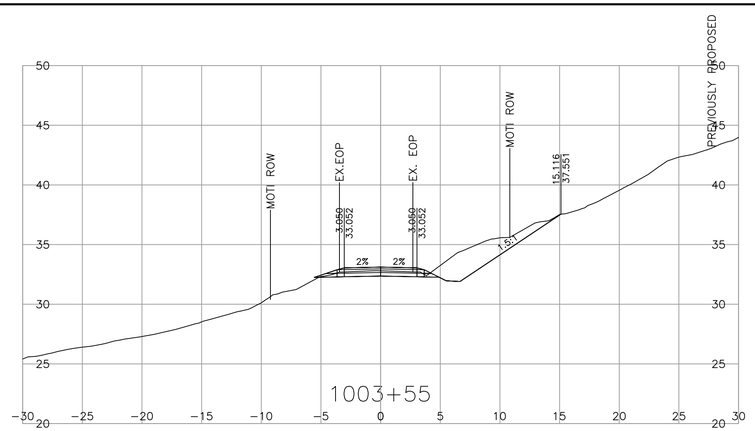
CANAL ROAD REMEDATION

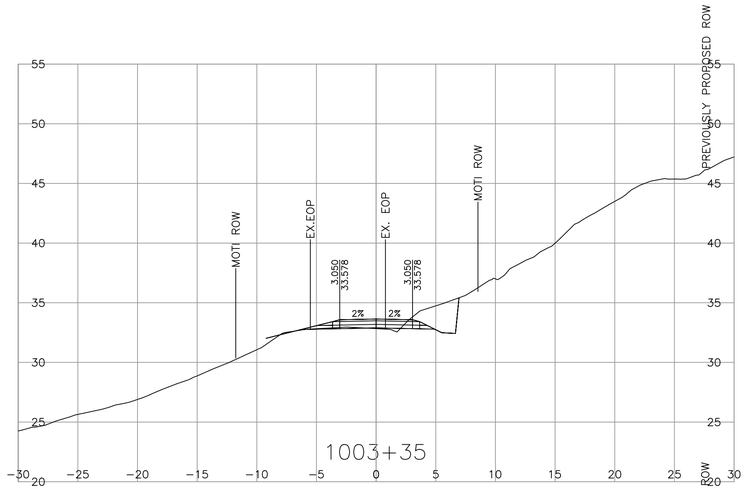
STA. 10+000.000 TO 20+000.000

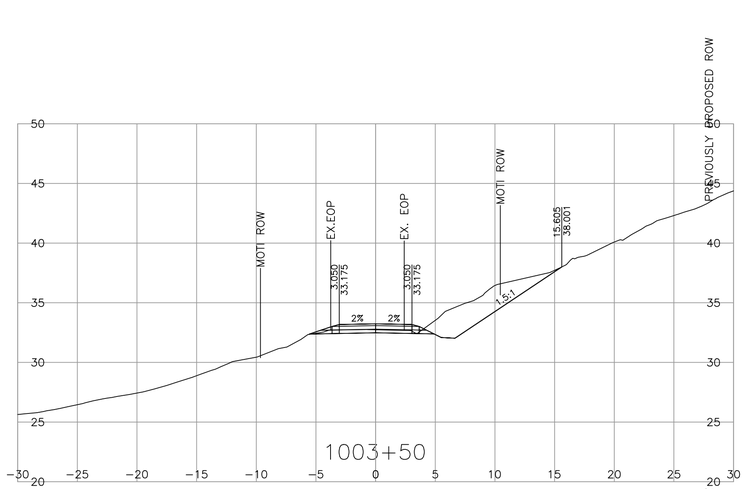
FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

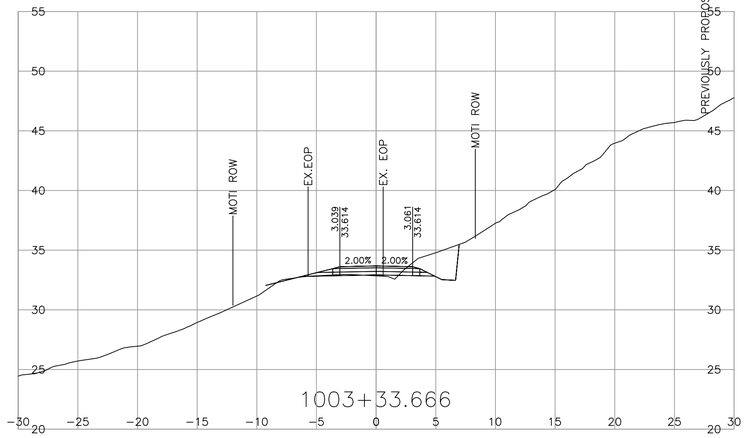
PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\2300_SketchDrawings\CROSS-SECTIONS.dwg

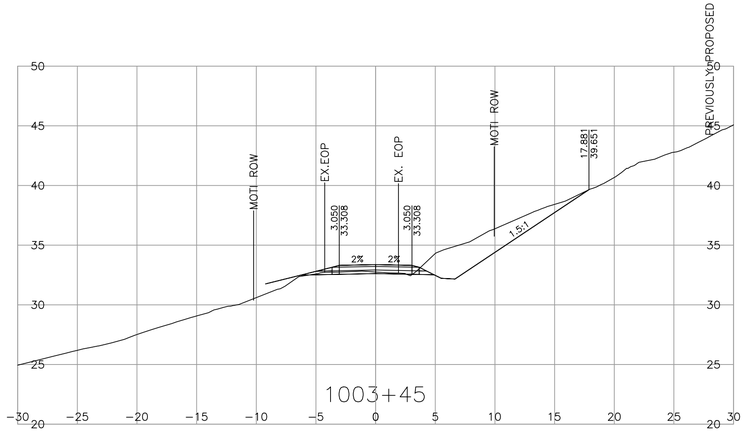












PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering \CanalRoad \drawingProduction \2300_SketchDrawings \CROSS-SECTIONS.dwg

SCALE

CAD FILENAME CROSS-SECTIONS
PLOT DATE 2022-03-17

REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

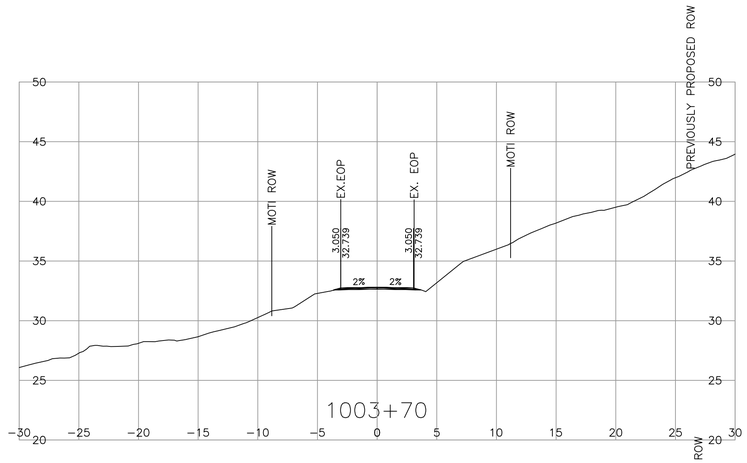
DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

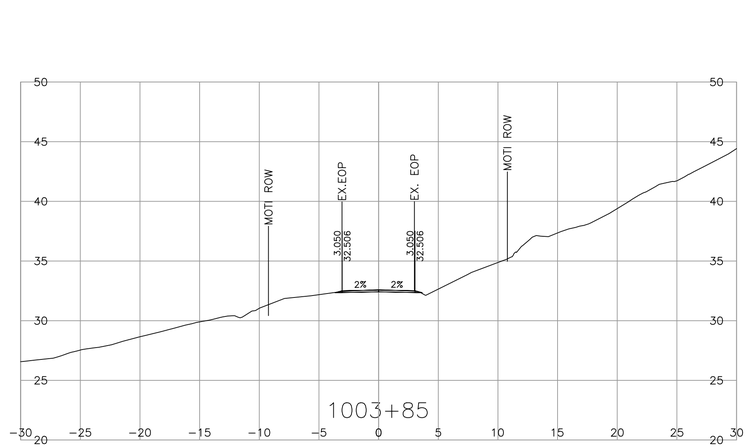
CROSS SECTIONS

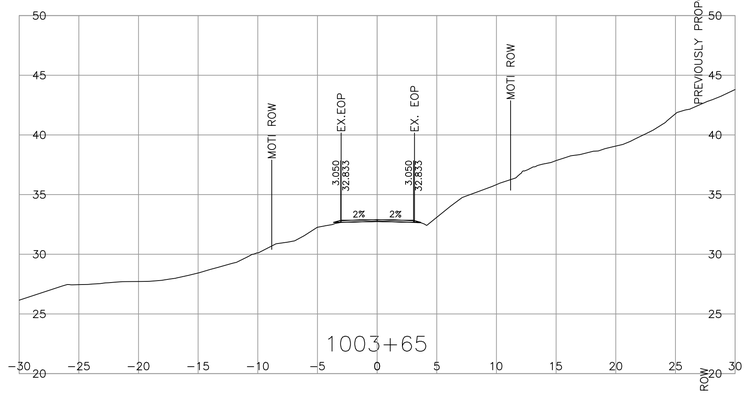
CANAL ROAD REMEDATION

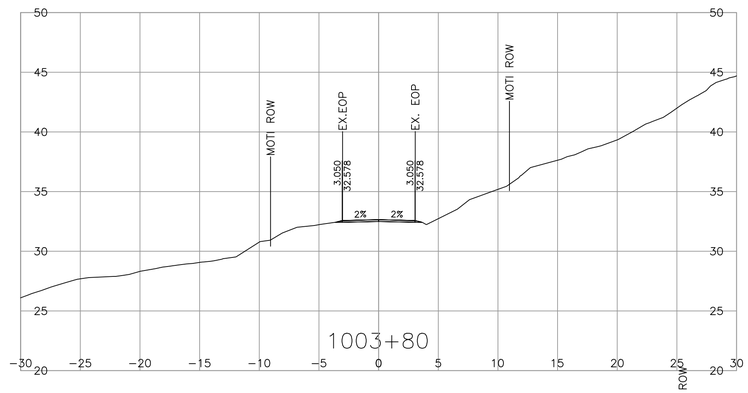
STA. 10+000.000 TO 20+000.000

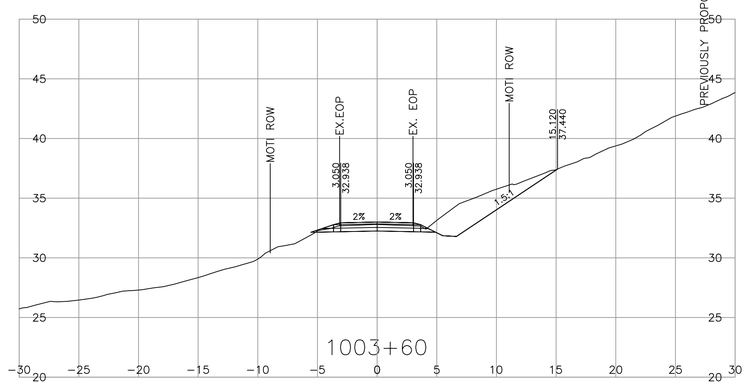
FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

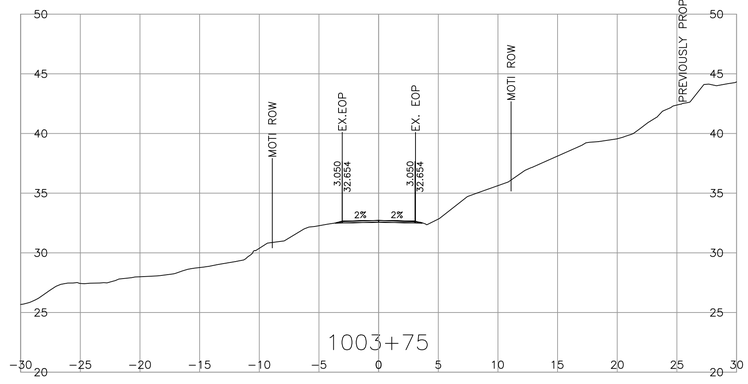












SCALE		CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17	
REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

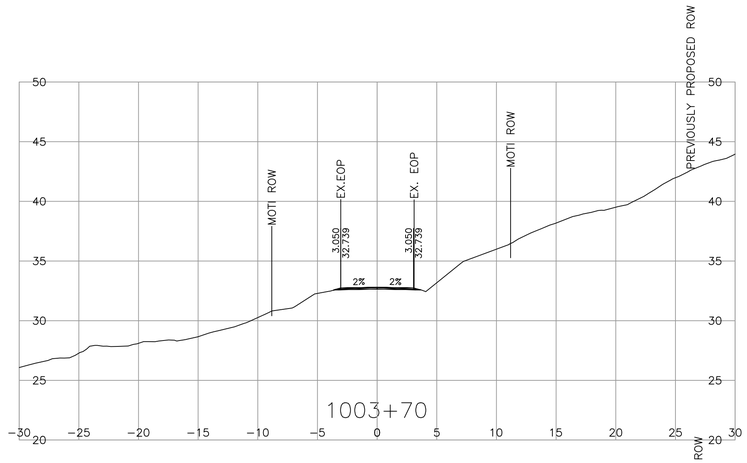
CROSS SECTIONS

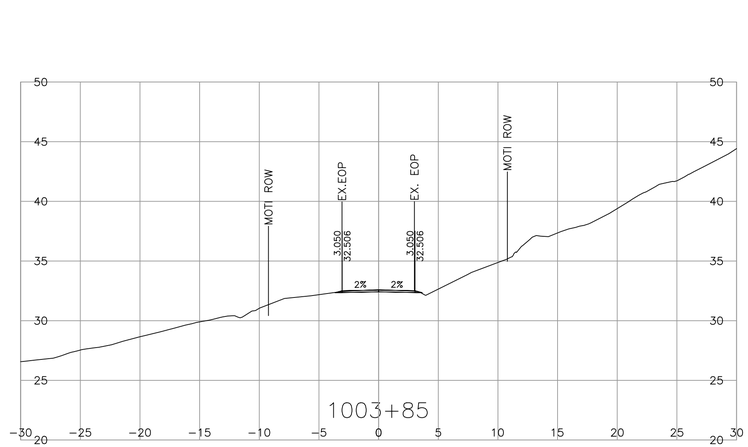
CANAL ROAD REMEDATION

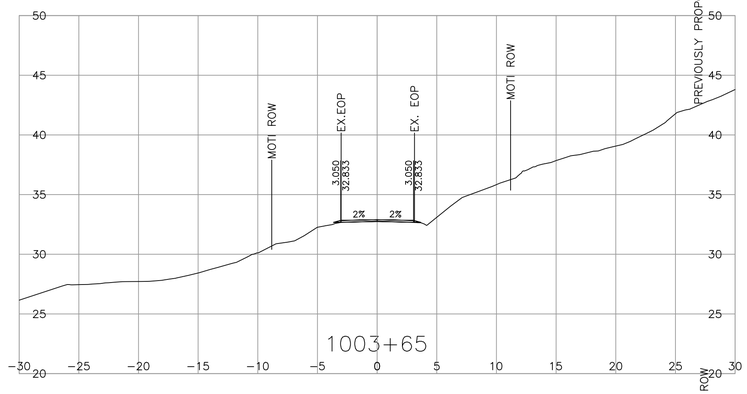
STA. 10+000.000 TO 20+000.000

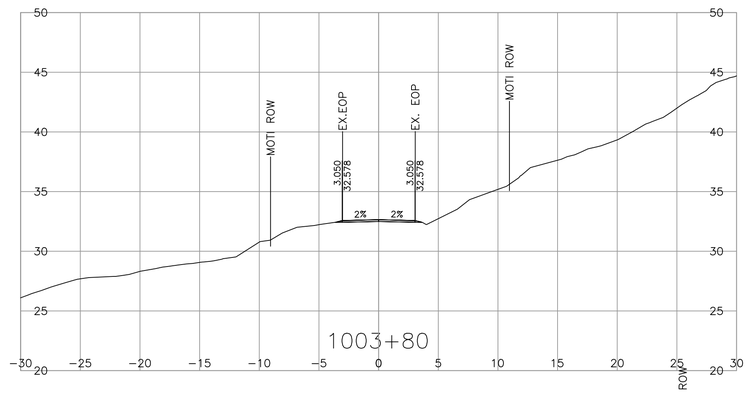
FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

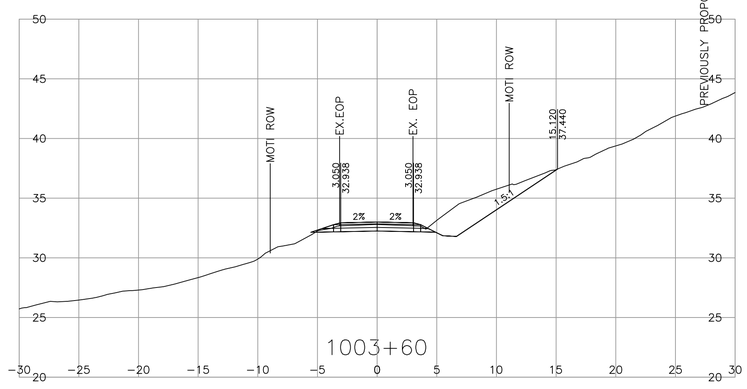
PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\Y300_SketchDrawings\CROSS-SECTIONS.dwg

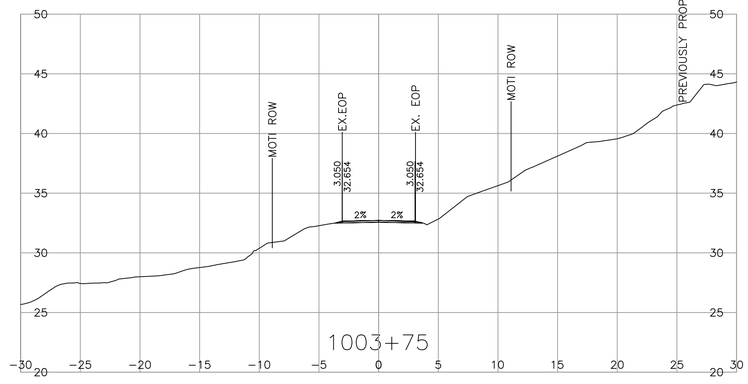












SCALE		CAD FILENAME CROSS-SECTIONS PLOT DATE 2022-03-17	
REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

BRITISH COLUMBIA

MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
NORTHERN REGION
HIGHWAY ENGINEERING AND GEOMATICS

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

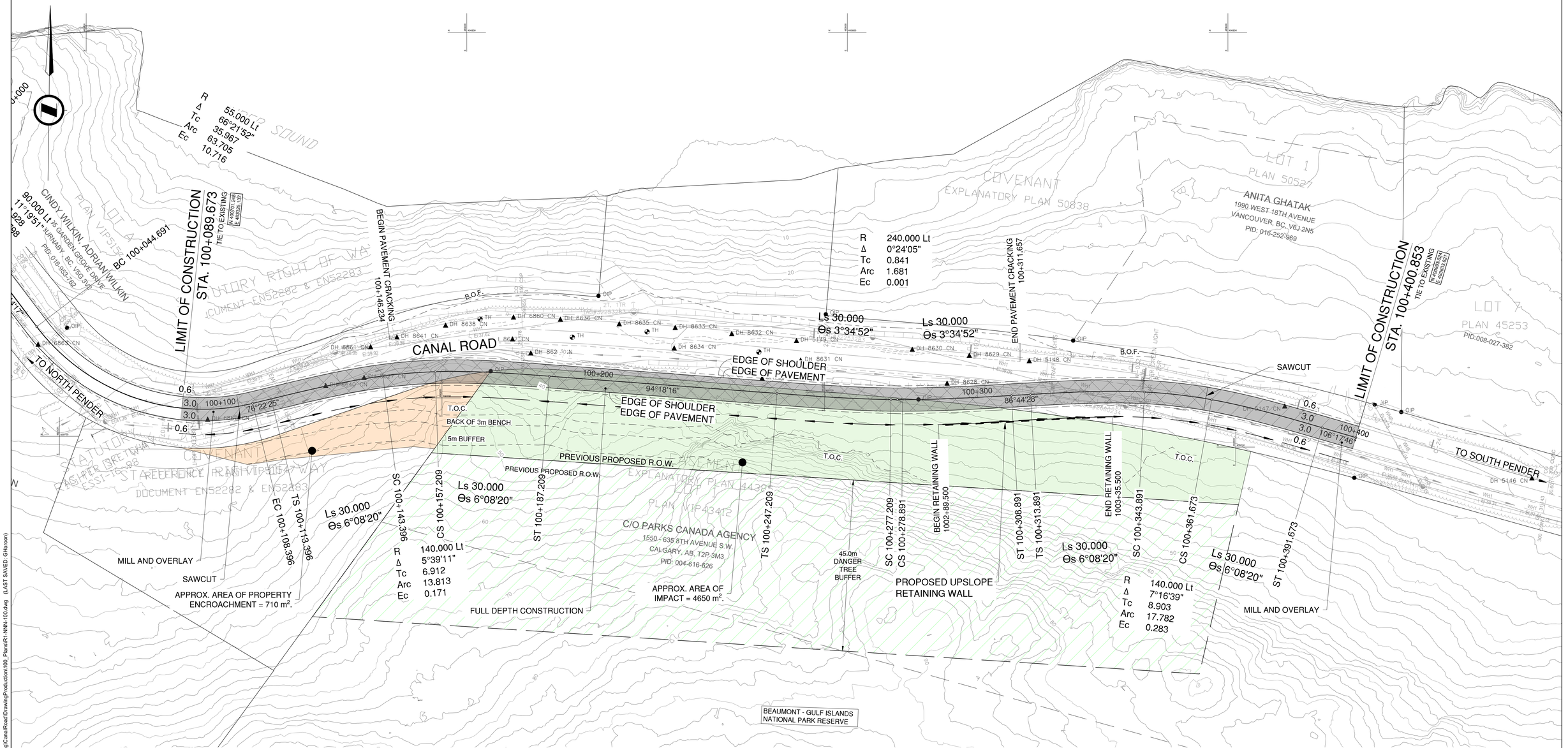
CROSS SECTIONS

CANAL ROAD REMEDATION

STA. 10+000.000 TO 20+000.000

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	CROSS-SECTIONS	A

PLOT DATE: 2022/03/17 X:\2121\2121-00865-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\Y300_SketchDrawings\CROSS-SECTIONS.dwg



FOR DISCUSSION ONLY

CL. & GR. TOTAL THIS SHEET= 0.0 ha

ALIGNMENT	CLASSIFICATION	DESIGN SPEED
CANAL ROAD (L100)	MINOR RURAL (IT)	50 km/hr

REFERENCE DRAWINGS	
PROFILE	R1-NNN-201

McElhanney
Suite 200
858 Beatty Street
Vancouver BC
Canada V6B 1C1
Tel 604 683 8521

SCALE 0 5 1:500 25m

CAD FILENAME R1-NNN-100
PLOT DATE 2022-03-17

REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

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

PLAN

CANAL ROAD REMEDIATION

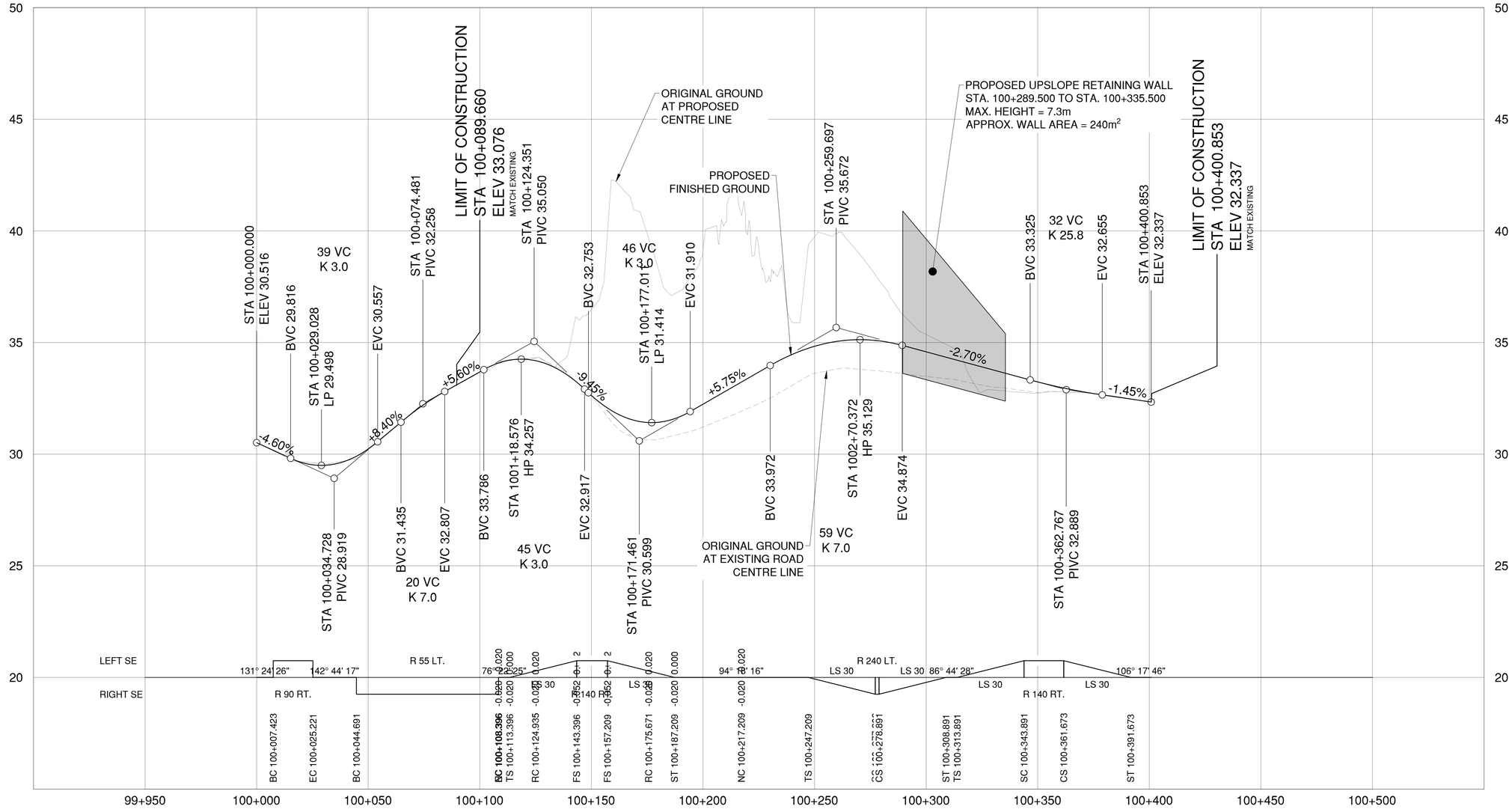
STA. 100+089.660 TO STA. 100+400.853

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	R1-NNN-101	A

PRINTED: March 17, 2022 - 4:41 PM
CAD FILE: X:\21\12\121-00985-09 MoTI - Canal Road Remediation\10.0 DRAWINGS\10.13 Engineering\CanalRoad\Drawing\Production\100_Plans\R1-NNN-100.dwg (LAST SAVED: GHaroon)



FOR DISCUSSION ONLY

ALIGNMENT	CLASSIFICATION	DESIGN SPEED
CANAL ROAD (L100)	MINOR RURAL (IT)	50 km/hr

REFERENCE DRAWINGS	
PLAN	R1-NNN-101

McElhanney
Suite 200
858 Beatty Street
Vancouver BC
Canada V6B 1C1
Tel 604 683 8521

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 R1-NNN-200
PLOT DATE 2022-03-17

REV	DATE	REVISIONS	NAME
A	2022-04-01	50% DETAILED DESIGN	J. PINTO

PROFILE

CANAL ROAD REMEDIATION

STA. 100+000.000TO STA. 100+400.853

J. PINTO
SENIOR DESIGNER
DATE 2022-04-01

DESIGNED A. PAN DATE 2022-04-01
QUALITY CONTROL B. OYSTENSEN DATE 2022-04-01
QUALITY ASSURANCE J. PINTO DATE 2022-04-01
DRAWN G. HAROON DATE 2022-04-01

FILE NUMBER	PROJECT NUMBER	REG	DRAWING NUMBER	REV
153CS0766	12478-000	1	R1-NNN-201	----

PRINTED: March 17, 2022 - 4:37 PM
CAD FILE: X:\21\12\12\12\0086-09 Mo11 - Canal Road Remediation\10.0 DRAWINGS\10.3 Engineering\CanalRoad\DrawingProduction\200_Profiles\R1-NNN-200.dwg (LAST SAVED: GHaroon)

APPENDIX D
Record of Consultation

Ministry of Transportation and Infrastructure
Record of Consultation

PROJECT NUMBER / NAME:	18102 Canal Road Dip Slide - South Pender Island Project	MOTI PROJECT MANAGER:	Chad Bengert (McElhanney)
LOCATION:	South Pender Island	MOTI CONSULTATION LEAD:	Nick Cessford

First Nation	Date	Project Phase	Activity	MOTI Contact	First Nation Contact	Comments
Band, Tribal Council, Hereditary Chief	*yyyy-mm-dd*	*50% DD, 90% DD, 100% DD, Pre-tender etc.*	*Letter, E-mail, Phone Call, Meeting*	*Individual in MOTI who initiated / received contact*	*Individual(s) with First Nation who initiated / received contact*	*Reference to the nature of the call, letter etc.*
Semiahmoo, Lake Cowichan, Cowichan Tribes, Lyackson, Penelakut, Halalt, Stz'uminus, Te'emexw Treaty Assoc, Malahat, Tsawassen, Tsawout, Tsartlip, Pauquachin, Tseycum	2021-12-08	Initial Notification	Letter - Email Merge	Morganne Franssen (Rhiannon Dominy-Pergentile)	Chief and Council	Good afternoon, Please find attached to this email the Initial Notification Letter for the Canal Road Emergency Recovery located on Pender Island. Please note the Project Location Map on the last page of the attached letter. Additionally we have provided a KMZ for your review. If you have any questions, comments or concerns please contact Morganne Franssen (Senior Advisor) at 250-331-9914 or by email at Morganne.Franssen@gov.bc.ca Warm regards, Rhiannon Dominy-Pergentile Analyst, Indigenous Relations
Te'emexw Treaty Assoc	2021-12-08	Initial Notification	Letter - Email Merge	Morganne Franssen (Rhiannon Dominy-Pergentile)	idamak@temexw.org; mmcgraw@temexw.org	Hello, Please remove sjoseph@temexw.org from your list-serve. That email is no longer in use. Thank you. *(thanked, acknowledged and removed - RDP)*
Cowichan Tribes	2021-12-14	Initial Notification reply	Email	Morganne Franssen (Rhiannon Dominy-Pergentile)	Candace Charlie <Candace.Charlie@cowichantribes.com>	Hello Rhiannon, Thank you for your letter. Please keep Cowichan Tribes in the loop on this project as you refine the options. For any archaeological work Cowichan Tribes expects to be fully engaged; to that end please contact Dianne Hinkley (copied here) regarding any upcoming activities. Best, Candace Charlie
Cowichan Tribes	2021-12-14	Initial Notification reply	Email	Morganne Franssen	Candace Charlie <Candace.Charlie@cowichantribes.com>	Good morning Candace, Thank you for your email. We will continue to provide updates to Cowichan Tribes as we refine the scope and as this project progresses. Regarding archaeology, I will ensure Dianne Hinkley is kept informed regarding any archaeological work activities. Thank you, Morganne Franssen
Lyackson	2021-12-23	Update EIA, AIA, Geotech	Email	Morganne Franssen (Rhiannon Dominy-Pergentile)	referrals@lyackson.bc.ca	Good Afternoon, Please find attached to this email an Update Letter for the Canal Road Pender Island Slide Site regarding EIA, AIA and Geotechnical Investigations. Also included in the letter is a Project Location Map for your review. If Lyackson is interested in having a Lyackson monitor on site during any of these field investigations, please contact Morganne Franssen (Senior Advisor) at 250-331-9914 or by email at Morganne.Franssen@gov.bc.ca Warm regards, Rhiannon Dominy-Pergentile
Semiahmoo, Lake Cowichan, Cowichan Tribes, Penelakut, Halalt, Stz'uminus, Te'emexw Treaty Assoc, Malahat, Tsawassen, Tsartlip, Pauquachin, Tseycum	2021-12-23	Update EIA, AIA, Geotech	Email	Morganne Franssen (Rhiannon Dominy-Pergentile)	Chief and Council	Good Afternoon, Please find attached to this email an Update Letter for the Canal Road Pender Island Slide Site regarding EIA, AIA and Geotechnical Investigations. Also included in the letter is a Project Location Map for your review. If you have any questions, comments or concerns please contact Morganne Franssen (Senior Advisor) at 250-331-9914 or by email at Morganne.Franssen@gov.bc.ca Warm regards, Rhiannon Dominy-Pergentile
Tsawout	2021-12-23	Update EIA, AIA, Geotech	Email	Morganne Franssen (Rhiannon Dominy-Pergentile)	referrals@tsawout.ca landsmanager@tsawout.ca	Good Afternoon, Please find attached to this email an Update Letter for the Canal Road Pender Island Slide Site regarding EIA, AIA and Geotechnical Investigations. Also included in the letter is a Project Location Map for your review. If Tsawout is interested in having a Tsawout monitor on site during any of these field investigations, please contact Morganne Franssen (Senior Advisor) at 250-331-9914 or by email at Morganne.Franssen@gov.bc.ca Warm regards, Rhiannon Dominy-Pergentile

First Nation	Date	Project Phase	Activity	MOTI Contact	First Nation Contact	Comments
Malahat	2022-01-07	18102 Initial Notification	Email	Morganne Franssen	Kate Richey	Hi Morganne, I would like to request an extension for 18102 Initial Notification - Canal Road Emergency Recovery - Pender Island until January 24th 2022. COVID is really slowing things down here at Malahat. The extra time is needed for us to process this application. Thank you for your time and consideration. Regards, Kate Richey Traditional Use Researcher
Malahat	2022-01-07	Update EIA, AIA, Geotech	Email	Morganne Franssen	Kate Richey	Hi Morganne, I would like to request an extension for 18102 Initial Notification - Canal Road Emergency Recovery - Pender Island until January 24th 2022. COVID is really slowing things down here at Malahat. The extra time is needed for us to process this application. Thank you for your time and consideration. Regards, Kate
Malahat	2022-01-11	18102 Initial Notification	Email	Morganne Franssen	Kate Richey	Hi Kate, No problem with extending until Jan 24th. Regarding the Geotech works there is the potential for them to occur as early as Jan 19th, so if you would like to have a cultural monitor on site, please let me know and I will keep you updated with schedule. I will provide you with other updates for field work (Geotech, env, arch) as I learn more about schedule. As noted in the letter, Wood will contact Malahat directly to coordinate participants in arch fieldwork (likely early Feb). Thank you, Morganne Franssen
Malahat	2022-01-12	18102 Initial Notification	Email	Morganne Franssen	Kate Richey	Hi Morganne, Thank you for the update, we would like a cultural monitor on site, if scheduling allows. Once you have a better idea of possible dates I will check with Harold our cultural monitor to see if they work for him. Yes, that sound great, I will keep an eye out for an email from Wood around that time. Cheers, Kate
Malahat	2022-01-12	18102 Initial Notification	Email	Morganne Franssen	Kate Richey	Thanks, Kate. It looks like the first drilling location will move forward on January 19th at the location SAA1 shown below. As it is positioned roughly 0.5m off the edge of pavement with ~1.5m to the center of the wires (Telus/shaw), we are hopeful that we would just have to relocate and de-energize the hydro lines at this time without conflicting the Telus/shaw lines. Our Geotech consultant (Thurber) will be the geotechnical representative on-site. All parties (BC Hydro, Shaw and TELUS, Thurber) will meet on-site on Tuesday, January 18th to look at the proposed drilling location and come up with a necessary plan, and to assess the other proposed locations (SAA2 and SAA3) to determine whether we can drill these at another time. The pre-works site visit will be early afternoon (~1pm) on January 18th to complete the site visit and assess the drilling locations. The actual drilling works will be completed on January 19th. Please let me know if your cultural monitor is able to attend the pre-site visit or the drilling (or both). I look forward to hearing from you. Thank you, Morganne Franssen
Malahat	2022-01-12	Update EIA, AIA, Geotech	Email	Morganne Franssen	Kate Richey	Thanks, Kate. It looks like the first drilling location will move forward on January 19th at the location SAA1 shown below. As it is positioned roughly 0.5m off the edge of pavement with ~1.5m to the center of the wires (Telus/shaw), we are hopeful that we would just have to relocate and de-energize the hydro lines at this time without conflicting the Telus/shaw lines. Our Geotech consultant (Thurber) will be the geotechnical representative on-site. All parties (BC Hydro, Shaw and TELUS, Thurber) will meet on-site on Tuesday, January 18th to look at the proposed drilling location and come up with a necessary plan, and to assess the other proposed locations (SAA2 and SAA3) to determine whether we can drill these at another time. The pre-works site visit will be early afternoon (~1pm) on January 18th to complete the site visit and assess the drilling locations. The actual drilling works will be completed on January 19th. Please let me know if your cultural monitor is able to attend the pre-site visit or the drilling (or both).

First Nation	Date	Project Phase	Activity	MOTI Contact	First Nation Contact	Comments
Malahat	2022-01-14	18102 Initial Notification	Email	Morganne Franssen	Kate Richey	Hi Morganne, Our cultural monitor Harold, is able to attend the site visit on the afternoon of the 18th and the work day on the 19th. Would it be best to pass his contact info on to you? Or is it best to organize logistics, meeting times etc through me? Cheers, Kate Thanks, Kate. I'm happy to hear he is available. If you and I are able to sort out the logistics and you can pass the info to Harold, I think that would work best. Is that okay with you? Do you have a daily rate available for Harold to be on site? I can draft a capacity funding letter for your review and signature. I'll check in with the PM regarding exact schedule info, PPE required, site contact and get back to you on Monday with this info. Have a great weekend, Morganne Franssen Hi Morganne, Yes that works for me. Yes the daily rate for Harold is 500 per day, or 55 per hour if he is working less than 4 hours. Thanks and have a great weekend, Kate
Malahat	2022-01-17	18102 Initial Notification	Email	Morganne Franssen	Kate Richey	Hi Kate, I hope you had a nice weekend! Please find capacity funding agreement attached for your review and signature. I put a date range of Jan 18-Feb 18 in case additional Geotech investigations occur and Harold wants to be involved. The project team has now confirmed they will meet onsite at 3pm tomorrow. PPE required (Hard hat, steel toes, High vis). If you are able to please provide Harold's full name and contact #, I will pass on to the site contact. Site contact: Chad Bengert (McHelhanney) – 778-222-6738 The work involved boreholes approximately 6 inches in diameter to be drilled into the downslope road shoulder, within the project area, just off the edge of the pavement. Monitoring instruments will then be installed in an inclinometer casing grouted into the boreholes. A metal enclosure will also be installed on the ground surface for a datalogger. The attached meeting invite explains this further. Thank you, Morganne Franssen
Malahat	2022-01-17	18102 Initial Notification	Email	Morganne Franssen	Kate Richey	Hi Morganne, Harold Joe's number is 250 252 5307. Are you able to send me a visual of where Harold will be meeting the project team? I told him Tunnel Hill but would like to provide a more specific location. Thanks, Kate Hi Kate, This is for Canal Road Emergency Recovery on Pender Island. Please see attached location information. Thank you, Morganne Franssen
Tsawout	2022-02-03	Monitoring Opportunity: EIA and Geotech	Email	Morganne Franssen	Casey Dick-Wyatt; Neesha (Referrals)	Good afternoon, Further to notification sent on December 23, 2021 (attached), I have two updates regarding the geotech and environmental investigations for the Canal Road Slope Failure Project on Pender Island. There are 2 monitoring opportunities coming up for this project: Geotech Geotechnical drilling works for the Canal Road Pender Island Project are planned for February 15th and 16th, 7AM to 5PM. Environment There will also be environmental investigations occurring for this project. The site visit will be comprised of a 1-day reconnaissance level assessment to determine existing environmental conditions at the site (e.g., valued environmental components pertaining to aquatic habitat, wildlife habitat, vegetation, species at risk), and to inform the Impact Assessment. These works are anticipated for late next week or the following week. I will reach out with more schedule details as I learn more. If you are interested in having one Tsawout monitor participate in either of these works, please let me know as soon as possible. Thank you, Morganne Franssen
Tsawout	2022-02-04	Monitoring Opportunity: EIA and Geotech	Email	Morganne Franssen	Neesha (Referrals) Lands Clerk	Good Morning Morganne, Our cultural monitor Adrian is interested in attending. His daily rate is $350 plus travel. Please let me know if you have any questions. Kind Regards, Neesha

First Nation	Date	Project Phase	Activity	MOTI Contact	First Nation Contact	Comments
Tsawout	2022-02-11	Monitoring Opportunity: EIA and Geotech - Capacity Funding	Email	Morganne Franssen Chad Bengert; Rhiannon Dominy-Pergentile	Neesha (Referrals) Lands Clerk; Band Manager	Hello Neesha, Please find capacity funding letter attached for Tsawout's review and signature. This is based on a daily rate of $450, which includes any associated travel costs. 1. Geotech drilling on Feb 15th and 16th a. 7AM-5PM b. Site contact - Jillian Usher (Thurber Engineering) – Adrian may call Jill upon arrival i. Jusher@thurber.ca; and ii. C: 778-535-6819 PPE required c. Steel toe boots, vest, hardhat, high vis vest Parking/meeting location info d. (embedded site image) e. Park near the trail access off the roadway and walk to the site 2. Environmental Investigations on February 17th, 2022 a. Site contact: Sarah Wyness (Hemmera) b. I will provide you with an update on Monday regarding meeting time and location Thank you, Morganne Franssen
Tseycum	2022-02-11	Monitoring Opportunity: EIA and Geotech - Capacity Funding	Email	Morganne Franssen	Chief and Council	Good afternoon, Further to notification sent on December 23, 2021 (attached), I have two updates regarding the geotech and environmental investigations for the Canal Road Slope Failure Project on Pender Island. There are 2 monitoring opportunities coming up for this project: Geotech Geotechnical drilling works for the Canal Road Pender Island Project are planned for February 15th and 16th, 7AM to 5PM. Environment There will also be environmental investigations occurring on February 17, 2022. The site visit will be comprised of a 1-day reconnaissance-level assessment to determine existing environmental conditions at the site (e.g., valued environmental components pertaining to aquatic habitat, wildlife habitat, vegetation, species at risk), and to inform the Impact Assessment. If you are interested in having one Tseycum monitor participate in either of these works, please let me know as soon as possible. Thank you, Morganne Franssen
Tsawout	2022-02-14	Monitoring Opportunity: EIA and Geotech - Capacity Funding	Email	Morganne Franssen Chad Bengert; Rhiannon Dominy-Pergentile	Neesha (Referrals) Lands Clerk; Band Manager	Hello Neesha, I am following up on the capacity funding letter attached for Adrian to participate in monitoring this week, for the Canal Road Slope Failure Geotech and Env investigations. I have also provided an update below (highlighted) related to the environmental investigations. Please find capacity funding letter attached for Tsawout's review and signature. This is based on a daily rate of $450, which includes any associated travel costs. 1. Geotech drilling on Feb 15th and 16th a. 7AM-5PM b. Site contact - Jillian Usher (Thurber Engineering) – Adrian may call Jill upon arrival i. Jusher@thurber.ca; and ii. C: 778-535-6819 PPE required c. Steel toe boots, vest, hardhat, high vis vest Parking/meeting location info d. (embedded site image) e. Park near the trail access off the roadway and walk to the site 2. Environmental Investigations on February 17th, 2022 a. Site contact: Sarah Wyness (Hemmera) Phone # 778-877-1508 b. Meeting Location: Mount Norman Access Road at Canal Road (meet and mobilize to site from here); I am not certain what parking will look like (will aim to find a safe pull-out near the project site) c. Meeting Time: 9:30 am (Duration: ~2 hours) d. PPE Requirements: Steel toe boots, Safety vest, Hard hat Thank you, Morganne Franssen
Tsawout	2022-02-14	Monitoring Opportunity: EIA and Geotech - Capacity Funding	Email	Morganne Franssen Rhiannon Dominy-Pergentile	Neesha (Referrals) Casey Dick-Wyatt; Band Manager	Good Morning Morganne, Please see the attached completed capacity funding agreement for Tsawout First Nation regarding the Canal Road Repair Project. I will forward all pertinent information to Adrian. Kind Regards, Neesha Thank you, Neesha. Please find signed CF letter attached. Morganne Franssen

First Nation	Date	Project Phase	Activity	MOTI Contact	First Nation Contact	Comments
Malahat	2022-02-18	Cultural Monitor Work	Email	Morganne Franssen	Kate Richey	Hi Morganne, Would it be best to send the invoice to you for the work Harold did at Canal Road on Pender? Or do you have another contact at MoTI that I should send the invoice to? Thanks, Kate
Malahat	2022-02-25	Cultural Monitor Work	Email	Morganne Franssen	Kate Richey	Hi Morganne, Wanted to follow up on this one. Preferences on where we send the invoice to? Thanks, Kate Hi Kate, Thanks for following up. You may send the invoice to me for processing. Thank you! Morganne Franssen
Malahat	2022-02-25	Cultural Monitor Work	Email	Morganne Franssen	Kate Richey	Hi Morganne, Attached is the invoice for the Canal Road work. Have a great weekend, Kate
Tsawout	2022-04-11	Cultural Monitor Work	Email	Nick Cessford	Neesha Nandhra	Hi Neesha, I am contacting you in regard to the Canal Road Slide on Pender Island. I have attached our previous consultation letters for context. I understand that Tsawout has previously provided monitoring on this project. As such I would like to know if Tsawout would have an interest and availability in providing monitors for additional geotechnical testing to occur on May 2 to 6. The scope of the geotechnical drilling will include utilization of a track mounted sonic core drill. There will be four boreholes drilled. Two in the existing roadbed and two at the bottom of the adjacent slope to the North of the Road. Please let me know if you require any additional information and I will be happy to help! Thanks.
Tsawout	2022-04-11	Cultural Monitor Work	Email	Nick Cessford	Neesha Nandhra	" Hi Nick, Just spoke with Adrian and he is available for those dates, he just needs to find another cultural monitor to assist him. Thank you, Neesha "
Tsawout	2022-04-14	Cultural Monitor Work	Email	Nick Cessford	Neesha Nandhra	"Hi Neesha, Thanks for getting back to me so quickly. I would like to clarify a bit, are you looking to have two monitors on site for the geotechnical drilling? As I understand it, the drilling plan is to proceed at one hole a day and proceed to the next hole as they are completed. I do not believe that the four holes would be drilled simultaneously. I am happy to look at the costs of having two monitors on site but would like to ensure that it is warranted based on the scope of work we proposing at this time. Thanks, "
Tsawout	2022-04-20	Cultural Monitor Work	Email	Nick Cessford	Neesha Nandhra	"Hi Neesha, I have attached a capacity funding letter for Tsawout's review and signature. Please let me know if the estimated amount should cover the time required to monitor the drilling. I will forward along a site contact and start times shortly. If you have any questions let me know. Thanks."
Semiahmoo, Lake Cowichan, Cowichan Tribes, Lyackson, Penelakut, Halalt, Stz'uminus, , Malahat, Tsawassen, Tsawout, Tsartlip, Pauquachin, Tseycum	2022-04-26	50% DD	Email / Letter	Nick Cessford	Various Referrals Contacts	Provided 50% Detailed Design Letter. Letter discusses scope of work required. Indicates that the road will be re-aligned. Attached Tree assessment, and a electronic spatial file for the project location

First Nation	Date	Project Phase	Activity	MOTI Contact	First Nation Contact	Comments
Tswassen First Nation	2022-04-06	50% DD	Email / Letter	Nick Cessford	Robin Buss	"Hello, Thank you for your email/referral. I am currently experiencing a high volume of emails and may not be able to respond promptly. If you need to contact me directly, please email me at rbuss@tsawwassenfirstnation.com or if it is an emergency (ie. absolute critical or emergent work) please call me at 604-202-3202. All other emails will be responded as/when I am able. ciθamə cən Thank You"
Lake Cowichan First Nation	2022-04-26	50% DD	Email / Letter	Nick Cessford	Aaron Hamilton	I will be away on annual leave from April 25th, 2022 until Monday May 9th at 9:00am. I will be checking e-mails throughout, but will have limited responses. Klecko, Klecko (Thank you),
Tsawout	2022-04-27	Cultural Monitor Work	Email	Nick Cessford	Neesha Nandhra	"Hello Nick, I just wanted to confirm what days Adrian was supposed to work on the Canal Project. He notified me he was there today till Friday, instead of May 2-6? Thank you, Neesha"
Cowichan Tribes	2022-04-27	50% DD Letter	Email	Nick Cessford	Tracy Fleming CC Dianne Hinkley Eduardo Sousa Natalie Anderson	"Good afternoon, Thank you for your referral package with Detailed Design drawings and a Danger Tree Assessment. We understand that the Canal Road 2.5 km east from the Pender Canal was damaged during the fall 2021 atmospheric river events. At this time Cowichan Tribes has two comments: 1.We wonder whether McElhanney arborists are sufficiently trained in Culturally Modified Tree identification particularly as there was uncertainty as to the cause of "damage" to some trees. We recommend that archaeological consultants provide input to this assessment. 2.We understand that archaeological field work by Wood PLC is beginning this month and that an interim report will be shared when it is available. Please ensure that Dianne Hinkley, copied here, is copied on all arch reports. Cowichan Tribes may require Indigenous Archaeological Monitor oversight during construction starting in the fall. Please contact Dianne to arrange. Thank you for your attention to these comments and requests."
Cowichan Tribes	2022-04-28	50% DD Letter	Email	Nick Cessford	Tracy Fleming CC Dianne Hinkley Eduardo Sousa Natalie Anderson	"Good morning, Thank you for Cowichan Tribes response to the Canal Road Pender Island Slide 50% Detailed Design Update. The Ministry can confirm that the Tree Assessment has been shared with the Wood PLC's archaeologist for comment in concurrence with the AIA that is occurring this week. If a Culturally Modified Tree or any heritage resources are identified through the archaeological investigation Cowichan Tribes will be updated accordingly. I will forward Dianne's contact information to Wood PLC for the reporting piece as well. I believe that a monitor from Cowichan Tribes was to participate in the on this arch investigation on this project. Regarding construction monitoring, would this requirement be identified once the arch report has been received? If Cowichan Tribes have any further questions or comments please feel free to reach out. Thanks, Nick Cessford"

First Nation	Date	Project Phase	Activity	MOTI Contact	First Nation Contact	Comments
Tsawout	2022-04-28	50% DD	Email	Nick Cessford	Neesha Nandhra	"Hi Neesha, Further to my last email, please see the site contact information for the Canal Road Geotechnical drilling on May 2 – 6. Khal Joyce, kjoyce@thurber.ca T. 250 727 2201 | C. 250 858 2956 If you have any additional questions on this please let me know! Thanks, "
Tsawout	2022-04-29	50% DD	Email	Nick Cessford	Neesha Nandhra	"Hi Nick, I just want to first say thank you for all your correspondence in setting up this site visit for Monday. Adrian, our cultural worker, was contacted by the archeology branch to complete work for canal road this week. There was a communication error, thinking this was the same project, and he is now booked for next week along with our other monitors. Because our cultural monitors were present on site for the impact assessment, we will not require our presence for the geotechnical drilling. Thank you for your efforts,"
Semiahmoo, Lake Cowichan, Cowichan Tribes, Lyackson, Penelakut, Halalt, Stz'uminus, , Malahat, Tsawassen, Tsawout, Tsartlip, Pauquachin, Tseycum	2022-07-29	90% DD	Email / Letter	Nick Cessford	Various Referrals Contacts	Sent 90% DD design package including design drawings, and AIAs
Semiahmoo, Lake Cowichan, Cowichan Tribes, Lyackson, Penelakut, Halalt, Stz'uminus, , Malahat, Tsawassen, Tsartlip, Pauquachin, Tseycum	2022-09-02	100% DD and Pre-tender	Email / Letter	Nick Cessford	Various Referrals Contacts	Sent 100% Detailed design package Good day, Please find the attached consultation update letter and 100% detailed design package for the Canal Road Dip Slide – South Pender Island Project. As MoTI plans to tender the Canal Road Dip Slide – South Pender Island Project as early as October 3, 2022, we require any final comments prior to October 2, 2022.
Tsawout	2022-09-02	100% DD and Pre-tender	Email / Letter	Nick Cessford	Neesha Nandhra	Hi Neesha, Please find the attached 100% Detailed Design and Pre-tender Notification for the Canal Road Dip Slide – South Pender Island Project. I have uploaded these documents to "Project 2022-00005: Canal Road Dip Slide – South Pender Island Project – 90% Detailed Design Update" on the Louis Toolkit. Would Tsawout prefer that this update be created as a "new project" on the portal? Additionally, as stated in the letter, MoTI plans to tender the Canal Road Dip Slide – South Pender Island Project as early as October 3, 2022, we require any final comments prior to October 2, 2022. If you have any questions please let me know. Thanks,
Semiahmoo, Lake Cowichan, Cowichan Tribes, Lyackson, Penelakut, Halalt, Stz'uminus, , Malahat, Tsawassen, Tsartlip, Pauquachin, Tseycum	2022-09-015	100% DD and Pre-tender Follow up	Email	Nick Cessford	Various Referrals Contacts	Good morning, I am hoping to follow up on the 100% detailed design and pre-tender notification for the Canal Road Dip Slide – South Pender Island Project. As MoTI plans to tender the Canal Road Dip Slide – South Pender Island Project as early as October 3, 2022, we require any final comments prior to October 2, 2022. Thanks,
Tsawout	2022-09-15	100% DD and Pre-tender Follow up	Email	Nick Cessford	Various Referrals Contacts	Hi Neesha, I am just following up on the 100% detailed design and pre-tender notification for the Canal Road Dip Slide – South Pender Island Project. If Tsawout has any questions or requires clarification on the information provided please let me know. Thanks,

First Nation	Date	Project Phase	Activity	MOTI Contact	First Nation Contact	Comments
Tsawout	2022-10-06	100% DD and Pre-tender Follow up	Phone call	Nick Cessford	Neesha Nandhra	NC called Tsawout Nation to discuss the project and undersatnd if Tsawout would be providing a response. Indicated that if FN cultural monitoring was an interest MoTI would be happy to discuss. Neesha indicated that she would discuss internally and get back to NC by end of day.
Tseycum	2022-10-06	100% DD and Pre-tender Follow up	Phone call	Nick Cessford	Tseycum Reception	NC called Tseycum Nation. Was unable to connect with anyone to discuss referral for Canal Rd. Project. Was given Chief@Tseycum.ca email, and kare40099@gmail.com email to connect with.
Tseycum	2022-10-06	100% DD and Pre-tender Follow up	Email	Nick Cessford	Karen and CC Chief Tanya Jimmy	Hi Karen, I was forwarded along your email from the Tseycum reception. I am hoping to follow up with Tseycum First Nation for the consultation on the Canal Road Pender Island Slide Project and understand if Tseycum had any comments / questions or concerns with the Project. I am available by phone at 778-362-4850 if you would like to chat and discuss MoTI's project. I am available today, tomorrow and next week to discuss. Thanks,
Pauquachin	2022-10-06	100% DD and Pre-tender Follow up	Phone call	Nick Cessford	Band Administrator	NC called Paquachin First Nation and left a message for Band Administrator to call NC back to discuss the Canal Road, Pender Island Slide Project.
Tsartlip Nation	2022-10-06	100% DD and Pre-tender Follow up	Phone call	Nick Cessford	William Morris	NC called William Morris (stewardship Director) and left a message to call NC bac kto discuss Canal Road Pender Island Slide Project.
Malahat	2022-10-06	100% DD and Pre-tender Follow up	Phone call	Nick Cessford	Shannon Ralfs	NC called Shannon Ralfs and left a message call NC back to discuss Canal Road Pender Island Slide Project.
Tsawassen First Nation	2022-10-06	100% DD and Pre-tender Follow up	Phone call	Nick Cessford	Sheila Williams	Nc called Sheila Williams and left a message to call NC back to discuss Canal Road Pender Island Slide Project.
Cowichan Tribes	2022-10-06	100% DD and Pre-tender Follow up	Phone call	Nick Cessford	Tracy Fleming	NC called Tracy Fleming, and enquired if Cowichan Tribes had any concerns or coments regarding the Project. Tracy enquired about aia work, if Cowichan Tribes was involved with monitors. NC indicated AiA was complate no sites found and that Cowichan Tribes was involved. Tracy Fleming indicated that there are no concerns with proceeding with Project and looks forward to seeing any updates.
Semiahmoo	2022-10-06	100% DD and Pre-tender Follow up	Phone call	Nick Cessford	Don Welsh	NC left a message for Don Welsh asking him to call NC back to discuss the Canal Road Pender Island Slide Project.
T'suubaa-asatx First Nation	2022-10-06	100% DD and Pre-tender Follow up	Phone call	Nick Cessford	Aaron Hamilton / Carole Livingstone	NC left a message for Aaron Hamilton / Carole Livingstone asking him to call NC back to discuss the Canal Road Pender Island Slide Project.
Lyackson	2022-10-06	100% DD and Pre-tender Follow up	Phone call	Nick Cessford	Lyackson First Nation	NC left a message for Lyackson First Nation to call NC back to discuss the Canal Road Pender Island Slide Project.
Halalt First Nation	2022-10-06	100% DD and Pre-tender Follow up	Phone call	Nick Cessford	Caroline Gladstone	NC called Halalt First Nation and spoke to Caroline Gladstone (General Manager) and discussed the Canal Road Project. Caroline indicated that they have no concerns with the Project.
Penelakut Tribe	2022-10-06	100% DD and Pre-tender Follow up	Phone call	Nick Cessford	Front desk	NC called Penelakut Tribe and left a message for Penelakut to call NC back to discuss the consultation for the Canal Road Pender Island Slide Project.
Stz'uminus First Nation	2022-10-06	100% DD and Pre-tender Follow up	Phone call	Nick Cessford	Ray Gauthier	NC called Ray Gauthier and left a message to call NC back to discuss the consultation on the Canal Road Pender Island Slide Project.
Tsawout	2022-10-06	100% DD and Pre-tender Follow up	Email	Nick Cessford	Neesha Nandhra	Hi Nick, Thank you for following up today. Tsawout does not have any concerns for the project at this time and will be requesting our cultural monitors on site for any land altering works. Also was just wondering what you were planning to do with the logs from the project? Thanks,
Tsawassen First Nation	2022-10-06	100% DD and Pre-tender Follow up	Phone call	Nick Cessford	Ameilia Cooper	NC received call from Amelia Cooper of Tsawassen First Nation who requested additional time to review the referral. MoTI agreed to extend additional time to review until October 14, 2022.

First Nation	Date	Project Phase	Activity	MOTI Contact	First Nation Contact	Comments
Tsawassen First Nation	2022-10-13	100% DD and Pre-tender Follow up	Email	Nick Cessford	Ameilia Cooper	Hi Nick, Thank you for your referral. We understand the urgency of repair works. We have no major concerns with the works as proposed and are pleased to know that you have completed appropriate archaeological investigations. We would be grateful for assurances as follows: •that erosion and sediment control works will be in place during construction (and that these will be adequate to handle very high volumes of water and sediment, given new extremes associated with climate change) •that new roadway runoff collection structures (ditches and/or culverting) are designed to prevent the mobilization of oily wastewater into the Salish Sea once construction is complete.
Penelakut Tribe	2022-10-17	D and Pre-tender Fc	Phone call	Nick Cessford	Robert Sam	NC Received a call from Robert Sam of Penelakut Tribe. Robert Sam indicated that that Penelakut would not be providing a response. NC indiciated that MoTI would continue to provide updates as necessary.
Tsawout First Nation	2022-10-19	D and Pre-tender Fc	Email	Nick Cessford CC Chad Bengert	Neesha Nandhra	Hi Neesha, We are able to accommodate monitoring through construction of the Project. Once I have some more details in terms of a construction schedule I will forward along a capacity funding letter for monitoring. Is there a specific aspect of construction that Tsawout would want to be on site for or just any ground disturbing works? Regarding the logs – we are still working to get an inventory of what we have on site but Tsawout's interest is definitely noted. Can you confirm that if the logs were provided it would only be used for cultural purposes / firewood. I will hopefully have a bit more of an update regarding tree species, size, and amount of trees likely next week. If you have any other questions or comments regarding the project please let me know. Thanks,
Tsawout First Nation	2022-10-21	D and Pre-tender Fc	Email	Nick Cessford CC Chad Bengert	Neesha Nandhra	Hi Nick, Cultural monitors for just the beginning of ground works is sufficient. As for the logs, they will be used for cultural purposes during Bighouse season and left over wood will be given to elders to heat their homes. Let me know if you have any other questions. Kind regards,
Tsawassen First Nation	2022-10-28	100% DD and Pre-tender Follow up	Email	Nick Cessford CC Chad Bengert	Ameilia Cooper Copy: Robin Buss	Hi Amelia, Thank you for Tsawwassen First Nation's questions in relation to the Canal Road Dip Slide – South Pender Island Project. I apologize for taking so long to get back to you. In response to your questions: 1.The Erosion Sediment Control (ESC) plan is something contractor and their Appropriately Qualified Professional (AQP) / Environmental Monitor (EM) is responsible for creating and implementing. the EM is responsible for monitoring and to ensure that it is implemented correctly. The ESC plan creation process doesn't typically employ modeling of precipitation patterns - it's based on typical / standard procedures that are monitored in real-time during the work to confirm they are working as intended. The EM is responsible for monitoring effectiveness of ESC measures. If deficiencies are identified, they are corrected by the contractor with guidance by the EM. 2.The road ditches and culverts are designed to convey the natural flows of surface runoff. The proposed system is not introducing any new surface runoff and the final result will still have the water directed in the same location as the existing culvert. The proposed and existing system are using grass lined swales to help dilute the surface water that would have collected oils/grits from typical road sources. The outflow location will now be lined with a rip-rap key, which will allow the water to dissipate onto the slope with less velocity, helping dilute the water downslope before being collected by the Salish sea, in which there are opportunities for the majority of the potential contaminants to "settle out" and be filtered on the way down. Please let me know if you have any additional questions or would like clarification on the above.

First Nation	Date	Project Phase	Activity	MOTI Contact	First Nation Contact	Comments
adership Council (Tsartlip and	2022-10-25	D and Pre-tender Fo	email	Nick Cessford	Gordon Elliot	Hi Gord, As per James' email below, do you have some time this week to chat about the Canal Road Project and the Timber that will be cut. Let me know a time that works well for you and I will forward an MS Teams invite. Thanks,
adership Council (Tsartlip and	2022-10-25	D and Pre-tender Fo	email	Nick Cessford	Gordon Elliot	Good day Nick, I have time this Friday to chat anytime between 10-12 NC Scheduled MS teams meeting for October 28 2022 at 11-11:30
adership Council (Tsartlip and	2022-10-28	D and Pre-tender Fo	MS teams meeting	Nick Cessford Chad Bengert	Gordon Elliot	Discussed provision of timbers to Tsartlip and Tseycum First Nations.
adership Council (Tsartlip and	2022-10-28	D and Pre-tender Fo	Email	Nick Cessford CC Chad Bengert	Gordon Elliot	"Hi Gord, Thanks for the meeting this morning it was great to connect. If you don't mind connecting me with the staff at Pauquachin and Tseycum that may be interested in the wood from the Canal Road Project that would be much appreciated. Once we have an idea of species and quantity of timber I will let you know. If you have any questions regarding the project please don't hesitate to reach out. Thanks, "
Tsawassen First Nation	2022-11-08	D and Pre-tender Fo	Email	Nick Cessford CC Chad Bengert	Amelia Cooper CC Robin Buss	"Good morning Amelia, I am just hoping to follow up with you in regard to the Canal Road, Pender Island Slide Project. Please let me know if Tsawwassen would like further clarification or additional information in regards to my previous email. Thanks,"
Tswassen First Nation	2022-11-10	D and Pre-tender Fo	Phone call	Nick Cessford	Amelia Cooper	NC called and left a message with Amelia Cooper to follow up on the Canal Road Project.
Tsawout First Nation	2022-11-10	D and Pre-tender Fo	Email	Nick Cessford CC Chad Bengert	Neesha Nandhra	Hi Neesha, I apologize for taking so long to get back to you. We will be happy to accommodate a cultural monitor during the early ground works of the Project. Can you confirm Tsawout's monitoring rate? As the Project hasn't gone to tender I don't have a schedule from the contractor on when the ground works will occur. Once I have the monitoring rate confirmed and an idea on scheduling I will put together a funding letter for Tsawout's review and signature. That is great to hear that the logs would go to good use for the community. I am still waiting to get more details from the Project on what will be available but once I do I will be in touch to discuss further. Do you have any updates in regard to species preference for Tsawout? If you have any other questions regarding the Project please let me know. Thanks,