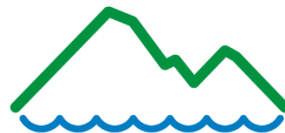




NORTH PENDER TRAIL REPORT MOVING AROUND PENDER

March 18, 2021



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Appendix A – Overall Site Plan, Figure 1 to Figure 3

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1 INTRODUCTION

Multi-use trails provide safe, efficient routes for non-motorized travel and have been shown to increase property value, encourage economic development, and promote active lifestyles. They are a link between community amenities and residential properties.

The following report outlines the alignment and the constrains of the proposed multi-use trail that would connect Pender Islands School and Danny Martin Baseball Park located on North Pender Island.

1.1 Background

The Moving Around Pender Alternative Transportation Society is proposing a multi-use trail connecting Pender Islands School and Danny Martin Baseball Park. The proposed alignment of the trail would be on the south side of Canal Road, east side of Aldridge Road and south side of Schooner Way.

Westbrook Consulting walked the proposed trail alignment in September 2020, and has identified possible construction constraints, that are outlined below and noted in the enclosed Figures.

Please note any permit applications or construction work within the road right of way should be coordinated with the BC's Ministry of Transportation and Infrastructure, BC Hydro, the Capital Regional District and the Islands Trust were applicable.

2 TRAIL ALIGNMENT

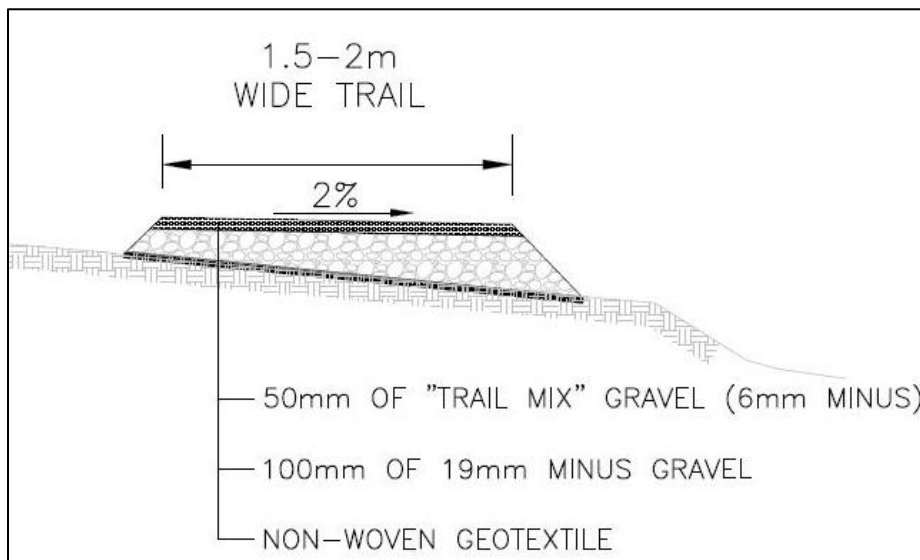
The proposed trail alignment would be along the south side of Canal Road, east side of Aldridge Road and south side of Schooner Way. The proposed trail alignment was chosen based on the topography, road shoulder width and access to amenities.

2.1 Multi-Use Trail Cross Section

The multi-use trail is proposed to be 2m wide built on a 100mm thick crushed gravel placed on a non-woven geotextile fabric. The surface of the trail is proposed to be 50 mm chip trail mix. At the pinch points identified further in the reports, the trail would narrow to 1 – 1.5m width.

Figure 1 shows the proposed trail section between Pender Islands School and Danny Martin Baseball Park.

Figure 1. Typical Trail Section



2.2 Construction Constraints

The following constraints were identified for the three segments of the multi-use trail

- The portion of the trail along Canal Road.
- The portion of the trail along Aldridge Road.
- The portion of the trail along Schooner Way.

2.2.1 Canal Road

The proposed trail alignment would be located along the south side of Canal Road, fronting rural residential properties and the Medicine Beach Nature Sanctuary.

Existing steep grades are the main construction constraint along the south side of Canal Road.

Retaining walls would be required to widen the existing road shoulder and construct the proposed trail. Another option would be to import and place fill to widen the shoulder, instead of retaining wall construction. Construction of both the retaining walls and placing of the fill would impact the existing trees within the Medicine Beach Nature Sanctuary.

The alternative to retaining walls and fill placement along the road, would be integrating the proposed trail with the existing trail through the nature sanctuary. This option would require tree removal within the sanctuary and approval from the owners of the lots the trail would be going through. During Westbrook Consulting's site visit, a trail route through Medicine Beach Nature

Sanctuary was not identified. Additional investigation would be required to determine the impact on the trees and vegetation within the sanctuary.

Figure 2. Narrow road shoulder along Canal Road



Figure 3. Steep shoulder grades along Canal Road



2.2.2 Aldridge Road

The proposed trail alignment would be along the east side of Aldridge Road fronting the Medicine Beach Nature Sanctuary.

Existing narrow road shoulder, due to the existing rock outcrop, and the required tree removal are the main construction constraints on Aldridge Road.

Blasting of the existing rock and tree removal to make room for the proposed trail would be required to widen the shoulder to accommodate the proposed multi-use trail.

The alternative would be bypassing the existing rock outcrop by integrating the multi-use trail with the existing trails through the nature sanctuary mentioned above. The existing trails would need to be improved to meet the proposed multi-use trail standard.

Figure 4. Existing rock outcrop on Aldridge Road



2.2.3 Schooner Way

The proposed trail alignment would be along the south side of Schooner Way fronting the commercial and residential properties. Depending on the type of the constraints along the alignment, the trail would be located either along the road or separated from the road.

The proposed trail route along Schooner Way has several construction constraints that include tree and shrubs removal, road drainage issues, private property encroachments, hydro pole conflicts, steep grades, and deep roadside ditches.

The existing road shoulder at the intersection of Schooner Way and Aldridge Road is showing signs of scour due to the storm water runoff, that can be addressed during the proposed trail construction, by installing a catch basin or directing the runoff to a roadside ditch.

Along the sections of Schooner Way, where the shoulder is narrow and located next to steep grades and deep ditches, retaining walls would be required to widen the shoulder to accommodate the multi-use trail. Additionally, road ditch would have to be replaced with pipes and catch basins to accommodate the proposed retaining walls.

The alternative to retaining walls, piping of the ditches and catch basin installation along Schooner Way would be locating the first half of the proposed trail alignment along Schooner Way within the private properties. This option would require approval from the owners of the lots and private tree removal.

Retaining of the road shoulder and piping of the ditches would be required along the portion of the trail fronting 4809 Schooner Way property.

The solutions for the existing hydro pole constraints would be relocating the hydro poles, that will require discussions, design, and approval by BC Hydro, or narrowing of the trail to a reduced width.

Refer to the enclosed Figures for the locations of the listed constraints and possible solutions.

Figure 5. Narrow shoulder and steep grades along Schooner Way



Figure 6. Steep grades and ditch along Schooner Way



Figure 7. Steep grades, vegetation overgrowth and deep ditch along Schooner Way



Figure 8. Deep ditch and existing culvert headwall along Schooner Way



Figure 9. Wider shoulder and ditch along Schooner Way



Figure 10. Wide shoulder and ditch along Schooner Way



Figure 11. Steep grades and deep ditch along Schooner Way



Figure 12. Wide shoulder for the trail alignment along Schooner Way



Figure 13. Hydro pole, shoulder narrowing and vegetation constraint along Schooner Way



Figure 14. Hydro pole constraint with the proposed trail alignment



3 SCHEDULE OF QUANTITIES

As discussed with the MAP representative, we are providing a Schedule of Quantities for the proposed trail works. The intent of the Schedule of Quantities is to obtain the unit prices and the cost of construction from the local contractors on North and South Pender Island.

The following Schedule of Quantities identifies the work that is required for the proposed trail. It does not include the following items:

- Application fees.
- Arborist services.
- Detailed Design.
- Environmental engineering.
- Environmental fees.
- Geotechnical engineering.
- Geotechnical fees.
- Governing authority fees.
- Legal fees.
- Legal survey.
- Liaising with BC Hydro, TELUS, Shaw and Fortis.
- Municipal applications and fees.
- Earthworks.
- Unit Prices.

4 SUMMARY

The preceding report outlines the proposed alignment and constraints of the multi-use trail proposed by the Moving Around Pender Alternative Transportation Society. The multi-use trail would connect Pender Islands School and Danny Martin Baseball Park located on North Pender Island and provide a safe route for non-motorized vehicles and pedestrians.

The proposed alignment of the trail would be on the south side of Canal Road, east side of Aldridge Road and south side of Schooner Way.

To accommodate the proposed multi-use trail connection between Pender Islands School and the Danny Martin Baseball Park, rock removal, regrading, tree and vegetation removal, drainage improvements and power pole relocation would be required. The approvals and the construction of the trail should be coordinated with the BC's Ministry of Transportation and Infrastructure, BC Hydro, the Capital Regional District, and the Islands Trust.

If you have any questions, please contact the undersigned.

Yours truly,

WESTBROOK CONSULTING LTD.

Reviewed by,



Ivana Kvantuc, B.Eng.
Project Manager

Nicole Fischer, P. Eng.
Project Manager

IK

ENCL: Appendix A – Overall Site Plan, Figures 1-3
Appendix B –Cost Estimate



Legend



1: 5,000



254.0 0 127.00 254.0 Meters

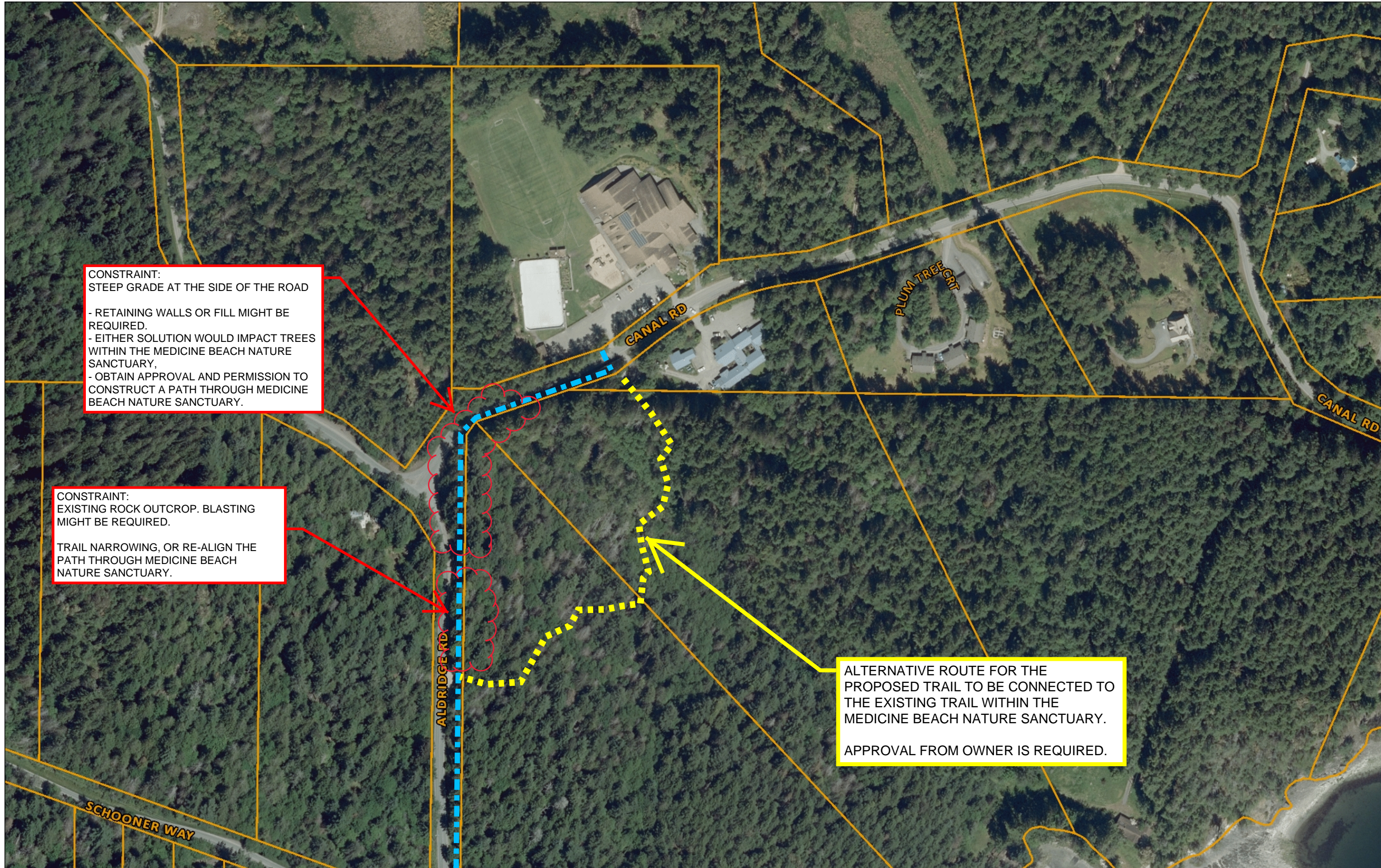
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Notes

OVERALL SITE PLAN



Legend



CONSTRAINT:
STEEP GRADE AT THE SIDE OF THE ROAD

- RETAINING WALLS OR FILL MIGHT BE REQUIRED.
- EITHER SOLUTION WOULD IMPACT TREES WITHIN THE MEDICINE BEACH NATURE SANCTUARY,
- OBTAIN APPROVAL AND PERMISSION TO CONSTRUCT A PATH THROUGH MEDICINE BEACH NATURE SANCTUARY.

CONSTRAINT:
EXISTING ROCK OUTCROP. BLASTING MIGHT BE REQUIRED.

TRAIL NARROWING, OR RE-ALIGN THE PATH THROUGH MEDICINE BEACH NATURE SANCTUARY.

ALTERNATIVE ROUTE FOR THE PROPOSED TRAIL TO BE CONNECTED TO THE EXISTING TRAIL WITHIN THE MEDICINE BEACH NATURE SANCTUARY.

APPROVAL FROM OWNER IS REQUIRED.

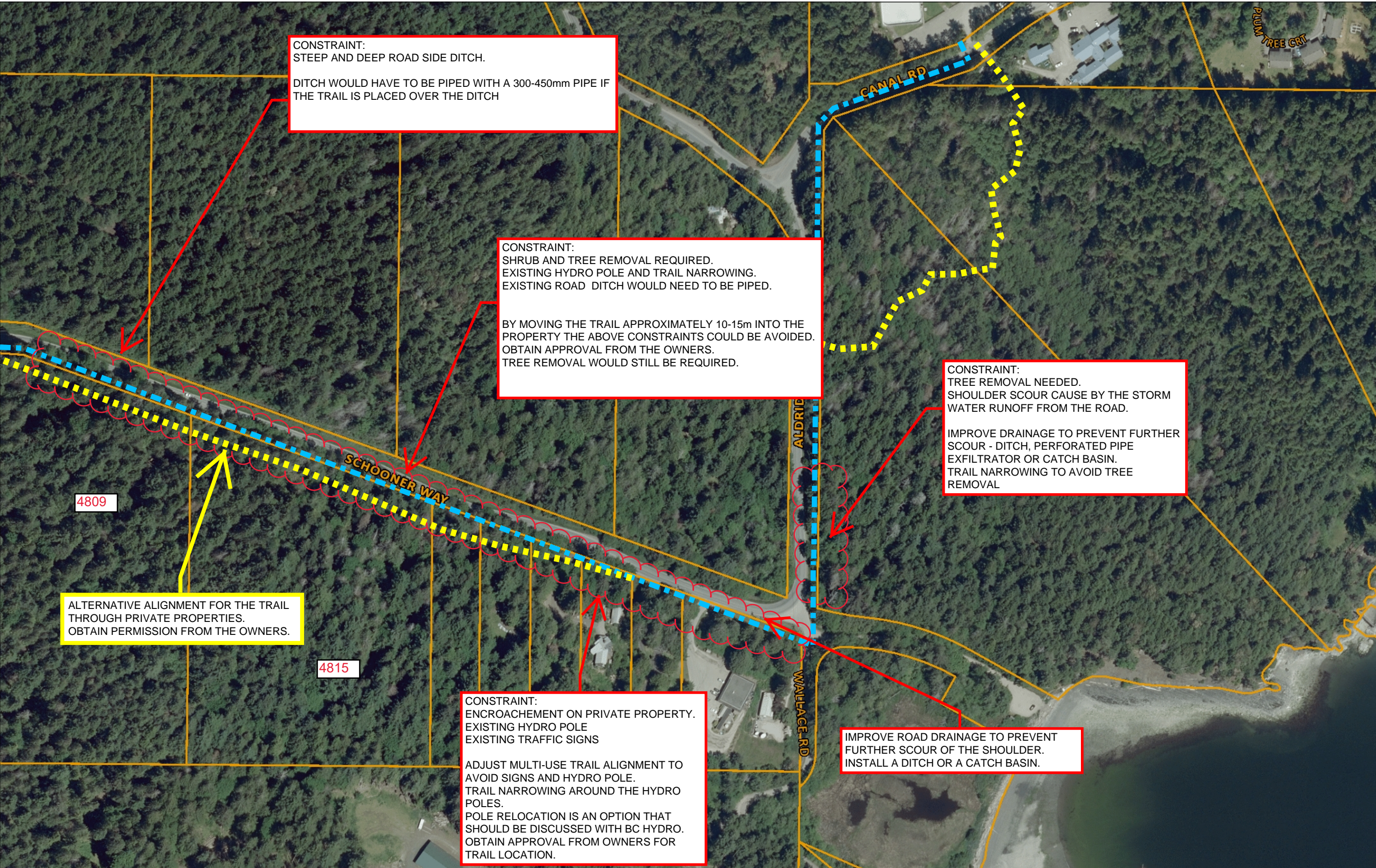
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127.0 0 63.50 127.0 Meters

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Notes



CONSTRAINT:
STEEP AND DEEP ROAD SIDE DITCH.

DITCH WOULD HAVE TO BE PIPED WITH A 300-450mm PIPE IF THE TRAIL IS PLACED OVER THE DITCH

CONSTRAINT:
SHRUB AND TREE REMOVAL REQUIRED.
EXISTING HYDRO POLE AND TRAIL NARROWING.
EXISTING ROAD DITCH WOULD NEED TO BE PIPED.

BY MOVING THE TRAIL APPROXIMATELY 10-15m INTO THE PROPERTY THE ABOVE CONSTRAINTS COULD BE AVOIDED.
OBTAIN APPROVAL FROM THE OWNERS.
TREE REMOVAL WOULD STILL BE REQUIRED.

CONSTRAINT:
TREE REMOVAL NEEDED.
SHOULDER SCOUR CAUSE BY THE STORM WATER RUNOFF FROM THE ROAD.

IMPROVE DRAINAGE TO PREVENT FURTHER SCOUR - DITCH, PERFORATED PIPE EXFILTRATOR OR CATCH BASIN.
TRAIL NARROWING TO AVOID TREE REMOVAL

ALTERNATIVE ALIGNMENT FOR THE TRAIL THROUGH PRIVATE PROPERTIES.
OBTAIN PERMISSION FROM THE OWNERS.

CONSTRAINT:
ENCROACHMENT ON PRIVATE PROPERTY.
EXISTING HYDRO POLE
EXISTING TRAFFIC SIGNS

ADJUST MULTI-USE TRAIL ALIGNMENT TO AVOID SIGNS AND HYDRO POLE.
TRAIL NARROWING AROUND THE HYDRO POLES.
POLE RELOCATION IS AN OPTION THAT SHOULD BE DISCUSSED WITH BC HYDRO.
OBTAIN APPROVAL FROM OWNERS FOR TRAIL LOCATION.

IMPROVE ROAD DRAINAGE TO PREVENT FURTHER SCOUR OF THE SHOULDER.
INSTALL A DITCH OR A CATCH BASIN.

Legend

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Notes

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FIGURE 2

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Map Title



Legend



127.0 0 63.50 127.0 Meters

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Notes

FIGURE 3

WESTBROOK CONSULTING LTD.

115 - 866 Goldstream Avenue

Victoria, B.C. V9B 0J3

SCHEDULE OF QUANTITIES

Project Name..... : **North Pender Multi-use Trail**

Project Number..... : **3585**

Project Description..... : **Multi-use trail**

Date Estimate Prepared..... : **01/14/21**

Estimate Prepared For..... : **Moving around Pender (MAP)**

Estimate Prepared By..... : **IK/NF**

BASIS OF SCHEDULE

This Schedule is based on a conceptual design and site visit observations and, as such, is subject to change.

This Schedule has been prepared for the sole use of those stated above. Westbrook Consulting Ltd. shall not be held responsible for the use of this schedule by any other party unless otherwise authorized in writing by Westbrook Consulting Ltd. All unauthorized use of this schedule shall be taken at the users own risk.

This Schedule does not guarantee the cost of construction.

This Schedule assumes the following:

- * QUANTITIES ARE APPROXIMATE BASED ON THE IDENTIFIED CONSTRAINTS DURING THE SITE VISIT
- * 2m WIDE GRAVEL MULTI-USE TRAIL
- * RETENTION OF THE EXISTING HYDRO INFRASTRUCTURE
- * NUMBER OF TREES TO BE REMOVED FROM THE ROAD RIGHT OF WAY IS APPROXIMATE.
- * TREES TO BE REMOVED TO BE CONFIRMED IN THE FIELD PRIOR TO CONSTRUCTION.

This Estimate does not include the following:

- | | | |
|--------------------------|----------------------------------|----------------------------|
| * IRRIGATION | * REAL ESTATE FEES | * PERMIT FEES |
| * ENVIRONMENTAL FEES | * LEGAL FEES | * LEGAL SURVEY |
| * GST | * SITE GRADING | * GEOTECHNICAL FEES |
| * SOIL PERMIT FEES | * GOVERNING AUTHORITY FEES | * CANADA POST FEES |
| * CIVIL ENGINEERING FEES | * EARTHWORKS AND TRENCH BLASTING | * PRIVATE OWNERS APPROVALS |
| | | * MOTI PERMITS |

SUMMARY OF THE DIRECT CONSTRUCTION COSTS

CANAL ROAD

Trail Work - Canal Road.....

Trail Work - Nature Sanctuary.....

Earthworks.....

SUBTOTAL

ALDRIDGE ROAD

Drainage Improvements.....

Trail Work.....

Earthworks.....

SUBTOTAL

SCHOONER WAY

Drainage Improvements.....

Trail Work.....

Earthworks.....

SUBTOTAL

TOTAL PROJECT COSTS

SCHEDULE OF QUANTITIES

Project Name: North Pender Multi-use Trail

Project Number: 3585

DIRECT CONSTRUCTION COSTS					
CANAL ROAD					
Description	Quantity	Unit	Unit Cost	Amount	Total
TRAIL WORK - CANAL ROAD					
Extruded Asphalt Curb	150	m			
100mm Gravel Path	150	m			
Subgrade Construction	300	sq.m			
Street Sign	2	ea			
Sub-total					
TRAIL WORK - NATURE SANCTUARY					
100mm Gravel Path	200	m			
Subgrade Construction	400	sq.m			
Street Sign	2	ea			
Sub-total					
EARTHWORKS					
Isolated Stump Removal	20	ea			
Isolated Tree Clearing	30	ea			
Rock Wall	90	sq.m			
Stripping and Grubbing	500	sq.m			
Sub-total					

SCHEDULE OF QUANTITIES

Project Name: North Pender Multi-use Trail

Project Number: 3585

DIRECT CONSTRUCTION COSTS					
ALDRIDGE ROAD					
Description	Quantity	Unit	Unit Cost	Amount	Total
DRAINAGE IMPROVEMENTS					
Exfiltrator					
150mm PVC PERF	10	m			
Catch Basin	1	ea			
Sub-total					
OR					
Roadside Ditch/Swale	15	m			
Sub-total					
TRAIL WORK					
100mm Gravel Path	320	m			
Subgrade Construction	640	sq.m			
Street Sign	2	ea			
Sub-total					
EARTHWORKS					
Isolated Stump Removal	1	ea			
Isolated Tree Clearing	5	ea			
Shear Blast Line	30	m			
Stripping and Grubbing	640	sq.m			
Sub-total					

SCHEDULE OF QUANTITIES

Project Name: North Pender Multi-use Trail

Project Number: 3585

DIRECT CONSTRUCTION COSTS					
SCHOONER WAY					
Description	Quantity	Unit	Unit Cost	Amount	Total
DRAINAGE IMPROVEMENTS					
150mm PVC Catch Basin					
Lead	50	m			
450mm PVC	100	m			
Catch Basin Top Inlet	6	ea			
300mm Concrete Culverts	60	m			
Headwall	3	ea			
Roadside Ditch/Swale	50	m			
Regrade Existing Ditch	100	m			
Sub-total					
TRAIL WORK					
100mm Gravel Path	1200	m			
Subgrade Construction	2400	sq.m			
Street Sign	6	ea			
Sub-total					\$0.00
EARTHWORKS					
Isolated Stump Removal	20	ea			
Isolated Tree Clearing	60	ea			
Vegetation Clearing	5	LS			
Rock Wall	200	sq.m			
Stripping and Grubbing	3000	sq.m			
Sub-total					