Regional District of Bulkley Nechako

Cycle 16 Phase 1 Construction

CONTRACT No. 201-11400-01

ISSUED FOR TENDER

2021

WSP Canada Inc.
#1 – 3772 Fourth Avenue
P.O. Box 939
Smithers, B.C. V0J 2N0

RDBN
37 3rd Avenue
P.O. Box 820
Burns Lake, BC V0J 1E0

Regional District of Bulkley Nechako
Cycle 16 Phase 1 Construction

Contract No. 201-11400-01

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INVITATION TO TENDER
Regional District of Bulkley Nechako
Cycle 16 Phase 1 Construction
Contract No. 201-11400-01

Tenders for the **"Cycle 16 Phase 1 Construction"** project will be received by WSP at the WSP office in Smithers up to **2:00 p.m. October 13th, 2021.**

The general scope of work for this contract is the construction of a 3.7km long multi-use pathway. Construction of the pathway will involve some clearing and grubbing, stripping, site grading, supply and installation of base coarse aggregates and asphalt pavement as an Optional Item. The project scope also includes the extension of a structural multi-plate cattle underpass culvert as well as number of other small culverts, traffic and pathway signs, safety handrails, concrete roadside barriers and other miscellaneous items. Optional work for this contract includes asphalt pavement, shouldering, Type-C fencing and headwalls. The inclusion of the optional work in the contract is contingent on whether the received prices allow for the work within the grant-funded budget.

Tender documents are available on BC Bid, on or after **September 13th, 2021**. **A pre-tender site meeting will be held on September 22th, 2021 at 10:00 a.m.** The meeting will begin at the Laidlaw Frontage Road, in Smithers BC. The meeting is not mandatory, but all interested contractors are encouraged to attend to become familiar with the project requirements and site conditions. **A question acceptance deadline will be set for one week (5 business days) prior to Tender Close.**

All Tenders must be submitted to the WSP office in Smithers, or to Allan Kindrat (allan.kindrat@wsp.com via. email. Refer to *Instructions to Tenderers Part 1* for further submission of tender requirements

Tenders will be publicly opened at the above stated time in the WSP Office. All materially compliant Tenders will be examined as to their sufficiency and submitted to the Regional District of Bulkley Nechako for consideration. The Regional District of Bulkley Nechako reserves the right to waive informalities or reject any or all Tenders or to accept the tender deemed most favourable in the interest of the Regional District of Bulkley Nechako. The Regional District of Bulkley Nechako will not be responsible for any cost incurred by the Tenderer in preparing the Tender. Contract award will be subject to approval from the Regional District of Bulkley Nechako. The lowest cost may not necessarily be accepted, due to many factors beyond the scope of this invitation to tender.

Questions regarding the tender documents shall be in written form and directed to:

Allan Kindrat, P.Eng, PMP
WSP Canada Inc.
#1 – 3772 Fourth Avenue
P.O. Box 939
Smithers, B.C. V0J 2N0
Email: allan.kindrat@wsp.com

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(TO BE READ WITH "INSTRUCTIONS TO TENDERERS - PART II" CONTAINED IN THE EDITION OF THE PUBLICATION "MASTER MUNICIPAL CONSTRUCTION DOCUMENTS" SPECIFIED IN ARTICLE 2.2 BELOW)

Regional District of Bulkley Nechako
(NAME OF OWNER)

Contract: Cycle 16 Phase 1 Construction
(TITLE OF CONTRACT)

Reference No. 201-11400-01
(OWNER'S CONTRACT REFERENCE NO.)

Introduction

I.

1.1 These Instructions apply to and govern the preparation of tenders for this *Contract*. The *Contract* is generally for the following work:

The general scope of work for this contract is the construction of a 3.6km long multi-use pathway. Construction of the pathway will involve some clearing and grubbing, stripping, site grading, supply and installation of base coarse aggregates and asphalt pavement as an Optional Item. The project scope also includes the extension of a structural multi-plate cattle underpass culvert as well as number of other small culverts, traffic and pathway signs, safety handrails, concrete roadside barriers and other miscellaneous items.

1.2 Direct all inquiries regarding the *Contract*, to:

WSP Canada Inc.
Allan Kindrat, P.Eng, PMP

Address: 1-3772 Fourth Avenue
P.O. Box 939
Smithers, BC V0J 2N0

Phone: 778-872-5526

Email: allan.kindrat@wsp.com

Written responses to questions will be provided to all Tenderers in the form of Addenda.

Tender Documents

2

2.1 The tender documents which a tenderer should review to prepare a tender consist of all the *Contract Documents* listed in Schedule 1 entitled "Schedule of Contract Documents". Schedule 1 is attached to the Agreement which is included as part of the tender package. The *Contract Documents* include the drawings listed in Schedule 2 to the Agreement, entitled "List of *Contract Drawings*".

2.2 A portion of the *Contract Documents* are included by reference. Copies of these documents have not been included with the tender package. These documents are the Instructions to Tenderers - Part II, General Conditions, Specifications and Standard Detail Drawings. They are those contained in the publication entitled "Master Municipal Construction Documents – 2019 Edition – Volume II". Supplementary General Conditions will also form a portion of the Contract Documents, which can be found on the MMCD website. Refer to Schedule 1 to the Agreement or, if not

specified in Schedule 1, then the applicable edition shall be the most recent edition as of the date of the *Tender Closing Date*. All sections of this publication are by reference included in the *Contract Documents*.

2.3 Any additional information made available to tenderers prior to the Tender Closing Time by the Owner or representative of the Owner, such as geotechnical reports or as-built plans, which is not expressly included in Schedule 1 or Schedule 2 to the Agreement, is not included in the *Contract Documents*. Such additional information is made available only for the assistance of Tenderers who must make their own judgement about its reliability, accuracy, completeness and relevance to the *Contract*, and neither the Owner nor any representative of the Owner gives any guarantee or representation that the additional information is reliable, accurate, complete or relevant.

Submission of Tenders

3

3.1 Tenders must be submitted in a sealed envelope, marked on the outside with "TENDER – Cycle 16 Phase 1 Construction" and must be received at the WSP office.

Submission of Tenders in email format will also be accepted, if sent to Allan Kindrat (allan.kindrat@wsp.com) and admin@wsp.com. Email submissions must include the subject line, "TENDER – Cycle 16 Phase 1 Construction" and tenderers shall note that the timestamp on the receiver's email will be used to evaluate if the tender was submitted on time.

Tenders shall be accompanied by a security in the amount of ten percent (10%) of the Total Tender Price payable to the Regional District of Bulkley Nechako. Tenders submitted electronically via email must include a scanned copy of the bid security and the original copy of the bid security must be received at the WSP office within five (5) business days of the Tender Closing Date for the Tender to be considered compliant.

Tenders must be submitted to:

WSP Canada Inc.

on or before:

Tender Closing Time: 2:00 pm local time

Tender Closing Date: October 13th, 2021

at:

Address: WSP Canada Inc.
1-3772 Fourth Avenue,
P.O. Box 939
Smithers, B.C. V0J 2N0

Email: allan.kindrat@wsp.com
admin@wsp.com

3.2 Late tenders will not be accepted or considered, and will be returned

unopened.

3.3 Amendments to the submitted Tender will be permitted, if received in writing or by email, prior to the Tender closing time and if endorsed by the same party or parties who signed and sealed the offer. Amendments will be accepted provided that only the amendment is shown and not the total tendered price.

Additional Instructions to Tenderers

4 The following Instructions to Tenderers modifies MMCD Form of Tender in the following section:

4.1 Copies of the Master Municipal Construction Documents 2019 Edition - Volume II, Instructions to Tenderers – Part II, General Conditions, Specifications and Standard Detail Drawings are available separately from:

Master Municipal Construction Document Association
Suite 102
211 Columbia Street
Vancouver, B.C. V6A 2R5

Tel (604) 681-0295
Fax: (604) 681-4545
www.mmcd.net

4.2 A pre-tender site meeting will be held on September 22nd, 2021 at 10:00 a.m. The meeting will begin at the Laidlaw Frontage Road in Smithers, BC. This pre-tender meeting is not mandatory, but all Tenderers are **strongly** encouraged to attend to become familiar with the project requirements and site conditions.

4.3 **Completing the Form of Tender**

The submitted Form of Tender must be legible, written in ink, or by typewriter and ALL ITEMS MUST BE BID, unless the Form of Tender specifically permits otherwise, with the price for every item and other extras clearly shown. Each page must be initialled by the Tenderer.

The Tenderer shall be deemed to have satisfied themselves as to the sufficiency of their tender for the work and of the unit and lump sum prices stated in the Form of Tender. These unit prices shall cover all their costs including overhead, profit and tax, except for the GST.

The Tenderers attention is drawn to MMCD 2019 Edition - Volume II, Instructions to Tenderers, Part II Sections 5-17 for Tender Requirements, Qualifications, Modifications, Alternative Tenders, Approved Equals, Inspection of the Place of Work, Interpretation of Contract Documents, Prices, Taxes, and Amendment of Tenders, Duration of Tenders, Qualification of Tenderers, Award, Subcontractors, and Optional Work, and as amended below.

4.4 The lowest or any Tender may not necessarily be accepted. The Regional District of Bulkley Nechako reserves the right to waive

informalities or reject any or all Tenders, or to accept the Tender deemed most favourable in the interest of the Regional District. The Regional District will not be responsible for any cost incurred by the Tenderer in preparing the Tender. Contract award will be subject to approval by the Regional District. The lowest or any Tender may not necessarily be accepted.

4.5 Environmental Protection

The Contractor is advised that they are responsible for all necessary measures required to prevent the transportation of any silt or other deleterious material from the site into any fish bearing watercourses or their tributaries. All requirements of the Ministry of Environment, Lands and Parks, Fish and Wildlife Branch and Fisheries & Oceans Canada, with respect to air, earth and water pollution, must be strictly adhered to.

4.6 Material Testing

All material testing including granular materials, concrete, compaction and pressure and/or exfiltration tests, as well as biosolids solids content testing, will be arranged by and paid for by the Contractor. Where initial tests fail and subsequent testing is deemed necessary by the Engineer, the cost of the subsequent testing shall be the responsibility of the Contractor.

4.7 The MMCD published the following Supplementary Update to the Instructions to Tenderers – Part II which shall be read in conjunction with MMCD 2019 Edition – Volume II (Printed 2019) Instructions to Tenderers – Part II

Supplementary Specification	**IT 17.1S**		
Affected Document(s)	Volume II	Change Type	Correction
Section	Instructions to Tenderers – Part II	Reference	IT 17.1
Change Summary	Correction in reference to Optional Work definition		
Currently	17.1 If the Schedule of Quantities and Prices includes any tender prices for Optional Work, as defined in GC 1.41, then tenderers must complete all the unit prices for such Optional Work. Such tender prices shall not include any general overhead costs, or other costs, or profit, not directly related to the Optional Work. Tenderers are directed to GC 9.4.2.		
Should Be	17.1 If the Schedule of Quantities and Prices includes any tender prices for Optional Work, as defined in GC 1.47, then tenderers must complete all the unit prices for such Optional Work. Such tender prices shall not include any general overhead costs, or other costs, or profit, not directly related to the Optional Work. Tenderers are directed to GC 9.4.2.		

4.8 The MMCD published the following Supplementary Update to the Instructions to Tenderers – Part II which shall be read in conjunction with MMCD 2019 Edition – Volume II, Instructions to Tenderers – Part II

Supplementary Specification	**IT 12.1S**		
Affected Document(s)	Volume II	Change Type	Correction
Section	Instructions to Tenderers – Part II	Reference	IT 12.1
Change Summary	Replacing the word fax with email		
Currently	12.1 A tenderer may amend or revoke a tender by giving written notice, delivered by hand, mail or fax, to the office referred to in paragraph 3.1 of the Instructions to Tenderers – Part I at any time up until the *Tender Closing Date and Time*. An amendment or revocation that is received after the *Tender Closing Date and Time* shall not be considered and shall not affect a tender as submitted.		
Should Be	12.1 A tenderer may amend or revoke a tender by giving written notice, delivered by hand, mail or **email**, to the office referred to in paragraph 3.1 of the Instructions to Tenderers – Part I at any time up until the *Tender Closing Date and Time*. An amendment or revocation that is received after the *Tender Closing Date and Time* shall not be considered and shall not affect a tender as submitted.		

Supplementary Specification	**IT 12.5S**		
Affected Document(s)	Volume II	Change Type	Correction
Section	Instructions to Tenderers – Part II	Reference	IT 12.5
Change Summary	Replacing the word fax with email		
Currently	12.5 If a tender amendment or revocation is sent by fax the tenderer assumes the entire risk that equipment and staff at the office referred to in paragraph 3.1 of the Instructions to Tenderers – Part I will properly receive the fax containing the amendment or revocation before the *Tender Closing Date and Time*. The Owner assumes no risk or responsibility whatsoever that any fax will be received as required by paragraph 12.1 of these Instructions to Tenderers – Part II, and shall not be liable to any tenderer if for any reason a fax is not properly received.		
Should Be	12.5 If a tender amendment or revocation is sent by **email** the tenderer assumes the entire risk that equipment and staff at the office referred to in paragraph 3.1 of the Instructions to Tenderers – Part I will properly receive the **email** containing the amendment or revocation before the *Tender Closing Date and Time*. The Owner assumes no risk or responsibility whatsoever that any **email** will be received as required by paragraph 12.1 of these Instructions to Tenderers – Part II, and shall not be liable to any tenderer if for any reason an **email** is not properly received.		

Tender Requirements

5 Instructions to Tenderers - Part II 5 is amended by the following, as applicable.

5.2.3 **Consent of Surety**

The Contractor shall provide a Consent of Surety for the issue of a Performance Bond and a Labour and Material Payment Bond, each in the amount of 50% of the Contract Price, covering the performance of the Work, including the Contractor's obligations during the Maintenance Period, issued by a surety licensed to carry on the business of suretyship in the province of British Columbia, and in a form acceptable to the Owner.

5.3.6 **Appendix 6 – Force Account Rates**

A complete list of all relevant project personnel force account rates, for regular and overtime hours.

Inspection of the Place of Work

8 IT – Part II is amended by the following, as applicable.

8.1 **Examination and Site Inspection**

The Tenderer is responsible for examining the site of the work before submitting their tender; either personally or through a representative, to satisfy themselves as to the nature and location of the work; local conditions, soil structure and topography at the site of the work; the nature and quality of the materials to be used, the equipment and facilities needed preliminary to and during the prosecution of the work; the means of access to the site, all necessary information as to risks, contingencies and circumstances as may affect their tender; and all other matters which can in any way affect the work under this Contract. The Tenderer is fully responsible for conducting sufficient field investigation and obtaining all information required for the preparation of their tender and for the execution of the work.

END OF SECTION

UNIT PRICE CONTRACT

Form of Tender

Regional District of Bulkley Nechako
(NAME OF OWNER)

Contract: Cycle 16 Phase 1 Construction
(TITLE OF CONTRACT)

Reference No. 201-11400-01
(OWNER'S CONTRACT REFERENCE NO.)

TO OWNER:

1 **WE, THE UNDERSIGNED**:

1.1 have received and carefully reviewed all the *Contract Documents*, including the Instructions to Tenderers, the specified edition of the "Master Municipal Construction Documents - General Conditions, Specifications and Standard Detail Drawings" and the following Addenda:

_____

_____

_____

(ADDENDA, IF ANY)

1.2 have full knowledge of the *Place of the Work*, and the *Work* required; and

1.3 have complied with the Instructions to Tenderers; and

1.4 have full knowledge that the Owner may choose to complete any amount of the Section 5.0 – Optional Items, which will be added into the Contract as Change Orders at the Owner's discretion; and

2 ACCORDINGLY WE HEREBY OFFER:

2.1 to perform and complete all the *Work* and to provide all the labour, equipment and material as set out in the *Contract Documents*, in strict compliance with the *Contract Documents*; and

2.2 to achieve:

- *Substantial Performance of the Work, including Section 5.0 items, on or before July 31st, 2022;*

2.3 to do the *Work* for the price, which is the sum of the products of the actual quantities incorporated into the *Work* and the appropriate unit prices set out in Appendix 1, the "*Schedule of Quantities and Prices*", plus any lump sums or specific prices and adjustment amounts as provided by the *Contract Documents*. For the purposes of tender

Tenderer's Initials _____

comparison, our offer is to complete the *Work* for the "*Tender Price*" as set out on Appendix 1 of this Form of Tender. Our *Tender Price* is based on the estimated quantities listed in the *Schedule of Quantities and Prices* and excludes *GST*.

3 **WE CONFIRM**:

3.1 that we understand and agree that the quantities as listed in the *Schedule of Quantities and Prices* are estimated, and that the actual quantities will vary.

4 **WE CONFIRM**:

4.1 that the following are attached to and form a part of this tender:

4.1.1 the appendices as required by paragraph 5.3 of the Instructions to Tenderers - Part II; and

4.1.2 the *Bid Security* as required by paragraph 5.2 of the Instructions to Tenderers - Part II.

5 **WE AGREE**:

5.1 that this tender will be irrevocable and open for acceptance by the *Owner* for a period of 60 calendar days from the day following the *Tender Closing Date and Time*, even if the tender of another tenderer is accepted by the *Owner*. If within this period, the *Owner* delivers a written notice ("*Notice of Award*") by which the *Owner* accepts our tender we will:

5.1.1 within 15 Days of receipt of the written Notice of Award deliver to the Owner:

a) a Performance Bond and a Labour and Material Payment Bond, each in the amount of 50% of the *Contract Price*, covering the performance of the *Work* including the *Contractor*'s obligations during the *Maintenance Period*, issued by a surety licensed to carry on the business of suretyship in the province of British Columbia, and in a form acceptable to the *Owner*;

b) Should the successful Tenderer prefer, the Performance Bond may be waived and in its place the Owner will retain until Substantial Performance of the Contract, the Tender Security, if it is in the form of a certified cheque, cash or irrevocable letter of credit acceptable to the Owner in the amount of 10% of the Contract Price (as of Contract signing date), in lieu of the Performance Bond and Labour & Materials Bond. For any Change Orders issued, the Owner may require submission of an additional security amount ensuring the security held

Tenderer's Initials _____

reflects 10% of the amended Contract Price.

c) a *Construction Schedule*, as provided by GC 4.6.1;

d) a "clearance letter" indicating that the tenderer is in WorkSafe BC compliance; and

e) a copy of the insurance policies as specified in GC 24 indicating that all such insurance coverage is in place and;

5.1.2 within 2 Days of receipt of written "Notice to Proceed", or such longer time as may be otherwise specified in the Notice to Proceed, commence the Work; and

5.1.3 sign the Contract Documents as required by GC 2.1.2.

6 WE AGREE:

6.1 that, if we receive written *Notice of Award* of this *Contract* and, contrary to paragraph 5 of this Form of Tender, we:

6.1.1 fail or refuse to deliver the documents as specified by paragraph 5.1.1 of this Form of Tender; or

6.1.2 fail or refuse to commence the Work as required by the Notice to Proceed,

then such failure or refusal will be deemed to be a refusal by us to enter into the *Contract* and the *Owner* may, on written notice to us, award the *Contract* to another party. We further agree that, as full compensation on account of damages suffered by the *Owner* because of such failure or refusal, the *Bid Security* shall be forfeited to the *Owner*, in an amount equal to the lesser of:

6.1.3 the face value of the Bid Security; or

6.1.4 the amount by which our Tender Price is less than the amount for which the Owner contracts with another party to perform the Work.

7 OUR ADDRESS is as follows:

_____

_____

_____

Phone: _____

Fax: _____

Attention: _____

This Tender is executed this _____ day of _____.

Tenderer's Initials _____

Contractor:

_____
(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

_____
(AUTHORIZED SIGNATORY)

_____
(AUTHORIZED SIGNATORY)

Tenderer's Initials _____

Form of Tender - Appendix 1

Regional District of Bulkley Nechako
Cycle 16 Phase 1 Construction
(TITLE OF CONTRACT)

SCHEDULE OF QUANTITIES AND PRICES
(See paragraph 5.3.1 of the Instructions to Tenderers - Part II)

(All prices and *Quotations* including the *Contract Price* shall include all *Taxes*, but shall not include *GST*. *GST* shall be shown separately.)

Summary Sheet

TENDER PRICE (Sum of all Items, including Sec. 5.0 - Optional Items)	$_____
GST (5%)	$_____
TENDER PRICE plus GST (5%)	$_____

GST REGISTRATION NUMBER_____

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Form of Tender - Appendix 1

Regional District of Bulkley Nechako
Cycle 16 Phase 1 Construction
(TITLE OF CONTRACT)

SCHEDULE OF QUANTITIES AND PRICES

*SS = Supplementary Specifications

ITEM NO.	MMCD REF.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
SECTION 1.0 – GENERAL						
1.1	SS 1.1	Mobilization / Demobilization	LS	1		
1.2	SS 1.2	Traffic Control	LS	1		
1.3	SS 1.3	Quality Management & Survey	LS	1		
SECTION 2.0 – TRAIL CONSTRUCTION						
2.1	33 11 01 - SS1.4.1, 1.4.2	Clearing & Grubbing	LS	1		
2.2	31 22 01 - SS1.4.1	Stripping	LS	1		
2.3	31 22 01 - SS1.4.2	Site Grading (Cut & Fill on Site)	LS	1		
2.4	31 22 01 - SS1.4.4	Site Grading (Cut & Remove and dispose of off site)	m3	750		
2.5	32 11 23 - 1.4.2, SS1.4.5	Granular Well Graded Base (Trail and Shoulder) - 300mm - Haul & Place	m2	14965		
2.6	32 11 23 - 1.4.2, SS1.4.6	Granular Well Graded Base (Driveways) - 150mm - Haul & Place	m2	228		
2.7	32 11 23 - 1.4.2, SS1.4.6	Granular Well Graded Base (Parking on Laidlaw Frontage Road) - 300mm - Haul & Place	m2	205		
2.8	SS 2.1	Concrete Roadside Barrier (CBN)	EA	2		
2.9	SS 2.1	Concrete Roadside Barrier (CTB-E)	EA	2		
2.10	SS 2.1	Concrete Roadside Barrier (CRB-E)	EA	18		
2.11	SS 2.1	Concrete Roadside Barrier (CRB-H)	EA	19		
2.12	SS 2.2	Concrete Curb Island at Laidlaw Road Intersection (incl. removal of exisitng island)	LS	1		
SECTION 3.0 – CULVERTS						
3.1	33 42 13 - 1.5.1, 1.5.2	5.0m, 400mm Dia. CSP Culvert Extension c/w coupler (at 0+155)		1		
3.2	33 42 13 - 1.5.1, 1.5.2	4.0m, 600mm Dia. CSP Culvert Extension c/w coupler (at 0+265)		1		
3.3	33 42 13 - 1.5.1, 1.5.2	10.0m, 400mm Dia. CSP Culvert (at 0+400)		1		
3.4	33 42 13 - 1.5.1, 1.5.2	8.0m, 300mm Dia. CSP Culvert (at 0+950)		1		
3.5	33 42 13 - 1.5.1, 1.5.2	3.0m, 300mm Dia. CSP Culvert (at 0+970, 1+030 & 1+095)		3		
3.6	33 42 13 - 1.5.1, 1.5.2	7.5m, 400mm Dia. CSP Culvert (at 1+675)		1		
3.7	33 42 13 - 1.5.1, 1.5.2	9.0m, 400mm Dia. CSP Culvert (at 1+725)		1		
3.8	33 42 13 - 1.5.1, 1.5.2	10.0m, 400mm Dia. CSP Culvert (at 1+773)		1		
3.9	33 42 13 - 1.5.1, 1.5.2	30.0m, 500mm Dia. CSP Culvert (at 3+200)		1		
3.10	33 42 13 - 1.5.1, 1.5.2	4.5m, 800mm Dia. CSP Culvert Extension c/w coupler (at 3+250)		1		
3.11	33 42 13 - 1.5.1, 1.5.2	9.5m, 450mm Dia. CSP Culvert (at 3+255)		1		
3.12	SS 3.1	10.973m Multi-Plate CSP Culvert - Cattle Underpass Extension		1		

Tenderer's Initials _____

ITEM NO.	MMCD REF.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
SECTION 4.0 – SIGNS, LINE PAINTING, FENCING & OTHER						
4.1	SS 4.1	Remove and Relocate Existing Stop Sign	EA	2		
4.2	SS 4.2	Traffic and Trail Signs, c/w sign base, pole & mounting hardware	EA	20		
4.3	SS 4.3	Flexible Bollards (R8323 - Reliance Foundry, c/w removable mounting reciever)	EA	30		
4.4	SS 4.4	Type-C 1.8m High Fencing - Page Wire Type - (Regular Post Bury Depth - 850mm)	lm	145		
4.5	SS 4.5	Type-C 1.8m High Fencing - Page Wire Type - (Deepened Post Bury Depth - 1050mm)	lm	30		
4.6	SS 4.5	Turf Reinforcement Matting (AEC Recyclex TRM)	m2	1000		
4.7	SS 4.6	1.5m Tall Guard Railing	lm	220		
4.8	32 17 23 - 1.5.2	Line Painting (incl. road crossings, centerline, stop bars & reduce speed hill)	LS	1		
4.9	32 92 19 - 1.8.1	Hydroseeding	m2	4000		
SECTION 5.0 – OPTIONAL ITEMS						
5.1	32 11 23 - SS1.4.7	Granular Well Graded Base - Supply	tonne	500		
5.1	32 12 16 - 1.5.7	Asphalt Saw Cutting	lm	90		
5.2	32 12 16 - 1.5.1	Asphalt Pavement (50mm thick)	tonne	1360		
5.3	SS 5.1	Shouldering (0.5m)	m2	3800		
5.4	SS 5.2	Type-C 1.3m High Fencing - Paige Wire Type - (Regular Post Bury Depth - 850mm)	lm	300		
5.5	SS 5.3	Trail Counter - Supply and Install	EA	1		
5.6	SS 5.4	Pro-Ecolite Headwall - 300mm dia.	EA	8		
5.7	SS 5.4	Pro-Ecolite Headwall - 400mm dia.	EA	9		
5.8	SS 5.4	Pro-Ecolite Headwall - 450mm dia.	EA	2		
5.9	SS 5.4	Pro-Ecolite Headwall - 500mm dia.	EA	2		
5.10	SS 5.4	Pro-Ecolite Headwall - 600mm dia.	EA	1		
5.11	SS 5.4	Pro-Ecolite Headwall - 800mm dia.	EA	1		

Tenderer's Initials _____

Form of Tender - Appendix 2

Regional District of Bulkley Nechako
Cycle 16 Phase 1 Construction
(TITLE OF CONTRACT)

PRELIMINARY CONSTRUCTION SCHEDULE

(See paragraph 5.3.2 of the Instructions to Tenderers - Part II)

INDICATE SCHEDULE WITH BAR CHART WITH MAJOR ITEM DESCRIPTIONS AND TIME
Note: Substantial Performance Date is July 31st, 2022

ACTIVITY	CONSTRUCTION SCHEDULE (WEEKS)																																							
	JAN				FEB				MAR					APR				MAY				JUN					JUL				AUG					SEPT							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39		

Form of Tender - Appendix 3

Regional District of Bulkley Nechako
Cycle 16 Phase 1 Construction
(TITLE OF CONTRACT)

EXPERIENCE OF SUPERINTENDENT
(See paragraph 5.3.3 of the Instructions to Tenderers - Part II)

Name: _____

Experience:

Dates: _____
Project Name: _____
Responsibility: _____
_____
_____
References: _____

Dates: _____
Project Name: _____
Responsibility: _____
_____
_____
References: _____

Dates: _____
Project Name: _____
Responsibility: _____
_____
_____
References: _____

Form of Tender - Appendix 4

Regional District of Bulkley Nechako
Cycle 16 Phase 1 Construction
(TITLE OF CONTRACT)

COMPARABLE WORK EXPERIENCE

(See paragraph 5.3.4 of the Instructions to Tenderers - Part II)

PROJECT	OWNER/ CONTRACT NAME	PHONE NUMBER	WORK DESCRIPTION	VALUE ($)

Tenderer's Initials _____

Form of Tender - Appendix 5

Regional District of Bulkley Nechako
Cycle 16 Phase 1 Construction
(TITLE OF CONTRACT)

SUBCONTRACTORS

(See paragraph 5.3.5 of the Instructions to Tenderers - Part II)

TENDER ITEM	TRADE	SUBCONTRACTOR NAME	PHONE NUMBER

Tenderer's Initials _____

UNIT PRICE CONTRACT

Form of Agreement

Between Owner and Contractor

(FOR USE WHEN UNIT PRICES FORM THE BASIS OF PAYMENT - TO BE USED ONLY WITH THE GENERAL CONDITIONS AND OTHER STANDARD DOCUMENTS OF THE UNIT PRICE MASTER MUNICIPAL CONSTRUCTION DOCUMENTS.)

THIS AGREEMENT made in duplicate this _____ day of _____, 20___.

Contract: Cycle 16 Phase 1 Construction
(TITLE OF CONTRACT)

Reference No. 201-11400-01
(OWNER'S CONTRACT REFERENCE NO.)

BETWEEN:

The Regional District of Bulkley Nechako
(NAME OF OWNER)

(the "*Owner*")

AND:

_____
_____
_____
(NAME AND OFFICE ADDRESS OF CONTRACTOR)

(the "*Contractor*")

The *Owner* and the *Contractor* agree as follows:

ARTICLE 1 THE WORK - START/COMPLETION DATES

1.1 The *Contractor* will perform all *Work* and provide all labour, equipment and material and do all things strictly as required by the *Contract Documents*.

1.2 The *Contractor* will commence the *Work* in accordance with the *Notice to Proceed*. The *Contractor* will proceed with the *Work* diligently, will perform the *Work* generally in accordance with the construction schedules as required by the *Contract Documents* and will achieve Substantial Performance of the Work, including the selected Section 5.0 Optional Items on or before July 31st, 2022 subject to the provisions of the *Contract Documents* for adjustments to the *Contract Time*.

1.3 Time shall be of the essence of the *Contract*.

ARTICLE 2 CONTRACT DOCUMENTS

2.1 The "*Contract Documents*" consist of the documents listed or referred to in Schedule 1, entitled "Schedule of Contract Documents", which is attached and forms a part of this Agreement, and includes any and all additional and amending documents issued in accordance with the provisions of the *Contract Documents*. All of the *Contract Documents* shall constitute the entire *Contract* between the *Owner* and the *Contractor*.

2.2 The *Contract* supersedes all prior negotiations, representations or agreements, whether written or oral, and the *Contract* may be amended only in strict accordance with the provisions of the *Contract Documents*.

ARTICLE 3 CONTRACT PRICE

3.1 The price for the *Work* ("*Contract Price*") shall be the sum in Canadian dollars of the following:

3.1.1 the product of the actual quantities of the items of *Work* listed in the *Schedule of Quantities and Prices* which are incorporated into or made necessary by the *Work* and the unit prices listed in the *Schedule of Quantities and Prices*; plus

3.1.2 all lump sums, if any, as listed in the *Schedule of Quantities and Prices*, for items relating to or incorporated into the *Work*; plus

3.1.3 any adjustments, including any payments owing on account of *Changes* and agreed to *Extra Work*, approved in accordance with the provisions of the *Contract Documents*.

3.2 The *Contract Price* shall be the entire compensation owing to the *Contractor* for the *Work* and this compensation shall cover and include all profit and all costs of supervision, labour, material, equipment, overhead, financing, and all other costs and expenses whatsoever incurred in performing the *Work*.

ARTICLE 4 PAYMENT

4.1 Subject to applicable legislation and the provisions of the *Contract Documents*, the *Owner* shall make payments to the *Contractor*.

4.2 If the *Owner* fails to make payments to the *Contractor* as they become due in accordance with the terms of the *Contract Documents* then interest calculated at 2% per annum over the prime commercial lending rate of the Royal Bank of Canada on such unpaid amounts shall also become due and payable until payment. Such interest shall be calculated and added to any unpaid amounts monthly.

ARTICLE 5 RIGHTS AND REMEDIES

5.1 The duties and obligations imposed by the *Contract Documents* and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

5.2 Except as specifically set out in the *Contract Documents*, no action or failure to act by the *Owner*, *Contract Administrator* or *Contractor* shall constitute a waiver of any of the parties' rights or duties afforded under the *Contract*, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach under the *Contract*.

ARTICLE 6 NOTICES

6.1 Communications among the *Owner*, the *Contract Administrator* and the *Contractor*, including all written notices required by the *Contract Documents*, may be delivered by hand, by email, by fax, or by pre-paid registered mail to the addresses as set out below:

The *Owner*:

Regional District of Bulkley Nechako
37 3rd Avenue
PO Box 820
Burns Lake, BC V0J 1E0

Attention: Mr. Jason Lewellyn, Director of Planning

The *Contractor*:

The *Contract Administrator*:

6.2 A communication or notice that is addressed as above shall be considered to have been received:

6.2.1 immediately upon delivery, if delivered by hand; or

6.2.2 immediately upon transmission if sent and received by fax; or

6.2.3 after 5 *Days* from date of posting if sent by registered mail.

6.2443 at the time of receipt stated on the email received in the recipient's inbox, if sent by email.

6.3 The *Owner* or the *Contractor* may, at any time, change its address for notice by giving written notice to the other at the address then applicable. Similarly, if the *Contract Administrator* changes its address for notice then the *Owner* will give or cause to be given written notice to the *Contractor*.

6.4 The sender of a notice by fax assumes all risk that the fax will be received properly, and the provisions of paragraph 12.5 of the Instructions to Tenderers apply to the sender.

ARTICLE 7 GENERAL

7.1 This *Contract* shall be construed according to the laws of British Columbia.

7.2 The *Contractor* shall not, without the express written consent of the *Owner*, assign this *Contract*, or any portion of this *Contract*.

7.3 The headings included in the *Contract Documents* are for convenience only and do not form part of this *Contract* and will not be used to interpret, define or limit the scope or intent of this *Contract* or any of the provisions of the *Contract Documents*.

7.4 A word in the *Contract Documents* in the singular includes the plural and, in each case, vice versa.

7.5 This agreement shall ensure to the benefit of and be binding upon the parties and their successors, executors, administrators and assigns.

IN WITNESS WHEREOF the parties hereto have executed this Agreement the day and year first written above.

Contractor:

_____
(FULL LEGAL NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL)

_____
(AUTHORIZED SIGNATORY)

_____
(AUTHORIZED SIGNATORY)

Owner:

Regional District of Bulkley Nechako
(FULL LEGAL NAME OF OWNER)

_____
(AUTHORIZED SIGNATORY)

_____
(AUTHORIZED SIGNATORY)

Schedule 1

Schedule of *Contract Documents*

(INCLUDE IN LIST ALL DOCUMENTS INCLUDING, IF ANY, SUPPLEMENTARY GENERAL CONDITIONS, SUPPLEMENTARY SPECIFICATIONS, SUPPLEMENTARY STANDARD DETAIL DRAWINGS)

The following is an exact and complete list of the *Contract Documents*, as referred to in Article 2.1 of the Agreement.

NOTE: The documents noted with "*" are contained in the "Master Municipal Construction Documents 2019 Edition - General Conditions, Specifications and Standard Detail Drawings and all approved updates and standard detail drawings". All sections of this publication form part of the *Contract Documents*.

1 Agreement, including all Schedules;
2 Supplementary General Conditions;
3 General Conditions*;
4 Supplementary Specifications;
5 Specifications*;
6 Standard Detail Drawings*;
7 Executed Form of Tender, including all Appendices;
8 *Contract Drawings* listed in Schedule 2 to the Agreement – "List of *Contract Drawings*";
9 Instructions to Tenderers - Part I;
10 Instructions to Tenderers - Part II*;
11 All Addenda issued during the Tender Period

Schedule 2

List of *Contract Drawings*

(Complete listing of all drawings, plans and sketches which are to form a part of this Contract, other than Standard Detail Drawings and Supplementary Standard Detail Drawings.)

DRAWING NO.	SHEET TITLE	REVISION DATE	REVISION NO.
C000	TITLE SHEET	2021-08-11	B
C001	KEY PLAN	2021-08-11	B
C101	PLAN & PROFILE - STA 0+000 TO 0+250	2021-08-11	B
C102	PLAN & PROFILE - STA 0+250 TO STA 0+620	2021-08-11	B
C103	PLAN & PROFILE - STA 0+620 TO STA 0+960	2021-08-11	B
C104	PLAN & PROFILE - STA 0+960 TO STA 1+320	2021-08-11	B
C105	PLAN & PROFILE - STA 1+320 TO STA 1+740	2021-08-11	B
C106	PLAN & PROFILE - STA 1+740 TO STA 2+160	2021-08-11	B
C107	PLAN & PROFILE - STA 2+160 TO STA 2+580	2021-08-11	B
C108	PLAN & PROFILE - STA 2+580 TO STA 2+980	2021-08-11	B
C109	PLAN & PROFILE - STA 2+980 TO STA 3+380	2021-08-11	B
C110	PLAN & PROFILE - STA 3+380 TO STA 3+700	2021-08-11	B
C201	DETAILS - SWITCHBACKS	2021-08-11	B
C202	DETAILS - CATTLE CROSSING	2021-08-11	B
C203	DETAILS - WEME ROAD CROSSING	2021-08-11	B
C204	DETAILS - LAIDLAW ROAD CROSSING	2021-08-11	B
C205	DETAILS - TYPICAL	2021-08-11	B
C301	SECTIONS - STA 0+000 TO 0+320	2021-08-11	B
C302	SECTIONS - STA 0+340 TO 0+580	2021-08-11	B
C303	SECTIONS - STA 0+600 TO 0+900	2021-08-11	B
C304	SECTIONS - STA 0+920 TO 1+160	2021-08-11	B
C305	SECTIONS - STA 1+180 TO 1+460	2021-08-11	B
C306	SECTIONS - STA 1+480 TO 1+760	2021-08-11	B
C307	SECTIONS - STA 1+780 TO 2+120	2021-08-11	B
C308	SECTIONS - STA 2+140 TO 2+480	2021-08-11	B
C309	SECTIONS - STA 2+500 TO 2+860	2021-08-11	B
C310	SECTIONS - STA 2+880 TO 3+280	2021-08-11	B
C311	SECTIONS - STA 3+300 TO 3+660	2021-08-11	B
C312	SECTIONS - HYDRO ACCESS ROAD	2021-08-11	B
C313	SECTIONS - CATTLE CROSSING	2021-08-11	B

SUPPLEMENTARY GENERAL CONDITIONS

MMCD STANDARD

Note: Supplementary Sections & Clauses ending with an 'S' are published on the MMCD website and available for download. Supplementary Sections & Clauses beginning with an 'SS' are written exclusively for this contract.

All 2019 Edition MMCD Issued Supplemental General Conditions apply to this contract. Refer to Supplemental Update 2021-04-23 for all applicable MMCD issued supplemental updates.

PROJECT SPECIFIC

Supplementary Specification	**GC SS 1.79**		
Affected Document(s)	Volume II	Change Type	Addition
Section	General Conditions	Reference	1.79
Change Summary	Add a new definition.		
Currently	<>		
Should Be	1.79 "***Utilities***" means public or private services and their appurtenances which include, but are not limited to, storm drains, sanitary sewers, watermains, street lighting and traffic signal systems, pipe lines, conduits, transmission lines, telephone, cablevision, gas and electrical systems.		

Supplementary Specification	**GC SS 3.3.10**		
Affected Document(s)	Volume II	Change Type	Addition
Section	General Conditions	Reference	3.3.10
Change Summary	Specify the extent of survey layout to be provided by the *Owner*.		
Currently	<>		
Should Be	The *Contract Administrator* will provide control point data and digital layout files upon request of the Contractor.		

Supplementary Specification	**GC SS 4.3.4**		
Affected Document(s)	Volume II	Change Type	Revision
Section	General Conditions	Reference	4.3.4
Change Summary	Include *Contractor* responsibility for BC One Call and coordination of construction activities with utility owners.		
Currently	Before Commencing any *Work* at the Place *of the Work* the *Contractor* shall: (1) expose and determine conclusively the location in the field and all underground utilities and structures indicated on the *Contract Documents* as being at the *Place of the Work*; (2) consult with all utility corporations that provide electricity, communication, gas or other utility services in the area of the *Place of the Work*, to similarly expose and conclusively determine the location of all underground utilities for which they have records; and (3) similarly expose and conclusively determine the location of any other utilities or underground structures that are reasonably apparent in an		

	inspection of the *Place of the Work*.
Should Be	Before commencing any *Work* at the *Place of the Work*, the *Contractor* shall be responsible to locate in three dimensions all *Utilities* and structures indicated on the *Contract Documents* as being at the *Place of the Work*. The *Contractor* shall also be responsible to consult with all utility corporations that provide electricity, communication, gas or other utility services in the area of the *Place of the Work*, to locate in three dimensions all *Utilities* for which they have records. The *Contractor* shall also locate in three dimensions any other *Utilities* or underground structures that are reasonably apparent in an inspection of the *Place of the Work*. The *Contractor* shall contact BC One Call 1-800-474-6886 prior to construction. The *Contractor* shall coordinate his activities with utility owners and is responsible for protecting and supporting all *Utilities* during construction in a manner acceptable to the utility owner. The *Contractor* shall promptly repair or have repaired any and all damaged *Utilities*.

Supplementary Specification	**GC SS 4.3.7**		
Affected Document(s)	Volume II	Change Type	Addition
Section	General Conditions	Reference	4.3.7
Change Summary	Add a new clause.		
Currently	<>		
Should Be	The *Contractor* shall locate, mark and protect from damage or disturbance, any and all stakes, survey pins, monuments and markers at the *Place of the Work*. All survey stakes, pins, monuments or markers which, in the opinion of the *Owner*, have been damaged or disturbed shall be made good following construction by a registered B.C. Land Surveyor at the *Contractor's* expense. The Contractor is responsible for re-instating any existing stakes, survey pins, monuments and markers that are indicated on the drawing that need to be disturbed as a result of construction. Re-instatement of legal pins must be completed by a qualified professional and no additional claim for cost will be considered.		

Supplementary Specification	**GC SS 4.3.8**		
Affected Document(s)	Volume II	Change Type	Addition
Section	General Conditions	Reference	4.3.8
Change Summary	Add a new clause.		
Currently	<>		
Should Be	The cost of utility relocation shall be paid by the *Contractor* if the relocation is for the convenience or safety of construction, or by the *Owner* if the relocation is necessary by a direct conflict between the work and the utility which in the opinion of the *Contract Administrator* cannot be otherwise avoided except as noted herein or on the drawings as being the *Contractor's* responsibility. If instructed by the *Contract Administrator*, the *Contractor* will be responsible for arranging the relocation of *Utilities*.		

Supplementary Specification	**GC SS 4.3.9**		
Affected Document(s)	Volume II	Change Type	Addition
Section	General Conditions	Reference	4.3.9
Change Summary	Add a new clause.		
Currently	<>		
Should Be	The *Contractor* shall conduct operations so as to cause the minimum obstruction and inconvenience to traffic and to places of business and residences adjacent to the *Place of Work*. No greater quantity of work shall be undertaken at any one time than can be properly conducted with due regard to the rights and interests of the public as may be determined by the *Contract Administrator*. The *Contractor* is to provide safe, satisfactory and convenient means of approach and entrance to adjoining lanes, driveways, buildings and property, both for vehicles and pedestrians where necessary in the opinion of the *Contract Administrator*. Where trenches have been backfilled or where road improvements are incomplete the *Contractor* shall take any steps necessary to prevent potholes or other hazards. During all phases of the Work the *Contractor* shall take precautions to abate nuisance caused by mud or dust by clean-up, sweeping, sprinkling with water, or other means as necessary to accomplish results satisfactory to the *Contract Administrator*. The *Contractor* shall take care to prevent spillage on streets over which hauling is done and the *Contractor* shall immediately clean up any spillage or debris deposited on streets due to his operations. The *Contractor* shall not deposit any material upon any street, sidewalk, boulevard or other property, without the *Contract Administrator's* or the *Owner's* permission, nor shall the *Contractor* allow the same to remain longer than necessary. All surplus spoil and rubbish and other waste material shall be removed from the site so that the area of work is cleaned up and restored to as clean a condition as it was before the *Contract* started, within four days of the *Contract Administrator's* written request to do so, failing which the *Owner* may carry out the work or have the work carried out by others and recover the cost from the *Contractor* or may deduct the cost from any monies due or that may become due to *the Contractor*. All spoil material is to be disposed of at a permitted fill site.		

Supplementary Specification	**GC SS 4.3.10**		
Affected Document(s)	Volume II	Change Type	Addition
Section	General Conditions	Reference	4.3.10
Change Summary	Add a new clause.		
Currently	<>		
Should Be	Nothing shown or anything not shown on the drawings will relieve the *Contractor* of the responsibility for damages to persons or property, or delay in construction, caused by damage to or interference with existing *Utilities* along the route of the work to be completed under this *Contract*. No payment will be made for any loss or cost to the *Contractor* occasioned by damage to or interference with *Utilities*.		

Supplementary Specification	**GC SS 4.12.11**		
Affected Document(s)	Volume II	Change Type	Addition
Section	General Conditions	Reference	4.12.11
Change Summary	Add a new clause.		
Currently	<>		
Should Be	The *Contractor* shall retain the services of an Independent Inspection/Testing Agency, acceptable to the *Contract Administrator*, for the purpose of inspecting and/or testing portions of the Work. They are to provide the results of independent testing to the *Contract Administrator* as they become available. Quality Control and associated testing is the responsibility of the *Contractor*. During the progress of the Work, the *Contractor* shall have a sufficient number of tests and inspections completed to determine and demonstrate to the satisfaction of the *Contract Administrator* that the Material Product and installation meet the specified requirements. Quality Control testing shall include at a minimum but not be limited to the following: a) 3 compaction tests for every second lift for the structural plate culvert bedding and backfill b) 1 compaction test for the bedding material for each culvert or culvert extension installation c) 1 set of concrete tests for the concrete curb island (air, slump & 2 concrete cylinders) d) 1 compaction test every 150m2 for subgrade preparation; e) 1 compaction test every 150m2 for granular base; f) 1 Proctor for the native and each granular type material which will be incorporated into the work; provide a new Proctor(s) whenever the material changes substantially; g) Provide a gradation analysis on all imported granular materials In addition to the above noted frequency of testing, the *Contractor* must receive approval from the *Contract Administrator* prior to the placement of fill on all subgrade surfaces. Review and approval of subgrade surfaces will require proof rolling with a loaded tandem axle dump truck (supplied by the Contractor) and indication of satisfactory compaction results.		

Supplementary Specification	**GC SS 4.17**		
Affected Document(s)	Volume II	Change Type	Addition
Section	General Conditions	Reference	4.17
Change Summary	Add a new clause.		
Currently	<>		
Should Be	**4.17 Hours of Work** 4.17.1 The hours of work must not extend beyond 0700h and 1900h, inclusive, daily. The *Contractor* shall schedule their work within these hours and will not be permitted to commence work earlier than 0700h and/or		

	work later than 1900h, except as authorized by the *Contract Administrator*. No Sunday work will be permitted except in the case of emergency and then only with written permission of the *Contract Administrator* and to such an extent as they deem necessary. In case the *Contractor* desires to work on a day which is a statutory holiday, it shall notify the *Contract Administrator* in writing at least four (4) days in advance of such holiday, stating those places where said work will be conducted. In case the *Contractor* fails to give such notice in advance of any statutory holiday, no work within the terms of the *Contract* shall be done on such holiday. The *Owner* reserves the right not to allow any work to be undertaken on Statutory Holidays. With approval of the *Contract Administrator*, extended working hours on working days will be permitted for operations which must reasonably be completed on that date. 4.17.2 The *Contractor* shall not schedule work that will require inspection beyond the normal office hours (8:00am – 5:00pm, Monday through Friday) without the *Contract Administrator's* prior approval. Any extra cost incurred by the *Owner* for work done outside of normal office hours may be deducted from the *Contractor's* monthly payments. The *Contractor* shall not schedule construction work requiring inspection in excess of a 45-hour working week.

Supplementary Specification	**GC SS 18.4.6**		
Affected Document(s)	Volume II	Change Type	Addition
Section	General Conditions	Reference	18.4.6
Change Summary	Add a new clause.		
Currently	<>		
Should Be	Maintenance Security holdback: The *Owner* will, in addition to any other holdbacks that may be provided by the *Contract Documents*, deduct from the progress payments otherwise due to the *Contractor*, a Maintenance Security holdback in the amount of 2% of each progress payment, up to a total amount not to exceed 2% of the *Contract Price,* to cover the cost of corrections to the *Work* that may be required under GC 25. The *Contractor* may substitute a letter of credit, in the amount of the Maintenance Security, in a form and from a financial institution acceptable to the *Owner*, for the Maintenance Security holdback for the duration of the *Maintenance Period*. The Maintenance Security not required under GC 25, and remaining at the end of the *Maintenance Period*, shall be paid without interest to the *Contractor*.		

Supplementary Specification	**GC SS 18.4.7**		
Affected Document(s)	Volume II	Change Type	Addition
Section	General Conditions	Reference	18.4.7
Change Summary	Add a new clause.		
Currently	<>		

Should Be	In the case of an improvement that is exempt from the application of the *Builders Lien Act*, where letters of non-payment are received by the *Owner* from a *Subcontractor* before expiry of the holdback period as the term is defined in the *Builders Lien Act*, the *Owner* must retain the holdback amounts applicable to the disputing *Subcontractor* until the *Owner* receives: a. notice in writing from both the *Contractor* and *Subcontractor* that the dispute has been resolved; or b. a court order directing payment.

Supplementary Specification	**GC SS 18.6.6**		
Affected Document(s)	Volume II	Change Type	Revision
Section	General Conditions	Reference	18.6.6
Change Summary	Clarify responsibility of *Contractor* for certifying *Substantial Performance* of the *Work* of each *Subcontractor*.		
Currently	The *Contract Administrator* shall be the payment certifier responsible for payment certification for the *Contractor* under the *Builders Lien Act*. The *Contractor* shall be the person responsible for payment certification for all subcontractors, including the *Subcontractors*, as required under the *Builders Lien Act*.		
Should Be	The *Contract Administrator*, as defined herein, shall be the *Payment Certifier* responsible under the *Builders Lien Act* for certifying *Substantial Performance* of the *Work* of the *Contractor*, but not the *Work* of *Subcontractors*. The *Contractor* shall cooperate with and assist the *Contract Administrator* by providing information and assistance in a manner as timely as the *Contract Administrator* considers necessary to carry out the duties of the *Payment Certifier* for the *Contract*. The *Contractor* shall be the *Payment Certifier* responsible for payment certification under the *Builders Lien Act* for certifying *Substantial Performance* of the *Work* of each *Subcontractor*. Prior to certifying completion for a *Subcontractor*, the *Contractor* shall consult with the *Contract Administrator* and obtain the *Contract Administrator's* comments on the status of completion by the *Subcontractor*, including any deficiencies or defects in the *Subcontractor's Work* noted by the *Contract Administrator*. The *Contractor* will indemnify and save the *Owner* harmless from any and all liability the *Owner* may have to anyone arising out of the certification by the *Contractor* of *Substantial Performance* for that *Subcontractor*. Notwithstanding any other provision of the *Contract*, no payments will be due or owing to the *Contractor* so long as a Lien filed by anyone claiming under or through the *Contractor* remains registered against the Project or any lands, or interest therein, on which *Work* for the project was performed. Failure of the *Contractor* to remove all Liens promptly will entitle the *Owner* to damages.		

Supplementary Specification	**GC SS 24.1.7**		
Affected Document(s)	Volume II	Change Type	Addition
Section	General Conditions	Reference	24.1.7
Change Summary	Add a new clause.		
Currently	<>		

Should Be	The *Contractor* shall ensure the following are additional named insured under this contract: • Regional District of Bulkley Nechako • Ministry of Transportation and Infrastructure • Cycle 16 Trail Society • Virgo Holdings Ltd, • Willem H. Tersago

Supplementary Specification	**GC SS 25.1.4**		
Affected Document(s)	Volume II	Change Type	Addition
Section	General Conditions	Reference	25.1.4
Change Summary	Add a new clause.		
Currently	<>		
Should Be	The *Owner* is authorized to make repairs to defects or deficiencies if, ten days after giving written notice, the *Contractor* has failed to make or undertake with due diligence the required repairs. However, in the case of emergency where, in the opinion of the *Owner*, delay is not reasonable, repairs may be made without notice being sent to the *Contractor*. All expenses incurred by the *Owner* in connection with repairs made pursuant to GC 25 shall be paid by the *Contractor* and may be deducted from the Maintenance Security, or other holdbacks. The *Contractor* shall promptly pay any shortfall.		

SUPPLEMENTARY SPECIFICATIONS

MMCD STANDARD

Note: Supplementary Sections & Clauses ending with an 'S' are published on the MMCD website and available for download. Supplementary Sections & Clauses beginning with an 'SS' are written exclusively for this contract.

All 2019 Edition MMCD Issued Supplemental Specifications apply to this contract. Refer to Supplemental Update 2021-04-23 for all applicable MMCD issued supplemental updates.

PROJECT SPECIFIC

Supplementary Specification	**31 11 01 - SS 1.4.1**		
Affected Document(s)	Volume II	Change Type	Revision
Section	31 11 01	Reference	1.4.1
Change Summary	Revision		
Currently	Payment for all clearing and grubbing items includes removal and disposal of all branches, stumps, timbers and vegetation remains.		
Should Be	Payment for all clearing and grubbing items includes removal and disposal of all branches, stumps, timbers and vegetation remains, expressly including the existing brush piles on the hill side between stations 0+650 to 0+950.		

Supplementary Specification	**31 22 01 – SS 1.4.1**		
Affected Document(s)	Volume II	Change Type	Revision
Section	31 22 01	Reference	1.4.1
Change Summary	Revision		
Currently	Measurement for topsoil stripping including stockpiling for re-use will be made from before and after cross sections of stripped area as determined by Contract Administrator.		
Should Be	This pay item is for the stripping of all organics to subgrade along the trail, stockpile on site and respreads along the trail embankment prior to hydroseeding. This item shall be paid by Lump Sum based on the % stripping complete as determined by the Contract Administrator. This item includes all materials, labour and equipment required for construction, as well as removal and disposal of excess stripping material from the site or within the highway right-of-way. It includes the replacement of stripped topsoil, re-distributed evenly and levelled over all disturbed areas along the length of the trail. Works to conform to specifications contained within section 31 24 13 – Roadway Excavation, Embankment and Compaction.		

Supplementary Specification	**31 22 01 – SS 1.4.2**		
Affected Document(s)	Volume II	Change Type	Revision
Section	31 22 01	Reference	1.4.2
Change Summary	Revision		
Currently	Payment for rough site grading includes cut and fill excavation and its on-site redistribution and compaction to design elevations and grades with off-site disposal of surplus materials to be paid for separately.		

	Measurement for rough site grading will be made for the entire area graded including excavating and filling.
Should Be	Payment for rough site grading will be based on Lump Sum and includes cut and fill excavation and its on-site redistribution and compaction to design subgrade elevations and grades with off-site disposal of surplus materials to be paid for separately. Payment for compaction testing will be covered under payment item 1.3 Quality Management and Survey. Measurement for rough site grading will be based on an estimated % complete of entire area graded including excavating and filling, agreed upon on a monthly basis between the Contract Administrator and the Contractor.

Supplementary Specification	**31 22 01 – SS 1.4.4**		
Affected Document(s)	Volume II	Change Type	Revision
Section	31 22 01	Reference	1.4.4
Change Summary	Revision		
Currently	Measurement for removal and disposal of soft or unsuitable subgrade material including overlying topsoil will be made by loose truck box volume as determined by Contract Administrator. Specified backfill and compaction will be paid under 1.4.3.		
Should Be	Measurement for removal and disposal of soft, unsuitable or surplus subgrade material will be made by loose truck box volume as determined by the Contract Administrator. For the purposes of this payment item the term loose shall mean the uncompacted/unconsolidated volume of material in a loaded dump truck and each load counts will be based on 7m3 per tandem axel dump truck. The Contract Administrator shall review the suitability of all subgrade material prior to it being removed and disposed of offsite. Subgrade material is only deemed as "surplus" once all subgrade fill has been completed and no further fill is required to meet design subgrade elevations and grades.		

Supplementary Specification	**32 11 23 – SS 1.4.5**		
Affected Document(s)	Volume II	Change Type	Addition
Section	32 11 23	Reference	-
Change Summary	Addition		
Currently	< >		
Should Be	Payment for 1.4.2 of this Section includes hauling, placing, adjustment of moisture content and compaction of granular base material. All granular base material covered in this payment item has already been crushed and stockpiled at the Steti Transport gravel pit (Highway 16, west of Raymond Road), and therefore the cost of supplying the aggregate should not be included in the tender price. To verify quantities of granular base material supplied from the pre-crushed stockpile at the Steti gravel pit, the Contractor must provide weigh scale tickets for each load taken from the stockpile. Payment for compaction testing will be covered under payment item 1.3 Quality Management and Survey.		

Supplementary Specification	**32 11 23 – SS 1.4.6**		
Affected Document(s)	Volume II	Change Type	Addition
Section	32 11 23	Reference	-
Change Summary	Addition		

Currently	< >
Should Be	Payment for SS of this Section includes stripping, excavating and re-grading the existing ground surface as required to meet design grade elevations. It also includes hauling, placing, adjustment of moisture content and compaction of granular base material. All granular base material covered in this payment item has already been crushed and stockpiled at the Steti Transport gravel pit (Highway 16, west of Raymond Road), and therefore the cost of supplying the aggregate should not be included in the tender price. To verify quantities of granular base material supplied from the pre-crushed stockpile at the Steti gravel pit, the Contractor must provide weigh scale tickets for each load taken from the stockpile. Payment for compaction testing will be covered under payment item 1.3 Quality Management and Survey.

Supplementary Specification	**32 11 23 – SS 1.4.7**		
Affected Document(s)	Volume II	Change Type	Addition
Section	32 11 23	Reference	-
Change Summary	Addition		
Currently	< >		
Should Be	This payment item is for the supply of granular base material (WGB) that is required by the project in addition to the pre-crushed and stockpiled material in the Stetti gravel pit. This payment item shall include all costs required to supply the granular base material, including any hauling cost differential should the supply of the aggregate not be provided from the Stetti gravel pit. For example, payment items 2.5, 2.6 and 2.7 include hauling and placing granular base material, with the hauling being from the Stetti gravel pit. Should the Contractor supply the additional granular base material required for payment item 5.1 from an alternate gravel pit, then the Contractor should allow for any hauling cost differential in this pay item.		

Supplementary Specification	**SS 1.1 Mobilization & Demobilization**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for Mobilization and Demobilization		
Currently	< >		
Should Be	This pay item includes all costs for mobilization, demobilization, insurance and bonding. Payment will be based on a lump sum. Payment of 50% of the total price will be made in the first progress payment. The remaining 50% will be paid in the final progress payment.		

Supplementary Specification	**SS 1.2 Traffic Control**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for Traffic Control		
Currently	< >		
Should Be	This payment item includes <u>all costs</u> associated with traffic control for the project including the development and submission of a BC Ministry of Transportation level <u>*Category 1 Traffic Management Plan*</u>. The Traffic Management Plan shall include all Category 1 requirements, including by not limited to an Incident Management Plan, a Public Information Plan and an Implementation Plan. Costs covered by this payment item shall include, but		

	not be limited to; traffic control personnel, traffic control management, creation of the Traffic Management Plan, traffic control equipment such as signs, vehicles, personal protective equipment, etc. The Contractor shall also conduct all traffic control activities in accordance with MMCD Section 01 55 00. Payment for this item will be based on Lump Sum and will be made based on the following breakdown; • 25% of the Lump Sum will be paid when the Contractor has submitted and received approval for the Traffic Management Plan. • 65% of the Lump sum will be paid prorated on a monthly basis based on the percentage of the Contract completed. • 10% of the Lump Sum when the Contractor has completed all Work and has left the Site in a condition acceptable to the Contract Administrator.

Supplementary Specification	**SS 1.3 Quality Management & Survey**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for Quality Management & Survey		
Currently	< >		
Should Be	This payment item includes all costs associated with quality control such as compaction testing, proof rolling, development of material proctors, gradation analysis, and concrete testing in accordance with SGC 4.12.11. This payment item also includes all costs associated with survey layout and quantity tracking in order to construct the works as set out in the Contract. Payment for this item will be based on Lump Sum. Payment will be made on a monthly basis prorated for the percentage of Work completed as determined by the Contract Administrator, subject to the Contractor being totally compliant with the requirements of the Contract.		

Supplementary Specification	**SS 2.1 Concrete Roadside Barrier**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for Concrete Roadside Barriers		
Currently	< >		
Should Be	This payment item includes all costs associated with the supply and installation of concrete roadside barriers. Measurement for this payment item will be based on Each type of concrete barrier installed as indicated by the Contract Drawings. Payment will be made following the correct installation of Each barrier.		

Supplementary Specification	**SS 2.2 Concrete Curb Island at Laidlaw Road**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for Concrete Curb Island		
Currently	< >		
Should Be	This payment item includes all costs associated with construction of a new concrete island at the Laidlaw Road and Highway 16 intersection. This		

	includes, but is not limited to; saw cutting of existing asphalt around the existing island, removal of the existing concrete curb and asphalt from the island and around the island, preparation of base course surface prior to installation of new curb, installation of new curb with two let-downs for pathway, installation of concrete surface on the island and patching of asphalt around the island. Finished island dimensions shall match the existing island dimensions (to be surveyed by Contractor prior to removal). Measurement for this payment item will be Lump Sum and payment will be based on the % of work completed by the Contractor at the end of each progress period. Payment for concrete testing will be covered under payment item 1.3 Quality Management and Survey.

Supplementary Specification	**SS 3.1 Multi-Plate CSP Culvert – Cattle Underpass**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for Cattle Underpass Multi-Plate CSP Culvert		
Currently	< >		
Should Be	This payment item includes all costs associated with the supply and installation of the multi-plate CSP culvert extension at the cattle underpass. This includes, but is not limited to the following work; - Removal and reinstallation of bevel plate section - Removal and disposal of existing drainage culvert - Regrading the approach into the culvert - Removal of existing sections of fence - Supply and installation of new multi-plate culvert which includes; o Supply and placement of culvert bedding and backfill o Supply and installation of all culvert sections and applicable hardware in accordance with the manufacture's recommendations The pipe bedding shall be WGB and must be a minimum of 300 mm thick placed in discrete lifts a maximum of 150 mm in thickness and be compacted with vibratory equipment to not less than 95 percent of the material's SPD except for in the middle 1/3 of the pipe where the bedding should be left uncompacted for a depth equal to twice the corrugation depth. The embedment/backfill material shall be WGB and shall be placed in discrete lifts of 150 mm and compacted to not less than 95 percent of the material's SPD except for the last 300 mm of material below the subgrade elevation which should be compacted to not less than 100 percent of the material's SPD. The culvert embedment material should be placed and compacted simultaneously on both sides of the culvert to avoid eccentrically loading the culvert sides during backfilling. Embedment material should extend to 1/6 of the diameter of the culvert above the crown. The new multi-plate CSP culvert shall have the following specifications; - 84Pi, 79" Span x 88" Rise - Structural Shape: Vertical ellipse (28N – 4x7N plates per ring) - Thickness: 5mm - Coating: 915 g/m2 Galvanized		

	The Contractor is responsible for confirming with the culvert supplier that the above noted culvert type and plate layout will be compatible with the existing culvert. The Contractor shall submit shop drawings to the Contract Administrator prior to procurement of the culvert extension. 10% payment will be made upon approved shop drawings. Measurement for this payment item will be Lump Sum and payment will be based on the % of work completed by the Contractor at the end of each progress period.

Supplementary Specification	**SS 4.1 Remove & Relocate Existing Signs**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for Removing & Relocating Existing Signs		
Currently	< >		
Should Be	This payment item is for the removal and relocation of signs as noted on the Contract Drawings. The Contractor shall take care in relocating the signs and will be responsible for any and all damage caused to the signs during the process of relocation. Payment for this item includes all labour, equipment and material costs required to relocate the sign to the location indicated on the Contract Drawings. Payment for this item will be made upon 100% completion of Each sign.		

Supplementary Specification	**SS 4.2 New Signs**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for New Signs		
Currently	< >		
Should Be	This payment item is for supply and installation of traffic and trail signs as described in and in accordance with the Contract Drawings and MOT Standard Specifications SP635-3.8.1. Payment shall be for all earthworks, materials, labour and equipment required to complete the installation of each sign, including by not limited to; sign bases, sign poles, mounting hardware, signs and all labour and equipment required to complete the installation. Payment for this item will be made upon 100% completion of Each sign.		

Supplementary Specification	**SS 4.3 Flexible Bollards**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for Flexible Bollards		
Currently	< >		
Should Be	This payment item is for supply and installation of flexible traffic bollards as described in and in accordance with the Contract Drawings. The flexible bollards shall be the R8323 model supplied by *Reliance Foundry* and shall include the removable mounting receiver. Alternate flexible bollard alternatives will be considered for approval. Payment shall be for all earthworks, materials, labour and equipment required to complete the installation of the removable bollards in accordance with Reliance Foundry's flexible bollard installation guide. Payment for this item will be made upon 100% completion of Each bollard installed.		

Supplementary Specification	**SS 4.4 Type-C Paige Wire Fencing (1.8m High)**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for Type-C Paige Wire Fencing		
Currently	< >		
Should Be	Fencing will be measured by the Linear Meter. Measurements will be made parallel to the ground line of complete fencing, including any tensioning assemblies, but excluding gate openings. Payment for Fencing will be at the Contract Unit Price per metre of complete fencing. The Contract Unit Price shall be accepted as full compensation for furnishing all material, all labour, tools equipment and incidentals to complete the required installation, including the clearing of any additional right of way, construction of temporary fencing, connection to existing fences and structures, and final clean-up. Fencing shall be constructed in accordance with MOT Standard Specifications SP741-02.01.		

Supplementary Specification	**SS 4.5 Turf Reinforcement Matting (AEC Recyclex TRM)**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for Turf Reinforcement Matting		
Currently	< >		
Should Be	This payment item is for supply and installation of turf reinforcement matting as described in and in accordance with the Contract Drawings, as well as the manufacturer's installation recommendations. The turf reinforcement matting shall be the AEC Recyclex TRM supplied by *Curlex*. Alternate turf matting products will be considered for approval should they meet the outlined performance requirements. The turf matting shall have the following performance requirements; - Sheer Stress Rating of 480+ Pa - MD Tensile Strength Max – 5.7kN/m - TD Tensile Strength Max – 5.0kN/m - MD Elongation – 21.2% - TD Elongation – 20.3% - Colour – Green - Anchoring Depth – 200mm - Anchoring Frequency – 1 anchor per 2 meters squared Payment for this item will be based on the Square Meters of the finished turf matting surface installed and shall not include payment for overlapping as required by the manufacture's installation recommendations. Payment shall be for all materials, labour and equipment required to complete supply, installation and anchoring of the turf matting system. Hydraulic seeding of the turf mat will be paid under a separate contract item.		

Supplementary Specification	**SS 4.6 Guard Railing (1.4m High)**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for Guard Railing		
Currently	< >		
Should Be	This payment item is for supply and installation of the guard rail as described in and in accordance with the Contract Drawings, as well as the		

	manufacturer's installation recommendations. The guard rail shall be the Kee Klamp Guardrail System supplied by *Kee Safety*. Alternate guard rail products will be considered for approval should they meet the outlined requirements. The guard rail system shall meet the following requirements; - Railing Height – 1.5m - Vertical Post Spacing – 3m - Horizontal Rail Spacing – 0.5m - Vertical Tube Size – 1' ½" - Horizontal Tube Size – 1' ¼" - Pipe – Galvanized Steel - Depth of footing – 1.25m - Depth of pipe into footing – 0.5m min Payment for this item will be based on the Linear Meters of the finished guard rail and shall be for all materials, labour and equipment required to complete supply and installation of the guard rail system, which includes, but is not limited to; concrete footings, piping rails, couplers, flanges, end caps and fasteners.

Supplementary Specification	**SS 5.1 Shouldering**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for Shouldering		
Currently	< >		
Should Be	This payment item is for the supply and installation of a 0.5m wide gravel shoulder along each side of the trail. The depth of gravel shoulder shall match the depth of asphalt pavement of 50mm. Measurement for this payment item will be based on Square Meters for installed gravel shoulder and shall be for all materials, labour and equipment required to complete the gravel shoulders. No additional payment will be made for areas where greater than 0.5m of gravel shoulder was placed.		

Supplementary Specification	**SS 5.2 Type-C Fencing (1.3m High)**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for Type-C Fencing		
Currently	< >		
Should Be	Fencing will be measured by the Linear Meter. Measurements will be made parallel to the ground line of complete fencing, including any tensioning assemblies, but excluding gate openings. Payment for Fencing will be at the Contract Unit Price per metre of complete fencing. The Contract Unit Price shall be accepted as full compensation for furnishing all material, all labour, tools equipment and incidentals to complete the required installation, including the clearing of any additional right of way, construction of temporary fencing, connection to existing fences and structures, and final clean-up. Fencing shall be constructed in accordance with MOT Standard Specifications SP741-02.01.		

Supplementary Specification	**SS 5.3 Trail Counter**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-

Change Summary	Add Payment Item for Trail Counter
Currently	< >
Should Be	This pay item is for the supply and installation of a trail counter. The trail counter shall be the "Multi in a Wooden Post" model supplied by *Eco-Counter*, or an approved alternative. The counter shall have the following performance requirements; - Ability to count pedestrians and cyclists with differentiation - 1-year battery life minimum - 11 months of memory minimum - Acceptable temperature range of -40C to 40C - 3.5m minimum of range - Bi-directional detection Payment for the trail counter will be at the Contract Unit Price. The Contract Unit Price shall be accepted as full compensation for furnishing all material, all labour, tools equipment and incidentals to complete the required installation.

Supplementary Specification	**SS 5.4 Pro Eco Lite Headwall**		
Affected Document(s)	Volume II	Change Type	Addition
Section	-	Reference	-
Change Summary	Add Payment Item for Pro Eco Lite Headwall		
Currently	< >		
Should Be	This pay item is for supply and installation of 'Pro Eco Lite' stormwater outfall in accordance with the Contract Drawings. Payment for the Pro Eco Lite headwall will be for Each headwall installed based on the size of headwall required as outlined in the Drawings and on the Schedule of Quantities. Payment shall be for all earthworks, materials, labour and equipment required to complete the installation.		

REFERENCE DOCUMNETS

BC MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

CYCLE 16 BIKE PATH

GEOTECHNICAL ENGINEERING ASSESSMENT REPORT

FEBRUARY 19, 2021

CONFIDENTIAL

CYCLE 16 BIKE PATH

GEOTECHNICAL ENGINEERING ASSESSMENT REPORT

BC MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

REPORT
CONFIDENTIAL

PROJECT NO.: 20P-00109-00
DATE: FEBRUARY 19, 2021

WSP
LANDMARK 6, SUITE 700
1631 DICKSON AVENUE
KELOWNA, BC
CANADA V1Y 0B5

T: +1 250 980-5500
F: +1 250-980-5511
WSP.COM

February 19, 2021

CONFIDENTIAL

BC MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE
District Program Manager,
Bulkley Strikine District,
Ministry of Transportation

Via email to: Rosemary.Barnewall@gov.bc.ca

Attention: Rosemary Barnewall, P.Geo

Subject: Cycle 16 Society Bike Path - Geotechnical Engineering Assessment Report

As requested, WSP Canada Inc. (WSP) has prepared this geotechnical engineering assessment report regarding the pavement structure for the Bike Path between the Bulkley River and Babine Lake Road south of Highway 16 in Smithers, BC. Our scope of work for this project was provided in our proposal No. P20-P1000-07 dated October 15th, 2020.

Our scope of work for this project did not include assessment of the soil or groundwater at the site with respect to environmental considerations nor geohazards that could impact the site.

Yours sincerely,

Per: Stephen Renner, EIT
Geotechnical Engineer

Per: Paul Ell, P.Eng.
Senior Geotechnical Engineer

SR/pre
Encl.

WSP ref.: 20P-00109-00

LANDMARK 6, SUITE 700
1631 DICKSON AVENUE
KELOWNA, BC
CANADA V1Y 0B5

T: +1 250 980-5500
F: +1 250-980-5511
wsp.com

REVISION HISTORY

FIRST ISSUE

February 19, 2021		
Prepared by	Reviewed by	Approved by
Stephen Renner, EIT Geotechnical Engineer in Training	Nick Wodzianek, M.Sc., P.Eng. Geotechnical Engineer	Paul Ell, P.Eng. Senior Geotechnical Engineer

SIGNATURES

PREPARED BY

Per: Stephen Renner, EIT
Geotechnical Engineer

February 19, 2021

REVIEWED BY

Per: Nick Wodzianek, M.Sc., P.Eng.
Senior Geotechnical Engineer

February 19, 2021

APPROVED[1] BY

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
P. R. ELL

FEB 19/2021

Per: Paul Ell, P.Eng.
Senior Geotechnical Engineer

February 19, 2021

[1] Approval of this document is an administrative function indicating readiness for release and does not impart legal liability on to the Approver for any technical content contained herein. Technical accuracy and fit-for-purpose of this content is obtained through the review process. The Approver shall ensure the applicable review process has occurred prior to signing the document.

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APPENDICES

1 SITE AND PROJECT DESCRIPTION

The proposed project consists of construction of a multi-use pathway that follows the existing Ministry of Transportation and Infrastructure (MoTI) Right-of-Way (ROW) along the west side (southbound) of Highway 16 from the Bulkley River Bridge to Babine Lake Road (north end to south end respectively). The path will follow within the Ministry's ROW for most of the alignment, except for a short portion that will run along existing private land ROWs as the pathway follows a series of switchbacks up a hill. The project also includes the extension of a 2.2m diameter culvert that currently crosses under the highway at the approximate mid-point of the pathway, which is used as a cattle crossing. The total length of the proposed pathway is 3.5km and is shown on Figures 2 and 3 attached in Appendix A.

The natural topography varies throughout the path's alignment. Most of the path will match existing ground contours and have moderate longitudinal grades ranging from approximately 0.5% to 4%, however there are sections where grades will exceed 5% as a result of the existing hill directly east of the Bulkley River Bridge.

In some cases, the proposed pathway parallels the highway at the toe of the highway embankment, and in other cases it parallels at the crest of the highway embankment. Existing highway embankment cut/fill slopes range from 1 Horizontal: 1 Vertical (1H:1V), to 2H:1V.

The topography of the hill directly east of the Bulkley River bridge is moderately steep with slopes ranging from 4H:1V to 2H:1V. As a result, the trail will be designed with a series of switchbacks to make the grades consistent with current transportation design guidelines. Aside from the hill east of the bridge where the two private land ROWs exist and is heavily treed, the trail alignment follows the MoTI ROW, which either acts as an access road for BC Hydro and PNG utility vehicles, or is relatively flat and well-vegetated with native grasses.

2 GEOTECHNICAL INVESTIGATION

To assess the soil and groundwater conditions at the site, on September 4, 2020, WSP advanced a total of twenty-two (22) test pits (TP20-01 to TP20-22) along the proposed bike path at intervals of approximately 200 metres using a track mounted excavator. The test pits were advanced to depths of ranging from 0.5 m to 3.0 m below ground surface (mbgs). The approximate locations of the test pits are shown on the attached Figures 2 and 3 in Appendix A.

The soil and groundwater conditions encountered at the test pits were logged in the field by a member of our technical staff. Disturbed soil samples were collected from the test pits for visual classification and laboratory index testing purposes. The test pits were backfilled with the excavated soils and bucket packed immediately upon completion of logging the soils.

Detailed descriptions of the soil and groundwater conditions encountered at the test pits are provided on the attached soil logs in Appendix B. The soil logs also graphically illustrate the moisture content of disturbed soil samples collected from the test pits and the percent fines (material passing the 0.075 mm sieve) for the samples on which grain size analyses were conducted. The results of the grain size analyses and Atterberg Limit test conducted on select samples are attached to this report in Appendix C. The approximate UTM Northing and Easting coordinates of the test pit locations, as determined on site by hand-held GPS device, are recorded at the top of each soil log.

A summary discussion of the soil and groundwater conditions at the test pits are provided in the following section of this report. The attached soil logs should be used in preference to the general summary of soil conditions provided below.

3 SOIL AND GROUNDWATER CONDITIONS

3.1.1 SURFICIAL GEOLOGY

The surficial geology map titled "Map 1557A, Surficial Geology, Skeena River – Bulkley River Area – Sheet 5" prepared by the Geological Survey of Canada describes the soils adjacent to the Bulkley River bridge as a gravel and sand plain subject to occasional flooding. Farther east of the bridge the soils are described as a gravel and sand terrace/scarp generally one to seven metres thick overlying gravel. The alignment of the majority of the proposed bike path borders between surficial deposits described as either a till ground moraine or terrace scarps/river banks consisting of various unconsolidated sediments underlying a blanket or veneer of colluvium.

3.1.2 SOIL STRATIGRAPHY

The soils encountered at the WSP test pits were generally consistent with the description provided on the surficial geology map. In general, the soil deposits encountered at the test pits were as follows:

- Topsoil;
- Fill;
- Organic soils;
- Granular deposits;
- Fine-grained deposits; and
- Till.

Topsoil was encountered at the ground surface of every test hole except in TP20-20 where compact silty sand to sandy silt was encountered. Topsoil extended to depths ranging from 0.1 to 0.8 mbgs.

Suspected fill was encountered in TP20-02 and TP20-03 directly beneath the topsoil and extended to depths of about 0.6 to 0.8 m. The fill consisted of either firm to hard silty clay or dense non-cohesive sandy gravelly silt.

Shallow organic soils were encountered in TP20-17, TP20-19, and TP20-20 beneath native granular deposits and extended to depths ranging from 0.5 to 0.9 mbgs.

Granular deposits were encountered in TP20-01, TP20-04, TP20-06, TP20-17 through TP20-20, and TP20-22. They generally consisted of either sandy gravel, sand with some gravel, or silty sand/sandy silt with some gravel. Where encountered the granular deposits were generally underlying the topsoil and extended to the bottom of the test pits in TP20-01, TP20-04 and TP20-06. In TP20-22 the sand was encountered below fine-grained, cohesive deposits and extended to the bottom of the test pit.

Fine-grained, non-cohesive deposits were encountered, generally consisting of silt with varying amounts of sand and gravel (encountered in TP20-04 and TP20-07), or of silty clay or clayey silt (TP20-05, TP20-07, TP20-10, and TP20-22). The fine-grained deposits were underlying the topsoil in each of the test pits that they were encountered and extended to depths of about 0.8 to 1.2 mbgs.

Till was encountered in all the test pits except for TP20-01 to TP20-04, TP20-06, TP20-07, and TP20-22. The till was generally stiff to hard and consisted of varying amounts of sand and gravel in a silt or clay matrix. Where encountered, the till extended to the bottom of the test pits.

3.1.3 LAB TESTING

Grain size analyses were conducted on seven samples. The grain size analysis results are summarized in Table 1:

Table 1: Summary of Grain Size Analyses

SAMPLE (DEPTH)	GRAVEL CONTENT	SAND CONTENT	FINES CONTENT*
TP20-01 – G3 (1.0 m)	3.1 %	64.2%	32.7%
TP20-03 – G2 (0.9 m)	23.4 %	27.1 %	49.5 %
TP20-04 – G1 (0.3 m)	13.4 %	20.1 %	66.5 %
TP20-04 – G3 (1.3 m)	50.1 %	34.3 %	15.6 %
TP20-06 – G2 (1.0 m)	22.4 %	56.1 %	21.5 %
TP20-07 – G3 (1.2 m)	3.4 %	25.2 %	71.4 %
TP20-22 – G3 (1.0 m)	18.7 %	55.2 %	26.1 %

*Fines is material passing the 0.075 mm sieve.

Atterberg Limits testing was conducted on three fine-grained cohesive samples. The Atterberg Limits test results are summarized in Table 2:

Table 2: Summary of Atterberg Limits Test Results

SAMPLE (DEPTH)	PLASTIC LIMIT	LIQUID LIMIT	PLASTICITY INDEX
TP20-02 G2 (0.7 m)	17.2 %	22.9 %	5.7 %
TP20-05 – G2 (0.7 m)	14.0 %	24.0 %	10.0 %
TP20-10 – G2 (1.5 m)	12.0 %	23.0 %	11.0 %

3.1.4 GROUNDWATER

Groundwater seepage was encountered in test pits TP20-06, TP20-07, TP20-10, TP20-14, TP20-17, and TP20-20 at depths of ranging from about 0.1 to 0.8 mbgs during the time they remained open. From our observations, we consider these are due to isolated perched groundwater conditions. We anticipate that the depth to groundwater fluctuates on a seasonal basis and with precipitation events and snowmelt.

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 GENERAL

Based on the information from the WSP test pits, it is our opinion that the project site is suitable for the type of development proposed from a geotechnical engineering perspective. It is also our opinion that the type the proposed bike path can be constructed subject to the recommendations provided in the following sections of this report.

4.2 SUBGRADE PREPARATION

Based on the soil conditions observed in the test pits, it is anticipated that stripping depths between 0.1 and 0.9 mbgs would be required to remove surface vegetation and organic soils to expose either native, competent subgrade soils consisting generally of either silty clay till, clayey silt till, or granular fill. If excavations deeper than indicated above are required to obtain competent subgrade to remove unsuitable fill, soft soils, or subsurface obstructions encountered during excavation, subgrade fill as described in Section 4.4 (Subgrade Fill) should be placed atop the stripped subgrade. The width of prepared subgrade must be widened to account for permanent fill slopes where they occur. The subgrade should be sloped to suitable drainage areas such as ditches or culverts.

The exposed subgrade should be compacted with a large, smooth-drum vibratory roller, and proof-rolled under the review of a geotechnical engineer prior to placing utilities, subgrade fill, or pavement structure fills. Areas that rut or deflect excessively would require further excavation and replacement with compacted subgrade fill.

To reduce subgrade disturbance, excavation should be conducted with a smooth-mouth clean-out bucket as the excavator retreats from the excavated area.

The geotechnical engineer should review the prepared subgrade prior to placing subgrade fill.

4.3 TEMPORARY AND PERMANENT SLOPES

Temporary excavations that are more than 1.2 m in depth and require worker access should be conducted in accordance with WorkSafeBC regulations. An allowable inclination of 1H:1V (Horizontal: Vertical) is considered appropriate for unsupported temporary excavations deeper than 1.2 m in the site soils located above the groundwater table. The inclination of temporary excavations may need to be reduced where groundwater seepage or loose soil is encountered. All temporary excavations steeper than recommended above should be approved in writing by the Geotechnical Engineer prior to workers entering / approaching the edge of such areas. We recommend that unsupported temporary excavation slopes be covered with polyethylene sheeting securely fastened at the top and toe of the slopes to limit erosion by surface water runoff.

Permanent unsupported slopes comprised of compacted subgrade fill or native soils should not be steeper than 2H:1V. Steeper cut and fill slopes of 1.5H:1V may be feasible, depending upon the fill material used to construct the slope, but they would need to be provided with suitable erosion protection such as rock armor, erosion control blankets, suitable plantings, etc. to limit shallow seated instability and, depending on their height could require geogrid reinforcement (mechanically stabilized earth). These steeper slopes should be reviewed by a geotechnical engineer following construction.

The recommended fill slope inclination is qualified as follows:

1 The fill should be placed in horizontal lifts, regardless of the pre-existing site topography;

2 The Geotechnical Engineer approved fill should be compacted to no less than 98 percent of the material's Standard Proctor Maximum Dry Density (SPMDD), as confirmed by in-place soil density testing conducted by the Geotechnical Engineer;
3 Fill material should be compacted in lifts no greater than 0.3 m in thickness. The lift thickness should not be increased without prior written approval from the Geotechnical Engineer;
4 The fill should be stepped into adjoining existing slope areas when constructing a lateral extension to an embankment or natural hillside, as illustrated below in Figure 1. The steps should be not more than 1.0 m in height and have a horizontal length of not less than 1.5 times the height of the adjacent step. The recommended stepping will create a staggered transition between the pre-existing slope and the new fill that will provide the necessary stability at the interface between the existing slope face and the new fill slope extension;

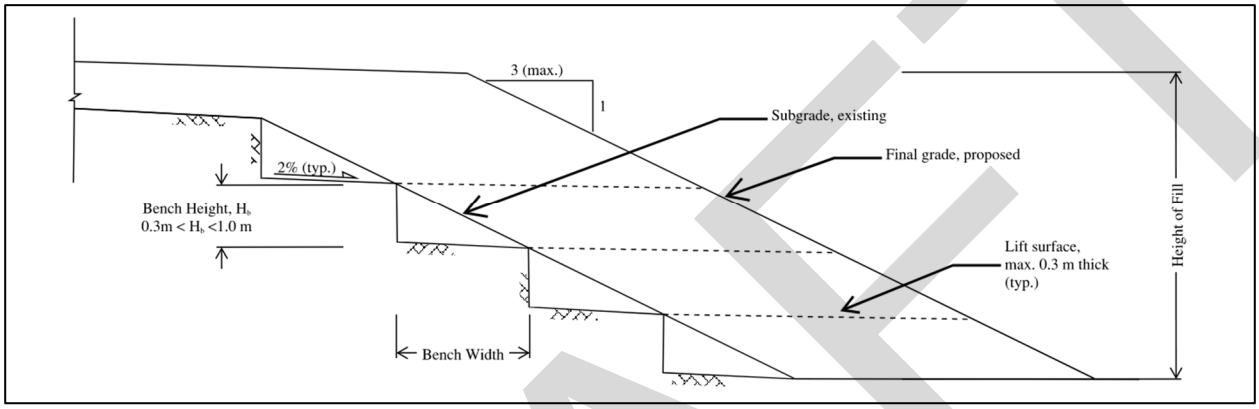

Figure 1: Bench Slope Fill Construction

5 The constructed fill slope should be over-built at least 300 mm beyond its final position and then trimmed back to the final position after compaction;
6 The placement and compaction of the fill slope should be reviewed by the Geotechnical Engineer as it occurs.

The extent of erosion and sediment control requirements during and following construction will depend on the site location and season. However, the provided general guidelines are as follows:

1 Best practices should be implemented by the Contractor for erosion and sediment control during construction;
2 Surface water should be directed away from cut and fill slopes or drained in a controlled manner down the slope that does not result in slope erosion. Surface water flows should be drained to a suitable location in accordance with the design and the Ministry of Transportation and Infrastructure (MotTI) requirements;
3 The cut and fill soil slopes should be vegetated immediately following construction. Temporary erosion control of permanent cut and fill soil slopes can be achieved using Geotechnical Engineer approved proprietary erosion control mats. Alternatively, hydraulic seeding using an appropriate seed mix for the site exposure and climate, fertilizer, mulch, and tackifier may be considered for erosion protection.

4.4 SUBGRADE FILL

Subgrade fill is defined in this report as fill soils and aggregates required to build the embankment at the culvert extension and pavements to subgrade elevation. Imported subgrade fill should consist of 150 mm minus pit run sand and gravel or crushed aggregate sand and gravel containing less than 8 percent fines by weight. It should be placed in discrete lifts a maximum of 300 mm in thickness and be compacted to not less than 98 percent of the material's SPMDD.

It is our opinion that the native cohesive soils encountered at the test pits would generally be suitable for use as subgrade fill. The recommended equipment for compacting cohesive soils is a sheepsfoot roller or a footed drum. Cohesive soils should be spread to a uniform lift thickness at least 25 mm less than the length of the rollers foot so that the foot of the roller penetrates the previous layer. The soils should be compacted to 98% of the material's

SPMDD at a water content that is ± 2% of optimum water content. Rollers may be ballasted to increase compaction effort if required to achieve the specified density.

If the moisture content of the soil is too high the material should be spread and thoroughly worked until the optimum moisture content is achieved. Discing and mixing with drier materials are suitable methods for reducing the moisture content. If the moisture content of the material is too low, the material should be disced and broken down, water added as required and the material thoroughly worked to mix the water throughout the material prior to commencing compaction operations. Dry material may also be mixed with wetter material to increase the moisture content. After moisture conditioning, the water content must be uniform throughout the lift thickness (e.g., a wet or dry zone in the upper few centimeters of the lift is unacceptable).

If prior to placing subsequent lifts of material the compacted surface is too hard for the compaction equipment to penetrate the surface, the top ± 150 mm should be scarified or disced. If prior to placing subsequent lifts of material the compacted surface is too wet or too dry, the affected material should be removed and replaced with new material and/or treated as noted above before recompacting. Cohesive soils should be free from organic, frozen, or other deleterious material.

In-place soil density testing and/or visual review should be conducted on the subgrade fill by the Geotechnical Engineer, as it is being placed and compacted, to confirm that adequate compaction is achieved.

The suitability any soils proposed for use as subgrade fill at the site should be reviewed and confirmed by the Geotechnical Engineer at the time of excavation. Subgrade fill should be placed by end-dumping and be spread with tracked equipment to limit disturbance to the subgrade.

4.5 CULVERT FOUNDATION AND BEDDING

Based on the test pits conducted in the vicinity of the cattle crossing culvert extension (TP20-07, TP20-08 and TP20-09) , it is anticipated that the soil at the base of the cattle crossing culvert extension after topsoil removal will generally consist of dense clayey silt or stiff silty clay and improvement of the trench subgrade is generally not expected to be necessary. We recommend that any protruding cobbles or boulders be removed from below the culvert and that the subgrade be compacted with vibratory equipment prior to placement of bedding material.

Based on the information obtained from the test pits, it is anticipated that specialized temporary excavation dewatering will not be necessary for construction of the culvert. It is expected that surface water and groundwater seepage entering any excavations could be adequately controlled using sump pits and pumps.

We recommend that the culvert bedding material conform to the gradation for 25 mm minus Well Graded Base (WGB) conforming to Article 202.02.02 (a), Section 202 of the BC MoTI 2020 Standard Specifications for Highway Construction as per Article 303.21.05 (b) (i) of Section 303 of the Specifications. The pipe bedding should a minimum of 300 mm thick placed in discrete lifts a maximum of 150 mm in thickness and be compacted with vibratory equipment to not less than 95 percent of the material's SPMDD except for in the middle 1/3 of the pipe where the bedding should be left uncompacted for a depth equal to twice the corrugation depth.

4.6 CULVERT EMBEDMENT AND BACKFILL

Foundation and cattle crossing culvert extension embedment material should comprise of 25 mm WGB conforming to Article 202.02.02 (a), Section 202 of the BC MoTI 2020 Standard Specifications for Highway Construction as per Article 303.21.07 of Section 303 of the Specifications, placed in discrete lifts of 150 mm and compacted to not less than 95 percent of the material's SPMDD except for the last 300 mm of material below the subgrade elevation which should be compacted to not less then 100 percent of the material's SPMDD. The culvert embedment material should be placed and compacted simultaneously on both sides of the culvert to avoid eccentrically loading the culvert sides during backfilling. Embedment material should extend to 1/6 of the diameter of the culvert above the crown.

Backfill material should comprise of subgrade fill, as described in Section 4.4. The first lift of backfill above the crown of the culvert should be placed 450 mm thick while the remaining layers should be placed in discrete lifts of 300 mm. Backfill material should be compacted to not less than 100 percent of the material's SPMDD. The culvert backfill material should be placed and compacted simultaneously on both sides of the culvert a maximum difference in height of 300 mm to avoid eccentrically loading the culvert sides.

The site soils are considered to be unsuitable for re-use as backfill in this area. We recommend that any soils considered for use as backfill be reviewed by the Geotechnical Engineer prior to their use.

4.7 POST CONSTRUCTION SETTLEMENT

The magnitude of ground settlement is a function of the past loading on the subgrade soils, soil compressibility, and the magnitude of the new loads. Placement of fill around the culvert and atop the culvert will increase the stress in the soils underlying the foundations, which will result in consolidation of the underlying soils and consequent settlement.

It is estimated that total settlement of the culvert on the order of 25 mm could occur, assuming the finished grade over and adjacent to the culvert is approximately at the elevation of the existing roadway or top of banks. The settlement would occur relatively quickly (i.e. immediate settlement) as the culvert is backfilled to the proposed road elevation. The settlement estimate may need to be revised based on the final design grade over the culvert and approaches. The Structural and Civil Engineer or Client should advise WSP of design changes that could affect the culvert approach settlement estimates.

4.8 PAVEMENT STRUCTURE

The following minimum pavement structure is recommended for the bike path, based on the anticipated subgrade conditions:

- 50 mm of asphalt conforming to Article 502.08.02 (b) Class 1; underlain by
- 100 mm of 25 mm minus WGB conforming to Article 202.02.02 (a), Section 202 of the BC MoTI 2020 Standard Specifications for Highway Construction; underlain by
- 200 mm of 75 mm minus Select Granular Sub base (SGSB) conforming to Article 202.02.03 (a), Section 202 of the BC MoTI 2020 Standard Specifications for Highway Construction; underlain by
- Geotechnical Engineer approved subgrade.

The pavement structure is based on a 20-year design criteria and load of 10,000 equivalent single axle loads (ESAL's), referenced from AASHTO 1993. Our estimate of the number of ESAL's is based on our understanding that the path may experience low frequency service vehicle traffic. Parameters from BC MoTI's Technical Circular T-01/15 were used to assess the proposed pavement structure. Positive drainage should be provided to mitigate the potential for frost heave; however, based on the fine-grained nature of the subgrade soils, some frost heave may occur resulting in additional maintenance costs throughout the life of the bike path.

The granular sub-base and base materials for all pavements should be compacted to no less than 98 percent of the materials' SPMDD. Sub-base and base courses should extend horizontally beyond the pavement edges at least 150 mm.

Subgrade should consist of inorganic very stiff to hard, fine-grained or compact to dense granular deposits approved by the geotechnical engineer. It is recommended that the subgrade be proof-rolled with a loaded dump truck under the review of the Geotechnical Engineer prior to the placement of the sub-base material. Any areas that exhibit excessive deflection or rutting during the proof-rolling should be sub-excavated to competent subgrade and grade reinstated with Geotechnical Engineer approved subgrade fill compacted to no less than 100 percent of the material's SPMDD.

4.9 WINTER AND WET WEATHER CONSTRUCTION

Construction that occurs during periods of cold or wet weather may encounter difficulties when preparing the pavement subgrades or compacting fill where long-term settlement control is expected. Frozen soils, fill containing snow, or subgrade surfaces that are snow-covered or frozen could experience excessive post-construction settlements when the frozen soil thaws or the snow melts. Likewise, excessively wet subgrade or fill surfaces could experience excessive post-construction settlements upon draining. Considerations for managing winter construction and wet weather are provided below:

- Keep subgrade surfaces free of frost before, during, and after construction by using sacrificial lifts of fill or other means to reduce exposure.
- Keep fill free of snow, ice, and other deleterious materials and avoid placing fill on frozen or snow-covered surfaces.
- Cover fill stockpiles with tarpaulins to protect them from precipitation and to manage the soil water content.
- Place fill on surfaces that are free of standing water and that are not excessively wet (relative to the optimum water content for compaction purposes).
- Reduce standing water on exposed surfaces where fill or foundation elements will be placed by using an appropriate water management plan during construction, and/or by using sacrificial lifts of fill or other means to reduce exposure.

4.10 GEOTECHNICAL REVIEW

During site preparation and construction, WSP should be provided with the opportunity to review/test the following:

- Temporary and permanent cut slopes;
- Imported subgrade fill, pavement subbase, and pavement base fills;
- Site soils under consideration for re-use as subgrade fill;
- Stripped subgrades prior to the placement of subgrade fill;
- Proof rolling of subgrade beneath the cattle crossing culvert extension;
- Placement and compaction of bedding material and subgrade fill beneath the cattle crossing culvert extension;
- Placement and compaction of subgrade fill where required for pavement structure;
- Proof rolling of subgrade in pavement areas, prior to the placement of sub-base fill; and
- Placement and compaction of pavement sub-base and base courses.

5 CLOSURE

This geotechnical engineering assessment report has been prepared by WSP Canada Inc. for the account of BC Ministry of Transportation and Infrastructure in accordance with the professional services agreement. The disclosure of any information contained in this report is the sole responsibility of the intended recipient. The material in it reflects WSP's judgement in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. WSP accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. The limitations statement is considered part of this report.

We acknowledge that the BC Ministry of Transportation may use and rely upon the information contained in this report for permitting purposes.

The soil logs attached to this report provide description of the soil and groundwater conditions encountered at discrete test pit locations. Actual soil conditions in areas remote from the test pits may vary across the site. Contractors should make their own interpretation of the soil logs and the site conditions for the purposes of bidding and performing work at the site.

The original of the technology-based document sent herewith has been authenticated and will be retained by WSP for a minimum of ten years. Since the file transmitted is now out of WSP's control and its integrity can no longer be ensured, no guarantee may be given to any modifications made to this document.

The attached Terms of Reference for an integral part of this geotechnical report.

We trust this meets your immediate requirement. If you have any questions or require further information, please contact our office.

APPENDIX

A SITE PLANS

Note: Test Pit Locations are Approximate

LEGEND

TP20-XX TEST PIT

ADAPTED FROM: Google Earth

DATE: 2020

PROJECT NO.: N/A

700 - 1631 Dickson Avenue
Kelowna, BC V1Y 0B5
p: 250-980-5500
f: 250-980-5511
www.wsp.com

TITLE: Site Plan		DSN: N/A	SCALE: NTS
PROJECT: Cycle 16 Bike Path		CHK: SR	DATE: December 2020
ADDRESS: Hwy 16 Between Bulkley River Bridge and Babine Lake Road		DWN: HT	PROJECT NO.: 20P-00109-00
CLIENT: British Columbia Ministry of Transportation & Infrastructure			DRAWING NO.: FIGURE 2

Note: Test Pit Locations are Approximate

LEGEND

TP20-XX TEST PIT

ADAPTED FROM: Google Earth

DATE: 2020

PROJECT NO.: N/A

700 - 1631 Dickson Avenue
Kelowna, BC V1Y 0B5
p: 250-980-5500
f: 250-980-5511
www.wsp.com

TITLE: Site Plan		DSN: N/A	SCALE: NTS
PROJECT: Cycle 16 Bike Path		CHK: SR	DATE: December 2020
ADDRESS: Hwy 16 Between Bulkley River Bridge and Babine Lake Road		DWN: HT	PROJECT NO.: 20P-00109-00
CLIENT: British Columbia Ministry of Transportation & Infrastructure			DRAWING NO.: FIGURE 3

APPENDIX

B TEST HOLE LOGS

WSP Canada Inc.
#108 - 3677 Highway 97N
Kelowna, B.C. V1X 5C3
Tel: +1 250-491-9778
Fax: +1 250-491-9729
www.wsp.com

Cycle 16 Bike Path
BC Ministry of Transportation & Infrastructure
Hwy 16 Between Bulkley River Bridge and Babine Lake Rd

TP20-01

Project No: 20P-00109-00
Northing: 6070692 Easting: 620250

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample #	Recovery	Water Level
		Loose to compact, dark brown, SILT TOPSOIL, with roots and rootlets, moist.			G1		
		Compact, brown, silty SAND/sandy SILT, some gravel, occasional rootlets, moist.					
	2	Dense, brown, coarse GRAVEL, some sand, dry.			G2		
1		Dense to very dense, silty SAND, trace gravel, wet.			G3		
	4	Dense, sandy GRAVEL, trace silt, occasional cobbles, occasional boulders, dry.					
	6				G4		P1 Nov 4 2020
2							
	8						
3	10	Bottom of test pit at 3.0 metres.					
	12						
4							
	14						
	16						

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

SOIL CLASSIFICATION IN ACCORDANCE WITH THE CANADIAN FOUNDATION ENGINEERING MANUAL 4TH EDITION 2006.

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) — Moisture Content (%) — Liquid Limit (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
Checked by: PE

1 LOG PER PAGE 19/2/21

WSP Canada Inc.
#108 - 3677 Highway 97N
Kelowna, B.C. V1X 5C3
Tel: +1 250-491-9778
Fax: +1 250-491-9729
www.wsp.com

Cycle 16 Bike Path
BC Ministry of Transportation & Infrastructure
Hwy 16 Between Bulkley River Bridge and Babine Lake Rd

TP20-02

Project No: 20P-00109-00
Northing: 6070625 Easting: 620443

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose, dark brown, SILT TOPSOIL, with roots and rootlets, moist.				
		Compact to dense, brown to grey, clayey SILT to silty CLAY, trace sand, trace gravel, with cobbles, occasional boulders, moist. Suspected Fill			G1	
	2	Stiff, brown, silty CLAY TILL, trace sand, trace gravel, low plasticity, moist.			G2	
1		Stiff to hard, brown to grey, CLAY TILL, some silt, trace sand, trace gravel, occasional cobbles, moist.			G3	
	4	Bottom of test pit at 1.4 metres.				
	6					
2						
	8					
	10					
3						
	12					
4						
	14					
	16					

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
Checked by: PE

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WSP Canada Inc.
#108 - 3677 Highway 97N
Kelowna, B.C. V1X 5C3
Tel: +1 250-491-9778
Fax: +1 250-491-9729
www.wsp.com

Cycle 16 Bike Path
BC Ministry of Transportation & Infrastructure
Hwy 16 Between Bulkley River Bridge and Babine Lake Rd

TP20-03

Project No: 20P-00109-00
Northing: 6070556 Easting: 620542

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample #	Recovery	Water Level
		Loose, dark brown, SILT TOPSOIL, with roots and rootlets, moist.					
		Firm, brown to grey, silty CLAY, some sand, some gravel, occasional cobbles, dry. Suspected Fill.			G1		
0.5	2						
		Dense, brown to grey, sandy, gravelly SILT, with cobbles, non cohesive, moist.			G2		
1	4						
		Stiff, grey, silty CLAY TILL, trace sand, trace gravel, with cobbles, with boulders, moist.			G3		
		Bottom of test pit at 1.4 metres.					
1.5	6						
2	8						
2.5	10						
3	12						
3.5	14						
4	16						

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) ▶ Liquid Limit (%) ◀
Moisture Content (%)

- Ground Water Level
- Shear strength in kPa (Torvane)
- PP Pocket Penetrometer (compressive strength in kPa)
- Shear strength in kPa (Unconfined)
- Shear strength in kPa (Field vane)
- Remolded strength in kPa
- Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
Checked by: PE

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WSP Canada Inc.
#108 - 3677 Highway 97N
Kelowna, B.C. V1X 5C3
Tel: +1 250-491-9778
Fax: +1 250-491-9729
www.wsp.com

Cycle 16 Bike Path
BC Ministry of Transportation & Infrastructure
Hwy 16 Between Bulkley River Bridge and Babine Lake Rd

TP20-04

Project No: 20P-00109-00
Northing: 6070343 Easting: 620673

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample #	Recovery	Water Level
		Loose, dark brown, SILT TOPSOIL, occasional roots and rootlets, moist.					
		Compact, brown, sandy SILT, some gravel, moist.			G1		
		- Peat between 0.4 m to 0.5 m.					
	2	Dense, dark brown, SILT, some fine sand, wet.			G2		
		- Peat between 0.6 m to 0.7 m.					
1	4	Dense to very dense, brown, sandy GRAVEL, some silt, occasional cobbles, moist to wet.			G3		
	6	Bottom of test pit at 1.5 metres.					
2	8						
	10						
3	12						
4	14						
	16						

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

SOIL CLASSIFICATION IN ACCORDANCE WITH THE CANADIAN FOUNDATION ENGINEERING MANUAL 4TH EDITION 2006.

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) ▶ ● ◀ Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
Checked by: PE

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WSP Canada Inc.
#108 - 3677 Highway 97N
Kelowna, B.C. V1X 5C3
Tel: +1 250-491-9778
Fax: +1 250-491-9729
www.wsp.com

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TP20-05

Project No: 20P-00109-00
Northing: 6070320 Easting: 620772

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose, dark brown, SILT TOPSOIL, with roots and rootlets, moist.				
		Stiff, brown to grey, silty CLAY, some sand, trace gravel, moist.			G1	
		Stiff, brown, silty CLAY to clayey SILT, some sand, some gravel, low plasticity, moist.				
	2				G2	
1						
	4	Very dense, brown, clayey SILT TILL, some sand, some gravel, occasional cobbles, moist.				
		Bottom of test pit at 1.4 metres.				
	6					
2						
	8					
3	10					
	12					
4						
	14					
	16					

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) — Moisture Content (%) — Liquid Limit (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
Checked by: PE

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WSP Canada Inc.
#108 - 3677 Highway 97N
Kelowna, B.C. V1X 5C3
Tel: +1 250-491-9778
Fax: +1 250-491-9729
www.wsp.com

Cycle 16 Bike Path
BC Ministry of Transportation & Infrastructure
Hwy 16 Between Bulkley River Bridge and Babine Lake Rd

TP20-06

Project No: 20P-00109-00
Northing: 6070117 Easting: 620899

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample #	Recovery	Water Level
		Loose, dark brown, SILT TOPSOIL, with roots and rootlets, moist.					
		Compact, light brown, SAND, some gravel, occasional cobbles, moist.			G1		
	2	Dense, brown, gravelly, silty SAND, occasional cobbles, occasional boulders, moist.					
1	4				G2		
		Perched water table observed from 0.1 m to 0.8 m. Bottom of test pit at 1.4 metres.					
	6						
2							
	8						
	10						
3							
	12						
4							
	14						
	16						

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
Checked by: PE

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WSP Canada Inc.
#108 - 3677 Highway 97N
Kelowna, B.C. V1X 5C3
Tel: +1 250-491-9778
Fax: +1 250-491-9729
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Cycle 16 Bike Path
BC Ministry of Transportation & Infrastructure
Hwy 16 Between Bulkley River Bridge and Babine Lake Rd

TP20-07
Pg 1 of 1
Project No: 20P-00109-00
Northing: 6069946 Easting: 621007

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose, dark brown, SILT TOPSOIL, with roots, moist.				
		Stiff, brown, silty CLAY, some sand, some gravel, moist.				
	2				G1	
		Dense, brown to grey, clayey SILT, trace sand, trace gravel, occasional cobbles, moist.			G2	
1						
	4	Dense, brown, sandy SILT, trace gravel, occasional cobbles, moist.			G3	
		Perched water table observed from 0.8 m to 1.0 m. Bottom of test pit at 1.4 metres.				
	6					
2						
	8					
3	10					
	12					
4						
	14					
	16					

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
Checked by: PE

SOIL CLASSIFICATION IN ACCORDANCE WITH THE CANADIAN FOUNDATION ENGINEERING MANUAL 4TH EDITION 2006.

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Cycle 16 Bike Path
BC Ministry of Transportation & Infrastructure
Hwy 16 Between Bulkley River Bridge and Babine Lake Rd

TP20-08

Project No: 20P-00109-00
Northing: 6069750 Easting: 621141

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose, black, SILT TOPSOIL, with rootlets, moist to wet.				
		Dense, brown to grey, clayey SILT TILL, some sand, some gravel, occasional cobbles, moist.				
		Test Pit used to determine stipping depth. Bottom of test pit at 0.5 metres.				

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) — Moisture Content (%) — Liquid Limit (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
Checked by: PE

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Kelowna, B.C. V1X 5C3
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Fax: +1 250-491-9729
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Cycle 16 Bike Path
BC Ministry of Transportation & Infrastructure
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TP20-09

Project No: 20P-00109-00
Northing: 6069720 Easting: 621159

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose, black, SILT TOPSOIL, with rootlets, moist to wet.				
	2					
		Compact to dense, brown to grey, clayey SILT TILL, some sand, some gravel, occasional cobbles, moist.				
1						
	4	Test Pit used to determine stripping depth. Bottom of test pit at 1.0 metres.				
	6					
2						
	8					
	10					
3						
	12					
4						
	14					
	16					

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
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TP20-10

Project No: 20P-00109-00
Northing: 6069683 Easting: 621186

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample #	Recovery	Water Level
		Loose, black, SILT TOPSOIL, with rootlets, moist.					
1	2	Stiff, brown to grey, silty CLAY, some sand, trace gravel, occasional cobbles, moist.			G1		
2	4	Dense, brown, SILT TILL, some sand, some gravel, occasional cobbles, low plasticity, moist.			G2		
	6						
	8						
3	10	Perched water table obsereved at 0.5 m. Bottom of test pit at 2.5 metres.					
	12						
4	14						
	16						

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
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TP20-11

Project No: 20P-00109-00
Northing: 6069654 Easting: 621194

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose, black, SILT TOPSOIL, with roots and rootlets, moist to wet.				
		Stiff, brown to grey, silty CLAY TILL, some sand, some gravel, occasional cobbles, moist.				
		Test Pit used to determine stripping depth. Bottom of test pit at 0.6 metres.				

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
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TP20-12

Project No: 20P-00109-00
Northing: 6069616 Easting: 621219

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose, dark brown, SILT TOPSOIL, with rootlets, moist.				
		Compact, borwn, sandy SILT, some gravel, occasional cobbles, moist to wet.				
		Stiff, brown to grey, silty CLAY TILL, some sand, some gravel, occasional cobbles, moist.				
		Test Pit used to determine stripping depth. Bottom of test pit at 0.6 metres.				

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
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TP20-13

Project No: 20P-00109-00
Northing: 6069489 Easting: 621304

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample #	Recovery	Water Level
		Loose, black, SILT TOPSOIL, with rootlets, moist.					
	2	Compact to dense, brown, SILT, some coarse sand, some gravel, occasional cobbles, moist.			G1		
		- Dense from 0.5 m.			G2		
1	4	Hard, brown to grey, silty CLAY TILL, some sand, some gravel, occasional cobbles. - Large boulder at 1.1 m.			G3		
		Bottom of test pit at 1.4 metres.					
	6						
2	8						
	10						
3	12						
4	14						
	16						

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
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TP20-14

Project No: 20P-00109-00
Northing: 6069332 Easting: 621408

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose, black, SILT TOPSOIL, with rootlets, moist.				
		Stiff, dark brown, silty CLAY, some sand, with roots, moist.				
		- Seepage at 0.2 m.				
		Stiff, brown, silty CLAY TILL, some sand, some gravel, occasional cobbles, moist.			G1	
1	2					
	4					
		Bottom of test pit at 1.4 metres.				
2	6					
	8					
3	10					
	12					
4	14					
	16					

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
Checked by: PE

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TP20-15

Project No: 20P-00109-00
Northing: 6069151 Easting: 621526

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose, black, SILT TOPSOIL, with roots and rootlets, moist.				
		Stiff, brown to grey, silty CLAY TILL, some gravel, trace sand, occasional cobbles, moist.			G1	
					G2	
		Bottom of test pit at 1.5 metres.				

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
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TP20-16

Project No: 20P-00109-00
Northing: 6068975 Easting: 621629

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose to compact, dark brown, SILT TOPSOIL, with roots and rootlets, moist.				
		Stiff, brown, silty CLAY TILL, some sand, some gravel, occasional cobbles, moist to wet.				
0.6	2				G1	
		- Stiff to hard from 0.7 m. - Wet fine sand seam at 0.8 m.				
1.2	4				G2	
1.7	6	Bottom of test pit at 1.7 metres.				
2.3	8					
3.0	10					
3.7	12					
4.3	14					
4.9	16					

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
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TP20-17

Project No: 20P-00109-00
Northing: 6068782 Easting: 621679

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose, black, SILT TOPSOIL, with rootlets, moist.				
		Dense, brown, silty SAND/sandy SILT, some gravel, occasional organics, moist.			G1	
		Firm, black organic soil, moist.				
	2	Stiff, light brown, silty CLAY TILL, some sand, some gravel, moist.			G2	
1		Hard, dark brown from 0.8 m.			G3	
	4	Perched water table observed at 0.7 m. Bottom of test pit at 1.2 metres.				
	6					
2						
	8					
	10					
3						
	12					
4						
	14					
	16					

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

SOIL CLASSIFICATION IN ACCORDANCE WITH THE CANADIAN FOUNDATION ENGINEERING MANUAL 4TH EDITION 2006.

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:

DCPT Blow/300 mm

Plastic Limit (%) ▶ Liquid Limit (%) ◀
Moisture Content (%)

- Ground Water Level
- Shear strength in kPa (Torvane)
- PP Pocket Penetrometer (compressive strength in kPa)
- Shear strength in kPa (Unconfined)
- Shear strength in kPa (Field vane)
- Remolded strength in kPa
- Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
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TP20-18

Project No: 20P-00109-00
Northing: 6068558 Easting: 621698

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose, dark brown, SILT TOPSOIL, with roots, moist.				
		Dense, brown, SAND, some gravel, occasional organics, moist.			G1	
	2	Dense, brown, SILT TILL, some clay, some gravel, trace sand, occasional cobbles, moist.				
1	4				G2	
		Bottom of test pit at 1.3 metres.				
	6					
2						
	8					
	10					
3						
	12					
4						
	14					
	16					

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
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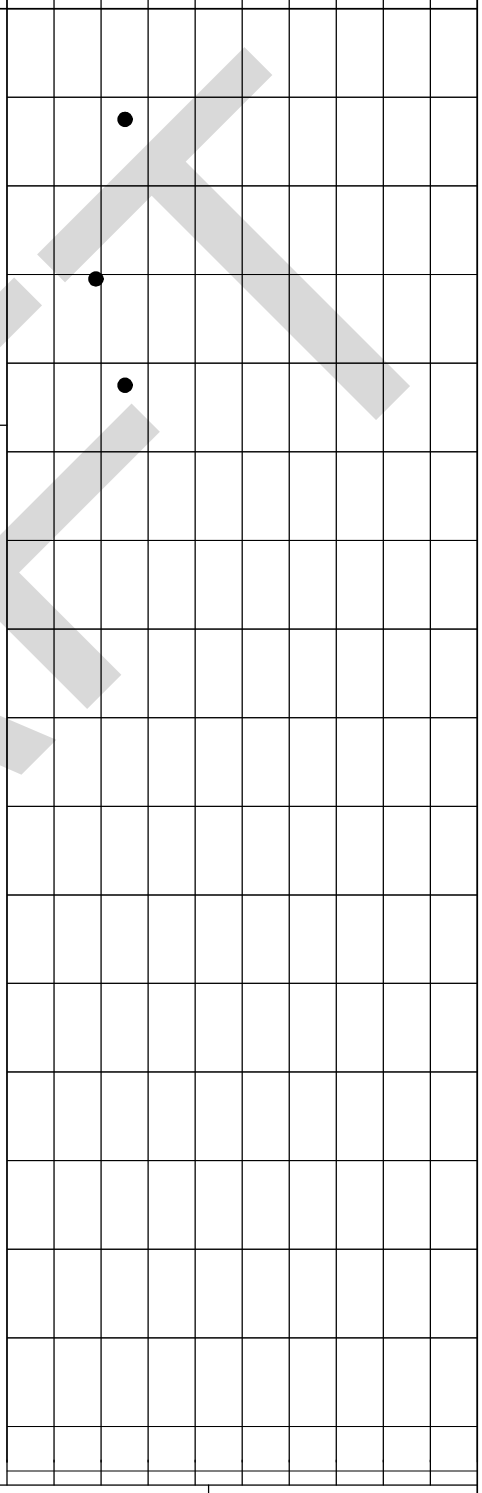
TP20-19

Project No: 20P-00109-00
Northing: 6068343 Easting: 621699

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose, black, SILT TOPSOIL, with roots and rootlets, moist.				
		Dense, silty SAND/sandy SILT, with organics, moist to wet.			G1	
	2	Firm, black, organic soil, moist to wet.				
		Dense, brown, clayey SILT TILL, some sand, some gravel, occasional cobbles, moist.			G2	
1	4	Hard, brown, silty CLAY TILL, some sand, trace gravel, moist to wet.			G3	
		Bottom of test pit at 1.4 metres.				
	6					
2						
	8					
	10					
3						
	12					
4						
	14					
	16					



C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
Checked by: PE

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BC Ministry of Transportation & Infrastructure
Hwy 16 Between Bulkley River Bridge and Babine Lake Rd

TP20-20

Project No: 20P-00109-00
Northing: 6068265 Easting: 621695

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample #	Recovery	Water Level
		Compact, brown, silty SAND/sandy SILT, some gravel, with roots and rootlets, moist.			G1		
	2	Firm, black, organic soil, moist to wet, some seepage.					
1		Dense, brown, silty CLAY TILL, some sand, some gravel, low plasticity, moist.			G2		
	4	- Occasional cobbles, occasional boulders from 1.3 m.					
		Bottom of test pit at 1.5 metres.					
	6						
2							
	8						
3	10						
	12						
4							
	14						
	16						

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
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BC Ministry of Transportation & Infrastructure
Hwy 16 Between Bulkley River Bridge and Babine Lake Rd

TP20-21

Project No: 20P-00109-00
Northing: 6068119 Easting: 621695

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose to compact, dark brown, SILT TOPSOIL, some sand, some gravel, with roots and rootlets, moist.			G1	
	2	Dense, brown, clayey SILT TILL, some sand, some gravel, occasional cobbles, moist.			G2	
1	4				G3	
		Bottom of test pit at 1.2 metres.				
2	6					
	8					
3	10					
	12					
4	14					
	16					

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

Plastic Limit (%) Liquid Limit (%)
Moisture Content (%)
Ground Water Level
Shear strength in kPa (Torvane)
PP Pocket Penetrometer (compressive strength in kPa)
Shear strength in kPa (Unconfined)
Shear strength in kPa (Field vane)
Remolded strength in kPa
Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
Checked by: PE

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Kelowna, B.C. V1X 5C3
Tel: +1 250-491-9778
Fax: +1 250-491-9729
www.wsp.com

Cycle 16 Bike Path
BC Ministry of Transportation & Infrastructure
Hwy 16 Between Bulkley River Bridge and Babine Lake Rd

TP20-22

Project No: 20P-00109-00
Northing: 6067936 Easting: 621711

Depth (m)	Depth (ft)	Description	C	N	Type/ Sample # / Recovery	Water Level
		Loose, dark brown, SILT TOPSOIL, with roots and rootlets, moist.				
		Stiff, brown, silty CLAY, some gravel, trace sand, occasional cobbles, wet.			G1	
	2				G2	
1		Dense, brown, silty SAND, some gravel, occasional cobbles, moist.			G3	
	4	Bottom of test pit at 1.2 metres.				
	6					
2						
	8					
	10					
3						
	12					
4						
	14					
	16					

10 20 30 40 50 60 70 80 90

C: Condition of Sample
Good
Disturbed
No Recovery

Type: Type of Sampler
SPT : 2 in. standard
ST : Shelby
G : Grab
CORE

N: Number of Blows
WH : Weight of Hammer
WR : Weight of Rod
Standard Penetration Test : ASTM D1586
Hammer Type:
DCPT Blow/300 mm

SOIL CLASSIFICATION IN ACCORDANCE WITH THE CANADIAN FOUNDATION ENGINEERING MANUAL 4TH EDITION 2006.

Plastic Limit (%) ▶ Liquid Limit (%)
Moisture Content (%)

- Ground Water Level
- Shear strength in kPa (Torvane)
- PP Pocket Penetrometer (compressive strength in kPa)
- Shear strength in kPa (Unconfined)
- Shear strength in kPa (Field vane)
- Remolded strength in kPa
- Percent Passing # 200 sieve

Drill Method: Test Pit
Date Drilled: 04/11/2020
Logged by: AK
Checked by: PE

1 LOG PER PAGE 19/2/21

APPENDIX

C LABORATORY TESTING RESULTS

#108, 3677 Hwy 97N
Kelowna, BC V1X 5C3
Tel: (250) 491-9778
Fax: (250) 491-9729

#100, 20339 96 Ave.
Langley, BC V1M 0E4
Tel: (604) 533-2992
Fax: (604) 533-0768

12791 Clarke Pl.
Richmond, BC V6V 2H9
Tel: (604) 278-1411
Fax: (604) 278-1412

Client: British Columbia Ministry of Transportation & Infrastructure **File No.:** 20P-00109-00

Project Name: Cycle 16 Bike Path **Phase:** 00300

Site Address: Hwy 16 Between Bulkley River and Babine Lake Road

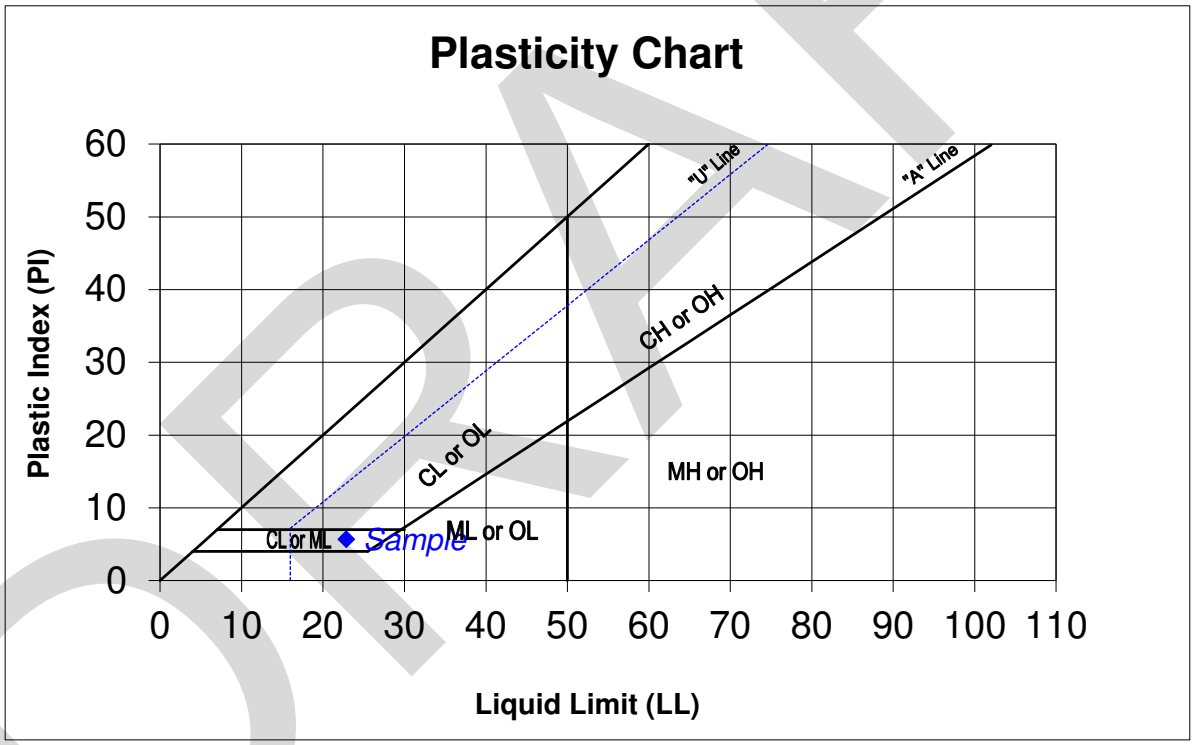
ATTERBERG LIMITS
ASTM D 4318

Sampled By: Allan K. **Sampling Date:** 4-Nov-20

Tested By: Scott F. **Test Date:** 26-Nov-20

Sample Location: TP20-02, G2 (0.7 m)

Source/Supplier:



LL: 22.9 %
PL: 17.2 %
PI: 5.7 %

Comments:

WSP Canada Inc.

Per: Stephen Renner, EIT

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Kelowna, BC V1X 5C3
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Tel: (604) 533-2992
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Richmond, BC V6V 2H9
Tel: (604) 278-1411
Fax: (604) 278-1412

Client: British Columbia Ministry of Transportation & Infrastructure **File No.:** 20P-00109-00

Project Name: Cycle 16 Bike Path **Phase:** 00300

Site Address: Hwy 16 Between Bulkley River and Babine Lake Road

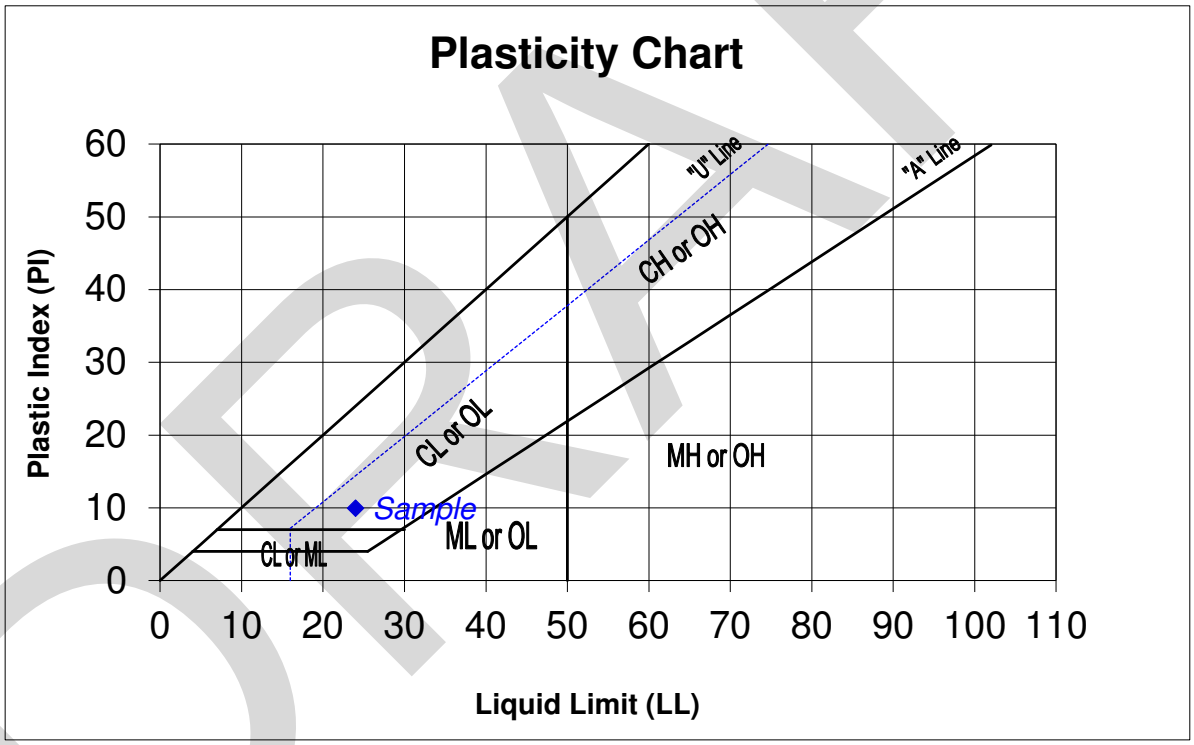
ATTERBERG LIMITS
ASTM D 4318

Sampled By: Allan K. **Sampling Date:** 4-Nov-20

Tested By: Scott F. **Test Date:** 30-Nov-20

Sample Location: TP20-05, G2 (0.7 m)

Source/Supplier:



LL: 24.0 %
PL: 14.0 %
PI: 10.0 %

Comments:

WSP Canada Inc.

Per: Stephen Renner, EIT

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Langley, BC V1M 0E4
Tel: (604) 533-2992
Fax: (604) 533-0768

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Richmond, BC V6V 2H9
Tel: (604) 278-1411
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Client: British Columbia Ministry of Transportation & Infrastructure **File No.:** 20P-00109-00

Project Name: Cycle 16 Bike Path **Phase:** 00300

Site Address: Hwy 16 Between Bulkley River and Babine Lake Road

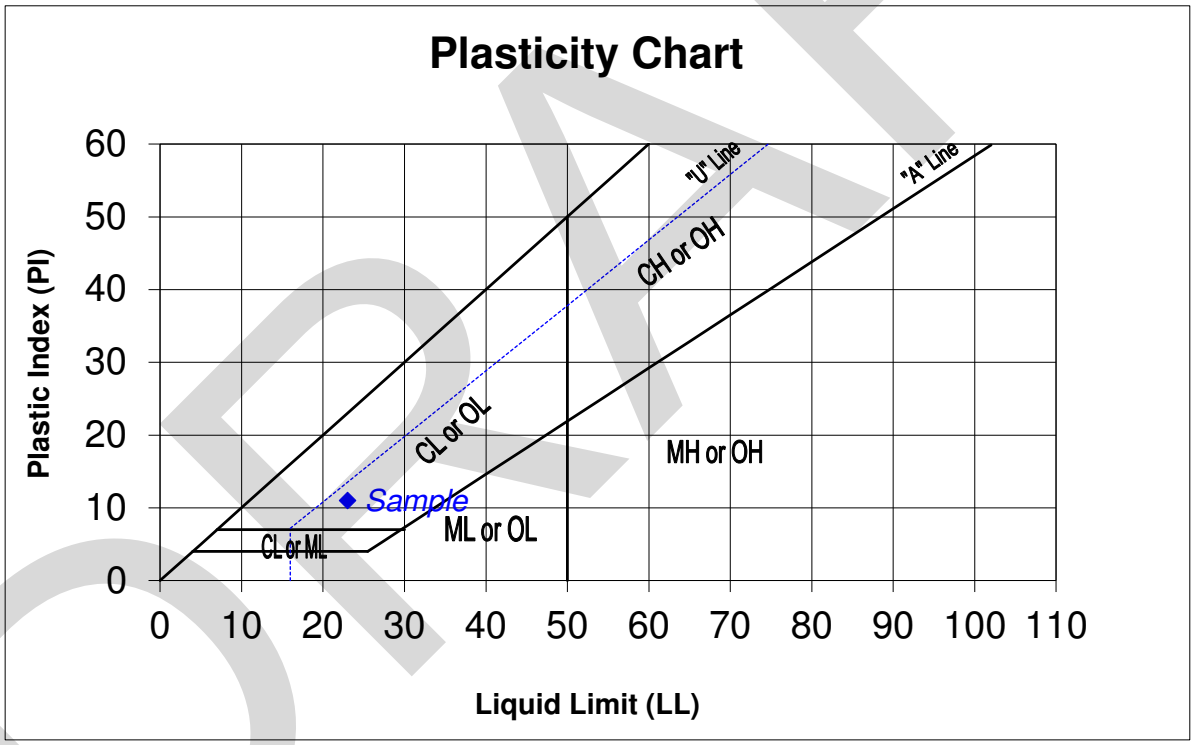
ATTERBERG LIMITS
ASTM D 4318

Sampled By: Allan K. **Sampling Date:** 4-Nov-20

Tested By: Scott F. **Test Date:** 27-Nov-20

Sample Location: TP20-10, G2 (1.5 m)

Source/Supplier:



LL: 23.0 %
PL: 12.0 %
PI: 11.0 %

Comments:

WSP Canada Inc.

Per: Stephen Renner, EIT

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Kelowna, BC V1X 5C3
Tel: (250) 491-9778
Fax: (250) 491-9729

#100, 20339 96 Ave.
Langley, BC V1M 0E4
Tel: (604) 533-2992
Fax: (604) 533-0768

12791 Clarke Pl.
Richmond, BC V6V 2H9
Tel: (604) 278-1411
Fax: (604) 278-1412

Client: BC Ministry of Transportation & Infrastructure
File No.: 20P-00109-00
Project: Cycle 16 Bike Path
Phase: 00300
Site Address: Hwy 16 Between Bulkley River and Babine Lake Rc

Report of Grain Size Analysis

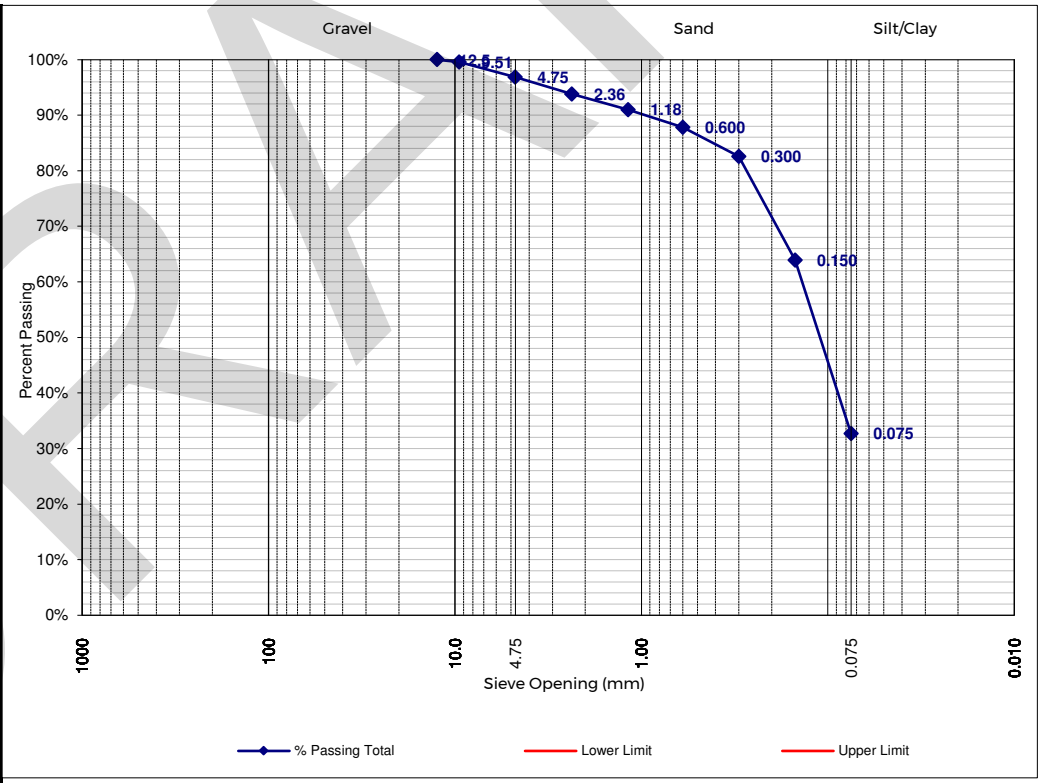
Sample Location: TP20-01, G3 (1.0 m)
Supplier:
Material Type: Silty SAND, trace gravel
Usage:
Specification:

Sampled By: AK
Tested By: SF
Date Sampled: November 4, 2020
Date Tested: November 23, 2020
Sieve No. 1

Moisture Content (as received): 25%

Washed Sieve

Screen Opening (mm):	% Passing Total:	Specification Upper Limit	Specification Lower Limit
150.0			
100.0			
75.0			
50.0			
37.5			
25.0			
19.0			
12.5	100.0%		
9.51	99.6%		
4.75	96.9%		
2.36	93.8%		
1.18	91.0%		
0.600	87.8%		
0.425			
0.300	82.6%		
0.150	63.9%		
0.075	32.7%		



Remarks:

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Per: Stephen Renner

Stephen Renner, EIT

#108, 3677 Hwy 97N
Kelowna, BC V1X 5C3
Tel: (250) 491-9778
Fax: (250) 491-9729

#100, 20339 96 Ave.
Langley, BC V1M 0E4
Tel: (604) 533-2992
Fax: (604) 533-0768

12791 Clarke Pl.
Richmond, BC V6V 2H9
Tel: (604) 278-1411
Fax: (604) 278-1412

Client: BC Ministry of Transportation & Infrastructure
File No.: 20P-00109-00
Project: Cycle 16 Bike Path
Phase: 00300
Site Address: Hwy 16 Between Bulkley River and Babine Lake Rc

Report of Grain Size Analysis

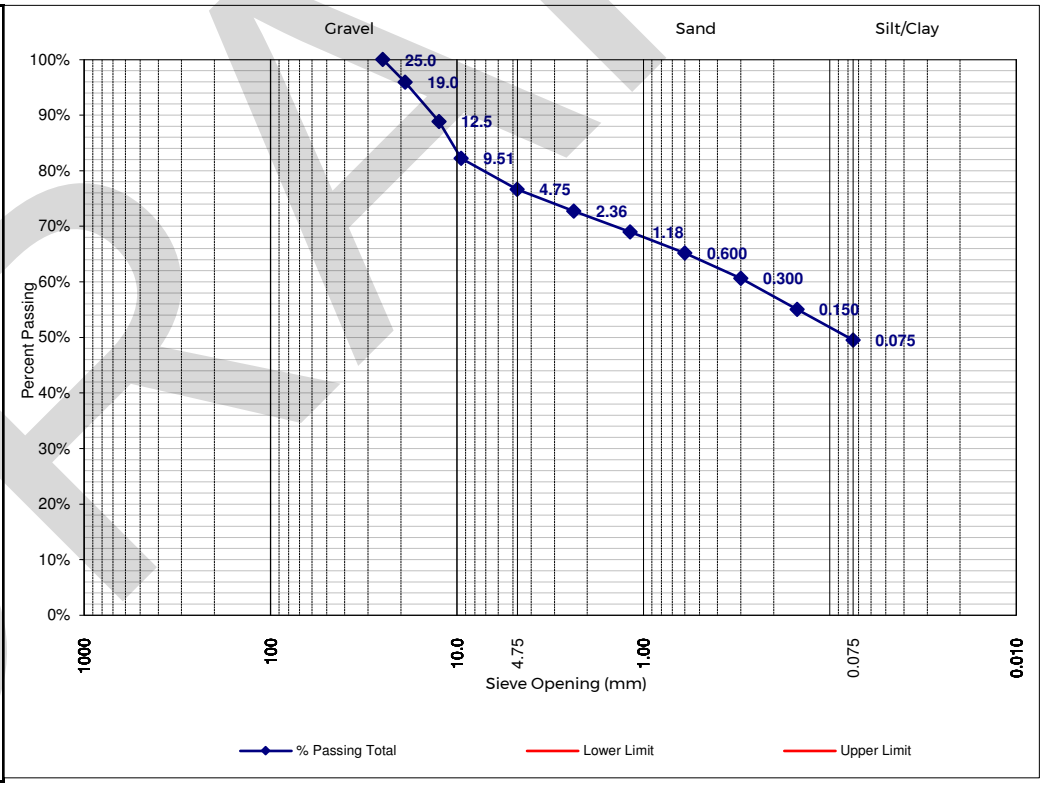
Sample Location: TP20-03, G2 (0.9 m)
Supplier:
Material Type: Sandy, gravelly SILT/CLAY
Usage:
Specification:

Sampled By: AK
Tested By: SF
Date Sampled: November 4, 2020
Date Tested: November 23, 2020
Sieve No. 2

Moisture Content (as received): 17%

Washed Sieve

Screen Opening (mm):	% Passing Total:	Specification Upper Limit	Specification Lower Limit
150.0			
100.0			
75.0			
50.0			
37.5			
25.0	100.0%		
19.0	95.9%		
12.5	88.9%		
9.51	82.3%		
4.75	76.6%		
2.36	72.7%		
1.18	69.0%		
0.600	65.2%		
0.425			
0.300	60.7%		
0.150	55.1%		
0.075	49.5%		



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Stephen Renner, EIT

#108, 3677 Hwy 97N
Kelowna, BC V1X 5C3
Tel: (250) 491-9778
Fax: (250) 491-9729

#100, 20339 96 Ave.
Langley, BC V1M 0E4
Tel: (604) 533-2992
Fax: (604) 533-0768

12791 Clarke Pl.
Richmond, BC V6V 2H9
Tel: (604) 278-1411
Fax: (604) 278-1412

Client: BC Ministry of Transportation & Infrastructure
File No.: 20P-00109-00
Project: Cycle 16 Bike Path
Phase: 00300
Site Address: Hwy 16 Between Bulkley River and Babine Lake Rc

Report of Grain Size Analysis

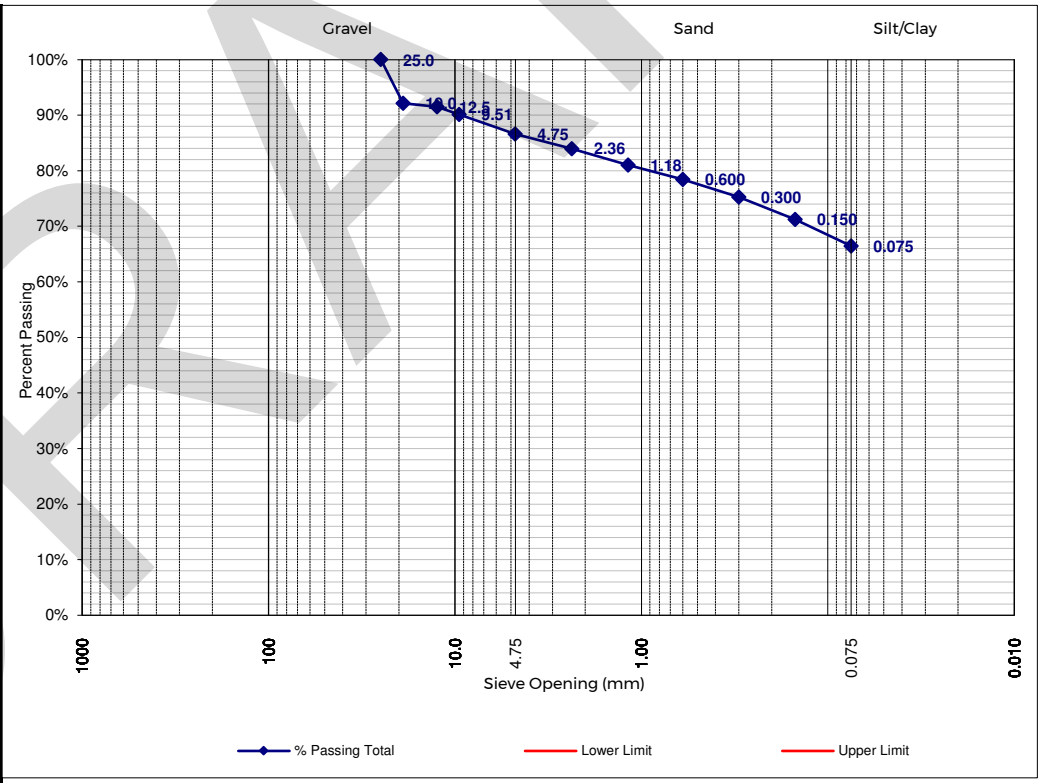
Sample Location: TP20-04, G1 (0.3 m)
Supplier:
Material Type: Sandy SILT/CLAY, some gravel
Usage:
Specification:

Sampled By: AK
Tested By: SF
Date Sampled: November 4, 2020
Date Tested: November 23, 2020
Sieve No. 3

Moisture Content (as received): 19%

Washed Sieve

Screen Opening (mm):	% Passing Total:	Specification Upper Limit	Specification Lower Limit
150.0			
100.0			
75.0			
50.0			
37.5			
25.0	100.0%		
19.0	92.1%		
12.5	91.5%		
9.51	90.1%		
4.75	86.6%		
2.36	84.0%		
1.18	81.0%		
0.600	78.4%		
0.425			
0.300	75.3%		
0.150	71.2%		
0.075	66.5%		



Remarks:

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#108, 3677 Hwy 97N
Kelowna, BC V1X 5C3
Tel: (250) 491-9778
Fax: (250) 491-9729

#100, 20339 96 Ave.
Langley, BC V1M 0E4
Tel: (604) 533-2992
Fax: (604) 533-0768

12791 Clarke Pl.
Richmond, BC V6V 2H9
Tel: (604) 278-1411
Fax: (604) 278-1412

Client: BC Ministry of Transportation & Infrastructure
File No.: 20P-00109-00
Project: Cycle 16 Bike Path
Phase: 00300
Site Address: Hwy 16 Between Bulkley River and Babine Lake Rc

Report of Grain Size Analysis

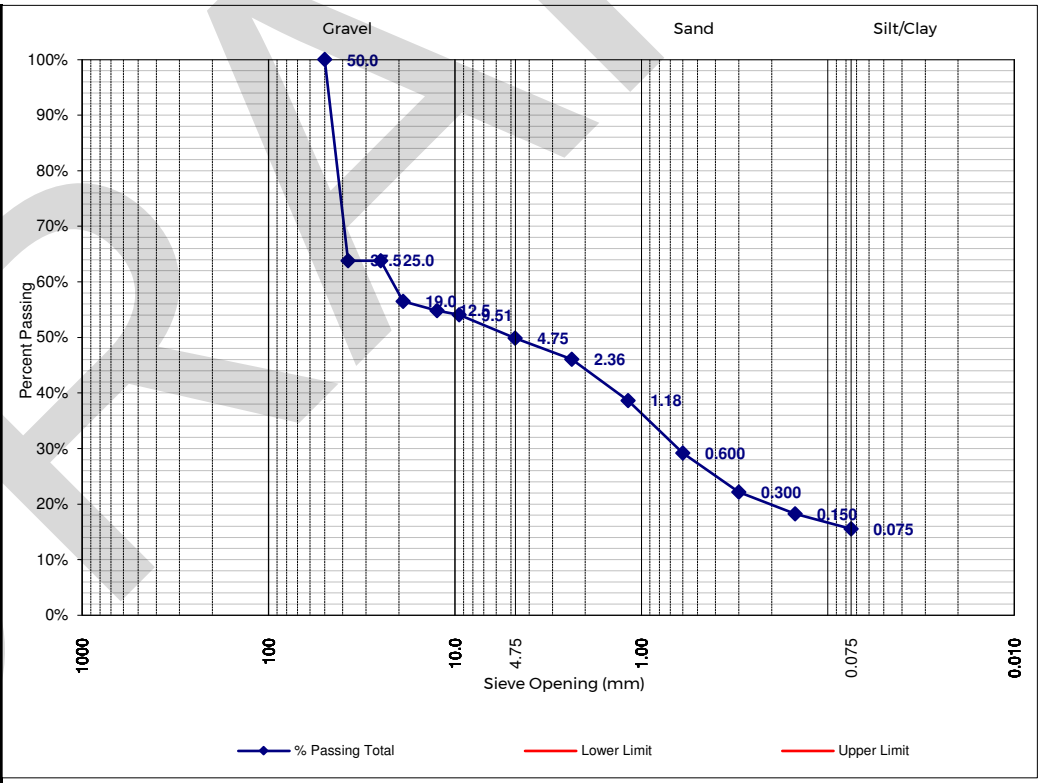
Sample Location: TP20-04, G3 (1.3 m)
Supplier:
Material Type: Sandy GRAVEL, some silt/clay
Usage:
Specification:

Sampled By: AK
Tested By: SF
Date Sampled: November 4, 2020
Date Tested: November 23, 2020
Sieve No. 4

Moisture Content (as received): 14%

Washed Sieve

Screen Opening (mm):	% Passing Total:	Specification Upper Limit	Specification Lower Limit
150.0			
100.0			
75.0			
50.0	100.0%		
37.5	63.8%		
25.0	63.8%		
19.0	56.5%		
12.5	54.8%		
9.51	54.1%		
4.75	49.9%		
2.36	46.1%		
1.18	38.7%		
0.600	29.2%		
0.425			
0.300	22.2%		
0.150	18.2%		
0.075	15.6%		



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Stephen Renner, EIT

#108, 3677 Hwy 97N
Kelowna, BC V1X 5C3
Tel: (250) 491-9778
Fax: (250) 491-9729

#100, 20339 96 Ave.
Langley, BC V1M 0E4
Tel: (604) 533-2992
Fax: (604) 533-0768

12791 Clarke Pl.
Richmond, BC V6V 2H9
Tel: (604) 278-1411
Fax: (604) 278-1412

Client: BC Ministry of Transportation & Infrastructure
File No.: 20P-00109-00
Project: Cycle 16 Bike Path
Phase: 00300
Site Address: Hwy 16 Between Bulkley River and Babine Lake Rc

Report of Grain Size Analysis

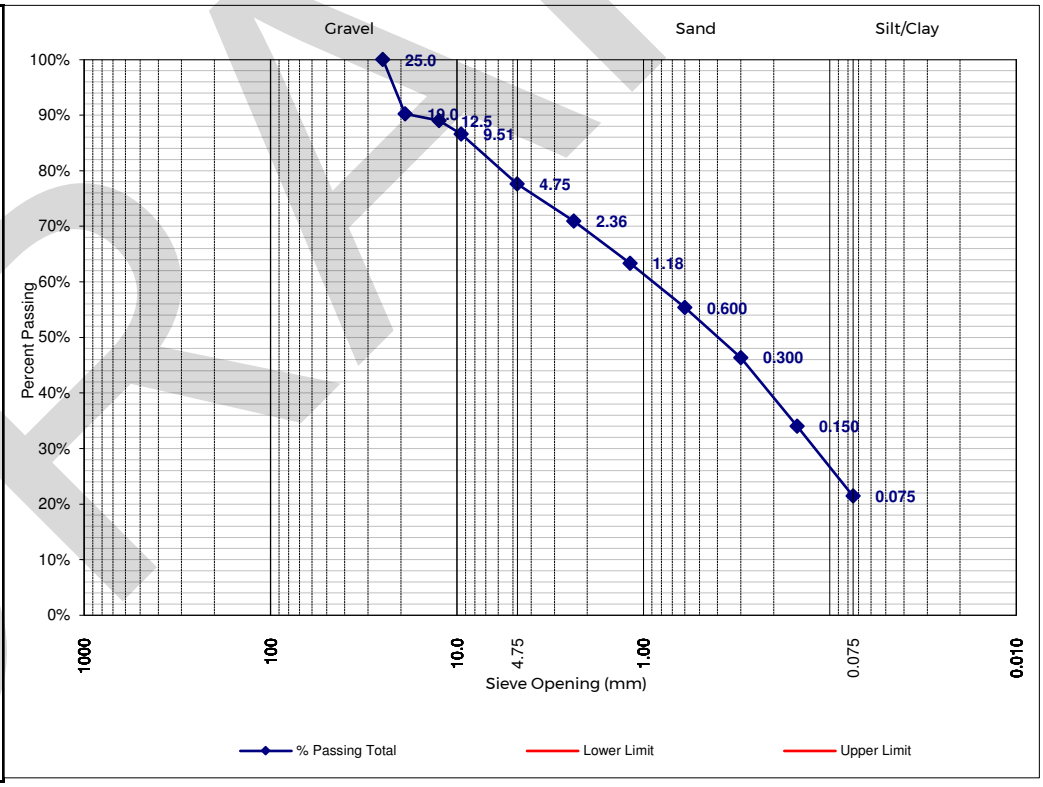
Sample Location: TP20-06, G2 (1.0 m)
Supplier:
Material Type: Gravelly, silty SAND
Usage:
Specification:

Sampled By: AK
Tested By: SF
Date Sampled: November 4, 2020
Date Tested: November 23, 2020
Sieve No. 5

Moisture Content (as received): 14%

Washed Sieve

Screen Opening (mm):	% Passing Total:	Specification Upper Limit	Specification Lower Limit
150.0			
100.0			
75.0			
50.0			
37.5			
25.0	100.0%		
19.0	90.3%		
12.5	89.0%		
9.51	86.6%		
4.75	77.6%		
2.36	71.0%		
1.18	63.4%		
0.600	55.4%		
0.425			
0.300	46.4%		
0.150	34.0%		
0.075	21.5%		



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Tel: (604) 533-2992
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12791 Clarke Pl.
Richmond, BC V6V 2H9
Tel: (604) 278-1411
Fax: (604) 278-1412

Client: BC Ministry of Transportation & Infrastructure
File No.: 20P-00109-00
Project: Cycle 16 Bike Path
Phase: 00300
Site Address: Hwy 16 Between Bulkley River and Babine Lake Rc

Report of Grain Size Analysis

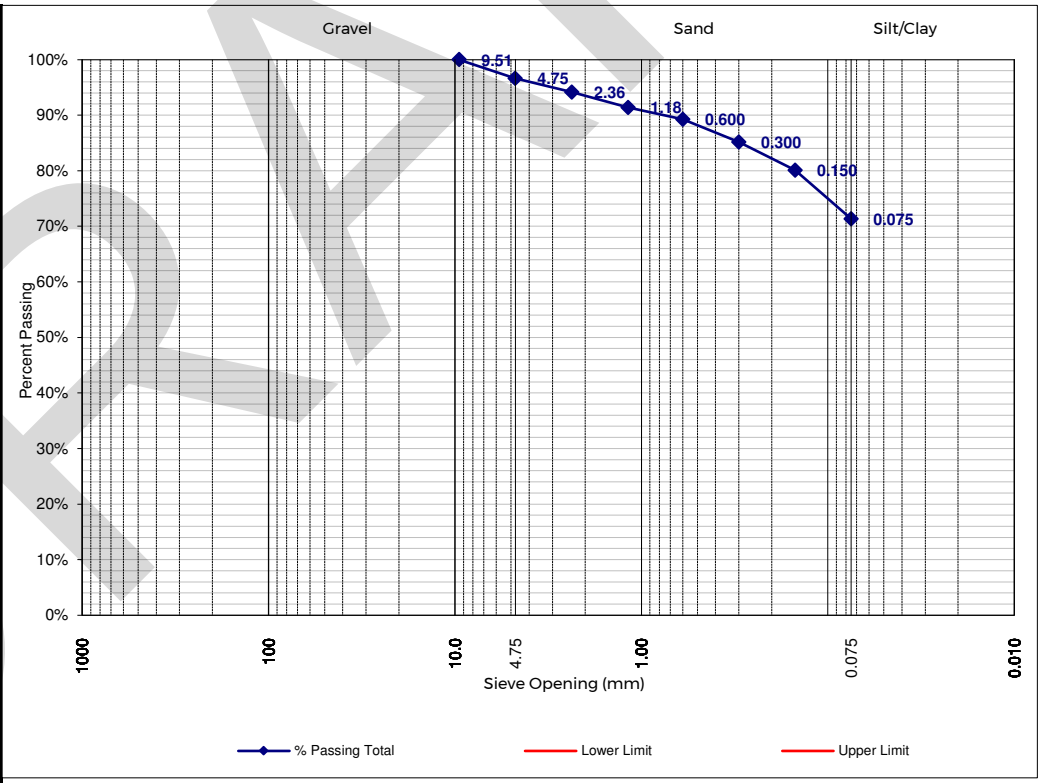
Sample Location: TP20-07, G3 (1.2 m)
Supplier:
Material Type: Sandy SILT/CLAY, trace gravel
Usage:
Specification:

Sampled By: AK
Tested By: SF
Date Sampled: November 4, 2020
Date Tested: November 23, 2020
Sieve No. 6

Moisture Content (as received): 17%

Washed Sieve

Screen Opening (mm):	% Passing Total:	Specification Upper Limit	Specification Lower Limit
150.0			
100.0			
75.0			
50.0			
37.5			
25.0			
19.0			
12.5			
9.51	100.0%		
4.75	96.6%		
2.36	94.1%		
1.18	91.4%		
0.600	89.3%		
0.425			
0.300	85.2%		
0.150	80.1%		
0.075	71.4%		



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Langley, BC V1M 0E4
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Richmond, BC V6V 2H9
Tel: (604) 278-1411
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File No.: 20P-00109-00
Project: Cycle 16 Bike Path
Phase: 00300
Site Address: Hwy 16 Between Bulkley River and Babine Lake Rc

Report of Grain Size Analysis

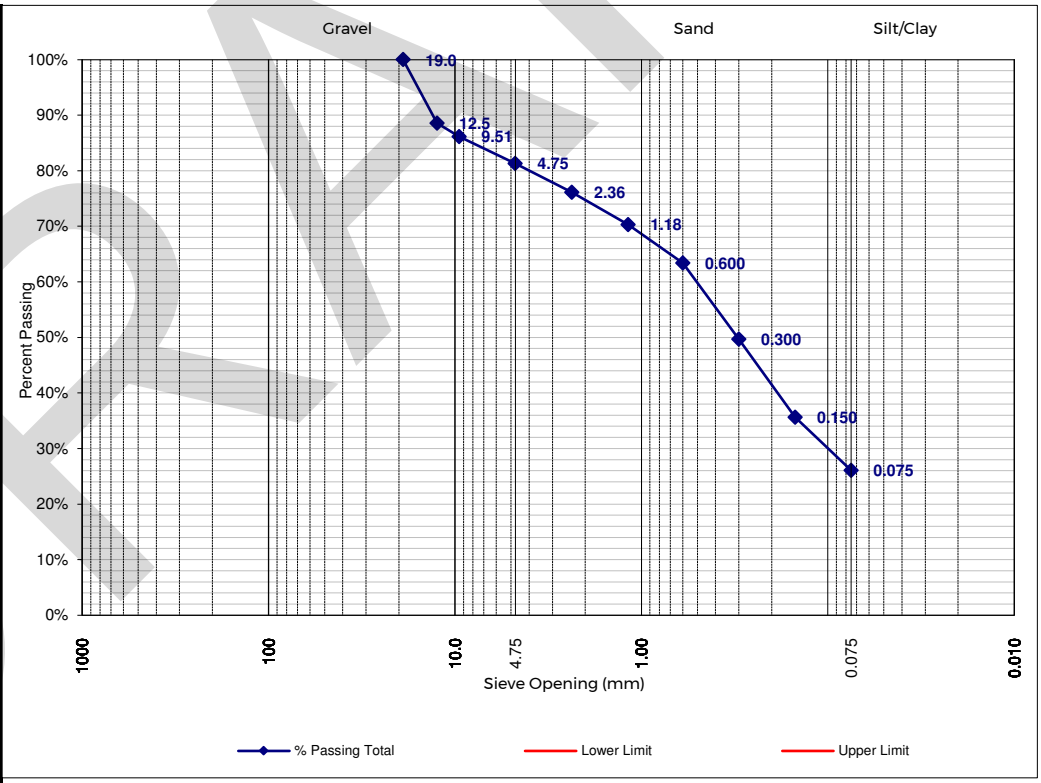
Sample Location: TP20-22, G3 (1.0 m)
Supplier:
Material Type: Silty SAND, some gravel
Usage:
Specification:

Sampled By: AK
Tested By: SF
Date Sampled: November 4, 2020
Date Tested: November 27, 2020
Sieve No. 7

Moisture Content (as received): 14%

Washed Sieve

Screen Opening (mm):	% Passing Total:	Specification Upper Limit	Specification Lower Limit
150.0			
100.0			
75.0			
50.0			
37.5			
25.0			
19.0	100.0%		
12.5	88.6%		
9.51	86.2%		
4.75	81.3%		
2.36	76.1%		
1.18	70.3%		
0.600	63.4%		
0.425			
0.300	49.7%		
0.150	35.6%		
0.075	26.1%		



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WSP Canada Inc.

Per: Stephen Renner

Stephen Renner, EIT

APPENDIX

D TERMS OF REFERENCE

TERMS OF REFERENCE FOR GEOTECHNICAL REPORTS ISSUED BY WSP CANADA INC.

1 STANDARD OF CARE

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The terms of reference for geotechnical reports issued by WSP (the "Terms of Reference") contained in the present document provide additional information and caution related to standard of care and the use of the Report. The Client should read and familiarize itself with these Terms of Reference.

2 COMPLETENESS OF THE REPORT

All documents, records, drawings, correspondence, data, files and deliverables, whether hard copy, electronic or otherwise, generated as part of the services for the Client are inherent components of the Report and, collectively, form the instruments of professional services (the "Instruments of Professional Services"). The Report is of a summary nature and is not intended to stand alone without reference to the instructions given to WSP by the Client, the communications between WSP and the Client, and to any other reports, writings, proposals or documents prepared by WSP for the Client relative to the specific site described in the Report, all of which constitute the Report.

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3 BASIS OF THE REPORT

WSP prepared the Report for the Client for the specific site, development, building, design or building assessment objectives and purpose that the Client described to WSP. The applicability and reliability of any of the information, observations, findings, suggestions, recommendations and opinions contained in the Report are only valid to the extent that there was no material alteration to or variation from any of the said descriptions provided by the Client to WSP unless the Client specifically requested WSP to review and revise the Report in light of such alteration or variation.

4 USE OF THE REPORT

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5 INTERPRETATION OF THE REPORT

a. **Nature and Exactness of Descriptions:** The classification and identification of soils, rocks and geological units, as well as engineering assessments and estimates have been based on investigations performed in accordance with the standards set out in Paragraph 1 above. The classification and identification of these items are judgmental in nature and even comprehensive sampling and testing programs, implemented with the appropriate equipment by experienced personnel,

may fail to locate some conditions. All investigations or assessments utilizing the standards of Paragraph 1 involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and all persons making use of such documents or records should be aware of, and accept, this risk. Some conditions are subject to changes over time and the parties making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or when the Client has special considerations or requirements, the Client must disclose them to WSP so that additional or special investigations may be undertaken, which would not otherwise be within the scope of investigations made by WSP or the purposes of the Report.

b. **Reliance on information**: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site investigation and field review and on the basis of information provided to WSP. WSP has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, WSP cannot accept responsibility for any deficiency, misstatement or inaccuracy contained in the report as a result of misstatements, omissions, misrepresentations or fraudulent acts of persons providing information.

c. **Additional Involvement by WSP**: To avoid misunderstandings, WSP should be retained to assist other professionals to explain relevant engineering findings and to review the geotechnical aspects of the plans, drawings and specifications of other professionals relative to the engineering issues pertaining to the geotechnical consulting services provided by WSP. To ensure compliance and consistency with the applicable building codes, legislation, regulations, guidelines and generally-accepted practices, WSP should also be retained to provide field review services during the performance of any related work. Where applicable, it is understood that such field review services must meet or exceed the minimum necessary requirements to ascertain that the work being carried out is in general conformity with the recommendations made by WSP. Any reduction from the level of services recommended by WSP will result in WSP providing qualified opinions regarding adequacy of the work.

6 ALTERNATE REPORT FORMAT

When WSP submits both electronic and hard copy versions of the Instruments of Professional Services, the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding upon WSP. The hard copy versions submitted by WSP shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancy, the hard copy versions shall govern over the electronic versions; furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed and sealed versions of the Instruments of Professional Services maintained or retained, or both, by WSP shall be deemed to be the overall originals for the Project.

The Client agrees that the electronic file and hard copy versions of Instruments of Professional Services shall not, under any circumstances, no matter who owns or uses them, be altered by any party except WSP. The Client warrants that the Instruments of Professional Services will be used only and exactly as submitted by WSP.

The Client recognizes and agrees that WSP prepared and submitted electronic files using specific software or hardware systems, or both. WSP makes no representation about the compatibility of these files with the current or future software and hardware systems of the Client, the Approved Users or any other party. The Client further agrees that WSP is under no obligation, unless otherwise expressly specified, to provide the Client, the Approved Users and any other party, or any or all of them, with specific software and hardware systems that are compatible with any electronic submitted by WSP. The Client further agrees that should the Client, an Approved User or a third party require WSP to provide specific software or hardware systems, or both, compatible with the electronic files prepared and submitted by WSP, for any reason whatsoever included but not restricted to an order from a court, then the Client will pay WSP for all reasonable costs related to the provision of the specific software or hardware systems, or both. The Client further agrees to indemnify and hold harmless WSP, its officers, directors, employees, agents, representative or sub-consultant, or any or all of them, against any claim or any nature whatsoever brought against WSP, whether in contract or in tort, arising or related to the provision or use or any specific software or hardware provided by WSP.

McElhanney

BEST MANAGED COMPANIES CANADA

Smithers Telkwa Cycle 16 Path – Environmental Management Plan

March 23, 2021

Submitted to: Ministry of Transportation and Infrastructure

Prepared by: McElhanney Ltd.

Contact
Madison Wassick, RPBio
Biologist
250-631-4071
mwassick@mcelhanney.com

Address
1 – 5008 Pohle Avenue, Terrace
BC Canada, V8G 4S8

Prepared by
Madison Wassick, BSc, RPBio
Date: March 19, 2021

Reviewed by
Garrett Kerr, BSc, RPBio

Our file: 2321-30342-00

Contents

1. INTRODUCTION

1.1. SCOPE

McElhanney Ltd. (McElhanney) was retained by the Ministry of Transportation and Infrastructure (MoTI) – Northern Region to complete an environmental overview assessment and associate Environmental Management Plan (EMP) for the Smithers Telkwa Cycle 16 Path, just east of Smithers, BC (the Project). The Project will involve clearing and paving a 12-km path just east of the Bulkley River Bridge in Smithers to Telkwa, BC. This Project will be completed in phases, with Phase I encompassing the first 3.5 km of the path from the Bulkley River Bridge to the intersection of Highway 16 and Babine Lake Road. Phase II will include the remaining 8.5 km of the Project.

1.2. OBJECTIVE

The objective of the Environmental Review (Section 2) was to complete a desktop review of the proposed Project and summarize environmental sensitivities, including terrestrial and aquatic features, that may be impacted by Project development. Results from this review aided in the development of an EMP. The EMP (included in Section 3) outlines site-specific considerations and mitigations to protect environmental sensitivities and aid in Project design and construction. At this time, the EMP is based solely on desktop findings, which have identified the need for field investigations to confirm whether site-specific permitting is required. Since EMP is continuously evolving, it is considered preliminary and is subject to change based on new information provided by MoTI as well as results from field investigations.

2. ENVIRONMENTAL OVERVIEW

2.1. STUDY AREA LOCATION

The Cycle 16 path will be 5 m wide from toe to toe and extend along the west side of Highway 16 within the MoTI Right of Way (RoW) in Phase I. Conceptual drawings have yet to be finalized; however, it is assumed Phase II will continue along the west side of Highway 16, with similar dimensions as described in Phase I (Figure 1).

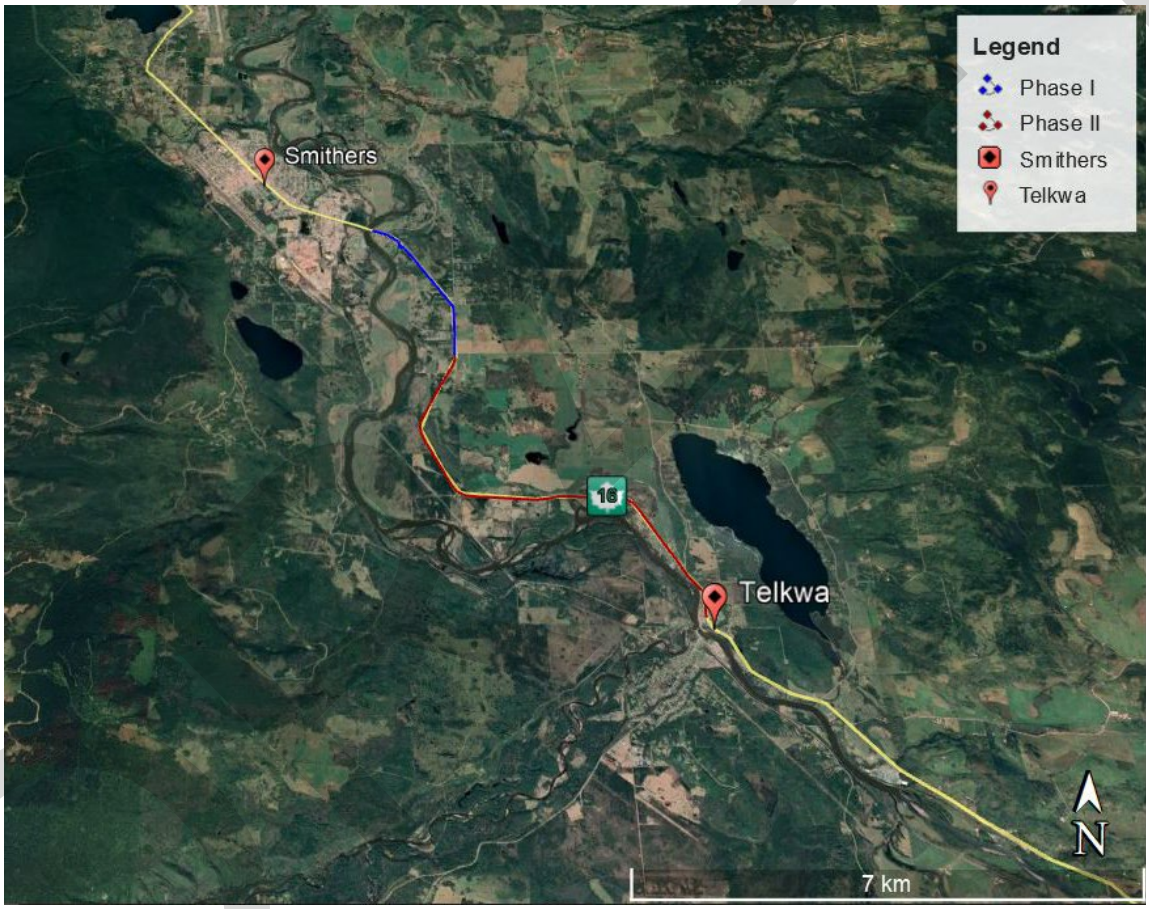

Figure 1. Site overview and Project alignment. Phase I footprint delineated in blue; Phase II (assumed alignment) in red.

To the east of the Project is rural farmland, and to the west the path parallels the floodplain of the Bulkley River. The Project is located within the Sub-Boreal Spruce dry cool (SBSdk) biogeoclimatic subzone, near the transition to the cooler and moister Babine variant of the Sub-Boreal Spruce moist cold (SBSmc2) subzone (Figure 2).

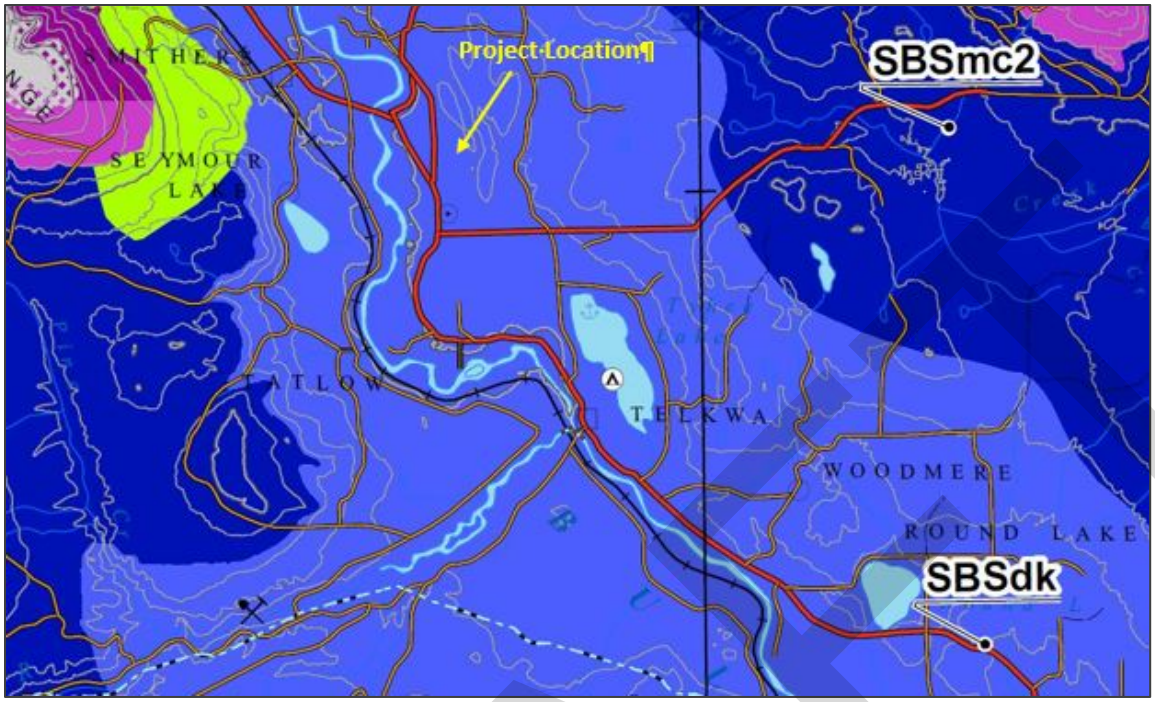

Figure 2. Biogeoclimatic subzone mapping in the Smithers-Telkwa area. Cycle 16 path will follow Highway 16 between the two communities.

2.2. ASSESSMENT METHODOLOGY

A desktop review was completed to identify known environmental sensitivities such as mapped watercourses or wetlands, records of species or ecosystems at risk, protected habitat areas, or other features. Online resources reviewed for this desktop study included aerial imagery of the Site, as well as a variety of mapping platforms, databases and search engines, including:

- HabitatWizard/Conservation Data Centre (CDC) iMap/iMapBC – provincial government's environmental mapping platforms – spatial data layers reviewed included:
    - Fresh Water Atlas provincial stream mapping
    - Fisheries information (fish points, obstacles to fish passage)
    - Provincial studies registered under the Ecological Reports Catalogue (EcoCat)
    - Critical Habitat for Federally Listed Species at Risk (*Species at Risk Act [SARA]*)
    - Invasive Plant Site Markers
    - Wildlife Habitat Areas and Ungulate Winter Range polygons (*Forest and Range Practices Act*)
    - BC CDC element occurrences – records of species and ecosystems at risk
- Community Mapping Network – a series of citizen science mapping initiatives, including:
    - Great Blue Heron Atlas, Bulkley-Nechako Regional Atlas, Wildlife Tree Stewardship Atlas, DFO Fisheries Information Summary System, BC Wetlands Atlas, Stewardship Project Registry Atlas

- CDC Species and Ecosystems Explorer – provincial search engine allowing area-based searches for potential occurrence of animals, plants, fungi and ecological communities at risk. Search criteria was narrowed down by eco-section (Bulkley Basin), habitat type (agriculture, anthropogenic, forest, grassland/shrub, rock/sparsely vegetated rock) and habitat sub-type (coniferous forest – dry, cultivated field, mixed forest, roadside/ditch). Results from the searchers were further narrowed based on the probability of occurrences given the site location, available habitat and species distribution mapping.

2.3. AQUATIC RESOURCES

The Bulkley River parallels the Project alignment over its entire length, with distances ranging from 20 m at its nearest point to 1400 m away at its farthest point. The shortest distance between the MoTI RoW and the Bulkley River is at the south end of the Project, near Telkwa. This area accounts for approximately 650 m of the Project footprint, with distances less than 100 m to the river's edge. The Bulkley River is well documented as a very high value fish stream, providing excellent habitat for all Pacific salmon species, as well as steelhead and rainbow trout (*Oncorhynchus mykiss*), cutthroat trout (*O. clarkii*), bull trout (*Salvelinus confluentus*), Dolly Varden (*S. malma*) and several forage fish species.

A review of the BC government's *Habitat Wizard* website revealed three mapped drainage paths within the Project footprint. All three cross Highway 16 from the east and eventually connect to the Bulkley River. Running north to south, the intersection points of each drainage path are as follows:

- UTM 09U: 621101m E, 6069829 m N
- UTM 09U: 621671 m E, 6067632 m N
- UTM 09U: 621255 m E, 6066645 m

A field investigation will be required to confirm if each of these drainage paths connect to the Bulkley River and identify potential barriers to fish passage. If connectivity is confirmed and no barriers are present, these drainage paths will be assumed to support fish. This may trigger permitting requirements at both federal and provincial levels, including instream works and scientific fish collection permits. Results of field investigations and final designs will dictate the mitigation measures required to protect fish and fish habitat. Regardless of the field findings, both spill response and Erosion and Sediment Controls (ESC) will be required to protect any watercourses from deleterious substances.

2.4. WILDLIFE

Results from the CDC Species and Ecosystems Explorer identified 13 wildlife species with the potential to occur within the Project area. However, given the habitat requirements of these species, none are predicted to be encountered. In addition, the Endangered Species and Ecosystems at Risk layer in *Habitat Wizard* identified a habitat polygon for the federally listed gypsy cuckoo bumble bee (*Bombus bohemicus*) within the greater Smithers area. This species is listed as endangered by the Committee of the Status of Endangered Wildlife in Canada. The gypsy cuckoo bumble bee nests in abandoned

underground rodent burrows and rotten logs and is unlikely to be impacted by the Project. However, it maybe be observed moving through the Project footprint, foraging for nectar in adjacent forested habitat.

2.4.1. Birds

Together, the federal *Migratory Birds Regulations* and the *BC Wildlife Act* prohibit the possession, injury, disturbance/molestation or destruction of birds, their eggs, or their nests when occupied by birds or eggs. The Project is in Environment Canada's Nesting Zone A4, which has a nesting period from late April to mid-August. If vegetation clearing is required, it should be conducted outside of the nesting period to avoid incidental take of active nests. Alternatively, an Active Migratory Bird Nesting Survey protocol may be developed and implemented by a Qualified Environmental Professional (QEP) to reduce the risk of incidental take of active nests.

Results from the CDC Species and Ecosystems Explorer identified 45 bird species with conservation designations with the potential to occur within the Bulkley Basin. Comparison of known habitat requirements against apparent site conditions and review of distribution mapping identified eight listed avian species that could occur within the Project. Three of these species are provincially red-listed: Swainson's hawk (*Buteo swainsoni*), northern goshawk, *laingi* subspecies (*Accipiter gentilis laingi*) and peregrine falcon, *anatum* subspecies (*Falco peregrinus anatum*). Four are blue-listed: pine grosbeak, *carlottae* subspecies (*Pinicola enucleator carlottae*), barn swallow (*Hirundo rustica*), olive-sided flycatcher (*Contopus cooperi*), and short-eared owl (*Asio flammeus)*. One species is yellow-listed, the common nighthawk *(Chordeiles minor*), but is designated Threatened at the federal level under the *SARA*.

While all eight of the identified species could interact within the Project while foraging or migrating between habitats, they are all considered to have a low chance of being impacted by the Project due to a lack of suitable nesting habitat within the immediate footprint. The existing level of disturbance within the MoTI RoW from the adjacent highway is also likely to deter nesting.

2.4.2. Amphibians

Results from a search of the CDC Species and Ecosystems Explorer identified western toad (*Anaxyrus boreas*) as occurring within the Bulkley Basin. Review of *Habitat Wizard* also found mapped occurrences of Columbia spotted frog (*Rana luteiventris*) within the greater Project area. Both mapped species occurrences are closely linked to wetted areas outside the Project footprint. Both species are provincially yellow listed, with western toad listed as Special Concern under the federal *SARA*.

While the Project doesn't intersect with any mapped wetlands or known amphibian habitat, there is potential for incidental observations of amphibian species migrating through the Project area or inhabiting un-mapped wetted areas. Both western toad and Columbia spotted frog have habitat associations with rural, agricultural, and disturbed areas. While the chances are low, incidental occurrences of amphibians are possible that could trigger provincial permitting for the salvage and translocation of affected individuals. The necessity of the permitting will depend on the final alignment of the Project and the timing of construction. Field confirmation to identify possible amphibian habitat will assist in determining the level of mitigation required to protect amphibian populations.

2.5. VEGETATION

Results from the CDC Species and Ecosystems Explorer identified two blue-listed plant species projected to occur within the Bulkley Basin: whitebark pine (*Pinus albicaulis*) and northern Jacob's ladder (*Polemonium boreale*). Whitebark pine is found in montane forests and on thin, rocky, cold soils at or near timberline, while northern Jacob's ladder is linked to dry meadows, tundra, scree slopes and rock outcrops in the montane to alpine zones. The topography of the Project does not support the habitat requirements for either species. No listed lichens of macro-fungi at risk are mapped to occur within the Project area.

Review of the invasive species layer in *Habitat Wizard* identified 20 invasive plant species along the Highway 16 RoW in the Project limits. Of these eight species, five are listed as provincially noxious weeds, and three as regionally noxious weeds within the Bulkley-Nechako Regional District (BNRD) (**Error! Reference source not found.**).

Table 1. Noxious weeds within MoTI RoW that are subject to the Weed Control Regulation.

Common Name	Scientific Name	Provincial Noxious Weeds	Regional Noxious Weeds (BNRD)
Canada thistle	*Cirsium arvense*	X	-
spotted knapweed	*Centaurea biebersteinii*	X	-
Dalmatian toadflax	*Linaria dalmatica*	X	-
perennial sow thistle	*Sonchus arvensis*	X	-
scentless chamomile	*Matricaria perforata*	X	-
burdock	*Arctium* spp.	-	X
orange hawkweed	*Hieracium aurantiacum*	-	X
common tansy	*Tanacetum vulgare*	-	X

The remaining 12 invasive species identified within the MoTI RoW are not subject to provincial regulations; however, Best Management Practices (BMPs) must be adopted for proper handling, removal, and management of these species (Table 2).

Table 2. Invasive species within the Project boundaries.

Common Name	Scientific Name
curled dock	*Rumex crispus*
chicory	*Cichorium intybus*
tall hawkweed	*Hieracium piloselloides*
bachelor's button	*Centaurea cyanus*
groundsel	*Senecio vulgaris*
yellow hawkweed	*Hieracium pratense*
bull thistle	*Cirsium vulgare*
meadow buttercup	*Ranunculus acris*
western goat's-beard	*Tragopogon dubius*
mountain bluet	*Centaurea montana*
annual hawksbeard	*Crepis tectorum*
oxeye daisy	*Leucanthemum vulgare*

2.6. RARE ECOSYSTEMS

The provincially red-listed ecological community of saskatoon / slender wheatgrass (*Amelanchier alnifolia/ Elymus trachycaulus*) is mapped within the Project footprint (Figure 3). While this community is predominantly present along the east side of Highway 16, there are some instances where mapped polygons overlap the Project RoW along the west side of the highway.

This ecological community is predominantly found on south-facing escarpments near the Bulkley River (Habitat Wizard 2021). To date, much of the surrounding habitat has been cleared for agriculture, with patches of forested areas remaining between fields. If the Cycle 16 path is developed exclusively on the west side of Highway 16, impact to this ecosystem should be completely avoidable. Given that the Project occurs within the MoTI RoW, the proposed path likely receives regular brushing and clearing to maintain highway sightlines, reducing the likelihood of this ecological community being present.

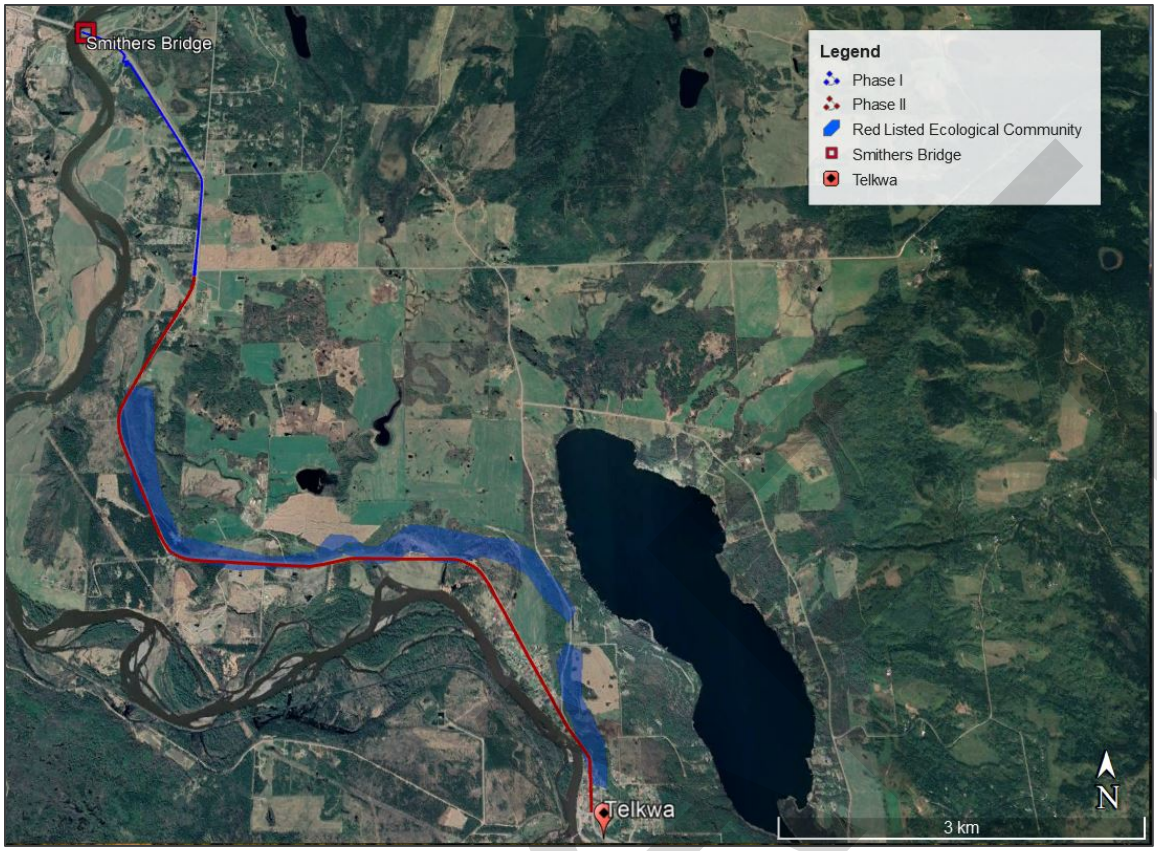

Figure 3. Approximate location of mapped, red-listed ecological community (70937) overlapping Highway 16 (red line) along the southern extent of the Project.

2.7. REGULATORY CONSIDERATIONS

Results from the desktop review indicated that the following permits could be required:

- Fisheries and Oceans Canada (DFO)
  - Federal Scientific Fish Collection Permit
  - Request for Review
- Ministry of Forests Lands, Natural Resource Operations and Rural Development
  - *BC Wildlife Act* General Wildlife Permit – Amphibian Salvage
  - BC Scientific Fish Collection Permit
  - Water Sustainability Regulations Part 3 Notification

Confirmatory field assessment and final Project design will determine which applications require pursuit. If permits are obtained, all terms, conditions and mitigations outlined in regulatory agency documents must be adhered to throughout Project development.

Noxious weeds are invasive plants that have been designated under the provincial *Weed Control Act*, which imposes measures to control the spread of certain invasive plants. Under the *Weed Control Act*,

the Weed Control Regulation provides legal requirements pertaining to the movement of noxious weeds. Section 5 of the Weed Control Regulation states that:

"No person shall transport on a highway grain, screenings or other material that contains, or is likely to contain, seeds of a noxious weed unless

a) the grain, screenings or other material is transported in a covered container, or

b) the horse trailer, recreational vehicle or other vehicle in which the grain, screenings or other material is transported is constructed so that no weed seeds can escape from the vehicle."

Additionally, Section 6 of the Weed Control Regulation states that the following machinery or vehicles that are known have noxious weeds shall not be moved on the highway:

a. any vehicle that has any knapweed on it, or

b. any

- *agricultural equipment or implement of husbandry,*
- *construction machinery,*
- *recreational vehicle, or*,
- *horse trailer."*

If BMPs are followed to ensure construction equipment used on site remains clean and weed-free throughout the duration of the Project, in addition to adherence of the above transportation laws, no permitting will be triggered under the *Weed Control Act*.

2.8. PROJECT RECOMMENDATIONS AND CONCLUSIONS

McElhanney's desktop review of the Project identified numerous possible environmental sensitivities. For Project due diligence, field investigations are recommended to clearly identify whether regulatory permitting will be required:

- Prior to construction, it is recommended that McElhanney completes a Site visit to confirm the presence and connectivity of the three noted drainage pathways and identify if they constitute fish habitat. Assessment of the RoW should also inventory wetted depressions/ditch lines suitable for amphibians as well as presence/absence surveys of raptor nests within or adjacent to the Project footprint.
- Under Section 34 (b) of the *Wildlife Act*, "A person commits an offence if the person, except as provided by regulation, possesses, takes, injures, molests or destroys the nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl." Given the nests of these species are protected year-round, a pre-construction nest survey is strongly recommended to ensure incidental take of a bird or its nest is mitigated.
- As previously mentioned, migratory birds are also protected under the federal Migratory Birds Regulations and the *BC Wildlife Act.* If clearing is required for the Project, vegetation removal

should occur before the nesting period (late April to mid-August) to prevent work delays and the need for pre-clearing migratory bird nest surveys.

- A habitat assessment to identify possible occurrences of the red-listed ecological community of saskatoon/slender wheatgrass should also be completed. If presence is confirmed, McElhanney will work with MoTI to determine an alternative route to ensure the path does not impact this sensitive ecological community.

McElhanney is pleased to provide this Environmental Review for Smithers Telkwa Cycle 16 Path in Smithers, BC.

If you have any questions or concerns, please do not hesitate to contact the undersigned at your convenience.

Regards,

Prepared by:

Madison Wassick, BSc, RPBio
mwassick@mcelhanney.com

Reviewed by:

Garrett Kerr, BSc, RPBio
gkerr@mcelhanney.com

3. ENVIRONMENTAL MANAGEMENT PLAN

3.1. BEST MANAGEMENT PRACTICES

In addition to relevant legislation and project-specific permit conditions and requirements, Contractors will be expected to implement environmental BMPs throughout construction. Examples of BMPs for the protection of the environment are contained within the below referenced documents. This list should not be considered exhaustive. The Contractor is responsible for ensuring that appropriate BMPs and guidance documents are evaluated whether listed herein or not, and that relevant measures from such documents are employed as needed.

- General nesting periods of migratory birds (Government of Canada 2018)
- Best Practices for Managing Invasive Plants on Roadsides (Province of BC 2019)
- BC Approved and Working Water Quality Guidelines (MECCS 2019)
- Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Aquatic Life (CCME 1999)
- A Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area British Columbia (FLNRO 2014a)
- A Field Guide to Fuel Handling, Transportation and Storage (WLAP 2002)

The MoTI Representative will work directly with the Contractor on implementing BMPs in the Project planning, execution and site restoration stages.

3.2. APPLICABLE LEGISLATION

The Contractor is responsible for ensuring compliance with all relevant legislation, whether listed herein or not. Any questions regarding the applicability of specific provincial and federal legislation should be discussed with McElhanney and MoTI representatives.

3.2.1. Federal Legislation

- *Fisheries Act*
- *Migratory Birds Convention Act*
- Migratory Birds Regulations
- *Species at Risk Act*

3.2.2. Provincial Legislation

- *Environmental Management Act*

- Contaminated Sites Regulation
- Hazardous Waste Regulation
- Spill Reporting Regulation
- Waste Discharge Regulation
- *Weed Control Act*
- *Wildlife Act*

3.3. PROJECT CONSIDERATIONS

Any clearing that may be required along the MoTI RoW should take place before the onset of the bird breeding/nesting season. If this is not possible, a pre-construction migratory bird survey will be required. All trees and shrubs should be removed down to the ground level, leaving root systems in place where possible to help maintain soil stability until stripping and grubbing begins. All felled timber material should be removed offsite or chipped, so the material does not provide nesting opportunities. If exposed soils occur, ESC measures such as silt fencing shall be installed to mitigate potential sediment transport offsite during the interval between clearing and construction.

As the Project area is approximately 12 km long, stripping and grubbing should progress with construction rather than exposing the soils over the entire site at once. Dependent on weather and soil conditions, silt fencing should be kept on site for the duration of work for ESC purposes. Once construction is completed, all exposed soils that remain after paving should be grass-seeded with an MoTI-approved native seed mixture to minimize erosion.

3.4. ENVIRONMETNAL MONITORING

It is anticipated that environmental monitoring (EM) will not be a requirement of the Project. However, should the final designs require instream works or any high-risk activities near water that could result in adverse environmental effects (e.g., introduction of sediment or deleterious substances), EM presence is recommended. If required, Contractors shall plan and execute all instream works with the EM three days in advance of work.

3.5. FUEL HANDLING AND SPILL RESPONSE

To prevent adverse environmental effects related to fuel handling, transport or storage, the following guidelines should be followed for all aspects of the Project:

- Ensure that equipment and machinery are in good operating condition, clean (power washed), and free of leaks, excess oil and grease.
- Do not refuel or service equipment within 30 m of any watercourse or surface water drainage.

Care must be exercised during refueling of equipment to avoid spills that may contaminate local soils. It is anticipated fueling will mostly be conducted from tidy tanks in pickups or service trucks. All construction equipment should be equipped with spill kits to allow quick response to spills. Spills shall be reported to

the MoTI representative, who can direct spill response measures and reporting requirements. Any spilled fuel, oil or grease should be cleaned up and disposed of offsite. Stained soils should be excavated down to clean, unstained soil, isolated from the receiving environment, and disposed of offsite. See Table 3 for reportable spill quantities. Note that any spill into water is reportable to Emergency Management BC.

Table 3. Reportable Spill Amounts.

Substance	Quantity	External Reporting Requirements	Internal Reporting Requirements
Flammable Liquids	>100 L	EMBC	TBD
Oil and Waste Oil	≥100 L	EMBC	TBD

3.6. WATER QUALITY AND EROSION AND SEDIMENT CONTOL

The three drainage paths identified within the Project footprint are anticipated to transport stormwater from the east side of Highway 16 to the west, where flow is assumed to be ephemeral. However, Site drainage has the potential to lead downstream into the Bulkley River. As such, the water quality of Site runoff should be managed to avoid the introduction of deleterious substances such as fine sediments and hydrocarbons into fish-bearing watercourses. The *BC Approved Water Quality Guidelines* (MECCS 2019), and the *CCME Environmental Quality Guidelines* (CCME 1999) will be used to evaluate the need for, and efficacy of, ESC measures (examples provided in Table 4).

Table 4. Examples of BC Water Quality Guidelines considered applicable to the Project.

Parameter	Maximum Allowable Level
Suspended Solids	• Change from background of 25 mg/L at any one time for a duration of 24 h in all waters during clear flows or in clear waters • Change from background of 5 mg/L at any one time for a duration of 30 d in all waters during clear flows or in clear waters • Change from background of 10 mg/L at any time when background is 25 - 100 mg/L during high flows or in turbid waters • Change from background of 10% when background is >100 mg/L at any time during high flows or in turbid waters
Turbidity	• Change from background of 8 NTU at any one time for a duration of 24 h in all waters during clear flows or in clear waters • Change from background of 2 NTU at any one time for a duration of 30 d in all waters during clear flows or in clear waters • Change from background of 5 NTU at any time when background is 8 - 50 NTU during high flows or in turbid waters • Change from background of 10% when background is >50 NTU at any time during high flows or in turbid waters
pH	• 6.5-8.0 (or the same as receiving waters/background conditions)
Oil and Grease	• The surface of the water should be virtually free of petroleum, animal or vegetable oils

Localized erosion and sediment transport may occur after the site has been stripped or if severe or prolonged precipitation events occur. It is the Contractor's responsibility to maintain a stockpile of various ESC supplies on Site throughout construction (e.g., pumps and lengths of hose, silt fence and stakes, sandbags, erosion control blankets and staples, straw bales, straw wattles, grass seed etc.). The Contractor is responsible for implementing ESC measures, conducting daily inspection of these measures, and maintaining their efficacy.

3.6.1. Installation, Management and Maintenance of ESC Measures

- Install erosion and sediment control measures before starting work, to prevent the entry or re-suspension of sediment into waterbodies.
- Inspect ESC measures regularly to ensure proper function and make all necessary repairs.
- Maintain effective ESC measures until complete revegetation of disturbed areas is achieved.

3.7. AIR QUALITY AND DUST CONTROL

If necessary, dust control can be achieved by spraying work sites and stockpiles with water. Dust dispersal from wind erosion can be mitigated by completing soil stripping and grading activities during appropriate weather conditions (i.e., during calm weather) and in a timely manner to expedite the spreading of less erodible materials, and by stabilizing exposed soils with seed, mulch, etc.

3.8. WILDLIFE MANAGEMENT

3.8.1. Fish

Desktop review did not identify any documented fish streams within the Project footprint. As such, potential for impacts is assumed to be restricted to downstream impacts to water quality. However, field verification of potential for fish habitat occurrence within the Project footprint is recommended. If no fish habitat occurs within the Project footprint, maintaining water quality parameters for all Site runoff should sufficiently mitigate risks to possible downstream fish or fish habitat from Project activities.

3.8.2. Amphibians

Desktop review did not identify any mapped wetlands or wetted areas within the Project footprint. However, field verification of potential for the occurrence of amphibian breeding habitat within or adjacent to the Project footprint is recommended. Pre-construction Visual Encounter Surveys should be conducted by a QEP if work occurs within the active breeding season (April – October). If amphibians are identified in wetted areas within the Project footprint, the Contractor will be required to adapt works to protect them (e.g., exclusion fencing, delineation of no work zones).

3.8.3. Mammals

Potential presence of mammalian species at risk and impacts to sensitive habitat is anticipated to be low, given of the current level of disturbance existing within the Project boundaries. In general, large mammal species at risk tend to avoid areas of disturbance and will stay outside of active construction areas whenever possible.

Minimizing animal attractants such as food waste is of utmost importance to prevent wildlife interactions, particularly when it comes to bears. If any clearing or construction activities are proposed beyond the present clearing limits, potential wildlife impacts must be assessed. The EM will evaluate potential effects and identify mitigation measures, as necessary.

3.9. INVASIVE SPECIES MANAGEMENT

If construction will require disturbance or removal of noxious weeds, a QEP should be engaged to develop an Invasive Plant Management Plan to ensure compliance with the *Weed Control Act* and other relevant legislation. General measures to ensure noxious weed and invasive plants are not spread or propagated include:

- Locations where noxious weeds are present within the RoW should be identified and marked.
- Any noxious and invasive species noted in this area shall be removed by hand and placed in a bag for disposal. This will reduce the potential for spread of these species by equipment used within the project area.
- Discuss the management of noxious weeds and invasive plant removal protocols during the onsite kick-off meeting.
- All equipment shall be washed clean of soil, seeds, plant parts, and oil and grease prior to entering the Project site at the start of the project. All equipment shall be inspected for soil/seeds/plant parts when the project is completed.

Soil disturbance shall be minimized where practical, and disturbed areas shall be revegetated as quickly as practicable

3.10. COLSURE

Should all the recommendations listed in this report as well as the terms and conditions provided by regulatory agencies be followed throughout the planning, design and construction of the Project, environmental impacts can be greatly reduced.

4. REFERENCES

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Appendix A

Statement of Limitations

Statement of Limitations

Use of this Report. This report was prepared by McElhanney Ltd. ("**McElhanney**") for the particular site, design objective, development and purpose (the "**Project**") described in this report and for the exclusive use of the client identified in this report (the "**Client**"). The data, interpretations and recommendations pertain to the Project and are not applicable to any other project or site location and this report may not be reproduced, used or relied upon, in whole or in part, by a party other than the Client, without the prior written consent of McElhanney. The Client may provide copies of this report to its affiliates, contractors, subcontractors and regulatory authorities for use in relation to and in connection with the Project provided that any reliance, unauthorized use, and/or decisions made based on the information contained within this report are at the sole risk of such parties. McElhanney will not be responsible for the use of this report on projects other than the Project, where this report or the contents hereof have been modified without McElhanney's consent, to the extent that the content is in the nature of an opinion, and if the report is preliminary or draft. This is a technical report and is not a legal representation or interpretation of laws, rules, regulations, or policies of governmental agencies.

Standard of Care and Disclaimer of Warranties. This report was prepared with the degree of care, skill, and diligence as would reasonably be expected from a qualified member of the same profession, providing a similar report for similar projects, and under similar circumstances, and in accordance with generally accepted scientific judgments, principles and practices. McElhanney expressly disclaims any and all warranties in connection with this report.

Information from Client and Third Parties. McElhanney has relied in good faith on information provided by the Client and third parties noted in this report and has assumed such information to be accurate, complete, reliable, non-fringing, and fit for the intended purpose without independent verification. McElhanney accepts no responsibility for any deficiency, misstatements or inaccuracy contained in this report as a result of omissions or errors in information provided by third parties or for omissions, misstatements or fraudulent acts of persons interviewed.

Effect of Changes. All evaluations and conclusions stated in this report are based on facts, observations, site-specific details, legislation and regulations as they existed at the time of the site assessment/report preparation. Some conditions are subject to change over time and the Client recognizes that the passage of time, natural occurrences, and direct or indirect human intervention at or near the site may substantially alter such evaluations and conclusions. McElhanney should be requested to re-evaluate the conclusions of this report and to provide amendments as required prior to any reliance upon the information presented herein upon any of the following events: a) any changes (or possible changes) as to the site, purpose, or development plans upon which this report was based, or b) any changes to applicable laws subsequent to the issuance of the report.

Independent Judgments. McElhanney will not be responsible for the independent conclusions, interpretations, interpolations and/or decisions of the Client, or others, who may come into possession of this report, or any part thereof. This restriction of liability includes decisions made to purchase, finance or sell land or with respect to public offerings for the sale of securities.

Archaeological Overview Assessment No. 13706

1 Report Title

Archaeological overview assessment of Ministry of Transportation and Infrastructure Cycle 16 Bike Path Between Smithers and Telkwa.

2 Management Summary

2.1 Overview of Study

At the request of Alexandria Carnevale of the Ministry of Transportation and Infrastructure, ARCHER CRM Partnership (ARCHER) completed an archaeological overview assessment (AOA) of the study area using orthophoto imagery, forest cover and TRIM data, as well as Archaeology Branch data to aid in the current desktop review of archaeological potential. A field visit to the study area has not been conducted.

2.2 Results (Figures 1-7)

Record of archaeological sites protected by the *Heritage Conservation Act* (*HCA*): As of March 16, 2021, there are no archaeological sites recorded inside of, or immediately adjacent to, the study area.

Interpreted Archaeological Potential: Areas interpreted as having a potential to contain *HCA*-protected archaeological remains have been identified and comprise a total length of 4.5 km (13.1 ha) or 38.8% of the study area.

Additional observations: No documented trail data is known for the study area.

2.3 Recommendations

Our archaeological overview assessment (AOA) of the Cycle 16 Bike Path Between Smithers and Telkwa has identified areas and terrain features that could contain cultural or other archaeological remains protected by the *HCA*. Areas of archaeological potential are illustrated in Figures 1, 2, 4, 6, and 7, and selection criteria are presented in Section 4.2. Consideration must be provided for archaeological remains to be present in unpredictable locations because of complex variations in temporal, cultural, environmental, and geological factors. Recommendations for mitigation of archaeological matters where applicable are as follows:

1. *Should ground and/or vegetation altering activities be proposed in those areas identified on Figures 1, 2, 4, 6, and 7 as having a reasonable potential for archaeological remains to be present and/or found, then a field investigation of these areas is recommended. This assessment should be conducted by a qualified professional who is recognized at the BC Archaeology Branch as an Archaeological Field Director in the culture area the project is proposed. In the majority of instances it can be presumed that existing engineered road works (defined by the outer boundary of excavated ditch back-slopes) possess low to nil archaeological potential, even when adjacent to archaeological sites, unless there is significant potential for an archaeological site to be deeply stratified and hence buried under the roadway or visible in ditch lines.*
2. *It is recommended that an archaeological impact assessment (AIA) be undertaken if ground and/or vegetation altering activities are to commence in areas identified as having archaeological potential illustrated in Figures 1, 2, 4, 6, and 7 in order to ascertain potential cultural resource management needs.*
3. *All archaeological sites, including those not yet recorded, are protected by the* HCA *regardless of level of disturbance unless granted Legacy Status by the Archaeology Branch. It is recommended that the proponent conduct archaeological field investigations where necessary to avoid impact to unrecorded archaeological sites. The archaeological potential map provided in this report is to be used as a guide when identifying the type and intensity of archaeological assessment required prior*

to the inception of ground and/or vegetation altering activities in the Study Area.

Despite the information presented in this overview assessment, the measure of archaeological potential is relative, not absolute. The possibility remains that cultural material and/or features may be uncovered outside of areas identified as possessing archaeological potential. Where archaeological potential is deemed low in this document it is recommended that the client develop or be in possession of a 'chance-find' due-diligence policy to address accidental discoveries of heritage remains protected by the *HCA*. If archaeological materials or other heritage remains are uncovered during construction, work in the area of the find must immediately cease and the Archaeology Branch and/or ARCHER informed. It is recommended that the proponent also promptly inform the relevant First Nations concerning any unanticipated archaeological findings.

An example of a chance find protocol may be found at:

- http://archercrm.ca/media/13965/Archer_ChanceFind_Brochure.pdf.

This study is intended primarily to identify and assess the potential for archaeological materials or features protected under the Heritage Conservation Act (HCA) to be present in the study area. It does not include a consideration for other heritage interests such as traditional land use, heritage landscapes, or other concerns expressed by Aboriginal groups with an asserted traditional territory in the study area. As a result, culturally valued heritage features that are not protected under the HCA may be present in, or overlap with the project area but are beyond the scope of this study.

3 Administrative Information

3.1	***Permit #***	2017-0162	3.2	***Permit Holder***	Frank Craig
3.3	***Proponent***	Ministry of Transportation and Infrastructure	3.4	***Contact***	Alexandria Carnevale
3.5	***Report Author***	Laura Enns	3.6	***Report Date***	March 16, 2021
3.7	***Survey #***	N/A	3.8	***NTS Map***	93L/11 and 93L/14
3.9	***Components & size***	• Cycle 16 Bike Path (11.6 km), Figures 1-7			
3.10	***Location***	POC: NAD 83 UTM Zone 9 UTM Coordinates: 620174 E. 6070727 N. POT: NAD 83 UTM Zone 9 UTM Coordinates: 625551 E. 6063328 N. Based on a review of the Provincial Consultative Areas Database, the study area overlaps with the asserted traditional territory of the Office of the Wet'suwet'en, Gidimt'en Clan, Cas Yikh House.			

4 Methodology

4.1	***AOA methods***	***Desktop Review:*** ☒ ***Data utilized:*** Orthophoto interpretation, RAAD, PARL, TRIM data
4.2	***Identification of Archaeological Potential***	A location in the study area is determined to have predictable archaeological potential if it displays one or a combination of the following attributes[1]: • It is a defined topographical rise on level terrain and/or is surrounded by a wetland

[1] While not exhaustive, this list of attributes has been used successfully by the compiler in past studies to identify archaeological sites and areas of archaeological potential in environments very similar to, or in close proximity to, those found in the subject study area.

(i.e., knolls, eskers, whalebacks).

- Is adjacent to a significant change in slope (i.e., terrace edges, valley tops, ridges).
- It is well-drained and relatively level.
- A source of (potable) water lies in close proximity (i.e., lake, stream, mineral seep, seasonal water run, wetland complex, clean snow/ice).
- It lies on a preferred path of travel between or adjacent to landscape features (i.e., edges of wetlands and terraces, ridge-tops).
- It offers a view of wetlands and/or natural corridors (i.e., gullies, valleys, ridges).
- If any of the above conditions may have existed in the past (i.e., abandoned terraces, paleo-drainages), but are not present today.
- It is in areas of old growth forest cover for CMT sites.
- It is within 250 m of a known archaeological or traditional-use site or within 500 m of a known pack trail.

4.3 Previous Archaeological Studies

The study area partially overlaps a previous archaeological overview assessment conducted by ARCHER as shown on Figures 5 and 6 (ARCHER CRM Partnership 2019). The assessment identified areas of archaeological potential which are consistent with the current assessment of archaeological potential within the study area.

5 Recorded Archaeological Sites within 5 km (closest five)

Borden no.	*Direction & distance from Study Area*	*Site Type*	*Permit # of Previous Visits*	*Site in Conflict (Y/N)*
GeSs-12	249 m southeast	Precontact – Other Feature – Cultural Depression – Function Unassigned	1978-007	No
GeSs-13	317 m southeast	Precontact – Subsistence Feature – Cultural Depression – Cache Pit	1978-007	No
GeSs-9	347 m east	Historic – Transportation – Trail	1974-001 1978-007	No
GeSs-14	381 m southeast	Precontact – Subsistence Feature – Cultural Depression – Cache Pit	1978-007	No
GeSs-5	432 m southeast	Precontact – Transportation Feature – Trail Historic – Transportation – Trail	1974-001 1978-007	No

Previously recorded archaeological site information obtained from RAAD on March 16, 2021.

6 Study Area Environment

6.1 Cycle 16 Bike Path (11.6 km) *Figures 1-7*

6.2 Terrain, Vegetation Cover, Hydrology & Prior Disturbances

The study area traverses generally featureless terrain, with smaller sections of undulating or sloping terrain within the existing Highway 16 R/W corridor. High potential areas are associated with minor drainages which bisect the study area, and the Bulkley River which roughly parallels the project to the south and west. Forest cover, where present, includes hybrid spruce, lodgepole pine, trembling aspen, and cottonwood (projected age classes of 4-7 [61-140 years]).

Prior anthropogenic disturbances include Yellowhead Highway 16, agricultural farmland, residences, commercial buildings, and access roads.

6.3 Archaeological Potential

Subsurface/Surface: ***Yes*** - Locations possessing predictable archaeological potential consist of level, well drained terrain overlooking the Bulkley River to the south and

west, as well as small unnamed tributary streams. Areas deemed as possessing low archaeological potential consist of poorly drained and/or featureless terrain far from hydrology and associated landscape features, as well as heavily disturbed locations such as the existing highway matrix.

Pre AD 1846 CMT: ***Low –*** Although areas of mature forest cover are present in the study area, they are unlikely to contain CMTs protected by the *HCA* as they are stands of unsuitable species and/or insufficient age.

6.4 *Results*

Locations identified as having predictable archaeological potential are illustrated on Figures 1, 2, 4, 6, and 7. CMTs protected by the *HCA* are unlikely to be present in the study area based on available forest cover data.

Site types that could be anticipated in the study area include those previously recorded in the region and in environments similar to the study area, such as: lithic scatters, cultural depressions, CMTs, trails, etc.

7 *Disclosure and Signature*

Indicators of archaeological potential and concordant areas in the subject study area as identified in this report represent a Professional opinion. An absence of noted potential outside of the subject study area is not to be construed as such. If the area of interest extends outside of the identified study area, the results of this assessment may not be applicable in part or in whole.

To address the prospect of unanticipated archaeological remains being discovered, it is recommended that the proponent inform its employees and contractors of this possibility. If archaeological materials or other heritage remains are uncovered during construction, work in the area of the find must immediately cease and the Archaeology Branch and/or ARCHER informed. It is recommended that the proponent also promptly inform the relevant First Nations concerning any unanticipated archaeological findings.

It was not the intent of this study to identify, evaluate, or comment on the presence or absence of Aboriginal Rights in the study area. Completion of this study does not "abrogate or derogate from aboriginal treaty rights" (Heritage Conservation Act Sec. 8). The study was conducted without prejudice to First Nations Treaty Negotiations, aboriginal rights or aboriginal title.

Sincerely,

Prepared by,
Laura Enns, *M.A.*
Archaeologist

On behalf of:

Frank Craig, *B.A., RPCA*
Permit Holder

8 *References Cited*

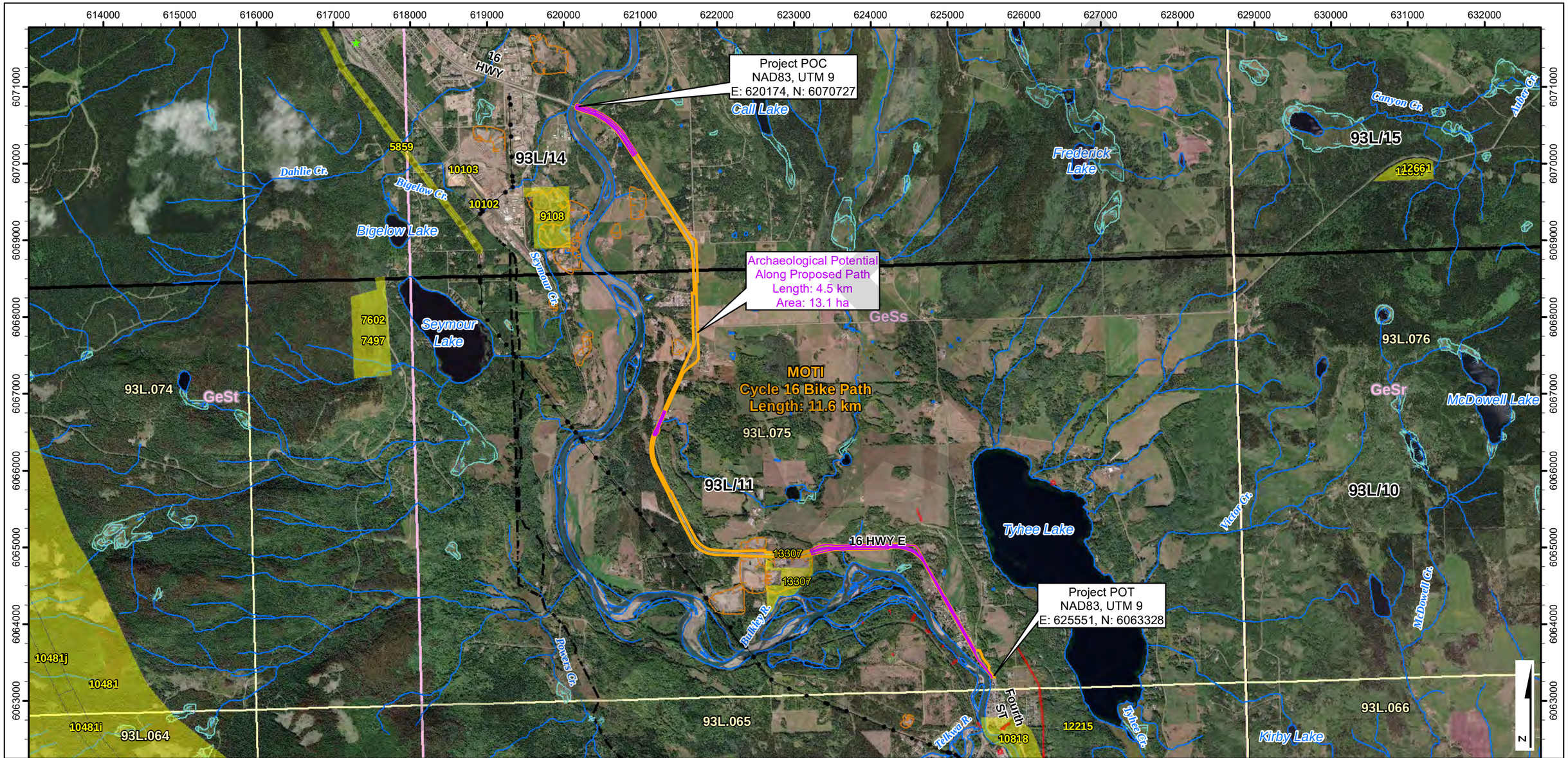
ARCHER CRM Partnership
2019 *Archaeological Overview Assessment of Ministry of Transportation and Infrastructure Donaldson Pit.* ARCHER CRM Partnership file # 13307. Submitted to Ministry of Transportation and Infrastructure, Prince George, BC.

Subject Report Citation:

ARCHER CRM Partnership
2021 *Archaeological overview assessment of Ministry of Transportation and Infrastructure Cycle 16 Bike Path Between Smithers and Telkwa.* ARCHER CRM Partnership file # 13706. Submitted to Ministry of Transportation and Infrastructure, Prince George, BC.

9 Contact information

Individual	*Affiliation*	*Phone*	*E-mail*
Alexandria Carnevale	Ministry of Transportation and Infrastructure	250.645.9656	Alexandria.Carnevale@gov.bc.ca
Permitting & Assessment	Archaeology Branch	250.953.3334	https://www.for.gov.bc.ca/archaeology/contacts.htm



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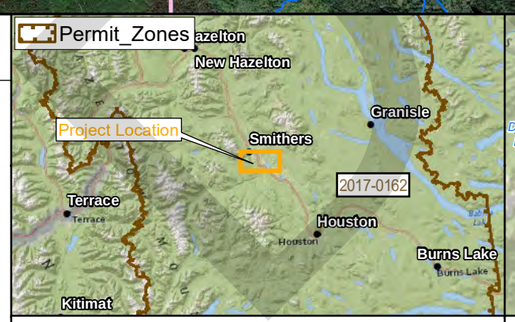
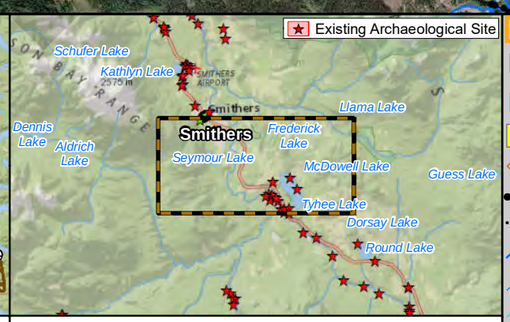
Archaeological Overview Assessment

Ministry of Transportation and Infrastructure
Cycle 16 Bike Path Between Smithers and Telkwa

Figure: 1 **Page: 6**





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- Existing Archaeological Site (location unverified)
- Previous Archer Project
- Gravel Pit
- Transmission Line
- Pipeline
- Open Water / Watercourse
- Intermittant Lake/River
- Wetland
- BCGS Mapsheet
- Borden Grid (archaeology)
- NTS Mapsheet
- Archaeological Potential - Not Verified

Archer Project:	13706
Proponent:	Ministry of Transportation and Infrastructure
HCA Permit:	2017-0162
OGC AMS AA#:	N/A
Surveyor's File:	N/A

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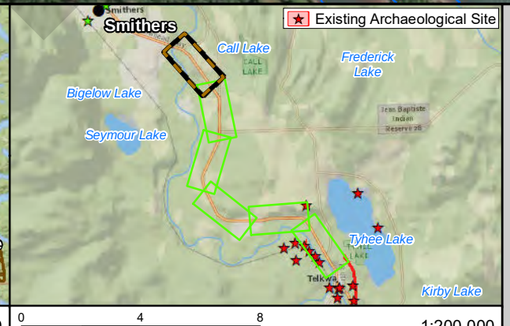
Archaeological Overview Assessment

Ministry of Transportation and Infrastructure
Cycle 16 Bike Path Between Smithers and Telkwa

Figure: 2 **Page: 7**



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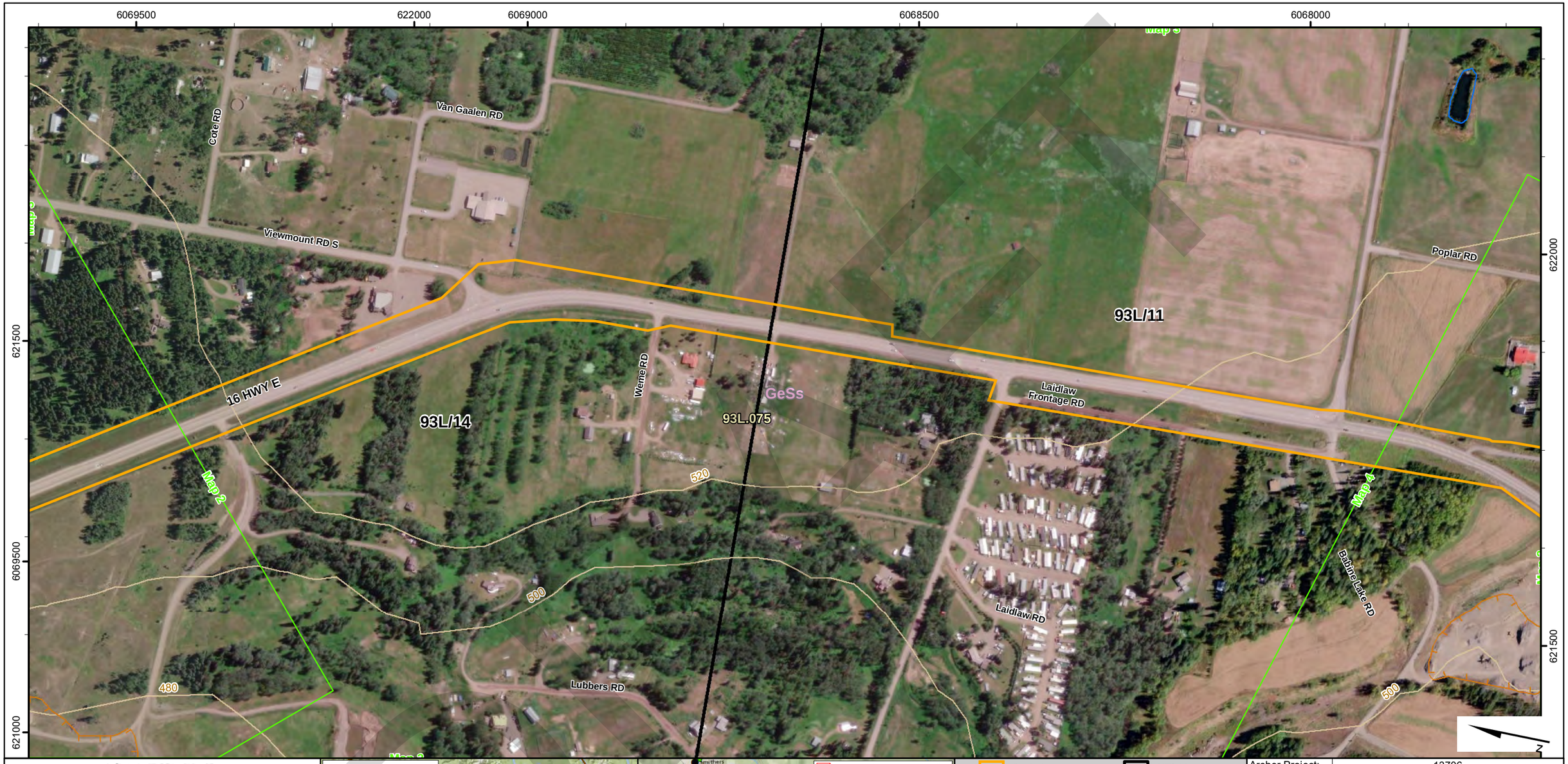

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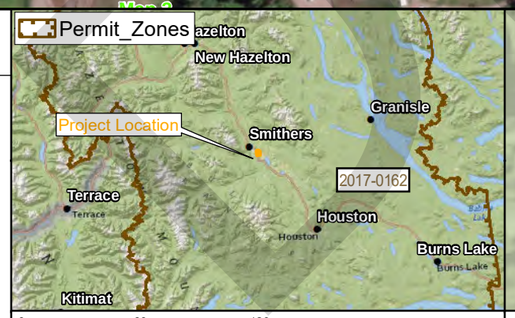
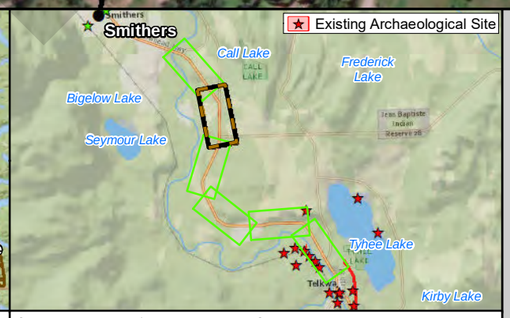
Ministry of Transportation and Infrastructure
Cycle 16 Bike Path Between Smithers and Telkwa

Figure: 3 **Page: 8**





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622000 621500 621000 6066000

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Archaeological Overview Assessment

Ministry of Transportation and Infrastructure Cycle 16 Bike Path Between Smithers and Telkwa

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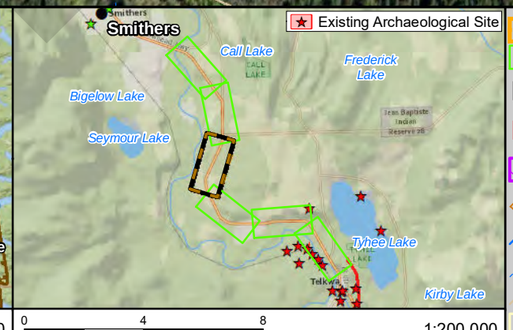

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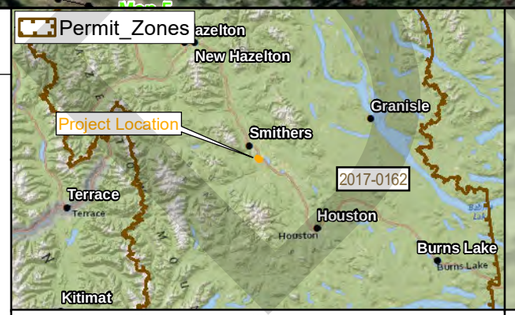
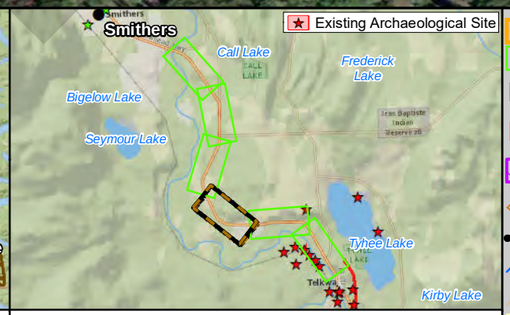
Archaeological Overview Assessment

Ministry of Transportation and Infrastructure Cycle 16 Bike Path Between Smithers and Telkwa

Figure: 5 **Page: 10**





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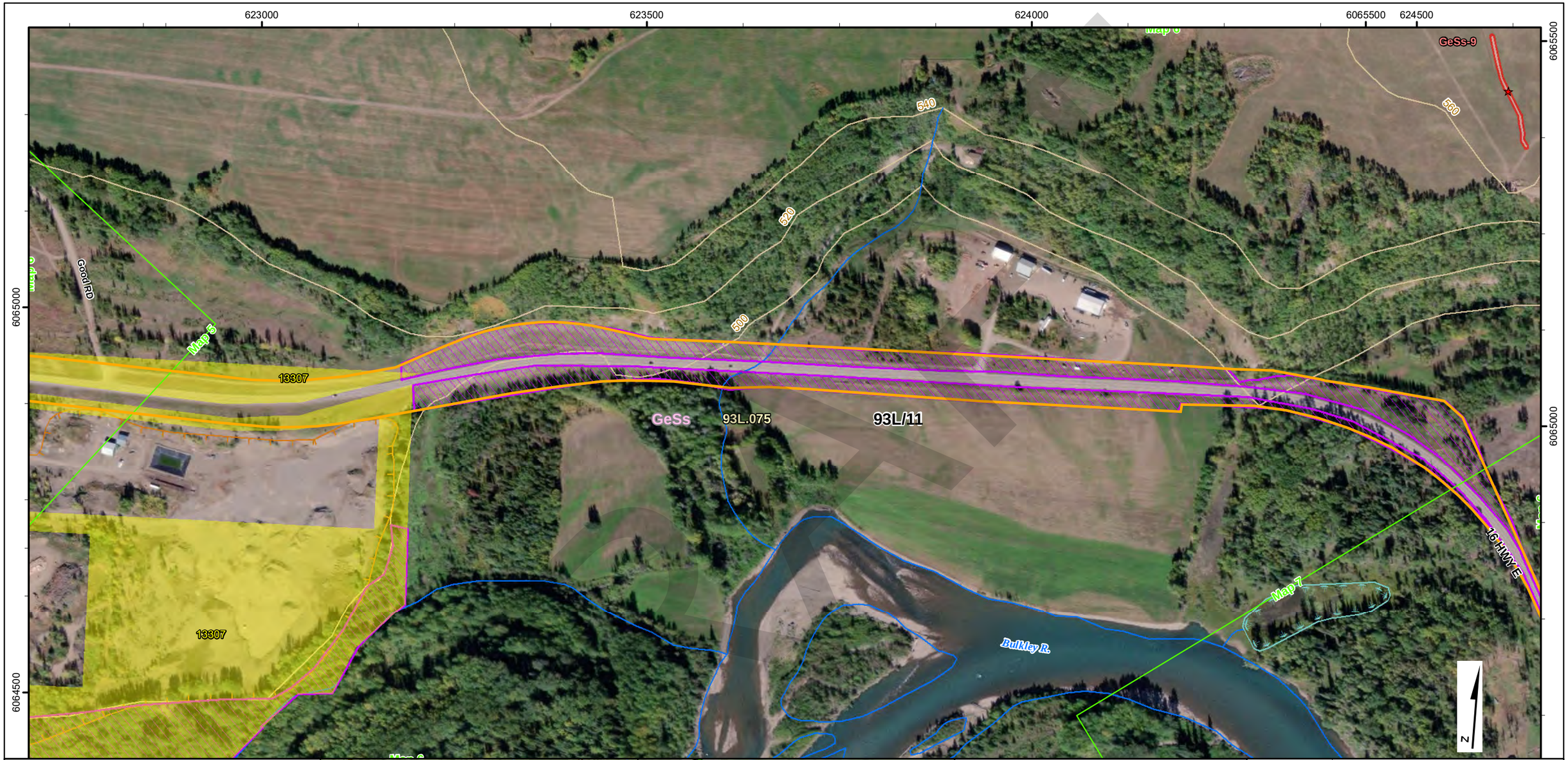

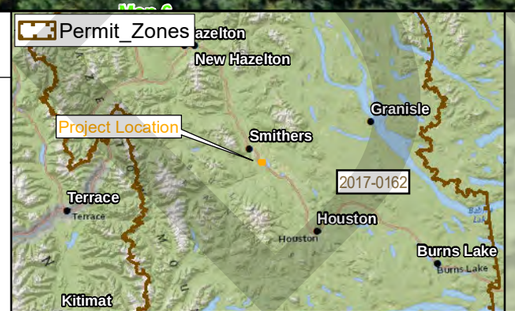

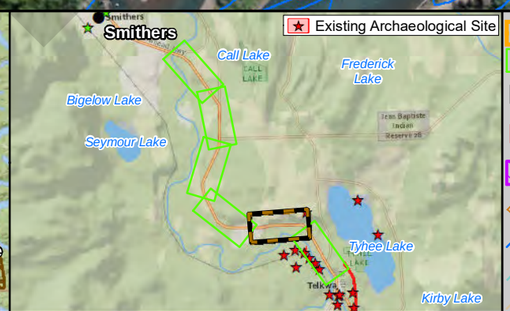

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Archaeological Overview Assessment

Ministry of Transportation and Infrastructure Cycle 16 Bike Path Between Smithers and Telkwa

Figure: 6 **Page: 11**

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NAD 1983 UTM Zone 9N; Meters *DRM - PGross - 18-Mar-2021*

625000 6064500 625500 6064000 626000

6065000 624500 626000 625500 6063000

Tyhee RD
GeSs-5
Hubert ST
First ST
Second ST
Hudson AVE
Telkwa High RD
540
520
500
16 HWY E
GeSs
16 HWY
93L/11
93L.075
Hunter AVE
Howson AVE
Fourth ST
Riverside ST
Map 6
Bulkley R.
GeSs-12
GeSs-13
GeSs-14
GeSs-15
93L.065

Archaeological Overview Assessment

Ministry of Transportation and Infrastructure Cycle 16 Bike Path Between Smithers and Telkwa

Figure: 7 **Page: 12**

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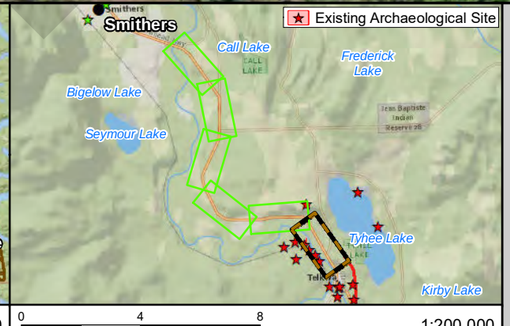

- Study Area
- Map Tile
- Existing Archaeological Site (location verified)
- Existing Archaeological Site (location unverified)
- Archaeological Potential - Not Verified
- Open Water / Watercourse
- Wetland
- Contour 20 m
- BCGS Mapsheet
- Borden Grid (archaeology)
- NTS Mapsheet

Archer Project:	13706
Proponent:	Ministry of Transportation and Infrastructure
HCA Permit:	2017-0162
OGC AMS AA#:	N/A
Surveyor's File:	N/A

0 50 100 200 Meters 1:5,000

Version	Detail	Reviewed by:	Date
0	Original		18-Mar-2021

NAD 1983 UTM Zone 9N; Meters *DRM - PGross - 18-Mar-2021*