

THIS AGREEMENT made as of January 30, 2018, is

BETWEEN:

City of Kelowna, 1435 Water Street, Kelowna, British Columbia, V1Y 1J4
(the "City")

AND:

Ponds Ventures Inc., P.O. Box 29053, Okanagan Mission RPO, Kelowna, British Columbia, V1W 4A7
(the "Developer").

WHEREAS:

- A. The Developer is the owner of and wishes to develop the lands legally described as:

PID: 017-150-604, Lot B Section 20, Township 29, Similkameen Division, Yale District, Plan KAP44335 Except Plan KAP86178,

and is participating in a coordinated effort with a number of other developers that wish to develop the lands legally described as:

PID: 028-432-207, Lot A, District Lot 579, Similkameen Division, Yale District, Plan EPP9618, Except Plans EPP9638, EPP15721, EPP18670, EPP20408, EPP22118, EPP33403 and EPP 43336;

PID: 028-948-521, Lot 3, District Lot 579, Similkameen Division, Yale District, Plan EPP22118;

PID: 029-124-298, Lot 1, District Lot 579, Similkameen Division, Yale District, Plan EPP29197; and,

PID: 029-930-898, Lot 2, District Lot 579, Similkameen Division, Yale District, Plan EPP45189;

(all of the lands in this preamble A are hereby defined as the "Development Lands");

- B. The Development Lands are located within the area of Kelowna, British Columbia, known as the Southwest Mission Service Area, as set out and identified as "R-B South Mission" on the map attached as Schedule A, (the "Benefitting Area");

- C. The City has, through the 20-Year Servicing Plan & Financial Strategy (the “Plan and Strategy”), recognized the future need for the construction of an extension to Gordon Drive, known as Gordon Drive 1 – Part 2, and certain road works, known as the South Perimeter Road, (together known as the South Perimeter Road Project (the “SPR Project”)) for the development of the Benefitting Area, with the City’s projected timing under the Plan and Strategy for the construction of the SPR Project being some time between 2025 and 2030;
- D. The Developer has requested that the City advance the timing of the construction of the SPR Project to accommodate the Developer’s development of those parts of the Development Lands owned by the Developer;
- E. The Developer has obtained and delivered to the City letters of acceptance acceptable to the City in its sole discretion from developers in the Benefitting Area for the terms of the SPR Project and the developers’ obligations in respect of the SPR Project;
- F. The Developer has agreed to design, construct and finance the SPR Project;
- G. The City and the Developer wish to set out the terms and conditions on which the Developer will design, construct, and finance the SPR Project;
- H. Sections 565 and 566 of the *Local Government Act* authorize the City Council to enter into an agreement to permit an owner to provide works and services in lieu of payment of all or any portion of a development cost charge; and,
- I. The City Council has passed a bylaw (the “Bylaw”) authorizing the parties to enter into this Development Cost Charge Frontending Agreement (the “Agreement”) pursuant to sections 565 and 566 of the *Local Government Act* for the provision of the SPR Project, including the payments to the Developer contemplated by the Agreement.

IN CONSIDERATION of their mutual promises set out in this Agreement, and for other good and valuable consideration, the receipt and sufficiency of which are acknowledged, the parties agree as follows:

Conditions Precedent

- 1. This Agreement shall not be binding on the parties unless the following conditions precedent have, within 6 months of the execution of this Agreement, been satisfied by the Developer or waived by the City:
 - a. The Developer has entered into agreements acceptable to it in its sole discretion to provide water, utilities, and road access to the Development Lands;

- b. The Developer has retained engineering and other consultants satisfactory to the City (the "Design Consultants") to prepare the detailed design the SPR Project (the "Detailed Design");
- c. The Developer has submitted to the City for review and acceptance the Detailed Design;
- d. The City has, in its sole discretion, accepted the Detailed Design;
- e. The Developer has submitted to the City for review and acceptance the Developer's engineer's estimate of the total cost of the SPR Project (the "ECE"), which shall include all costs of negotiating and acquiring all road dedications necessary for the completion of the SPR Project (the "Road Dedications"), in sufficient detail to allow the City to assess its reasonableness. The ECE shall set out unit prices that include all costs to complete the SPR Project, including but not limited to overhead, profit, financing, insurance, etc., but not the costs of the Road Dedications. The ECE shall include the costs of the Road Dedications as separate items;
- f. The appraisal commissioned by the Developer from Kent McPherson Appraisals Inc. (the "KM Appraisal") of the market value of those Road Dedications that are, in the opinion of the Developer, at risk of the Developer, after making all commercially reasonable efforts to acquire the Road Dedications, being unable to acquire the Road Dedications (the "At Risk Road Dedications") being no more than 50% greater than the estimate dated January 12, 2017, obtained by the Developer from A-1 Appraisals Ltd. (the "A-1 Estimate") of the market value of the At Risk Road Dedications .
- g. The City has, in its sole discretion, accepted the ECE;
- h. The Developer has agreed in writing to comply with the requirements of the City's Subdivision, Development and Servicing Bylaw No. 7900, as amended or replaced from time to time, ("Bylaw No. 7900") in relation to the construction of the SPR Project, and has entered into a works and services agreement satisfactory to the City as evidence of the terms of that agreement;
- i. The City has obtained the approval of the electors to this Agreement or has satisfied itself, in its sole discretion, that the same is not required;
- j. The City has adopted the Bylaw; and,

- k. The City and all other authorities having jurisdiction have issued all required development and other permits for the construction of the SPR Project to proceed.

Construction of the SPR

- 2. The Developer shall design, construct and transfer to the City the SPR Project and, for those purposes, shall, subject to the direction of the City:
 - a. acquire all Road Dedications. Should, after making all commercially reasonable efforts to acquire the Road Dedications, the Developer be unable to acquire some of the At Risk Road Dedications, the City will, at the request of the Developer, consider exercising its powers as a local government to acquire the At Risk Road Dedications. In the event that the City exercises its powers to acquire the At Risk Road Dedications, the Developer shall reimburse the City for all costs incurred by the City in acquiring the same, including without limitation compensation for the market value of the land so acquired, disturbance damages and business losses resulting from the acquisition of the same, and legal, survey, and appraisal costs. The City's consideration of the exercise of its powers to acquire the At Risk Road Dedications does not in any manner whatsoever relieve or reduce the obligation of the Developer to acquire all Road Dedications;
 - b. acquire all required permits and approvals for the SPR Project;
 - c. construct the SPR Project in compliance with:
 - i. the Detailed Design and all issued for construction drawings, and under the oversight of the Design Consultants or other consultants acceptable to the City;
 - ii. all required permits and approvals for the SPR Project; and
 - iii. the geotechnical recommendations contained in the geotechnical report attached as Schedule B (the "Geotechnical Specifications").
- 3. The Developer shall:
 - a. commence construction of the SPR Project within 30 days of the requirements of paragraph 1 of this Agreement being satisfied or waived and this Agreement becoming binding on the parties;
 - b. retain the Design Consultants, or other consultants acceptable to the City, for the entire period of construction of the SPR Project to oversee the construction; and,

- c. complete the construction of the SPR Project within 12 months of commencing construction.
- 4. The SPR Project shall be deemed to be complete (the "Completion Date") upon the commencement of the one-year maintenance period for the SPR Project in accordance with Bylaw No. 7900.

Costs and financing

- 5. The City is not responsible for any of the costs of the SPR Project.
- 6. The Developer shall complete the SPR Project at its own expense, including acquiring the Road Dedications, solely in exchange for remittances by the City in accordance with paragraph 9 of this Agreement of the project cost (the "Project Cost") determined in accordance with paragraph 7 of this Agreement.
- 7. The Project Cost is the lesser of the actual total costs of completing the SPR Project, including the cost of acquiring the Road Dedications, and:
 - a. the lesser of the ECE and \$9.263 million, plus
 - b. any additional costs, to a maximum of \$1.5 million, arising out of any City-requested changes to the Detailed Design, as may be agreed in writing by both the City and the Developer.

With respect to the actual total costs of completing the SPR Project, the review and determination shall only be in respect of the total costs and shall not involve a review of individual line items in the ECE.

- 8. If the ECE is less than \$9.263 million, the Developer agrees that it shall complete the SPR Project. If the ECE is greater than \$8.863 million, it shall be within the sole discretion of the Developer as to whether or not it proceeds with the SPR Project. If the Developer decides not to proceed with the SPR Project, it shall notify the City in writing of that decision no later than thirty days after the City executes this Agreement. If the Developer so notifies the City, this Agreement shall terminate on the day that the City is so notified, and the City will purchase from the Developer the Detailed Design for \$100,000 payable within three months of the termination of this Agreement.
- 9. In consideration of the completion of the SPR Project to the satisfaction of the City without any cost to the City, the City agrees to pay the Developer the Project Cost by remitting to the Developer a portion of the Southwest Mission Service Area Roads Development Cost Charges (as set out in Schedule A to Bylaw 10589) (the "Roads DCCs") collected by the City from developers in the Benefitting Area until the earlier of the Project Cost having been fully paid and

the expiry of 35 years from the date of this Agreement, in accordance with the following:

- a. Within 30 days of the Completion Date, the City shall remit to the Developer an amount equal to \$2.56 million plus 80% of the Road DCCs collected by the City in the 180 days immediately preceding the Completion Date;
 - b. Within 30 days of the date that is the last day of the first calendar quarter following the Completion Date, the City shall remit to the Developer of an amount equal to 80% of the Road DCCs collected by the City between the Completion Date and the last day of that same calendar half; and
 - c. Within 30 days of the date that is the last day of each subsequent calendar quarter following the Completion Date, the City shall remit to the Developer of an amount equal to 80% of the Road DCCs collected by the City in that subsequent.
10. The Developer agrees that the remittances by the City to the Developer pursuant to paragraph 9 of this Agreement are only required in the event that the SPR Project is completed in accordance with the Detailed Design to the satisfaction of the City, acting reasonably, are the only payments required to be made by the City to the Developer in relation to the completion of the SPR Project, and shall continue only until the earlier of the Project Cost having been fully paid and the expiry of 35 years from the date of this Agreement, after which time the City shall no longer be obligated to make any further remittances to the Developer, and all such remittances to the Developer shall cease.
11. The Developer agrees that no interest is payable by the City to the Developer in relation to the remittances to the Developer of Roads DCCs by the City at all and, in particular, that no interest is payable by the City to the Developer in relation to the remittances of Roads DCCs for the period between the City's collection of the Roads DCCs and the City's remittances of them to the Developer.
12. The Developer agrees that the City is not obliged to make any remittances to the Developer pursuant to paragraph 9 of this Agreement except to the extent that the Roads DCCs have actually been received by the City, and that, where a developer in the Benefitting Area utilizes development cost charge credits granted under the *Local Government Act* ("DCC Credits") to reduce the amount of Roads DCCs that would otherwise be required to be collected by the City from the developer, the value of the DCC Credits utilized by the developer does not form part of the amounts to be remitted by the City to the Developer pursuant to paragraph 9 of this Agreement.

13. The Developer agrees that the City is solely responsible for the administration of its development cost charge program including, without limitation, determining the amount of Roads DCCs to be collected by the City from a developer in the Benefitting Area, including determining what DCC Credits are available to the developer to be utilized to reduce the amount of Road DCCs that would otherwise be required to be collected by the City from the developer, and agrees that the City's determination of such amounts is in each case conclusive and binding on the Developer.

Waiver of Development Cost Charge Credits and Latecomer Payments

14. In consideration of the City's remittance obligations pursuant to paragraph 10 of this Agreement, the Developer hereby irrevocably waives, relinquishes and abandons any and all rights that the Developer now has or may at any time hereafter have to:
 - a. any DCC Credits related in any manner whatsoever to the SPR Project; and
 - b. any entitlement to latecomer payments granted under the *Local Government Act* related in any manner whatsoever to the SPR Project (the "Latecomer Payments").
15. The Developer hereby releases and forever discharges the City and its current and past elected officials, officers, employees, servants, agents, successors and assigns from all manner of actions, causes of action, suits, debts, dues, accounts, bonds, covenants, contracts, claims and demands whatsoever against the City, or any one or more of its current or past elected officials, officers, employees, servants, agents, successors and assigns that the Developer ever had, now has or hereafter may have by reason of the SPR Project and, without limiting the generality of the foregoing, by reason of the Developer's inability to utilize DCC Credits available to the Developer or to receive Latecomer Payments to which the Developer would be entitled to but for this Agreement.

General Provisions

16. The Developer represents and warrants to the City that:
 - a. it has the full and complete power, authority and capacity to enter into, execute and deliver this Agreement;
 - b. all necessary corporate actions and proceedings have been taken to authorize entry into and performance of this Agreement;
 - c. this Agreement shall be fully and completely binding upon such party in accordance with the terms hereof;

- d. neither the execution and delivery, nor the performance of or covenants in, this Agreement breaches any other agreement or obligation or causes default of any other agreement or obligation on the part of such party; and
 - e. the foregoing representations and warranties shall have force and effect notwithstanding any knowledge on the part of the City whether actual or constructive concerning the status of such party or any other matter whatsoever.
17. Any notice to be given under this Agreement shall be in writing and may be delivered personally or sent by prepaid registered mail. The addresses of the parties for the purpose of notice shall be the addresses set out in this Agreement. Any party may at any time give notice in writing to another of any change of address.
18. No partnership, joint venture or agency involving the City or the Developer is created by or under this Agreement and the Developer will not have the authority to commit and will not purport to commit the City to the payment of any money to any person.
19. The parties each agree that this Agreement creates only contractual rights and obligations among them and each party by this section agrees that no tort or other duty, obligation or liability is created by or under this Agreement (including any duty of care or fiduciary duty).
20. This Agreement is the entire agreement among the parties, and supersedes and terminates all previous agreements, promises, representations and warranties respecting the subject matter of this Agreement. The City has made no representations, warranties, guarantees, promises, covenants or agreements to or with the Developer other than those in this Agreement. For certainty, the Developer acknowledges and agrees that the City has not made or given any representations or warranties to the Developer respecting the subject matter of this Agreement.
21. No amendment to or waiver of any part of this Agreement is valid unless in writing and executed by the parties. Waiver of any default by a party is not to be deemed a waiver of any subsequent default by that party.
22. Wherever the singular or masculine is used in this Agreement, the same shall be construed as meaning the plural or the feminine or the body corporate or politic where the context or the parties so require.
23. Time is of the essence of this Agreement.

24. Neither party may assign this Agreement without the prior written consent of the other party, which consent will not be unreasonably withheld.
25. This Agreement shall enure to the benefit of and be binding upon the parties, their respective heirs, executors, administrators, successors and permitted assigns.
26. Nothing contained or implied in this Agreement shall fetter in any way the discretion of the City or the Council of the City. Further, nothing contained or implied in this Agreement shall derogate from the obligation of the Developer under any other agreement with the City or, if the City so elects, prejudice or affect the City's rights, powers, duties or obligation in the exercise of its functions pursuant to the *Community Charter* or the *Local Government Act*, as amended or replaced from time to time, or act to fetter or otherwise affect the City's discretion, and the rights, powers, duties and obligations of the City under all public and private statutes, bylaws, orders and regulations, which may be, if the City so elects, as fully and effectively exercised as if this Agreement had not been executed and delivered by the parties.
27. The laws of British Columbia are to govern its interpretation and enforcement and each of the City and the Developer accepts the jurisdiction of the courts of British Columbia.
28. If a party to this Agreement consists of more than one person, firm, or corporation, the covenants and obligations of such party under this Agreement shall be joint and several.
29. Subject to the earlier termination of this Agreement, this Agreement shall expiry 35 years from the date of this Agreement.

IN WITNESS WHEREOF the City and the Developer have executed this Agreement as of the day and year written below.

CITY OF KELOWNA by its authorized)
signatories:)
)
)
_____)
Mayor:)
)
)
_____)
Corporate Officer:)
)
)
Date: _____)

PONDS VENTURES INC. by its
authorized signatories:

Name:

WALTER S. LEUNG

Name:

Date:

Nov. 30/18

C/S

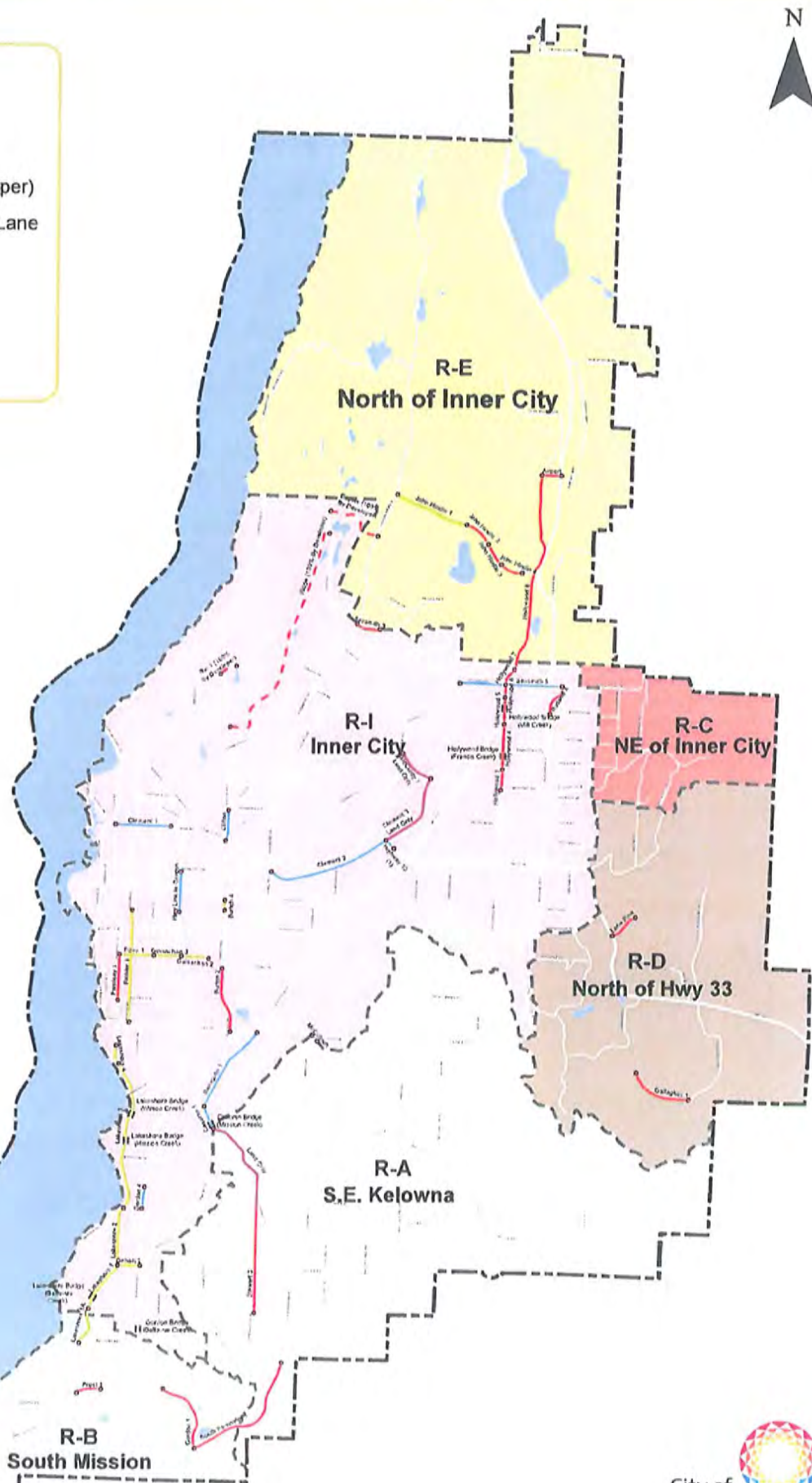
Schedule A – Benefitting Area

[Refer to Page 11-1]



- City Boundary
- DCC Sectors Boundary
- 2 Lane
- 2 Lane (100% By Developer)
- 2 Lane and Centre Turn Lane
- 4 Lane
- Land Only
- DCC Road Limits
- Bridge

Line	From	To	Length (km)	Speed (km/h)
1	Highway 1	Highway 2	1.2	80
2	Highway 2	Highway 3	1.5	80
3	Highway 3	Highway 4	1.8	80
4	Highway 4	Highway 5	2.1	80
5	Highway 5	Highway 6	2.4	80
6	Highway 6	Highway 7	2.7	80
7	Highway 7	Highway 8	3.0	80
8	Highway 8	Highway 9	3.3	80
9	Highway 9	Highway 10	3.6	80
10	Highway 10	Highway 11	3.9	80
11	Highway 11	Highway 12	4.2	80
12	Highway 12	Highway 13	4.5	80
13	Highway 13	Highway 14	4.8	80
14	Highway 14	Highway 15	5.1	80
15	Highway 15	Highway 16	5.4	80
16	Highway 16	Highway 17	5.7	80
17	Highway 17	Highway 18	6.0	80
18	Highway 18	Highway 19	6.3	80
19	Highway 19	Highway 20	6.6	80
20	Highway 20	Highway 21	6.9	80
21	Highway 21	Highway 22	7.2	80
22	Highway 22	Highway 23	7.5	80
23	Highway 23	Highway 24	7.8	80
24	Highway 24	Highway 25	8.1	80
25	Highway 25	Highway 26	8.4	80
26	Highway 26	Highway 27	8.7	80
27	Highway 27	Highway 28	9.0	80
28	Highway 28	Highway 29	9.3	80
29	Highway 29	Highway 30	9.6	80
30	Highway 30	Highway 31	9.9	80
31	Highway 31	Highway 32	10.2	80
32	Highway 32	Highway 33	10.5	80
33	Highway 33	Highway 34	10.8	80
34	Highway 34	Highway 35	11.1	80
35	Highway 35	Highway 36	11.4	80
36	Highway 36	Highway 37	11.7	80
37	Highway 37	Highway 38	12.0	80
38	Highway 38	Highway 39	12.3	80
39	Highway 39	Highway 40	12.6	80
40	Highway 40	Highway 41	12.9	80
41	Highway 41	Highway 42	13.2	80
42	Highway 42	Highway 43	13.5	80
43	Highway 43	Highway 44	13.8	80
44	Highway 44	Highway 45	14.1	80
45	Highway 45	Highway 46	14.4	80
46	Highway 46	Highway 47	14.7	80
47	Highway 47	Highway 48	15.0	80
48	Highway 48	Highway 49	15.3	80
49	Highway 49	Highway 50	15.6	80
50	Highway 50	Highway 51	15.9	80
51	Highway 51	Highway 52	16.2	80
52	Highway 52	Highway 53	16.5	80
53	Highway 53	Highway 54	16.8	80
54	Highway 54	Highway 55	17.1	80
55	Highway 55	Highway 56	17.4	80
56	Highway 56	Highway 57	17.7	80
57	Highway 57	Highway 58	18.0	80
58	Highway 58	Highway 59	18.3	80
59	Highway 59	Highway 60	18.6	80
60	Highway 60	Highway 61	18.9	80
61	Highway 61	Highway 62	19.2	80
62	Highway 62	Highway 63	19.5	80
63	Highway 63	Highway 64	19.8	80
64	Highway 64	Highway 65	20.1	80
65	Highway 65	Highway 66	20.4	80
66	Highway 66	Highway 67	20.7	80
67	Highway 67	Highway 68	21.0	80
68	Highway 68	Highway 69	21.3	80
69	Highway 69	Highway 70	21.6	80
70	Highway 70	Highway 71	21.9	80
71	Highway 71	Highway 72	22.2	80
72	Highway 72	Highway 73	22.5	80
73	Highway 73	Highway 74	22.8	80
74	Highway 74	Highway 75	23.1	80
75	Highway 75	Highway 76	23.4	80
76	Highway 76	Highway 77	23.7	80
77	Highway 77	Highway 78	24.0	80
78	Highway 78	Highway 79	24.3	80
79	Highway 79	Highway 80	24.6	80
80	Highway 80	Highway 81	24.9	80
81	Highway 81	Highway 82	25.2	80
82	Highway 82	Highway 83	25.5	80
83	Highway 83	Highway 84	25.8	80
84	Highway 84	Highway 85	26.1	80
85	Highway 85	Highway 86	26.4	80
86	Highway 86	Highway 87	26.7	80
87	Highway 87	Highway 88	27.0	80
88	Highway 88	Highway 89	27.3	80
89	Highway 89	Highway 90	27.6	80
90	Highway 90	Highway 91	27.9	80
91	Highway 91	Highway 92	28.2	80
92	Highway 92	Highway 93	28.5	80
93	Highway 93	Highway 94	28.8	80
94	Highway 94	Highway 95	29.1	80
95	Highway 95	Highway 96	29.4	80
96	Highway 96	Highway 97	29.7	80
97	Highway 97	Highway 98	30.0	80
98	Highway 98	Highway 99	30.3	80
99	Highway 99	Highway 100	30.6	80



This map is for general information only.
The City of Kelowna does not guarantee its accuracy. All information should be verified.



DCC Roads Program

Rev April 7/11



Schedule B – Geotechnical Specifications

[Refer to Pages 12-1 to 12-31]



MATERIALS TESTING • SOILS
CONCRETE • ASPHALT • CORING
GEOTECHNICAL ENGINEERING

1 - 1925 KIRSCHNER ROAD
KELOWNA, B.C. V1Y 4N7
PHONE: 860-6540
FAX: 860-5027

Arthon
Suite 9 – 1790 KLO Road
Kelowna, BC V1W 3P6

April 20, 2016
Job 16.072

Attention: Mr Keith Muldrum, ASCT, RTMgr – Manager, Special Projects

Dear Ms;

Re: **Geotechnical Investigation
Proposed South Perimeter Road
Kelowna, BC**

As requested and further to our proposal of March 18, 2016 Interior Testing Services Ltd (ITSL) has carried out a geotechnical investigation for the above noted proposed road construction project.

Please see attached the following:

- One page location plan (Drawing 16.072-1)
- One page of schematic soil logs (Drawing 16.072-1A)
- Nine pages of test pit logs (Drawings 16.072-2 to 16.072-12)
- Three pages of borehole logs (Drawing 16.072-13 to 16.072-15)
- One page of gradation analysis results (Drawings 16.072-16)

At the end of this letter report, please also see attached a copy of our two-page "Terms of Engagement" that applies to our work on this project, which has been previously signed and accepted.

1.0 INTRODUCTION & SCOPE OF WORK

Based on the preliminary plans, we understand that roughly 2300 m of roadway is proposed to connect Stewart Road West to Gordon Drive. The current plan is to construct two, 3.5 m wide traffic lanes with one paved bike lane and gravel shoulders. There is a multi-plate structure proposed for the Bellevue Creek crossing which is being designed by others.

With respect to underground services, we understand that only near the connection to Stewart Road West is any pipework to be installed.

Due to the undulating nature of the existing ground profile, there are significant areas of cut and fill work that will be required. Based on the plan-profile sections prepared by Protech Consulting (2012), cut heights are estimated to be on the order of 11 m in some areas. Fill heights appear to be on the order of 8 m.

To evaluate existing soil conditions, we carried out a two phase subsurface investigation. Initially, a series of machine dug test pits were carried out to evaluate the shallower conditions. Within the deep cut zones, we carried out deeper drilling to identify the potential for bedrock, which we anticipate to be a significant cost to construction.

The purpose of our investigation was to identify the underlying soil and groundwater conditions with respect to general geotechnical comments for construction of the proposed roadway. The following report presents our investigation and laboratory results, along with general geotechnical comments and recommendations for subgrade fill, slope finishing, trench work and pavement structure.

2.0 SITE DESCRIPTION

The site is an undeveloped tract of land that extends from Stewart Road West to Gordon Drive in a general northeast to southwest fashion. The property is currently privately held and contains a significant recreational trail network. The land undulates significantly throughout the planned alignment. The local vegetation is sparse, with mature trees generally only around the Bellevue Creek and Jack Smith Lake areas.

There is an active quarry to the southeast of the Stewart Road West area. Throughout the overall property there are active haul roads that access the quarry area.

3.0 FIELD WORK

On April 14, 2016, a tracked excavator operated by Dirty Deeds Landscaping was used to advance a total of eleven test pits to as much as roughly 2.8 m below current site grades. The intent of the test pits was to identify the potential for near surface bedrock and to sample the near surface soils for additional testing.

Following our test pit investigation, on April 15, 2016 a track mounted drill rig operated by Mud Bay Drilling Co Ltd was used to advance three boreholes within areas where deep cuts are proposed. The initial auger hole (AH1) was completed using conventional solid stem equipment. However, due to the dense condition of the other areas, AH2 and AH3 were completed using air rotary tooling. Air rotary has the advantage of penetrating very dense, coarse conditions. However, sampling is limited to the significant disturbance to the soil profile.

All test holes (test pits and boreholes) were continuously logged in the field and regular, representative samples were recovered and returned to our laboratory for additional analysis.

Locations of the test holes were referenced onsite to the centerline stake alignment and stations were roughly paced off. The locations of the test holes are approximately shown on attached location plan provided by Protech Consulting (2012) as Drawing 16.072-1. Using the plan-profile sections from Protech Consulting (2012) we approximated the surface elevation at each test hole location, which are shown on the schematic logs and the attached test hole logs. The elevations should be considered approximate and may vary from those shown.

4.0 RESULTS

4.1 Soil Profile

The schematic logs of all test holes are shown on Drawing 16.072-1A. Detailed soil descriptions are shown on the attached test hole logs (Drawings 16.072-2 to 16.072-13), which should be used in preference to the generalized soil descriptions that follow.

As a very general comment, the proposed roadway alignment typically appears to be underlain by natural SANDs or SAND, GRAVEL, COBBLE and occasional boulders.

As much as 1.5 m of FILL was noted within TP1 to TP3. The FILL material was usually darker in colour and contained occasional evidence of wood waste / topsoils.

Between Stations roughly 2+880 to 1+850 the soil profile appears to have a significant SAND component. Within AH1, SAND was encountered to the base of the borehole at roughly 9.1 m. However, there also appear to be at least occasional seams of larger granular material, as noted within TP2, TP3, TP4 and TP5.

From roughly Station 1+850 to the terminus of the alignment, Station 0+540, the underlying soil profile typically consists of dense, coarse SAND, GRAVEL, COBBLE and BOULDER.

While bedrock was not specifically encountered in the test holes, possible bedrock outcrops were observed, so that the potential remains for bedrock to be exposed within cut areas.

4.2 Groundwater Conditions

Standing groundwater was only noted within TP7 at roughly 0.5 m below grade. However, we anticipate that this may be part of an ephemeral stream and speculate that the water observed is not part of the local groundwater regime. This is in part due to the seepage that was observed along the existing cut slopes that form the onsite haul roads.

Groundwater or seepage was not encountered in any other test holes.

As a general comment, groundwater levels will vary seasonally and will be affected by drainage and infiltration conditions. As outlined below, there were occasional ephemeral streams observed during our field work and consideration will need to be given by the design team to adequately address these systems during and after construction.

4.3 Laboratory Work

Moisture contents were determined on all recovered samples and the results are presented on the attached test hole logs. The natural soils varied in oven dried moisture content from approximately 2 to 23%.

We carried out gradation analyses on several select samples and the results have been plotted on Drawing 16.072-16. Of the four samples, three generally can be classified as fine to coarse SAND and GRAVEL, trace to some silt. The sample from TP5 at roughly 0.6 m below grade indicates a SILT / SAND soil, with over 50% fines.

Currently, we are also carrying out a California Bearing Ratio test on a larger bucket sample recovered from TP4 at roughly 0.8 m below grade. We will forward the results of this test when they are ready.

4.4 General Field Observations

During our site investigation work, we made the following general notes.

- Ephemeral stream path noted to the northeast of TP3.
- Seepage at the toe of the existing cut bank to the east of TP4.
- Flowing stream noted at roughly Station 1+905.
- Possible bedrock outcrop or very large boulder noted at Station 1+700.
- Possible bedrock outcrop or very large boulder noted at Station 1+570
- Shallow pond to the southeast of TP11, at roughly Station 0+570.

5.0 CONSTRUCTION CONSIDERATIONS

We provide the following general comments for construction of the proposed roadway.

5.1 Old Fill Comments

As part of the initial site preparation work, we anticipate that some level of grubbing will be carried out to remove vegetation and topsoils. In addition, we recommend that any existing

old fills be removed to expose suitable natural soils. Based on our investigation, there were fills noted within TP1 to TP3 and potentially within AH1.

5.2 Roadway Fill & Existing Soil Re-Use

As noted above, there are areas of the alignment that require significant cuts and fills. Based on our deeper drilling information, the cut areas typically consist of SANDs to SAND, GRAVEL and COBBLE. These granular materials are expected to be suitable for use as subgrade fill. For the areas where cobbles and / or boulders are encountered and if it is desired to re-use these materials, crushing and screening will be required to limit the maximum particle size to 200 mm (8 inches). Additional guidance can be provided at the time of construction if needed.

Approved subgrade FILLs should be placed in maximum 300 mm (1 ft) thick lifts, compacted to at least 95% of Modified Proctor Density (MPD) and conditioned to within 2% of the optimum moisture content.

Regular field density testing should be carried out to evaluate the compactive and conditioning efforts of the contractor during subgrade fill placement.

5.3 Underground Utility Service Installation

We anticipate that the proposed utility services will be set on competent, natural soils such that pipe (service) support is expected to be adequate.

Conventional Worksafe BC side slopes of 3H:4V should be satisfactory during construction for trench depths up to approximately 3 m for dry conditions. If steeper slopes are required, if deeper excavations are proposed or if water is encountered, a geotechnical engineer should be given the opportunity to review and comment.

5.4 Pavement Structure

We understand that the South Perimeter Road is to be an arterial corridor. For the natural granular soils or satisfactorily compacted subgrade FILLs (see 5.1), we anticipate the California Bearing Ratio (CBR) value will be on the order of 10. We are currently completing a CBR test in our laboratory on the natural SANDs and we will forward the results when ready. On a preliminary basis, the following pavement structure is expected to be satisfactory and reasonable from a frost protection perspective.

100 mm	ASPHALT
100 mm	BASE GRAVEL (19 mm Minus) – compacted to 95% of MPD
200 mm	SUBBASE GRAVEL (150 mm Minus) – compacted to 95% of MPD

After completion of our CBR test, we will forward the results and confirm the above pavement structure.

5.5 Finished Slopes

We recommend that all fill and cut slopes be finished to no steeper than 1.5 Horizontal to 1 Vertical (1.5H:1V). Slopes should also be vegetated or hydro-seeded to reduce the potential for surface erosion.

If significant grade separations require the construction of retaining walls, ITSL can provide further design information as necessary.

Although not expected to be encountered, bedrock cuts should be finished to no steeper than 1H:4V. If necessary, rock catchment zones beneath bedrock slopes should be as per the Ministry of Transportation and Infrastructure's Technical Bulletin GM02001.

6.0 CONCLUSIONS

- 6.1 We have carried out a geotechnical investigation for the proposed roadway. There are significant cuts and fills required along the proposed alignment. Our comments with respect to material re-use, subgrade fill and other construction considerations are provided in the above section of this letter report.
- 6.2 During construction of the proposed roadway, ITSL can carry out materials testing services and engineering review as needed.

We trust the above comments are sufficient at this stage. After your review, please feel free to call and discuss any questions you may have.

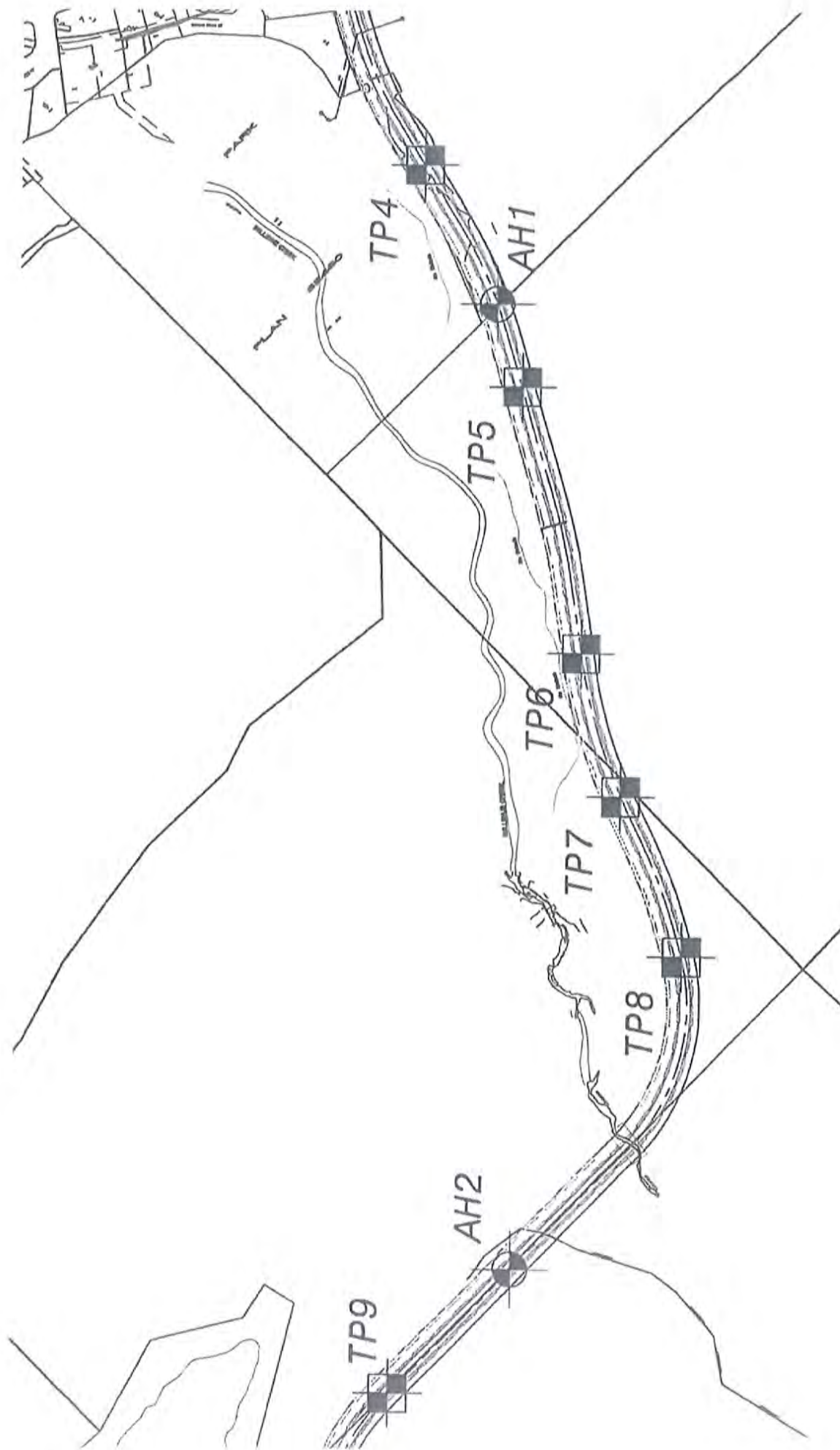
Sincerely,
Interior Testing Services Ltd

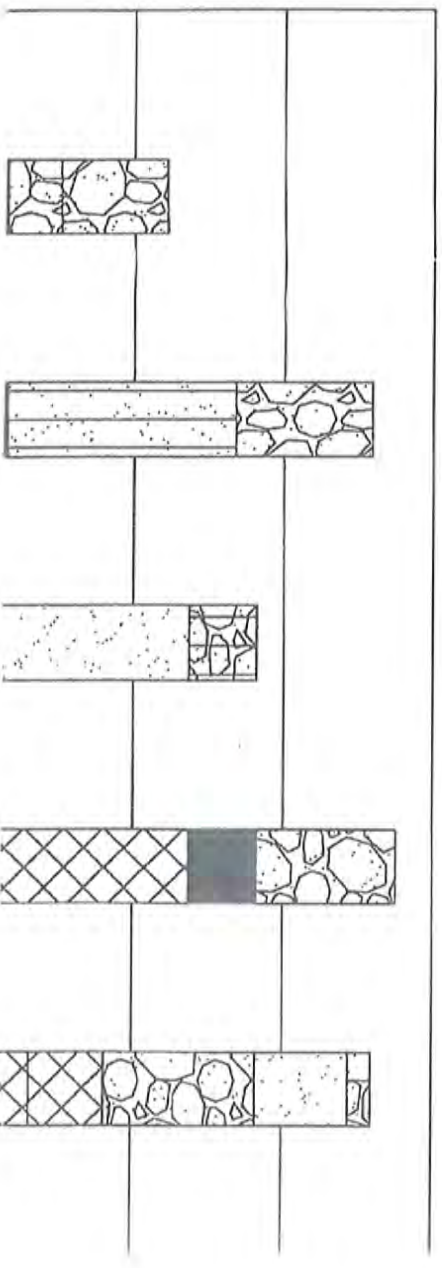
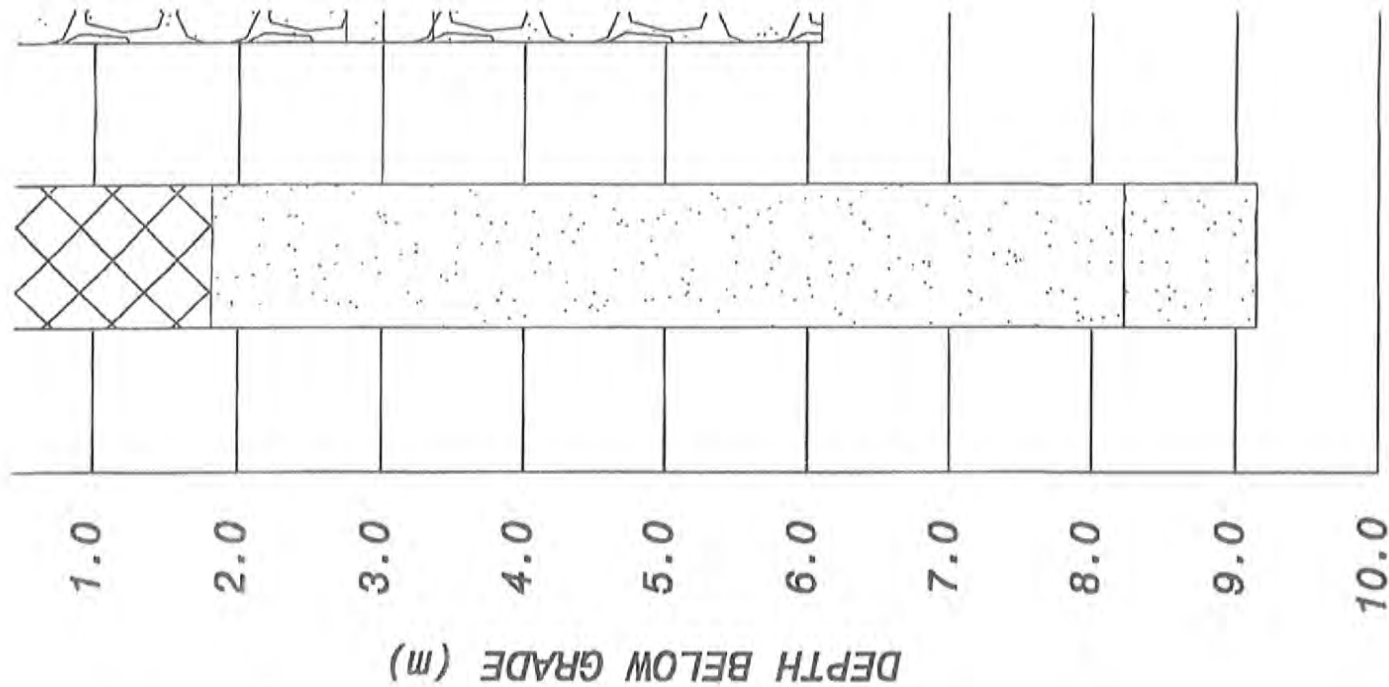
Prepared By:

Jeremy Block, P Eng
Intermediate Geotechnical Engineer

Reviewed By:

Peter Hanenburg, P Eng
Principal Geotechnical Engineer





ON

TOPSOIL
 SAND

FILL
 SAND, GRAVEL, COBBLE, BOULDER

STONY SAND & GRAVEL

L14/16)

**- INTERIOR -
TESTING SERVICES
- LTD. -**

LOG OF TEST BORING TP 1

Interior Testing Services Ltd
1 - 1925 Kirschner Road
Kelowna, BC V1Y 4N7
(250) 860 - 6540
email: info@interiortesting.com

Project	: 16.072	Method	: Tracked Excavator
	: Geotechnical Investigation	Driller	: Dirty Deeds Landscape
	: Proposed South Perimeter Rd	Logged By	: JB
	: Kelowna, BC	Date	: April 14, 2016
Location	: See Dwg. No. 16.072-1		

Depth in Meters	% Moisture	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	Legend	Depth in Meters
								☐ Disturbed Sample	
DESCRIPTION									
0				Location: Station 2+828 (+/-)				Sand and gravel FILL.	0
								Clean, fine to medium SAND.	
1									1
	5%			No seepage or groundwater observed.		S1	☐		
2									2
								Bottom of test pit at 2.75 m.	
3									3
4									4

Drawing No. 16.072-2

**- INTERIOR -
TESTING SERVICES
- LTD. -**

LOG OF TEST BORING TP 2

Interior Testing Services Ltd
1 - 1925 Kirschner Road
Kelowna, BC V1Y 4N7
(250) 860 - 6540
email: info@interiortesting.com

Project	16.072	Method	: Tracked Excavator
	: Geotechnical Investigation	Operator	: Dirty Deeds Landscape
	: Proposed South Perimeter Rd	Logged By	: JB
	: Kelowna, BC	Date	: April 14, 2016
Location	See Dwg. No. 16.072-1		

Depth in Meters	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	Legend	DESCRIPTION	Depth in Meters
							☐ Disturbed Sample		
0			Location: Station 2+659 (+/-)					Light brown, sand to sand gravel FILL.	0
			No seepage or groundwater observed.					Brown to dark brown, silty topsoil / old fill, occasional wood waste.	
1	11%				S1	☐		Brown to rust brown, SAND, GRAVEL and COBBLE.	1
	5%		Sieve Analysis - 6% Fines		S2	☐			
2								Light brown SAND, some gravel.	2
								Light brown, SAND, GRAVEL and COBBLE.	
3								Bottom of test pit at 2.6 m.	3
4									4

Drawing No. 16.072-3

- INTERIOR -
TESTING SERVICES
- LTD. -

LOG OF TEST BORING TP 3

Interior Testing Services Ltd
1 - 1925 Kirschner Road
Kelowna, BC V1Y 4N7
(250) 860 - 6540
email: info@interiortesting.com

Project : 16,072
: Geotechnical Investigation
: Proposed South Perimeter Rd
: Kelowna, BC
Location : See Dwg. No. 16.072-1

Method : Tracked Excavator
Operator : Dirty Deeds Landscape
Logged By : JB
Date : April 14, 2016

Depth in Meters	% Moisture	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	Legend	DESCRIPTION	Depth in Meters
								☐ Disturbed Sample		
0				Location: Station 2+483 (+/-)					Light brown, sand, occasional cobble and boulder, FILL.	0
				Seasonal stream path observed to the northeast.						
1	10%					S1	☐			
				No seepage or groundwater observed.					TOPSOIL and roots.	
2									Light brown, SAND to SAND, GRAVEL, occasional cobble.	2
3									Bottom of test pit at 2.75 m.	3
4										4

Drawing No. 16.072-4

**- INTERIOR -
TESTING SERVICES
- LTD. -**

LOG OF TEST BORING TP 4

Interior Testing Services Ltd
1 - 1925 Kirschner Road
Kelowna, BC V1Y 4N7
(250) 860 - 6540
email: info@interiortesting.com

Project	: 16.072	Method	: Tracked Excavator
	: Geotechnical Investigation	Operator	: Dirty Deeds Landscape
	: Proposed South Perimeter Rd	Logged By	: JB
	: Kelowna, BC	Date	: April 14, 2016
Location	: See Dwg. No. 16.072-1		

Depth in Meters	% Moisture	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	Legend	DESCRIPTION	Depth in Meters
								☐ Disturbed Sample		
0				Location: Station 2+294(+/-)					Light brown, fine to medium SAND, traces of silt. 150 mm thick gravel seam at roughly 0.3 m.	0
1				Seepage noted along toe of the cut face to the east.		S1	☐			1
				California Bearing Ratio Test (Dwg 16.072-17)						
				No seepage or groundwater observed within test pit.					Grey, dense, silty SAND and GRAVEL (till-like).	
2									Bottom of test pit at 1.8 m.	2
3										3
4										4

Drawing No. 16.072-5

- INTERIOR -
TESTING SERVICES
- LTD. -

LOG OF TEST BORING TP 5

Interior Testing Services Ltd
1 - 1925 Kirschner Road
Kelowna, BC V1Y 4N7
(250) 860 - 6540
email: info@interiortesting.com

Project : 16.072
Geotechnical Investigation
Proposed South Perimeter Rd
Kelowna, BC
Location : See Dwg. No. 16.072-1

Method : Tracked Excavator
Operator : Dirty Deeds Landscape
Logged By : JB
Date : April 14, 2016

Depth in Meters	% Moisture	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	Legend	DESCRIPTION	Depth in Meters
								☐ Disturbed Sample		
0				Location: Station 2+063 (+/-) Flowing stream observed at Station 1+905 (+/-).					TOPSOIL / roots.	0
	13%			Sieve Analysis - 51% Fines		S1	☐		Light brown to grey, moist SILT / SAND.	
1				No seepage or groundwater observed within test pit.					Coarse SAND, GRAVEL and COBBLE.	1
2	5%					S2	☐			2
3									Bottom of test pit at 2.6 m.	3
4										4

Drawing No. 16.072-6

**- INTERIOR -
TESTING SERVICES
- LTD. -**

LOG OF TEST BORING TP 6

Interior Testing Services Ltd
1 - 1925 Kirschner Road
Kelowna, BC V1Y 4N7
(250) 860 - 6540
email: info@interiortesting.com

Project	: 16.072	Method	: Tracked Excavator
	: Geotechnical Investigation	Operator	: Dirty Deeds Landscape
	: Proposed South Perimeter Rd	Logged By	: JB
	: Kelowna, BC	Date	: April 14, 2016
Location	: See Dwg. No. 16.072-1		

Depth in Meters	% Moisture	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	Legend	DESCRIPTION	Depth in Meters
								☐ Disturbed Sample		
0										0
	15%			Location: Station 1+811 (+/-)		S1	☐	TOPSOIL.		
				Possible BEDROCK outcrop at Station 1+700 (+/-)				Rust brown, SAND, GRAVEL, COBBLE, BOUDLER. Boulder diameter roughly 1 m. Occasional roots.		
				No seepage or groundwater observed within test pit.				Light brown, SAND, GRAVEL, COBBLE and BOULDER.		
1										1
2									Bottom of test pit at 1.2 m due to refusal on boulder.	2
3										3
4										4

Drawing No. 16.072-7

**- INTERIOR -
TESTING SERVICES
- LTD. -**

LOG OF TEST BORING TP 7

Interior Testing Services Ltd
1 - 1925 Kirschner Road
Kelowna, BC V1Y 4N7
(250) 860 - 6540
email: info@interiortesting.com

Project	: 16.072	Method	: Tracked Excavator
	: Geotechnical Investigation	Operator	: Dirty Deeds Landscape
	: Proposed South Perimeter Rd	Logged By	: JB
	: Kelowna, BC	Date	: April 14, 2016
Location	: See Dwg. No. 16.072-1		

Depth in Meters	% Moisture	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	Legend	Depth in Meters
								☐ Disturbed Sample	
DESCRIPTION									
0				Location: Station 1+675 (+/-)				TOPSOIL / weeds.	0
								Moist silty SAND.	
								Light brown, SAND, GRAVEL, COBBLE and BOULDER.	
				Groundwater level / ephemeral stream noted on April 14, 2016.					
				Possible BEDROCK outcrop at Station 1+570 (+/-)				Bottom of test pit at 0.75 m due to high water level.	
1									1
2									2
3									3
4									4

Drawing No. 16.072-8

**- INTERIOR -
TESTING SERVICES
- LTD. -**

LOG OF TEST BORING TP 8

Interior Testing Services Ltd
1 - 1925 Kirschner Road
Kelowna, BC V1Y 4N7
(250) 860 - 6540
email: info@interiortesting.com

Project	16.072	Method	: Tracked Excavator
	: Geotechnical Investigation	Operator	: Dirty Deeds Landscape
	: Proposed South Perimeter Rd	Logged By	: JB
	: Kelowna, BC	Date	: April 14, 2016
Location	: See Dwg. No. 16.072-1		

Depth in Meters	% Moisture	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	Legend	Depth in Meters
								☐ Disturbed Sample	
								DESCRIPTION	
0				Location: Station 1+512 (+/-)				TOPSOIL / weeds.	0
								Brown, medium to coarse SAND, moist.	
								Bottom of test pit at 0.5 m due to large boulder.	
1									1
				No groundwater or seepage observed.					
2									2
3									3
4									4

Drawing No. 16.072-9

**- INTERIOR -
TESTING SERVICES
- LTD. -**

LOG OF TEST BORING TP 9

Interior Testing Services Ltd
1 - 1925 Kirschner Road
Kelowna, BC V1Y 4N7
(250) 860 - 6540
email: info@interiortesting.com

Project	: 16.072	Method	: Tracked Excavator
	: Geotechnical Investigation	Operator	: Dirty Daeds Landscape
	: Proposed South Perimeter Rd	Logged By	: JB
	: Kelowna, BC	Date	: April 14, 2016
Location	: See Dwg. No. 16.072-1		

Depth in Meters	% Moisture	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	Legend	Depth in Meters
								☐ Disturbed Sample	
0				Location: Station 1+000 (+/-)					0
0.5	7%			No seepage or groundwater observed within test pit.		S1	☐	Brown, silty gravel FILL, occasional wood waste.	0.5
1.5	9%			Sieve Analysis - 20% Fines		S2	☐	Light brown, SAND, GRAVEL, COBBLE and occasional boulder. Trace to some silt.	1.5
2.4								Bottom of test pit at 2.4 m due to refusal on coarse dense soils.	2.4

Drawing No. 16.072-10

**- INTERIOR -
TESTING SERVICES
- LTD. -**

LOG OF TEST BORING TP 10

Interior Testing Services Ltd
1 - 1925 Kirschner Road
Kelowna, BC V1Y 4N7
(250) 860 - 6540
email: info@interiortesting.com

Project	: 16.072	Method	: Tracked Excavator
	: Geotechnical Investigation	Operator	: Dirty Deeds Landscape
	: Proposed South Perimeter Rd	Logged By	: JB
	: Kelowna, BC	Date	: April 14, 2016
Location	: See Dwg. No. 16.072-1		

Depth in Meters	% Moisture	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	Legend	Depth in Meters
								☐ Disturbed Sample	
0				Location: Station 0+720 (+/-)					0
1	9%			No seepage or groundwater observed within test pit.		S1	☐	Brown, topsoil-like silt / sand.	1
	9%		S2			☐	Light brown, medium to coarse SAND, GRAVEL and COBBLE. Difficult digging with depth.		
2						Bottom of test pit at 1.8 m due to refusal on coarse dense soils.	2		
3									3
4									4

Drawing No. 16.072-11

**- INTERIOR -
TESTING SERVICES
- LTD. -**

LOG OF TEST BORING TP 11

Interior Testing Services Ltd
1 - 1925 Kirschner Road
Kelowna, BC V1Y 4N7
(250) 860 - 6540
email: info@interiortesting.com

Project	: 16.072	Method	: Tracked Excavator
	: Geotechnical Investigation	Operator	: Dirty Deeds Landscape
	: Proposed South Perimeter Rd	Logged By	: JB
	: Kelowna, BC	Date	: April 14, 2016
Location	: See Dwg. No. 16.072-1		

Depth in Meters	% Moisture	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	Legend	Depth in Meters
								☐ Disturbed Sample	
0				Location: Station 0+590(+/-)				TOPSOIL / roots.	0
				Shallow pond to the south at Station 0+570 (+/-)		S1	☐	Clean SAND, GRAVEL, COBBLE and BOULDER. Boulder diameter roughly 0.6 m.	
1	3%			No seepage or groundwater observed within test pit.					1
				Sieve Analysis - 8% Fines		S2	☐		
2	6%							Bottom of test pit at 2.1 m due to refusal on coarse dense soils.	2
3									3
4									4

Drawing No. 16.072-12

**- INTERIOR -
TESTING SERVICES
- LTD. -**

LOG OF TEST BORING AH1

Interior Testing Services Ltd
1 - 1925 Kirschner Road
Kelowna, BC V1Y 4N7
(250) 860 - 6540
email. info@interiortesting.com

Project	: 16.072	Method	: Solid Stem Auger
	: Geotechnical Investigation	Driller	: Mud Bay Drilling Co Ltd
	: Proposed South Perimeter Rd	Logged By	: JB
	: Kelowna, BC	Date	: April 15, 2016
Location	: See Dwg. No. 16.072-1		

Depth in Meters	% Moisture	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	Legend	DESCRIPTION	Depth in Meters
								☐ Disturbed Sample		
0				Location: Station 2+149(+/-)					Brown to dark brown, moist, fine to medium sand, trace to some silt and gravel, possible FILL.	0
1	10%			No seepage or groundwater observed within test pit.		S1	☐			1
2	6%					S2	☐		Light brown, compact, fine to medium SAND. Medium SAND between 5.2 to 6.1 m.	2
3										3
4	9%					S3	☐			4
5										5
6	9%					S4	☐			6
7	12%					S5	☐			7
8										8
9	23%					S6	☐		Grey, moist, occasionally rust stained, fine SAND, some silt.	9
10									Bottom of auger hole at 9.1 m.	10

Drawing No. 16.072-13

**- INTERIOR -
TESTING SERVICES
- LTD. -**

LOG OF TEST BORING AH2

Interior Testing Services Ltd
1 - 1925 Kirschner Road
Kelowna, BC V1Y 4N7
(250) 860 - 6540
email: info@interiortesting.com

Project	: 16.072	Method	: Air Rotary
	: Geotechnical Investigation	Driller	: Mud Bay Drilling Co Ltd
	: Proposed South Perimeter Rd	Logged By	: JB
	: Kelowna, BC	Date	: April 15, 2016
Location	: See Dwg. No. 16.072-1		

Depth in Meters	% Moisture	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	Legend	Depth in Meters
								Disturbed Sample	
0				Location: Station 1+160 (+/-)					0
1				No seepage or groundwater observed within test pit.					1
2				Limited sample and description due to disturbance by air rotary.					2
3	3%			No bedrock encountered		S1	☐	Coarse, clean SAND.	3
4								BOULDER.	4
5	6%					S2	☐	SAND, GRAVEL, COBBLE.	5
6									6
7									7
8									8
9									9
10									10

Bottom of auger hole at 6.1 m.

Drawing No. 16.072-14

- INTERIOR -
TESTING SERVICES
- LTD. -

LOG OF TEST BORING AH3

Interior Testing Services Ltd
1 - 1925 Kirschner Road
Kelowna, BC V1Y 4N7
(250) 860 - 6540
email: info@interiortesting.com

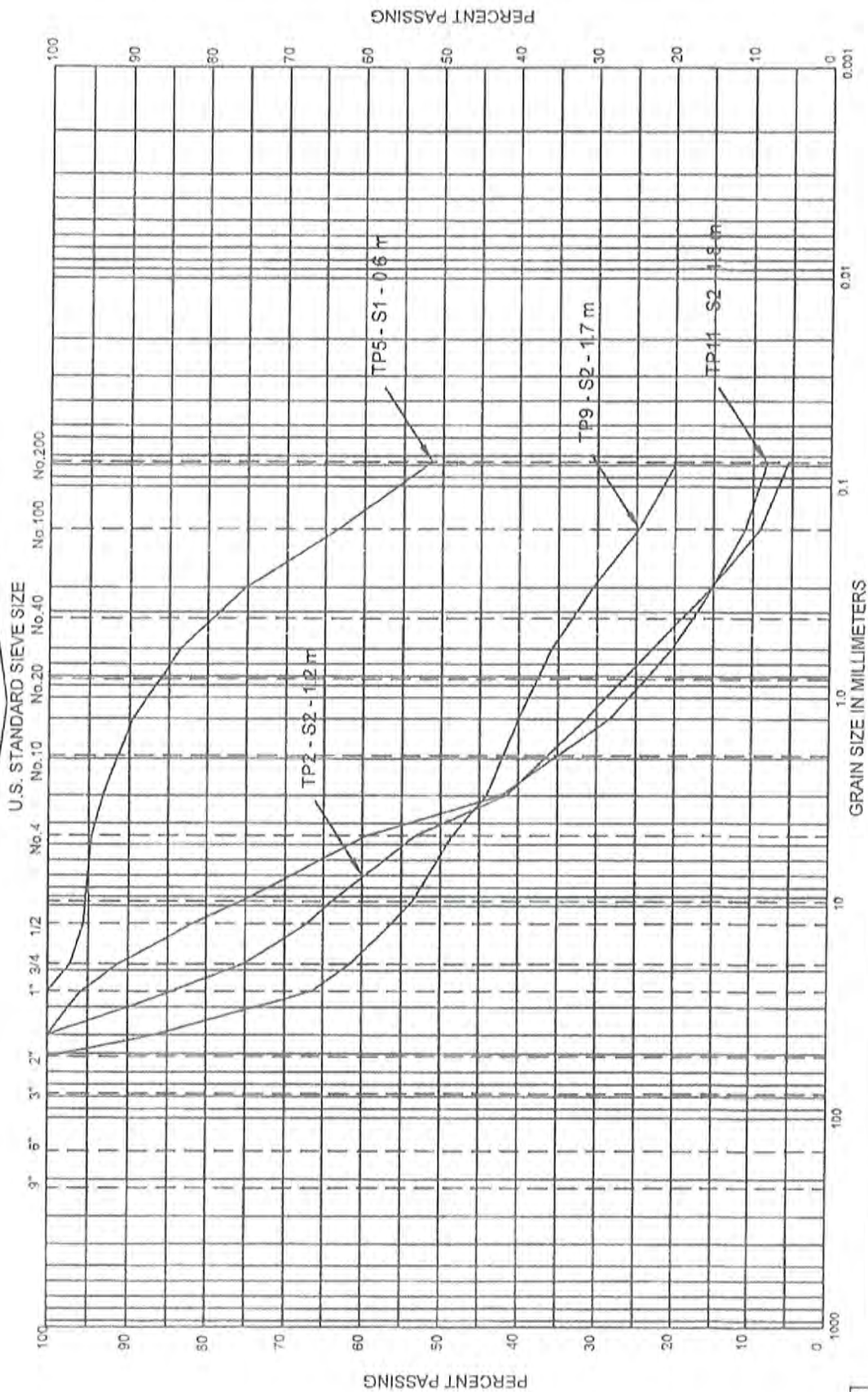
Project : 16.072
Geotechnical Investigation
Proposed South Perimeter Rd
Kelowna, BC
Location : See Dwg. No. 16.072-1

Method : Air Rotary
Driller : Mud Bay Drilling Co Ltd
Logged By : JB
Date : April 15, 2016

Depth in Meters	% Moisture	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	Legend	DESCRIPTION	Depth in Meters
								☐ Disturbed Sample		
0				Location: Station 0+662 (+/-)					SAND, GRAVEL and COBBLE.	0
1				No seepage or groundwater observed within test pit.						1
2				Limited sample and description due to disturbance by air rotary.						2
3				No bedrock encountered.						3
4	2%					S1	☐			4
5										5
6										6
7										7
8									Bottom of auger hole at 7.6 m.	8
9										9
10										10

Drawing No. 16.072-15

INTERIOR TESTING SERVICES LTD
 1-1925 KIRSCHNER ROAD, KELOWNA, B.C. V1Y 4N7
 PH: 250-860-6540 FAX: 250-860-5027
 EM: info@interiortesting.com



SAMPLE	GRAVEL				SAND			SILT OR CLAY		PROJECT
	COARSE	FINE	COARSE	FINE	COARSE	MEDIUM	FINE			
TP2 - S2 - 1.2 m										Proposed South Perimeter Road Kelowna, BC
TP5 - S1 - 0.6 m										
TP9 - S2 - 1.7 m										
TP11 - S2 - 1.8 m										

TERMS OF ENGAGEMENT

GENERAL

Interior Testing Services Ltd. (ITSL) shall render the Services performed for the Client on this Project in accordance with the following Terms of Engagement. ITSL may, at its discretion and at any stage, engage subconsultants to perform all or any part of the Services. Unless specifically agreed in writing, these Terms of Engagement shall constitute the entire Contract between ITSL and the Client.

COMPENSATION

Charges for the Services rendered will be made in accordance with ITSL's Schedule of Fees and Disbursements in effect from time to time as the Services are rendered. All Charges will be payable in Canadian Dollars. Invoices will be due and payable by the Client within thirty (30) days of the date of the invoice without hold back. Interest on overdue accounts is 12% per annum.

REPRESENTATIVES

Each party shall designate a representative who is authorized to act on behalf of that party and receive notices under this Agreement.

TERMINATION

Either party may terminate this engagement without cause upon thirty (30) days' notice in writing. On termination by either party under this paragraph, the Client shall forthwith pay ITSL its Charges for the Services performed, including all expenses and other charges incurred by ITSL for this Project.

If either party breaches this engagement, the non-defaulting party may terminate this engagement after giving seven (7) days' notice to remedy the breach. On termination by ITSL under this paragraph, the Client shall forthwith pay to ITSL its Charges for the Services performed to the date of termination, including all fees and charges for this Project.

ENVIRONMENTAL

ITSL's field investigation, laboratory testing and engineering recommendations will not address or evaluate pollution of soil or pollution of groundwater. ITSL will co-operate with the Client's environmental consultant during the field work phase of the investigation.

PROFESSIONAL RESPONSIBILITY

In performing the Services, ITSL will provide and exercise the standard of care, skill and diligence required by customarily accepted professional practices and procedures normally provided in the performance of the Services contemplated in this engagement at the time when and the location in which the Services were performed. ITSL makes no warranty, representation or guarantee, either express or implied as to the professional services rendered under this agreement.

LIMITATION OF LIABILITY

ITSL shall not be responsible for:

- (a) the failure of a contractor, retained by the Client, to perform the work required in the Project in accordance with the applicable contract documents;
- (b) the design of or defects in equipment supplied or provided by the Client for incorporation into the Project;
- (c) any cross-contamination resulting from subsurface investigations;
- (d) any damage to subsurface structures and utilities;
- (e) any Project decisions made by the Client if the decisions were made without the advice of ITSL or contrary to or inconsistent with ITSL's advice;
- (f) any consequential loss, injury or damages suffered by the Client, including but not limited to loss of use, earnings and business interruption;
- (g) the unauthorized distribution of any confidential document or report prepared by or on behalf of ITSL for the exclusive use of the Client.

The total amount of all claims the Client may have against ITSL under this engagement, including but not limited to claims for negligence, negligent misrepresentation and breach of contract, shall be strictly limited to the lesser of our fees or \$50,000.00.

No claim may be brought against ITSL in contract or tort more than two (2) years after the Services were completed or terminated under this engagement.

PERSONAL LIABILITY

For the purposes of the limitation of liability provisions contained in the Agreement of the parties herein, the Client expressly agrees that it has entered into this Agreement with ITSL, both on its own behalf and as agent on behalf of its employees and principals.

The Client expressly agrees that ITSL's employees and principals shall have no personal liability to the Client in respect of a claim, whether in contract, tort and/or any other cause of action in law. Accordingly, the Client expressly agrees that it will bring no proceedings and take no action in any court of law against any of ITSL's employees or principals in their personal capacity.

THIRD PARTY LIABILITY

This report was prepared by ITSL for the account of the Client. The material in it reflects the judgement and opinion of ITSL in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. ITSL accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This report may not be used or relied upon by any other person unless that person is specifically named by us as a beneficiary of the Report. The Client agrees to maintain the confidentiality of the Report and reasonably protect the report from distribution to any other person.

INDEMNITY

The client shall indemnify and hold harmless ITSL from and against any costs, damages, expenses, legal fees and disbursements, expert and investigation costs, claims, liabilities, actions, causes of action and any taxes thereon arising from or related to any claim or threatened claim by any party arising from or related to the performance of the Services.

DOCUMENTS

All of the documents prepared by ITSL or on behalf of ITSL in connection with the Project are instruments of service for the execution of the Project. ITSL retains the property and copyright in these documents, whether the Project is executed or not. These documents may not be used on any other project without the prior written agreement of ITSL.

FIELD SERVICES

Where applicable, field services recommended for the Project are the minimum necessary, in the sole discretion of ITSL, to observe whether the work of a contractor retained by the Client is being carried out in general conformity with the intent of the Services.

DISPUTE RESOLUTION

If requested in writing by either the Client or ITSL, the Client and ITSL shall attempt to resolve any dispute between them arising out of or in connection with this Agreement by entering into structured non-binding negotiations with the assistance of a mediator on a without prejudice basis. The mediator shall be appointed by agreement of the parties. If a dispute cannot be settled within a period of thirty (30) calendar days with the mediator, the dispute shall be referred to and finally resolved by an arbitrator appointed by agreement of the parties.

CONFIRMATION OF PROFESSIONAL LIABILITY INSURANCE

As required by by-laws of the Association of Professional Engineers and Geoscientists of British Columbia, it is required that our firm advises whether or not Professional Liability Insurance is held. It is also required that a space for you to acknowledge this information be provided.

Our professional liability insurance is not project specific for the project and should not be regarded as such. If you require insurance for your project you should purchase a project specific insurance policy directly.

Accordingly, this notice serves to advise you that ITSL carries professional liability insurance. Please sign and return a copy of this form as an indication of acceptance and agreement to the contractual force of these Terms of Engagement.

ACKNOWLEDGEMENT: _____

1 – 1925 Kirschner Road
Kelowna, BC V1Y 4N7
Phone: (250) 860-6540
Email: info@interiortesting.com

**-INTERIOR-
TESTING SERVICES
-LTD.-**

GEOTECHNICAL MEMO

To:	Mr Keith Meldrum, ASCT, RTMgr	Company:	Arthon Industries Ltd
Email:	keith@arthon.com	Date:	June 15, 2016
Job:	16.072	Pages:	6 (including this page)
Re:	California Bearing Ratio Results – Proposed South Perimeter Road, Kelowna, BC		
Email cc:	Mr Ron Boyer – Protech Consulting – rboyer@protech-consulting.com		

Further to our geotechnical report dated April 20, 2016, Interior Testing Services Ltd (ITSL) has carried out laboratory testing of two samples recovered adjacent to TP4. Please find attached a one page site plan, two pages of California Bearing Ratio (CBR) results and one page of gradation analyses. As before, our work is subject to our two-page "Terms of Engagement" which has previously been signed and accepted.

1. To evaluate the suitability of the underlying natural soils, two samples were recovered adjacent to TP4. We anticipate that these finer grained soils will represent the "weakest" materials throughout the proposed road alignment. The samples were compacted to approximately 98.9 and 99.6% of Modified Proctor Density (MPD).
2. The results are shown on Drawings 16.072-17 and 16.072-18. After soaking the lowest CBR value at 0.1 inches was recorded as 4 for the "surface" sample and 5 for the deeper sample.

We anticipate that as part of the general construction procedure, the surface soils will be stripped and the underlying soils will be exposed prior to placement of the pavement structure. Therefore, it is our opinion that it will be reasonable to use a minimum CBR value of 5 in design. Furthermore, as noted above, these tested soils are expected to be the "weakest" throughout the roadway alignment, with natural sands, gravels, cobbles and boulders anticipated for the majority of the project.

3. Based on the CBR test results and our comments above, we confirm the pavement structure from our April 20, 2016 report is expected to be reasonable for the proposed roadway.

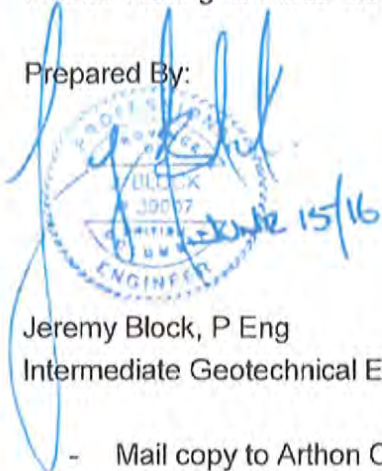
100 mm	ASPHALT
100 mm	BASE GRAVEL (crushed 19 mm gravel) – 95% of MPD
200 mm	SUBBASE GRAVEL (150 mm minus) – 95% of MPD

In addition, we can provide construction reviews as needed to provide further guidance and comments in localized sections where alternative comments with respect to pavement structure may be required.

We trust the above comments are sufficient. Please do not hesitate to call if you have any questions.

Regards,
Interior Testing Services Ltd

Prepared By:



Jeremy Block, P Eng
Intermediate Geotechnical Engineer

Reviewed By:



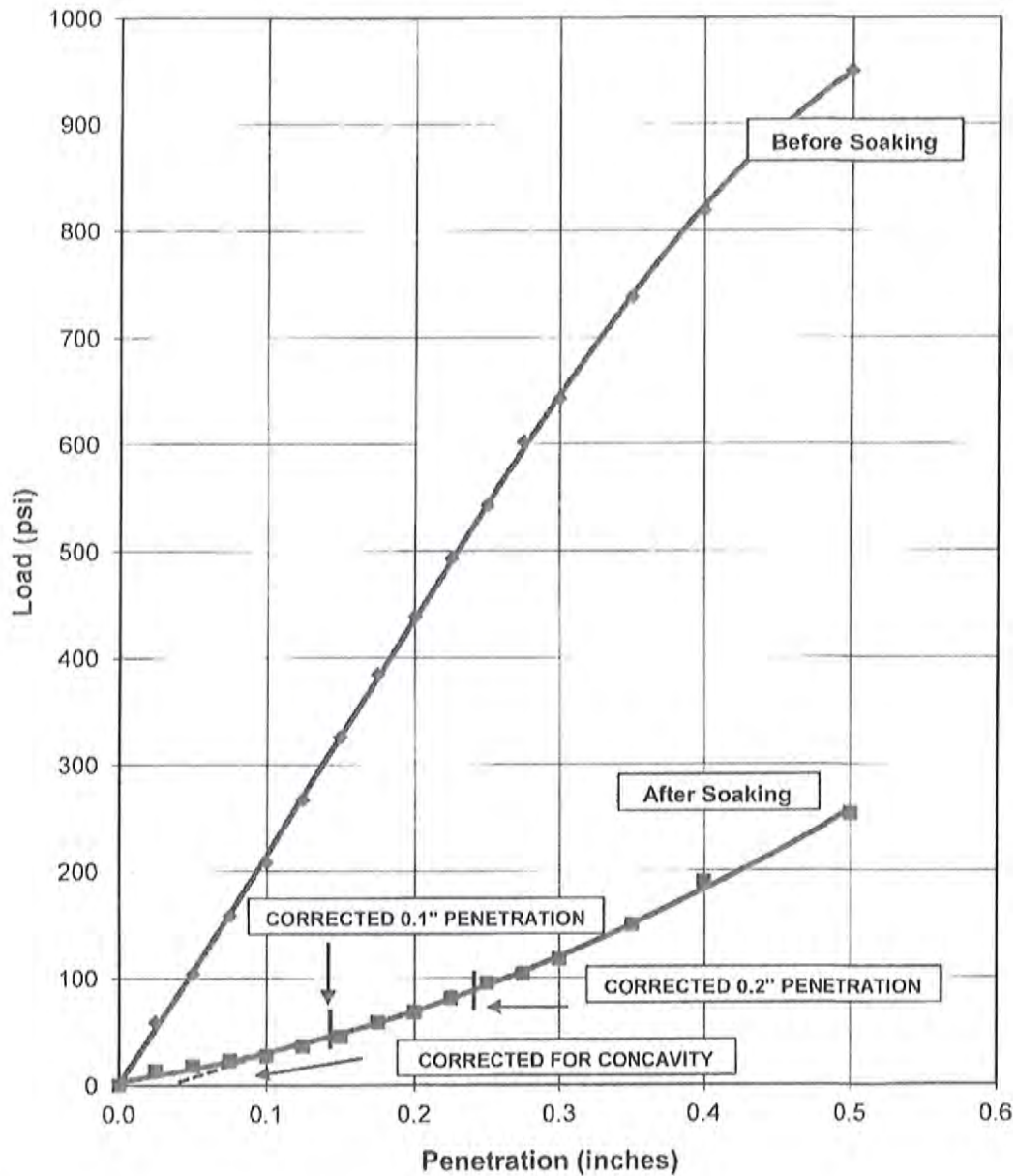
Peter Hanenburg, P Eng
Principal Geotechnical Engineer

- Mail copy to Arthon Constructors Ltd



SCALE 1:5000
50 100 200

CALIFORNIA BEARING RATIO TEST



RE-COMPACTED SAMPLE

SAMPLE: Natural SILT / SAND - TP4 - 0.3 m

ASTM D1883

INITIAL MOISTURE: 16.1%

FINAL MOISTURE: 20.7%

CBR AT 0.1 INCHES (BEFORE SOAKING): 21

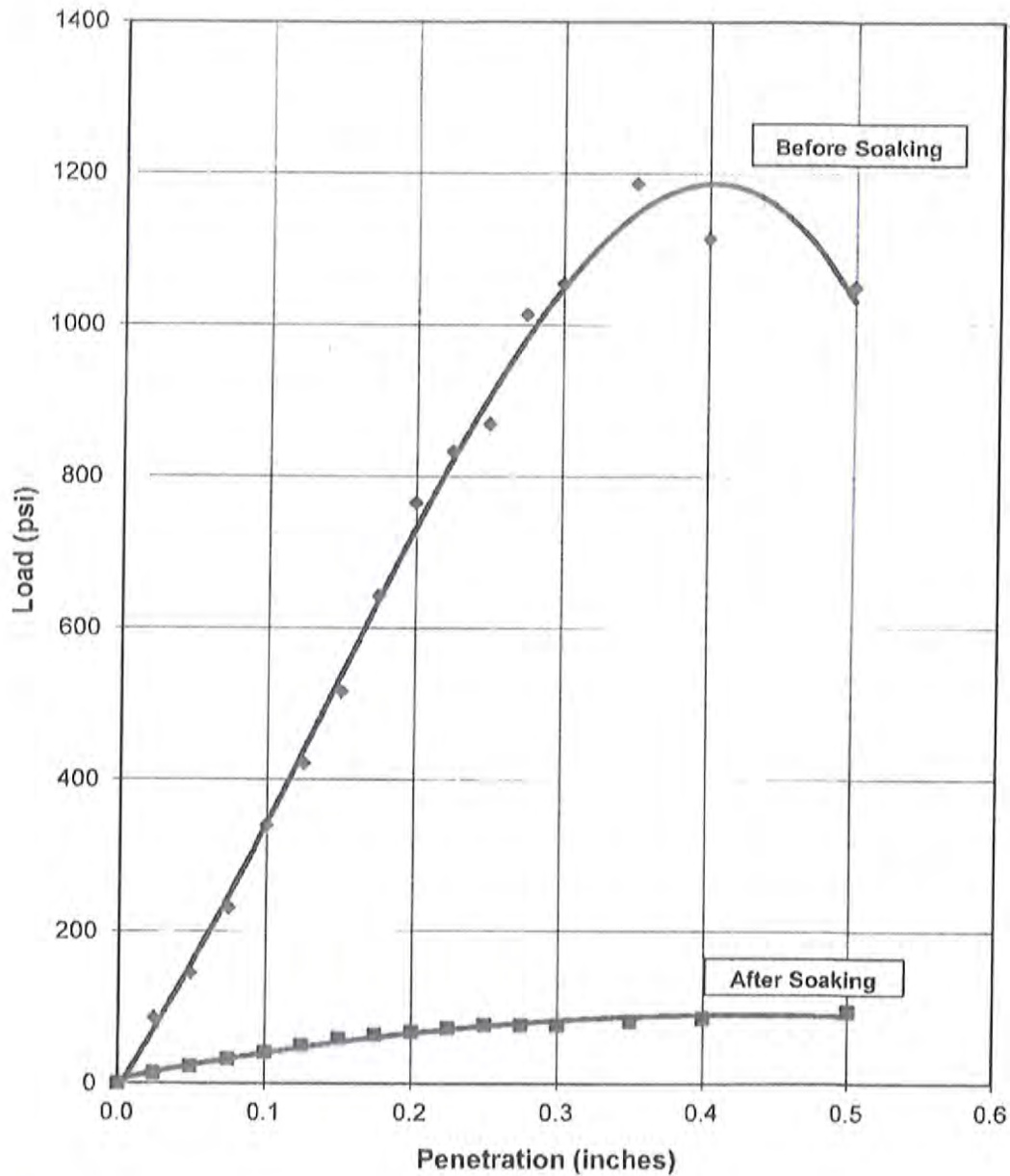
CBR AT 0.2 INCHES (BEFORE SOAKING): 29

CBR AT 0.1 INCHES (AFTER SOAKING): 5 (corrected)

CBR AT 0.2 INCHES (AFTER SOAKING): 9 (corrected)

Arthon Industries Ltd Proposed Roadway South Perimeter Road Kelowna, BC	<u>CBR TEST RESULTS</u>	INTERIOR TESTING SERVICES LTD soils - concrete - asphalt	
		TEST DATE: June 2016	JOB NO. 16.072 DWG NO. 16.072-18

CALIFORNIA BEARING RATIO TEST



RE-COMPACTED SAMPLE

SAMPLE: Natural silty SAND - TP4 - +/-Surface

ASTM D1883

INITIAL MOISTURE: 10.9%

FINAL MOISTURE: 17.1%

CBR AT 0.1 INCHES (BEFORE SOAKING): 34

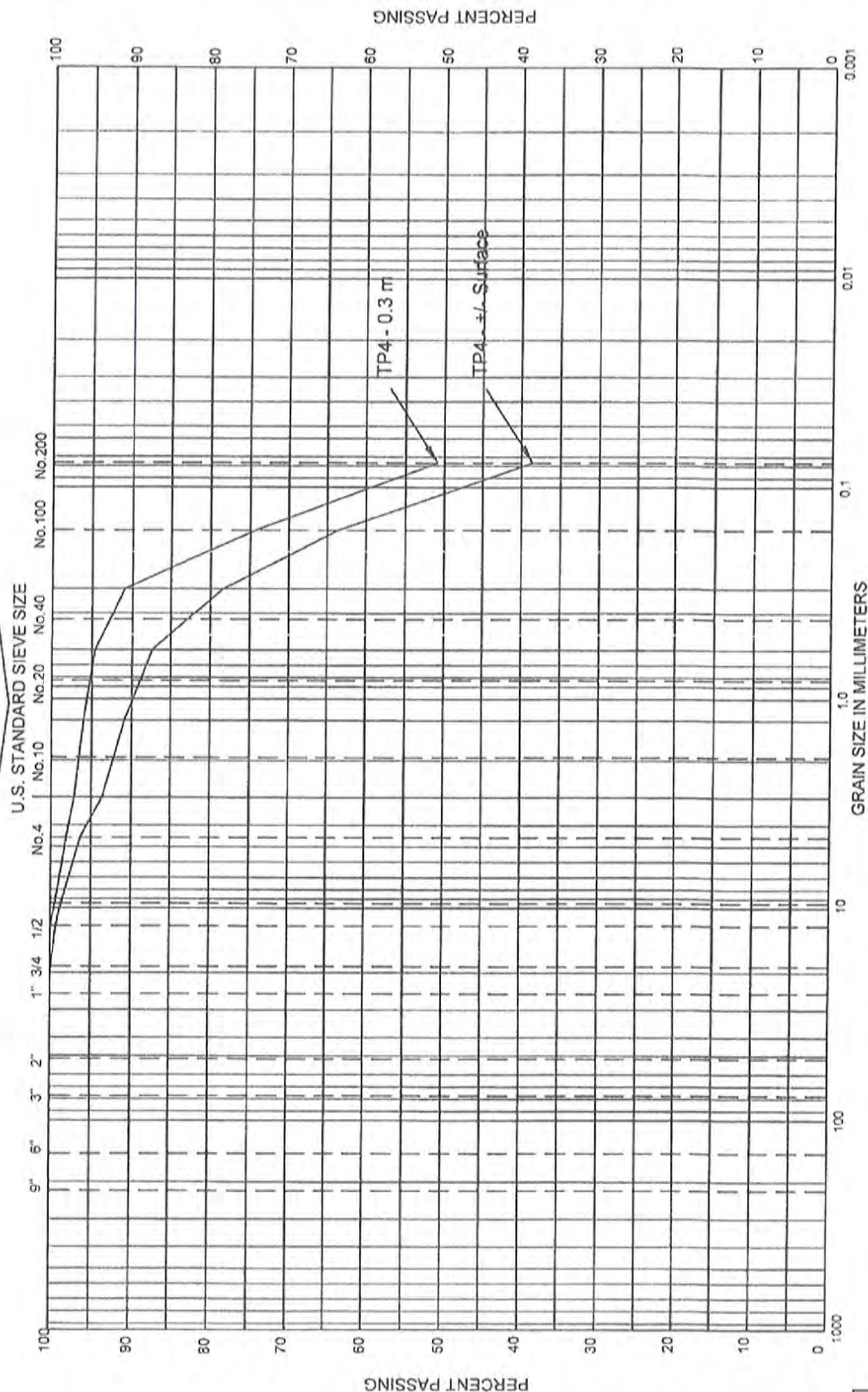
CBR AT 0.2 INCHES (BEFORE SOAKING): 51

CBR AT 0.1 INCHES (AFTER SOAKING): 4

CBR AT 0.2 INCHES (AFTER SOAKING): 5

Arthon Industries Ltd Proposed Roadway South Perimeter Road Kelowna, BC	CBR TEST RESULTS	INTERIOR TESTING SERVICES LTD soils - concrete - asphalt	
		TEST DATE: June 2016	JOB NO. 16.072 DWG NO. 16.072-17

INTERIOR TESTING SERVICES LTD.
 1-1925 KIRSCHNER ROAD, KELOWNA, B.C. V1Y 4N7
 PH: 250-860-6540 FAX: 250-860-5027
 EM: info@interiortesting.com



COBBLES	GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	COARSE	MEDIUM	FINE		
SAMPLE	SOIL DESCRIPTION						PROJECT
TP4 - +/- Surface	Fine SAND and SILT.						Arthon Industries Ltd
TP4 - 0.3 m	Fine to medium SAND and SILT.					Proposed South Perimeter Road Kelowna, BC	

DWG. NO. 16.072-19