DEVELOPMENT PERMIT

NO. **DP- 2016-10**

TO: **Hyak Marine Services**

ADDRESS: **P.O. Box 570**
Gibsons, B.C. V0N 1V0
(Permittee)

1) This Development Permit is issued subject to compliance with all of the Bylaws of the Town of Gibsons applicable thereto, except those specifically varied or supplemented by this Permit.

2) The Development Permit applies to those "lands" within the Town of Gibsons described below:

Parcel Identifier: **007-359-870**

Legal Description: **Lot 2, Block A, Plan 14197, District Lot 686**

Civic Address: **377 Gower Point Road**

3) These lands are within Development Permit Area No. 9 of the Town of Gibsons Official Community Plan (Bylaw 985, 2005). This permit applies to the following Development Permit Area:

- Development Permit Area No. 9 (Gibsons Aquifer) for the purpose of the protection of the Gibsons Aquifer.

4) The "land" described herein shall be developed strictly in accordance with the terms and conditions and provisions of this Permit, and any plans and specifications attached to this Permit which shall form a part thereof; specifically:

- Memorandum Regarding Proposed Test Pit Sampling Program, prepared by Horizon Engineering Inc., dated July 6, 2016

5) Details around TP12-2 are to be reviewed by Horizon Engineering Inc. and submitted to the Director of Engineering prior to proceeding with sampling in this area (i.e., was the inflow of water controlled, how was it confirmed the influx of groundwater was from a drainage trench and not from interception of an aquifer, does the drainage trench still exist, where is the proposed test pit relative to the drainage trench, etc.).

6) All details of the above noted memorandum are to be followed. On site monitoring by Horizon Engineering Inc. during construction as outlined in the memorandum is required.

7) Minor changes to the aforesaid memorandum that do not affect the intent of this Development Permit are permitted only with the approval of the Town of Gibsons and Horizon Engineering Inc.

8) If the Permittee does not commence the development permitted by this Permit within twenty four months of the date of this Permit, this Permit shall lapse.

9) This Permit is NOT a Building Permit.

ISSUED THIS 22 DAY OF July, 2016.

Dave Newman, AScT
Director of Engineering

Copy of permit to the Horizon Engineering Inc.

HORIZON ENGINEERING INC

Unit 220 - 18 Gostick Place
North Vancouver, BC
Canada V7M 3G3

Phone 604-990-0546
Fax 604-990-0583
www.horizoneng.ca

July 6, 2016

Our File: 112-3155

TOWN OF GIBSONS
474 South Fletcher Road
Gibsons, BC V0N 1V0

Attn: Andre Boel, Director of Planning

Re: Proposed "The George" Mixed Use Development
377, 385 & 407 Gower Point Road, 397 & 689 Winn Road, and
Winn Road Right-of-Way, Gibsons, BC
Memorandum Regarding Proposed Test Pit Sampling Program

1.0 INTRODUCTION

This letter has been prepared at the request of the Town of Gibsons to provide a description of the test pit sampling program that is proposed to be carried out at the site of the proposed "The George" development, with reference to DPA #9.

As described in Section 12.0 of our Geotechnical Investigation Report for the aforementioned development dated April 7, 2015, we recommend that foundations for the entire building footprint are supported on shallow foundations that are constructed upon improved soil, as the natural loose and compressible subgrade materials are judged to be unsuitable for supporting conventional shallow foundations in their current state.

2.0 DEEP SOIL MIXING

As described in Section 12.0 of the aforementioned report, deep soil mixing is the recommended method of ground improvement at the subject site. Deep soil mixing involves drilling into the unsuitable subgrade materials with large diameter drilling equipment and subsequently introducing grout into the hole, which is mechanically mixed with the disturbed soil to create a soil-cement column that is approximately 1.0 to 1.5 metre (3 to 5 feet) in diameter. Columns of improved soil, or "soil-cement", are created, which would terminate at the surface of the underlying, natural, compact to dense soil.

3.0 SAMPLING AND LABORATORY TESTING PROGRAM

The strength of the completed soil-cement columns will be designed to meet the required structural loads, with a suitable Factor of Safety. In order to determine the ratios of grout to each soil type expected to be encountered at the deep soil mixing column locations, a series of laboratory tests are required to be carried out prior to initiation of the ground improvement program. Laboratory testing will involve mixing various quantities of soil with grout, and allowing the resulting soil-cement

samples to cure. The samples will then be subjected to Uniaxial Compression Testing in order to assess the soil-cement strength.

In order to obtain soil samples for the testing program, a series of test pits is required to be excavated at the site, during which samples from the relevant soil layers will be collected. We envisage that approximately three to seven test pits may be excavated, which would be located at accessible portions of the proposed building footprint area.

Test pits would be excavated through the fill, peat, and sand, and terminated within the silty sand to sandy silt to silt materials, to the approximate depths indicated in Table 1 below.

Table 1: Proposed Test Pit Depths

PREVIOUS DRILL HOLE OR TEST PIT LOCATED NEAR PROPOSED TEST PIT LOCATION	PREVIOUSLY ENCOUNTERED DEPTH TO TILL-LIKE SOIL (feet)	PROPOSED TEST PIT DEPTH (feet)
TP12-1	13	10
TP12-2	N/A	8
AH12-2	7.5	6
AH14-6	17	13
AH12-3	14.5	13
BH14-5	16.5	10
AH14-5	13	10

Test pit locations are proposed to be immediately adjacent to the locations of drill holes previously carried out by Horizon, as shown on Figure 1 (attached), such that test pits can be terminated prior to exposing till-like soils. It is noteworthy that the Gibsons Aquifer soils (gravelly sand to sand and gravel to gravel) were not encountered at these locations without a horizon of till overlying them.

As a precautionary measure, a dump truck load of road base material will be available on site in the event that rising groundwater is encountered within a test pit. In this scenario, excavation would be immediately halted and the test pit would be quickly backfilled with the road base material, compacted in lifts with a hoe pack.

An engineer from Horizon will be on site at all times during test pit excavation to direct the subsurface investigation and to collect samples. An engineer from Keystone Environmental Ltd. will be on site at all times during Horizon's test pit investigation to supervise the excavation from an environmental perspective. A description of the proposed environmental subsurface investigations is attached to this document.

4.0 CLOSURE

We judge that if the proposed subsurface investigation is carried out in accordance with the methods described above, there would be no impact on the Gibsons Aquifer.

We trust that our comments and recommendations are both helpful and sufficient for your current purposes. If you would like further details or require clarification of the above, please do not hesitate to contact us

For
HORIZON ENGINEERING INC

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA K. KARIMZADEGAN #27156

July 6, 2016

Karim Karimzadegan, M.A.Sc., P.Eng.
Principal

Reviewed by: Pamela Bayntun, P.Eng.
Project Engineer

Attachments: Figure 1: Test Pit Locations Proposed for the Deep Soil Mixing Testing Program
"Detailed Site Investigation" letter from Keystone Environmental (July 6, 2016)

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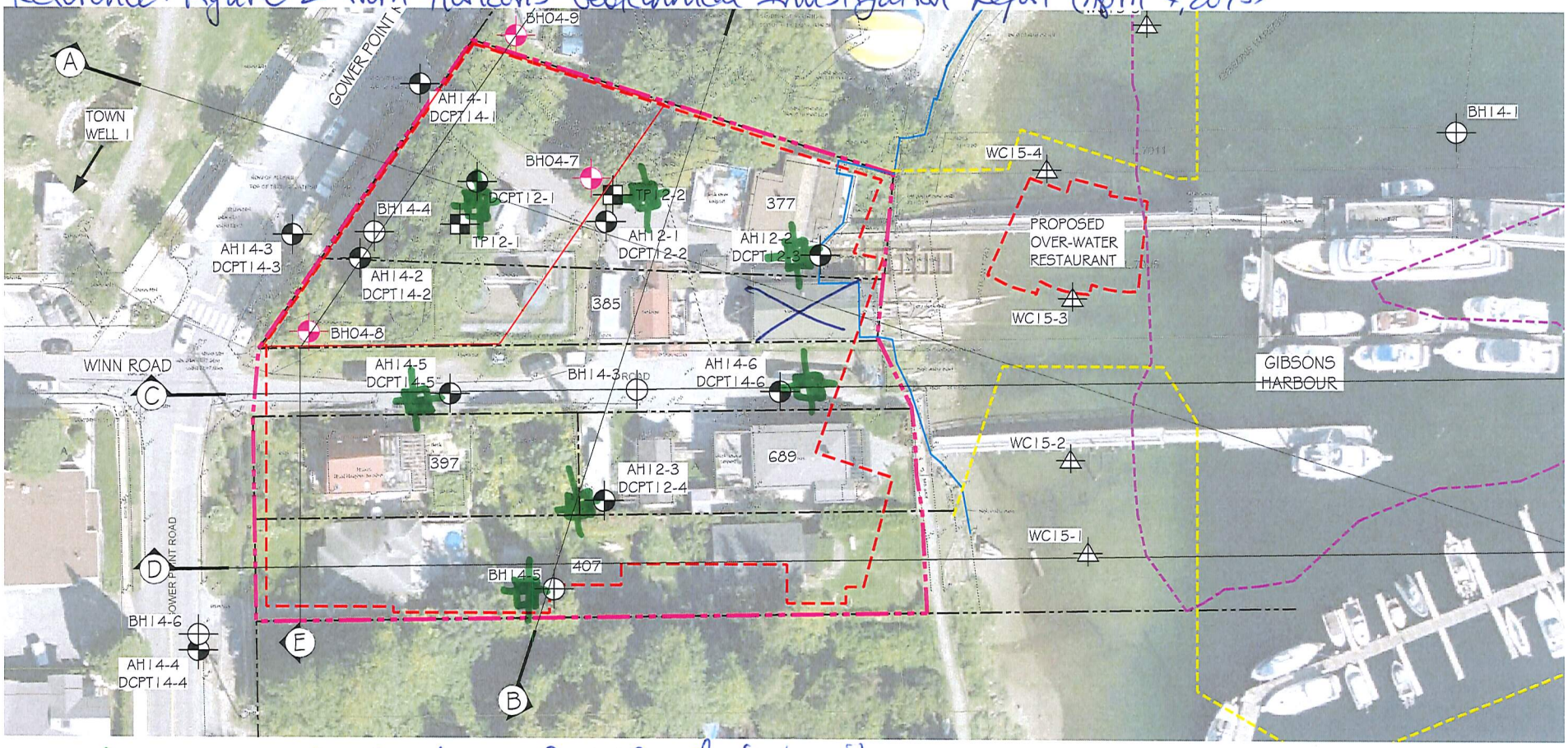
Test Pit Locations Proposed for the Deep Soil Mixing Testing Program

112-3155
June 8/16

Reference: Figure 2 from Horizon's Geotechnical Investigation Report (April 7, 2015)



Approximate location of proposed test pit

FIGURE 1

N:\2012 Projects\112-3155 GIB 385 Gower Point Road – The George\Drawings\112-3155 Test Hole Plan & Sections R1 DP Issued with report.dwg