COMMUNITY SERVICES GROUP
City of Vancouver

HAZARDOUS MATERIALS REPORT FORM

DEMOLITION PERMIT #: BU444739

BUILDING PERMIT #: _____

DATE ISSUED: _____ (Dd/mm/yy)

LEGAL DESCRIPTION: LOT_____BLK_____DL_____PLAN_____

ADDRESS: 338 SEYMOUR

BUILDING TYPE: SINGLE FAMILY ☐ MULTIPLE FAMILY ☐ COMMERCIAL ■
INSTITUTIONAL ☐ INDUSTRIAL ☐

DATE OF DEMOLITION/DECONSTRUCTION: May 09

APPLICANT

NAME: Assertive (As below)

ADDRESS:

TEL: FAX: BUSINESS LICENSE #:

DEMOLITION CONTRACTOR

NAME: ASSERTIVE EXCAVATING & DEMOLITION LTD. (MIKE)

ADDRESS: # 264 - 19567 FRASER HWY

TEL: 778-552-1231 FAX: 604. 888. 3222. BUSINESS LICENSE #:

HAZARDOUS MATERIALS

	PRESENT	NOT PRESENT	REMOVED	TYPE AND LOCATION
ASBESTOS	☑	☐	☐	duct
DRYWALL	☑	☐	☐	
UNDERGROUND STORAGE TANKS	☐	☐	☐	
PCBs	☑	☐	☐	light ballasts
ABANDONED CHEMICALS	☐	☐	☐	
OTHERS *(see other side for examples)*	☐	☐	☐	

CONDITIONS

1. **All hazardous materials identified above shall be handled and disposed of in accordance with all relevant rules and regulations. (*See other side for contacts*)**
2. **Documentation including receipts, inspection reports, sampling reports, waste manifests, etc., from the disposal of hazardous materials must be kept for a 6-month period for inspection purposes.**
3. **Hazardous Materials Survey required by Work Safe BC MUST be submitted with this form.**

CERTIFICATION

To be completed by a qualified or knowledgeable person.

I, Mike Holloway, certify that I understand and will comply with the conditions listed above, have read and understand the information on the back of this report and that the information presented in this report is true to the best of my knowledge.

Signature

April 21/09
Date

Owner
Position

Bulletin 2000-065 Hazardous Material Report Form
Revised: January 30, 2006
H:\CBO\BULLETINS\2007 VBBL\2000\065_att.doc

Schedule 1
Site Profile

(Version 4.0)

I. Contact Identification

A. Name of Site Owner

Last: Wall First: Bruno Middle Initial(s): ____ and/or, if applicable

Company: 1300 Richards Street Development Limited Partnership

Owner's Civic Address: 3502-1088 Burrard Street

City: Vancouver Province/State: BC

Country: Canada Postal Code/ZIP: V6Z 2R9

B. Person Completing Site Profile

Last: ____ First: ____ Middle Initial(s): ____ and/or, if applicable

Company: Pottinger Gaherty Environmental Consultants Ltd. (PGL)

C. Person to Contact Regarding the Site Profile

Last: Gagné First: Keith Middle Initial(s): ____

Company: Pottinger Gaherty Environmental Consultants Ltd.

Mailing Address: Suite 1200, 1185 West Georgia Street

City: Vancouver Province/State: BC

Country: Canada Postal Code/ZIP: V6E 4E6

Telephone: (604) 895-7618 Fax: (604) 682-3497

II. Site Identification

Please attach a site location map

All Property

Coordinates (using the North American Datum 1983 convention) for the centre of the site:

Latitude:	Degrees:49	Minutes:16	Seconds:27.72
Longitude:	Degrees:123	Minutes:7	Seconds:33.78

Please attach a map of appropriate scale showing the boundaries of the site.

Legally Titled, Registered Property

Site Street Address (if applicable): 1320 Richards Street

City/Province: Vancouver, BC Postal Code: V6B 3G6

Schedule 1
Site Profile

(Version 4.0)

PID numbers and associated legal descriptions. ***Attach additional sheet if necessary.***

PID	Legal Description
008-236-267	Lot B, Block 115, District Lot 541, Plan 5210

Total Number of Titled Parcels represented by this Site Profile:	1

IF Untitled CrownLand

1) PIN numbers and associated Land Description. ***Attach additional sheet if necessary.***

PIN	Land Description

Total number of untitled crown land parcels represented by this site profile is: _____

(and, If available)

Crown land file numbers. ***Attach additional sheet if necessary.***

III. Commercial and Industrial Purposes or Activities

Please indicate below, in the format of the example provided, which of the industrial and commercial purposes and activities from Schedule 2 have occurred or are occurring on this site

Please Print Legibly. Attach additional sheet if necessary.

Schedule 2 Reference	Description
F7	petroleum product, other than compressed gas, or produced water storage in above ground or underground tanks

Schedule 1
Site Profile

(Version 4.0)

IV. Areas of Potential Concern			
Is there currently or to the best of your knowledge has there previously been on the site any (please mark the appropriate column opposite the question):		Yes	No
A.	Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?		X
B.	Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?		X
C.	Discarded barrels, drums or tanks?		X
D.	Contamination resulting from migration of substances from other properties?		X
V. Fill Materials			
Is there currently or to the best of your knowledge has there previously been on the site any deposit of (please mark the appropriate column opposite the question):		Yes	No
A.	Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activities listed under Schedule 2?		X
B.	Discarded or waste granular materials such as sand blasting grit, asphalt paving or roofing material, spent foundry casting sands, mine ore, waste rock, or float?		X
C.	Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal sanitary or stormwater discharges?		X
VI. Waste Disposal			
Is there currently or to the best of your knowledge has there previously been on the site any landfilling, deposit, spillage or dumping of the following materials(please mark the appropriate column opposite the question):		Yes	No
A.	Materials such as household garbage, mixed municipal refuse, or demolition debris?		X
B.	Waste or byproducts such as tank bottoms, residues, sludge, or flocculation precipitates from industrial processes or wastewater treatment?		X
C.	Waste products from smelting or mining activities, such as smelter slag, mine tailings, or spill materials from coal processing?		X
D.	Waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?		X
E.	Waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (e.g., ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (e.g., solvents); or from the cleaning or repair of parts of boats, ships, barges, automobiles or trucks, including sandblasting grit or paint scrapings?		X

Schedule 1
Site Profile

(Version 4.0)

XVII. Tanks or Containers Used or Stored, Other Than Tanks Used for Residential Heating Fuel			
Are there currently or to the best of your knowledge have there previously been on the site any (please mark the appropriate column opposite the question):		**Yes**	**No**
A.	Underground fuel or chemical storage tanks other than storage tanks for compressed gases?	X	
B.	Above ground fuel or chemical storage tanks other than storage tanks for compressed gases?		X

VIII. Hazardous Wastes or Hazardous Substances			
Are there currently or to the best of your knowledge have there previously been on the site any (please mark the appropriate column opposite the question):		**Yes**	**No**
A.	PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?		X
B.	Waste asbestos or asbestos-containing materials such as pipe wrapping, blown-in insulation or panelling buried?		X
C.	Paints, solvents, mineral spirits or waste pest control products or pest control product containers stored in volumes greater than 205 litres?		X

IX. Legal or Regulatory Actions or Constraints			
To the best of your knowledge are there any of the following pertaining to the site (please mark the appropriate column opposite the question):		**Yes**	**No**
A.	Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?		X
B.	Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?		X
C.	Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?		X

X. Additional Comments and Explanations
PGL understands based on our 2005 Phase I that the *"underground fuel or chemical storage tanks other than storage tanks for compressed gases"* in section XVII was used for the storage of heating oil

Schedule 1
Site Profile

(Version 4.0)

XI. Signature

The person completing the site profile certifies that the above information is true based on the person's current knowledge as of the date completed.

13-07-11

Signature of person completing site profile | Date completed (YY-MM-DD)

XII. Official Use

Local Authority

Reason for Submission *(Please check one or more of the following)*

☐ Soil Removal ☑ Subdivision Application ☑ Zoning Application
☑ Development Permit ☐ Variance Permit ☑ Demolition Permit

Date received	Local Government contact	Date submitted to Site Registrar	Date forwarded to Director of Waste Management
July 15 2013	Name: James Smith Agency: City of Vancouver Address: 515 W 10th Ave, Vancouver, BC V5Z 4A8 Telephone: 604-871-6289 Fax:		Aug 14 / 13

Director of Waste Management

Reason for Submission *(Please check one or more of the following)*

☐ Under Order ☐ Site Decommissioning ☐ Foreclosure

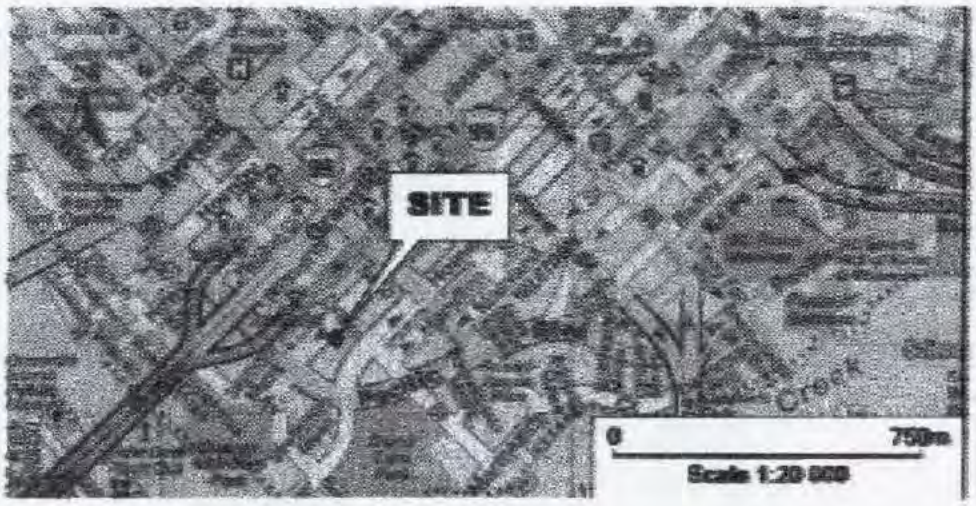
Date received	Assessed by: Name: Region: Telephone: Fax: If site profile entered, SITE ID #	Investigation required? ☐ Yes ☐ No	Decision date

Site Registrar

Date received	Entered into site registry by:	SITE ID#	Entry date

Site Plan

Location Map



BRITISH COLUMBIA
The Best Place on Earth

Ministry of Environment

CERTIFICATE OF COMPLIANCE

(Pursuant to Section 53 of the *Environmental Management Act*)

THIS IS TO CERTIFY that as of the date indicated below, the lands identified below have been satisfactorily remediated to meet Contaminated Sites Regulation standards for ***residential land soil use***[1]. The substances for which remediation has been satisfactorily completed are as follows:

In soil: Barium, molybdenum, copper, lead and zinc; and
Benz[a]anthracene, benzo[b]fluoranthene, indeno(1,2,3-c,d)pyrene and benzo[b]pyrene.

The lands covered by this Certificate are located at 1321 Richards Street, Vancouver, British Columbia, V6P 3Y7 which are more particularly known and described as:

Parcel E, Block 114, District Lot 541, Group 1, New Westminster District Plan LMP49246

PID: 024-969-745

Approximate centre of the lands *

Latitude:	49°	16'	28.7"	* Using the NAD (North American
Longitude:	123°	7'	35.9"	Datum) 1983 convention

A site plan is attached as Schedule "A" to this Certificate.

I have issued this Certificate based on the information summarized in:

Report of Findings, Preliminary Site Investigations – Stage 1 & 2, Detailed Site Investigation and Confirmation of Remediation, 1321 Richards Street, Vancouver, BC, prepared by Keystone Environmental Ltd., dated January 2008; and

[1] Soil and water standards listed in Schedule 10 of the Contaminated Sites Regulation are specific to human health only. It is the responsibility of the responsible person for the site to ensure that use of the standards of Schedule 10 do not constitute a significant risk or hazard to ecological health.

Feb 21/08
Date Issued

Doug Walton
For Director, *Environmental Management Act*

SITE Identification Number 10523
R

Summary of Site Condition prepared by William R. Donald, P.Eng. dated January 30, 2008.

This Certificate is qualified by the conditions described in Schedule "B" which is attached to and is part of this Certificate.

This Certificate is based on the most recent information provided to the ministry regarding the specified lands. I, however, make no representation or warranty as to the accuracy or completeness of this information.

The Director may rescind this Certificate of Compliance if conditions imposed in the Certificate are not complied with or any fees payable under Part 4 of the Act or regulations are outstanding.

This Certificate should not be construed as an assurance that there are no hazards present on the site described above.

Feb 21/08

Date Issued

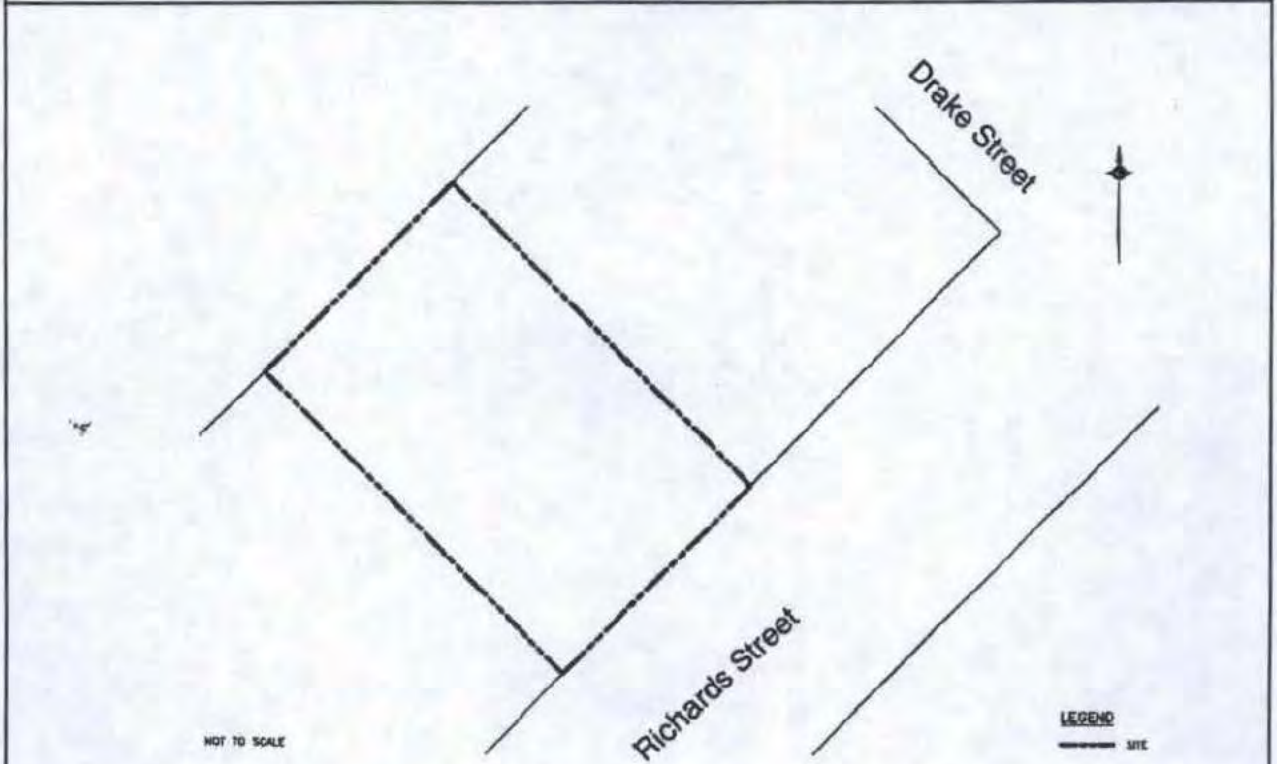
Doug Walton

For Director, *Environmental Management Act*

SITE Identification Number #10523

Schedule "A"

Site Plan



Location Map

Feb 21/08

Date Issued

Doug Walton
For Director, *Environmental Management Act*

SITE Identification Number #10523

Schedule "B"

Conditions

1. A qualified environmental consultant shall be available to identify, characterize and appropriately manage any environmental media of suspect quality which may be encountered during any future subsurface work at the site.

Feb 21/08
Date Issued

Doug Walton
For Director, *Environmental Management Act*

SITE Identification Number #10523

DE410078

SCHEDULE 1
Site Profile
(All Information Must be Provided and All Questions Answered) (Version 3.0)

I CONTACT IDENTIFICATION

A. Name of Site Owner:

Last _____ First _____ Middle Initial(s) _____ (and/or, if applicable)
Company City of Vancouver
Owner's Civic Address 453 West 12th Avenue
City Vancouver Province/State BC
Country Canada Postal Code/ZIP V5Z 4A8

B. Person Completing Site Profile (Leave blank if same as above):

Last Duffy First Terry J Middle Initial(s) J (and/or, if applicable)
Company Keystone Environmental Ltd.

C. Person to Contact Regarding the Site Profile:

Last Duffy First Terry J Middle Initial(s) J (and/or, if applicable)
Company Keystone Environmental Ltd.
Mailing Address 320-4400 Dominion Street
City Burnaby Province/State BC
Country Canada Postal Code/ZIP V5G 4G3
Telephone (604) 430-0671 Fax (604) 430-0672

II SITE IDENTIFICATION

Please attach a site location map

IF Legally Titled, Registered Property

Site Street Address (if applicable) 1321 Richards St.
City Vancouver Postal Code _____

PID numbers and associated legal descriptions. ***Attach an additional sheet if necessary.***

PID	Legal Description
024-969-745	Parcel E, Block 114, District Lot 541, Group 1 New Westminster District Plan LMP49246

Total number of titled parcels represented by this site profile is: 1

SCHEDULE 1
Site Profile

(Version 3.0)

IF Untitled Crown Land

1) PIN numbers and associated Land Description. ***Attach an additional sheet if necessary.***

PIN	Land Description

Total number of untitled crown land parcels represented by this site profile is:_____

OR

2) Coordinates (using the North American Datum 1983 convention) for the centre of the site:
Latitude: Degrees 49 Minutes 16 Seconds 28.7
Longitude: Degrees 123 Minutes 7 Seconds 35.9

Please attach a map of appropriate scale showing the boundaries of the site.
(and, if available)

Crown land file numbers. ***Attach an additional sheet if necessary.***

_____ _____ _____ _____ _____

III COMMERCIAL AND INDUSTRIAL PURPOSES OR ACTIVITIES

Please indicate below, in the format of the example provided, which of the industrial and commercial purposes and activities from Schedule 2 have occurred or are occurring on this site.

EXAMPLE

Schedule 2 Reference	Description
E1	appliance, equipment or engine repair, reconditioning, cleaning or salvage
F10	solvent manufacturing or wholesale bulk storage

Please print legibly. Attach an additional sheet if necessary

Schedule 2 Reference	Description
	None

SCHEDULE 1
Site Profile

(Version 3.0)

IV	AREAS OF POTENTIAL CONCERN		
	Is there currently or to the best of your knowledge has there previously been on the site any (please mark the appropriate column opposite the question):	**YES**	**NO**
A.	Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?		X
B.	Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?		X
C.	Discarded barrels, drums or tanks?		X
D.	Contamination resulting from migration of substances from other properties?		X
V	**FILL MATERIALS**		
	Is there currently or to the best of your knowledge has there previously been on the site any deposit of (please mark the appropriate column opposite the question):	**YES**	**NO**
A.	Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activities listed under Schedule 2?		X
B.	Discarded or waste granular materials such as sand blasting grit, asphalt paving or roofing material, spent foundry casting sands, mine ore, waste rock or float?		X
C.	Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal sanitary or stormwater discharges?		X
VI	**WASTE DISPOSAL**		
	Is there currently or to the best of your knowledge has there previously been on the site any landfilling, deposit or dumping of the following materials (please mark the appropriate column opposite the question):	**YES**	**NO**
A.	Materials such as household garbage, mixed municipal refuse, or demolition debris?		X
B.	Waste or byproducts such as tank bottoms, residues, sludge, or flocculation precipitates from industrial processes or wastewater treatment?		X
C.	Waste products from smelting or mining activities, such as smelter slag, mine tailings, or cull materials from coal processing?		X
D.	Waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?		X
E.	Waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (e.g. ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (e.g. solvents); or automobile and truck parts cleaning or repair?		X

SCHEDULE 1
Site Profile

(Version 3.0)

VII	TANKS OR CONTAINERS USED OR STORED		
	Are there currently or to the best of your knowledge have there been previously on the site any (please mark the appropriate column opposite the question):	**YES**	**NO**
A.	Underground fuel or chemical storage tanks?		X
B.	Above ground fuel or chemical storage tanks?		X

VIII	SPECIAL (HAZARDOUS) WASTES OR SUBSTANCES		
	Are there currently or to the best of your knowledge have there been previously on the site any (please mark the appropriate column opposite the question):	**YES**	**NO**
A.	PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?		X
B.	Waste asbestos or asbestos containing materials such as pipe wrapping, blown-in insulation or panelling buried?	X	
C.	Paints, solvents, mineral spirits or waste pest control products or pest control product containers stored in volumes greater than 205 litres?		X

IX	LEGAL OR REGULATORY ACTIONS OR CONSTRAINTS		
	To the best of your knowledge are there currently any of the following pertaining to the site (please mark the appropriate column opposite the question):	**YES**	**NO**
A.	Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?		X
B.	Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?		X
C.	Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?		X

X ADDITIONAL COMMENTS AND EXPLANATIONS

(Note 1: Please list any past or present government orders, permits, approvals, certificates and notifications pertaining to the environmental condition, use or quality of soil, surface water, groundwater or biota at the site.

Note 2: If completed by a consultant, receiver or trustee, please indicate the type and degree of access to information used to complete this site profile. Attach extra pages, if necessary):

Keystone DSI completed Nov-3/2006 found shallow soil to be contaminated with metals > CSR CL standards. Client intends to remediate to Residential quality and apply for Certificate of Compliance.

Schedule 1
Site Profile

(Version 4.0)

I. Contact Identification

A. Name of Site Owner

Last: Wall First: Bruno Middle Initial(s): ____ and/or, if applicable

Company: 1300 Richards Street Development Limited Partnership

Owner's Civic Address: 3502-1088 Burrard Street

City: Vancouver Province/State: BC

Country: Canada Postal Code/ZIP: V6Z 2R9

B. Person Completing Site Profile

Last: _____ First: _____ Middle Initial(s): ____ and/or, if applicable

Company: Pottinger Gaherty Environmental Consultants Ltd. (PGL)

C. Person to Contact Regarding the Site Profile

Last: Gagné First: Keith Middle Initial(s): _____

Company: Pottinger Gaherty Environmental Consultants Ltd.

Mailing Address: Suite 1200, 1185 West Georgia Street

City: Vancouver Province/State: BC

Country: Canada Postal Code/ZIP: V6E 4E6

Telephone: (604) 895-7618 Fax: (604) 682-3497

II. Site Identification

Please attach a site location map

All Property

Coordinates (using the North American Datum 1983 convention) for the centre of the site:

Latitude:	Degrees:49	Minutes:16	Seconds:27.72
Longitude:	Degrees:123	Minutes:7	Seconds:33.78

Please attach a map of appropriate scale showing the boundaries of the site.

Legally Titled, Registered Property

Site Street Address (if applicable): 1320 Richards Street

City/Province: Vancouver, BC Postal Code V6B 3G6

Schedule 1
Site Profile

(Version 4.0)

PID numbers and associated legal descriptions. ***Attach additional sheet if necessary.***	
PID	**Legal Description**
008-236-267	Lot B, Block 115, District Lot 541, Plan 5210

Total Number of Titled Parcels represented by this Site Profile:	1

IF Untitled CrownLand

1) **PIN** numbers and associated Land Description. ***Attach additional sheet if necessary.***

PIN	**Land Description**

Total number of untitled crown land parcels represented by this site profile is:

(and, if available)

Crown land file numbers. ***Attach additional sheet if necessary.***

III. Commercial and Industrial Purposes or Activities

Please indicate below, in the format of the example provided, which of the industrial and commercial purposes and activities from Schedule 2 have occurred or are occurring on this site.

EXAMPLE

Schedule 2 Reference	**Description**
E1	Appliance, equipment or engine repair, reconditioning, cleaning or salvage
F10	Solvent manufacturing or wholesale bulk storage

Please Print Legibly. Attach additional sheet if necessary.

Schedule 2 Reference	**Description**

Schedule 1
Site Profile

(Version 4.0)

	No Schedule 2 Use. No Site Profile Required – see below. Environmental Management Act, Contaminated Sites Regulation [includes amendments up to B.C. Reg. 97/2011, May 31, 2011] 2 (1) A person is exempt from the duty to provide a site profile under section 40 (1), (2), (3), (6) and (7) of the Act with respect to industrial or commercial purposes and industrial or commercial activities which are not described in Schedule 2.

IV. Areas of Potential Concern			
Is there currently or to the best of your knowledge has there previously been on the site any (please mark the appropriate column opposite the question):		**Yes**	**No**
A.	Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?		
B.	Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?		
C.	Discarded barrels, drums or tanks?		
D.	Contamination resulting from migration of substances from other properties?		

V. Fill Materials			
Is there currently or to the best of your knowledge has there previously been on the site any deposit of (please mark the appropriate column opposite the question):		**Yes**	**No**
A..	Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activities listed under Schedule 2?		
B.	Discarded or waste granular materials such as sand blasting grit, asphalt paving or roofing material, spent foundry casting sands, mine ore, waste rock, or float?		
C.	Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal sanitary or stormwater discharges?		

VI. Waste Disposal			
Is there currently or to the best of your knowledge has there previously been on the site any landfilling, deposit, spillage or dumping of the following materials(please mark the appropriate column opposite the question):		**Yes**	**No**
A.	Materials such as household garbage, mixed municipal refuse, or demolition debris?		
B.	Waste or byproducts such as tank bottoms, residues, sludge, or flocculation precipitates from industrial processes or wastewater treatment?		
C.	Waste products from smelting or mining activities, such as smelter slag, mine tailings, or cull materials from coal processing?		

Schedule 1
Site Profile

(Version 4.0)

D.	Waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?		
E.	Waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (e.g., ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (e.g., solvents); or from the cleaning or repair of parts of boats, ships, barges, automobiles or trucks, including sandblasting grit or paint scrapings?		
VII.	**Tanks or Containers Used or Stored, Other Than Tanks Used for Residential Heating Fuel**		
Are there currently or to the best of your knowledge have there previously been on the site any (please mark the appropriate column opposite the question):		**Yes**	**No**
A.	Underground fuel or chemical storage tanks other than storage tanks for compressed gases?		
B.	Above ground fuel or chemical storage tanks other than storage tanks for compressed gases?		
VIII.	**Hazardous Wastes or Hazardous Substances**		
Are there currently or to the best of your knowledge have there previously been on the site any (please mark the appropriate column opposite the question):		**Yes**	**No**
A.	PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?		
B.	Waste asbestos or asbestos-containing materials such as pipe wrapping, blown-in insulation or panelling buried?		
C.	Paints, solvents, mineral spirits or waste pest control products or pest control product containers stored in volumes greater than 205 litres?		
IX.	**Legal or Regulatory Actions or Constraints**		
To the best of your knowledge are there any of the following pertaining to the site (please mark the appropriate column opposite the question):		**Yes**	**No**
A.	Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?		
B.	Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?		
C.	Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?		
X.	**Additional Comments and Explanations**		
(Note 1: Please list any past or present government orders, permits, approvals, certificates and notifications pertaining to the environmental condition, use or quality of soil, surface water, groundwater or biota at the site. Note 2: if completed by a consultant, receiver or trustee, please indicate the type and degree of access to information used to complete this site profile. Attach extra pages if necessary):			

Schedule 1
Site Profile

(Version 4.0)

XI. Signatures

The person completing the site profile states that the above information is true based on the person's current knowledge as of the date completed.

12-10-25

Signature of person completing site profile | Date completed: (YY-MM-DD)

XII. Official Use

Local Authority

Reason for Submission *(Please check one or more of the following)*

☐ Soil Removal ☐ Subdivision Application ☐ Zoning Application

☐ Development Permit ☐ Variance Permit ☐ Demolition Permit

Date received:	Local Government contact: Name Agency Address Telephone Fax	Date submitted to Site Registrar:	Date forwarded to Director of Waste Management

Director of Waste Management

Reason for Submission *(Please check one or more of the following)*

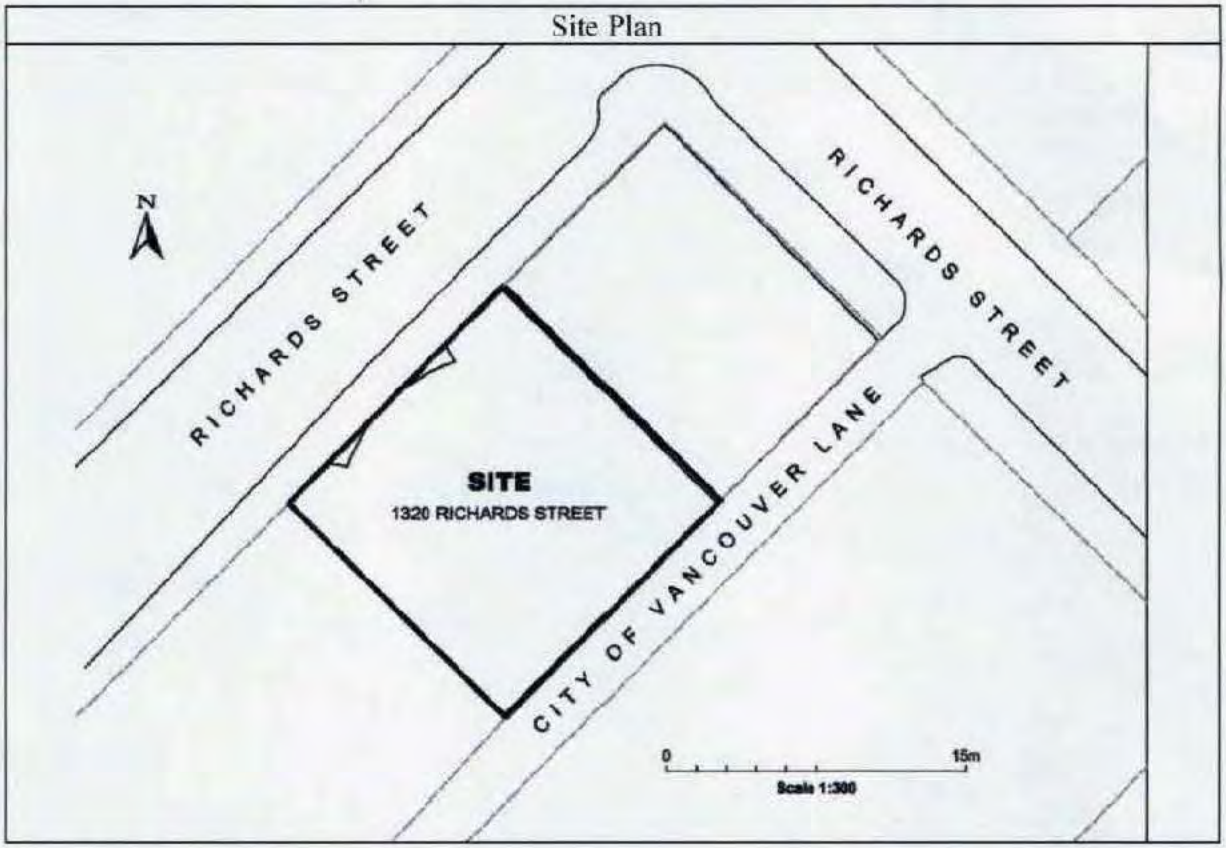
☐ Under Order ☐ Site Decommissioning ☐ Foreclosure

Date received:	Assessed by: Name Region Telephone Fax If site profile entered, SITE ID #	Investigation required? ☐ Yes ☐ No	Decision date:

Site Registrar

Date received:	Entered into site registry by:	SITE ID#	Entry date:

Site Plan



Location Map

TRANSMITTAL

To: City of Vancouver

Attention: Roz Mayer

☐ Via Fax: ☐ Other: Hand Delivered

Project: LIUS Housing

Number: 01-214B

☐ Urgent

☐ Confidential

LMDG Building Code Consultants Ltd.

SPECIALISTS IN FIRE PROTECTION AND LIFE SAFETY CONSULTING
www.LMDG.com
codeinfo@LMDG.com

4th Floor, 780 Beatty Street
Vancouver, British Columbia
Canada V6B 2M1

Tel. 604-682-7146
Fax. 604-682-7149

BU 438014

From: Ed MacKinnon / Richard Boulton

Date: June 18, 2007

No. Pgs: including this page

☐ For your action

☐ For your comments

☐ For your information

☐ Copy to follow by mail

RE: LETTER REGARDING SOILS REPORT APPLICABILITY
LIUS HOUSING - 1321 RICHARDS STREET - BU 438014

Further to your request, enclosed is a letter from the Geotechnical Engineer for the Project relative to the applicability of the soils report to the building.

Regards,

RB/ 01214B618.fax.wpd

cc: Larry Adams / Ken Wong, NSDA Architects (Via Courier)

HORIZON ENGINEERING INC

Unit 114 - 2433 Dollarton Hwy Phone 604-990-0546
North Vancouver, BC Fax 604-990-0583
Canada V7H 0A1 www.horizonengineering.net

June 18, 2007

File No: 106-1760

GRANVILLE MENNONITE HOUSING SOCIETY
c/o Innovative Housing Consultants
1148 Odlum Drive
Vancouver, BC V5L 3L7

Attention: Mr Derek Simons

Dear Derek,

Re: **Proposed 12-Storey Residential Development**
1321 Richards Street, Vancouver, BC
Foundation Recommendations

This will confirm that the foundation recommendations developed by Horizon Engineering Inc for the above-referenced development and described in our letter of February 21, 2007 pertain to a twelve storey tower.

We trust the above is sufficient for your current requirements. Should you have any questions, or require additional information, please do not hesitate to contact the undersigned.

Yours truly,

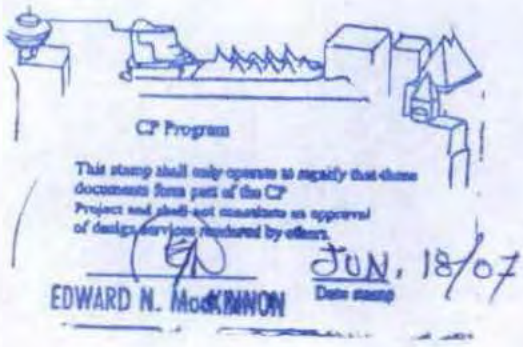
HORIZON ENGINEERING INC

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
KAREN E. SAVAGE

Karen E. Savage, P.Eng.
President

cc: Neale Staniszkis Doll Adams Architects
Fast + Epp Structural Engineers

N:\2006 Projects\106-1760 VAN 1321 Richards\106-1760 BP letter 18jun07 kes.wpd



Active Earth
Engineering Ltd

March 11, 2015 AE Project No. 816

Southwest Contracting Ltd.
9426-192nd St.
Surrey, BC V4N 3R9

ATTENTION: Jason Rook

REFERENCE: **Heating Oil Tank Decommissioning & Remedial Excavation**
1300 Richards Street (498 Drake Street), Vancouver, BC
Tank Removal Permit No. FI 412083

1.0 INTRODUCTION

Active Earth Engineering Ltd. (Active Earth) was retained by Southwest Contracting Ltd. (Southwest) on behalf of the Wall Financial Corporation to document the decommissioning of an underground storage tank (UST), and to oversee an associated remedial soil excavation, at 1300 Richards Street, Vancouver, BC (the "Site"). The Site is also known as 498 Drake Street.

Wall Financial Corporation is undertaking the Site redevelopment which will include mixed commercial and residential use. The former UST (likely used to store fuel for a back-up generator) was uncovered during bulk excavations as part of the re-development. The Site location and current on-Site conditions are shown on the attached Figure.

This work follows the decommissioning of a separate on-Site heating oil UST conducted under the direct supervision of Active Earth in January 2015, and reported under separate cover.

2.0 BACKGROUND

The former UST was uncovered near the northwest corner of the Site on February 19, 2015. Active Earth was then retained to oversee the removal of the UST and to direct remedial soil excavations adjacent to the UST if deemed necessary.

Based on field observations, it was determined that the UST was likely used to store fuel for a back-up generator. Fuel within the UST was deemed to be likely diesel. The Potential Contaminants of Concern (PCOCs) typically associated with diesel are presented in the following table, along with the confirmed Contaminants of Concern that were identified at the Site:

Summary of Potential and Confirmed Contaminants of Concern

Issue	Potential Contaminants of Concern	Confirmed Contaminants of Concern
On-Site Former UST	LEPH, HEPH, PAH	None

LEPH/HEPH – Light/Heavy Extractable Petroleum Hydrocarbons PAH – Polycyclic Aromatic Hydrocarbons

3.0 REGULATORY ASSESSMENT AND REMEDIATION CRITERIA

In British Columbia, environmental matters pertaining to contaminated sites generally fall under the jurisdiction of the BC Ministry of Environment (BC MOE), pursuant to the *Environmental Management Act* (SBC 2003) [including 2004 Bill 13 (B.C. Reg. 110/2010) amendments (effective May 1, 2010)].

The two key regulations under the *Environmental Management Act* relating to the assessment and remediation of contaminated sites are:

- *Contaminated Sites Regulation* (CSR, BC Reg. 375/96, including amendments effective February 1, 2014); and,
- *Hazardous Waste Regulation* (HWR, BC Reg. 63/88, O.C. 268/88 including amendments up to BC Reg. 261/2006, updated to September 21, 2006).

Based on the current Site zoning (Comprehensive Development District 571) and future use at grade (Commercial), the CSR Commercial Land Use (CL) standards were considered to apply, as listed in Schedules 4, 5, and 10 of the CSR. We note that below 3m depth, the CSR stipulates that Commercial Land Use standards apply, irrespective of use at grade.

Off-Site, within the streets, standards are dictated by the City of Vancouver (City). For soil, the City requires that the top 3m meets Residential Land Use (RL) standards, with CL standards applied below this depth.

For information and soil disposal purposes, results have also been compared to the RL standards and the Soil Relocation Agreement (SRA) standards as set out in Schedule 7 Column II (relocation to non-agricultural land).

Generic numerical standards are listed in Schedules 4 and 10, while matrix-based numerical standards are listed in Schedule 5. For the matrix-based numerical standards, the following site-specific factors were applied:

- Human Health Protection – Intake of contaminated soils.
- Environmental Protection – Toxicity to soil invertebrates and plants.

In addition, matrix-based numerical standards for soil are dependent on groundwater use. The matrix-based soil standards for groundwater flow to surface water used by Marine Aquatic Life (AW_M) were considered to apply. The matrix-based soil standards for groundwater used for *Drinking Water* (DW) were not considered to apply, based on our former hydrogeologic assessments at nearby sites.

The BC Hazardous Waste Regulation (HWR) provides standards to determine if material qualifies as Hazardous Waste based on toxicity equivalency (TEQ) and leachability. TEQ standards are provided for oil and grease, dioxins and furans, PAHs and Tetrachloroethylene. Leachability refers to the concentration of particular contaminants in dissolved form following the subjugation of soil to a strong acid solution during a standardized Toxicity Characteristic Leachate Procedure (TCLP) test.

4.0 SCOPE OF WORK AND RESULTS

The UST decommissioning and remedial excavation was completed under the direct supervision of Active Earth, using machinery and operators supplied by Southwest. A representative from Active Earth was on-Site throughout, in order to observe and document the work, track soil quantities, and collect the necessary confirmatory soil samples.

A Notification of Independent Remediation (Initiation and Completion) is currently being completed and will be submitted to BC MOE in the coming days for the previous remedial activities at the Site. Although no analytical soil results exceeded the applicable CL standards, results did exceed the RL standards (as documented below) and a Notice of Independent Remediation is therefore being submitted for due diligence purposes.

Field methodologies for all activities followed Active Earth's standard practice and protocols. These are presented briefly below.

4.1 Soil Assessment and UST Decommissioning

The UST measured 1.1m in diameter by 2.4m in length (approximately 1900L capacity), was constructed of single-wall steel, and was observed to be moderately corroded with holes noted in the base. The top of the UST was approximately 3m below grade, under a concentrate slab. The UST contained water, trace residual diesel fuel, and oily sludge.

An initial assessment of the UST and collection two soil samples (UST2-1 and UST2-2) from what was deemed the most likely contaminated soils was completed on February 19, 2015, prior to the UST removal. These preliminary samples were collected following the methodologies presented in Section 4.4, and were delivered under chain of custody protocol to AGAT Laboratories in Burnaby, BC. Concentrations of LEPH in sample UST2-1 exceeded the CSR RL standard, with a concentration of 1920 ug/g. All other results were within the CSR RL and CL standards. These soils were excavated as part of the remedial excavation, discussed below.

The decommissioning on February 20, 2015 proceeded as follows:

- A hole was cut into the top of the tank to allow for inspection and cleaning;
- The tank was evacuated and cleaned using a vacuum truck operated by Advantage Environmental Waste Specialists of Fort Langley, BC;
- Groundwater/rainwater that had collected in the tank nest was removed by the same vacuum truck;
- The vacuum truck contents (6709 litres total) were disposed at the Sumas Environmental Byrne Road facility; and,

- The tank was crushed and prepared for appropriate off-Site disposal (metal recycling).

A Tank Removal Permit (No. FI 412083) was obtained on February 20, 2015. A copy of the permit is provided in Appendix A.

The oily water/sludge disposal documentation is provided in Appendix B. Photographs are provided in Appendix C.

4.2 Remedial Excavation

The remedial excavation was completed at the former diesel UST on February 20, 2015. The excavation was approximately rectangular in shape, measuring 8m by 6.5m, with an average depth of 4.5m (the top of the UST was approximately 3m below grade) for a total volume of approximately 72m^3. All of the soil removed from the UST excavation area was transported to the Ecowaste Landfill at 15111 Williams Road, Richmond, BC, and disposed of as Industrial Quality (i.e. exceeding RL standards).

In total, approximately 130 tonnes of soil were transported to the Ecowaste Landfill and disposal as Industrial Quality from the remedial excavation. The soil was stockpiled and removed along with other fill soils on the Site. In total, 968 tonnes of material was disposed of at Ecowaste on February 24, 2015. Soil disposal documentation is provided in Appendix B. Photographs are provided in Appendix C.

4.3 *Geology and Hydrogeology*

Review of the surficial geology map of the Site indicates the Site is underlain by Glacial Drift, including lodgment and minor flow till.

The soil encountered in the UST remedial excavation area generally consisted of dense, compact till, consisting mainly of silts, with trace sand and trace gravel.

No groundwater seepage was observed within the excavation. Trace hydrocarbon sheen was observed on the precipitation water directly adjacent to the UST water during preliminary excavation work. No groundwater was discharged from the Site.

4.4 Remedial Excavation Closure

Following remediation, closure soil samples were collected directly from the sidewalls and base of the excavation.

All soil samples were immediately placed into laboratory supplied sample jars. The sample jars were completely filled with soil to minimize loss of volatile constituents. To minimize the potential for cross contamination, Active Earth's field representative wore fresh nitrile sampling gloves prior to collecting each soil sample. The sample jars were placed in a cooler, on ice, and delivered under chain of custody protocol to both ALS Environmental and AGAT Laboratories in Burnaby, BC. The sample closure density was in general accordance with BC MOE Technical Guidance Document 1 (TG1).

Results from all closure samples were below the RL and CL standards for LEPH/HEPH and PAH. All closure sample results were additionally within the CSR SRA Standards as set out in Schedule 7 Column II.

All previously identified hydrocarbon-impacted soil associated with the UST has been removed. No hydrocarbon soil contamination (i.e. no hydrocarbon concentrations above the RL or CL standards) was identified at the Site boundary, and therefore no contamination appears to have migrated off-Site, onto City lands.

The excavation closure soil sample locations and results are shown on the attached Figure, and Table 1. Laboratory Certificates are included in Appendix D.

5.0 SUMMARY AND CONCLUSIONS

A UST was identified on-Site during Site excavation activities. The UST was evacuated, removed, and crushed for appropriate off-Site disposal. Preliminary soil investigation work identified LEPH concentrations above the RL standards, but within the CL standards (applicable to the Site), in soil immediately adjacent to the UST.

A remedial excavation was conducted to remove all hydrocarbon-impacted and odourous soil, for appropriate disposal to a permitted facility. The disposal volume is summarized below:

Disposal Summary

Media	Volume	Tonnage	Disposal Class	Disposal Location
Soil	72 m3	130	Industrial Quality	Ecowaste Landfill
UST Contents (Oily Water and Sludge)	6709 Litres	n/a	n/a	Sumas Remediation (Byrne Road)

Closure samples were collected from the walls and base of the excavaton in general accordance with Technical Guidance Document 1. All closure sample results were within the RL and CL standards. The results indicate that no impacted soil remains on-Site, and no soil contamination extends off-Site onto the adjacent City lands.

6.0 CLOSURE

This report has been prepared by Active Earth Engineering Ltd. for Southwest Contracting Ltd. on behalf of the Wall Financial Corporation based on information obtained through recent investigation and remediation work completed under the direction of Active Earth, and other information sources. This report may be relied upon by Southwest Contracting Ltd., Wall Financial Corporation, and the City of Vancouver.

Active Earth has relied on data, studies, plans, specifications and documents prepared by others, and accepts no responsibility for information contained in them. The environmental investigations were limited to those areas and contaminants specifically addressed in this report.

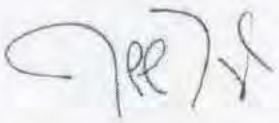
This report is believed to provide a reasonable representation of general environmental condition at the Site in the vicinity of the former diesel UST. The conclusions made in this report reflect Active Earth's best judgment in light of the information available at the time of reporting. Should additional information become available or Site conditions change, the conclusions and recommendations of this report may be subject to change.

Any use which the client or a third party, other than those specifically listed above, makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such parties. Active Earth accepts no responsibility for damages, if any, suffered by third parties as a result of business decisions made or actions based on this report.

We trust that this provides the information you currently require. If you have any questions or comments, please feel free to contact the undersigned.

Yours truly,
ACTIVE EARTH ENGINEERING LTD.

Reviewed by:



Bob Reid, EIT
Project Engineer

Jeff Taylor, P.Eng., CSAP
Senior Engineer

Attachments:

Tables

Table 1: Soil Hydrocarbon Analytical Results

Figures

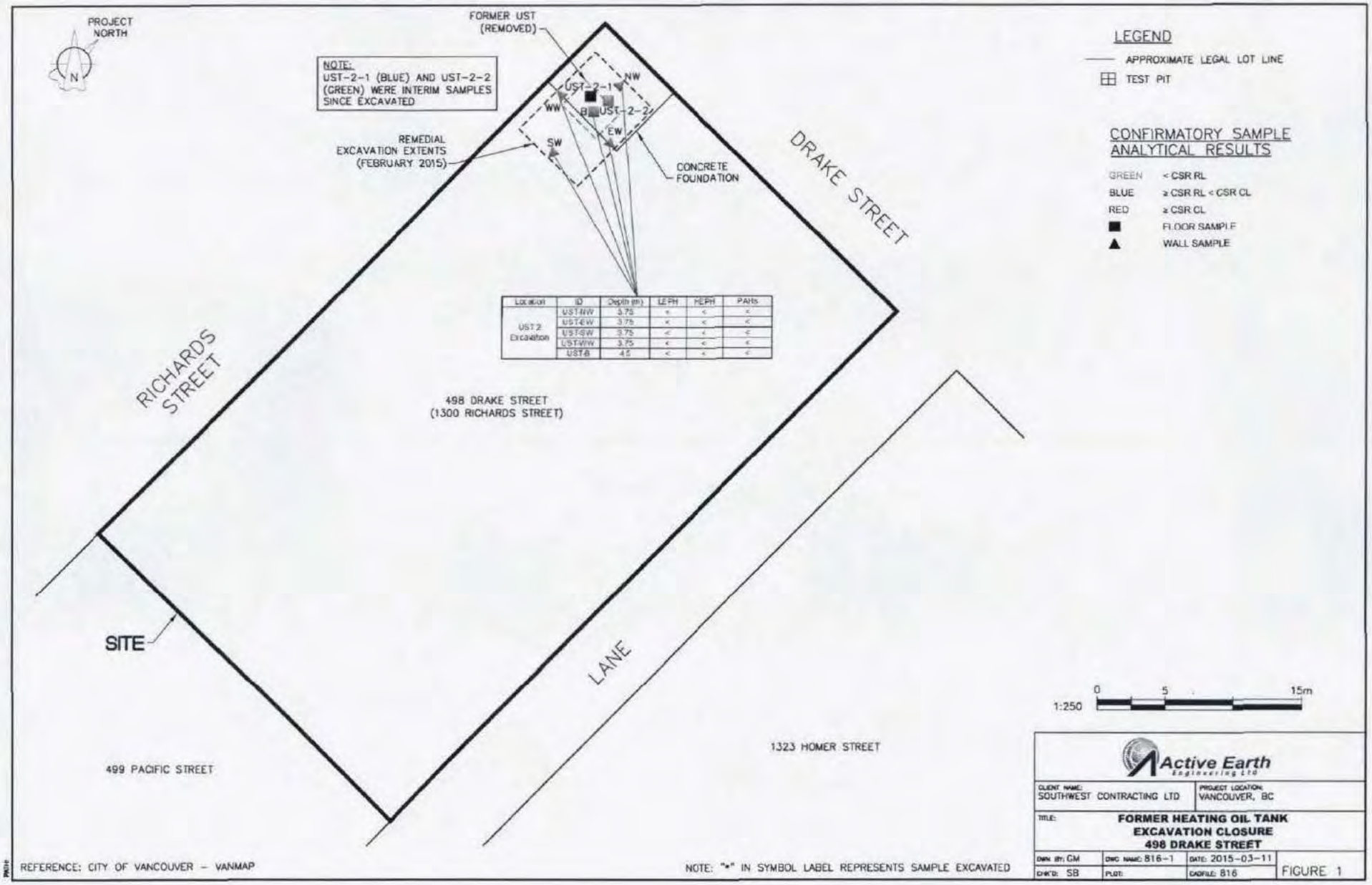
Figure: Former Diesel UST - Excavation Closure

Appendices

Appendix A: Tank Removal Permit
Appendix B: Soil and Waste Disposal Documentation
Appendix C: Photographs
Appendix D: Laboratory Certificates

Active Earth Engineering Ltd

FIGURES



Location	ID	Depth (m)	LEPH	HEPH	PAHs
UST 2 Excavation	UST-NW	3.75	<	<	<
	UST-EW	3.75	<	<	<
	UST-SW	3.75	<	<	<
	UST-WW	3.75	<	<	<
	UST-B	4.5	<	<	<

Active Earth Engineering Ltd

CLIENT NAME: SOUTHWEST CONTRACTING LTD	PROJECT LOCATION: VANCOUVER, BC
TITLE: **FORMER HEATING OIL TANK EXCAVATION CLOSURE 498 DRAKE STREET**	
DWN BY: GM / DWG NAME: 816-1 / DATE: 2015-03-11	
CHK'D: SB / PLOT: / CADFILE: 816	FIGURE 1

TABLES

Analytical Table Footnotes: Analytical Results for Soil

All concentrations in ug/g, except pH.

All terms defined within the body of Active Earth's report.

"<" Result is less than the laboratory detection limit indicated.

"-" Parameter not analyzed or no standard or guideline applies.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

(1) BC Contaminated Sites Regulation (CSR BC Reg. 375/96 includes amendments up to BC Reg. 4/2014) Generic Numerical Soil Standards (Schedules 4 and 10) and Matrix Numerical Soil Standards (Schedule 5), considering the site specific factors of toxicity to soil invertebrates and plants, groundwater flow to marine aquatic life, and groundwater used for drinking water, for Residential (RL) and Commercial (CL) Land Use.

(2) BC Contaminated Sites Regulation (CSR BC Reg. 375/96 includes amendments up to BC Reg. 4/2014) Standards Triggering Contaminated Soil Relocation Agreements (Schedule 7) for Soil Relocation to Non-Agricultural Lands (Column II). If soils exceed these standards, a Soil Relocation Agreement is required to dispose of soils off-Site, without authorization.

(3) The standards referenced are for light extractable petroleum hydrocarbons (LEPH) and heavy extractable petroleum hydrocarbons (HEPH), which are corrected for polyaromatic hydrocarbons (PAHs). EPH (c 10 - c 19) and EPH (c19 - c32) are uncorrected for PAH.

BOLD, BLUE SHADING	Concentration > CSR RL Standard.
BOLD, RED SHADING	Concentration > CSR CL Standard.
Underline, Grey Shading	Concentration >CSR SRA Standard.

Table 1: Analytical Results for Hydrocarbons in Soil

			Site Area	**Heating Oil Tank Excavation 2**									
			Sample Location	**Stockpile**	**Base**					**West Wall**	**North Wall**	**South Wall**	**East Wall**
			Sample ID	UST-SP-COMP	UST2-1	UST2-2	UST-B	DUP1	RPD	UST-WW	UST-NW	UST-SW	UST-EW
			Depth (m)	n/a	3.5	3.5	4.5		%	3.75	3.75	3.75	3.75
			Fill / Native Soil	Native	Native	Native	Native			Native	Native	Native	Native
			Vapour Reading (ppm)	-	-	-	-			-	-	-	-
			Excavated / Remains	**Excavated**	**Excavated**	**Excavated**	Remains			Remains	Remains	Remains	**Excavated**
			Date Sampled	20-FEB-15	19-Feb-15	19-Feb-15	20-FEB-15			20-FEB-15	20-FEB-15	20-FEB-15	20-FEB-15
	CSR Standards [1]												
	RL [1]	**CL** [1]	**SRA** [2]										
Extractable Petroleum Hydrocarbons (ug/g)													
LEPH	**1000**	**2000**	**2000**	<200	**1920**	195	<200	<200		<200	<200	<200	<200
HEPH	**1000**	**5000**	**5000**	<200	274	65	<200	<200		<200	<200	<200	<200
EPH10-19	**1000**	**2000**	**1000**	<200	-	-	<200	<200	*	<200	<200	<200	<200
EPH19-32	**1000**	**5000**	**1000**	<200	-	-	<200	<200	*	<200	<200	<200	<200
Volatile Petroleum Hydrocarbons (ug/g)													
VHs6-10	-	-	-	-			-	-	-	-	-	-	-
VPHs	**200**	**200**	**200**	-			-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons (ug/g)													
Acenaphthene	-	-	-	0.315	<0.01	0.01	<0.050	<0.050	*	<0.050	<0.050	<0.050	0.083
Acenaphthylene	-	-	-	<0.050	<0.01	<0.01	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Anthracene	-	-	-	0.134	<0.02	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Benz(a)anthracene	**1**	**10**	**1**	<0.050	<0.02	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Benzo(a)pyrene	**1**	**10**	**1**	<0.050	<0.05	<0.05	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Benzo(b)fluoranthene	**1**	**10**	**1**	<0.050	<0.02	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Benzo(g,h,i)perylene	-	-	-	<0.050	<0.05	<0.05	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Benzo(k)fluoranthene	**1**	**10**	**1**	<0.050	<0.02	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Chrysene	-	-	-	<0.050	<0.05	<0.05	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Dibenz(a,h)anthracene	**1**	**10**	**1**	<0.050	<0.02	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Fluoranthene	-	-	-	0.222	0.05	<0.05	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Fluorene	-	-	-	0.244	0.22	0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Indeno(1,2,3-c,d)pyrene	**1**	**10**	**1**	<0.050	<0.02	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
2-Methylnaphthalene	-	-	-	0.408	1.35	0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Naphthalene	**5**	**50**	**5**	0.114	<0.01	<0.01	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Phenanthrene	**5**	**50**	**5**	0.318	<0.02	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Pyrene	**10**	**100**	**10**	0.185	0.06	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050

Notes:
Associated Lab Files: 15V946791, L1580393

BOLD, BLUE SHADING	Concentration greater than CSR Residential Land Use (RL) Standard.
BOLD, RED SHADING	Concentration greater than CSR Commercial Land Use (CL) Standard.
Underline, Grey Shading	Concentration greater than CSR Soil Relocation Agreement (SRA) Standard.

Active Earth Engineering Ltd

APPENDIX A

Tank Removal Permit

453 WEST 12TH
VANCOUVER, B.C. V5Y 1V4
TEL - 604-873-7555 FAX : 604-873-7109

CITY OF VANCOUVER

DATE ISSUED: FEBRUARY 20, 2015

PERMIT TYPE: FIRE PREVENTION DIVISION PERMIT

P

PERMIT NUMBER: FI 412083

LEGAL DESCRIPTION: LOT BLOCK PLAN DIST

ADDRESS: 1300 RICHARDS ST

ADDITIONAL ADDRESS INFORMATION

SPECIFICS

APPLICATION DATE	PURPOSE	PROJECT VALUE	ASSESSED VALUE	PLANS	METRIC	PLACE NAME
FEB 20, 2015	REMOVAL				NO	

TEMPORARY PERMIT DATES

TEMPORARY USE DATES

SUBTYPE

APPLICANT
CONTRACTOR
ACTIVE EARTH ENGINEERING LTD
SHANNON KNEALE
4510 SADDLEHORN CRES
LANGELY BC V2Z 1J6

CONTACT 2

CONTACT 3

TEL 604-856-5119 FAX	BUS LICENSE CERTIFICATE 468766	TEL FAX	BUS LICENSE CERTIFICATE	TEL FAX	BUS LICENSE CERTIFICATE

PURSUANT TO THE FIRE BY-LAW, THE FOLLOWING WORK IS HEREBY AUTHORIZED:

TO REMOVE ONE TANK ON SITE; CAP=2000LTRS, SETBACK IS 4.50M FROM NORTH PL;
BOTTOM OF TANK IS AT 3.5M, TYPE OF LIQUID IS PETROLEUM.

PERMIT CONDITIONS AND NOTES:

001 THE WORK UNDER THIS PERMIT IS AUTHORIZED PURSUANT TO THE FIRE BY-LAW.
020 Clearance is required from the Engineering Department, Streets Division, for work affecting .....
039 For removal: the tanks, together with connected piping and dispensing equipment, shall have all combustible or flammable liquids removed. The tanks and piping must be removed from the ground and purged of vapours. The pipe ends must be permanently sealed by capping or plugging.
035 For abandonment: pump out remaining content, steam clean interior, and fill with sand/concrete slurry.
040 Tank removal must comply with subsection 4.10.3 of the Vancouver Fire By-law.
910 Construction must be carried out in compliance with the provisions of Noise Control By-law No. 6555
994 1. This permit shall expire if:
(a) Work authorized by the permit has not commenced within 90 days from the date of issuance; or
(b) Work has been substantially discontinued for a period of 90 days.
2. The premises shall be kept in safe manner with guards, shoring, etc. as required by the Occupational Health and Safety Regulation and city by-laws
3. Environmental Final Closure Report and clearance required
4. Backfill with clean soil required
5. Underground storage tank removal shall be done in accordance with good engineering practice
6. Contractor must be on site for the inspection by the Vancouver Fire and Rescue Services

GENERAL USE	SPECIFICS/LOCATION	AREA (SF)	OCC	GENERAL USE	SPECIFICS/LOCATION	AREA (SF)	OCC
E30 GENERAL OFFICE			D				

ITEM	SPECIFICS/REFERENCE	QTY/AMT	ITEM	SPECIFICS/REFERENCE	QTY/AMT
OIL TANK		1 GU			

APPROVALS REQD BEFORE PERMIT IS COMPLETED INCLUDE : FI01 ENV CONTAMINATION FIRE INSPECTION BRETT COOKE 604-873-7544

ADDITIONAL NOTES:

915 To book an inspection call 3-1-1 from within Vancouver or 604-873-7000 from outside Vancouver. The 3-1-1 Centre is open 7 days a week from 7AM to 10PM, 365 days a year. Also, our 24 hour Building Inspections booking request message line is 604-873-7058. For information on how to use it, please contact the 3-1-1 Centre.

AS OWNER OR OWNERS' AGENT, I HAVE VERIFIED THAT THE INFORMATION CONTAINED WITHIN THIS DOCUMENT AND ASSOCIATED PLANS IS CORRECT, AND DESCRIBES A USE, A BUILDING OR A WORK WHICH COMPLIES WITH ALL RELEVANT BY-LAWS AND STATUTES. I ACKNOWLEDGE THAT RESPONSIBILITY FOR BY-LAW COMPLIANCE RESTS WITH THE OWNER AND THE OWNER'S EMPLOYEES, AGENTS AND CONTRACTORS. I WILL INDEMNIFY AND SAVE HARMLESS THE CITY OF VANCOUVER, ITS OFFICIALS, EMPLOYEES AND AGENTS AGAINST ALL CLAIMS, LIABILITIES AND EXPENSES OF EVERY KIND, IN RESPECT OF ANYTHING DONE OR NOT DONE PURSUANT TO THIS APPLICATION OR FACT SHEET OR ENSUING PERMIT, INCLUDING NEGLIGENCE AND/OR THE FAILURE TO OBSERVE ALL BY-LAWS, ACTS OR REGULATIONS.

FEE	AMOUNT	FEE	AMOUNT
657 TANK - OTHER	300.00		

SIGNATURE	
DATE	
ISSUED BY	H POWALLA
FOR THE	FIRE CHIEF

INVOICE: 775397 TOTAL $300.00

PSD200.01 REVISED FEB/08

2015/02/20 10:43:21

APPLICANT COPY

Active Earth
Engineering Ltd

APPENDIX B

Soil and Waste Disposal Documentation

Listing of Tickets
For Feb 24,15
All Tickets
Both Posted & Unposted
Customer ID=4693 Sumas Remediation Services Inc.

Ticket #	Date	Tm In	License	Vehicle Desc	Yds	GVW(kg)	Tare kg	Net Wgt
Customer: 4693 Sumas Remediation Services Inc.								
Material: T141208 1300 Richards St Vcr								
1342507	Feb 24	08:27	4241GS	Kler Truck/Pup	28	43240	17994	25246
1342509	Feb 24	08:31	3567FE	H & K Truck/Pup	28	42790	17746	25044
1342514	Feb 24	08:35	BN7085	ASL Trucking/Pup	28	41840	16966	24874
1342519	Feb 24	08:42	6738JB	NS Gill Truck/Pup	28	41300	17420	23880
1342521	Feb 24	08:47	JA4057	GBS/Pup	28	42740	18180	24560
1342522	Feb 24	08:48	HL8345	M & S Truck/Pup	28	43490	19330	24160
1342526	Feb 24	08:56	CW3295	Bal Bros/Pup	28	42810	17632	25178
1342528	Feb 24	08:58	CE2956	Amendeep Truck/Pup	28	40650	16020	24630
1342531	Feb 24	09:01	HM9537	TS Mahal Truck/Pup	28	41770	17108	24662
1342533	Feb 24	09:05	EW5925	H Nijjar Lndscp/Pup	28	42380	17720	24660
1342535	Feb 24	09:10	EK3999	01888 Trucking/Pup	28	42200	16762	25438
1342537	Feb 24	09:12	DL5313	DSM Excav/Pup	28	42940	17700	25240
1342586	Feb 24	10:45	4241GS	Kler Truck/Pup	28	41300	17994	23306
1342589	Feb 24	10:50	3567FE	H & K Truck/Pup	28	41790	17746	24044
1342590	Feb 24	10:51	BN7085	ASL Trucking/Pup	28	41790	16966	24824
1342592	Feb 24	10:53	6738JB	NS Gill Truck/Pup	28	42650	17166	25484
1342595	Feb 24	10:55	JA4057	GBS/Pup	28	42050	18180	23870
1342598	Feb 24	10:58	HL8345	M & S Truck/Pup	28	41460	19330	22130
1342602	Feb 24	11:04	CE2956	Amendeep Truck/Pup	28	39690	16116	23574
1342605	Feb 24	11:07	HM9537	TS Mahal Truck/Pup	28	40990	17108	23882
1342608	Feb 24	11:10	DL5313	DSM Excav/Pup	28	42900	17710	25190
1342609	Feb 24	11:11	EW5925	H Nijjar Lndscp/Pup	28	42320	17376	24944
1342614	Feb 24	11:16	EK3999	01888 Trucking/Pup	28	41940	16762	25178
1342660	Feb 24	12:14	CW3295	Bal Bros/Pup	28	42600	17632	24968
1342669	Feb 24	12:32	4241GS	Kler Truck/Pup	28	41340	17994	23346
1342673	Feb 24	12:38	3567FE	H & K Truck/Pup	28	41380	17746	23634
1342674	Feb 24	12:40	BN7085	ASL Trucking/Pup	28	39810	16966	22844
1342677	Feb 24	12:45	6738JB	NS Gill Truck/Pup	28	41660	17166	24494
1342681	Feb 24	12:54	JA4057	GBS/Pup	28	41130	18180	22950
1342683	Feb 24	12:56	HL8345	M & S Truck/Pup	28	42480	19330	23150
1342686	Feb 24	12:58	CE2956	Amendeep Truck/Pup	28	39640	16116	23524
1342695	Feb 24	13:08	HM9537	TS Mahal Truck/Pup	28	43880	17108	26772
1342702	Feb 24	13:15	EW5925	H Nijjar Lndscp/Pup	28	42380	17376	25004
1342709	Feb 24	13:22	EK3999	01888 Trucking/Pup	28	38450	16762	21688
1342715	Feb 24	13:28	DL5313	DSM Excav/Pup	28	40490	17378	23112
1342767	Feb 24	14:37	4241GS	Kler Truck/Pup	28	40460	17994	22466
1342771	Feb 24	14:40	3567FE	H & K Truck/Pup	28	40550	17746	22804
1342772	Feb 24	14:41	BN7085	ASL Trucking/Pup	28	41960	16966	24994
1342776	Feb 24	14:49	6738JB	NS Gill Truck/Pup	28	41020	17166	23854
1342779	Feb 24	14:51	JA4057	GBS/Pup	28	42310	18180	24130
SubSubTotal:					1120			967732
Material: T150101 2001 W 10th Ave Vcr								
1342587	Feb 24	10:46	EF8540	A & G Excavating/Pup	28	41450	18330	23120
Material: T150211 4623 Byrne Rd Bby-500 TON/DAY								
1342489	Feb 24	07:58	FA2800	JS Nijjar/Pup	28	39270	17620	21650
1342494	Feb 24	08:06	DD8337	Richport Truck/Pup	28	42570	18028	24542
1342498	Feb 24	08:11	FD0559	Pahl Truck/Pup	28	42420	17858	24562
1342544	Feb 24	09:25	FA2800	JS Nijjar/Pup	28	42560	17620	24940
1342546	Feb 24	09:28	FD0559	Pahl Truck/Pup	28	42990	17858	25132
1342554	Feb 24	09:43	DD8337	Richport Truck/Pup	28	42120	18028	24092
1342572	Feb 24	10:12	1611JS	Pahl Truck/Pup #26	28	41560	17568	23992
1342579	Feb 24	10:35	FD0559	Pahl Truck/Pup	28	42100	17858	24242
1342581	Feb 24	10:40	FA2800	JS Nijjar/Pup	28	40160	17620	22540

02-114

BILL OF LADING

LT# 0638 19462

ADVANTAGE
Waste Specialties, Inc.
www.advantagewaste.com
Box 164, Fort Langley, B.C. V1M 2R5 Bus: (604) 451-4578 • Fax: (604) 451-4579

DATE: FEB. 20, 2015
PURCHASE ORDER NUMBER:

SHIPPER (FROM)	CONSIGNEE (TO)
ACTIVE EARTH	AWS
STREET: 498 DRAKE ST.	STREET: 1051 PAGE ST.
CITY/PROVINCE: VANCOUVER, B.C. POSTAL CODE:	CITY/PROVINCE: RICHMOND, B.C. POSTAL CODE:

BILLING ADDRESS, IF DIFFERENT:

SPECIAL INSTRUCTIONS: ARR- 2:00PM DEP- 3:20 PM

PIECES	UNIT	DESCRIPTION OF ARTICLES AND SPECIAL MARKS	DANGEROUS GOODS CLASS.	DANGEROUS GOODS P.I.N.	DANGEROUS GOODS PKG/GRP	WEIGHT (KGS)
6709	l	OILY WATER (3% OIL	N/A	N/R	N/A	6709 Kg
		2 UST'S				
		TOTAL VOLUME 6,709 l.				
		P.O. # 816				

EMERGENCY RESPONSE TELEPHONE NO.	TYPE OF PLACARD	QUANTITY	EMERGENCY RESPONSE PLAN NO.
604-451-4578	NONE		

DIMENSIONS: TOTAL CUBIC FEET:

NOTICE OF CLAIM: (a) No carrier is liable for loss, damage or delay to any goods under the Bill of Lading unless notice thereof setting out particulars of the origin, destination and date of shipment of the goods and the estimated amount claimed in respect of such loss, damage or delay is given in writing to the originating carrier or the delivering carrier within sixty (60) days after the delivery of the goods, or, in the case of failure to make delivery, within nine (9) months from the date of shipment. (b) The final statement of the claim must be filed within nine (9) months from the date of shipment together with a copy of the paid freight bill.

REC'D BY:

RECEIVED at the point of origin on the date specified, from the consignor mentioned herein, the property herein described, in apparent good order, except as noted (contents and conditions of contents of package unknown) marked, consigned and destined as indicated below, which the carrier agrees to carry and to deliver to the consignee at the said destination, if on its own authorized route or otherwise to cause to be carried by another carrier on the route to said destination, subject to the rates and classification in effect on the date of shipment.

It is mutually agreed, as to each carrier of all or any of the goods over all or any portion of the route to destination, and as to each party of any time interested in all or any of the goods, that every service to be performed hereunder shall be subject to all the conditions not prohibited by law, whether printed or written including conditions set aside by the standard bill of lading, in power at the date of issuing, which are hereby agreed by the consignor and accepted for himself and his assigns.

The Contract for the carriage of the goods listed in the bill of lading is governed by regulation in force in the jurisdiction at the time and place of shipment and is subject to the conditions set out in such regulations.

AT: RICHMOND

DATE: FEB 24/15

PER: Bob Reid	PER: Rick Webber DATE 2-20-15
SHIPPER: Bob Reid	CARRIER: ADVANTAGE WASTE SPECIALTIES INC.

Active Earth Engineering Ltd

APPENDIX C
Photographs

Photo 1 – Looking west. View of the former heating oil UST during removal of residual liquids/sludge.

Photo 2 – Looking west. View of the former UST during removal.

Photo 3 – Looking northeast. Shows the completed remedial excavation.

Photo 4 – Looking north. Shows the completed remedial excavation following additional excavation work to remove adjacent fills.

Active Earth
Engineering Ltd

APPENDIX D
Laboratory Certificates

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

CLIENT NAME: ACTIVE EARTH ENGINEERING
4510 SADDLE HORN CRESCENT
LANGLEY, BC V2Z1J6
(778) 888-0473

ATTENTION TO: Steve Boyce

PROJECT: 816

AGAT WORK ORDER: 15V946791

TRACE ORGANICS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

DATE REPORTED: Feb 23, 2015

PAGES (INCLUDING COVER): 8

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (778) 452-4000

*NOTES
VERSION 1: Sample receipt temperature 4°C.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 15V946791

PROJECT: 816

CLIENT NAME: ACTIVE EARTH ENGINEERING

ATTENTION TO: Steve Boyce

SAMPLING SITE:

SAMPLED BY:

Active Earth LEPH / HEPH Soil

DATE RECEIVED: 2015-02-20

DATE REPORTED: 2015-02-23

		SAMPLE DESCRIPTION:		UST2-1	UST2-2
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2/19/2015	2/19/2015
Parameter	Unit	G / S	RDL	6326798	6326799
Acenaphthene	µg/g		0.01	<0.01	0.01
Acenaphthylene	µg/g		0.01	<0.01	<0.01
Anthracene	µg/g		0.02	<0.02	<0.02
Benzo(a)anthracene	µg/g	1	0.02	<0.02	<0.02
Benzo(a)pyrene	µg/g		0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g	1	0.02	<0.02	<0.02
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g	1	0.02	<0.02	<0.02
Chrysene	µg/g		0.05	<0.05	<0.05
Dibenzo(a,h)anthracene	µg/g	1	0.02	<0.02	<0.02
Fluoranthene	µg/g		0.05	0.05	<0.05
Fluorene	µg/g		0.02	0.22	0.02
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02
2-Methylnaphthalene	µg/g		0.01	1.35	0.02
Naphthalene	µg/g		0.01	<0.01	<0.01
Phenanthrene	µg/g	5	0.02	<0.02	<0.02
Pyrene	µg/g	10	0.02	0.06	<0.02
LEPH C10-C19	µg/g	1000	20	**1920**	195
HEPH C19-C32	µg/g	1000	20	274	65
Surrogate	**Unit**	**Acceptable Limits**			
Nitrobenzene - d5	%	50-130		NA	95
2-Fluorobiphenyl	%	50-130		110	*88*
P-Terphenyl - d14	%	60-130		104	95

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to BC CSR (RL-G) (Van)

6326798 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Nitrobenzene-d5 surrogate is not available due to sample matrix interference.

6326799 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.

Certified By: Andrew Leonard

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 15V946791

PROJECT: 816

CLIENT NAME: ACTIVE EARTH ENGINEERING

ATTENTION TO: Steve Boyce

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Soil

DATE RECEIVED: 2015-02-20

DATE REPORTED: 2015-02-23

		SAMPLE DESCRIPTION:		UST2-1
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2/19/2015
Parameter	Unit	G / S	RDL	6326798
Methyl tert-butyl ether (MTBE)	µg/g	320	0.1	<0.1
Benzene	µg/g	0.04	0.02	<0.02
Toluene	µg/g	2.5	0.05	<0.05
Ethylbenzene	µg/g	7	0.05	<0.05
m&p-Xylene	µg/g	20	0.05	<0.05
o-Xylene	µg/g	20	0.05	<0.05
Styrene	µg/g	5	0.05	<0.05
VPH	µg/g	200	10	<10
VH	µg/g		10	<10
Total Xylenes	ug/g		0.1	<0.1
Surrogate	**Unit**	**Acceptable Limits**		
Bromofluorobenzene	%	70-130		103
Dibromofluoromethane	%	70-130		128
Toluene - d8	%	70-130		126

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to BC CSR (RL-G) (Van)

6326798 Results are based on dry weight of sample.
VPH results have been corrected for BTEX contributions.

Certified By: Andrew Conrad

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: ACTIVE EARTH ENGINEERING

AGAT WORK ORDER: 15V946791

PROJECT: 816

ATTENTION TO: Steve Boyce

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Feb 23, 2015

PARAMETER	Batch	Sample Id	DUPLICATE Dup #1	Dup #2	RPD	Method Blank	REFERENCE MATERIAL Measured Value	Acceptable Limits Lower	Upper	METHOD BLANK SPIKE Recovery	Acceptable Limits Lower	Upper	MATRIX SPIKE Recovery	Acceptable Limits Lower	Upper
Active Earth LEPH / HEPH Soil															
Acenaphthene	63739	6325260	<0.01	<0.01	0.0%	< 0.01	102%	80%	120%				103%	50%	130%
Acenaphthylene	63739	6325260	<0.01	<0.01	0.0%	< 0.01	102%	80%	120%				104%	50%	130%
Anthracene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	98%	80%	120%				102%	60%	130%
Benzo(a)anthracene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	103%	80%	120%				102%	60%	130%
Benzo(a)pyrene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	100%	80%	120%				98%	60%	130%
Benzo(b)fluoranthene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	107%	80%	120%				88%	60%	130%
Benzo(g,h,i)perylene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	103%	80%	120%				106%	60%	130%
Benzo(k)fluoranthene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	96%	80%	120%				104%	60%	130%
Chrysene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	101%	80%	120%				101%	60%	130%
Dibenzo(a,h)anthracene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	104%	80%	130%				99%	60%	130%
Fluoranthene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	100%	80%	120%				103%	60%	130%
Fluorene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	102%	80%	120%				104%	50%	130%
Indeno(1,2,3-c,d)pyrene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	105%	80%	120%				103%	60%	130%
2-Methylnaphthalene	63739	6325260	<0.01	<0.01	0.0%	< 0.01	104%	80%	120%				100%	50%	130%
Naphthalene	63739	6325260	<0.01	<0.01	0.0%	< 0.01	104%	80%	120%				104%	50%	130%
Phenanthrene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	101%	80%	120%				103%	60%	130%
Pyrene	63739	6325260	0.02	0.02	0.0%	< 0.02	100%	80%	120%				100%	60%	130%
Nitrobenzene - d5	63739	6325260	96	80	18.0%		109%	80%	120%				96%	50%	130%
2-Fluorobiphenyl	63739	6325260	95	80	17.0%		101%	80%	120%				97%	50%	130%
P-Terphenyl - d14	63739	6325260	95	86	10.0%		96%	80%	120%				96%	60%	130%
BTEX / VPH (C6-C10) Soil															
Methyl tert-butyl ether (MTBE)	63739	6325260	<0.1	<0.1	0.0%	< 0.1	102%	80%	120%				96%	70%	130%
Benzene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	101%	80%	120%				98%	70%	130%
Toluene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	100%	80%	120%				97%	70%	130%
Ethylbenzene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				95%	70%	130%
m&p-Xylene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	100%	80%	120%				96%	70%	130%
o-Xylene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	101%	80%	120%				97%	70%	130%
Styrene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	100%	80%	120%				90%	70%	130%
VPH	63739	6325260	<10	<10	0.0%	< 10									
VH	63739	6325260	<10	<10	0.0%	< 10									
Bromofluorobenzene	63739	6325260	96	99	3.0%		102%	70%	130%				87%	70%	130%
Dibromofluoromethane	63739	6325260	104	104	0.0%		102%	70%	130%				85%	70%	130%
Toluene - d8	63739	6325260	101	102	1.0%		101%	70%	130%				84%	70%	130%

Comments: RPDs are calculated using raw analytical *data and not* the rounded duplicate values reported.

Certified By:

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: ACTIVE EARTH ENGINEERING

AGAT WORK ORDER: 15V946791

PROJECT: 816

ATTENTION TO: Steve Boyce

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Acenaphthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Naphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Nitrobenzene - d5	ORG-180-5102	modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Fluorobiphenyl	ORG-180-5102	modified from BC MOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5102	modified from BC MOE Lab Manual Section D (PAH)	GC/MS
LEPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
Methyl tert-butyl ether (MTBE)	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Benzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Toluene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Ethylbenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
m&p-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID

AGAT Laboratories

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Method Summary

CLIENT NAME: ACTIVE EARTH ENGINEERING

AGAT WORK ORDER: 15V946791

PROJECT: 816

ATTENTION TO: Steve Boyce

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
o-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Styrene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VPH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Bromofluorobenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Dibromofluoromethane	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Toluene - d8	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS

AGAT Laboratories

120 - 8600 Glenlyon Parkway
Burnaby, BC V5J 0B6
778.452.4006
webearth.agatlabs.com

P: 778.452.4000 · F: 778.452.4074

Chain of Custody Record

Laboratory Use Only
Arrival Temperature: 4°C
AGAT Job Number: FEB 20 @ 11:55 K5V946741

Notes: 24 HR TAT ACTIVE EARTH RELEASE

Report Information
Company: ACTIVE EARTH ENG.
Contact: STEVE BOYCE
Address: 101 - 2250 BOUNDARY RD
BURNABY BC
Phone: 7788886473 Fax:
LSD:
Client Project #: 816

Report Information
1. Name:
Email: STEVE.BOYCE@ACTIVEEARTH.CA
2. Name:
Email: BOB.REID@ACTIVEEARTH.CA

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☐ Excel Format Included

Turnaround Time Required (TAT)
Regular TAT ☐ 5 to 7 working days
Rush TAT ☒ Day 2 - 100%
☐ Day 3 - 50%
☐ Day 4 - 25%
Date Required: MONDAY FEB 23 (11AM)
PLEASE CONTACT LABORATORY IF RUSH REQUIRED SAMPLE SUBMISSION CUT OFF FOR EFFECTIVE DATE BY 3 PM

Invoice To Same as above Yes ☒ No ☐
Company:
Contact: CAROL KRAFT
Address:
Phone: Fax:
PO/AFE#:

Requirements *(Please Check)*
☒ BC CSR Soil
☐ AL ☐ IL ☐ PL ☐ CL ☒ RL
☐ BC CSR - Water
☐ DW ☐ AW ☐ IW ☐ LW

Schedule 11 *(Please Specify)*
CCME *(Please Specify)*
Other *(Please Specify)*

LABORATORY USE (LAB ID #)	SAMPLE IDENTIFICATION	SAMPLE MATRIX	DATE/TIME SAMPLED	COMMENTS - SITE SAMPLE INFO. SAMPLE CONTAINMENT	LEAD/HEPH/PAH	BTEX/VPH	NUMBER OF CONTAINERS	PRESERVED (Y/N)	HAZARDOUS (Y/N)	Hold for: ☐ 60 DAYS
6526798	UST2-1	SOIL	19-FEB-15 15:00		X	X	4	Y	N	N
↓ 799	UST2-2	SOIL	〃		X		4	Y	N	N

Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time
STEVE BOYCE	20 FEB 15 @ 1200	Steven Ridley	20 Feb 2015
Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time
Samples Relinquished By (Print Name and Sign):	Date/Time	Samples Received By (Print Name and Sign):	Date/Time

Page ____ of ____
N°: 013604

Page 7 of 8

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM - BURNABY

Work Order # 15V9446791

RECEIVING BASICS:
Received From: A1 Messenger Waybill #: _____

SAMPLE QUANTITIES:
Coolers: 1 Containers: 8

TIME SENSITIVE ISSUES:
Earliest Date Sampled: 19Feb2015 ALREADY EXCEEDED? Yes (No)

NON-CONFORMANCES:
3 temperatures of samples* and average of each cooler: (record differing temperatures on the CoC next to sample ID's) *use jars when available

(1) 4 + 5 + 4 = 4 °C (2) ___ + ___ + ___ = ___ °C (3) ___ + ___ + ___ = ___ °C (4) ___ + ___ + ___ = ___ °C

Was ice or ice pack present: (Yes) No

Integrity Issues:

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date and Time: _____

ADDITIONAL NOTES:

Document #: SR-186-9504.001
Revision Date: July 9, 2014

Page 1 of 1

ACTIVE EARTH ENGINEERING LTD.
ATTN: Bob Reid
160-2250 Boundary Road
Burnaby BC V5M 3Z3

Date Received: 23-FEB-15
Report Date: 24-FEB-15 16:00 (MT)
Version: FINAL

Client Phone: 778-938-9038

Certificate of Analysis

Lab Work Order #: L1580393

Project P.O. #: NOT SUBMITTED
Job Reference: 816
C of C Numbers: 10-388312
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1580393-1	L1580393-2	L1580393-3	L1580393-4	L1580393-5
Description	SOIL	SOIL	SOIL	SOIL	SOIL
Sampled Date	20-FEB-15	20-FEB-15	20-FEB-15	20-FEB-15	20-FEB-15
Sampled Time					
Client ID	UST-NW	UST-SW	UST-EW	UST-WW	UST-B
Grouping / **Analyte**					
SOIL					
Physical Tests Moisture (%)	7.80	8.88	8.84	6.29	9.04
Hydrocarbons EPH10-19 (mg/kg)	<200	<200	<200	<200	<200
EPH19-32 (mg/kg)	<200	<200	<200	<200	<200
LEPH (mg/kg)	<200	<200	<200	<200	<200
HEPH (mg/kg)	<200	<200	<200	<200	<200
Polycyclic Aromatic Hydrocarbons Acenaphthene (mg/kg)	<0.050	<0.050	0.083	<0.050	<0.050
Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Chrysene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Fluorene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
2-Methylnaphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Naphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Phenanthrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
Surrogate: Acenaphthene d10 (%)	78.2	89.6	79.2	92.1	90.1
Surrogate: Chrysene d12 (%)	96.5	99.3	100.7	112.9	105.7
Surrogate: Naphthalene d8 (%)	76.8	88.6	80.3	91.7	91.1
Surrogate: Phenanthrene d10 (%)	88.2	95.4	90.0	98.7	101.2

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1580393-6	L1580393-7			
	Description	SOIL	SOIL			
	Sampled Date	20-FEB-15	20-FEB-15			
	Sampled Time					
	Client ID	DUP1	UST-SP-COMP			
Grouping	**Analyte**					
SOIL						
Physical Tests	Moisture (%)	8.68	12.5			
Hydrocarbons	EPH10-19 (mg/kg)	<200	<200			
	EPH19-32 (mg/kg)	<200	<200			
	LEPH (mg/kg)	<200	<200			
	HEPH (mg/kg)	<200	<200			
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	0.315			
	Acenaphthylene (mg/kg)	<0.050	<0.050			
	Anthracene (mg/kg)	<0.050	0.134			
	Benz(a)anthracene (mg/kg)	<0.050	<0.050			
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050			
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050			
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050			
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050			
	Chrysene (mg/kg)	<0.050	<0.050			
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050			
	Fluoranthene (mg/kg)	<0.050	0.222			
	Fluorene (mg/kg)	<0.050	0.244			
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050			
	2-Methylnaphthalene (mg/kg)	<0.050	0.408			
	Naphthalene (mg/kg)	<0.050	0.114			
	Phenanthrene (mg/kg)	<0.050	0.318			
	Pyrene (mg/kg)	<0.050	0.185			
	Surrogate: Acenaphthene d10 (%)	76.4	83.7			
	Surrogate: Chrysene d12 (%)	92.7	95.4			
	Surrogate: Naphthalene d8 (%)	76.5	82.6			
	Surrogate: Phenanthrene d10 (%)	86.4	94.2			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Anthracene	DUP-H	L1580393-1, -2, -3, -4, -5, -6, -7

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
EPH-TUMB-FID-VA	Soil	EPH in Solids by Tumbler and GCFID	BC MOE EPH GCFID

Analysis is in accordance with BC MOE Lab Manual method "Extractable Petroleum Hydrocarbons in Solids by GC/FID", v2.1, July 1999. Soil samples are extracted with a 1:1 mixture of hexane and acetone using a rotary extraction technique modified from EPA 3570 prior to gas chromatography with flame ionization detection (GC-FID). EPH results include Polycyclic Aromatic Hydrocarbons (PAH) and are therefore not equivalent to Light and Heavy Extractable Petroleum Hydrocarbons (LEPH/HEPH).

LEPH/HEPH-CALC-VA	Soil	LEPHs and HEPHs	BC MOE LABORATORY MANUAL (2005)

Light and Heavy Extractable Petroleum Hydrocarbons in Solids. These results are determined according to the British Columbia Ministry of Environment, Lands, and Parks Analytical Method for Contaminated Sites "Calculation of Light and Heavy Extractable Petroleum Hydrocarbons in Solids or Water". According to this method, LEPH and HEPH are calculated
by subtracting selected Polycyclic Aromatic Hydrocarbon results from Extractable Petroleum Hydrocarbon results. To calculate LEPH, the individual results for Naphthalene and Phenanthrene are subtracted from EPH(C10-19). To calculate HEPH, the individual results for Benz(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-c,d)pyrene, and Pyrene
are subtracted from EPH(C19-32). Analysis of Extractable Petroleum Hydrocarbons adheres to all prescribed elements of the BCMELP method "Extractable Petroleum Hydrocarbons in Solids by GC/FID" (Version 2.1, July 20, 1999).

MOISTURE-VA	Soil	Moisture content	ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PAH-TMB-H/A-MS-VA	Soil	PAH - Rotary Extraction (Hexane/Acetone)	EPA 3570/8270

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation. Because the two isomers cannot be readily chromatographically separated, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

10-388312

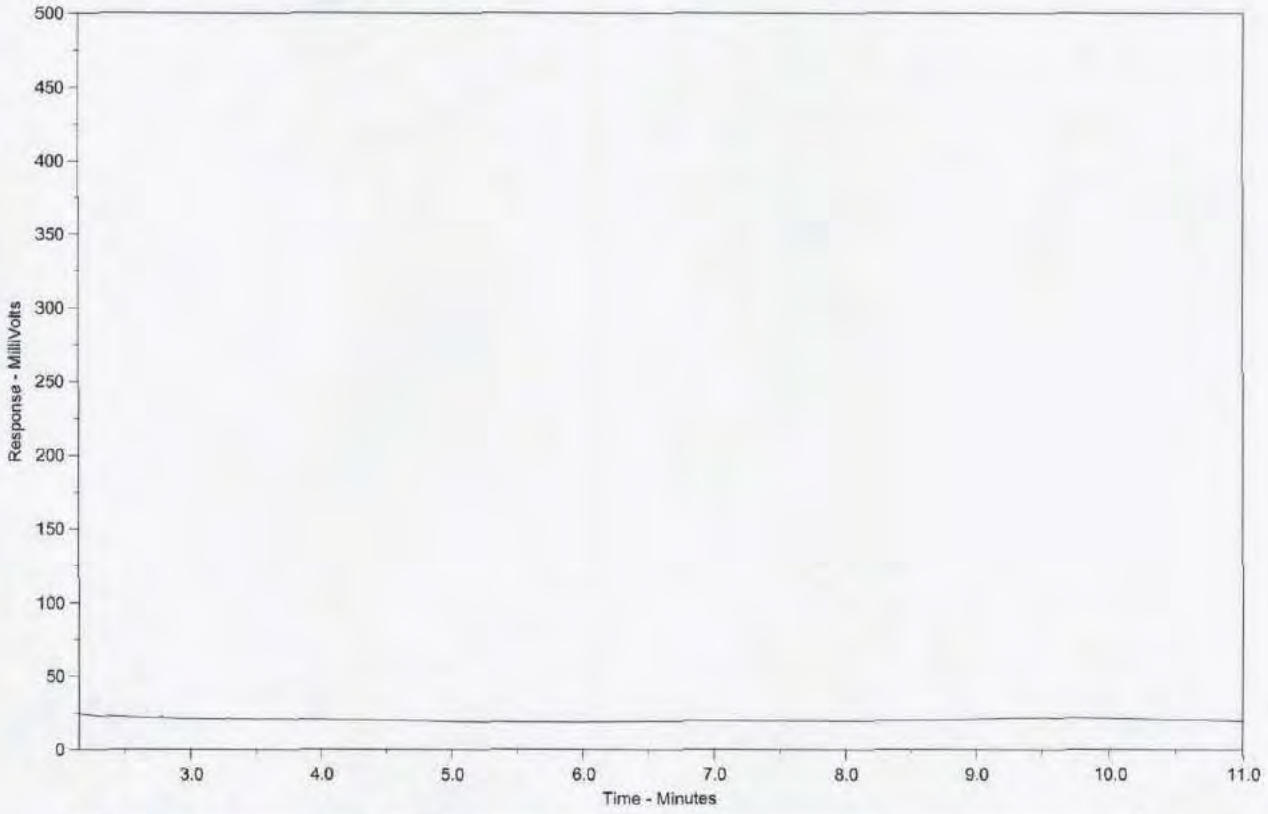
GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Hydrocarbon Distribution Report

ALS Sample ID: L1580393-1
Client Sample ID: UST-NW



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →	← Motor Oils / Lube Oils / Grease →	
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on www.alsglobal.com or upon request.

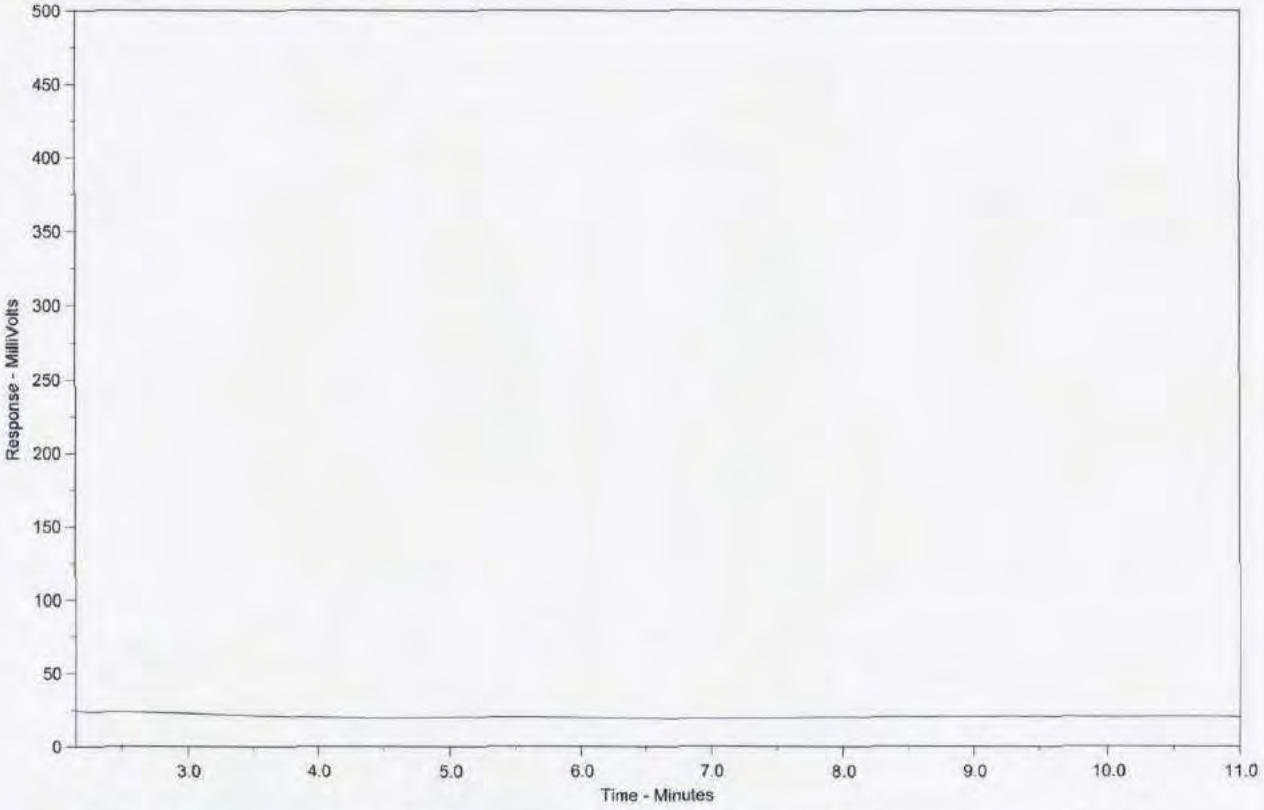
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Hydrocarbon Distribution Report

ALS Sample ID: L1580393-2
Client Sample ID: UST-SW



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →	← Motor Oils / Lube Oils / Grease →	
← Diesel / Jet Fuels →		

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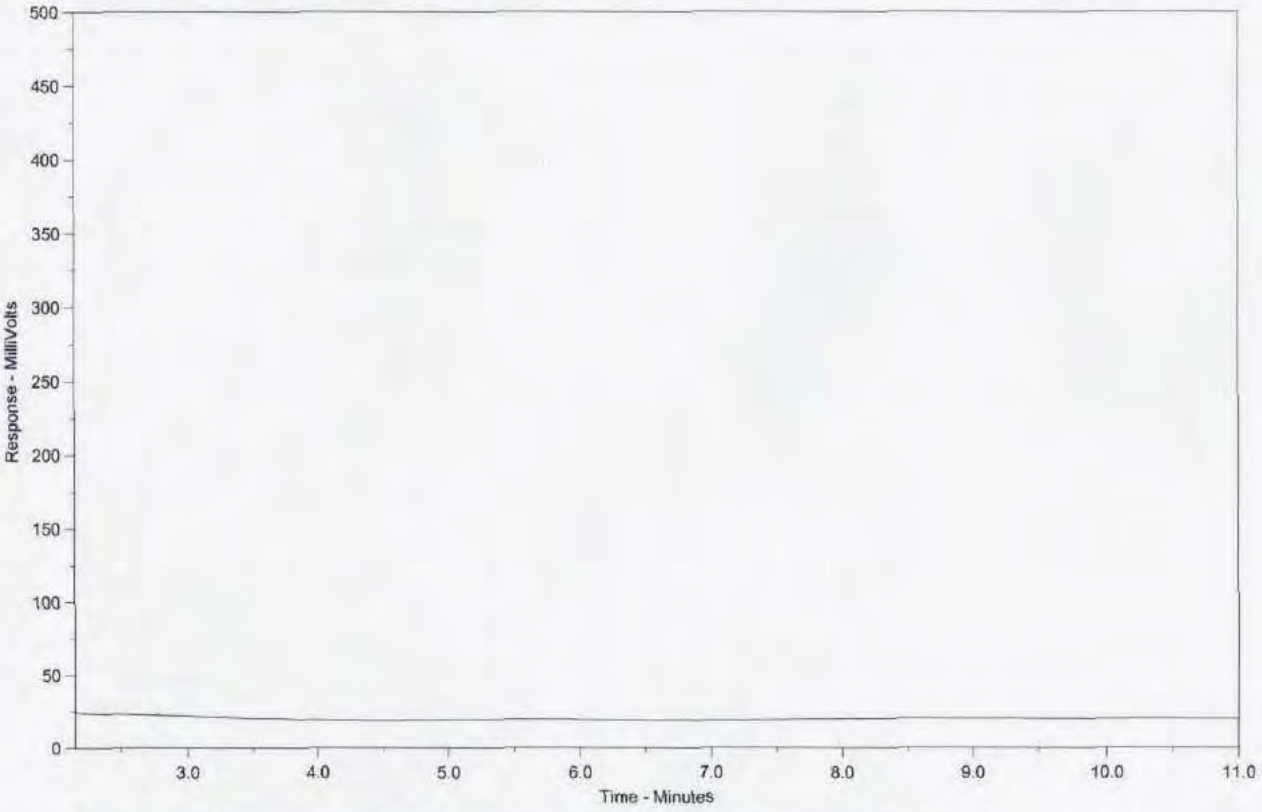
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Hydrocarbon Distribution Report

ALS Sample ID: L1580393-3
Client Sample ID: UST-EW



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →	← Motor Oils / Lube Oils / Grease →	
← Diesel / Jet Fuels →		

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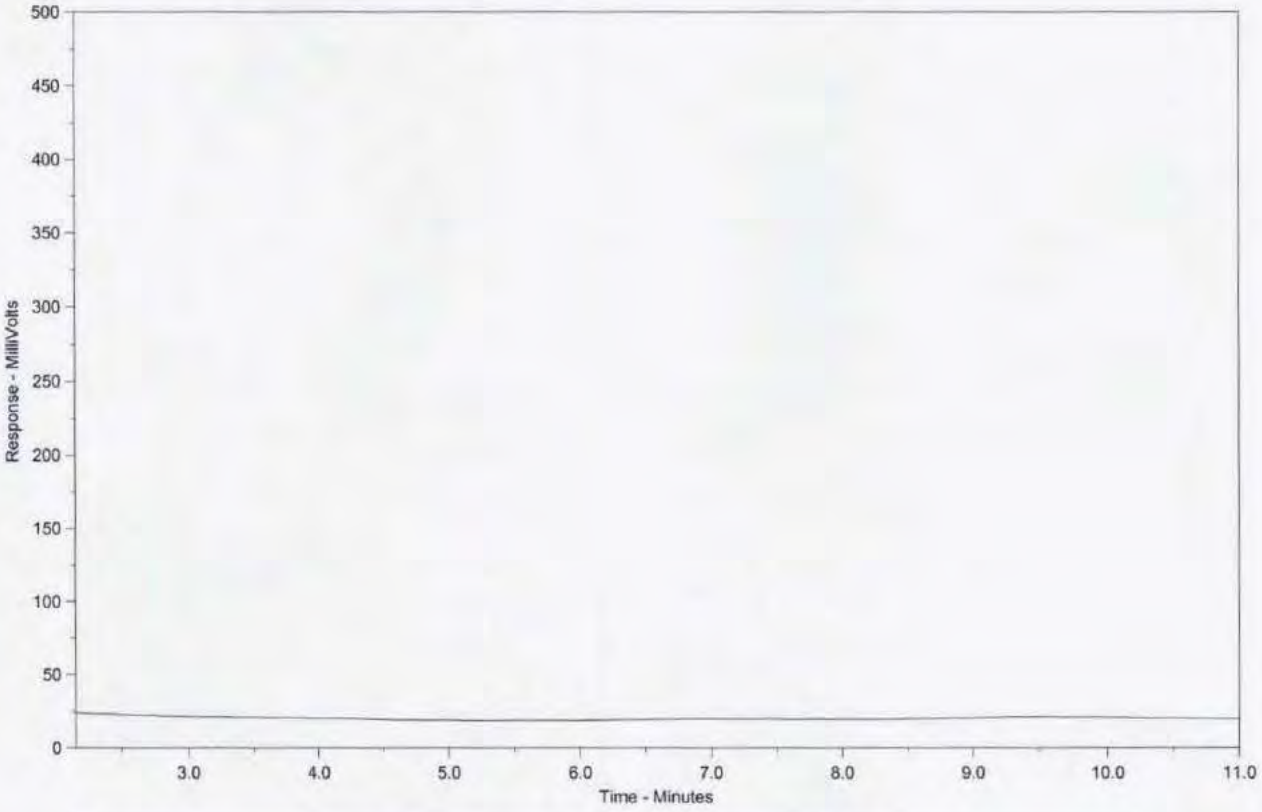
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Hydrocarbon Distribution Report

ALS Sample ID: L1580393-4
Client Sample ID: UST-WW



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →	← Motor Oils / Lube Oils / Grease →	
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on www.alsglobal.com or upon request.

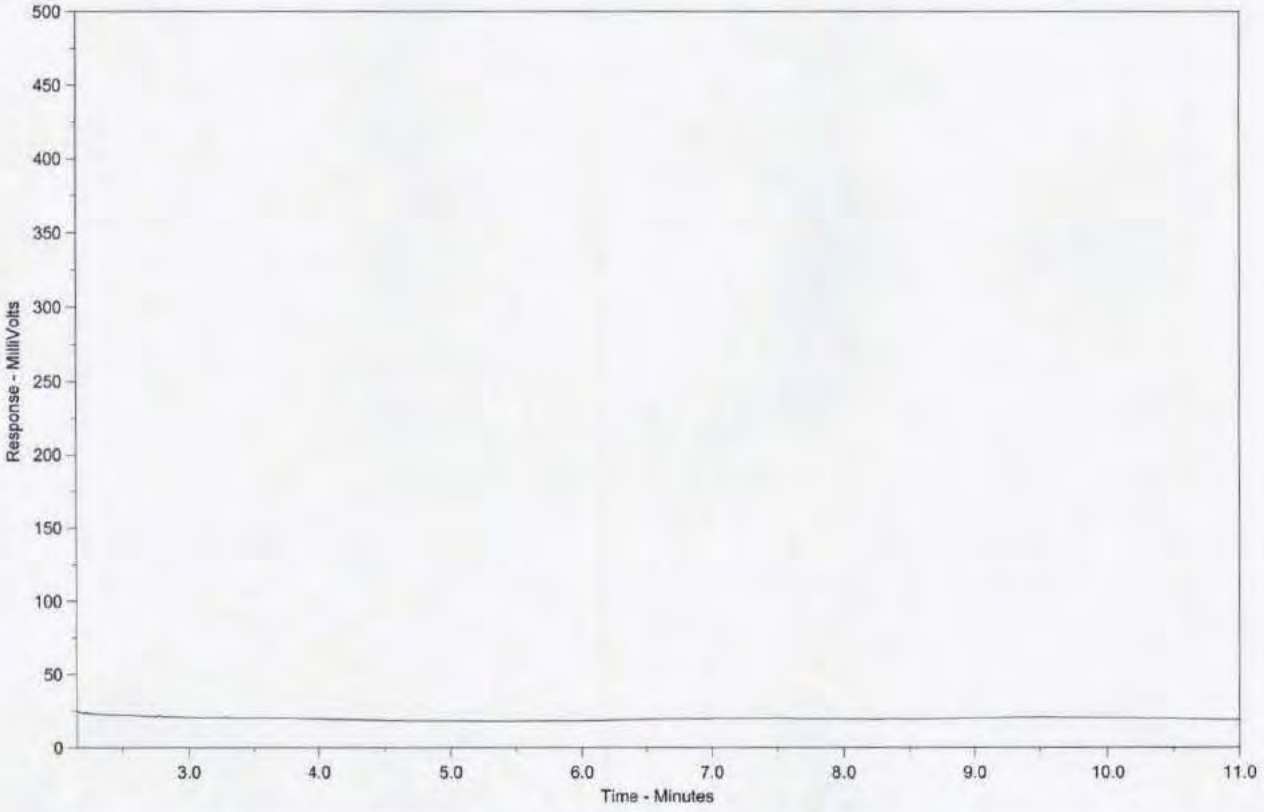
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Hydrocarbon Distribution Report

ALS Sample ID: L1580393-5
Client Sample ID: UST-B



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →	← Motor Oils / Lube Oils / Grease →	
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on www.alsglobal.com or upon request.

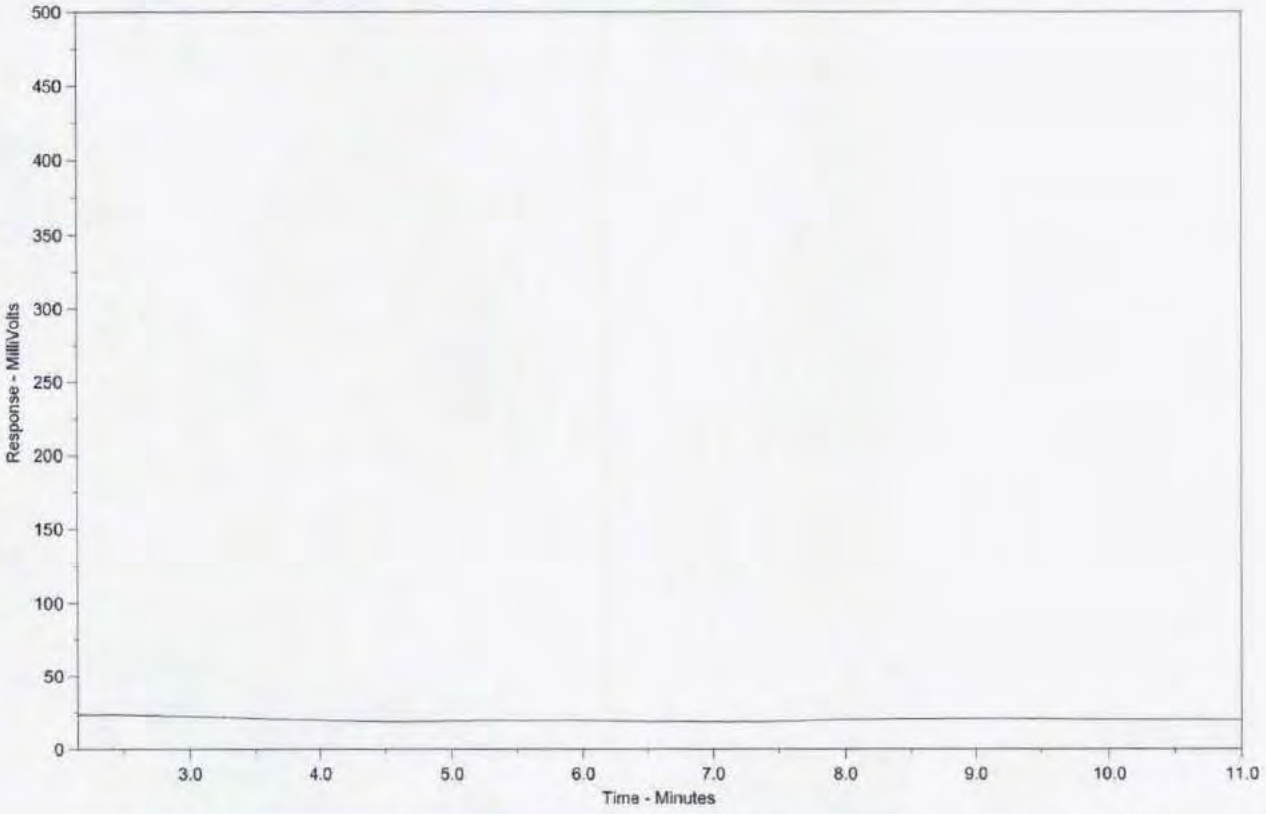
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Hydrocarbon Distribution Report

ALS Sample ID: L1580393-6
Client Sample ID: DUP1



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →	← Motor Oils / Lube Oils / Grease →	
← Diesel / Jet Fuels →		

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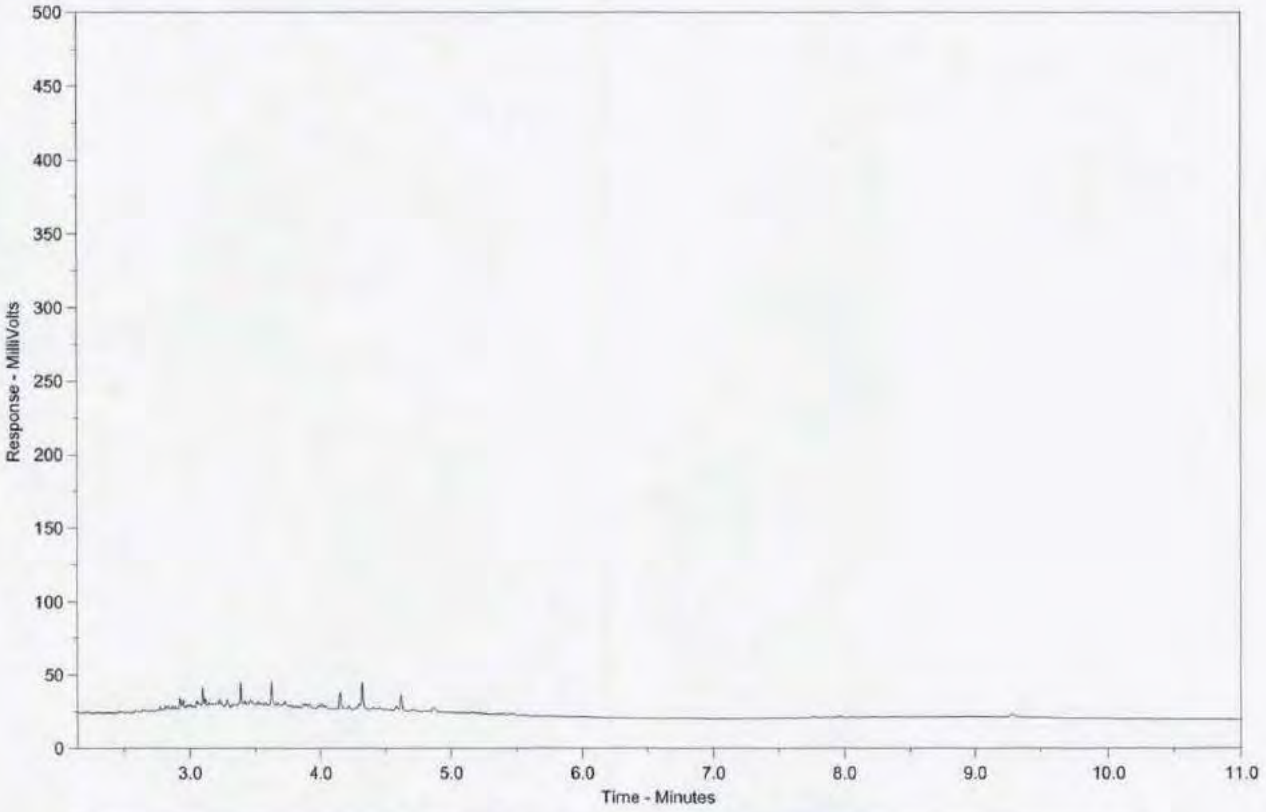
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Hydrocarbon Distribution Report

ALS Sample ID: L1580393-7
Client Sample ID: UST-SP-COMP



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →	← Motor Oils / Lube Oils / Grease →	
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on www.alsglobal.com or upon request.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

10- 388312

L1580393-COFC

ALS Er

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Page 1 of 1

Report To	**Report Format / Distribution**	**Service Request:** (Rush subject to availability - Contact ALS to confirm TAT)
Company: Active Earth	Standard: ✓ Other (specify):	Regular (Standard Turnaround Times - Business Days)
Contact: Bob Reid	Select: PDF ✓ Excel ✓ Digital Fax	Priority (2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address: Burnaby	Email 1: steve.boyce@activeearth.ca	✓ Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT Feb. 24
	Email 2:	Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone: 778-438-9058 Fax:		**Analysis Request**
Invoice To Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**	(Indicate Filtered or Preserved, F/P)
Copy of Invoice with Report? (circle) Yes or No	Job #: 816	
Company:	PO / AFE:	
Contact:	LSD:	
Address:		
Phone: Fax:	Quote #:	
Lab Work Order # (lab use only)	**ALS Contact:** Sampler:	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	UST-NW	20-Feb-15		Soil	
	UST-SW				
	UST-EW				
	UST-WW				
	UST-B				
	DUP 1				

RUSH
Priority processing

Special Instructions / Regulation with water or land use (CCME- Freshwater Aqua / **Hazardous Details**

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
			[illegible]	Feb 23	13:42	9.6 °C				

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY — GENF 18.01 Front

CITY OF VANCOUVER

UNDERGROUND STORAGE TANK REMOVAL/DECOMMISSIONING REPORT

This report must be completed and submitted to the City of Vancouver (Environmental Contamination Team) after completion of underground storage tank (UST) removal projects.

1. **Site Information:**

   Owner's Name: Wall Financial Corporation (Title held by 0888189 BC Ltd.)

   Site Address: 1300 Richards Street

2. **Excavation Plan:** (see report attachments)
   A scaled (about 1:200) plan including (at minimum): north arrow, nearby buildings, tank location, extents of excavation, soil sample location, and soil sample analytical results summary.

3. **Site Photos (electronic only) Attached:** (see report attachments)

   The photos must include the tank-hold excavation and the removed tank.

4. **Tank Information:**

   Was oil removed from tank? Y ☒
   Was all associated (e.g., feed lines, venting) piping removed? Y ☒ N ☐

Tank Summary Table:

		Perforation(s)		Other visible physical damage (e.g. pipe damage)		Product in tank	Date tank removed from service (YYYY/MM/DD)
Permit #	Capacity (L)	Yes	No	Yes	No		
FI 412083	1900	Yes		No		No-oily water	February 20, 2015

5. **Tank and Piping Disposal/Recycling:**

   Name/address of tank and piping disposal/recycling receiver:

   Hauled to Southwest Contracting Scrap Metal Storage Yard

   Tank disposal/recycling receipts attached: Y ☐

6. **Liquid Waste Disposal:**

   Liquid/sludge disposal (e.g., type/volume/class): 6709 L of oily water and water

   Receiver name/address: Sumas Remediation , Byrne Road, Burnaby BC

   Disposal date (YYYY/MM/DD): 2015/02/20

Liquid Waste Disposal Receipt/Manifest attached: Y ☒ N/A ☐

7. Soil Disposal (if applicable):

Soil volume (m^3) disposed: 72

Soil disposal carrier: Southwest Contracting Ltd.

Soil receiver information:
Receiver/company name: RL Ecowaste Industries Ltd.

Receiver's address: 15111 Williams Road, Richmond, BC

Soil relocation agreement required: Y ☐ N ☒

Disposal date: YY/MM/DD February 24, 2015

Soil disposal receipt/manifest attached: Y ☒ N ☐ (see report attachments)

8. Field Observations

Field-screening (e.g., soil vapour, visual observations, staining) findings summary:

See report - Section 4

Was product or contamination suspected of migrating into preferential pathways (e.g., perimeter drains), or beneath buildings? Y ☐ N ☒
Comments:

Groundwater Observations:

Was water present in the excavation? Y ☒ N ☐

Was there petroleum hydrocarbon sheen on excavation water? Y ☒ N ☐

(Comments): Trace sheen directly adjacent to UST - removed by vacuum truck and soil removal

9. Confirmatory Soil Sampling

Total Number of discrete *in-situ* soil samples (minimum five: one from each sidewall and the base) analyzed: 7, with one duplicate

Sampler's name and company: Bob Reid, EIT - Active Earth Engineering Ltd.

Sample chain of custody and laboratory certificate of analysis attached? Y ☒

CALA analytical laboratory name: ALS Environmental

Laboratory address: 8081 Lougheed Highway, Burnaby, BC

Analysis/PCOCs (e.g., LEPH/HEPH for heating oil): LEPH/HEPH/PAH for diesel

10. Ministry of Environment Forms:

Was notice of independent remediation (NIR) completed? Y ☒ N/A ☐ --Pending

Was notice of offsite migration (NOM) required and submitted. Y ☐ N/A ☒

Comments: _____

11. Conclusion Summary Table

Address	Contractor/ Consultant	Tank Details (L, condition)	Liquid Waste Disposal Details	Soil Receiver and m^3 Disposed	Confirmatory Samples Meet Standards (Y/N, PCOCs)	Estimated Volume Residual Contamination (m^3, N/A)	Offsite Migration (Y/N)	MoE Forms Submitted (i.e., NIR, NOM, N/A)
1300 Richards Street	Active Earth Engineering	1900L Poor	6709L Oily Water	Ecowaste 72m3	Yes - LEPH/ HEPH, PAH	None - All Removed	N	NIR

12. Name and License of Individual/Firm Who Completed this Report:

Name (company and individual): Active Earth Engineering Ltd. - Bob Reid

Business license number: 468766

Date of tank removal (MM/DD/YYYY): 02/20/2015

13. Conclusion Statement:

Please select the appropriate checkmark that accurately reflects site conditions.
"I confirm all information contained in this report is true and accurate. Based on this information, residual soils are less than ☐, / (or) exceed ☐, the applicable (select one: residential ☐ / commercial ☐ / industrial ☐) standards. Contamination is ☐ / (or) is not ☐ /, suspected or confirmed to have migrated offsite."

Jeff Taylor
Printed Name

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA J. C. TAYLOR #27797

Signature (with stamp)

March 11, 2015
Date

Katigbak, Veronica

From: Kwan, Linda
Sent: Friday, March 27, 2015 9:17 AM
To: DOMINO (CITYVAN)
Subject: FW: Heating Oil Tank - 498 Drake
Attachments: 1300 Richards (498 Drake) Tank 2 Closure Report.pdf; 816 - 1300 Richards - UST2 Closure Form.pdf

---

From: Steve Boyce [mailto:steve.boyce@activeearth.ca]
Sent: Wednesday, March 11, 2015 2:54 PM
To: Smith, James; Kwan, Linda
Cc: 'Jason Rook'; 'Grant Myles'; Robertson, David (CSG)
Subject: RE: Heating Oil Tank - 498 Drake

Linda/James,

Please see the attached closure report and City form related to the decommissioning of the second tank encountered at this Site.
Note that a Permit was obtained prior to removing the tank, and a follow-up inspection with the fire department was completed as required.

Closure results confirmed that all soil contamination was removed and no contamination extended to the nearby City lands.
We are currently completing the NIR for submission to the Ministry.

Cheers,

Steve Boyce, B.A. (Environment & Development)

Active Earth Engineering Ltd
160 - 2250 Boundary Road
Burnaby, BC V5M 3Z3
t 778.888.0473
f 778.737.3488
steve.boyce@activeearth.ca
www.activeearth.ca

From: Smith, James [mailto:James.Smith@vancouver.ca]
Sent: February-20-15 7:21 AM
To: 'Steve Boyce'
Subject: RE: Heating Oil Tank - 498 Drake

Steve,

Thanks for the heads up. Be sure to obtain a Permit for the tank removal work.

James

From: Steve Boyce [mailto:steve.boyce@activeearth.ca]
Sent: Thursday, February 19, 2015 10:15 PM
To: Kwan, Linda; Robertson, David (CSG)
Cc: 'Bob Reid'; 'Jason Rook'; 'Grant Myles'; 'Jeff Taylor'; 'Phil'; Smith, James
Subject: Heating Oil Tank - 498 Drake

Hi Linda,

We discovered another old heating oil tank at 498 Drake today during the final concrete removal at the northwest corner of the Site.
We are scheduled to obtain the tank removal permit tomorrow (Friday) morning, and will decommission the tank in the afternoon. Our site contact is Bob Reid (778-938-9038).

Any suspected contaminated soil will be characterized, stockpiled (covered by poly), and disposed off-Site to a permitted landfill early next week.
We will issue the tank closure report as required as soon as all closure results have been obtained.

David – please note that minimal water was encountered in the vicinity of the tank. This will be removed by vacuum truck tomorrow, and any contaminated soil will be handled and stored in such a way as to minimize the risk of contamination to any water within the excavation. If any sheen is observed on water within the excavation, the discharge will be halted until remediation is complete.

Regards,

Steve Boyce, B.A. (Environment & Development)

Active Earth
Engineering Ltd
160 - 2250 Boundary Road
Burnaby, BC V5M 3Z3
t 778.888.0473
f 778.737.3488
steve.boyce@activeearth.ca
www.activeearth.ca

March 11, 2015 AE Project No. 816

Southwest Contracting Ltd.
9426-192nd St.
Surrey, BC V4N 3R9

ATTENTION: Jason Rook

REFERENCE: **Heating Oil Tank Decommissioning & Remedial Excavation**
1300 Richards Street (498 Drake Street), Vancouver, BC
Tank Removal Permit No. FI 412083

1.0 INTRODUCTION

Active Earth Engineering Ltd. (Active Earth) was retained by Southwest Contracting Ltd. (Southwest) on behalf of the Wall Financial Corporation to document the decommissioning of an underground storage tank (UST), and to oversee an associated remedial soil excavation, at 1300 Richards Street, Vancouver, BC (the "Site"). The Site is also known as 498 Drake Street.

Wall Financial Corporation is undertaking the Site redevelopment which will include mixed commercial and residential use. The former UST (likely used to store fuel for a back-up generator) was uncovered during bulk excavations as part of the re-development. The Site location and current on-Site conditions are shown on the attached Figure.

This work follows the decommissioning of a separate on-Site heating oil UST conducted under the direct supervision of Active Earth in January 2015, and reported under separate cover.

2.0 BACKGROUND

The former UST was uncovered near the northwest corner of the Site on February 19, 2015. Active Earth was then retained to oversee the removal of the UST and to direct remedial soil excavations adjacent to the UST if deemed necessary.

Based on field observations, it was determined that the UST was likely used to store fuel for a back-up generator. Fuel within the UST was deemed to be likely diesel. The Potential Contaminants of Concern (PCOCs) typically associated with diesel are presented in the following table, along with the confirmed Contaminants of Concern that were identified at the Site:

Summary of Potential and Confirmed Contaminants of Concern

Issue	Potential Contaminants of Concern	Confirmed Contaminants of Concern
On-Site Former UST	LEPH, HEPH, PAH	None

LEPH/HEPH – Light/Heavy Extractable Petroleum Hydrocarbons PAH – Polycyclic Aromatic Hydrocarbons

3.0 REGULATORY ASSESSMENT AND REMEDIATION CRITERIA

In British Columbia, environmental matters pertaining to contaminated sites generally fall under the jurisdiction of the BC Ministry of Environment (BC MOE), pursuant to the *Environmental Management Act* (SBC 2003) [including 2004 Bill 13 (B.C. Reg. 110/2010) amendments (effective May 1, 2010)].

The two key regulations under the *Environmental Management Act* relating to the assessment and remediation of contaminated sites are:

- *Contaminated Sites Regulation* (CSR, BC Reg. 375/96, including amendments effective February 1, 2014); and,
- *Hazardous Waste Regulation* (HWR, BC Reg. 63/88, O.C. 268/88 including amendments up to BC Reg. 261/2006, updated to September 21, 2006).

Based on the current Site zoning (Comprehensive Development District 571) and future use at grade (Commercial), the CSR Commercial Land Use (CL) standards were considered to apply, as listed in Schedules 4, 5, and 10 of the CSR. We note that below 3m depth, the CSR stipulates that Commercial Land Use standards apply, irrespective of use at grade.

Off-Site, within the streets, standards are dictated by the City of Vancouver (City). For soil, the City requires that the top 3m meets Residential Land Use (RL) standards, with CL standards applied below this depth.

For information and soil disposal purposes, results have also been compared to the RL standards and the Soil Relocation Agreement (SRA) standards as set out in Schedule 7 Column II (relocation to non-agricultural land).

Generic numerical standards are listed in Schedules 4 and 10, while matrix-based numerical standards are listed in Schedule 5. For the matrix-based numerical standards, the following site-specific factors were applied:

- Human Health Protection – Intake of contaminated soils.
- Environmental Protection – Toxicity to soil invertebrates and plants.

In addition, matrix-based numerical standards for soil are dependent on groundwater use. The matrix-based soil standards for groundwater flow to surface water used by Marine Aquatic Life (AW_M) were considered to apply. The matrix-based soil standards for groundwater used for Drinking Water (DW) were not considered to apply, based on our former hydrogeologic assessments at nearby sites.

The BC Hazardous Waste Regulation (HWR) provides standards to determine if material qualifies as Hazardous Waste based on toxicity equivalency (TEQ) and leachability. TEQ standards are provided for oil and grease, dioxins and furans, PAHs and Tetrachloroethylene. Leachability refers to the concentration of particular contaminants in dissolved form following the subjugation of soil to a strong acid solution during a standardized Toxicity Characteristic Leachate Procedure (TCLP) test.

4.0 SCOPE OF WORK AND RESULTS

The UST decommissioning and remedial excavation was completed under the direct supervision of Active Earth, using machinery and operators supplied by Southwest. A representative from Active Earth was on-Site throughout, in order to observe and document the work, track soil quantities, and collect the necessary confirmatory soil samples.

A Notification of Independent Remediation (Initiation and Completion) is currently being completed and will be submitted to BC MOE in the coming days for the previous remedial activities at the Site. Although no analytical soil results exceeded the applicable CL standards, results did exceed the RL standards (as documented below) and a Notice of Independent Remediation is therefore being submitted for due diligence purposes.

Field methodologies for all activities followed Active Earth's standard practice and protocols. These are presented briefly below.

4.1 Soil Assessment and UST Decommissioning

The UST measured 1.1m in diameter by 2.4m in length (approximately 1900L capacity), was constructed of single-wall steel, and was observed to be moderately corroded with holes noted in the base. The top of the UST was approximately 3m below grade, under a concentrate slab. The UST contained water, trace residual diesel fuel, and oily sludge.

An initial assessment of the UST and collection two soil samples (UST2-1 and UST2-2) from what was deemed the most likely contaminated soils was completed on February 19, 2015, prior to the UST removal. These preliminary samples were collected following the methodologies presented in Section 4.4, and were delivered under chain of custody protocol to AGAT Laboratories in Burnaby, BC. Concentrations of LEPH in sample UST2-1 exceeded the CSR RL standard, with a concentration of 1920 ug/g. All other results were within the CSR RL and CL standards. These soils were excavated as part of the remedial excavation, discussed below.

The decommissioning on February 20, 2015 proceeded as follows:

- A hole was cut into the top of the tank to allow for inspection and cleaning;
- The tank was evacuated and cleaned using a vacuum truck operated by Advantage Environmental Waste Specialists of Fort Langley, BC;
- Groundwater/rainwater that had collected in the tank nest was removed by the same vacuum truck;
- The vacuum truck contents (6709 litres total) were disposed at the Sumas Environmental Byrne Road facility; and,

- The tank was crushed and prepared for appropriate off-Site disposal (metal recycling).

A Tank Removal Permit (No. FI 412083) was obtained on February 20, 2015. A copy of the permit is provided in Appendix A.

The oily water/sludge disposal documentation is provided in Appendix B. Photographs are provided in Appendix C.

4.2 Remedial Excavation

The remedial excavation was completed at the former diesel UST on February 20, 2015. The excavation was approximately rectangular in shape, measuring 8m by 6.5m, with an average depth of 4.5m (the top of the UST was approximately 3m below grade) for a total volume of approximately 72m^3. All of the soil removed from the UST excavation area was transported to the Ecowaste Landfill at 15111 Williams Road, Richmond, BC, and disposed of as Industrial Quality (i.e. exceeding RL standards).

In total, approximately 130 tonnes of soil were transported to the Ecowaste Landfill and disposal as Industrial Quality from the remedial excavation. The soil was stockpiled and removed along with other fill soils on the Site. In total, 968 tonnes of material was disposed of at Ecowaste on February 24, 2015. Soil disposal documentation is provided in Appendix B. Photographs are provided in Appendix C.

4.3 *Geology and Hydrogeology*

Review of the surficial geology map of the Site indicates the Site is underlain by Glacial Drift, including lodgment and minor flow till.

The soil encountered in the UST remedial excavation area generally consisted of dense, compact till, consisting mainly of silts, with trace sand and trace gravel.

No groundwater seepage was observed within the excavation. Trace hydrocarbon sheen was observed on the precipitation water directly adjacent to the UST water during preliminary excavation work. No groundwater was discharged from the Site.

4.4 Remedial Excavation Closure

Following remediation, closure soil samples were collected directly from the sidewalls and base of the excavation.

All soil samples were immediately placed into laboratory supplied sample jars. The sample jars were completely filled with soil to minimize loss of volatile constituents. To minimize the potential for cross contamination, Active Earth's field representative wore fresh nitrile sampling gloves prior to collecting each soil sample. The sample jars were placed in a cooler, on ice, and delivered under chain of custody protocol to both ALS Environmental and AGAT Laboratories in Burnaby, BC. The sample closure density was in general accordance with BC MOE Technical Guidance Document 1 (TG1).

Results from all closure samples were below the RL and CL standards for LEPH/HEPH and PAH. All closure sample results were additionally within the CSR SRA Standards as set out in Schedule 7 Column II.

All previously identified hydrocarbon-impacted soil associated with the UST has been removed. No hydrocarbon soil contamination (i.e. no hydrocarbon concentrations above the RL or CL standards) was identified at the Site boundary, and therefore no contamination appears to have migrated off-Site, onto City lands.

The excavation closure soil sample locations and results are shown on the attached Figure, and Table 1. Laboratory Certificates are included in Appendix D.

5.0 SUMMARY AND CONCLUSIONS

A UST was identified on-Site during Site excavation activities. The UST was evacuated, removed, and crushed for appropriate off-Site disposal. Preliminary soil investigation work identified LEPH concentrations above the RL standards, but within the CL standards (applicable to the Site), in soil immediately adjacent to the UST.

A remedial excavation was conducted to remove all hydrocarbon-impacted and odourous soil, for appropriate disposal to a permitted facility. The disposal volume is summarized below:

Disposal Summary

Media	Volume	Tonnage	Disposal Class	Disposal Location
Soil	72 m3	130	Industrial Quality	Ecowaste Landfill
UST Contents (Oily Water and Sludge)	6709 Litres	n/a	n/a	Sumas Remediation (Byrne Road)

Closure samples were collected from the walls and base of the excavaton in general accordance with Technical Guidance Document 1. All closure sample results were within the RL and CL standards. The results indicate that no impacted soil remains on-Site, and no soil contamination extends off-Site onto the adjacent City lands.

6.0 CLOSURE

This report has been prepared by Active Earth Engineering Ltd. for Southwest Contracting Ltd. on behalf of the Wall Financial Corporation based on information obtained through recent investigation and remediation work completed under the direction of Active Earth, and other information sources. This report may be relied upon by Southwest Contracting Ltd., Wall Financial Corporation, and the City of Vancouver.

Active Earth has relied on data, studies, plans, specifications and documents prepared by others, and accepts no responsibility for information contained in them. The environmental investigations were limited to those areas and contaminants specifically addressed in this report.

This report is believed to provide a reasonable representation of general environmental condition at the Site in the vicinity of the former diesel UST. The conclusions made in this report reflect Active Earth's best judgment in light of the information available at the time of reporting. Should additional information become available or Site conditions change, the conclusions and recommendations of this report may be subject to change.

Any use which the client or a third party, other than those specifically listed above, makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such parties. Active Earth accepts no responsibility for damages, if any, suffered by third parties as a result of business decisions made or actions based on this report.

We trust that this provides the information you currently require. If you have any questions or comments, please feel free to contact the undersigned.

Yours truly,
ACTIVE EARTH ENGINEERING LTD.

Reviewed by:

Bob Reid, EIT
Project Engineer

Jeff Taylor, P.Eng., CSAP
Senior Engineer

Attachments:

Tables

Table 1: Soil Hydrocarbon Analytical Results

Figures

Figure: Former Diesel UST - Excavation Closure

Appendices

Appendix A: Tank Removal Permit
Appendix B: Soil and Waste Disposal Documentation
Appendix C: Photographs
Appendix D: Laboratory Certificates

FIGURES

PROJECT NORTH

N

NOTE:
UST-2-1 (BLUE) AND UST-2-2 (GREEN) WERE INTERIM SAMPLES SINCE EXCAVATED

FORMER UST (REMOVED)

REMEDIAL EXCAVATION EXTENTS (FEBRUARY 2015)

CONCRETE FOUNDATION

UST-2-1

UST-2-2

NW

WW

B

EW

SW

DRAKE STREET

RICHARDS STREET

Location	ID	Depth (m)	LEPH	HEPH	PAHs
UST 2 Excavation	UST-NW	3.75	<	<	<
	UST-EW	3.75	<	<	<
	UST-SW	3.75	<	<	<
	UST-WW	3.75	<	<	<
	UST-B	4.5	<	<	<

498 DRAKE STREET
(1300 RICHARDS STREET)

SITE

LANE

499 PACIFIC STREET

1323 HOMER STREET

LEGEND

APPROXIMATE LEGAL LOT LINE

TEST PIT

CONFIRMATORY SAMPLE ANALYTICAL RESULTS

GREEN	< CSR RL
BLUE	≥ CSR RL < CSR CL
RED	≥ CSR CL
■	FLOOR SAMPLE
▲	WALL SAMPLE

1:250 0 5 15m

REFERENCE: CITY OF VANCOUVER – VANMAP

NOTE: "*" IN SYMBOL LABEL REPRESENTS SAMPLE EXCAVATED

Active Earth Engineering Ltd

CLIENT NAME: SOUTHWEST CONTRACTING LTD	PROJECT LOCATION: VANCOUVER, BC
TITLE: **FORMER HEATING OIL TANK EXCAVATION CLOSURE 498 DRAKE STREET**	
DWN BY: GM	DWG NAME: 816-1
CHK'D: SB	PLOT: City of Vancouver FOI #2018-010, page 0350

DATE: 2015-03-11

CADD FILE: 816

FIGURE 1

PATH:

TABLES

Analytical Table Footnotes: Analytical Results for Soil

	All concentrations in ug/g, except pH.
	All terms defined within the body of Active Earth's report.
"<"	Result is less than the laboratory detection limit indicated.
"-"	Parameter not analyzed or no standard or guideline applies.
*	RPDs are not normally calculated where one or more concentrations are less than five times MDL.
(1)	BC Contaminated Sites Regulation (CSR BC Reg. 375/96 includes amendments up to BC Reg. 4/2014) Generic Numerical Soil Standards (Schedules 4 and 10) and Matrix Numerical Soil Standards (Schedule 5), considering the site specific factors of toxicity to soil invertebrates and plants, groundwater flow to marine aquatic life, and groundwater used for drinking water, for Residential (RL) and Commercial (CL) Land Use.
(2)	BC Contaminated Sites Regulation (CSR BC Reg. 375/96 includes amendments up to BC Reg. 4/2014) Standards Triggering Contaminated Soil Relocation Agreements (Schedule 7) for Soil Relocation to Non-Agricultural Lands (Column II). If soils exceed these standards, a Soil Relocation Agreement is required to dispose of soils off-Site, without authorization.
(3)	The standards referenced are for light extractable petroleum hydrocarbons (LEPH) and heavy extractable petroleum hydrocarbons (HEPH), which are corrected for polyaromatic hydrocarbons (PAHs). EPH (c 10 - c 19) and EPH (c19 - c32) are uncorrected for PAH.

BOLD, BLUE SHADING	Concentration > CSR RL Standard.
BOLD, RED SHADING	Concentration > CSR CL Standard.
Underline, Grey Shading	Concentration >CSR SRA Standard.

Table 1: Analytical Results for Hydrocarbons in Soil

Site Area				Heating Oil Tank Excavation 2									
Sample Location				Stockpile	Base					West Wall	North Wall	South Wall	East Wall
Sample ID				UST-SP-COMP	UST2-1	UST2-2	UST-B	DUP1	RPD	UST-WW	UST-NW	UST-SW	UST-EW
Depth (m)				n/a	3.5	3.5	4.5		%	3.75	3.75	3.75	3.75
Fill / Native Soil				Native	Native	Native	Native			Native	Native	Native	Native
Vapour Reading (ppm)				-	-	-	-			-	-	-	-
Excavated / Remains				Excavated	Excavated	Excavated	Remains			Remains	Remains	Remains	Excavated
Date Sampled				20-FEB-15	19-Feb-15	19-Feb-15	20-FEB-15			20-FEB-15	20-FEB-15	20-FEB-15	20-FEB-15
	CSR Standards (1)												
	RL (1)	CL (1)	SRA (2)										
Extractable Petroleum Hydrocarbons (ug/g)													
LEPH	**1000**	**2000**	**2000**	<200	**1920**	195	<200	<200		<200	<200	<200	<200
HEPH	**1000**	**5000**	**5000**	<200	274	65	<200	<200		<200	<200	<200	<200
EPH10-19	**1000**	**2000**	**1000**	<200	-	-	<200	<200	*	<200	<200	<200	<200
EPH19-32	**1000**	**5000**	**1000**	<200	-	-	<200	<200	*	<200	<200	<200	<200
Volatile Petroleum Hydrocarbons (ug/g)													
VHs6-10	-	-	-	-			-	-	-	-	-	-	-
VPHs	**200**	**200**	**200**	-			-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons (ug/g)													
Acenaphthene	**-**	**-**	**-**	0.315	<0.01	0.01	<0.050	<0.050	*	<0.050	<0.050	<0.050	0.083
Acenaphthylene	**-**	**-**	**-**	<0.050	<0.01	<0.01	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Anthracene	**-**	**-**	**-**	0.134	<0.02	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Benz(a)anthracene	**1**	**10**	**1**	<0.050	<0.02	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Benzo(a)pyrene	**1**	**10**	**1**	<0.050	<0.05	<0.05	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Benzo(b)fluoranthene	**1**	**10**	**1**	<0.050	<0.02	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Benzo(g,h,i)perylene	**-**	**-**	**-**	<0.050	<0.05	<0.05	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Benzo(k)fluoranthene	**1**	**10**	**1**	<0.050	<0.02	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Chrysene	**-**	**-**	**-**	<0.050	<0.05	<0.05	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Dibenz(a,h)anthracene	**1**	**10**	**1**	<0.050	<0.02	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Fluoranthene	**-**	**-**	**-**	0.222	0.05	<0.05	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Fluorene	**-**	**-**	**-**	0.244	0.22	0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Indeno(1,2,3-c,d)pyrene	**1**	**10**	**1**	<0.050	<0.02	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
2-Methylnaph halene	**-**	**-**	**-**	0.408	1.35	0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Naphthalene	**5**	**50**	**5**	0.114	<0.01	<0.01	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Phenanthrene	**5**	**50**	**5**	0.318	<0.02	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050
Pyrene	**10**	**100**	**10**	0.185	0.06	<0.02	<0.050	<0.050	*	<0.050	<0.050	<0.050	<0.050

Notes:
Associated Lab Files: 15V946791, L1580393

BOLD, BLUE SHADING	Concentration greater than CSR Residential Land Use (RL) Standard.
BOLD, RED SHADING	Concentration greater than CSR Commercial Land Use (CL) Standard.
Underline, Grey Shading	Concentration greater than CSR Soil Relocation Agreement (SRA) Standard.

APPENDIX A

Tank Removal Permit

453 WEST 12TH
VANCOUVER, B.C. V5Y 1V4
TEL : 604-873-7595 FAX : 604-873-7100

CITY OF VANCOUVER

DATE ISSUED	PERMIT TYPE		PERMIT NUMBER
FEBRUARY 20, 2015	FIRE PREVENTION DIVISION PERMIT	P	FI 412083

LEGAL DESCRIPTION				ADDRESS
LOT	BLOCK	PLAN	DIST	1300 RICHARDS ST

ADDITIONAL ADDRESS INFORMATION

SPECIFICS

APPLICATION DATE	PURPOSE	PROJECT VALUE	ASSESSED VALUE	PLANS	METRIC	PLACE NAME
FEB 20, 2015	REMOVAL				NO	

TEMPORARY PERMIT DATES	TEMPORARY USE DATES	SUBTYPE

APPLICANT	CONTACT 2	CONTACT 3
CONTRACTOR ACTIVE EARTH ENGINEERING LTD SHANNON KNEALE 4510 SADDLEHORN CRES LANGELY BC V2Z 1J6		
TEL 604-856-5119 FAX	BUS.LICENSE 468766 CERTIFICATE	TEL FAX BUS.LICENSE CERTIFICATE	TEL FAX BUS.LICENSE CERTIFICATE

PURSUANT TO THE FIRE BY-LAW, THE FOLLOWING WORK IS HEREBY AUTHORIZED:

TO REMOVE ONE TANK ON SITE; CAP=2000LTRS, SETBACK IS 4.50M FROM NORTH PL; BOTTOM OF TANK IS AT 3.5M, TYPE OF LIQUID IS PETROLEUM.

PERMIT CONDITIONS AND NOTES:

001 THE WORK UNDER THIS PERMIT IS AUTHORIZED PURSUANT TO THE FIRE BY-LAW.
020 Clearance is required from the Engineering Department, Streets Division, for work affecting .....
030 For removal: the tanks, together with connected piping and dispensing equipment, shall have all combustible or flammable liquids removed. The tanks and piping must be removed from the ground and purged of vapours. The pipe ends must be permanently sealed by capping or plugging.
035 For abandonment: pump out remaining content, steam clean interior, and fill with sand/concrete slurry.
040 Tank removal must comply with subsection 4.10.3 of the Vancouver Fire By-law.
910 Construction must be carried out in compliance with the provisions of Noise Control By-law No. 6555
994 1. This permit shall expire if:
(a) Work authorized by the permit has not commenced within 90 days from the date of issuance; or
(b) Work has been substantially discontinued for a period of 90 days.
2. The premises shall be kept in safe manner with guards, shoring, etc. as required by the Occupational Health and Safety Regulation and city by-laws
3. Environmental Final Closure Report and clearance required
4. Backfill with clean soil required
5. Underground storage tank removal shall be done in accordance with good engineering practice
6. Contractor must be on site for the inspection by the Vancouver Fire and Rescue Services

GENERAL USE	SPECIFICS/LOCATION	AREA (SF)	OCC	GENERAL USE	SPECIFICS/LOCATION	AREA (SF)	OCC
E30 GENERAL OFFICE			D				

ITEM	SPECIFICS/REFERENCE	QTY/AMT	ITEM	SPECIFICS/REFERENCE	QTY/AMT
OIL TANK		1 GU			

APPROVALS REQD BEFORE PERMIT IS COMPLETED INCLUDE :

ENV CONTAMINATION			
FI01 FIRE INSPECTION	BRETT COOKE	604-873-7544	

ADDITIONAL NOTES:

915 To book an inspection call 3-1-1 from within Vancouver or 604-873-7000 from outside Vancouver. The 3-1-1 Centre is open 7 days a week from 7AM to 10PM, 365 days a year. Also, our 24 hour Building Inspections booking request message line is 604-873-7058. For information on how to use it, please contact the 3-1-1 Centre.

AS OWNER OR OWNERS' AGENT, I HAVE VERIFIED THAT THE INFORMATION CONTAINED WITHIN THIS DOCUMENT AND ASSOCIATED PLANS IS CORRECT, AND DESCRIBES A USE, A BUILDING OR A WORK WHICH COMPLIES WITH ALL RELEVANT BY-LAWS AND STATUTES. I ACKNOWLEDGE THAT RESPONSIBILITY FOR BY-LAW COMPLIANCE RESTS WITH THE OWNER AND THE OWNER'S EMPLOYEES, AGENTS AND CONTRACTORS. I WILL INDEMNIFY AND SAVE HARMLESS THE CITY OF VANCOUVER, ITS OFFICIALS, EMPLOYEES AND AGENTS AGAINST ALL CLAIMS, LIABILITIES AND EXPENSES OF EVERY KIND, IN RESPECT OF ANYTHING DONE OR NOT DONE PURSUANT TO THIS APPLICATION OR FACT SHEET OR ENSUING PERMIT, INCLUDING NEGLIGENCE AND/OR THE FAILURE TO OBSERVE ALL BY-LAWS, ACTS OR REGULATIONS.

FEE	AMOUNT	FEE	AMOUNT
657 TANK - OTHER	300.00		

SIGNATURE	
DATE	
ISSUED BY	H POWVALLA
FOR THE	FIRE CHIEF

INVOICE : 775397 TOTAL $300.00

PSD200.01 REVISED FEB/08

2015/02/20 10:43:21

APPLICANT COPY

APPENDIX B

Soil and Waste Disposal Documentation

RL Ecowaste Industries Ltd.
Listing of Tickets
For Feb 24,15
All Tickets
Both Posted & Unposted
Customer ID=4693 Sumas Remediation Services Inc.

Ticket #	Date	Tm In	License	Vehicle Desc	Yds	GVW(kg)	Tare kg	Net Wgt
Customer: 4693 Sumas Remediation Services Inc.								
Material: T141208 1300 Richards St Vcr								
1342507	Feb 24	08:27	4241GS	Kler Truck/Pup	28	43240	17994	25246
1342509	Feb 24	08:31	3567FE	H & K Truck/Pup	28	42790	17746	25044
1342514	Feb 24	08:35	BN7085	ASL Trucking/Pup	28	41840	16966	24874
1342519	Feb 24	08:42	6738JB	NS Gill Truck/Pup	28	41300	17420	23880
1342521	Feb 24	08:47	JA4057	GBS/Pup	28	42740	18180	24560
1342522	Feb 24	08:48	HL8345	M & S Truck/Pup	28	43490	19330	24160
1342526	Feb 24	08:56	CW3295	Bal Bros/Pup	28	42810	17632	25178
1342528	Feb 24	08:58	CE2956	Amendeep Truck/Pup	28	40650	16020	24630
1342531	Feb 24	09:01	HM9537	TS Mahal Truck/Pup	28	41770	17108	24662
1342533	Feb 24	09:05	EW5925	H Nijjar Lndscp/Pup	28	42380	17720	24660
1342535	Feb 24	09:10	EK3999	01888 Trucking/Pup	28	42200	16762	25438
1342537	Feb 24	09:12	DL5313	DSM Excav/Pup	28	42940	17700	25240
1342586	Feb 24	10:45	4241GS	Kler Truck/Pup	28	41300	17994	23306
1342589	Feb 24	10:50	3567FE	H & K Truck/Pup	28	41790	17746	24044
1342590	Feb 24	10:51	BN7085	ASL Trucking/Pup	28	41790	16966	24824
1342592	Feb 24	10:53	6738JB	NS Gill Truck/Pup	28	42650	17166	25484
1342595	Feb 24	10:55	JA4057	GBS/Pup	28	42050	18180	23870
1342598	Feb 24	10:58	HL8345	M & S Truck/Pup	28	41460	19330	22130
1342602	Feb 24	11:04	CE2956	Amendeep Truck/Pup	28	39690	16116	23574
1342605	Feb 24	11:07	HM9537	TS Mahal Truck/Pup	28	40990	17108	23882
1342608	Feb 24	11:10	DL5313	DSM Excav/Pup	28	42900	17710	25190
1342609	Feb 24	11:11	EW5925	H Nijjar Lndscp/Pup	28	42320	17376	24944
1342614	Feb 24	11:16	EK3999	01888 Trucking/Pup	28	41940	16762	25178
1342660	Feb 24	12:14	CW3295	Bal Bros/Pup	28	42600	17632	24968
1342669	Feb 24	12:32	4241GS	Kler Truck/Pup	28	41340	17994	23346
1342673	Feb 24	12:38	3567FE	H & K Truck/Pup	28	41380	17746	23634
1342674	Feb 24	12:40	BN7085	ASL Trucking/Pup	28	39810	16966	22844
1342677	Feb 24	12:45	6738JB	NS Gill Truck/Pup	28	41660	17166	24494
1342681	Feb 24	12:54	JA4057	GBS/Pup	28	41130	18180	22950
1342683	Feb 24	12:56	HL8345	M & S Truck/Pup	28	42480	19330	23150
1342686	Feb 24	12:58	CE2956	Amendeep Truck/Pup	28	39640	16116	23524
1342695	Feb 24	13:08	HM9537	TS Mahal Truck/Pup	28	43880	17108	26772
1342702	Feb 24	13:15	EW5925	H Nijjar Lndscp/Pup	28	42380	17376	25004
1342709	Feb 24	13:22	EK3999	01888 Trucking/Pup	28	38450	16762	21688
1342715	Feb 24	13:28	DL5313	DSM Excav/Pup	28	40490	17378	23112
1342767	Feb 24	14:37	4241GS	Kler Truck/Pup	28	40460	17994	22466
1342771	Feb 24	14:40	3567FE	H & K Truck/Pup	28	40550	17746	22804
1342772	Feb 24	14:41	BN7085	ASL Trucking/Pup	28	41960	16966	24994
1342776	Feb 24	14:49	6738JB	NS Gill Truck/Pup	28	41020	17166	23854
1342779	Feb 24	14:51	JA4057	GBS/Pup	28	42310	18180	24130
SubSubTotal:					1120			967732
Material: T150101 2001 W 10th Ave Vcr								
1342587	Feb 24	10:46	EF8540	A & G Excavating/Pup	28	41450	18330	23120
Material: T150211 4623 Byrne Rd Bby-500 TON/DAY								
1342489	Feb 24	07:58	FA2800	JS Nijjar/Pup	28	39270	17620	21650
1342494	Feb 24	08:06	DD8337	Richport Truck/Pup	28	42570	18028	24542
1342498	Feb 24	08:11	FD0559	Pahl Truck/Pup	28	42420	17858	24562
1342544	Feb 24	09:25	FA2800	JS Nijjar/Pup	28	42560	17620	24940
1342546	Feb 24	09:28	FD0559	Pahl Truck/Pup	28	42990	17858	25132
1342554	Feb 24	09:43	DD8337	Richport Truck/Pup	28	42120	18028	24092
1342572	Feb 24	10:12	1611JS	Pahl Truck/Pup #26	28	41560	17568	23992
1342579	Feb 24	10:35	FD0559	Pahl Truck/Pup	28	42100	17858	24242
1342581	Feb 24	10:40	FA2800	JS Nijjar/Pup	28	40160	17620	22540

02-114

BILL OF LADING

LT# 0638 19462

ADVANTAGE
Waste Specialties, Inc.
www.advantagewaste.com
Box 164, Fort Langley, B.C. V1M 2R5 Bus: (604) 451-4578 • Fax: (604) 451-4579

DATE: FEB. 20, 2015
PURCHASE ORDER NUMBER:

SHIPPER (FROM)	CONSIGNEE (TO)
ACTIVE EARTH	AWS
STREET: 498 DRAKE ST.	STREET: 1051 PAGE ST.
CITY/PROVINCE: VANCOUVER, B.C. POSTAL CODE:	CITY/PROVINCE: RICHMOND, B.C. POSTAL CODE:

BILLING ADDRESS, IF DIFFERENT:

SPECIAL INSTRUCTIONS: ARR- 2:00PM DEP- 3:20 PM

PIECES	UNIT	DESCRIPTION OF ARTICLES AND SPECIAL MARKS	DANGEROUS GOODS CLASS.	DANGEROUS GOODS P.I.N.	DANGEROUS GOODS PKG/GRP	WEIGHT (KGS)
6709	l	OILY WATER (3% OIL	N/A	N/R	N/A	6709 kg
		2 UST'S				
		TOTAL VOLUME 6,709 l.				
		P.O. # 816				

EMERGENCY RESPONSE TELEPHONE NO.	TYPE OF PLACARD	QUANTITY	EMERGENCY RESPONSE PLAN NO.
604-451-4578	NONE		

DIMENSIONS: TOTAL CUBIC FEET:

NOTICE OF CLAIM: (a) No carrier is liable for loss, damage or delay to any goods under the Bill of Lading unless notice thereof setting out particulars of the origin, destination and date of shipment of the goods and the estimated amount claimed in respect of such loss, damage or delay is given in writing to the originating carrier or the delivering carrier within sixty (60) days after the delivery of the goods, or, in the case of failure to make delivery, within nine (9) months from the date of shipment. (b) The final statement of the claim must be filed within nine (9) months from the date of shipment together with a copy of the paid freight bill.

REC'D BY:

RECEIVED at the point of origin on the date specified, from the consignor mentioned herein, the property herein described, in apparent good order, except as noted (contents and conditions of contents of package unknown) marked, consigned and destined as indicated below, which the carrier agrees to carry and to deliver to the consignee at the said destination, if on its own authorized route or otherwise to cause to be carried by another carrier on the route to said destination, subject to the rates and classification in effect on the date of shipment.

It is mutually agreed, as to each carrier of all or any of the goods over all or any portion of the route to destination, and as to each party of any time interested in all or any of the goods, that every service to be performed hereunder shall be subject to all the conditions not prohibited by law, whether printed or written including conditions set aside by the standard bill of lading, in power at the date of issuing, which are hereby agreed by the consignor and accepted for himself and his assigns.

The Contract for the carriage of the goods listed in the bill of lading is governed by regulation in force in the jurisdiction at the time and place of shipment and is subject to the conditions set out in such regulations.

AT: RICHMOND

DATE: FEB 24/15

PER: Bob Reid	PER: Rick Webber	DATE: 2-20-15
SHIPPER: Bob Reid	CARRIER: ADVANTAGE WASTE SPECIALTIES INC.	

APPENDIX C
Photographs

Photo 1 – Looking west. View of the former heating oil UST during removal of residual liquids/sludge.

Photo 2 – Looking west. View of the former UST during removal.

Photo 3 – Looking northeast. Shows the completed remedial excavation.

Photo 4 – Looking north. Shows the completed remedial excavation following additional excavation work to remove adjacent fills.

APPENDIX D
Laboratory Certificates

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

CLIENT NAME: ACTIVE EARTH ENGINEERING
4510 SADDLE HORN CRESCENT
LANGLEY, BC V2Z1J6
(778) 888-0473

ATTENTION TO: Steve Boyce

PROJECT: 816

AGAT WORK ORDER: 15V946791

TRACE ORGANICS REVIEWED BY: Andrew Garrard, B.Sc., General Manager

DATE REPORTED: Feb 23, 2015

PAGES (INCLUDING COVER): 8

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (778) 452-4000

*NOTES
VERSION 1: Sample receipt temperature 4°C.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 15V946791

PROJECT: 816

CLIENT NAME: ACTIVE EARTH ENGINEERING

ATTENTION TO: Steve Boyce

SAMPLING SITE:

SAMPLED BY:

Active Earth LEPH / HEPH Soil

DATE RECEIVED: 2015-02-20

DATE REPORTED: 2015-02-23

		SAMPLE DESCRIPTION:		UST2-1	UST2-2
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2/19/2015	2/19/2015
Parameter	**Unit**	**G / S**	**RDL**	**6326798**	**6326799**
Acenaphthene	µg/g		0.01	<0.01	0.01
Acenaphthylene	µg/g		0.01	<0.01	<0.01
Anthracene	µg/g		0.02	<0.02	<0.02
Benzo(a)anthracene	µg/g	1	0.02	<0.02	<0.02
Benzo(a)pyrene	µg/g		0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g	1	0.02	<0.02	<0.02
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g	1	0.02	<0.02	<0.02
Chrysene	µg/g		0.05	<0.05	<0.05
Dibenzo(a,h)anthracene	µg/g	1	0.02	<0.02	<0.02
Fluoranthene	µg/g		0.05	0.05	<0.05
Fluorene	µg/g		0.02	0.22	0.02
Indeno(1,2,3-c,d)pyrene	µg/g		0.02	<0.02	<0.02
2-Methylnaphthalene	µg/g		0.01	1.35	0.02
Naphthalene	µg/g		0.01	<0.01	<0.01
Phenanthrene	µg/g	5	0.02	<0.02	<0.02
Pyrene	µg/g	10	0.02	0.06	<0.02
LEPH C10-C19	µg/g	1000	20	**1920**	195
HEPH C19-C32	µg/g	1000	20	274	65
Surrogate	**Unit**	**Acceptable Limits**			
Nitrobenzene - d5	%	50-130		NA	95
2-Fluorobiphenyl	%	50-130		110	88
P-Terphenyl - d14	%	60-130		104	95

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to BC CSR (RL-G) (Van)

6326798 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.
Nitrobenzene-d5 surrogate is not available due to sample matrix interference.

6326799 Results are based on dry weight of sample.
LEPH & HEPH results have been corrected for PAH contributions.

Certified By:

AGAT Laboratories

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FAX (778)452-4074
http://www agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 15V946791

PROJECT: 816

CLIENT NAME: ACTIVE EARTH ENGINEERING

ATTENTION TO: Steve Boyce

SAMPLING SITE:

SAMPLED BY:

BTEX / VPH (C6-C10) Soil

DATE RECEIVED: 2015-02-20

DATE REPORTED: 2015-02-23

		SAMPLE DESCRIPTION:		UST2-1
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2/19/2015
Parameter	**Unit**	**G / S**	**RDL**	**6326798**
Methyl tert-butyl ether (MTBE)	µg/g	320	0.1	<0.1
Benzene	µg/g	0.04	0.02	<0.02
Toluene	µg/g	2.5	0.05	<0.05
Ethylbenzene	µg/g	7	0.05	<0.05
m&p-Xylene	µg/g	20	0.05	<0.05
o-Xylene	µg/g	20	0.05	<0.05
Styrene	µg/g	5	0.05	<0.05
VPH	µg/g	200	10	<10
VH	µg/g		10	<10
Total Xylenes	ug/g		0.1	<0.1
Surrogate	**Unit**	**Acceptable Limits**		
Bromofluorobenzene	%	70-130		103
Dibromofluoromethane	%	70-130		128
Toluene - d8	%	70-130		126

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to BC CSR (RL-G) (Van)

6326798 Results are based on dry weight of sample.
VPH results have been corrected for BTEX contributions.

Certified By:

AGAT Laboratories

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FAX (778)452-4074
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: ACTIVE EARTH ENGINEERING

AGAT WORK ORDER: 15V946791

PROJECT: 816

ATTENTION TO: Steve Boyce

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Feb 23, 2015			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Active Earth LEPH / HEPH Soil															
Acenaphthene	63739	6325260	<0.01	<0.01	0.0%	< 0.01	102%	80%	120%				103%	50%	130%
Acenaphthylene	63739	6325260	<0.01	<0.01	0.0%	< 0.01	102%	80%	120%				104%	50%	130%
Anthracene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	98%	80%	120%				102%	60%	130%
Benzo(a)anthracene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	103%	80%	120%				102%	60%	130%
Benzo(a)pyrene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	100%	80%	120%				98%	60%	130%
Benzo(b)fluoranthene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	107%	80%	120%				88%	60%	130%
Benzo(g,h,i)perylene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	103%	80%	120%				106%	60%	130%
Benzo(k)fluoranthene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	96%	80%	120%				104%	60%	130%
Chrysene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	101%	80%	120%				101%	60%	130%
Dibenzo(a,h)anthracene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	104%	80%	130%				99%	60%	130%
Fluoranthene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	100%	80%	120%				103%	60%	130%
Fluorene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	102%	80%	120%				104%	50%	130%
Indeno(1,2,3-c,d)pyrene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	105%	80%	120%				103%	60%	130%
2-Methylnaphthalene	63739	6325260	<0.01	<0.01	0.0%	< 0.01	104%	80%	120%				100%	50%	130%
Naphthalene	63739	6325260	<0.01	<0.01	0.0%	< 0.01	104%	80%	120%				104%	50%	130%
Phenanthrene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	101%	80%	120%				103%	60%	130%
Pyrene	63739	6325260	0.02	0.02	0.0%	< 0.02	100%	80%	120%				100%	60%	130%
Nitrobenzene - d5	63739	6325260	96	80	18.0%		109%	80%	120%				96%	50%	130%
2-Fluorobiphenyl	63739	6325260	95	80	17.0%		101%	80%	120%				97%	50%	130%
P-Terphenyl - d14	63739	6325260	95	86	10.0%		96%	80%	120%				96%	60%	130%
BTEX / VPH (C6-C10) Soil															
Methyl tert-butyl ether (MTBE)	63739	6325260	<0.1	<0.1	0.0%	< 0.1	102%	80%	120%				96%	70%	130%
Benzene	63739	6325260	<0.02	<0.02	0.0%	< 0.02	101%	80%	120%				98%	70%	130%
Toluene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	100%	80%	120%				97%	70%	130%
Ethylbenzene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	99%	80%	120%				95%	70%	130%
m&p-Xylene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	100%	80%	120%				96%	70%	130%
o-Xylene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	101%	80%	120%				97%	70%	130%
Styrene	63739	6325260	<0.05	<0.05	0.0%	< 0.05	100%	80%	120%				90%	70%	130%
VPH	63739	6325260	<10	<10	0.0%	< 10									
VH	63739	6325260	<10	<10	0.0%	< 10									
Bromofluorobenzene	63739	6325260	96	99	3.0%		102%	70%	130%				87%	70%	130%
Dibromofluoromethane	63739	6325260	104	104	0.0%		102%	70%	130%				85%	70%	130%
Toluene - d8	63739	6325260	101	102	1.0%		101%	70%	130%				84%	70%	130%

Comments: RPDs are calculated using raw analytical data and not the rounded duplicate values reported.

Certified By:

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
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CANADA V5J 0B6
TEL (778)452-4000
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http://www.agatlabs.com

Method Summary

CLIENT NAME: ACTIVE EARTH ENGINEERING

AGAT WORK ORDER: 15V946791

PROJECT: 816

ATTENTION TO: Steve Boyce

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Acenaphthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Acenaphthylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(a)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(b)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(g,h,i)perylene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Benzo(k)fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Chrysene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Dibenzo(a,h)anthracene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluoranthene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Fluorene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Indeno(1,2,3-c,d)pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Methylnaphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Naphthalene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Phenanthrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Pyrene	ORG-180-5102	Modified from BC MOE Lab Manual Section D (PAH)	GC/MS
Nitrobenzene - d5	ORG-180-5102	modified from BC MOE Lab Manual Section D (PAH)	GC/MS
2-Fluorobiphenyl	ORG-180-5102	modified from BC MOE Lab Manual Section D (PAH)	GC/MS
P-Terphenyl - d14	ORG-180-5102	modified from BC MOE Lab Manual Section D (PAH)	GC/MS
LEPH C10-C19	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
HEPH C19-C32	ORG-180-5101	Modified from BCMOE Lab Manual Section D (EPH)	GC/FID
Methyl tert-butyl ether (MTBE)	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Benzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Toluene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Ethylbenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
m&p-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID

AGAT Laboratories

Unit 120, 8600 Glenlyon Parkway
Burnaby, British Columbia
CANADA V5J 0B6
TEL (778)452-4000
FAX (778)452-4074
http://www.agatlabs.com

Method Summary

CLIENT NAME: ACTIVE EARTH ENGINEERING

AGAT WORK ORDER: 15V946791

PROJECT: 816

ATTENTION TO: Steve Boyce

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
o-Xylene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Styrene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VPH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
VH	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS/FID
Bromofluorobenzene	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Dibromofluoromethane	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS
Toluene - d8	ORG-180-5100	Modified from BC MOE Lab Manual Sec D (BTEX, VPH)	GC/MS

AGAT Laboratories

120 - 8600 Glenlyon Parkway
Burnaby, BC V5J 0B6
778.452.4006
webearth.agatlabs.com

Laboratory Use Only
Arrival Temperature: 4°C
AGAT Job Number: FEB 20 AM 11:55 15V946791
Notes: 24 HR TAT ACTIVE EARTH PRICING

Chain of Custody Record

P: 778.452.4000 · F: 778.452.4074

Report Information
Company: ACTIVE EARTH ENG.
Contact: STEVE BOYCE
Address: 106 - 2250 BOUNDARY Rd BURNABY BC
Phone: 778 888 0473 Fax:
LSD:
Client Project #: 816

Report Information
1. Name:
Email: STEVE.BOYCE@ACTIVEEARTH.CA
2. Name:
Email: BOB.REID@ACTIVEEARTH.CA

Report Format
- ☐ Single Sample per page
- ☐ Multiple Samples per page
- ☐ Excel Format Included

Turnaround Time Required (TAT)
Regular TAT ☐ 5 to 7 working days
Rush TAT ☒ Day 2 - 100% ☐ Day 3 - 50% ☐ Day 4 - 25%
Date Required: MONDAY FEB 23 (11am)
PLEASE CONTACT LABORATORY IF RUSH REQUIRED SAMPLE SUBMISSION CUT OFF FOR EFFECTIVE DATE BY 3 PM

Invoice To Same as above Yes ☒ / No ☐
Company:
Contact: CAROL KISACE
Address:
Phone: Fax:
PO/AFE#:

Requirements *(Please Check)*
- ☒ BC CSR Soil
  - ☐ AL
  - ☐ IL
  - ☐ PL
  - ☐ CL
  - ☒ RL
- ☐ BC CSR - Water
  - ☐ DW
  - ☐ AW
  - ☐ IW
  - ☐ LW

Schedule 11 *(Please Specify)*
CCME *(Please Specify)*
Other *(Please Specify)*

LABORATORY USE (LAB ID #)	SAMPLE IDENTIFICATION	SAMPLE MATRIX	DATE/TIME SAMPLED	COMMENTS - SITE SAMPLE INFO. SAMPLE CONTAINMENT	LEPH/HEPH/PAH	BTEX/VPH	NUMBER OF CONTAINERS	PRESERVED (Y/N)	HAZARDOUS (Y/N)	Hold for: ☐ 60 DAYS
6326798	UST2-1	SOIL	19-FEB-15 15:00		X	X	4	Y	N	N
↓ 799	UST2-2	SOIL	"		X		4	Y	N	N

Samples Relinquished By (Print Name and Sign)	Date/Time	Samples Received By (Print Name and Sign)	Date/Time
STEVE BOYCE	20 FEB 15 08:00	Steven Ridley	20 Feb 2015

Page ____ of ____

Nº: 013604

Document #: DIV-186-1501.002 Date Revised: October 24, 2014

AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM - BURNABY

Work Order # 15V946791

RECEIVING BASICS:
Received From: A1 Messenger Waybill #: _____

SAMPLE QUANTITIES:
Coolers: 1 Containers: 8

TIME SENSITIVE ISSUES:
Earliest Date Sampled: 19Feb2015 ALREADY EXCEEDED? Yes (No)

NON-CONFORMANCES:
3 temperatures of samples* and average of each cooler: (record differing temperatures on the CoC next to sample ID's) ***use jars when available**

(1) 4 + 5 + 4 = 4 °C (2) ___ + ___ + ___ = ___ °C (3) ___ + ___ + ___ = ___ °C (4) ___ + ___ + ___ = ___ °C

Was ice or ice pack present: (Yes) No

Integrity Issues:

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date and Time: _____

ADDITIONAL NOTES:

Document #: SR-186-9504.001
Revision Date: July 9, 2014

ACTIVE EARTH ENGINEERING LTD.
ATTN: Bob Reid
160-2250 Boundary Road
Burnaby BC V5M 3Z3

Date Received: 23-FEB-15
Report Date: 24-FEB-15 16:00 (MT)
Version: FINAL

Client Phone: 778-938-9038

Certificate of Analysis

Lab Work Order #: L1580393

Project P.O. #: NOT SUBMITTED
Job Reference: 816
C of C Numbers: 10-388312
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1580393-1	L1580393-2	L1580393-3	L1580393-4	L1580393-5
	Description	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled Date	20-FEB-15	20-FEB-15	20-FEB-15	20-FEB-15	20-FEB-15
	Sampled Time					
	Client ID	UST-NW	UST-SW	UST-EW	UST-WW	UST-B
Grouping	**Analyte**					
SOIL						
Physical Tests	Moisture (%)	7.80	8.88	8.84	6.29	9.04
Hydrocarbons	EPH10-19 (mg/kg)	<200	<200	<200	<200	<200
	EPH19-32 (mg/kg)	<200	<200	<200	<200	<200
	LEPH (mg/kg)	<200	<200	<200	<200	<200
	HEPH (mg/kg)	<200	<200	<200	<200	<200
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050	0.083	<0.050	<0.050
	Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chrysene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	D benz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Fluorene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	2-Methylnaphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Phenanthrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Surrogate: Acenaphthene d10 (%)	78.2	89.6	79.2	92.1	90.1
	Surrogate: Chrysene d12 (%)	96.5	99.3	100.7	112.9	105.7
	Surrogate: Naphthalene d8 (%)	76.8	88.6	80.3	91.7	91.1
	Surrogate: Phenanthrene d10 (%)	88.2	95.4	90.0	98.7	101.2

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1580393-6	L1580393-7			
	Description	SOIL	SOIL			
	Sampled Date	20-FEB-15	20-FEB-15			
	Sampled Time					
	Client ID	DUP1	UST-SP-COMP			
Grouping	**Analyte**					
SOIL						
Physical Tests	Moisture (%)	8.68	12.5			
Hydrocarbons	EPH10-19 (mg/kg)	<200	<200			
	EPH19-32 (mg/kg)	<200	<200			
	LEPH (mg/kg)	<200	<200			
	HEPH (mg/kg)	<200	<200			
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	0.315			
	Acenaphthylene (mg/kg)	<0.050	<0.050			
	Anthracene (mg/kg)	<0.050	0.134			
	Benz(a)anthracene (mg/kg)	<0.050	<0.050			
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050			
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050			
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050			
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050			
	Chrysene (mg/kg)	<0.050	<0.050			
	D benz(a,h)anthracene (mg/kg)	<0.050	<0.050			
	Fluoranthene (mg/kg)	<0.050	0.222			
	Fluorene (mg/kg)	<0.050	0.244			
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050			
	2-Methylnaphthalene (mg/kg)	<0.050	0.408			
	Naphthalene (mg/kg)	<0.050	0.114			
	Phenanthrene (mg/kg)	<0.050	0.318			
	Pyrene (mg/kg)	<0.050	0.185			
	Surrogate: Acenaphthene d10 (%)	76.4	83.7			
	Surrogate: Chrysene d12 (%)	92.7	95.4			
	Surrogate: Naphthalene d8 (%)	76.5	82.6			
	Surrogate: Phenanthrene d10 (%)	86.4	94.2			

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Anthracene	DUP-H	L1580393-1, -2, -3, -4, -5, -6, -7

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
EPH-TUMB-FID-VA	Soil	EPH in Solids by Tumbler and GCFID	BC MOE EPH GCFID

Analysis is in accordance with BC MOE Lab Manual method "Extractable Petroleum Hydrocarbons in Solids by GC/FID", v2.1, July 1999. Soil samples are extracted with a 1:1 mixture of hexane and acetone using a rotary extraction technique modified from EPA 3570 prior to gas chromatography with flame ionization detection (GC-FID). EPH results include Polycyclic Aromatic Hydrocarbons (PAH) and are therefore not equivalent to Light and Heavy Extractable Petroleum Hydrocarbons (LEPH/HEPH).

LEPH/HEPH-CALC-VA	Soil	LEPHs and HEPHs	BC MOE LABORATORY MANUAL (2005)

Light and Heavy Extractable Petroleum Hydrocarbons in Solids. These results are determined according to the British Columbia Ministry of Environment, Lands, and Parks Analytical Method for Contaminated Sites "Calculation of Light and Heavy Extractable Petroleum Hydrocarbons in Solids or Water". According to this method, LEPH and HEPH are calculated
by subtracting selected Polycyclic Aromatic Hydrocarbon results from Extractable Petroleum Hydrocarbon results. To calculate LEPH, the individual results for Naphthalene and Phenanthrene are subtracted from EPH(C10-19). To calculate HEPH, the individual results for Benz(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-c,d)pyrene, and Pyrene
are subtracted from EPH(C19-32). Analysis of Extractable Petroleum Hydrocarbons adheres to all prescribed elements of the BCMELP method "Extractable Petroleum Hydrocarbons in Solids by GC/FID" (Version 2.1, July 20, 1999).

MOISTURE-VA	Soil	Moisture content	ASTM D2974-00 Method A

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

PAH-TMB-H/A-MS-VA	Soil	PAH - Rotary Extraction (Hexane/Acetone)	EPA 3570/8270

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation. Because the two isomers cannot be readily chromatographically separated, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

10-388312

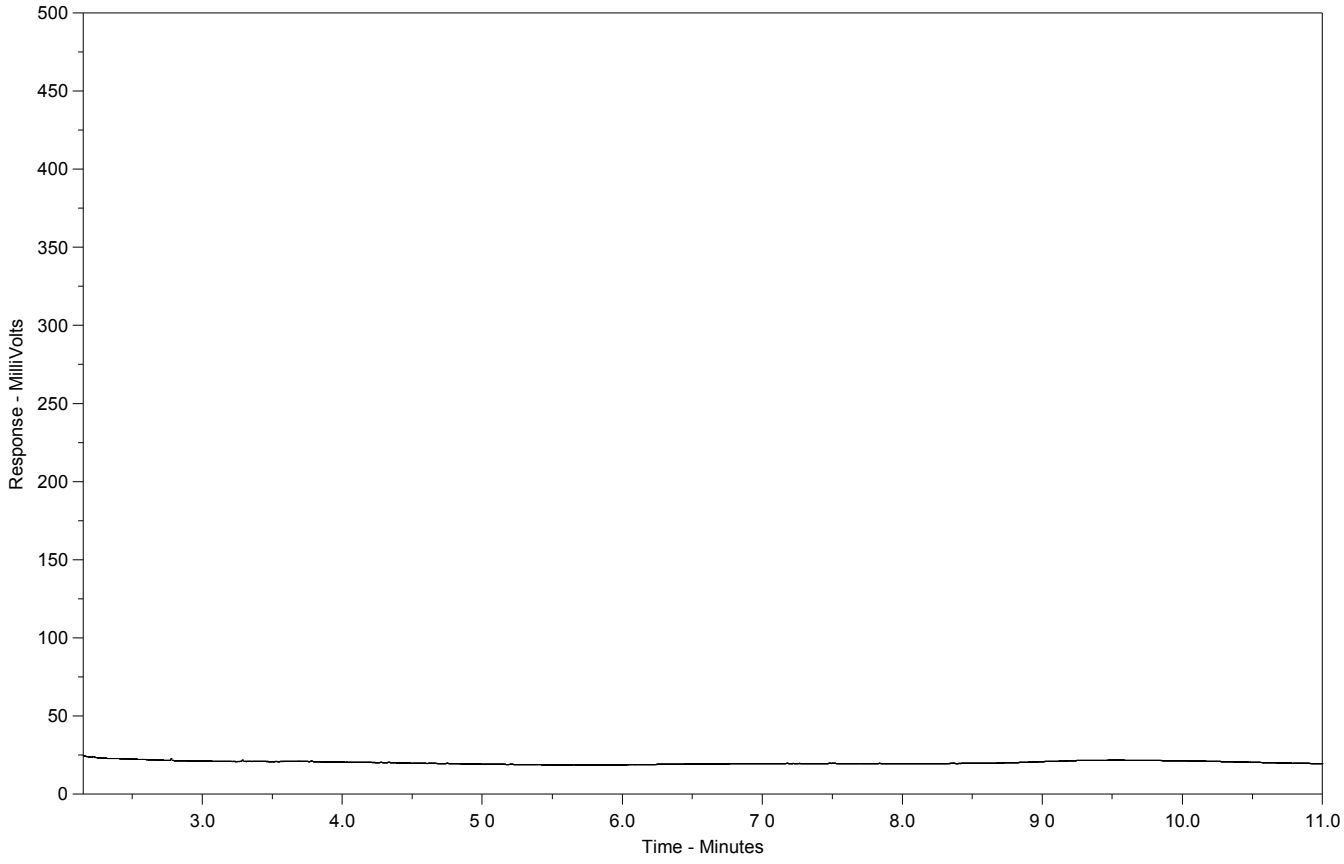
GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Hydrocarbon Distribution Report

ALS Sample ID: L1580393-1
Client Sample ID: UST-NW



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →	← Motor Oils / Lube Oils / Grease →	
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on www.alsglobal.com or upon request.

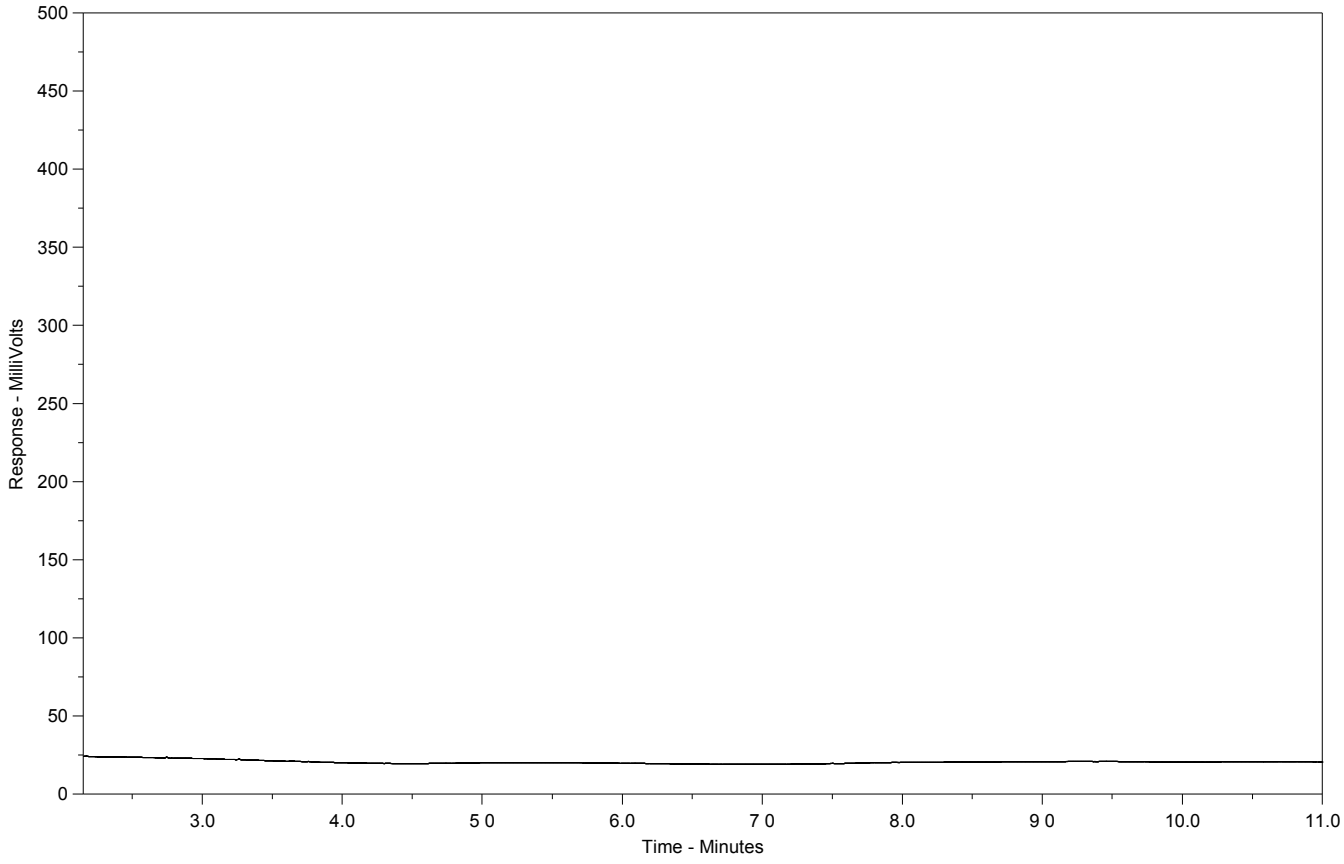
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Hydrocarbon Distribution Report

ALS Sample ID: L1580393-2
Client Sample ID: UST-SW



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →	← Motor Oils / Lube Oils / Grease →	
← Diesel / Jet Fuels →		

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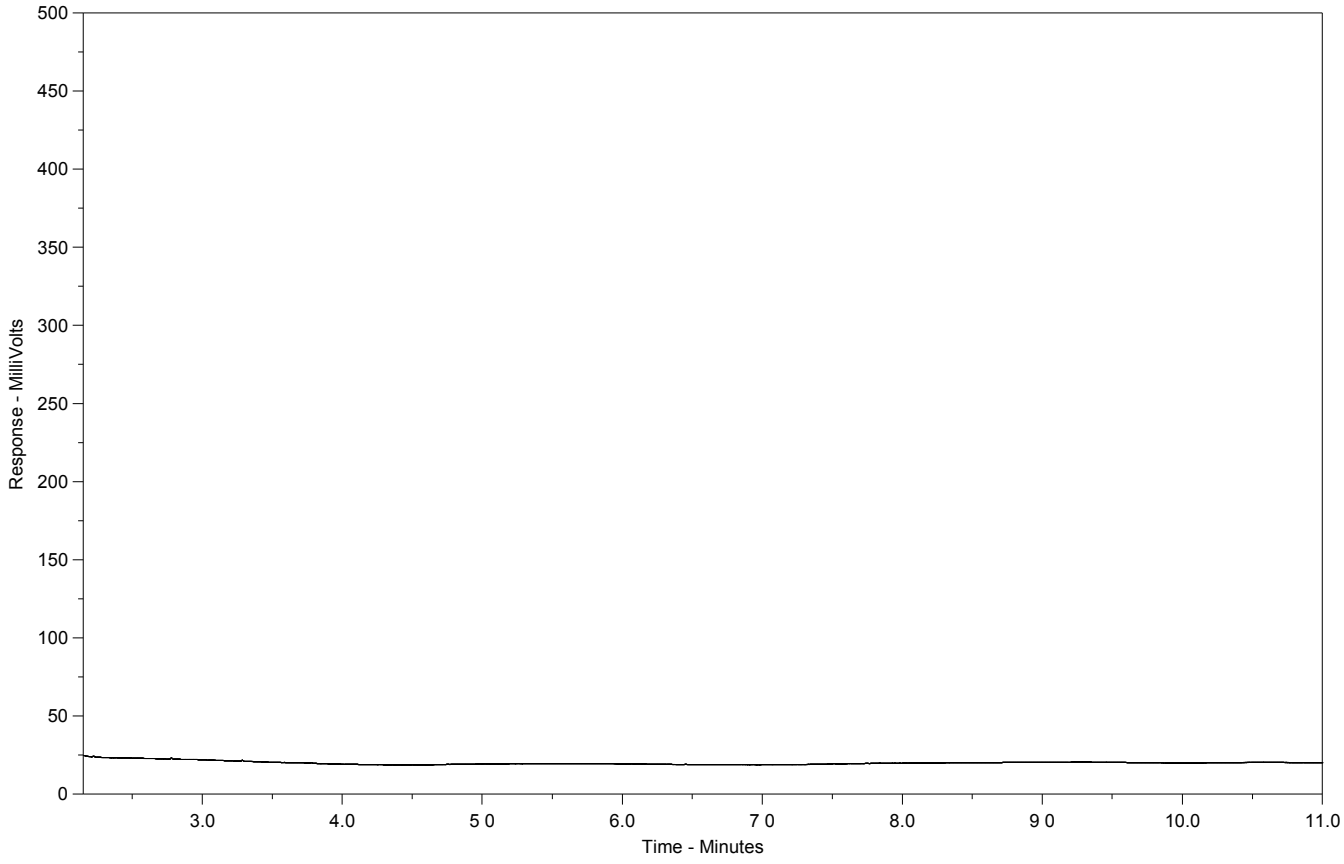
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Hydrocarbon Distribution Report

ALS Sample ID: L1580393-3
Client Sample ID: UST-EW



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →	← Motor Oils / Lube Oils / Grease →	
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on www.alsglobal.com or upon request.

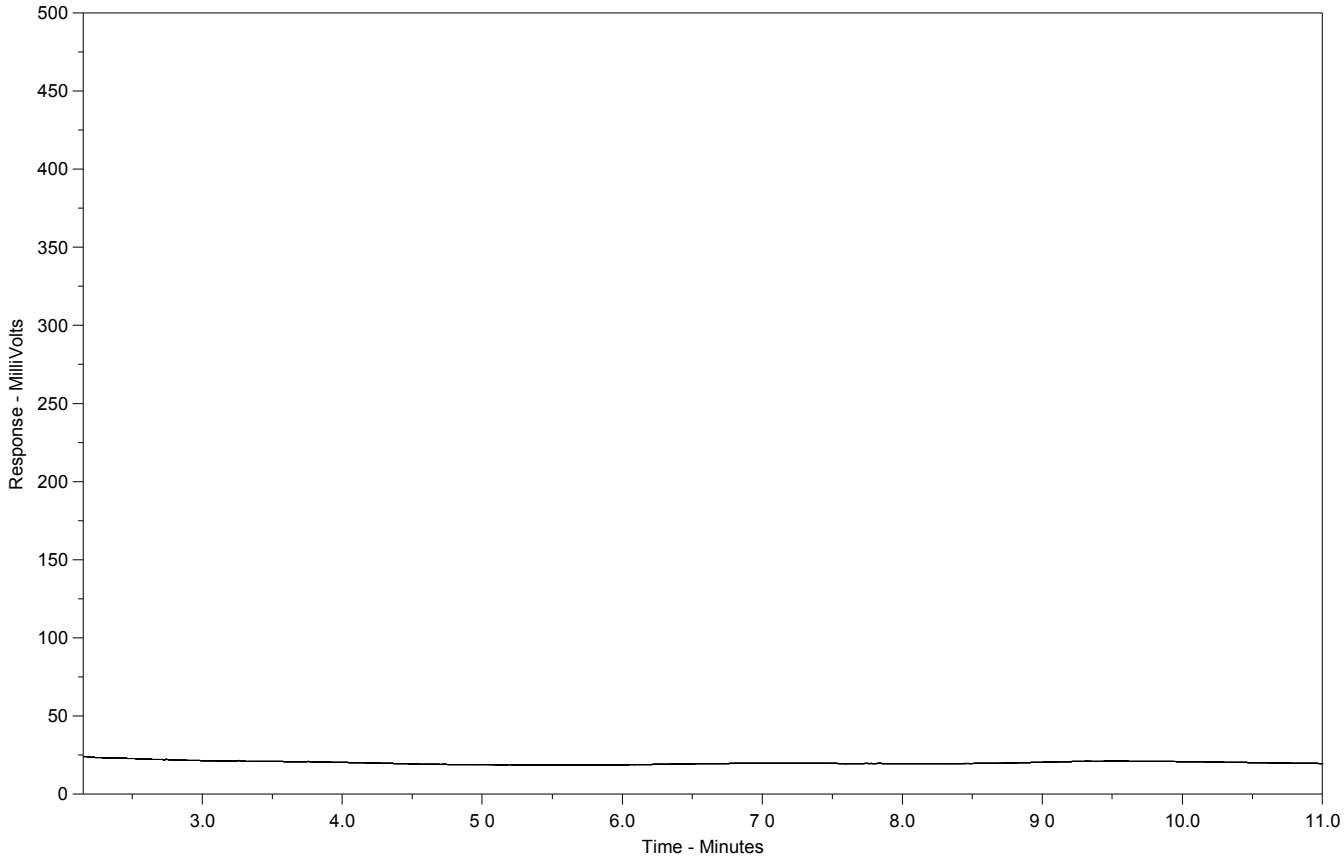
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Hydrocarbon Distribution Report

ALS Sample ID: L1580393-4
Client Sample ID: UST-WW



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →	← Motor Oils / Lube Oils / Grease →	
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on www.alsglobal.com or upon request.

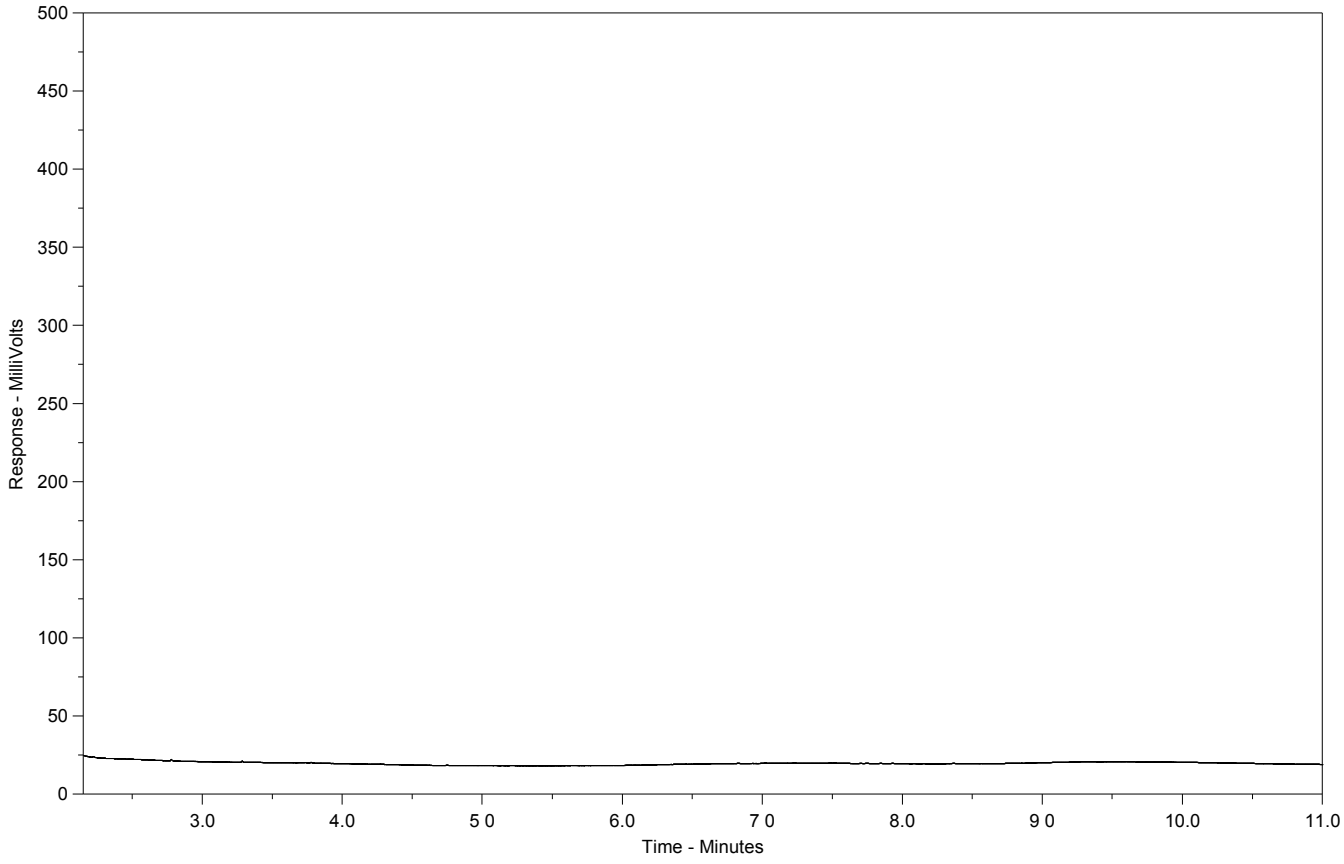
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Hydrocarbon Distribution Report

ALS Sample ID: L1580393-5
Client Sample ID: UST-B



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →	← Motor Oils / Lube Oils / Grease →	
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on www.alsglobal.com or upon request.

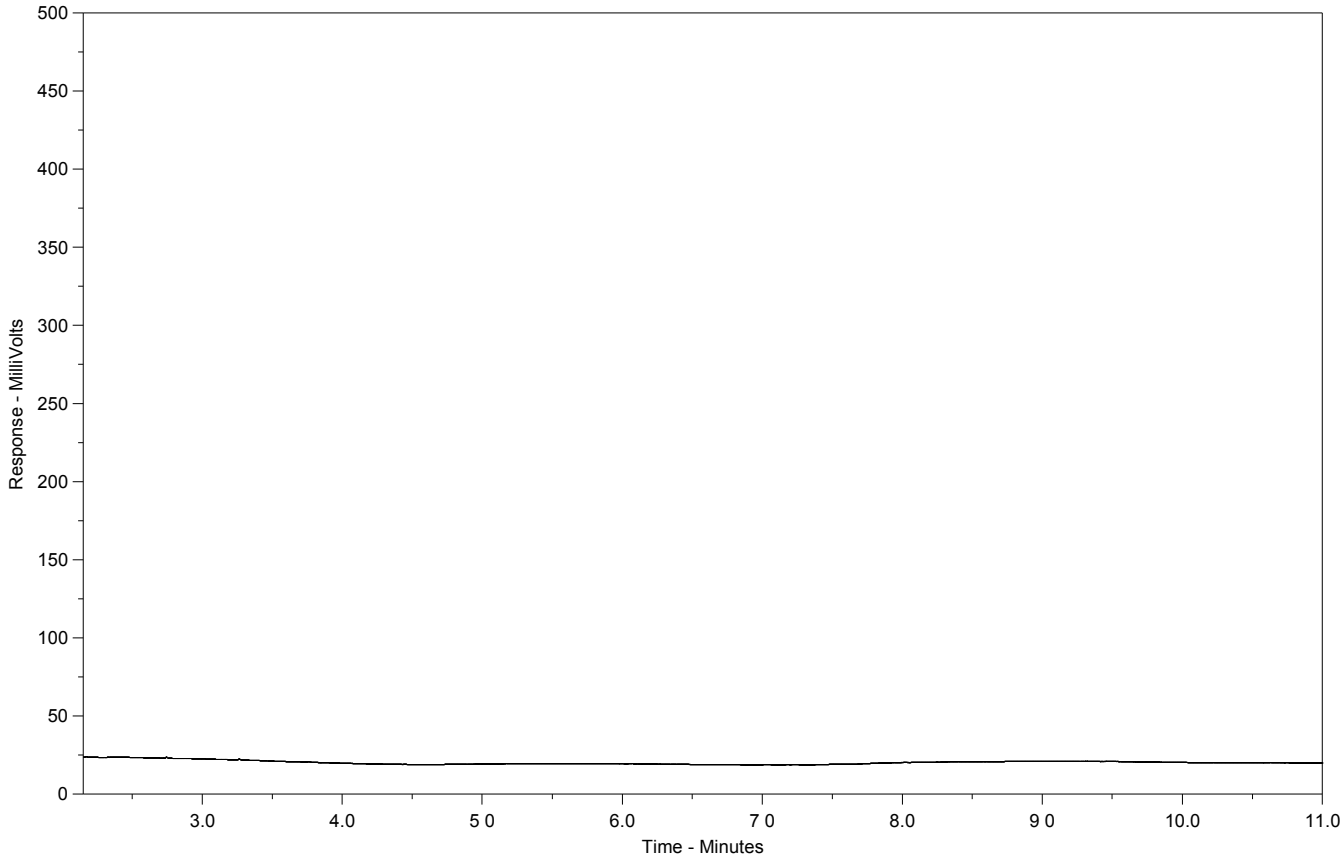
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Hydrocarbon Distribution Report

ALS Sample ID: L1580393-6
Client Sample ID: DUP1



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →	← Motor Oils / Lube Oils / Grease →	
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on www.alsglobal.com or upon request.

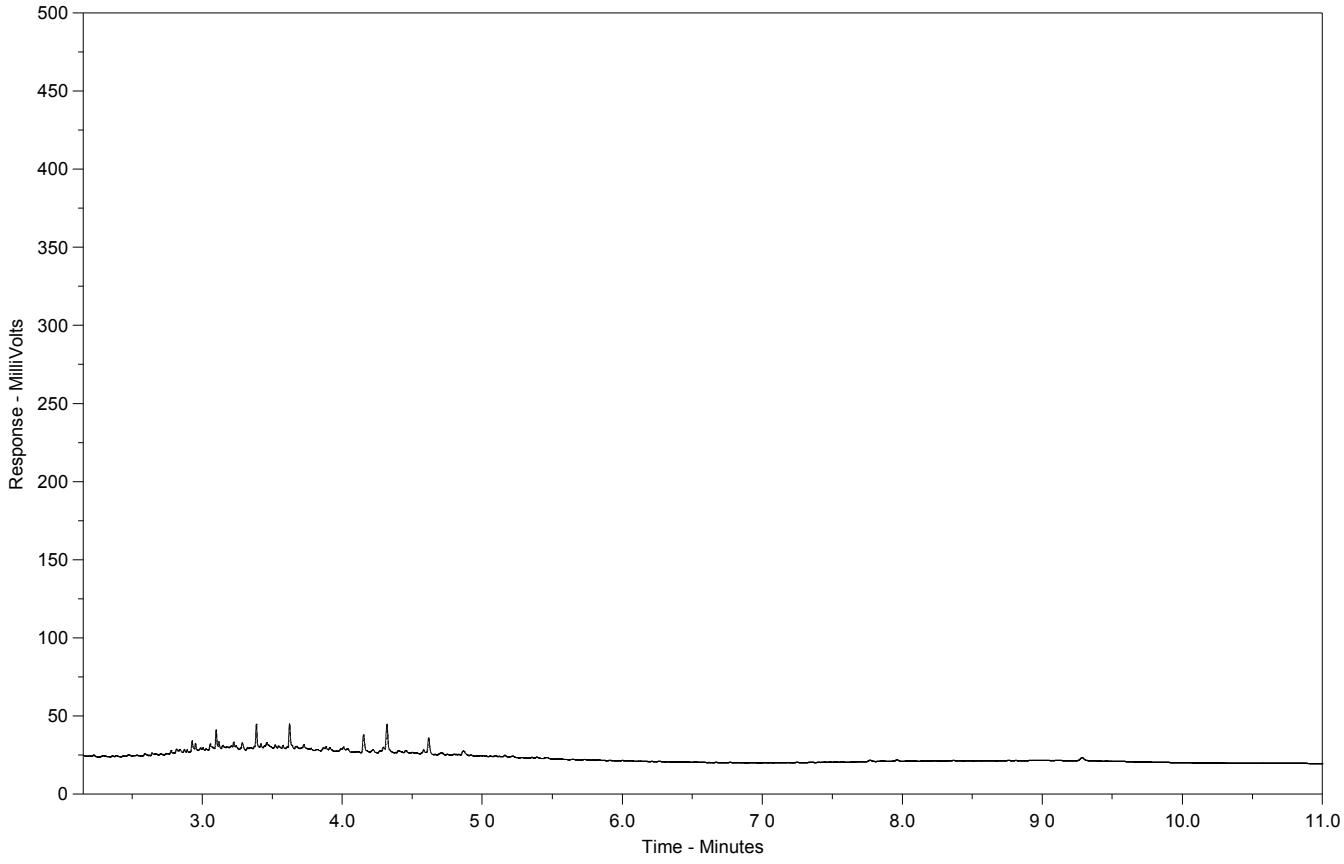
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

Hydrocarbon Distribution Report

ALS Sample ID: L1580393-7
Client Sample ID: UST-SP-COMP



nC10	nC19	nC32
174°C	330°C	467°C
346°F	626°F	873°F
← Gasoline →	← Motor Oils / Lube Oils / Grease →	
← Diesel / Jet Fuels →		

The EPH Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample. For further interpretation, a current library of reference products is available on www.alsglobal.com or upon request.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products, and three n-alkane hydrocarbon marker compounds. Retention times may vary between samples by as much as 0.5 minutes.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the response scale at the left.

A "-L-" in the sample ID denotes a low level sample. A "-S-" denotes a silica gel cleaned sample.

L1580393-COFC

10- 388312

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Page 1 of 1

Report To		Report Format / Distribution		Service Request: (Rush subject to availability - Contact ALS to confirm TAT)
Company:	Active Earth	Standard: ✓ Other (specify):		Regular (Standard Turnaround Times - Business Days)
Contact:	Bob Reid	Select: PDF ✓ Excel ✓ Digital Fax		Priority (2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address:	Burnaby	Email 1:	steve.boyce@activeearth.ca	✓ Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT Feb 24!
		Email 2:		Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone: 778-938-9038	Fax:			Analysis Request

Invoice To	Same as Report ? (circle) Yes or No (if No, provide details)	Client / Project Information	
	Copy of Invoice with Report? (circle) Yes or No	Job #:	816
Company:		PO / AFE:	
Contact:		LSD:	
Address:			
Phone:	Fax:	Quote #:	
Lab Work Order # (lab use only)		ALS Contact:	Sampler:

(Indicate Filtered or Preserved, F/P)

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	LEPH/HEPH/PAH	Number of Containers
	UST-NW	20-Feb-15		Soil	✓	
	UST-SW	↓		↓	✓	
	UST-EW	↓		↓	✓	
	UST-WW	↓		↓	✓	
	UST-B	↓		↓	✓	
	DUP1	↓		↓	✓	

RUSH

Priority processing

Special Instructions / Regulation with water or land use (CCME- Freshwater Aqua... / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

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City of Vancouver FOI #2018-010, page 0382

81 - ENV PROTECTN INSPN	ENV PROTECTION	01 - OPEN	10 Jan 2001	

Action Details

Date	Action by	Action	Action specifics	Reference
10 Jan 2001	H UYEYAMA	060 - OPEN GROUP	-	-
10 Jan 2001	H UYEYAMA	N12 - SOIL ASSESSMENT	01 - ROUTINE	-
10 Jan 2001	H UYEYAMA	R69 - NO ACTION REQUIRED	- RE:DE405476	-
10 Jan 2001	H UYEYAMA	993 - SEE INTERNAL NOTES	-	-
25 May 2001	H UYEYAMA	N30 - APPLICATION	01 - ROUTINE	-
25 May 2001	H UYEYAMA	R90 - ACCEPTED	- RE:BU418324	-
25 May 2001	H UYEYAMA	993 - SEE INTERNAL NOTES	-	-
21 Aug 2002	H UYEYAMA	N58 - COFC REC'D	07 - FILED - DOMINO	-
21 Aug 2002	H UYEYAMA	R90 - ACCEPTED	- RE: CC417808	-
21 Aug 2002	H UYEYAMA	993 - SEE INTERNAL NOTES	-	-

Address 1295 to RICHARDS ST Search

Note Topics

Topic	Rows
190 ENVIRONMENTAL PROTECTION	1

Note Numbers

001 Entered by: H UYEYAMA On: 20010110 Updated by: H UYEYAMA On: 20020821

Note

Jan 10/01:- Re:DE405476:- See note under 1267 Richards. (previous use
of 515 Drake Street was for a residential).
The Building Application for the above Development Application requires
a clearance from the Environmental Protection Branch (ie erosion and
sediment control plan).

May 25/01:- Re:BU418324:- Received an erosion and sediment control plan
for the above project. BU418324 is approved on a performance basis.

Aug 21/02:- Re: OC417808:- Received a copy of Certificate of Compliance
issued by the Ministry of Water, Land and Air Protection for the above
referenced site. The ministry certify that the site have been
satisfactorily remediated for residential land use.

Address 1267 to RICHARDS ST Search

Note Types

Note Type	Number of notes for this permit
09 - INTERNAL NOTES	1

Notes

Number	Title	Included?	List seq	Updated By	Date Updated
081	ENV PROTECTION INSPECTION		081	H UYEYAMA	10 Aug 2001

June 27/00:- Received a site profile for the above referenced site. There was no schedule 2 activity use on the site as noted in the site profile. No further soil issues. OK for approval of Development, Demolition and/or Subdivision/Rezoning Application.

Aug 9/01:- Received a copy of letter from the Ministry of Water, Land and Air Protection for the above referenced site Re: Notice of Commencement of Independent Remediation - 1267 Richards Street. Hold approval of Occupancy until we receive a clearance from the MWLAP or a closure report for the completion of remediation.

Address 1321 to RICHARDS ST Search

Note Topics

Topic	Rows
190 ENVIRONMENTAL PROTECTION	3

Note Numbers

001 Entered by: H UYEYAMA On: 20010611 Updated by: H UYEYAMA On: 20020312

Note

June 11/01:- Re:*P401660:- A site profile is required for the above
referenced site.

Aug 3/01:-Re: DE406078:- A site profile is required for the above refere
nced site.

Mar 12/02:- Re: DE406078:- Received an E-Mail from Ted Price informing
us that they will obtain an AIP from the MWLAP for the above site if
the development goes ahead. Hold approval of DE406078 until an issuance
of AIP from the MWLAP for the site.

002 Entered by: L PETERSEN On: 20061214 Updated by: L PETERSEN On: 20061214

Note

Dec 13/06 DE: 406078 - Site profile received for site. No schedule 2
uses occured on site. Contaminated fill material found on site. As per
e-mails from Mathew Cleary, Keystone, & Real Estate sevives the MoE is

not required in for the DE approval process as no Scedule 2 activites
but the City will obtain a C of C prior to OC. DE is cleared on the
condition of receiving a C of C prior to occupancy, An erosion
sediment control plan is required at the BU applicationstage for our
review & approval & a Waste Discharge Permit will be required for any
groundwater discharged from the site.

003 Entered by: L PETERSEN On: 20080226 Updated by: L PETERSEN On: 20080303

Note

Feb 26/08- Rcv'd a copy of a COC dated Feb 21/08- Site has been
remediated to meet CSR RL soil standards. Conditions - A qualified
environmental consultant must be available to ID, characterize &
appropriately manage any environmental media of suspect quality which
may be encountered during any subsurface work at the site.

81 - ENV PROTECTN INSPN | ENV PROTECTION | 01 - OPEN | 11 Jun 2001

Action Details

Date	Action by	Action	Action specifics	Reference
11 Jun 2001	H UYEYAMA	060 - OPEN GROUP	-	-
11 Jun 2001	H UYEYAMA	N30 - APPLICATION	01 - ROUTINE	-
11 Jun 2001	H UYEYAMA	993 - SEE INTERNAL NOTES	-	-
11 Jun 2001	H UYEYAMA	R32 - FOLLOW-UP REQUIRED	- RE:*P401660	-
03 Aug 2001	H UYEYAMA	N30 - APPLICATION	01 - ROUTINE	-
03 Aug 2001	H UYEYAMA	993 - SEE INTERNAL NOTES	-	-
03 Aug 2001	H UYEYAMA	R32 - FOLLOW-UP REQUIRED	- RE:DE406078	-
12 Mar 2002	H UYEYAMA	R62 - INFORMATION RECVD	- FROM TED PRICE	-
12 Mar 2002	H UYEYAMA	993 - SEE INTERNAL NOTES	-	-
13 Dec 2006	L PETERSEN	N44 - SITE PROFILE	07 - FILED - DOMINO	-
13 Dec 2006	L PETERSEN	993 - SEE INTERNAL NOTES	-	-
24 Oct 2007	L PETERSEN	N31 - ISSUE SC PERMIT	10 - SRCE CNTRL PERMIT	SC - 070375
24 Oct 2007	L PETERSEN	N32 - FEE BILLED	10 - SRCE CNTRL PERMIT	SC - 070375
26 Feb 2008	L PETERSEN	N58 - COFC REC'D	07 - FILED - DOMINO	-
26 Feb 2008	L PETERSEN	993 - SEE INTERNAL NOTES	- RL SOIL	-

Address 1338 to SEYMOUR ST Search

Note Types

Note Type	Number of notes for this permit
09 - INTERNAL NOTES	1

Notes

Number	Title	Included?	List seq	Updated By	Date Updated
081	ENV PROTECTION INSPECTION		081	L KWAN	26 Oct 2009

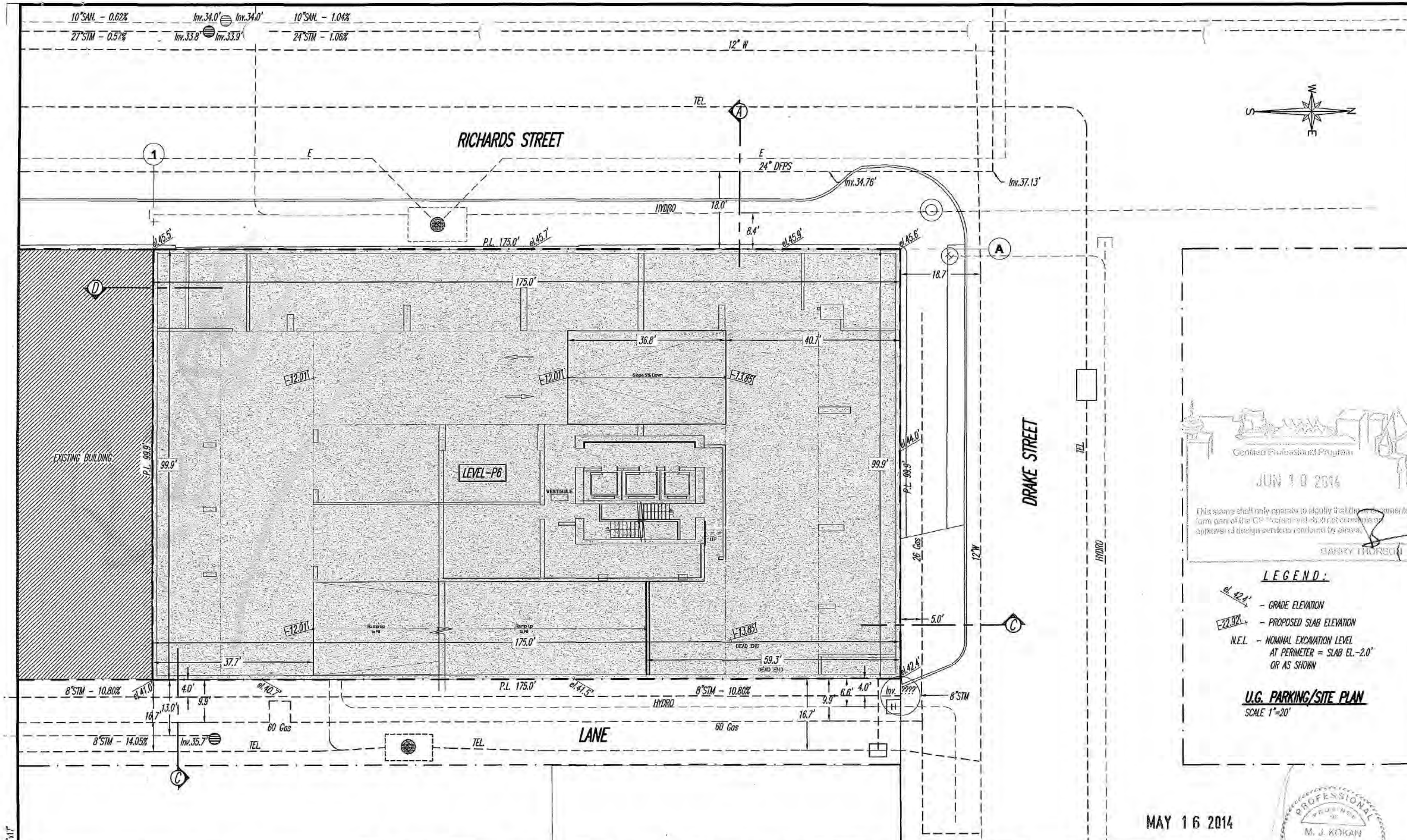
October 20/09: Waste Discharge permit for dewatering activities onsite including geothermal drilling.

October 23/09: WDP issue date - permit for 180 days.

81 - ENV PROTECTN INSPN EP01 ENV PROTECTION 01 - OPEN 21 Oct 2008

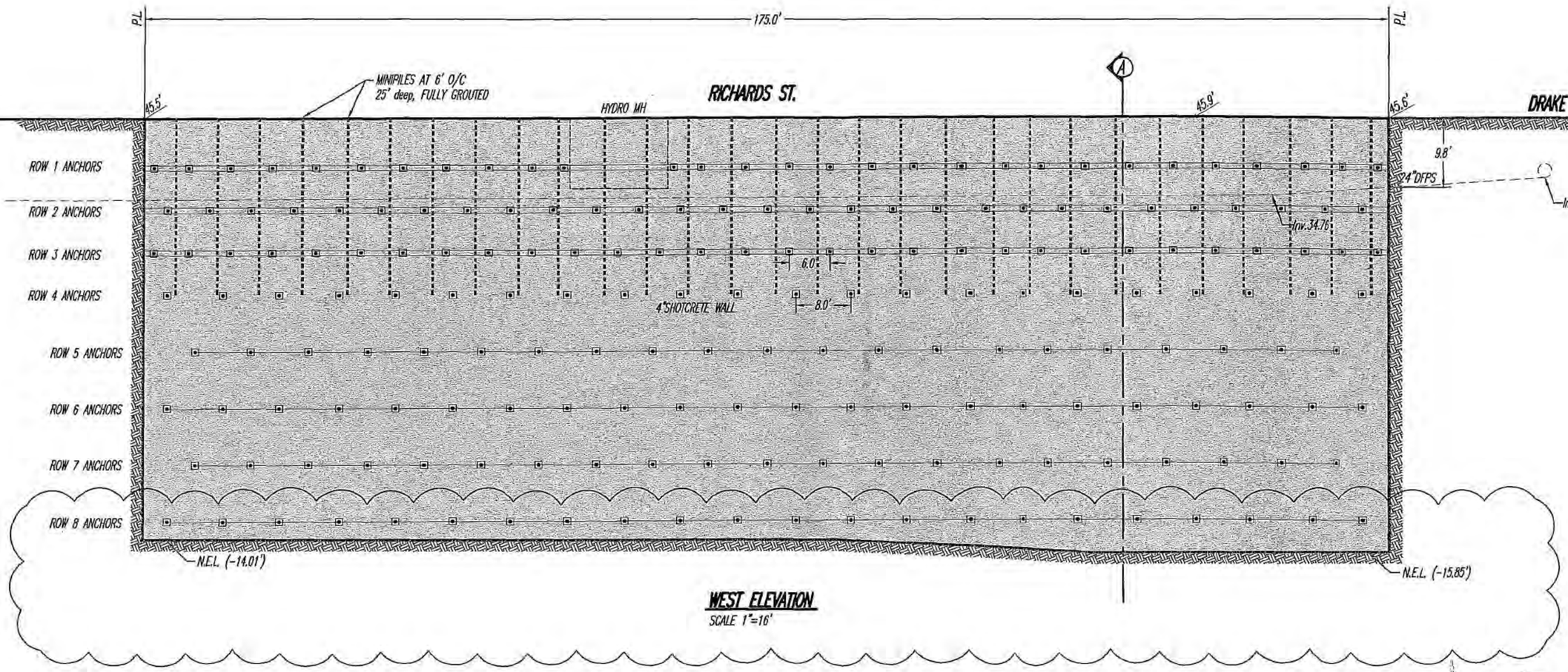
Action Details

Date	Action by	Action	Action specifics	Reference
21 Oct 2008	L PETERSEN	060 - OPEN GROUP	-	-
21 Oct 2008	L PETERSEN	N10 - SUBDIVISION APP	- DEDICATION	-
21 Oct 2008	L PETERSEN	991 - NOTE	- SITE PROFILE @ DE	-
21 Oct 2008	L PETERSEN	R90 - ACCEPTED	- NO SCHED 2	-
20 Oct 2009	L KWAN	993 - SEE INTERNAL NOTES	-	-
20 Oct 2009	L KWAN	N07 - WSTE DSCHRG PERMIT	10 - SRCE CNTRL PERMIT	SC - 090401
23 Oct 2009	L KWAN	993 - SEE INTERNAL NOTES	-	-
26 Oct 2009	L KWAN	N32 - FEE BILLED	10 - SRCE CNTRL PERMIT	-
27 Oct 2009	L KWAN	N07 - WSTE DSCHRG PERMIT	07 - FILED - DOMINO	SC - 090401



ORIGINAL PAPER SIZE 11"x17"

REFERENCE:		DATE: MARCH 6, 2014	MIXED-USE HIGH RISE DEVELOPMENT	FILE NO.: 9760	REVISIONS:
DIALOG ARCHITECTS PROJ. NO.: 04004 DATE: 6/12/13	#215-1200 West 73-rd Ave. Vancouver, B.C. Canada V6P 6G5 Ph. (604) 439-0922 Fax (604) 439-9189 **GeoPacific Consultants Ltd.**	DRN. BY: KAZ. APP'D. M.J.K. SCALE: AS SHOWN	498 DRAKE STREET, VANCOUVER, B.C. SHORING PLAN	DWG. NO.: G-S1	A. APRIL 8, 2014 B. MAY 13, 2014-FLOOR LEVEL CHANGED C.

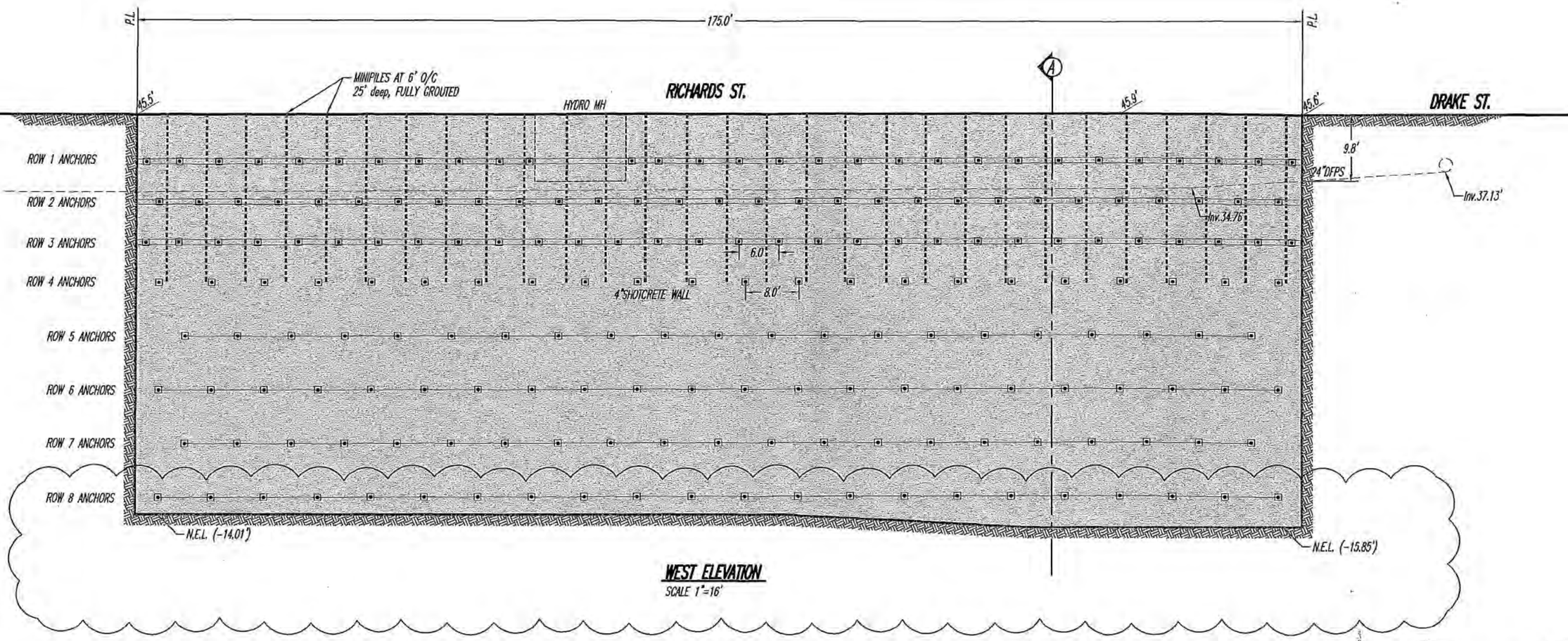


WEST ELEVATION
SCALE 1"=16'

MAY 16 2014

ORIGINAL PAPER SIZE 11"x17"

REFERENCE:	#215–1200 West 73–rd Ave. Vancouver, B.C. Canada V6P 6G5 GeoPacific Consultants Ltd. Ph. (604) 439–0922 Fax (604) 439–9189	DATE: MARCH 6, 2014	MIXED–USE HIGH RISE DEVELOPMENT 498 DRAKE STREET, VANCOUVER, B.C. WEST ELEVATION	FILE NO.: 9760	REVISIONS: A. APRIL 8, 2014
		DRN. BY: KAZ. APP'D. M.J.K.		DWG. NO.: G–S2A	B. MAY 13, 2014
		SCALE: AS SHOWN			C.



WEST ELEVATION
SCALE 1"=16'

Certified Professional Program
JUN 10 2014
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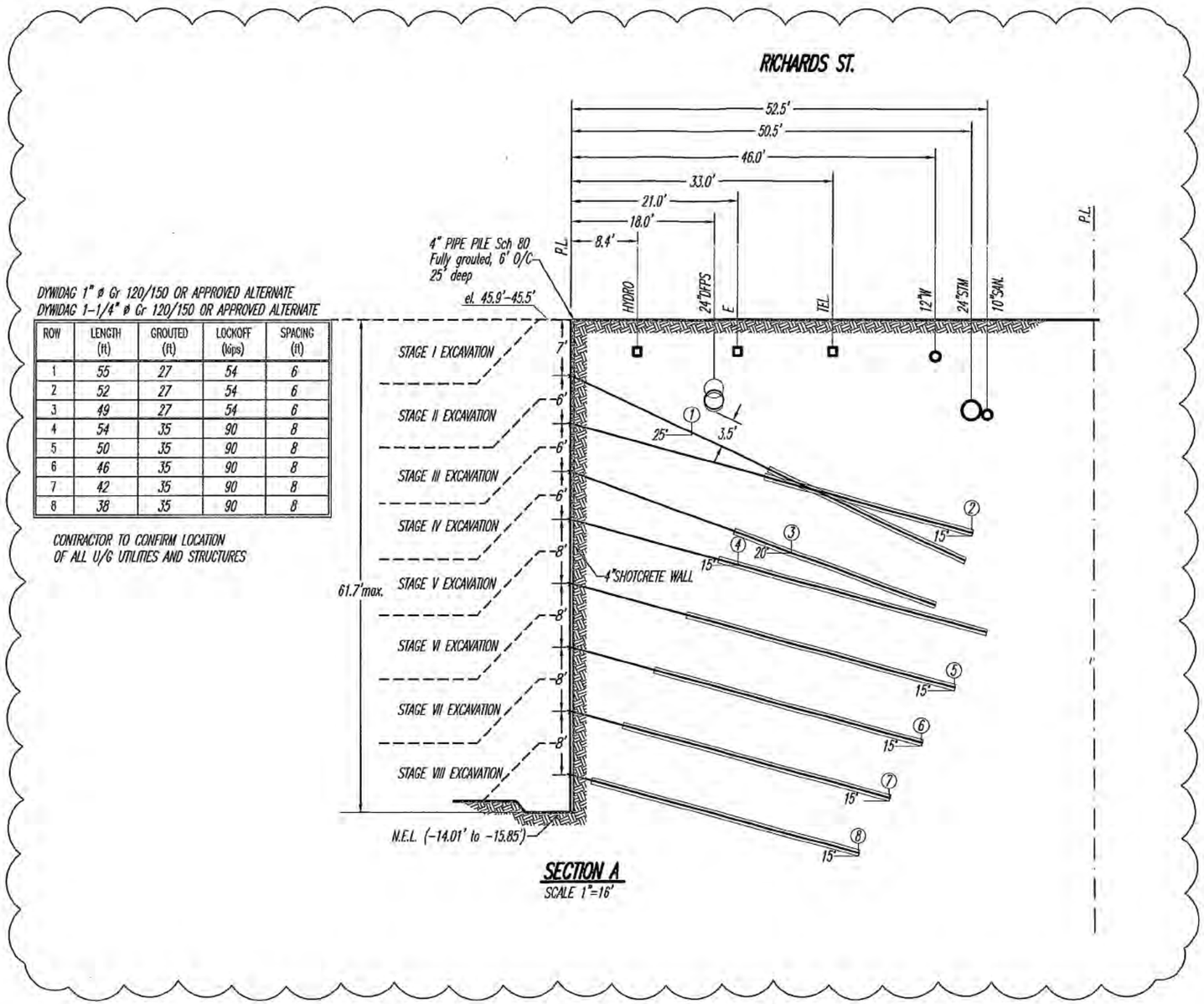
BARRY GIBSON

MAY 16 2014

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
M. J. KOKAN
21364

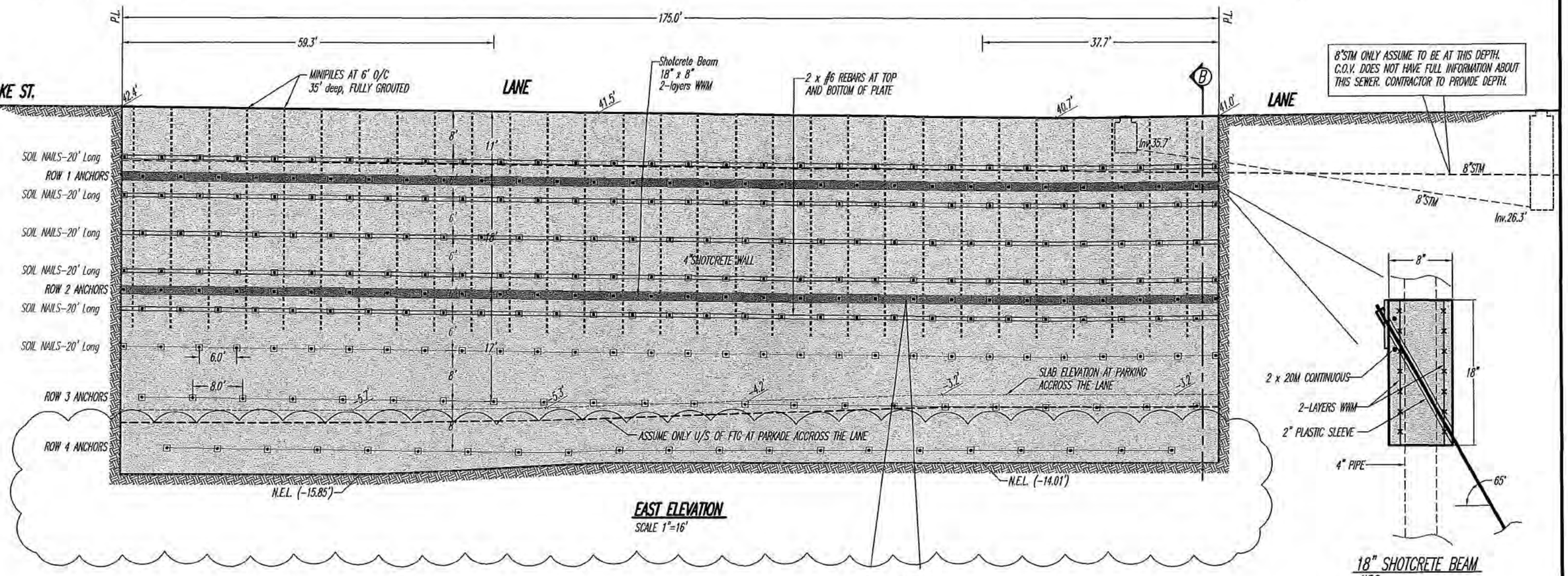
ORIGINAL PAPER SIZE 11"x17"

REFERENCE:	#215–1200 West 73–rd Ave. Vancouver, B.C. Canada V6P 6G5 Ph. (604) 439–0922 Fax (604) 439–9189 GeoPacific Consultants Ltd.	DATE: MARCH 6, 2014 DRN. BY: KAZ. APP'D. M.J.K. SCALE: AS SHOWN	MIXED–USE HIGH RISE DEVELOPMENT 498 DRAKE STREET, VANCOUVER, B.C. WEST ELEVATION	FILE NO.: 9760 DWG. NO.: G–S2A	REVISIONS: A. APRIL 8, 2014 B. MAY 13, 2014 C.



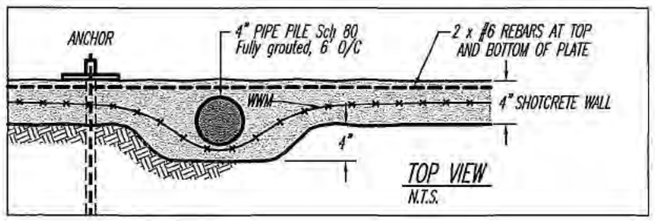
ORIGINAL PAPER SIZE 11"x17"

REFERENCE:	#215-1200 West 73rd Ave. Vancouver, B.C. Canada V6P 6G5 GeoPacific Consultants Ltd. Ph. (604) 439-0922 Fax (604) 439-9189	DATE: MARCH 6, 2014 DRN. BY: KAZ. APP'D. M.J.K. SCALE: AS SHOWN	MIXED-USE HIGH RISE DEVELOPMENT 498 DRAKE STREET, VANCOUVER, B.C. SECTION A	FILE NO.: 9760 DWG. NO.: G-S2B	REVISIONS: A. APRIL 8, 2014 B. MAY 13, 2014 C.

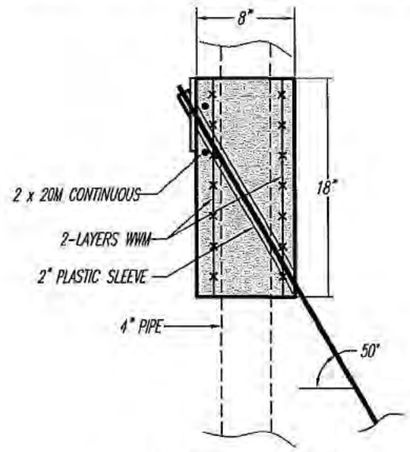


EAST ELEVATION
SCALE 1"=16'

18" SHOTCRETE BEAM
N.T.S.



TOP VIEW
N.T.S.

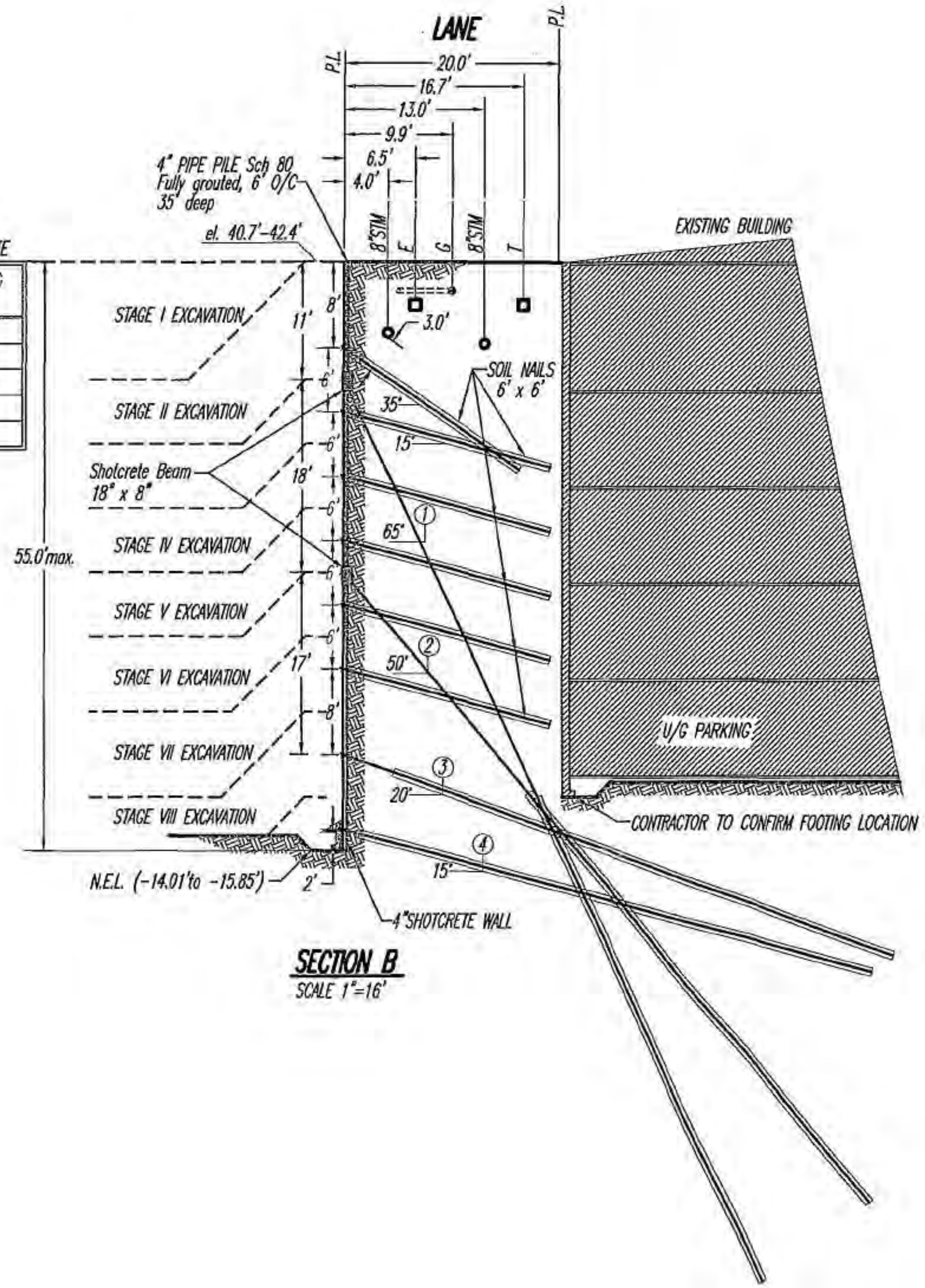


18" SHOTCRETE BEAM
N.T.S.

MAY 16 2014

ORIGINAL PAPER SIZE 11"x17"

REFERENCE:	#215-1200 West 73rd Ave. Vancouver, B.C. Canada V6P 6G5 Ph. (604) 439-0922 Fax (604) 439-9189 GeoPacific Consultants Ltd.	DATE: MARCH 6, 2014 DRN. BY: KAZ. APP'D. M.J.K. SCALE: AS SHOWN	**MIXED-USE HIGH RISE DEVELOPMENT** 498 DRAKE STREET, VANCOUVER, B.C. EAST ELEVATION	FILE NO.: 9760 DWG. NO.: G-S3A	REVISIONS: A. MAY 13, 2014 B. C.



DYWIDAG 1-1/4" ø Gr 120/150 OR APPROVED ALTERNATE

ROW	LENGTH (ft)	GROUTED (ft)	LOCKOFF (kips)	SPACING (ft)
1	93	50	112	6
2	77	50	112	6
3	60	50	112	8
4	55	50	112	8
5	51	50	112	8

ROW 1 TO BE FULLY GROUTED AFTER TESTING–30 kips LOCKOFF

CONTRACTOR TO CONFIRM LOCATION OF ALL U/G UTILITIES AND STRUCTURES

ROW 1, 2, 3 TO BE DRILLED USING CASING METHOD

SECTION B
SCALE 1"=16'

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JUN 10 2014
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MAY 16 2014

PROFESSIONAL ENGINEER M. J. KOKAN # 21364 BRITISH COLUMBIA

REFERENCE:

#215-1200 West 73-rd Ave. Vancouver, B.C. Canada V6P 6G5
Ph. (604) 439-0922 Fax (604) 439-9189
GeoPacific Consultants Ltd.

DATE: MARCH 6, 2014
DRN. BY: KAZ. APP'D. M.J.K.
SCALE: AS SHOWN

MIXED-USE HIGH RISE DEVELOPMENT
498 DRAKE STREET, VANCOUVER, B.C.
SECTION B

FILE NO.: 9760
DWG. NO.: G-S3B

REVISIONS:
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B. MAY 13, 2014
C.

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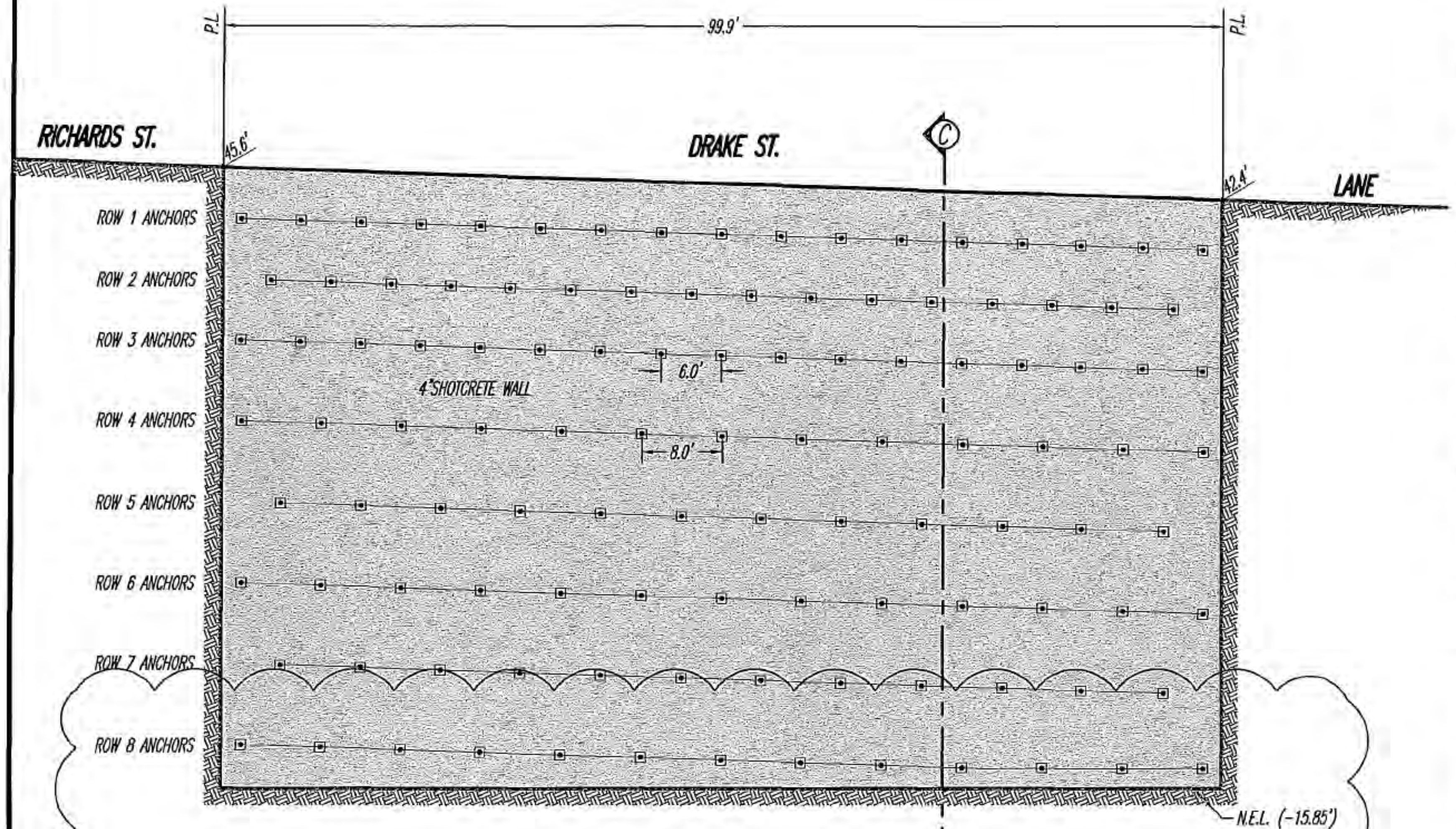
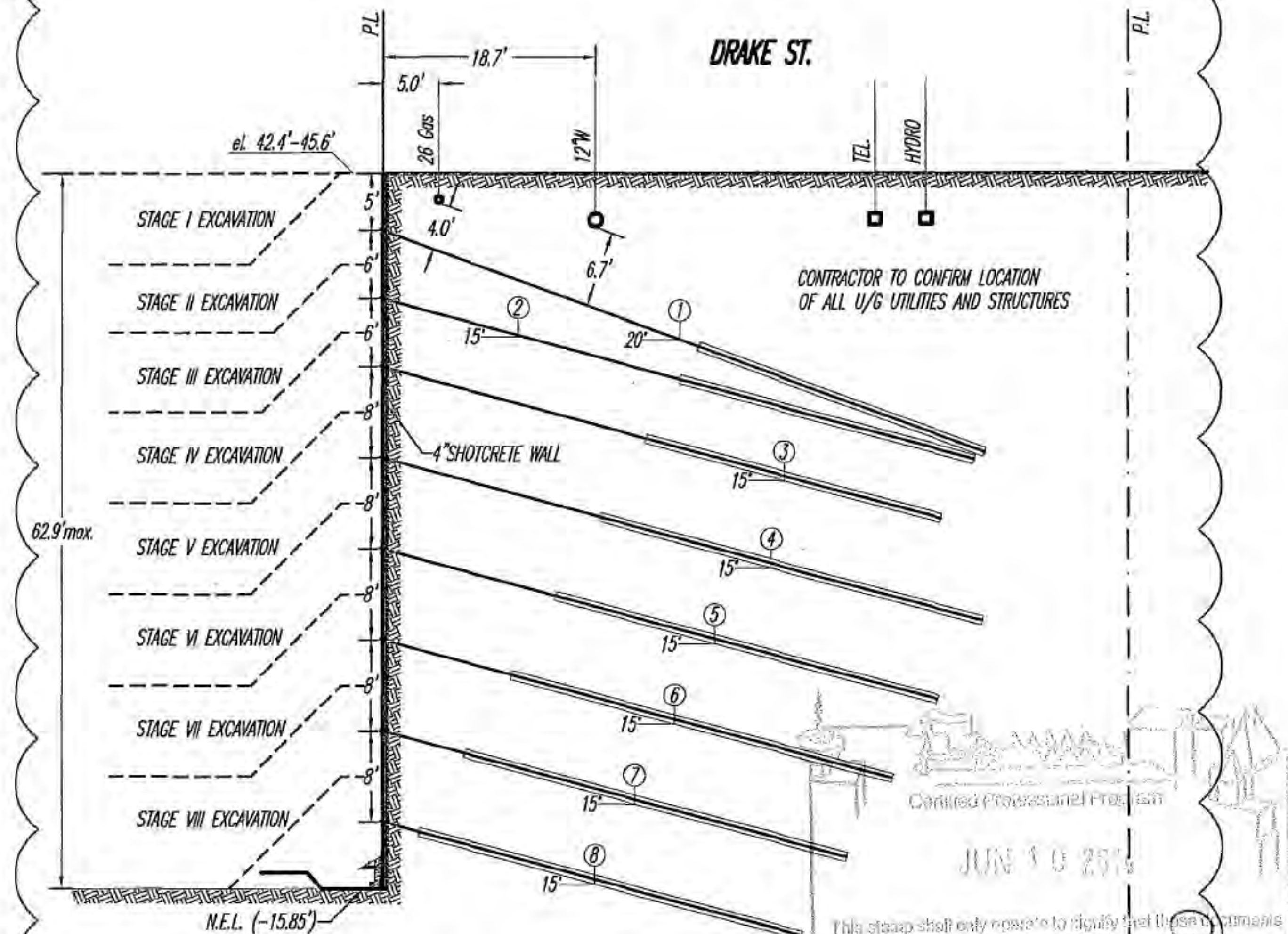


NORTH ELEVATION

SCALE 1"=16'



SECTION C

SCALE 1"=16'

DYWIDAG 1" ø Gr 120/150 OR APPROVED ALTERNATE
DYWIDAG 1-1/4" ø Gr 120/150 OR APPROVED ALTERNATE

ROW	LENGTH (ft)	GROUTED (ft)	LOCKOFF (kips)	SPACING (ft)
1	57	27	54	6
2	54	27	54	6
3	51	27	54	6
4	55	35	90	8
5	51	35	90	8
6	47	35	90	8
7	43	35	90	8
8	39	35	90	8

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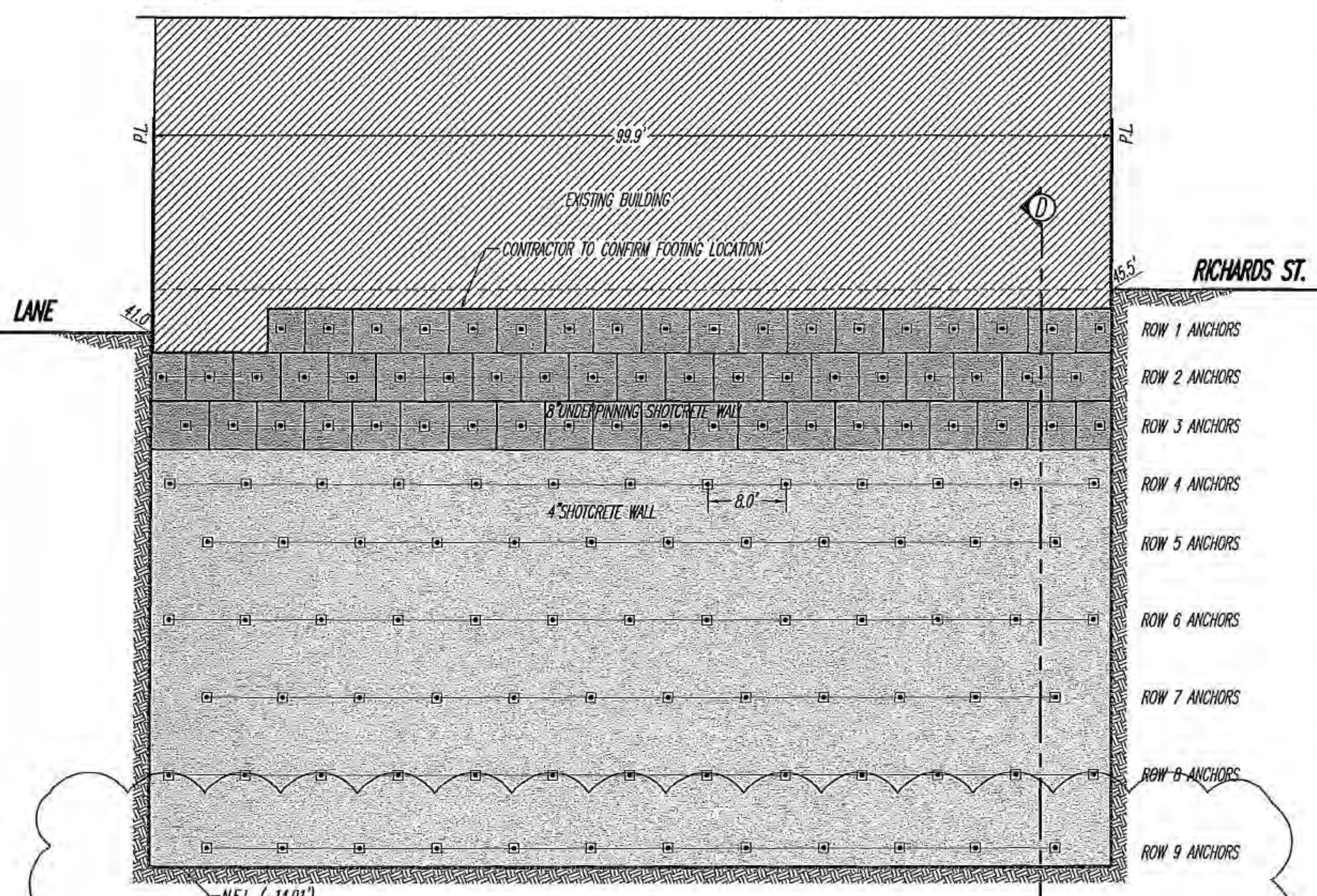
Fax (604) 439-9189
GeoPacific Consultants Ltd.

DATE: MARCH 6, 2014
DRN. BY: KAZ. APP'D. M.J.K.
SCALE: AS SHOWN

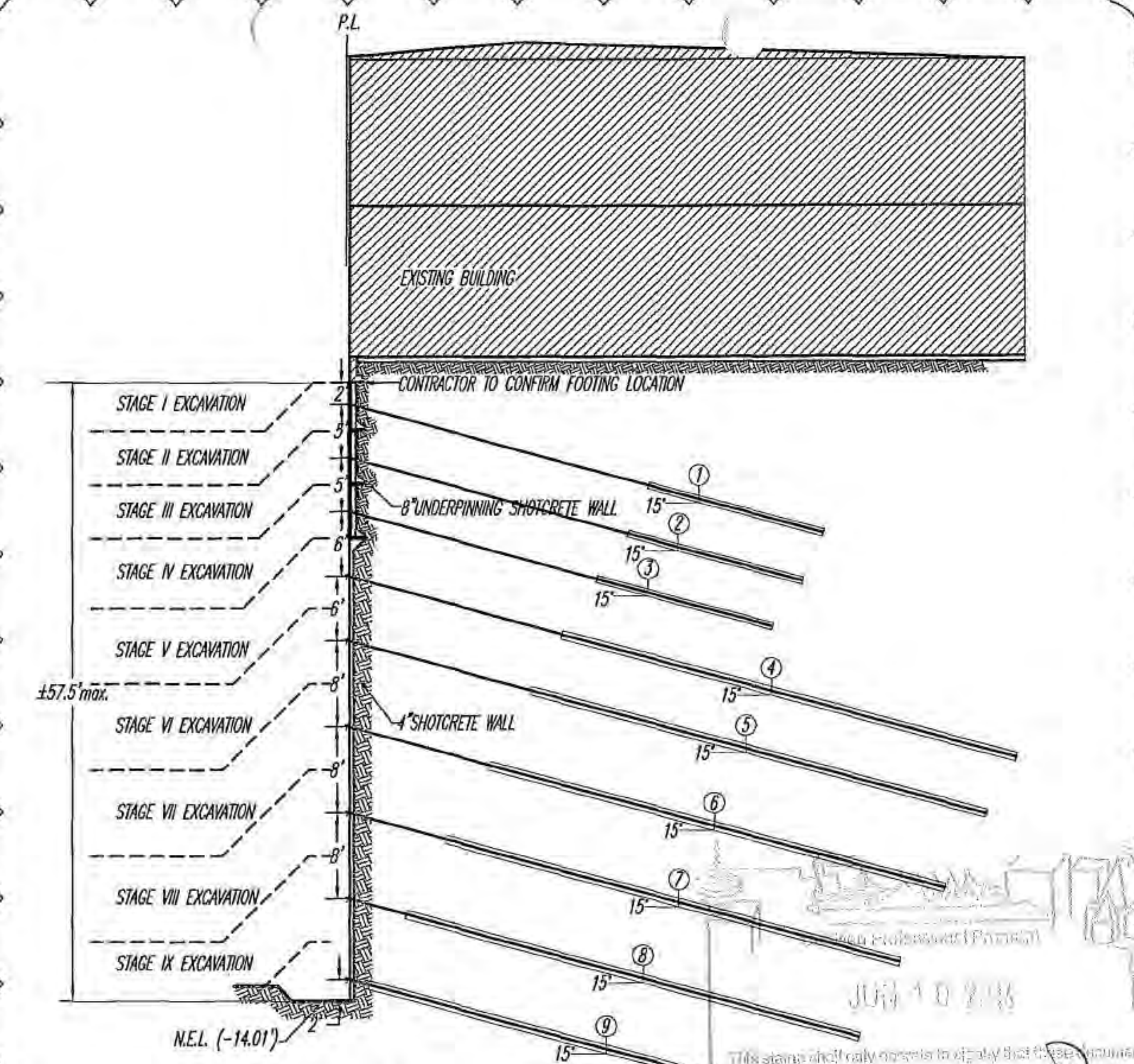
MIXED-USE HIGH RISE DEVELOPMENT
498 DRAKE STREET, VANCOUVER, B.C.
NORTH ELEVATION, SECTION C

FILE NO.: 9760
DWG. NO.: G-S4

REVISIONS:
A. MAY 13, 2014
B.
C.



SOUTH ELEVATION
SCALE 1"=16'



SECTION D
SCALE 1"=16'

DYWIDAG #8 Gr 75/100 OR APPROVED ALTERNATE
DYWIDAG 1-1/4" ø Gr 120/150 OR APPROVED ALTERNATE

ROW	LENGTH (ft)	GROUTED (ft)	LOCKOFF (kips)	SPACING (ft)
1	46	17	32	5
2	44	17	32	5
3	41	17	32	5
4	65	44	84	8
5	62	44	84	8
6	58	44	84	8
7	54	44	84	8
8	50	44	84	8
9	46	44	84	8

MAY 16 2014

PROFESSIONAL ENGINEER M. J. KOKAN

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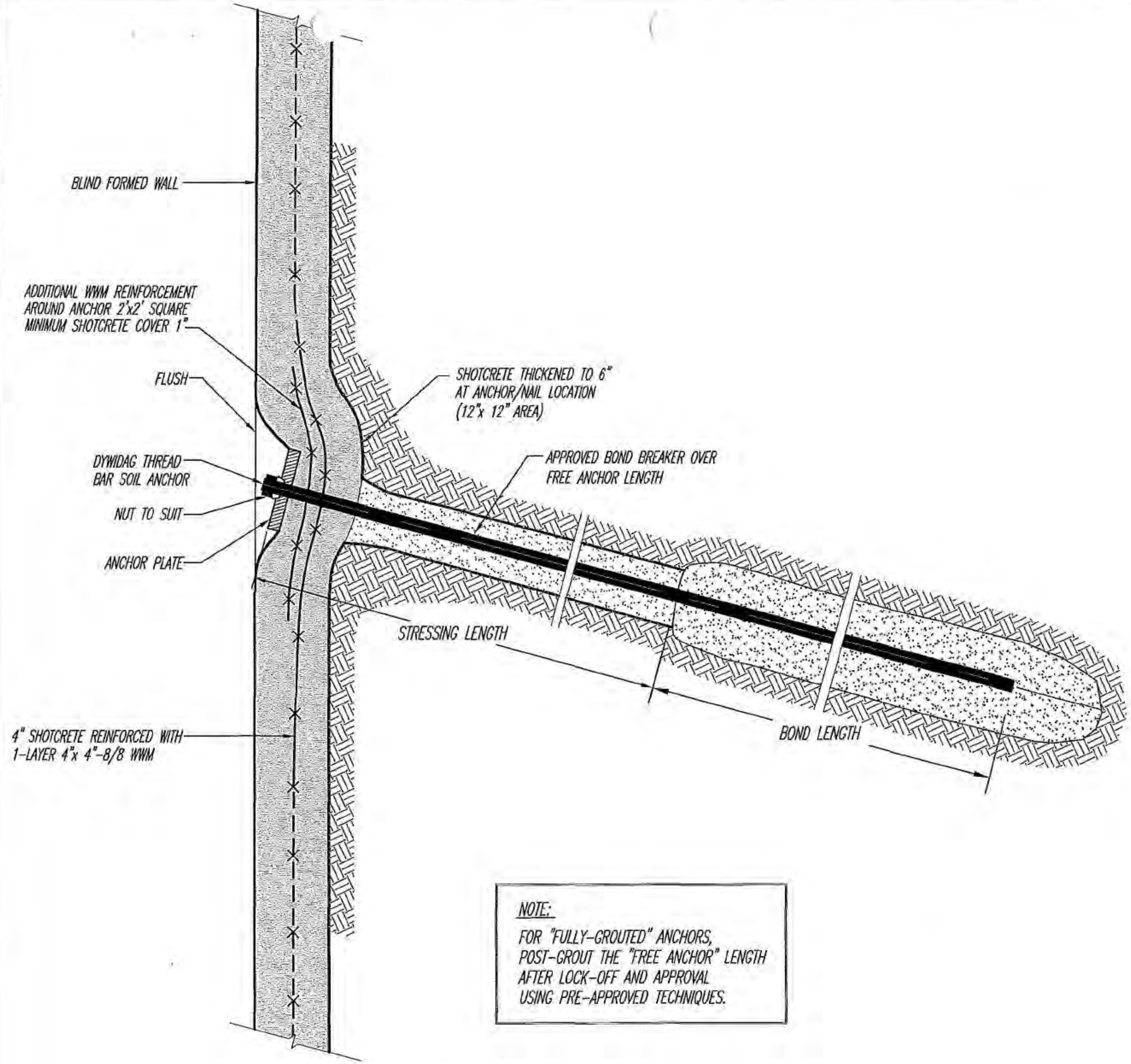
Fax (604) 439-9189
GeoPacific Consultants Ltd.

DATE: MARCH 6, 2014
DRN. BY: KAZ. APP'D. M.J.K.
SCALE: AS SHOWN

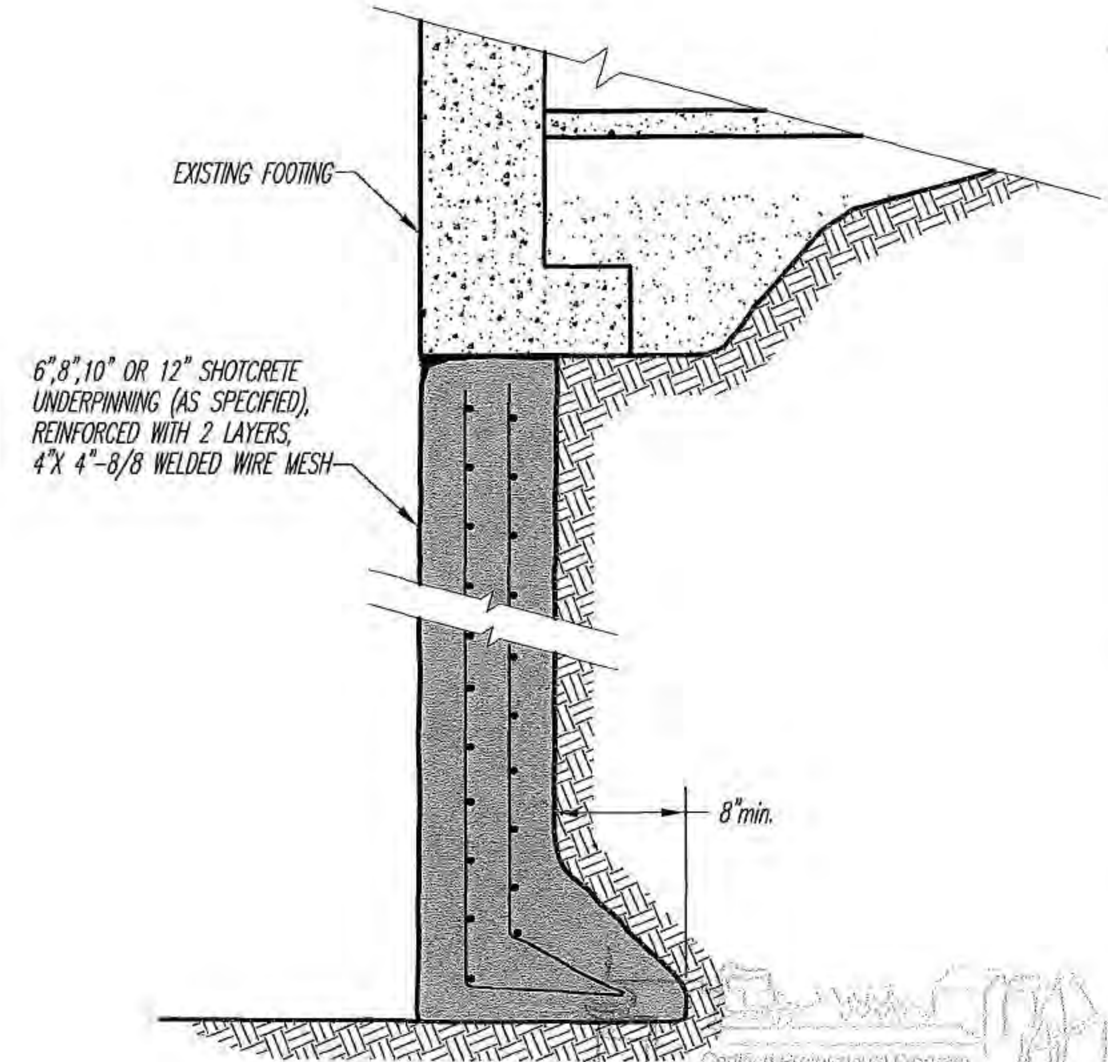
MIXED-USE HIGH RISE DEVELOPMENT
498 DRAKE STREET, VANCOUVER, B.C.
SOUTH ELEVATION, SECTION D

FILE NO.: 9760
DWG. NO.: G-S5

REVISIONS:
A. MAY 13, 2014
B.
C.



NOTE:
FOR "FULLY-GROUTED" ANCHORS, POST-GROUT THE "FREE ANCHOR" LENGTH AFTER LOCK-OFF AND APPROVAL USING PRE-APPROVED TECHNIQUES.



UNDERPINNING DETAIL

ANCHORED SHOTCRETE DETAIL
N.T.S.

MAY 16 2014

REFERENCE:

#215-1200 West 73-rd Ave.
Vancouver, B.C.
Canada V6P 6G5
Ph. (604) 439-0922
Fax (604) 439-9189
GeoPacific Consultants Ltd.

DATE:	
DRN. BY: KAZ.	APP'D.:
SCALE: AS SHOWN	

GENERAL
UNDERPINNING & ANCHORED SHOTCRETE DETAILS

FILE NO.:	
DWG. NO.:	G-1

REVISIONS:
A.
B.
C.

1.0 GENERAL

1.1 In these Notes, the Engineer is GeoPacific Consultants Ltd.

1.2 These Notes must be read in conjunction with the design Drawings.

1.3 The work described and shown involves near vertical excavated slopes or structure using a combination of shotcrete and ground anchors. All slopes shall be covered with secured polyethylene sheeting to prevent erosion.

1.4 The anchors will be installed in ground around the site and the actual soil and groundwater conditions must be assumed.

1.5 The grouted anchor lengths required to resist the design loads are based on the assumed conditions. The capacity of the anchors will be confirmed at the beginning of the contract and may be lengthened or shortened.

1.6 Some utilities, foundations and structures which may affect the installation procedures and techniques are noted on the Drawings.The Contractor shall confirm the locations and condition of ALL man-made elements which may be damaged because of the anchored shotcrete operations. It is the Contractor's responsibility to install the anchored shotcrete in the actual site conditions encountered.

Elements which may, in the opinion of the Contractor, be damaged by the anchored shotcrete operations must be reported to the Engineer well in advance of the work to take place.

1.7 These documents are based on architectural, structural and survey Drawings provided. It is the Contractor's responsibility to verify all dimensions and report discrepancies to the Engineer.

1.8 The Contractor shall schedule and co-ordinate the work to satisfy the reasonable requirements of adjacent Owners and Tenants who shall be given sufficient Notice before carrying out work which may affect their property.

1.9 The Contractor shall erect and maintain a secure closed hoarding around the site for the safety of all persons in the vicinity of the site.

1.10 The Contractor shall inspect the slopes and the support to the slopes and structures daily and shall immediately report any potentially damaging movement or deterioration to the Engineer by telephoning 604-439-0922.

2.0 MATERIALS

2.1 ANCHOR BAR:

The anchors shall be installed in minimum 75 mm (3 inch) diameter holes which shall be drilled, unless otherwise approved in advance by the Engineer. Anchor capacity is dependant upon installation techniques and the drilling equipment and methods shall be subject to the Engineer's approval.

Drilling techniques shall produce a hole which is free of debris and ensure continuous support of the hole and shall not erode or disturb soil around the hole.

2.2 Anchor tendons shall be as shown on the design drawings.

Anchorage equipment couplings and any necessary wedges washers and plates shall be in accordance with the tendon manufacturer's specifications and requirements.

Minimum anchorage length ("fixed" length) and stressing length ("free" length) are shown on the Drawings.

2.3 Grout in the anchorage shall be a prior-approved non-shrink cementitious material mixed with a minimum compressive strength of 5 MPa in 24 hours and 35 MPa in 28 days.

2.4 Shotcrete shall be reinforced with 102 x 102 MW13.3/13.3 (4"x4"-8/8) welded wire mesh as shown on the Drawings. Steel shall have a minimum yield strength of 450 MPa (65 ksi) and shall be in accordance with ASTM A497.

2.5 All shotcreting shall be carried out in accordance with ACI 506 : "Specifications for Materials Proportioning and Application of Shotcrete"

2.6 Shotcrete shall have a minimum compressive strength of 5 MPa in 24 hours and 30 MPa in 28 days. The Engineer may require test panels to be prepared by the Contractor so they can be cored by others to confirm the shotcrete strength. The Contractor shall co-operate with the independent testing laboratory appointed by the Owner for this purpose.

3.0 INSTALLATION

3.1 Hollow Core Bar Installation (if required)

Set the bar on an appropriate drill rig. Start pumping the grout to assure that grout will exit drill bit.

Proceed with rotary drilling and flushing approx. three feet per min (depending on ground condition). Rotation speed should be approx. 60 to 120 RPM. To achieve higher friction values, advance and retract the bars several times for each 3.0 m (10 feet) length of bar installed in the bond zone.

The grout should be applied CONTINUOUSLY during drilling. A grout pump with at least 60 l/min volume and minimum 2 MPa (300 psi) pressure capacity (preferably 10 MPa, 1500 psi) should be used.

Refer to the manufacture's specifications and recommendations for more detail.

3.2 Anchors and shotcrete shall be installed in sequence and stages to maintain stability of the excavation. Excavation of soil from the site shall also take place in stages. Stages shall not exceed 1.8 m (6 feet) vertical.

The Contractor may remove all soil within any mass excavation Stage before anchors in that Stage are installed but further excavation shall not take place until all anchored shotcrete in that Stage is installed and approved by the Engineer.

The mass excavation for any Stage does not include a perimeter berm with a minimum top width of one metre and a side slope of 1 horizontal to 1 vertical.

Ground conditions may locally require a wider berm, flatter slopes and/or other slope protection measures including covering or short-term temporary support.

The perimeter berms in any stage shall be excavated in staggered panels. THE MAXIMUM WIDTH OF A PANEL SHALL BE THE HORIZONTAL SPACING OF THE ANCHOR PLUS 0.6 M (2 FEET). This panel width may be INCREASED OR DECREASED by the Engineer's agreement, in writing, BEFORE increasing the panel width.

No adjacent panels shall be excavated concurrently and no more than 1/3 of the panels shall be excavated concurrently. In addition no panel shall be excavated into the berm until at least 24 hours after that panel anchor has been grouted.

Anchors and shotcrete may be installed concurrently in different panels. Anchors shall be installed at right angles to the property lines on plan and within 2.5 degrees of the declination shown on the Drawings except with the prior approval of the Engineer.

Certified Professional Program

JUN 10 2014

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BARRY THOMSON

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
M. J. KOKAN
21464

MAY 16 2014

REFERENCE:	#215-1200 West 73-rd Ave. Vancouver, B.C. Canada V6P 6G5 GeoPacific Consultants Ltd. Ph. (604) 439-0922 Fax (604) 439-9189	DATE:	GENERAL NOTES	FILE NO.:	REVISIONS: A. B. C.
		DRN. BY: APP'D.		DWG. NO.: G-2 (SHEET 1 OF 2)	
		SCALE:			

3.3 Immediately following excavation of the soil berm in a panel the excavated face shall be trimmed back to the required line and mesh reinforcement shall be fixed to the soil to ensure the minimum specified shotcrete cover. Shotcrete shall be applied without delay to thicknesses shown on the Drawings.

Shotcrete panels shall be kept moist to aid curing by spraying with water and covering with sacking or polyethylene sheeting.

Sufficient wire mesh reinforcement shall be installed to provide a full strength overlap with adjacent panels. This overlap shall not be less than 200 mm (8 inch).

The end surfaces of panels shall be thoroughly cleaned with compressed air to ensure a full strength bond when adjacent panels are shotcreted.

3.4 Drains to relieve groundwater pressure shall be installed through the shotcrete. Drains shall be a minimum of 50 mm (2 inches) diameter and at normal 3.0 m (10 feet) centres horizontally and 1.5 m (5 feet) centres vertically. The Contractor shall install filters in drains as fines are being removed with the water.

Additional special drains may be required where water seeps are noted. This special drains shall consist of minimum 50 mm (2 inches) diameter perforated ABS pipe installed within 75 mm (3 inches) diameters holes drilled 5 degrees UPWARDS from the 3 metres (10 feet) measured from the face of the shotcrete. These special drains may be required to be filtered with fine sand or gravel or filter fabrics.

3.5 Anchors shall be tensioned as soon as practicable but no sooner than 24 hours after the construction of the applicable shotcrete panel. Anchors shall be tensioned and tested as follows:

3.5.1 Apply a proof load of 1.33 times the lock-off load for two minutes. Monitor the load in the anchor. If the reduction in load is less than 2.5 percent of proof load reduce the load to lock-off load and lock the working load into the anchor.

3.5.2 If the anchor does not hold at least 133 percent of lock-off load for two minutes the Engineer must be informed. Further testing in the presence of the Engineer will required as follows:

Load the anchor in 22 kN (5 kip) increments to 130.5 percent of lock-off load. Hold each increment for 5 minutes except at maximum load when the load shall be maintained for 100 minutes. The increase in length of the anchor shall be measure at the start and end of each load increment except at maximum load when the extension shall be measured at 5 minutes intervals.

This information shall be utilized by the Engineer to deduce the utilized anchor length and to assess the creep characteristics.

Anchors which creep more than 2 mm (0.08 inch) per log cycle of time will not be accepted. The Contractor shall install replacement anchors at the Contractor's expense.

3.6 A minimum of 2 performance tests shall be carried out on each row of anchors per section. Testing of the anchors shall conform to the Post Tensioning Institute 4th Edition 2004.

3.7 Lift-off testing of the anchors should be carried out on a minimum of 50% of the installed anchors once a week for the duration of the construction of the wall. If any significant reduction in the capacity of the anchors is recorded ALL anchors should be re-tensioned to the design lock-off load.

4.0 SHOTCRETE REMOVAL/ANCHOR DETENSIONING

4.1 All excavation and support works within the CITY OF VANCOUVER shall be in strict accordance with the City's requirements.

4.2 No part of the anchor system shall remain in place within 1.5 m (5 feet) of final grade. Anchors 1.5 m (5 feet) below final grade shall be detensioned or fully grouted when no longer required in the opinion of the Engineer.

4.3 No shotcrete shall remain in place within 1.5 m (5 feet) of final grade. A bond breaker must be installed between blind-formed foundation walls and shotcrete on city property to allow for shotcrete removal.

5.0 BACKFILLING ON AND ADJACENT TO CITY PROPERTY

5.1 Backfilling on and adjacent to City property must be in accordance with the City's backfill specifications, with the City's backfill specifications, "Street Restoration Manual" dated AUGUST 18, 2008.

5.2 Backfill Containment dams will be required at excavation corners where excavation to be backfilled against City property.

6.0 REQUIRED INSPECTIONS

6.1 The following are the MINIMUM inspections which are required by the Geotechnical Engineer. The Contractor is responsible for informing the Geotechnical Engineer that the Work is ready for these inspections. The Contractor shall be liable for any loss caused by failure to inform the Geotechnical Engineer that the Work is ready for inspection.

1. 2 days before work commences on site.
2. 1 day before the anchors are detensioned.
3. 2 days before backfilling commences.
4. 1 day before shotcrete removal.

6.2 Daily Inspection is required during installation of anchors, and full time inspection is required during anchor testing.

7.0 CONTRACTOR QUALIFICATION

7.1 Temporary works and shoring installation is highly sensitive to processes including sequence of installation, quality and quantity of materials used, monitoring of the works and other factors. Consequently a high degree of skill and professionalism is required for its successful implementation. As a result, all contractors considered for tender of the shoring work described in the Design Drawings must be approved by the Engineer in advance of tender. The work must be carried out only by a shoring contractor with experience and expertise in shoring construction. The contractors experience and expertise must be with projects of similar size and scope to that shown in the Design Drawings. The following shoring contractors are permitted to undertake the work:

1) Matcon Canada
2) Southwest Contracting
3) Bel Pacific Excavation & Shoring
4) Vancouver Shotcrete
5) Blue Ace Shoring
6) Power Civil Constructions LTD.

7.2 The preceding list does not express or imply any gu[illegible]ee or warranty of the contractor's performance. It is the responsibility of the contractor to undertake the work shown on the Design Drawings.

7.3 Shoring contractors other than those listed above may be considered by the Engineer only with submission of references and qualifications for at least 10 projects of similar size and scope. GeoPacific reserves the right to accept or reject the qualifications of any shoring contractor.

NOTES:

1. The excavation support design is based on the locations of adjacent structures and utilities which have been supplied. The Contractor shall confirm the locations and elevations of all foundations and utilities which may be affected by the work and raport any discrepancies to GeoPacific Consultants Ltd. (Tel.: 439-0922)
2. All slopes shall be covered with secured polyethylene sheeting to prevent erosion.
3. The extent of the excavation shall be based on the Architectural and Structural Drawings. The Contractor shall confirm the size of the excavation required by the basement and report any discrepancy with these Drawings to GeoPacific Consultants Ltd.
4. The Contractor must obtain prior permission in writing to carry out any work on adjacent private property.
5. The Contractor shall inform GeoPacific Consultants Ltd. of any surcharge loads which will be within half the height of the excavation from the top of the excavation so that the support system can be modified to support the additional loads. The Contractor shall also inform GeoPacific if and when any groundwater seepages occur which may require additional special drains as outlined in Note 3.4, Drawing G-2.
6. The ground conditions must be confirmed by GeoPacific Consultants Ltd. when the excavation is 4 feet deep. The Contractor is responsible for ensuring that GeoPacific personnel inspect the site.

DRAWING LIST:

SITE PLAN------------------------- G-S1
ELEVATIONS, SECTIONS-------------- G-S2A, G-S2B, G-S3A, G-S3B, G-S4, G-S5

GENERAL SHOTCRETE/UNDERPINNING
AND ANCHOR DETAILS--------------- G-1
GENERAL NOTES------------------- G-2, (SHEET 1 TO 2)
TEMPORARY SEDIMENT CONTROL FACILITY--- G-SP1, G-SP2 & G-SP3

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JUN 16 2014
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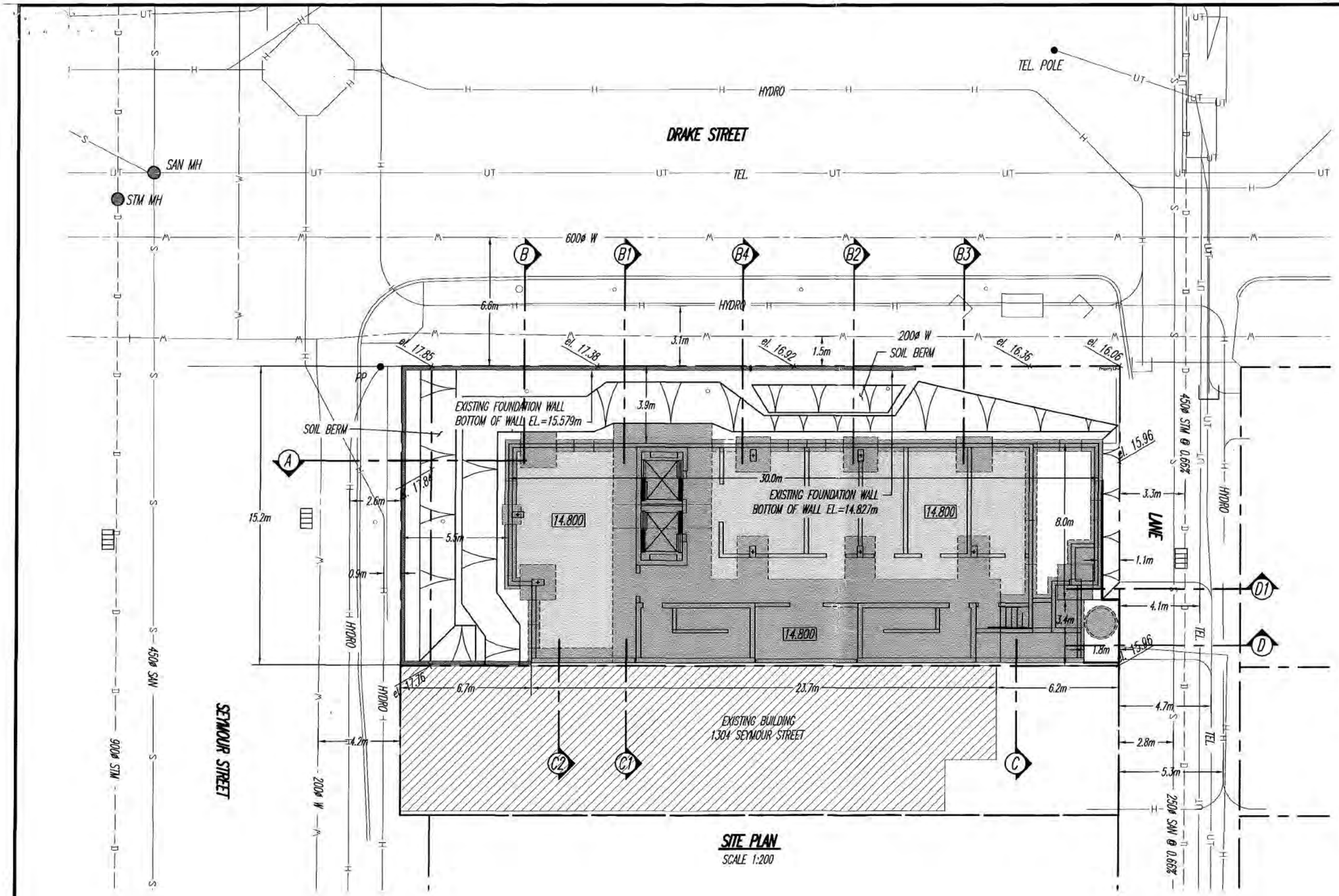
BARRY THORSON

MAY 16 2014

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA M. J. KOKAN # 31364

REFERENCE:		DATE: MARCH 6, 2014		MIXED-USE HIGH RISE DEVELOPMENT 498 DRAKE STREET, VANCOUVER, B.C. GENERAL NOTES	FILE NO.: 9760	REVISIONS:
	#215-1200 West 73-rd Ave. Vancouver, B.C. Canada V6P 6G5 Ph. (604) 439-0922 Fax (604) 439-9189 GeoPacific Consultants Ltd.	DRN. BY:	APP'D. M.J.K.			A.
		SCALE: AS SHOWN			DWG. NO.: G-2 (SHEET 2 OF 2)	B.
						C.



SITE PLAN
SCALE 1:200

TRUE NORTH

PROJECT NORTH

LEGEND:

14.800 – PROPOSED SLAB ELEVATION

el. 17.85 – EXISTING GRADE ELEVATION

N.E.L. – NOMINAL EXCAVATION LEVEL

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OCT 12 2017
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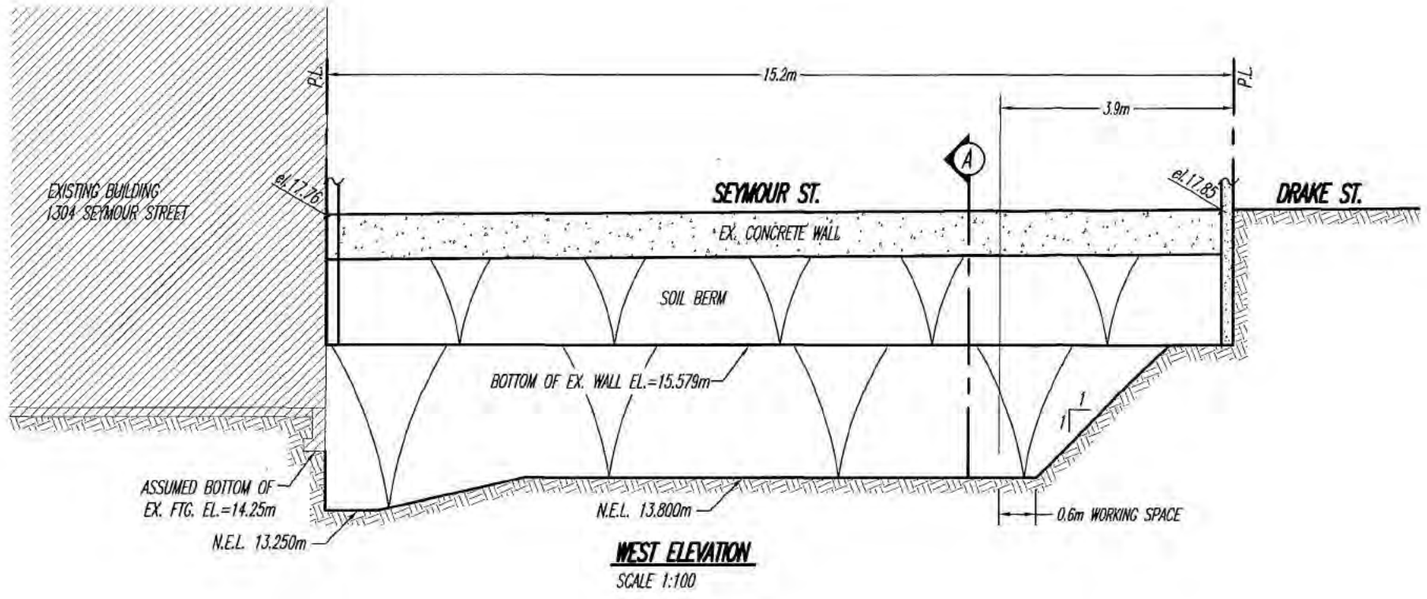
SEP 14 2017

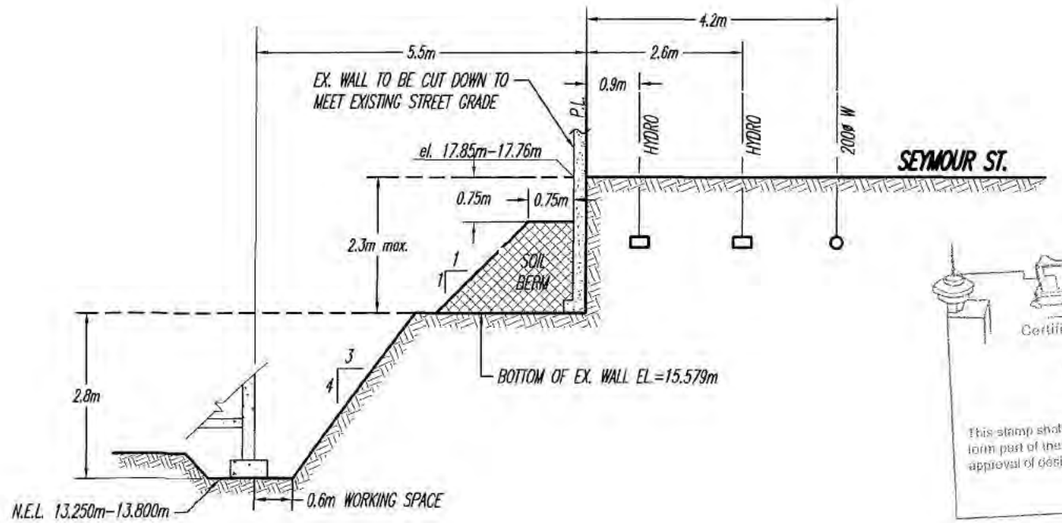
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
M. J. KOKAN
21364

ORIGINAL PAPER SIZE 11"x17"

REFERENCE: NSDA ARCHITECTS PROJECT No.: 15018 PROJECT DATE: JUNE 15, 2016	GEOPACIFIC VANCOUVER KAMLOOPS CALGARY 1779 W. 75th Avenue Vancouver, B.C. V6P 6P2 P 604.439.0922 F 604.439.9189	DATE: MARCH 28, 2017 DRAWN BY: M.S. / APPROVED BY: M.J.K. / REVIEWED BY: W.J. SCALE: AS SHOWN	COVENANT HOUSE 530 DRAKE STREET, VANCOUVER, B.C. SHORING PLAN	FILE NO.: 13925 DWG. NO.: G-S1	REVISIONS: A. AUGUST 31, 2017 – New foundations B. SEPTEMBER 11, 2017 – Issued For BP C.



WEST ELEVATION
SCALE 1:100



SECTION A
SCALE 1:100

SEP 14 2017

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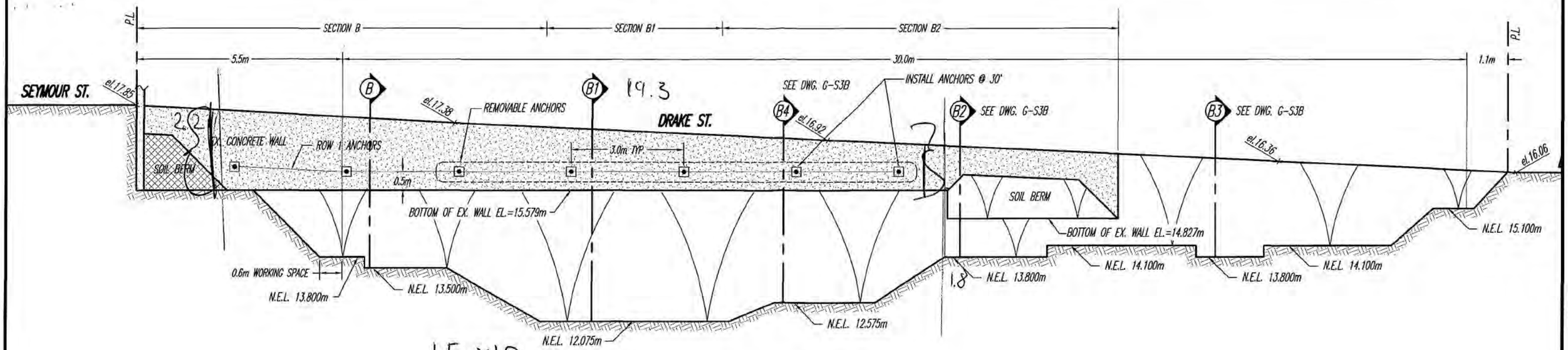
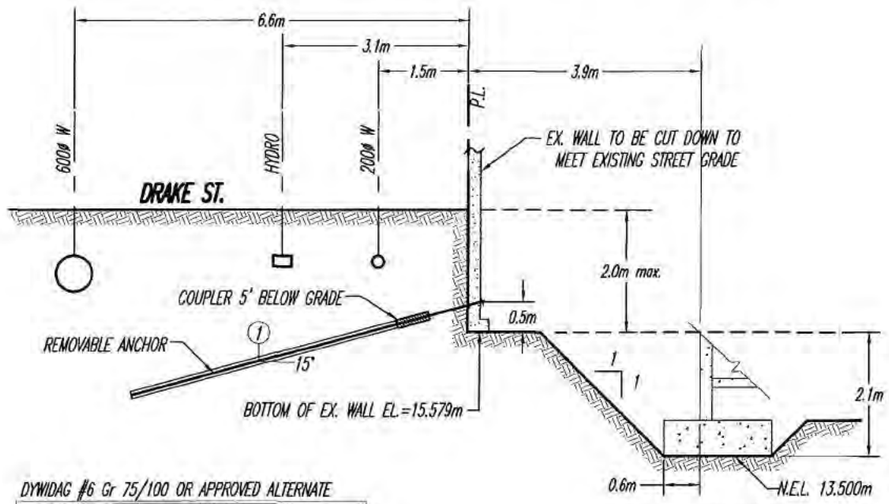


1.5 x 19 = 28.5

NORTH ELEVATION
SCALE 1:100

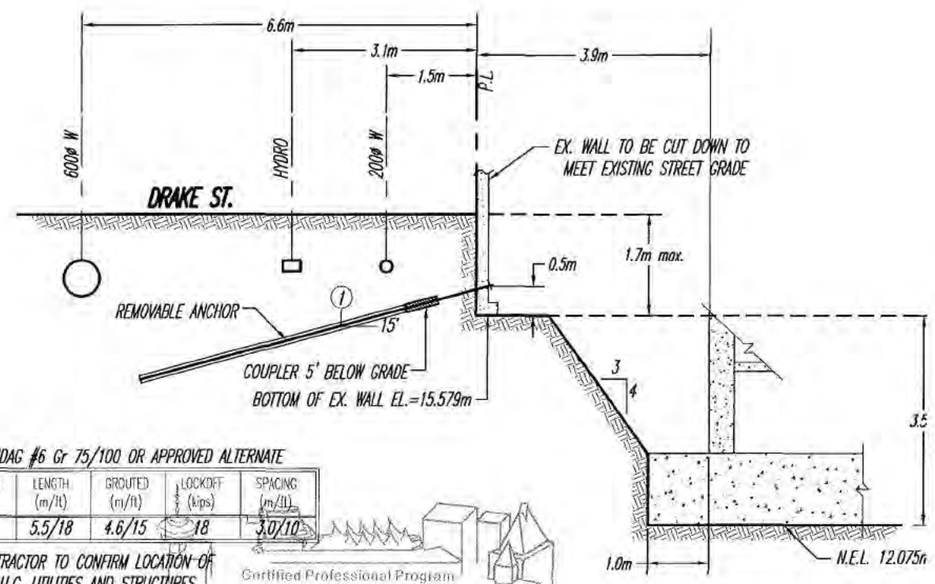


DYWIDAG #6 Gr 75/100 OR APPROVED ALTERNATE

ROW	LENGTH (m/ft)	GROUTED (m/ft)	LOCKOFF (kips)	SPACING (m/ft)
1	5.5/18	4.6/15	18	3.0/10

CONTRACTOR TO CONFIRM LOCATION OF
ALL U.G. UTILITIES AND STRUCTURES

SECTION B
SCALE 1:100



DYWIDAG #6 Gr 75/100 OR APPROVED ALTERNATE

ROW	LENGTH (m/ft)	GROUTED (m/ft)	LOCKOFF (kips)	SPACING (m/ft)
1	5.5/18	4.6/15	18	3.0/10

CONTRACTOR TO CONFIRM LOCATION OF
ALL U.G. UTILITIES AND STRUCTURES

SECTION B1
SCALE 1:100

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SEP 14 2017

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
M. J. KOKAN
21364

ORIGINAL PAPER SIZE 11"x17"

REFERENCE:
NSDA ARCHITECTS
PROJECT No.: 15018
PROJECT DATE: JUNE 15, 2016

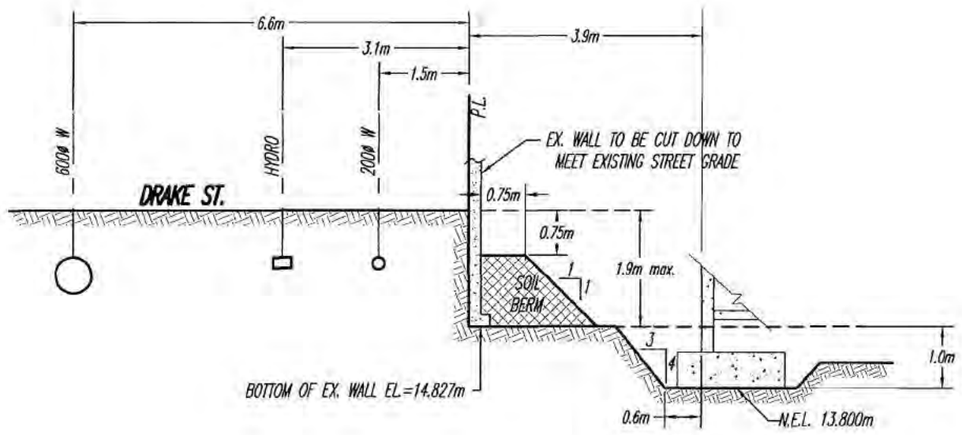
GEOPACIFIC
VANCOUVER KAMLOOPS CALGARY
1779 W. 75th Avenue
Vancouver, B.C. V6P 6P2
P 604.439.0922
F 604.439.9189

DATE: APRIL 12, 2017
DRAWN BY: M.S. | APPROVED BY: M.J.K. | REVIEWED BY: W.J.
SCALE: AS SHOWN

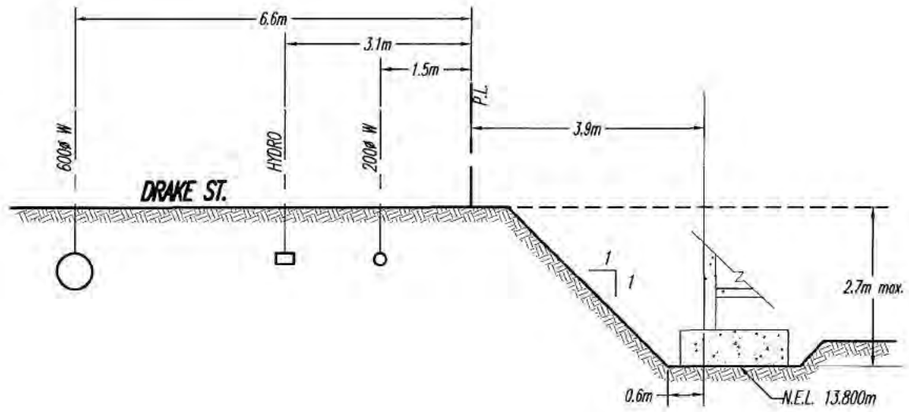
COVENANT HOUSE
530 DRAKE STREET, VANCOUVER, B.C.
NORTH ELEVATION, SECTIONS B, B1

FILE NO.: 13925
DWG. NO.: G-S3A

REVISIONS:
A. AUGUST 31, 2017 – New foundations
B. SEPTEMBER 11, 2017 – Issued For BP
C.



SECTION B2
SCALE 1:100



SECTION B3
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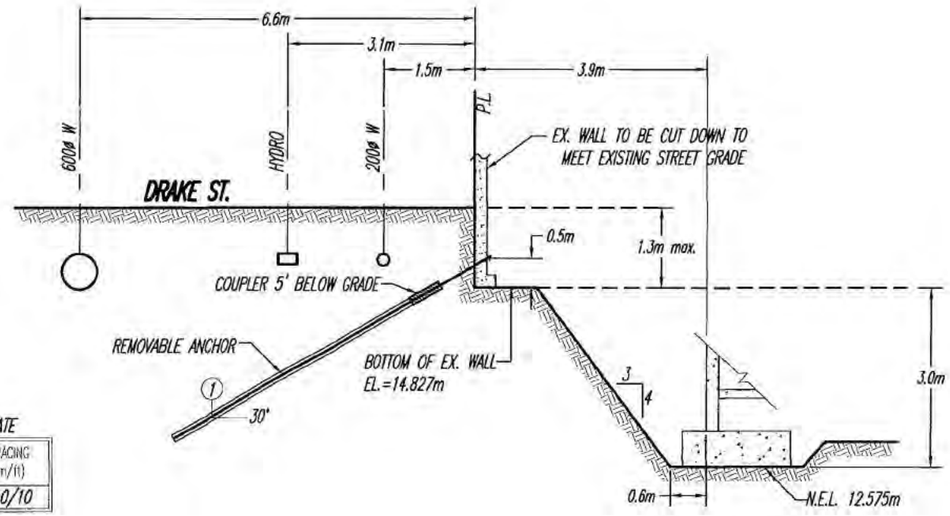

SECTION B4
SCALE 1:100

DYWIDAG #6 Gr 75/100 OR APPROVED ALTERNATE

ROW	LENGTH (m/ft)	GROUTED (m/ft)	LOCKOFF (kips)	SPACING (m/ft)
1	5.5/18	4.6/15	18	3.0/10

CONTRACTOR TO CONFIRM LOCATION OF ALL U.G. UTILITIES AND STRUCTURES

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PROJECT No.: 15018
PROJECT DATE: JUNE 15, 2016

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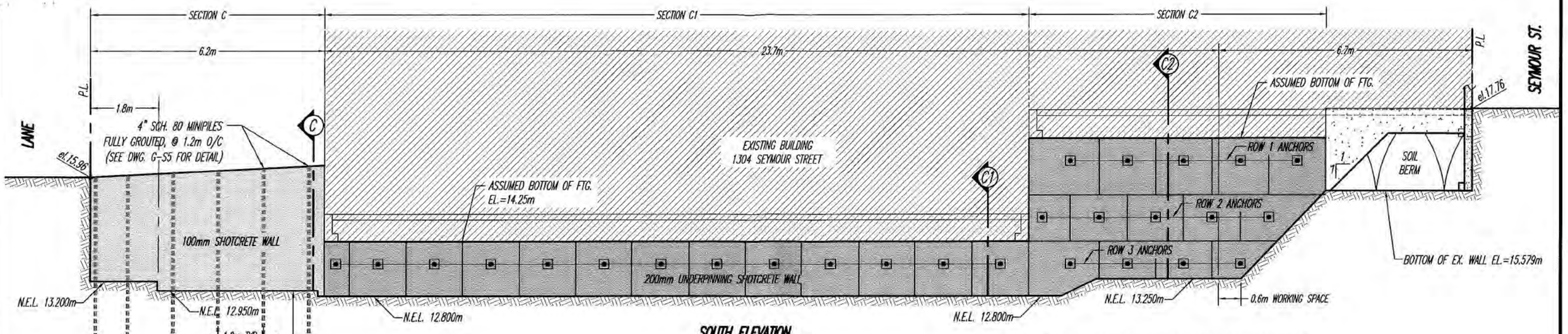
1779 W. 75th Avenue
Vancouver, B.C. V6P 6P2
P 604.439.0922
F 604.439.9189

DATE: APRIL 12, 2017
DRAWN BY: M.S. | APPROVED BY: M.J.K. | REVIEWED BY: W.J.
SCALE: AS SHOWN

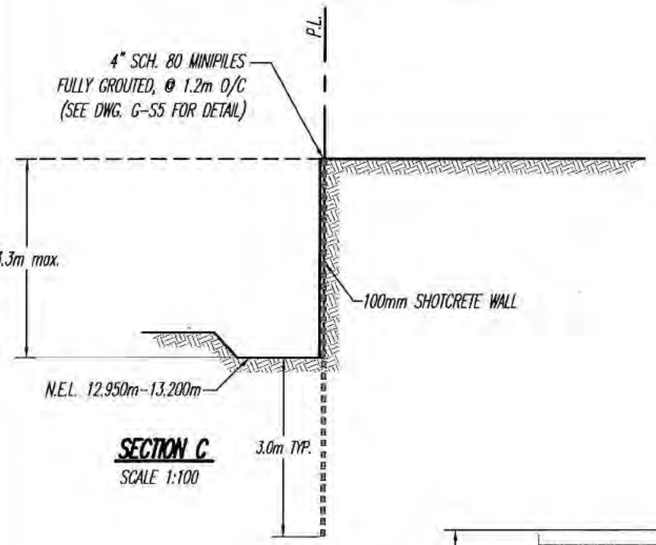
COVENANT HOUSE
530 DRAKE STREET, VANCOUVER, B.C.
SECTIONS B2, B3, B4

FILE NO.: 13925
DWG. NO.: G-S3B

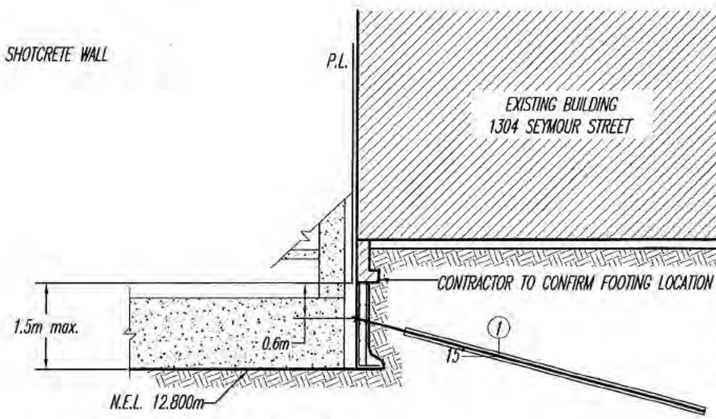
REVISIONS:
A. AUGUST 31, 2017 – New foundations
B. SEPTEMBER 11, 2017 – Issued For BP
C.



SOUTH ELEVATION
SCALE 1:100



SECTION C
SCALE 1:100

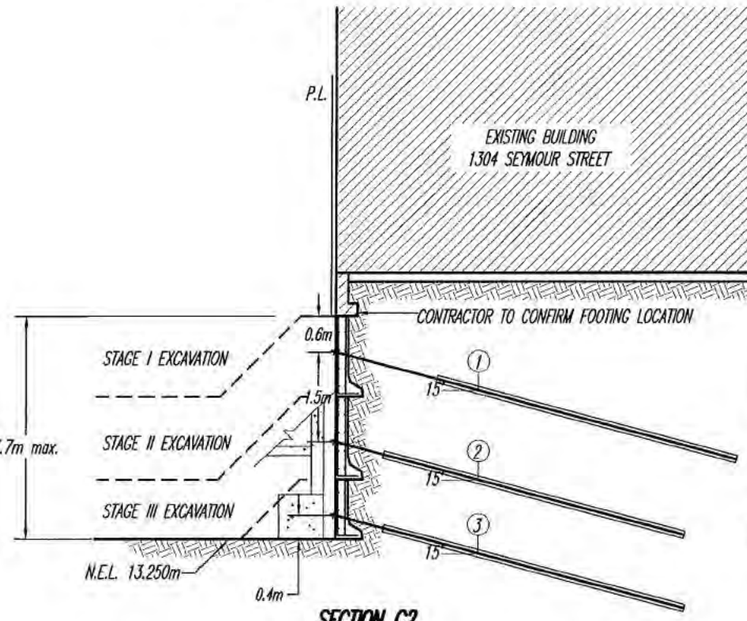


SECTION C1
SCALE 1:100

DYWIDAG #7 Gr 75/100 OR APPROVED ALTERNATE

ROW	LENGTH (m/ft)	GROUTED (m/ft)	LOCKOFF (kips)	SPACING (m/ft)
1	6.1/20	5.2/17	25	1.5/5

CONTRACTOR TO CONFIRM LOCATION OF
ALL U.G. UTILITIES AND STRUCTURES



SECTION C2
SCALE 1:100

DYWIDAG #7 Gr 75/100 OR APPROVED ALTERNATE

ROW	LENGTH (m/ft)	GROUTED (m/ft)	LOCKOFF (kips)	SPACING (m/ft)
1	7.0/23	5.2/17	25	1.5/5
2	6.1/20	5.2/17	25	1.5/5
3	6.1/20	5.2/17	25	1.5/5

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ALL U.G. UTILITIES AND STRUCTURES

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21364

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PROJECT No.: 15018
PROJECT DATE: JUNE 15, 2016

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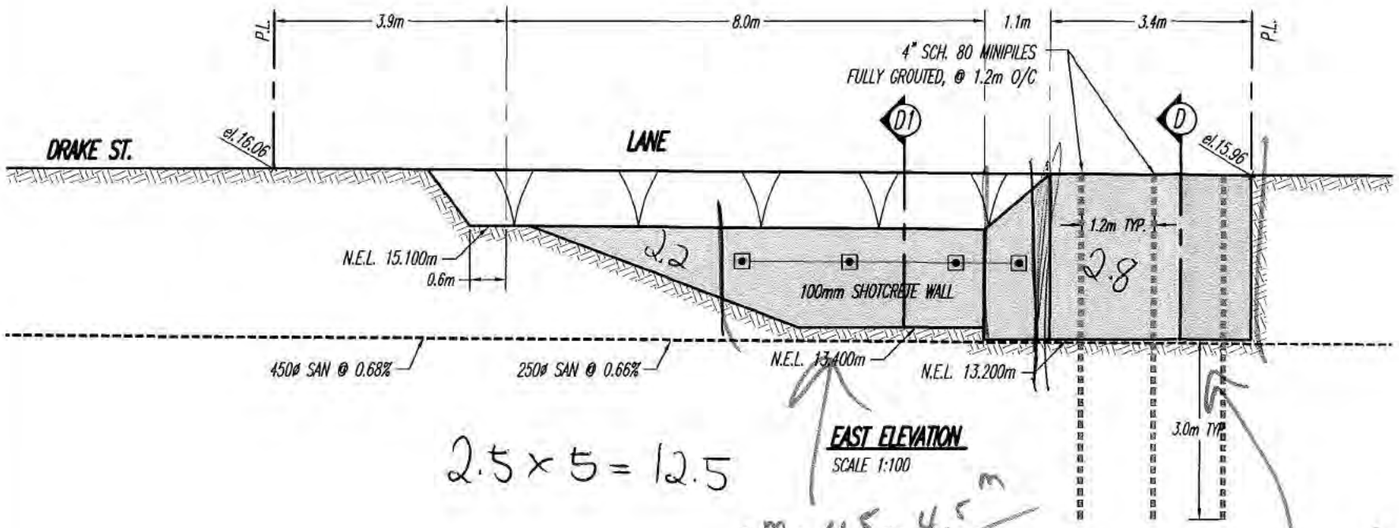
1779 W. 75th Avenue
Vancouver, B.C. V6P 6P2
P 604.439.0922
F 604.439.9189

DATE: APRIL 12, 2017
DRAWN BY: M.S. | APPROVED BY: M.J.K. | REVIEWED BY: W.J.
SCALE: AS SHOWN

COVENANT HOUSE
530 DRAKE STREET, VANCOUVER, B.C.
SOUTH ELEVATION, SECTIONS C, C1, C2

FILE NO.: 13925
DWG. NO.: G-S4

REVISIONS:
A. AUGUST 31, 2017 – New foundations
B. SEPTEMBER 11, 2017 – Issued For BP
C.

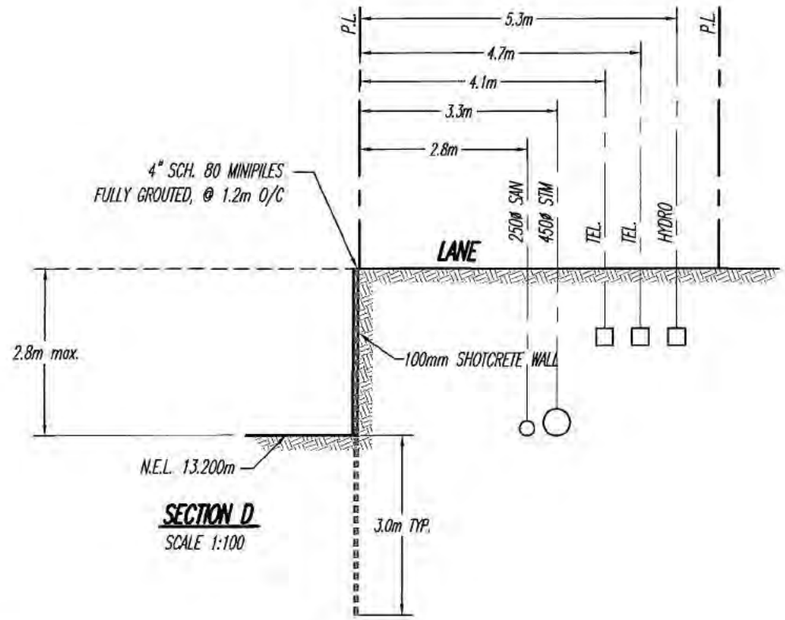


EAST ELEVATION
SCALE 1:100

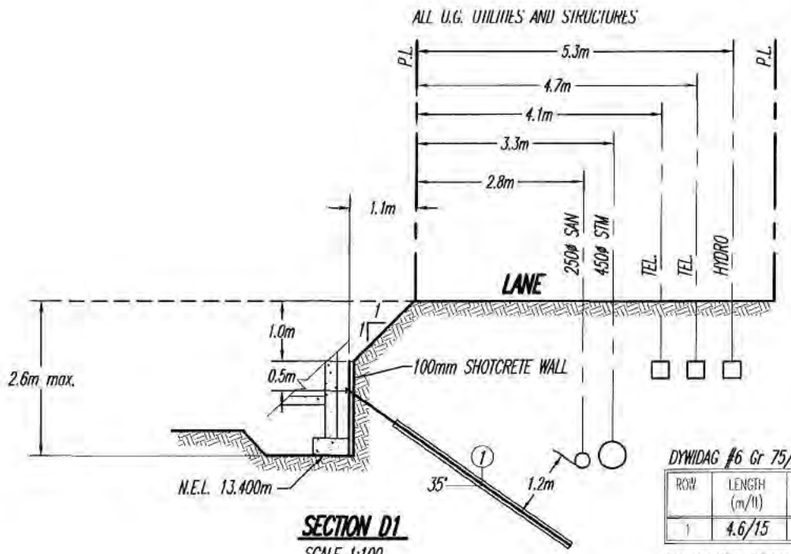
2.5 × 5 = 12.5

1m + 4.5 = 4.5m

4.5 ∝ 2.8 = 12.6



SECTION D
SCALE 1:100



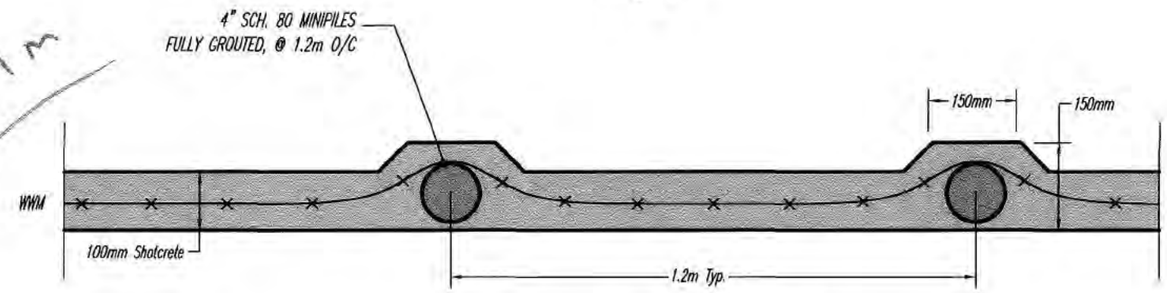
SECTION D1
SCALE 1:100

DYWIDAG ø6 Gr 75/100 OR APPROVED ALTERNATE

ROW	LENGTH (m/ft)	GROUTED (m/ft)	LOCKOFF (kips)	SPACING (m/ft)
1	4.6/15	3.6/12	15	1.8/6

CONTRACTOR TO CONFIRM LOCATION OF ALL U.G. UTILITIES AND STRUCTURES

Total 17.1m



100mm SHOTCRETE DETAIL
N.T.S.

SEP 14 2017

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
M. J. KOKAN
21364

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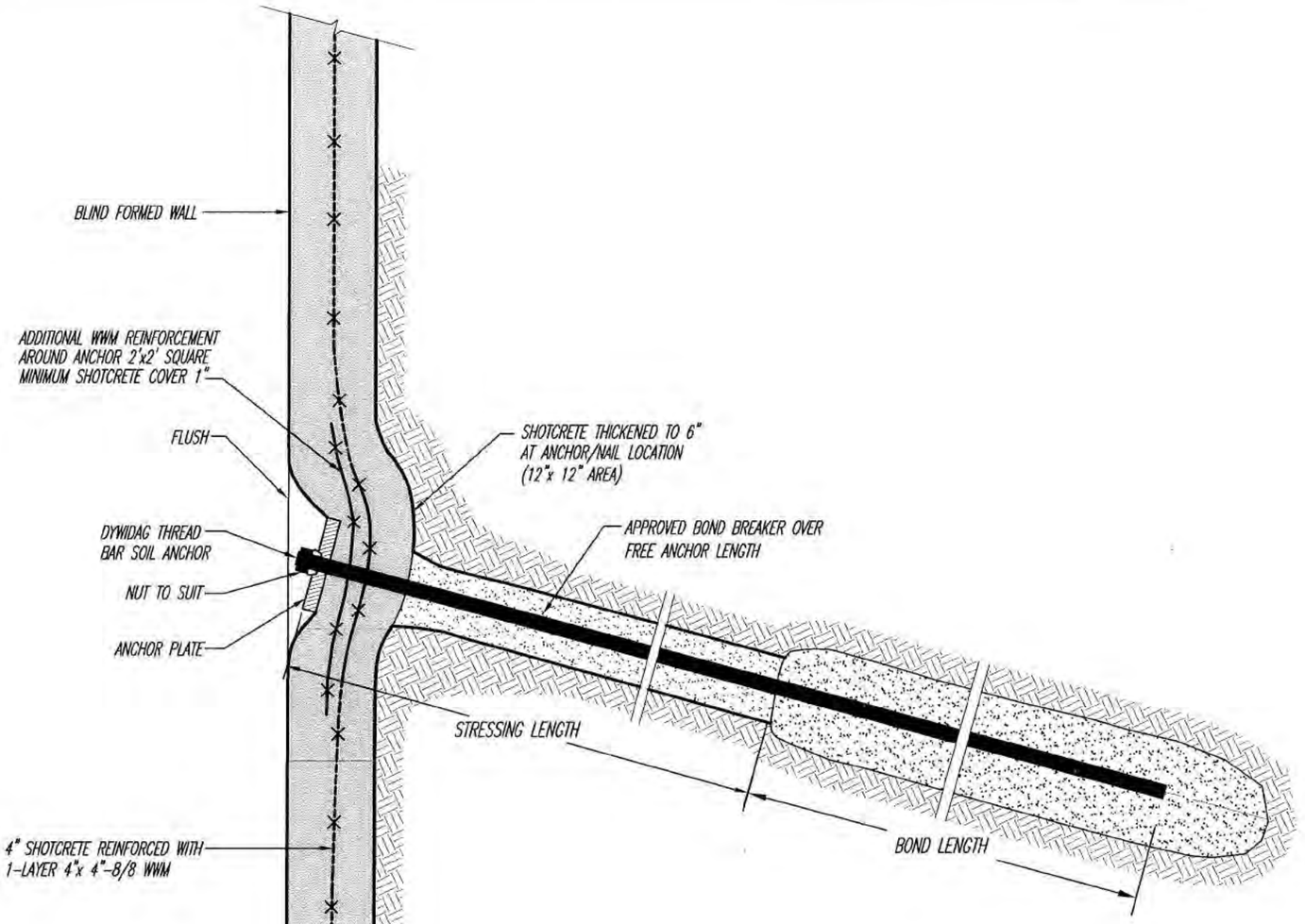

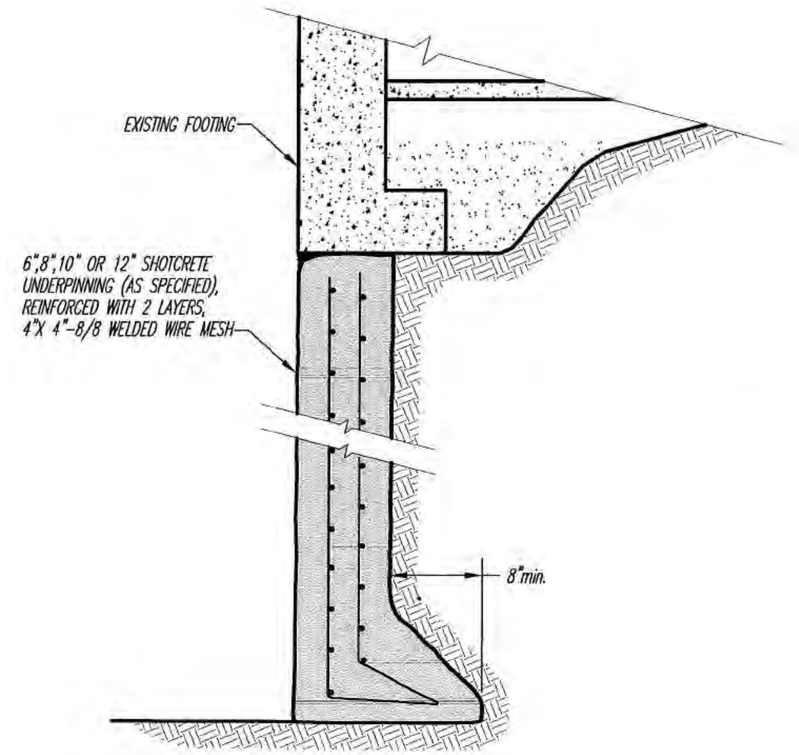

UNDERPINNING DETAIL

NOTE:

FOR "FULLY-GROUTED" ANCHORS, POST-GROUT THE "FREE ANCHOR" LENGTH AFTER LOCK-OFF AND APPROVAL USING PRE-APPROVED TECHNIQUES.

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SEP 14 2017

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA M. J. KOKAN # 21364

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GEOPACIFIC VANCOUVER KAMLOOPS CALGARY
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P 604.439.0922 F 604.439.9189

DATE: APRIL 12, 2017		
DRAWN BY: M.S.	APPROVED BY: M.J.K.	REVIEWED BY: W.J.
SCALE: AS SHOWN		

COVENANT HOUSE
530 DRAKE STREET, VANCOUVER, B.C.
ANCHORED SHOTCRETE AND UNDERPINNING DETAIL

FILE NO.: 13925	REVISIONS:
DWG. NO.: G-1	A. SEPTEMBER 11, 2017 – Issued For BP
	B.
	C.

1.0 GENERAL

1.1 In these Notes, the Engineer is GeoPacific Consultants Ltd.

1.2 These Notes must be read in conjunction with the design Drawings.

1.3 The work described and shown involves near vertical excavated slopes or structure using a combination of shotcrete and ground anchors. All slopes shall be covered with secured polyethylene sheeting to prevent erosion.

1.4 The anchors will be installed in ground around the site and the actual soil and groundwater conditions must be assumed.

1.5 The grouted anchor lengths required to resist the design loads are based on the assumed conditions. The capacity of the anchors will be confirmed at the beginning of the contract and may be lengthened or shortened.

1.6 Some utilities, foundations and structures which may affect the installation procedures and techniques are noted on the Drawings.The Contractor shall confirm the locations and condition of ALL man-made elements which may be damaged because of the anchored shotcrete operations. It is the Contractor's responsibility to install the anchored shotcrete in the actual site conditions encountered.

Elements which may, in the opinion of the Contractor, be damaged by the anchored shotcrete operations must be reported to the Engineer well in advance of the work to take place.

1.7 These documents are based on architectural, structural and survey Drawings provided. It is the Contractor's responsibility to verify all dimensions and report discrepancies to the Engineer.

1.8 The Contractor shall schedule and co-ordinate the work to satisfy the reasonable requirements of adjacent Owners and Tenants who shall be given sufficient Notice before carrying out work which may affect their property.

1.9 The Contractor shall erect and maintain a secure closed hoarding around the site for the safety of all persons in the vicinity of the site.

1.10 The Contractor shall inspect the slopes and the support to the slopes and structures daily and shall immediately report any potentially damaging movement or deterioration to the Engineer by telephoning 604-439-0922.

2.0 MATERIALS

2.1 ANCHOR BAR:

The anchors shall be installed in minimum 75 mm (3 inch) diameter holes which shall be drilled, unless otherwise approved in advance by the Engineer. Anchor capacity is dependant upon installation techniques and the drilling equipment and methods shall be subject to the Engineer's approval.

Drilling techniques shall produce a hole which is free of debris and ensure continuous support of the hole and shall not erode or disturb soil around the hole.

2.2 Anchor tendons shall be as shown on the design drawings.

Anchorage equipment couplings and any necessary wedges washers and plates shall be in accordance with the tendon manufacturer's specifications and requirements.

Minimum anchorage length ("fixed" length) and stressing length ("free" length) are shown on the Drawings.

2.3 Grout in the anchorage shall be a prior-approved non-shrink cementitious material mixed with a minimum compressive strength of 5 MPa in 24 hours and 35 MPa in 28 days.

2.4 Shotcrete shall be reinforced with 102 x 102 MW13.3/13.3 (4"x4"-8/8) welded wire mesh as shown on the Drawings. Steel shall have a minimum yield strength of 450 MPa (65 ksi) and shall be in accordance with ASTM A497.

2.5 All shotcreting shall be carried out in accordance with ACI 506 : "Specifications for Materials Proportioning and Application of Shotcrete"

2.6 Shotcrete shall have a minimum compressive strength of 5 MPa in 24 hours and 30 MPa in 28 days. The Engineer may require test panels to be prepared by the Contractor so they can be cored by others to confirm the shotcrete strength. The Contractor shall co-operate with the independent testing laboratory appointed by the Owner for this purpose.

2.7 Soil Berm material to be well compacted, clean, granular material or approved alternative. Compaction to be reviewed by Geopacific on site. Material to be reviewed by Geopacific prior to placement. Soil Berm to be covered in poly sheeting.

2.8 The minipiles shall be installed in minimum 150mm (6 inch) diameter holes which shall be drilled, unless otherwise approved in advance by the Engineer. Minipiles capacity is dependant upon installation techniques, and the drilling equipment, and methods shall be subject to the Engineer's approval.

3.0 INSTALLATION

3.1 Hollow Core Bar Installation (if required)

Set the bar on an appropriate drill rig. Start pumping the grout to assure that grout will exit drill bit.

Proceed with rotary drilling and flushing approx. three feet per min (depending on ground condition). Rotation speed should be approx. 60 to 120 RPM. To achieve higher friction values, advance and retract the bars several times for each 3.0 m (10 feet) length of bar installed in the bond zone.

The grout should be applied CONTINUOUSLY during drilling. A grout pump with at least 60 l/min volume and minimum 2 MPa (300 psi) pressure capacity (preferably 10 MPa, 1500 psi) should be used.

Refer to the manufacture's specifications and recommendations for more detail.

3.2 Anchors and shotcrete shall be installed in sequence and stages to maintain stability of the excavation. Excavation of soil from the site shall also take place in stages. Stages shall not exceed 1.8 m (6 feet) vertical.

The Contractor may remove all soil within any mass excavation Stage before anchors in that Stage are installed but further excavation shall not take place until all anchored shotcrete in that Stage is installed and approved by the Engineer.

The mass excavation for any Stage does not include a perimeter berm with a minimum top width of one metre and a side slope of 1 horizontal to 1 vertical.

Ground conditions may locally require a wider berm, flatter slopes and/or other slope protection measures including covering or short-term temporary support.

The perimeter berms in any stage shall be excavated in staggered panels. THE MAXIMUM WIDTH OF A PANEL SHALL BE THE HORIZONTAL SPACING OF THE ANCHOR PLUS 0.6 M (2 FEET). This panel width may be INCREASED OR DECREASED by the Engineer's agreement, in writing, BEFORE increasing the panel width.

No adjacent panels shall be excavated concurrently and no more than 1/3 of the panels shall be excavated concurrently. In addition no panel shall be excavated into the berm until at least 24 hours after that panel anchor has been grouted.

Anchors and shotcrete may be installed concurrently in different panels. Anchors shall be installed at right angles to the property lines on plan and within 2.5 degrees of the declination shown on the Drawings except with the prior approval of the Engineer.

SEP 14 2017

ORIGINAL PAPER SIZE 11"x17"

REFERENCE:	GEOPACIFIC VANCOUVER KAMLOOPS CALGARY 1779 W. 75th Avenue Vancouver, B.C. V6P 6P2 P 604.439.0922 F 604.439.9189	DATE: APRIL 12, 2017 DRAWN BY: M.S. / APPROVED BY: M.J.K. / REVIEWED BY: W.J. SCALE: AS SHOWN	COVENANT HOUSE 530 DRAKE STREET, VANCOUVER, B.C. GENERAL NOTES	FILE NO.: 13925 DWG. NO.: G-2 (sheet 1 of 2)	REVISIONS: A. SEPTEMBER 11, 2017 – Issued For BP B. C.

3.3 Immediately following excavation of the soil berm in a panel the excavated face shall be trimmed back to the required line and mesh reinforcement shall be fixed to the soil to ensure the minimum specified shotcrete cover. Shotcrete shall be applied without delay to thicknesses shown on the Drawings.

Shotcrete panels shall be kept moist to aid curing by spraying with water and covering with sacking or polyethylene sheeting.

Sufficient wire mesh reinforcement shall be installed to provide a full strength overlap with adjacent panels. This overlap shall not be less than 200 mm (8 inch).

The end surfaces of panels shall be thoroughly cleaned with compressed air to ensure a full strength bond when adjacent panels are shotcreted.

3.4 Drains to relieve groundwater pressure shall be installed through the shotcrete. Drains shall be a minimum of 50 mm (2 inches) diameter and at normal 3.0 m (10 feet) centres horizontally and 1.5 m (5 feet) centres vertically. The Contractor shall install filters in drains as fines are being removed with the water.

Additional special drains may be required where water seeps are noted. This special drains shall consist of minimum 50 mm (2 inches) diameter perforated ABS pipe installed within 75 mm (3 inches) diameters holes drilled 5 degrees UPWARDS from the 3 metres (10 feet) measured from the face of the shotcrete. These special drains may be required to be filtered with fine sand or gravel or filter fabrics.

3.5 Anchors shall be tensioned as soon as practicable but no sooner than 24 hours after the construction of the applicable shotcrete panel. Anchors shall be tensioned and tested as follows:

3.5.1 Apply a proof load of 1.33 times the lock-off load for two minutes. Monitor the load in the anchor. If the reduction in load is less than 2.5 percent of proof load reduce the load to lock-off load and lock the working load into the anchor.

3.5.2 If the anchor does not hold at least 133 percent of lock-off load for two minutes the Engineer must be informed. Further testing in the presence of the Engineer will required as follows:

Load the anchor in 22 kN (5 kip) increments to 130.5 percent of lock-off load. Hold each increment for 5 minutes except at maximum load when the load shall be maintained for 100 minutes. The increase in length of the anchor shall be measure at the start and end of each load increment except at maximum load when the extension shall be measured at 5 minutes intervals.

This information shall be utilized by the Engineer to deduce the utilized anchor length and to assess the creep characteristics.

Anchors which creep more than 2 mm (0.08 inch) per log cycle of time will not be accepted. The Contractor shall install replacement anchors at the Contractor's expense.

4.0 SHOTCRETE REMOVAL/ANCHOR DETENSIONING

4.1 All excavation and support works within the CITY OF VANCOUVER shall be in strict accordance with the City's requirements.

4.2 No part of the anchor system shall remain in place within 1.5 m (5 feet) of final grade. Anchors 1.5 m (5 feet) below final grade shall be detensioned or fully grouted when no longer required in the opinion of the Engineer.

4.3 No shotcrete shall remain in place within 1.5 m (5 feet) of final grade. A bond breaker must be installed between blind-formed foundation walls and shotcrete on city property to allow for shotcrete removal.

5.0 BACKFILLING ON AND ADJACENT TO CITY PROPERTY

5.1 Backfilling on and adjacent to City property must be in accordance with the City's backfill specifications, with the City's backfill specifications, "Street Restoration Manual" dated AUGUST 18, 2008.

5.2 Backfill Containment dams will be required at excavation corners where excavation to be backfilled against City property.

6.0 REQUIRED INSPECTIONS

6.1 The following are the MINIMUM inspections which are required by the Geotechnical Engineer. The Contractor is responsible for informing the Geotechnical Engineer that the Work is ready for these inspections. The Contractor shall be liable for any loss caused by failure to inform the Geotechnical Engineer that the Work is ready for inspection.

1. 2 days before work commences on site.
2. 1 day before the anchors are detensioned.
3. 2 days before backfilling commences.
4. 1 day before shotcrete removal.

6.2 Daily Inspection is required during installation of anchors, and full time inspection is required during anchor testing.

7.0 CONTRACTOR QUALIFICATION

7.1 Temporary works and shoring installation is highly sensitive to processes including sequence of installation, quality and quantity of materials used, monitoring of the works and other factors. Consequently a high degree of skill and professionalism is required for its successful implementation. As a result, all contractors considered for tender of the shoring work described in the Design Drawings must be approved by the Engineer in advance of tender. The work must be carried out only by a shoring contractor with experience and expertise in shoring construction. The contractors experience and expertise must be with projects of similar size and scope to that shown in the Design Drawings. The following shoring contractors are permitted to undertake the work:

- Matcon Canada
- Southwest Contracting
- Bel Pacific Excavation & Shoring
- Vancouver Shotcrete
- Power Shotcrete Shoring LTD.
- Mainland Excavation & Shoring ltd.

7.2 The preceding list does not express or imply any guarantee or warranty of the contractor's performance. It is the responsibility of the contractor to undertake the work shown on the Design Drawings.

7.3 Shoring contractors other than those listed above may be considered by the Engineer only with submission of references and qualifications for at least 10 projects of similar size and scope. GeoPacific reserves the right to accept or reject the qualifications of any shoring contractor.

NOTES:

1. The excavation support design is based on the locations of adjacent structures and utilities which have been supplied. The Contractor shall confirm the locations and elevations of all foundations and utilities which may be affected by the work and raport any discrepancies to GeoPacific Consultants Ltd. (Tel.: 439-0922)
2. All slopes shall be covered with secured polyethylene sheeting to prevent erosion.
3. The extent of the excavation shall be based on the Architectural and Structural Drawings. The Contractor shall confirm the size of the excavation required by the basement and report any discrepancy with these Drawings to GeoPacific Consultants Ltd.
4. The Contractor must obtain prior permission in writing to carry out any work on adjacent private property.
5. The Contractor shall inform GeoPacific Consultants Ltd. of any surcharge loads which will be within half the height of the excavation from the top of the excavation so that the support system can be modified to support the additional loads. The Contractor shall also inform GeoPacific if and when any groundwater seepages occur which may require additional special drains as outlined in Note 3.4, Drawing G-2.
6. The ground conditions must be confirmed by GeoPacific Consultants Ltd. when the excavation is 4 feet deep. The Contractor is responsible for ensuring that GeoPacific personnel inspect the site.

DRAWING LIST:

ORIGINAL PAPER SIZE 11"x17"

REFERENCE:

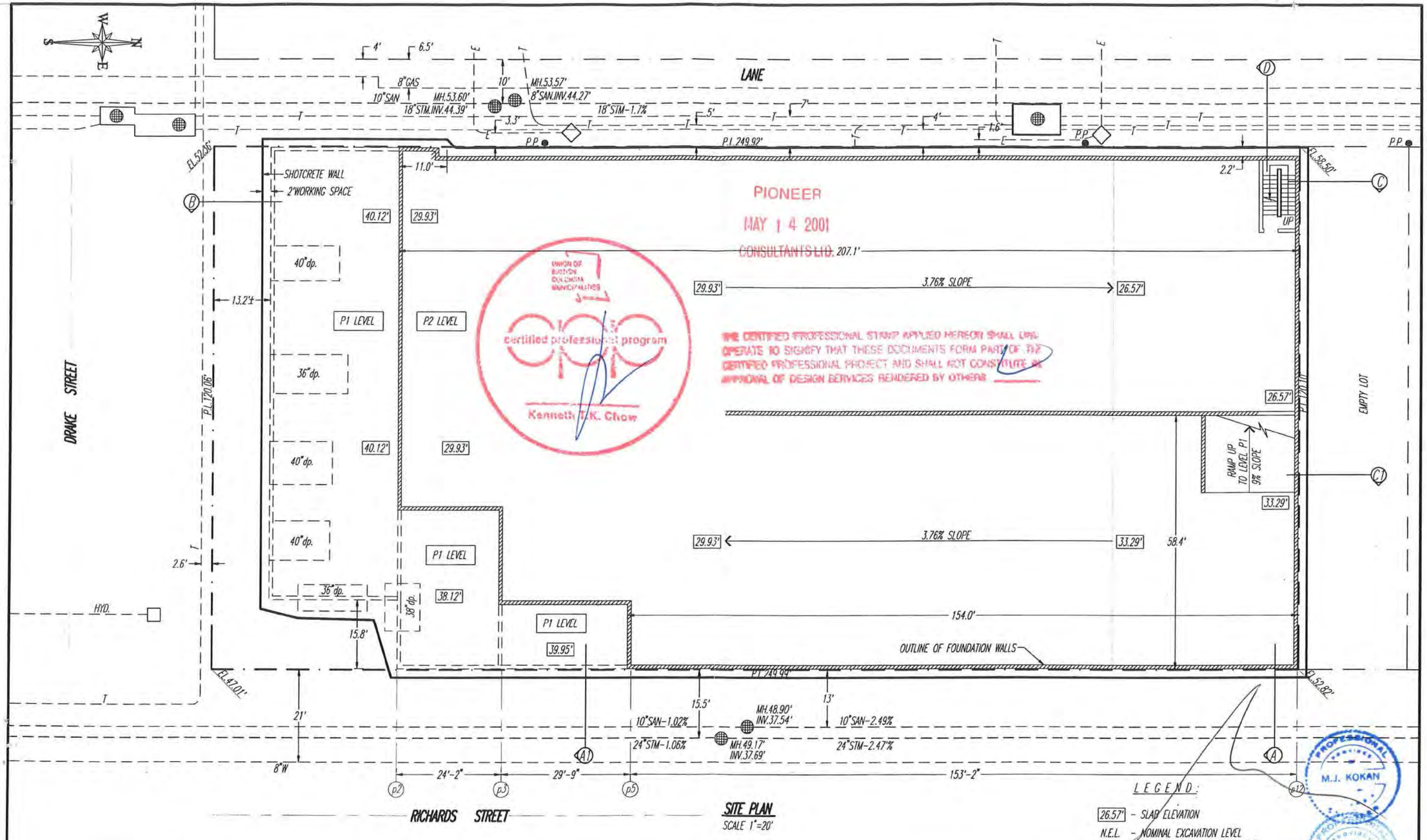
GEOPACIFIC VANCOUVER KAMLOOPS CALGARY
1779 W. 75th Avenue Vancouver, B.C. V6P 6P2
P 604.439.0922 F 604.439.9189

DATE:	APRIL 12, 2017	
DRAWN BY: M.S.	APPROVED BY: M.J.K.	REVIEWED BY: W.J.
SCALE:	AS SHOWN	

COVENANT HOUSE
530 DRAKE STREET, VANCOUVER, B.C.
GENERAL NOTES

FILE NO.: 13925
DWG. NO.: G-2 (sheet 2 of 2)

REVISIONS:
A. AUGUST 31, 2017 – added sheets G-S4, G-S5
B. SEPTEMBER 11, 2017 – Issued For BP
C.



PIONEER

MAY 1 4 2001

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SITE PLAN
SCALE 1"=20'

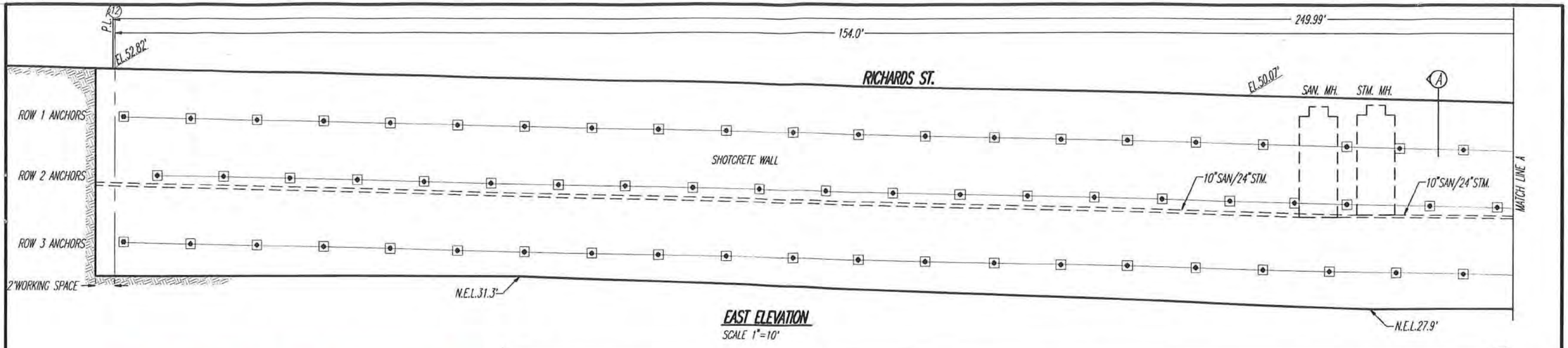
LEGEND:
26.57' - SLAB ELEVATION
N.E.L. - NOMINAL EXCAVATION LEVEL AT PERIMETER = SLAB EL.-2.0'

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA M.J. KOKAN E. J. HARRINGTON

REFERENCE: HOWARD + BINGHAM + HILL - ARCHITECTS PROJ. NO.: 0005 DATE:	102-6968 Russell Avenue Burnaby, B.C. V5J 4P9 Email: geopacific@telus.net Ph. (604) 439-0922 Fax (604) 439-9189 GeoPacific Consultants Ltd.	DATE: APRIL 11, 2001 DRN. BY: KAZ. APP'D. E.J.H. SCALE: AS SHOWN	**RICHARDS at DRAKE RESIDENTIAL DEVELOPMENT** 1295 RICHARDS STREET, VANCOUVER, B.C. **SHORING PLAN**

FILE NO.:	3550
DWG. NO.:	G-S1

REVISIONS:
A. MAY 9/01
B.
C.



EAST ELEVATION
SCALE 1"=10'

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ROW	LENGTH (ft)	GROUTED (ft)	LOCKOFF (kips)	SPACING (ft)
1	30	18	30	7
2	25	18	30	7
3	21	18	30	7

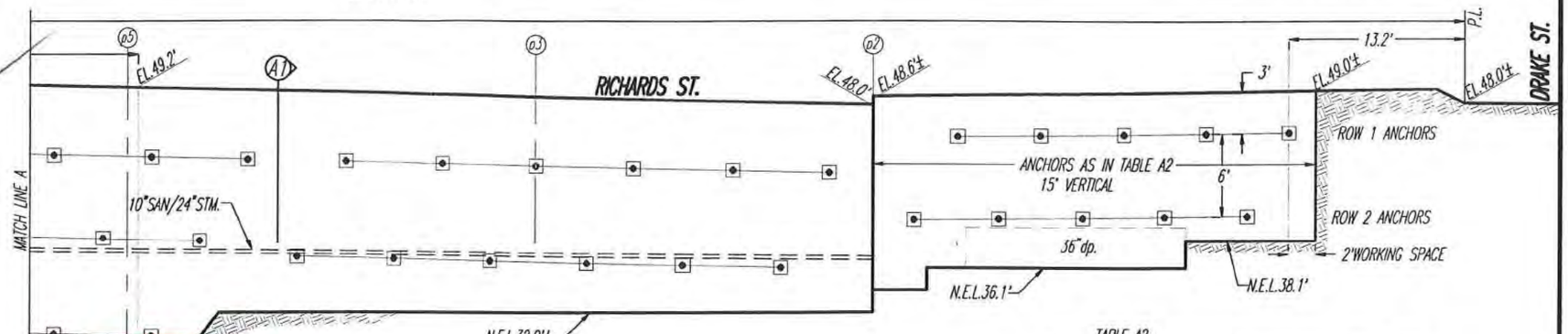
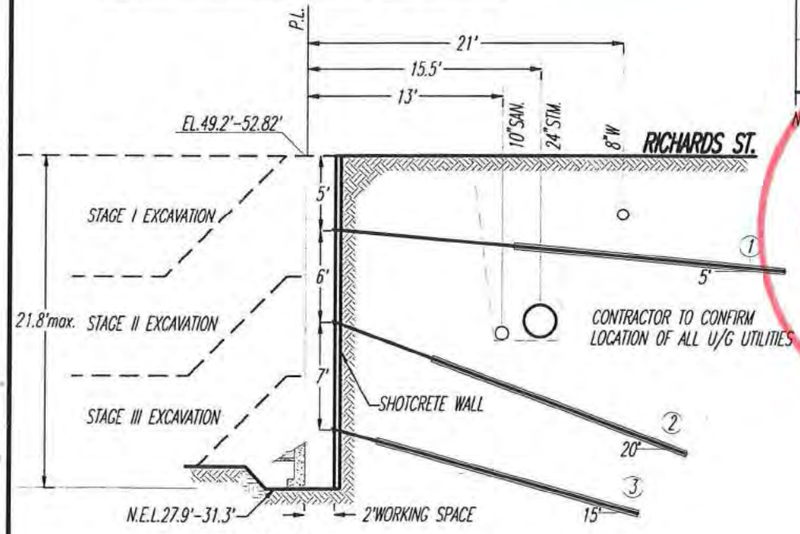


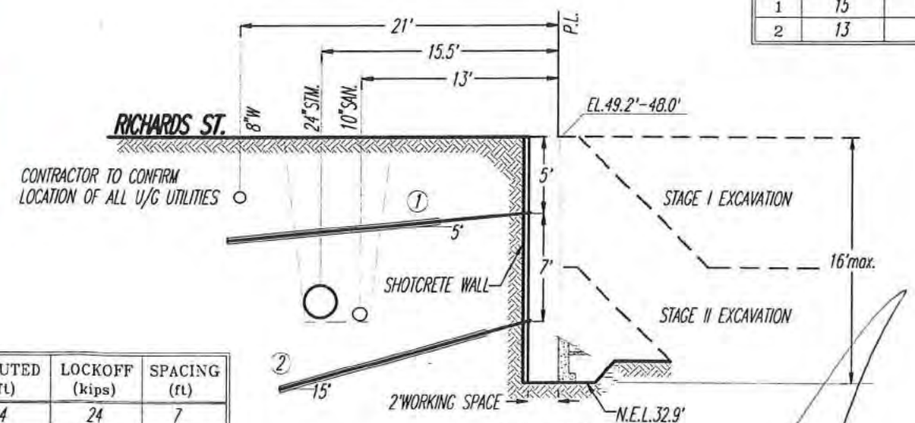
TABLE A2

ROW	LENGTH (ft)	GROUTED (ft)	LOCKOFF (kips)	SPACING (ft)
1	15	10	16	6
2	13	10	16	6



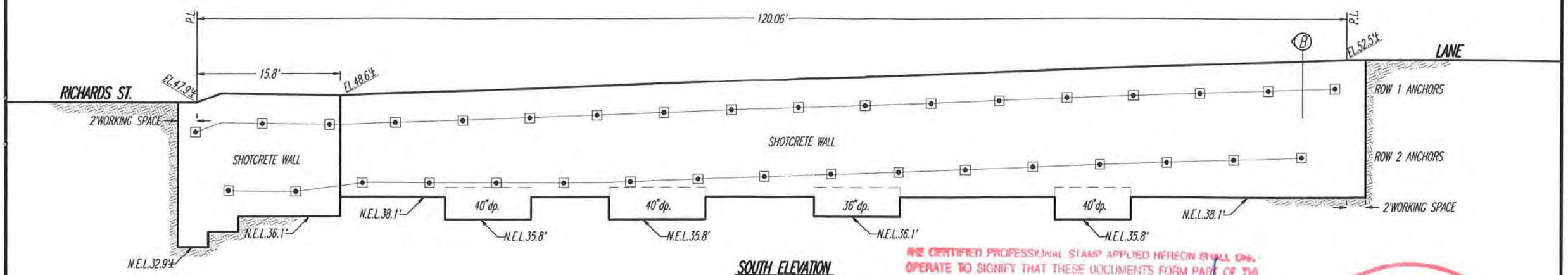
SECTION A
SCALE 1"=10'

ROW	LENGTH (ft)	GROUTED (ft)	LOCKOFF (kips)	SPACING (ft)
1	20	14	24	7
2	17	14	24	7

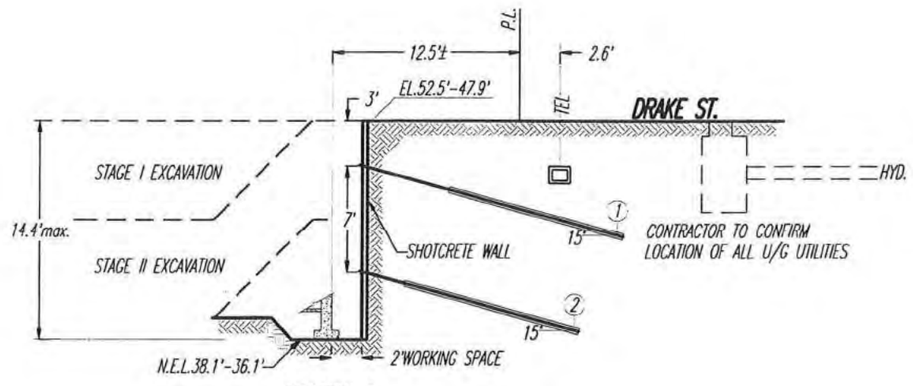


SECTION A1
SCALE 1"=10'

REFERENCE:	102-6968 Russell Avenue Burnaby, B.C. V5J 4R9 Email: geopacific@telus.net Ph. (604) 439-0922 Fax (604) 439-9189 GeoPacific Consultants Ltd.	DATE: APRIL 11, 2001	RICHARDS at DRAKE RESIDENTIAL DEVELOPMENT 1295 RICHARDS STREET, VANCOUVER, B.C.	FILE NO: 3550
		DRN. BY: KAZ. APP'D. E.J.H.		DWG. NO: G-S2
		SCALE: AS SHOWN		REVISIONS: A. MAY 9/01 B. C.

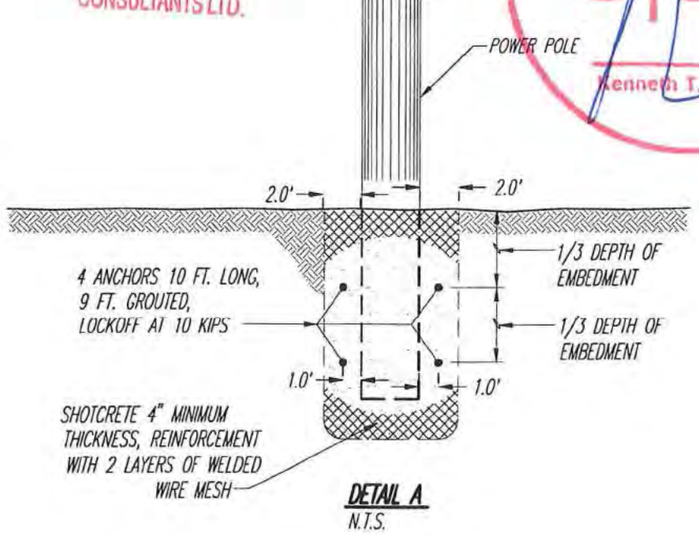


SOUTH ELEVATION
SCALE 1"=10'



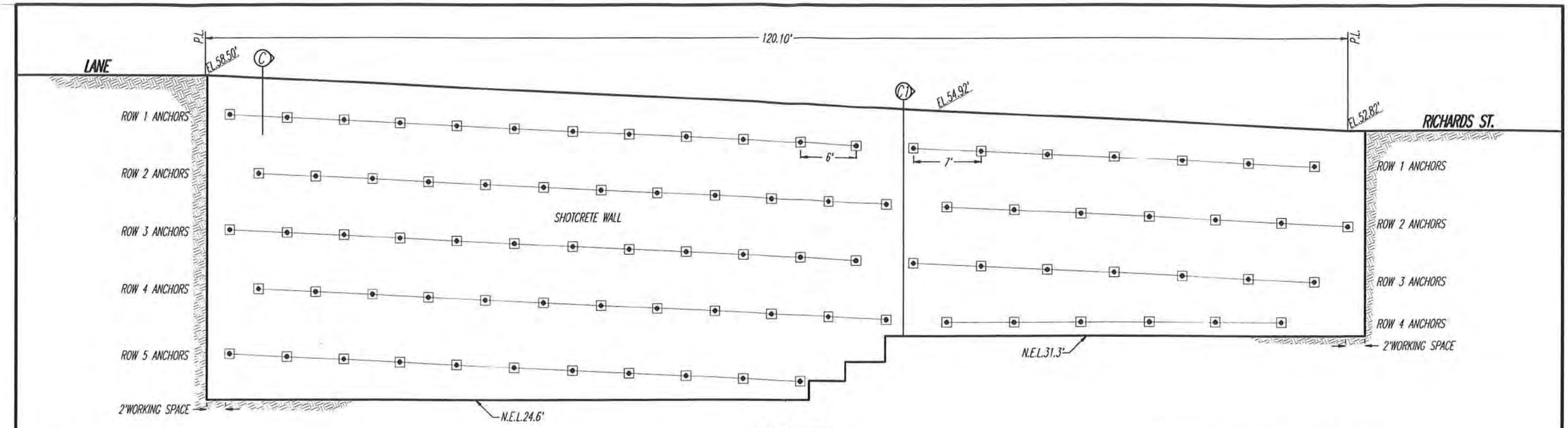
SECTION B
SCALE 1"=10'

ROW	LENGTH (ft)	GROUTED (ft)	LOCKOFF (kips)	SPACING (ft)
1	18	12	20	7
2	15	12	20	7



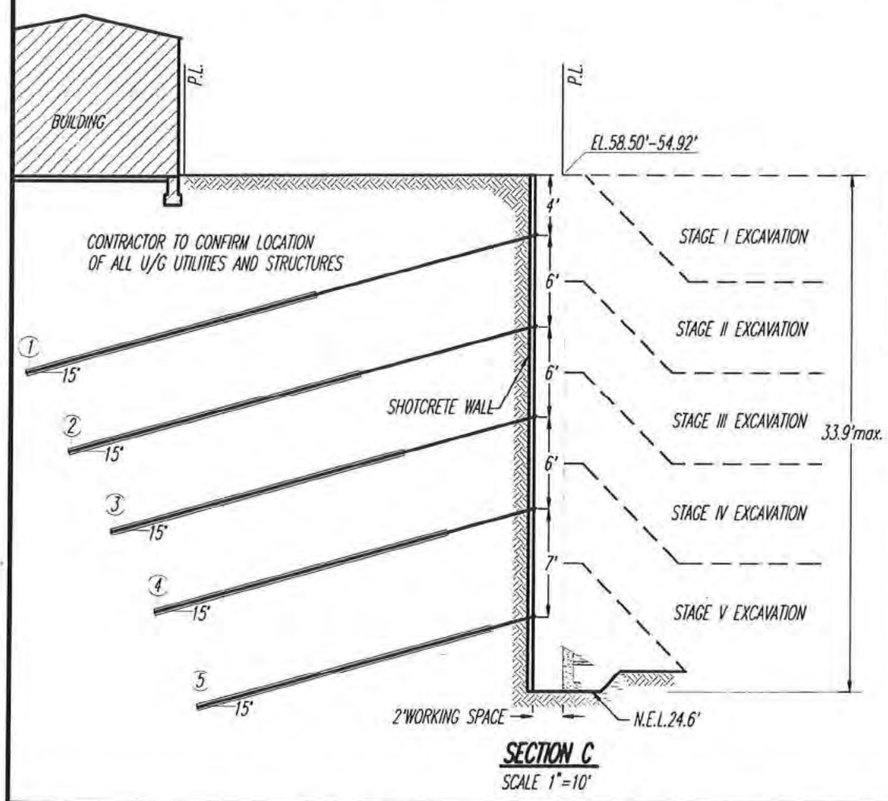
DETAIL A
N.T.S.

REFERENCE:	102-6968 Russell Avenue Burnaby, B.C. V5J 4R9 Email: geopacific@telus.net Ph. (604) 439-0922 Fax (604) 439-9189 GeoPacific Consultants Ltd.	DATE: APRIL 11, 2001	RICHARDS at DRAKE RESIDENTIAL DEVELOPMENT 1295 RICHARDS STREET, VANCOUVER, B.C.	FILE NO.: 3550	REVISIONS: A. MAY 9/01 B. C.
		DRN. BY: KAZ. APP'D. E.J.H.		DWG. NO.: G-S3	
		SCALE: AS SHOWN			



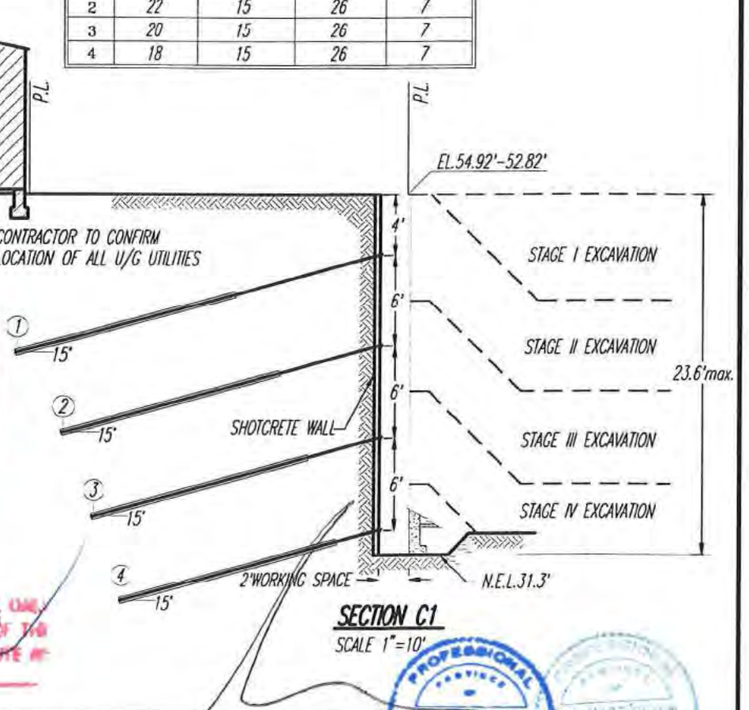
NORTH ELEVATION
SCALE 1"=10'

ROW	LENGTH (ft)	GROUTED (ft)	LOCKOFF (kips)	SPACING (ft)
1	25	15	26	7
2	22	15	26	7
3	20	15	26	7
4	18	15	26	7



SECTION C
SCALE 1"=10'

ROW	LENGTH (ft)	GROUTED (ft)	LOCKOFF (kips)	SPACING (ft)
1	35	20	35	6
2	32	20	35	6
3	29	20	35	6
4	26	20	35	6
5	23	20	35	6



SECTION C1
SCALE 1"=10'

REFERENCE:

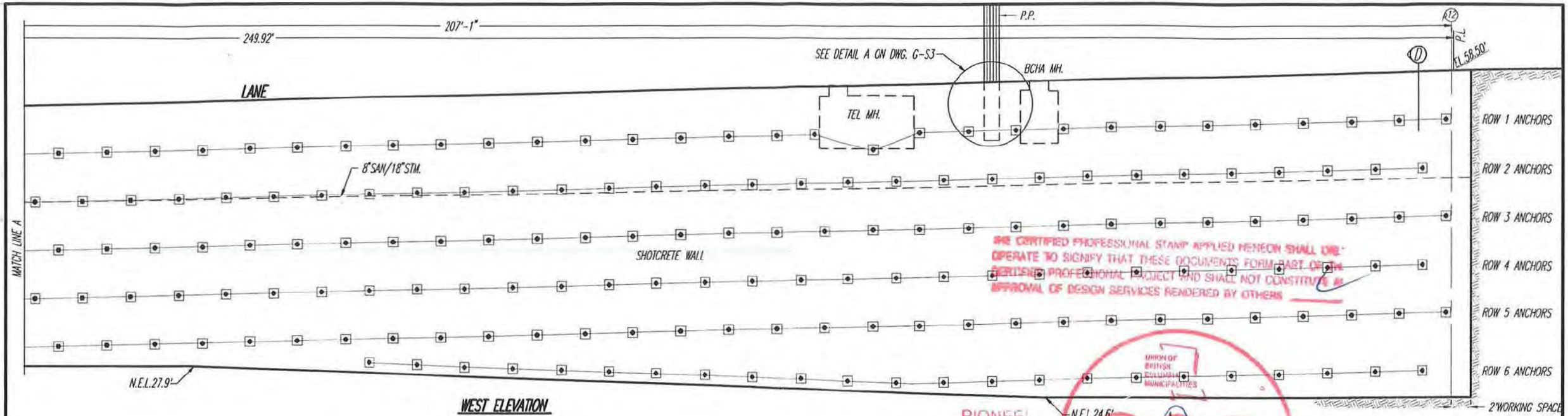
102-6968 Russell Avenue
Burnaby, B.C. V5J 4R9
Email: geopacific@telus.net
Ph. (604) 439-0922
Fax (604) 439-9189
GeoPacific Consultants Ltd.

DATE: APRIL 11, 2001
DRN. BY: KAZ. APP'D. E.J.H.
SCALE: AS SHOWN

RICHARDS at DRAKE RESIDENTIAL DEVELOPMENT
1295 RICHARDS STREET, VANCOUVER, B.C.

FILE NO.: 3550
DWG. NO.: G-S4

REVISIONS:
A.
B.
C.



WEST ELEVATION
SCALE 1"=10'

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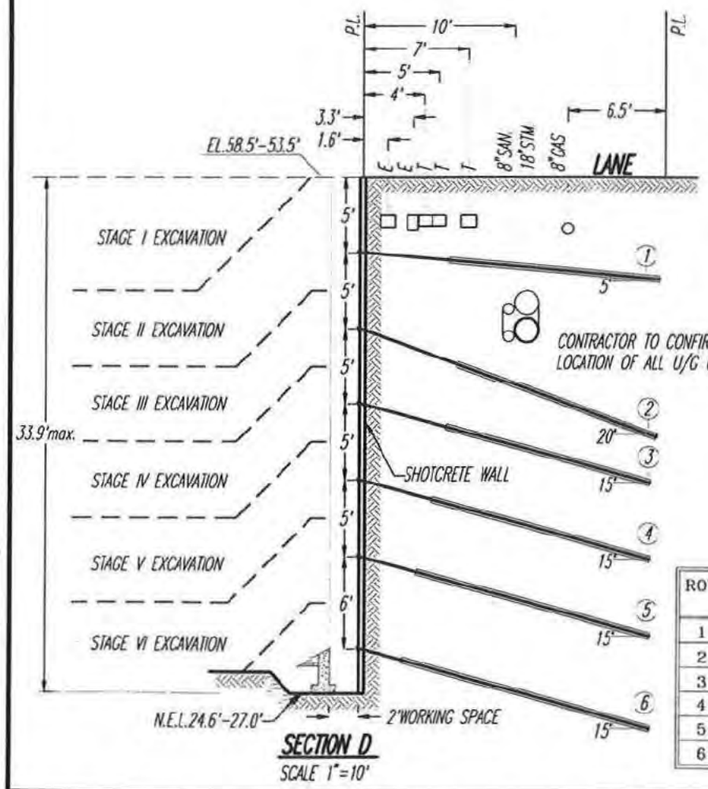
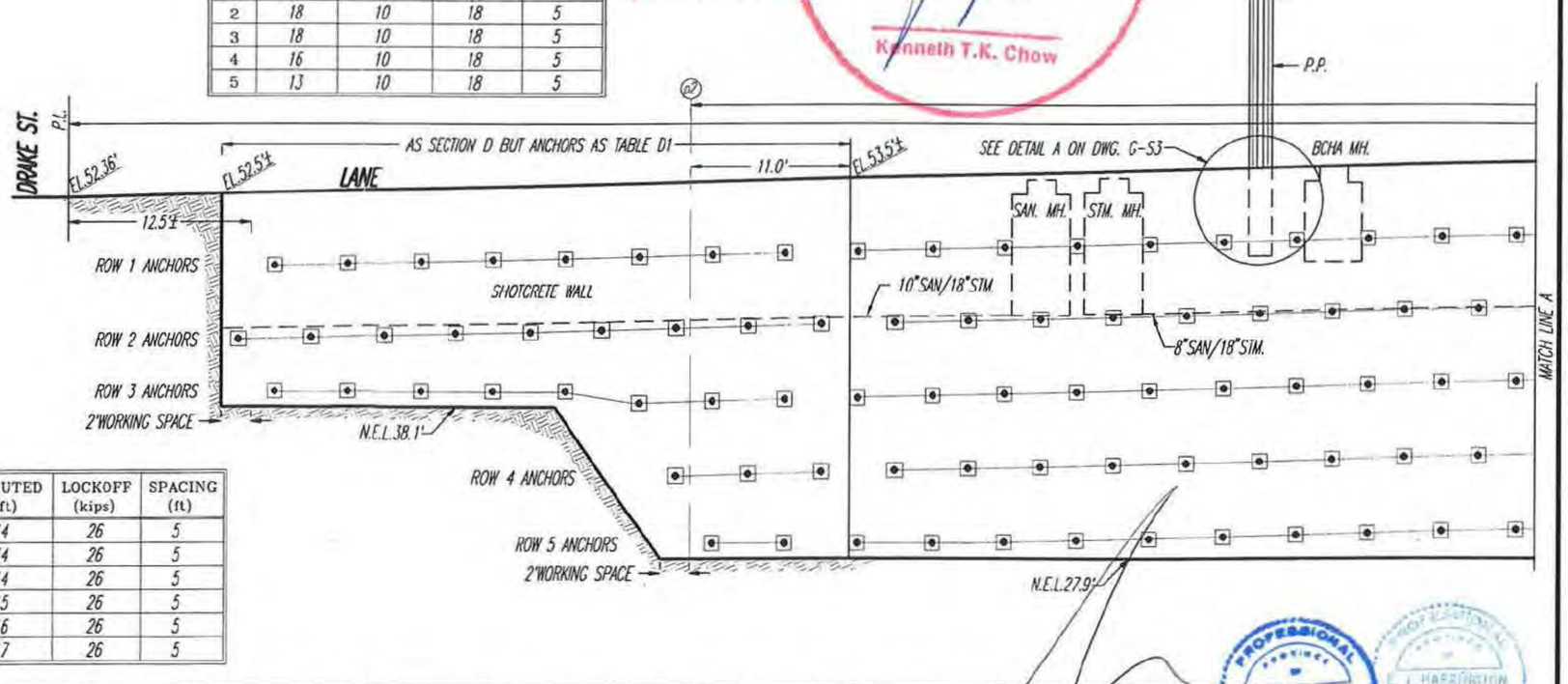
TABLE D1

ROW	LENGTH (ft)	GROUTED (ft)	LOCKOFF (kips)	SPACING (ft)
1	18	10	18	5
2	18	10	18	5
3	18	10	18	5
4	16	10	18	5
5	13	10	18	5



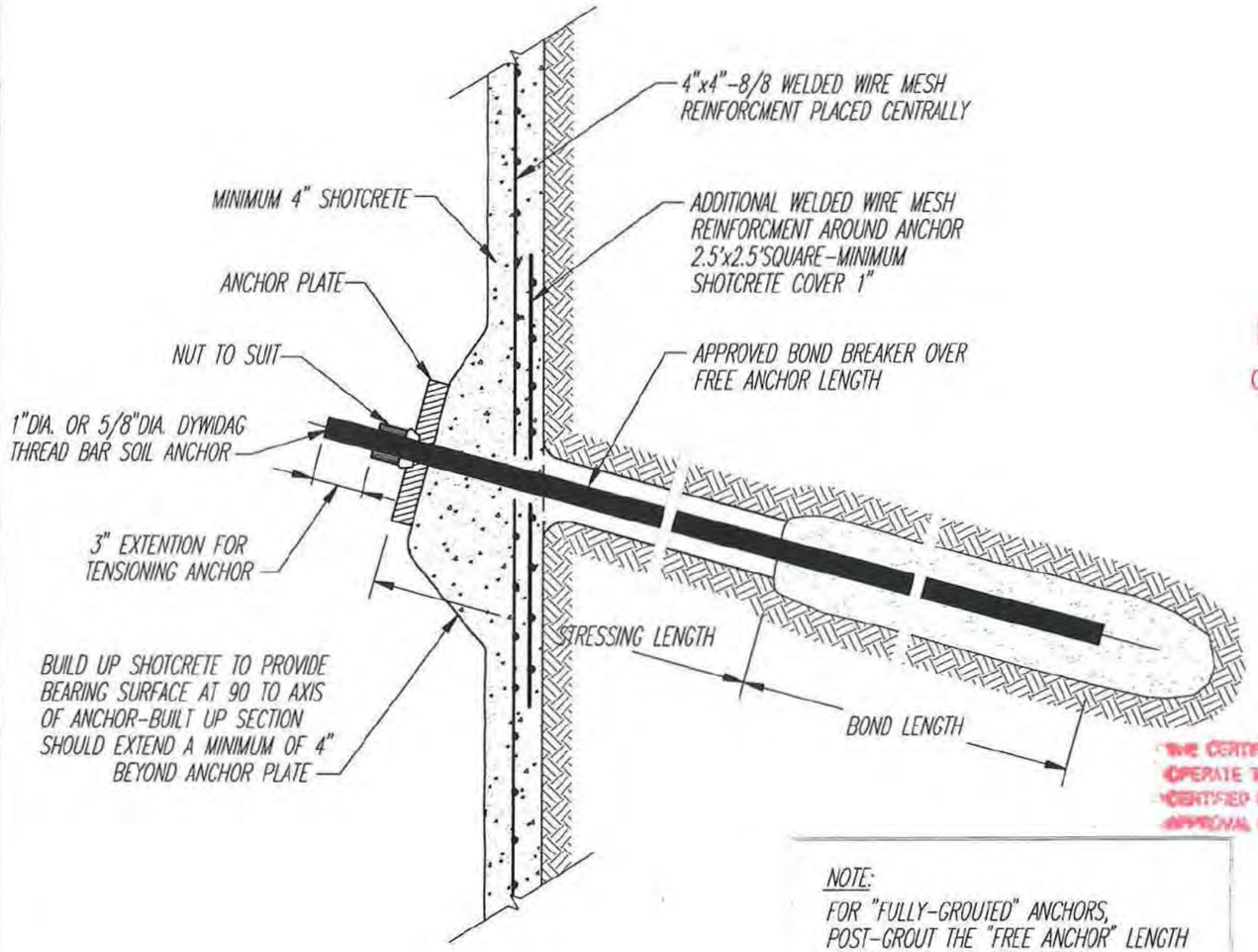
SECTION D
SCALE 1"=10'

ROW	LENGTH (ft)	GROUTED (ft)	LOCKOFF (kips)	SPACING (ft)
1	20	14	26	5
2	21	14	26	5
3	20	14	26	5
4	20	15	26	5
5	20	16	26	5
6	20	17	26	5



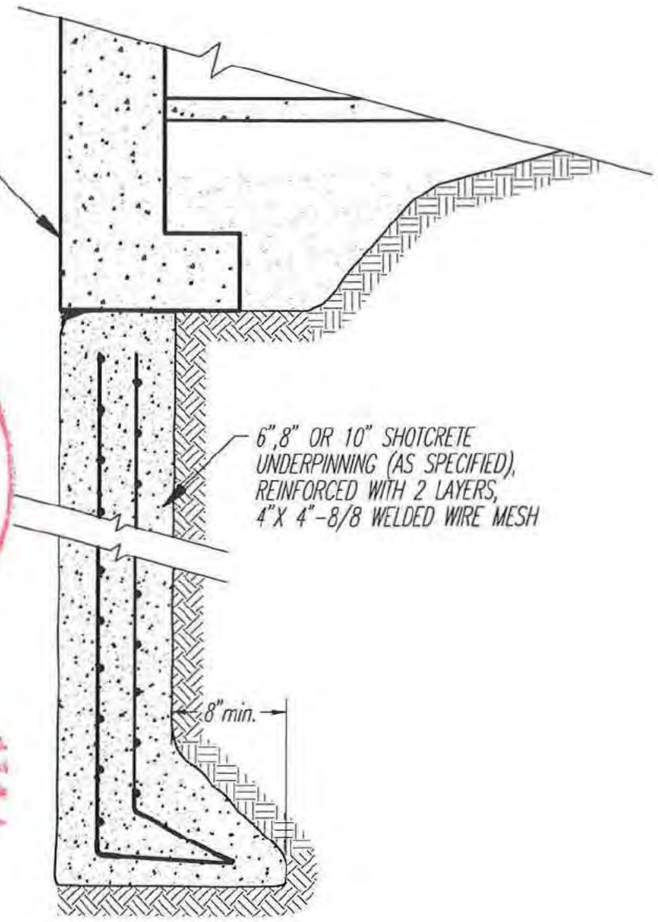
PROFESSIONAL ENGINEER M.J. KOKAN
PROFESSIONAL ENGINEER E.J. HARRINGTON

REFERENCE:	102-6968 Russell Avenue, Burnaby, B.C. V5J 4R9 Email: geopacific@telus.net Ph. (604) 439-0922 Fax (604) 439-9189 **GeoPacific Consultants Ltd.**	DATE: APRIL 11, 2001 DRN. BY: KAZ. APP'D. E.J.H. SCALE: AS SHOWN	**RICHARDS at DRAKE RESIDENTIAL DEVELOPMENT** 1295 RICHARDS STREET, VANCOUVER, B.C.
FILE NO: 3550 DWG. NO: G-S5	REVISIONS: A. B. C.		



NOTE:
FOR "FULLY-GROUTED" ANCHORS,
POST-GROUT THE "FREE ANCHOR" LENGTH
AFTER LOCK-OFF AND APPROVAL
USING PRE-APPROVED TECHNIQUES.

ANCHORED SHOTCRETE DETAIL



UNDERPINNING DETAIL - IF APPLICABLE

REFERENCE:	GeoPacific Consultants Ltd. GEOTECHNICAL ENGINEERS	DATE:	GENERAL UNDERPINNING & ANCHORED SHOTCRETE DETAILS	FILE NO:	REVISIONS: A. B. C.
		DRN. BY: KAZ. APP'D.		DWG. NO: G-1	
		SCALE:			

1.0 GENERAL

1.1 In these Notes, the Engineer is GeoPacific Consultants Ltd.

1.2 These Notes must be read in conjunction with the design Drawings.

1.3 The work described and shown involves temporarily supporting near-vertical excavated slopes or structures using a combination of shotcrete and ground anchors.

1.4 The anchor will be installed in ground around the site and the actual soil and groundwater conditions must be assumed.

1.5 The grouted anchor lengths required to resist the design loads are based on the assumed conditions. The capacity of the anchors will be confirmed at the begining of the contract and may be lengthened or shortened.

1.6 Some utilities, foundations and structures which may affect the installation procedures and techniques are noted on the Drawings. The Contractor shall confirm the locations and condition of ALL man-made elements which may be damaged because of the anchored shotcrete operations. It is the Contractor's responsibility to install the anchored shotcrete in the actual site conditions encountered.

Elements which may, in the opinion of the Contractor, be damaged by the anchored shotcrete operations must be reported to the Engineer well in advance of the work to take place.

1.7 These documents are based on architectural, structural and survey Drawings provided. It is the Contractor's responsibility to verify all dimensions and report discrepancies to the Engineer.

1.8 The Contractor shall schedule and co-ordinate the work to satisfy the reasonable requirements of adjacent Owners and Tenants who shall be given sufficient Notice before carring out work which may affect their property.

1.9 The Contractor shall erect and maintain a secure closed hoarding around the site for the safety of all persons in the vicinity of the site.

1.10 The Contractor shall inspect the slopes and the support to the slopes and structures daily and shall immediately report any potentially damaging movement or deterioration to the Engineer by telephoning 439-0922.

2.0 MATERIALS

2.1 The anchors shall be installed in minimum 75 mm (3 inch) diameter holes which shall be drilled, unless otherwise approved in advance by the Engineer. Anchor capacity is dependant upon installation techniques and the drilling equipment and methods shall be subject to the Engineer's approval.

Drilling techniques shall produce a hole which is free of debris and ensure continuous support of the hole and shall not erode or disturb soil around the hole.

2.2 Anchor tendons shall be Dywidag threadbar with a minimum nominal diameter of 15 mm(5/8 inches) and minimum ultimate tensile strength of 1100 MPa (160 kips/inch X inch) or other similar materials with prior approval.

Anchors with design loads higher than 120 kN (26 kips) require larger diameter bars and the Contractor shall ensure that the appropriate diameter and grade of steel are used.

Anchorage equipment couplings and any necessary wedges washers and plates shall be in accordance with the tendon manufacturer's specifications and requirements.

Minimum anchorage length ("fixed" length) and stressing length ("free" length) are shown on the Drawings.

2.3 Grout in the anchorage shall be a prior-approved non-shrink cementitious material with a minimum compressive strength of 21 MPa in 24 hours and 35 MPa in 28 days.

2.4 Shotcrete shall be reinforced with 4"/4" 8/8 welded wire mesh as shown on the Drawings. Steel shall have a minimum yield strength of 60 ksi. and shall be in accordance with CSA G30.5.

Alternatively steel fibre reinforced shotcrete may be used with prior approval.

2.5 All shotcreting shall be carried out in accordance with ACI 506 : "Specifications for Materials Proportioning and Application of Shotcrete."

2.6 Shotcrete shall have a minimum compressive strength of 21 MPa in 24 hours and 30 MPa in 28 days. The Engineer may require test panels to be prepared by the Contractor so they can be cored by others to confirm the shotcrete strength. The Contractor shall co-operate with the independent testing laboratory appointed by the Owner for this purpose.

The charge of the independent testing laboratory shall be borne by the Owner but the Contractor shall be responsible for the cost of any work required to assist the laboratory.

3.0 INSTALLATION

3.1 Anchors and shotcrete shall be installed in sequence and Stages to maintain stability of the excavation. Excavation of soil from the site shall also take place in stages as shown on the Drawings.

The Contractor may remove all soil within any mass excavation Stage before anchors in that Stage are installed but further excavation shall not take place until all anchored shotcrete in that Stage is installed tested and approved by the Engineer.

The mass excavation for any Stage does not include a perimeter berm with a minimum top width of one metre and a side slope of 1 horizontal to 1 vertical.

Ground conditions may locally require a wider berm, flatter slopes and/or other slope protection measures including covering or short-term temporary support.

The perimeter berms in any stage shall be excavated in staggered panels. THE MAXIMUM WIDTH OF A PANEL SHALL BE THE HORIZONTAL SPACING OF THE ANCHORS PLUS 0.6 METRES. This panel width may be INCREASED OR DECREASED by the Engineer to suit the ground conditions. The Contractor shall obtain the Engineer's agreement, in writing, BEFORE increasing the pannel width.

No adjacent panels shall be excavated concurrently and no more than 1/3 of the panels shall be excavated concurrently. In addition no panel shall be excavated into the berm until at least 24 hours after that panel anchor has been grouted.

Anchors and shotcrete may be installed concurrently in different panels. Anchors shall be installed at right angles to the property lines on plan and within 2.5 degrees of the declination shown on the Drawings except with the prior approval of the Engineer.

3.2 The grout shall be introduced into the anchored zone by tremie methods starting at the base of the hole to ensure that any groundwater or soil debries is flushed from the hole and the tendon is located centrally within a homogeneous cementitious mass having intimate contact with the drill hole parimeter. Excess grout shall be flushed out of the stressing zone (free anchor length) or a suitable prior-approved bond breaker shall be used.

3.3 Immediately following excavation of the soil berm in a panel the excavated face shall be trimmed back to the required line and mesh reinforcement shall be fixed to the soil to ensure the minimum specified shotcrete cover. Shotcrete shall be applied without delay to produce a dense homogeneous concrete having the minimum thicknesses shown on the Drawings.

Shotcrete panels shall be kept moist to aid curing by spraying with water and covering with sacking or polyethylene sheeting.

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Sufficient wire mesh reinforcement shall be installed to provide a full strength overlap with adjacent panels. This overlap shall not be less than 2 squares (8 inches).

The end surfaces of panels shall be thoroughly cleaned with compressed air to ensure a full strength bond when adjacent panels are shotcreted.

3.4 Drains to relieve groundwater pressure shall be installed through the shotcrete. Drains shall be a minimum of 50 mm (2 inches) diameter and at nominal 2.5 metres (8 feet) centres horizontally and 1.5 metres (5 feet) centres vertically. The Contractor shall install filters in drains from which fines are being removed with the water.

Additional special drains may be required where water seeps are noted. This special drains shall consist of minimum 50 mm (2 inches) diameter perforated ABS pipe installed within 75 mm (3 inches) diameter holes drilled 5 degrees UPWARDS from the horizontal. These special drains shall be a minimum length of 3 metres measured from the face of the shotcrete. These special drains may be required to be filtered with fine sand or gravel or filter fabrics.

3.5 Anchors shall be tensioned as soon as practicable but no sooner than 24 hours after the construction of the applicable shotcrete panel. Anchors shall be tensioned and tested as follows:

3.5.1 Apply a proof load of 1.25 times the working load (lock-off load) for two minutes. Monitor the load in the anchor. If the reduction in load is less than 2.5 percent of proof load reduce the load to working load and lock the working load into the anchor.

3.5.2 If the anchor does not hold at least 122.5 percent of working load for two minutes the Engineer must be informed. Further testing in the presence of the Engineer will be required as follows:

Load the anchor in 5 kip increments to 125 percent of working load. Hold each increment for 5 minutes except at maximum load when the load shall be maintained for 100 minutes. The increase in length of the anchor shall be measured at the start and end of each load increment except at maximum load when the extension shall be measured at 5 minute intervals.

This information shall be utilized by the Engineer to deduce the utilized anchor length and to assess the creep characteristics.

Anchors which creep more than 2 mm per log cycle of time will not be accepted. The Contractor shall install replacement anchors at the Contractor's expense.

4.0 MUNICIPAL OR CITY REQUIREMENTS

4.1 All excavation and support works within the CITY OF VANCOUVER shall be in strict accordance with the City's requirements.

4.2 No part of the anchor system shall remain in place within 1.5 metres (5 feet) of final grade.
Anchors 1.5 metres (5 feet) below final grade shall be detensioned or fully grouted when no longer required in the opinion of the Engineer.

4.3 No shotcrete shall remain in place within 1.3 metres (4 feet) of final grade.

5.0 BACKFILLING ON AND ADJACENT TO CITY PROPERTY

5.1 Backfilling on and adjacent to City property must be in accordance with the City's backfill specifications,
Appendix H in their Backfill Manual, revised 17 December 1997

6.0 REQUIRED INSPECTIONS

6.1 The following are the MINIMUM inspections which are required by the Geotechnical Engineer in order to prepare the required Municipal Assurances.The Contractor is responsible for informing the Geotechnical Engineer that the Work is redy for these inspections. The Contractor shall be liable for any losses caused by failure to inform the Geotechnical Engineer that the Work is ready for inspection.

1. 2 days before work commences on site.
2. 1 day before the excavation is 1.2 metres (4 feet) deep.
3. 1 day before the anchors are detensioned.
4. 2 days before backfilling commences.

UNION OF BRITISH COLUMBIA MUNICIPALITIES
certified professional program
Kenneth T.K. Chow

PIONEER
MAY 14 2001
CONSULTANTS LTD

THE CERTIFIED PROFESSIONAL STAMP APPLIED HEREON SHALL ONLY OPERATE TO SIGNIFY THAT THESE DOCUMENTS FORM PART OF THE CERTIFIED PROFESSIONAL PROJECT AND SHALL NOT CONSTITUTE AN APPROVAL OF DESIGN SERVICES RENDERED BY OTHERS

NOTES

1. The excavation support design is based on the locations of adjacent structures and utilities which have been supplied. The Contractor shall confirm the locations and elevations of all foundations and utilities which may be affected by the work and raport any discrepancies to GeoPacific Consultants Ltd. (Tel.: 439-0922)

2. All slopes shall be covered with secured polyethylene sheeting to prevent erosion.

3. The extent of the excavation shall be based on the Architectural and Structural Drawings. The Contractor shall confirm the size of the excavation required by the basement and report any discrepancy with these Drawings to GeoPacific Consultants Ltd.

4. The Contractor must obtain prior permission in writing to carry out any work on adjacent private property.

5. The Contractor shall inform GeoPacific Consultants Ltd. of any surcharge loads which will be within half the height of the excavation from the top of the excavation so that the support system can be modified to support the additional loads. The Contractor shall also inform GeoPacific if and when any groundwater seepages occur which may require additional special drains as outlined in Note 3.4, Drawing G-2.

6. The ground conditions must be confirmed by GeoPacific Consultants Ltd. when the excavation is 4 feet deep. The Contractor is responsible for ensuring that GeoPacific personnel inspect the site.

DRAWING LIST:

SITE PLAN---------- *G-S1*

ELEVATIONS, SECTIONS---------- *G-S2, G-S3, G-S4, G-S5*

GENERAL SHOTCRETE/UNDERPINNING AND ANCHOR DETAILS---------- *G-1*

GENERAL NOTES----------*G-2, (SHEET 1 TO 2)*

SPECIAL REQUIREMENTS---------

PROFESSIONAL PROVINCE OF BRITISH COLUMBIA M.J. MOKAN ENGINEER
PROFESSIONAL PROVINCE OF BRITISH COLUMBIA E. J. HARRINGTON ENGINEER

REFERENCE:	102-6968 Russell Avenue Burnaby, B.C. V5J 4R9 Email: geopacific@telus.net Ph. (604) 439-0922 Fax (604) 439-9189 GeoPacific Consultants Ltd.	DATE: APRIL 11, 2001	GENERAL NOTES	FILE NO: 3550	REVISIONS: A. B. C.
		DRN. BY: APP'D. E.J.H.		DWG. NO: G-2 (SHEET 2 OF 2)	
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