DEVELOPMENT PERMIT APPLICATION SUBMISSION
JANUARY 7th, 2016

INDIAN RESIDENTIAL SCHOOLS HISTORY AND DIALOGUE CENTRE

UBC, VANCOUVER, B.C.

FORMLINE ARCHITECTURE
1103- 945 Marine Drive West Vancouver, BC V7T 1A8
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Please contact us at any time for more detailed information:

FORMLINE ARCHITECTURE

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APPENDIX

THE UNIVERSITY OF BRITISH COLUMBIA
Campus and Community Planning
2210 West Mall • Vancouver, B.C. • V6T 1Z4
☎ 604.822.8228 • 🗋 604.822.6119

DP # _____

Development Permit Application Form

Complete application form and prepare associated materials prior to scheduling an application intake meeting with the UBC Manager, Development Services.

Project Address and Building Name: Indian Residential School History and Dialogue Centre
Description of Area: The project is an addition to the Sedgewick Library and consists of a 224sm (2,411sft) renovation and a 396sm (4,262 sft) addition for a total gross area of 620sm (6,673sft).
Description of Project: This 2 level facility will that will provide exhibitory and program space to promote learning and dialogue concerning Indian Residential School and its place in Canadian History.

Applicant (authorized agent):		
Contact name: Alfred Waugh		
Mailing address: 1103, 945 Marine Drive		Email: alfred@formline.ca
City: West Vancouver	Postal Code: V7T 1A8	Phone: 604.912.0203 ext 221
Architect: Formline Architecture		
Contact name: Alfred Waugh		
Mailing address: 1103, 945 Marine Drive		Email: alfred@formline.ca
City: West Vancouver	Postal Code: V7T 1A8	Phone: 604.912.0203 ext 221
Landscape Architect: PFS Studio		
Contact name: Chris Phillips		
Mailing address: 1777 West 3rd Avenue		Email: cphillips@phs.bc.ca
City: Vancouver	Postal Code: V6J 1K7	Phone: 604.736.5168

I, THE AUTHORIZIED AGENT, GIVE CONSENT FOR CAMPUS & COMMUNITY PLANNING TO POST DIGITAL DRAWINGS AND SUPPORTING TEXT FOR PUBLIC VIEWING ON THEIR WEBSITE.

I HEREBY AGREE THAT I WILL COMPLY WITH ALL RULES, BYLAWS, REGULATIONS AND POLICIES OF THE UNIVERSITY OF BRITISH COLUMBIA AND ALL OTHER STATUTES, RULES, BYLAWS, POLICIES AND REGULATIONS OF OTHER AUTHORITIES IN FORCE AT THE UNIVERSITY OF BRITISH COLUMBIA RELATING TO THE WORK, UNDERTAKING OR PERMISSION IN RESPECT OF WHICH THIS APPLICATION IS MADE AND THAT I WILL INDEMNIFY AND SAVE HARMLESS THE UNIVERSITY OF BRITISH COLUMBIA, ITS OFFICIALS, EMPLOYEES AND AGENTS FROM ALL CLAIMS, LIABILITIES, JUDGEMENTS, COSTS OR EXPENSES OF EVERY KIND, INCLUDING NEGLIGENCE, IN RESPECT OF ANYTHING DONE OR NOT DONE IN CONSEQUENCE OF ANY PERMISSION, PERMIT OR LICENSE ISSUED AS A RESULT OF THE APPLICATION OR THE FAILURE TO OBSERVE COMPLETELY ALL STATUTES, RULES, BYLAWS, POLICIES AND REGULATIONS RELATING TO ANY WORK OR UNDERTAKING IN RESPECT OF WHICH THIS APPLICATION IS MADE.

SIGNED AT VANCOUVER, B.C. THIS _____ DAY OF _____ 20_____

SIGNATURE OF AUTHORIZED AGENT: _____

Please continue application on reverse

THE UNIVERSITY OF BRITISH COLUMBIA
Campus and Community Planning
2210 West Mall • Vancouver, B.C. • V6T 1Z4
☎ 604.822.8228 • 🖷 604.822.6119

DP Fee (see Fee Schedule below): All fees must be paid prior to the issuance of a permit.

Development permit projects		
Type of application:	❑ New Building	❑ Site / Park Design
❑ Major (Value > $2.5 Million)	☒ Addition	❑ Amendment
☒ Minor (Value < $2.5 Million)	❑ Façade Alterations only	❑ DP Extension
Gross Floor Area: 6,673 ft² or 620 m²	Permit fee: $1,900	Amount enclosed:
Payment by: ❑ Cheque** ❑ Cash ❑ Work Order/Project#:		

Fee Schedule:

A	**Minor Applications** (Development Permit Board approval not required)	**Fee**
	For each 100 m² up to 500 m² GFA* (or part thereof)	$350
	Additional GFA (rate per 100 m² or part thereof)	$150
	Maximum	$15,000
B	**Major Applications**	**Fee**
	For each 100 m² up to 500 m² GFA* (or part thereof)	$300
	Additional GFA (rate per 100 m² or part thereof)	$110
	Maximum	None
	REAP Applications - For Residential projects only, UBC REAP (Residential Environmental Assessment Program) certification is required. Documentation review and certification services provided by the Campus Sustainability Office (fee includes 5% GST).	$3,150 (please provide a separate cheque)
C	**Site Changes** (includes Public Realm)	**Fee**
	Up to 1,000 m² (rate per 200 m² or part thereof)	$250
	Additional area (rate per 200 m² or part thereof)	$85
	Maximum	$5000
D	**Alterations, Changes of Use**	**Fee**
	For each 100 m² GFA* (or part thereof)	$290
	Maximum	$2,350
E	**Revisions**	**Fee**
	Revisions to drawings resulting from non-compliance or insufficient information, or applicant's request	10% of fee that would apply to a new application (minimum fee $160)
F	**Minor Amendments**	**Fee**
	Amendments where less than 15% of GFA or building exterior is altered or where less than 15% of GFA use is changed	25% of fee that would apply to a new application (minimum fee $160)
G	**Extensions and Renewals**	**Fee**
	Extension of validity of development permit or renewal of a development permit which has become void	75% of fee that would apply to a new application (minimum fee $340)

* GFA = gross floor area

** Submit separate cheques for each application and make payable to the 'University of British Columbia'

Note: Where public notice in community newspapers is required as part of the Development Permit process, Campus & Community Planning will coordinate the advertising, but the applicant is responsible for all costs.

2 WRITTEN DESCRIPTION

The Indian Residential School History and Dialogue Centre (IRSHDC) is a 620sm (6,673sft) facility which will have a program split between two levels.

The lower level at the bottom of the landscape bowl will house a digital exhibit space that will also be used for public programming, teaching, and interaction with community visitors. This space will be suitable for university classes, visiting groups of primary and secondary students, community members and other visitors.

The upper level will provide meeting, research, and administrative spaces accessible located at the mid level plaza.

DESIGN CHALLENGES

The site is located in a landscape bowl with the main exhibit space at the bottom. There is a 9 m elevation change between the bottom and the main plaza. The existing space is accessible to Koerner however due to security reasons public will not be able to access the facility through the library. The Client wants the main entrance to be at the bottom and use the landscape as a calming relief for entering and exiting the main exhibit space. The following challenges arise out of this requirement.

- How to get visitors from upper level of the bowel down to the exhibit space addressing accessibility.
- The mid level plaza is 2m below the Irving Barber Learning Centre and 4m below the Main Plaza.
- How do you define a legible public entrance giving this vertical challenge?

The following is a list of other challenges

- Establishing a fluid relationship with the surrounding landscape currently being redesigned
- Integrate outdoor programming for educational purposes
- Developing a building form that will be pleasing to look at from varying vertical vantage points.
- Developing an identity that embodies First Nations Culture without making specific Cultural references.
- How will the building maximize the interface with the Library Gardens
- How will it be responsive to environmental influences
- The existing pre-cast structure of Koerner Building was not designed to take another storey at the mid level plaza. Building directly over the space will require costly upgrade of substructure.
- Plumbing at the lower level will be difficult as excessive excavation will be required and tying into Koerner will require trenching through the existing concrete slab.

A design concept was developed that reinforces an edge to the landscape bowl and preserves the visual access between the Koerner and Irving Barber Libraries. The buildings north face descends following the stepped landscape animating the building and engaging the landscape. The following is a summary of the main design principals

Legible entrance - It was decided the main entrance will be from the East which is culturally important to most first First Nations groups. This is also the direction which traffic from Learners walk will have the easiest access into the site. There is a 2m drop to the mid level plaza which can be navigated by stairs and accessible ramps. This main entry point is clearly legible and provides an entrance to the landscape as well as the building. From this entry point one can continue on the main floor to the upper program or descend along the landscape to the reception for the exhibit hall below.

Expression of dark and Light- The exhibit space is at the lower level and is in a

dark space with relief to the garden. The content of this space will contain the memory of the past and the realities of residential school. To counterpoint this space the pavilion above will be light and airy to provide relief and promote optimism toward the future. This will be a place of discussion, education and growth.

Reaching into the Landscape- All program spaces engage the landscape reinforcing First Nations connection with nature as well providing relief for the heavy content. The abundant glazing makes the building a beacon to the adjacent landscape and enhances the CPTED strategy. As soon as one enters the building they are looking out to the terraced landscape which circles the bowl and penetrates the building forming a gentle terraced stair to below. The Exhibit Space is a multifunction space with sliding windows that completely opens the room to a plaza with a storm water feature in the distant. The board room, offices and elders room all have views of the landscape bowl or the forest to the south.

Form and Interest- The pavilion form is defined by a folding plane of cross laminated timber (CLT) panels supported by a CLT structure. The roof is clad in a copper foil membrane directing all rain water I to one point celebrating water which references our rainy climate and its significance to the Coast Salish People. As the roof is seen from many vantage points it provides a layer of interest amongst the landscape. The roof form provides broad overhangs to offer protection to visitors that may choose to descend the landscape without entering the upper level. Abundant glazing is provided to allow natural light to flood the upper level and engage the landscape outside. The glazing facing the garden can be a canvas for a frit pattern or colour to animate the facade.

3 DESIGN POLICY COMPLIANCE

The IRSHDC is located in the Campus Core Area between the Koerner and the Irving Barber Building. The new addition is a small building of with a foot print of 3,200 sft. It is set in a landscape bowl connected to the Sedgewick library.

The building respects the Campus core architectural principles with the following features.

- The building is carefully designed with the PFS Studio to enforce a strong interplay between landscape and building.
- Respecting the International style of modernism the building is a low horizontal rectangular mass that is heavily glazed at the ground plane.
- The copper clad tilted roof provides a sculptural element within a rectilinear composition.
- The long rectangular building reinforces a strong edge to the landscape bowl defining a sunken courtyard.
- The siting of the building respects the existing Sequoia Tree and is set below it not to interfere with sight lines of the Millennium Pavilion.
- The low set building does not interfere with the site lines between the Koerner and Irving Barber Library.

The building respects the Campus core Material Palette with the following features:

- The building exterior enclosure is predominantly glass which will incorporate a fritted silk screen pattern on some of the extensive planes. This is indicative of the legacy of international style architecture.
- Complimenting this material are walls clad in charred western red cedar. This is a reference to the Coast Salish Peoples in the local area. The technique of charing the wood surface is a Japanese technique called "Shou Sugi Ban" wraps the wood in a layer of carbon protecting it from mould, insects and water. This will reduce the maintenance usually associated with wood products.
- The renovated area in Sedgewick will include an concrete planter to match the existing planter using architectural concrete. Architectural concrete will also be used for the entrance portal.
- A copper foil roof and copper panels will clad the roof and the water feature bringing an accent material contextually connected to the First Nations House of Learning. This noble material is upheld in the Coast Salish Culture as well adorns some of the older buildings on campus.

APPENDIX

TITLE SEARCH PRINT 2015-12-01, 15:29:53

File Reference: Requestor: Barbara Tully

CURRENT INFORMATION ONLY - NO CANCELLED INFORMATION SHOWN

Title Issued Under	SECTION 189 LAND TITLE ACT
Land Title District	VANCOUVER
Land Title Office	VANCOUVER
Title Number	BA282668
From Title Number	BV314089
Application Entered	2006-07-06
Application Received	2006-07-06

Registered Owner in Fee Simple

Registered Owner/Mailing Address: THE UNIVERSITY OF BRITISH COLUMBIA
NO ADDRESS ON FILE FOR THIS OWNER

Taxation Authority VANCOUVER ASSESSMENT AREA

Description of Land

Parcel Identifier: 015-891-909

Legal Description:

DISTRICT LOT 3044 GROUP 1 NEW WESTMINSTER DISTRICT EXCEPT
FIRSTLY; PART ON PLAN 6147
SECONDLY: PART ON PLAN 9301
THIRDLY; PART ON PLAN BCP6556
FOURTHLY: PART ON PLAN BCP23719

Legal Notations

NOTICE OF INTEREST, BUILDERS LIEN ACT (S.3(2)), SEE BM82495A
FILED 1998-03-19

HERETO IS ANNEXED EASEMENT BR303310 OVER PART SHOWN HATCHED (91M2) ON PLAN LMP51811 OF DISTRICT LOT 3045 GROUP 1 NWD EXCEPT: PART PLAN 19440

HERETO IS ANNEXED EASEMENT BR303311 OVER PART SHOWN CROSS HATCHED (884M2) ON PLAN LMP51811 OF DISTRICT LOT 3045 GROUP 1 NWD EXCEPT: PART PLAN 19440

ZONING REGULATION AND PLAN UNDER THE AERONAUTICS ACT (CANADA) FILED 10/02/1981 UNDER NO. DF J12559

Charges, Liens and Interests

Nature:	STATUTORY RIGHT OF WAY
Registration Number:	BH21529
Registration Date and Time:	1994-01-24 09:52
Registered Owner:	GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT
Remarks:	PORTIONS SHOWN HATCHED AND OUTLINED IN HEAVY BLACK ON PLAN LMP14638 INTER ALIA

Nature:	STATUTORY RIGHT OF WAY
Registration Number:	BR303313
Registration Date and Time:	2001-11-14 11:19
Registered Owner:	GREATER VANCOUVER REGIONAL DISTRICT
Remarks:	INTER ALIA PLAN LMP51812

Nature:	STATUTORY RIGHT OF WAY
Registration Number:	BW334934
Registration Date and Time:	2004-07-21 11:11
Registered Owner:	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY
Remarks:	INTER ALIA

Nature:	CLAIM OF BUILDERS LIEN
Registration Number:	CA4372587
Registration Date and Time:	2015-05-01 09:42
Registered Owner:	MAINLAND CIVIL WORKS INC. INCORPORATION NO. BC0790077

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers NONE

Pending Applications NONE

GEOPACIFIC
VANCOUVER KAMLOOPS CALGARY

215 - 1200 West 73 Avenue
Vancouver, BC
V6P 6G5
604-439-0922

UBC Properties Trust
200 – 3313 Shrum Lane
Vancouver, BC
V6S 0C8

December 21, 2015
File: 13377

Attention: Dave Poettcker

Re: Geotechnical Investigation Report, Indian Residential School Dialogue Centre, Main Mall, UBC Campus

1.0 INTRODUCTION

As requested, GeoPacific has carried out a geotechnical site investigation for the proposed Indian Residential School Dialogue Centre which is to be located on the UBC campus.

We have been provided with preliminary architectural drawings prepared by Formline Architecture dated October 11, 2015, for reference. The project is conceptual at this time and therefore structural drawings are not yet available. The proposed building is to be constructed near site grades and is to be built into the sloping grades such that a portion of the building will be below grade.

This report presents the results of our geotechnical investigation of the site and makes geotechnical recommendations for the design and construction of the proposed structure. This report has been prepared exclusively for UBC Properties Trust and for the use of others on their design and construction team, although it remains the property of GeoPacific Consultants Ltd.

2.0 SITE DESCRIPTION

The site is bounded by the Walter C. Koerner Library to the northwest, the Irvin K. Barber Learning Centre to the northeast and landscaping on the other sides.

The proposed building is rectangular and is to be 27.5 m in length and 14.5 m in width. The site gradually slopes from east to west with an elevation differential of about 2 m. The site is currently undeveloped and covered with grass and bushes.

3.0 FIELD INVESTIGATION

GeoPacific investigated the site on November 13, 2015. The investigation consisted of a review of geological maps, visual inspection, and augered test holes supplemented with dynamic cone penetration test (DCPT) soundings. A drill permit from UBC Campus & Community Planning department was obtained confirming the proposed test hole locations were acceptable to them. A third party utility locating company was hired to help ensure that the test holes were clear of any underground services and utilities.

Six test holes were advanced using the subcontracted drilling services of On Track Drilling of Coquitlam, BC. The test holes were advanced to depths ranging from 4.6 to 6.1 m below grade. Two of the test holes were supplemented with DCPT soundings to help characterize the in-situ density of the soil.

The test hole locations are shown on our Drawing No. 13377-1 included with this report.

3.1 Subsurface Conditions

The general geology of the region under investigation is described as Vashon glacial drift, overlying Quadra fluvial deposits with reference to the Geological Survey of Canada's map 1484A. The glacial drift is characterized as lodgement and minor flow till with lenses and interbeds of substratified glaciofluvial sand and gravel, including lenses and interbeds of glaciolacusterine stony silt. The Quadra fluvial deposits consist of channel fill and floodplain deposits; crossbedded sand with minor silt and gravel lenses.

A general description of the soils encountered at our test hole locations is given below.

Topsoil

The majority of the site is overlain by grass and topsoil.

Sand and Gravel (Fill)

The topsoil is underlain by sand and gravel fill materials with trace silt ranging in depths of 0.2 m to 0.3 m below existing site grades. Based on our observations and DCPT soundings the fill materials are compact.

Sand and Gravel (Glacial Till)

The fill materials are underlain by glacial till comprised of sand and gravel with trace to some silt; some cobbles and occasional boulders are expected within this deposit. DCPT testing and drill observations indicate that this stratum is very dense. These deposits were found to extend to the full depth of our investigation.

Detailed soil descriptions are included on the test hole logs in Appendix A.

3.2 Groundwater Conditions

The groundwater table was not identified in our investigation and is expected to be well below development grades. Perched groundwater may be encountered overlying the dense native soils within the fill materials or from more permeable zones within the glacial till.

4.0 DISCUSSION

4.1 General Comments

We understand that the proposed development includes of at-grade two-level pavilion and a sitting podium with various landscape features. The new building is to be constructed on the northeast side of the Walter C. Koerner Library. The proposed sitting podium is to be constructed along the east side of the site,

extending from the main building to the north.

Structural drawings are not yet available, however, we expect that the building loads will be relatively light.

A portion of the foundations for the new building will be constructed adjacent to the Walter C. Koerner Library`s foundations and are likely to impose additional earth pressure on the existing foundations. Where foundations for the new building are at a higher elevation than the adjacent existing foundations and 1H:1V slope measured downward or outward from the underside of the foundations should be maintained. If footings are immediately adjacent to one another the new foundation should be lowered to the same elevation of the existing ones.

We confirm that from a geotechnical point of view that the proposed development is feasible provided the following recommendations are implemented in the design and construction of the development.

5.0 DESIGN RECOMMENDATIONS

5.1 Site Stripping for Foundations and Grade Supported Slabs

Site preparation associated with foundations and grade supported slabs includes removing any organic topsoil, variable fill materials and any other material considered to compromise the design recommendations stated herein.

Any soft, loose or disturbed material should be removed in order to allow for construction on the proposed subgrade in its natural undisturbed state.

5.2 Grade Reinstatement

If necessary, any required grade reinstatement beneath foundations should be carried out with lean mix concrete having a minimum compressive strength of 5 MPa.

Any grade reinstatement beneath grade supported slabs, stairs and other landscape features should be done with “engineered fill”. In the context of this report any “engineered fill” is defined as clean sand to sand and gravel fill, compacted in 300 mm loose lifts to a minimum standard of 95% of its Modified Proctor Maximum Dry Density (ASTM D1557) while at moisture content that is within 2% of its optimum for compaction.

5.3 Foundations

We envision that the new structure will be founded on conventional spread foundations supported on undisturbed very dense glacial till.

Foundation supported on dense glacial till can be designed based on a service limit state (SLS) bearing pressure of 400 kPa and a factored Ultimate Limit States (ULS) of 800 kpa.

Post construction settlement of foundations designed as recommended should be less than 25 mm total with differential settlement of less than 20 mm over a 10 metre span.

Footings should not be less than 450 and 600 mm in width for strip footings and pads respectively. Foundations should be located at least 0.45 m below finished grades for frost protection.

5.4 Seismic Considerations

We have considered a design earthquake with a 2% probability of exceedance over a 50 year period which equates to an earthquake with a return period of 1 in 2475 years. Accordingly, we have considered an earthquake having a peak horizontal ground acceleration of 0.46g for this site (Ref. National Resources Canada, Site Coordinates: 49.25096 North, 123.23348 West).

The soils at this site are **not** considered susceptible to liquefaction triggering or strain softening in consideration of the seismic hazard defined in the 2012 British Columbia Building Code (BCBC).

This site qualifies as "Site Class C" as defined in Table 4.1.8.4.A of the 2012 British Columbia Building Code (2012 BCBC). Site Class C sites are defined as very dense soil sites where the average properties in the top 30 metres have an average penetration resistance ($\tilde{N}_{60}$) greater than 50 for coarse grained soils, or an undrained shear strength (S_u) greater than 100 kPa for fine grained soils. We recommend that the structural design be based on the acceleration- and velocity-based site coefficients for "Site Class C" as specified in the 2012 BCBC.

5.5 Grade Supported Concrete Slabs

We recommend that any fill placed under the slab should conform to our recommendation for engineered fill in Section 5.2 above.

The floor slab should be directly underlain by a polyethylene moisture barrier and a minimum of 150 mm of 19 mm clear crushed gravel fill to inhibit upward migration of moisture beneath the slab.

5.6 Earth Pressures on Foundation Walls

A portion of the building is expected to be below grade and therefore earth pressure can be expected to develop against the buried foundation walls. Earth pressures on foundation walls depend on a number of factors including wall rigidity, backfill materials and their degree of compaction, surcharge loads, backfill slope, the drainage conditions and the method and sequence of construction.

For this project we anticipate that river sand backfill will be used and will be compacted in place using light hand operated compaction equipment and that the backfill will be fully drained.

Based on these assumptions we recommend that the below grade foundation walls be designed for service earth pressures of 5.0 x H kPa (where H is the wall height in metres) with a triangular pressure distribution. The walls should be designed to withstand an addition seismic earth pressure of 5.0 x H kPa with an inverted triangular pressure distribution.

These earth pressures should be reviewed in light of the shoring and excavation design once it is available.

5.7 Site and Foundation Drainage

A passive mechanical perimeter drainage system should be included to ensure that hydrostatic pressure does not develop against the foundation wall or beneath the slab-on-grade. Hydraulic connectivity should be maintained between the under-slab fill and the outside of foundation wall using weep holes.

5.8 Utility Installation

Site utilities will be required beneath the grade supported slab. The design of these systems must consider the location and of the depth of the foundations. The service trenches and excavations required for the installation of underground vaults and/or manholes should be outside of a 1H:1V slope measured downward and outward from the underside of foundations.

Backfilling of trenches and excavations should be done with 19 mm clear crush gravel following the required pipe bedding.

All excavations and trenches must conform to the latest Occupational Health and Safety Regulation supplied by the Workers Compensation Board of British Columbia.

6.0 FIELD REVIEWS

As required for Municipal "Letters of Assurance", GeoPacific Consultants Ltd. will carry out sufficient field reviews during construction to ensure that the Geotechnical Design recommendations contained within this report have been adequately communicated to the design team and to the contractors implementing the design. These field reviews are not carried out for the benefit of the contractors and therefore do not in any way effect the contractors obligations to perform under the terms of his/her contract.

It is the contractors' responsibility to advise GeoPacific Consultants Ltd. (a minimum of 24 hours in advance) that a field review is required. Field reviews are normally required at the time of the following activities:

1. Stripping – Review of stripping
2. Foundations – Review of subgrade for foundations
3. Slab-on-grade – Review of the slab-on-grade preparation
4. Compaction – Review of any engineered fill, placement and compaction
5. Backfill – Review of backfill materials, placement and compaction

It is critical that these reviews are carried out to ensure that our intentions have been adequately communicated. It is also critical that contractors working on the site view this document in advance of any work being carried out so that they become familiar with the sensitive aspects of the works proposed. It is the responsibility of the developer to notify GeoPacific Consultants Ltd. when conditions or situations not outlined within this document are encountered.

7.0 CLOSURE

This report is prepared solely for used by our client's Design Team for this project as described to the general standards of similar work for similar projects in this area and no other warranty of any kind is expressed or implied.

GeoPacific Consultants Ltd. accepts no responsibility for any other use of this report. We are pleased to assist you with this project and we trust this information is helpful and sufficient for your purposes at this time. However, please do not hesitate to call the undersigned if you should require any clarification or additional details.

For:
GeoPacific Consultants Ltd.

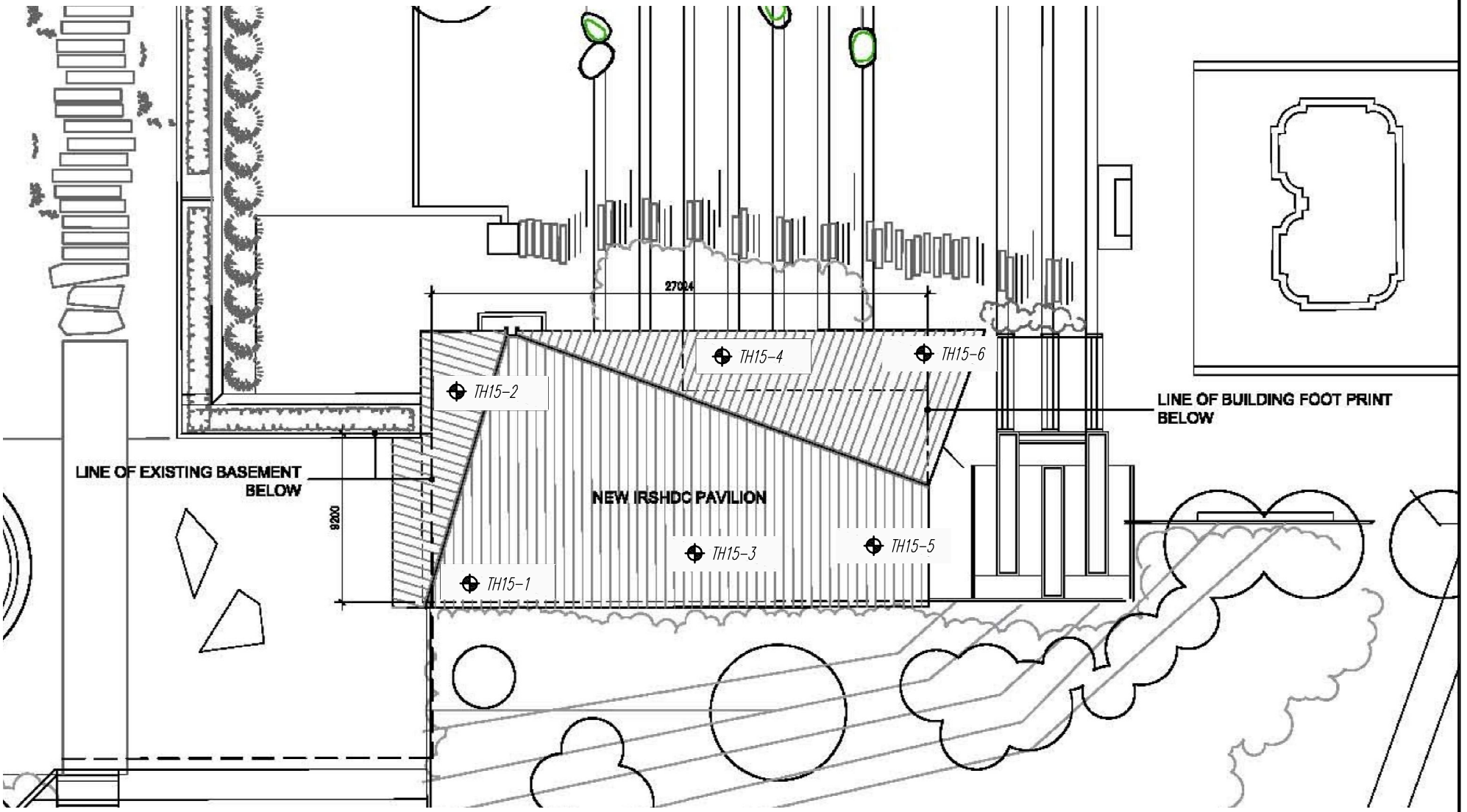
ORIGINAL SIGNED

Arye Lipshitz
Engineering Technician

Reviewed by:

ORIGINAL SIGNED

Steven Fofonoff, M. Eng. P.Eng.
Senior Geotechnical Engineer



LEGEND:

TH15-# – TEST HOLE (TH) LOCATION

SITE PLAN

SCALE = NTS

REFERENCE:

GEOPACIFIC
VANCOUVER KAMLOOPS CALGARY
#215 1200 West 73rd Ave.
Vancouver, B.C. V6P 6G5
P 604.439.0922
F 604.439.9189

DATE: November 13, 2015		
DRAWN BY: AL	APPROVED BY: SMF	REVIEWED BY:
SCALE: SEE ABOVE		

IRSDC
MAIN MALL, VANCOUVER, BC
TEST HOLE LOCATIONS

FILE NO.: 13377
DWG. NO.: 13377-1

REVISIONS:
A.
B.
C.

ORIGINAL PAPER SIZE 8.5"x11"

APPENDIX A

TEST HOLE LOGS

Test Hole Log: TH15-1

File: 13377
Project: Indian Residential School Dialogue Centre
Client: UBC Properties Trust
Site Location: Main Mall, UBC

GEOPACIFIC CONSULTANTS
215 - 1200 West 73rd Avenue, Vancouver, BC, V6P 6G5
Tel: 604-439-0922 Fax:604-439-9189

INFERRED PROFILE

Depth (ft / m)	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)	Fines content (%)	DCPT (blows per foot) 10 20 30 40	Groundwater / Well	Remarks
0 / 0		Ground Surface					
0 / 0		***Topsoil*** Grass on top, sand, dark brown, wet	0.0		12		
1 / 0		***Sand and gravel (Fill)*** Compact, trace silt, medium grained sand, brown, wet	0.3		>50		DCPT refusal at 2'
2 / 1		***Sand and gravel (Glacial till)*** Very dense, trace to some silt, medium to coarse grained sand, sub-angular gravel, grey to brown, moist to wet					
3 / 1		1'-7' some silt, moist					
7 / 2		7'-15 trace silt, coarse grained sand, brown					
15 / 4		End of Borehole	4.6				

Logged: A.L.
Method: Soild Stem Auger
Date: November 13, 2015

Datum: Ground Surface
Figure Number: A.1.

Test Hole Log: TH15-2

File: 13377
Project: Indian Residential School Dialogue Centre
Client: UBC Properties Trust
Site Location: Main Mall, UBC

GEOPACIFIC CONSULTANTS
215 - 1200 West 73rd Avenue, Vancouver, BC, V6P 6G5
Tel: 604-439-0922 Fax:604-439-9189

INFERRED PROFILE

Depth (ft / m)	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)
0 / 0		Ground Surface	
		Topsoil Grass on top, sand, dark brown, wet	0.0
		Sand and gravel (Fill) Compact, trace silt, medium grained sand, brown, wet	0.3
		Sand and gravel (Glacial till) Very dense, trace to some silt, medium to coarse grained sand, sub-angular gravel, grey to brown, moist to wet 1'-7' some silt, moist 7'-15 trace silt, coarse grained sand, brown	
15 / 4.6		End of Borehole	4.6

Fines content (%)

DCPT (blows per foot) 10 20 30 40

Groundwater / Well

Remarks

Logged: A.L.
Method: Soild Stem Auger
Date: November 13, 2015

Datum: Ground Surface
Figure Number: A.2.

Test Hole Log: TH15-3

File: 13377
Project: Indian Residential School Dialogue Centre
Client: UBC Properties Trust
Site Location: Main Mall, UBC

GEOPACIFIC CONSULTANTS
215 - 1200 West 73rd Avenue, Vancouver, BC, V6P 6G5
Tel: 604-439-0922 Fax:604-439-9189

INFERRED PROFILE

Depth (ft / m)	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)
0 / 0		Ground Surface	
		Topsoil Grass on top, sand, dark brown, wet	0.0
		Sand and gravel (Fill) Compact, trace silt, medium grained sand, brown, wet	0.3
		Sand and gravel (Glacial till) Very dense, trace to some silt, medium to coarse grained sand, sub-angular gravel, grey to brown, moist to wet 1'-8' some silt, moist 8'-15 trace silt, coarse grained sand, brown	
15 / 4.6		End of Borehole	4.6

Fines content (%)

DCPT (blows per foot) 10 20 30 40

Groundwater / Well

Remarks

Logged: A.L.
Method: Soild Stem Auger
Date: November 13, 2015

Datum: Ground Surface
Figure Number: A.3.

Test Hole Log: TH15-4

File: 13377
Project: Indian Residential School Dialogue Centre
Client: UBC Properties Trust
Site Location: Main Mall, UBC

GEOPACIFIC CONSULTANTS
215 - 1200 West 73rd Avenue, Vancouver, BC, V6P 6G5
Tel: 604-439-0922 Fax:604-439-9189

INFERRED PROFILE

Depth (ft / m)	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)
0 / 0		Ground Surface	
		Topsoil Grass on top, sand, dark brown, wet	0.0
		Sand and gravel (Fill) Compact, trace silt, medium grained sand, brown, wet	0.3
		Sand and gravel (Glacial till) Very dense, trace to some silt, medium grained sand, grey, moist	
		End of Borehole	4.6

Fines content (%)

DCPT (blows per foot) 10 20 30 40

Groundwater / Well

Remarks

Logged: A.L.
Method: Soild Stem Auger
Date: November 13, 2015

Datum: Ground Surface
Figure Number: A.4.

Test Hole Log: TH15-4

File: 13377
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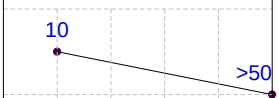
215 - 1200 West 73rd Avenue, Vancouver, BC, V6P 6G5
Tel: 604-439-0922 Fax:604-439-9189

INFERRED PROFILE

Depth (ft / m)	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)
0 / 0		Ground Surface	
		Topsoil Grass on top, sand, dark brown, wet	0.0
		Sand and gravel (Fill) Compact, trace silt, medium grained sand, brown, wet	0.2
		Sand and gravel (Glacial till) Very dense, trace to some silt, medium grained sand, grey, moist	
20 / 6		End of Borehole	6.1

Fines content (%)

DCPT (blows per foot)
10 20 30 40



Groundwater / Well

Remarks

DCPT Refusal at 2'

Logged: A.L.
Method: Soild Stem Auger
Date: November 13, 2015

Datum: Ground Surface
Figure Number: A.4.

Test Hole Log: TH15-6

File: 13377
Project: Indian Residential School Dialogue Centre
Client: UBC Properties Trust
Site Location: Main Mall, UBC

GEOPACIFIC CONSULTANTS
215 - 1200 West 73rd Avenue, Vancouver, BC, V6P 6G5
Tel: 604-439-0922 Fax:604-439-9189

INFERRED PROFILE

Depth (ft / m)	Symbol	SOIL DESCRIPTION	Depth (m)/Elev (m)
0 / 0		Ground Surface	
		Topsoil Grass on top, sand, dark brown, wet	0.0
		Sand and gravel (Fill) Compact, trace silt, medium grained sand, brown, wet	0.3
		Sand and gravel (Glacial till) Very dense, trace to some silt, medium grained sand, grey, moist	
20 / 6		End of Borehole	6.1

Fines content (%)

DCPT (blows per foot) 10 20 30 40

Groundwater / Well

Remarks

Logged: A.L.
Method: Soild Stem Auger
Date: November 13, 2015

Datum: Ground Surface
Figure Number: A.6.

PRELIMINARY SITE INVESTIGATION
STAGE I ENVIRONMENTAL
SITE ASSESSMENT

OF

Indian Residential School History and Dialogue Centre Project

REPORT PREPARED FOR:

UBC Properties Trust
200 - 3313 Shrum Lane
Vancouver, BC
V6S 0B9

REPORT PREPARED BY:

A.C.M. Environmental Corporation
217 - 2323 Quebec Street
Vancouver, BC
V5T 4S7

January 5, 2016

EXECUTIVE SUMMARY

A.C.M. Environmental Corporation (ACM) was retained by UBC Properties Trust (the Client) to conduct a Stage I Preliminary Site Investigation (PSI) for the property site known as the Indian Residential School History and Dialogue Centre (IRSHDC) Project located at the University of British Columbia in Vancouver, BC (the Site).

The Site is a proposed two-level development: a repurposing of several rooms located at the southeast corner of the Walter C. Koerner library below ground and a building addition to be located above these corner rooms. No road access is available to the Site due to pedestrian only designation for the surrounding roadways, though the nearest road access to the Site is from Main Mall or Agricultural Road.

A summary of relevant details with reference to the Site is provided as follows:

Civic Address	N/A
Legal Description	District Lot 3044, Group 1, NWD Except Firstly; Part On Plan 6147 Secondly: Part On Plan 9301 Thirdly; Part On Plan BCP6556 Fourthly: Part On Plan BCP23719
Parcel Identifier Number	015-891-909
Current Zoning	Institutional
Latitude / Longitude	49°16'0.71"N / 123°15'14.34"W
Registered Site Owners	The University of British Columbia
Total Lot Area	250 square metres (approximately)

The objective of this PSI was to determine the environmental liability posed by the subject site and its surrounding properties. The investigation was undertaken in accordance with the requirements as set forth by the British Columbia (BC) Ministry of Environment (MOE) (1997), *Contaminated Sites Regulation* and included relevant steps, documents and suggestions as outlined in the MOE Guidance Document 10 (2005), *Checklist for Reviewing a Preliminary Site Investigation*, the CSA Standard Z768-01 Phase I Environmental Site Assessments and the American Society of Testing Materials (ASTM) Standard Practice for Environmental Site Assessments E-1527-05.

The table below summarizes the areas of potential environmental concern (APECs) at the Site as well as the evaluation of environmental risk posed by each potential source.

Location	Current Land Use	Potential Sources	PCoCs	Evaluation of Risk and Associated Potential Environmental Concerns
Library Garden (Onsite and Adjacent Area of the Site)	Institutional	Fill Soil / USTs	Metals, LEPH / HEPH	**Low** • All areas are landscaped and sloped. • Mix of different soil types observed around the Site. • No signs of staining indicating potential contamination. • No historical records of USTs within the area. • No visual indications of USTs.
Walter C. Koerner Library and Irving K. Barber Learning Centre (Buildings West and East of the Site)	Institutional	USTs	Metals, LEPH / HEPH	**Low** • No historical operations or activities identified as environmental concerns. • No visual indications of USTs. • No signs of stains/spills.

Based on the information collected during this investigation, it is considered that a low potential exists for soil, groundwater and/or soil vapour contamination to be present at the Site. This low potential of contamination may be generated from identified onsite or offsite sources. Activities relating to onsite operations are not considered to present a considerable risk of contamination.

Please note that an assessment of potential hazardous building materials was not conducted during the investigation. Hazardous building materials may exist within the building onsite in the form of asbestos, lead, polychlorinated biphenyl (PCBs), mercury, etc. All hazardous materials must be properly removed in accordance with WorkSafeBC regulations prior to the start of renovation or demolition activities that may impact these materials.

TABLE OF CONTENTS

1.0 INTRODUCTION

A.C.M. Environmental Corporation (ACM) was retained by UBC Properties Trust (the Client) to conduct a Stage I Preliminary Site Investigation (PSI) for the property site known as the Indian Residential School History and Dialogue Centre (IRSHDC) Project located at the University of British Columbia in Vancouver, BC (the Site).

The Site is a proposed two-level development: a repurposing of several rooms located at the southeast corner of the Walter C. Koerner Library below ground and a building addition to be located above these corner rooms. No road access is available to the Site due to pedestrian only designation for the surrounding roadways, though the nearest road access to the Site is from Main Mall or Agricultural Road. The legal description details for the Site are provided in Table 1 as follows:

Table 1: Site Legal Description Details

Civic Address	N/A
Legal Description	District Lot 3044, Group 1, NWD Except Firstly; Part On Plan 6147 Secondly: Part On Plan 9301 Thirdly; Part On Plan BCP6556 Fourthly: Part On Plan BCP23719
Parcel Identifier Number	015-891-909

1.1 OBJECTIVE

The objective of the Stage I PSI was to determine the environmental liability posed by the Site by identifying any onsite and offsite areas of potential environmental concern (APECs) and the risk level of the APECs that may adversely impact (i.e. contaminate) the soil, groundwater and vapour underlying the Site.

This investigation will follow the requirements as set forth by the British Columbia (BC) Ministry of Environment (MoE), 1997 Contaminated Sites Regulation (CSR), with all current amendments. The investigation will reference the MoE Technical Guidance Document 10 on Contaminated Sites (2005), *Checklist for Reviewing a Preliminary Site Investigation* and other relevant MoE technical guidance documents, policies, procedures and protocols.

1.2 SCOPE

The scope of this Stage I PSI will include a site visual inspection and records review. The visual inspection will be completed by a qualified environmental consultant and will include an inspection of the Site and surrounding properties for evidence of potential environmental risk.

The records review will include the following current and historical sources:

- Relevant local and regional topography, geology and hydrogeology maps;
- Surrounding groundwater well locations;
- Aerial photographs;
- Site plans, zoning maps and building permits;
- Historical fire insurance maps;
- Certificates of title; and
- Historical directory records.

Interviews may also be conducted with the Site owner and any other persons with knowledge of the current and recent land use activities at the Site.

Please note that no intrusive environmental media samples will be collected or analysed as part of this investigation.

2.0 SITE DESCRIPTION

2.1 SITE DESCRIPTION AND LOCATION

The Site is a proposed two-level development: a repurposing of several rooms located at the southeast corner of the Walter C. Koerner Library below ground and a building addition to be located above these corner rooms. No road access is available to the Site due to pedestrian only designation for the surrounding roadways, though the nearest road access to the Site is from Main Mall or Agricultural Road.

The Site is made up of a single lot. The lot is square in shape with a gross parcel area of approximately 250 square metres. The Site is a section of a paved walkway and existing rooms located within the library garden and the library itself. The surrounding areas of the Site consist of paved roads/walkways and academic buildings: Memorial Road and the Buchanan (Arts) academic buildings to the north, the Irving K. Barber Learning Centre to the east, Agricultural Road and the Sciences academic buildings to the south, and Main Mall and the Walter C. Koerner Library to the west. A location map of the Site is presented in Figure 1. A site plan of the Site is presented in Figure 2.

A summary of relevant details with reference to the Site is provided in Table 2 below.

Table 2: Site Details

Civic Address	N/A
Legal Description	District Lot 3044, Group 1, NWD Except Firstly; Part On Plan 6147 Secondly: Part On Plan 9301 Thirdly; Part On Plan BCP6556 Fourthly: Part On Plan BCP23719
Parcel Identifier Number	015-891-909
Current Zoning	Institutional
Latitude / Longitude	49°16'0.71"N / 123°15'14.34"W
Registered Site Owners	The University of British Columbia
Total Lot Area	250 square metres (approximately)

2.2 SITE PHYSICAL SETTING

2.2.1 Topography

According to the topographic map available from the land survey branch, the Site is situated at approximately 83-84 metres (m) above sea level. The overall topography of the surrounding area slopes to the west. A contour map of the Site is presented in Figure 3.

2.2.2 Site Drainage

The Site is comprised of impervious ground surfaces paved for pedestrian use. As such, any water runoff originating from the Site is expected to infiltrate directly into any unpaved grounds or catch basins on the Site or adjacent walkways.

2.2.3 Site Geology

The 1979 Surficial Geology map (1486A Vancouver) shows that the surficial geology of the Site consists of Vashon Drift and Capilano Sediments. Glacial drift including: lodgment and minor flow till, lenses and interbeds of substratified glaciofluvial sand to gravel, and lenses and interbed of glaciolacustrine laminated stony silt; up to 25m thick; overlain by glaciomarine and marine deposits similar to marine and glaciomarine stony to stoneless silt loam to clay loam with minor sand and silt, normally less than 3m but in places up to 10m thick. Marine derived lag gravel normally less than 1m thick containing marine shell casts has been found mantling till and glaciomarine deposits up to 175m above sea level; above 175m till is mantled by boulder gravel that may be in part ablation till, in part colluviums, and in part marine. Bedrock is more than 10m below surface.

2.3 SITE HYDROGEOLOGY

The inferred groundwater flow direction is to the west toward the Strait of Georgia, based on the topography of the area. However, site specific hydraulic conditions may differ from those inferred and can be confirmed after intrusive onsite works only.

A search of the Ministry of Environment (MoE) water well database within a 500m radius of the Site was conducted utilizing the online MoE BC Water Resources Atlas service. The search revealed four (4) wells within 500m from the Site. The nearest well that may be impacted by the Site is located approximately 430 m northwest of the Site. The other 3 wells are located north of the Site, but are not expected to be impacted by the Site due to the inferred groundwater flow direction of the Site. See Figure 3 for the locations of the water wells within 500m from the Site.

Drinking water for the Site and the surrounding area in much of Metro Vancouver is provided by a municipal piped water distribution network. The sources for this potable drinking water supply originate in the North Shore mountains.

Should further work be recommended for the Site, the applicability of the Contaminated Sites Regulation (CSR) Drinking Water standards may need to be further assessed.

2.4 NEAREST ECOLOGICALLY SENSITIVE AREAS

No ecologically sensitive areas are known to exist within or adjacent to the Site.

2.5 ANNUAL PRECIPITATION RECORDS

Annual precipitation records were obtained from the Environment Canada National Climate Data and Information Archive. The average annual precipitation for the nearest weather station, Vancouver UBC station (Climate ID: 1108487) with sufficient annual precipitation data was used to represent the approximate annual precipitation at the Site. Annual precipitation records from 1958 to 1994 are presented in Table 3 below:

Table 3: Monthly and Annual Average Precipitation (mm)

January	February	March	April	May	June
171.62	134.28	115.78	82.74	64.09	50.08
July	**August**	**September**	**October**	**November**	**December**
37.08	48.68	65.70	128.03	185.94	190.93

Total annual precipitation: 1274.94 mm
Average monthly precipitation: 106.25 mm

2.5.1 Infiltration of Precipitation

As the Site is covered with impervious surfaces, direct infiltration of surface water runoff into the subsurface is expected to be low.

3.0 SITE HISTORY

3.1 AERIAL PHOTOGRAPHS

Historical aerial photographs of the Site and surrounding area were obtained from the UBC Geographic Information Centre Library. Aerial photographs from 1938 to 2002 were examined using a magnification stereoscope to assess changes to onsite and offsite conditions over time. The historical aerial photographs are presented in Appendix A and visible descriptions summarized in Table 4 as follows:

Table 4: Aerial Photograph Interpretation

Date	Aerial Interpretation
1938	The Site appears to be part of an open field with no visible structures onsite. All adjacent areas are part of the open field with some paved pathways to the north. A roadway, currently known as Main Mall, is located west of the Site. The surrounding areas further from the Site are visibly occupied by large buildings.
1949	No significant changes to the Site visible. No significant changes to the adjacent areas of the Site visible. Building additions visible to a building, previously known as the Main Library, located further east from the Site.
1954	No significant changes to the Site visible. Adjacent areas around the Site remain as part of an open field, though there are visible ground disturbances. No significant changes to the surrounding areas further from the Site visible.
1963	No significant changes to the Site visible. Adjacent areas around the Site remain as part of an open field, though an addition walkway going north to south was added. The Main Library now appears to have more building additions. Additional buildings are also visible further south of the Site, currently known as the Chemistry academic buildings area. Additional buildings occupy the areas further north of the Site.
1969	No significant changes to the Site visible. No significant changes to the adjacent and surrounding areas of the Site visible.
1977	The Site now appears to be part of a paved walkway that is currently known to be above a building section of the Walter C. Koerner Library. Adjacent areas to the south and east of the Site remain as part of an open field, though are now partially landscaped. The adjacent area west of the Site is part of the paved walkway of the Site leading to Main Mall. The adjacent area north of the Site appears to drop below ground level and is part of another small landscaped field. A section of Main Mall west of the Site appears to be widened and now blocked from public traffic.

Date	Aerial Interpretation
1984	No significant changes to the Site visible. No significant changes to the adjacent and surrounding areas of the Site visible.
1997	No significant changes to the Site visible. A section of Main Mall west of the Site appears to be further widened.
2002	No significant changes to the Site visible. No significant changes to the adjacent and surrounding areas of the Site visible.

3.2 LAND TITLE SEARCH

The Land Title and Survey Authority of British Columbia was engaged to conduct a search of current and cancelled titles with reference to the Site. The detailed results of the title search records are presented in Appendix B.

The current title for the Site is registered under The University of British Columbia. PID 015-891-909 had been registered with the owner since 2006. The search of the current and historical title records has revealed no environmental concerns on the Site due to previous site use.

3.3 DOCUMENT REVIEW

No drawings or permits for the Site were found relating to the presence of underground storage tanks or any other potential contaminant sources.

3.4 HISTORICAL DIRECTORY SEARCH

Historical directory records are known to be available for the Site dating back to 1925. The Site had historically been kept an open area to present day as a portion of a garden area between the current buildings known as Walter C. Koerner Library located west of the Site and the Irving K. Barber Learning Centre located east of the Site. These buildings had undergone multiple renovations and repurposing throughout history, though the buildings remained as either a library or learning centre.

Over the directory search period, the libraries and learning centre are not considered to have potential environmental impact on the Site, as no major activities or environmental concerns were observed on the aerial photographs. Surrounding areas remained in use for academic purposes and are not considered to have potential environmental impacts on the Site. However, due to the age of the Walter C. Koerner Library, building materials within the lower level of the Site is likely to contain hazardous building materials. Detailed results of the directories search are presented in Appendix C.

3.5 FIRE INSURANCE MAPS AND CAMPUS MAPS

Fire insurance maps from 1962 are known to be available for the Site. However, the maps reveal only an open area on the Site. Surrounding buildings near the Site were all shown to be academic in use. No environmental concerns were identified on the Site and surrounding areas by the fire insurance maps.

UBC campus maps from 1925 to 1968 were available for the Site. The maps revealed the Site and adjacent areas were historically used for academic purposes as a library, learning centre, and Arts area. The Site has remained an open area since 1925. Therefore, activities on the Site and surrounding areas are not considered to be of environmental concerns to the Site. Fire insurance maps and Campus Maps are presented in Appendix D.

3.6 MOE SITE REGISTRY SEARCH

A 0.5 kilometre (km) area search of the Site Registry database at BC Online was conducted utilizing the latitude and longitude geographic coordinates of the Site. The purpose of this search was to identify sites listed by the MoE which have been reported under the Site Registry provisions of the CSR. Results of the Site Registry search are presented in Appendix E.

As of December 13, 2015, the Site Registry database revealed a nil search, indicating no site registered properties were found within a 0.5 km radius from the Site. Therefore, no potential environmental concerns was revealed through the site registry search.

3.7 NATURAL GAS RECORDS

Natural gas connection records are no longer provided to the public by the natural gas utility, Fortis. No Site natural gas connection records were obtained for this investigation.

3.8 PRIOR INVESTIGATIONS

No prior environmental investigations were known to have been completed for the Site.

4.0 SITE INSPECTION

An inspection of the Site was conducted by Tony Lai of ACM on December 29, 2015. A site plan showing the current land uses of the Site is presented in Figure 4. Photographs taken during the site inspection are presented in Appendix F.

4.1 CURRENT SITE CONDITIONS

The Site currently consists of several rooms of the Walter C. Koerner Library located below garden at the southeast corner of the library and a paved walkway above these rooms. Both areas are located below ground level with nearby stairways leading into the area from ground level. The paved area is an open area with a single seating bench. No access was available to the library rooms, though were observed to be used for storage. A location map of the Site is presented in Figure 1. A site plan of the Site is presented in Figure 2.

The following is a detailed discussion of the site inspection findings in accordance with the CSA standard for Phase I ESAs.

4.1.1 Fuel/Chemical Handling and Storage

No visual evidence of underground storage tanks (USTs) were observed to be on the Site.

4.1.2 Waste Materials

No hazardous waste generation or storage was observed. No unidentified wastes and debris, hazardous or non-hazardous, were observed throughout the Site.

4.1.3 Spill and Stain Areas

No evidence of major spills or stains was observed.

4.1.4 Wastewater Discharges

No wastewater discharges are expected to occur at the Site. No oil/water separator or other potential sources of contamination related to wastewater discharge were observed.

4.1.5 Air Discharges

No sources of air emissions, suspected to result in contamination to the near surface of the Site, were observed.

4.1.6 Polychlorinated Biphenyls (PCBs)

The past use of PCBs in electrical equipment such as transformers, fluorescent lamp ballasts and capacitors was common. The federal *Environmental Contaminants Act*, 1976, prohibited the use of PCBs in heat transfer and electrical equipment installed

after September 1, 1977, and in transformers and capacitors installed after July 1, 1980. In addition, storage and disposal of PCBs is regulated.

Fluorescent lamp fixtures were observed within the southeast corner rooms of the Walter C. Koerner Library. Therefore, PCB ballasts may be present.

4.1.7 Asbestos

The common use of potential friable asbestos containing materials (ACMs) such as pipe/boiler insulation and fireproofing in building construction generally ceased voluntarily in the mid-1970s. However, asbestos is known to be present in buildings constructed as late as the mid-1980s.

Given the age of the Walter C. Koerner Library and therefore the lower portion of the Site, ACMs are likely to be present. During site inspection, suspect ACMs were observed in the form of asbestos flooring and window glazing putty. Other hidden ACMs such as piping insulation may be present.

4.1.8 Urea Formaldehyde Foam Insulation (UFFI)

The sale and installation of UFFI as thermal insulation began in approximately 1970 and continued until 1980 when UFFI was banned under the federal *Hazardous Products Act*. UFFI was installed in both new and existing buildings during this period. UFFI was primarily installed in residential single family dwellings in the 1970s.

Given the age of the Walter C. Koerner Library and therefore the lower portion of the Site, UFFI may be present.

4.1.9 Lead

In 1976, the lead content in interior paint products was limited to 0.5% by weight under the federal *Hazardous Products Act*. Lead is also associated with plumbing solder and old pipes as well as other lead based products such as wall shielding (x-ray rooms).

Given the age of the Walter C. Koerner Library and therefore the lower portion of the Site, lead paints and other lead containing materials are likely to be present.

4.1.10 Ozone Depleting Substances (ODSs)

In 1994, the federal government filed the Ozone-depleting Substances Regulations to amend controls on production and consumption of chlorofluorocarbons (CFCs), halons, carbon tetrachloride and methyl chloroform.

As the lower portion of the Site is currently in use, refrigeration equipment may be present and therefore may contain ODSs.

4.1.11 Radon

Radon gas is a product of the decay series that begins with uranium. Radon is produced directly from radium which can be commonly found in bedrock that contains black shale and/or granite. Radon gas can migrate through the ground and enter buildings through porous concrete or fractures. Radon tends to accumulate in poorly ventilated basements.

No testing for radon gas at the Site has come to our attention. However, based on information contained on regional geological maps, radon gas is not expected to be an issue in the Lower Mainland area.

4.1.12 Electromagnetic Fields (EMFs)

No high tension hydro transmission lines or electrical substations which could generate significant EMFs were identified on or adjacent to the Site.

4.1.13 Noise and Vibration

No major sources of noise or vibration on or adjacent to the Site were identified.

4.1.14 Mercury

Mercury may be found in thermostats switches or fluorescent light tubes. Given that the lower portion of the Site of the Walter C. Koerner Library contains fluorescent light fixtures, mercury is likely to be present within the building. Mercury thermostats may also be present due to the age of the building.

4.1.15 Mould

Mould can be present, for example in buildings where water leaks have occurred and affected damaged building materials still remain in place in poorly ventilated and moist interior environments.

Visible water stains were observed within the lower portion of the Site, though no signs of mould were found. However, inspections of the potential presence of mould were beyond the scope of this investigation.

4.1.16 Radioactive Materials

No radioactive substances requiring licensing are known to be present or to have been located at the Site.

4.2 CURRENT ADJACENT LAND USES

A visual assessment of the adjacent and neighbouring properties was also conducted during the site inspection to identify any potential offsite sources of contamination which may affect or adversely impact the Site.

The lower portion of the Site was observed to be adjacent to a sunken garden and other connected areas of the Walter C. Koerner Library. The portion of the Site above these rooms was observed to be adjacent to other open and landscaped areas of the library garden. The majority of the adjacent landscaped areas, starting from the sunken garden, are leveled and/or sloped to ground level of the surrounding areas. Buildings within the surrounding areas remain as academic buildings of the UBC campus. A surrounding land use map is presented in Figure 4.

No groundwater monitoring wells or other indications of previous environmental work were observed adjacent to the Site. See Section 4.3 for further information.

4.3 INTERVIEWS

No personnel were available for interview during the site visit.

Guy Champagne of the UBC Risk Management Services was contacted for this investigation. Mr. Champagne informed ACM that asbestos containing materials (ACMs) exist underground beneath the Site in the form of asbestos cement pipes. In addition, the library room to be repurposed for the IRSHDC project contains existing ACMs in the form of floor tiles, window glazing putty, duct mastic, elbows and fittings, and drywall.

Noga Levit of the UBC Risk Management Services department was questioned through email on identifying potential sources of contamination which may adversely impact the Site. Ms. Levit indicated that no underground storage tanks or spills had occurred on or adjacent to the Site.

The gathering of anecdotal evidence from interviews highlighted potential environmental concerns in the form of ACMs on the Site. No other potential environmental concerns was revealed through interviews with respect to the current and past use of the Site.

5.0 AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

The objective of this Stage 1 PSI is to determine the environmental liability posed by the Site by identifying any areas of potential environmental concern (APECs) along with the associated potential contaminants of concern (PCoCs) that may impact soil and groundwater beneath the Site. The APECs and PCoCs are summarised in Table 5 and detailed below.

Table 5: Areas of Potential Environmental Concern

Location	Current Land Use	Potential Sources	PCoCs	Evaluation of Risk and Associated Potential Environmental Concerns
Library Garden (Onsite and Adjacent Area of the Site)	Institutional	Fill Soil / USTs	Metals, LEPH / HEPH	**Low** • All areas are landscaped and sloped. • Mix of different soil types observed around the Site. • No signs of staining indicating potential contamination. • No historical records of USTs within the area. • No visual indications of USTs.
Walter C. Koerner Library and Irving K. Barber Learning Centre (Buildings West and East of the Site)	Institutional	USTs	Metals, LEPH / HEPH	**Low** • No historical operations or activities identified as environmental concerns. • No visual indications of USTs. • No signs of stains/spills.

5.1 POTENTIAL ONSITE APECS

Historical records indicate that the Site has been used as part of the library garden or library rooms since its development. No evidence of vent or fill pipes indicating the possible presences of underground storage tanks (USTs) were observed. No evidence of chemical storage infrastructure was observed during the Site inspection. As such, activities relating to onsite operations are not considered to be potential sources of contamination.

5.2 POTENTIAL OFFSITE APECS

In addition to any evidence of onsite sources of contamination, potential offsite sources of contamination were assessed as part of the investigation.

No evidence of vent or fill pipes indicating the possible presence of underground storage tanks (USTs) were observed. No evidence of chemical storage infrastructure was observed in the area of the Site. Therefore, activities relating to adjacent operations are not considered to be potential sources of contamination.

6.0 CONCLUSION AND RECOMMENDATIONS

A.C.M. Environmental Corporation (ACM) was retained by UBC Properties Trust (the Client) to conduct a Stage I Preliminary Site Investigation (PSI) for the property located at IRSHDC Project in Vancouver, BC (the Site).

The scope of this Stage I PSI was limited to a desktop records review, visual inspection of the Site and interviews with persons knowledgeable of the current use and recent history of the Site.

Based on the information collected during this investigation, it is considered that a low potential exists for soil, groundwater and/or soil vapour contamination to be present at the Site. This low potential of contamination may be generated from identified onsite or offsite sources. Activities relating to onsite operations are not considered to present a considerable risk of contamination.

Please note that an assessment of potential hazardous building materials was not conducted during the investigation. Hazardous building materials may exist within the building onsite in the form of asbestos, lead, polychlorinated biphenyl (PCBs), mercury, etc. All hazardous materials must be properly removed in accordance with WorkSafeBC regulations prior to the start of renovation or demolition activities that may impact these materials.

7.0 REFERENCES

British Columbia Ministry of Environment (MoE) (1997), *Contaminated Sites Regulation,* as amended with Stage 8 Amendments, dated January 2013.

British Columbia Ministry of Environment (MoE) (2005), Technical Guidance Document 10 on Contaminated Sites – *Checklist for Reviewing a Preliminary Site Investigation.*

American Society of Testing Materials (ASTM), Standard Practice for Environmental Site Assessments E-1527-00.

Canadian Standards Association, CSA Standard Z768-01 - Environmental Site Assessments.

WorkSafeBC, Occupational Health and Safety (OH&S) Regulations and Guidelines.

BC Online, Site Registry Database.

British Columbia (BC) Ministry of Environment (MoE) Water Resources Atlas website.

Environment Canada, National Climate Data and Information Archive.

Google Earth (Version 7.1.2.2041).

Natural Resources Canada, Canada Centre for Mapping and Earth Observation (1979), *Map – Surficial Geology, Vancouver, British Columbia.*

City of Vancouver, VanMap website.

8.0 STATEMENT OF LIMITATIONS

The information in this report is prepared solely for the use of the Client and is based on public and private records obtained by A.C.M. Environmental Corporation (ACM). ACM has made all reasonable attempts to locate documents pertaining to relevant information for this site and shall not be responsible for matters over which it has no control, including, but not limited to such matters as access to complete records, ability to enter private dwellings or on site buildings, and availability of complete documentation.

The ACM report is intended to direct the Client's attention to recognized environmental conditions and to potential sources of environmental contamination. The findings and conclusion regarding contamination of the Site are based solely on the extent of observations and information gathered during the Stage I PSI. Nothing in the report is intended to express any legal opinion upon environmental liabilities relating to the Site or whether operations legally conformed to relevant legislative requirements.

Furthermore, it must be understood that changing circumstances in the physical environment, the use of the Site, as well in changes in any substances stored, used, handled at the Site, and could radically alter the conclusions and information contained in this report. Therefore, it is important that the Site is periodically re-evaluated and the client kept informed as to developments, which may impact the Site.

Unless an accidental release has been caused by our negligence, our Client agrees to hold harmless and to indemnify and defend ACM, its directors, officers, servants, agents, employees, workmen, contractors, subcontractors, and sub-consultants from, and against, any and all claims, losses, damages, demands, disputes, liability, and legal and investigative costs, for the defence of any proceedings resulting from all accidental releases which may occur in the course of our retainer. This indemnification shall extend to all claims brought or threatened against ACM under any federal or provincial statute or municipal bylaw. Our Client further agrees that it will assert no claims against ACM (except for our own negligence) for accidental releases, which may occur in the course of our retainer.

Information from this report is for the sole use of UBC Properties Trust and is their intellectual property. The Ministry of Environment may rely on the information contained in this report. This report is subject to copyright and shall not be reproduced in whole or part without the express written consent of ACM. Copies can be obtained upon request from ACM if permission for disclosure is received from UBC Properties Trust.

9.0 QUALIFICATIONS OF ASSESSOR

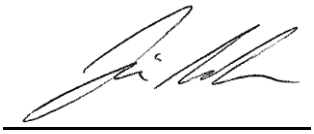
Tony Lai has a diploma in Occupational Health and Safety from the British Columbia Institute of Technology in 2008, where he is currently completing the Environmental Engineering Technology degree program.

Jim Williams has a diploma in Environmental Engineering Technology from the British Columbia Institute of Technology in 1998. Jim has practiced environmental consulting in the province of British Columbia for the past fifteen years.

A.C.M. ENVIRONMENTAL CORPORATION

Tony Lai, Dipl. Tech., ABI
Environmental Technologist

Reviewed by:



Jim Williams, Dipl. Tech., ABI
Sr. Environmental Assessment Manager

FIGURES

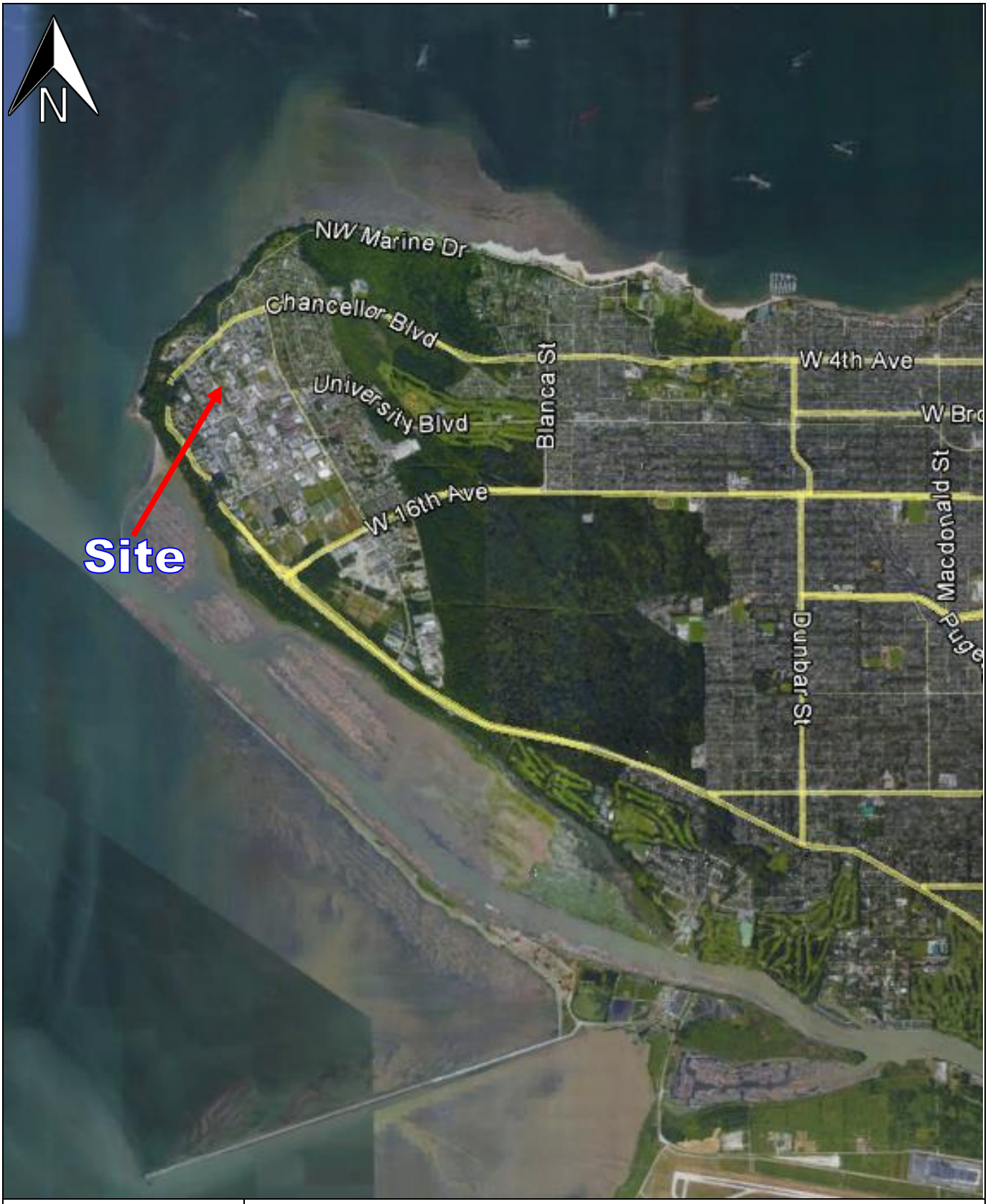


Figure 1: Site Location

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:50,000

0 1000 2000m

Figure 2: Site Plan

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:500

0 10 20m

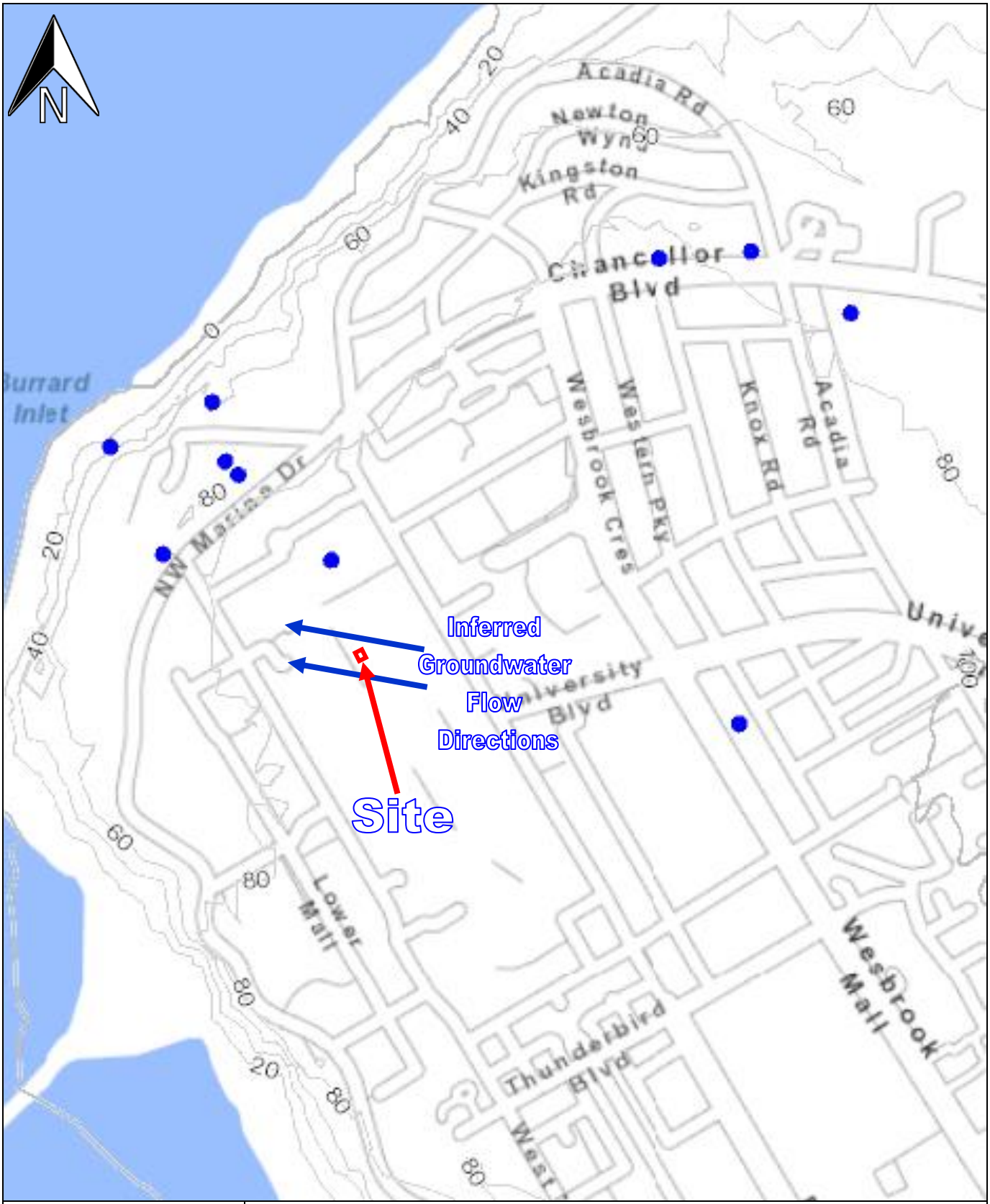


Figure 3: Contour and Water Well Map

ACM Environmental Corporation

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:13,000

0 300 600m

Figure 4: Surrounding Land Use

ACM Environmental Corporation

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:2,500

0 60 120m

APPENDICES

APPENDIX A

AERIAL PHOTOGRAPHS

ACM Environmental Corporation

Aerial Photo: 1938

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:2,300

0 55 110m

ACM Environmental Corporation

Aerial Photo: 1949

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:2,300

0 55 110m

ACM Environmental Corporation

Aerial Photo: 1954

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:2,300

0 55 110m

ACM Environmental Corporation

Aerial Photo: 1963

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:2,300

0 55 110m

ACM Environmental Corporation

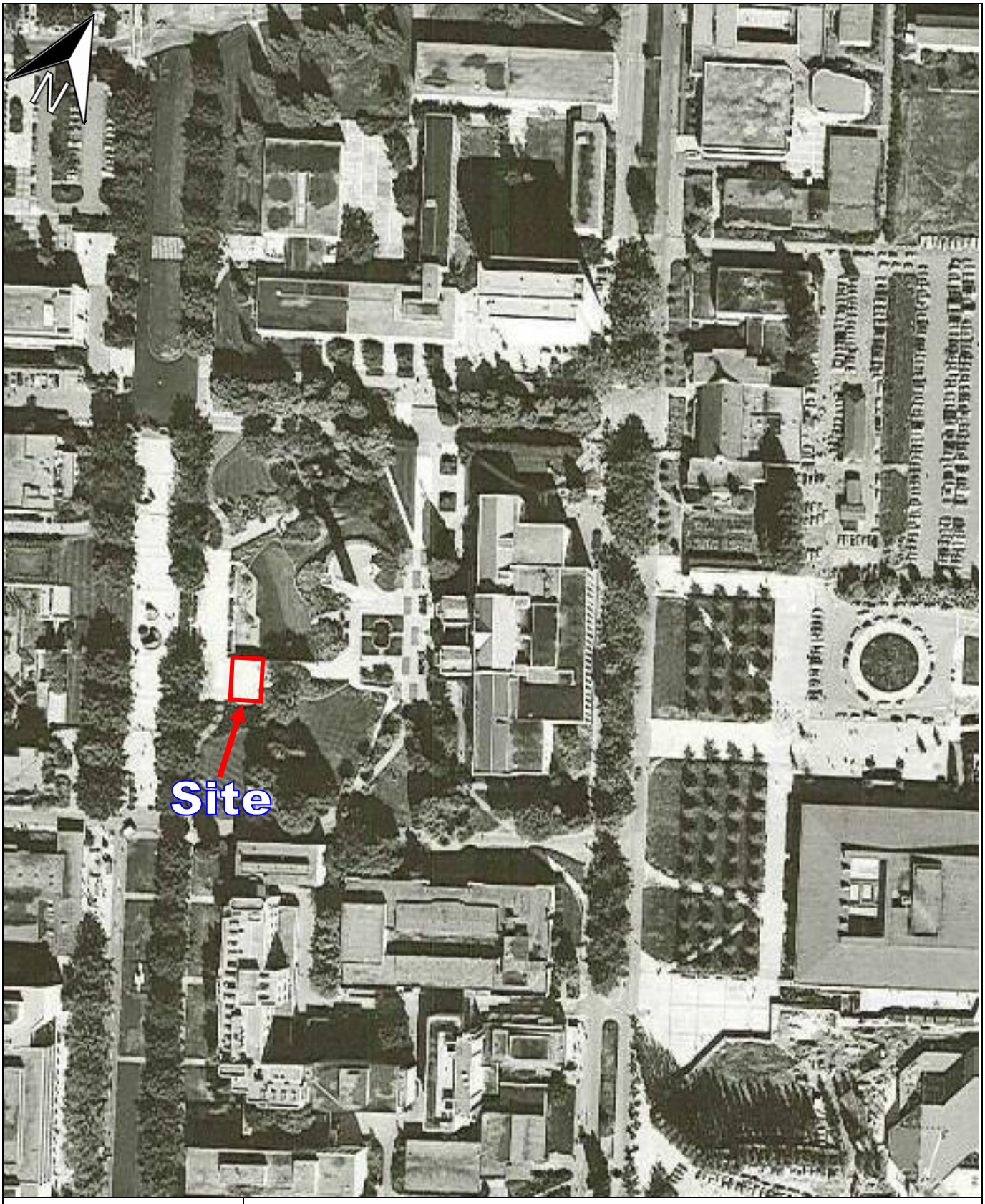
Aerial Photo: 1969

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:2,300

0 55 110m



ACM Environmental Corporation

Aerial Photo: 1977

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:2,100

0 50 100m

ACM Environmental Corporation

Aerial Photo: 1984

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:2,100

0 50 100m

ACM Environmental Corporation

Aerial Photo: 1997

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:2,300

0 55 110m

ACM Environmental Corporation

Aerial Photo: 2002

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:2,300

0 55 110m

APPENDIX B

TITLE SEARCH

TITLE SEARCH PRINT 2015-12-03, 11:13:23

File Reference: Requestor: Tony Lai

CURRENT INFORMATION ONLY - NO CANCELLED INFORMATION SHOWN

Title Issued Under	SECTION 189 LAND TITLE ACT
Land Title District	VANCOUVER
Land Title Office	VANCOUVER
Title Number	BA282668
From Title Number	BV314089
Application Entered	2006-07-06
Application Received	2006-07-06

Registered Owner in Fee Simple

Registered Owner/Mailing Address: THE UNIVERSITY OF BRITISH COLUMBIA
NO ADDRESS ON FILE FOR THIS OWNER

Taxation Authority VANCOUVER ASSESSMENT AREA

Description of Land

Parcel Identifier: 015-891-909

Legal Description:

DISTRICT LOT 3044 GROUP 1 NEW WESTMINSTER DISTRICT EXCEPT
FIRSTLY; PART ON PLAN 6147
SECONDLY: PART ON PLAN 9301
THIRDLY; PART ON PLAN BCP6556
FOURTHLY: PART ON PLAN BCP23719

Legal Notations

NOTICE OF INTEREST, BUILDERS LIEN ACT (S.3(2)), SEE BM82495A
FILED 1998-03-19

HERETO IS ANNEXED EASEMENT BR303310 OVER PART SHOWN HATCHED (91M2) ON PLAN LMP51811 OF DISTRICT LOT 3045 GROUP 1 NWD EXCEPT: PART PLAN 19440

HERETO IS ANNEXED EASEMENT BR303311 OVER PART SHOWN CROSS HATCHED (884M2) ON PLAN LMP51811 OF DISTRICT LOT 3045 GROUP 1 NWD EXCEPT: PART PLAN 19440

ZONING REGULATION AND PLAN UNDER THE AERONAUTICS ACT (CANADA) FILED 10/02/1981 UNDER NO. DF J12559

Charges, Liens and Interests

Nature:	STATUTORY RIGHT OF WAY
Registration Number:	BH21529
Registration Date and Time:	1994-01-24 09:52
Registered Owner:	GREATER VANCOUVER SEWERAGE AND DRAINAGE DISTRICT
Remarks:	PORTIONS SHOWN HATCHED AND OUTLINED IN HEAVY BLACK ON PLAN LMP14638 INTER ALIA

Nature:	STATUTORY RIGHT OF WAY
Registration Number:	BR303313
Registration Date and Time:	2001-11-14 11:19
Registered Owner:	GREATER VANCOUVER REGIONAL DISTRICT
Remarks:	INTER ALIA PLAN LMP51812

Nature:	STATUTORY RIGHT OF WAY
Registration Number:	BW334934
Registration Date and Time:	2004-07-21 11:11
Registered Owner:	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY
Remarks:	INTER ALIA

Nature:	CLAIM OF BUILDERS LIEN
Registration Number:	CA4372587
Registration Date and Time:	2015-05-01 09:42
Registered Owner:	MAINLAND CIVIL WORKS INC. INCORPORATION NO. BC0790077

Duplicate Indefeasible Title NONE OUTSTANDING

Transfers NONE

Pending Applications NONE

APPENDIX C

HISTORIAL DIRECTORY SEARCH

The above site located near the corner of Main Mall and Agricultural Road is located in the sunken garden area between Koerner Library and the Irving K. Barber Learning Centre. Prior to its major renovation in 1996, Koerner Library was known as Sedgewick Library, an almost completely underground structure. The Indian Residential School History & Dialogue Centre will be built adjacent to the underground portion of the Koerner Library, which was formerly Sedgewick Library. The Irving K. Barber Learning Centre was previously known as Main Library prior to its major renovation and addition in 2005/2008.

Directory listings for the University of British Columbia are very limited and incomplete, appearing in only one or two of the more directories over the University's history. This site does not appear in the directories. Details of Koerner Library and the IK Barber Learning Centre follow:

Walter C. Koerner Library
1958 Main Mall
Renovation/addition to Sedgewick Library: 1995/96
Notes: This building contains 7,000 square metres of new construction, and 10,200 square metres of renovated space from the former Sedgewick Library.

Sedgewick Library
1958 Main Mall
Constructed: 1973
Notes: This building was located almost entirely below ground level, in order to preserve the main mall, its oak trees and the traditional "library garden" that formed the central hub of the arts campus.

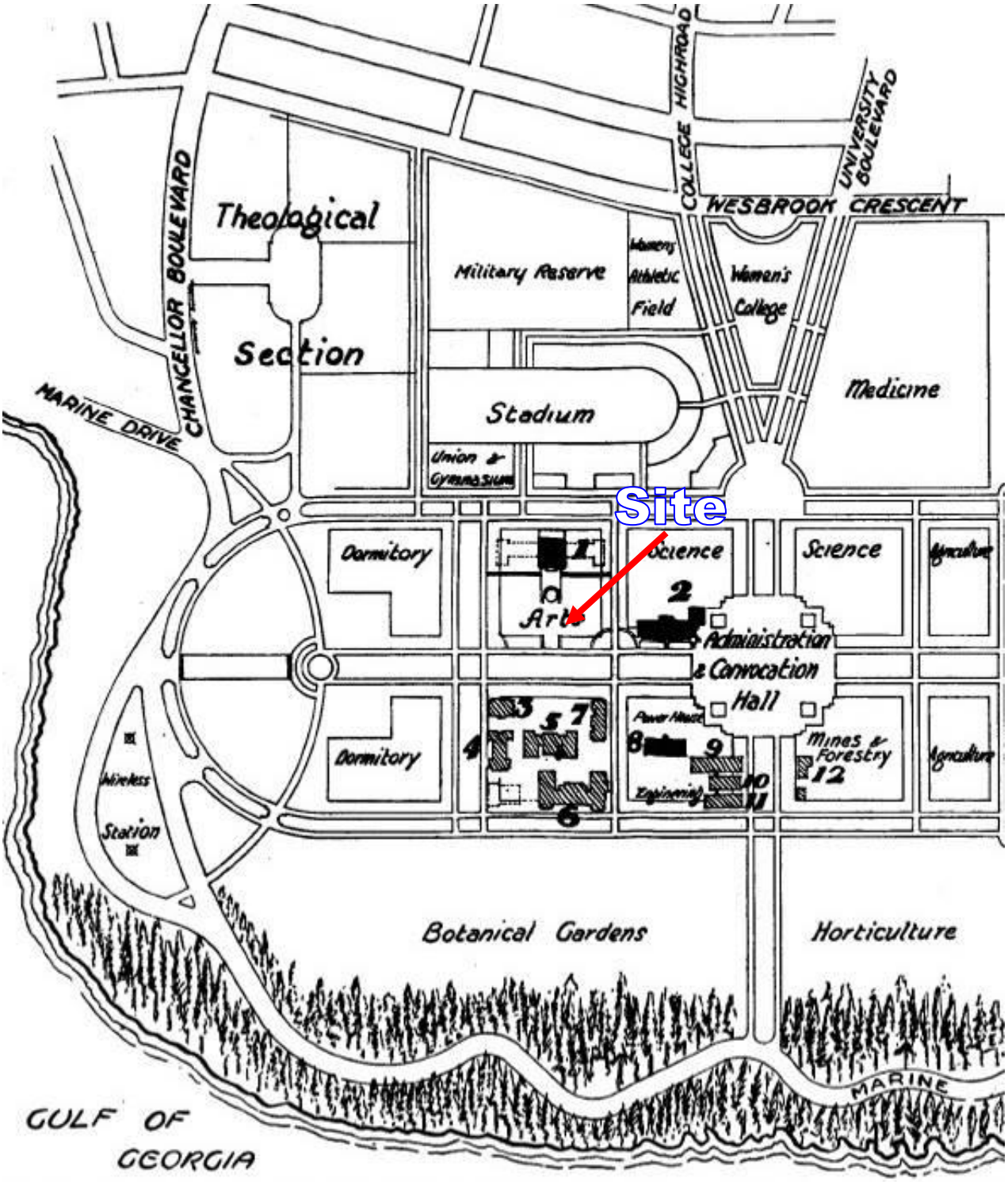
Irving K. Barber Learning Centre
1961 East Mall
Renovation/addition to Main Library: 2005/2008
Notes: The renovation to the Main Library included the addition of two massive wings to either side of the original core building. The original centre block was substantially upgraded to current fire and earthquake standards.

Main Library
1956 Main Mall
Constructed: 1925, additions in 1948 and 1960

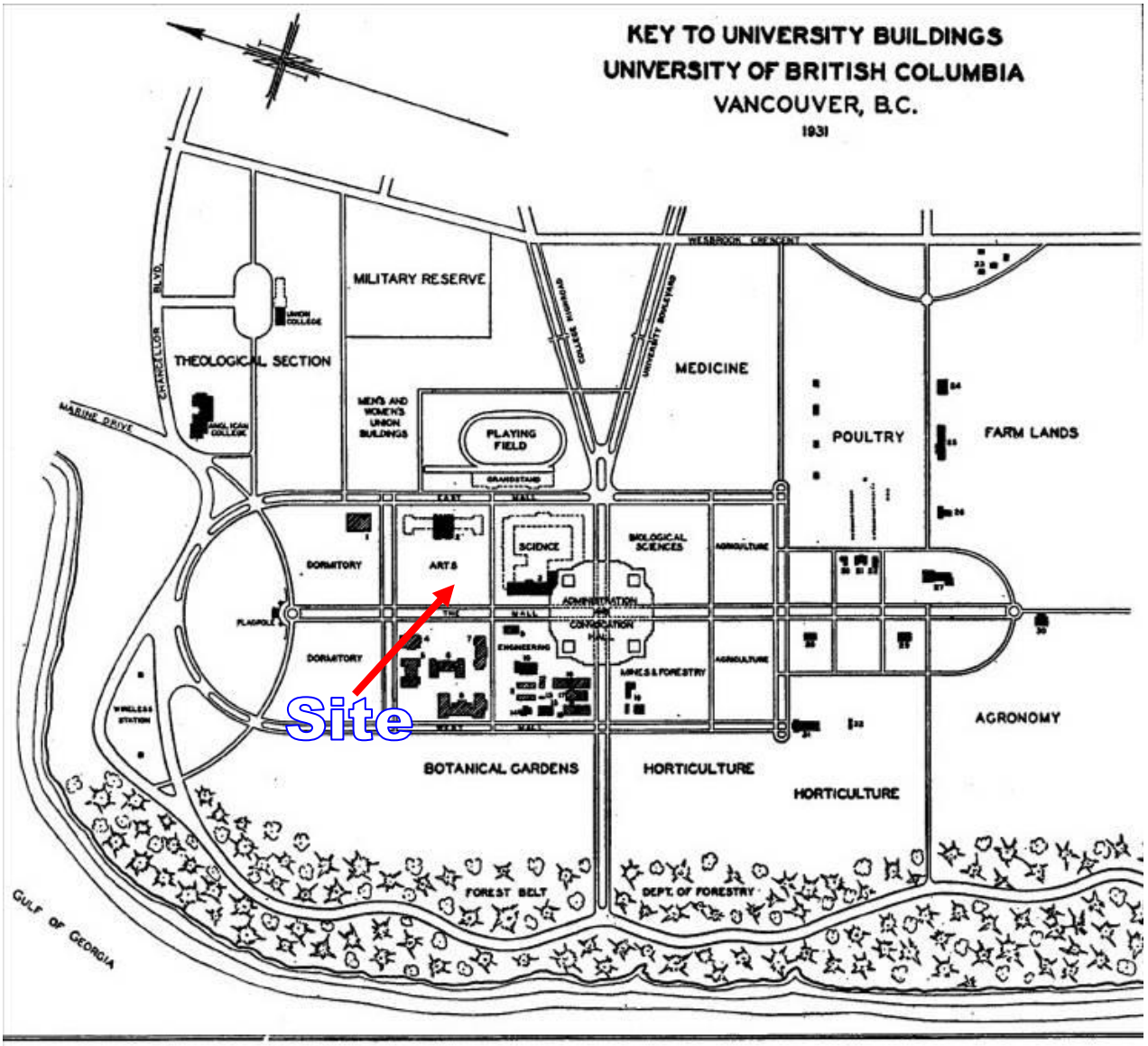
APPENDIX D

FIRE INSURANCE MAPS AND UBC CAMPUS MAPS

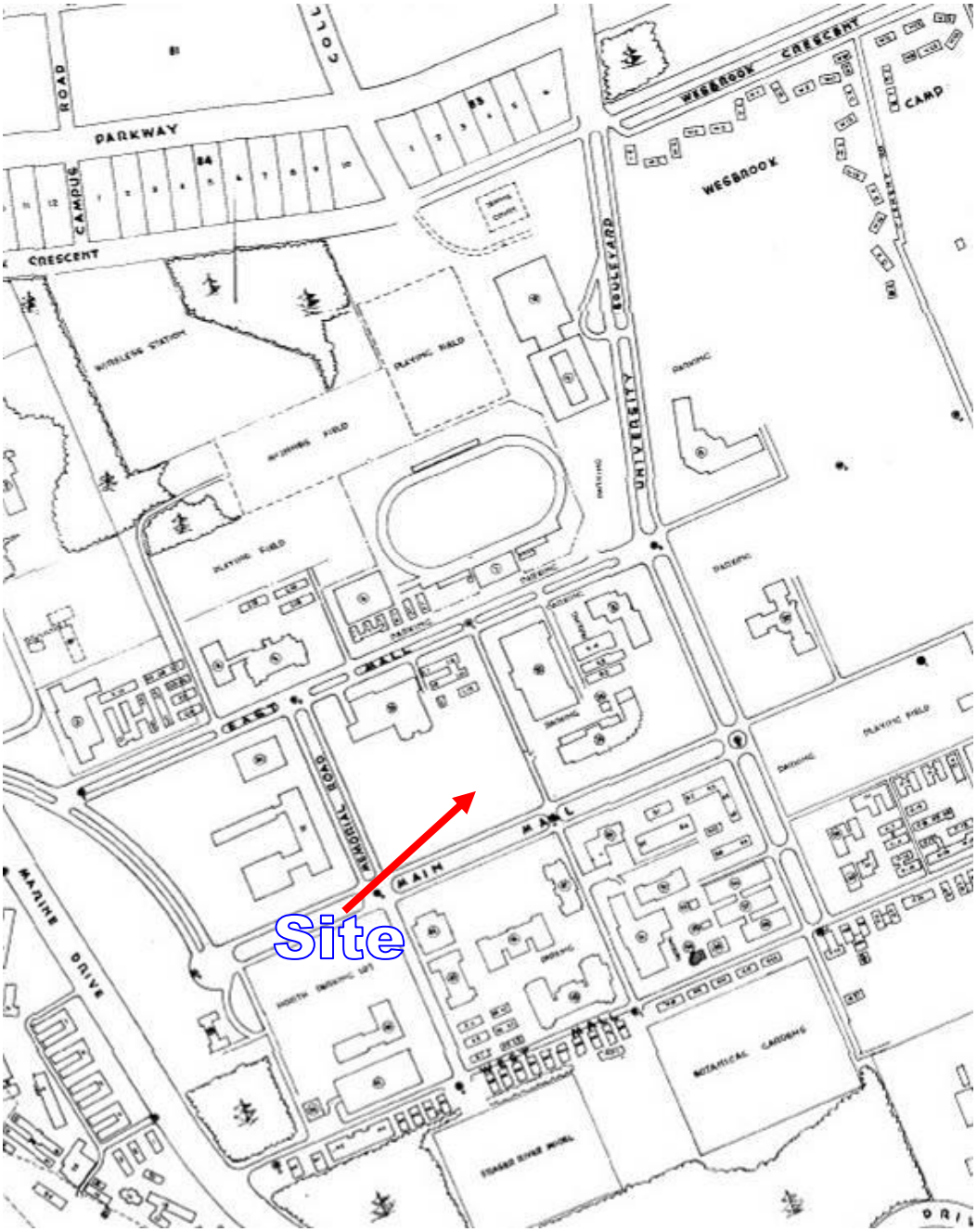
1925 UBC Campus Map



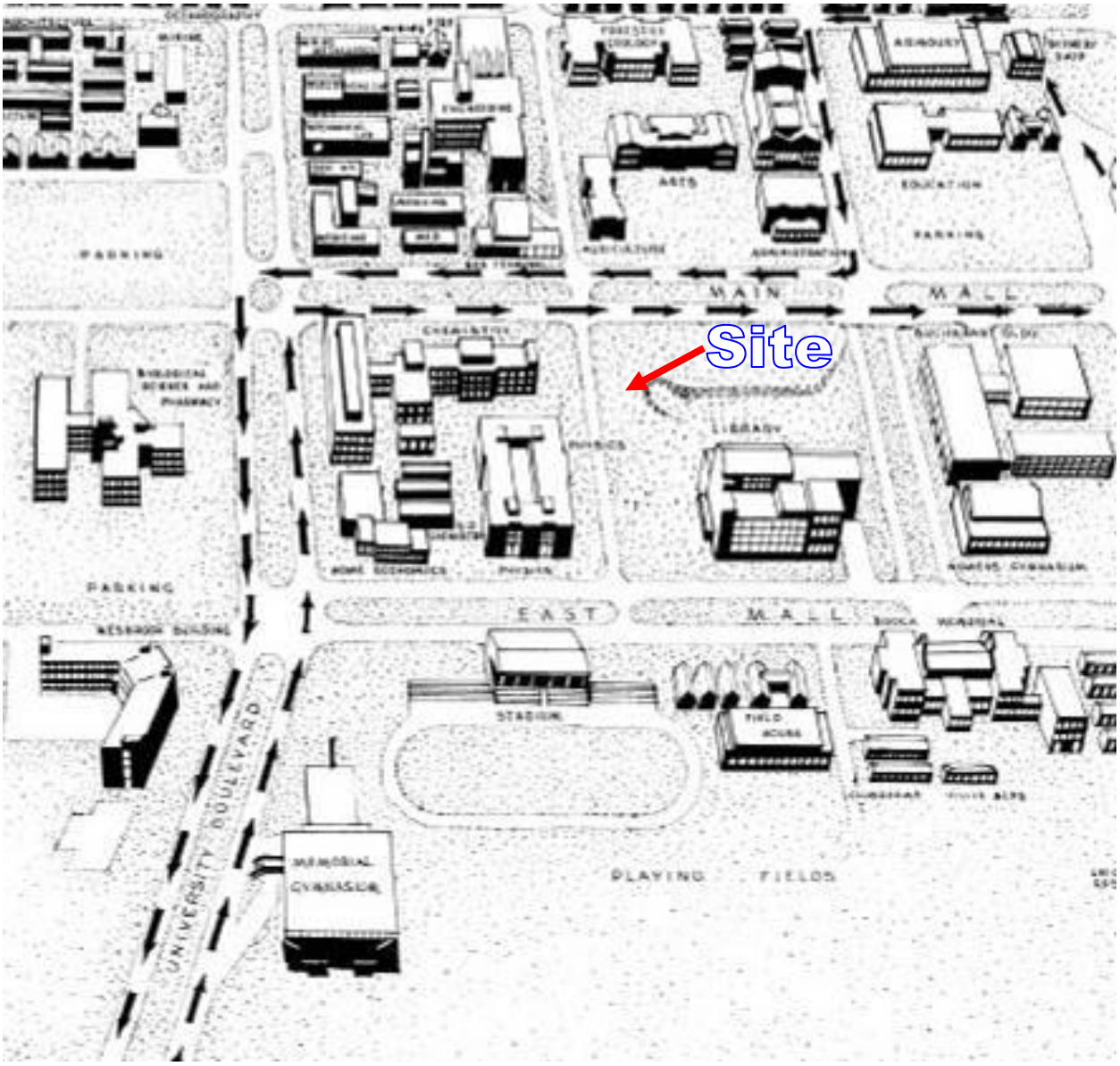
1931 UBC Campus Map



1950 UBC Campus Map



1958 UBC Campus Map



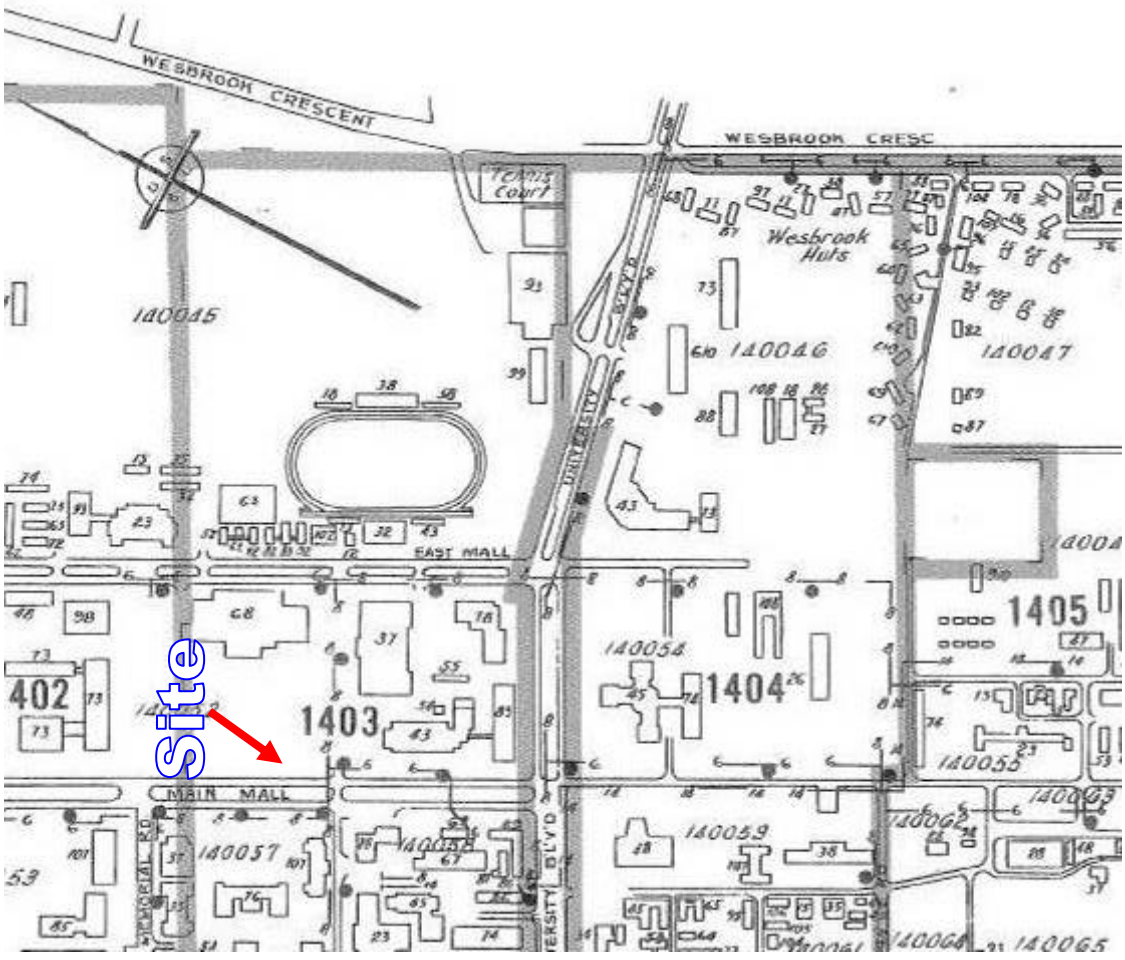
1962 Fire Insurance Map

— VANCOUVER, VOL 14 —
— JULY 1962 —

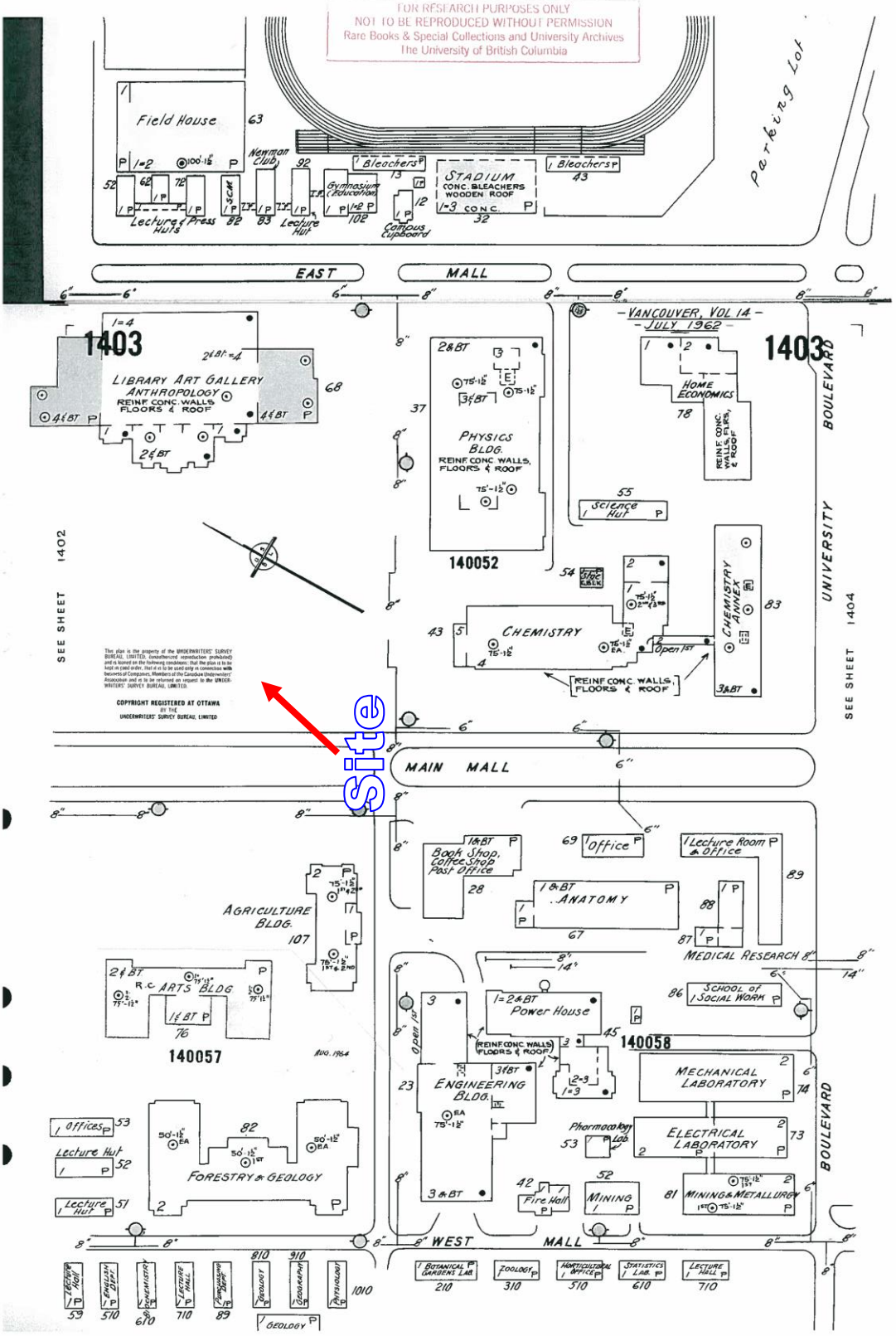
T REGISTERED AT OTTAWA
BY THE
ERS' SURVEY BUREAU, LIMITED

UNIVERSITY OF BRITISH COLUMBIA

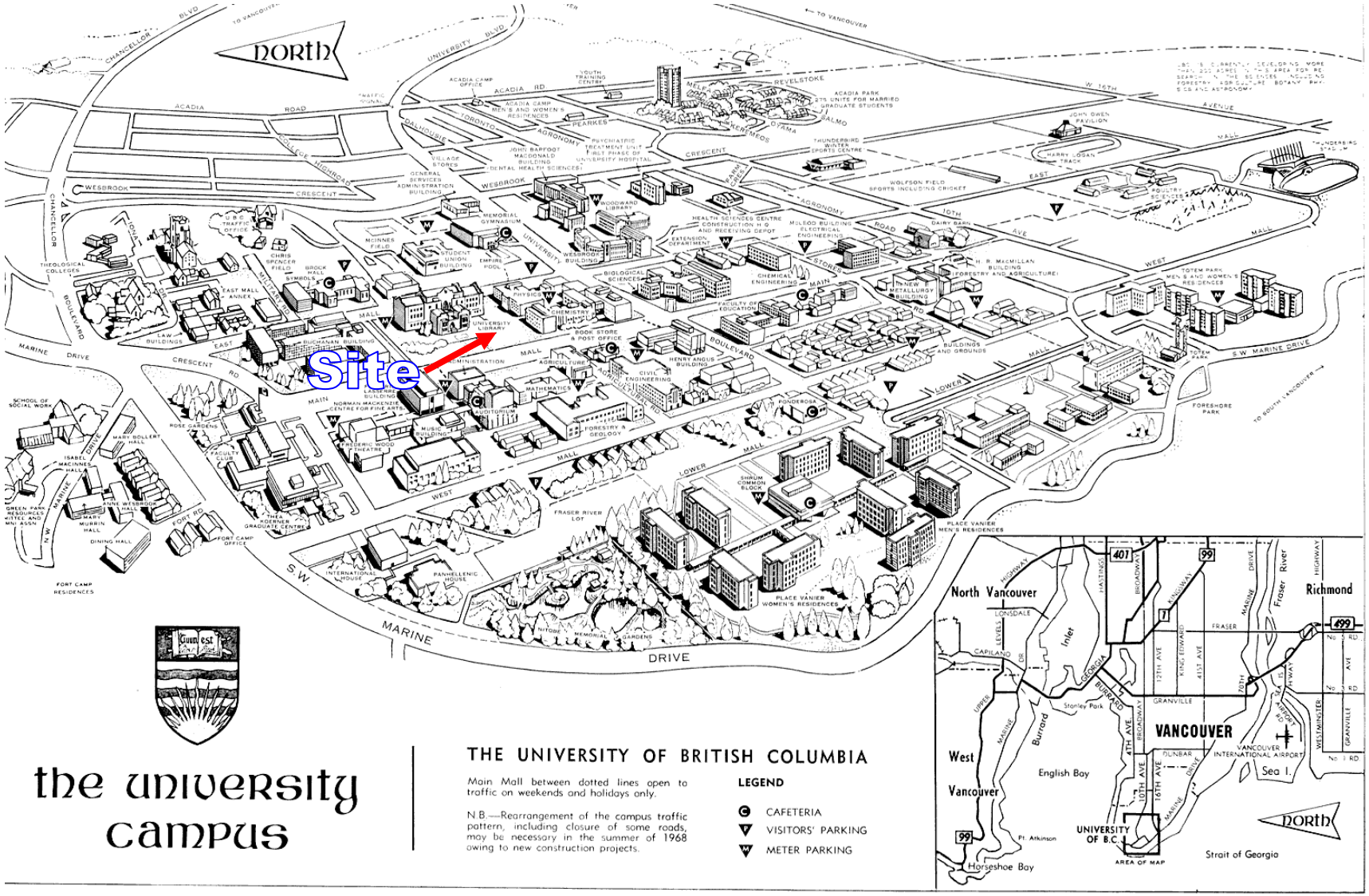
SCALE: 500 feet = 1 inch



1962 Fire Insurance Map



1968 UBC Campus Map



the university campus

APPENDIX E

SITE REGISTRY SEARCH

Area Nil Search

As of DEC 13, 2015, no records from Site Registry
fall within 0.5 kilometers of coordinates
Latitude 49 degrees, 16 minutes, 0.71 seconds, and
Longitude 123 degrees, 15 minutes, 14.3 seconds.

You have been charged for this information.

APPENDIX F

SITE PHOTOGRAPHS

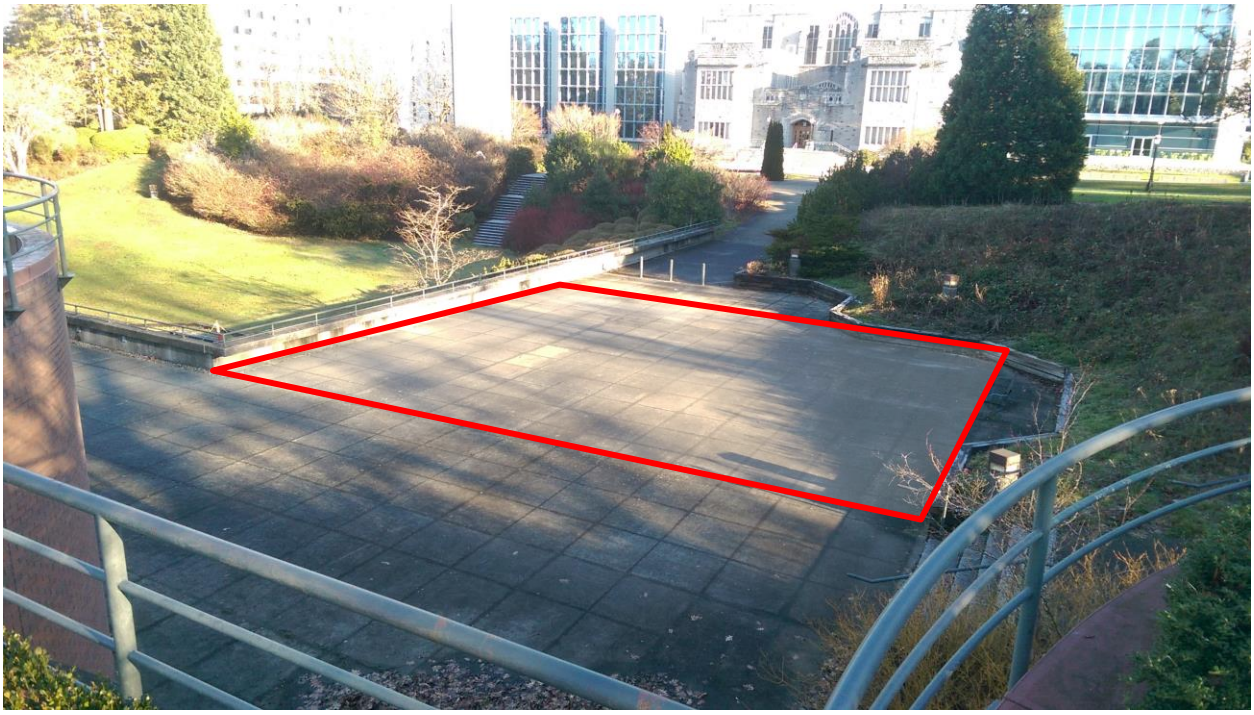


Photo 1: Upper portion of the Site viewed from the west.
Irving K. Barber Learning Centre visible further east of the Site.

Photo 2: Upper portion of the Site viewed from the east.
Walter C. Koerner Library visible adjacent west and below the Site.

Photo 3: Upper portion of the Site viewed from the south.
Majority of the adjacent areas are part of the library garden.

Photo 4: Areas south of the Site viewed at ground level.
More library garden areas with academic buildings further south.

Photo 5: Below portion of the Site. The area consists of several rooms of the Walter C. Koerner Library.

Photo 6: Inside view of the library room of the Site. The room appears to be used for storage purposes.

Photo 7: View of the below portion of the Site
and the adjacent sunken garden from the above level.

Photo 8: Below portion of the Site viewed from the north.

BRITISH COLUMBIA | Ministry of Environment

Site Profile
Schedule 1 Contaminated Sites Regulation

This form may be sent to the Ministry of Environment by paper mail, fax, or courier. It may also be scanned and e-mailed with the applicable attachments (such as maps) to siteprofiles@gov.bc.ca.

Mail, Fax or Courier:

Director of Waste Management
c/o Site Profile Administration
Ministry of Environment
#200 - 10470 - 152nd Street
Surrey BC V3R 0Y3

Fax: (604) 584-9751

For further information, please e-mail us at site@gov.bc.ca, or contact us by phone at (250) 387-4441.

Introduction

Under section 40 of the *Environmental Management Act*, a person who knows or reasonably should know that a site has been used or is used for industrial or commercial purposes or activities must in certain circumstances provide a site profile.

Schedule 2 of the Contaminated Sites Regulation sets out the types of industrial or commercial purposes or activities to which site profile requirements apply.

If section 40 of the Environmental Management Act applies to you and you know or reasonably should know that the site has been used or is used for one of the purposes or activities found in Schedule 2 of the Contaminated Sites Regulation, you may be required to complete the attached site profile.

Instructions

Persons preparing a site profile *must* complete Section I, II and III, answer all questions in sections IV through IX, and sign section XI. If the site profile is not satisfactorily completed, it will not be processed under the *Environmental Management Act* and the Contaminated Sites Regulation. Failure to complete the site profile satisfactorily may result in delays in approval of relevant applications and in the postponement of decisions respecting the property.

The person completing this site profile is responsible for the accuracy of the answers. Questions must be answered to the best of your knowledge.

Section 27 (1) of the *Freedom of Information and Protection of Privacy Act* requires that provision of personal information concerning an individual must be authorized by that individual. Persons completing the site profile on behalf of the site owner must be authorized by the site owner.

One (1) site profile may be completed for a site comprised of more than one titled or untitled parcel, but individual parcels must be identified.

The latitude and longitude (accurate to 0.5 of a second using North American Datum established in 1983) of the centre of the site must be provided. Also, please attach an accurate map, containing latitude, longitude and datum references, which shows the boundaries of the site in question. Please use the largest scale map available.

If the property is legally surveyed, titled and registered, then all PID numbers (Parcel Identifiers - Land Title Registry system) must be provided for *each* parcel as well as the appropriate legal description.

If the property is untitled Crown land (no PID number), then the appropriate PIN numbers (Parcel Identification Numbers - Crown Land registry system) for each parcel with the appropriate land description should be supplied.

If available, the Crown Land File Number for the site should also be supplied.

Anything submitted in relation to this site profile will become part of the public record and may be made available to the public through the Site Registry as established under the *Environmental Management Act.*

Under section 43 of the Environmental Management Act, corporate and personal information contained in the site profile may be made available to the public through the Site Registry. If you have questions concerning the collection of this information, contact the Site Registrar, at *site@gov.bc.ca*. For questions on site profiles, please send a message to *siteprofiles@gov.bc.ca*.

I. CONTACT IDENTIFICATION

A. Name of Site Owner

Last Name

First Name

Middle Initial(s)

(and/or, if applicable)

Company

UBC Properties Trust

Owner's Civic Address

200 - 3313 Shrum Lane

City

Vancouver

Province/State

BC

Country

Canada

Postal/Zip Code

V6S 0B9

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

Last Name

Lai

First Name

Tony

Middle Initial(s)

S. F.

(and/or, if applicable)

Company

ACM Environmental Corporation

C. Person to Contact Regarding the Site Profile:

Last Name

Lai

First Name

Tony

Middle Initial(s)

S. F.

(and/or, if applicable)

Company

ACM Environmental Corporation

Mailing Address

217 - 2323 Quebec Street

City

Vancouver

Province/State

BC

Country

Canada

Postal/Zip Code

V5T 4S7

Telephone (###) ###-####

(604) 873-8599

Fax (###) ###-####

(604) 873-5956

II. SITE IDENTIFICATION

Please attach a site map with your application

All Property

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

Latitude	Degrees	49	Minutes	16	Seconds	0.71
Longitude	Degrees	123	Minutes	15	Seconds	14.34

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

For Legally Titled, Registered Property

Site Address (if applicable)

City

Vancouver

Postal Code

PID numbers and associated legal descriptions.

PID	Legal Description	Add	Delete
015-891-909	District Lot 3044, Group 1, NWD Except	+	-
	Firstly; Part On Plan 6147	+	-
	Secondly: Part On Plan 9301	+	-
	Thirdly; Part On Plan BCP6556	+	-
	Fourthly: Part On Plan BCP23719	+	-

Total number of titled parcels represented by this site profile

1

For Untitled Crown Land

PIN numbers and associated Land Description (if applicable).

PIN	Land Description	Add	Delete
		+	-

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

(and, if available)

Crown Land File Numbers (comma separated)

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

Schedule 2 Reference	Description	Add	Delete
None	N/A	+	-

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?	☐	☑
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 been previously 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 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?	☐	☑
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 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?	☐	☑
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):

Completion of a Stage 1 Preliminary Site Investigation

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.

Signature

Tony Lai

Digitally signed by Tony Lai
DN: cn=Tony Lai, o=ACM Environmental Corporation, ou, email=tony@acmenvironmental.com, c=CA
Date: 2016.01.05 15:01:34 -08'00'

→ **OR:** ☑ By checking this box, I declare that the information contained in this form is complete and accurate information.

Date Signed (MMM/DD/YY)

Jan/05/16

OFFICIAL USE

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

- ☐ Soil removal
- ☐ Subdivision application
- ☐ Zoning application
- ☐ Development permit
- ☐ Variance permit
- ☐ Demolition permit

Local Government contact:

Name

Agency

Address

Telephone (###) ###-####

Fax (###) ###-####

E-mail

Date Received (YYYY-MM-DD)

Date Submitted to Site Registrar (YYYY-MM-DD)

Date forwarded to Director of Waste Management: (YYYY-MM-DD)

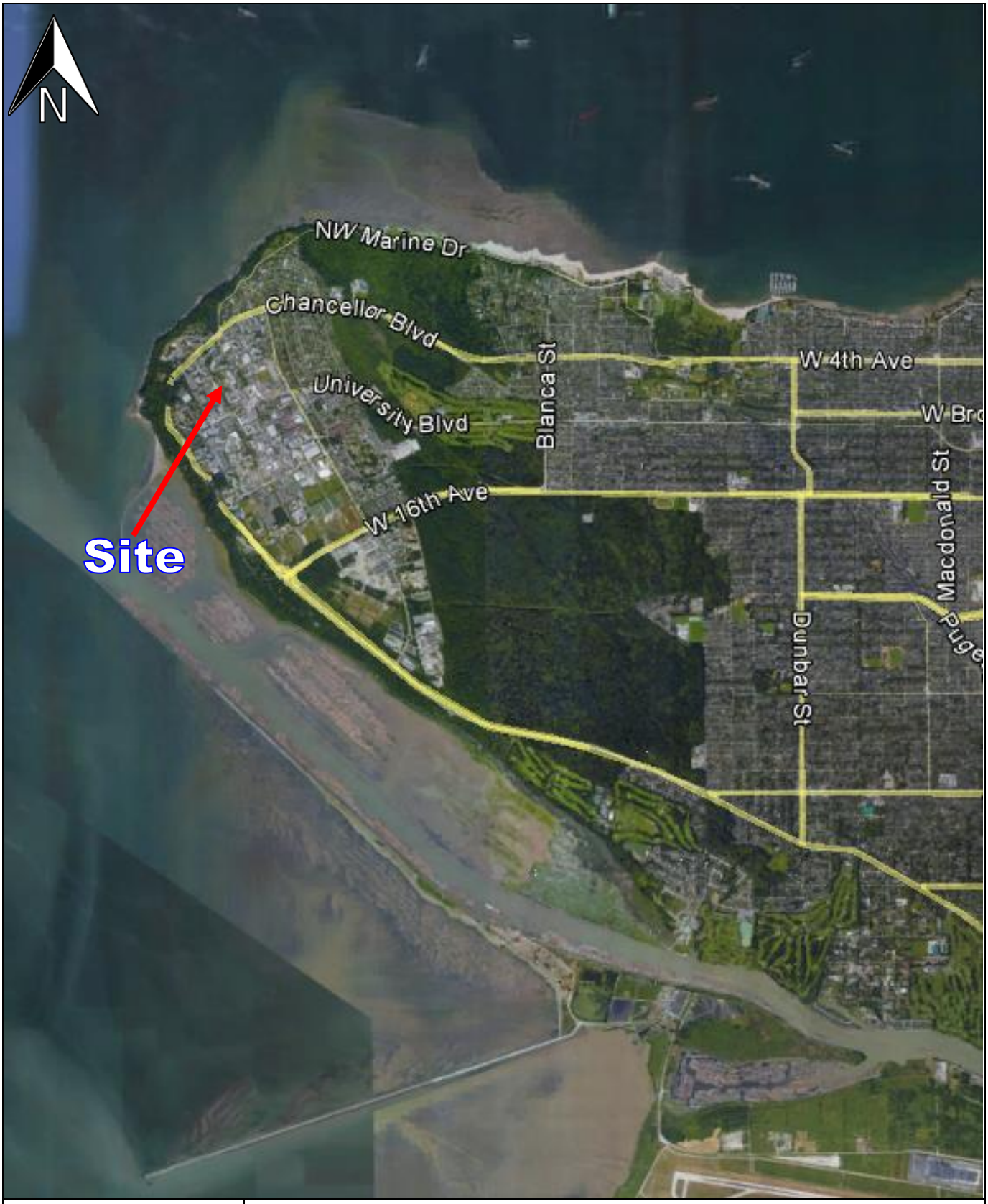


Figure 1: Site Location

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:50,000

0 1000 2000m

ACM Environmental Corporation

Figure 2: Site Plan

Client: UBC Properties Trust

Site Location:
IRSHDC Project
Vancouver, BC

Scale (approx.): 1:500

0 10 20m

Diamond Head Consulting Ltd.

November 23, 2015

UBC Properties Trust
200-3313 Shrum Lane
Vancouver, British Columbia

Re: UBC Library Gardens Tree Inventory, 1900 Main Mall

Diamond Head Consulting was engaged by UBC Properties Trust, to provide an inventory of the trees in the UBC Library Gardens. Eighty-four trees were assessed at the site on November 19, 2015.

Assignment

Provide a tree inventory and location plan for those trees located within the subject area (see attached map).

Limits of Assignment

- Our investigation is based solely on our visual inspection of the trees on November 18 & 19, 2015.
- This report does not provide any estimates to implement the proposed recommendations provided in this report.

Tree Inventory:

Tag	Common Name	Botanical Name	DBH (cm)	Height (m)	Overall Condition	Comments	RPZ (m)
2967	Red Oak	*Quercus rubra*	44	18	Normal	Planted in 10 m diameter concrete planter; open grown crown	2.6
2968	Red Maple	*Acer rubrum*	2	3	Poor	Previous dominant stem was cut and now has decay, New dominate stem has created poor stem formation	2.0
2969	Rhododendron sp.	*Rhododendron sp.*	18	7	Poor	Old pruning wounds with minor decay; growing on top of boulder retaining wall	2.0
2970	Portuguese Laurel	*Prunus lusitanica*	44	8	Poor	2 stems from base, lower stem pruned	2.6
2971	Camperdown Elm	*Ulmus 'Camperdownii'*	46	12	Poor	Bacterial growth on limbs, highly unusual crown pattern.	2.8
2972	Portuguese Laurel	*Prunus lusitanica*	120	12	Poor	Multiple stems from base; 6 stems with an average dbh 20cm; moderate rot in pruning wounds	7.2
2974	Azalea sp.	*Azalea sp.*	54	4	Poor	Multiple stems from base; pruning wounds with minor rot	3.2
2975	European Beech	*Fagus sylvatica*	16	7	Very poor	Possible Dawyck cultivar; Possible defect root graft causing narrow root collar	2.0
2976	Rhododendron sp.	*Rhododendron sp.*	18	3	Poor	Blight in some leaves and flower	2.0
2977	Maidenhair Tree	*Ginkgo - G.biloba*	9	5	Normal	Sapling, kink in stem otherwise no visible defects	2.0
2978	Japanese Maple	*Acer palmatum*	38	12	Dead/dying	3 stems at union, 1 dead, another limb dying; major rot in base	2.3
2979	Portuguese Laurel	*Prunus lusitanica*	280 Multi Stems	10	Poor	Multiple stems from base ,14 stems with an average dbh 20 cm; 1 dead/dying limb and pruning wounds with moderate rot	16.8

Tag	Common Name	Botanical Name	DBH (cm)	Height (m)	Overall Condition	Comments	RPZ (m)
2980	Portuguese Laurel	*Prunus lusitanica*	176 Multi Stems	10	Very poor	Multiple stems sharing root system; 8 stems with an average dbh 22 cm; dying limbs with major decay	10.6
2981	Red Oak	*Quercus rubra*	22	12	Poor	Planted in 10m diameter concrete planter; top 3 m of stem is bent	2.0
2983	Rhododendron sp.	*Rhododendron sp.*	20	3	Poor	Multiple stems from base; Appears to have Bacterial blight infection.	2.0
2984	Pacific Yew	*Taxus brevifolia*	34	15	Poor	Growing on tops of rocks.	2.0
2986	Siberian Spruce	*Picea omorica*	20	9	Poor	Sweep in stem, unusual stem form due to sweep and single stem growing out opposite of stem lean; in shrub bed	2.0
2987	Red Alder	*Alnus rubra*	20	5	Poor	3 stems growing from base, growing in mugo pine bush	2.0
2988	Giant Redwood	*Sequoia giganteum*	82	25	Normal	Slightly asymmetrical lower crown due phototropic growth and neighboring trees; planted on edge of slope. Has one exposed (surface) structural root.	4.9
2989	Cherry	*Prunus sp.*	59	10	Very poor	Stem grafted at 2 m with stems spreading outward in to wide and flat crown. Major rot in one of the limbs likely caused by pruning olds. Stem covered in ivy. Growing in shrub bed.	3.5
2990	Red Oak	*Quercus rubra*	16	18	Normal	Wide open grown crown; planted in 10m diameter concrete planter box.	2.0
2991	English Oak	*Quercus robur*	44	18	Normal	Single straight dominant stem; open grown, minor pruning wounds	2.6
2992	Red Oak	*Quercus rubra*	117	20	Poor	Large crown with 8 major limbs; cracks in bark some with minor rot; old pruning wounds	7.0
2993	Holly	*Ilex aquifolium*	20	8	Normal	Group of holly with dbh between 25-8cm; covers 5x5 m triangle by stairs	2.0

Tag	Common Name	Botanical Name	DBH (cm)	Height (m)	Overall Condition	Comments	RPZ (m)
2994	Japanese Maple	*Acer palmatum*	97	5	Poor	Multiple stems from base, 12 stems with an average 9cm dbh with inclusion scaring around base; several wounds; previous pruning and some deadwood	5.8
2995	Juniper	*Juniperus scopulorum*	18	7	Poor	Sweep in stem from suppression and phototropic growth; in dense scrub bed	2.0
2996	Juniper	*Juniperus scopulorum*	16	7	Poor	Sweep in stem from suppression and phototropic growth; in dense scrub bed	2.0
2997	Thread Leaf Cypress	*Chamaecyparis pisifera 'Filifera'*	42	8	Poor	Suppressed causing poor stem form, in edge of shrub bed.	2.5
5755	Weeping Willow	*Salix babylonica*	22	87	Poor	30cm pruning wound with major rot; stems twisted in crown.	2.0
5756	Norway Maple	*Acer platanoides*	50	16	Poor	Asymmetrical crown due to neighboring tree; bacteria canker at base and on stem.	3.0
5757	Norway Maple	*Acer platanoides*	48	16	Poor	Poor stem from; long narrow crown due to neighboring trees on opposite sides.	2.9
5758	Norway Maple	*Acer platanoides*	42	16	Poor	Several codominant stems with minor deadwood in crown.	2.5
5761	Western Redcedar	*Thuja plicata*	105	29	Normal	Open grown form; 1 m from concrete pool; large rocks near base.	6.3
5763	Japanese Maple	*Acer palmatum*	123	10	Poor	There are several historic pruning wounds, with one possible bacterial canker growth; 7 stems join at the base; wide open crown.	7.4
5764	Weeping Willow	*Salix babylonica*	88	20	Very poor	Numerous pruning wounds with moderate to major decay; bacteria growth, thin crown; Located in scrub bed part of an elevated rock garden	5.3
5765	Lawson Cypress	*Chamaecyparis lawsoniana*	13	6	Poor	Sweep in stem due to suppression and phototropic growth; in shrub bed	2.0

Tag	Common Name	Botanical Name	DBH (cm)	Height (m)	Overall Condition	Comments	RPZ (m)
5765	Thread Leaf Cypress	*Chamaecyparis pisifera 'Filifera'*	101	15	Poor	Multiple stems from base with connected roots system and forked tops. Asymmetrical crown due to neighboring tree. Some evidence of pruning.	6.1
5766	Japanese Maple	*Acer palmatum*	160	16	Poor	Multiple stems from base, numerous inclusion scars; crack around tag with minor rot; on garden mound with numerous boulders. Apply a 6m root protection zone.	6.0
5769	Lawson Cypress	*Chamaecyparis lawsoniana*	106	25	Poor	2 stems from base, 6 codominant stems past dbh with long inclusion scars; growing in shrub bed	6.4
5770	Thread Leaf Cypress	*Chamaecyparis pisifera 'Filifera'*	240	9	Poor	12 stem grouping with an average dbh of 20cm; pruning scars, shrub bed, poor stems do to competition from dense spacing. Apply a 6m root protection zone.	6.0
5808	Lawson Cypress	*Chamaecyparis lawsoniana*	71	23	Poor	Multiple stems from dbh with large inclusion scars; several weeping wounds from possible space in stem inclusion; in shrub bed, cables in stem for neighboring tree	4.3
5809	Judas Tree	*Cercis siliquastrum*	52	7	Dead/dying	Severe lean, held up with cable to prevent failure; bacteria growths on stem	3.1
5810	Lawson Cypress	*Chamaecyparis lawsoniana*	69	23	Poor	Multiple stems from dbh with large inclusion scars; several weeping wounds from possible space in stem inclusion; growing in shrub bed	4.1
5811	Chinese Fir	*Cunninghamia lanceolata*	108	22	Poor	2 stems from base with large inclusion scar and smaller previous cut stem in centre of inclusion; 2 asymmetrical crowns	6.5
5813	Tartan Maple	*Acer Tartarian*	120	11	Poor	Multiple stems from base with inclusion scars; Old pruning wounds, DBH estimate due to data collection error	7.2
5814	Tartan Maple	*Acer Tartarian*	52	10	Very poor	Only retain with tree 5813; old pruning wound with moderate rot; multiple stems from base with severe inclusion scar and phototropic lean	3.1

Tag	Common Name	Botanical Name	DBH (cm)	Height (m)	Overall Condition	Comments	RPZ (m)
5819	Japanese Maple	*Acer palmatum*	120	12	Poor	Multiple stems from base, 6 stems with an average dbh of 20cm, with minor rot and 1 dying limb, inclusion scars at base; Growing around boulders	6.0
5820	Chinese Fir	*Cunninghamia lanceolata*	150	25	Poor	3 stems from base 54/49/47; crown has some dead branches, surrounded by benches near gravel path	9.0
5822	Eastern White Cedar	*Thuja occidentalis*	129	16	Very poor	5 stems from base, with major lean; 2 stems cabled, one of the cables on the stem with the worst lean is broken and may be unsafe	7.7
5823	Umbrella Pine	*Pinus pinea*	41	16	Poor	2 stems from base; dominant stem topped at 12m with replacement with J shaped stem; inclusion scar at base, suppressed	2.5
5824	Laburnum	*Laburnum anagyroides*	68	19	Poor	Previously pruned for larger crown at dbh; some pruning wounds, lean in base	4.1
5825	Laburnum	*Laburnum anagyroides*	58	8	Very poor	Butt rot, severe lean possibly phototropic; major rot at union with old pruning wounds	3.5
5838	Western Redcedar	*Thuja plicata*	109	25	Normal	Base beginning to grow over back of wooden bench, it is suggested that the bench should be moved; lower asymmetrical crown due to tree growing in to crown	6.5
5839	Plumise Sawara Cypress	*Chamaecyparis pisifera 'Plumose'*	46	17	Poor	Phototropic lean, previously topped 3 limbs in candelabra like crown; asymmetrical crown due to neighboring tree; next to asphalt walkway and benches	2.8
5843	Cherry	*Prunus sp.*	62	10	Very poor	2 stems from base spreading out in opposite directions; headed top; major rot in pruning wounds	3.7
5848	Cherry	*Prunus sp.*	74	10	Very poor	Grafted limbs; old wound under tag with major rot; Holly trees growing through 60 % of crown	4.4
5849	Japanese Maple	*Acer palmatum*	40	5	Poor	Multiple stems from base; in shrub bed, some pruning; old wound with no bark.	2.4
5851	European Hornbeam	*Carpinus betulus*	54	18	Poor	Numerous stems in crown with inclusions scar, Wide decurrent crown; Growing in scrub bed	3.2

Tag	Common Name	Botanical Name	DBH (cm)	Height (m)	Overall Condition	Comments	RPZ (m)
5875	Red Oak	*Quercus rubra*	47	15	Normal	Moderate pruning wounds; decurrent open crown; planted in 10m diameter concrete planter	2.8
5879	Japanese Maple	*Acer palmatum*	15	8	Poor	Phototropic lean due to suppression in stand; growing in tall shrub bed	2.0
5880	Pacific Dogwood	*Cornus nuttallii*	0	25	Dead/dying	Several dead/dying limbs with major rot, centre of crown removed creating hole	2.0
5892	Red Oak	*Quercus rubra*	97	24	Poor	Open grown wide crown; large inclusion scars, fern growing in union	5.8
5893	Red Oak	*Quercus rubra*	96	24	Poor	7 major limbs with large inclusion scars, 1 limb partially dead; vertical irregularities in bark, possible bacteria	5.8
5978	Ponderosa Pine	*Pinus ponderosa*	43	18	Poor	Forked top; asymmetrical crown due to Portuguese laurel; roots under compacted soil walkway	2.6
9592	Japanese Maple	*Acer palmatum*	20	4	Poor	Multiple stems from base; planted on slope of mound for hidden door; old pruning wounds, inclusion scars and healed over vertical scars.	2.0
9593	Japanese Maple	*Acer palmatum*	40	5	Poor	Multiple stems from base; planted on slope of mound for hidden door; old pruning wounds, inclusion scars and healed over vertical scars.	2.4
9594	Japanese Maple	*Acer palmatum*	50	5	Very poor	Multiple stems from base; numerous pruning scars with major rot and flaking bark	3.0
9595	Japanese Maple	*Acer palmatum*	70	4	Poor	Multiple stems from base; some deadwood; in shrub bed	4.2
9596	Japanese Maple	*Acer palmatum*	30	4	Poor	Multiple stems from base; in planter box with mugo pine bush; poor stem form; large wound from broken stem with moderate rot	2.0
9597	Japanese Maple	*Acer palmatum*	30	4	Poor	In planter box with mugo pine bush; poor stem form	2.0

Tag	Common Name	Botanical Name	DBH (cm)	Height (m)	Overall Condition	Comments	RPZ (m)
9598	Japanese Maple	*Acer palmatum*	40	4	Poor	Multiple stems from base; in planter box with mugo pine bush; stunted poor stem form	2.4
9599	Giant Redwood	*Sequoia giganteum*	64	20	Normal	Near slope edge/drop off, growing next to shrub garden; full crown open grown with some lower asymmetrical phototropic growth.	3.8
9601	Japanese Maple	*Acer palmatum*	10	7	Poor	Suppressed in stand, growing around boulders	2.0
9602	Japanese Maple	*Acer palmatum*	18	7	Poor	Suppressed in stand, growing around boulders; 2 stems at dbh	2.0
9603	Lawson Cypress	*Chamaecyparis lawsoniana*	40	7	Poor	Multiple stems from base; growing around boulders and next to rocky pool; pruning scars	2.4
9604	Lawson Cypress	*Chamaecyparis lawsoniana*	13	7	Poor	Growing around boulders causing a twist at the base; topped stem	2.0
9605	Japanese Maple	*Acer palmatum*	10	7	Poor	Suppressed in stand, growing around boulders	2.0
9606	Thread Leaf Cypress	*Chamaecyparis pisifera 'Filifera'*	40	7	Poor	Multiple stems from dbh growing around boulders and next to rocky pool; pruning scars	2.4
9607	Thread Leaf Cypress	*Chamaecyparis pisifera 'Filifera'*	52	7	Poor	Multiple stems from base; growing around boulders and next to rocky pool; pruning scars	3.1
9608	Thread Leaf Cypress	*Chamaecyparis pisifera 'Filifera'*	51	7	Poor	Multiple stems from base, one stem topped at 4m; growing around boulders and next to rocky pool; pruning scars	3.1
9609	Thread Leaf Cypress	*Chamaecyparis pisifera 'Filifera'*	15	7	Poor	2 stems sharing root system; growing around boulders and next to rocky pool; pruning scars	2.0
9611	Lawson Cypress	*Chamaecyparis lawsoniana*	26	7	Poor	2 stems sharing root system; growing around boulders and next to rocky pool; pruning scars	2.0

Tag	Common Name	Botanical Name	DBH (cm)	Height (m)	Overall Condition	Comments	RPZ (m)
9612	Japanese Maple	*Acer palmatum*	12	2	Poor	Young and suppressed under mature western red cedar; the base of the tree has grown near boulders	2.0
9613	Plumose Sawara Cypress	*Chamaecyparis pisifera 'Plumose'*	10	8	Poor	Sweep in butt; phototropic lean and an asymmetrical crown due suppression	2.0

LEGEND

- TREE TO BE RETAINED
- TREE TO BE REMOVED
- UNSURVEYED TREE
- ROOT PROTECTION ZONE
- ROOT PROTECTION FENCING

DATE

November, 2015

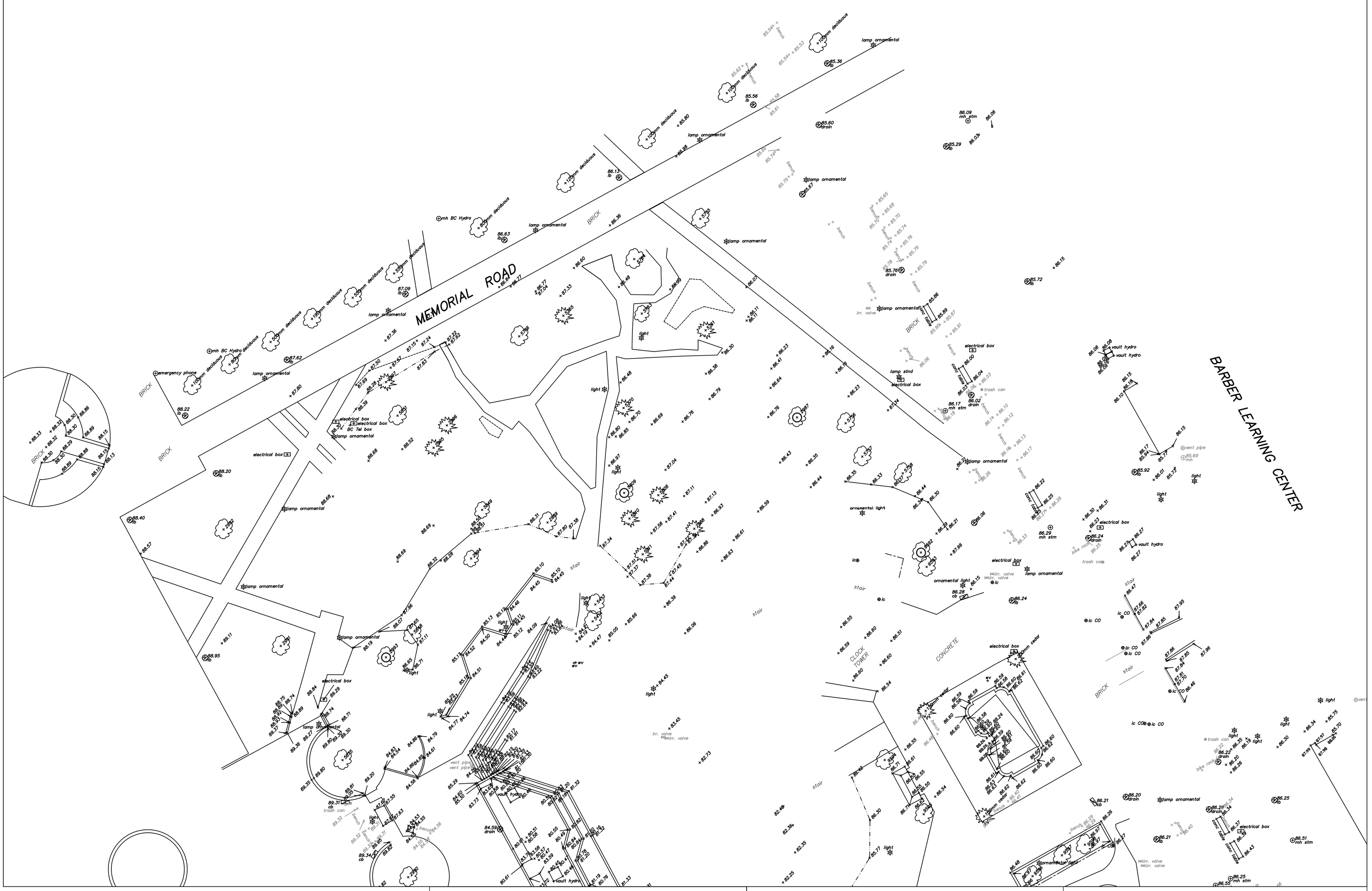
CLIENT

UBC Properties Trust

DIAMOND HEAD CONSULTING LTD.
3551 Commercial Street
Vancouver, B.C. V5N 4E8

TITLE

TREE INVENTORY PLAN
UBC library Gardens Tree Assessment, 1900 Main Mall



LEGEND

TREE WITH TAG #

DATE

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3551 Commercial Street
Vancouver, B.C. V5N 4E8

TITLE

TREE INVENTORY PLAN
UBC library Gardens Tree Assessment, 1900 Main Mall

MAIN MALL

AGRICULTURAL ROAD

LEGEND

TREE WITH TAG #

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