GEOPACIFIC
VANCOUVER KAMLOOPS CALGARY

P (604) 439 0922
F (604) 439 9189
www.geopacific.ca
#215-1200 West 73rd Ave.
Vancouver, B.C. Canada V6P 6G5

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

June 10, 2016
File: 13966

Attention: Cecile Ouillet

Re: Geotechnical Investigation Report: Proposed Outdoor Tennis & Basketball Courts
Totem Park Infill Student Residency, Lower Mall & Thunderbird Boulevard, UBC

1.0 INTRODUCTION

It is intended to construct two new outdoor tennis courts and a basketball court as part of the Totem Park Infill project. We have referenced the preliminary concept plan drawings prepared by Richard Findlay Landscape Architect Inc. dated March 2016, in preparation of this report.

GeoPacific carried out an investigation of the soil and groundwater conditions within the area of the proposed improvements. This report presents the findings of our investigation and makes geotechnical recommendations for design and construction.

2.0 SITE DESCRIPTION AND INVESTIGATION

The proposed development is currently undeveloped and covered with vegetation and large trees. The site is rectangular in shape and essentially flat. A small strip along the west side of the proposed courts was cleared to allow us to carry our investigation. Existing site grade is estimated to be at elevation 80.3 m.

GeoPacific conducted a geotechnical investigation for the project on May 25, 2016. Two test pits were advanced to depths of up to 1 m below existing site grades. The area available for investigation was limited due to the presence of the vegetation. The soil conditions were logged by a technologist from our office and backfilled. The test pit locations are shown on our Drawing No. 13966-1, included with this report.

3.0 SUBSURFACE CONDITIONS

3.1 Soil Conditions

The general geology of the region is described on the Geological Survey of Canada map 1484A as Vachon glacial drift overlying Quadra fluvial deposits. The glacial drift is described 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 deposits are described as channel fill and floodplain deposits; crossbedded sand with minor silt and gravel lenses.

A general description of the soils encountered at our test pit locations is provided below.

TOPSOIL

Sandy Topsoil of 0.5 and 0.8 m thick was encountered at the two test pits.

SAND to SILTY SAND (Glacial Till)

Glacial till underlies the topsoil. The glacial till consists of sand with trace to some silt and trace to some fine gravel and is dense.

The detailed test pit logs are included in Appendix A.

3.2 Groundwater Conditions

The groundwater table was not encountered during our investigation and is expected to be well below the proposed development. However, perched groundwater should be expected overlaying the dense glacial till in the more permeable sand or topsoil.

4.0 DISCUSSION

We understand that it is proposed to construct outdoor tennis and basketball courts as part of the Totem Park Infill Student Residency project. The proposed development will be constructed along the southeast corner of the intersection of Thunderbird Boulevard and the proposed Lower Mall.

The proposed courts are to be near road grades with elevations varying from 80.6 m to 79.25 m. We understand that the courts are to be surfaced with asphalt. Associated improvements consist of concrete curbs, sidewalks, turf and other landscape features.

5.0 RECOMMENDATIONS

5.1 Site Stripping and Filling

Prior to placement of fill required to meet the court elevations all topsoil, trees, roots, unsuitable fill or otherwise disturbed materials should be removed to expose a subgrade of dense glacial till. Any disturbed or softened fill materials will require removal.

Stripping should extend beyond the outer edge of the proposed courts field a distance equal to the total thickness of fill required including all engineered subgrade fill, sub-base and base materials. For example, if 1 m of fill is to be placed beneath the final grade, then stripping should extend a minimum distance of 1 m beyond the outer edge of the field.

Where grade reinstatement is required to meet the underside of the recommended road structure, engineered fill should be used. In the context of this report "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.

5.2 Pavement Structure- Tennis & Basketball Courts

The minimum recommended pavement structure for the courts area is shown in Table 1.

Table 1:

Recommended Minimum Pavement Structure for the Courts at Totem Infill Park Project, UBC	
Material	**Thickness (mm)**
Asphalt Pavement	60
19 mm CGB (Crushed Granular Base Course)	100
75 mm minus SGSB (Select Granular Sub-base)	200

All base and sub-base materials should be compacted to a minimum of 95% Modified Proctor maximum dry density (ASTM D1557) while at a moisture content within 2% of optimum for compaction.

6.0 DESIGN REVIEWS AND CONSTRUCTION INSPECTIONS

The preceding sections make recommendations for the design and construction of the new courts. It is the responsibility of the contractors carrying out the work to contact GeoPacific at least 24 hours in advance of construction to arrange for field reviews. Reviewed should be completed for the following construction activities.

1. Stripping - Review stripped subgrade
2. Materials - Review of materials for backfill under the courts
3. Compaction - Review compaction of backfill under the courts

7.0 CLOSURE

This report has been prepared exclusively for UBC Properties Trust, and for the use of others within their design and construction team, for the purpose of providing geotechnical recommendations for the project. This report remains the property of GeoPacific Consultants Ltd. and unauthorized use or duplication of this report is prohibited.

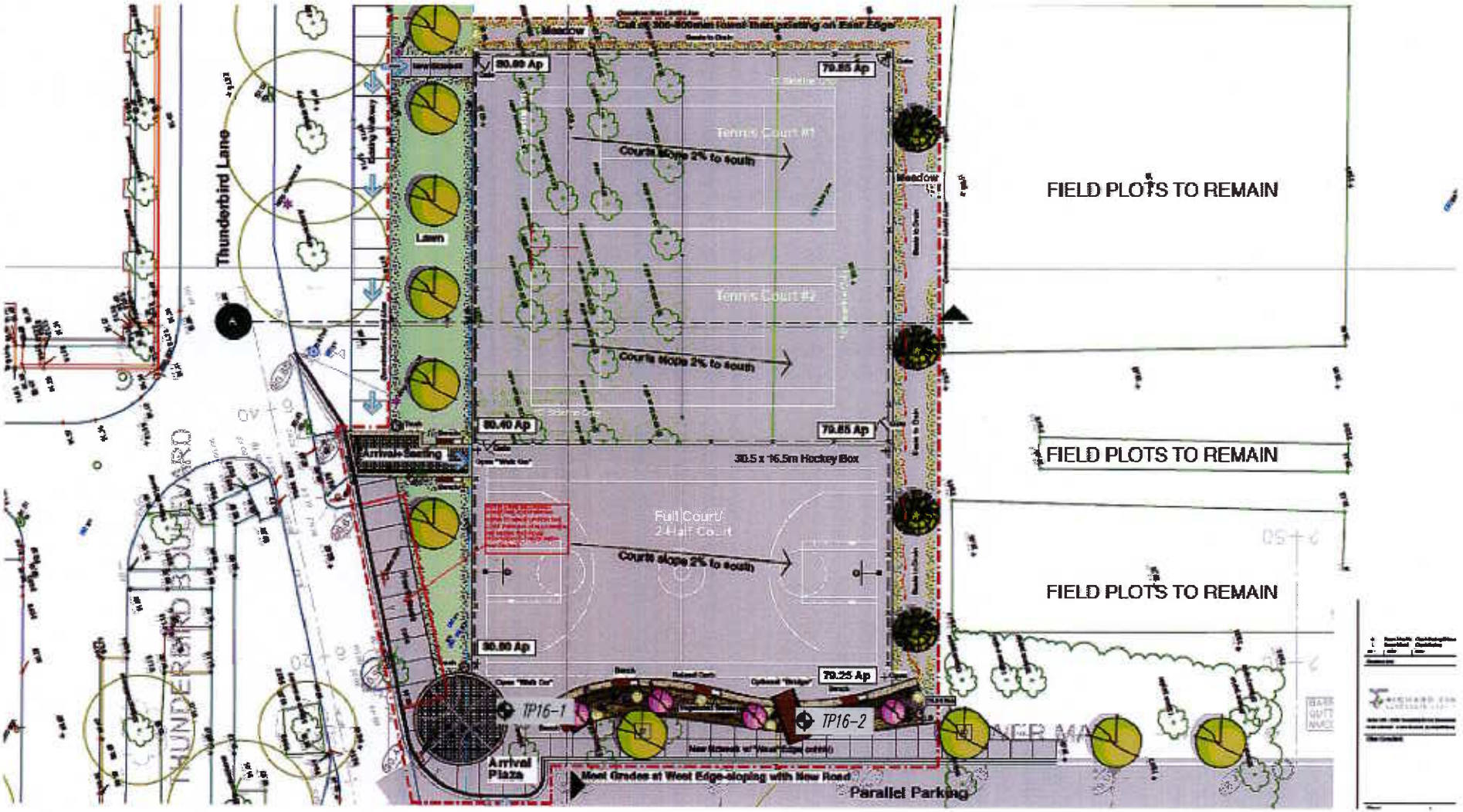
If you would like further details or clarification please contact the undersigned.

For:
GeoPacific Consultants Ltd.

Reviewed by:

Arye Lipshitz
Geotechnical Technician

Keith Robinson, M. Eng. P.Eng.
Senior Geotechnical Engineer



LEGEND:

TP16# – TEST PIT (TP) LOCATIONS

SITE PLAN

SCALE = NTS

REFERENCE:

GEOPACIFIC
VANCOUVER KAMLOOPS CALGARY

DATE: May 25, 2016

DRAWN BY:	APPROVED BY:	REVIEWED BY:
AL	SMF	

SCALE: SEE ABOVE

Totem Park Infill–Tennis & Basketball Courts

Lower Mall & Thunder Blvd, UBC

TEST PIT LOCATIONS

FILE NO.: 13966

DWG. NO.: 01

REVISIONS:

Test Pit Log: TP16-1

File: 13966
Project: Totem Park Infill - Proposed Tennis Courts & Parking
Client: UBC Properties Trust
Site Location: Lower Mall & Thunderbird Boulevard, UBC

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

Depth (ft / m)	Symbol	SOIL DESCRIPTION	Depth/Elev (m)	Moisture Content (%)	Groundwater	Remarks
0 / 0		Ground Surface				
		Topsoil Loose, sand, trace fine gravel, dark brown, moist	0.0			
2 / 1		***Sand (Till)*** Dense, some silt, trace to some fine gravel, golden-brown, moist	0.8			
3 / 1		End of Test Pit	1.0			
4 /						
5 /						
6 / 2						
7 /						
8 /						
9 / 3						

Logged: A.L.
Method: Excavator
Date: May 25, 2016

Datum: Ground surface
Figure Number: A.1.
Page: 1 of 1

Test Pit Log: TP16-2

File: 13966
Project: Totem Park Infill - Proposed Tennis Courts & Parking
Client: UBC Properties Trust
Site Location: Lower Mall & Thunderbird Boulevard, UBC

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

Depth (ft / m)	Symbol	SOIL DESCRIPTION	Depth/Elev (m)	Moisture Content (%)	Groundwater	Remarks
0 / 0		Ground Surface				
		Topsoil Loose, sand, trace fine gravel, dark brown, moist	0.0			
1 /		***Sand (Till)*** Dense, some silt, trace to some fine gravel, golden-brown, moist	0.5			
2 /		End of Test Pit	0.7			
3 / 1						
4 /						
5 /						
6 / 2						
7 /						
8 /						
9 / 3						

Logged: A.L.
Method: Excavator
Date: May 25, 2016

Datum: Ground surface
Figure Number: A.2.
Page: 1 of 1

Tree removal questions for communications

Update July 2016

Species in English	Red Alder
Species in Latin	Alnus Rubra
Number of trees being removed	Approx. 80
Reason for removal	For the construction of a sport court facility.
Condition of tree (dead, dying, sick, etc.)	Normal/Poor
Does the tree have any historical or research value to the university?	The trees were likely planted for research, however the research conducted has been completed and many of the trees are beginning to fall apart.
Exact location of the tree (please include a map with a point indicating tree location)	See attached
Surrounding buildings or landmarks (please include anything roughly within 30 meters)	Totem Park Residences
Will there be a replacement tree?	There will be some new vegetation in the surrounding area.
Replacement species in English	Not yet finalized.
When will the tree be replaced? (day, month, season, etc.)	Not yet finalized.
Will there be any traffic or pedestrian disruption during the removal?	N/A
Will there be any extreme noise or other disruptions during removal?	N/A
How will the tree be used once it is removed? (chipping for campus use, etc)	N/A

Please include pictures of the tree with the following in mind:

- Photos to be horizontal (landscape)
- Include any surrounding items/infrastructure that will help give context to the tree location (a street sign, a fire hydrant, a building)

- Include a map (informal) that indicates the exact location of trees to be removed.