- INTERIOR -
TESTING SERVICES
- LTD. -

MATERIALS TESTING • SOILS
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GEOTECHNICAL ENGINEERING

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Terreno Joint Venture
302 – 554 Leon AVenue
Kelowna, BC V1Y 6J6

July 5, 2021
Job 20.297

Attention: Mr. Stephen Duke, Development Manager

Re: **Geotechnical Report**
Proposed Residential Development - Terreno
2755 McCurdy Road, Kelowna, BC

As requested, Interior Testing Services Ltd (ITSL) has carried out a geotechnical investigation for the above noted proposed residential development. Please find attached the following documents:

- 2 pages of site plans prepared by DE Pilling and Associates (Pilling)
- 5 pages of proposed building plans prepared by Bluegreen Architecture (Bluegreen)
- A site plan with slope cross sections and schematic test pit logs (Drawing 20.297-1)
- 10 pages of test pit logs (Drawings 20.297-2 to 20.297-11)
- an EGBC Appendix D: Landslide Assessment Assurance Statement (3 pages)
- Appendix A, which includes 11 pages of test pit logs by others

Also attached is a copy of our standard two-page "Terms of Engagement" that governs our work and was previously signed and accepted. We understand this report will form part of your development permit application to the City of Kelowna. To that end, ITSL identifies the City of Kelowna as authorized users of this report, also subject to our standard "Terms of Engagement".

1.0 INTRODUCTION & SCOPE OF WORK

We understand the proposed development will likely be completed phases, including construction of roughly 4 condominium buildings and several townhouse buildings along with onsite roadways and site-servicing. The proposed development, including the pre and post development contours, are shown on the attached site plans prepared by Pilling and Bluegreen.

The proposed development will also include extension of McCurdy Road from the current west terminus at the old Marshall Feedlot property, across Mill Creek to connect with Mt. Baldy Drive. The

McCurdy Road extension is approximately 450 m in length, and we understand is being classified as an arterial roadway. Extension of Mt. Baldy Drive will also be required beyond the existing eastern terminus, roughly 150 m towards the north.

As part of the residential building construction, significant site grading cuts, including blasting of bedrock outcroppings, and some fills are proposed. Additional site grading cuts and fills will also be required for construction of McCurdy Road. The proposed site grading is shown on the attached site plans prepared by Pilling.

Previous geotechnical reporting by Beacon Geotechnical Ltd. (Beacon) was prepared for the proposed project, which we understand aided in the development of the proposed site plans and building locations. The following geotechnical reports by Beacon were reviewed ahead of our assessment:

- Geotechnical Hazard Assessment, Marshall Residential Hillside Development, Kelowna, BC dated December 16, 2008.
- Geotechnical Hazard Assessment, Marshall Residential Hillside Development, Kelowna, BC dated November 18, 2011.
- Geotechnical Assessment – Terreno Residential Development, 2755 McCurdy Road, Kelowna, BC dated May 18, 2016
- Terreno Developments – Mt. Baldy Drive Development, Geotechnical Assessment – 2755 McCurdy Road, Kelowna, BC dated February 2, 2017
- Geotechnical Investigation, Terreno "A Hillside Community," McCurdy Road Extension, Kelowna, BC dated September 18, 2019

We understand a Development Permit application will be pursued for the proposed project, for which additional geotechnical reporting is required. To that end, the purpose of our field investigation and reconnaissance was to review the surface terrain and identify the underlying soil and groundwater conditions with respect to general geotechnical comments for site suitability and safe land use, as well as to provide recommendations for site preparation, construction, and foundation design for the proposed buildings. The following report presents our findings and results, along with general geotechnical comments and recommendations for site development.

2.0 SITE DESCRIPTION

The project site is located on an east facing slope of Mt. Baldy at the north side of the Dilworth Mountain neighbourhood, in Kelowna, BC. The roughly 25-hectare subject property is irregularly shaped and ranges in elevation from roughly 385 to 460 m (geodetic). The property is generally vegetated with sparse mature pine trees, as well as bushes and grasses.

The subject property is bordered by undeveloped lands to the north, Mill Creek to the south and east, and residential developments to the west. The property is bisected by a gas main right-of-way in the north-south direction. The proposed development is focused at the uphill, west side adjacent to similar multifamily condominium buildings.

The site terrain includes moderate to steep slopes up towards the west. Near the middle of the proposed development area, a prominent bedrock knoll southeast of the current terminus of Mt. Baldy Drive characterizes the site terrain. The north and south ends of the proposed development area are situated within topographic saddles between additional knolls beyond the site boundaries. Bedrock outcrops were observed throughout the high lying knoll areas. A stream was observed on the site, flowing in the west-east direction from a small wetland area beyond the northwest corner of the site to Mill Creek.

3.0 FIELD INVESTIGATION & RESULTS

Site reconnaissance was carried out in the summer of 2020 as well as more recently during June 2021. In addition to review the previous test holes logs included in the various Beacon reports, several air-track bore holes were advanced within the proposed development area in 2020 by T&A Rock Works Inc. to check the presence/depth of bedrock at the proposed cut areas.

On June 11, 2021, 10 additional test pits were advanced within the proposed development area using a 100 series excavator operated by AG Appel Enterprises. The test pits were advanced to depths of roughly 2.4 to 3 m below surrounding grade and were observed and logged in the field by a representative of ITSL.

Locations and schematic logs of the test pits are shown on the attached Drawing 20.297-1 and Detailed soil descriptions are provided on the attached test hole logs Drawing 20.297-2 to 20.297-11 and Appendix A, which should be used in preference to the generalized soil descriptions that follow.

3.1 Soil Conditions

At the above noted knoll areas at the west side of the side, shallow or exposed bedrock was observed during our site reconnaissance. The bedrock appears to be a volcanic dacite material and was observed to be generally soft and heavily fractured/weathered where exposed at the ground surface.

Within the topographic saddles between the bedrock knolls at the west side of the site, lacustrine deposits SILT/CLAY soils were generally observed to glacial outwash deposits

comprised and SAND and GRAVEL soils. Colluvium deposits comprised of SILT, SAND, and angular GRAVEL were generally encountered at the steeper downhill slopes.

Moisture contents of the predominantly SILT soils were determined between and 11 and 22%, and the SILT/CLAY soils were determined between 30 and 39%. Moisture contents of the predominantly SILT, SAND and GRAVEL soils were determined between 3 and 19%.

3.2 Groundwater Conditions

As noted above, a stream was observed on the site, flowing in the west-east direction from a small wetland area beyond the northwest corner of the site to Mill Creek. We understand the stream has been considered with the civil roadway design, and it will be culverted where it crosses the proposed McCurdy Road extension.

The regional groundwater table is expected to be significantly deep on the site; although runoff and perched groundwater is expected to vary seasonally and will be affected by drainage and infiltration conditions. Groundwater seepage was occasionally observed within the various test holes, often near the underlying bedrock or till-like layers. During the spring freshet and after rainy weather, shallow groundwater courses on the bedrock and dense till-like layers are anticipated. To that end, potential for groundwater "breakout" should be anticipated where the proposed site grading interrupts the bedrock and till layers. While the installation of roads and underground utilities, including storm sewer servicing, is expected to capture and redirect some of the groundwater seepage for the post-development condition, "breakout" should be considered by your civil engineer and/or hydrogeologist. Additional infiltration drains may be recommended to control the post-development groundwater.

4.0 SITE SUITABILITY FOR DEVELOPMENT

Natural hazards of a geotechnical nature were assessed in the field based on visible soil and bedrock conditions, shallow test pits, topography, historical slope erosion and instabilities in areas with similar soil types, surface drainage patterns, and slope characteristics. Evidence of previous geotechnical hazards were not observed at the proposed development areas on the site.

Based on our review, the property appears well-suited for the proposed residential development from a geotechnical perspective, and safe building sites appear possible on the property particularly at the proposed development areas. Specifically, we suggest development be concentrated at the gentler slopes on the property (ie. less than 50%) and/or upon the bedrock knolls, as generally proposed.

Based on our observations and site reconnaissance, rockfall and slope creep generally appears to be relatively inactive for the predevelopment slopes. We note that some additional considerations to

geotechnical issues including slope stability, rockfall hazard, etc. will be required during design and construction phases.

In our opinion, the proposed development areas on the site are considered safe for the use intended, and safe building sites appear feasible throughout the property. We define "safe" based on the levels of safety adopted by the City of Kelowna, including a 2% probability of failure occurring in a 50 year period (1 in 2475) for slope instability.

In accordance with the EGBC Guidelines (formerly APEGBC) for Legislated Landslide Assessments for Residential Developments, we have included an Appendix D: Landslide Assessment Assurance Statement.

5.0 SITE PREPARATION & GRADING

At the beginning of site preparation for each phase of the proposed development, the surface vegetation, topsoil, and any fill materials should be completely removed to expose the underlying natural soils and/or bedrock.

5.1 Rock Cut Slopes

Rock cut slopes should be finished at no steeper than 0.5H:1V and scaled to remove loose particles at the rock face. For taller rock cut slopes, construction of a roughly 1 m wide bench at roughly 8 to 10 m up the cut face is anticipated to be required to allow for blasting and construction.

We suggest smooth wall, controlled blasting techniques (pre-splitting) and scaling as minimum slope and stabilization techniques. If highly fractured rock or unfavorable joint sets are encountered, additional stabilization work may be required, possibly including additional scaling/flattening of the cut slope, rock bolts, rock fall protection netting/mesh, etc. The rock cut slopes should be reviewed as they are exposed, and additional review by a rock mechanics specialist may be further recommended depending on the condition of the rock mass exposed.

To reduce the risk of rock fall posing a hazard to the public, rock slope catchment areas should be provided at the toe of any rock cuts 2.5 m or taller:

- Provide a 2 m wide catchment buffer area for rock cuts between 2.5 and 5 m in height.
- Provide a 3 m wide catchment buffer area for rock cuts between 5 and 10 m in height.

- Provide a 4 m wide catchment buffer area for rock cuts between 10 and 15 m in height.
- Provide a 5 m wide catchment buffer area for rock cuts taller than 15 m.

The base of the catchment ditches should be inclined at 4H:1V. The recommendations provided have been adapted from the attached MoTH Technical Bulletin No. GM02001 regarding rock slope catchment areas.

Above the top of the rock cuts, a 3 m wide (horizontal) area should be cleared of the surface over-burden and/or any loose weathered rock, and chain link fencing should be installed above the rock cuts. Signage, warning of rock fall hazard, would also be prudent below rock cut slopes.

The Terreno strata group should be made aware of the potential rock fall hazard and on-going, routine maintenance required of rock cut slopes, including scaling and removing rock fall/talus from the toe of the slope. The rock cut slopes should be reviewed after scaling has been carried out, as well as periodically by a geotechnical engineer or rock mechanics specialist at an interval of roughly every 5 years after initial blasting or in the event of significant changes.

5.2 Structural Fill

Blasting is anticipated to be necessary to achieve the desired cut elevations within portions of the proposed development area. In general, the blasted rock materials are anticipated to be suitable for re-use as structural fill, although particle diameters should be maintained at 300 mm maximum.

Where site grades are desired to be raised, clean (less than 8% fines) granular or blasted rock structural fills (placed and compacted in lifts) are recommended to achieve the desired grades. Additional care will be required to 'key' the structural fills into the natural slopes.

Structural fills should be placed and compacted in maximum 300 mm lifts to at least 95% Modified Proctor Density (MPD) and within 2% of optimum moisture content. Field density testing and/or proof roll observations should be carried out on every second lift of fill placed (every 600 mm).

5.3 Soil Cut and Fill Slopes

Soil cut and structural fill slopes should be finished at no steeper than 2 Horizontal to 1 Vertical (2H:1V). Soil slopes should be vegetated by means of hydro-seeding, landscaping,

rock armoring, or similar to reduce the potential for surface erosion. All slopes may require some degree of maintenance with the passing of time.

6.0 FOUNDATION DESIGN

For building support, conventional strip and pad foundations appear suitable. In general, the foundation bearing soils are expected to be competent and comprised of bedrock, natural granular soils, or blast rock structural FILL. A noted exception includes areas of natural cohesive, SILT and/or CLAY soils. Where cohesive soils are encountered at or near the proposed building foundation grades, they should be over-excavated to provide a minimum 1 m thickness of compacted granular FILL for consistent bearing support.

Where the individual buildings span between soil and bedrock conditions, the bedrock should be over-excavated to allow for a minimum 0.6 m of replacement structural fill below the foundations and provide a more consistent bearing surface.

For foundations set on bedrock, competent natural granular soils, or adequately compacted structural FILL, an allowable bearing pressure of 200 kPa (4000 psf) may be assumed for design purposes, subject to the following considerations.

a) Bearing surfaces to be clean, dry, and in a well compacted condition.
b) Minimum footing width to be 400 mm (16 inches).
c) Minimum depth of footing to be 900 mm (36 inches) below final adjacent grade, or as per local by-law, for frost protection.

The allowable bearing pressure provided above can also be taken as the design pressure for the Service Limit State (SLS) condition. The bearing resistance at the Ultimate Limit State (ULS) can be taken as 300 kPa (6000 psf).

Based on the results of our investigation and our general experience in the area, Site Class C can be used for design purposes, as taken from Table 4.1.8.4A from the BC Building Code.

6.1 Foundation Slope Stability

For buildings proposed above natural soils or structural FILL slopes, foundations should be maintained below and behind a conventional 2H:1V plane projected up from the toe of the slope.

For buildings proposed above bedrock slopes, foundations should be maintained below and behind a 1H:1V plane projected up from the toe of the bedrock slope. For foundations pinned

to the bedrock surface, it may be possible for the building foundations to be set closer to the crest of the bedrock slopes. If solid competent bedrock is exposed, pinning the footings to the rock with rebar dowels will be recommended. If weathered bedrock is exposed, pinning the footings to the rock with rock anchors will be recommended. Additional guidance with respect to pinning the footings should be provided at the time of construction based on our observations of the rock surface exposed.

6.2 Lateral Earth Pressures

If required, lateral earth pressures are provided for design of buried foundation walls. The foundation walls are expected to be relatively stiff and unyielding, so that at-rest conditions have been considered. We anticipate that the walls will be backfilled with free-draining granular soils such that drained conditions exist, and that the finished backfill will be sloped away from the building.

Lateral earth pressures have been estimated based on an assumed friction angle of 35° and a unit weight of 20 kN/m^3 for the expected granular backfill material. Given the above design parameters, we assume at rest conditions and a corresponding equivalent fluid pressure, γ_{eq}, of 8.6 $kN/m^2/m$ can be used in design. To account for any surcharge pressures, a uniform lateral pressure coefficient, K_o, of 0.43 times the estimated load should also be applied to the wall for at rest conditions. If passive or active lateral earth conditions are to be considered or if soils other than clean gravels are to be used as backfill, please advise and we can provide alternative comments.

6.3 Slab Base Preparation

We recommend slab preparation include placement of good-quality SAND and GRAVEL structural FILL below the slab and any required radon rock (design by others), over-lying competent natural soils. Underslab structural FILL should be placed and compacted as noted in Section 5.2 above.

6.3 Building Drainage

For proposed building slabs below the exterior finished grades (ie. basement conditions), standard perimeter footing drainage should be installed. Finished grades should be sloped away from the building in order to minimize infiltration of water into the backfill zone.

Roof drainage should be provided for all buildings and be directed to a suitable disposal location, such as the onsite storm system designed by your civil engineer. In all cases,

drainage should be directed away from fills and/or slopes to prevent saturation and potential settlement and/or instabilities.

7.0 SITE SERVICING CONSIDERATIONS

Based the results of our investigation, we provide the following comments for site development and construction of civil infrastructure and services. Additional geotechnical guidance should be provided regarding the proposed Mill Creek crossing, including the approach fills, crossing structure foundations, and retaining wall design.

7.1 Stormwater Design

In all cases, drainage should be directed away from fills and/or slopes to prevent saturation and potential settlement and/or instabilities.

Given the hillside nature of the site and shallow bedrock conditions, infiltration of site generated storm drainage to ground at concentrated points, such as drywells or similar, is not recommended. Alternatively, a storm pond or overland drainage system appears better-suited for the site and proposed development. Stormwater design should be provided by your civil engineer and remains outside of our scope of work. Hydrogeological design services also remain outside of our cope of work.

7.2 Roadway Subgrade Fill

Where grading fill is required at proposed municipal roads as well as the onsite access roads, driveways, and parking lots, the onsite, clean (less than 8% fines) granular or processed blast rock fill materials are generally expected to be best-suited for roadway subgrade fill.

We recommend road subgrade FILL be placed in a structural manner, including placement and compaction in maximum 300 mm lifts to a minimum of 95% MPD and within 2% of optimum moisture content. To maintain adequate quality control procedures, field density testing should be carried out on at least every 600 mm placed (every second lift) to confirm that adequate compaction is being achieved.

7.3 Underground Utility Service Installation

The proposed utility services are expected to be set on competent, natural soils or suitably compacted subgrade FILL such that pipe support would be adequate.

Standard Worksafe BC side slopes of 0.75H:1V should be satisfactory during construction for trench depths up to approximately 3 m for the natural soil conditions and/or structural grading FILL. If steeper slopes or deeper excavations are proposed, a geotechnical engineer should be given the opportunity to review and comment.

We anticipate that the onsite, clear granular soils and/or blast rock fill will be used for structural trench backfill. We anticipate that conventional MMCD standards (or City of Kelowna standards for municipal roadways) would apply for all civil infrastructure work.

7.4 Pavement Structure

Where fills are required to establish the proposed road subgrade levels, processed blast rock fill materials produced during grading of the residential building sites are expected to be well suited, and should be placed and compacted in a structural manner as outlined in Section 7.2 above.

Based on the test pit results and review of the site grading plans, the proposed roadways are generally expected to be constructed on natural granular soils, BEDROCK, and/or structural FILLS. The following pavement structures are recommended from a strength and frost protection perspective.

Local Roads	50 mm	ASPHALT**
	100 mm	crushed GRAVEL base
	200 mm	SAND and GRAVEL subbase
		On approved subgrade
Collector and Arterial Roads	100 mm	ASPHALT, placed in two lifts
	100 mm	crushed GRAVEL base
	200 mm	SAND and GRAVEL subbase
		On approved subgrade

** Within areas of heavy truck traffic (loading docks, entrances and tight turning areas), we recommend that consideration be given to increasing the asphalt thickness to 75 or 100 mm for improved pavement performance.

Where the placement of the subbase layer involves removal of bedrock, the above noted pavement structure can be reduced, with only a thicker layer of base gravel required. Additional review at the time of construction is recommended.

Conversely, where natural cohesive soils are encountered at the subgrade surface, an increased subbase structure should be provided. Further guidance to this respect should be provided at the time of construction.

8.0 CONCLUSIONS

8.1 The governing geotechnical design aspects of the site are expected to include grading design constraints given the sloping site conditions and potential for shallow groundwater courses and "break-out" on the underlying bedrock and dense till-like soils.

Recommendations for site preparation and foundation design have been provided in the previous sections of this report. The site appears suitable for the proposed multifamily development, and safe building sites appear practical on the property at the proposed building locations, subject to the recommendations provided.

8.2 During construction, ITSL should be called to periodically review site work including stripping to confirm the surface vegetation, topsoil, and all old fill has been adequately removed. In addition, ITSL should review the subgrade soils prior to placing concrete foundations, structural FILL, or pavement structure gravels. Regular field density testing and/or proof roll observations of all structural FILL is recommended to confirm adequate compaction is being achieved.

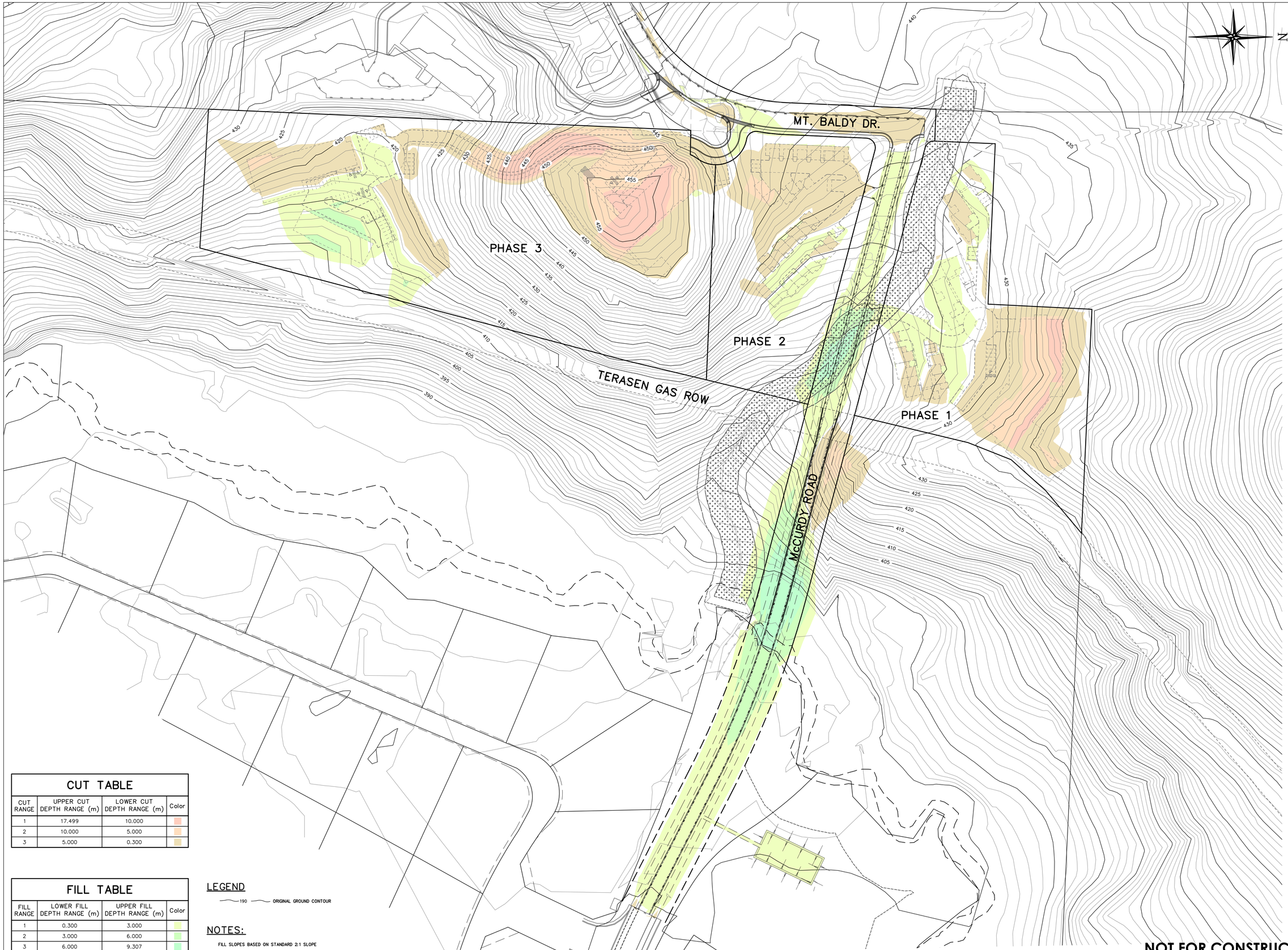
We trust this meets your current needs. Please call if you have any questions.

Yours Truly,
Interior Testing Services Ltd

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA J. L. ANDERSON # 39171 July 5, 2024

Jennifer Anderson, P.Eng

Peter Hanenburg, P.Eng



CUT TABLE			
CUT RANGE	UPPER CUT DEPTH RANGE (m)	LOWER CUT DEPTH RANGE (m)	Color
1	17.499	10.000	
2	10.000	5.000	
3	5.000	0.300	

FILL TABLE			
FILL RANGE	LOWER FILL DEPTH RANGE (m)	UPPER FILL DEPTH RANGE (m)	Color
1	0.300	3.000	
2	3.000	6.000	
3	6.000	9.307	

LEGEND

190 ORIGINAL GROUND CONTOUR

NOTES:

FILL SLOPES BASED ON STANDARD 2:1 SLOPE

NOT FOR CONSTRUCTION

TROIKA DEVELOPMENTS

BLUEGREEN ARCHITECTURE INC

D.E. Pilling & ASSOC. CONSULTING ENGINEERING

ecora

ECOSCAPE Environmental Consultants Ltd.

Seal

DAVID K.Y. MORI P.ENG.

DRAWN	DESIGN	APPROVED
K.W.	PA/CE	D.K.Y.M.

Client

TROIKA TERRENO DEVELOPMENT JV

NO.	DATE	RECORD OF REVISIONS
2	30/01/20	RE-ZONING
1	18/11/19	DEVELOPMENT PERMIT

NO.	DATE	RECORD OF ISSUED

Project

TERRENO

"A HILLSIDE COMMUNITY"

KELOWNA, BC

Sheet Title

AREAS OF CUTS & FILLS PLAN

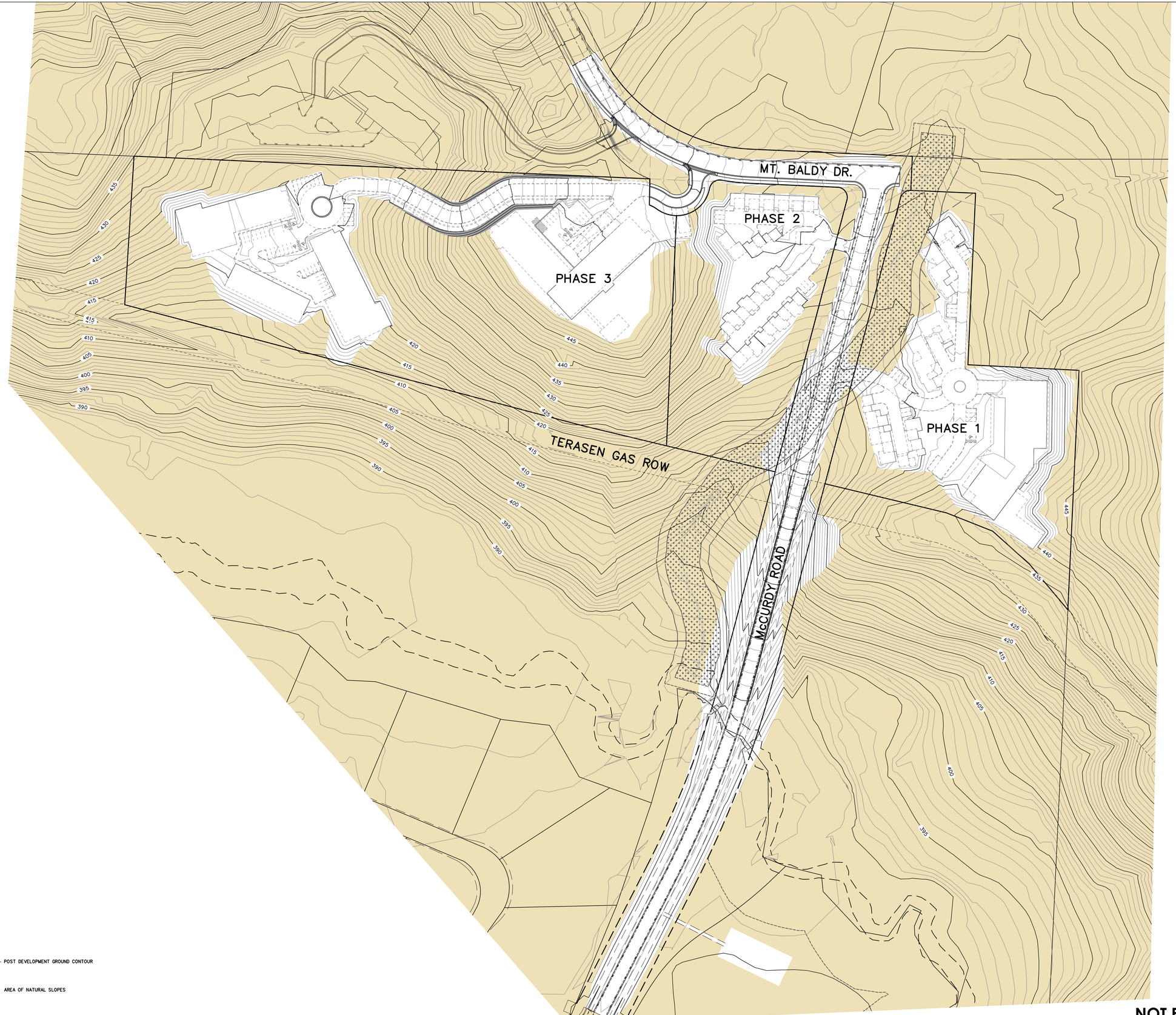
Job Number 2458

Date 2019.08.08

Scale 1:1000

Revision Number 2

Drawing Number 2458-P4



N

LEGEND

190 POST DEVELOPMENT GROUND CONTOUR

AREA OF NATURAL SLOPES

NOT FOR CONSTRUCTION

TROIKA DEVELOPMENTS

BLUEGREEN ARCHITECTURE INC

D.E. Pilling & ASSOC. CONSULTING ENGINEERING

ecora

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Seal

DAVID K.Y. MORI P.ENG.

DRAWN	DESIGN	APPROVED
K.W.	PA/CE	D.K.Y.M.

Client

TROIKA TERRENO DEVELOPMENT JV

NO.	DATE	RECORD OF REVISIONS
2	30/01/20	RE-ZONING
1	18/11/19	DEVELOPMENT PERMIT

NO.	DATE	RECORD OF ISSUED

Project

TERRENO

"A HILLSIDE COMMUNITY"

KELOWNA, BC

Sheet Title

POST CONSTRUCTION CONTOURS

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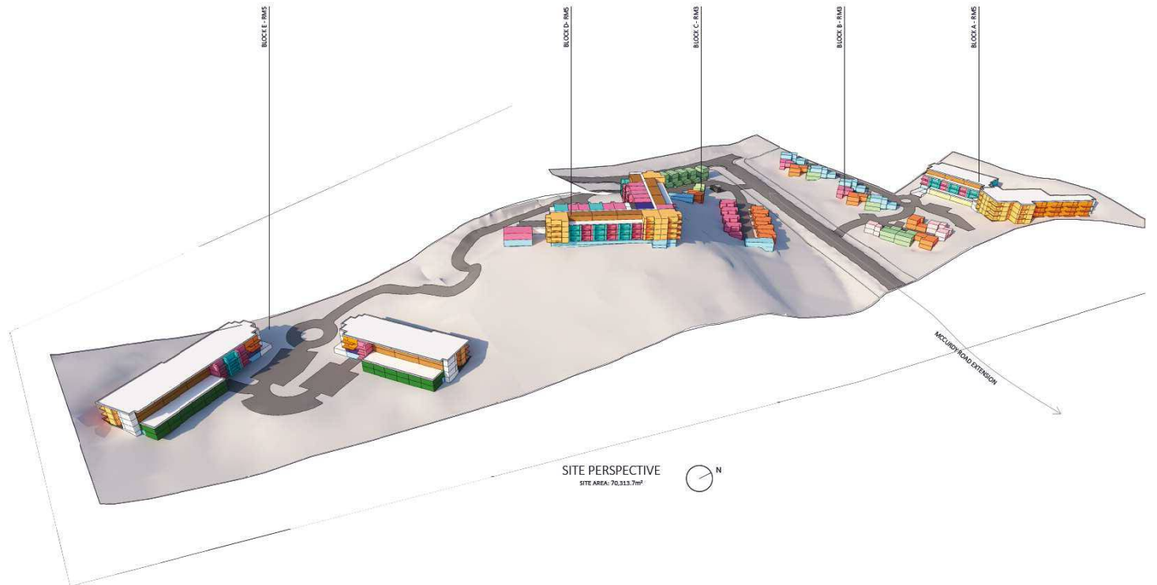
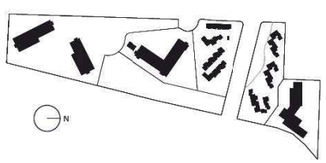
Revision Number	2
Drawing Number	2458-P3



SITE PERSPECTIVE
SITE AREA: 70,313.7m²

N



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NOT FOR CONSTRUCTION

TROIKA DEVELOPMENTS

BLUEGREEN ARCHITECTURE INC

D.E. Pilling & ASSOC. LTD. CONSULTING ENGINEERING

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Client
TROIKA TERRENO DEVELOPMENT JV

NO.	DATE	RECORD OF REVISIONS
1	18/11/19	RE-ZONING
2	18/12/11	RE-ZONING R1
3	20/03/09	RE-ZONING R2
4	21/05/03	ISSUED FOR REZONING R3

NO.	DATE	RECORD OF ISSUED

Project

TERRENO

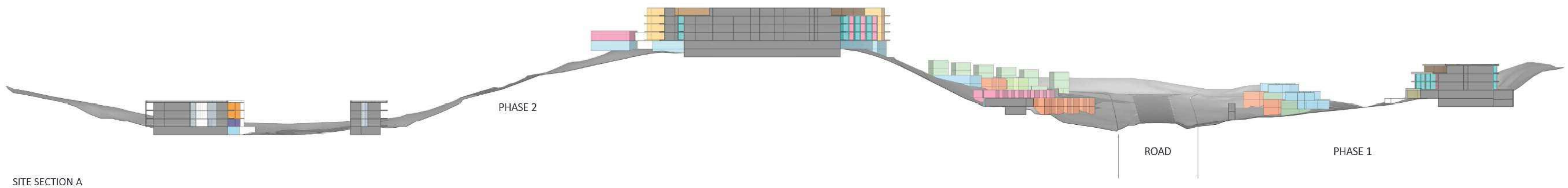
"A HILLSIDE COMMUNITY"

KELOWNA, BC

Sheet Title

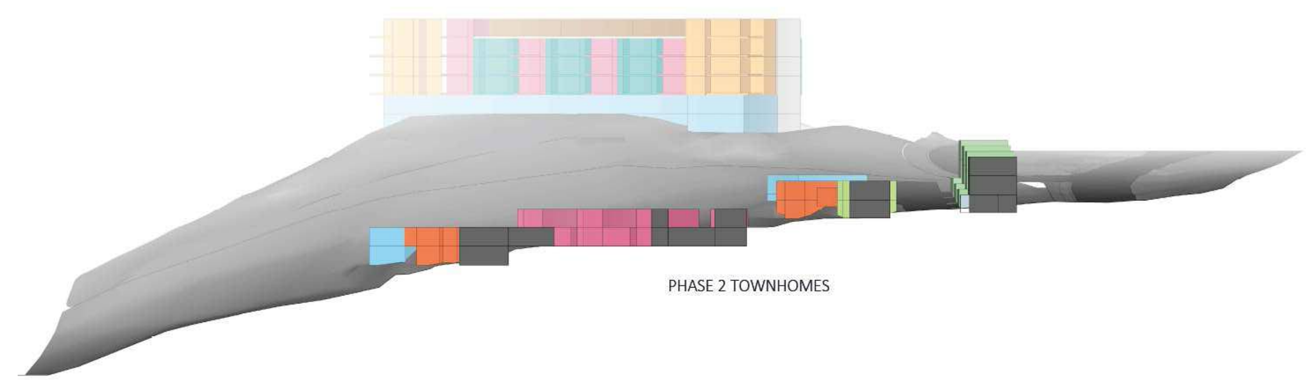
SITE PERSPECTIVES

Job Number	19.718
Date	2021.05.03
Scale	N.T.S.
Revision Number	0
Drawing Number	**A1.0**



SITE SECTION A
N.T.S.

SITE SECTION B
N.T.S.



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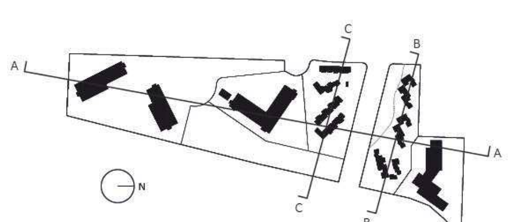
N.T.S.



NOT FOR CONSTRUCTION

TROIKA DEVELOPMENTS

BLUEGREEN ARCHITECTURE INC

D.E. Pilling & ASSOC. LTD. CONSULTING ENGINEERING

ecora

ECOSCAPE Environmental Consultants Ltd.

Seal

Client

TROIKA TERRENO DEVELOPMENT JV

NO.	DATE	RECORD OF REVISIONS

NO.	DATE	RECORD OF ISSUED
1	18/11/19	RE-ZONING
2	18/12/11	RE-ZONING R1
3	20/03/09	RE-ZONING R2
4	21/05/03	ISSUED FOR REZONING R3

Project

TERRENO

"A HILLSIDE COMMUNITY"

KELOWNA, BC

Sheet Title

SITE SECTION

Job Number 19.718

Date 2021.05.03

Scale N.T.S.

Revision Number 0

Drawing Number **A1.1**

RM5 - MEDIUM DENSITY MULTIPLE HOUSING
RM3 - LOW DENSITY MULTIPLE HOUSING
A1 - AGRICULTURE
P3 - PARKS
RIPARIAN AREA

NOT FOR CONSTRUCTION

TROIKA DEVELOPMENTS
BLUEGREEN ARCHITECTURE INC
D.E. Pilling & ASSOC. CONSULTING ENGINEERING
ecora
ECOSCAPE Environmental Consultants Ltd.

Seal

REGISTERED ARCHITECT
2021-05-27
BRITISH COLUMBIA

Client
TROIKA TERRENO DEVELOPMENT JV

NO.	DATE	RECORD OF REVISIONS

NO.	DATE	RECORD OF ISSUED
1	18/11/19	RE-ZONING
2	18/12/11	RE-ZONING R1
3	20/03/09	RE-ZONING R2
4	21/05/25	ISSUED FOR REZONING R3

Project

TERRENO

"A HILLSIDE COMMUNITY"

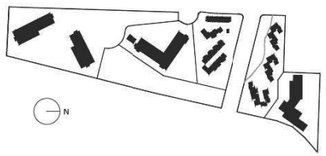
KELOWNA, BC

Sheet Title

SITE PLAN

Job Number 19.718
Date 2021.05.25
Scale 1/128" = 1'
Revision Number 0
Drawing Number

A1.2.1



RM5 - MEDIUM DENSITY MULTIPLE HOUSING
RM3 - LOW DENSITY MULTIPLE HOUSING
A1 - AGRICULTURE
P3 - PARKS
RIPARIAN AREA

NOT FOR CONSTRUCTION

TROIKA DEVELOPMENTS

BLUEGREEN ARCHITECTURE INC

D.E. Pilling & ASSOC. CONSULTING ENGINEERING

ecora

ECOSCAPE Environmental Consultants Ltd.

Seal

REGISTERED ARCHITECT
2021-05-27
PROVINCE OF BRITISH COLUMBIA

Client

TROIKA TERRENO DEVELOPMENT JV

NO.	DATE	RECORD OF REVISIONS
1	18/11/19	RE-ZONING
2	18/12/11	RE-ZONING R1
3	20/03/09	RE-ZONING R2
4	21/05/25	ISSUED FOR REZONING R3

NO.	DATE	RECORD OF ISSUED

Project

TERRENO

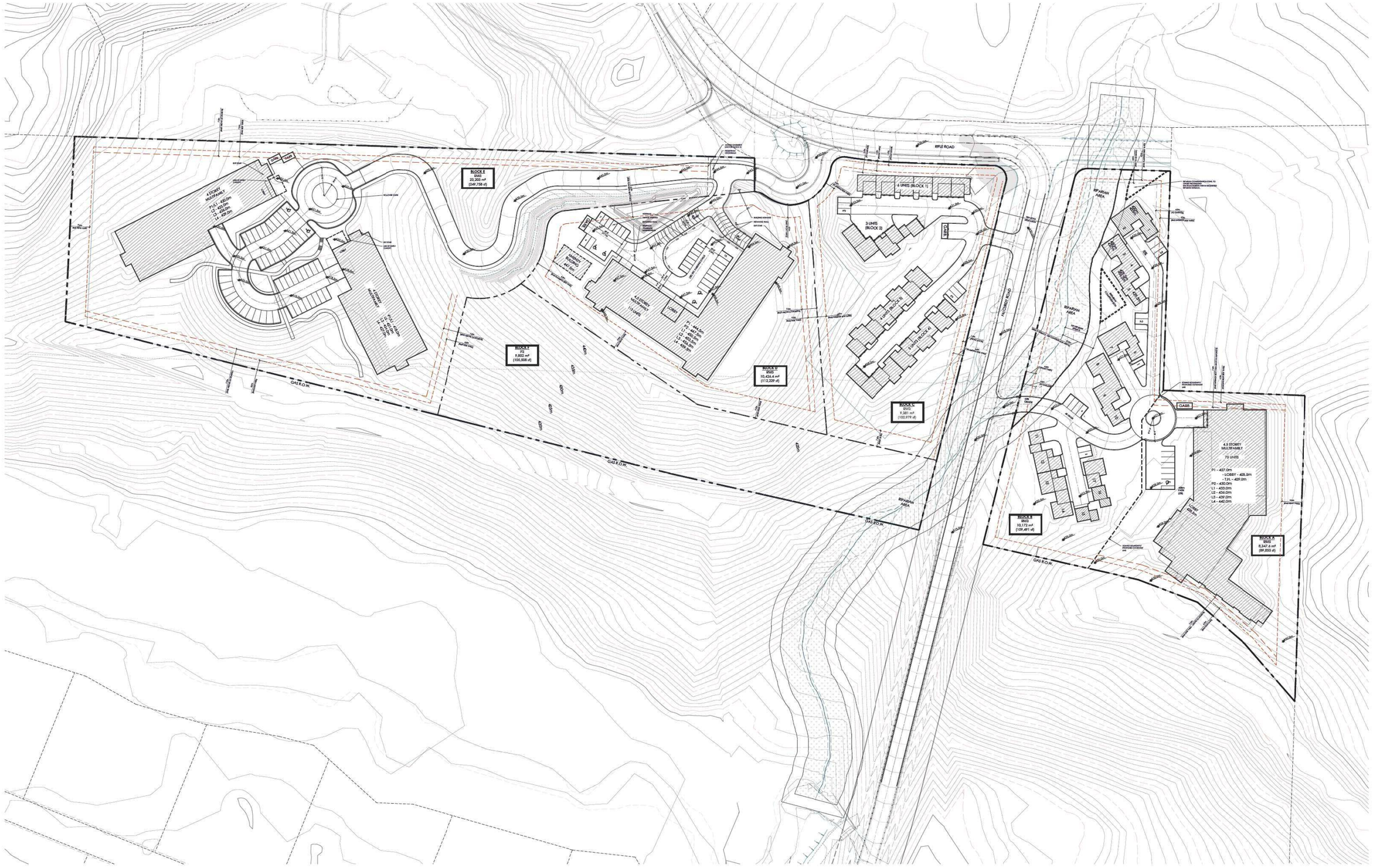
"A HILLSIDE COMMUNITY"

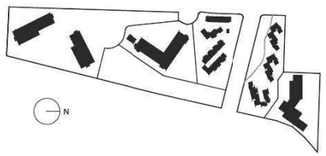
KELOWNA, BC

Sheet Title

SITE PLAN

Job Number	19.718
Date	2021.05.25
Scale	1/64" = 1'
Revision Number	0
Drawing Number	**A1.2.2**





NOT FOR CONSTRUCTION

TROIKA DEVELOPMENTS

BLUEGREEN ARCHITECTURE INC

D.E. Pilling & ASSOC. CONSULTING ENGINEERING

ecora

ECOSCAPE Environmental Consultants Ltd

Seal

Client

TROIKA TERRENO DEVELOPMENT JV

NO.	DATE	RECORD OF REVISIONS
1	18/11/19	RE-ZONING
2	18/12/11	RE-ZONING R1
3	20/03/09	RE-ZONING R2
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NO.	DATE	RECORD OF ISSUED

Project

TERRENO

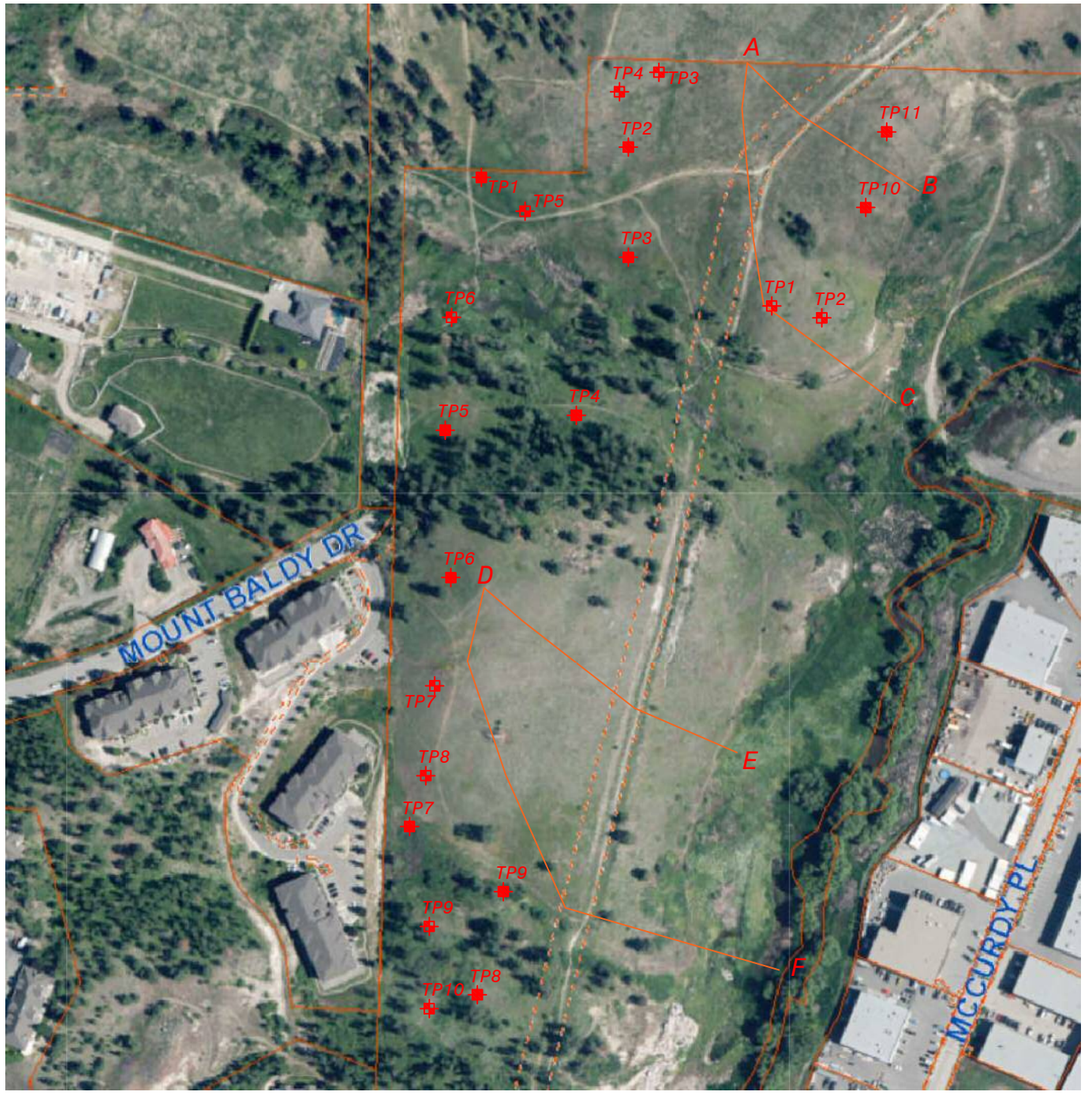
"A HILLSIDE COMMUNITY"

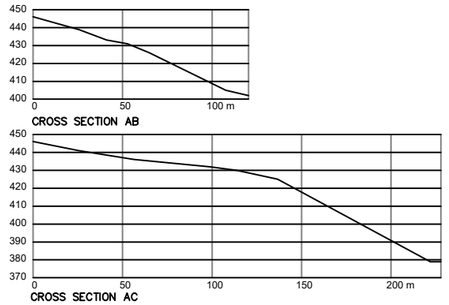
KELOWNA, BC

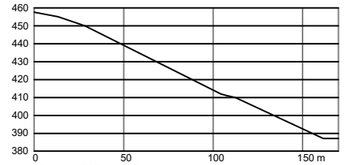
Sheet Title

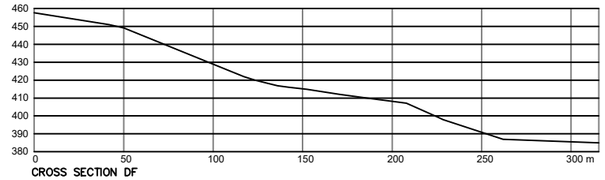
SITE PLAN

Job Number	19.718
Date	2021.05.25
Scale	1/64" = 1'
Revision Number	0
Drawing Number	**A1.2.3**



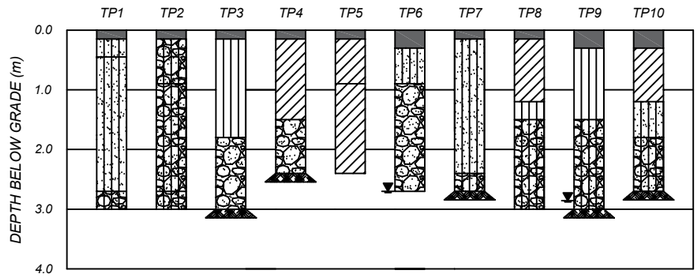






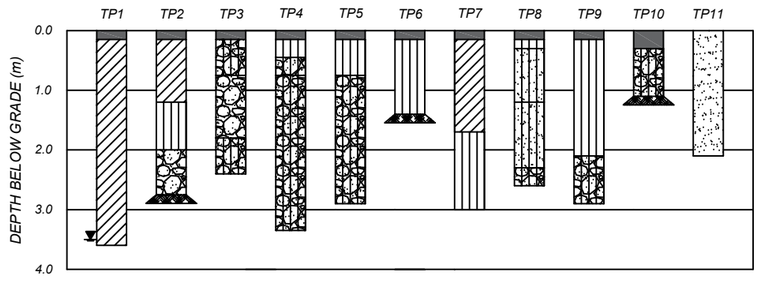
SCHEMATIC TEST PIT LOGS

SCALE: VERTICAL: 1:100



SCHEMATIC TEST PIT LOGS - (BY OTHERS)

SCALE: VERTICAL: 1:100



LEGEND

- TEST PIT LOCATION
- TEST PIT LOCATION (BY OTHERS)
- GROUNDWATER SEEPAGE
- FILL
- TOPSOIL
- SAND
- GRAVEL
- SILT
- SILT/CLAY
- BEDROCK

NOTES

1. REFERENCE PLAN ADAPTED FROM CITY OF KELOWNA MAPPING.
2. TEST HOLE LOCATIONS ARE APPROXIMATE AND MAY VARY FROM THAT SHOWN.
3. TEST HOLE LOGS SHOWN ON DRAWINGS 20.297-2 TO 20.297-11 AND APPENDIX A.

TERRENO JOINT VENTURE RESIDENTIAL DEVELOPMENT 2755 McCURDY ROAD KELOWNA, BC	SITE PLAN & SCHEMATIC LOGS	INTERIOR TESTING SERVICES LTD. 1-1965 MOSS COURT, KELOWNA, BC V1Y 9L3 PH: 250-860-6540 E-MAIL: info@interiortesting.com DATE OF INVESTIGATION: JUNE 2021 JOB NUMBER: 20.297 DRAWING NUMBER: 20.297-1

- INTERIOR -
TESTING SERVICES
- LTD. -

LOG OF TEST PIT 1

Interior Testing Services Ltd.
1 - 1965 Moss Court
Kelowna, BC V1Y 9L3
(250) 860 - 6540
email: info@interiortesting.com

Project	: 20.297	Method	: Tracked Excavator
	: Terreno - Multifamily Develop	Operator	: AG Appel
	: 2755 McCurdy Road	Logged By	: JA
	: Kelowna, BC	Date	: June 15, 2021
Location	: See Dwg. No. 20.297-1		

Legend: ▼ Water Noted During Digging; ☐ Disturbed Sample

Depth in Meters	% Moisture (0 – 40 – 80)	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	DESCRIPTION
0								Brown, silty TOSPOIL.
								Light grey-brown, silty, fine SAND.
								Brown, compact, fine SAND and SILT, some gravel.
1	o 23%					1	☐	
2	o 19%					2	☐	
								Grey-brown, dense, silty SAND and GRAVEL (till-like).
3								Bottom of Hole at 3.0 m.
4								

07-03-2021 C:\Users\Jennifer\Desktop\Jen jobs\2020\20.297 Terreno\20.297 TP1.bor

Drawing No. 20.297-2

- INTERIOR -
TESTING SERVICES
- LTD. -

LOG OF TEST PIT 2

Interior Testing Services Ltd.
1 - 1965 Moss Court
Kelowna, BC V1Y 9L3
(250) 860 - 6540
email: info@interiortesting.com

Project	: 20.297	Method	: Tracked Excavator
	: Terreno - Multifamily Develop	Operator	: AG Appel
	: 2755 McCurdy Road	Logged By	: JA
	: Kelowna, BC	Date	: June 15, 2021
Location	: See Dwg. No. 20.297-1		

Legend
▼ Water Noted During Digging
Disturbed Sample

Depth in Meters	% Moisture (0 – 40 – 80)	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	DESCRIPTION	Depth in Meters
0								Brown, silty TOSPOIL.	0
								Light grey-brown, silty, fine SAND and GRAVEL.	
1	o 21%					1	□	Brown, compact, fine SAND and SILT, some gravel.	1
2	o 11%					2	□	Grey-brown, dense, silty SAND and GRAVEL (till-like).	2
3								Bottom of Hole at 3.0 m.	3
4									4

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Drawing No. 20.297-3

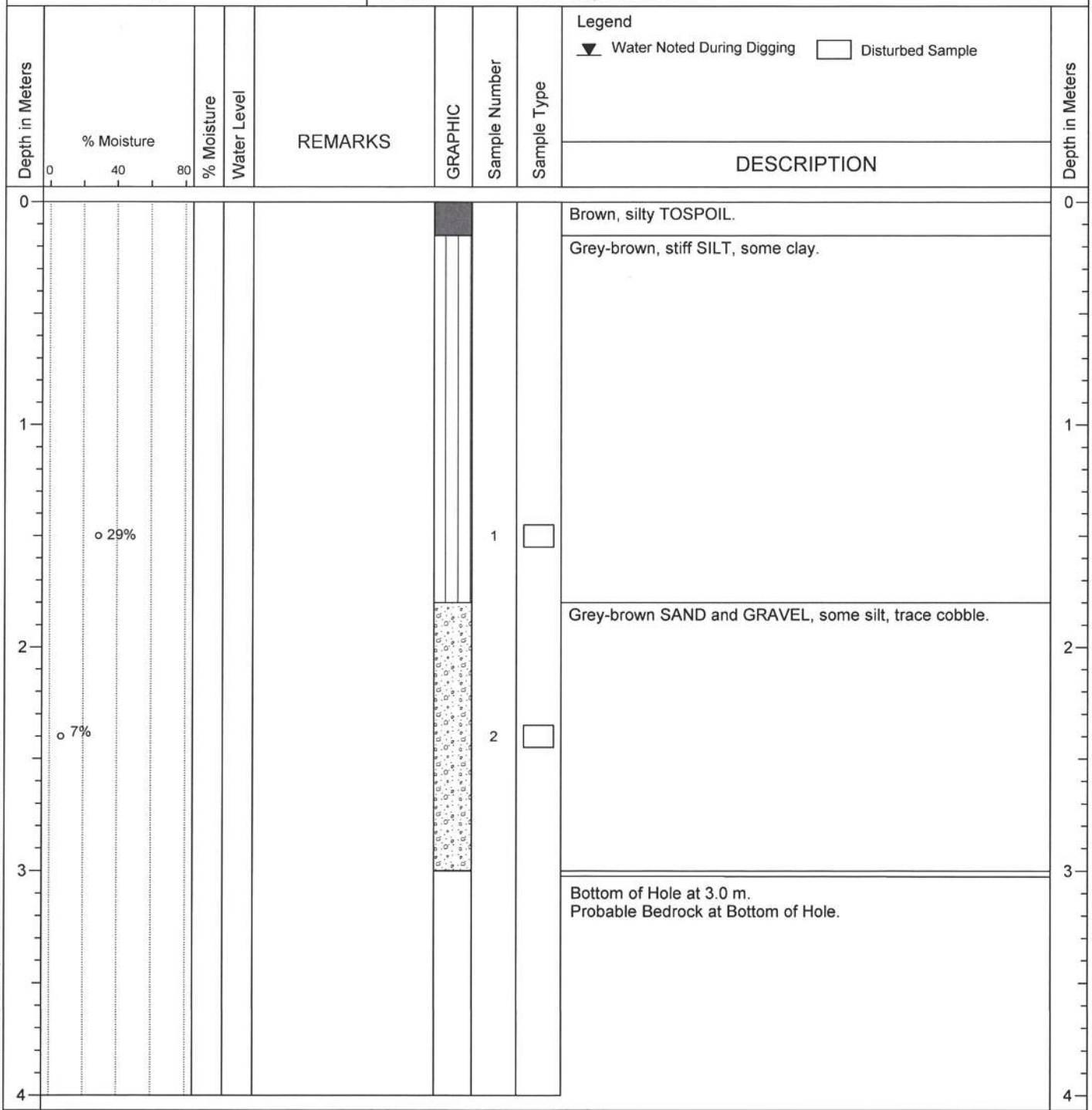
- INTERIOR -
TESTING SERVICES
- LTD. -

LOG OF TEST PIT 3

Interior Testing Services Ltd.
1 - 1965 Moss Court
Kelowna, BC V1Y 9L3
(250) 860 - 6540
email: info@interiortesting.com

Project	: 20.297	Method	: Tracked Excavator
	: Terreno - Multifamily Develop	Operator	: AG Appel
	: 2755 McCurdy Road	Logged By	: JA
	: Kelowna, BC	Date	: June 15, 2021
Location	: See Dwg. No. 20.297-1		

Legend
▼ Water Noted During Digging
Disturbed Sample



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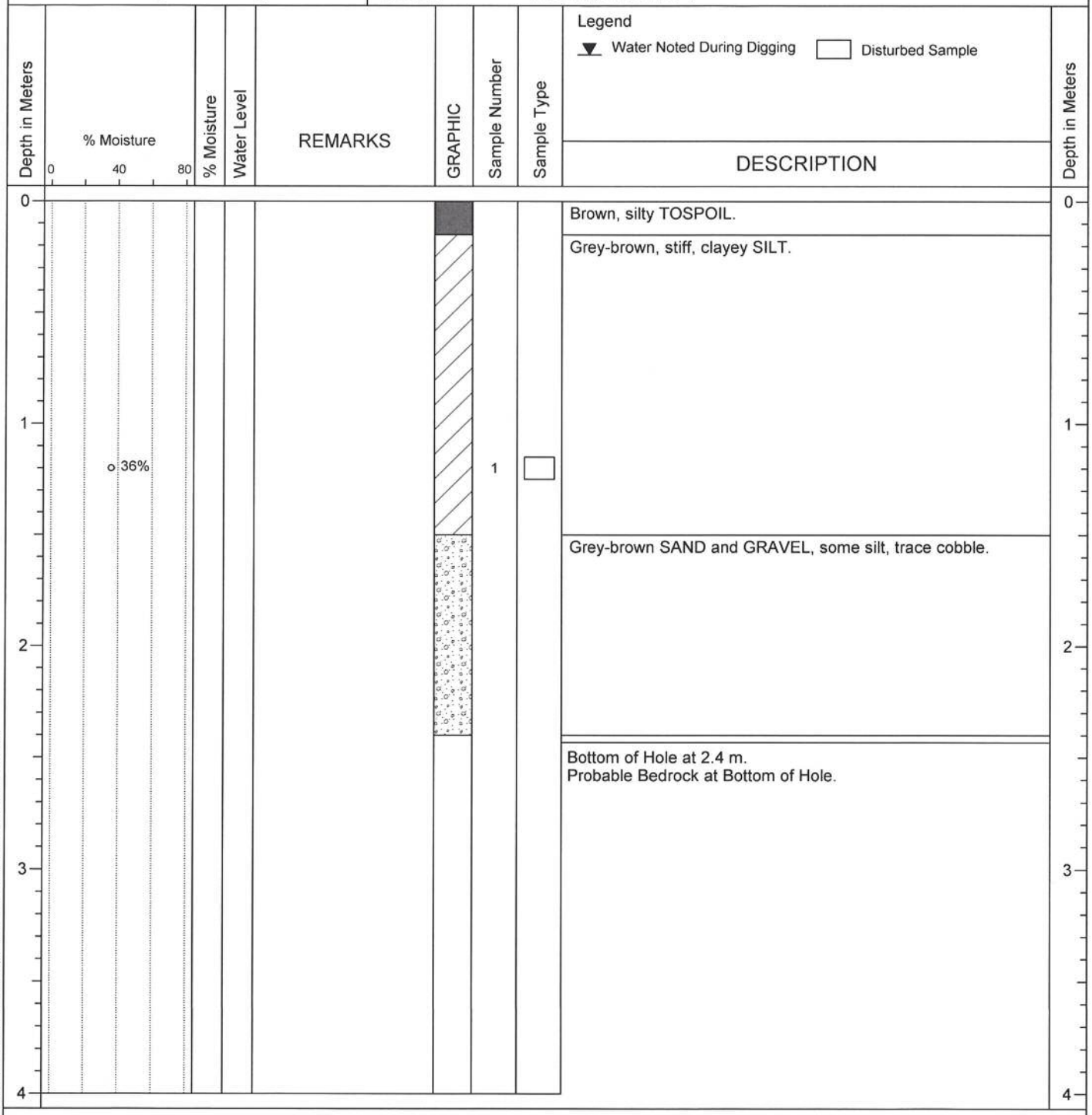
Drawing No. 20.297-4

- INTERIOR -
TESTING SERVICES
- LTD. -

LOG OF TEST PIT 4

Interior Testing Services Ltd.
1 - 1965 Moss Court
Kelowna, BC V1Y 9L3
(250) 860 - 6540
email: info@interiortesting.com

Project	: 20.297	Method	: Tracked Excavator
	: Terreno - Multifamily Develop	Operator	: AG Appel
	: 2755 McCurdy Road	Logged By	: JA
	: Kelowna, BC	Date	: June 15, 2021
Location	: See Dwg. No. 20.297-1		



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Drawing No. 20.297-5

- INTERIOR -
TESTING SERVICES
- LTD. -

LOG OF TEST PIT 5

Interior Testing Services Ltd.
1 - 1965 Moss Court
Kelowna, BC V1Y 9L3
(250) 860 - 6540
email: info@interiortesting.com

Project	: 20.297	Method	: Tracked Excavator
	: Terreno - Multifamily Develop	Operator	: AG Appel
	: 2755 McCurdy Road	Logged By	: JA
	: Kelowna, BC	Date	: June 15, 2021
Location	: See Dwg. No. 20.297-1		

Legend
▼ Water Noted During Digging ☐ Disturbed Sample

Depth in Meters	% Moisture (0 40 80)	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	DESCRIPTION	Depth in Meters
0								Brown, silty TOSPOIL.	0
								Grey-brown, desiccated, clayey SILT.	
1								Grey-brown, stif, clayey SILT.	1
2	o 38%					1	☐		2
								Bottom of Hole at 2.4 m.	
3									3
4									4

07-03-2021 C:\Users\Jennifer\Desktop\Jen jobs\2020\20.297 Terreno\20.297 TP5.bor

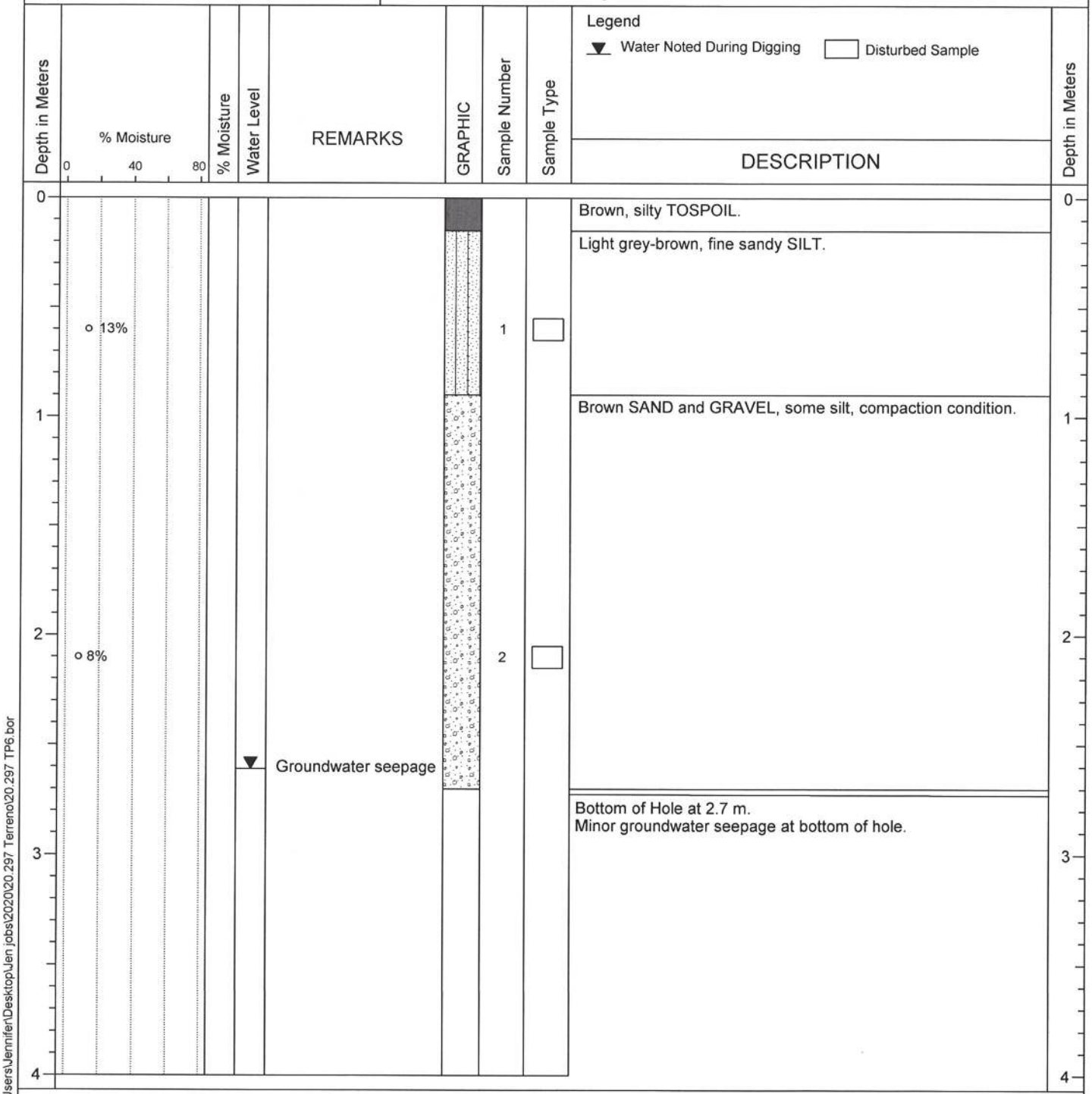
Drawing No. 20.297-6

- INTERIOR -
TESTING SERVICES
- LTD. -

LOG OF TEST PIT 6

Interior Testing Services Ltd.
1 - 1965 Moss Court
Kelowna, BC V1Y 9L3
(250) 860 - 6540
email: info@interiortesting.com

Project	: 20.297	Method	: Tracked Excavator
	: Terreno - Multifamily Develop	Operator	: AG Appel
	: 2755 McCurdy Road	Logged By	: JA
	: Kelowna, BC	Date	: June 15, 2021
Location	: See Dwg. No. 20.297-1		



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Drawing No. 20.297-7

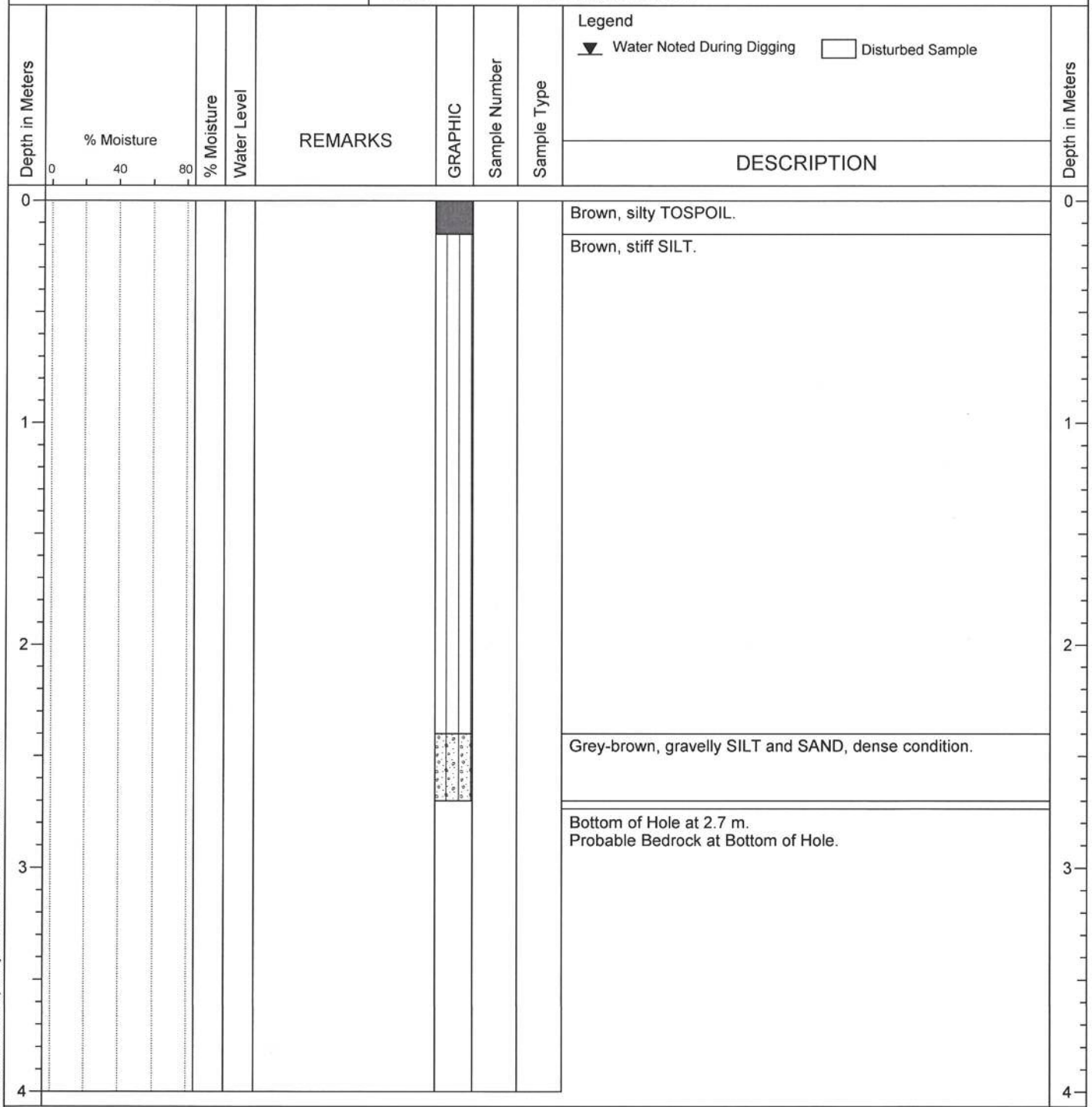
- INTERIOR -
TESTING SERVICES
- LTD. -

LOG OF TEST PIT 7

Interior Testing Services Ltd.
1 - 1965 Moss Court
Kelowna, BC V1Y 9L3
(250) 860 - 6540
email: info@interiortesting.com

Project	: 20.297	Method	: Tracked Excavator
	: Terreno - Multifamily Develop	Operator	: AG Appel
	: 2755 McCurdy Road	Logged By	: JA
	: Kelowna, BC	Date	: June 15, 2021
Location	: See Dwg. No. 20.297-1		

Legend
▼ Water Noted During Digging ☐ Disturbed Sample



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Drawing No. 20.297-8

- INTERIOR - TESTING SERVICES - LTD. -

LOG OF TEST PIT 8

Interior Testing Services Ltd.
1 - 1965 Moss Court
Kelowna, BC V1Y 9L3
(250) 860 - 6540
email: info@interiortesting.com

Project	: 20.297	Method	: Tracked Excavator
	: Terreno - Multifamily Develop	Operator	: AG Appel
	: 2755 McCurdy Road	Logged By	: JA
	: Kelowna, BC	Date	: June 15, 2021
Location	: See Dwg. No. 20.297-1		

Legend: ▼ Water Noted During Digging; ☐ Disturbed Sample

Depth in Meters	% Moisture (0 – 40 – 80)	% Moisture	Water Level	REMARKS	GRAPHIC	Sample Number	Sample Type	DESCRIPTION
0								Brown, silty TOSPOIL.
	o 31%					1	☐	Grey-brown, clayey SILT, stiff.
1								Light brown, stiff SILT.
	o 16%					2	☐	Brown, fine sandy SILT/silty SAND, some gravel to gravelly with depth.
3								Bottom of Hole at 3.0 m.
4								

Depth in Meters (duplicate): 0, 1, 2, 3, 4

07-03-2021 C:\Users\Jennifer\Desktop\Jen jobs\2020\20.297 Terreno\20.297 TP8.bor

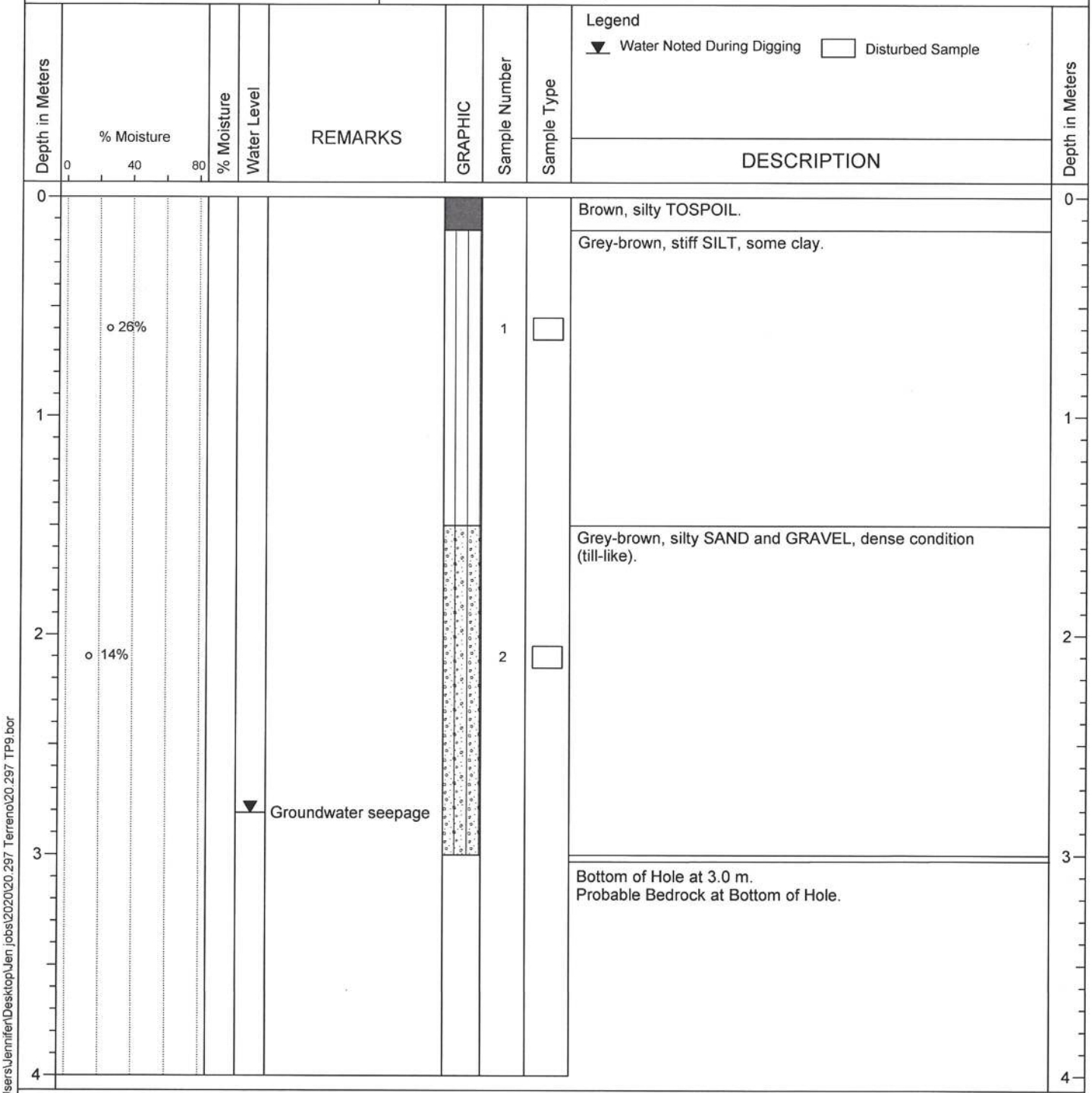
Drawing No. 20.297-9

- INTERIOR -
TESTING SERVICES
- LTD. -

LOG OF TEST PIT 9

Interior Testing Services Ltd.
1 - 1965 Moss Court
Kelowna, BC V1Y 9L3
(250) 860 - 6540
email: info@interiortesting.com

Project	: 20.297	Method	: Tracked Excavator
	: Terreno - Multifamily Develop	Operator	: AG Appel
	: 2755 McCurdy Road	Logged By	: JA
	: Kelowna, BC	Date	: June 15, 2021
Location	: See Dwg. No. 20.297-1		



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Drawing No. 20.297-10

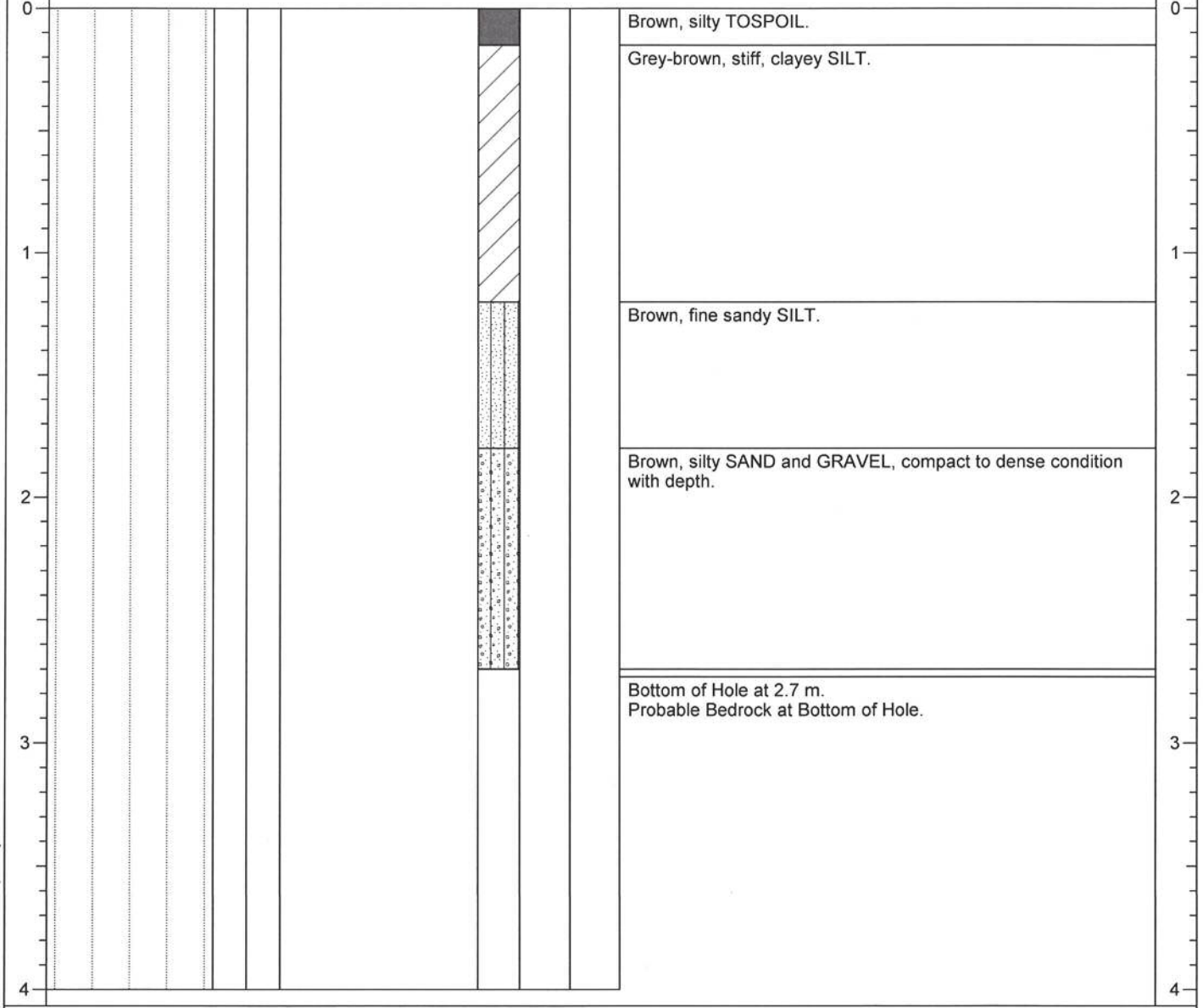
- INTERIOR -
TESTING SERVICES
- LTD. -

LOG OF TEST PIT 10

Interior Testing Services Ltd.
1 - 1965 Moss Court
Kelowna, BC V1Y 9L3
(250) 860 - 6540
email: info@interiortesting.com

Project	: 20.297	Method	: Tracked Excavator
	: Terreno - Multifamily Develop	Operator	: AG Appel
	: 2755 McCurdy Road	Logged By	: JA
	: Kelowna, BC	Date	: June 15, 2021
Location	: See Dwg. No. 20.297-1		

Legend
▼ Water Noted During Digging ☐ Disturbed Sample



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Drawing No. 20.297-11

APPENDIX D: *LANDSLIDE ASSESSMENT ASSURANCE STATEMENT*

Note: This Statement is to be read and completed in conjunction with the "*APEGBC Guidelines for Legislated Landslide Assessments for Proposed Residential Development in British Columbia*", March 2006/Revised September 2008 ("*APEGBC* Guidelines") and the "2006 BC Building Code (BCBC 2006)" and is to be provided for *landslide assessments* (not floods or flood controls) for the purposes of the Land Title Act, Community Charter or the Local Government Act. Italicized words are defined in the *APEGBC* Guidelines.

To: The *Approving Authority* Date: JULY 2, 2021

CITY OF KELOWNA
C/O TERRENO JOINT VENTURE

Jurisdiction and address

With reference to (check one):

- ☐ Land Title Act (Section 86) – Subdivision Approval
- ☑ Local Government Act (Sections 919.1 and 920) – Development Permit
- ☐ Community Charter (Section 56) – Building Permit
- ☐ Local Government Act (Section 910) – Flood Plain Bylaw Variance
- ☐ Local Government Act (Section 910) – Flood Plain Bylaw Exemption
- ☐ British Columbia Building Code 2006 sentences 4.1.8.16 (8) and 9.4 4.4.(2) (Refer to BC Building and Safety Policy Branch Information Bulletin B10-01 issued January 18, 2010)

For the Property:
2755 McCURDY ROAD; LOT 1 PLAN KAP84653
Legal description and civic address of the Property

The undersigned hereby gives assurance that he/she is a *Qualified Professional* and is a *Professional Engineer* or *Professional Geoscientist.*

I have signed, sealed and dated, and thereby certified, the attached *landslide assessment* report on the Property in accordance with the *APEGBC Guidelines.* That report must be read in conjunction with this Statement. In preparing that report I have:

Check to the left of applicable items

✓ 1. Collected and reviewed appropriate background information
✓ 2. Reviewed the proposed *residential development* on the Property
✓ 3. Conducted field work on and, if required, beyond the Property
✓ 4. Reported on the results of the field work on and, if required, beyond the Property
✓ 5. Considered any changed conditions on and, if required, beyond the Property
6. For a *landslide hazard analysis* or *landslide risk analysis* I have:
   ✓ 6.1 reviewed and characterized, if appropriate, any *landslide* that may affect the Property
   ✓ 6.2 estimated the *landslide hazard*
   ✓ 6.3 identified existing and anticipated future *elements at risk* on and, if required, beyond the Property
   ✓ 6.4 estimated the potential *consequences* to those *elements at risk*
7. Where the *Approving Authority* has adopted a *level of landslide safety* I have:
   ✓ 7.1 compared the *level of landslide safety* adopted by the *Approving Authority* with the findings of my investigation
   ✓ 7.2 made a finding on the *level of landslide safety* on the Property based on the comparison
   ✓ 7.3 made recommendations to reduce *landslide hazards* and/or *landslide risks*

8. Where the *Approving Authority* has **not** adopted a *level of landslide safety* I have:

___8.1 described the method of *landslide hazard analysis* or *landslide risk analysis* used

___8.2 referred to an appropriate and identified provincial, national or international guideline for *level of landslide safety*

___8.3 compared this guideline with the findings of my investigation

___8.4 made a finding on the *level of landslide safety* on the Property based on the comparison

___8.5 made recommendations to reduce *landslide hazards* and/or *landslide risks*

✓ 9. Reported on the requirements for future inspections of the Property and recommended who should conduct those inspections.

Based on my comparison between

Check one

☑ the findings from the investigation and the adopted *level of landslide safety* (item 7.2 above)

☐ the appropriate and identified provincial, national or international guideline for *level of landslide safety* (item 8.4 above)

I hereby give my assurance that, based on the conditions[1] contained in the attached *landslide assessment* report,

Check one

☐ for subdivision approval, as required by the Land Title Act (Section 86), "that the land may be used safely for the use intended"

Check one

☐ with one or more recommended registered covenants.

☐ without any registered covenant.

☑ for a development permit, as required by the Local Government Act (Sections 919.1 and 920), my report will "assist the local government in determining what conditions or requirements under [Section 920] subsection (7.1) it will impose in the permit".

☐ for a building permit, as required by the Community Charter (Section 56), "the land may be used safely for the use intended"

Check one

☐ with one or more recommended registered covenants.

☐ without any registered covenant.

☐ for flood plain bylaw variance, as required by the "Flood Hazard Area Land Use Management Guidelines" associated with the Local Government Act (Section 910), "the development may occur safely".

☐ for flood plain bylaw exemption, as required by the Local Government Act (Section 910), "the land may be used safely for the use intended".

JENNIFER ANDERSON, P.ENG
Name (print)

JULY 2, 2021
Date

Signature

[1] When seismic slope stability assessments are involved, *level of landslide safety* is considered to be a "life safety" criteria as described in the National Building Code of Canada (NBCC 2005), Commentary on Design for Seismic Effects in the User's Guide, Structural Commentaries, Part 4 of Division B. This states:

"The primary objective of seismic design is to provide an acceptable level of safety for building occupants and the general public as the building responds to strong ground motion; in other words, to minimize loss of life. This implies that, although there will likely be extensive structural and non-structural damage, during the DGM (design ground motion), there is a reasonable degree of confidence that the building will not collapse nor will its attachments break off and fall on people near the building. This performance level is termed 'extensive damage' because, although the structure may be heavily damaged and may have lost a substantial amount of its initial strength and stiffness, it retains some margin of resistance against collapse".

1965 MOSS COURT
Address

KELOWNA, BC V1Y 9L3

250 860 6540
Telephone

MAY 5, 2021

(Affix Professional seal here)

If the *Qualified Professional* is a member of a firm, complete the following.

I am a member of the firm INTERIOR TESTING SERVICES LTD.
and I sign this letter on behalf of the firm. (Print name of firm)

Appendix A

Test Pit Logs by Others (11 pages)

Project: Marshall Neighbourhood
Location: McCurdy Road & Mt. Baldy Road, Kelowna, BC
Client: Proventure Income Fund
Beacon Project No: 08-J00899

Log of Testpit TP-01

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0	0	***TOPSOIL*** silt, clayey, firm, dry, light brown.			
1		***CLAY*** some silt, firm to stiff, dessicated, dry to damp, dark grey brown.			
2					
3	1				
4			1A	G	● 20
5					
6		- to no silt, layered at 1.8m.	1B	G	● 40 (60–80)
7	2				
8			1C	G	● 40
9					
10	3		1D	G	● 40
11		- moist at 3.4m.			
		- fine to medium-grained sand layers, seepage at 3.5m.	1E	G	● 40
12		***END OF TESTPIT AT 3.6 METRES.*** MINOR SEEPAGE AT 3.5 METRES.			
13	4				
14					

Investigation Date: October 22, 2008
Contractor: On Trax Excavating
Equipment: Hitachi EX75 Tracked Excavator
Logged By: HF

Northing: 5530715
Easting: 326323
Elevation: 0
Figure No: B-01

Beacon Geotechnical Ltd.
201-1889 Spall Road,
Kelowna, B.C

Project: Marshall Neighbourhood
Location: McCurdy Road & Mt. Baldy Road, Kelowna, BC
Client: Proventure Income Fund
Beacon Project No: 08-J00899

Log of Testpit TP-02

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0	0	***TOPSOIL*** silt, loose, dry, brown.			
1		***CLAY*** some silt, firm to stiff, dessicated, dry to damp, dark grey brown.			
2					
3	1				
4		***SILT*** soft to firm, moist, grey brown.			
5			2A	G	
6					
7	2	***SAND AND GRAVEL*** fine to medium-grained sand, trace to some silt, rounded gravel, occasional cobbles, compact, damp, medium yellow brown.			
8			2B	G	●
9		***END OF TESTPIT ON BEDROCK AT 2.75 METRES.*** NO GROUNDWATER ENCOUNTERED.			
10	3				
11					
12					
13	4				
14					

Moisture Content: Percent — 20 40 60 80

Investigation Date: October 22, 2008
Contractor: On Trax Excavating
Equipment: Hitachi EX75 Tracked Excavator
Logged By: HF

Northing: 5530733
Easting: 326401
Elevation: 0
Figure No: B-02

Beacon Geotechnical Ltd.
201-1889 Spall Road,
Kelowna, B.C

Project: Marshall Neighbourhood
Location: McCurdy Road & Mt. Baldy Road, Kelowna, BC
Client: Proventure Income Fund
Beacon Project No: 08-J00899

Log of Testpit TP-03

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0		***TOPSOIL*** silt, loose, dry, light brown.			
1		***SAND AND GRAVEL*** fractured gravel, silty, compact, damp, medium yellow brown.			
2					
3	1	***SAND AND GRAVEL*** medium-grained sand, some to trace silt with increasing depth, occsaional rounded cobbles, compact, damp, medium yellow brown.			
4					
5					
6		***SAND AND GRAVEL (TILL)*** silty, dense, damp, grey brown.			
7	2				
8		***END OF TESTPIT ON DENSE TILL AT 2.4 METRES.*** NO GROUNDWATER ENCOUNTERED.			
9					
10	3				
11					
12					
13	4				
14					

Investigation Date: October 22, 2008
Contractor: On Trax Excavating
Equipment: Hitachi EX75 Tracked Excavator
Logged By: HF

Northing: 5530658
Easting: 326411
Elevation: 0
Figure No: B-03

Beacon Geotechnical Ltd.
201-1889 Spall Road,
Kelowna, B.C

Project: Marshall Neighbourhood
Location: McCurdy Road & Mt. Baldy Road, Kelowna, BC
Client: Proventure Income Fund
Beacon Project No: 08-J00899

Log of Testpit TP-04

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0		***TOPSOIL*** silt, loose, dry, light brown.			
1		***SILT*** some fine-grained sand, firm, dry to damp, light brown.			
2		***SAND AND GRAVEL*** fractured gravel, silty, compact, damp, medium yellow brown.			
3	1	***SAND AND GRAVEL*** to sand, some gravel, fine to medium-grained sand, silty, occasional cobbles, compact to dense at 1.4m, damp, medium yellow brown.			
4					
5			4A	G	●
6					
7	2				
8					
9					
10	3				
11		***END OF TESTPIT AT 3.35 METRES.*** NO GROUNDWATER ENCOUNTERED. POSSIBLE BEDROCK AT 2.4 METRES ON SOUTH END OF TESTPIT.			
12					
13	4				
14					

Moisture Content: Percent — 20 40 60 80

Investigation Date: October 22, 2008
Contractor: On Trax Excavating
Equipment: Hitachi EX75 Tracked Excavator
Logged By: HF

Northing: 5530590
Easting: 326369
Elevation: 0
Figure No: B-04

Beacon Geotechnical Ltd.
201-1889 Spall Road,
Kelowna, B.C

Project: Marshall Neighbourhood
Location: McCurdy Road & Mt. Baldy Road, Kelowna, BC
Client: Proventure Income Fund
Beacon Project No: 08-J00899

Log of Testpit TP-05

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0	0	***TOPSOIL*** silt, loose, dry, light brown.			
1		***SILT*** some fine-grained sand, firm, dry to damp, light to medium brown.			
3	1	***SAND AND GRAVEL*** to sand, some gravel, fine to medium-grained sand, silty, occasional cobbles, compact to dense at 1.4m, damp, medium yellow brown.			
10	3	***END OF TESTPIT AT 2.9 METRES.*** NO GROUNDWATER ENCOUNTERED.			

Moisture Content: Percent — 20 40 60 80

Investigation Date: October 22, 2008
Contractor: On Trax Excavating
Equipment: Hitachi EX75 Tracked Excavator
Logged By: HF

Northing: 5530585
Easting: 326305
Elevation: 0
Figure No: B-05

Beacon Geotechnical Ltd.
201-1889 Spall Road,
Kelowna, B.C

Project: Marshall Neighbourhood
Location: McCurdy Road & Mt. Baldy Road, Kelowna, BC
Client: Proventure Income Fund
Beacon Project No: 08-J00899

Log of Testpit TP-06

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0	0	***TOPSOIL*** silt, loose, dry, light brown.			
1		***SILT*** some fine-grained sand, firm, dry to damp, light to medium brown.			
5		***END OF TESTPIT ON BEDROCK AT 1.4 METRES.*** NO GROUNDWATER ENCOUNTERED.			

Moisture Content: Percent — 20, 40, 60, 80

Investigation Date: October 22, 2008
Contractor: On Trax Excavating
Equipment: Hitachi EX75 Tracked Excavator
Logged By: HF

Northing: 5530490
Easting: 326303
Elevation: 0
Figure No: B-06

Beacon Geotechnical Ltd.
201-1889 Spall Road,
Kelowna, B.C

Project: Marshall Neighbourhood
Location: McCurdy Road & Mt. Baldy Road, Kelowna, BC
Client: Proventure Income Fund
Beacon Project No: 08-J00899

Log of Testpit TP-07

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0	0	***TOPSOIL*** silt, loose, dry, brown.			
1		***CLAY*** some silt, firm to stiff, dessicated, dry to damp, dark grey brown.			
2					
3	1				
4					
5		- occasional fine-grained sand layers at 1.5m.			
6		***SILT*** firm to stiff, some fine-grained sand, occasional cobbles, damp, light grey brown.			
7	2				
8			7A	G	
9					
10	3	***END OF TESTPIT AT 3.0 METRES.*** NO GROUNDWATER ENCOUNTERED.			
11					
12					
13	4				
14					

Moisture Content: Percent — 20 40 60 80

Investigation Date: October 22, 2008
Contractor: On Trax Excavating
Equipment: Hitachi EX75 Tracked Excavator
Logged By: HF

Northing: 5530350
Easting: 326283
Elevation: 0
Figure No: B-07

Beacon Geotechnical Ltd.
201-1889 Spall Road,
Kelowna, B.C

Project: Marshall Neighbourhood
Location: McCurdy Road & Mt. Baldy Road, Kelowna, BC
Client: Proventure Income Fund
Beacon Project No: 08-J00899

Log of Testpit TP-08

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0		***TOPSOIL*** silt, loose, dry, brown.			
1		***SILT*** firm, damp, light to medium brown.			
2		***SAND AND GRAVEL*** silty, dense to very dense, damp, medium grey brown.			
3	1		8A	G	●
4		***SILT AND SAND*** some gravel, occasional cobbles, dry to damp, light to medium yellow brown.			
6	2				
7		***SAND AND GRAVEL*** some silt to silty, compact to dense, dry to damp, medium yellow brown.			
8		***END OF TESTPIT ON BOULDERS AT 2.6 METRES.*** NO GROUNDWATER ENCOUNTERED.			
9					
10	3				
11					
12					
13	4				
14					

Investigation Date: October 22, 2008
Contractor: On Trax Excavating
Equipment: Hitachi EX75 Tracked Excavator
Logged By: HF

Northing: 5530264
Easting: 326332
Elevation: 0
Figure No: B-08

Beacon Geotechnical Ltd.
201-1889 Spall Road,
Kelowna, B.C

Project: Marshall Neighbourhood
Location: McCurdy Road & Mt. Baldy Road, Kelowna, BC
Client: Proventure Income Fund
Beacon Project No: 08-J00899

Log of Testpit TP-09

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0		***TOPSOIL*** silt, loose, dry, brown.			
1		***SILT*** soft to firm, dry, occasional cobbles and boulders, light brown.			
2					
3	1				
4					
5					
6					
	2				
7		***SAND AND GRAVEL*** silty, compact to dense, damp, medium yellow brown.			
8					
9					
	3	***END OF TESTPIT AT 2.9 METRES.*** NO GROUNDWATER ENCOUNTERED.			
10					
11					
12					
13	4				
14					

Investigation Date: October 22, 2008
Contractor: On Trax Excavating
Equipment: Hitachi EX75 Tracked Excavator
Logged By: HF

Northing: 5530327
Easting: 326337
Elevation: 0
Figure No: B-09

Beacon Geotechnical Ltd.
201-1889 Spall Road,
Kelowna, B.C

Project: Marshall Neighbourhood
Location: McCurdy Road & Mt. Baldy Road, Kelowna, BC
Client: Proventure Income Fund
Beacon Project No: 08-J00899

Log of Testpit TP-10

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0	0	***TOPSOIL*** silt, loose, dry, brown.			
1		***SAND AND GRAVEL*** some silt to silty, compact to dense, dry to damp, light grey brown.			
3	1	***END OF TESTPIT ON BEDROCK AT 1.1 METRES.*** NO GROUNDWATER ENCOUNTERED.			
6	2				
9	3				
13	4				

Investigation Date: October 22, 2008
Contractor: On Trax Excavating
Equipment: Hitachi EX75 Tracked Excavator
Logged By: HF

Northing: 5530675
Easting: 326552
Elevation: 0
Figure No: B-10

Beacon Geotechnical Ltd.
201-1889 Spall Road,
Kelowna, B.C

Project: Marshall Neighbourhood
Location: McCurdy Road & Mt. Baldy Road, Kelowna, BC
Client: Proventure Income Fund
Beacon Project No: 08-J00899

Log of Testpit TP-11

Depth (ft)	Depth (m)	Description	Number	Type	Moisture Content (Percent)
0	0	Ground Surface			
0	0	***SAND*** medium-grained, some gravel, trace to some silt, loose to compact, dry to damp, light yellow brown.			
5		- trace gravel from 1.5m.			
7	2	***END OF TESTPIT AT 2.1 METRES.*** NO GROUNDWATER ENCOUNTERED. SLOUGHING FROM SURFACE.			
10	3				
13	4				

Moisture Content: Percent — 20 40 60 80

Investigation Date: October 22, 2008
Contractor: On Trax Excavating
Equipment: Hitachi EX75 Tracked Excavator
Logged By: HF

Northing: 5530736
Easting: 326561
Elevation: 0
Figure No: B-11

Beacon Geotechnical Ltd.
201-1889 Spall Road,
Kelowna, B.C

TERMS OF ENGAGEMENT

GENERAL

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

COMPENSATION

Charges for the Services rendered will be made in accordance with ITSL's Schedule of Fees and Disbursements in effect from time to time as the Services are rendered. All Charges will be payable in Canadian Dollars. Invoices will be due and payable by the Client within thirty (30) days of the date of the invoice without hold back. Interest on overdue accounts is 18% per annum, compounded monthly (19.6%)

REPRESENTATIVES

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

TERMINATION

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

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

ENVIRONMENTAL

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

PROFESSIONAL RESPONSIBILITY

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

LIMITATION OF LIABILITY

ITSL shall not be responsible for:

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

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

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

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

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

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

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

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

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

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

CONFIRMATION OF PROFESSIONAL LIABILITY INSURANCE
As required by by-laws of Engineers & Geoscientists British Columbia (EGBC), it is required that our firm advises whether or not Professional Liability Insurance is held. It is also required that a space for you to acknowledge this information be provided.

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

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

PRINT NAME:_____ DATE:_____

ACKNOWLEDGEMENT:_____