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Assessment of Parking Lot Subsurface Conditions
Jabulani Winery and Event Facility
8005 Jock Trail
Ottawa, Ontario

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Contents

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July 26, 2022

File: 101593.001

Jabulani Winery and Event Facility
8005 Jock Trail
Ottawa, Ontario
K0A 2Z0

Attention: Mr. Tom Moul

Re: Assessment of Parking Lot Subsurface Conditions
Jabulani Winery and Event Facility
8005 Jock Trail
Ottawa, Ontario

INTRODUCTION

This report presents the results of an assessment of the existing parking lot at Jabulani Winery and Event Facility (Jabulani) located at 8005 Jock Trail in rural Ottawa. Jabulani has applied to the City of Ottawa's Farm Diversification Program to allow it to host events such as weddings, catered private dinners and regularly scheduled events such as yoga and wine tastings. In response to this application, the City of Ottawa has requested that a number of studies be completed. One of these studies is for a geotechnical/slope stability investigation.

The existing Jabulani Winery consists of a 600 square metre single storey slab on grade building of post and beam construction. The building was constructed in 2013 under City of Ottawa Building Permit 1304497. On January 11, 2022, a virtual meeting was held with City of Ottawa staff. The purpose of this meeting was to discuss the scope of the various studies requested by the City. Given that the existing building was constructed 9 years ago with inspections by City of Ottawa staff and the structural engineer at various stages and considering that the foundation is supported on bedrock, it was agreed by Mr. Travis Smith, P.Eng. (City of Ottawa) that the geotechnical investigation could be limited to an assessment of the parking lot and comments regarding the potential for unstable slopes.

The assessment of the parking lot was carried out by means of a limited number of test pits advanced through the parking areas and access roadway.

PROJECT DESCRIPTION

The existing parking lot is about 30 by 60 metres, gravel surfaced and was constructed at the same time as the building. Access to the parking lot is by a gravel surfaced roadway connecting

to Jock Trail (see attached Site Plan – Figure 1). There are no planned expansions of the existing parking lot.

Site Geology

Surficial geology maps (Ontario Geologic Survey, 2010) indicate that the site is underlain by predominantly coarse-textured, foreshore to basinal, glaciomarine deposits of sand and gravel with minor silt and clay and the northern edge of the site is underlain by stone-poor silt to sand textured till.

Paleozoic bedrock geology mapping (Armstrong and Dodge, 2007) indicates that the subject site is underlain by dolostone, with minor shale and sandstone of the Oxford Formation (Beekmantown Group). A northwest-southeast oriented fault is located southwest of the subject site, which identifies sandstone, shale, limestone and dolostone of the Rockcliffe Formation.

Fill material associated with the existing development may also be present at the subject site.

METHODOLOGY

Subsurface Assessment

The field work for this assessment was carried out on May 2, 2022. At that time, five (5) test pits, numbered 22-01 to 22-05, respectively were advanced within the existing parking area to practical refusal on the underlying bedrock. Two additional test pits (22-06 and 22-07) were advanced outside of the parking area for septic design purposes. The results of those test pits are not discussed in this report. The test pits were advanced using a small track mounted backhoe supplied and operated by a licensed excavation contractor.

The subsurface conditions were identified based on visual and tactile examination of the materials exposed on the sides and bottom of the test pits. A sample of the crushed stone was obtained from test pit 22-04 and submitted to our laboratory for classification testing. The groundwater conditions in the open test pits were observed on completion of the test pits prior to backfilling. The test pits were backfilled with the excavated materials upon completion.

The results of the test pits are provided on the Record of Test Pit sheets in Attachment A. The approximate locations of the test pits are shown on the Site Plan, Figure 1. The laboratory testing results are provided on the Soils Grading chart, in Attachment B.

The test pit locations were selected by GEMTEC and positioned on site to cover the existing parking lot. The ground surface elevations at the location of the test pits were determined using a global positioning system. The elevations are referenced to geodetic datum (CGVD28) and are considered to be accurate to approximately 2 centimetres.

SUBSURFACE CONDITIONS

General

As previously indicated, the soil and groundwater conditions identified in the test pits are given on the Record of Test Pit sheets in Attachment A. The logs indicate the subsurface conditions at the specific test locations only. Boundaries between zones on the logs are often not distinct, but rather are transitional and have been interpreted. The precision with which subsurface conditions are indicated depends on the method of excavation, the frequency and recovery of samples, the method of sampling, and the uniformity of the subsurface conditions. Subsurface conditions at other than the test pit locations may vary from the conditions encountered in the test pits. In addition to soil variability, fill of variable physical and chemical composition can be present over portions of the site or on adjacent properties.

The soil descriptions in this report are based on commonly accepted methods of classification and identification employed in geotechnical practice. Classification and identification of soil involves judgement and GEMTEC does not guarantee descriptions as exact, but infers accuracy to the extent that is common in current geotechnical practice.

The groundwater conditions described in this report refer only to those observed at the place and time of observation noted in the report. Groundwater conditions may vary seasonally or as a consequence of construction activities in the area.

The following presents an overview of the subsurface conditions encountered in the test pits.

Crushed Stone Fill

All of the test pits encountered grey crushed stone fill at the parking lot surface. The crushed stone fill varies in thickness from 100 millimetres at test pit 22-02 to 400 millimetres at test pit 22-04. The average thickness of the surficial crushed stone at the test pit locations is 260 millimetres. The results of a grain size distribution analysis carried out on a grab sample obtained from test pit 22-04 is provided in Attachment A. The sample tested is slightly outside of the gradation envelope for Ontario Provincial Standard Specifications (OPSS) for Granular A.

Blast Rock Fill

Grey coarse blast rock fill was encountered at test pits 22-03 to 22-05. The blast rock fill has a thickness of 200 millimetres at test pit 22-03, 400 millimetres at test pit 22-04 and 500 millimetres at test pit 22-05. The blast rock fill material was observed to be reasonably broadly graded.

Glacial Till

Test pits 22-01 to 22-03 inclusive encountered a deposit of glacial till. The glacial till is a mixture of all grain sizes but at this site may be described as light grey brown sandy silt with variable amounts of gravel and cobbles. Based on the effort to excavate this material, the glacial till has

an estimated compact relative density. The thickness of the glacial till ranges from 300 to 400 millimetres at the test pit locations.

Bedrock

All of the test pits were terminated upon practical refusal to further excavating on the surface of the underlying bedrock formation. At test pit 22-01, the upper 200 millimetres of the bedrock was fractured and could be excavated. Practical refusal on the bedrock surface was realized at depths ranging from 0.5 to 0.8 metres (elevation 105.5 to 105.8 metres, geodetic datum).

Groundwater Conditions (Time of Investigation)

The groundwater conditions in the open test pits were observed prior to backfilling. Groundwater seepage was observed in the test pits at between 0.2 and 0.8 metres below existing grade (elevations 105.5 to 106.1 metres, geodetic). Test pit 22-02 was dry to elevation 105.8 metres, geodetic datum.

It should be noted that the groundwater levels may be higher during wet periods of the year such as the early spring or following periods of precipitation.

GEOTECHNICAL ASSESSMENT OF PARKING LOT STRUCTURE

General

The parking lot at Jabulani Winery is used on an infrequent basis, typically 14 to 18 times a year and mostly during the summer and fall seasons. Vehicle traffic during these events consists of cars and light trucks. There is also periodic heavy truck traffic such as septic haulage trucks and food delivery trucks. Gravel surfaced parking lots such as this typically require about 200 to 300 millimetres of suitable crushed stone over a competent soil subgrade in order to perform satisfactorily. Heavy truck traffic such as fire truck routes should have at least 400 millimetres of suitable crushed stone over a competent soil subgrade particularly during weak subgrade seasons such as the early spring.

Assessment of Existing Parking Lot Structure

It is understood that there have been no issues with vehicle trafficability in the existing parking lot during the past nine years. This includes the periodic heavy truck traffic described above. Using the methods described in the Ministry of Transportation (MTO) – 'Pavement Design and Rehabilitation Manual', the Granular Base Equivalency (GBE) of the parking lot for light vehicular traffic should be 200 to 300 millimetres; that for fire truck access routes should be about 380 millimetres. The GBE for the existing parking lot is:

Test pit 22-01	300 millimetres[1]
Test pit 22-02	100 millimetres[1]

Test pit 22-03	360 millimetres[1]
Test pit 22-04	720 millimetres[1]
Test pit 22-05	700 millimetres[1]

Note 1: Using a granular equivalency factor of 1.0 for Granular A and 0.8 for blast rock.

For the most part, the existing granular parking structure is considered to be adequate for light vehicle usage as well as for heavy truck traffic. The exception is at the location of test pit 22-02 where the granular material thickness is only 100 millimetres. To increase the GBE in the vicinity of test pit 22-02 to an acceptable level for heavy truck traffic and fire trucks, consideration could be given to placing an additional 300 millimetres of OPSS Granular A material. To avoid irregularities in the parking lot surface, the Granular A should be placed thinly near Jock Trail and gradually thickening towards test pit 22-02 and then progressively thinning towards test pits 22-03.

The slight deviation in the granular sample which was tested from meeting OPSS Granular A specifications is not considered to have an impact on the performance of this parking facility.

SLOPE STABILITY CONSIDERATIONS

The area around the Jabulani Winery and Event Centre consists of flat fields and vineyards. The closest slope which is more than about 1 metre in height is located along the Jock River, some 230 metres from the Winery building. The slopes along the Jock River in this vicinity are not considered to be unstable. As such, in GEMTEC's opinion, there are no issues with unstable slopes affecting this facility.

LIMITATIONS

The information provided in this report is for Jabulani Winery and the City of Ottawa only. Any future works which utilizes this information is outside of the scope of this investigation and should be discussed with GEMTEC at the preliminary design stage.

Furthermore, the presence or implications of possible surface and/or subsurface contamination resulting from previous uses or activities of this site or adjacent properties, and/or resulting from the introduction onto the site from materials from offsite sources have not been investigated or addressed.

We trust this report provides sufficient information for your present purposes. If you have any questions concerning this report, please do not hesitate to contact our office.

A.C. Houle, M.Eng.,P.Eng.
Senior Geotechnical Engineer

Attachment A: List of Abbreviations and Terminology
Record of Test Pit Sheets
Laboratory Test Sheets

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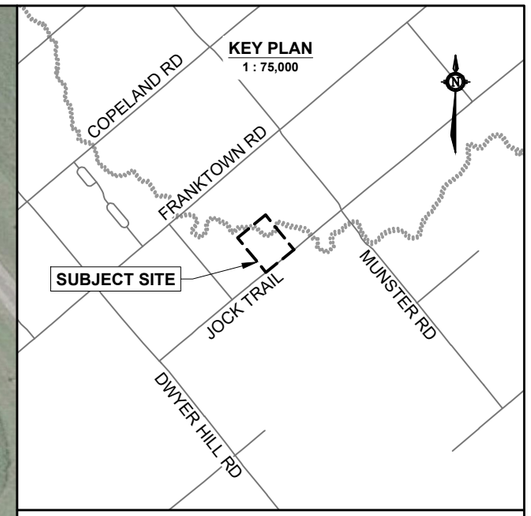

LEGEND

- TP # / XX.XX — TEST PIT ID; GROUND SURFACE ELEVATION, IN METRES GEODETIC DATUM
- TEST PIT LOCATION (current investigation by GEMTEC)
- APPROXIMATE PROPERTY BOUNDARY
- DITCH

Scale 1:1500

0 30 60 90m

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Drawing: SITE PLAN

Client: JABULANI WINERY

Project		
101593.001		JABULANI WINERY 8005 JOCK TRAIL AOTTAWA, ONTARIO
Drwn by: S.L.	Chkd by: B.W.	
Date: JULY, 2022	Rev.: 0	FIGURE 1

N:\PROJECTS\101500\101593.001\DRAFTING\1.DRAWINGS\101593.001_SP_R0_2022-05.DWG

ATTACHMENT A

List of Abbreviations and Terminology
Record of Test Pit Sheets
Laboratory Test Sheets

LIST OF ABBREVIATIONS AND TERMINOLOGY

SAMPLE TYPES

AS auger sample
CA casing sample
CS chunk sample
BS Borros piston sample
DO drive open
MS manual sample
RC rock core
ST slotted tube
TO thin-walled open Shelby tube
TP thin-walled piston Shelby tube
WS wash sample

PENETRATION RESISTANCE

Standard Penetration Resistance, N

The number of blows by a 63.5 kg hammer dropped 760 millimetre required to drive a 50 mm drive open sampler for a distance of 300 mm. For split spoon samples where less than 300 mm of penetration was achieved, the number of blows is reported over the sampler penetration in mm.

Dynamic Penetration Resistance

The number of blows by a 63.5 kg hammer dropped 760 mm to drive a 50 mm diameter, 60° cone attached to 'A' size drill rods for a distance of 300 mm.

WH

Sampler advanced by static weight of hammer and drill rods.

WR

Sampler advanced by static weight of drill rods.

PH

Sampler advanced by hydraulic pressure from drill rig.

PM

Sampler advanced by manual pressure.

SOIL TESTS

C consolidation test
H hydrometer analysis
M sieve analysis
MH sieve and hydrometer analysis
U unconfined compression test
Q undrained triaxial test
V field vane, undisturbed and remoulded shear strength

SOIL DESCRIPTIONS

Relative Density	'N' Value
Very Loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	over 50

Consistency	Undrained Shear Strength (kPa)
Very soft	0 to 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very Stiff	over 100

LIST OF COMMON SYMBOLS

c_u undrained shear strength
e void ratio
C_c compression index
c_v coefficient of consolidation
k coefficient of permeability
I_p plasticity index
n porosity
u pore pressure
w moisture content
w_L liquid limit
w_P plastic limit
ϕ^1 effective angle of friction
γ unit weight of soil
γ^1 unit weight of submerged soil
σ normal stress

RECORD OF TEST PIT 22-01

CLIENT: Jabulani Winery
PROJECT: Jabulani Winery, 8005 Jock Trail, Ottawa, Ontario
JOB#: 101593.001
LOCATION: See Septic Design Plan, Figure 1

SHEET: 1 OF 1
DATUM: Unknown
BORING DATE:

DEPTH SCALE METRES	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLE NUMBER	SAMPLE TYPE	SHEAR STRENGTH (Cu), kPA (+ NATURAL, ⊕ REMOULDED) / WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	WATER LEVEL IN OPEN TEST PIT OR STANDPIPE INSTALLATION
0	Ground Surface		106.3			10 20 30 40 50 60 70 80 90		Native backfill
	Grey crushed stone (FILL)		106.0 / 0.3					
	Light grey brown sandy silt with gravel and cobbles (GLACIAL TILL)		105.7 / 0.6					
	Fractured LIMESTONE BEDROCK		105.5 / 0.8					
	Refusal on Bedrock Water seepage at 0.8 metres depth							
1								
2								
3								

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CHECKED: C.H.

GEO - TESTPIT LOG 101593.001_SEPTICDESIGN_TP_2022-06.GPJ GEMTEC 2018.GDT 6/28/22

RECORD OF TEST PIT 22-02

CLIENT: Jabulani Winery
PROJECT: Jabulani Winery, 8005 Jock Trail, Ottawa, Ontario
JOB#: 101593.001
LOCATION: See Septic Design Plan, Figure 1

SHEET: 1 OF 1
DATUM: Unknown
BORING DATE:

DEPTH SCALE METRES	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLE NUMBER	SAMPLE TYPE	SHEAR STRENGTH (Cu), kPA (+ NATURAL, ⊕ REMOULDED) / WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	WATER LEVEL IN OPEN TEST PIT OR STANDPIPE INSTALLATION
0	Ground Surface		106.3			10 20 30 40 50 60 70 80 90		Native backfill
	Grey crushed stone (FILL)		106.2 / 0.1					
	Light grey sandy silt with gravel and cobbles (GLACIAL TILL)		105.8 / 0.5					
	Refusal on Bedrock Test Pit Dry							
1								
2								
3								

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CHECKED: C.H.

GEO - TESTPIT LOG 101593.001_SEPTICDESIGN_TP_2022-06.GPJ GEMTEC 2018.GDT 6/28/22

RECORD OF TEST PIT 22-03

CLIENT: Jabulani Winery
PROJECT: Jabulani Winery, 8005 Jock Trail, Ottawa, Ontario
JOB#: 101593.001
LOCATION: See Septic Design Plan, Figure 1

SHEET: 1 OF 1
DATUM: Unknown
BORING DATE:

DEPTH SCALE METRES	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLE NUMBER	SAMPLE TYPE	SHEAR STRENGTH (Cu), kPA (+ NATURAL, ⊕ REMOULDED) / WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	WATER LEVEL IN OPEN TEST PIT OR STANDPIPE INSTALLATION
0	Ground Surface		106.3			10 20 30 40 50 60 70 80 90		Native backfill
	Grey crushed stone (FILL)		106.1 / 0.2					
	Grey blast rock (FILL)		105.9 / 0.4					
	Light grey sandy silt with gravel and cobbles (GLACIAL TILL)		105.5 / 0.8					
	End of Test Pit Water seepage at 0.36 metres depth							
1								
2								
3								

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GEO - TESTPIT LOG 101593.001_SEPTICDESIGN_TP_2022-06.GPJ GEMTEC 2018.GDT 6/28/22

RECORD OF TEST PIT 22-04

CLIENT: Jabulani Winery
PROJECT: Jabulani Winery, 8005 Jock Trail, Ottawa, Ontario
JOB#: 101593.001
LOCATION: See Septic Design Plan, Figure 1

SHEET: 1 OF 1
DATUM: Unknown
BORING DATE:

DEPTH SCALE METRES	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLE NUMBER	SAMPLE TYPE	SHEAR STRENGTH (Cu), kPA (+ NATURAL, ⊕ REMOULDED) / WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	WATER LEVEL IN OPEN TEST PIT OR STANDPIPE INSTALLATION
0	Ground Surface		106.4			10 20 30 40 50 60 70 80 90		Native backfill
	Grey crushed stone (FILL)							
			106.0 / 0.4					
	Grey blast rock (FILL)							
			105.5 / 0.8					
	Refusal on Bedrock Water seepage at 0.4 metres depth							
1								
2								
3								

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GEO - TESTPIT LOG 101593.001_SEPTICDESIGN_TP_2022-06.GPJ GEMTEC 2018.GDT 6/28/22

RECORD OF TEST PIT 22-05

CLIENT: Jabulani Winery
PROJECT: Jabulani Winery, 8005 Jock Trail, Ottawa, Ontario
JOB#: 101593.001
LOCATION: See Septic Design Plan, Figure 1

SHEET: 1 OF 1
DATUM: Unknown
BORING DATE:

DEPTH SCALE METRES	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLE NUMBER	SAMPLE TYPE	SHEAR STRENGTH (Cu), kPA (+ NATURAL, ⊕ REMOULDED) / WATER CONTENT, % (W_P, W, W_L)	ADDITIONAL LAB. TESTING	WATER LEVEL IN OPEN TEST PIT OR STANDPIPE INSTALLATION
0	Ground Surface		106.3			10 20 30 40 50 60 70 80 90		Native backfill
	Grey crushed stone (FILL)							
			106.0 / 0.3					
	Blast rock (FILL)							
			105.5 / 0.8					
	Refusal on Bedrock Water seepage at 0.24 metres depth							
1								
2								
3								

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GEO - TESTPIT LOG 101593.001_SEPTICDESIGN_TP_2022-06.GPJ GEMTEC 2018.GDT 6/28/22

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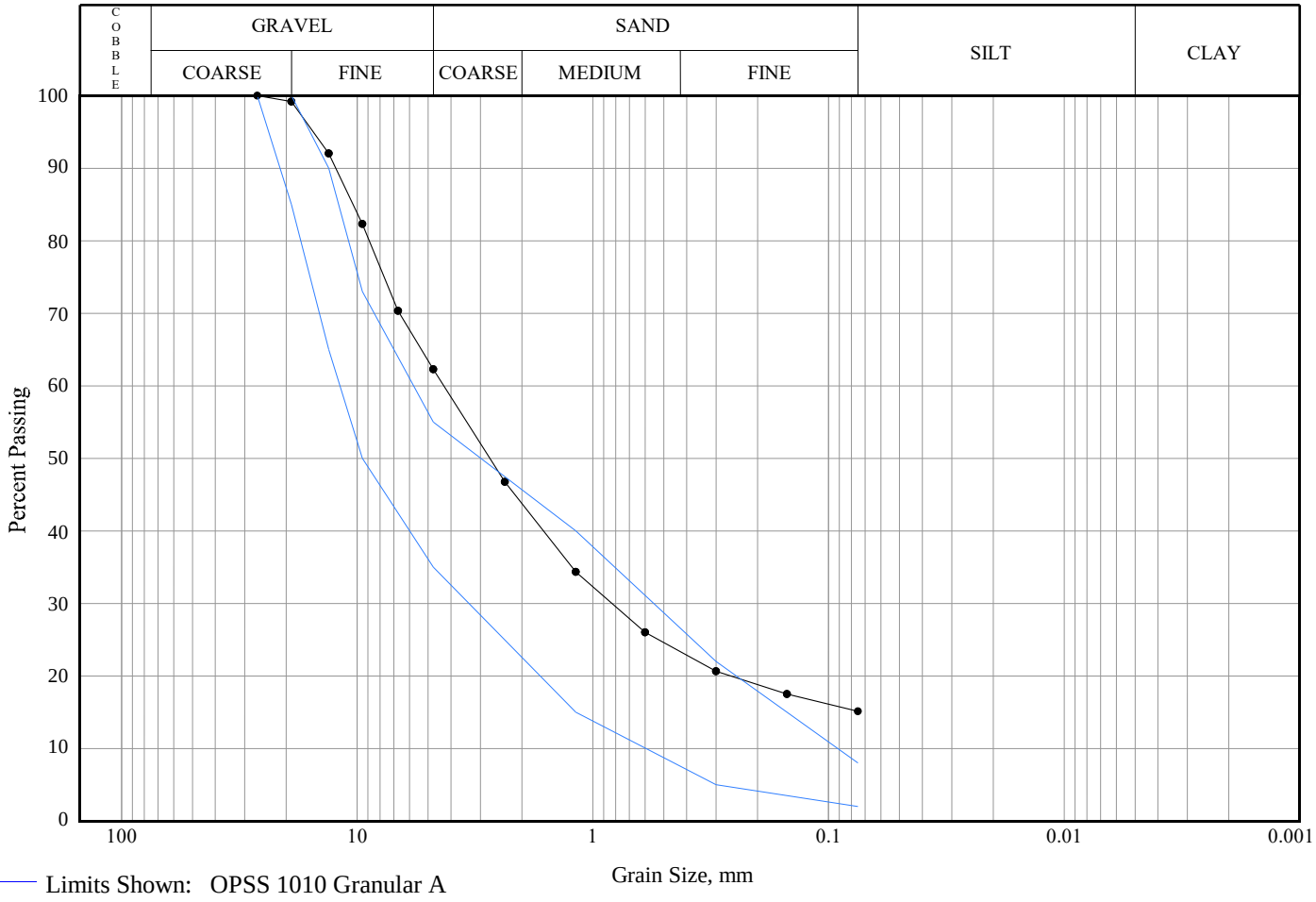
Client:	Jabulani Winery
Project:	Geotechnical, Groundwater Impact and Hydrogeological
Project #:	101593001

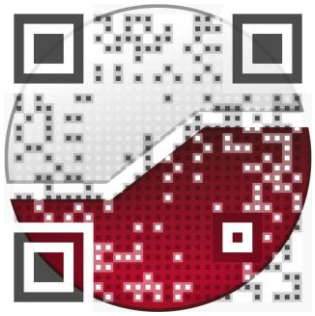
Soils Grading Chart



Line Symbol	Sample	Borehole/ Test Pit	Sample Number	Depth	% Cob.+ Gravel	% Sand	% Silt	% Clay
—●—		TP22-04	GS 1		37.7	47.2	15.1	

Line Symbol	CanFEM Classification	USCS Symbol	D_{10}	D_{15}	D_{30}	D_{50}	D_{60}	D_{85}	% 5-75µm
—●—	Sand and gravel , some silt	N/A	---	---	0.83	2.73	4.29	10.41	---

experience • knowledge • integrity



civil	civil
geotechnical	géotechnique
environmental	environnementale
field services	surveillance de chantier
materials testing	service de laboratoire des matériaux

expérience • connaissance • intégrité