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Reg No. 99 / 07828 / 07

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**Attention: Mr. A van der Westhuizen**

Sonskyn Kunsmis (Pty) Ltd  
P O Box 1380  
**STANDERTON**  
2430

Ons Verw/Our ref:

**SonskynK**

Date/Datum: 07/11/2015

Sir

re: **SOIL PROFILE PROPOSED WAREHOUSE SITE, HOLFONTEIN PORTION 4, HOLMDENE**

Test pits were done on the 18<sup>th</sup> October 2016 to the north and south of the proposed development. The soil profile of both test pits was very similar although the clayey soil of the test pit on the southern side was somewhat deeper and more active than the test pit on the northern side.

Hereby included is a laboratory test done by Accutest to determine the properties of the subsoil. The following were noted and are certified herewith:

Soil Profile

1. The mean soil profile consist of dark brown slicken sided active silty clay up to a depth of  $\pm 1.2\text{m}$  at the northern test pit and  $\pm 1.8\text{m}$  at the southern test pit where after the colour of the clayey soil becomes grey.
2. Both test pits were dug up to a depth of  $\pm 2\text{m}$ . No water table was found although the soil was moist.
3. The plasticity index of the northern test pit is 12 and the southern test pit 20. The activity of the soil can be classified as low to medium although the silty/clayey content is quite high with 80% and 72% passing through the 0.075mm sieve.
4. The area on the northern side where the test pit had been excavated is covered with a brick layer (old brick factory) which means that moisture fluctuation was curbed. The southern test pit had no cover and it was expected that the soil in this area could have been somewhat dryer due to the time of the year and more evaporation. Moisture content was however very similar which means that expected differential movement of subsoil between the northern and southern side will be limited.

Proposed Foundations

1. The maximum point load of the proposed warehouse building will be  $\pm 50\text{kN}$ . The load is calculated for a building 25m wide, portal frames at 5m centres with 5m high sheeting covered sides. If a 1.2x1.2 concrete base is used, the load on the soil will be 35kPa.

2. The point load of portal frames will stay more or less the same if sides are replaced with brickwork. Load of a 5m high brick wall will be 24.2kN/m. With a foundation width of 0.6m, the load on the soil from the brickwork will be 58kPa and for a 0.75m foundation 32kPa. If the maximum load of the mentioned loads is doubled, the load becomes  $\pm 70$ kPa.
3. According to SANS 10161 the safe bearing capacity of soft sandy or silty clays varies between 50-100kPa when submerged. It is thus safe to assume that the insitu soil is capable to support the proposed warehouse with either sheet- or brick wall sides. It is however important to keep the moisture content stable. Adequate storm water drainage must be ensured in order to prevent or curb severe moisture changes in the subsoil with subsequent differential expansion/contraction.

#### Flood line 1/100 Year

1. A catchment area of  $\pm 450$ ha was calculated by using Google Earth and the watershed around the proposed site to determine the 1/100 flood line. With a 1/100 year rainfall occurrence, rainfall intensity is  $\pm 120$ mm/hour.
2. With the above mentioned parameters, maximum flow adjacent to the proposed development can be 60m<sup>3</sup>/s. This flow relates to a high water mark  $\pm 75$ m from the middle of the lowest point of the waterway or  $\pm 65$ m from the edge of the proposed development. It can be certified that a flood with an interval occurrence of 1/100 years will not have an influence on the development.

Further information will be submitted on request.

Yours Faithfully



**A.F. PRETORIUS**  
for KBK Engineers (Pty) Ltd

Customer : KBK ENGINEERS		Job Number :	
Job Description : HOLMDENE SONSKYN KUUSMIS		Contract Number :	
Road Number :		Date : 2016-10-26	
<b>SAMPLE DESCRIPTION</b>			
Sample Number	00030	00031	
Sample Position	SOUTH	NORTH	
Sample Depth (mm)			
Material Description	CLAY CLAY	CLAY CLAY	
Max size of boulder (mm)			
<b>SCREEN ANALYSIS (% PASS)</b>			
75.00 mm	100	100	
63.00 mm	100	100	
53.00 mm	100	100	
37.50 mm	100	100	
25.00 mm	100	100	
19.00 mm	100	100	
13.20 mm	100	100	
4.750 mm	100	100	
2.000 mm	100	100	
0.425 mm	80	88	
0.075 mm	80	72	
<b>SOIL MORTAR</b>			
Coarse Sand 2,000-0,425	2	1	
Coarse Fine Sd 0,425-0,250	3	3	
Medium Fine Sd 0,250-0,150	5	6	
Fine Fine Sand 0,150-0,075	10	15	
Material <0,075	80	72	
<b>CONSTANTS</b>			
Grading Modulus	0,22	0,30	
Liquid Limit	43	37	
Plasticity Index	20	12	
Linear Shrinkage (%)	10,0	5,0	
Sand Equivalent			
Classification - TRB	A-7-6 (10)	A-6 (0)	
Classification - CGLTO			
<b>CBR / UCS VALUES</b>			
<b>MOD. AASHTO</b>			
Max Dry Density (kg/m <sup>3</sup> )			
Optimum Moisture Cont (%)			
Moulding Moisture Cont (%)			
Dry Density (kg/m <sup>3</sup> )			
% of Max Dry Density			
100% Mod CBR/UCS			
% Swell			
<b>NRB</b>			
Dry Density (kg/m <sup>3</sup> )			
% of Max Dry Density			
100% NRB CBR/UCS			
% Swell			
<b>PROCTOR</b>			
Dry Density (kg/m <sup>3</sup> )			
% of Max Dry Density			
100% Proc CBR/UCS			
% Swell			
<b>CBR / UCS VALUES</b>			
100% Mod AASHTO			
98% Mod AASHTO			
97% Mod AASHTO			
85% Mod AASHTO			
83% Mod AASHTO			
80% Mod AASHTO			

