



LENNERTVILLE
PROPOSED NEW CEMETERY

REPORT ON
STORM WATER DRAINAGE &
GEOTECHNICAL CONDITIONS

PREPARED FOR:

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1. BACKGROUND

Kai !Garib Municipality appointed Stabilis Development (Pty) Ltd to conduct a feasibility study for the development of a new cemetery for the town of Lennertsville.

MIG funding was approved to conduct the feasibility study. The feasibility study also includes the subdivision and rezoning and the required EIA requirements of the portion of land required for a new cemetery.

An application for the funding of the capital costs involved for the development of the proposed new cemetery will be lodged at the Department of Corporate Governance, Human Settlements and Traditional Affairs on the MIG program.

2. INTRODUCTION

The town of Lambertville is located approximately 12 Kilometres to the south of Keimoes, one of the main centres of Kai !garib Municipality.

The existing cemetery at Lennertsville is situated in the town of Lennertville and adjacent to a natural major storm water drainage channel and therefore prone to flooding during heavy rains in the catchment area.

The existing cemetery is also approximately 95 % full and a new cemetery is required to meet the needs of the Lennertville Community.

This report addresses the storm water drainage, external and internal, and the geotechnical conditions at the portion of land identified for the new proposed cemetery at Lennertsville.

3. GENERAL INFORMATION

The portion of land identified for the development of the proposed new cemetery is located approximately 500 meters to the south of the Lennertville town on plot 173/34. This portion of land was sold to Kai !Garib Municipality by the owner, J Hanekom Boerdery.

The portion of land identified is indicated in the attached Annexure A, drawing SK 2278/4. This portion of land is approximately 3,25 Hectares and can accommodate an estimated total number of 4 465 graves – 3 484 adult and 981 children graves respectively.

Water will be supplied from the Lennertsville town and a new access road will form part of the development of the new proposed cemetery.

4. STORM WATER AND GEOTECHNICAL

The prevailing storm water and geotechnical conditions at the site identified for a new cemetery at Lennertsville are described in the following paragraphs.

4.1 Storm Water Drainage

4.1.1 Climatic Conditions

The mean annual rainfall in this area is approximately 169 mm per year according to the rainfall statistics of the weather station, station number 0317/447AX, at Upinton.

This area falls within the summer rainfall region of South Africa with approximately 80% of the annual rainfall that occurs normally from January to April. Thunderstorms are typical of the rainfall pattern in this area.

4.1.2 Catchment Characteristics

The percentage run-off in this area is expected to be relatively high due to the scarce vegetation and the semi-permeable soil.

Normally the run-off from rain storms is concentrated in natural storm water drains or channels that flow down to the Orange River.

The natural gradient of the land where the site is located is approximately 1:800. The run-off from this land, and the identified site, can thus be easily accommodated by the natural gradient and be accommodated in the natural drainage channels in the area.

4.1.3 Suitability of Site

The identified site is suitable for the development of a new cemetery as far as the external storm water drainage is concerned. No natural channels that can cause flooding of the site are adjacent to the site and the run-off from the land in the upper catchment area will be accommodated by the natural gradient of the land.

The drainage of the internal storm water will be addressed at the design and the development of the new proposed cemetery. Small earth embankments or open drains can be constructed on the southern side of the new cemetery to prevent storm water from flowing into the cemetery and to drain any run-off that originates from the new cemetery site.

4.2 Geotechnical

4.2.1 General Geological Information

The area is mainly characterised by intrusive rock that mainly entails Vaalputs Granite and Quarts-feldspar gneiss. The granite is normally a hard rock in the un-weathered state.

4.2.1 Site Conditions

A test hole was excavated by means of a TLB excavator hired from Mega Construction during the week of 13 June 2011. The TLB is a relative small plant with limited excavation capacity.

The test hole was excavated up to a depth of approximately 1,0 meter below natural ground level without any difficulty. The upper 600 mm was identified as stiff red soil and the next 400 mm in the profile hard calcrete gravel. The excavated test hole indicated stable soil conditions with red sandy soil at the upper zone of the test hole.

Intermediate material or hard rock may be encountered below a level of 1,0m

The profile of this test hole is shown in Annexure B.

4.2.3 Suitability of Site

As far as the geotechnical conditions are concerned, the site is suitable for the development of a new cemetery, but it is recommended that the graves be pre-excavated to the required depth of 1,8 meter. The pre-excavation of the graves are normally done where hard materials are encountered and the cost thereof is then part of the development costs of the cemetery.

5. REMARKS AND RECOMMENDATIONS

The following remarks recommendations regarding the storm water and geotechnical conditions are relevant;

5.1 Storm Water Drainage

The identified site can be regarded as suitable for a cemetery as far as the external and internal storm water drainage is concerned.

It is recommended that a small earth embankment or berm, of approximately 300mm in height, be constructed on the southern side of the site to prevent external storm water flowing onto the site. The internal storm water drainage can be accommodated by shaping the roads on the site.

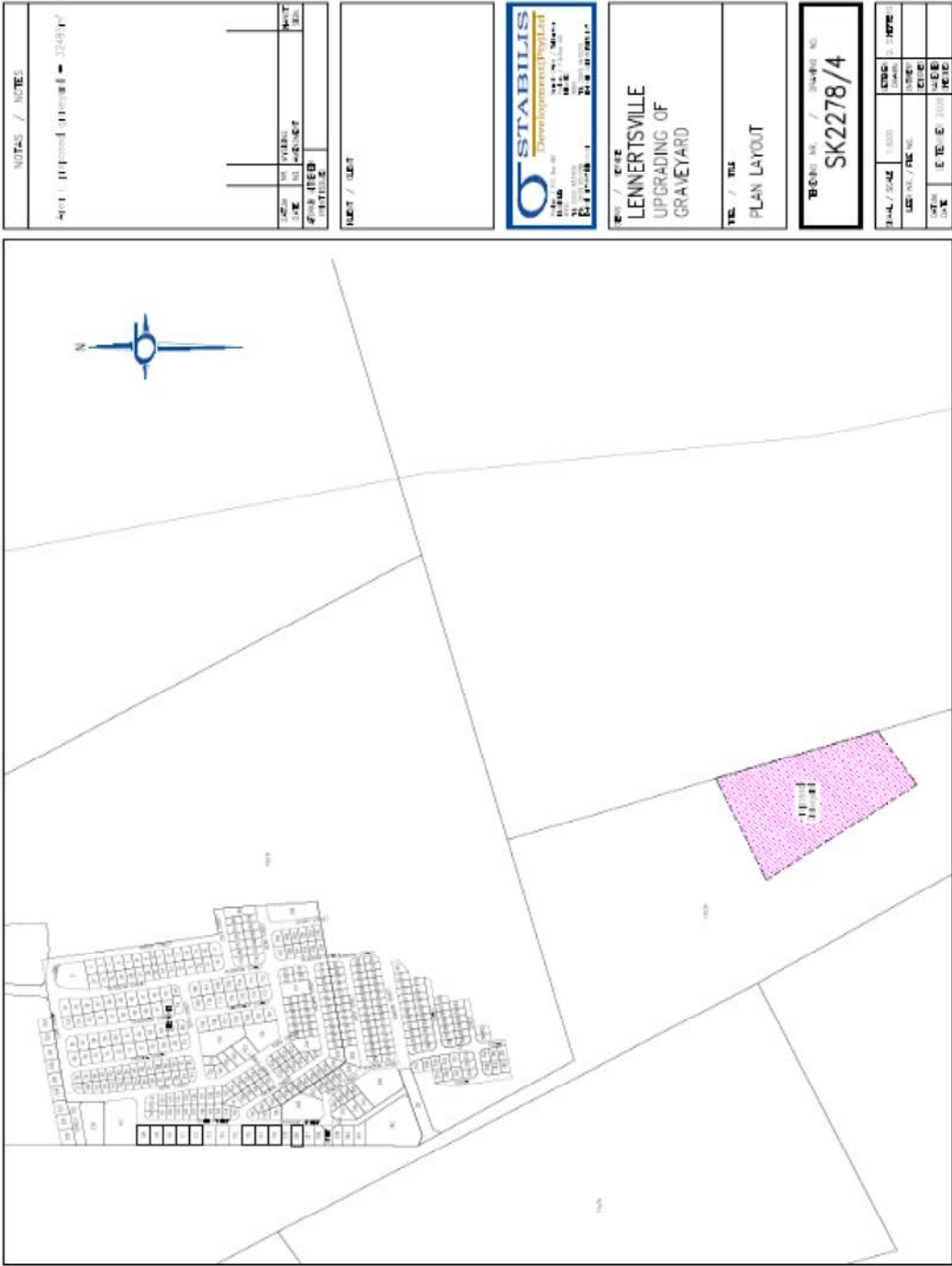
5.2 Geotechnical Conditions

The test hole excavated on the site indicated that hard material may be encountered at a depth of more than 1 meter below natural ground level. This material is typical of this area and therefore it is recommended that the graves be pre-excavated as part of the development of the new cemetery.

C.J Botha Pr.Eng
Stabilis Development (Pty) Ltd

ANNEXURE A

LOCALITY PLAN



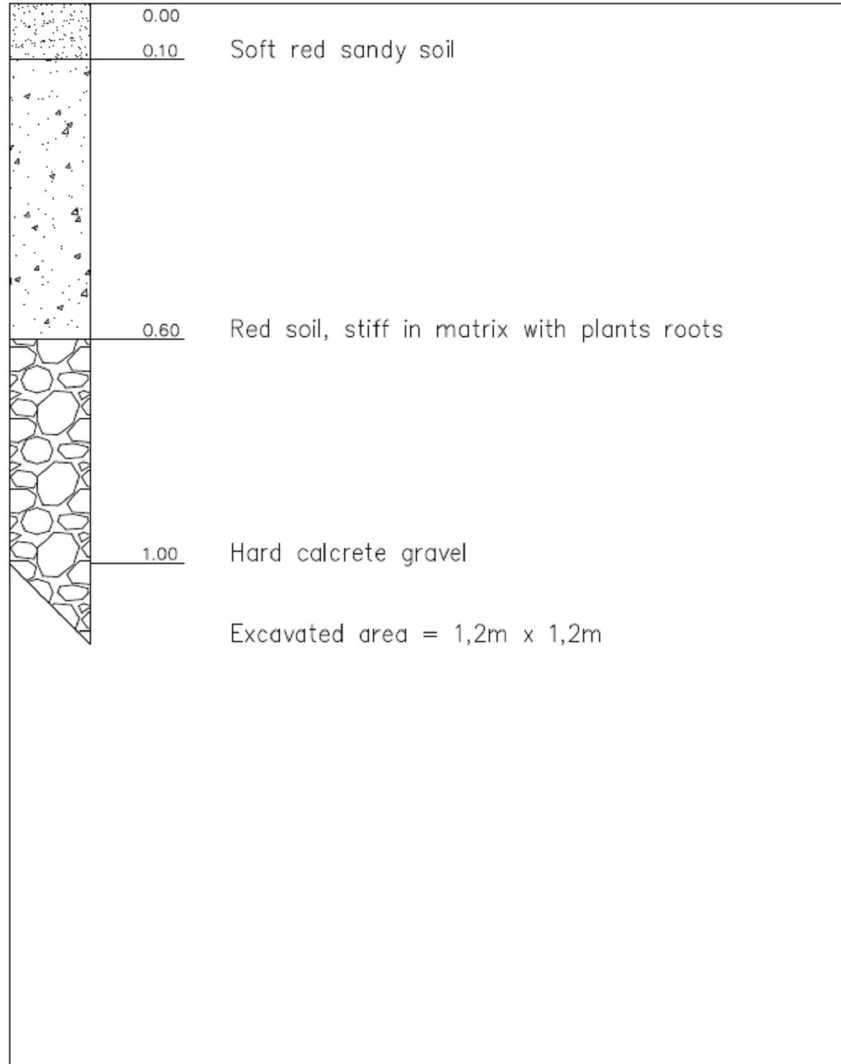
ANNEXURE B

TEST HOLE PROFILE

KAI! GARIEB MUNICIPALITY:
LENNERTSVILLE

HOLE No: 1

Scale 1:10



TEST HOLE PROFILE

DATE: Mar 2012

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ANNEXURE C

Photograph of Test Hole



Lennertsville Test Hole