



CILLIE
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 Cillie.

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 Cillie is located approximately 15 Kilometres to the north-West of Kakamas, the main centre of Kai !Garib Municipality.

The existing three cemeteries at Cillie are situated in the town of Cillie and are almost full. The cemetery currently in use is approximately 90 % full.

Therefore a new cemetery is required to meet the needs of the Cillie 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 Cillie.

3. GENERAL INFORMATION

The portion of land identified for the development of the proposed new cemetery is located adjacent to one of the existing cemeteries, approximately 250meters from the town. This land belongs to Kai !Garib Municipality.

A total of 100 new plots are planned for the extension of the town to meet the housing shortage in this area.

The site identified is indicated in the attached Annexure A, drawing SK 2278/1. This portion of land is approximately 0.40 Hectares and can accommodate an estimated total number of 404 graves – 294 adult and 110 children graves respectively.

Water will be supplied from the Cillie 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 Cillie 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 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.

The new identified site is situated adjacent to an existing cemetery on a higher level than the existing natural storm water channels in the area and flooding of the proposed new cemetery is not likely to occur.

The drainage of the internal storm water will be addressed at the design and the development of the new proposed cemetery. An earth embankment can be constructed on the north-eastern 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 1,1 meter below natural ground level without any difficulty. The upper 100 mm was identified as sandy red soil and the next 1 000 mm in the profile entails stiff red soil with weathered granite gravel in the matrix. The excavated test hole indicated stable soil conditions with stiff red sandy soil mixed with weathered granite in the profile.

Intermediate material or hard rock may be encountered below a level of 1,2m.

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 north-eastern 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 1,20 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

NOTAS / NOTES

Area : existing graveyard = 8696m²
 proposed graveyard = m²

DATUM DATE	NR. WYSGIC NO.	AMENDMENT	HANDT. SIGN.
AFRIK UITSEERK PRINT ISSUED			

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DIENS / SERVICE
CILLIE
 UPGRADING OF GRAVEYARD
 TITEL / TITLE
 PLAN LAYOUT

TEKENING NR. / DRAWING NO.
SK2278/2

SKAAL / SCALE	1:5000	SEKON. SKRYW. O. SCHEFFERS
LEER NR. / FILE NO.		ONTWERP DESIGER
DATUM DATE	SEPTEMBER 2009	NAKESSEN NAKESSEN
		REGISTR. (REGIS)



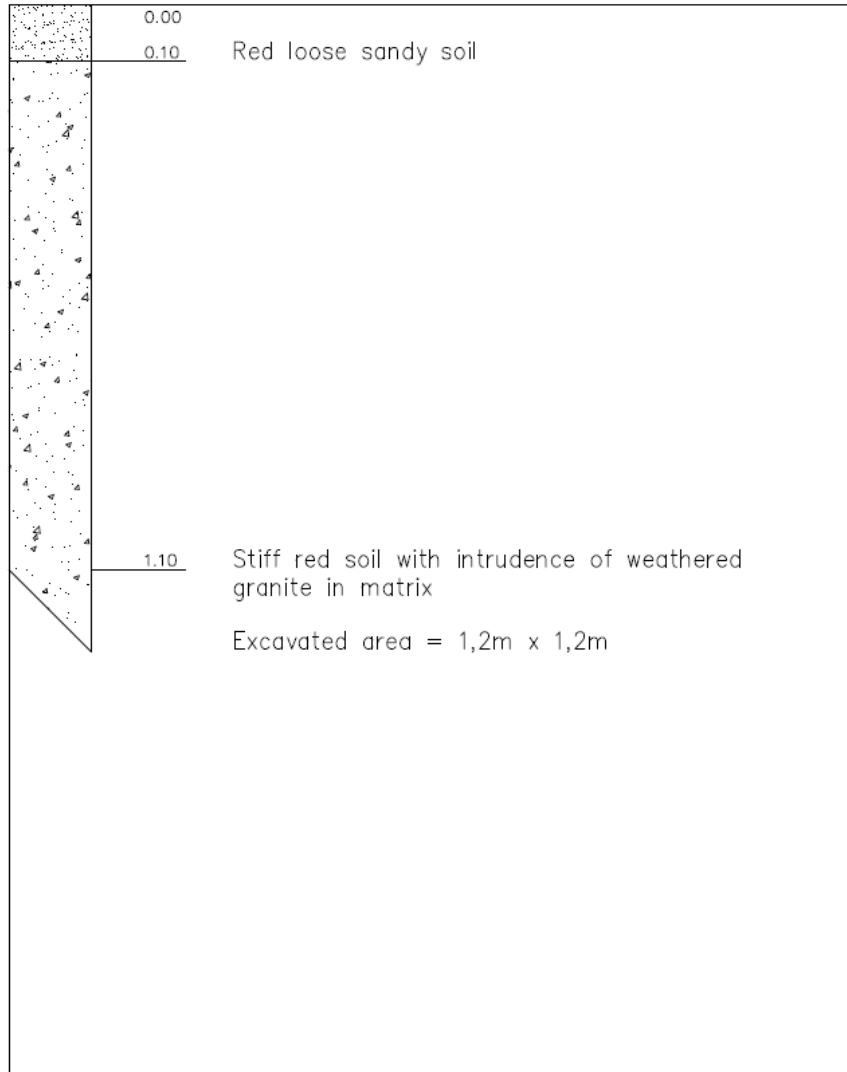
ANNEXURE B

TEST HOLE PROFILE

KAI! GARIEB MUNICIPALITY:
CILLIE

HOLE No: 1

Scale 1:10



TEST HOLE PROFILE

DATE: Mar 2012

JOB NUMBER:

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ANNEXURE C

Photographs of Test Hole



Photograph of Test hole at Cillie