Civil Concepts (Pty) Ltd Reg Number: 95/12428/07
Alec's Place Building The Hillside Lynnwood
P O Box 36148 Menlo Park 0102
Tel: (012) 365 1414 Fax: (012) 365 1192
E-mail: ronald@civilconcepts.co.za

Our reference
C756 / RW/alam

Date
6 March 2012

Leap Landscape Architects
P.O. Box 13185
HATFIELD
0028

Attention: Gwen Theron (gwen.theron@telkomsa.net)

Dear Madam,

**PROPOSED TOWNSHIPS KLERKSOORD EXTENSIONS 25 AND 26 SITUATED ON THE FARM WITFONTEIN 301-JR**

**PRELIMINARY REPORT ON THE BULK CIVIL ENGINEERING SERVICES**

## 1. Introduction

The above proposed townships are situated on the following properties:

Klerksoord Ext 25 - Portion 147, Part of Portions 146, the Remaining Extent of Portion 160 and the Remaining Extent of Portion 164, all of the Farm Witfontein 301-JR

Klerksoord Ext 26 - Portion RE/145 and Parts of Portions 146, RE/160 and RE/164 of the Farm Witfontein 301-JR

Klerksoord Ext 25 is approximately 36.22Ha in extent and lies to the North of Provincial Road R566 (K8). Klerksoord Ext 25 falls in a South Easterly direction and has a fall of approximately 8m. Klerksoord Ext 26 is approximately 41.6Ha in extent and lies to the South of Provincial Road R566 (K8). There is a drainage line which runs in an Easterly direction, approximately through the middle of Klerksoord Ext 26. Either side of the drainage line, the Township falls towards it. The drainage line comprises a concrete lined canal.

This report covers the proposed bulk civil engineering services for these two townships, which fall under the jurisdiction of the City of Tshwane.

## 2. The Proposed Townships

2.1 Klerksoord Ext 25

Klerksoord Ext 25 consists of the following land uses:

| | | |
|---|---|---|
| a) | Industrial 1 (excluding a public garage) = | 150 erven with a total area of 23.26Ha |
| b) | Industrial 1 (including place of amusement, restaurant, shop, office and institution = | 1 erf with an area of 3.52Ha |
| c) | Private open space = | 1 erf with an area of 0.42Ha |
| d) | Special for access = | 3 erven with an area of 6.59Ha |
| e) | Roads = | With an area of 2.43Ha |

The FSR for items a) and b) above is 0.6.

2.2 Klerksoord Ext 26

Klerksoord Ext 26 consists of the following land uses:

| | | |
|---|---|---|
| a) | Residential 1 = | 589 erven with a total area of 19.142Ha |
| b) | Residential 3 = | 4 erven with a total area of 4.563Ha |
| c) | Business = | 1 erf with a total area of 0.624Ha |
| d) | Public Open Space = | 2 erven with a total area of 6.8175Ha |
| e) | Roads = | With an area of 10.4125Ha |

The FSR for item b) above is 0.9 and for item c), 0.4.

## 3. Water Supply

3.1 Water Demand

Based on the above land uses, the daily water demand is:

3.1.1 Klerksoord Ext 25

| | | | |
|---|---|---|---|
| a) | Industrial 1: | $\frac{23.26Ha \times 10\,000 \times 0.6}{100m^2}$ @ 0.4Kl/d | = 558.4Kl/d |
| b) | Industrial 1: | $\frac{3.52Ha \times 10\,000 \times 0.6}{100m^2}$ @ 0.8Kl/d | = 168.96Kl/d |
| c) | Private Open Space: | 0.42Ha @ 15Kl/Ha/d | = 6.3Kl/d |
| d) | Access Control; | 1 erf @ 0.8Kl/d | = 0.8Kl/d |
| | Total daily water demand | | 734.3Kl/d |
| | The average flow over a 24 hour period | | 8.5lps |
| | The peak flow (4 x factor) | | 34.0lps |

3.1.2 Klerksoord Ext 26

| | | | |
|---|---|---|---|
| a) | Residential 1: | 589 erven @ 1.2Kl/erf/day | 706.8Kl/d |
| b) | Residential 3: | $\frac{4.563Ha \times 10\,000 \times 0.9}{100m^2}$ @ 0.6Kl/u/d | 246.6Kl/d |
| c) | Business: | $\frac{0.674Ha \times 10\,000 \times 0.4}{100m^2}$ @ 0.8Kl/d | 21.6Kl/d |
| d) | Public Open Space: | 6.8175Ha @ 15Kl/Ha | 102.26Kl/d |
| | Total daily water demand | | 1 077.26Kl/d |
| | The average flow over a 24 hour period | | 12.47lps |
| | The peak flow (4 x factor) | | 49.87lps |

3.2 Bulk Water Supply

The existing City of Tshwane's bulk water network, which lies to the West of both townships, comprises the following:

a) A 380mm diam bulk pipe along Granate Street up to the intersection with Willem Cruywagen Street.

b) A 160mm diam pipe along Robyn Street up to the intersection with Willem Cruywagen Street.

c) A 100mm diam pipe along Diamant Street up to the intersection with Willem Cruywagen Street.

d) Along Willem Cruywagen Street there is a 200mm diam water pipe which connects to the above three pipes.

e) From the 200m diam pipe, the proposed two townships will be fed and these existing pipes include a 160mm diam pipe along the Northern boundary of Klerksoord Ext 25; a 160mm diam pipe along the Western boundary of both townships; and a 200mm diam pipe along the Southern boundary of Ext 26.

f) The internal water network will connect to the pipes mentioned in e) and each erf will be provided with a water connection off this network.

During detail design stage, GLS Consulting Engineers, who do the water master planning for the City of Tshwane, will be appointed to analyse the bulk water network supplying these townships and if they find that upgrading of the bulk water network is required, then this work will be done by the Developer, using the bulk service contributions which are payable.

## 4. Sewerage Network

4.1 Sewage Outflow

Based on the above land uses, the daily sewage outflow is:

4.1.1 Klerksoord Ext 25

| | | | |
|---|---|---|---|
| a) | Industrial 1: | $\frac{23.26Ha \times 10\,000 \times 0.6}{100m^2}$ @ 0.3Kl/d | 418.7Kl/d |
| b) | Industrial 1: | $\frac{3.52Ha \times 10\,000 \times 0.6}{100m^2}$ @ 0.8Kl/d | 168.96Kl/d |
| c) | Access Control: | 1 erf @ 0.8 Kl/d | 0.8Kl/d |
| | Total daily sewage outflow | | 588.44Kl/d |
| | The average flow over a 24 hour period | | 6.81lps |
| | The peak flow (3 x factor) | | 20.43lps |

4.1.2 Klerksoord Ext 26

| | | | |
|---|---|---|---|
| a) | Residential 1: | 589 erven @ 0.7Kl/erf/day | 412.3Kl/d |
| b) | Residential 3: | $\frac{4.563Ha \times 10\,000 \times 0.9}{100m^2}$ @ 0.6Kl/u/d | 246.6Kl/d |
| c) | Business: | $\frac{0.674Ha \times 10\,000 \times 0.4}{100m^2}$ @ 0.8Kl/d | 21.6Kl/d |
| | Total daily sewage outflow | | 680.5Kl/d |
| | The average flow over a 24 hour period | | 7.88lps |
| | The peak flow (3 x factor) | | 23.63lps |

4.2 Bulk Sewer Network

The existing City of Tshwane's bulk sewer network comprises the following:

4.2.1 Klerksoord Ext 25

There are existing 160mm diam sewers along the Western and Eastern boundaries of the township. These sewers connect to a 160mm diam sewer which flows in an Easterly direction adjacent to Provincial Road R566. This sewer increases to a 250mm diam pipe, and at this point turns to the South and joins to the existing 450mm diam bulk sewer which flows adjacent to the stormwater canal which flows through Klerksoord Ext 26.

The internal sewers within this township will connect to the above sewers and a sewer connection will be provided to each erf.

4.2.2 Klerksoord Ext 26

As stated above, there is an existing 450mm diam bulk outfall sewer adjacent to the stormwater canal which flows in an Easterly direction through this township.

The internal sewers within this township will connect to the above sewers and a sewer connection will be provided to each erf.

During detail design stage, GLS Consulting Engineers, who do the sewer master planning for the City of Tshwane, will be appointed to analyse the bulk sewer network supplying these townships and if they find that upgrading of the bulk sewer network is required, then this work will be done by the Developer, using the bulk service contributions which are payable.

**5. Stormwater**

5.1 Klerksoord Ext 25

As stated in the Introduction, this township falls in a South Easterly direction. The internal stormwater network within the township will drain to this point, from where a bulk stormwater pipe will be laid along the Eastern boundary of Klerksoord Ext 26 to the existing stormwater canal which runs through Klerksoord Ext 26.

5.2 Klerksoord Ext 26

As stated above and in the Introduction, there is an existing concrete lined stormwater canal approximately in the middle of the township, which flows in an Easterly direction. The internal stormwater networks, either side of the canal, will drain to the canal and discharge their stormwater into the canal.

The 1:50 and 1:100 year flood lines over the canal have been calculated and the stormwater generated by both townships will be released within the flood lines.

**6. Roads**

6.1 Traffic Impact Statement

A traffic impact statement has been prepared and is submitted as a separate document.

6.2 Access

Access to both townships will be obtained off Provincial Road R506 at an approved access point. This point is opposite the Eastern boundaries of both townships.

6.3 Upgrading of External Roads

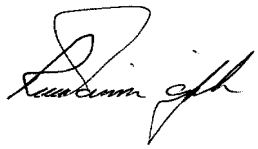
During detail design, a comprehensive traffic impact study will be carried out during which those external roads that need to be upgraded will be identified, and these roads will be upgraded by the Developer.

6.4 Internal Roads

The internal roads will be built to the City of Tshwane's standards.

We trust that the above report is in order and should any further information be required, please contact the undersigned.

Yours faithfully



Ronald Wainwright
Civil Concepts (Pty) Ltd

cc Peter Roos Town Planner
Marc Schutte
For your information