

KWANONKQUBELA CHC

**PRELIMINARY
ENGINEERING SERVICES REPORT**

JANUARY 2015

Engineering Services Report

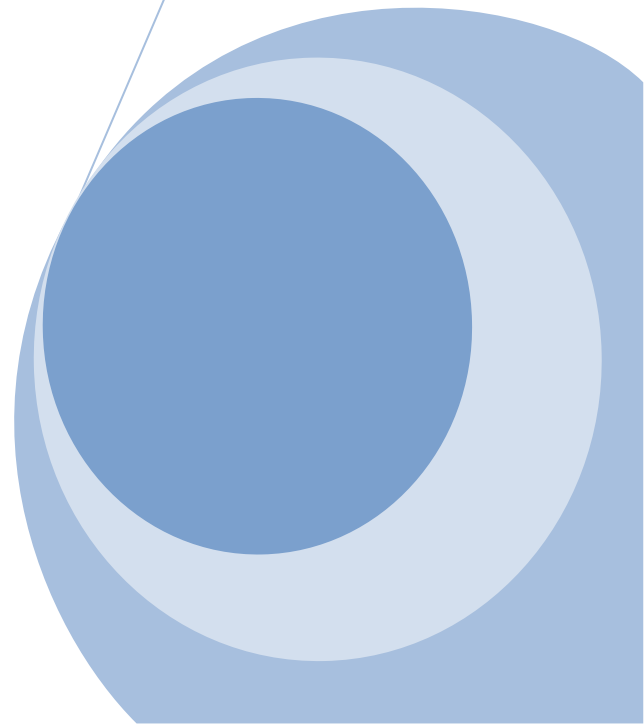


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1 INTRODUCTION

1.1 TERMS OF REFERENCE

1.2 PROJECT DESCRIPTION

The scope of the proposed development entails the following:

- 1 clinic
- 4 staff accommodation houses
- Internal 92 bay parking area
- Internal Paved Access roads
- Wet services
- The clinic will have 14 in patients and 350 outpatients capacity

1.3 PROJECT LOCATION

The site is located in an open land to the west of Alexandria town. A street bounds the site to the south, existing residential properties bound to the site to the west while a stream lies to the north.

2 EXISTING BULK SERVICES

As-built information of existing services have been made available by the local authorities i.e. Ndlambe Local Municipality.

2.1 Water

The development will be supplied from a network of four (4) reservoirs that supply Kwanonqhubela Township situated on the outskirts of Alexandria. The connection point will be in a street as shown on the drawing layout.

The total water demand for the development is estimated at **22.45KL/day**

The existing bulk water line in front of the development is 110mm diameter.

Pressure tests will be carried out to determine the existing pressure in the system.

2.2 Sewer

The existing municipal sewer main is 250mm diameter and is located in a northerly direction towards the stream.

Three connection points have been identified for connection into the sewer mains. The reticulation lines will be 110mm UPVC pipes.

Based on preliminary calculations, the sewage throughput from the site is estimated at **17 000l/day**.

2.3 Stormwater

There are no existing stormwater facilities around the site

Stormwater generated from the site will be channelled off site via a combination of open channels and subsurface pipes. It is intended to discharge all the stormwater from the channels and pipes to natural ground at the back of the development and ultimately to the nearby stream.

The proposed stormwater design philosophy is as follows:

- Stormwater pipes will be used to drain restricted areas. A minimum size of 450mm was utilised for ease of maintenance
- Open channels and aprons will collect water from roofs of buildings and surroundings
- Due to the sloping terrain of the site, cut off drains will be proposed upstream of the development to prevent stormwater from flooding buildings.

3 TRAFFIC STUDY

A specialist will be appointed to look into the traffic impact due to the development.

4 DESIGN STANDARDS

The following design standards will be used:

- a) **Water Supply**: The water supply design will be done according to PW 345 and 'Guidelines for the provision of engineering services and amenities in residential township development' –Red book.
- b) **Sewers**: Sewers are to be done to the guidelines supplied by the Local Municipality.
- c) **Stormwater Drainage**: designed according to Department of Public Works Civil Engineering Worksguidelines (PW 347-2004) and Drainage Manual (SANRAL).
- d) **Parking Areas (Design of layer works)**: Applicable SABS 1200 specifications. Applicable SABS 1200 specifications will also apply.

5 WATER RETICULATION

5.1 Water Demand

The water supply will be fed directly from the municipal bulk line. Investigations have revealed that the supply is not reliable and not adequate for fire, therefore on-site storage will be considered with a booster pump house to raise pressure to the required level.

Internal fire hydrants are to be installed at strategic points.

5.2 Fire Demand

Flow velocity under instantaneous peak flow conditions shall not exceed 1.5 m/s.

- The fire risk category is classified as "moderate risk".
- The duration of design fire flow of 4 hours is allowed for.
- Design fire flow is 20ℓ/s, maximum number of hydrants discharging simultaneously is one and 0.5ℓ/s for horse reels

5.2.1 Pipeline Material

It is proposed that uPvc pipes and HDPE be used for this project.

5.2.2 Legal requirements

The EIA approval process is currently underway.

6 SEWER RETICULATION

The sewer from the site will discharge into an sewer mains north of the development.

Three tie-in points have been identified.

6.1 Design Flow

Sewers will be designed such that a self cleansing velocity of 0.7 m/s is generally achieved at least once a day (during PDWF). But in some instances at the head of sewer, this is seldom achieved.

Design is generally complying with sewerage problems related to provisions of the Department of Public Works- Civil Engineering Manual PW 347. The reticulation will be designed taking into consideration the factors below:

- Stormwater Ingress =15 %
- Peak Factor =1