

APPENDIX D₃

Bulk Service Report

PROPOSED TRUCK STOP
AND DIESEL DEPOT,
PORTION 5 OF THE FARM
AVENHAM 2187,
BLOEMFONTEIN

STATUS OF BULK CIVIL SERVICES

JUNE 2016

**PROPOSED TRUCK STOP AND
DIESEL DEPOT, PORTION 5 OF
THE FARM AVENHAM 2187,
BLOEMFONTEIN**

STATUS OF BULK CIVIL SERVICES

Andre Smith

Date: June 2016

—
WSP | Parsons Brinckerhoff

PO Box 100872, Brandhof, 9324

1st Floor, 46 Second Avenue, Westdene, Bloemfontein, 9300


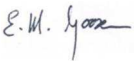

Tel: +0 (51) 447 1586

Fax: +0 (51) 430 4957

www.wspgroup.com

www.pbworld.com

QUALITY MANAGEMENT

| ISSUE/REVISION | FIRST ISSUE | REVISION 1 | REVISION 2 | REVISION 3 |
|----------------|---|------------|------------|------------|
| Remarks | | | | |
| Date | 15/06/2016 | | | |
| Prepared by | E. Botes | | | |
| Signature |  | | | |
| Checked by | EM Goosen | | | |
| Signature |  | | | |
| Authorised by | ME Goosen | | | |
| Signature |  | | | |
| Project number | | | | |
| Report number | /01 | | | |
| File reference | /11 | | | |

PRODUCTION TEAM

CLIENT

Andre Smith

WSP | PARSONS BRINCKERHOFF

Divisional Director

ME Goosen

TABLE OF CONTENTS

| | | |
|-----|--|---|
| 1 | INTRODUCTION..... | 1 |
| 2 | SITE LOCATION | 2 |
| 3 | STATUS OF EXISTING BULK CIVIL SERVICES | 3 |
| 3.1 | BULK WATER SUPPLY | 3 |
| 3.2 | SEWAGE DISPOSAL | 5 |
| 3.3 | STORM WATER NETWORK | 5 |
| 4 | SUMMARY..... | 6 |

LIST OF FIGURES

| | |
|--|---|
| FIGURE 1: DEVELOPMENT ON PORTION 5 OF FARM AVENHARM 2187 | 1 |
| FIGURE 2: SITE LOCATION..... | 2 |

APPENDICES

| | | |
|-----------------|---|-----------------------------|
| A P P E N D I X | A | ZONING |
| A P P E N D I X | B | BULK WATER AND SEWER SUPPLY |
| A P P E N D I X | C | STORM WATER RETICULATION |

1 INTRODUCTION

This report provides information on the status of the existing bulk civil services for the proposed Truck Stop on Portion 5 of the Farm Avenham 2187, Bloemfontein of approximately 3.967 ha.

This report also makes recommendations regarding the upgrading requirements for the civil infrastructure should the development continue.

The bulk civil services which are addressed in this report are as follows:

- a) Bulk water supply
- b) Sewage disposal
- c) Storm water

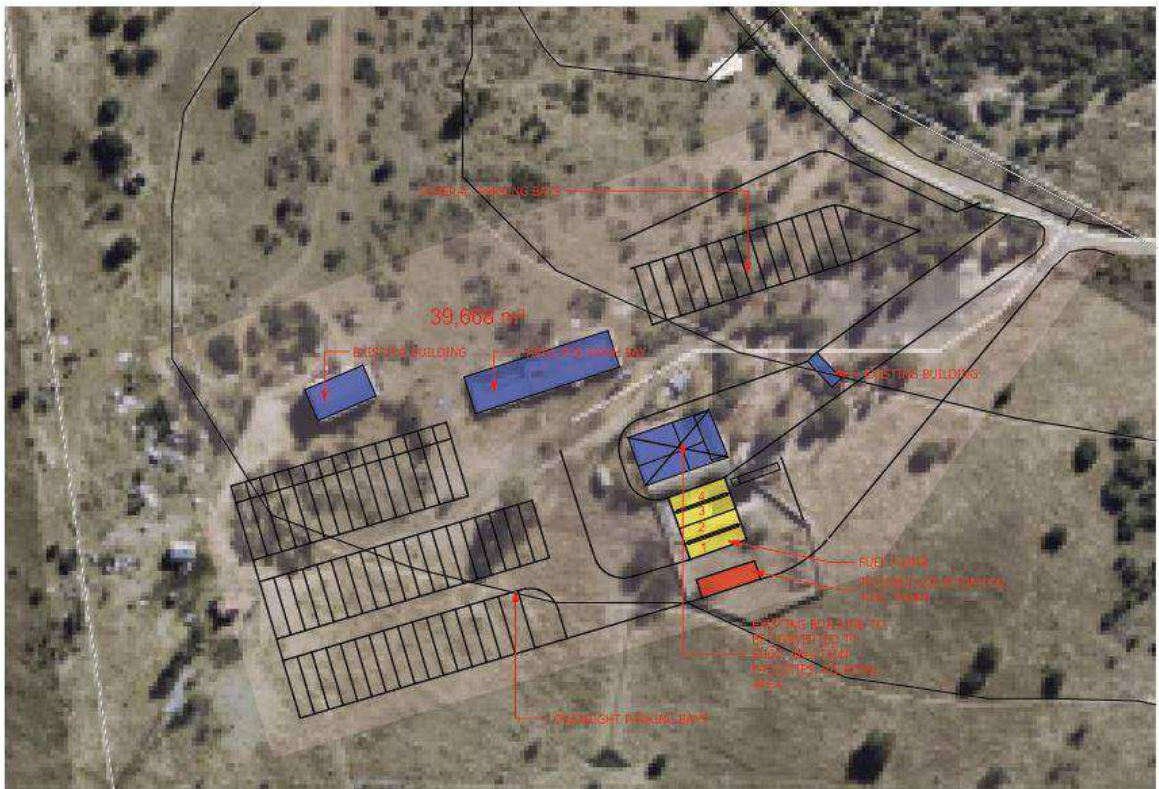


Figure 1: Development on Portion 5 of Farm Avenham 2187

2 SITE LOCATION

The site is located East of a National Road namely the N1 on the Avenham Off-ramp. To the west side of the site is the Star Stop Sunny Hill Gas Station. See the locality map below.

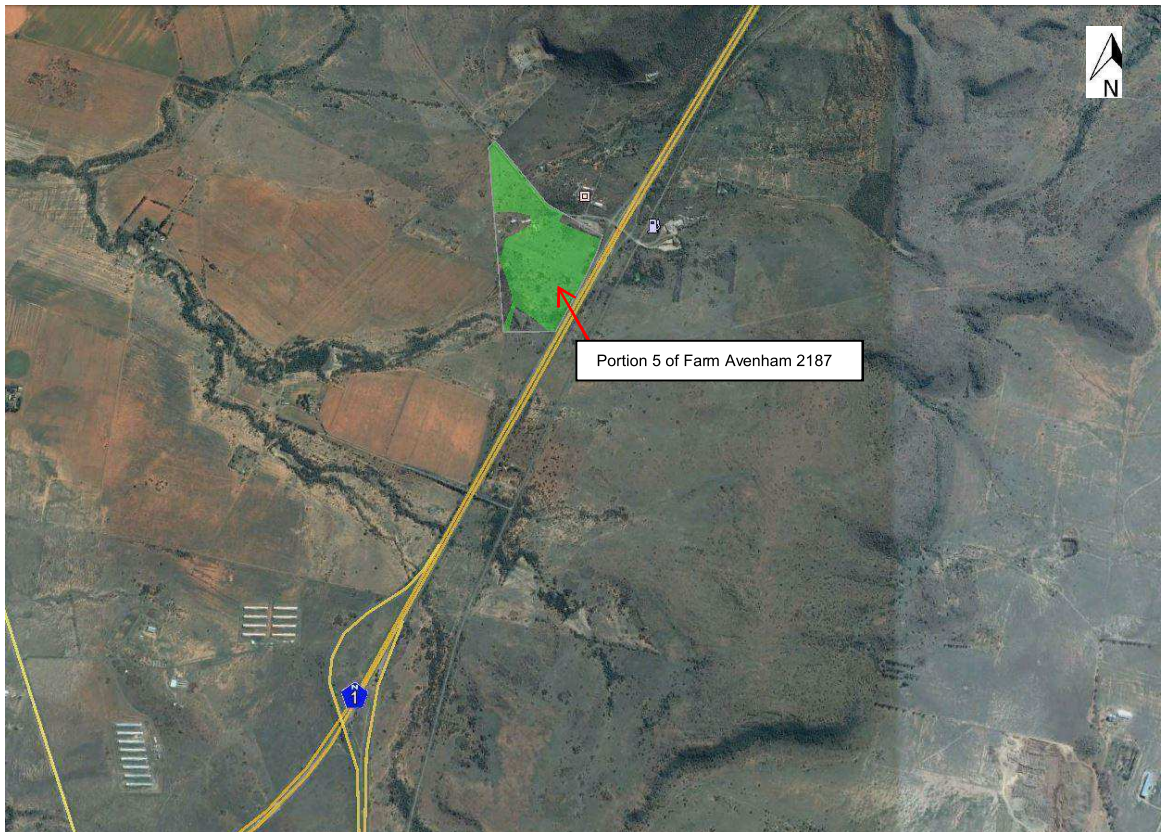


Figure 2: Site Location

3

STATUS OF EXISTING BULK CIVIL SERVICES

3.1 BULK WATER SUPPLY

3.1.1 Introduction

Potable water is provided from boreholes that are located on site. The two boreholes deliver the following amount of water:

- Borehole 1 – 5000 l/hour
- Borehole 2 – 1500 l/hour

These two boreholes are proposed as the potable water source for the new development.

3.1.2 Design Criteria

The water demand of the proposed development unit is based on the following criteria as per the Blue Book:

- a) The average daily demand (ADD) of 450 l/day for 100m² GLA, being 2.066l/s for the development.
- b) The peak demand being four (4) times the ADD.
- c) The peak daily demand of the new development is estimated at 8.264 l/s.
- d) The peak demand for the existing erf is 8.264 l/s
- e) No additional water demand is required
- e) The minimum water pressure under instantaneous peak demand should be 24 m.

3.1.3 Evaluation of Existing Borehole Water in the Avenham Area

- The existing water network on the Avenham farm receives water from the two boreholes.

3.1.4 Water Storage

Currently the site consists of the following water storage tanks:

- Two – 5000 l tanks
- Two – 10 000 l tanks and

- A dam of 150 000 l

Providing a total of 180 000l of storage for the site.

3.1.5 Water Storage design

The water demand of the proposed development unit is based on the following criteria as per the Red Book:

- A storage capacity of 24 hours of annual average daily demand is suggested. The average daily demand (ADD) of 450l/day for 100m² GLA, being 178 506l for 24 hours.
- The pump that is provided should be able to provide the instantaneous peak demand plus an allowance of 20%, being 9.917l/s
- The inflow rate to the reservoir should be 1.5 x annual average daily demand for the area, being 3.099l/s

3.1.6 Proposed water storage

§ The proposed storage requirements will be met by the existing water storage facilities on site.

3.1.7 Proposed Bulk Water Supply

- The proposed development can be provided with potable water from the two existing boreholes.
- **The building connections should be upgraded to a 24mm ø connection.**

3.1.8 Proposed Fire Flow Supply

A required fire flow of 20l/s at a constant pressure of 30m is needed. The fire flow of the proposed business unit is based on the following criteria as per SABS 0400:

- Fire flow demand at any one fire hydrant being approximately 20l/s.
- Fire flow demand (20l/s) should be provided for 20 minutes via boosting form external sources.

We would like to recommend that the development provide a separate storage tank with the capacity of 24 000l for fire flow network (100mm dia) with a booster pump (for fire department) that can deliver 20l/s.

3.2 SEWAGE DISPOSAL

3.2.1 Introduction

The site will make use of septic tanks for sewage disposal. Only

3.2.2 Design Criteria

The sewage runoff of the proposed site is based on the following criteria:

- a) The average dry weather flow for development is accepted as 400 l/day per 100m² GLA.
- b) The estimated average dry weather flow for the development is 158.67 kl/day or 1.836l/s.
- c) The peak sewage runoff is accepted as 4,0 x ADWF plus 15 % infiltration being 8.446l/s.

3.2.3 Design of a septic tanks

- A Septic tank will have to be provided that can accommodate 400l/day per 100m².
- The size of the septic tank, the amount of use, and the type of material discharged will determine how often your septic tank will need to be drained.

3.3 STORM WATER NETWORK

3.3.1 Introduction

There is no existing storm water infrastructure on site. The site has a -3.06% fall towards South-West side of the site. Refer to drawing in Appendix B indicating the direction of the slope of the site.

3.3.2 Design Criteria

The water demand of the proposed development unit is based on the following criteria as per the Blue Book:

- a) Manning's formula – $Q = CIA/3.6$ was used to determine the run-off.
- b) With $C = 0.6$; I – Average rainfall for Bloemfontein = 618mm/year; 1:5 year flood, A = Area of plot 61600m²
- c) The run-off for the development is 1.741m³/s for the 1:5 year flood and 3.262m³/s for the 1:25 year flood.
- d) The run-off for the erf before the development is 0.751 m³/s for the 1:5 year flood.

- e) The additional run-off is c)-d) = 2.511 m³/s which will be attenuated on site. This is the difference between the 1:25 year post development and 1:5 year pre development floods. For storage requirement purposes a volume of 300 m³/ha is normally required to be attenuated for a 1:25 storm. A total storage of 1848m³ will therefore be required.

3.3.3 Evaluation of Existing Municipal Storm Water Network in Avenham area

- The site will have to be properly sloped to falls in order to allow the storm water to drain towards the south-west area of the site

4

SUMMARY

A bulk services contribution will have to be negotiated with the Mangaung Metropolitan Municipality after which a service agreement will have to be entered into by the concerned parties, if required.

Appendix A

PROPOSED DEVELOPMENT

**Proposed development on Portion 5 of the Farm Avenham No 2187, Bloemfontein
(Bloemplase Truck Stop)**

1. The proposed development:

- 1.1 Truck stop;
- 1.2 Diesel depot (above ground storing of diesel with a capacity of more than 80 cubic metres but less than 500 cubic meters);
- 1.3 Overnight and ablution facilities for truck drivers;
- 1.4 Convenience shop; and
- 1.5 The site for all the amenities will measure 15ha in extent.

2. Notes:

- 2.1 The existing diesel depot will be replaced by the proposed development;
- 2.2 Water will be obtained from an existing bore hole;
- 2.3 Sewage will be accommodated by means of a septic tank; and
- 2.4 Electricity is available on site.

Appendix B

STORM WATER RETICULATION



phone 072 356 6268
 e-mail paula@indetail.co.za
 website www.indetail.co.za
 fax 086 541 0715
 address PO Box 59
 Verblyden
 Brandfort
 9400

paula gutter
 professional architect
 M.Arch.Prof (UFS)
 SACAP Pr.Arch 20980



| CONCEPT DEVELOPMENT DRAWINGS | | | |
|------------------------------|---------|-----------|----------|
| PROJECT TITLE | SCALE | 1:1203.97 | SKAAL |
| 5/2187 TRUCKSTOOP | DATE | 4/7/2016 | DATUM |
| | DRAWN | PG | GETEKEN |
| | CHECKED | PG | NAGESIEN |
| | DWG USE | DESIGN | GEBRUIK |
| DESCRIPTION | CLIENT | PROJ. No | DWG No |
| CONCEPT PLAN 02 | A.SMITH | DHI_64 | A1.2 |