CHAPTER FOUR: SUPPLEMENTARY BULK SERVICES REPORT

4.1 INTRODUCTION

This Chapter of the report is supplementary to the Preliminary Bulk Services Report, conducted by Hatch Africa (Pty) Ltd, for this development dated 01 October 2010 and deals with the developer's requirement to amend the zoning of the areas known as Phases 5 and 6 from Residential to Special Purposes.

The area to be rezoned is situated on the northern corner of Circular Drive and Fern Road in Fairview, Port Elizabeth and is indicated as Phases 5 and 6 on Metroplan's Drawing No. Fai/2027/10 Rev 10.

4.2 SPECIALIST TERMS OF REFERENCE

Hatch Africa (Pty) Ltd has been appointed by Fairview Suburban Estates Company (Pty) Ltd to undertake all the required investigations, reports, design and Project Management for the Civil Engineering Services associated with the proposed rezoning from Residential 2 to Special Purposes. In consultation with the project applicant and taking into account the recommendations of the various specialist assessments, this appointment includes the identification and design of additional infrastructure on site.

4.3 SCOPE

This supplementary report is limited to the public infrastructure required for the rezoning of Phases 5 and 6 from residential to special purposes and has been prepared to be included in the EIA Amendment Application required by DEDEAT in terms of the NEMA EIA Regulations 2014 (as amended).

The report deals with the preliminary engineering investigation for the public infrastructure services required for the proposed area to be rezoned.

The report will consider the advantages and disadvantages that the proposed rezoning may have on the provision of bulk services and will propose measures to manage and mitigate any adverse impacts associated with the proposed rezoning.

4.4 LEVEL OF SERVICES

The level of services provided will be in accordance with the Guidelines for Human Settlement Planning and Design compiled under the patronage of the Department of Housing by CSIR Building and Construction Technology: (2000: Revision August 2003) and the design specifications of the Nelson Mandela Bay Municipality (NMBM).

4.5 DATA COLLECTION

4.5.1 Drawings

Relevant "as built" drawings of existing services have been obtained from the As Built records provided by Hatch Africa (Pty) Ltd to the authorities after the completion of the construction works for Phases 1 to 4 and the upgrading of Willow Road and Circular Drive.

4.5.2 Town Planning Details

The proposed latest Town Planning details have been obtained from the Town and Regional Planners – Metroplan.

Metroplan will handle the relevant town planning aspects of the proposed rezoning application.

The proposed rezoning will not change the footprint of the original proposed development area for Phases 5 and 6 (~8.19ha in extent). In place of 109 residential erven the rezoning will create 28 Special Purpose erven, namely, rezoning from Residential 2 (townhouses), Private Open Space and Special Purposes (Access) to Special Purposes (high tech/ industrial business park) and Transportation 1 (roads). The following table represents the changes proposed:

Zoning	Current	Proposed	Change
Res 2 to Special Purposes	6.24 ha	7.23 ha	+0.99
Private Open Space	0.52	0	-0.52
Special Purpose (Access) to Transportation	1.42	0.96	-0.46
TOTAL	**8.19**	**8.19**	

As part of the rezoning, a request has been submitted to relax 30% of the area to be set aside for landscaping within the Special Purpose area and to relax the rear and side 5m meter building line to 2.5m.

The majority of the Road Reserve widths will increase from 10m to 15m, however the total Road Reserve area is proposed to be reduced from 14 200 m² (1.42 ha) to 9600 m² (0.96 ha). The total surfaced road area for the proposed Special Purpose zoning is proposed to be reduced to approximately 3100 m² from approximately 6000 m².

4.6 INVESTIGATION AND PRELIMINARY DESIGN

4.6.1 Existing Roads – Access to Proposed Special Purpose Erven

The original TIA considered the full proposed development of Erf 1082 Fairview when evaluating what upgrades were needed for the existing road infrastructure.

All the existing roads infrastructure identified to be upgraded in the original TIA included in the EMPr and approved by the DEDEAT have recently been upgraded to the satisfaction of the NMBM.

The existing roads adjacent to Erf 1082 which have recently been upgraded are:

- Willow Road
- Circular Drive
- Centenary Road

Access to the proposed area to be rezoned will be off the newly upgraded roads mentioned above and the recently constructed Fern Road.

Royal HaskoningDHV in their report “Addendum: Traffic Impact Assessment for the Proposed Development on Erf 1082 Fairview, Port Elizabeth” dated 16 August 2018 concluded that “no further upgrading of the existing road infrastructure is considered necessary to accommodate the additional traffic at the Circular Drive / Fern Road and Willow Road / Mimosa Road traffic circles”. Please refer to Royal HaskoningDHV report (see Chapter Six of this Report) for details of their assessment**.**

4.6.2 Proposed Internal Roads

The structural design of the internal roads will be done in accordance with the Guidelines for Human Settlement Planning and Design – Chapter 8 with road category and traffic class selected to accommodate the type of vehicles which will require access to the Special Purpose erven.

The geometric design of the roads will be done to accommodate the roads within the Road Reserves provided in the Town Planning layout. The category of road will be determined by the width of the Road Reserves and the Guidelines for Human Settlement Planning and Design compiled under the patronage of the Department of Housing by CSIR Building and Construction Technology: (2000: Revision August 2003) and the design specifications of the Nelson Mandela Bay Municipality (NMBM).

The proposed wider road reserves (15m) will enable the surfaced width of the roads to be increased to accommodate the larger vehicles which will require access to the Special Purpose erven.

Despite the proposed increase in width of the road reserves and surfaced road areas, the revised plan layout for the proposed rezoning to special purposes will reduce both road length and total surfaced area which will have a positive impact on maintenance and life cycle costs.

4.6.3 Stormwater

4.6.3.1 Floodline Report

The development is situated adjacent to a tributary of the Baakens River. The Baakens River Flood Line Determination Report dated May 2008 was attached to the Bulk Services report dated October 2010 and the 1:100-year floodline for the tributary of the Baakens River determined by that report is indicated on the preliminary layout drawing No. H-115868/AS/001 Rev A (attached as Annexure A to this Chapter). This drawing also shows the proposed roads and wet services for the area to be rezoned.

Stormwater generated from the proposed rezoned area is still proposed to discharge overland and via a piped stormwater network to eventuate into the Baakens River via the defined water course adjacent to the area to be rezoned. However, no piped stormwater discharge is proposed directly into the tributary of the Baakens River.

The rezoning of the area from residential to special purposes will increase the hard surfaces which will result in shorter times of concentration in major storm events, thus increasing the stormwater runoff from the area under consideration. The effect of this has been calculated for the 1:50 and 1:100-year storms as follows:

Table 4.1: Erf 1082 Fairview: Rezoning of Phase 5 & 6: Stormwater Major Events.

Type of Development	**1:50 Year Event**	**1:100 Year Event**
Type of Development	1:50 Year Event	1:100 Year Event
Residential	1.0 m^3/s	1.2 m^3/s
Special Purposes	1.7 m^3/s	1.9 m^3/s
Additional runoff	0.7 m^3/s	0.7 m^3/s

It should be noted that the proposed development is adjacent to the abovementioned defined water course and all stormwater flows discharge directly overland or via the piped system to eventuate into

this water course. The minimal additional flows generated from the rezoning will not noticeably affect the 1:100-year flood line previously determined.

From the above it can be seen that an additional 0.7 m^3/s will be generated for both the 1:50 and 1:100-year storm events.

The rezoning will have no effect on the 1:100 year floodline previously determined as the additional runoff is considered negligible.

4.6.3.2 Proposed Internal Stormwater

The stormwater system will be designed such that minor storms (1 in 2-year event) will be piped (maximum pipe size 450mm) and major storms will be accommodated in the road reserves and through open spaces.

Because the road lengths and surfaced road area will be reduced from what was proposed under the residential zoning the maintenance and life cost cycle of the stormwater infrastructure will also be reduced.

Stormwater generated from erven 1 to 10 inclusive (28,266 m^2) will discharge overland (northwards) to eventuate into the adjacent water course thus reducing the concentration of stormwater runoff at the proposed stormwater outlet situated in the road reserve between erven 10 and 11 (north eastern corner).

The outlet from the piped system and stormwater accommodated within the road reserves, will be provided with scour protection measures to prevent erosion.

4.6.4 Water Supply System

The Annual Average Daily Demand (AADD) of the total proposed development of Erf 1082 Fairview (115.7 Ha) has been calculated to be 1477 Kl/day under post-development conditions.

The water demand for the area proposed for rezoning (Phases 5 and 6) as set out in the Guidelines for Human Settlement Planning and Design are:

- For the original layout of 109 residential Erven - AADD is 109 Kl/day.
- For the 28 Special Purpose Erven – AADD is 203 Kl/day
- The additional AADD for the Special Purpose Erven will therefore be 94Kl/day (as set out in the Guidelines).

It should be noted that the Guidelines suggests that the AADD for Special Purposes be calculated based on 400l/d per 100m^2 of gross floor area. However, in reality and based on past professional experience, the water usage for this type of development actually tends to be far lower than for residential erven.

Notwithstanding the above, however, the **additional Annual Average Daily Demand required in terms of the Guideline for the proposed rezoning to Special Purpose is relatively minimal (additional 94Kl/day; total 203Kl/day) and equivalent to the AADD of an additional 94 residential erven.**

The additional demand will not significantly affect pressure available in the existing reticulation surrounding and supplying this development.

The provision of water to the proposed rezoned development will be off the existing 250 mm diameter water main in Fern Road.

It should be noted that the length of water main pipelines required to service the Special Purposes Erven will be significantly shorter and will therefore require less maintenance during its life cycle.

4.6.5 Foulsewer System

The Guidelines for Human Settlement Planning and Design states that the discharge from business sites need not be considered when calculating peak design flows, since these are relatively minor flows that do not peak at the same time as the main residential flows.

Dry Weather Flow (PDWF) and Peak Wet Weather Flow (PWWF) will therefore not be affected by the proposed rezoning to Special Purposes.

The effluent from the proposed rezoned area will flow into internal 160 mm diameter foulsewer pipelines still to be constructed and then into the existing 250 mm diameter foulsewer pipeline situated on the northern boundary of the proposed development area which in turn discharges into the existing 600 mm diameter Baakens River Bulk Sewer pipeline.

4.6.6 Electricity Supply

As is the norm with developments within the NMBM area, the electrical reticulation will be designed by the Municipality's Electricity and Energy Business Unit.

Mr. Siyabulela Rasmeni, of the Municipality's Electricity and Energy Business Unit, confirmed on 14 August 2018 that the **existing Bulk Electrical Infrastructure will be able to support the proposed rezoning.**

The developer will be required to provide any additional local substation buildings and pay the municipality for any transmission lines or other electricity infrastructure that may be required within the proposed development.

4.6.7 Telkom

It is proposed to construct an underground Telkom ducting system to Telkom requirements to provide telecommunication connections to each Erf within the rezoned area.

Duct pipe diameters should not exceed 160 mm diameter.

4.7 CONCLUSION

Sufficient capacity exists in existing roads, wet services and electricity supply to support the proposed rezoning of Phases 5 & 6 of the development to Special Purposes use. The following conclusions are made with regards to the roads and wet services required for the proposed rezoning:

- The revised plan layout for the rezoning to special purposes will reduce both road length and surfaced area which will have a positive impact on maintenance and life cycle costs.
- Because the road lengths and surfaced road area will be reduced from what was proposed under the residential zoning the maintenance and life cost cycle of the stormwater infrastructure will also be reduced.
- An increase in the hard surfaces which will result in shorter times of concentration in major storm events, is anticipated to increase the stormwater runoff from the area under consideration. An

additional 0.7 m³/s will be generated for both the 1:50 and 1:100-year storm events. The rezoning will have no effect on the 1:00 year floodline previously determined as the additional runoff is considered negligible.

- The additional Annual Average Daily Demand for water required in terms of the Guideline for the proposed rezoning to Special Purpose is relatively minimal and equivalent to the AADD of an additional 94 residential erven (additional 94Kl/day).
- It should be noted that the length of water main pipelines required to service the Special Purposes Erven will be significantly shorter and will therefore require less maintenance during its life cycle.
- Dry Weather Flow (PDWF) and Peak Wet Weather Flow (PWWF) for effluent will not be affected by the proposed rezoning to Special Purposes.

4.8 ANNEXURE A

4.8.1 Layout Drawing

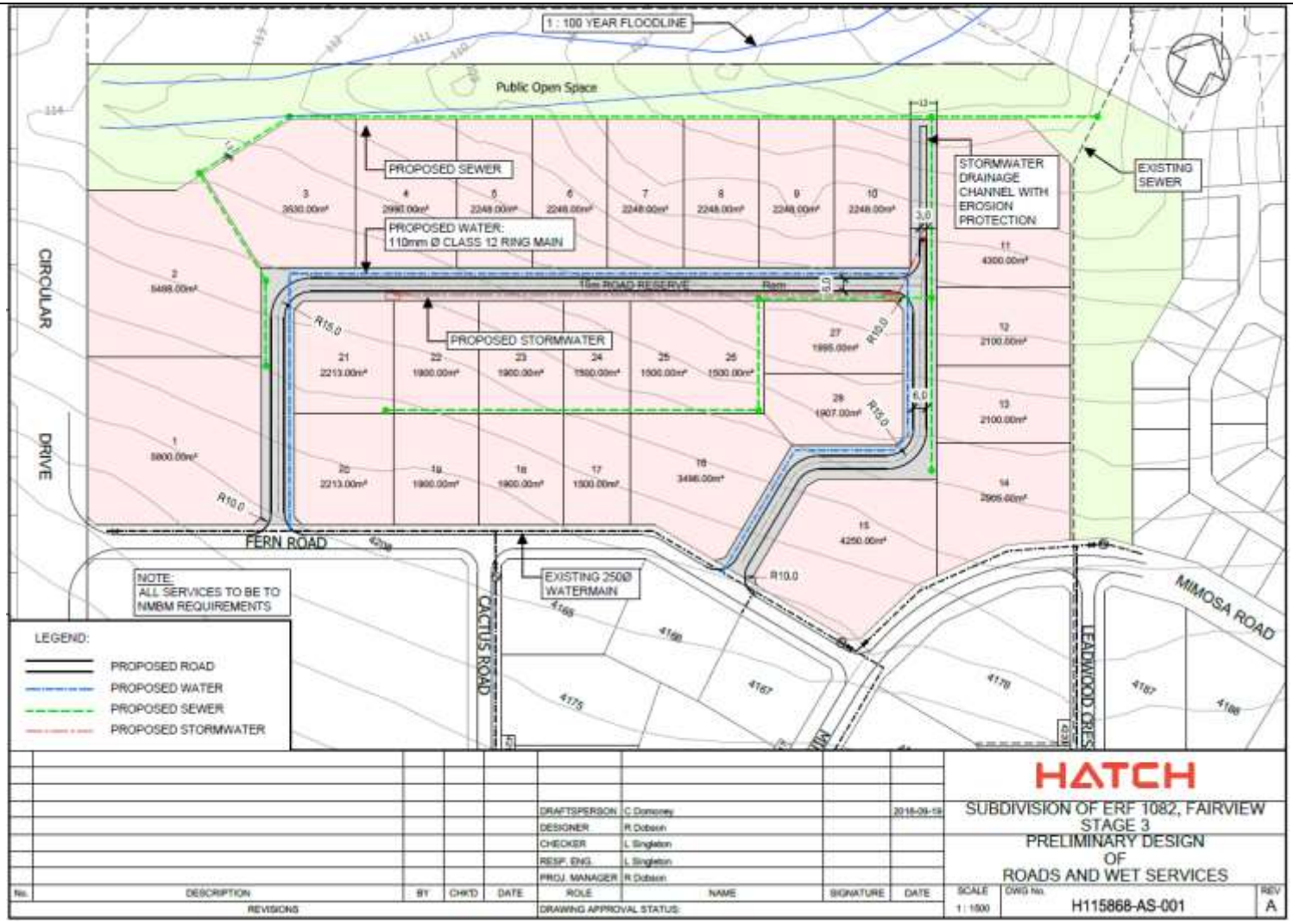

Figure 4.1: Drawing no. H115868-AS-001 Rev A.