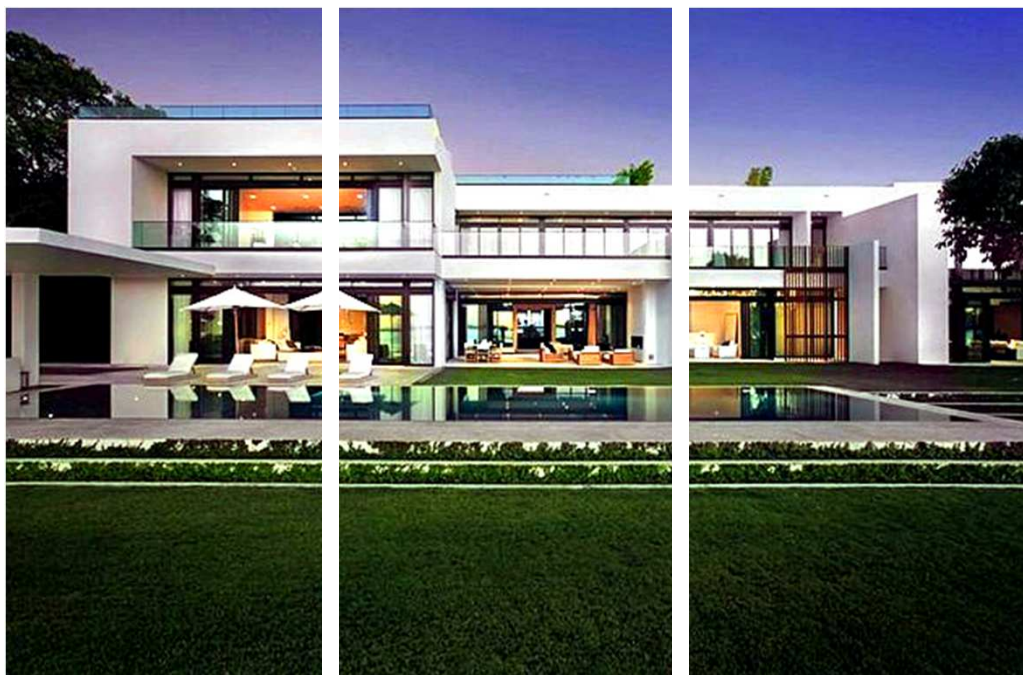




PROPOSED HUDDLE PARK RESIDENTIAL ESTATE
Civil Engineering Services Report

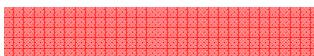


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Contents

1	THE PROPERTY	2
2	EXISTING SERVICES.....	2
2.1	SEWER.....	2
2.2	WATER	2
2.3	ROADS.....	2
2.4	STORMWATER.....	2
3	SERVICING PROPOSALS	3
3.1	WATER	3
3.2	SEWERS.....	3
4	ROADS AND TRAFFIC.....	4
5	STORMWATER	4
6	GAS.....	5

1 THE PROPERTY

The proposed development of a Residential Estate is situated on part of what was known as Huddle Park Golf Course (Proposed Portion 84 of the remaining extent of the Farm Bedford No. 88-1R). The property fronts onto Club Street to the east and onto open space between the proposed township boundary and the drainage line to the west and north. The property slopes generally from East to West with an overall slope from south to north. The property is currently covered with the remnants of a golf course and is traversed by several ill-defined drainage lines. The township lies entirely outside of Wetlands which have been determined and which are associated with the major drainage line.

2 EXISTING SERVICES

2.1 SEWER

There is a major sewer outfall in the valley to the west of the property. This sewer is a major collector for the area and drains from south to north.

2.2 WATER

Although there is a water pipeline in Club Street, this has been shown to be inadequate to supply the proposed development and a new connector line from the corner of Grant Road, along the Club Street servitude, to a connection point opposite Donne Avenue will be provided. The connection point is from an existing high pressure municipal supply line from the Linksfield reservoir and it is indicated that a connection, in Club Street, can be taken from an existing Scour Valve, through a pressure reducing valve, to connect into a proposed 200mm diameter link pipeline.

2.3 ROADS

A comprehensive Traffic Impact Assessment has been undertaken by Goba (Pty) Ltd and this addresses all aspects regarding access to the site as well as the upgrading of the surrounding roads and intersections. Currently access to the site is off Club Street and the TIA deals with proposed new entrances. This statement will not deal in detail with roads as the TIA can be used as reference.

2.4 STORMWATER

There is currently no formal stormwater system within the site and although there are points of discharge from Club Street onto the site, the stormwater is not formally conveyed to the drainage line in the West. The proposal is that within the development, a comprehensive storm water management system will be implemented and this will include attenuation of site run off before discharge to the main drainage line.

3 SERVICING PROPOSALS

3.1 WATER

The estimated daily consumption of water for the Estate is shown on the attached Annexure A and has been estimated at approximately 783 kL per day. Using a peak factor of five, demand is estimated at 45.31 L per second. A connection point, from a proposed new 200mm diameter of link waterline, is shown at the intersection of Club Street and Donne Avenue. A site connection would be jacked under Club Street and the reticulation of the township will be fed from a single point.

Reticulation within the township will be as per a detailed design, however Johannesburg Water standards will be observed throughout. It is proposed that uPVC pipes be used with the minimum diameter of 110mm serving each unit with an appropriate diameter service connection and water meter. The estimated length of various diameter pipes is as follows:

- 200 mm diameter 1400 m
- 160 mm diameter 3900 m
- 110 mm diameter 2400 m

To conserve water on-site recycling, by each of the residents, will be encouraged and rainwater harvesting will be included in the design guidelines. Johannesburg Water has confirmed that sufficient water is available for this project.

It is proposed that the water reticulation will be handed over to Johannesburg Water upon completion and that Johannesburg Water will retain responsibility for maintaining and billing the service in perpetuity. Details of the proposed link sewer and connection point are shown on Goba drawing number 21535-01-01-100-001

3.2 SEWERS

It is intended that the entire development will be served as waterborne sewerage. The standards laid down by Johannesburg Water will be observed throughout. The preliminary design of the reticulation indicates a single link into the outfall sewer in the valley to the west. The position of the proposed connection is shown as "Connection" on plan number 21535-01-01-100-001. A servitude across the golf course will be registered. Where the township link sewer crosses the wetland associated with the drainage line the sewer pipe will be jacked under the wetland to obviate disturbances associated with open trenching. It is estimated that the daily flow of effluent from the township will be approximately 608 kL. This is based on the standard Johannesburg Water consumption figures. Peak flow based on 80% of peak water demand is estimated at 35.19 m/s.

The estimated length of pipe work is 8200 m.

As mentioned above, recycling greywater, by each of the residents, will be encouraged.

Johannesburg Water has confirmed that there is sufficient capacity in the sewer system for this project.

It is proposed that the sewer reticulation will be handed over to Johannesburg Water upon completion and that JW will retain responsibility for maintaining the service in perpetuity.

4 ROADS AND TRAFFIC

It is proposed that the roads within the development will be private and will be maintained by the Home Owners Association (a Company not for gain) the roads will, however be designed to normal municipal standards and will be fully surfaced with a mixture of black top and segmented paving as appropriate. It is proposed that access to the development will be well away of two connections onto Club Street (as detailed in the TIA document which is submitted separately). In addition there is a proposed access directly into the parking area associated with the retail centre.

Roads width will be determined as per the "Red Book" and will vary between 5.5m and 7.4m. Current estimates are that they would be:

- 7.4m wide roads 4040m
- 5.5 m wide roads 2250 m

All matters relating to traffic contained in a specific Traffic Impact Assessment Report prepared by Goba Pty Ltd is attached. The TIA deals with the upgrading of surrounding streets and in particular proposes a major upgrade of Club Street with fronts onto the development.

5 STORMWATER

It is proposed that full attenuation of stormwater will be facilitated within the development and a large number of attenuation facilities have been proposed throughout the development to both limit concentration and to provide "waterways" which may include recycling of a certain amount of water.

The underground stormwater system will be designed to intercept the 1:5 year storm and routing of the 1: 25 year storm will take place throughout the development and will be directed towards the attenuation facilities. The attenuation facilities will be designed to reduce the outflow from the entire development to the 1:5 year predevelopment flow.

Attenuation will take place in tanks associated with the commercial development and the high density developments and in open ponds for the remainder of the township. It is intended that were practical ponds will be maintained as "wet ponds" with the attenuation occurring within the freeboard provided at each pond. The indicated area of the ponds on plan number 21535-01-01-100-200 is approximately 13,000 m². The attenuation required for the township can therefore be accommodated in a freeboard of between 400 and 500 mm depending on the locality in the routing of the storm flow.

The proposed tank on the commercial site (Erf 367) is sized at 2200 m³ in the tank on Erf 348 at 620 m³.

Fully attenuated stormwater will be discharge at several points onto the surrounding golf course.

6 GAS

It is proposed that the township will be reticulated with town gas. Arrangements have been made with In Egoli Gas for a connection to the west of the proposed township. The township will be fully reticulated to Egoli Gas standards and the system will be handed over to Egoli Gas upon completion. Although negotiations have taken place a formal supply agreement has not yet been reached.

Where the gas line crosses the wetland associated with the drainage line west of the proposed development the pipe will be jacked under the wetland to limit disruption as a result of trending.

The position of the proposed gas link is shown on drawing number 21535-01-01-100-100.

GOBA (PTY) LTD

05 April 2013

HUDDLE PARK RESIDENTIAL

Services Demand

		No of Units	Size	500m2 units	Q per unit	Total Q			
Water	Res 1	314	750-999		1.31	411.34 Kl			
	Res 3 Far 2.8		2.1841	122.31	2.7	330.23592 Kl			
	Comm (2 Kl /500m2)	Far 0.2	4.8031	19.21	2	38.4248 Kl			
	Special HoA	2			1.31	2.62 Kl			
						782.62072 Kl	783 Kl per day	Peak Factor	Estimated Peak Flow
							5	45.31 l/sec	
Sewer	Res 1	314	750-999		0.94	295.16 Kl			
	Res 2/3 Far 0.6		2.1841	122.31	2.295	280.70053 Kl			
	Comm (2 Kl /500m2)	Far 0.2	4.8031	19.2124	1.6	30.73984 Kl			
	Special HoA	2			0.94	1.88 Kl			
						608.48037 Kl	608 Kl per Day		35.19 l/sec

Water Peak Factor from "Red Book" Fig 8.27

Sewer Peak Flow assumes NO attenuation within township system.

GOBA (Pty) Ltd

July 2012 App Plan