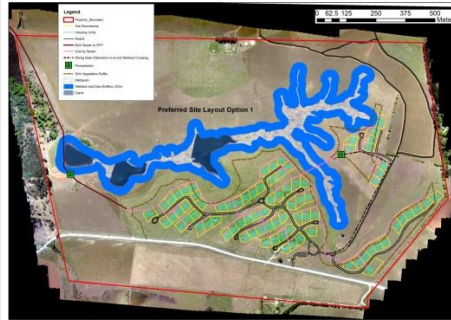




PROJECT	: UPM140
DATE	: 2019-2020
CLIENT	: Gwens Stream Estate (Pty) Ltd
CONTRACTOR	: To be Appointed
PROJECT VALUE	: R25,000,000

Dairy on Hilton



Umsunguli Project Management cc was appointed by Gwens Stream (Pty) Ltd to undertake a bulk services report and stormwater management plan to support the environmental and rezoning applications for the proposed Dairy at Hilton development, comprising 81 sites with an average erf size of 1800m². The proposed development is situated on the 1760ha Hilton College Estate on Portion 167 (of 10) of the Farm Hilton No. 12304 located within uMngeni Municipality. UPM will be responsible for the scope of work under the civil engineering component, including the design and supervision of a waterborne sewage system, water reticulation, internal surfaced roads, stormwater, stormwater attenuation ponds and the upgrade of the D494 access road to Department of Transport standards, including a large 2 x 1,2 x 1,2m box culvert. A more detailed description of the respective services is:

Internals Roads

All internal roads (3250m) will 6m wide asphalt surfacing and constructed to suit the anticipated traffic flow through the development, with additional parking provided near the Guardhouse for visitors. The geometric design of the internal road network will include crossfalls that direct the run-off into grass lined side drains, connected to the stormwater attenuation ponds through the provision of catchpits, stormwater pipes and headwalls, fitted with energy dissipaters. The length of the internal road is approximately 2.8 km in length. The pavement design will be a conventional municipal standard Category UC road for granular bases with an anticipated design bearing capacity ES1 0,3-1,0 x 10⁶ within a wet region (Red Book Extract). The access off the D494 to site will be upgraded to a B1 intersection approved by the Department of Transport.

D494 Upgrade

The D494 is a gravel district road that provides access to the development off the P139-1, all under the authority of the Department of Transport. A portion of 1900m of the D494 will be upgraded to a 7,4m wide asphalt surfaced road, including the improvement of the geometric design to ensure the horizontal and vertical alignments comply with the proposed design speed of 80km/h. The existing culvert will be upgraded to a double cell 1,2 x 1,2m precast box culvert, suitable for floods of 1:50 occurrence.

Storm water

The implementation of rainwater harvesting is encouraged by the Home Owners Association and rainwater harvesting tanks will act at the first form of attenuation, whilst it could also serve other uses. Run-off from roofs will be captured in gutters and stored in rainwater tanks for the utilization of gardening and other domestic activities. Any overflow from the tank or gutters will be directed overland into hardened areas like roads and side drains before being collected in stormwater attenuation ponds, before overflows will disperse into the natural drainage areas, wetlands and storage dams on the tributary of the Gwens Stream. Stormwater attenuation ponds will also serve as a feature within the residential estate and will be designed to release stormwater in a controlled manner to prevent scouring and erosion.

Stormwater Attenuation Pond

The purpose of the stormwater attenuation pond is to attenuate the peak flow and to release stormwater into the municipal system at pre-development flows to protect downstream natural drainage areas and wetlands. Attenuation ponds will constructed by means of natural ground compacted in layers and earth embankments. The basement of the pond is 500mm lower than the outlet to act a natural silt trap. The attenuation areas will also be used in the landscaping plan as a focal point and feature for residents. Aesthetically pleasing bio-retention mechanisms such as reed beds and specialised vegetation may be included to ensure that the quality of the controlled release of run-off is not compromised.

Water Reticulation

The existing water purification plant will be expanded by adding a 70m³/h module, from where potable water is transferred through a 1430m main into a 250kl bulk water reservoir. A new bulk water supply line will feed into the development, which will provide each residential site with a metered water connection.

Internal Sewer Reticulation

The internal sewer reticulation comprise 3080m of 160mm uPVC Class 34 sewer pipes with 1m precast concrete manholes at placed at a maximum spacing of 80m or at a change in direction throughout the development. House connections will be provided for each for site either midblock or into the nearest manhole.

Bulk Sewer

The proposed development will be provided with waterborne sewage system. The internal reticulation will gravitate to a lowpoint from where it will be pumped over the ridge into a gravity sewerline, linked to a future development, known as The Oaks. The sewer pumpstation located within The Oaks will then pump sewage into the existing Hilton College Waste Water Treatment Works, where effluent is treated to special limits before it is used for the irrigation of grazing pastures or returned to the stream. The total length of the bulk sewer rising main is 3150m.