

Method Statement for Construction of Water, Stormwater and Sewer Pipelines

1. Introduction

This technical note covers the generic design and construction considerations and parameters for the laying of pipelines for the Westfield Estate.

The proposed pipelines range in size from 1 500mm to 75mm nominal diameter. All pipes will be laid, as far as is possible, in existing pipeline servitudes. Pipelines will be laid in trenches and backfilled to natural ground level. The development layout is as shown in Annexure A.

This method statement has been prepared to fulfil the WULA requirement of any structure that is to be developed and falls within a 500m radius of an existing wetland must apply for a Section 21(c) and (i).

2. Planning of Pipelines

In the planning for the design phase of the pipelines, cognisance is taken of the following reference documents;

- Red Book – Guidelines for Human Settlement Planning and Design;
- SABS 1200 – Standardised Specification for Civil Engineering Construction;
- Local municipal standards.

When planning or designing the pipelines, a holistic approach that adheres to all the tenets of the reference or policy documents listed above will be adopted. The environmental sensitivity of wetland areas is acknowledged and designs undertaken will take full cognisance of the proposed impact to these areas.

The approach to design and construction will encompass the following;

- Appropriate and adequate protection of existing manmade and natural structures such as buildings, fences, river banks, etc. in the vicinity of the pipelines will be incorporated into the design.
- Existing fences will be maintained as far as is possible, but if not possible will be temporarily removed and reinstated to the same or better condition. The time taken will be kept to a minimum and where necessary temporary fencing will be erected to maintain the level of security to the effected properties.
- Where crossing or running alongside river or stream courses, the existing river/stream bank structure will be maintained to reduce disturbance to the river flow.
- Where the pipeline crosses stormwater channels these will be designed to have no impact on normal stormwater flow in that all pipes and concrete casing will be buried at least 500mm below natural channel level in the case of soft material, and level with the natural channel in the case of hard rock material.
- In the case of sewer and stormwater pipelines, manholes will be provided at all changes in grade and direction and at intervals not exceeding 80m to facilitate maintenance during the lifetime of the pipelines.

3. Planning of River/Stream and Wetland Crossings

In the planning for the design phase of the pipe crossing, cognisance is taken of the following reference documents;

- Red Book – Guidelines for Human Settlement Planning and Design;
- SABS 1200 – Standardised Specification for Civil Engineering Construction;
- Local municipal standards.

When planning or designing the pipe crossing, a holistic approach that adheres to all the tenets of the reference or policy documents listed above will be adopted. The environmental sensitivity of wetland areas is acknowledged and designs undertaken will take full cognisance of the proposed impact to these areas.

This includes the impact on all, or any, matters relating to water quality, flooding, agricultural drainage, erosion, flora and fauna and any adjacent topographical features.

The approach to design and construction will encompass the following;

- Appropriate and adequate protection of the river/stream/wetland banks in the vicinity of the pipeline will be incorporated into the design.
- The existing river/stream bank structure will be maintained to reduce disturbance to the river/stream flow.
- Wherever possible, the pipelines will cross river/stream and wetlands within a road prism.
- The pipe crossings have been designed to have no impact on normal river/stream flow.
- Where pipes are laid through a flood plain (1 : 100 year flood line), a minimum cover level of 1 metre will be maintained.

4. Construction Methodology

Construction methodology will differ slightly depending on the nature of the river/stream or wetland being crossed. Perennial streams will require the temporary diversion of water flow during construction, whereas non-perennial streams may not require flow diversion depending on the season.

4.1 *A typical construction sequence is summarised hereunder:*

- Conduct a competent site investigation to build up an informed picture of the task.
- Conduct a topographical survey of the pipeline route.
- Adequate design of all the stages of construction.
- All Environmental and Health and Safety requirements and good practice to be adhered to.

4.2 *Plant and Resources required for the Construction may include, inter alia:*

- Excavators;
- Crane of sufficient lifting capacity and reach for pipe laying (if required);
- Tipper trucks for the delivery of bedding material;
- Compaction equipment;
- Pneumatic breakers (if required);
- On-site concrete batching plant (if required);
- Concrete delivery vehicles for wet concrete;
- Formwork, reinforcing steel and the necessary equipment and tools for assembly;

- Equipment for the construction of concrete ring manholes and concrete encasement of pipes.

4.3 *Construction Method for Pipes laid in Trenches:*

This method will be used where pipes are conventionally laid in trenches and backfilled to natural ground level.

- Remove topsoil and stockpile for later use.
- Excavate trench for pipeline to the design level.
- If the material is firm normal excavation techniques will apply. In soft material shoring of the trench sides may be required. In hard rock material trench excavation may require the use of pneumatic breakers or blasting.
- Install temporary dewatering pumps to keep the excavation dry (if required due to groundwater ingress).
- Construct stormwater diversion berms where required.
- Place concrete to encasement if required. The top level will be determined by the stormwater channel level.
- Place bedding, lay pipe, place and compact selected fill over the pipeline.
- Construct manholes, where required. Manholes will be constructed along the pipeline route at changes in grade and direction.
- Backfill to specification.
- Dress backfill, topsoil and re-vegetate all exposed areas.

5. Conclusion

All design and construction work will be carried out in accordance with the relevant construction specifications and in compliance with the Construction Health and Safety Specifications as well as the Construction Environmental Management Plan.

Annexure A
Development Plan