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Reference number:Portion 21/195, GeorgeDate:06/02/2025

Enquiries:

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ATTENTION: MR JUSTIN BRANFORD

Pieterkoen Development Company (Pty) Limited PO Box 92 George 6530

APPLICATION FOR REZONING AND SUBDIVISION OF THE FARM PIETER KOEN (KRAAIBOSCH 195/21), GEORGE - STORMWATER MANAGEMENT PLAN.

Regarding correspondence (16/3/3/1/D2/19/0033/24) dated **18 November 2024** regarding the draft Basic Assessment Report (BAR) for the proposed development on Portion 21 of Farm 195, George.

With respect to Clause 2.5 Stormwater management plan, the Municipality confirm the following:

1. Preliminary Design Compliance

The preliminary stormwater management plan, as submitted, aligns with the **CSIR Red Book guidelines** and incorporates **Sustainable Urban Drainage Systems (SuDS)** principles. Based on our initial review, the proposed designs conform to the municipality's applicable standards and requirements for stormwater management.

2. Detailed Design Assessment

While the preliminary design meets municipal standards, a detailed evaluation will be conducted once the final design plans are submitted. This assessment will ensure that all technical elements, including servitudes, runoff management, and structural details, are fully compliant.

3. Environmental Considerations

The municipality acknowledges the proximity of the watercourse to the site and emphasizes the importance of preventing contamination in runoff. The detailed design phase will incorporate necessary mitigation measures, which will be reflected in the Environmental Management Programme (EMP).

We trust this confirmation is satisfactory. Should you require any further information or clarification, please do not hesitate to contact our office.

Kindly confirm your acceptance of the above in writing.

Yours faithfully, PΡ

JANNIE KOEGELENBERG DIRECTOR: CIVIL ENGINEERING SERVICES





21 November 2024

Our Ref: G5215BA Your Ref:

Pieterkoen Development Company (Pty) Limited PO Box 92 George 6530

Attention: Justin Branford

PER e-mail: justin.branford@igen.co.za

Dear Sir

APPLICATION FOR REZONING AND SUBDIVISION OF THE FARM PIETER KOEN (KRAAIBOSCH 195/21), GEORGE: EIA AND TOWN PLANNING – STORMWATER MANAGEMENT PLAN

We refer to the Stormwater Management Plan as submitted with the WULA application, by others, and as received on 20 November 2024 nl.:

- STORMWATER MANAGEMENT PLAN_WU35086_RE_21_195

After scrutiny we conclude that the recommendations and preliminary drawings from our Civil Services Report have been taken into consideration in the above referred management plan.

We trust you find the above in order. Please let us know if anything is unclear or if you require further information.

Yours faithfully KANTEY & TEMPLER

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STORMWATER MANAGEMENT PLAN:

DEVELOPMENT OF A RESIDENTIAL ESTATE ON REMAINDER OF PORTION 21 OF FARM 195 (PIETER KOEN TRUST), GEORGE

Stormwater Disposal and Management Plan

According to the civil report and drawings, the following is relevant: Stormwater infrastructure is envisaged to be provided by the developer – see drawing G5215BA-CE-102-A, G5215BA-CE-110-A and G5215BA-CE-111-A. All necessary precautions will be taken to prevent erosion. Also see figures at the end of this document.

Design Philosophy

Stormwater management will be according to recommendations contained in the Red Book i.e., Guidelines for Human Settlement Planning and Design as compiled by the CSIR. The principals of SuDS will further be considered to minimise the amount and impact of stormwater leaving the site. A dual drainage system will be adopted. Source control of the minor flood with 1:5 year or less recurrence intervals will be provided by the utilisation of roof water collection rainwater tanks to collect runoff from roofs for later use in irrigation of gardens etc. Local control will be facilitated by the use of catchment structures and will, where possible, be constructed per erf pockets as required. This will to some extent facilitate infiltration of water at source. The major flood with 1:50 year recurrence interval will be carried in the streets and the formal system (as per Guidelines) and only where the above minor system's capacity is exceeded, then in overland open or piped channels to the natural watercourses. During the detail design phase, storm runoff from catchment areas will be calculated and catchpit inlets will be positioned and sized to match runoff volumes. The capacity of road kerbs will also be checked against major runoff volumes. Stormwater servitudes will be provided between erven where necessary to accommodate overland open channels with sufficient capacity to carry major storm runoff from the edge of the road to the nearest natural watercourse.

Specific Considerations

Runoff from the land will increase because of the development, but this will be accommodated in the design of the minor and major stormwater system. The increased runoff will not affect any existing or proposed properties, since all properties are well above the 1:100 year flood lines for the major natural watercourse (Swart River).

Increased overland flow velocities

Various measures will be incorporated to mitigate increased flow velocities like:

• Energy dissipaters and stilling basins at stormwater pipe outlets. Reno mattress aprons with stilling basins where appropriate will be provided at all culvert outlets. Large rocks will be effective as energy dissipaters and will contribute to the landscaping.

• Lining of open channels with grass (swales) and or stone pitching where required.

• Utilisation of invader tree logs to act as flow speed calming structures placed across flow paths and anchored properly.

• Utilisation of Gabion type structures to act as flow speed calming elements placed across flow paths and anchored properly.

Quality of water

Long term contamination of stormwater run-off is not a concern as the development consists mostly of commercial and housing development. In line with the SuDS principals pipe culvert outlets will be provided with Gabion and Reno mattress structures to facilitate slowing of minor storm flows and to provide infiltration areas to augment subsurface flow. Possible pollutants will be trapped in these structures and can be cleaned out as part of a regular maintenance schedule. The site is most vulnerable during the construction phase, and it will be necessary to utilize silt screens and onion bags to trap silt before the run-off joins the natural watercourses. Once vegetation in all the disturbed areas of the development is well established and ground surfaces have consolidated, no further measures will be required. These measures will be the subject of the Environmental Management Plan (EMP) which will be issued to the contractor at construction stage. The Environmental Control Officer (ECO) will be responsible for enforcing the EMP.

Protection of slopes that occur on the property

Natural slopes that have been disturbed and where sheet flow occurs will be landscaped and revegetated. Where flow is concentrated, measures will be incorporated as proposed above. Where stormwater is channelled towards the river and tributary streams, outlets have been spaced at intervals along the stream edge to avoid concentration of large flows. Stormwater will thus be fed into the streams and river system along a wide front allowing dissipated flow and seepage to all areas.

Preliminary High level Flow Estimation

The figures provided below should be considered as estimated quantities only. Flow estimation has been done according to the Rational Method for the 1:5 years return period nl. stormwater accommodated in the underground piped system and stormwater accommodated as overland sheet flow per the existing topography. Flow is indicated for the east side contributing to the existing stream as follows.

Pre-development flows: - 202,63 l/s Post-development flows: - 399,18 l/s As can be seen the expected increase in flow is 196,55 l/s.

Structure Designs

Of specific relevance to the WULA application, it is important to note that various stormwater management measures and structures are proposed to prevent any concentrated flow from entering the watercourse. These are in alignment with the principles of SUDs and the recommendations of the aquatic specialist.

Apart from the aquatic buffer zone, the following structures are included:

- · Gabion and reno-mattress erosion protection at outlets
- Stormwater retention
- Stilling basins
- Swales (600mm deep) at the gabion stormwater outlets with multiple exits over reno-mattress
- Retention ponds and infiltration swales
- Concrete baffles at outlet to slow and distribute flow

Refer to designs below taken from the civils design report:











Swales (600mm deep) at the gabion stormwater outlets with multiple exits over reno-mattress:

Retention and infiltration swales:









HE CARBA INC.