# ANNEXURE 14

Planning and Development
E-mail: town.planning.application@george.gov.za
Tel: +27 (0)44 801 9477

| YES | NO |
|---|---|

# LAND USE PLANNING PRE-APPLICATION CONSULTATION FORM

**PLEASE NOTE:**

*Pre-application consultation is an advisory session and is required prior to submission of an application for rezoning, consent use, temporary departure and subdivision. It does not in any way pre-empt the outcome of any future application which may be submitted to the Municipality.*

## PART A: PARTICULARS

Reference number: ____**Collab no. 3901579**_____

Purpose of consultation: _____**To discuss proposed land use application**_____

Brief proposal: __**Proposed Rezoning**_____

Property(ies) description: ____**Rem Kraai Bosch 195/7; Rem Kraai Bosch 195/8; Kraai Bosch 195/12; Rem Kraai Bosch 195/23; Kraai Bosch 195/48**

Date: _____**27 October 2025**_____

Attendees:

| | Name & Surname | Organisation | Contact Number | E-mail |
|---|---|---|---|---|
| **Official** | **Ilané Huyser** | **George Municipality** | **044 801 9477** | **ihuyser@george.gov.za** |
| **Official** | **Robert Jnase van Rensburg** | **George Municipality** | **044 801 9477** | **rhjansevanrensburg@george.gov.za** |
| **Pre-applicant** | **Marlize de Bruyn** | **DMC Town Planning** | **0766340150** | **marlize@mdbplanning.co.za** |

**Documentation provided for discussion:**

*(Include document reference, document/plan dates and plan numbers where possible and attach to this form)*
____**Copy of title deed, locality, development plan**_____

Has pre-application been undertaken for a Land Development application with the Department of Environmental Affairs & Development Planning (DEA&DP)?

**Comprehensive overview of proposal:**

*Just over 16 years ago, the land use application for Rem Kraai Bosch 195/7; Rem Kraai Bosch 195/8; Kraai Bosch 195/12; Rem Kraai Bosch 195/23; Kraai Bosch 195/48 was approved by the Department of Environmental Affairs & Development Planning. The development proposal was then known as Destiny Africa. The new owner has re-named it to Garden Route City. The previous land use application has lapsed. The development area is still included in the urban edge for the first four properties. Kraai Bosch 195/48 is not included in the urban edge.*

*Following a market investigation, the new owners propose to develop the first four properties for various housing typologies, a business node focussed on the daily needs of the community, a site for a school(s) and a mixed land use area with the exact detail to be decided on it time. The development proposal makes provision for the needed road linkages which will also accommodate GOGeorge in future.*

*The northern section of the development area (Rem Kraai Bosch 195/7; Rem Kraai Bosch 195/23) consisting of 3 phases will be developed first. It is to include about 608 residential opportunities in phase 1 & 2 (dwelling houses, group housing units, town housing units, flats) as well as convenience shopping, medical services, a crèche and sporting facilities in phase 3. The residential density is estimated at an average of 18.8du/ha.*

*The detail of the phases to follow, will be determined as the first 3 phases roll out and the exact reaction of the market. For Phase 4 and 5 is at this point in time estimated to accommodate at least 620 group housing erven with a density of about 17du/ha.*

*The topography of the development area is challenging resulting in a lower density that generally expected.*

*Phase 6 is to be a mixed land use area which could include business opportunities and probably light industrial activities to focus on employment opportunities. Residential opportunities can also be provided, especially above ground floor, to combine work & home.*

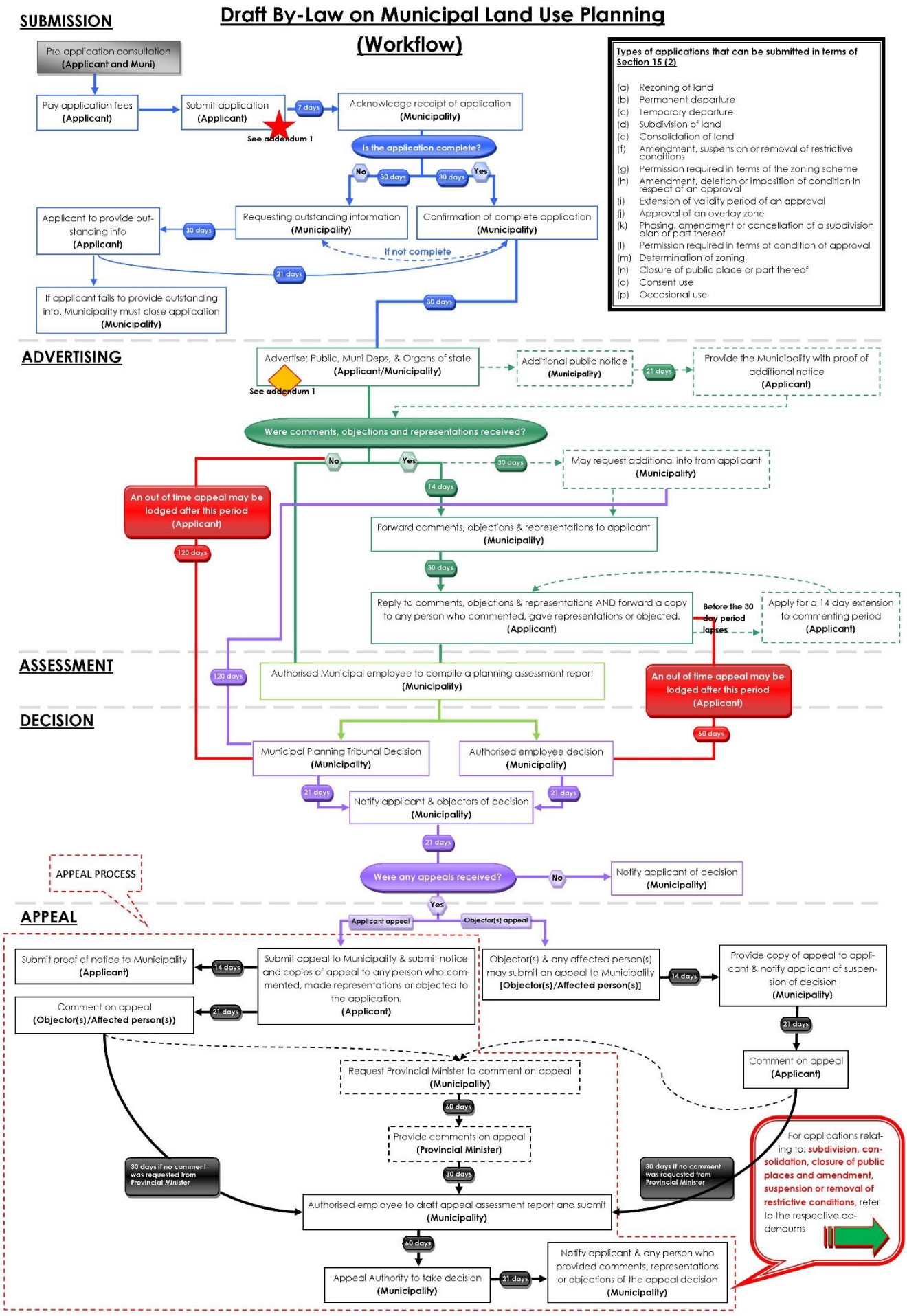
*Phase 7 is to be developed as GRZIV – flats. The density it expected to be at least 60 du/ha with up to 4350 units possible on about 72ha.*

*The development of Kraai Bosch 195/48, the 105.7317ha not included in the urban edge, is to be developed considering the natural environment but with access and activities for residents and the general public such as hiking trails, mountain biking, etc. It should link with the open spaces between all the phases of this development.*

*An overlay zone approach is proposed for the land use application – Section 15(2)(j) of the planning by-law. A development framework is to be compiled with the detail for Phase 1, 2 & 3 (rezoning to subdivisional area – SRZII – estate housing).*

## PART B: APPLICATION PROCESS (WILL FULLY APPLY ONLY ONCE LUPA REGULATIONS ARE IN FORCE)

# Draft By-Law on Municipal Land Use Planning (Workflow)



PART C: *QUESTIONNAIRES*

SECTION A:

DETERMINATION OF APPLICATION TYPES, PRESCRIBED NOTICE AND ADVERTISEMENT PROCEDURES

| Tick if relevant | | What land use planning applications are required? | Application fees payable |
|---|---|---|---|
| **x** | **2(a)** | **a rezoning of land;** | R |
| | 2(b) | a permanent departure from the development parameters of the zoning scheme; | R |
| | 2(c) | a departure granted on a temporary basis to utilise land for a purpose not permitted in terms of the primary rights of the zoning applicable to the land; | R |
| **x** | **2(d)** | **a subdivision of land that is not exempted in terms of section 24, including the registration of a servitude or lease agreement;** | R |
| | 2(e) | a consolidation of land that is not exempted in terms of section 24; | R |
| | 2(f) | a removal, suspension, or amendment of restrictive conditions in respect of a land unit; | R |
| | 2(g) | a permission required in terms of the zoning scheme; | R |
| | 2(h) | an amendment, deletion, or imposition of conditions in respect of an existing approval; | R |
| | 2(i) | an extension of the validity period of an approval; | R |
| **x** | **2(j)** | **an approval of an overlay zone as contemplated in the zoning scheme;** | R |
| | 2(k) | an amendment or cancellation of an approved subdivision plan or part thereof, including a general plan or diagram; | R |
| | 2(l) | a permission required in terms of a condition of approval; | R |
| | 2(m) | A determination of a zoning; | R |
| | 2(n) | A closure of a public place or part thereof; | R |
| | 2(o) | a consent use contemplated in the zoning scheme; | R |
| | 2(p) | an occasional use of land; | R |
| | 2(q) | to disestablish a home owner's association; | R |
| | 2(r) | to rectify a failure by a home owner's association to meet its obligations in respect of the control over or maintenance of services; | R |
| | 2(s) | a permission required for the reconstruction of an existing building that constitutes a non-conforming use that is destroyed or damaged to the extent that it is necessary to demolish a substantial part of the building | R |
| **Tick if relevant** | | **What prescribed notice and advertisement procedures will be required?** | **Advertising fees payable** |
| **Y** | N | Serving of notices (i.e. registered letters etc.) | R |
| **Y** | N | Publication of notices (i.e. Provincial Gazette, Local Newspaper(s) etc.) | R |
| **Y** | N | Additional publication of notices (i.e. Site notice, public meeting, local radio, website, letters of consent etc.) | R |
| **Y** | N | Placing of final notice (i.e. Provincial Gazette etc.) | R |
| | | **TOTAL APPLICATION FEE* (VAT excluded):** | To be determined |

**PLEASE NOTE:** * *Application fees are estimated on the information discussed and are subject to change with submission of the formal application and/or yearly application fee increase.*

**SECTION B:**

**PROVISIONS IN TERMS OF THE RELEVANT PLANNING LEGISLATION / POLICIES / GUIDELINES**

| QUESTIONS REGARDING PLANNING POLICY CONTEXT | YES | NO | TO BE DETERMINED | COMMENT |
|---|---|---|---|---|
| Is any Municipal Integrated Development Plan (IDP)/Spatial Development Framework (SDF) and/or any other Municipal policies/guidelines applicable? If yes, is the proposal in line with the aforementioned documentation/plans? | | | **X** | |
| Any applicable restrictive condition(s) prohibiting the proposal? If yes, is/are the condition(s) in favour of a third party(ies)? [List condition numbers and third party(ies)] | | | **X** | |
| Any other Municipal by-law that may be relevant to application? (If yes, specify) | | | **X** | |
| **Zoning Scheme Regulation considerations:**<br>Which zoning scheme regulations apply to this site?<br>_____**GIZSB 2023**_____<br>What is the current zoning of the property?<br>_____ **AZI**_____<br>What is the proposed zoning of the property?<br>_____ **Overlay Zone & Subdivisional Area**_____<br>Does the proposal fall within the provisions/parameters of the zoning scheme?<br>_____**To be determined** _____<br>Are additional applications required to deviate from the zoning scheme? (if yes, specify)<br>_____**To be determined**_____ | | | | |

| QUESTIONS REGARDING OTHER PLANNING CONSIDERATIONS | YES | NO | TO BE DETERMINED | COMMENT |
|---|---|---|---|---|
| Is the proposal in line with the Provincial Spatial Development Framework (PSDF) and/or any other Provincial bylaws/policies/guidelines/documents? | | | **X** | |
| Are any regional/district spatial plans relevant? If yes, is the proposal in line with the document/plans? | | | **X** | |

**SECTION C:**

**CONSENT / COMMENT REQUIRED FROM OTHER ORGANS OF STATE**

| **OUESTIONS REGARDING CONSENT / COMMENT REQUIRED** | **YES** | **NO** | **TO BE DETERMINED** | **OBTAIN APPROVAL / CONSENT / COMMENT FROM:** |
|---|---|---|---|---|
| Is/was the property(ies) utilised for agricultural purposes? | | | **X** | Western Cape Provincial Department of Agriculture |
| Will the proposal require approval in terms of Subdivision of Agricultural Land Act, 1970 (Act 70 of 1970)? | | | **X** | National Department of Agriculture |
| Will the proposal trigger a listed activity in terms of National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA)? | | | **X** | Western Cape Provincial Department of Environmental Affairs & Development Planning (DEA&DP) |
| Will the proposal require authorisation in terms of Specific Environmental Management Act(s) (SEMA)? (National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003) (NEM:PAA) / National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEM:BA) / National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) (NEM:AQA) / National Environmental Management: Integrated Coastal Management Act, 2008 (Act 24 of 2008) (NEM:ICM) / National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEM:WA) (strikethrough irrelevant) | | | **X** | National Department of Environmental Affairs (DEA) & DEA&DP |
| Will the proposal require authorisation in terms of the National Water Act, 1998 (Act 36 of 1998)? | | | **X** | National Department of Water & Sanitation (DWS) |
| Will the proposal trigger a listed activity in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)? | | | **X** | South African Heritage Resources Agency (SAHRA) & Heritage Western Cape (HWC) |
| Will the proposal have an impact on any National or Provincial roads? | | | **X** | National Department of Transport / South Africa National Roads Agency Ltd. (SANRAL) & Western Cape Provincial Department of Infrastructure (RNM) |

| OUESTIONS REGARDING CONSENT / COMMENT REQUIRED | YES | NO | TO BE DETERMINED | OBTAIN APPROVAL / CONSENT / COMMENT FROM: |
|---|---|---|---|---|
| Will the proposal trigger a listed activity in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993): Major Hazard Installations Regulations | | | **X** | National Department of Labour (DL) |
| Will the proposal affect any Eskom owned land and/or servitudes? | | | **X** | Eskom |
| Will the proposal affect any Telkom owned land and/or servitudes? | | | **X** | Telkom |
| Will the proposal affect any Transnet owned land and/or servitudes? | | | **X** | Transnet |
| Is the property subject to a land / restitution claims? | | | **X** | National Department of Rural Development & Land Reform |
| Will the proposal require comments from SANParks and/or CapeNature? | | | **X** | SANParks / CapeNature |
| Will the proposal require comments from DFFE? | | | **X** | Department of Environment, Forestry and Fishery |
| Is the property subject to any existing mineral rights? | | | **X** | National Department of Mineral Resources |
| Does the proposal lead to densification to such an extent that the number of schools, healthcare facilities, libraries, safety services, etc. In the area may be impacted on? (strikethrough irrelevant) | | | **X** | Western Cape Provincial Departments of Cultural Affairs & Sport (DCAS), Education, Social Development, Health and Community Safety |

**SECTION D:**

**SERVICE REQUIREMENTS**

| DOES THE PROPOSAL REQUIRE THE FOLLOWING ADDITIONAL INFRASTRUCTURE / SERVICES? | YES | NO | TO BE DETERMINED | OBTAIN COMMENT FROM: (list internal department) |
|---|---|---|---|---|
| Electricity supply: | | | **X** | Directorate: Electro-technical Services |
| Water supply: | | | **X** | Directorate: Civil Engineering Services |
| Sewerage and waste water: | | | **X** | Directorate: Civil Engineering Services |
| Stormwater: | | | **X** | Directorate: Civil Engineering Services |
| Road network: | | | **X** | Directorate: Civil Engineering Services |

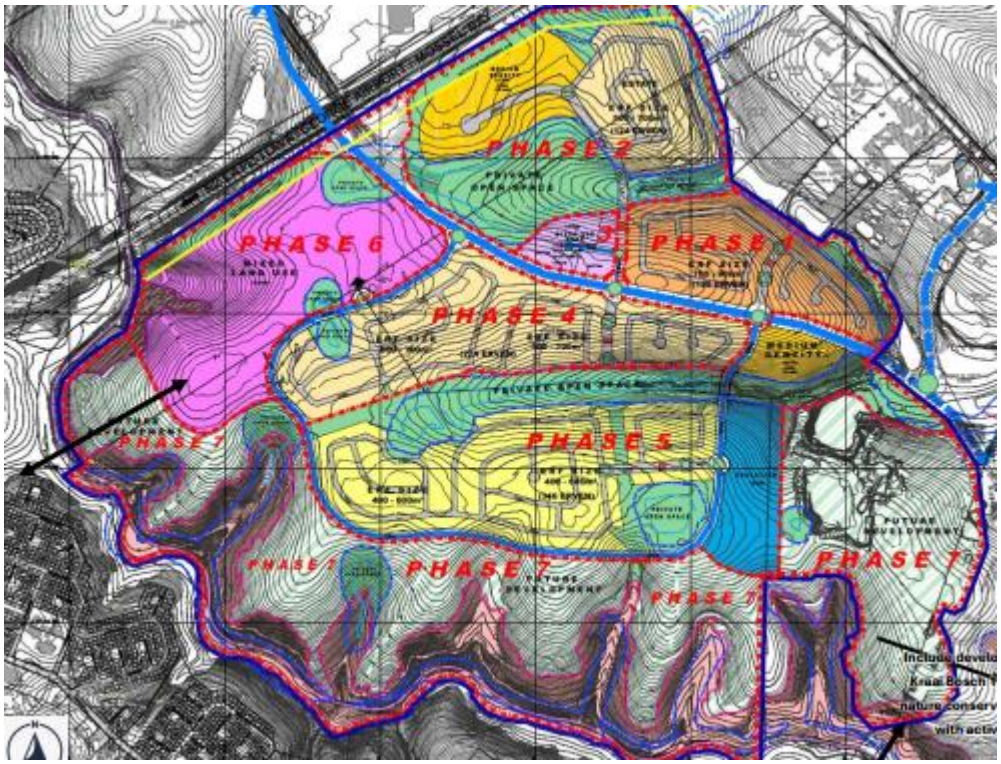
| | | | | |
|---|---|---|---|---|
| Telecommunication services: | | | **X** | |
| Other services required? Please specify. | | | **X** | |
| Development charges: | | | **X** | |

## PART D: COPIES OF PLANS / DOCUMENTS TO BE SUBMITTED AS PART OF THE APPLICATION

| | | | | | | |
|---|---|---|---|---|---|---|
| **COMPULSORY INFORMATION REQUIRED:** | | | | | | |
| **Y** | N | Power of Attorney / Owner's consent if applicant is not owner (if applicable) | | **Y** | N | S.G. noting sheet extract / Erf diagram / General Plan |
| **Y** | N | Motivation report / letter | | **Y** | N | Full copy of the Title Deed |
| **Y** | N | Locality Plan | | **Y** | N | Site Layout Plan |
| **Y** | N | Proof of payment of fees | | Y | **N** | Bondholder's consent |
| **MINIMUM AND ADDITIONAL REQUIREMENTS:** | | | | | | |
| Y | N | Site Development Plan | | **Y** | N | Conveyancer's Certificate |
| **Y** | N | Land Use Plan | | **Y** | N | Proposed Zoning plan |
| **Y** | N | Phasing Plan | | **Y** | N | Consolidation Plan |
| Y | **N** | Abutting owner's consent | | Y | **N** | Landscaping / Tree Plan |
| **Y** | N | Proposed Subdivision Plan (including street names and numbers) | | Y | **N** | Copy of original approval letter |
| **Y** | N | Services Report or indication of all municipal services / registered servitudes | | Y | **N** | Home Owners' Association consent |
| Y | **N** | Copy of Environmental Impact Assessment (EIA) / Heritage Impact Assessment (HIA) / Traffic Impact Assessment (TIA) / Traffic Impact Statement (TIS) / Major Hazard Impact Assessment (MHIA) / Environmental Authorisation (EA) / Record of Decision (ROD) (strikethrough irrelevant) | | Y | **N** | 1 : 50 / 1:100 Flood line determination (plan / report) |
| Y | **N** | Other (specify) | | Y | N | Required number of documentation copies |

## PART E: DISCUSSION

The Pre-Application meeting dated 29 October 2025 refers. The layout presented at the meeting is illustrated below:




_

Town Planning:

- The overall proposal was discussed.
- It was stated that a meeting is scheduled for 13 November 2025 with various departments to establish consensus regarding the development overlay zone proposed and way forward.
- It is noted that the densities are quite low, to consider increasing the densities.
- The applications mentioned in the pre-application - for the initial phases- can be submitted simultaneously.
- Need to address compliance with MSDF of 2023, SPLUMA, Zoning Scheme etc**.**
- Accesses to be addressed and confirmed.
- Necessary departures to be applied for where applicable.
- Further Pre-Applications will be required based on the outcome of the meetings between the Municipality and developers.

## PART F: SUMMARY / WAY FORWARD

Refer to comments in section E. Further discussions and meeting/pre app(s) required.

OFFICIAL: Robert Janse van Rensburg
Town Planner

PRE-APPLICANT: _____ **Marlize De Bruyn** _____
(FULL NAME)

SIGNED: _____ SIGNED: _____ _____

DATE: _____05.11.2025_____ DATE: _____27 **October 2025**_____

OFFICIAL: **Ilané Huyser**

(Senior Town Planner)

SIGNED: _____

DATE: _____06.11.2025_____

# ANNEXURE 15

Planning and Development
E-mail: town.planning.application@george.gov.za
Tel: +27 (0)44 801 9477

| YES | **NO** |
|---|---|

# LAND USE PLANNING PRE-APPLICATION CONSULTATION FORM

**PLEASE NOTE:**

*Pre-application consultation is an advisory session and is required prior to submission of an application for rezoning, consent use, temporary departure and subdivision. It does not in any way pre-empt the outcome of any future application which may be submitted to the Municipality.*

## PART A: PARTICULARS

Reference number: **4368181**

Purpose of consultation: _____**To discuss proposed land use application**_____

Brief proposal: __**Proposed Rezoning**_____

Property(ies) description: ____**Rem Kraai Bosch 195/7; Rem Kraai Bosch 195/8; Kraai Bosch 195/12; Rem Kraai Bosch 195/23; Kraai Bosch 195/48**

Date: _____**18 May & 6 July 2026** _____

Attendees:

| | **Name & Surname** | **Organisation** | **Contact Number** | **E-mail** |
|---|---|---|---|---|
| **Official** | | | | |
| **Pre-applicant** | **Marlize de Bruyn** | **DMC Town Planning** | **0766340150** | **marlize@mdbplanning.co.za** |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Documentation provided for discussion:**

*(Include document reference, document/plan dates and plan numbers where possible and attach to this form)*
____**Copy of title deed, locality, development plan**_____

Has pre-application been undertaken for a Land Development application with the Department of Environmental Affairs & Development Planning (DEA&DP)?

**Comprehensive overview of proposal:**

*The previous pre-application feedback dated 5 November 2025 (27 October 2026) refers as well as the meeting with various officials which took place on 13 November 2026. Various points were discussed including the following:*

- *Expropriation process – for access to N2 (northeast)*
- *Link to Ntaka Street*
- *Market investigation (Urban Econ)*
- *Infrastructure costs & demand*
- *Phase 1 – middle income; Phase II – affordable housing*
- *Inclusionary housing – municipal incentives*
- *Financial relief for infrastructure? For affordable housing & income bracket (below R800 000.00)*
- *SDP for each phase*
- *GM Guidelines for affordable housing*
- *Rezoning to Subdivisional Area; validity 5 years – extension 5 years*
- *Infrastructure capacity linked to roll out.*
- *Developable areas (which includes functional open space and excludes areas with biophysical constraints)*

*A follow-up discussion took place on 18 May 2026 with an accompanying pre-application later withdrawn awaiting further details. Matters discussed on 18 May 2026 are as follows:*

- *Technical detail for development proposal;*
- *Rezoning to subdivisional area with basket of each phase;*
- *Subdivision applications to be submitted per later phases;*
- *Consider how to address Kraaibosch 195/8 (mine);*
- *Open space provision.*

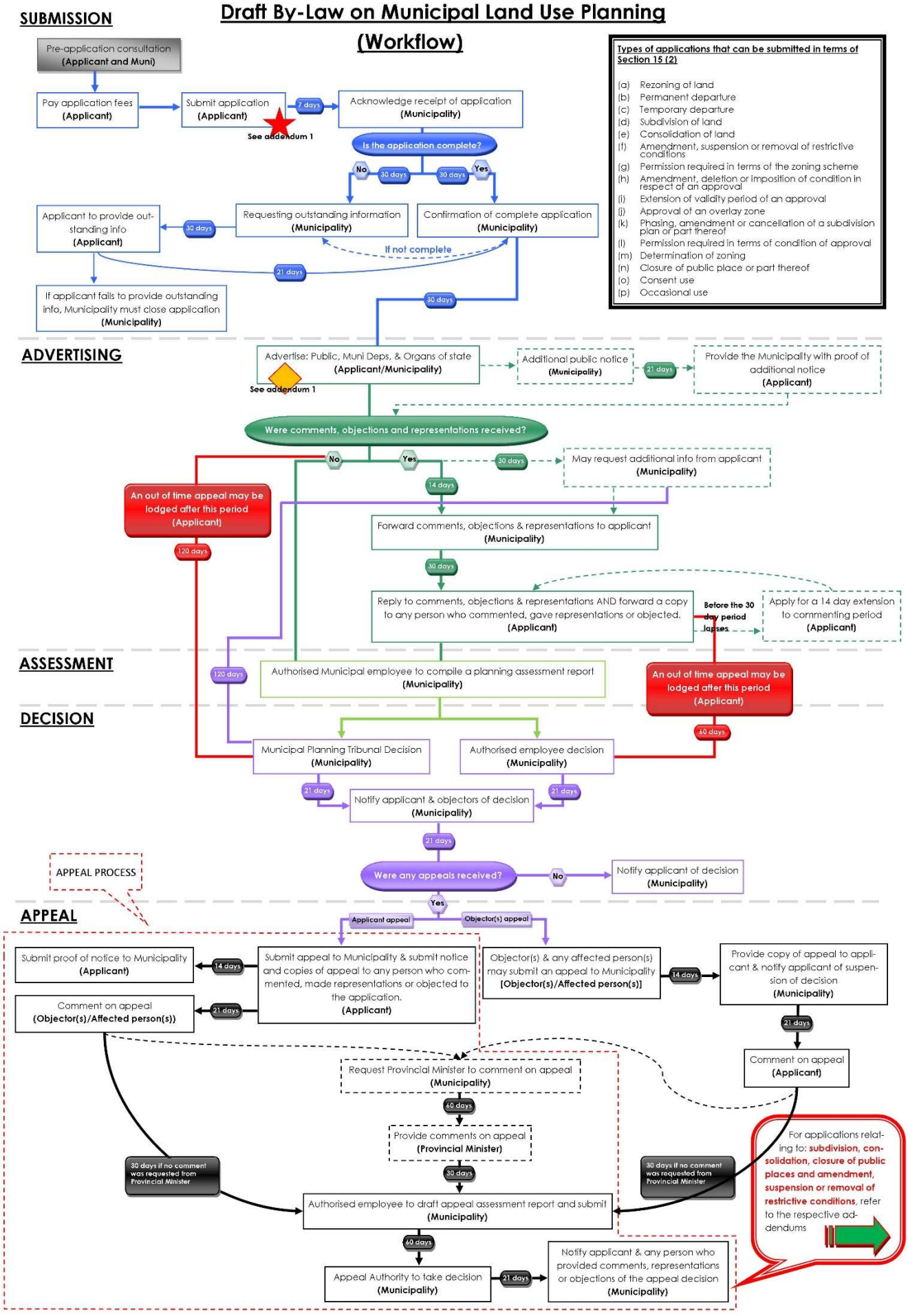
*Further project team discussions have taken place and the subdivision plans are being updated at present. The engineering disciplines (civil, traffic, electrical) are attending to what is necessary on the relevant levels. From an environmental perspective, specialist attending to the requirements in terms of NEMA.*

*Phase 1 as presented will remain the focus of the land use application to follow. Due to the NEMA-process and especially due to engineering services constraints outside of Phase 1, detail of the phases to follow, will not be part of the lan duse application to be submitted. What is expected from the future phases, will however be included. It is important for the NEMA-process to show that Phase 1 is self-sufficient.*

*The technical description of the proposed land use application will be coordinated with the relevant official.*

## PART B: APPLICATION PROCESS (WILL FULLY APPLY ONLY ONCE LUPA REGULATIONS ARE IN FORCE)

# Draft By-Law on Municipal Land Use Planning (Workflow)



PART C: *QUESTIONNAIRES*

SECTION A:

DETERMINATION OF APPLICATION TYPES, PRESCRIBED NOTICE AND ADVERTISEMENT PROCEDURES

| Tick if relevant | | What land use planning applications are required? | Application fees payable |
|---|---|---|---|
| **x** | **2(a)** | **a rezoning of land;** | R |
| | 2(b) | a permanent departure from the development parameters of the zoning scheme; | R |
| | 2(c) | a departure granted on a temporary basis to utilise land for a purpose not permitted in terms of the primary rights of the zoning applicable to the land; | R |
| **x** | **2(d)** | **a subdivision of land that is not exempted in terms of section 24, including the registration of a servitude or lease agreement;** | R |
| | 2(e) | a consolidation of land that is not exempted in terms of section 24; | R |
| | 2(f) | a removal, suspension, or amendment of restrictive conditions in respect of a land unit; | R |
| | 2(g) | a permission required in terms of the zoning scheme; | R |
| | 2(h) | an amendment, deletion, or imposition of conditions in respect of an existing approval; | R |
| | 2(i) | an extension of the validity period of an approval; | R |
| | 2(j) | an approval of an overlay zone as contemplated in the zoning scheme; | R |
| | 2(k) | an amendment or cancellation of an approved subdivision plan or part thereof, including a general plan or diagram; | R |
| | 2(l) | a permission required in terms of a condition of approval; | R |
| | 2(m) | A determination of a zoning; | R |
| | 2(n) | A closure of a public place or part thereof; | R |
| | 2(o) | a consent use contemplated in the zoning scheme; | R |
| | 2(p) | an occasional use of land; | R |
| | 2(q) | to disestablish a home owner's association; | R |
| | 2(r) | to rectify a failure by a home owner's association to meet its obligations in respect of the control over or maintenance of services; | R |
| | 2(s) | a permission required for the reconstruction of an existing building that constitutes a non-conforming use that is destroyed or damaged to the extent that it is necessary to demolish a substantial part of the building | R |
| **Tick if relevant** | | **What prescribed notice and advertisement procedures will be required?** | **Advertising fees payable** |
| Y | N | Serving of notices (i.e. registered letters etc.) | R |
| Y | N | Publication of notices (i.e. Provincial Gazette, Local Newspaper(s) etc.) | R |
| Y | N | Additional publication of notices (i.e. Site notice, public meeting, local radio, website, letters of consent etc.) | R |
| Y | N | Placing of final notice (i.e. Provincial Gazette etc.) | R |
| | | **TOTAL APPLICATION FEE* (VAT excluded):** | TBD |

**PLEASE NOTE:** * *Application fees are estimated on the information discussed and are subject to change with submission of the formal application and/or yearly application fee increase.*

**SECTION B:**

**PROVISIONS IN TERMS OF THE RELEVANT PLANNING LEGISLATION / POLICIES / GUIDELINES**

| QUESTIONS REGARDING PLANNING POLICY CONTEXT | YES | NO | TO BE DETERMINED | COMMENT |
|---|---|---|---|---|
| Is any Municipal Integrated Development Plan (IDP)/Spatial Development Framework (SDF) and/or any other Municipal policies/guidelines applicable? If yes, is the proposal in line with the aforementioned documentation/plans? | **X**<br>**X** | | | |
| Any applicable restrictive condition(s) prohibiting the proposal? If yes, is/are the condition(s) in favour of a third party(ies)? [List condition numbers and third party(ies)] | | | **X** | **Conveyance Attorney to confirm** |
| Any other Municipal by-law that may be relevant to application? (If yes, specify) | **X** | | | |
| **Zoning Scheme Regulation considerations:**<br>Which zoning scheme regulations apply to this site?<br>_____**GIZSB 2023**_____<br>What is the current zoning of the property?<br>_____ **AZI**_____<br>What is the proposed zoning of the property?<br>_____ **Subdivisional Area**_____<br>Does the proposal fall within the provisions/parameters of the zoning scheme?<br>_____**To be determined** _____<br>Are additional applications required to deviate from the zoning scheme? (if yes, specify)<br>_____**To be determined**_____ | | | | |

| QUESTIONS REGARDING OTHER PLANNING CONSIDERATIONS | YES | NO | TO BE DETERMINED | COMMENT |
|---|---|---|---|---|
| Is the proposal in line with the Provincial Spatial Development Framework (PSDF) and/or any other Provincial bylaws/policies/guidelines/documents? | | | **X** | |
| Are any regional/district spatial plans relevant? If yes, is the proposal in line with the document/plans? | | **X** | | |

**SECTION C:**

**CONSENT / COMMENT REQUIRED FROM OTHER ORGANS OF STATE**

| **OUESTIONS REGARDING CONSENT / COMMENT REQUIRED** | **YES** | **NO** | **TO BE DETERMINED** | **OBTAIN APPROVAL / CONSENT / COMMENT FROM:** |
|---|---|---|---|---|
| Is/was the property(ies) utilised for agricultural purposes? | | **X** | | Western Cape Provincial Department of Agriculture |
| Will the proposal require approval in terms of Subdivision of Agricultural Land Act, 1970 (Act 70 of 1970)? | **X** | | | National Department of Agriculture |
| Will the proposal trigger a listed activity in terms of National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA)? | **X** | | | Western Cape Provincial Department of Environmental Affairs & Development Planning (DEA&DP) |
| Will the proposal require authorisation in terms of Specific Environmental Management Act(s) (SEMA)? (National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003) (NEM:PAA) / National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEM:BA) / National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) (NEM:AQA) / National Environmental Management: Integrated Coastal Management Act, 2008 (Act 24 of 2008) (NEM:ICM) / National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEM:WA) (strikethrough irrelevant) | | | **X** | National Department of Environmental Affairs (DEA) & DEA&DP |
| Will the proposal require authorisation in terms of the National Water Act, 1998 (Act 36 of 1998)? | | | **X** | National Department of Water & Sanitation (DWS) |
| Will the proposal trigger a listed activity in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)? | | | **X** | South African Heritage Resources Agency (SAHRA) & Heritage Western Cape (HWC) |
| Will the proposal have an impact on any National or Provincial roads? | | | **X** | National Department of Transport / South Africa National Roads Agency Ltd. (SANRAL) & Western Cape Provincial Department of Infrastructure (RNM) |

| OUESTIONS REGARDING CONSENT / COMMENT REQUIRED | YES | NO | TO BE DETERMINED | OBTAIN APPROVAL / CONSENT / COMMENT FROM: |
|---|---|---|---|---|
| Will the proposal trigger a listed activity in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993): Major Hazard Installations Regulations | | | **X** | National Department of Labour (DL) |
| Will the proposal affect any Eskom owned land and/or servitudes? | | | **X** | Eskom |
| Will the proposal affect any Telkom owned land and/or servitudes? | | | **X** | Telkom |
| Will the proposal affect any Transnet owned land and/or servitudes? | | **X** | | Transnet |
| Is the property subject to a land / restitution claims? | | | **X** | National Department of Rural Development & Land Reform |
| Will the proposal require comments from SANParks and/or CapeNature? | | | **X** | SANParks / CapeNature |
| Will the proposal require comments from DFFE? | | | **X** | Department of Environment, Forestry and Fishery |
| Is the property subject to any existing mineral rights? | | | **X** | National Department of Mineral Resources |
| Does the proposal lead to densification to such an extent that the number of schools, healthcare facilities, libraries, safety services, etc. In the area may be impacted on? (strikethrough irrelevant) | | | **X** | Western Cape Provincial Departments of Cultural Affairs & Sport (DCAS), Education, Social Development, Health and Community Safety |

**SECTION D:**

**SERVICE REQUIREMENTS**

| DOES THE PROPOSAL REQUIRE THE FOLLOWING ADDITIONAL INFRASTRUCTURE / SERVICES? | YES | NO | TO BE DETERMINED | OBTAIN COMMENT FROM: (list internal department) |
|---|---|---|---|---|
| Electricity supply: | | | **X** | Directorate: Electro-technical Services |
| Water supply: | | | **X** | Directorate: Civil Engineering Services |
| Sewerage and waste water: | | | **X** | Directorate: Civil Engineering Services |
| Stormwater: | | | **X** | Directorate: Civil Engineering Services |
| Road network: | | | **X** | Directorate: Civil Engineering Services |

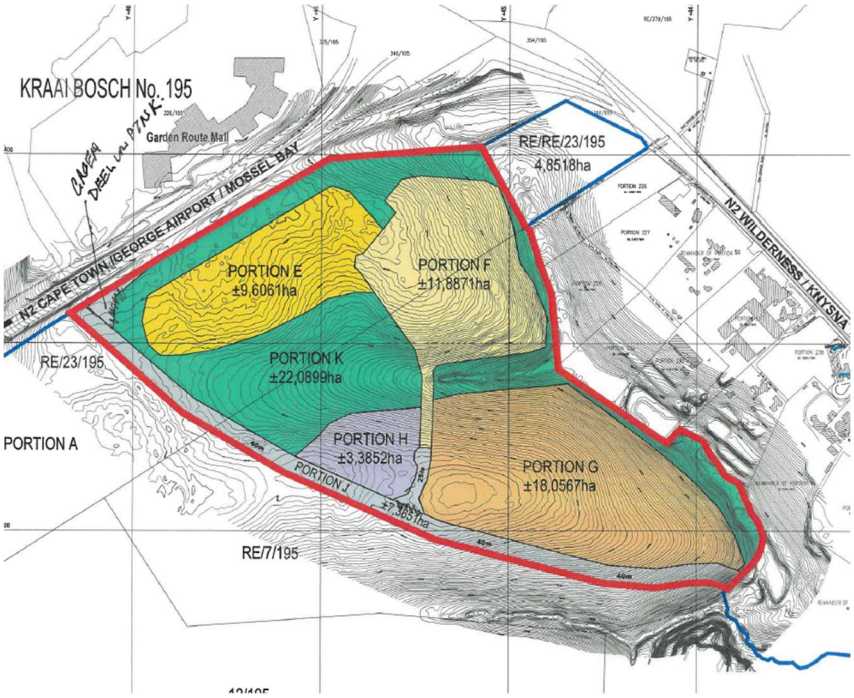
| | | | | |
|---|---|---|---|---|
| Telecommunication services: | | | **X** | |
| Other services required? Please specify. | | | **X** | |
| Development charges: | | | **X** | |

## PART D: COPIES OF PLANS / DOCUMENTS TO BE SUBMITTED AS PART OF THE APPLICATION

| | | | | | | |
|---|---|---|---|---|---|---|
| **COMPULSORY INFORMATION REQUIRED:** | | | | | | |
| **Y** | N | Power of Attorney / Owner's consent if applicant is not owner (if applicable) | | **Y** | N | S.G. noting sheet extract / Erf diagram / General Plan |
| **Y** | N | Motivation report / letter | | **Y** | N | Full copy of the Title Deed |
| **Y** | N | Locality Plan | | **Y** | N | Site Layout Plan |
| **Y** | N | Proof of payment of fees | | Y | **N** | Bondholder's consent |
| **MINIMUM AND ADDITIONAL REQUIREMENTS:** | | | | | | |
| Y | N | Site Development Plan | | **Y** | N | Conveyancer's Certificate |
| **Y** | N | Land Use Plan | | **Y** | N | Proposed Zoning plan |
| **Y** | N | Phasing Plan | | **Y** | N | Consolidation Plan |
| Y | **N** | Abutting owner's consent | | Y | **N** | Landscaping / Tree Plan |
| **Y** | N | Proposed Subdivision Plan (including street names and numbers) | | Y | **N** | Copy of original approval letter |
| **Y** | N | Services Report or indication of all municipal services / registered servitudes | | Y | **N** | Home Owners' Association consent |
| **Y** | N | Copy of Environmental Impact Assessment (EIA) / Heritage Impact Assessment (HIA) / Traffic Impact Assessment (TIA) / Traffic Impact Statement (TIS) / Major Hazard Impact Assessment (MHIA) / Environmental Authorisation (EA) / Record of Decision (ROD) (strikethrough irrelevant) | | Y | **N** | 1 : 50 / 1:100 Flood line determination (plan / report) |
| Y | **N** | Other (specify) | | Y | N | Required number of documentation copies |

## PART E: DISCUSSION

The pre-application meeting dated 15 July 2026 refers. The layout presented by the applicant at the meeting is illustrated below:




**Town Planning:**

- Need to confirm if the access towards the 'mall' would be sufficient for phase 1 or would an alternative access be required.
- Phase 1 – proposal: Group housing, town housing, flats and neighbourhood centre – erf sizes ranging between 500m² - 900m².
    - Need to relook at the sizes of the erven – need to consider higher density developments. Will have to achieve a min density (see comments from spatial).
    - The sizes/pockets of the private developments are excessively large and are not aligned with the objectives of the Zoning Scheme or the MSDF. The layout should be revised to create a more integrated urban form with an improved public transport network and better connectivity between the development pockets.
    - Need to confirm if all erven are suitable for developable. Areas with slopes of 1:4 and steeper needs to be indicated on the plans.
    - The layout and orientation of the proposed developments should be reconsidered to ensure that buildings front onto public open spaces rather than turning their backs on them. This will promote active surveillance, improve safety, and create vibrant, usable public spaces.
    - Need to show 'functional active' open spaces in the respective developments/cells/pockets.
    - The proposed housing typologies, residential densities, and mix of land uses should be reconsidered to achieve a more compact, integrated urban form and to reduce unnecessary urban sprawl.

- Master OA: to be considered. Association to be responsible for, *inter alia*, implementation and management of EMP.
- Mine/Quarry: The proposed development is located in close proximity to an existing mine/quarry. The extent of the required buffer area must be confirmed, and it must be demonstrated that the proposed residential development will not be adversely affected by mining activities, including dust, noise, vibration, and other potential impacts. Suitable specialist input may be required to confirm that the site is appropriate and safe for residential occupation.
- Expropriation: CES stated that applicant need to drive this project. Applicant to contact CES. All costs will be for the developer.

- CES mentioned that they need to align the roads with the latest roads master plan.
- Environmental: Alignment with ROD to be confirmed.
  - Developer must consider how stormwater will be managed on the respective sites.
  - Municipal Environmental official forwarded/mailed the training materials on the 'Sustainable Urban Drainage Systems' to the applicant on 15 July 2026.
- It is recommended that an application for the removal of all the old redundant and archaic title deed conditions be submitted with the land use application.
- Application procedure to be discussed with applicant.

**Spatial Comments**

- The proposal appears to be an isolated development, with no indication of how it relates to or integrates with the planning and development of the surrounding area (relating to the intention to submit only phase 1 without a broader plan that can be solidified with an approval or reference).
- This is particularly evident in the proposed residential density, which is considered inadequate when assessed against the objectives of the Western Cape Spatial Development Framework and the Municipality's spatial planning principles of 25du/ha (*note it can go higher and/or spread over the development*)
- A more appropriate approach would be to prepare a comprehensive master plan for the broader development area, applying a net density methodology across the entire site. Such an approach would allow for varying densities across individual development cells while ensuring that the overall development achieves an appropriate average net density.
- Each development cell could then be implemented through separate land use applications, provided that these applications clearly demonstrate their relationship to the broader approved development framework and surrounding planning proposals.
- A holistic planning approach would also provide a more appropriate basis for the determination and apportionment of engineering services and development contributions, ensuring that infrastructure requirements are assessed at the scale of the overall development rather than on an ad hoc basis.
- In its current form, the proposal appears to be driven by the intention to develop an isolated portion of land without demonstrating how it contributes to a coherent long-term spatial structure.
- Take note of the stormwater by-law for nature-based solutions and stormwater management on-site.
- Active Open space interfaces are required for developments on the edges of open spaces.
- To explore inclusionary housing options in the development of about 20% (R300 000 to R900 000.) Currently, the Municipality is conducting a feasibility study and formulating policies. Negotiations can be undertaken with the Municipality.

**CES:**

- The developer will be required to enter into an SLA, which shall include, but not limited to the developer being required to constructed public roads in lour of paying Road development charges. The provision of road links should also clearly indicate within the Road building schedule (included in the SLA) The provision of installing services in lour of paying DC applies to water & sewer as well. PLEASE START WITH SLA AS SONE AS POSIBLE.
- Capacity for provision of water & sewer bulk services must be clarified withe GLS, as the developer may be required to provided "private capacity" / Package plant on site. The detail around operational and maintenance cost must be included in the proposed SAL.

**ETS:**

BDE/Electrical Engineers to discuss the plans/proposals with ETS.

**PART F: SUMMARY / WAY FORWARD**

- *Refer to comments above.*
- *Further discussions/meetings are advisable.*
- *Furthermore, these pre-application comments are not exhaustive and should not be relied upon as a definitive assessment or preliminary approval of the proposal. It remains the applicant's responsibility to ensure the accuracy and completeness of the application and to ensure that it is prepared and submitted in accordance with all relevant requirements and legislation.*

OFFICIAL: _Ilane Huyser_____ PRE-APPLICANT: _____**Marlize de Bruyn** ____

(FULL NAME) (FULL NAME)



SIGNED: _____ SIGNED: _____

DATE: __3 August 2026_____ DATE: _**18 May 2026 & 6 July 2026** _____

**Please note that the above comments are subject to the documents and information available to us at the time of the pre-application meeting and we reserve our rights to elaborate on this matter further and/or request more information/documents should it deemed necessary.*

# ANNEXURE 16

# MASTER PLAN
# GARDEN ROUTE CITY

## PTN'S. 7,8 12, REM. 23 & 48
## KRAAIBOSCH No.195

| PHASE 1 | | |
|---|---|---|
| USE | QUANTITY | NOTATION |
| GROUP HOUSING 35u/ha | 255 UNITS | |
| ESTATE HOUSING (500-700m²) | 127 | |
| ESTATE HOUSING (500-700m²) 40u/ha | 144 | |
| **PHASE 2** | | |
| USE | QUANTITY | NOTATION |
| RESIDENTIAL 1 (500 - 700m²) | 270 | |
| RESIDENTIAL 1 (400 - 600m²) | 360 | |
| EDUCATION | | |
| MIXED LAND USE | | |
| OPEN SPACE | | |
| PRIVATE STREETS | | |
| PUBLIC ROADS | | |
| ACCESS CONTROL POINT | | |
| MIXED USE NODE | | |
| MUNICIPAL | | |
| SLOPES STEEPER THAN 1 : 5 | | |

N

0 50 100 250 200 250 300 350 400 450 500m

| DATE | AMENDMENTS |
|---|---|
| | |


Town Planning (PTY)Ltd
AETERNO

P.O. Box 1435
Faerie Glen 0043
Tel: (012) 348 5081


Date: 06 OCTOBER 2026
Scale: 1 : 5000 (A0)
Plan No:

# ANNEXURE 17

# GARDEN ROUTE CITY

## SERVICES REPORT FOR
## CIVIL ENGINEERING SERVICES FOR THE DEVELOPMENT OF PORTIONS 7,8 12 & REMAINDER OF PORTION 23 OF THE FARM KRAAIBOSCH NO. 195, GEORGE MUNICIPAL AREA

**HESRIV-557**

**October 2026**

**PREPARED BY:**


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**CLIENT:**

Kiron Property Development
26 Whittakers Way
Bedfordview
**GERMISTON**
2008

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**HESRIV-557-S2: PROPOSED NEW BULK SEWER**

**HESRIV-557-S3: PROPOSED NEW BULK SEWER**

**HESRIV-557-SW1: BULK STORMWATER LAYOUT**

**HESRIV-557-W1: PROPOSED NEW BULK/LINK WATER**

## 1. INTRODUCTION

Hessequa Consulting Engineers CC was appointed by Kiron Property Developments for the planning of civil engineering services for the proposed development of portions 7, 8, 12 and the remainder of portion 23 of the Farm Kraaibosch No. 195 within the George Municipal Area.

The provision of civil engineering services will be designed in accordance with the guidelines and requirements of the *Guidelines for the Provision of Engineering Services and Amenities in Residential Township Development* as published by the CSIR and that of the George Municipality.

This report indicates, discusses and elaborates on the design criteria and specifications to be applied in the detail design of the internal and external infrastructure including roads, stormwater, water and sewer reticulation as well as requirements for the provision of fibre and electrical sleeves.

The concept design is based on a Lidar arial survey provided by the Client.

This report indicates, discusses and elaborates on the design criteria and specifications to be applied in the detail design of the internal and external infrastructure. The supply and distribution of electrical services and bulk supply will be discussed in a separate Electrical Services Report.

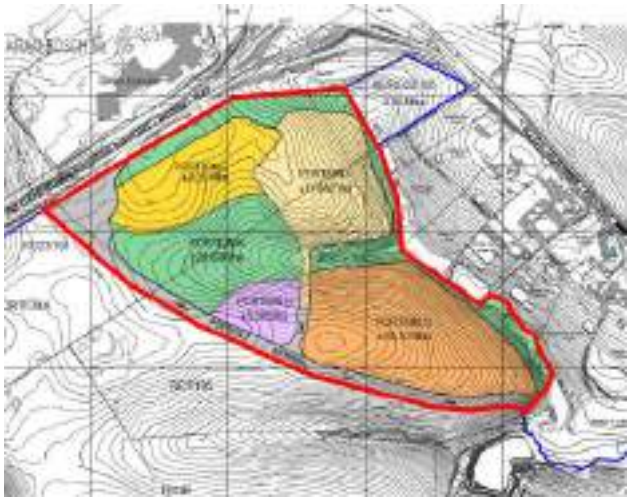
The following studies were completed in support of civil engineering services:

- Traffic Impact Assessment : ITS Innovative Transport Solutions – October 2026
- GLS Consulting Engineers: Water and Sewer Master Plans - Impact of the development on the existing bulk services including the available water sources, bulk water storage, bulk water supply pipelines, bulk sewer mains, sewage treatment – 6 February 2026
- Geological Report: Phase 1 Geological Report will be completed prior to the design of layer works and to determine soil stability with trench excavations. - Pending
- Storm Water Management Plan : JT Evolve Consulting Engineers – 30 July 2026
- Civil Engineering Services Report: Hessequa Consulting Engineers – 13 October 2026

## 2. LOCATION AND PROPOSED ZONING

The proposed development's northern boundary is directly adjacent to the N2. Existing small holdings serves as a buffer between the proposed development and the N2 to the eastern side. A water course to the western side forms a natural border between the proposed development and the existing Thembalethu residential township.

Locality Plan & Phase 1:

| | |
|---|---|
|  |  |
| Locality Plan | Phase 1 |

The following number of erven will be developed under Phase 1:

| *Zoning* | *No. of Erven* |
|---|---|
| ➢ Residential 1 (700-900 m²) | 142 |
| ➢ Residential 1 (500-700 m²) | 127 |
| ➢ Medium Density Residential (35 units/ha) | 255 |
| ➢ Mixed Land Use (3,011ha) | 4 |

## 3. ACCESS ROADS AND TRAFFIC UPGRADING PROPOSALS

Innovative Transport Solutions (ITS) completed a Traffic Impact Assessment for the proposed Garden Route City (Phase 1) development. (The TIA is included under Annexure A)

*Site Access:*

The main access to Phase 1 of the development will be via the bridge over the N2. The access road will connect to the extension of Park Road and the Platinum Drive/Park Road intersection. Under Phase 1 the bridge will be widened to accommodate one lane per direction.

The gravel road that connects the quarry/mine operations to the service road next to the N2 will be used as a construction/emergency access.




*Traffic upgrading proposals for Phase 1:*

ITS's transport impact assessment confirmed that all study intersections currently operate at acceptable levels. Under total traffic conditions, including the proposed Garden Route City development, the road network is expected to continue operating at acceptable levels, subject to the implementation of the proposed mitigation measures

The following mitigating measures are proposed, by ITS, for the development of Phase 1 of the Garden Route City project:

- Upgrade the Platinum Drive/Park Road intersection with a fourth approach of Park Road that will extend towards the bridge over the N2.
- The bridge over the N2 to be widened to one lane per direction. With the development of future phases, the Park Road/Platinum Drive roundabout must be dualled and the bridge be further widened to accommodate two lanes per direction. It must be investigated if a once off widening of the bridge, to accommodate two lanes per direction, will not be more cost effective to be completed under Phase 1 of the project.
- It is also required to dual Park Road between Blue Mountain Boulevard and Saint George's Road. The sidewalk along Park Drive to be extended to the new widened bridge.
- It is recommended that the GoGeorge Bus Routes be extended, to in future, service the Garden Route City Development.

## 4. ENGINEERING SERVICES

Civil engineering services will be designed in accordance with the design standards of the *Guidelines for the Provision of Engineering Services and Amenities in Residential Township Development* as published by the CSIR as well as the minimum requirements of George Municipality.

### 4.1. MASS EARTHWORKS

Mass earthworks will be limited to the creation of stormwater attenuation Ponds 1 & 2 and the cutting and filling of material to accommodate safe sight distances for road longitudinal sections.

### 4.2. ROADS

The access road, under Phase 1 will consist of a 7,4m wide extension of Park Road, over the widened bridge, to the single access road to Phase 1 as well as the construction/emergency access. The widening of Park Road extension, bridge and Park Road/Platinum Drive roundabout will be required with the implementation of further phases.

Internal roads, constructed under Phase 1 of the development, will have road widths between 5 and 6m. Identified minor bus routes may require widening of specific roads surfaces to 6,8m.

Surface treatments will consist of 40mm continuous graded asphalt. Intersections and turning circles will be constructed with 80mm Interlocking segmented paving.

The design criteria will be based on the design standards of the *Guidelines for the Provision of Engineering Services and Amenities in Residential Township Development* as published by the CSIR and that of the George Municipality.

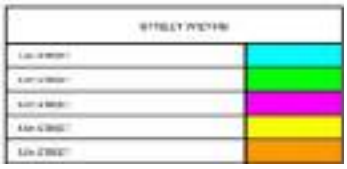
**Table 1: Road Design Criteria**

| Parameter | Local Distributor (Class 4) | Residential Access Loop (Class 5b) | Residential Access way (Class 5d) |
|---|---|---|---|
| Surface Treatment | 40mm Continuous Graded Asphalt or 80mm Interlocking Segmented Paving at intersections and turning circles | 40mm Continuous Graded Asphalt or 80mm Interlocking Segmented Paving at intersections and turning circles | 40mm Continuous Graded Asphalt or 80mm Interlocking Segmented Paving at intersections and turning circles |
| All Base and Selected materials to be imported from commercial sources | 150mm G2 (98% MAASHTO) Base on 150mm G4 (95% MAASHTO) Sub-Base on 150mm G7 Upper Selected (93% MAASHTO) on 150mm | 150mm G4 (98% MAASHTO) Base on 150mm G5 (95% MAASHTO) Sub-Base on 150mm G7 Upper Selected (93% MAASHTO) on 150mm | 150mm G4 (98% MAASHTO) Base on 150mm G5 (95% MAASHTO) Sub-Base on 150mm G7 Upper Selected (93% MAASHTO) on 150mm |

| | | | |
|---|---|---|---|
| (Preliminary quality and layer thickness – subject to the outcome of the Geotechnical Report) | G7 Lower Selected (93% MAASHTO) on 150mm Roadbed prep in-situ Material (90% MAASHTO) | G7 Lower Selected (93% MAASHTO) on 150mm Roadbed prep in-situ Material (90% MAASHTO) | G7 Lower Selected (93% MAASHTO) on 150mm Roadbed prep in-situ Material (90% MAASHTO) |
| Carriage Way Width | 7,4m | 5,5 to 6,0m (6,8m for minor bus route) | 5m |
| Design Speed | 60 km/h | 40 km/h | 30 km/h |
| Maximum Gradient | 10% over 100m max | 16% over 50m max | 16% over 30m max |
| Minimum Gradient | 0.5% | 0.5% | 0.5% |
| Cross Fall (minimum) | 2% | 2% | 2% |
| Bell mouths | Subject to ITS design standards | 8m Radius | 8m Radius |
| Road design life | 20 years | 20 years | 20 years |

The following street widths are proposed for the road network under Phase 1:





## 4.3. STORMWATER

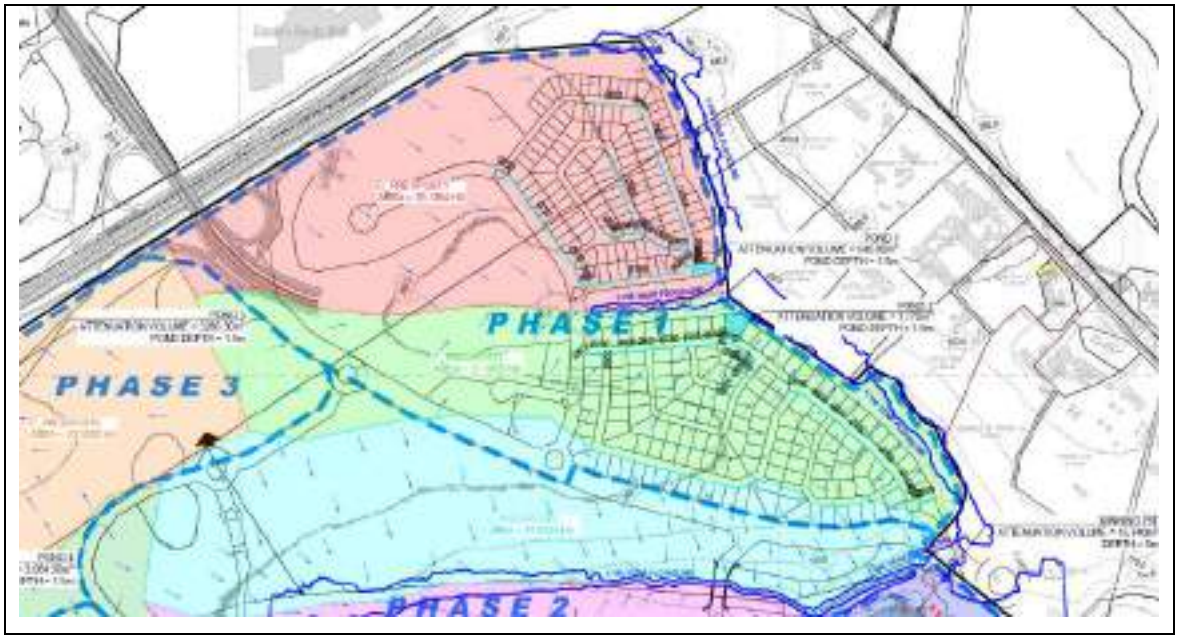
### *4.3.1. Stormwater Catchment Areas*

JT Evolve Consulting Engineers was appointed to prepare a Storm Water Management Plan (SWMP) for the complete development area. (The complete SWMP is included under Annexure B)

The total site surface area (all Phases) is approximately 298,23 ha which is divided into 13 sub-catchment areas. Phase 1 will drain to two Attenuation Ponds and an existing mining pit that will discharge overland, above the 1:100-year floodline, and eventually drain into the Meulrivier.

Catchment 1: 35,1364 ha
Catchment 2: 31,1068 ha
Catchment 3: 37,8396 ha (Phase 1, approximately 15%)

The following stormwater catchment key plan was developed by JT Evolve Consulting Engineers for Phase 1 of the development area:



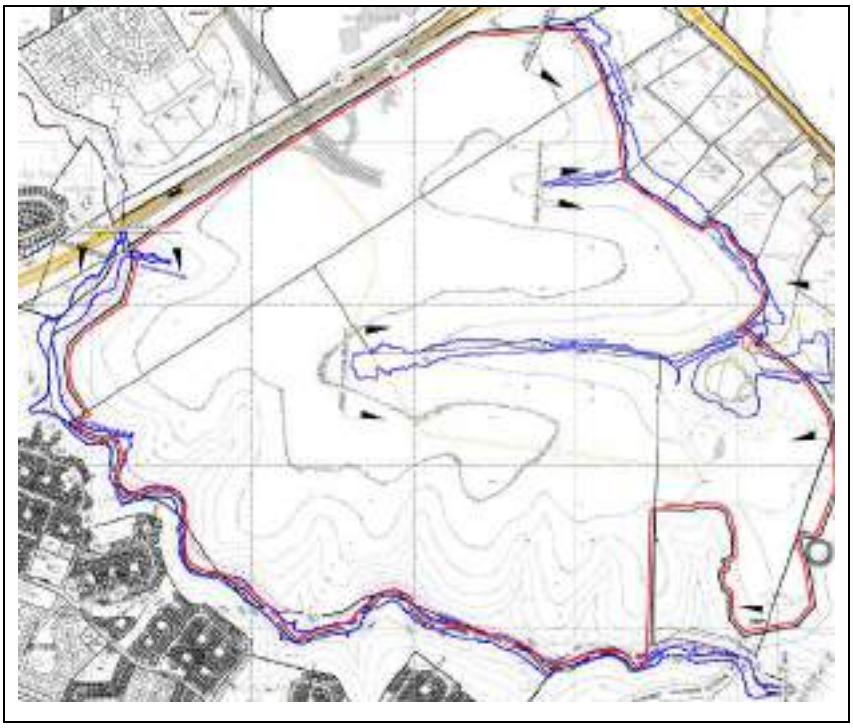

The following measures are proposed to mitigate the impact of post development stormwater runoff on the existing infrastructure downstream from the proposed development:

- Installation of 5 kℓ water tanks on each residential erf will contribute to the attenuation of initial runoffs.
- Public Open Spaces will be utilised as recreation areas as well as stormwater detention areas where the concentration of stormwater runoff will be minimised through the application of landscaping techniques, i.e. by creating grass lined swales, undulations and depressions.
- Post development runoffs will be attenuated in two Attenuation Ponds. Stilling basins and energy dissipating structures will be constructed at outlet structures.



### *4.3.2. Floodlines*

The following floodline plan was compiled by JT Evolve regarding the complete site:



### *4.3.3. Stormwater Design*

Stormwater infrastructure will be constructed in accordance with the standard requirements and specifications as agreed with the George Municipality as well as the SWMP. All designs will be confirmed with the municipality during the detail design stage.

Stormwater runoff will be routed to the attenuation swales via the internal stormwater infrastructure, including minor stormwater conduits, roads and open free-surface flow channels. The Attenuation Ponds within Phase 1 (Catchment 1: Pond 1 = 550m³ and Catchment 2: Pond 2 = 1,180m³) will minimize the negative effect on lower lying properties. To achieve the required attenuation, each pond will be constructed with outlet controls for the 1:10-year and 1:50-year recurrence interval storm events, either in the form of outlet orifice pipes or broad-crested weirs. The overflow weirs to discharge excess floodwater during higher-order storm events, such as the 1:100-year recurrence interval storm. The overflow weirs will be constructed using stone gabions and grouted stone pitching for energy dissipation and to protect against erosion and scour during high-flow events. The ponds will discharge attenuated stormwater runoff overland on the surface and above the 1:100-year floodline.

Design criteria adopted for the development regarding stormwater infrastructure is summarised as follows:

- Minor systems designed for 2-year return period.
- Major system designed for 50 and 100-year return periods.
- Minimum gradients for pipelines to allow minimum flow speeds of 0.7m/s at full flow.
- Maximum pipeline flow velocities to be 3.5m/s.
- Stormwater pipes to be 100D as required by specific loadings or installation conditions.
- Bedding to be Class C.
- Manholes at each point of deflection on pipes.
- Minimum cover on pipes to be 800mm.
- Minimum pipe diameter to be 450mm.
- Gravel traps to be provided in manholes (where required on steeper slopes).
- Gabion mattresses to be provided at all outlets for energy dissipation.
- Litter traps to be provided at all outlets.
- Sub-soil drainage will be provided in specific conditions.

## 4.4. WATER

### *4.4.1. Water Demand*

GLS Consulting Engineers was appointed to complete analysis on the existing water and sewer networks to determine what water and sewer upgrades will be required to accommodate the proposed complete development within the existing George networks. This report differentiates between infrastructure upgrading required for each phase thus ensuring that bulk infrastructure is also provided

practical and cost effective (affordable) for each phase. (The complete GLS Report is included under Annexure C)

The estimated Annual Average Daily Demand (AADD), in accordance with the Master Plan criteria (GLS Consulting Engineers) for the development of Phase 1 is as follows:

| | |
|---|---|
| 127 Residential 1 Erven (500-700 m² @ 813 ℓ/erf/day) | 103,3 kℓ/day |
| 142 Residential 1 Erven (700-900 m² @ 813 ℓ/erf/day) | 115,4 kℓ/day |
| Group Housing Erven (7,2876 ha @ 35 units/ha @ x 375 ℓ/unit/day) | 95,6 kℓ/day |
| *4 Mixed Land use:* | |
| School/Creche (120 learners) (2,000m² floor space @ 400 ℓ/100m²) | 9,0 kℓ/day |
| Medical Centre (2,000m² floor space @ 500 ℓ/100m²) | 10,0 kℓ/day |
| Sport (Gymnasium) (2,000m² floor space @ 1,000 ℓ/100m²) | 20,0 kℓ/day |
| Business/Commercial (2,000m² floor space @ 400 ℓ/100m²) | 9,0 kℓ/day |
| **Total AADD** | **362,3 kℓ/day or 4,19 ℓ/s** |

Peak factors will be considered during the detail design stage of the project.

### *4.4.2. Availability of sufficient Water Sources*

George Municipality to confirm that the municipality consists of sufficient water sources to accommodate the proposed development of Phase 1 of the project. GLS Consulting Engineers confirmed that sufficient water treatment capacity exists to accommodate Phase 1 of the development.

### *4.4.3. Water Storage*

The current George Old WTP reservoirs AADD (Theoretical Fully Occupied Demand) is 34,996 kℓ/d. The capacity of the existing George Old WTP reservoirs is 36,120 kℓ. The existing FCV has a required flow rate of 689 ℓ/s. Using these three input variables in a reservoir sizing analysis, it shows that the remaining spare capacity is 2,120 kℓ.

The spare capacity only indicative of the status quo and availability will be subject to the timeframe for several imminent private developments and planned housing projects. It is therefore recommended that the provision of additional storage capacity at the Old WTP reservoir site be prioritised.

Water towers serve merely to sustain pressure in a network and should not be regarded as facilities for balancing peaks and for emergency supply. Because of their relatively small volumes, the supply rates to towers must be such that they can be always kept full. The Kraaibosch tower has a capacity of 100 kℓ and the supply pump station has one operational and one standby pump set, each with an estimated supply duty point of 55 ℓ/s at 35 m head. The Kraaibosch tower and its supply pump station have capacity to accommodate the proposed development. Recent activity on Kraaibosch farm appear indicative of imminent development in the reservoir and tower zone. It is thus recommended that additional bulk capacity should be prioritised, as the bulk system to Kraaibosch is close to capacity.

### *4.4.4. Water Link Services*

In accordance with the GLS Report, dated February 2026, the following project specific Link Water Mains will be required to accommodate the proposed development of Phase 1 (See drawing HESRIV-557-W1 included under Annexure D):

- GMR F10.01a: Pressure reducing valve: 260m EGL, 250mm Ø
- GMR F10.01b: Pipe with meter to install: 250mm Ø
- GMR F10.02: 41m Long x 450mm Ø water main (N2 crossing)
- GMR F103.02: 919m Long x 450mm Ø water main
- GMR F103.03: 302m Long x 400mm Ø water main
- GMR F103.05: 356m Long x 250mm Ø water main

### *4.4.5. Water Reticulation*

New 90/110/160/200/250/400/450mm Class 9 to 12 uPVC water mains complete with isolating valves, fire hydrants and erf connections will be provided.

The basis of the water reticulation design for the proposed development is summarised below:

- Design consumption : As per Water Demand
- Peak factors as prescribed.
- Minimum pressures for the network are calculated for a fire flow 30 ℓ/sec and peak demand at the point of lowest pressure under peak conditions.
- Maximum of 4 valves to isolate a pipe section.
- Maximum length of 600m of main pipe per isolated section.
- Air valves to be provided where applicable.
- Minimum cover to pipes to be 900mm.

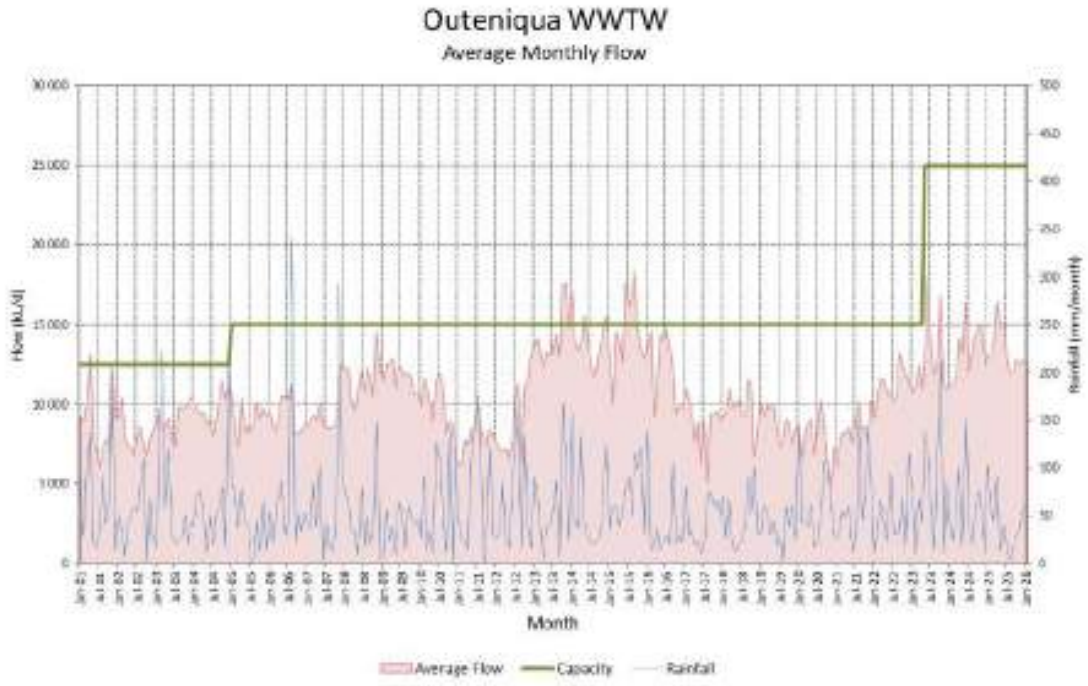
- Pipe type and class to be uPVC class 9 to 12, depending on existing network pressure.
- Pipe diameters varying between 90/110/160/200/250/400/450mm Ø.
- Erf connections to be HDPE PE80 PN12,5.
- Erven to be serviced with a 20mm connection and Aqua-Loc box and meter.
- Fire hydrants to be provided in accordance to relevant guidelines and legislation.

From a bulk water engineering services perspective, the development will improve the holistic financial sustainability of the local municipality because of additional rates and taxes being generated without the burden of additional capital outlay. Capital contributions will strengthen the municipality financially in the short term. From a long-term perspective, the additional Operation and Maintenance (O&M) costs of the municipal network will be covered from the additional rates and taxes.

## 4.5. SEWERAGE

### *4.5.1. WWTW*

The graph shows that the design capacity of the Outeniqua WWTW (green line) has been exceeded by the Average Monthly Flow (light red shaded area) a few times in the last decade but has since been upgraded. The WWTW is thus not operating at risk and can accommodate the proposed development.



The existing WWTW has a design capacity of 25 Mℓ/d with a modelled spare capacity of approximately 7,341 Mℓ/d. (The measured spare capacity 2025/26 is 12,154 Mℓ/d.)

### *4.5.2. Sewer Design Flows*

In accordance with the *Guidelines for the Provision of Engineering Services and Amenities in Residential Township Development* it is expected that 70% of the Average annual water daily demand will end up in the wastewater system.

The annual average dry weather flow (AADWF) equals 70% of 362,3 kℓ/d = 253,6 kℓ/d = 2,93 ℓ/s.

To determine the Peak Wet Weather Flow (PWWF) a peak factor of 3,6 were taken in consideration with an expected stormwater infiltration of 15%. The PWWF equals 12,13 ℓ/s.

### *4.5.3. Sewer Link and Bulk Infrastructure (Annexure D)*

There are no existing drainage networks in the vicinity of the proposed development. The nearest drainage networks of Blue Mountain estate were not designed to accommodate external flow and would be wholly inundated by even the first phase of the development.

The following development specific items are required to accommodate the proposed development in the sewer reticulation system (considering the interim alternative) Refer to drawings HESRIV-557-S1, -S2 & -S3 under Annexure D:

- OT F33.01: 598m Long, 160 mm Ø Gravity Main
- OT F33.02: 10m Long, 200 mm Ø Gravity Main
- OT F33.03: 400m Long, 250 mm Ø Gravity Main
- OT F33.04: 280m Long, 315 mm Ø Gravity Main
- OT F36.02: 215m Long, 525 mm Ø Gravity Main
- OT F135.02: 415m Long, 160 mm Ø Gravity Main
- OT F135.03: 336m Long, 200 mm Ø Gravity Main
- OT F136.01: 32m Long, 200 mm Ø Gravity Main
- OT F137.03: 600m Long, 160 mm Ø Gravity Main
- OT F151.02: 10m Long, 200 mm Ø Gravity Main
- OT F152.01: New 50 ℓ/s Garden Route City Pump Station
- OT F152.02: 1,150m Long, 200 mm Ø Rising Main

The following upgrading is required to accommodate existing developments:

- Pacaltsdorp Pump Station 1 and rising mains are currently operating at capacity and require upgrading.
- Thembalethu Pump Station 6 is currently being upgraded by GLM.
- GLM is busy with the design for upgrading of Thembalethu East Pump Station (formerly Destiny Africa Pump Station)

The pro rata cost for the construction of shared external sewer infrastructure will be deducted from the Capital Contributions payable George Municipality.

### *4.5.4. Design Criteria*

The following minimum design criteria shall be applicable to sewer pipework:

- Design parameters: Average daily flow as per Red Book for the different housing categories Peak factor – Harmon formula: Extraneous flow – 15% : Minimum velocity – 0.7m
- Minimum cover to pipes: 0.80m
- Minimum pipe size: 110mm diameter for house connections : 160mm diameter for sewer mains
- Minimum gradients: 110mm diameter house connection 1:60 : main lines at 80% capacity as follows :

| **Number of Dwelling/units** | **Grade** |
|---|---|
| House Connection | 1:60 |
| Less than 6 | 1:80 |
| 6 to 10 | 1:100 |
| 11 to 80 | 1:120 |

- House connection depth shall be 1.0m but at least be able to drain 80% of the erf.
- Maximum manhole spacing of 80m.
- All concrete, mortar or screed used with manholes to be from dolomite aggregate and low alkali sulphate resistant cement to SABS 471.
- Pipelines to be uPVC class 34 and to be laid on Class C bedding.

## 4.6. ELECTRICAL SLEEVES

The position of electrical sleeves (110/160mm Class 34 PVC) and data sleeves will be determined in consultation with the Electrical Engineer.

## 5. SOLID WASTE

Solid waste collection facilities will be identified and incorporated under the SDP's for the Group Housing and Mixed-Use developments. Single Residential erven will be serviced through normal weekly collection cycles.

A formal arrangement for the removal of solid waste will be entered into with the George Municipality as part of the Service Level Agreement. From a solid waste engineering perspective, the development will improve the holistic financial sustainability of the local municipality due to additional rates and taxes being generated. From a long-term perspective, the additional O&M of the municipal solid waste collection service will be covered from the additional rates and taxes.

## 6. AUGMENTATION LEVIES

The offset of Augmentation Levies, payable for water, sewer and road and stormwater services, against the bridging finance of incremental services will be negotiated with George Municipality.

Cost for project specific link/bulk services will be carried by the Developer. Levies will be determined and escalated in accordance with the municipality's annual budgets.

## 7. CONCLUSION

We trust that the information included in this report will provide insight to the level of services required for the proposed development of Phase 1 of the Garden Route City Development.



**G PEPLER Pr Tech Eng**
**HESSEQUA CONSULTING ENGINEERS**

13 October 2026

## ANNEXURE A (TIA)

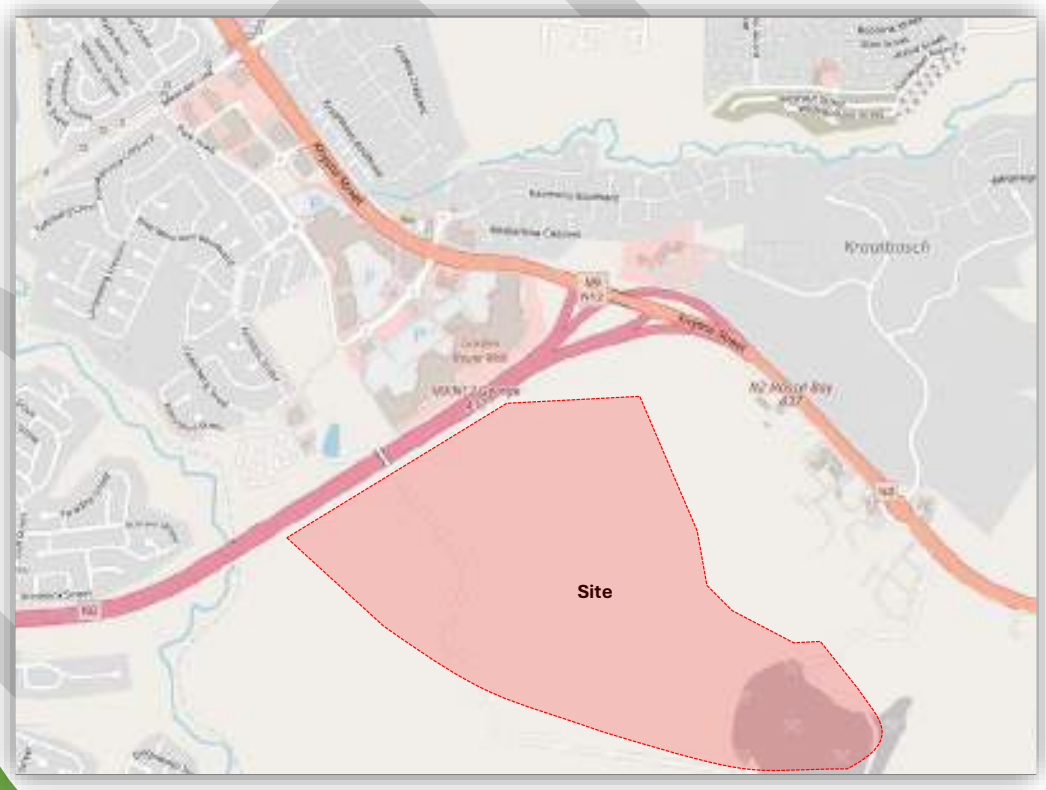
ITS: GARDEN ROUTE CITY TRAFFIC IMPACT ASSESSMENT (OCTOBER 2026)

# *Garden Route City*

## *Transport Impact Assessment*

## *George, Western Cape*

***September 2026***




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**Imperial Terraces**

**Carl Cronje Drive**

**Tyger Waterfront**

**Bellville, 7530**

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**SUMMARY SHEET**

| | |
|---|---|
| Report Type | Transport Impact Assessment |
| Title | Garden Route City |
| Location | George, Western Cape |
| Client | Kiron Properties |
| Reference Number | ITS 4628 |
| Project Team | Christoff Krogscheepers |
| | Inge van Tonder |
| Contact Details | Tel: 021 914 6211 |
| Date | September 2026 |
| Report Status | First Draft |
| File Name | G:\4628 TIA Garden Route City, George\12 Reports\Issued\4628 TIA Garden Route City George Draft Report_IvT_2026-09-22.docx |

*It is herewith certified that this Traffic Impact Assessment has been prepared according to the requirements of the South African Traffic Impact and Site Traffic Assessment Manual (TMH 16 and 17).*

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## REPORT - SUMMARY TABLE

*This transport impact assessment is reported only in a summary table format instead of a traditional report to assist review and interpretation of the results. This summary table includes all the relevant information. It should be sufficient for the review and interpretation of the expected transport impacts as well as the comprehension of the required measures to mitigate the transport impact. If any more detail is required, please contact the authors.*

## ANNEXURES

Annexure A: Figures
Annexure B: Tables

## ABBREVIATIONS

| | |
|---|---|
| COTO | Committee of Transport Officials |
| Ha | Hectare |
| HCM | Highway Capacity Manual |
| LOS | Level of Service |
| NMT | Non-motorised Transport |
| SQM | Square Meters ($m^2$) |
| TIA | Transport Impact Assessment |
| V/C | Volume to Capacity Ratio |
| WCG | Western Cape Government |

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# *Transport Impact Assessment*

*Garden Route City, George, Western Cape*

| | |
|---|---|
| **1 Background** | This report summarises an assessment of the transport-related impacts expected as part of the proposed Garden Route City Phase 1 development planned in George. The purpose of this assessment is to identify potential constraints within the surrounding road network and recommend appropriate mitigation measures where applicable. |
| **2 Purpose of Study** | The purpose of this study is to determine the transport impacts of the proposed Phase 1 of the development. The assessment is done by considering all the completed developments within Eden Meander, and all the latent developments in the area. It also considers the existing transport system as improved over recent years. |
| **3 Locality** | The proposed development will be located in the southern quadrant of the N2 Kraaibosch Interchange. The site is bounded by the N2 to the north and east and the Thembalethu residential area to the west. Refer to **Figure 1** for the locality map. |




*Figure 1: Locality Plan*

| | |
|---|---|
| **4 Land Use** | **Existing Land Use:** The site is currently vacant, with a quarry and sand mine activities on the eastern edge of the site.<br><br>**Proposed Land Use:** The planned development will include the following:<br>• Medium density residential: 299 units<br>• Low density residential: 281 units<br>• Mixed-use (~3.1 ha):<br>o Creche<br>o Sports Complex<br>o Medical Centre<br>o Convenience Shopping<br>The mixed-use precinct detail will be determined at site development plan level, and for this report it was assumed that the total erf size was divided equally between the four land uses. Further assumptions on the Gross Leasable Area (GLA) for the various land uses will be discussed in Section 14 of the report.<br>The above will be Phase 1 of the development. Subsequent Traffic Impact Assessments (TIA) will be undertaken for the phases that will follow.<br><br>Refer to **Figure A1** in Annexure A for the subdivision plan for Phase 1. |
| **5 Existing Access** | Currently, the site area is served by two informal gravel road accesses:<br>• The first is a narrow bridge over the N2 that links local gravel roads south of the N2 to the area south-west and north of the N2.<br>• The existing quarry gains access from a narrow gravel road which in turn intersects with the southern approach of the N2 / Engen roundabout. |
| **6 Existing Roadways** | The existing roadways in the site vicinity are described below. The road classification is based on the George Comprehensive Integrated Transport Plan (CITP) 2023-2028 (George Municipality, August 2024). Refer to **Figure 2** for the road classification of George.<br><br>**N2**: Class 1 Freeway. Two lanes per direction, 120km/h speed limit, with a median, no on-street parking and no sidewalks.<br><br>**Knysna Road (TR210)**: Class 2 Major Arterial. Two lanes per direction, 80km/h speed limit, no on-street parking, with a median and sidewalks on both sides of the road for most of its length. Sidewalks are absent for a section between Saint George's Road and Madiba Drive.<br><br>**Saint George's Road west of Knysna Road**: Class 5 collector road. Two lanes per direction, 60km/h speed limit, no on-street parking and sidewalks on both sides of the road.<br><br>**Park Drive**: Class 5 local road. Single lane per direction, 60km/h speed limit, |

| | |
|---|---|
| | no on-street parking, no median and sidewalks on both sides of the road. Park Drive splits into a dual carriageway with a median for 150m northwest and southeast of the roundabout access to the Garden Route Mall.<br><br>**Garden Route Mall Access Road**: Class 5 local road. It comprises of a dual carriageway road with two lanes per direction, 60km/h speed limit, no on-street parking and sidewalks on both sides of the road<br><br>**Platinum Drive**: Class 5 Collector Road. Single lane per direction, 60km/h speed limit, no on-street parking, no median and sidewalks on both sides of the road. |

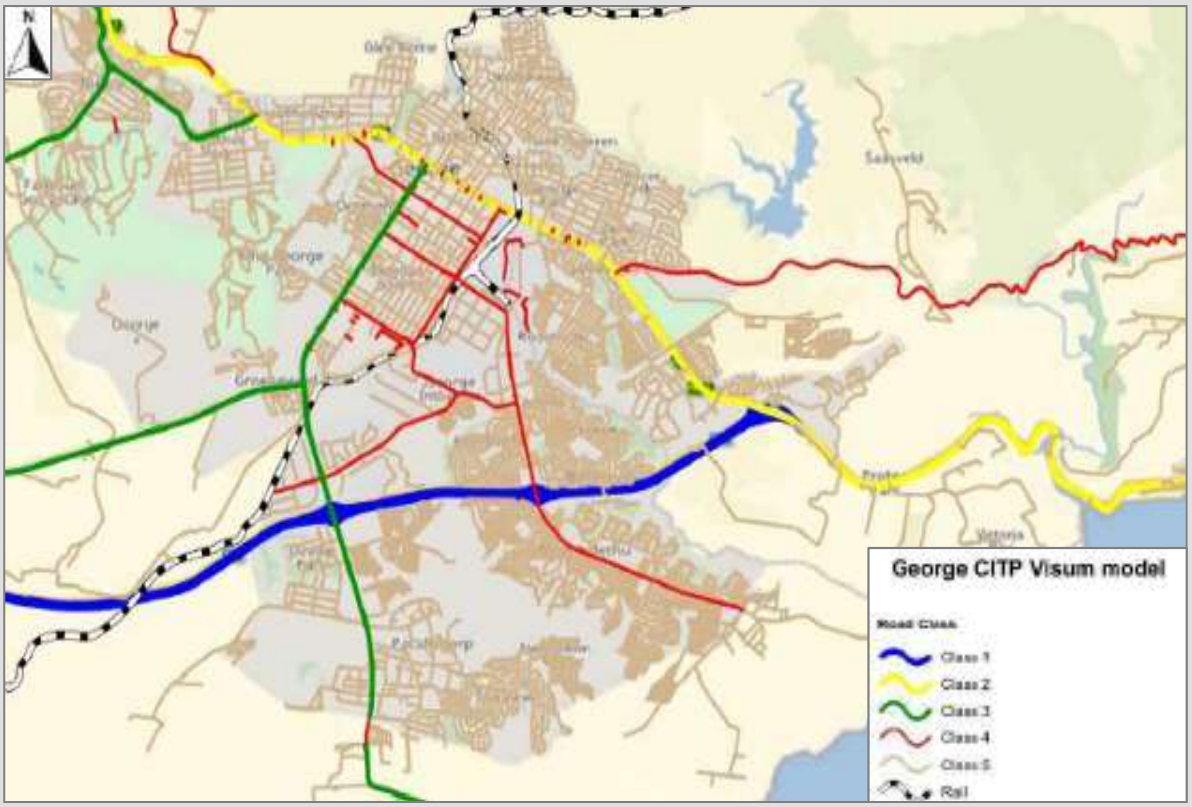



*Figure 2: Road Hierarchy for George, as used in the Base Year of the Transportation Model (George CITP, 2024)*

| | |
|---|---|
| **7 Analysis Hours** | The following peak periods were included as part of this investigation:<br>• Weekday a.m. peak period (07:00 - 09:00)<br>• Weekday p.m. peak period (16:30 – 17:30) |
| **8 Scenarios Analysed** | The following traffic scenarios were analysed:<br>• **Scenario 1**: 2026 Existing Traffic Conditions – Based on existing 2025 counted traffic volumes. |

| | |
|---|---|
| | • **Scenario 2**: 2031 Background Traffic Conditions – *Based on Scenario 1 traffic volumes PLUS the expected trips from the future land uses and latent developments. Further discussed in Section 11. No background growth was applied.*<br>• **Scenario 3**: 2031 Total Traffic Conditions – *Based on Scenario 2 traffic volumes PLUS the expected trips from the Garden Route City development.* |
| **9 Study Intersections** | The following intersections were evaluated:<br>**Intersection 1:** Knysna Road/St George's Road - Signalised Intersection<br>**Intersection 2:** Knysna Road/Partial Mall Access - Partial Intersection<br>**Intersection 3:** Knysna Road/Park Road (Mall Access) - Signalised Intersection<br>**Intersection 4:** Knysna Road/N2 Off-Ramp - Priority Control<br>**Intersection 5:** Knysna Road/N2 On-Ramp - Priority Control<br>**Intersection 6:** St George's Road/Park Road – Priority Control<br>**Intersection 7:** Park Drive/ Blue Mountain Village Construction Road - Priority Control<br>**Intersection 8:** Park Drive/Blue Mountain Village Access - Roundabout<br>**Intersection 9:** Park Drive/ Platinum Drive – Future roundabout<br>**Intersection 10:** N2/Rademachers - Roundabout<br>Refer to **Figure 3** for the location of the study intersections. Refer to Annexure A, **Figure A2,** for the lane configurations and controls of the study intersections. |

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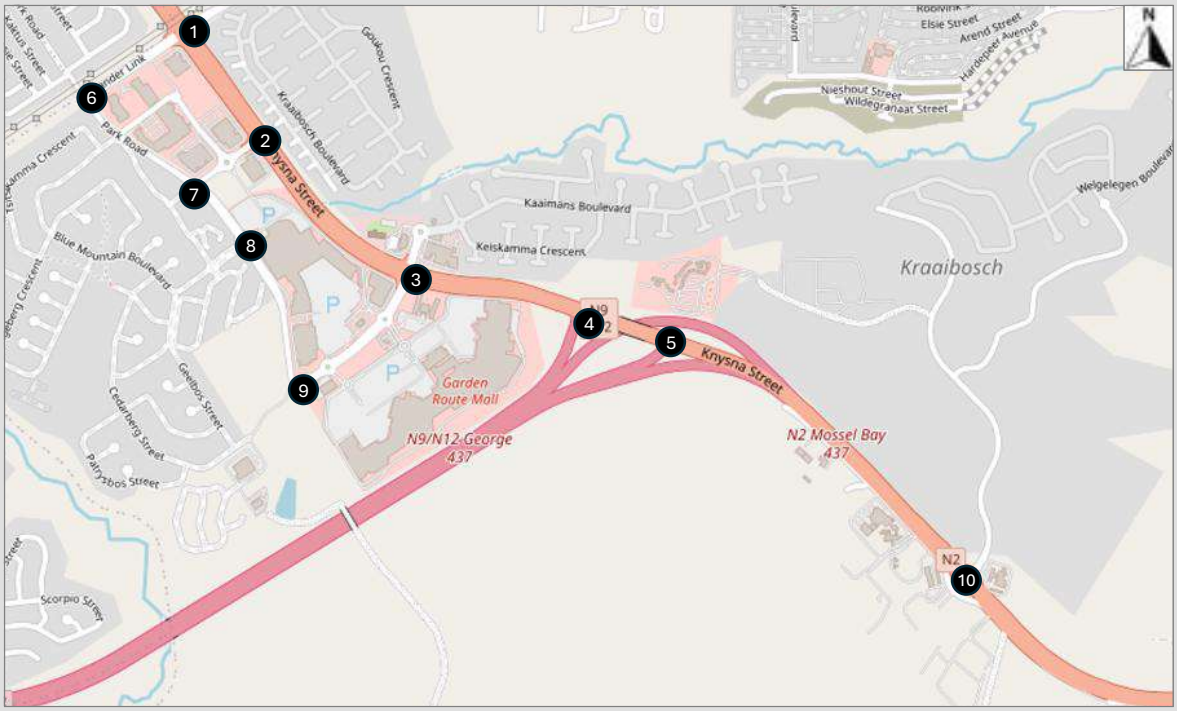



*Figure 3: Intersection Count Locations*

| | |
|---|---|
| **10 Existing Intersection Operations** | The 2026 Existing Traffic conditions are based on existing intersection geometries, controls and counted traffic volumes. Historical traffic counts were used and adjusted based on the latest Kraaibosch Roads Master Plan and Cost Apportionment Model (SMEC, December 2025).<br><br>Refer to **Figure A2** for the existing lane configurations and controls. Refer to **Figures A3** and **A4** for the existing a.m. and p.m. peak hour traffic volumes and operations, respectively.<br><br>Based on the Existing Traffic capacity analysis results as well as on-site observations, the following can be concluded:<br><br>All the study intersections currently operate at acceptable Levels-Of-Service (LOS), and therefore, no upgrades are proposed from a capacity analysis point of view. |
| **11 Approved Developments/ Latent Rights** | There are several in-process and planned developments in the immediate vicinity. These developments are:<br>• Garden Route Mall<br>• Meulenzicht Estate<br>• Oude Meulen<br>• Sweetpea<br>• George Campus<br>• Greater Kraaibosch Area<br>• Open Erven in Eden Meander Precinct<br>• Residential Development on Erf 28005, Eden Meander |

The in-process development which will have the most significant impact on the traffic operations around Eden Meander is the development of the Greater Kraaibosch Area and the George Campus. All the above planned and in-process developments were added as background trips for Scenario 2. The trips for the Kraaibosch, George Campus and Sweetpea were obtained from the Kraaibosch Roads Master Plan and Cost Apportionment Model (SMEC, 2025) and the Meulenzicht Estate and Oude Meulen trips were obtained from Innovative Transport Solutions (Pty) LTD (Project No. 4730, 2025).

The following trips were included as part of the Background Scenario:

*Table 1: Background Development Trips*

| | AM Peak Hour Trips | | PM Peak Hour Trips | |
|---|---|---|---|---|
| **Development** | **In** | **Out** | **In** | **Out** |
| **Meulenzicht** | 57 | 170 | 159 | 68 |
| **Oude Meulen** | 120 | 348 | 324 | 140 |
| **Sweetpea** | 18 | 51 | 48 | 21 |
| **Kraaibosch** | 1 087 | 2 307 | 2 307 | 1 087 |
| **George Campus** | 1 119 | 361 | 1 117 | 1 593 |
| **Open Erven Eden Meander including Proposed Hospital** | 396 | 231 | 521 | 549 |
| **Residential** | 23 | 54 | 54 | 23 |
| **Offices** | 49 | 12 | 49 | 12 |
| **Erf 28005, Eden Meander** | 111 | 332 | 287 | 155 |
| **TOTAL** | **2 980** | **3 866** | **4 866** | **3 838** |

## 12 Future Road Network

The Georgy Municipality Roads Master Plan, showing the proposed future links, is provided in **Figure 4**. The following planned roads were included as part of this study:

- The northward extension of St George's Road to link to Madiba Drive.
- The extension of the Mall Access Road into the Kraaibosch/Glenwood area to link to Madiba Road.
- The extension of Welgelegen Road across the Modderrug River to link into the Kraaibosch area.

However, at the time of this report, the timeline for the construction of these roads is unknown.

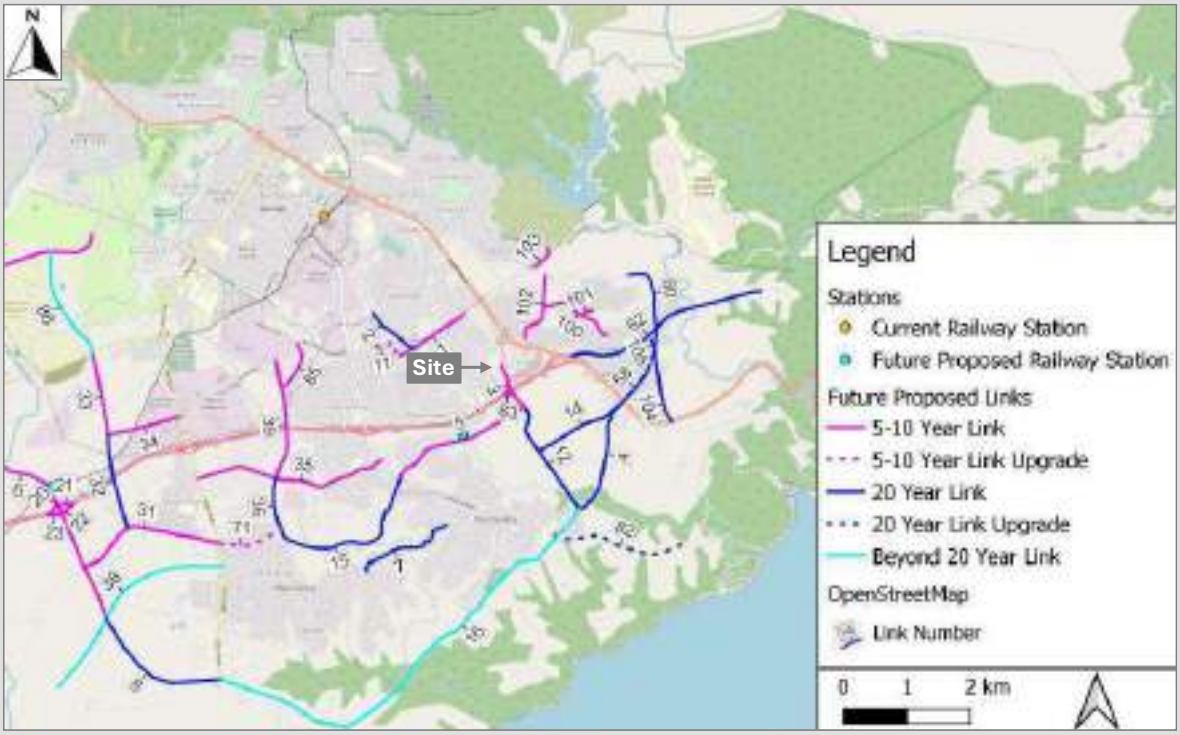



*Figure 4: George Municipality Roads Master Plan 2023 - Time Horizons (CITP, George, 2024)*

**13 Background Traffic Conditions**

The 2031 Background Traffic volumes were calculated by adding the anticipated trips from the future developments planned in the immediate site vicinity to the Existing Scenario.

Refer to **Figure A2** for the existing lane configurations and controls used for the Background traffic analysis. Refer to **Figures A5** and **A6** for the background AM, PM and Saturday midday peak hour traffic volumes and operations.

Based on the Background Traffic capacity analysis results, it is expected that all study intersections will continue to operate at acceptable levels-of-service and delay, except the following intersections:

- **Int. 1 Knysna Road/Saint George's Road:**
  This intersection is operating unacceptably during the AM peak hour. It is recommended to add a protected right-turn phase on the north and south approaches. It is also recommended to change the southbound through to a shared through and right-turn lane from the Kraaibosch area side.
- **Int. 3 Knysna Road/Park Road:**
  It is recommended to add protected right-turn phases on the east, west and south approaches.
- **Int. 4 N2 Off-Ramp/Knysna Road**:
  It is proposed to have two lanes along Knysna Road (N12) eastbound through this intersection.

- **Int. 9 Platinum Drive/Park Road:**
  It is proposed to upgrade this intersection to a single circulating roundabout with single approach lanes on all approaches.
- **Int. 5 N2 O2-Ramp/Knysna Road**: This intersection is expected to operate at longer delays, resulting in a LOS F for both peak hours. No upgrades are proposed. The right turn lane turning towards the N2 has been lengthened to approximately 200 m. The storage length is sufficient to accommodate the 95$^{th}$ percentile queue length at this intersection for both the a.m. and p.m peak hours.

It is important to note that the upgrades provided above will be due to the background developments and not as part of the development on the Garden Route City.

The recommended upgrades also align with the Kraaibosch Roads Master Plan and Cost Apportionment Model (SMEC, 2025) report. Refer to **Figure A7** for the proposed upgrades for this scenario. Refer to **Figures A8** and **A9** for the expected intersection operations after the proposed upgrades are in place.

**14 Trip Generation Rates and Development Trips**

The trip generation rates and resulting development trips were derived from the *South African Traffic Trip Data Manual* prepared by the Committee of Transport Officials (COTO, 2013). The trip rates and the corresponding estimated trips for the proposed development are presented below. **Table 2** summarises the trip generation rates applied in this assessment.

*Table 2: Trip Generation Rates*

| | | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|---|
| **Land Use** | **Code** | **Base Rate** | **Adj. Rate** | **Base Rate** | **Adj. Rate** |
| **Residential** | COTO 220 | 0.65 | 0.59 | 0.65 | 0.59 |
| **Residential** | COTO 210 | 1.00 | 0.90 | 1.00 | 0.90 |
| **Creche** | ITE 565 | 13.11 | 11.14 | 13.29 | 12.63 |
| **Sport Complex** | ITE 492 | 1.52 | 1.52 | 3.80 | 3.80 |
| **Medical Centre** | COTO 720 | 8.00 | 7.20 | 8.00 | 8.00 |
| **Convenience Shopping** | COTO 820 | 2.54 | 2.28 | 14.37 | 12.93 |

Refer to **Table B1** and **Table B2,** Annexure B, for more details on the trip generation. A mixed-use reduction factor was applied between the land uses.

The mixed-use erf (30 111 $m^2$) was divided equally among the 4 land uses, and the following percentages of the divided erf sizes were assumed for the GLA of the various land uses:

- Crèche: GLA is 15% of the assumed erf size,
- Sport Complex: GLA is 35% of the assumed erf size,
- Medical Centre: GLA is 40% of the assumed erf size,
- Convenience Shopping: GLA is 40% of the assumed erf size.

More detail on the mixed-use precinct will be determined at the site development plan level.

Refer to **Table 3** for the expected development trips.

*Table 3: Expected Development Trips*

| Peak Hour | In | Out | Total |
|---|---|---|---|
| **AM Peak Hour** | 369 | 522 | **891** |
| **PM Peak Hour** | 727 | 574 | **1 301** |

See **Figures A10** and **A11** for the expected trip generation for the AM and PM peak hours distributed on the network.

**15 Trip Distribution**

The expected trip distribution of new development trips is based on existing traffic volumes and patterns along Frankie Fredericks Street. Based on these existing traffic patterns, the following split was used to calculate the trip distribution of new development trips:

- 20% of trips to/from the site along Knysna Road to George CBD
- 10% of trips to/from the N2 towards Knysna Road
- 10% of trips to/from the east of Saint George's Road
- 20% of trips to/from the N2 towards Mossel Bay
- 15% of trips to/from the north along Park Road
- 25% of trips to/from the Eden Meander Precinct

Refer to **Figures A10** and **A11**, **Annexure A,** for the distribution of the new development trips through the study intersections.

| | |
|---|---|
| **16 Site Access and Access Control** | The main access to Phase 1 of the development will be via the bridge over the N2 and will connect to the extension of Park Road and the Platinum Drive/Park Road intersection. The bridge will be widened to accommodate two lanes per direction.<br><br>The gravel road that connects the quarry/mine operations to the service road next to the N2 will be used as a construction/emergency access. |
| **17 Total Traffic Conditions** | Refer to **Figure A12** for the lane configurations and controls used for the total traffic analysis. Refer to **Figures A13** and **A14** for the total a.m. and p.m. peak hour traffic volumes and operations. Based on the Total Traffic capacity analysis results, it is expected that all study intersections will continue to operate at acceptable levels-of-service and delay. The following recommendations are provided for the intersections:<br><br>• **Int. 9 Platinum Drive/Park Road:** It is proposed to upgrade this intersection with the fourth leg of Park Road that will extend towards the bridge over the N2.<br>• Further upgrades will include the bridge over the N2 with one lane per direction.<br>• **Int. 5 N2 On-Ramp/Knysna Road**: This intersection is expected to operate at longer delays, resulting in a LOS F for both peak hours. No upgrades are proposed. The right turn lane turning towards the N2 has been lengthened to approximately 200 m. The storage length is sufficient to accommodate the 95$^{th}$ percentile queue length at this intersection for both the a.m. and p.m peak hours. Any signalisation/upgrades at this intersection will be abortive in the future when the N2 is extended. Therefore, no upgrades are proposed at this intersection.<br><br>It is also required to dual Park Road between Blue Mountain Boulevard and Saint George's Road as part of Phase 1 of this development.<br><br>Subsequent phases of the development will require more detailed Transport Impact Assessments. However, the following high-level capacity analysis provides an indication of the remaining capacity available over the N2 bridge beyond Phase 1. The analysis indicates that the N2 bridge can accommodate a total of 2 000 vehicle trips per peak hour, with the following directional split:<br><br>• Morning peak hour: 1 500 outbound and 500 inbound trips.<br>• Afternoon peak hour: 1 500 inbound and 500 outbound trips.<br><br>Based on the total trips generated by Phase 1, approximately 1 120 vehicle trips during the morning peak hour and 700 vehicle trips during the afternoon peak hour remain available over the N2 bridge. These figures represent the remaining capacity across both directions combined, subject to the |

| | |
|---|---|
| | directional limits indicated above.<br><br>Based on the assumed residential trip generation rates, the total bridge capacity equates to approximately 1 800 residential units. Phase 1 comprises 580 residential units, leaving an indicative allowance of approximately 1 220 additional residential units. This allowance is subject to confirmation of the final land-use mix and the trips generated by the Phase 1 mixed-use component, which also contribute towards the available bridge capacity.<br><br>This development allocation is subject to the dualling of Park Road and the upgrading of the Park Road/Platinum Drive roundabout to a double-lane roundabout.<br><br>This conclusion assumes that the background traffic conditions include all planned developments within George, as reflected in the Kraaibosch Roads Master Plan and Cost Apportionment Model (SMEC, December 2025), together with the proposed residential development on Erf 28005 (the former proposed Makro site), south of Park Road. |
| **18 Pedestrians and Cyclists** | There are sidewalks along all of Platinum Drive and Park Road in the vicinity of the site. It is proposed that, with the extension of Park Road to the bridge, sidewalks be provided along the extension of Park Road. |
| **19 Public Transport** | Based on the George Municipal Spatial Development Framework Parking Areas map (George CITP, 2024), the site is not located within a PT1 area. The Go George bus service has a major terminal along the Mall Access Road as well as a PTI (public transport interchange) for minibus taxis.<br><br>The site vicinity is serviced by six Go George routes that travel either along Park Road, Knysna Road or the N2 to and from the terminal point along the Mall Access Road. The Go George routes and the minibus taxi routes are provided in **Figure 5**. It is recommended that the GoGeorge Bus routes be extended to form part of the Garden Route City development in the future. |

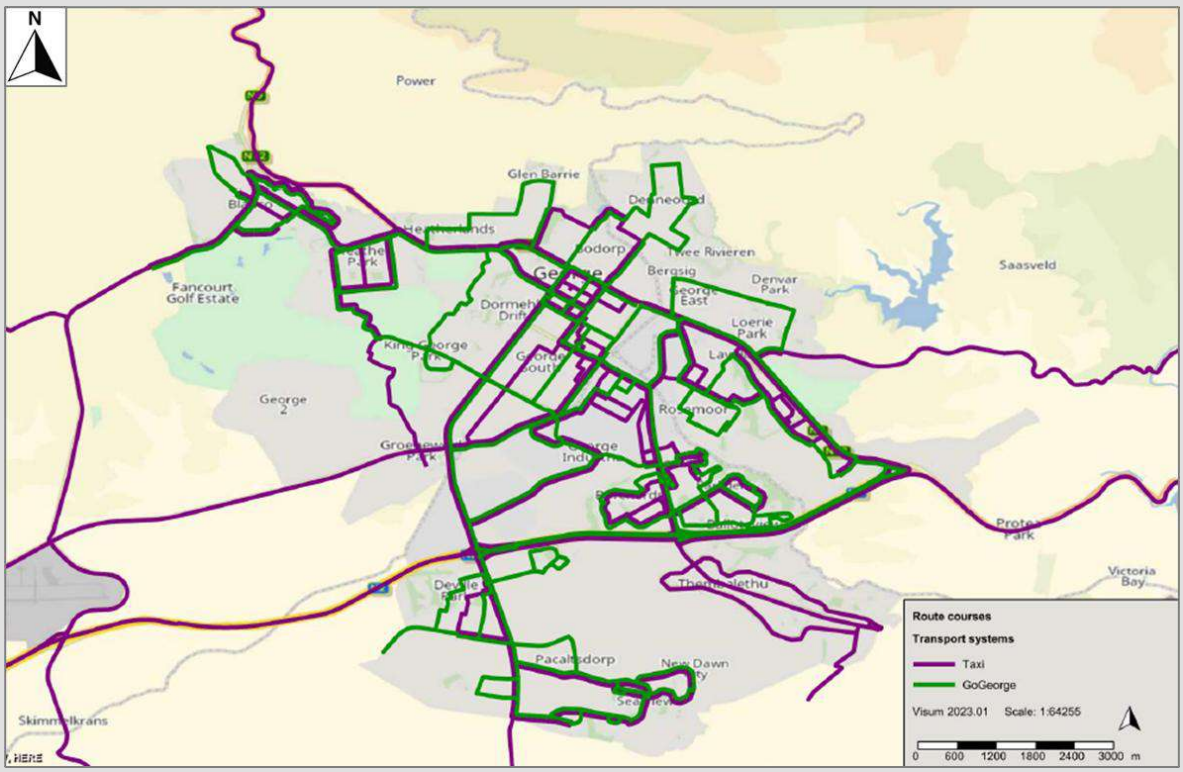



*Figure 5: Public Transport Routes for the GO GEORGE and Minibus Taxi Transport Systems (Zoomed In). (Source: George CITP, 2024)*

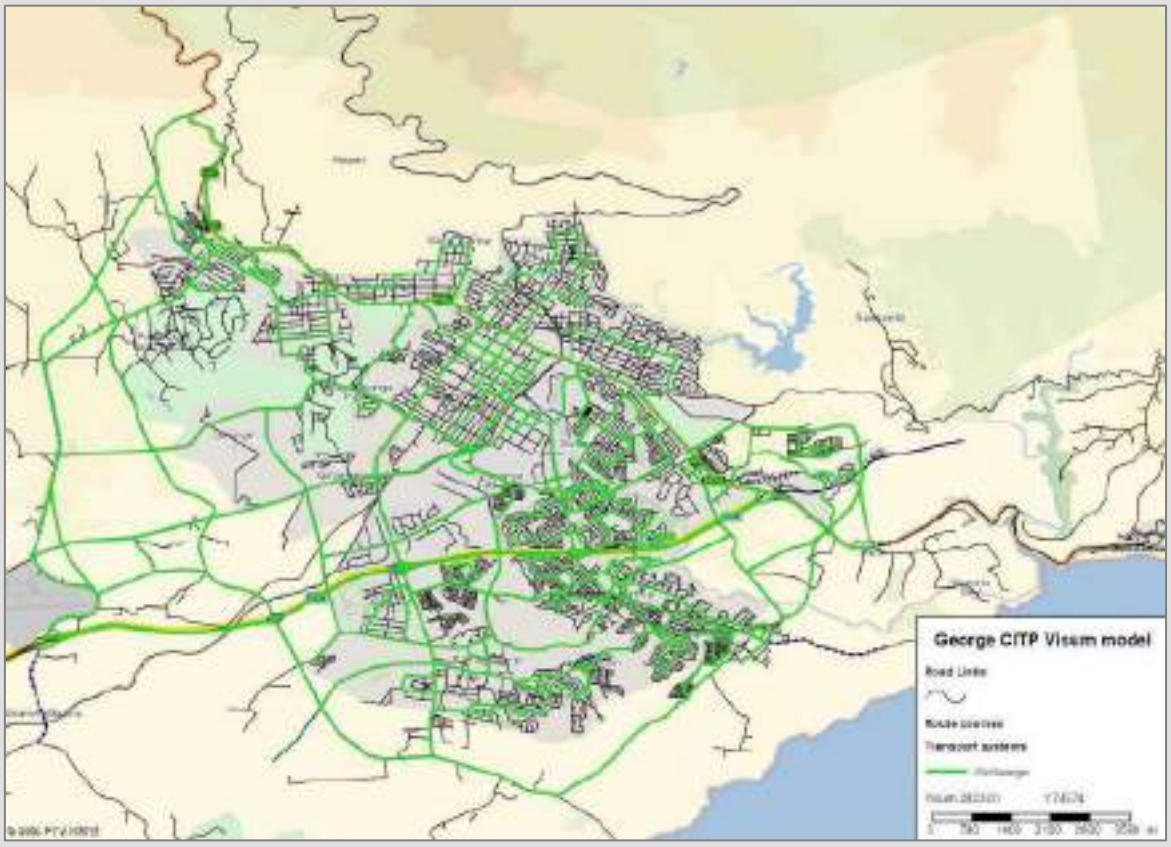



*Figure 6: Current GO GEORGE lines with proposed subsidised lines combined to reflect network coverage*

| | |
|---|---|
| **20 Parking** | The parking must be provided in accordance with the George Integrated Zoning Scheme By-Law (2023) and will be discussed in further detail during the site development plan phase. |
| **21 Conclusion & Recommen-dations** | The transport impact assessment reviewed the expected transport-related impacts of the proposed Phase 1 of the Garden Route City development.<br>Based on the analysis outlined in this study, the following findings, conclusions and recommendations are relevant:<br>• **Existing Conditions:** All study intersections are currently operating at acceptable Levels of Service under existing conditions<br>• **Background Conditions:** Most of the study intersections are currently operating at acceptable Levels of Service under future background conditions; certain intersections are expected to experience increased delays; however, these impacts are primarily attributable to approved and latent developments in the broader area and not the proposed development. Upgrades were also provided in accordance with the Kraaibosch Roads Master Plan and Cost Apportionment (SMEC, 2025).<br>• **Expected Development Trips:** The proposed development is expected to generate approximately 891 vehicle trips (369 in/ 522 out) during the a.m. peak hour and 1 301 vehicle trips (727 in/ 574 out) during the p.m. peak hour.<br>• **Total Traffic Conditions:** Under total traffic conditions, including the proposed development, the road network is expected to continue operating at acceptable levels, subject to the implementation of the proposed mitigation measures (as discussed in the existing and background conditions) as well as the following upgrades:<br>o Upgrading the Platinum Drive/Park Road intersection (Int. 9) with a fourth approach extending Park Road towards the bridge over the N2.<br>o Further upgrades will include the bridge over the N2 with one lane per direction.<br>o It is also required to dual Park Road between Blue Mountain Boulevard and Saint George's Road as part of Phase 1 of this development.<br>• The high-level capacity analysis indicates that, following Phase 1, approximately 1 120 a.m. and 700 p.m. peak-hour vehicle trips, across both directions combined, remain available over the N2 bridge. An indicative 1 220 additional residential units could be accommodated in subsequent phases, subject to the final land-use mix, mixed-use traffic demand and directional capacity limits. This is |

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| | |
|---|---|
| | conditional on the dualling of Park Road and the Park Road/Platinum Drive roundabout, with the development extent to be confirmed through detailed TIAs for subsequent phases.<br><br>• **Site Access and Circulation:** The main access to Phase 1 of the development will be via the bridge over the N2 and will connect to the extension of Park Road and the Platinum Drive/Park Road intersection. The bridge will be widened to accommodate two lanes per direction. The gravel road that connects the quarry/mine operations to the service road next to the N2 will be used as a construction/emergency access.<br><br>• **Public Transport and NMT:** There are sidewalks along all Platinum Drive and Park Road in the vicinity of the site. It is proposed that, with the extension of Park Road to the bridge, sidewalks be provided along the extension of Park Road. It is also recommended that the GoGeorge Bus routes be extended to form part of the Garden Route City development in the future<br>• **Parking:** It is recommended that the parking be provided in accordance with the George Integrated Zoning Scheme By-Law (2023). The parking will be confirmed during the site development plan development.<br><br>It is concluded that the additional traffic from the proposed development can be accommodated on the transport network with minor mitigation requirements. It is recommended that the proposed development be approved from a transportation point of view, provided that the required mitigation, as defined in this study, is in place. |

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2. Comprehensive Integrated Transport Plan, George Municipality, 2024
3. Highway Capacity Manual (HCM), Transportation Research Board, 2000
4. Kraaibosch Roads Master Plan and Cost Apportionment, SMEC, April 2025
5. South African Traffic Impact and Site Traffic Assessment Manual, TMH16, Volume 1, COTO, August 2012
6. South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual, TMH16, Volume 2, COTO, February 2014
7. South African Trip Data Manual, TMH17, Version 1.1, COTO, September 2013
8. Transport Impact Assessment, Eden Meander, Innovative Transport Solutions (Pty) Ltd, July 2023
9. Transportation Impact Study, Garden Route East, Innovative Transport Solutions (Pty) Ltd, January 2010
10. Transport Impact Study, Garden Route East/Eden Meander Development, Innovative Transport Solutions (Pty) Ltd, February 2012

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# ANNEXURE A

Figures

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# GARDEN ROUTE CITY

## PTN'S. 7,8 12 & REM. 23 KRAAIBOSCH No.195

| USE | AREAS | No. OF ERVEN / UNITS | NOTATION |
|---|---|---|---|
| RESIDENTIAL 1 (400 - 600m²) | 20,10 | 335 | |
| RESIDENTIAL 1 (500 - 700m²) | 26,66 | 380 | |
| RESIDENTIAL 1 (700 - 900m²) | 14,50 | 161 | |
| MEDIUM DENSITY RESIDENTIAL 40u/ha | 7,48 | 299 UNITS | |
| FUTURE DEVELOPMENT | 72,62 | 5807 UNITS | |
| EDUCATION | | | |
| MIXED LAND USE | | | |
| OPEN SPACE | | | |
| PRIVATE STREETS | | | |
| PUBLIC ROADS | | | |
| ACCESS CONTROL POINT | | | |
| MIXED USE NODE | | | |
| MUNICIPAL | | | |
| SLOPES STEEPER THAN 1 : 5 | | | |

0 50 100 250 200 250 300 350 400 450 500m

### PHASE 1

| USE | QUANTITY | NOTATION |
|---|---|---|
| RESIDENTIAL 1 (700 - 900m²) | 152 | |
| RESIDENTIAL 1 (500 - 700m²) | 129 | |
| MEDIUM DENSITY RESIDENTIAL 40u/ha | 299 | |
| PRIVATE OPEN SPACE | 2 | |
| PRIVATE STREET | 2 | |
| ACCESS CONTROL POINT | 1 | |
| PUBLIC ROADS | | |
| TOTAL | 585 | NOTATION |

### PHASE 2

| USE | QUANTITY | |
|---|---|---|
| RESIDENTIAL 1 (500 - 700m²) | 256 | |
| RESIDENTIAL 1 (400 - 600m²) | 335 | |
| EDUCATION | 1 | |
| MUNICIPAL | 1 | |
| PRIVATE OPEN SPACE | 5 | |
| ACCESS CONTROL POINT | 1 | |
| PUBLIC ROADS | | |
| TOTAL | 599 | |

### PHASE 3

| USE | QUANTITY | NOTATION |
|---|---|---|
| MIXED LAND | 1 | |
| PRIVATE OPEN SPACE | 2 | |
| PUBLIC ROADS | | |
| TOTAL | 3 | |

### PHASE 4

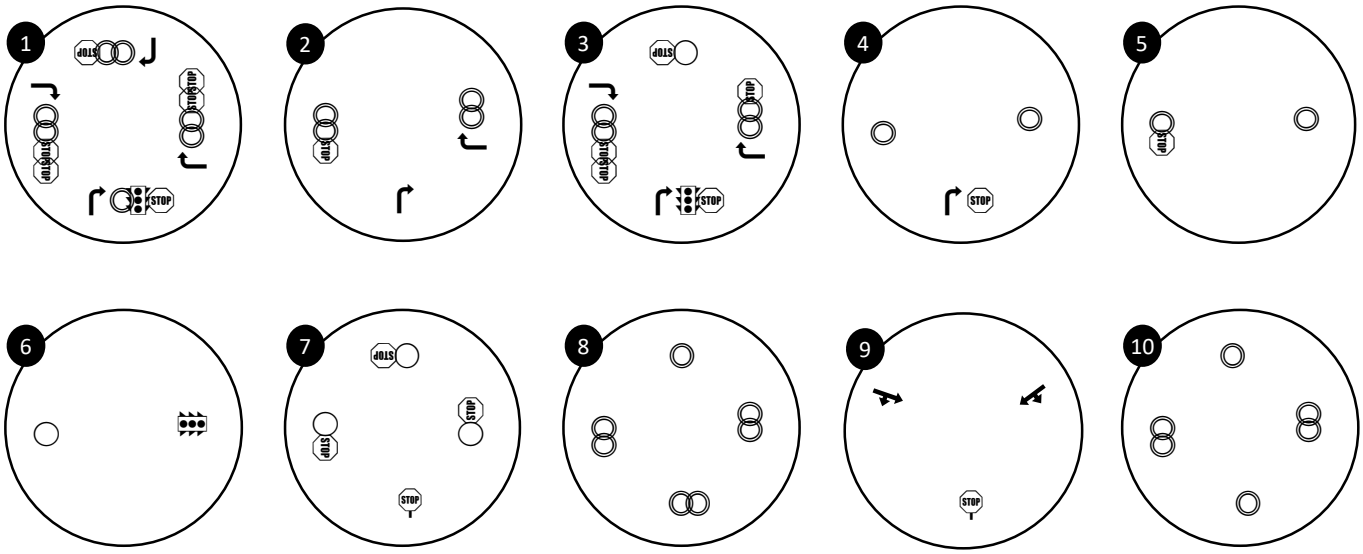
| USE | QUANTITY | NOTATION |
|---|---|---|
| FUTURE DEVELOPMENT | 5807 | |
| PUBLIC ROADS | | |
| TOTAL | 5807 | |

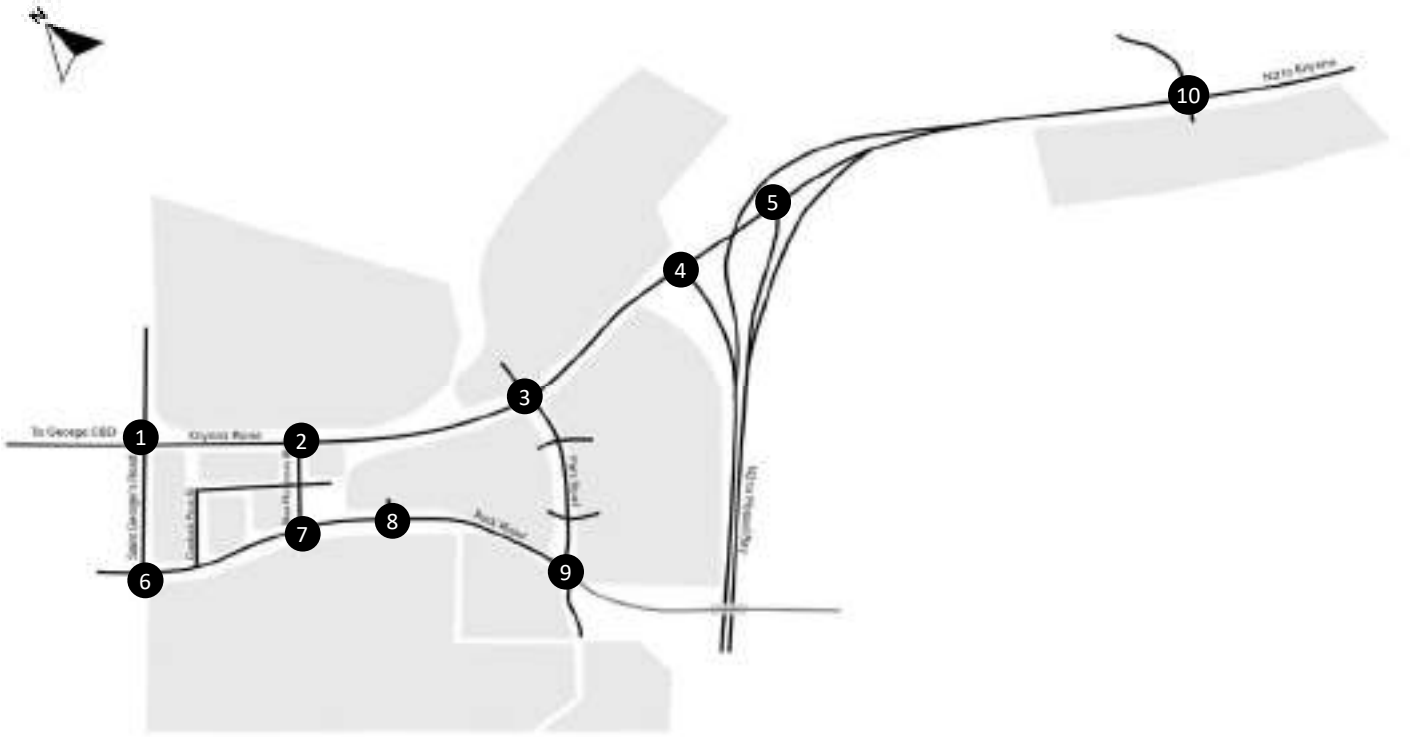
| DATE | AMENDMENTS |
|---|---|
| | |


Town Planning (PTY)Ltd
AETERNO

P.O. Box 1435
Faerie Glen 0043
Tel: (012) 348 5081


Date: 27 OCTOBER 2025
Scale: 1 : 5000 (A1)
Plan No:

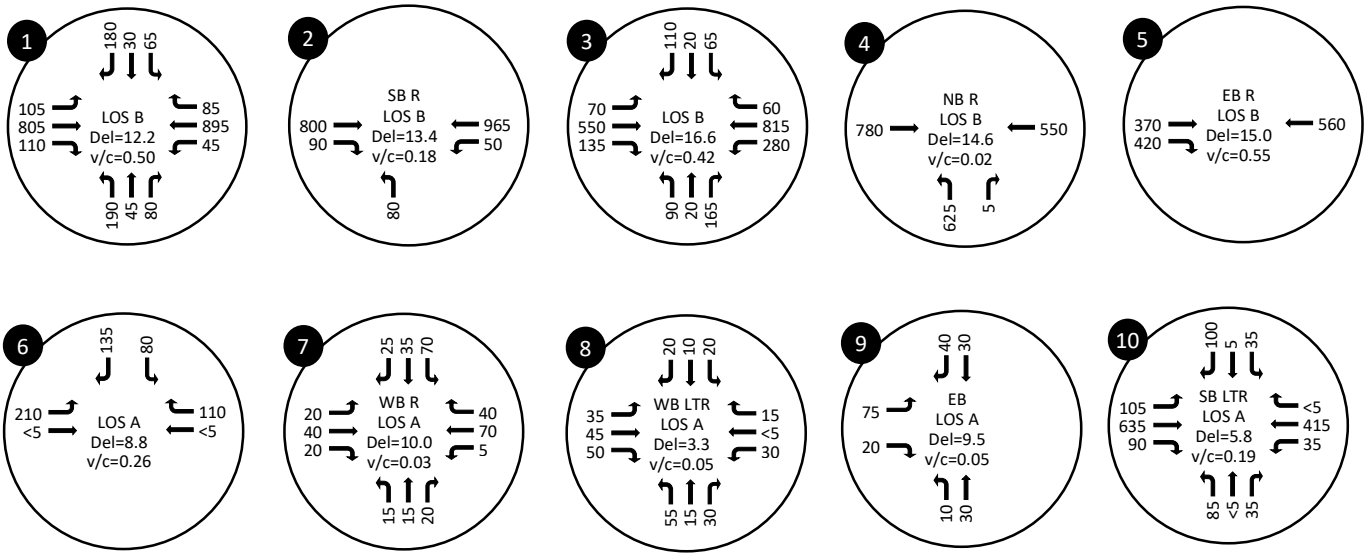


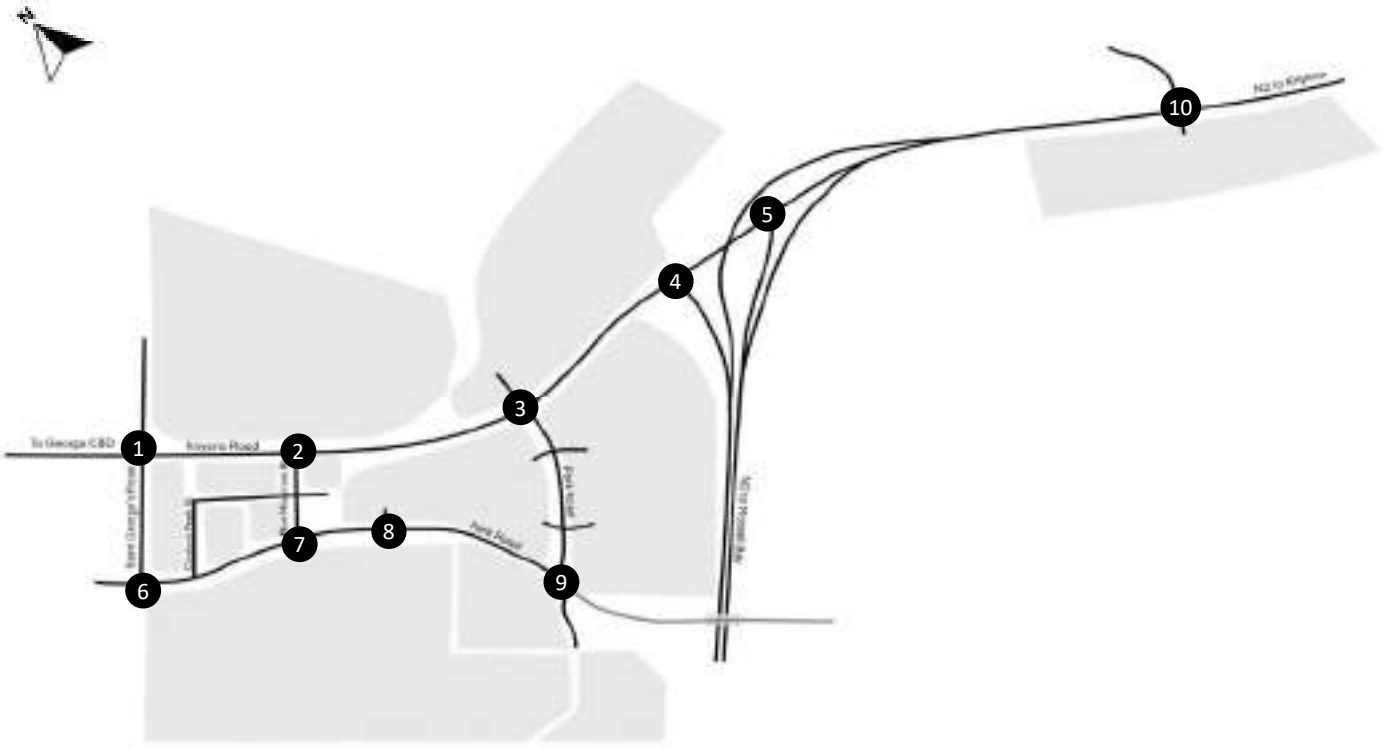




Turning lanes and turning movements
Stop Control
Traffic Signal Control
Roundabout (Yield Control)

*Diagramatic / Not to Scale*

| | | | |
|---|---|---|---|
| its INNOVATIVE TRANSPORT SOLUTIONS | **Garden Route City, George** | **Existing Traffic Conditions**<br>**Lane Configurations and Control** | **Figure:**<br>**A2** |

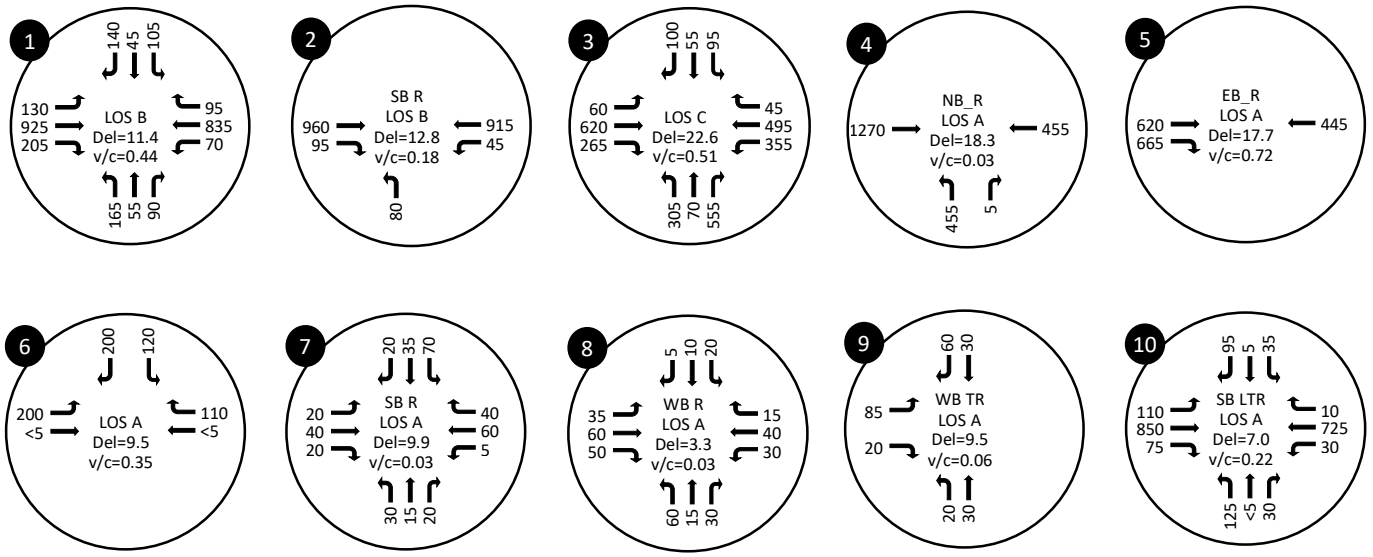


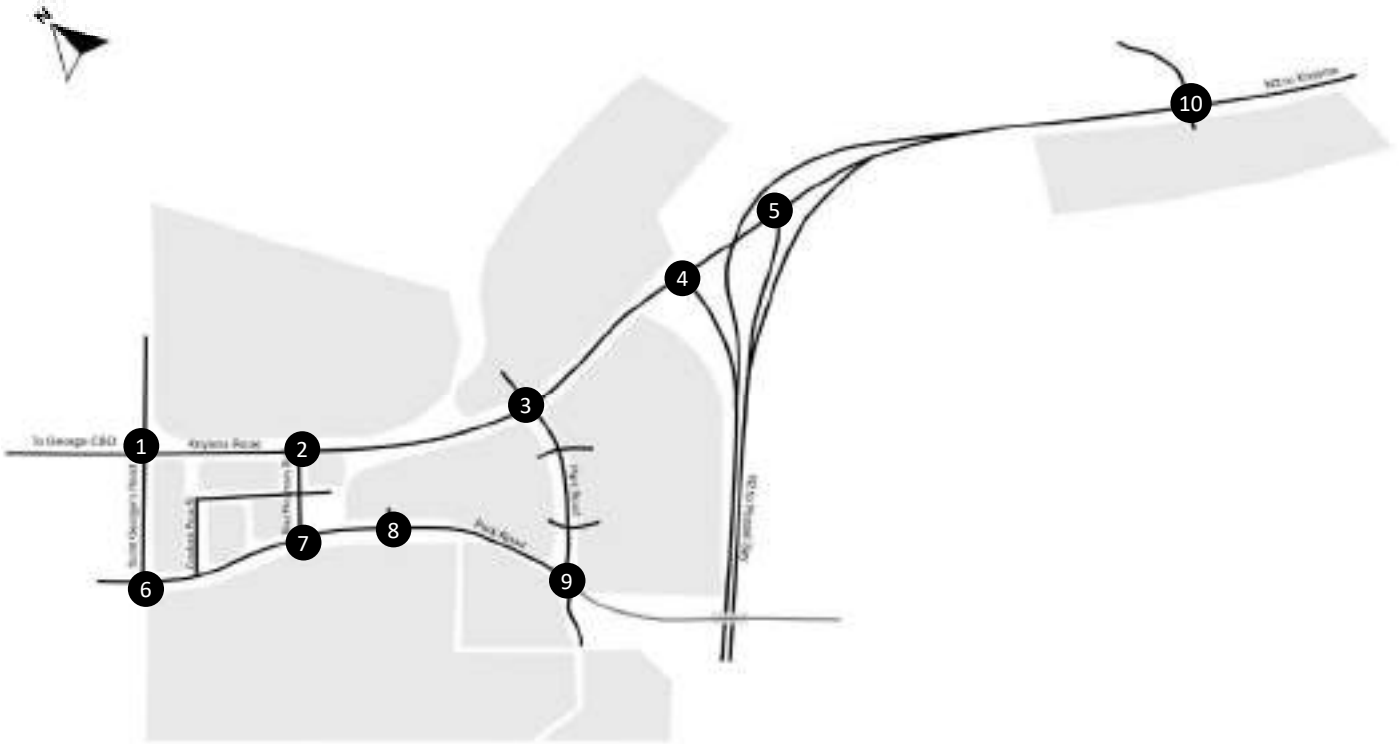




Turning lanes and turning movements
Stop Control
Traffic Signal Control
Roundabout (Yield Control)

*Diagramatic / Not to Scale*

| | | | |
|---|---|---|---|
| its INNOVATIVE TRANSPORT SOLUTIONS | **Garden Route City, George** | **Existing Traffic Conditions**<br>**AM Peak Hour** | **Figure:**<br>**A3** |

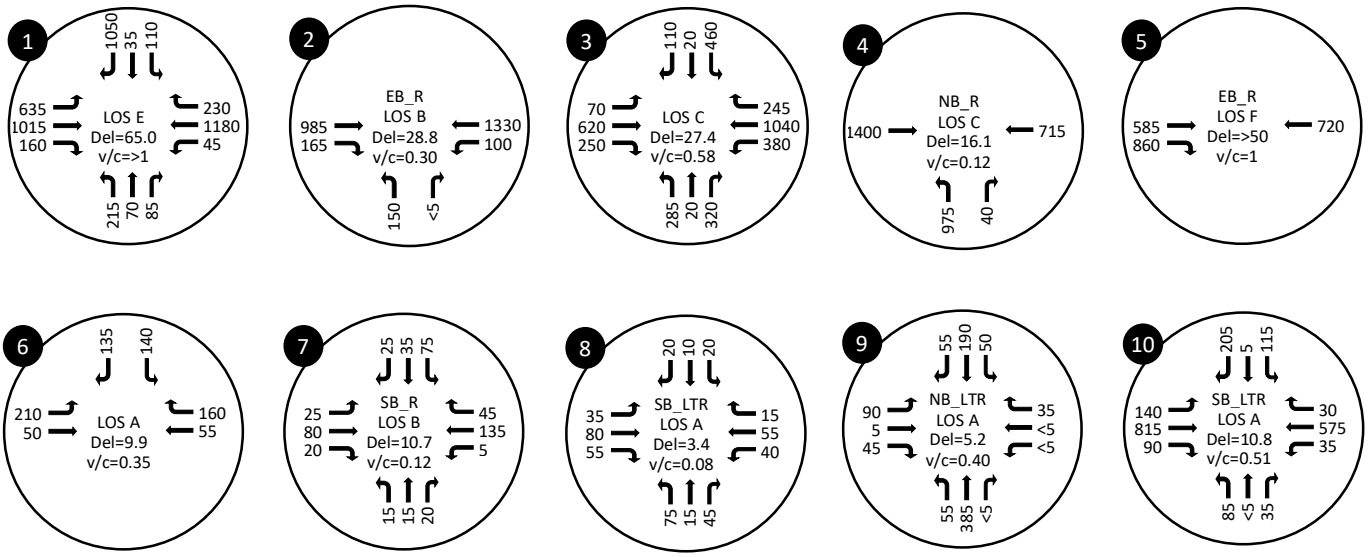


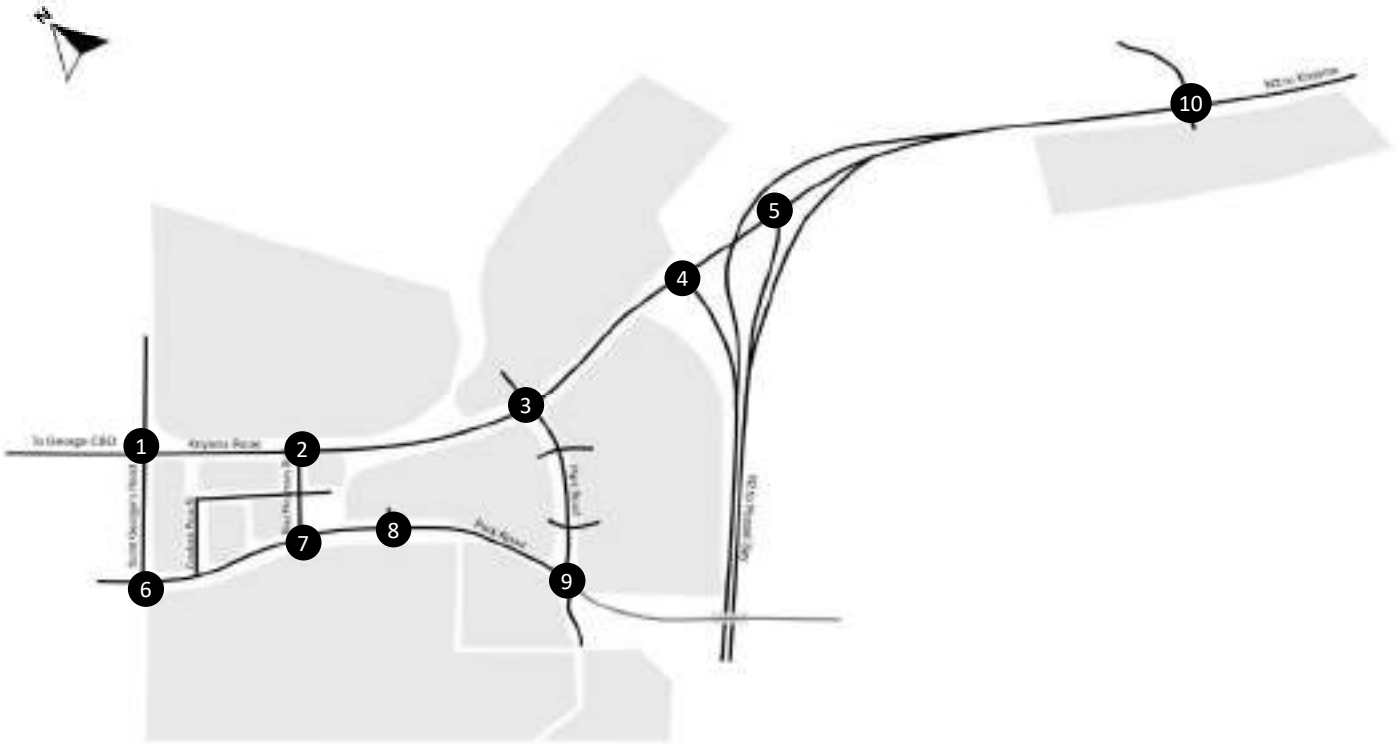




Turning lanes and turning movements
Stop Control
Traffic Signal Control
Roundabout (Yield Control)

*Diagramatic / Not to Scale*

| | | | |
|---|---|---|---|
| its INNOVATIVE TRANSPORT SOLUTIONS | **Garden Route City, George** | **Existing Traffic Conditions**<br>**PM Peak Hour** | **Figure:**<br>**A4** |

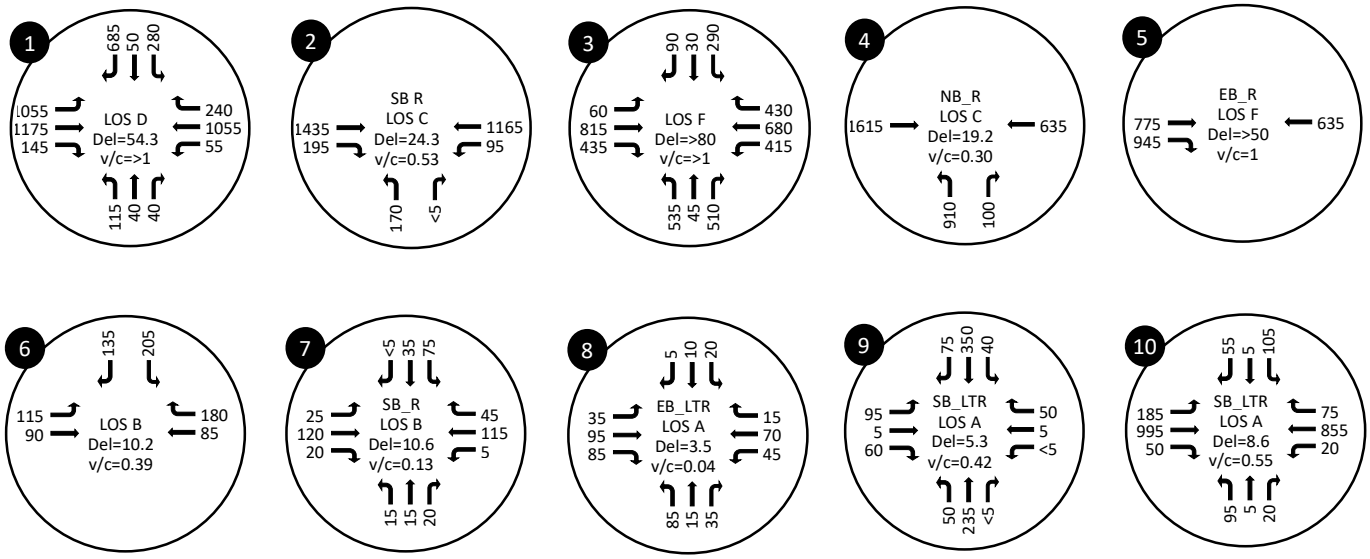


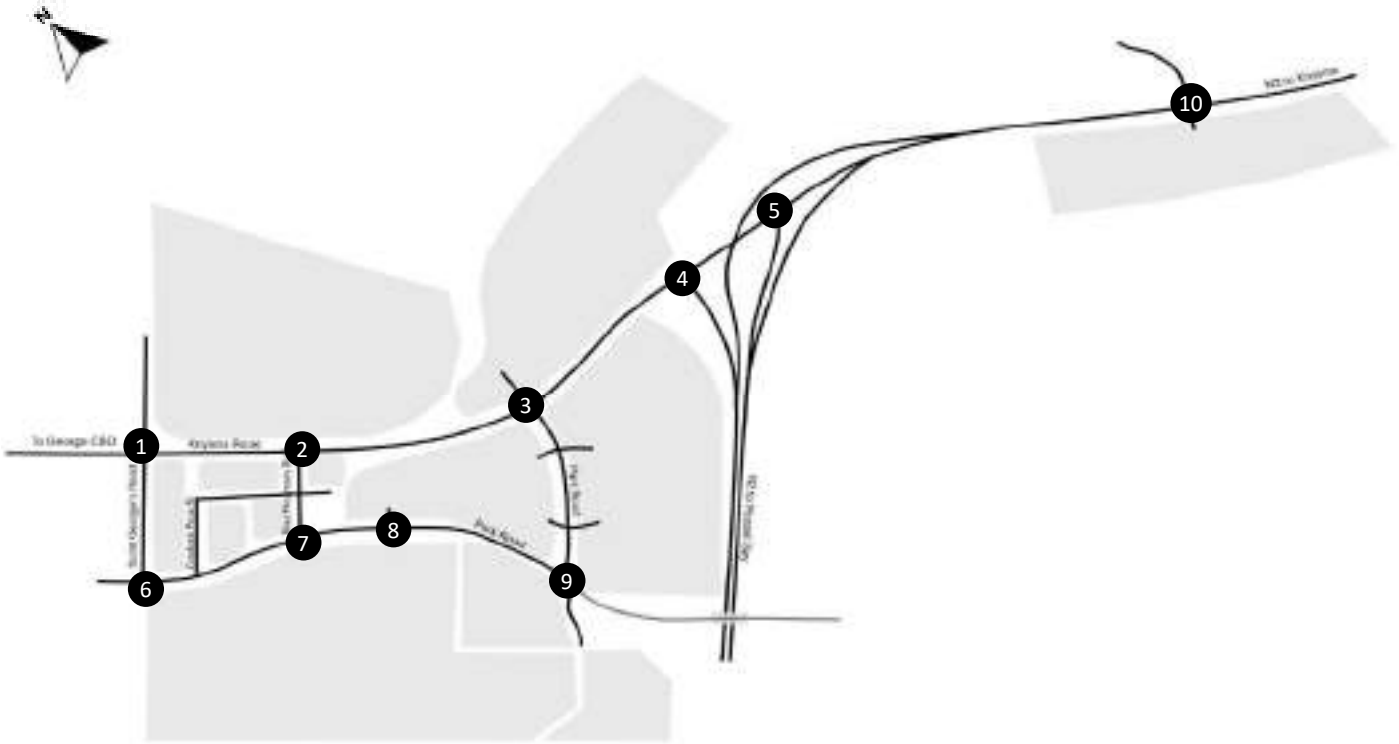




Turning lanes and turning movements
Stop Control
Traffic Signal Control
Roundabout (Yield Control)

*Diagramatic / Not to Scale*

| | | | |
|---|---|---|---|
| its INNOVATIVE TRANSPORT SOLUTIONS | **Garden Route City, George** | **Background Traffic Conditions**<br>**AM Peak Hour** | **Figure:**<br>**A5** |

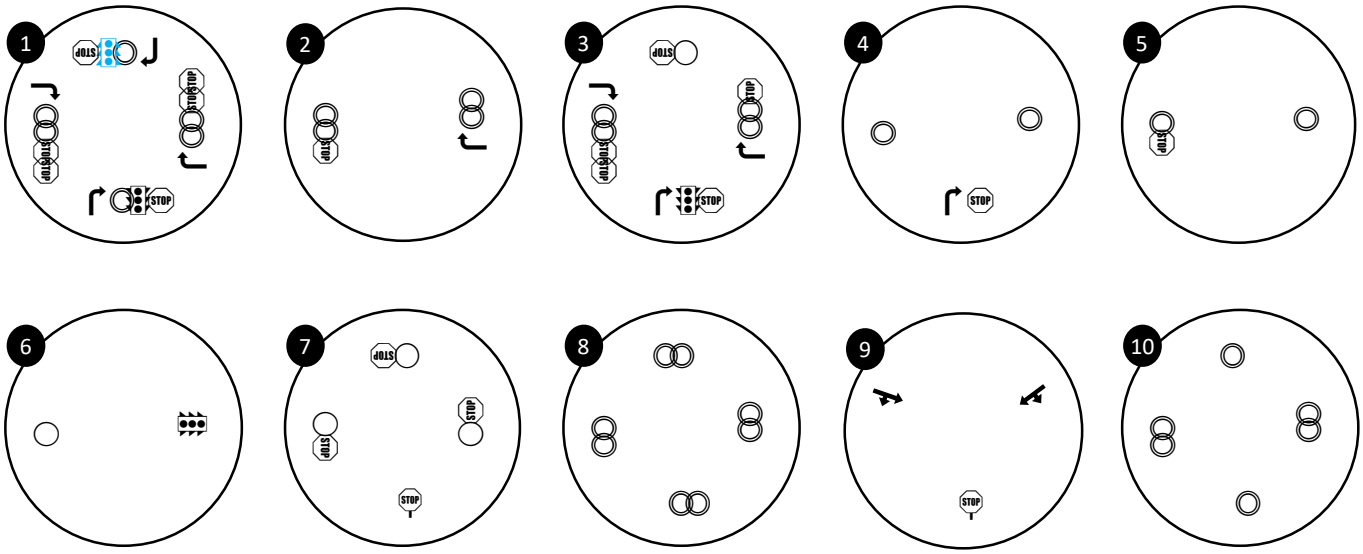


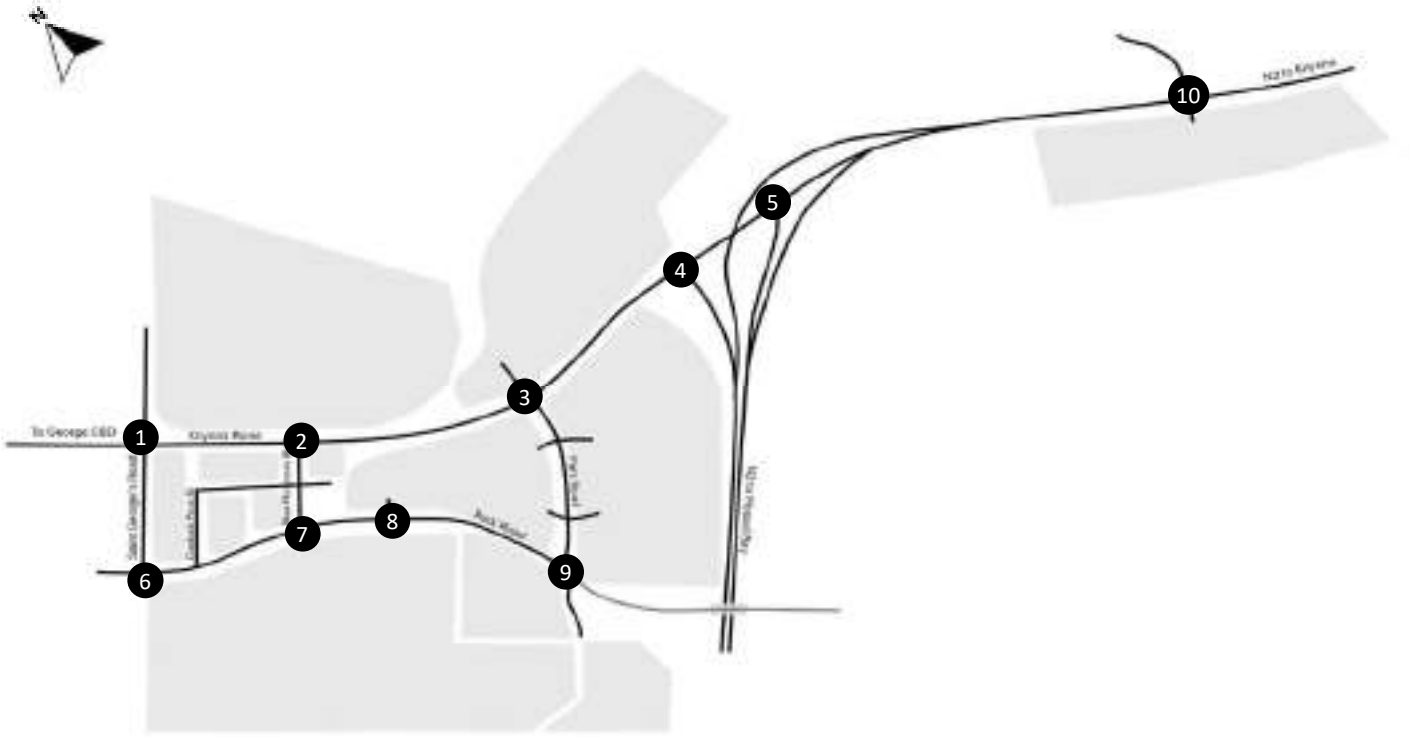




Turning lanes and turning movements
Stop Control
Traffic Signal Control
Roundabout (Yield Control)

*Diagramatic / Not to Scale*

| | | | |
|---|---|---|---|
| its INNOVATIVE TRANSPORT SOLUTIONS | **Garden Route City, George** | **Background Traffic Conditions**<br>**AM Peak Hour** | **Figure:**<br>**A6** |

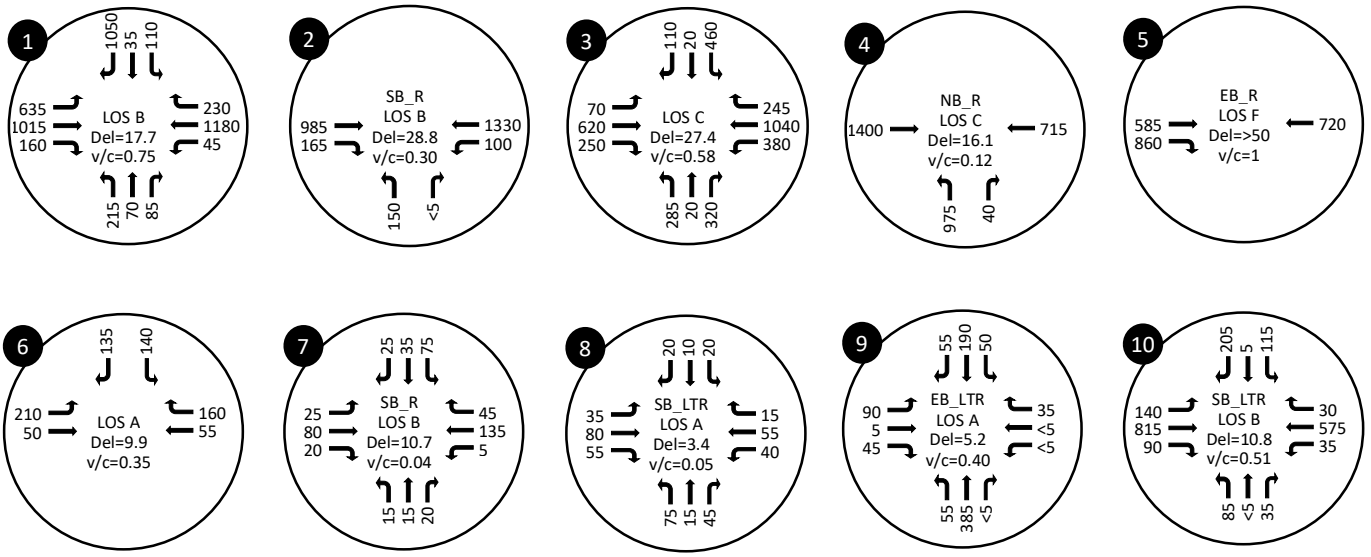


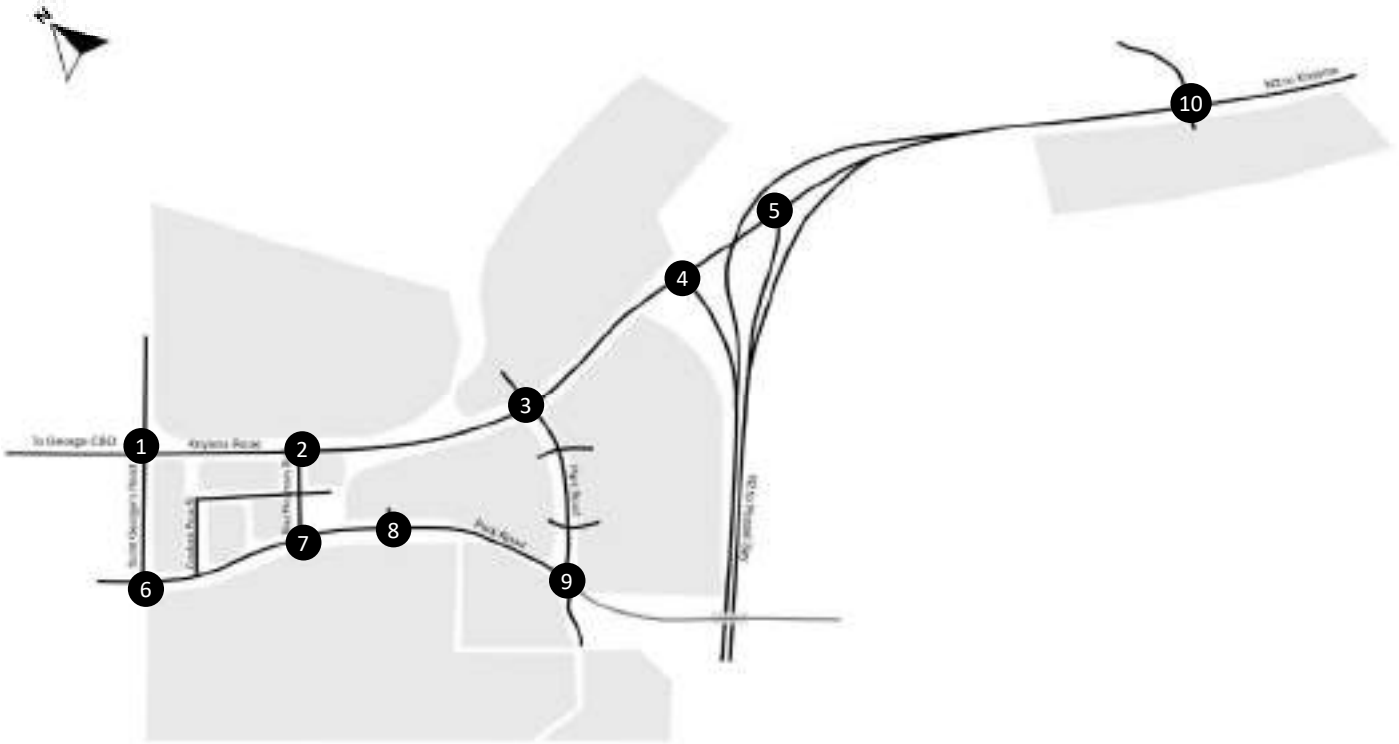




Turning lanes and turning movements
Stop Control
Traffic Signal Control
Roundabout (Yield Control)

*Diagramatic / Not to Scale*

| | | | |
|---|---|---|---|
| its INNOVATIVE TRANSPORT SOLUTIONS | **Garden Route City, George** | **Background Traffic Conditions**<br>**Proposed Upgrades** | **Figure:**<br>**A7** |

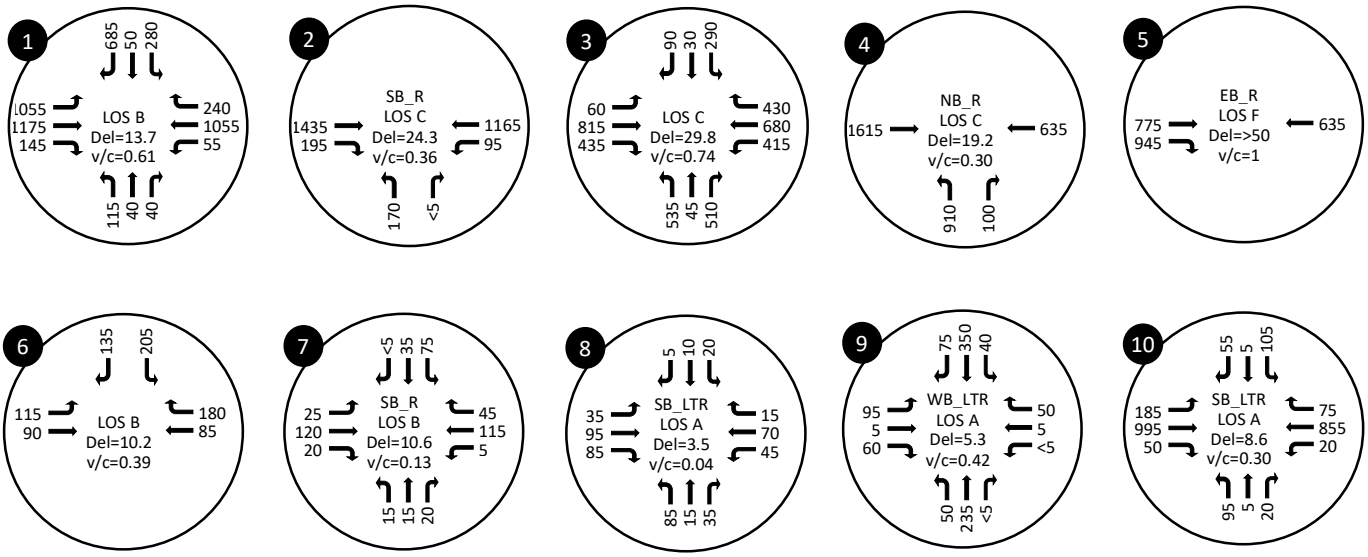


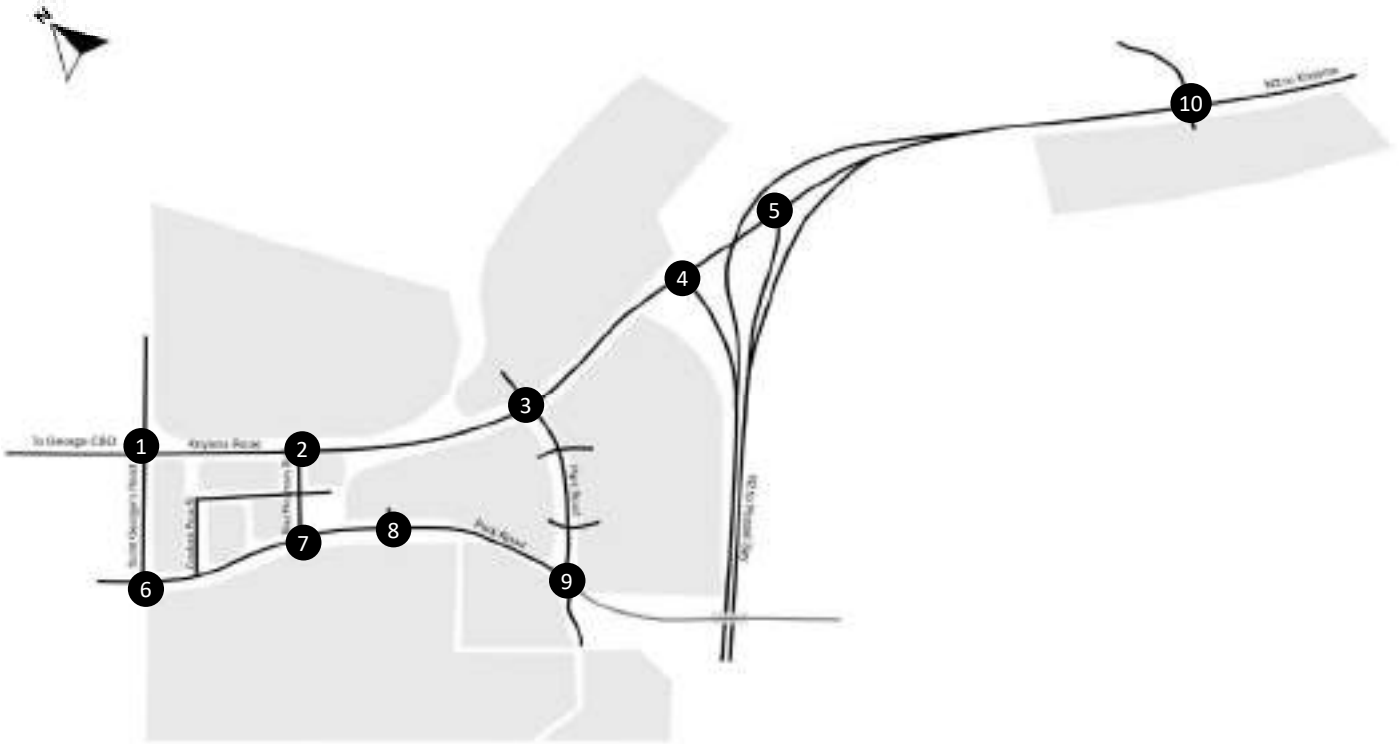




Turning lanes and turning movements
Stop Control
Traffic Signal Control
Roundabout (Yield Control)

*Diagramatic / Not to Scale*

| | | | |
|---|---|---|---|
| its INNOVATIVE TRANSPORT SOLUTIONS | **Garden Route City, George** | **Background Traffic Conditions**<br>**AM Peak Hour with upgades** | **Figure:**<br>**A8** |

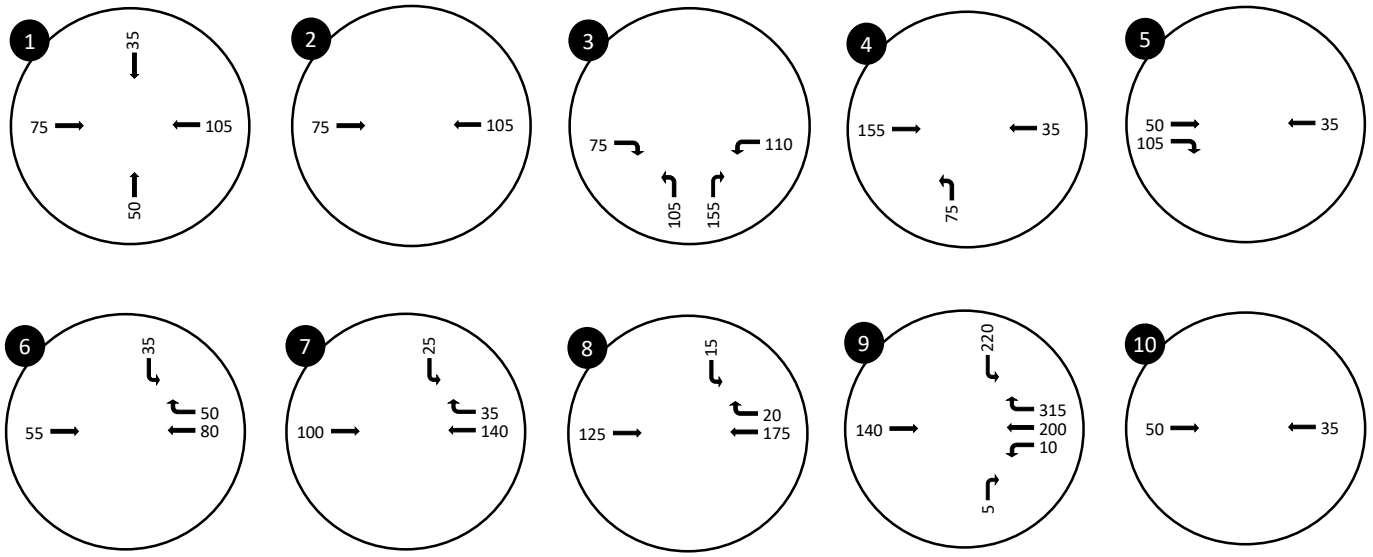


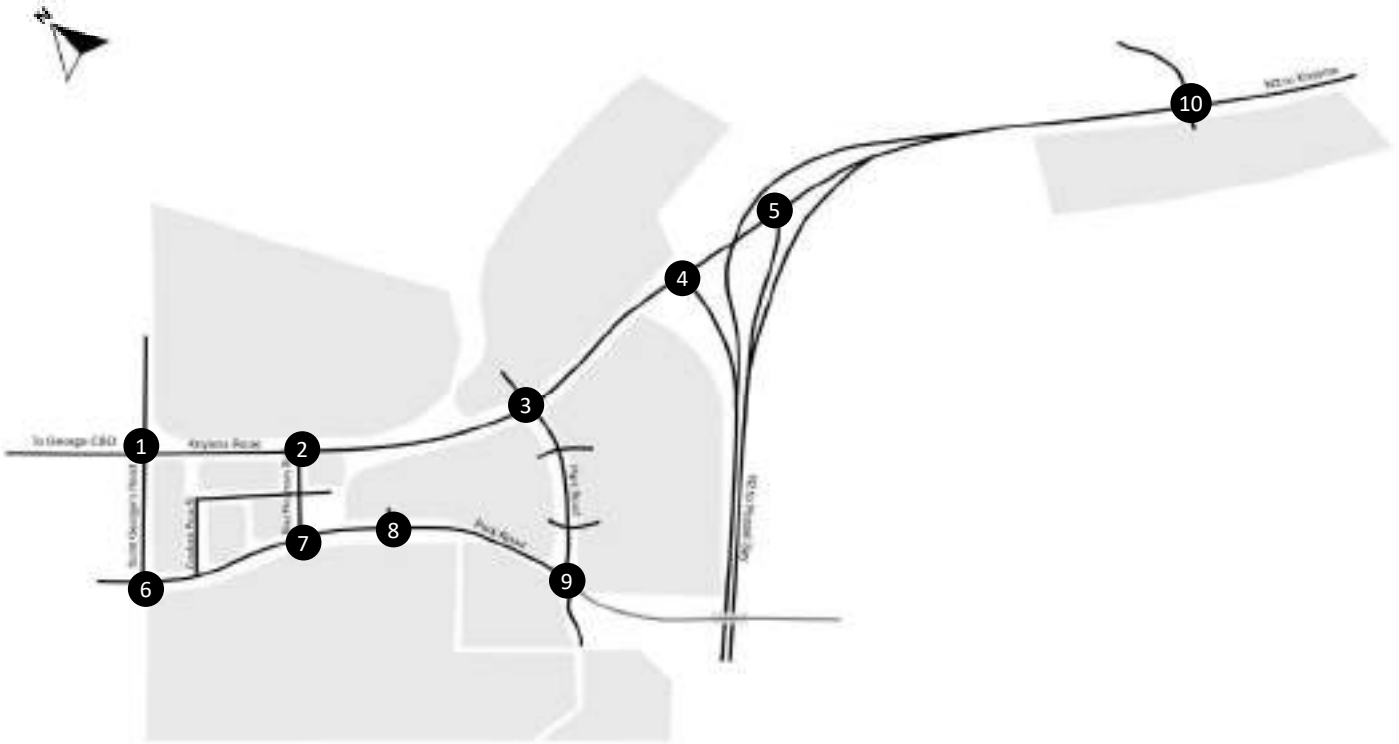




Turning lanes and turning movements
Stop Control
Traffic Signal Control
Roundabout (Yield Control)

*Diagramatic / Not to Scale*

| | | | |
|---|---|---|---|
| its INNOVATIVE TRANSPORT SOLUTIONS | **Garden Route City, George** | **Background Traffic Conditions**<br>**PM Peak Hour with upgades** | **Figure:**<br>**A9** |

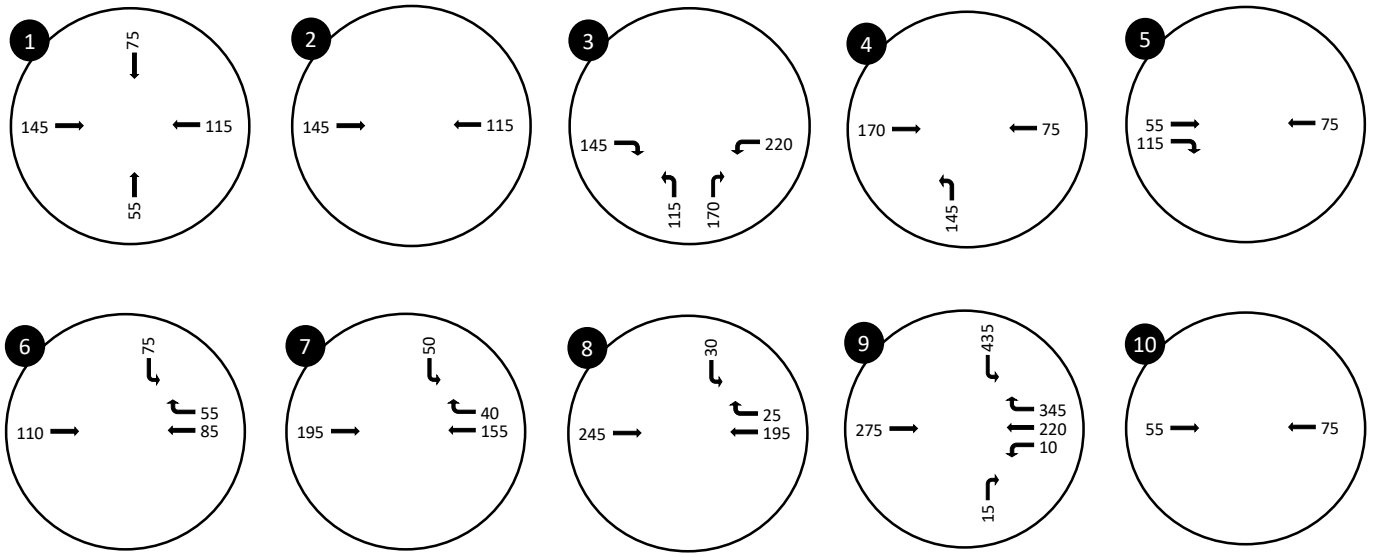


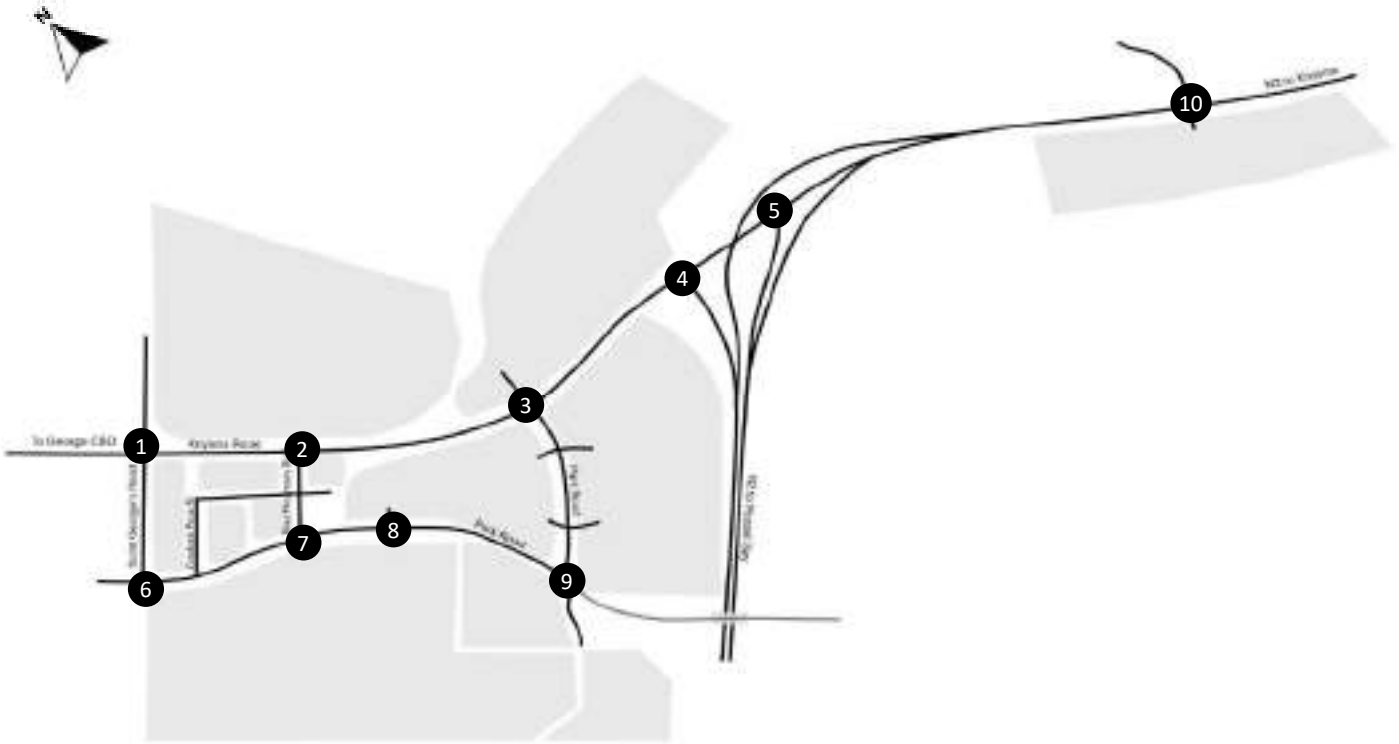




Turning lanes and turning movements
Stop Control
Traffic Signal Control
Roundabout (Yield Control)

*Diagramatic / Not to Scale*

| | | | |
|---|---|---|---|
| its INNOVATIVE TRANSPORT SOLUTIONS | **Garden Route City, George** | **Expected Development Trips**<br>**AM Peak Hour** | **Figure:**<br>**A10** |

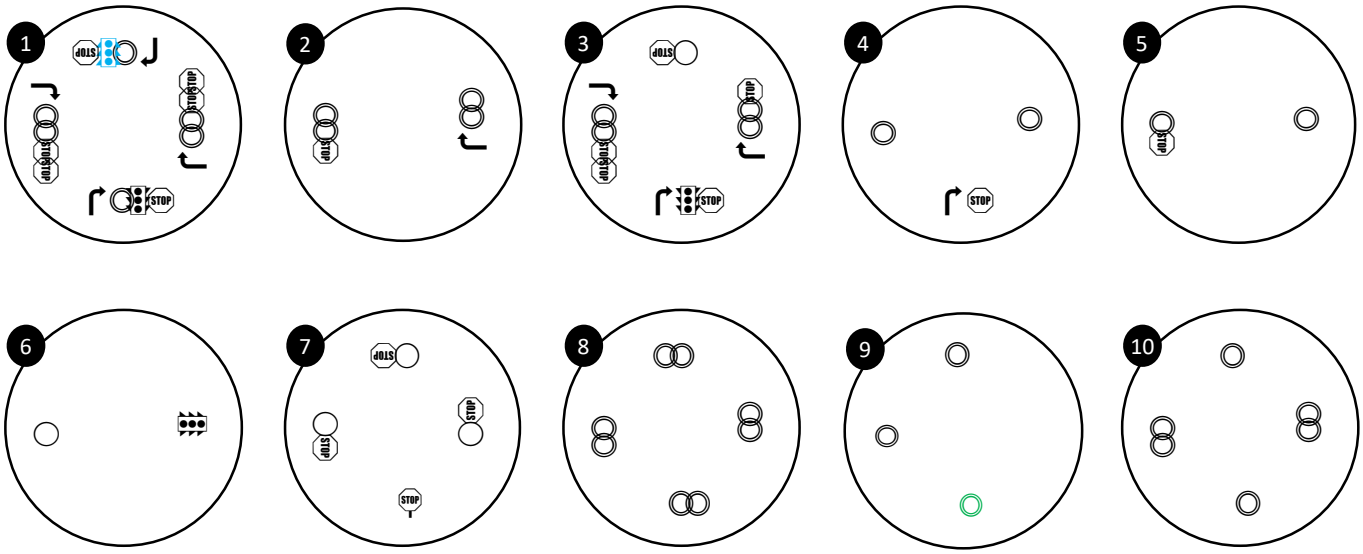


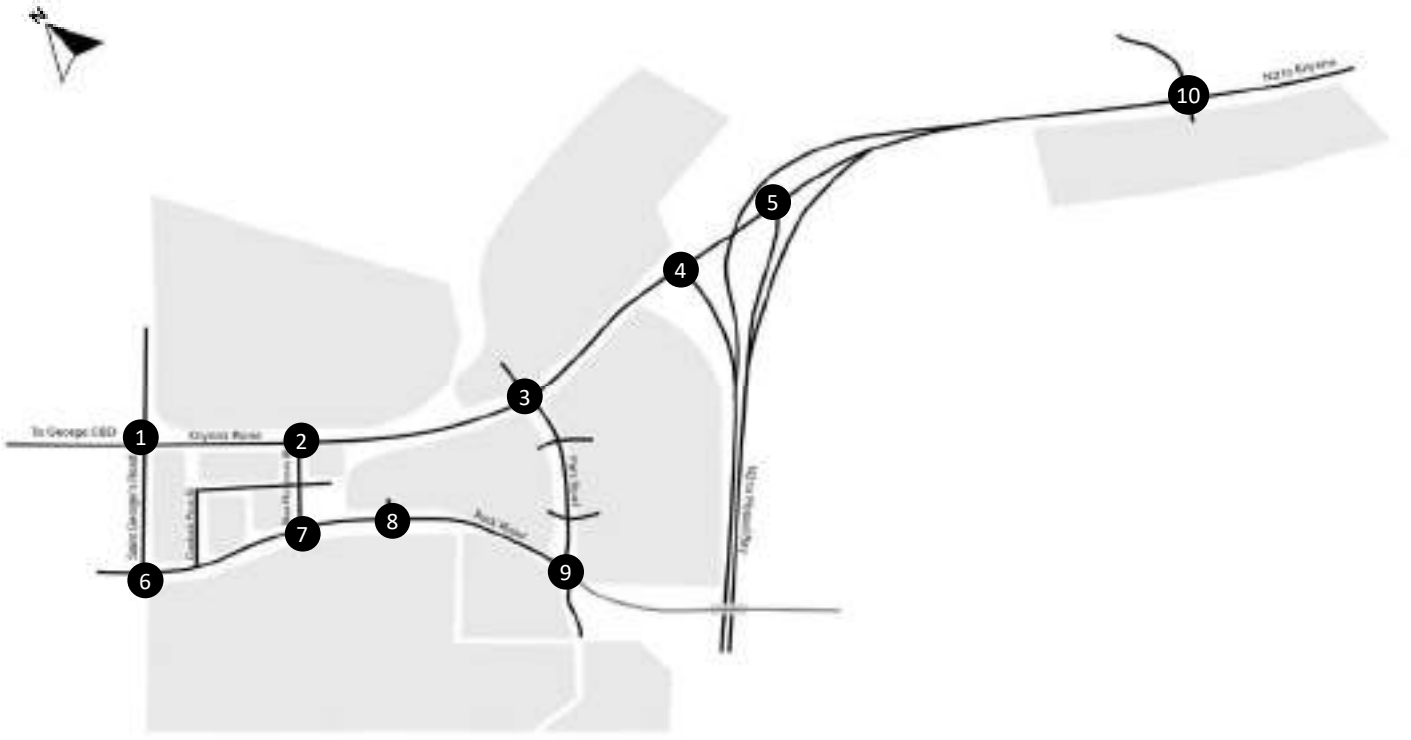




Turning lanes and turning movements
Stop Control
Traffic Signal Control
Roundabout (Yield Control)

*Diagramatic / Not to Scale*

| | | | |
|---|---|---|---|
| its INNOVATIVE TRANSPORT SOLUTIONS | **Garden Route City, George** | **Expected Development Trips**<br>**PM Peak Hour** | **Figure:**<br>**A11** |

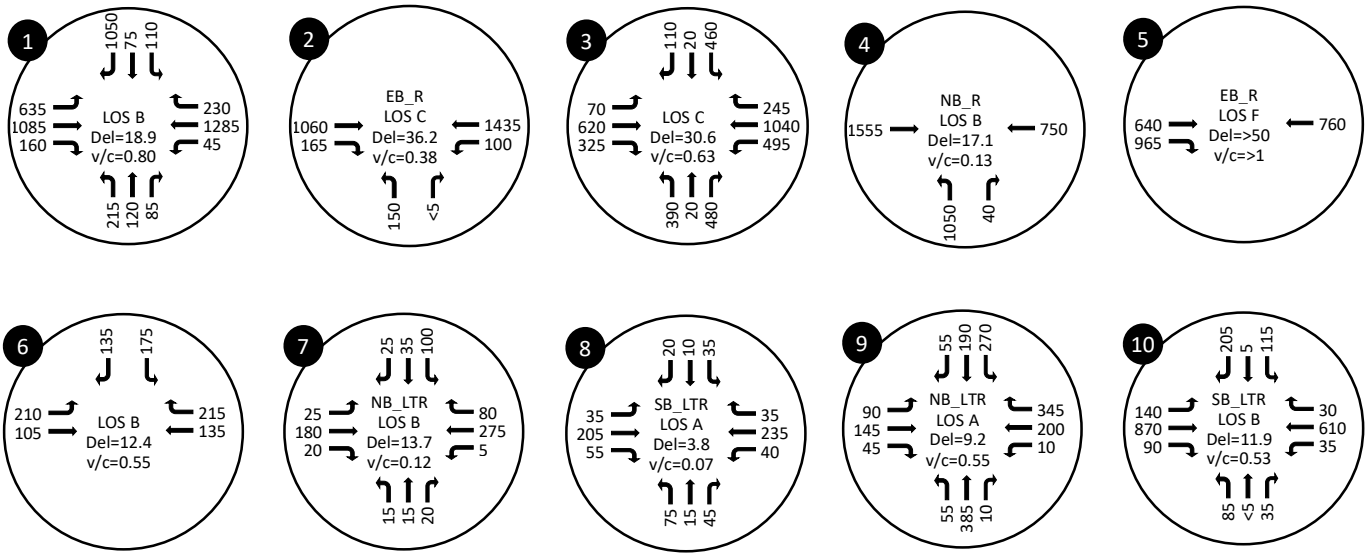


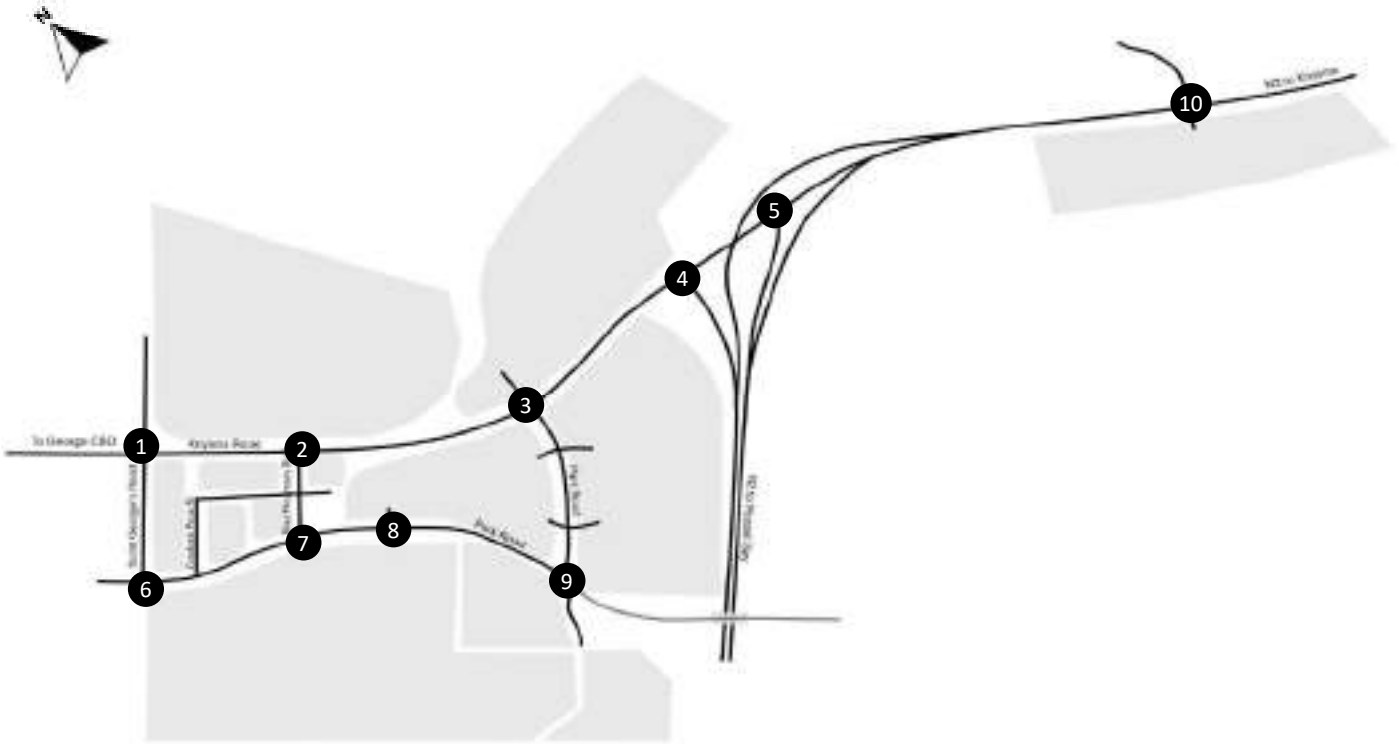




Turning lanes and turning movements
Stop Control
Traffic Signal Control
Roundabout (Yield Control)
Background Upgrades
Total Upgrades

*Diagramatic / Not to Scale*

| | | | |
|---|---|---|---|
| its INNOVATIVE TRANSPORT SOLUTIONS | **Garden Route City, George** | **Total Traffic Conditions**<br>**Proposed Upgrades** | **Figure:**<br>**A12** |

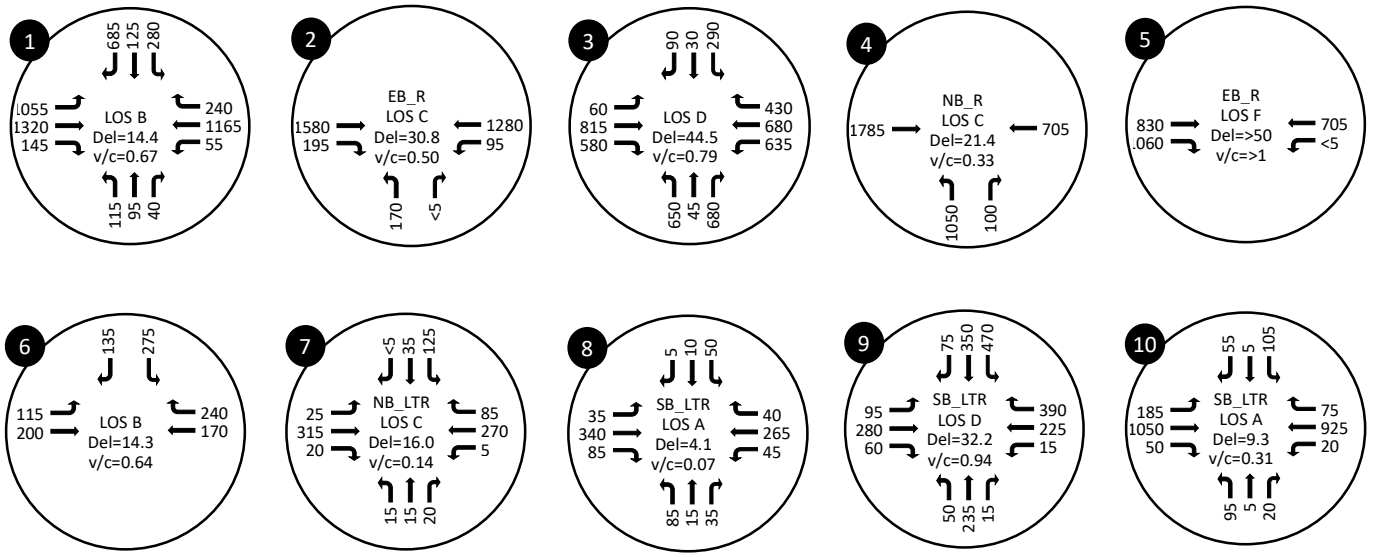


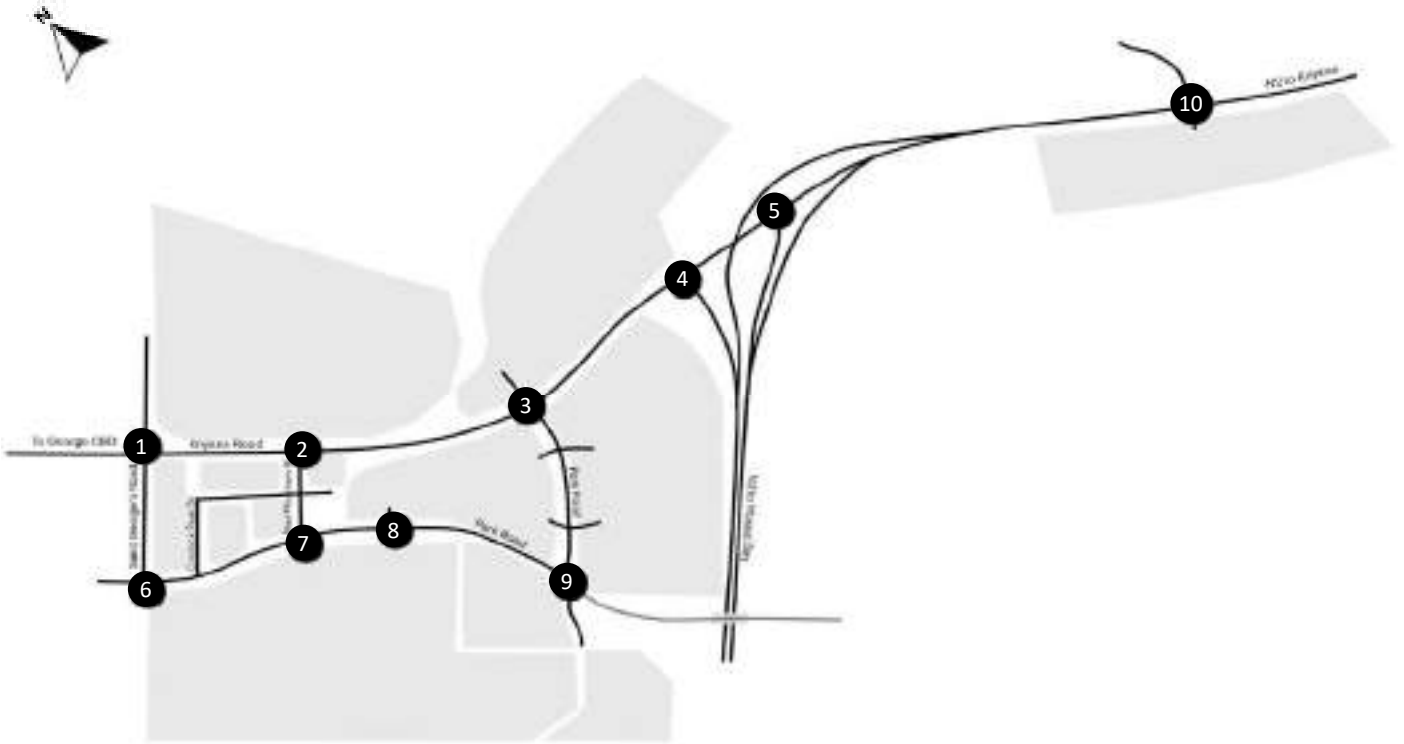




Turning lanes and turning movements
Stop Control
Traffic Signal Control
Roundabout (Yield Control)

*Diagramatic / Not to Scale*

| | | | |
|---|---|---|---|
| its INNOVATIVE TRANSPORT SOLUTIONS | **Garden Route City, George** | **Total Traffic Conditions**<br>**AM Peak Hour** | **Figure:**<br>**A13** |




Turning lanes and turning movements
Stop Control
Traffic Signal Control
Roundabout (Yield Control)

*Diagramatic / Not to Scale*

| | | | |
|---|---|---|---|
| its INNOVATIVE TRANSPORT SOLUTIONS | **Garden Route City, George** | **Total Traffic Conditions**<br>**PM Peak Hour** | **Figure:**<br>**A14** |

# ANNEXURE B

Tables

Draft

*Table B1: Trip Generation*

| Phase | Land Use | Extent | Units | Source | Weekday AM Peak | | | Adjustment Factors | | Weekday PM Peak | | | Adjustment Factors | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Base Rate | In | Out | Adjusted Rate | MU | Base Rate | In | Out | Adjusted Rate | MU |
| 1 | Residential | 299 | units | COTO 220 | 0.65 | 25% | 75% | 0.59 | 10% | 0.65 | 70% | 30% | 0.59 | 10% |
| 1 | Residential | 281 | units | COTO 210 | 1.00 | 25% | 75% | 0.90 | 10% | 1.00 | 70% | 30% | 0.90 | 10% |
| 1 | Creche | 1 129 | 100 sqm GLA | ITE 565 | 13.11 | 53% | 47% | 11.14 | 15% | 13.29 | 47% | 53% | 12.63 | 5% |
| 1 | Sport Complex | 2 635 | 100 sqm GLA | ITE 492 | 1.52 | 50% | 50% | 1.52 | 0% | 3.80 | 57% | 43% | 3.80 | 0% |
| 1 | Medical Centre | 3 011 | 100 sqm GLA | COTO 720 | 8.00 | 55% | 45% | 7.20 | 10% | 8.00 | 45% | 55% | 8.00 | 0% |
| 1 | Convenience Shopping | 3 011 | 100 sqm GLA | COTO 820 | 2.54 | 65% | 35% | 2.28 | 10% | 14.37 | 50% | 50% | 12.93 | 10% |
| | | | | | | | | | | | | | | |

*Table B2: Driveway Trips*

| Total Driveway Trips | | | | | | | |
|---|---|---|---|---|---|---|---|
| Precinct | Land Use | Weekday AM Peak | | | Weekday PM Peak | | |
| | | In | Out | Total | In | Out | Total |
| 1 | Residential | 49 | 146 | 194 | 136 | 58 | 194 |
| 1 | Residential | 70 | 211 | 281 | 197 | 84 | 281 |
| 1 | Creche | 78 | 70 | 148 | 71 | 80 | 150 |
| 1 | Sport Complex | 20 | 20 | 40 | 57 | 43 | 100 |
| 1 | Medical Centre | 132 | 108 | 241 | 108 | 132 | 241 |
| 1 | Convenience Shopping | 50 | 27 | 76 | 216 | 216 | 433 |
| | **Total** | **399** | **581** | **981** | **785** | **614** | **1399** |

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*Table B3: Mixed Use Trips*

| Mixed Use Trips | | | | | | | |
|---|---|---|---|---|---|---|---|
| Precinct | Land Use | Weekday AM Peak | | | Weekday PM Peak | | |
| | | In | Out | Total | In | Out | Total |
| 1 | Residential | 5 | 15 | 19 | 14 | 6 | 19 |
| 1 | Residential | 7 | 21 | 28 | 20 | 8 | 28 |
| 1 | Creche | 12 | 10 | 22 | 4 | 4 | 8 |
| 1 | Sport Complex | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | Medical Centre | 13 | 11 | 24 | 0 | 0 | 0 |
| 1 | Convenience Shopping | 5 | 3 | 8 | 22 | 22 | 43 |
| | **Total** | **42** | **60** | **101** | **58** | **40** | **98** |

*Table B4: Total Nett Trips*

| Nett-New Trips | | | | | | | |
|---|---|---|---|---|---|---|---|
| Precinct | Land Use | Weekday AM Peak | | | Weekday PM Peak | | |
| | | In | Out | Total | In | Out | Total |
| 1 | Residential | 44 | 131 | 175 | 122 | 52 | 175 |
| 1 | Residential | 63 | 190 | 253 | 177 | 76 | 253 |
| 1 | Creche | 67 | 59 | 126 | 67 | 76 | 143 |
| 1 | Sport Complex | 20 | 20 | 40 | 57 | 43 | 100 |
| 1 | Medical Centre | 119 | 98 | 217 | 108 | 132 | 241 |
| 1 | Convenience Shopping | 45 | 24 | 69 | 195 | 195 | 389 |
| | **Total** | **358** | **522** | **879** | **727** | **574** | **1301** |

Draft

## ANNEXURE B (SWMP)

JT EVOLVE: GARDEN ROUTE CITY:  STORMWATER MANAGEMENT REPORT (JULY 2026)

JT EVOLVE
ACTA NON VERBA (PTY)LTD.




# STORMWATER MANAGEMENT REPORT FOR THE DEVELOPMENT GARDEN ROUTE CITY

**Report Number: 458_R004_Stormwater Management Report_Rev.0**

**Date: 2026-07-30**

Dear Mam/Sir

**RE: STORMWATER MANAGEMENT REPORT FOR THE PROPOSED DEVELOPMENT OF GARDEN ROUTE CITY**

Kindly find enclosed our stormwater management plan for the above-mentioned project.

Should you have any further queries, please do not hesitate to contact the writer.

Yours Sincerely,



**Lucricia Maleka, BSc.Eng (Civil)**

## PROJECT INFORMATION

| | | | |
|---|---|---|---|
| **REPORT NUMBER** | **458_R001_Stormwater Management Report_Rev.0** | **REV** | 0 |
| **LOCAL AUTHORITY** | George Municipality | | |
| **DEVELOPMENT NAME** | Proposed development of Garden Route City | | |
| **PROPERTY DESCRIPTION** | Situated on portions 7, 8, 12 and remainder of portion 23 of the Farm Kraaibosch No. 195 | | |
| **NATURE OF PROJECT** | Township Establishment (Greenfield Development) | | |
| **LAND USE TYPE** | Mixed land-use | | |

| | | | | | |
|---|---|---|---|---|---|
| **COMPILED** | **NAME** | LL. Maleka | **APPROVED** | **NAME** | WF. Stoker |
| | **QUALIFICATIONS** | BSc.Eng (Civil) | | **QUALIFICATIONS** | Pr.Eng (Civil) |
| | | | | **PR NUMBER** | 202101798 |
| | **SIGNATURE** |  | | **SIGNATURE** |  |

## AMENDMENT HISTORY

| Issue | Date | Amendment Section/Chapter/Page | Checked By |
|---|---|---|---|
| Original | 2026-07-30 | | WFS |
| | | | |

## DISTRIBUTION

| Name | Copy No | Distribution Address |
|---|---|---|
| | 0 | 46 Market Street (Old York Hostel Building), George |

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**ANNEXURE H: STORMWATER MANAGEMENT PLANS**

## 1. INTRODUCTION

JT Evolve (Pty) Ltd was appointed as civil engineers for the proposed new Greenfield development of Garden Route City situated on portions 7, 8, 12 and remainder of portion 23 of the Farm Kraaibosch No. 195, hereafter referred to as "the site" or "the point of interest". Refer to the signed appointment letter in **Annexure A**. Part of the appointment includes the preparation of a stormwater management plan. This report will describe how the proposed development will install stormwater infrastructure on the development to comply with the George Municipality Stormwater By-Laws and guidelines and the City of Cape Town Stormwater Policies.

## 2. GENERAL INFORMATION

**Table 1: General Information**

| | DEVELOPER/CLIENT | CONSULTING CIVIL ENGINEERS |
|---|---|---|
| **COMPANY NAME:** | Compregen Pty Ltd | JT Evolve (Pty) Ltd |
| **REGISTRATION NO:** | - | 2016/132800/07 |
| **CONTACT PERSON:** | Barend Greyling | Wynand Stoker |
| **ADDRESS:** | 26 Whittakers Way,<br>Bedfordview,<br>2007 | 253 Monument Road<br>Glen Marais<br>Kempton Park<br>1620 |
| **EMAIL:** | barend@kironprop.co.za | wynand@jtevolve.com |
| **CONTACT NUMBER:** | 011 607 8000 | 083 659 5766 |

## 3. SITE DESCRIPTION

### 3.1. Locality

The affected site is bounded by the following:

- National Road N2 to the North-West,
- Meulrivier river to the West and South-West,
- Portions 228, 413, 239, 45, 46 and 48 of the Farm Kraaibosch No. 195 to the East and
- Meulrivier river to the South

Refer to attached locality plan in **Annexure B** and the preliminary town planner layout in **Annexure C**.

### 3.2. Topography

The proposed development is located on a mountainous and hilly area that consists of multiple natural catchments with steep slopes that drain in multiple directions to discharge into the existing natural watercourses located within the site boundary and to the West, South and East of the site boundary. A topographical survey was conducted for the proposed development of which the slopes of the catchments were determined to vary between 3.016% to 15.659%. Refer to the attached survey drawing in **Annexure D** showing the contours of the proposed development. The site is affected by the 1:100-year floodline. Refer to the attached certified floodline plan in **Annexure E2.**

## 4. DETAILS OF LAND USE

### 4.1. Current Land-use

The site is currently zoned as "Agricultural Zone I" in terms of the George integrated zoning scheme by-law. Refer to the **Figure 1 and Figure 2** for the existing zoning of the portions of the site.

Property Information

| | |
|---|---|
| SG 21 Digit Code | C02700000000019500007 |
| Property Type | FARM |
| Property Description | 195/7 |
| Valuation | R0 |
| Area (m²) | 686908.04 |
| Area (ha) | 68.69 |
| Allotment | GEORGE RD |
| Ward Number | 11 |
| Town | GEORGE |
| Address | No Address to show |

Zoning Information

| | |
|---|---|
| Zoning | Agricultural Zone I |
| Zoning Code | AZI |
| Primary Use | no data |

Property Information

| | |
|---|---|
| SG 21 Digit Code | C02700000000019500008 |
| Property Type | FARM |
| Property Description | 195/8 |
| Valuation | R0 |
| Area (m²) | 403091.89 |
| Area (ha) | 40.31 |
| Allotment | GEORGE RD |
| Ward Number | 11 |
| Town | GEORGE |
| Address | No Address to show |

Zoning Information

| | |
|---|---|
| Zoning | Agricultural Zone I<br>Agricultural Zone I |
| Zoning Code | AZI<br>AZI |
| Primary Use | no data<br>Agriculture |

**Figure 1: Portion 7 and Portion 8 of the Farm Kraaibosch 195 - Current Zoning**

Property Information

| | |
|---|---|
| SG 21 Digit Code | C02700000000019500012 |
| Property Type | FARM |
| Property Description | 195/12 |
| Valuation | R1220000<br>R1220000 |
| Area ($m^2$) | 1380784.30 |
| Area (ha) | 138.08 |
| Allotment | GEORGE RD |
| Ward Number | 11<br>13 |
| Town | GEORGE |
| Address | No Address to show |

Zoning Information

| | |
|---|---|
| Zoning | Agricultural Zone I |
| Zoning Code | AZI |
| Primary Use | no data |

Property Information

| | |
|---|---|
| SG 21 Digit Code | C02700000000019500023 |
| Property Type | FARM |
| Property Description | 195/23 |
| Valuation | R0 |
| Area ($m^2$) | 666069.01 |
| Area (ha) | 66.61 |
| Allotment | GEORGE RD |
| Ward Number | 11 |
| Town | GEORGE |
| Address | No Address to show |

Zoning Information

| | |
|---|---|
| Zoning | Agricultural Zone I |
| Zoning Code | AZI |
| Primary Use | no data |

**Figure 2: Portion 12 and Portion 23 of the Farm Kraaibosch 195 - Current Zoning**

## 4.2. Proposed Land-use

The proposed development Garden Route City is classified as a Greenfield New development in which the proposed zoning (total extent of 298.2336 ha) is mixed land-use – refer to **Table 2** below for the summary of the proposed land-use and to **Annexure C** for the draft town planner layout.

**Table 2: Garden Route City - Proposed Land use**

| LAND-USE/ZONING | DENSITY | NO. OF ERVEN | NO. OF UNITS | TOTAL EXTENT (HA) |
|---|---|---|---|---|
| Residential 1 | Stand sizes (700-900m²) | 161 | 161 | 14.50 |
| Residential 1 | Stand sizes (500-700m²) | 380 | 380 | 26.66 |
| Residential 1 | Stand sizes (400-600m²) | 335 | 335 | 20.10 |
| Medium Density Residential | 40 Units per Hectare | 299 | 299 | 7.48 |
| Education | N/A | 1 | 1 | 6.8404 |
| Municipal | N/A | 1 | 1 | 2.6592 |
| Access Control Point | N/A | N/A | 2 | 0.0725 |
| Mixed Land Use | As per integrated zoning scheme | - | - | 24.6864 |
| Private Open Space | N/A | 5 | N/A | 64.6216 |
| Roads | N/A | N/A | N/A | 57.9935 |
| Future Development | As per integrated zoning scheme | 5807 | 5807 | 72.62 |

The development will be implemented over the course of approximately 4 years. A proposed phasing schedule is provided in **Table 3** below.

**Table 3: Planned Phasing of Garden Route City**

| PLANNED PHASING | LAND USE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | RES 1 (700-900 m²) | RES 1 (500-700 m²) | RES 1 (400-600 m²) | MEDIUM DENSITY RESIDENTIAL (UNITS) | EDUCATION (HA) | MUNICIPAL (HA) | PRIVATE OPEN SPACE (HA) | MIXED LAND USE (HA) | ACCESS CONTROL POINT (UNIT) |
| **Phase 1 - Year 1** | 161 | 124 | 0 | 299 | 0 | 0 | 16.5505 | 0 | 1 |
| **Phase 2 - Year 2** | 0 | 256 | 335 | 0 | 6.8404 | 2.6592 | 12.2430 | 0 | 1 |
| **Phase 3 - Year 3** | 0 | 0 | 0 | 0 | 0 | 0 | 3.5643 | 24.6864 | 0 |
| **Phase 4 - Year 4** | 0 | 0 | 0 | 5807 | 0 | 0 | 32.2638 | 0 | 0 |
| **TOTAL** | **161** | **380** | **335** | **6106** | **6.8404** | **2.6592** | **64.6216** | **24.6864** | **2** |

# 5. EXISTING CATCHMENT DESCRIPTION AND DRAINAGE CHARACTERISTICS

## 5.1. Existing Catchment Description

The site consists of multiple farm portions namely Portion 7, Portion 8, Portion 12 and Remainder of Portion 23 of the Farm Kraaibosch No. 195 that are currently zoned as agriculture. However, it should be noted that while Portion 8 is zoned as agricultural, the land is currently being used for mining activities with a processing plant, open excavations, compacted, disturbed soils and an approximately 5m deep mining pit. The pre-development scenario thus consists of approximately 10% impervious surfaces. The remaining portions are covered with moderate bushes, grasslands and large trees.

Currently all stormwater runoff flows on surface towards the natural flood plains located within the site boundary and the natural flood plains that border the site to the East, West and South. The natural flood plains located within the site boundary and bordering the site to the East drain into the existing mining pit which once full, overflows into the Meulrivier that eventually drains into the ocean. Refer to **Figure 1** below for the site pre-development conditions.

When designing the stormwater management plan of the site, the pre-development conditions will be considered to determine the future post-development scenario. The developer will also perform earthworks to rehabilitate the Portion which is currently being used for mining activities for future development while the existing mining pit will be analysed for use as attenuation storage for the development.




**Figure 3: Site Pre-development conditions**

## 5.2. Geotechnical considerations

A desktop study was done, and it was determined that the site and neighbouring developments are not underlain by dolomite according to the George GIS website https://experience.arcgis.com/experience/6a2aff4189d04756866bdeca87b1d145/page/Main-Map/?views=Legend.

## 5.3. Floodline

The site is affected by the 1:100-year floodline. A floodline determination and delineation report was compiled by JT Evolve for the 1:100-year flood peaks that affect the site. Refer to the attached floodline catchment plan in **Annexure E1** and the certified floodline plan in **Annexure E2.**

# 6. STORMWATER MODELLING

## 6.1. Guidelines

The following design standards and guidelines will be used for the stormwater modelling and designs:

1. The South African Guidelines for Sustainable Drainage Systems (WRC)
2. Guidelines for Human Settlement Planning and Design Part II (Red Book) (July 2019) Section L: Stormwater
3. George Municipality Stormwater By-Law: Province of the Western Cape: Provincial Gazette Extraordinary 8795 (14 July 2023)
2. 2013. Drainage Manual. 6th. ed. Pretoria: The South African National Roads Agency SOC Ltd.
3. City of Cape Town: Stormwater Management By-Law (Approved by Council August 2005)
4. City of Cape Town: Management of Urban Stormwater Impact Policy, version 2.1 (May 2009)
5. City of Cape Town: Stormwater Management Planning and Design Guidelines for New Developments, version 1.0 (July 2002)
6. Guidelines for the Provision of Engineering Services and Amenities in Residential township developments by the National Housing Board (Blue Book)
7. City of Cape Town: Floodplain and River Corridor Management Policy, version 2.1 (Approved by Council 27 May 2009)
8. Applicable SANS 1200 Standards

## 6.2. Design Principles

The objective of stormwater management is to ensure that the development's post-development peak runoff rate is less than the pre-development peak runoff rate and that the quality of the stormwater runoff is acceptable for stormwater rainfall events of the recurrence interval for the specified land-uses. The stormwater management is thus divided into two systems as per the "Red Book".

Minor System: The internal stormwater network is designed for frequent storms of a minor nature.

Major System: The internal roads, paved areas and attenuation systems designed in combination with the minor system to handle infrequent storm events that is supported by the minor system.

## 6.3. Stormwater Quantity

The selection of the analysis, assessment and design criteria used for the stormwater management plan are based on the guidelines given in Section 6.1 above, "*City of Cape Town: Management of Urban Stormwater Impacts Policy*, "*Stormwater Management Planning and Design Guidelines for New Developments*" and the stormwater management of the "*Guidelines for Human Settlements Planning and Design*" from the "Red Book". Both the Red Book and the City of Cape Town's Policy guidelines give the applicable standards in terms of a recurrence interval (RI) events for specified land-uses and development types using the criteria highlighted in **Table *4*** and ***Table 5*** below.

According to the tables below, the proposed development falls under the Greenfield Developments and Brownfield and Existing Development Sites located in catchments of sensitive receiving water systems. Therefore, the development is required to design and implement Sustainable Drainage Systems (SuDS) for the stormwater management of the development for the recurrence interval (RI) rainstorm of up to the 1:10-year for the minor system and the RI rainstorm of up to the 1:50-year for the major system in accordance with ***Table 5*** below.

**Table 4: Interim Criteria for Achieving Sustainable Urban Drainage System Objectives in Various Developments Scenarios (Runoff Quality Improvement)**

| **SUDS OBJECTIVES** | **Greenfield Developments** ***and*** **Brownfield and Existing Development Sites located in catchments of sensitive receiving water systems** |
|---|---|
| **IMPROVE QUALITY OF RUNOFF** *Remove pollutants through combination of reducing and/or disconnecting impervious areas, and the use of BMPs which infiltrate or capture and treat stormwater runoff* | Design storm event for water quality treatment: 1/2-year RI, 24h storm |
| | Pollutant removal target: Reduction of post-development annual stormwater pollutant load discharged from development site: SS & TP – reduce to undeveloped catchment levels, or SS – 80% reduction TP – 45% reduction *Whichever requires higher level of treatment* |
| | All developments are required to trap litter, oil, grease at source |

**Table 5:Interim Criteria for Achieving Sustainable Urban Drainage System Objectives in Various Developments Scenarios (Quantity Control and Rate of Runoff)**

| **SUDS OBJECTIVES** | | **Greenfield Developments *and* Brownfield and Existing Development Sites located in catchments of sensitive receiving water systems** |
|---|---|---|
| **CONTROL QUANTITY AND RATE OF RUNOFF** | Protect the stability of downstream channels | 24 hour extended detention of the 1-year RI, 24h storm event |
| | Protect downstream properties from fairly frequent nuisance floods | Up to 10-year RI peak flow reduced to pre-development level |
| | Protect floodplain developments and floodplains from adverse impacts of extreme floods | Up to 50-year peak flow reduced existing development levels. Evaluate the effects of the 100-year RI storm event on the stormwater management system, adjacent property, and downstream facilities and property.<br>Manage the impacts through detention controls and/or floodplain management |
| | | Developments adjacent to floodplains must adhere to the requirements of the Floodplain and River Corridor Management Policy |
| **ENCOURAGE NATURAL GROUNDWATER RECHARGE** | | Where appropriate, site-specific requirements to be considered in consultation with Council |

## 6.4. Existing Stormwater Infrastructure

There are several developments within the vicinity of the proposed development that drain via sheet flow into the existing natural watercourses (Meulrivier rivers) from the Northern, Western and Easternly directions that bound the development site which is defined by the 1:100-year floodline attached in **Annexure E2**. There are no existing stormwater infrastructure within the vicinity of the site that the proposed development can connect to. There are also no existing servitudes over the proposed development protecting existing municipal pipes or outlet structures.

## 6.5. Stormwater Master Plan

The National Highway Cape Town/ George Airport/ Mossel Bay (N2) which bounds the proposed development to the North is an existing dual carriage and is classified as class 1 road. It is therefore safe to assume that the stormwater discharging from the road surface and higher lying areas is final. With the surrounding areas already being developed and discharging into the Meulrivier, it is therefore assumed that the masterplan for said stormwater infrastructure has been completed. The proposed development therefore does not need to make provision for stormwater discharging from the N2 road surface or stormwater from higher lying properties by way of servitude areas. Please refer to the drawings in **Annexure H1** for the proposed stormwater management plan.

## 6.6. Description of Catchment Areas

The proposed development measures a total site area of 298.2336 ha which can be divided into multiple catchments that slope and drain towards the defined watercourse flowing within the site and bordering the site to the West, South and East of the site. The catchment plan is thus divided into 13 sub-catchment areas indicated in the key plan layout in **Annexure H2**. The identified 13 sub-catchment areas will drain to the new attenuation systems and the existing mining pit that will discharge overland above the 1:100-year floodline and eventually drain into the Meulrivier.

## 6.7. Stormwater Model

Simulations of the stormwater runoff and evaluation of the stormwater management system for the proposed development were performed using the United States Environmental Protection Agency Stormwater Management Model (SWMM) Version 5.2

The model was selected based on the following considerations

I. The model is widely used throughout the world for the planning analysis and design related to stormwater runoff and drainage systems in urban areas. The model provides an integrated environment for editing study area input data, running infiltration hydrologic and hydraulic simulations and viewing the results in a variety of formats.

II. The model accounts for various hydrological processes including infiltration of rainfall into unsaturated soil layers and non-linear routing of overland flow and reservoir routing of storage units and

III. The model has the capability to perform reservoir routing and applies user defined control rules to simulate the operations of orifice openings and weir crest levels.

IV. The model is the preferred stormwater modelling as recommended by The City Of Cape Town in the Stormwater Management Planning and Design Guidelines for New Developments (July 2002)

### 6.7.1. Runoff Calculations

The Civil Designer Software was also used to analyse the catchment using the Rational method for the sub-catchments and to determine the rainfall data for the simulation of the stormwater runoff for the 1:10-, 1:50- and 1:100-year recurrence intervals which is based on the historical and statistical data from the actual South African Weather Stations located across the different provinces. The software uses the South African Weather Services grid the required rainfall data for the specified location can be extracted from. The MAR was not considered as historical data was used in determining the attenuation volumes required for the development. The Mean Annual Precipitation (MAP) for the area was determined to be 639mm. The IDF curve was thus derived with the historical data for the location at Latitude 34°03'11", Longitude 18°49'57" and the rainfall intensity was determined for the specified recurrence interval and time of concentration of the sub-catchments. Refer to the IDF curve results for the various storm events ***Figure 4*** below. The peak rainfall intensity associated with the time of concentration for the stormwater runoff flow calculations is shown in **Table 6** below. It should be noted that the climate change uplift factor was not applied for the post-development peak rainfall intensity.

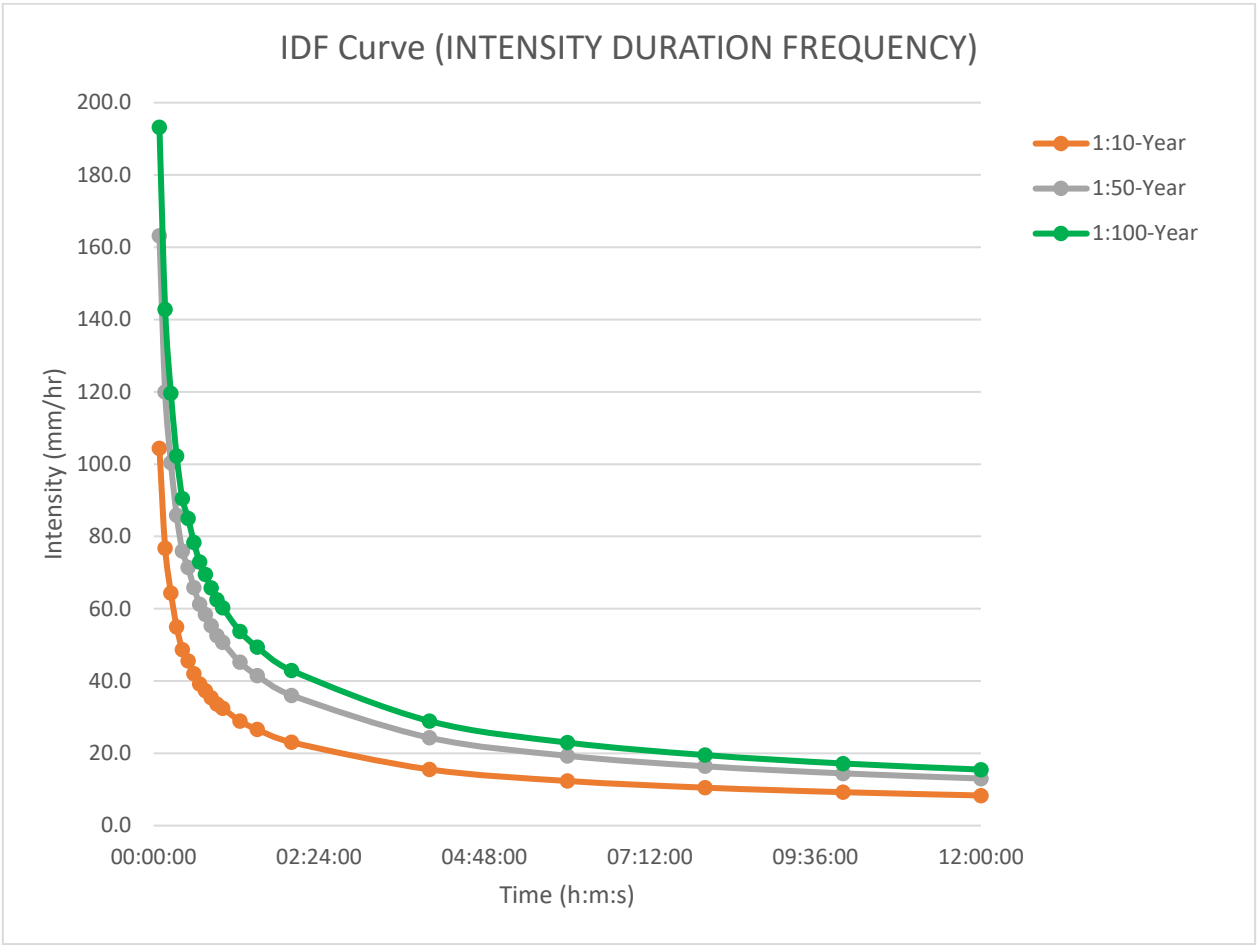



**Figure 4: IDF Curve**

The time of concentrations (Tc) for the post-development sub-catchments varies between 7.86 minutes to 16.32 minutes, therefore a minimum Tc of 15 minutes was used for the post-development sub-catchments (Denoted C_POST1 to C_POST13) which are predominantly zoned as residential. The Tc for the pre-development sub-catchments draining to the Eastern natural watercourse (Denoted C_PRE1 to C_PRE5) was taken to be 55 minutes and the Tc for the pre-development sub-catchments draining to the Southern natural watercourse (Denoted C_PRE6 to C_PRE13) was taken to be 50 minutes. Refer to **Table 6** below for a summary of the Tcs used for the pre- and post-development sub-catchments and to the key plan in **Annexure H2** for the details of the sub-catchments.

**Table 6: Pre- and Post-Development Sub-catchments Time of Concentration and Peak Rainfall Intensity**

| SUB-CATCHMENTS NAME | TIME OF CONCENTRATION (MINUTES) | PEAK RAINFALL INTENSITY (MM/HR) |
|---|---|---|
| C_PRE1 to C_PRE5 | 55 | 33.6 |
| C_PRE6 to C_PRE13 | 50 | 35.4 |
| C_POST1 to C_POST13 | 15 | 64.4 |

### 6.7.2. Stormwater Model Parameters

The model parameters used for the pre-development sub-catchments runoff are shown in **Table 7** below and the parameters for the post-development sub-catchments runoff are shown in **Table 8** below. The catchment names correlate with the model representations as can be seen in **Figure 5** showing the system diagram used in modelling the pre- and post-development scenarios.

The relevant manning's n values for the impervious areas and overland flow for the existing site conditions with moderate bushes, grasslands, large trees and disturbed and compacted soils from mining activities.

The peak discharge for the pre- and post-development sub-catchments were determined using the Rational method as described in Section **6.7.1** above. The results of which are part of the software model results, are attached in **Annexure G** for the difference recurrence interval rainstorms. The runoff coefficients that were used to determine the peak discharge for the pre- and post-development sub-catchments are also provided in the stormwater model software results in **Annexure G** for the three recurrence interval storms.

The attached town planner layout plan in **Annexure C** was used to determine the total impervious and pervious areas of the 13 identified sub-catchments. Refer to the attached sheet in **Annexure F** for the total impervious and pervious areas of the 13 sub-catchments.

**Table 7: Model Parameters for Pre-Development Catchments runoff simulations**

| PARAMETER DESCRIPTION | UNIT | PRE-DEVELOPMENT VALUE (C_PRE) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | C_PRE1 | C_PRE2 | C_PRE3 | C_PRE4 | C_PRE5 | C_PRE6 | C_PRE7 | C_PRE8 | C_PRE9 | C_PRE10 | C_PRE11 | C_PRE12 | C_PRE13 |
| Area | ha | 35.1364 | 31.1068 | 37.8396 | 31.2879 | 22.5011 | 25.3325 | 11.9205 | 22.0915 | 17.7580 | 20.5894 | 17.08 | 17.0204 | 8.8695 |
| Drainage path slope | % | 3.016 | 3.033 | 4.528 | 4.715 | 12.941 | 5.947 | 12.582 | 6.163 | 10.264 | 11.865 | 11.086 | 9.507 | 15.659 |
| Width | m | 340.085 | 324.084 | 220.892 | 208.412 | 437.971 | 432.576 | 287.273 | 252.578 | 282.605 | 351.831 | 254.484 | 224.860 | 183.956 |
| Percentage of impervious area | % | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Percentage of impervious areas with no depression storage | % | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| Manning n-value impervious areas | constant | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 |
| Manning n-value overland flow | constant | 0.200 | 0.200 | 0.200 | 0.200 | 0.15 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 |
| Depth of depression storage for impervious areas | mm | 3 | | | | | | | | | | | | |
| Depth of depression storage for pervious areas | mm | 5 | | | | | | | | | | | | |
| Green-Ampt infiltration parameters: | | | | | | | | | | | | | | |
| Suction head | mm | 239 | | | | | | | | | | | | |
| Conductivity | mm/hr | 0.5 | | | | | | | | | | | | |
| Initial deficit | constant | 0.1 | | | | | | | | | | | | |

**Table 8: Model Parameters for Post-Development Catchments runoff simulations**

| PARAMETER DESCRIPTION | UNIT | POST-DEVELOPMENT VALUE (C_POST) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | C_POST1 | C_POST2 | C_POST3 | C_POST4 | C_POST5 | C_POST6 | C_POST7 | C_POST8 | C_POST9 | C_POST10 | C_POST11 | C_POST12 | C_POST13 |
| Area | ha | 35.1364 | 31.1068 | 37.8396 | 31.2879 | 22.5011 | 25.3325 | 11.9205 | 22.0915 | 17.7580 | 20.5894 | 17.08 | 17.0204 | 8.8695 |
| Drainage path slope | % | 1.909 | 2.229 | 2.367 | 4.708 | 12.941 | 4.750 | 7.592 | 4.670 | 6.351 | 6.300 | 9.212 | 7.225 | 6.377 |
| Width | m | 340.085 | 324.084 | 220.892 | 208.412 | 437.971 | 432.576 | 287.273 | 252.578 | 282.605 | 351.831 | 254.484 | 224.860 | 183.956 |
| Percentage of impervious area | % | 47.7 | 48.6 | 47.3 | 43.9 | 53.6 | 67.6 | 66.9 | 59.1 | 61.2 | 66.2 | 61.7 | 60.7 | 76.7 |
| Percentage of impervious areas with no depression storage | % | 66.1 | 64.3 | 73.4 | 78.9 | 75 | 63.1 | 75.0 | 73.6 | 74.5 | 75.4 | 74.7 | 74.3 | 75.0 |
| Manning n-value impervious areas | constant | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 | 0.0200 |
| Manning n-value overland flow | constant | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.2 |
| Depth of depression storage for impervious areas | mm | 3 | | | | | | | | | | | | |
| Depth of depression storage for pervious areas | mm | 5 | | | | | | | | | | | | |
| Green-Ampt infiltration parameters: | | | | | | | | | | | | | | |
| Suction head | mm | 239 | | | | | | | | | | | | |
| Conductivity | mm/hr | 0.5 | | | | | | | | | | | | |
| Initial deficit | constant | 0.1 | | | | | | | | | | | | |

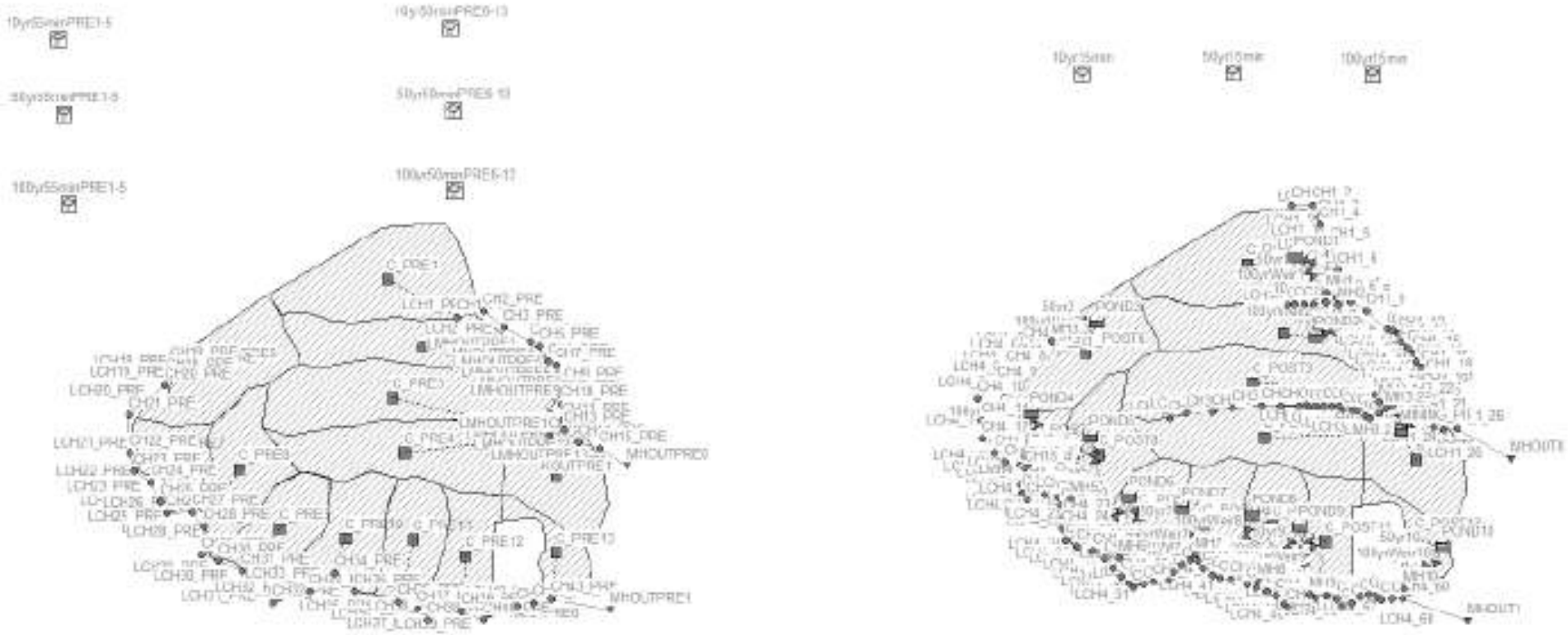


**Figure 5: SWMM Model Diagrammatical Representation**

### 6.7.3. SWMM Model Results

A hydraulic analysis was undertaken to assess the post-development effects of the proposed stormwater management system. The results indicate that, in addition to the existing mining pit, several attenuation ponds will be required to accommodate the increased stormwater runoff generated by the development. These attenuation facilities will retain and regulate runoff to ensure that discharge rates do not exceed pre-development conditions. The hydraulic analysis was run for approximately 24 hours to extend ponding and to improve the quality of stormwater runoff.

The proposed development was divided into 13 sub-catchments for both the pre- and post-development scenarios and shown in the drawing in **Annexure H2.** Of the 13 identified sub-catchments, 5 sub-catchments will drain and discharge in the Eastern floodplain of the Meulrivier natural river and the remaining 8 sub-catchments will drain and discharge into the Southern floodplains of the Meulrivier natural river.

The stormwater runoff results for the pre- and post-development scenarios are summarized in **Table 9** and **Table 10** below. **Table 9** below shows the stormwater results for the pre- and post-development sub-catchments draining to the Eastern floodplains and **Table 10** shows the stormwater results for the pre- and post-development sub-catchments draining to the Southern floodplains.

The results indicate that the additional attenuation facilities effectively reduce the post-development flood peak, ensuring that it does not exceed the pre-development flood peak.

**Table 9: Stormwater runoff results – Sub-catchments draining to the East (1-5)**

| STORM | PRE-DEVELOPMENT RUNOFF ($M^3/S$) | POST-DEVELOPMENT RUNOFF WITHOUT ATTENUATION ($M^3/S$) | POST-DEVEVLOPMENT RUNOFF WITH ATTENUATION ($M^3/S$) |
|---|---|---|---|
| 10 Year | 3.672 | 6.486 | 3.629 |
| 50 Year | 7.669 | 11.929 | 6.636 |
| 100 Year | 13.762 | 15.021 | 10.778 |

Refer to **Figure 6**, **Figure 8** and **Figure 10** for the 10-year storm hydrograph, 50-year storm hydrograph and the 100-year storm hydrograph for the 5 sub-catchments draining to the Eastern floodplains.

**Table 10: Stormwater runoff results – Sub-catchments draining to the South (6-13)**

| STORM | PRE-DEVELOPMENT RUNOFF ($M^3/S$) | POST-DEVELOPMENT RUNOFF WITHOUT ATTENUATION ($M^3/S$) | POST-DEVEVLOPMENT RUNOFF WITH ATTENUATION ($M^3/S$) |
|---|---|---|---|
| 10 Year | 5.105 | 11.789 | 4.580 |
| 50 Year | 10.279 | 20.775 | 8.416 |
| 100 Year | 13.161 | 25.951 | 13.082 |

Refer to **Figure 7**, **Figure 9** and **Figure 11** for the 10-year storm hydrograph, 50-year storm hydrograph and the 100-year storm hydrograph for the 8 sub-catchments draining to the Southern floodplains.

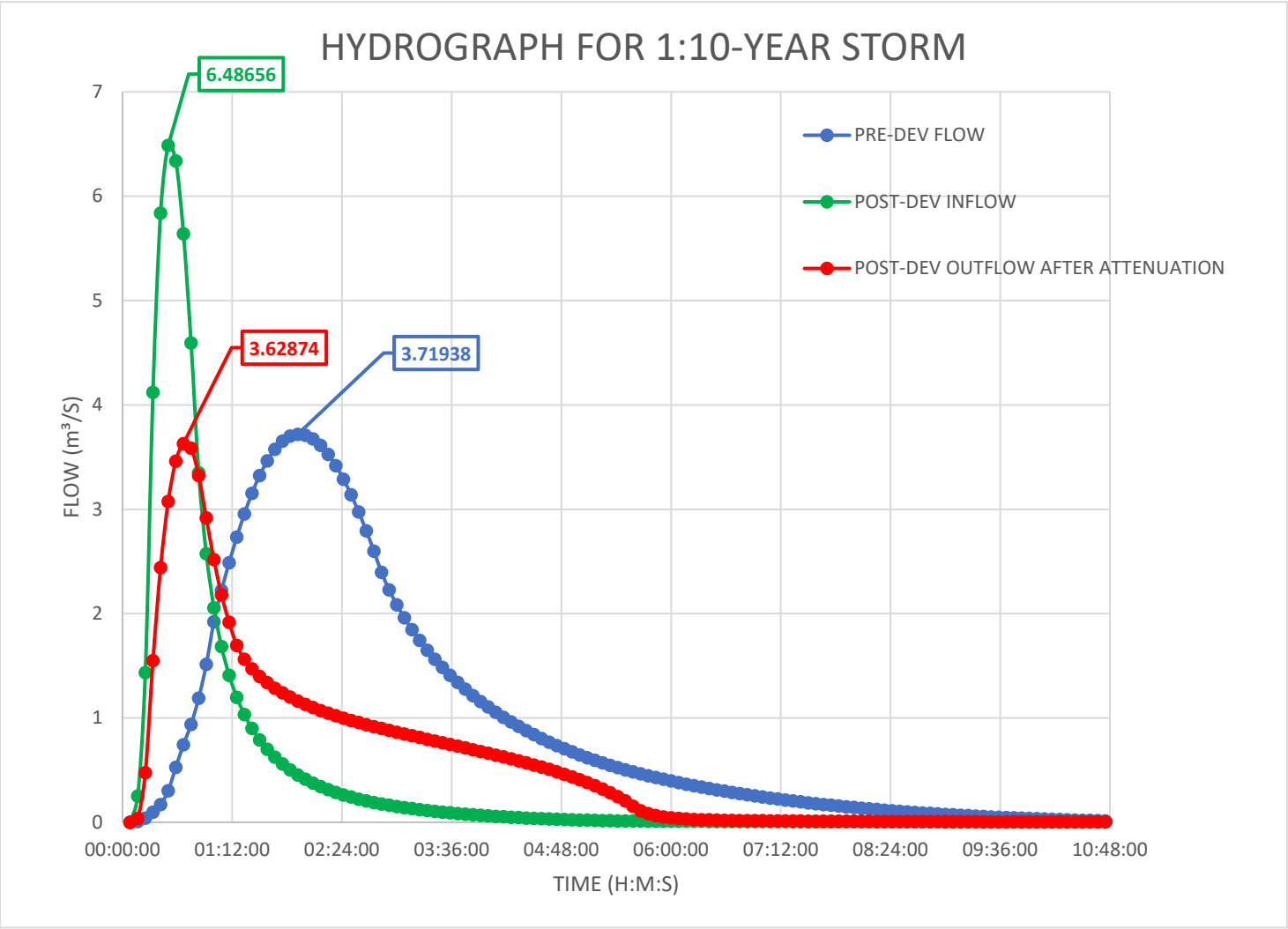



**Figure 6: 10-Year RI Storm Hydrograph (Eastern floodplain Sub-catchments)**

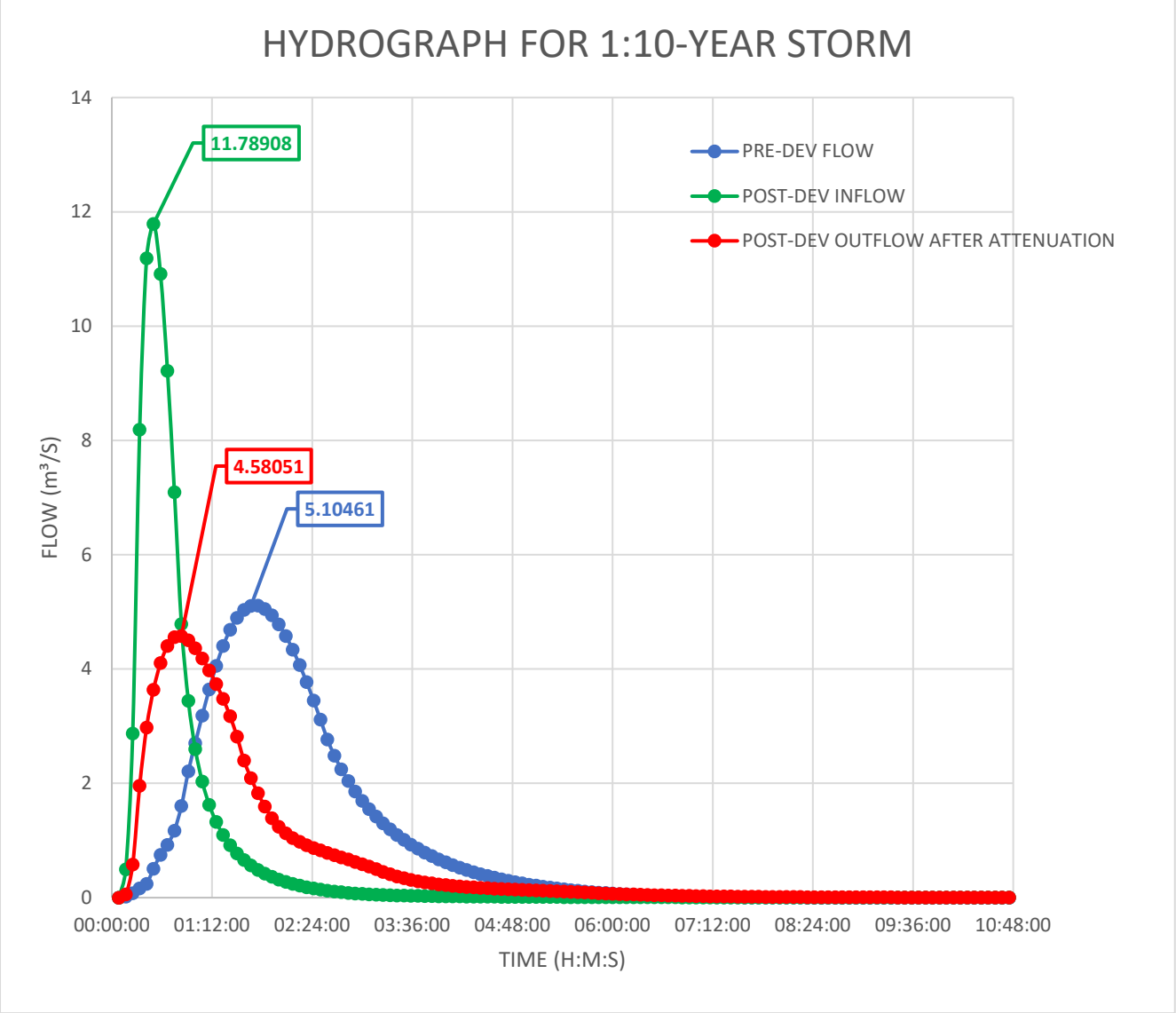



**Figure 7:10-Year RI Storm Hydrograph (Southern floodplain Sub-catchments)**

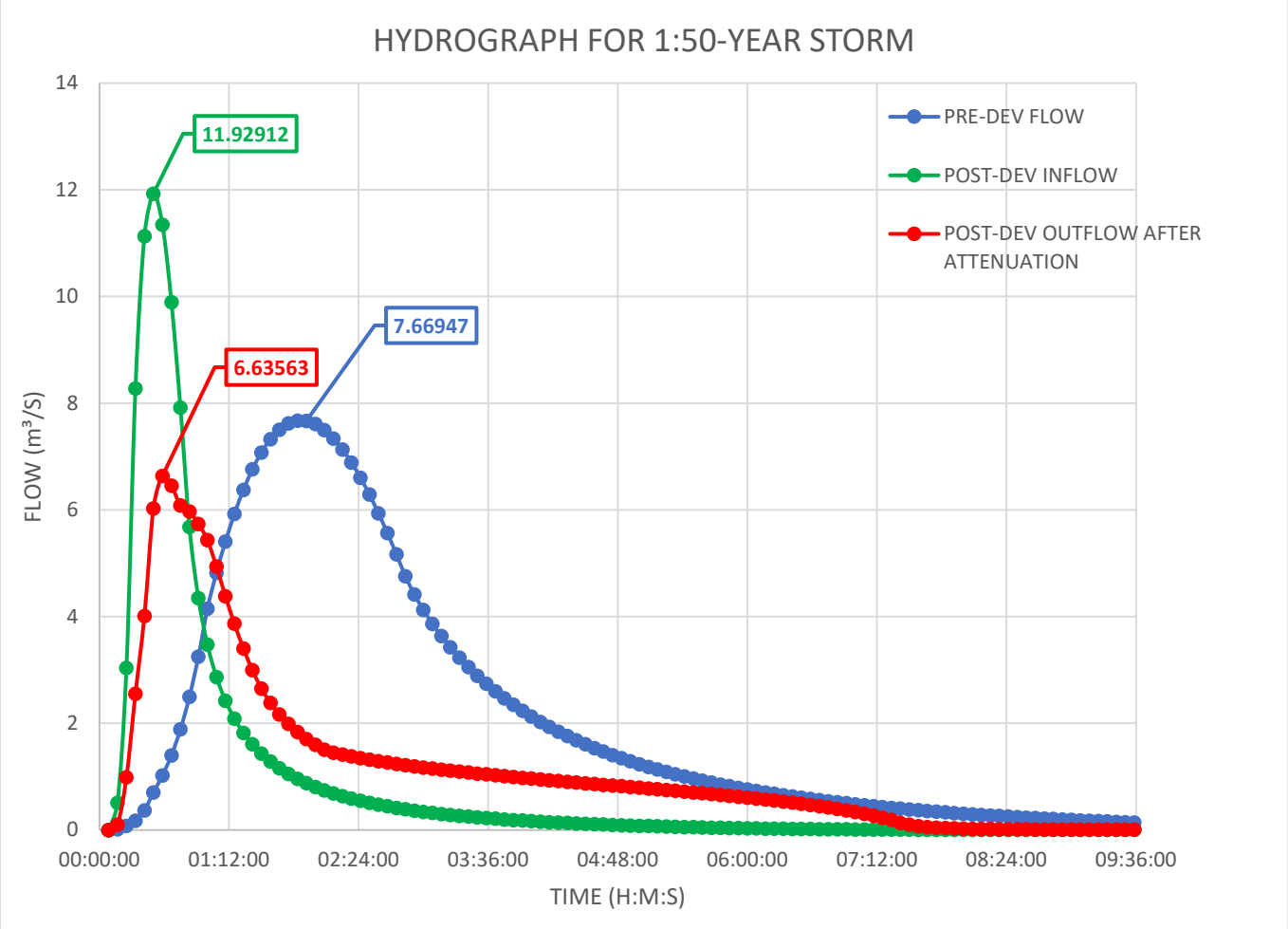



**Figure 8: 50-Year RI Storm Hydrograph (Eastern floodplain Sub-catchments)**

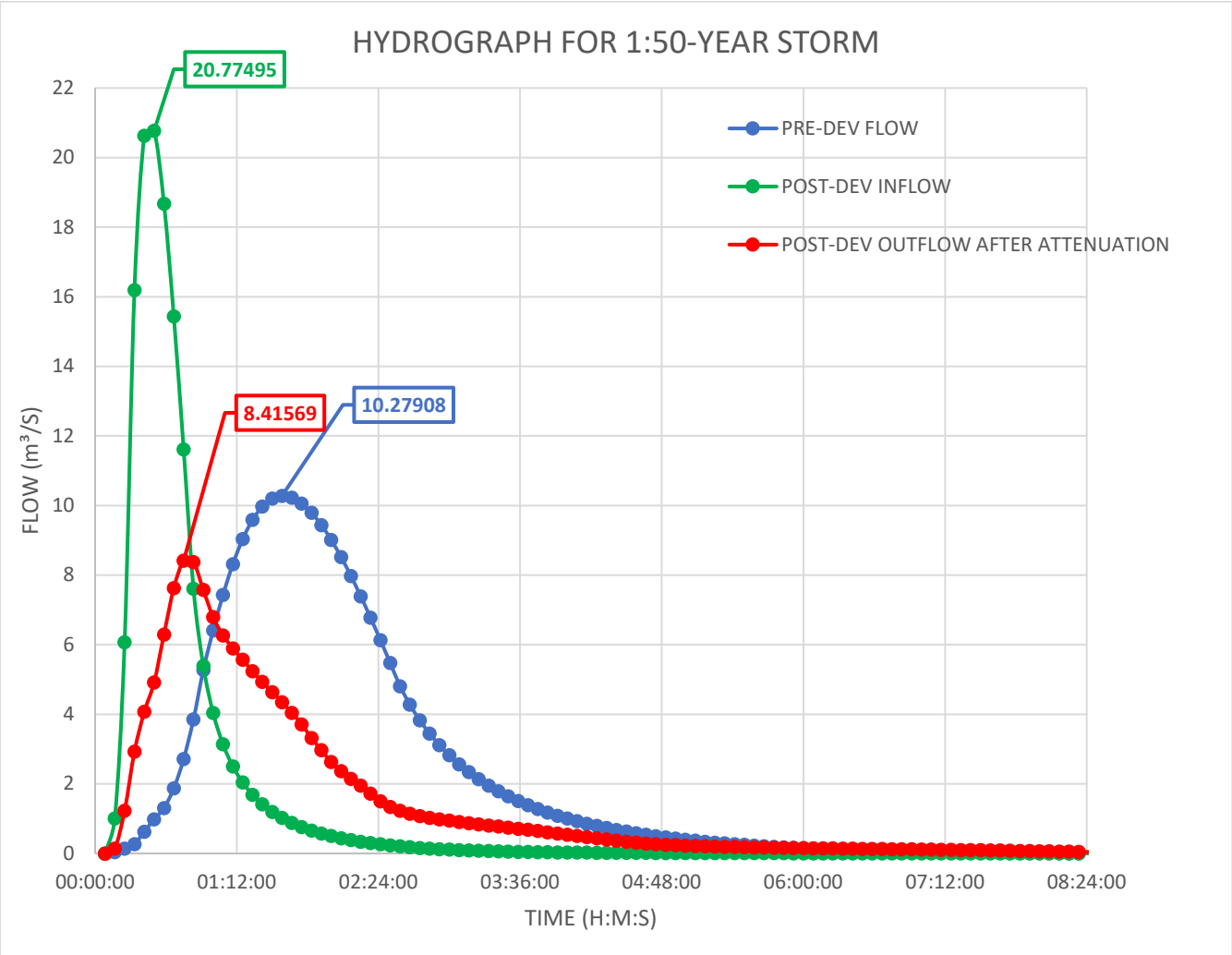



**Figure 9: 50-Year RI Storm Hydrograph (Southern floodplain Sub-catchments)**

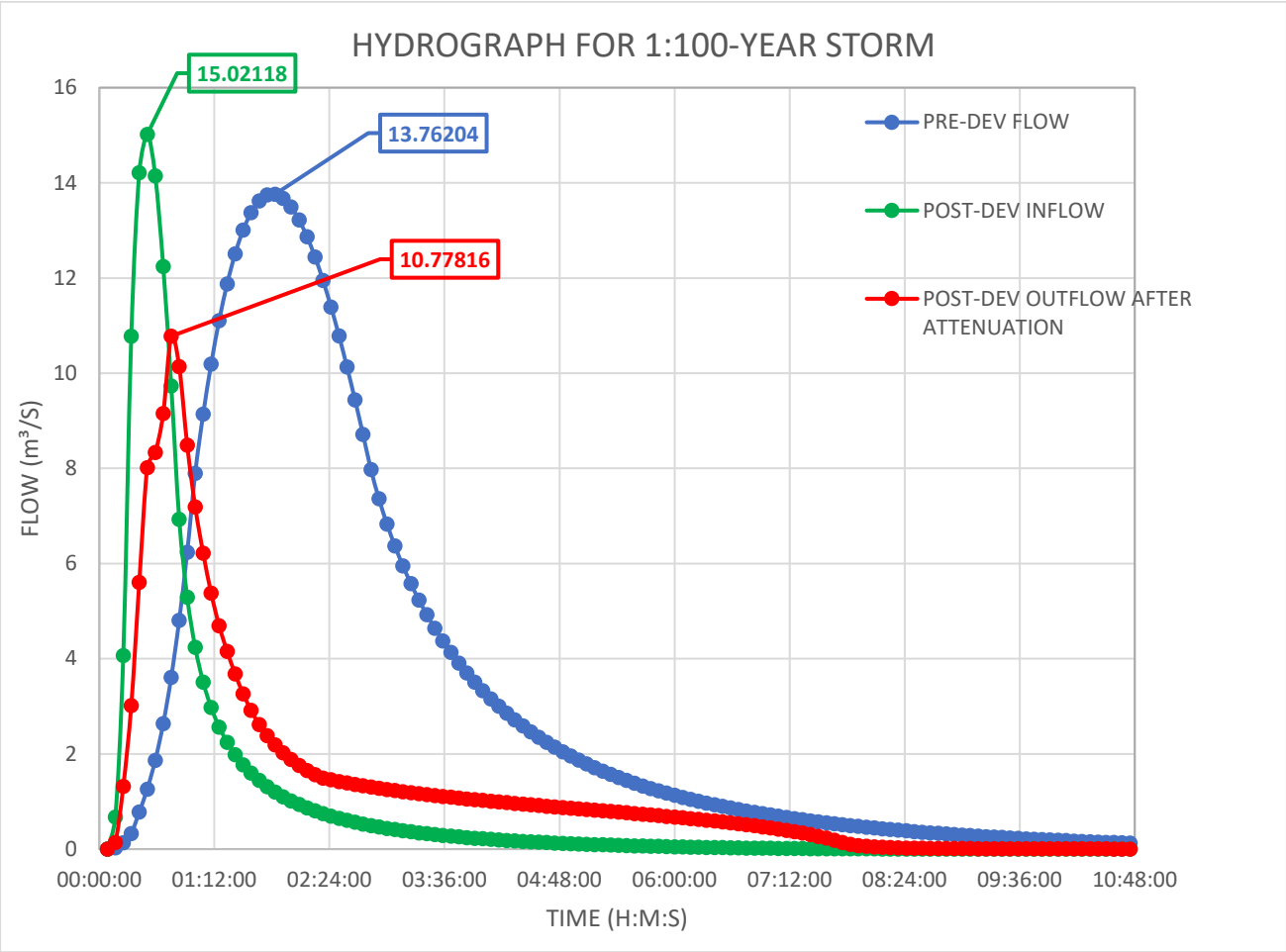



**Figure 10: 100-Year RI Storm Hydrograph (Eastern floodplain Sub-catchments)**

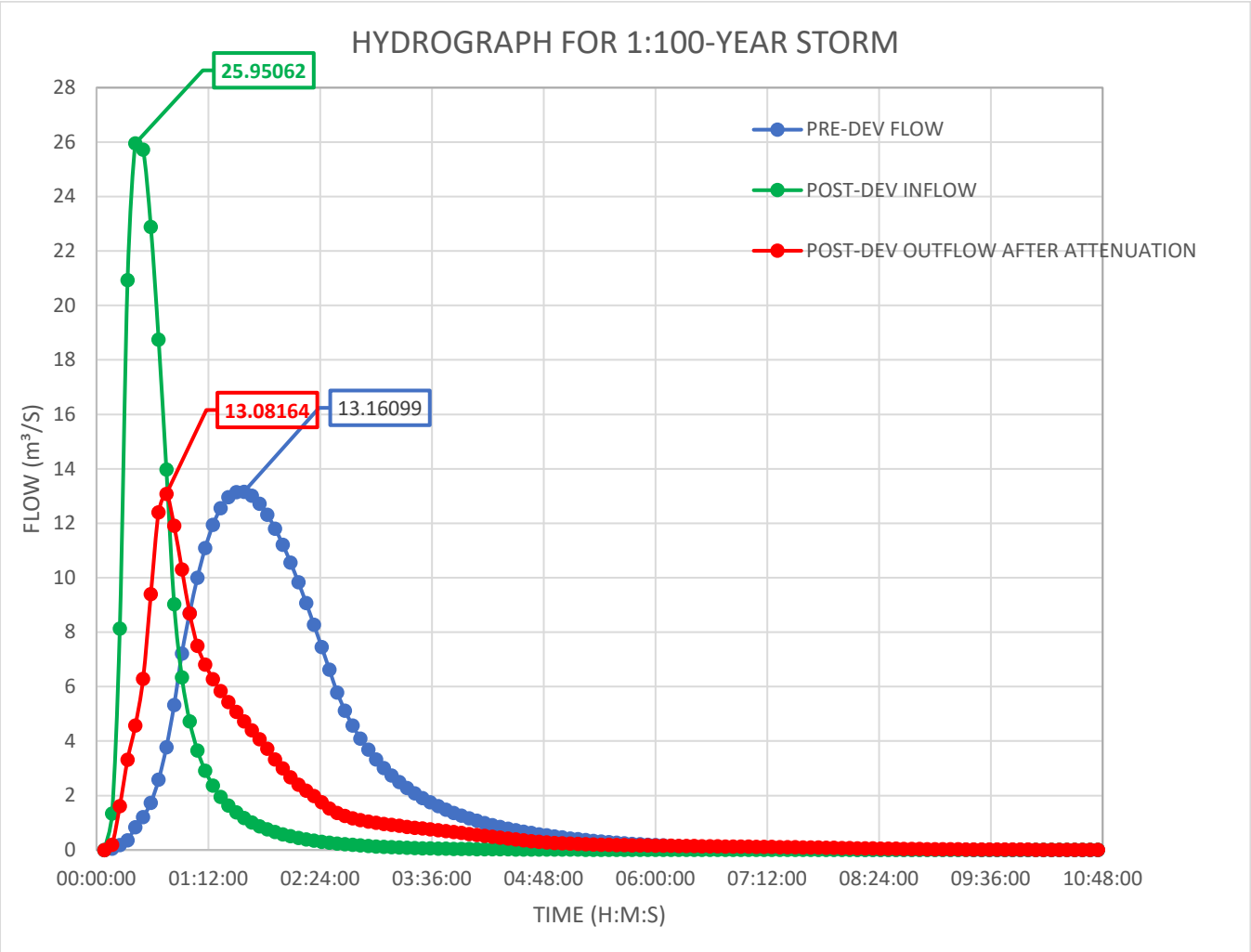



**Figure 11 100-Year RI Storm Hydrograph (Southern floodplain Sub-catchments):**

# 7. STORMWATER MANAGEMENT

It is a requirement of the George Municipality that stormwater runoff from new Greenfield developments located within catchments draining to sensitive receiving water systems must be controlled such that the post-development runoff generated by the 1:10-year and 1:50-year recurrence interval storms does not exceed the corresponding pre-development runoff rates.

## 7.1. Proposed Stormwater Management Infrastructure

The objective of this stormwater management plan is to manage and disperse stormwater through the implementation of Sustainable Urban Drainage Systems (SuDS), including attenuation/detention areas, swales and other suitable conveyance features. The primary focus is to protect the existing watercourses and wetlands and to ensure that the proposed development does not result in adverse impacts on these natural habitats. This includes the incorporation of SuDS Best Management Practices that promote infiltration where feasible and provide storages.

The proposed stormwater management infrastructure, in addition to the existing mining pit, will make use of multiple attenuation ponds in the form of swales to attenuate stormwater runoff generated by the development. These attenuation ponds will be strategically positioned throughout the site to effectively manage and attenuate post-development flows. Each attenuation pond will be provided with outlet structures to regulate discharge and ensure that stormwater is released at or below the applicable pre-development runoff rate. Refer to the stormwater management plan drawing in **Annexure H1** for the ponds' preliminary positions.

Based on the analysis and calculations undertaken, it was determined that, in addition to the storage available within the mining pit, a combined attenuation storage volume of **44,327.20 m$^3$** is required within the proposed attenuation ponds. Refer to **Table 11** below for the individual storage volume required for each pond. The maximum storage depth required to achieve the necessary attenuation volume differs for each pond and is also provided in **Table 11**. This volume is required to ensure that the post-development runoff rate does not exceed the pre-development runoff rate for the 1:50-year recurrence interval storm event.

To achieve the required attenuation, each pond will be constructed with outlet controls for the 1:10-year and 1:50-year recurrence interval storm events, either in the form of outlet orifice pipes or broad-crested weirs. Refer to the drawings in **Annexures H3** and **H4** for the typical details of the ponds' outlet structures. All attenuation ponds will include a minimum freeboard of 130 mm to accommodate larger-magnitude storm events. The ponds will discharge attenuated stormwater runoff overland on the surface and above the 1:100-year floodline.

Stormwater runoff will be routed to the attenuation swales via the internal stormwater infrastructure, including minor stormwater conduits, roads and open free-surface flow channels. All attenuation ponds will be constructed with overflow weirs to discharge excess floodwater during higher-order storm events, such as the 1:100-year recurrence interval storm. The overflow weirs will be constructed using stone gabions and grouted stone

pitching for energy dissipation and to protect against erosion and scour during high-flow events. Refer to the drawings in **Annexure H3** and **H4** for typical weir details.

Since the proposed development will be constructed in phases, the stormwater management infrastructure will be implemented in accordance with the phasing schedule indicated in **Table 12** below. Refer to **Annexure H2** for the stormwater catchment key plan indicating which sub-catchments fall within which phase of the development.

Phase 1, which comprises of Residential 1 erven, medium-density residential units and a mixed-use node, will require the construction of two attenuation ponds in the form of swales, associated outlet structures, and stormwater drainage infrastructure such as stormwater pipes, kerb inlets and related infrastructure. Refer to the drawing in **Annexure H5** for the stormwater infrastructure required for Phase 1 of the proposed development and to **Annexures H7 to H12** for the longitudinal sections of the stormwater infrastructure. Additionally, refer to the drawing in **Annexure H6** for the delineated sub-catchments areas used to design the stormwater pipes for phase 1 of the development.

Phase 2 of the development which consists of residential 1 erven, municipal and educational facilities will only require the construction of stormwater drainage infrastructure that will drain and discharge into the existing mining pit once it has been rehabilitated and an outlet structures have been constructed. Refer to **Table 12** for the summary of the pond and outlet structures details. The existing storage volume of the mining pit was determined to be approximately 38,729.0 $m^3$ with a depth of 5m. This is the maximum storage volume without any rehabilitation or earthworks being done to the mining pit. It should be noted that for the mining pit to accommodate both the 1:100-year flood peak and provide attenuation for the development, minimum earthworks will be required in the form of a berm to ensure that the mining pit can accommodate the 1:100-year flood peak without flooding the development.

The final position of the attenuation ponds for Phases 2, 3 and 4 as well as the design of the stormwater infrastructure such as pipes, catch pits and kerb inlets will be done once the town planner layout and Site Development Plan (SDP) have been finalised and approved.

**Table 11: Attenuation Volume Required**

| POND DESCRIPTION | STORAGE CAPACITY ($M^3$) | CATCHMENT CONTRIBUTING | MAXIMUM POND DEPTH(M) | 1:10-YEAR RI STORM OUTLET | | 1:50-YEAR RI STORM OUTLET | |
|---|---|---|---|---|---|---|---|
| | | | | OUTLET SIZE | POND WATER LEVEL (M) | OUTLET SIZE | POND WATER LEVEL (M) |
| POND1 | 546.80 | C_POST1 | 1.50 | 0.255m High x 2.4m Wide bottom Orifice | 0.91 | 0.255m High x 3.5m Wide x 1.02m pond crest weir | 1.33 |
| POND2 | 1,179.00 | C_POST2 | 1.50 | 0.255m High x 2.0m Wide bottom Orifice | 0.91 | 0.255m High x 3.5m Wide x 1.02m pond crest weir | 1.34 |
| MINING PIT | 15,740 | C_POST3, C4 & C5 | 5.0 | 0.250m High x 0.7m Wide bottom Orifice | 3.19 | 0.500m High x 2.5m Wide x 4m pond crest weir | 4.48 |
| POND3 | 3,286.30 | C_POST6 | 1.50 | 0.255m High x 1.9m Wide bottom Orifice | 0.89 | 0.17m High x 5m Wide x1.105m pond crest weir | 1.36 |
| POND4 | 3,084.80 | C_POST7 | 1.50 | Ø375mm Pipe bottom orifice | 0.93 | 0.255m High x 0.9m Wide x 1.105m pond crest weir | 1.35 |
| POND5 | 3,285.00 | C_POST8 | 1.50 | 0.255m High x 1.35m Wide bottom Orifice | 0.77 | 0.17m High x 1.5m Wide x 1.19m pond crest weir | 1.33 |
| POND6 | 4,744.50 | C_POST9 | 1.50 | 0.255m High x 0.3m Wide bottom Orifice | 0.9 | 0.17m High x 1.5m Wide x 1.19m pond crest weir | 1.34 |
| POND7 | 3,699.80 | C_POST10 | 1.50 | 0.255m High x 1.25m Wide bottom Orifice | 0.87 | 0.17m High x 3.5m Wide x1.19m pond crest weir | 1.36 |
| POND8 | 2,768.40 | C_POST11 | 1.80 | 0.255m High x 1.2m Wide bottom Orifice | 0.94 | 0.17m High x 2.0m Wide x 1.445m pond crest weir | 1.59 |
| POND9 | 3,884.30 | C_POST12 | 1.80 | 0.255m High x 0.5m Wide bottom Orifice | 1.03 | 0.17m High x 2m Wide x 1.445m pond crest weir | 1.59 |
| POND10 | 2,108.30 | C_POST13 | 1.50 | 0.255m High x 0.3m Wide bottom Orifice | 0.98 | 0.17m High x 2m Wide x 1.105m pond crest weir | 1.37 |
| **TOTAL STORAGE** | **44,327.20** | | | | | | |

**Table 12: Phased Stormwater Infrastructure Construction Schedule**

| CONSTRUCTION PHASE | ATTENUATION PONDS TO WHICH PHASE DRAINS TO: | REQUIRED STORMWATER INFRASTRUCTURE TO BE CONSTRUCTED: |
|---|---|---|
| Phase 1 | Pond 1 and Pond 2 | Construction of Ponds 1 and 2, outlet structures of the ponds, stormwater drainage catchpits, kerb inlets, pipes and manholes |
| Phase 2 | Existing Mining Pit | Rehabilitation and earthworks of the mining Pit, construction of outlet structures, stormwater drainage catchpits, kerb inlets, pipes, channels and manholes |
| Phase 3 | Pond 3 | Construction of Pond 3 in the form of swales, outlet structure of the pond, stormwater drainage catchpits, kerb inlets, pipes and manholes |
| Phase 4 | Ponds 4. 5, 6, 7, 8, 9 and 10 | Construction of ponds 4 to 10 with outlet structures, stormwater drainage catchpits, kerb inlets, pipes, channels and manholes |

## 7.2. Stormwater management during construction

The stormwater system must be managed and monitored during the construction at regular intervals by the contractor (for small sites) or the Environmental Control Officer (ECO) according to the Environmental Management Programme (EMP). The contractor or ECO is to ensure that the following are in place during construction:

- The site must be fenced off prior to construction, including the stormwater attenuation ponds, swales area to ensure that the area downstream of the site development area remains in its natural condition during the construction process.
- Implementation of temporary attenuation measures, such as earth berms to retain surface runoff until the stormwater network and attenuation areas are complete and functional.
- Runoff from the roads must be managed to avoid erosion and pollution problems both on and off the site.
- Providing a silt screen at all grid inlets to collect debris until the site is fully developed.
- The stormwater drainage network systems must be kept separate from the sewer system
- Controlling dust, especially during the construction of roads and bulk earthworks.
- Placing topsoil and grass sods onto cut/fill embankments to reduce runoff flow rates and velocities.
- The construction of the stormwater attenuation ponds it to be completed as soon as possible.
- Planting of grass and other vegetation as soon as open areas are complete to prevent scouring and erosion of the low cohesion soils found on site.
- Fencing-off the construction and keeping all construction vehicles off the undeveloped portions of vegetation and buffer areas.

## 7.3. Operation and Maintenance of Stormwater Infrastructure

The stormwater system is designed to be self-cleansing, but maintenance is required to ensure continual safe operation and to prevent the possibility of flooding and property damage. The developer will be responsible to monitor the internal stormwater system and attenuation facilities to identify possible improvements and / or maintenance issues. The factors to be monitored include the functionality of the internal roads, stormwater pipes and attenuations ponds. The proposed stormwater infrastructure will be constructed in road reserves and registered servitudes to ensure ease of access for maintenance. The operation and maintenance process should be done at regular intervals. The proposed interval is every 6 months which includes the following activities.

- Cleaning of kerbs and channels, catchpits, stormwater pipes and attenuation ponds.
- Removal of silt from collection points and attenuation pond.
- Plant/weed control.
- Landscaping on embankments to be trimmed.

## 8. ENVIRONMENTAL REQUIREMENTS

The proposed development is affected by the 1:100-year floodline with natural watercourses flowing through the site and bordering the East, West and Southern boundaries of the site. The development also consists of sensitive environmental aquatic areas and wetlands in which no construction activities should take place. Refer to the town planner layout in **Annexure C** for the sensitive areas zoned and demarcated as private open space. Additionally, the stormwater management plan proposes to discharge attenuated stormwater runoff overland to drain above the 1:100-year floodline, therefore environmental authorisation in the form of Environmental Authorisation (EA) will be required for the proposed development. Further to the above, a Water Use License Authorisation (WULA) may also be required based on the findings and requirements of the environmental authorisation. The developer is therefore required to appoint an environmental consultant to obtain this Environmental Authorisation.

## 9. CONCLUSION AND RECOMMENDATIONS

The design and operation of the development's stormwater management system will focus primarily on the attenuation of floods up to the 1:50-year recurrence interval rainfall events for the post-development scenario and to provide safe introduction of stormwater into the downstream stormwater system. This will be ensured by designing and building attenuation ponds or attenuation systems to attenuate a volume of at least **44,327.20 $m^3$.**

The proposed stormwater management system complies with the George Municipality Stormwater By-Laws and The City of Cape Town Stormwater Management Policies.

It is therefore recommended that George Municipality support this development.

# ANNEXURE A: APPOINTMENT LETTER

## ANNEXURE A: APPOINTMENT LETTER

JT EVOLVE
ACTA NON VERBA (PTY) LTD.

011 391 0134 | info@jtevolve.com | www.jtevolve.co.za

Postal Address:
P.O Box 992
Kempton Park
1620

Physical Address:
253 Monument Road
Glen Marais Ext 1
Kempton Park
Gauteng
South Africa

## LETTER OF APPOINTMENT

I/We hereby accept the proposal and terms and conditions as set out in the quotation submitted by JT Evolve (Pty) Ltd with reference number as stated below for the amount of **R100 000** (excluding VAT).

| Project Information | | | |
|---|---|---|---|
| **Reference:** | 719_OQ02_SWMP | | |
| **Appointed Services:** | This fee proposal includes Stormwater Management Plan | | |
| **Property Description:** | GARDEN ROUTE CITY | | |
| **Quotation Date:** | 2023-08-18 | | |
| **Prepared By:** | Wietsche Jacobs | | |
| **CUSTOMER INFORMATION** | | | |
| **Client Name:** | Compregen (Pty) Ltd | | |
| **Company Name** (if applicable) | " " | Company VAT no. | 4870256148 |
| **Physical Address:** | | | |
| | | | |
| | | Code: | |
| **Postal Address:** | | | |
| | | | |
| | | Code: | |
| **Cell:** | 067 · 429 · 7977 | Tel: 011 | 607 · 8000 |
| **E-mail address for accounts:** | *john@p1realty.co.za \| barend & jana | | |
| **E-main address for project correspondence** (if not the same as above) | Barend@kironprop.co.za | | |
| **Signed in Acceptance** | | Date: | 3/4/24 |



011 391 0134 | info@jtevolve.com | www.jtevolve.co.za

# ANNEXURE B: LOCALITY

## ANNEXURE B: LOCALITY PLAN


PARKDENE
BALLOTSVIEW
434
437
437
12
2
2
2
The Site_Kiron George
THEMBALETHU
THEMBALETHU ZONE 7
1208 m
Image © 2024 Airbus
Map Data © 2023 AND
© 2023 Google
Google Earth

# ANNEXURE C: TOWN PLANNING

## ANNEXURE C: TOWN PLANNER LAYOUT