

10. REFERENCES

- AIMH Civil Engineering, 2020. *Amaoti Flood Line Report*, s.l.: s.n.
- Climate-Data, 2020. *En-Climate*. [Online]
Available at: <https://en.climate-data.org/africa/south-africa/kwazulu-natal/durban-north-26948/>
- eThekwini GIS, 2020. *eThekwini GIS*. [Online]
Available at: <http://gis.durban.gov.za/cmvcgis/viewer/?config=cgisPublicViewer>
- eThekwini Municipality, 2019. *Integrated Development Plan*, s.l.: s.n.
- Phunga Consulting Engineers, 2017. *Greater Amaoti Housing Project-Preliminary / High Level Services Report*, s.l.: s.n.
- SSI, 2010. *Transportation Framework for NUDC*, s.l.: s.n.
- SSI, 2011. *Verulam-Cornubia Local Area Plan*, s.l.: s.n.
- The Biodiversity Company, 2017 (Updated 2019). *Wetland Assessment Report for the Proposed Amaoti Housing Development*, s.l.: s.n.
- Worley Parsons Pty Ltd (WP), 2017. *Preliminary Geotechnical Assessment of Greater Amaoti*, KZN: s.n.

Our Ref: 1793 02



human settlements

Department:
Human Settlements
PROVINCE OF KWAZULU-NATAL



STATUS-QUO REPORT

for the

UPGRADE OF INFORMAL SETTLEMENTS IN AMAOTI

ROADS

PREPARED BY:

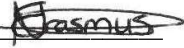
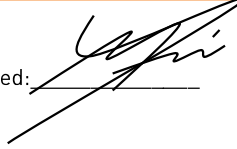



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FIRST ISSUE

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APPROVAL

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Executive Summary

The report outlines the existing civil infrastructure conditions in Amaoti and the surrounding areas, in the northern region of Durban. Furthermore, it will highlight key issues expected during the proposed upgrade of Amaoti Informal Settlements.

The project intends to formalise Amaoti Informal Settlements with civil engineering services, while mitigating relocation of existing occupants.

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1. INTRODUCTION

SCIP Engineering Group (trading as SCIP) was appointed by KwaZulu Natal Department of Human Settlements (the client) as the Civil and Traffic Engineers for the **Upgrading of Informal Settlements in Amaoti**.

1.1 PROJECT NAME

The proposed development will be referred to as **Amaoti Informal Settlements**.

2. DEVELOPMENT OVERVIEW

The purpose of this Housing Catalytic Project is to:

- Formalise the informal settlements
 - ✓ Establishment of a township with formal services through which residents obtain formal security of tenure through which RDP houses are developed.
- Regularise the informal settlements:
 - ✓ To bring a level of security to residents within informal settlements other than through the long and often tedious formal township establishment processes.
 - ✓ To include all settlements into an appropriate regulatory framework for the purposes of health and safety and for creating an environment conducive to investment by the state and by private individuals.
 - ✓ To provide a framework for the incremental upgrading of services and quality of life.
 - ✓ To provide security of tenure through resolving issues of land ownership and providing individuals with a right to occupy, thus enabling the building of houses.
 - ✓ To resolve the illegality of land use through amendments to the town planning scheme.
 - ✓ To provide a basic regulatory framework to secure health and safety.
 - ✓ To introduce a simple settlement layout to facilitate the provision of services and infrastructure and also to demarcate flood plains.
 - ✓ To upgrade services incrementally (water, sewer, lighting, roads and stormwater).
- Relocate the existing informal settlements
 - ✓ Temporary relocation of informal settlements, where necessary, to enable the formalization and regularization of the settlement.

The proposed formalisation, regularisation and/or relocation will be carried out in conjunction with the Municipal Standards and Human Settlement Policies.

3. PROJECT BACKGROUND

The project was initially funded by eThekweni Municipality, but due to budgetary constraints the project was placed on hold. At the time the project was placed on hold certain engineering services were already completed, approved by the municipality, and implemented. These include

both internal and bulk services. The site is currently partially serviced with temporary civil and electrical services including roads, stormwater, water, sewer and electricity.

The following additional information was discussed during the project meeting (4 November 2019), which is included in **Table 1**.

TABLE 1: GENERAL PROJECT INFORMATION

ITEM	DESCRIPTION	COMMENTS	STATUS
1	Site Boundary Stretching over Number of Wards	6 Wards (Wards 52, 53, 56, 57, 59 and 102)	Noted
2	Current Number of Units	Approximately 20,000 The number of units may differ as the area is unregulated and there may be newly erected units in the vicinity.	Noted
3	Relocation of Structures	Should be limited as much as possible. Some informal units were already temporarily relocated.	Ongoing
4	Community Meetings	The municipality has periodic meetings to report to the community.	Ongoing
5	4 Phased Implementation Plan	<i>Phase 1:</i> 161 Houses (Completed), 5 Houses (Outstanding) <i>Phase 4:</i> Contractor was appointed for implementation. <i>Phase 2 & 3:</i> Needs to be implemented.	Noted
6	Municipal Master Plan for Infrastructure	Might be outdated.	Noted
7	Existing Civil and Electrical Services	Roads Stormwater Water Sewer Electrical	Received from Topographical survey & GIS Received from Topographical survey & GIS Received from eThekweni Municipality Received from eThekweni Municipality Received from Topographical survey

4. SCOPE OF WORKS

This report represents the Status-Quo Report (SQR) on Roads for Amaoti Informal Settlement. The purpose of the report is to provide a holistic overview of the completed designs, installed infrastructure and their condition to date. The following aspects will be discussed throughout this report:

- Key challenges relative to the present population and topography;
- Discuss natural water resources within the development area;
- Discuss existing services surrounding and within the development area;
- Discuss already designed services surrounding and within the development area.

Reports relating to Water and Sanitation services will be presented in separate documents.

4.1 KEY ASSUMPTIONS

The SQR is submitted to KwaZulu Natal Department of Human Settlements on the assumption that the information provided by KwaZulu Natal Department of Human Settlements and eThekweni Municipality, as well as desktop studies conducted is relevant to the time of compilation. It should be noted that as the project progresses certain information in this report may be subject to change.

4.2 RELEVANT INFORMATION RECEIVED

The following documents and information, with regards to Amaoti Informal Settlements, was received from the appointed Project Managers (KwaZulu Natal Department of Human Settlements and eThekweni Municipality):

- Preliminary/High-Level Services Report: Preliminary findings indicate that Bulk Water and Sewer Infrastructure will be sufficient to enable the first part(s) of development and that there will be a requirement for the upgrade to realize the entire development,
- Project Boundary Shape-file;
- Development Framework;
- Preliminary Geotechnical Assessment: The majority of the site is classified as developable with precautions due to the characteristics of the soil and the thickness of the soil profile. The areas of a steep slope and drainage channels/floodplains is regarded as high risk due to the likelihood of flooding and seasonal perched water levels. Although the very steep slopes have been classified as developable with high risk, it is recommended that only place development in those areas as a matter of last resort;
- Biodiversity Assessment – Draft 3;
- Water Resources Report – Draft 3;
- Informal Settlement Upgrading Programme for City of Johannesburg Region C Phase 2 Draft Report Version 04 RS 2;
- Topographical Survey, dated February 2017;
- Cadastral Survey, dated February 2017; and

- GIS data downloaded from eThekweni Municipality GIS Website, including existing stormwater and road networks.

5. SITE DESCRIPTION

5.1 LOCALITY

The proposed site is located within the Northern eThekweni Municipal Planning Region (NMPR) in the province of KwaZulu Natal. Approximately 30km north-west of Durban Central, the proposed site spans roughly 1,236ha in extent.

The site can be accessed from the north through Main Road (M27), from the west through Mafukuzela Highway (M25) and from the south through Curniek Ndlovu Highway (M25), JG Champion Drive and Phoenix Highway.

Figure 1 indicates the spatial regions of eThekweni Municipality and Figures 2 and 3 illustrates a Site Locality Map and a Site Boundary Layout.

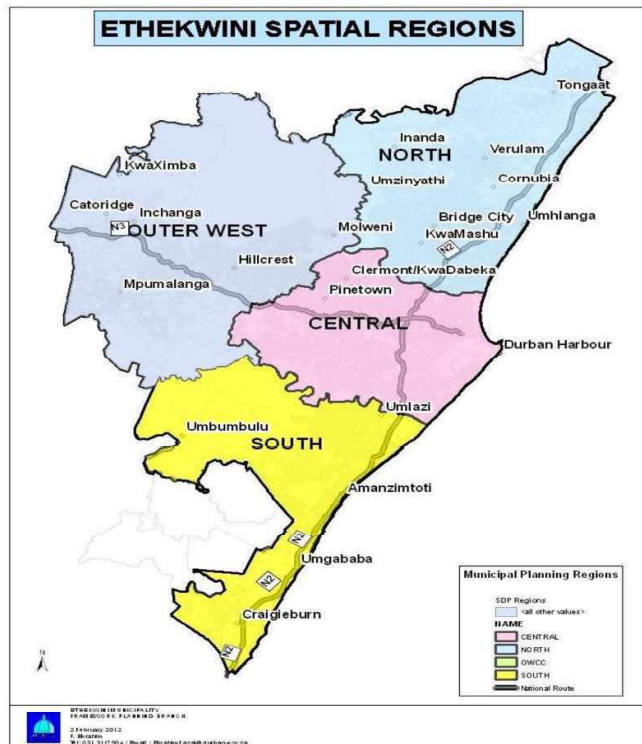


FIGURE 1: ETHEKWINI SPATIAL REGIONS (IMAGE FROM 2019/2020 IDP REPORT)

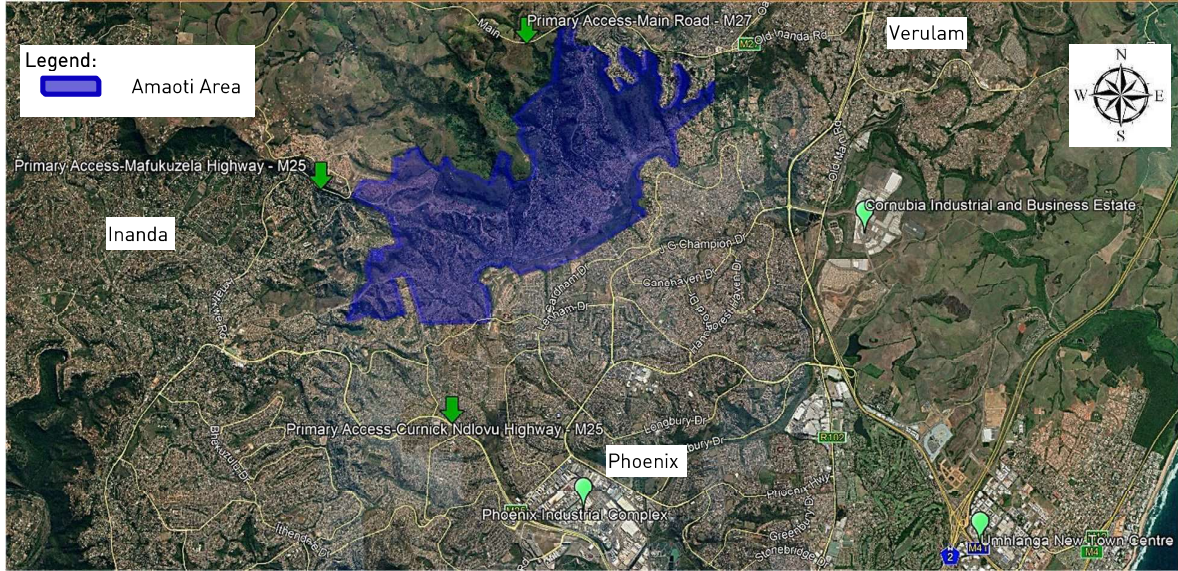


FIGURE 2: SITE LOCALITY MAP (GOOGLE EARTH VIEW)

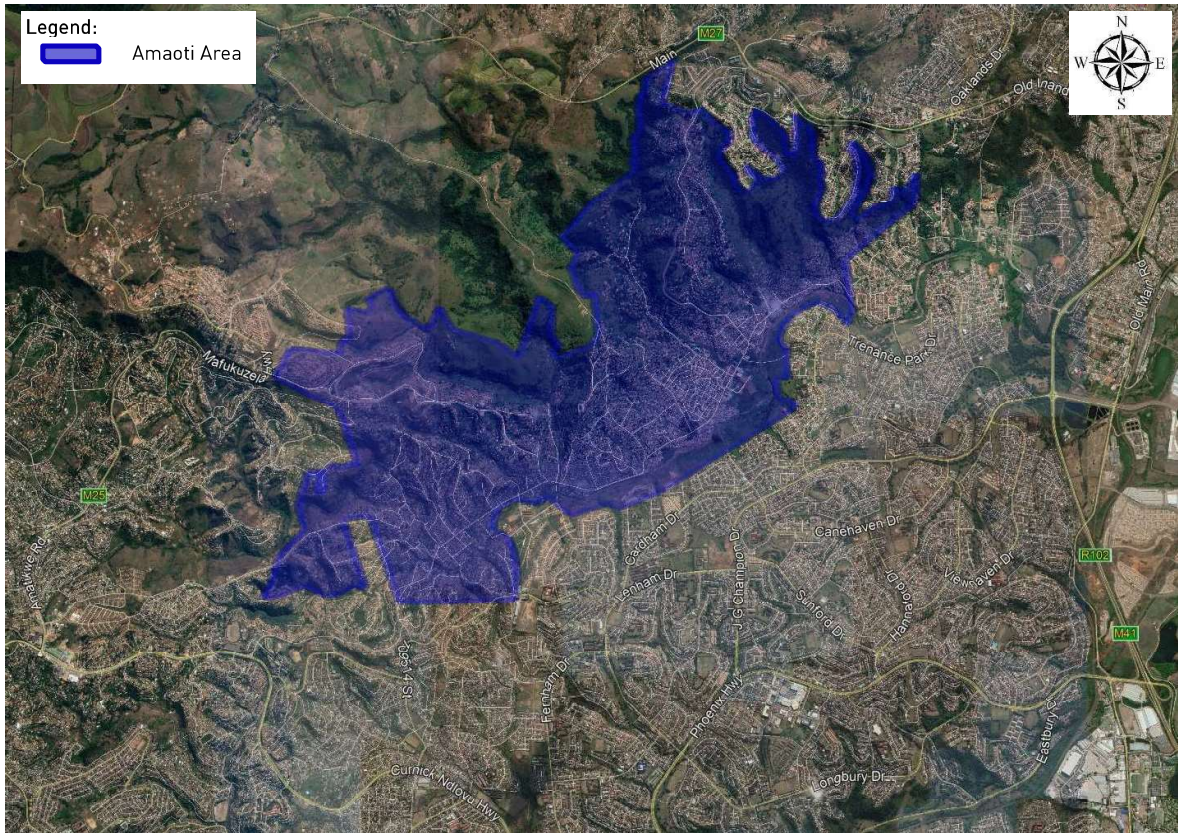


FIGURE 3: SITE BOUNDARY LAYOUT (GOOGLE EARTH VIEW)

5.2 PRESENT POPULATION

The settlements comprise of dense informal settlements (both temporary and permanent dwellings) and formalised settlements (residential areas with municipal facilities and amenities). The population in this area is constantly growing and it is impossible to provide accurate figures.

The average density of the eThekweni Municipality ranges from 4du/ha to 40du/ha, (*eThekweni Municipality, 2019*). Therefore, based on the above, it's been determined that approximately 20 000 informal dwelling are located within the site. Unfortunately, the population within the area is constantly growing, making it nearly impossible to provide accurate figures.

5.3 TOPOGRAPHY

The relative altitudes are 180 meters above sea level with undulating topographies. The study area is located on the southward facing upper-middle and lower hillslopes, as well as on the valley floor and in many cases are located within the floodplain of the streams. The stream draining from west to east is a high order tributary of the Umgeni River. It is drained by the small tributaries which lead to the Umgeni River. Overall, the area is characterized by gentle and steeply sloping topography, with slopes between 5% and 35% grade. The current urban development is concentrated on the floodplain, lower hillslope and the shallower mid-slope and hilltop areas. **Figure 4** indicates the typical topography of Amaoti Informal Settlements.



FIGURE 4: TYPICAL TOPOGRAPHY OF THE SITE

Topographical factors have a major influence on the pattern of urban settlement. Significant areas where there are very steep slopes, the area is subjected to high erosion risk and areas of concentrated seepage may be considered potentially unstable. **Figure 5** indicates the topographical elevation heat map.

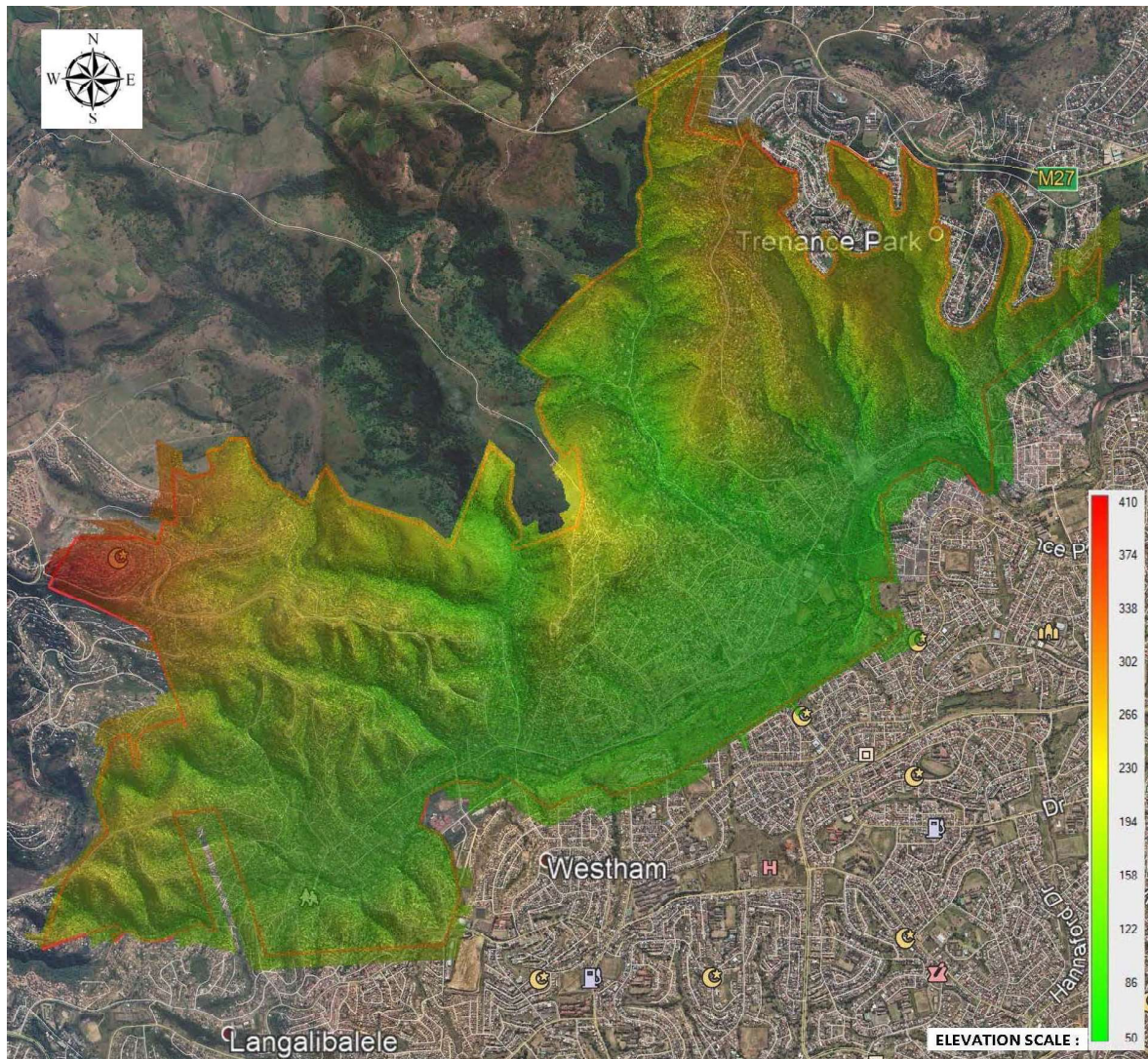


FIGURE 5: TOPOGRAPHICAL ELEVATION HEAT MAP.

5.4 INFRASTRUCTURE DELIVERY

The infrastructure delivery plan for the upgrading of the informal settlements in Amaoti have been investigated thoroughly and some key issues have been identified by eThekweni Municipality which may cause some delays during the progress of the project (*eThekweni Municipality, 2019*):

- Limited access to basic household and community services especially in informal settlements;
- Limited funding available to deal with big backlogs;
- Ageing infrastructure and need for a budget to maintain appropriate standards;
- Typography makes service delivery in parts of the municipality challenging; and
- Fragmented spatial patterns do not support the efficient delivery of bulk services

A vital component for the development and growth of the Northern region of eThekweni Municipality is the bulk engineering services which will be influenced by the anticipated numbers and locations of new houses to be constructed.

5.5 SERVITUDES

The area is subjected to various servitudes namely:

- Municipal services (roads, stormwater, water, sewer, electrical, etc.).
- Formalised areas (schools, police station, clinics, residential areas, etc.).
- Informal structures (temporary and permanent structures).
- Multiple natural water sources.

Applications for wayleaves will be submitted to the relevant municipal departments and other authorities prior to the implementation stage.

6. TRANSPORTATION

6.1 EXISTING TRANSPORTATION NETWORK

The existing main provincial roads providing access to the informal settlements are the M27 (Jabu Ngcobo Drive) to the north, the M25 (Curnick Ndlovu Highway) to the west and the R102 to the east.

It is essential that the transportation modes, both public and private, needs to be upgraded to accommodate for the current growth rate experienced within the region over the past years (*eThekweni Municipality, 2019*).

The following key issues was identified by eThekweni Municipality:

- Limited funding to provide adequate public transport services;
- Lack of integration of services between transport modes;
- Lack of adequate control and enforcement over public transport modes;
- Limited capacity to ensure safety at public transport pick-up and drop-off points; and
- Low ridership levels to make public transport sustainable.

Attached in **Annexure A**, is a full map from the 2019/20 Infrastructure Development Plan of the city, indicating all surrounding major transportation modes.

6.2 EXISTING ROADS

6.2.1 Overview

The existing informal settlements consists of both gravel and surfaced roads, as well as footpaths. The primary access to the site is from the D403, which runs along the south eastern side of the development.

Figure 6 represents the combined information obtained from the topographical survey (coloured lines), which was conducted in 2017, and from the eThekweni's GIS website (yellow lines).

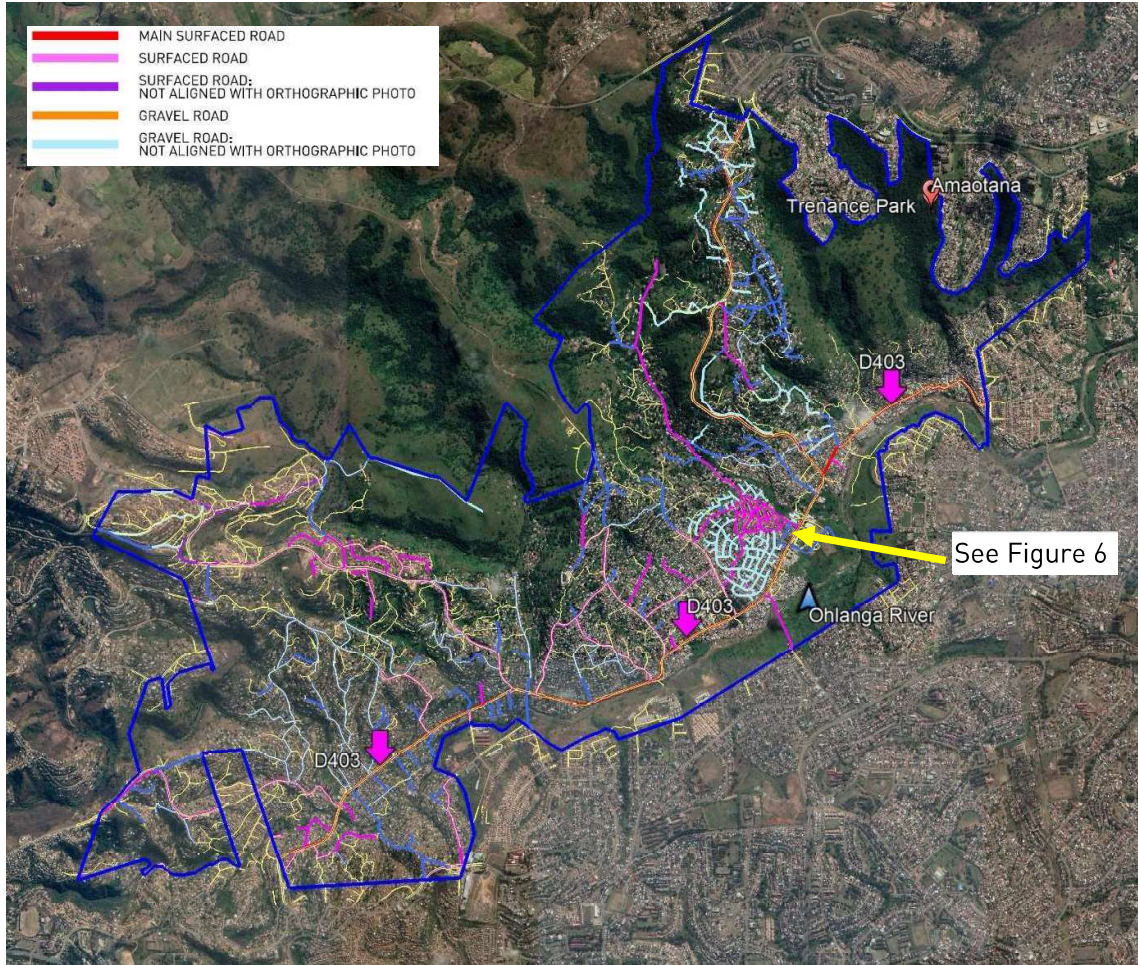


FIGURE 6: EXISTING ROADS

The figure indicates variances on the road's layout, between the survey (coloured lines), GIS data (yellow lines), and the Google Earth image obtained. This might be due to the continuous growth rate in this area, which in turn means the information might be outdated.

Figure 7 indicates the differences more clearly.

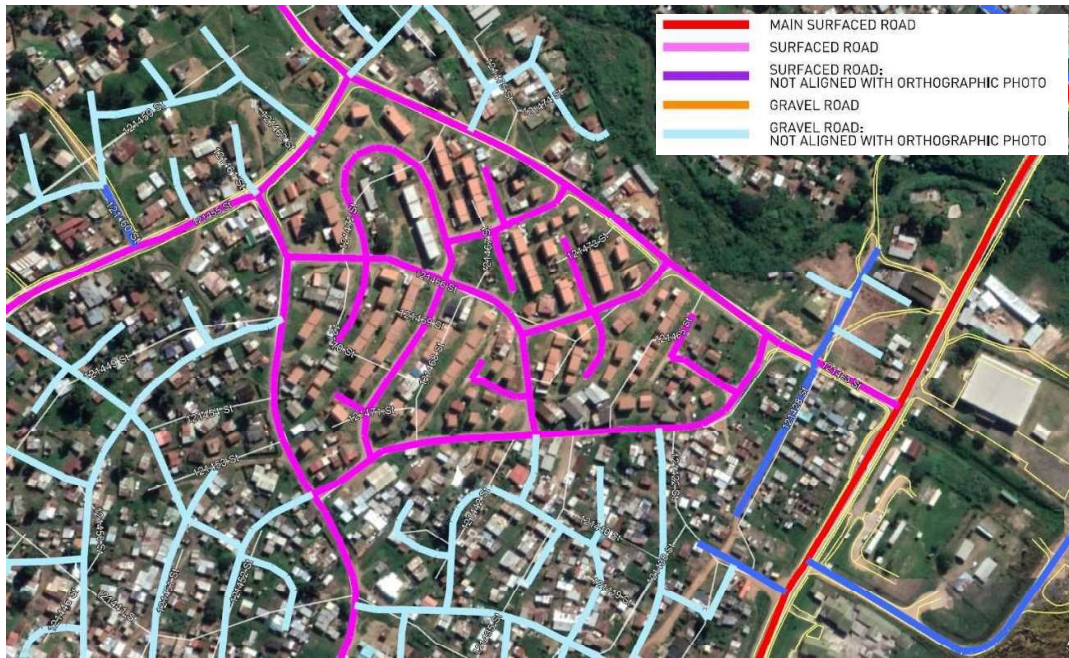


FIGURE 7: ROAD NETWORK DIFFERENCES BETWEEN OBTAINED DATA AND GOOGLE EARTH

In connection with the above figure, the accuracy of available information can be used as a guideline for preliminary designs. However further investigations will be required during the final design stage.

The following table (Table 2) represents the estimated existing road lengths which was obtained from GIS data:

TABLE 2: ESTIMATED ROAD LENGTHS

ITEM	ROAD TYPE	ESTIMATED LENGTH
1	Main surfaced roads – Including the D403	8.5 km
2	Surfaced roads	2.0 km
3	Surfaced roads - not aligned with orthographic photo	1.5 km
4	Gravel roads	2.9 km
5	Gravel roads - not aligned with orthographic photo	1.4 km

6.2.2 Current Conditions

Recently taken photos indicates that the surfaced roads are in a fair condition, which might require remedial work in the near future, as indicated in **Figure 8**.

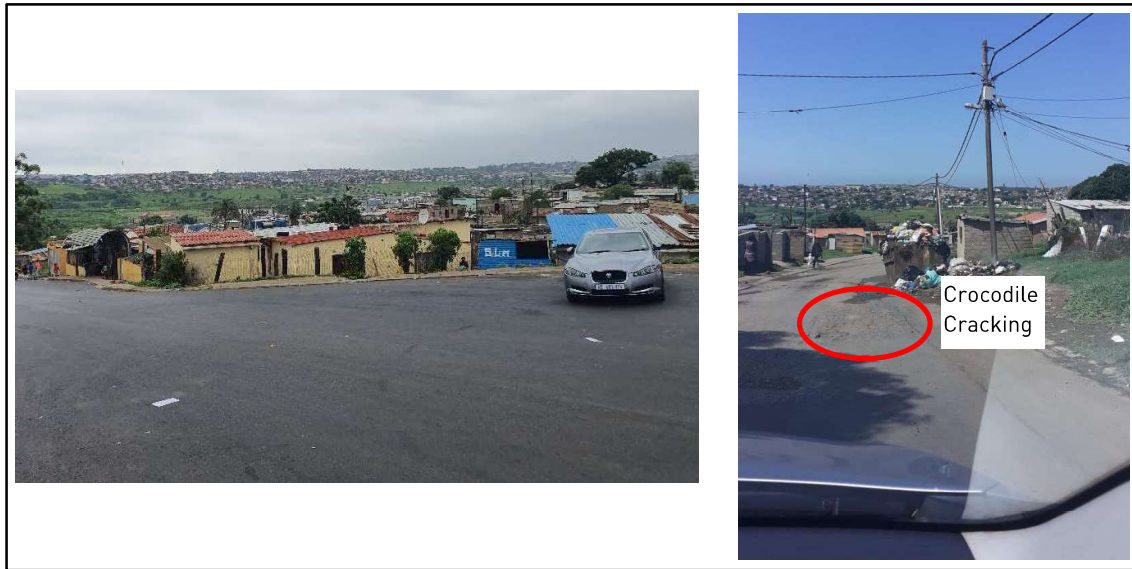


FIGURE 8: EXISTING SURFACED ROADS

Current damages on surfaced roads may be due to the pavement not meeting the required standards, including insufficient bearing capacities, and bitumen being laid at the correct temperature or thickness.

Figure 9 indicates that the current condition of the gravel roads requires some remedial work. Currently it is unknown if the roads are designed gravel roads, thus, indeterminate if the pavement structure is acceptable or not. However, the gravel roads which will be utilised in the new proposed township layout will be upgraded to surfaced roads.

6.2.3 Outstanding

Information required to proceed with the bulk services investigation and report will include the updated road layouts, which will also clearly indicate all surfaced and gravel roads, as well as, footpaths.



FIGURE 9: EXISTING GRAVEL ROADS

6.2.4 Future Procedures

The project will be phased, which will speed up the planning and implementation phases. This will also assist with effectively managing the project and improving the overall quality.

It should be noted that even though phasing will be used, the bulk services will be investigated and planned accordingly, and also phased per section.

The final road phasing plan will be determined as soon as the township layout has been approved.

Phasing is preliminary addressed within the Water and Sanitation SQR and will be subject to detailed investigations.

6.3 EXISTING BRIDGES

6.3.1 Overview

The topography of the proposed site consists of approximately 69 km of natural water sources. Figure 10 indicates the identified existing bridge positions. The process used for the identification of the bridges was a combination of reviewing the GIS data received and a desktop study on Google Earth.

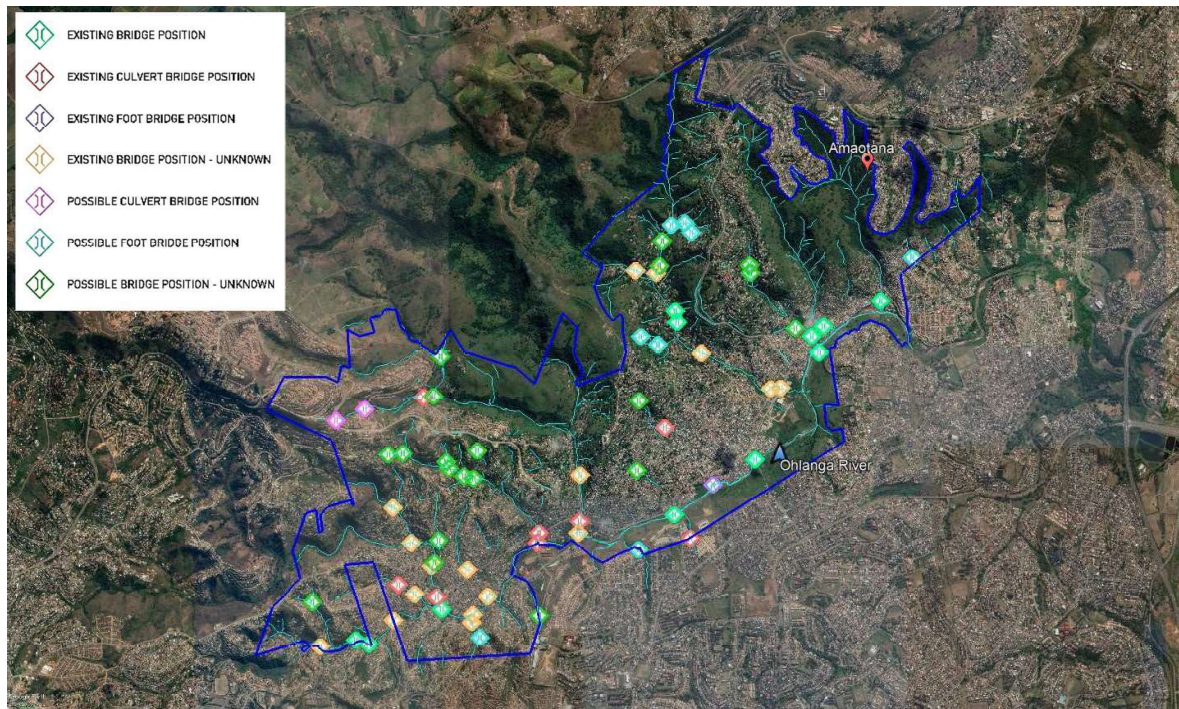


FIGURE 10: EXISTING BRIDGE POSITIONS

TABLE 3: ESTIMATED NUMBER OF BRIDGES

ITEM	BRIDGE TYPE	ESTIMATED NUMBER OFF
1	Existing Bridge Position (from GIS data)	11
2	Existing Culvert Bridge Position (from GIS data)	8
3	Existing Foot Bridge Position (from GIS data)	1
4	Existing Bridge Position - Unknown (from GIS data)	17
5	Possible Culvert Bridge Position	2
6	Possible Foot Bridge Position	8
7	Possible Bridge Position - Unknown	20
TOTAL		67

Detailed inspections will be conducted on all the existing bridges located within the site boundary. The inspections will clarify the type, position and condition of the bridge. Furthermore, the dimensions of the bridges will be obtained for a comprehensive check to ensure the bridges are wide enough. This will be indicated in the Traffic Investigation Assessment (TIA) and the flood lines determination studies.

6.3.2 Current Conditions

No visual inspections on the existing bridges was conducted by the time the report was compiled.

6.3.3 Still Outstanding

Positions, sizes and bridge types to be determined, together with the existing bridge conditions.

6.3.4 Future Procedures

The township layout will be used to determine which roads need remedial work or to be upgraded. In addition, it will also determine where new surfaced roads will be required.

This will also assist in determining which bridges needs to be upgraded or constructed.

7. PROVISIONAL MILESTONES

To ensure that the project progresses on time and within budget, it is of utmost importance that SCIP and the Project Managers and/or the client are in continuous liaison and compliance to timeframes. All communication relating to the project will be through the project manager, important information will be formal and written and verbal conversations and agreements will be followed up by written communication for confirmation (email or letter).

Table 4 indicates the provisional milestones required for the progress of the project.

TABLE 4: PROVISIONAL MILESTONES

STAGE	MILESTONE	MILESTONE DESCRIPTION	DELIVERABLES	DURATION (MONTHS)	TARGET	STATUS / COMMENTS
Stage 1: Inception	Project Scoping	Establish client requirements, preferences and project brief, including scope of work, programme, risks and opportunities.	Inception Report	1	Feb-20	Complete
Stage 2: Feasibility Studies	Status-Quo Analysis	Investigate existing municipal services and capacities, layout in line existing settlements and the proposed development including risks and recommendations.	Water and Sewer Reports	2	Apr-20	Complete
			Roads and Stormwater Reports			
			Electrical Report	3	May-20	<ul style="list-style-type: none"> Active with the collation of information. Visual inspections required.
	Transport Planning	Establish requirements for both the existing settlements and the proposed development.	Traffic Impact Assessment Report	3	Jul-20*	<ul style="list-style-type: none"> Active with a collation of information. Township Layout required.
			Site Traffic Assessment Report	3	Sep-20*	
	Flood-Line	Establish a flood plain within which development will be prohibited.	Flood-Line Demarcation	2	May-20	Active
Bulk Investigation	Establish the status and capacity of the existing bulk services and identify areas of opportunities and develop a strategy for the implementation.	Water and Sewer Reports	2	Jun-20*	<ul style="list-style-type: none"> Active with a collation of information. Existing bulk infrastructure conditions and capacities required. Township Layout required. Visual inspections required. 	
		Roads and Stormwater Reports				
		Electrical Report		Jul-20*		

STAGE	MILESTONE	MILESTONE DESCRIPTION	DELIVERABLES	DURATION (MONTHS)	TARGET	STATUS / COMMENTS
Stage 3: Concept and Viability	Preliminary Design	Collection of all data relevant to the project, investigate options for effective performance and produce concept designs and propose project implementation phasing.	Drawings and Reports: Water and Sewer	4	Oct-20*	<ul style="list-style-type: none"> • Active with a collation of information. • Draft Township Layout required. • Survey required. • Geotechnical investigation required.
			Drawings and Reports: Roads and Stormwater			
			Drawings and Report: Electricity			
			Project Phasing Plan			
Stage 4: Design Development	Detail Design	Undertake detailed design of the new facility and associated requirements, plan construction of the project, produce drawings, specifications and tender documentation, adjudicate tenders and recommend contract appointments.	Approved Drawings and Cost Estimate: Water and Sewer	4	Mar-21*	<ul style="list-style-type: none"> • Approved Township Layout required. • Approval of Preliminary Design and Environmental Authorisation required.
			Approved Drawings and Cost Estimate: Roads and Stormwater			
			Approved Drawings and Cost Estimate: Electricity			
			Project Phasing Plan			
Stage 5: Close-Out	Project completion	Prepare a completion report which will entail the summary of the project findings and recommendations.	Close-Out Report	2	May-20*	All the above

* Will be influenced by inputs from other disciplines and the turnaround time from the relevant authorities.

The visual inspections, which SCIP began in March, was put on hold due to the COVID-19 lockdown period, but will commence as soon as possible after clearance has been given by the government.

8. POTENTIAL RISKS

Table 5 is a live risk register prepared to identify and mitigate potential challenges.

TABLE 5: POTENTIAL RISKS

RISK	IMPACT	CONTINGENCY PLAN	PROBABILITY
Environmental authorization	Reduction of land to be developed. Delays.	Residential 3 and 4 developments. The municipality and the client to facilitate.	Medium
Town planning services	Delays in circulation.	Municipality to prioritize the project.	Medium
Flood plain	Reduced area of development. Location of structures within the flood plain.	Residential 3 and 4 developments.	Medium
Multi-year implementation	Budget, change in priorities Change in the executive.	Sufficient contingency reserves.	High
Red-tape/Bureaucracy	Processes to make decisions. Delays.		High
Executive	The conflict between executives. Executive turnover (leaving the company).		High
Stakeholders	Stakeholder conflicts. Stakeholders ignore communications. Stakeholder turnover.	Social facilitation.	Medium
Resources	Resources turnover. Team dynamics (conflicts, etc.). Unethical conduct.		Medium
Engineering designs	Delays from stakeholders' approval.		Low
Decisions making	Turnaround time. The ambiguity of decisions.		High
Time	Overly optimistic schedule.		Medium
External	Force majeure (e.g. act of nature). Technical change. Political change (local and federal). Community unrest.		High

9. CONCLUSION

The proposed upgrade of informal settlements will be beneficial to the residents of Amaoti and the surrounding areas especially from a transportation point of view.

The most challenging factors which may cause project delays are the topography and to mitigate relocation of the residents. However, it is anticipated that the upgrades within the township will be prolonged due to the vast density and unstructured settlements.

The approved township layout will be used as guide for which existing roads will be utilised or discarded. The township layout, together with detailed water and sewer investigations will be used to determine the construction phases.

Updated data on the positions and conditions of the existing surfaced and gravel roads, as well as the bridges and type of bridges are required for the concept and design stages of the project.

Visual inspections are recommended for the roads and bridges. Road sample testing might also be required to determine the pavement design conditions, especially of the severely damaged roads.

10. REFERENCES

eThekwini Municipality, 2019. *Integrated Development Plan*, s.l.: s.n.

Phunga Consulting Engineers, 2017. *Greater Amaoti Housing Project-Preliminary / High Level Services Report*, s.l.: s.n.

SSI, 2010. *Transportation Framework for NUDC*, s.l.: s.n.

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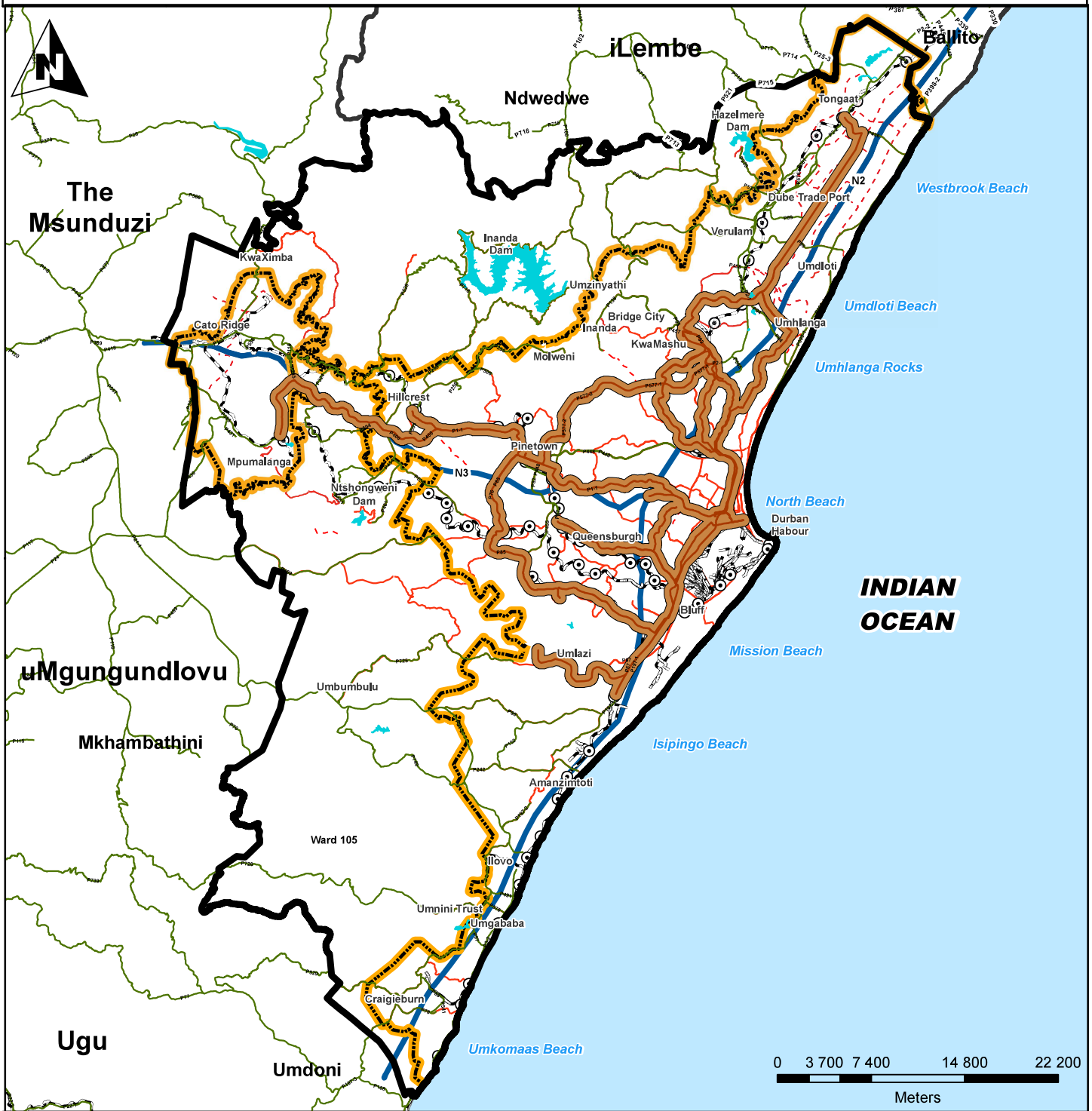
The Biodiversity Company, 2017 (Updated 2019). *Wetland Assessment Report for the Proposed Amaoti Housing Development*, s.l.: s.n.

ANNEXURE A












- Transportation Map

SPATIAL DEVELOPMENT FRAMEWORK 2019-2020

Transport Map



Legend

-  Ethekewini Municipal Boundary
-  Urban Development Line
-  IPTN
-  National Hwy
-  Provincial Roads
-  Metropolitan Route
-  Proposed Roads
-  Railway Lines
-  Railway Stations
-  IPTN Corridor
-  Dams

Scale: 1:300 000

Prepared For:

**STRATEGIC SPATIAL PLANNING BRANCH
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Date Prepared: May 2019
Reference No.:
Prepared By: Planning Information Office



Our Ref: 1793 02



human settlements

Department:
Human Settlements
PROVINCE OF KWAZULU-NATAL



STATUS-QUO REPORT

for the

UPGRADE OF INFORMAL SETTLEMENTS IN AMAOTI

WATER SUPPLY

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FIRST ISSUE

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	Date: April 2020	Date: April 2020	Date: April 2020
P 1793-Status Quo Report Water-LB-First Issue			

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	Date:	

Executive Summary

The report outlines the existing civil infrastructure conditions and the surrounding areas, in the northern region of Durban. Furthermore, it will highlight key issues expected during the proposed upgrade of Amaoti Informal Settlements.

The project intends to formalise Amaoti Informal Settlements with civil engineering services while mitigating relocation of existing occupants.

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1. INTRODUCTION

SCIP Engineering Group (trading as SCIP) was appointed by KwaZulu Natal Department of Human Settlements (the client) as Civil and Traffic Engineers for the **Upgrade of Informal Settlements in Amaoti**.

1.1. PROJECT NAME

The proposed development will be referred to as **Amaoti Informal Settlement**.

2. DEVELOPMENT OVERVIEW

The purpose of this Housing Catalytic Project is to:

- Formalise the informal settlements
 - ✓ Establishment of a township with formal services through which residents obtain formal security of tenure through which RDP houses are developed.
- Regularise the informal settlements:
 - ✓ To bring a level of security to residents within informal settlements other than through the long and often tedious formal township establishment processes.
 - ✓ To include all settlements into an appropriate regulatory framework for health and safety and for creating an environment conducive to investment by the state and by private individuals.
 - ✓ To provide a framework for the incremental upgrading of services and quality of life.
 - ✓ To provide security of tenure through resolving issues of land ownership and providing individuals with a right to occupy, thus enabling the building of houses.
 - ✓ To resolve the illegality of land use through amendments to the town planning scheme.
 - ✓ To provide a basic regulatory framework to secure health and safety.
 - ✓ To introduce a simple settlement layout to facilitate the provision of services and infrastructure and to demarcate flood plains.
 - ✓ To upgrade services incrementally (water, sewer, lighting, roads, and stormwater).
- Relocate the existing informal settlements
 - ✓ Temporary relocation of informal settlements, where necessary, to enable the formalization and regularization of the settlement.

The proposed formalisation, regularisation and/or relocation will be carried out in conjunction with the Municipal Standards and Human Settlement Policies.

3. PROJECT BACKGROUND

3.1. GENERAL PROJECT INFORMATION

The project was initially funded by eThekweni Municipality, but due to budgetary constraints, the project was placed on hold. At the time the project was placed on hold certain engineering services were already completed, approved by the municipality, and implemented. These include both internal and bulk services. The site is currently partially serviced with temporary civil and electrical services including roads, stormwater, water, sewer, and electricity.

The following additional information was discussed during the project meeting (4 November 2019), which is summarised in **Table 1**:

TABLE 1: SUMMARY OF GENERAL PROJECT INFORMATION

ITEM	DESCRIPTION	COMMENTS	STATUS
1	Site Boundary Stretching over Number of Wards	6 Wards (Wards 52, 53, 56, 57, 59 and 102)	Noted
2	Current Number of Units	Approximately 20,000 The number of units may differ as the area is unregulated and there may be newly erected units in the vicinity.	Noted
3	Relocation of Structures	Should be limited as much as possible. Some informal units were already temporarily relocated.	Ongoing
4	Community Meetings	The municipality has periodic meetings to report to the community.	Ongoing
5	4 Phased Implementation Plan	<i>Phase 1:</i> 161 Houses (Completed), 5 Houses (Outstanding) <i>Phase 4:</i> Contractor was appointed for implementation. <i>Phase 2 & 3:</i> Needs to be implemented.	Noted
6	Municipal Master Plan for Infrastructure	Might be outdated.	Noted
7	Existing Civil Services	Water Sewer	Received from eThekweni Municipality Received from eThekweni Municipality

3.2. INFRASTRUCTURE DELIVERY

The infrastructure delivery plan for the upgrading of the informal settlements in Amaoti has been investigated thoroughly and some key issues have been identified by eThekweni Municipality which may cause some delays during the progress of the project (eThekweni Municipality, 2019):

- Limited access to basic household and community services especially in informal settlements;
- Limited funding available to deal with big backlogs;
- Illegal water connections;
- Water loss % is significant within the municipality;
- Ageing infrastructure and need for a budget to maintain appropriate standards;
- The topography makes service delivery in parts of the municipality challenging; and
- Fragmented spatial patterns do not support the efficient delivery of bulk services.

A vital component for the development and growth of the Northern region of eThekweni Municipality is the bulk engineering services which will be influenced by the anticipated numbers and locations of new houses to be constructed.

4. SCOPE OF REPORT

This report represents the Status-Quo Report (SQR) on Water for Amaoti Informal Settlement. The purpose of the report is to provide a holistic overview of the completed designs, installed infrastructure and their condition to date. The following aspects will be discussed throughout this report:

- Key challenges relative to the present population and topography;
- Discuss existing services surrounding and within the development area; and
- Discuss already designed services surrounding and within the development area

Reports relating to Sanitation, Roads and Stormwater services will be presented in a separate document.

4.1. KEY ASSUMPTIONS

The SQR is submitted to KwaZulu Natal Department of Human Settlements on the assumption that the information provided by KwaZulu Natal Department of Human Settlements and eThekweni Municipality, as well as desktop studies conducted is relevant to the time of compilation. It should be noted that as the project progresses that certain information in this report may be subject to change.

4.2. RELEVANT INFORMATION RECEIVED

The following documents and information, with regards to Amaoti Informal Settlements, was received from the appointed Project Managers (KwaZulu Natal Department of Human Settlements and eThekweni Municipality):

- Preliminary/High-Level Services Report: Preliminary findings indicate that Bulk Water and Sewer Infrastructure will be sufficient to enable the first part(s) of development and that there will be a requirement for the upgrade to realize the entire development,
- Project Boundary Shape-file;
- Development Framework;
- Preliminary Geotechnical Assessment: The majority of the site is classified as developable with precautions due to the characteristics of the soil and the thickness of the soil profile. The areas of a steep slope and drainage channels/floodplains is regarded as high risk due to the likelihood of flooding and seasonal perched water levels. Although the very steep slopes have been classified as developable with high risk, it is recommended that only place development in those areas as a matter of last resort;
- Biodiversity Assessment – Draft 3;
- Water Resources Report – Draft 3;
- Informal Settlement Upgrading Programme for City of Johannesburg Region C Phase 2 Draft Report Version 04 RS 2;
- Topographical Survey, dated February 2017;
- Cadastral Survey, dated February 2017; and
- GIS data downloaded from eThekweni Municipality GIS Website.

5. SITE DESCRIPTION

5.1. LOCALITY

The proposed site is located within the Northern eThekweni Municipal Planning Region (NMPR) in the province of KwaZulu Natal. Approximately 30km north-west of Durban Central, the proposed site spans roughly 1,236ha in extent.

The site can be accessed from the north through Main Road (M27), from the west through Mafukuzela Highway (M25) and from the south through Curniek Ndlovu Highway (M25), JG Champion Drive and Phoenix Highway.

Figures 1 and 2 illustrates a Site Locality Map and a Site Boundary Layout, respectively.

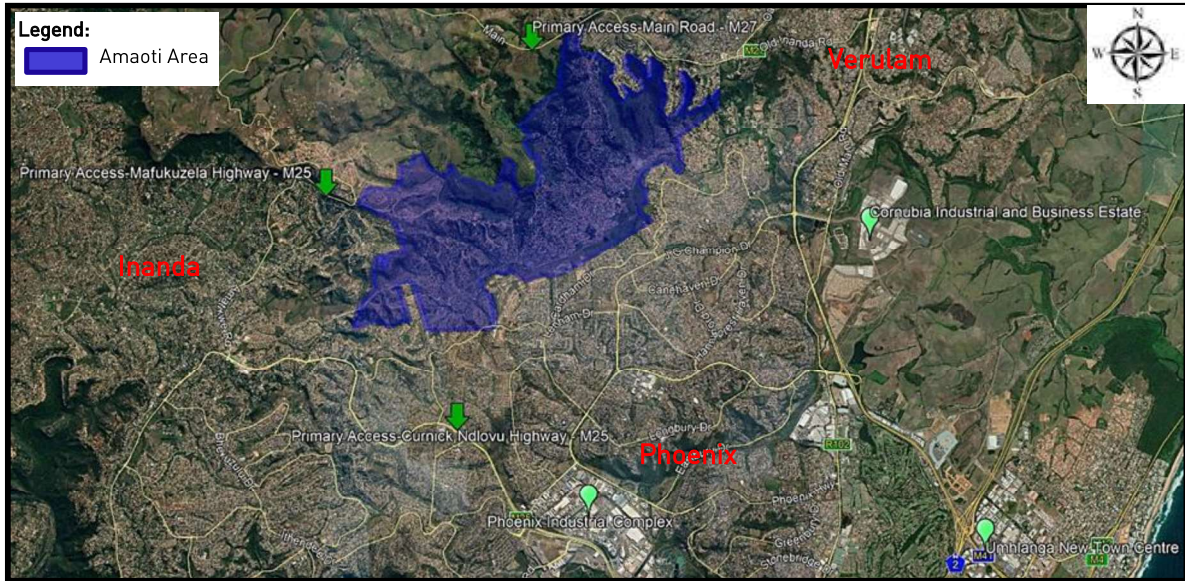


FIGURE 1: SITE LOCALITY MAP (GOOGLE EARTH VIEW)

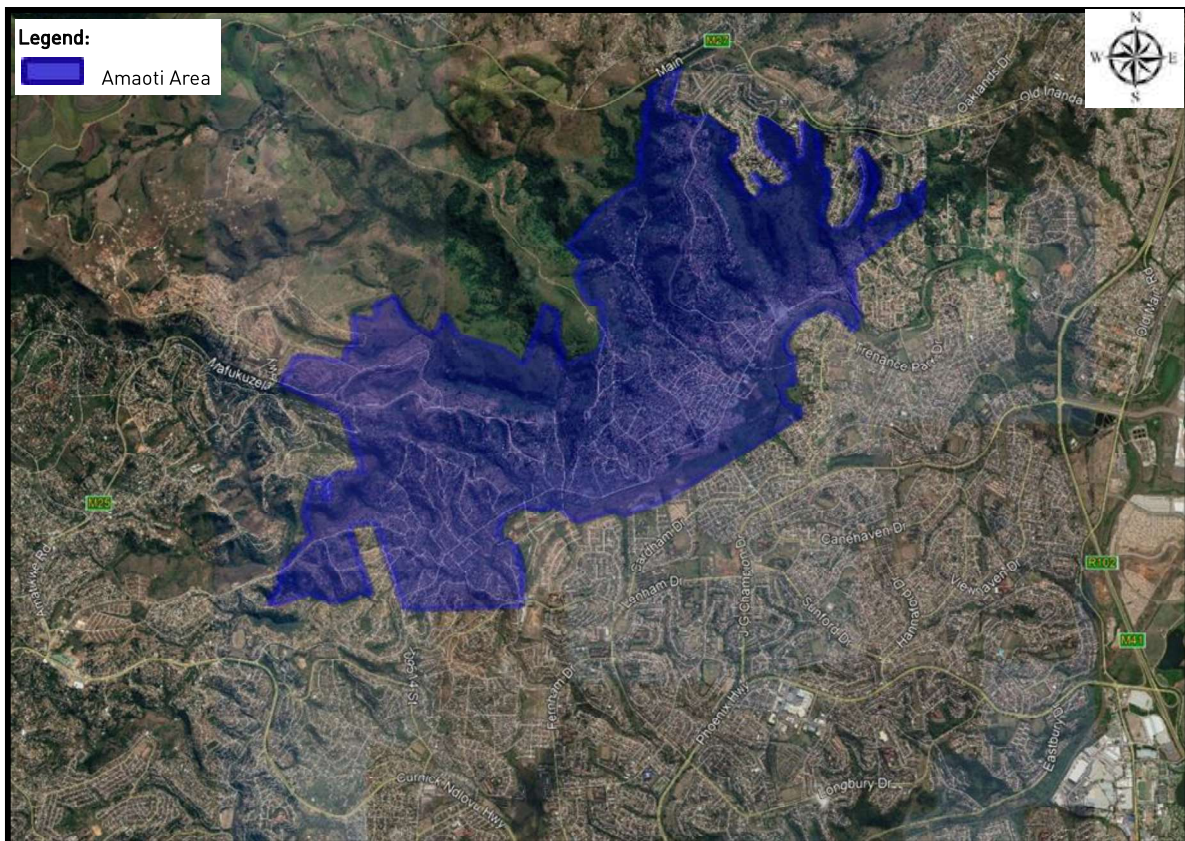


FIGURE 2: SITE BOUNDARY LAYOUT (GOOGLE EARTH)

5.2. PRESENT POPULATION

The settlements comprise of dense informal settlements (both temporary and permanent dwellings) and formalised settlements (residential areas with municipal facilities and amenities).

The average density of the eThekweni Municipality ranges from 4du/ha to 40du/ha, (eThekweni Municipality, 2019). Therefore, based on the above, it is been determined that approximately 20 000 informal dwelling are located within the site. Unfortunately, the population within the area is constantly growing, making it nearly impossible to provide accurate figures.

5.3. TOPOGRAPHY

The relative altitudes are 180 meters above sea level with undulating topographies. A typical topographical elevation heat map of Amaoti area is seen in **Figure 3**. The study area is located on the southward facing upper-middle and lower hillslopes, as well as on the valley floor and in many cases are located within the floodplain of the streams. The stream draining from west to east is a high order tributary of the Umgeni River. It is drained by the small tributaries which lead to the Umgeni River. Overall, the area is characterized by gentle and steeply sloping topography, with slopes between 5% and 35% grade (Worley Parsons Pty Ltd (WP), 2017).

The current urban development is concentrated on the floodplain, lower hillslope and the shallower mid-slope and hilltop areas.

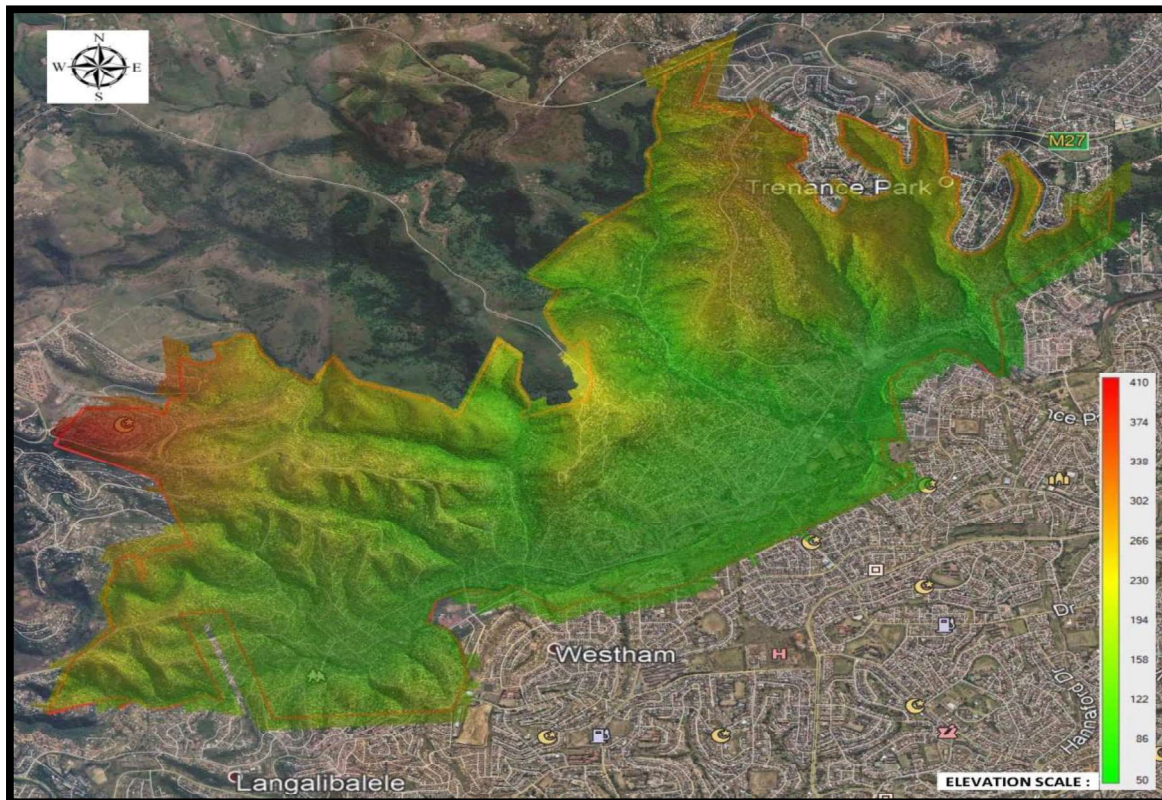


FIGURE 3: TOPOGRAPHICAL ELEVATION HEAT MAP OF AMAOTI

Topographical factors have a major influence on the pattern of urban settlement. Significant areas where there are very steep slopes, area subjected to high erosion risk and areas of concentrated seepage may be considered potentially unstable.

5.4. SERVIDUES

The area is subjected to various servitudes namely:

- Municipal services (roads, stormwater, water, sewer, lighting, etc.).
- Formalized areas (schools, police station, clinics, residential areas, etc.).
- Informal structures (shacks and permanent structures).
- Multiple natural streams.

Applications for wayleaves will be submitted to the municipal clients and other authorities prior to completion of the design.

6. WATER NETWORK

6.1. BULK WATER SUPPLY

Bulk water is supplied by Umgeni Water (UW), which is the water service authority for eThekweni Municipality. UW supplies water through the Lower Mgeni and North Coast Supply Systems serving Phoenix/Inanda/Verulam/Amaoti in the north. These supply systems derive primary water resources from Nagle and Hazelmere Dams as illustrated in **Figure 4**.

Umgeni Water treats water at Durban Heights and Hazelmere Water Treatment Works (WTW), which supplies water to the development. Durban Heights WTW is primarily gravity-fed with untreated water from the Nagle Dam. Water can also be supplemented to Durban Heights WTW via the Inanda Pump Station and the Durban Heights Shaft Pump Station (Umgeni Water, 2019).

Table 2 outlines the operating capacities of the water treatment works under consideration within the north of eThekweni.

TABLE 2: OPERATING CAPACITY OF WTW IN THE NORTHERN AREA (UMGENI WATER, 2019)

WTW NAME	SYSTEM	FULL SUPPLY CAPACITY (ML/DAY)	OPERATIONAL CAPACITY (ML/DAY)	SPARE CAPACITY (ML/DAY)	RESERVOIRS CAPACITIES (ML)
Durban Heights WTW	Lower Mgeni	615	520	95	497
Hazelmere WTW	North Coast Supply	90	75	15	25
Total		704	595	110	522