

ENVIRONMENTAL MANAGEMENT PROGRAMME

EXPANSION OF INFRASTRUCTURE WITHIN 100M OF THE HIGH-WATER MARK OF THE SEA
RESULTING IN THE INFILLING AND EXCAVATION OF MATERIAL WITHIN 100M OF
THE HIGH-WATER MARK AND THE PLANTING OF VEGETATION ON EXPOSED DUNE
AT HOUSE GOTZ LOCATED AT 31 LITTLE MARITZBURG ROAD, SHAKA'S ROCK
KWADUKUZA MUNICIPALITY
DC29/0013/2021



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Stephanie Denison
+27 (0) 82 929 4662
steph@confluencesd.co.za
www.confluencesd.co.za


CONFLUENCE
Strategic Development & Environmental Partner

AUTHOR OF REPORT

This Environmental Management Programme (EMPr) was compiled by Stephanie Denison from Confluence Strategic Development (Pty) Ltd (details of the Environmental Assessment Practitioner provided below). The contents of this Environmental Management Programme have been compiled in accordance with section 24N of the National Environmental Management Act 107 of 1998 as amended and Appendix 4 for of the Environmental Impact Assessment Regulations, 2014 as amended.

Environmental Assessment Practitioner (EAP):	Stephanie Denison	
Postal address:	30 Ashley Road, Ballito	
Postal code:	4399	
Cell:	082 929 4662	
E-mail:	steph@confluencesd.co.za	
Qualifications:	BSc (Hons) Botany and Ecophysiology (UCT) MPhil Marine and Environmental Law (UCT)	
Professional affiliations:	PR. Nat. Sci. Environmental Science (#120455) EAPASA Registered 2019/888	
Work Experience:	2012	Environmental Control Officer at Environmental Impact Management Services
	2012 – 2014	Environmental Scientist at Kerry Seppings Environmental Management Specialists
	2014 – 2020	Lead Environmental Consultant at EnviroPro Environmental Consulting
	2020 – Present	Director

Signed:



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TABLE OF CONTENTS

1.0.	PROJECT DESCRIPTION	4
1.1.	BACKGROUND	4
1.2.	DESCRIPTION OF ACTIVITY	4
1.3.	ENVIRONMENTAL SENSITIVITIES	7
1.4.	IMPACT MANAGEMENT OUTCOMES	7
2.0.	LEGISLATION.....	8
3.0.	MONITORING REQUIREMENTS.....	9
4.0.	IMPACT MANAGEMENT ACTIONS	10
4.1.	PLANNING & DESIGN	11
4.2.	PRE-CONSTRUCTION	11
4.3.	CONSTRUCTION.....	12
4.4.	REHABILITATION / POST CONSTRUCTION.....	20
4.5.	OPERATION	22
5.0.	ENVIRONMENTAL AWARENESS PLAN	24
5.1.	INDUCTION	24
5.2.	ENVIRONMENTALLY SENSITIVE AREAS.....	24
5.3.	BASIC ENVIRONMENTAL TRAINING POINTS	24
5.4.	PROCEDURES FOR HANDLING ENVIRONMENTAL RISKS	25
5.4.1.	SPILL RESPONSE	25
5.4.2.	ERADICATION OF ALIEN INVASIVE PLANTS.....	26
5.4.3.	REPORTING OF ENVIRONMENTAL INCIDENTS	28
6.0.	RECEIPT OF ENVIRONMENTAL MANAGEMENT PROGRAMME & ACKNOWLEDGEMENT OF ENVIRONMENTAL RISKS.....	29

1.0. PROJECT DESCRIPTION

1.1. BACKGROUND

Peter Gotz proposes to expand an existing private residential dwelling on Erf 157 in Shakas Rock, located at 31 Little Maritzburg Road. Development will take place within 100m of the high-water mark of the sea. A geofabric wall will be constructed in front of the house as a sea defence structure. This will require the replacement of material on the dune and plating of vegetation on the exposed sand surfaces to prevent erosion. The excavation of material on site during construction as well as the construction of the sea defence structure requires Environmental Authorisation from the Department of Economic Development, Tourism and Environmental Affairs (EDTEA) for the activities listed in Table 1 below.

Table 1: Listed and Specified Activities Triggered and Being Applied for.

Activity #	Relevant Listing Notice	Description of Listed Activity as Per the Project Description
18	Listing Notice 1 (GNR327) 04 th December 2014 as amended.	Approximately 180m ² of dune / exposed sand surfaces in front of the existing house will be re-vegetated during the construction of the geofabric defence structure and rehabilitation.
19A	Listing Notice 1 (GNR327) 04 th December 2014 as amended.	During construction, a total of 530m ³ of material will be excavated and infilled within 100m of the high-water mark of the sea.
54	Listing Notice 1 (GNR327) 04 th December 2014 as amended.	Infrastructure seaward of the existing house will be expanded by 277m ² . This expansion of infrastructure will take place within 100m inland of the high-water mark of the sea.

1.2. DESCRIPTION OF ACTIVITY

Peter Gotz is the owner of an existing residential dwelling located at 31 Little Maritzburg Road, Shaka's Rock, KwaDukuza Local Municipality, iLembe District. The existing structure has recently been refurbished (i.e. painting, interior improvements, new windows etc.). Peter Gotz now proposes to expand the existing footprint of the residential dwelling (Figure 1). The following new infrastructure is proposed on site:

- New double garage (48.4m²)
- Extension of the existing house (38m²)
- Timber decking (101.6m²);
- Swimming pool (18m²);
- Concrete walkway around house (33.6m²) and
- Geofabric defence structure along the shoreline (180m²).

There are existing municipal bulk services available to provide the house with potable water and sewage disposal. The extent of the property is 1 375m². The footprint of the existing house will be expanded by 240m² (shaded in red in Figure 1).

Figure 1: Site Development Plan Showing Proposed New Infrastructure for House Gotz Shaded in Red (Source: ZAARC Architects, 2021).

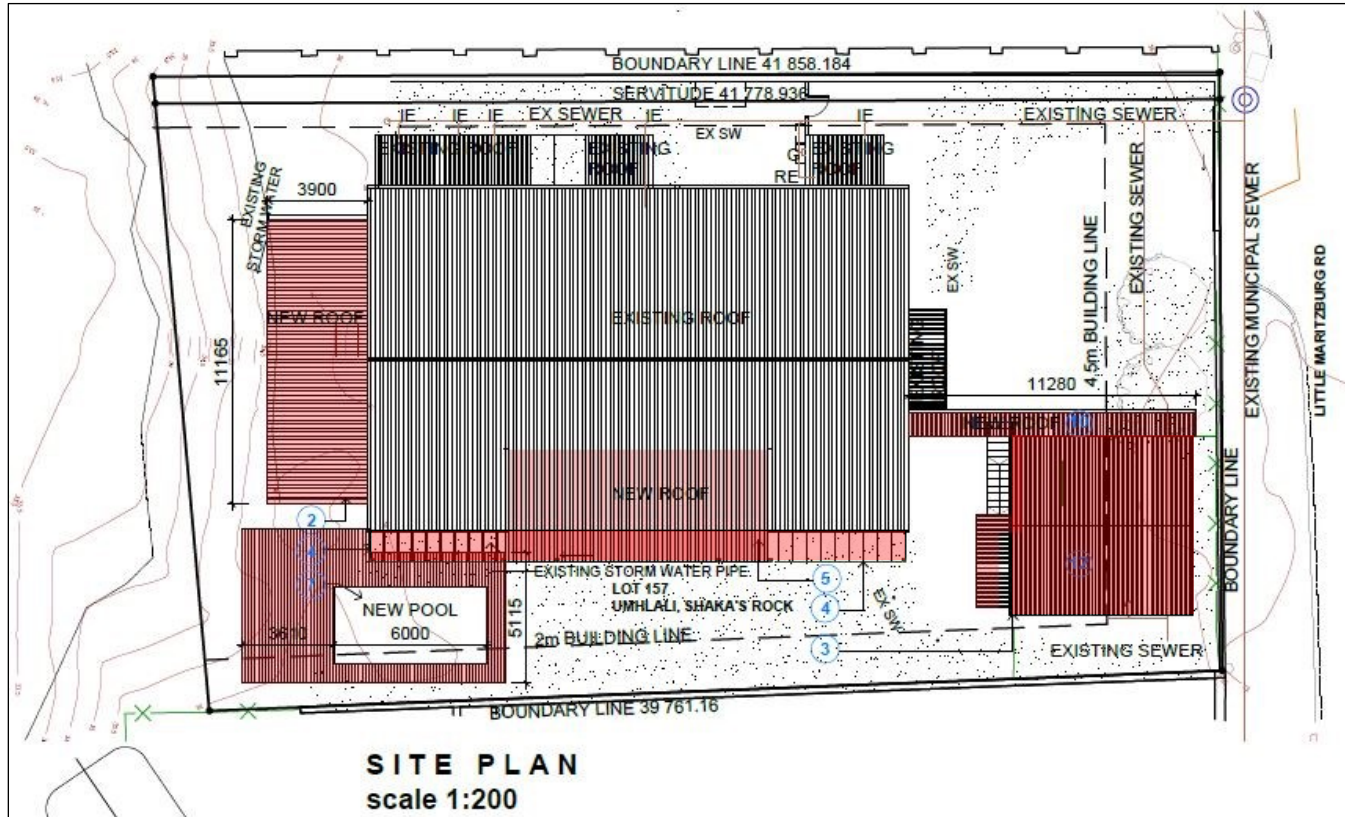
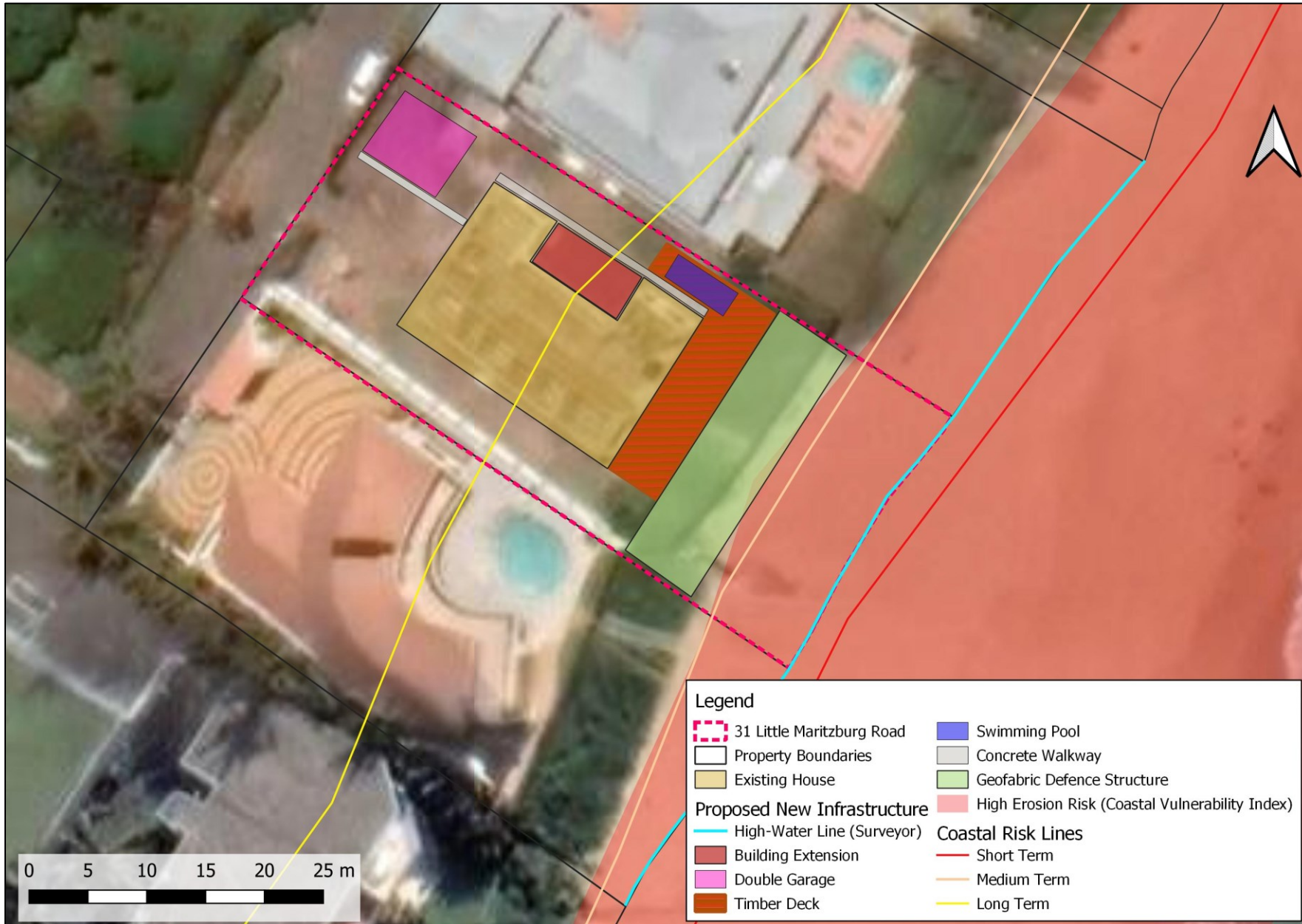


Figure 2: Map Superimposing the Proposed Activity and Associated Infrastructure on the Environmentally Sensitivities of the Site.



1.3. ENVIRONMENTAL SENSITIVITIES

The following sensitive environmental features have been identified within the study area (refer to Figure 2):

- The fore dune in front of House Gotz forms part of the sand sharing system. No unnecessary disturbance or excavations must take place in this area apart from establishment of the geofabric defence structure, which must be constructed in accordance with an approved methodology.
- The Coastal Vulnerability Index suggests that the study area has a “high” erosion risk. This vulnerability index refers to the level of vulnerability that may arise on built structures as a result of both sea level rise, storm forced erosion and tidal inundation, or a combination of both.
- The underlying geology is that of the Vryheid Formation, which is very highly sensitive, with this type of geology having the potential to preserve fossils of the *Glossopteris* flora. A Fossil Chance Find Protocol has been included in the EMPr.

The Applicant, Contractors and Staff on site must be made aware of the environmental sensitivities and associated restrictions. The restrictions must be clearly explained by the Environmental Control Officer (ECO) prior to construction commencing. An Environmental Awareness Plan has been prepared for Contractors working on site (section 5.0 of the EMPr). The Environmental Awareness Plan will form part of the Environmental Induction training prior to work commencing.

1.4. IMPACT MANAGEMENT OUTCOMES

Considering the type of activity and the environmental sensitivities associated with the site, impact management actions were formulated during the Environmental Impact Assessment to avoid, manage and mitigate risks that were identified for the different phases of the activity including planning and design, pre-construction activities, construction activities, rehabilitation / post-construction and operational activities (where applicable). Impact management actions are in place to achieve the following impact management outcomes:

Table 2: Impact Management Outcomes

Primary Impact Management Outcome: <i>To create a sustainable development by preventing construction activities from impacting the sand sharing system and ensuring the long-term defence of the property against climate change (sea level rise and more intense storm events).</i>		
#	Impact Management Outcome	Measures in Place to Achieve Outcome
1	To avoid unnecessary encroachment of construction activities into the sand sharing system.	An independent ECO must clearly demarcate the No Go area in front of the proposed timber deck. Measures to prevent and manage encroachment into the dune / coastal environment have been included under section 4.3 of the EMPr.
3	To avoid unnecessary disturbance (direct or indirect) to the fore dune, beach environment and neighbouring properties during the construction of the geofabric wall.	During construction of the geofabric wall, work must be monitored daily by the ECO to avoid unnecessary disturbance to the surrounding area. Other measures to prevent and manage construction in this sensitive area have been included under section 4.3 of the EMPr.
4	Ensure dune stability during initial excavations for the geofabric wall.	A Construction Method Statement must be prepared by the Contractor appointed to construct the geofabric wall in front of House Gotz and submitted to the ECO prior to any work commencing in this area. Existing sea defence structures must be identified by the Contractor prior to excavations commencing on the dune in front of House Gotz.
5	The long-term defence of the shoreline preventing dune retreat at 31 Little Maritzburg Road.	Provided that construction of the geofabric wall takes place in accordance with the mitigation measures provided under section 4.3 of the EMPr, there will be no further retreat of the dune and erosion risk in front of House Gotz. The re-established dune must be re-vegetated immediately on completion of work to stabilise the dune material.

2.0. LEGISLATION

Table 3 provides a list of legislation and municipal planning frameworks which are applicable to the activity. The holder of the Environmental Authorisation and Contractors working on site must be aware of the legal requirements and address non-compliances when they arise.

Table 3: Legislation Applicable to The Expansion of House Gotz at 31 Little Maritzburg Road, Shakas Rock.

Legislation	Acronym	Comment
National Environmental Management Act (Act No. 107 of 1998 as amended).	NEMA	NEMA provides environmental management principles that are applicable across South Africa to fulfil section 24 of the Constitution, which is the right to “an environment that is not harmful to their health or wellbeing”. Section 24 of NEMA defines the activities requiring Environmental Authorisation and the processes to be followed to obtain Environmental Authorisation (published in the Environmental Impact Assessment Regulations, 2014 as amended). This application triggers activities listed in Listing Notice 1 of the Environmental Impact Assessment Regulations, 2014 as amended. A Basic Assessment process is therefore underway to obtain Environmental Authorisation prior to any activities commencing.
DEA (2017), Public Participation guideline in terms of NEMA EIA Regulations, DEA, Pretoria, South Africa.	-	To give effect to section 2 (4)(f) and (o) of NEMA, adequate and appropriate opportunity for public participation in decisions that may affect the environment is required. NEMA requires that any person conducting public participation take into account any relevant guidelines applicable to the public participation process as contemplated in section 24J of NEMA. The public participation conducted as part of the Basic Assessment process complies with the NEMA EIA Regulations and has considered the relevant guidelines.
DEA (2017), Guideline on Need and Desirability, DEA, Pretoria, South Africa.	-	This guideline contains information on best practice and how to meet the requirements prescribed by NEMA when considering the need and desirability of a development. The need and desirability of the project has considered the list of questions outlined in the Need & Desirability Guidelines.
National Environmental Management: Waste Act (Act No. 59 of 2008 as amended).	NEM: WA	NEM: WA provides measures to protect health and the environment of South Africa by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. There are no activities proposed that will trigger a Waste Management License however measures have been provided in the EMPr to ensure that waste management is compliant with the requirements of NEM: WA.
National Environmental Management Biodiversity Act (Act No. 10 of 2004).	NEM: BA	To manage and conserve South Africa’s Biodiversity and protect species and ecosystems that warrant national protection. The proposed development does not require any specific permissions in terms of NEM:BA however the landowner must comply with the requirements of the Alien and Invasive Species Regulations (2020) which have been published in terms of section 97(1) of NEM:BA. These regulations categorise invasive species and outlines the way these species must be controlled by landowners. Section 52 of NEMBA allows for the publication of a national list of ecosystems that are threatened and in need of protection. The property is located within the Northern Coastal Grasslands Ecosystem which has been identified as “critically endangered” by the South African National Biodiversity Institute (SANBI). The vegetation on site has however been completely transformed by landscaping.
National Environmental Management: Air Quality Act (Act No. 39 of 2004).	NEM: AQA	Regulates air quality to protect the environment by providing measures to prevent pollution and ecological degradation and for securing ecologically sustainable development. There are no activities on site that will trigger an Air Emissions License however measures have been provided in the EMPr to ensure that air quality is managed in line with the requirements of NEM: AQA.
National Water Act (Act No. 36 of 1998) (as amended).	NWA	Provides for fundamental reform of the law relating to water resources. There are no watercourses within the property itself or within 32m of the site. The nearest watercourse is an unnamed watercourse, which terminates at Salt Rock main beach. This is approximately 370m north of the site. No watercourses will be impacted by the proposed development. A Water Use Authorisation is not required for this application.

National Forests Act (Act No. 84 of 1998).	NFA	To conserve and protect natural forests and woodlands as well as ensuring development with principles of sustainable management. The Department of Forestry Fisheries and Environment (DFFE) governs the removal, disturbance, cutting or damaging of protected tree species and natural forests. There are no forests or protected tree species located on site and therefore no permit from DFFE is required.
Integrated Coastal Management Amendment Act (Act No. 36 of 2014).	ICMAA	Establishes an integrated coastal and estuarine management system to promote the conservation of coastal environment and maintain natural attributes of coastal landscapes and seascapes. Sound coastal management principles are presented in the ICMAA which are applicable to this application. The Coastal Vulnerability Index shows the site to have a “high” vulnerability. All infrastructure proposed falls within 100m of the high-water mark of the sea and therefore the layout needs to be “economically justifiable and ecologically sustainable”, which is a requirement of the ICMAA.
Best Practises for Coastal Development in KwaZulu-Natal (2021) ¹	-	Recognises the interrelationships between coastal users and ecosystems. The Provincial Coastal Management Programme (PCMP) sets out objectives to ensure coastal development occurs in a manner that is appropriate, adaptive and systems-based. As a PCMP output, EDTEA produced this Guideline on best practises to be adopted for development along the coast. This development is classified as a private project in terms of these guidelines and adheres to the principles of development planning provided in this document.
National Heritage Resources Act (Act No. 25 of 1999).	NHRA	For the management of national heritage resources and to nurture and conserve heritage resources so that they may be bequeathed to future generations. The existing house is not a heritage feature (i.e. younger than 60 years old). No structures with heritage or archaeological value are located on site. The property falls within a “highly” sensitive palaeontological (i.e. fossils) area. A Palaeontological Impact Assessment was therefore carried out and is attached under Appendix B. The findings of the report are summarised in section 4.0 below.
iLembe District Municipality Integrated Development Plan (2020 – 2021 Review)	iLembe IDP	Provided that the construction is carried out in a sustainable manner, the activities proposed at House Gotz are in line with the iLembe District Vision outlined in section 1.2 of the iLembe IDP. This vision is “By 2030 iLembe District Municipality will be a sustainable people-centred economic hub providing excellent service and quality of life”.
KwaDukuza Local Municipality Spatial Development Framework (2017 – 2022)	KDM SDF	The proposed house alternations are compliant with the existing property zoning parameters with no special consent required. The project is therefore in line with the KDM SDF for the area.

3.0. MONITORING REQUIREMENTS

As per the findings of the Environmental Impact Assessment, the holder of the Environmental Authorisation is responsible for appointing an independent Environmental Control Officer (ECO) to monitor the implementation of the impact management actions. Table 4 provides a summary of the monitoring requirements to ensure effective implementation of the EMPr. It is noted that the mitigation measures listed in the EMPr as well as the Conditions of the Environmental Authorisation must be adhered to.

The appointed ECO must have the following skills:

- Knowledge and understanding of constructing on coastal environments.
- Knowledge of good practise environmental management standards.
- Understanding of the legal context of the activity including the Duty of Care and Polluter Pays principles.
- At least 3 years’ experience in the ECO field.

¹ Bundy, S., Goble, B., Parak, O. and Bodasing, M. “*Best Practises for Coastal Development in KwaZulu-Natal*” KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs, Pietermaritzburg (2021).

Table 4: Monitoring Requirements

Method of Monitoring	<ul style="list-style-type: none"> • Site inspection by ECO to monitor the implementation of the EMPr and conditions of the EA during construction and the post-construction audit. • Visual inspections & photographs for record keeping purposes.
Frequency of Monitoring	<ul style="list-style-type: none"> • The ECO must audit the construction period monthly. • One monthly report summarising the findings of the audits must be submitted to the applicant, Contractor and EDTEA: Compliance and Enforcement. • The auditing frequency must be increased to daily during the construction of the geofabric wall as a sea defence structure. The findings of the daily audits must be included in the monthly report write up. • One post-construction audit by ECO.
Mechanism for Monitoring Compliance	<ul style="list-style-type: none"> • Written monthly audit report to be submitted by the ECO after the site inspection to the Holder of Environmental Authorisation, Contractor and EDTEA: Compliance, Monitoring & Enforcement.
Program for Reporting on Compliance	<ul style="list-style-type: none"> • Prior to the Contractor commencing with construction, environmental induction training must be carried out in accordance with the Environmental Awareness Plan in section 5.0. • The register in section 6.0 must be signed by all Primary Contractors working on the site. • The roles and responsibilities of the individuals involved must be determined and the line of communication outlined by the ECO in the audit reports. • Any non-compliances with the EMPr identified during the site inspection must be reported to the relevant Contractor, who must rectify the non-compliance immediately or within a reasonable timeframe as agreed upon with the ECO. • An Environmental Audit Report, compliant with Appendix 7 of the NEMA EIA Regulations 2014 as amended, must be compiled by the ECO and submitted to the relevant parties as listed above. • Prior to construction commencing on site, the holder of the Environmental Authorisation must have an agreement with the Primary Contractors working on site as to what remedial actions must be taken should environmental damage arise on the site as a result of actions by the Contractor.

4.0. IMPACT MANAGEMENT ACTIONS

Mitigation measures provided in the tables below have been formulated during the Environmental Impact Assessment process to ensure that House Gotz is a sustainable development, as contemplated in the principles of NEMA. The actions aim to:

- (i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; and
- (ii) Comply with any prescribed environmental management standards or practices.

The tables below indicate the persons who will be responsible for the implementation of the mitigation measures / actions. Abbreviations provided below:

- | | |
|---|---|
| • Independent Environmental Control Officer (ECO) | • Holder of Environmental Authorisation (DEV) |
| • Engineer (ENG) | • Contractor (CON) |

4.1. PLANNING & DESIGN

The planning and design phase for House Gotz is complete and therefore there are no mitigation measures applicable to this phase of the development.

4.2. PRE-CONSTRUCTION

The following actions must be undertaken prior to construction commencing on site.

Table 5: Impact Management Actions to be Adhered to During the Pre-Construction Phase of House Gotz.

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
Infilling and excavation of material within 100m inland of the high-water mark during the expansion of infrastructure at 31 Little Maritzburg Road (i.e. garage, house expansion & swimming pool).	Indirect impact on the adjacent beach environment.	<ul style="list-style-type: none"> • Prior to any work commencing on site, the applicant must appoint an independent ECO. • All Primary Contractors on site must undergo environmental induction training prior to work commencing (see Environmental Awareness Plan under section 5.0 of the EMPr). • Environmental induction training must include: <ul style="list-style-type: none"> - An indication of the location of the environmentally sensitive area, which includes the fore dune in front of the house. - The importance of this environmentally sensitive area. - Restrictions associated with this area. - Contingency measures if the environmentally sensitive area is disturbed. • The existing sea defence structures for both neighbouring properties must be identified prior to excavations taking place for the new timber deck. 	APP ECO CON	
Establishment of a geofabric wall as dune defence structure.	Incorrect construction methodology used to construct the geofabric wall, creating a larger development footprint than necessary within the active coastal zone.	<p>To avoid unnecessary interference within the active coastal zone during the construction of the sea defence system, the following is required:</p> <ul style="list-style-type: none"> • The contractor appointed to construct the sea defence system must have experience in this field of work as well as working in the Salt Rock coastal area. • The appointed contractor must provide a method statement to the ECO for approval on how the establishment of the geofabric wall will take place. • The relevant permission and permit must be obtained from the Department of Forestry, Fisheries and Environment (DFFE) prior to any vehicles driving to the site along the beach. • Only the minimum, most necessary machinery / vehicles must access the beach. The use of plant machinery should be avoided, if applicable. • Prior to the excavator commencing work on site, neighbouring properties existing sea defence structures must be identified and uncovered, preferably by hand so that the structures are not damaged. 	CON	

	Physical impact on existing infrastructure surrounding the site (i.e. municipal stormwater infrastructure and infrastructure on neighbouring properties).	<p>There is an existing municipal stormwater outfall located to the south of the property.</p> <ul style="list-style-type: none"> • All services on the property and adjacent property boundaries must be identified prior to excavations on site commencing. • The existing sea defence structures for both neighbouring properties must be identified prior to the geofabric wall being established. 	CON	
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4.3. CONSTRUCTION

The following mitigation measures must be adhered to during the entire construction phase.

Table 6: Impact Management Actions to be Adhered to During Construction of House Gotz.

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
<p>Infilling and excavation of material within 100m inland of the high-water mark of the sea during the expansion of infrastructure at 31 Little Maritzburg Road (i.e. garage, house expansion & swimming pool).</p>	<p>Soil erosion resulting in wash away down frontal dune and damage to adjacent coastal environment.</p>	<p>As per the findings of the Geotechnical Report, the loose, upper sands on site are susceptible to surface erosion by wind and concentrated flow of water. The alteration of natural ground levels and compaction may result in silt washing off the site into the nearby beach environment during rainfall events. The following measures must be put in place to reduce stormwater runoff and associated erosion damage:</p> <ul style="list-style-type: none"> • Vegetation must remain in place wherever possible and for as long as possible during earthworks. • Sound management of surface water runoff from any exposed sand surfaces must be put in place early in the construction phase. This must include the placement of sandbags and/or bidim in areas of preferential flow. • An earth berm (maximum of 900mm high) must be placed along the top edge of the platform where the bank starts to slope down towards the beach. • Should an area of erosion be noticed on site, this must be addressed immediately, and the area stabilised to prevent further erosion. • All exposed surfaces areas / cut embankments must be vegetated as soon as work is complete in that area to minimise the potential for erosion. • Cut embankments in the loose sands as well as any fill embankments must be restricted to a slope batter of 1:2. • Any trench excavations / temporary cut embankments deeper than 1.2m must be suitably battered back or shored to prevent collapse. • Only deep, reinforces strip concrete foundations are suitable for the proposed new infrastructure on site². 	CON	

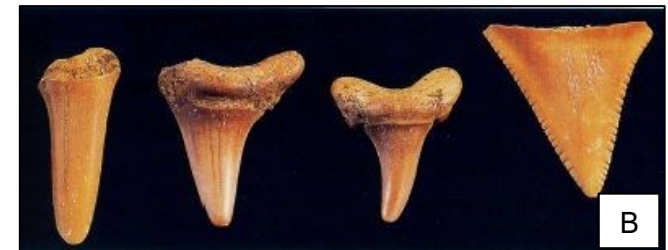
² Section 7.3 of the Marula Consulting (Pty) Ltd "Proposed New Residence on 31 Little Maritzburg Road, Sat Rock, Geotechnical Report".

		<ul style="list-style-type: none"> • There is existing stormwater infrastructure on site which the new roof extension must connect into. • The existing soakaway pit must be increased by 1m³ for every 40m² of new house surface area³. 		
	Heavy construction machinery and equipment working in close proximity to the frontal dune (i.e. during the construction of the new timber deck and swimming pool).	<ul style="list-style-type: none"> • A shade cloth fence must be erected across the front of the property where the bank slopes down to the beach. The area seaward of the shade cloth must be treated as a No-Go area until such time as work commences on the dune defence structure. • During the construction of new infrastructure on the existing platform, heavy construction machinery and equipment are not permitted near the front of the property where the bank starts to slope down to the beach (i.e. in front of the existing house – see Figure 3). • The foundations for the timber decking must be dug by hand to reduce the disturbance footprint in front of the existing house. • All construction machinery / equipment on site must be in good working order to ensure there are no leaks onto the fore dune. 	CON	
	Indirect impact on the adjacent beach environment.	<ul style="list-style-type: none"> • During excavations for the new swimming pool, all material must be stockpiled leeward of the swimming pool area to reduce the risk of excess sand / sediment from being blown / washed onto dune and / or beach environment. • Any excess material excavated from site must either be: <ul style="list-style-type: none"> - Removed from site completely; or - Used as fill material on site behind the new swimming pool footprint (i.e. not near the front of the property where the bank slopes down to the beach). • All cement mixing must take place on plastic sheets and must be contained to prevent cement / concrete from entering the dune and/or nearby beach environment. 	CON	
	Excavations destroying fossils impacting on palaeontology.	<p>The palaeontologist concluded that it is extremely unlikely that any fossils occur in the development footprint however, given the potentially very high sensitivity of the rocks underlying the site, a Fossil Chance Find Protocol has been provided below.</p> <ul style="list-style-type: none"> • During earthworks, the following procedure must be adhered to if fossils are discovered (see photographs provided below for examples of the type of fossils that could be found on the site): <ul style="list-style-type: none"> - When excavations begin the rocks must be given a cursory inspection by the ECO or designated person. Any fossiliferous material (shells, plants, insects, bone, coal – see Figure 3) must be put aside in a protected place. This way construction activities will not be interrupted. 	CON	

³ Section 7.3 of the Marula Consulting (Pty) Ltd “Proposed New Residence on 31 Little Maritzburg Road, Sat Rock, Geotechnical Report”.

- Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones (see below).
- Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
- If there is any possible fossil material found then a qualified palaeontologist, must visit the site to inspect the selected material.
- Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
- If no good fossil material is recovered, then no site inspections by the palaeontologist will not be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
- If no fossils are found and the excavations have finished, then no further monitoring is required.

Figure 3: Example of marine fossils from the Miocene and Pliocene (a) Selection of marine shells both modern and fossil; and (b) Selection of fossil shark teeth from the Alexander Formation (source: Proff. Marion Bamford).



Expansion of residential infrastructure by 277m ² within 100m inland of the high-water mark of the sea	New infrastructure negatively impacting coastal processes (i.e. the sand sharing system, biotic environment, sea-level rise and storm surges)⁴.	<p>The coastal specialist concluded that proposed “<i>activities associated with the homestead, including the swimming pool and deck will have little to no influence on coastal processes or the natural environment</i>”. The property falls within a long-term (100 year) risk category and is under high risk in terms of the Coastal Vulnerability Index. To reduce the risk of future damage to the property, CoastKZN recommends that a sea defence system be established. This is supported by the coastal specialist, who noted the slow retreat of the dune form in front of House Gotz. The following mitigation measures are provided to ensure that the expansion of new infrastructure on site does not impact on coastal processes:</p> <ul style="list-style-type: none"> • To ensure that proposed new infrastructure does not encroach into the sand sharing system, the sea defence structure must be established prior to the expansion of infrastructure seaward of the current dwelling. • The geofabric wall along the eastern extent of the property must be aligned with existing sea defence structures on neighbouring properties. • Construction of the geofabric wall to be carried out in accordance with the approved construction methodology (see below). • Existing services, in particular sewer infrastructure, must be incorporated to the lee of the defence structure. 	DEV CON	
	Incremental creep of infrastructure towards the sea.	<p>The seaward expansion of infrastructure is limited to the placement of the timber deck. The footprint of the existing infrastructure will be extended by 5m seaward. The swimming pool also shows minor expansion of structures in a seaward direction. The coastal specialist states that “<i>the placement of the sea defence structure would obviate any impacts on coastal processes that may arise</i>” from the expansion of infrastructure seaward. The proposed new deck is in line with the general development setback line of the area.</p> <ul style="list-style-type: none"> • The eastern edge of the new timber deck and the start of the geofabric wall provides the development setback line for the property. Any future development on site must take place leeward of this line. 	DEV	
Establishment of a geofabric wall as dune defence structure.	Incorrect construction methodology used to construct the geofabric wall, creating a larger development footprint than necessary within the active coastal zone.	<p>To avoid unnecessary interference within the active coastal zone during the construction of the sea defence system, the following is required:</p> <ul style="list-style-type: none"> • The establishment of the geofabric wall must only take place when the beach is inflated (i.e. during summer). • Vehicles may only drive on the beach during low tide and must drive below the high-water mark of the sea to reduce disturbance to the beach environment. • The ECO must be available to monitor the construction of the sea defence system daily. 	CON ECO	

⁴ Coastal processes identified in the “Best Practices for Coastal Development in KwaZulu-Natal” guideline that may be potentially impacted by coastal residential developments.

Expansion of residential infrastructure & establishment of geofabric wall at 31 Little Maritzburg Road.	Climate change and rising sea levels having a medium to long-term impact on infrastructure on site.	Climate change is anticipated to include a rise in sea level as well as an increase in severe storm events. An approximate maximum increase in sea level of 0.8m is expected over the next 25 years. <ul style="list-style-type: none"> The proposed geofabric defence system must incorporate measures to defend the site under the projected rise in sea level of approximately 1m. 	CON	
Expansion of residential infrastructure & establishment of geofabric wall at 31 Little Maritzburg Road.	Increase in hard surfaces resulting in high velocity stormwater runoff onto the beach and dune environment.	There is existing infrastructure on site to manage stormwater, including an onsite soakpit in front of the existing house. Stormwater runoff from the new roof extension will be connected to the existing stormwater network. As recommended by the geotechnical engineer: <ul style="list-style-type: none"> The existing soakaway pit must be increased by 1m³ for every 40m² of new house surface area. Rainwater must be allowed to percolate on site underneath the new timber deck. This is to promote stormwater infiltration and groundwater recharge. All stormwater must be attenuated on site and must not be discharged out the front of the property. 	ENG	
Site Camp	Incorrect placement of the site camp indirectly impacting environmentally sensitive areas (i.e. adjacent beach / coastal environment).	<ul style="list-style-type: none"> The site camp must be located on the platform, on the leeward side of the existing dwelling. Signage is to be erected outside site camp indicating relevant contact details of responsible person in case of complaints or emergencies after hours. 	CON	
Record Keeping	Proof of safe disposal & sustainably sourced material.	The following documents must be retained on site for auditing purposes: <ul style="list-style-type: none"> Environmental Authorisation Environmental Management Program Environmental Audits for the site A full inventory of all hazardous materials must be retained on site with the respective Material Safety Data Sheets Safe disposal slips for waste (general, hazardous and chemical toilets) Proof of raw material sourcing (i.e. building sand, gravel etc.) Environmental training registers Record of incidents on site, including photographs (if applicable) Any other permits, licenses or approvals that may be applicable to the site. 	CON	
Vehicles & Equipment	Disturbance to areas adjacent to construction site and contamination of environment.	<ul style="list-style-type: none"> Major vehicle servicing is not permitted on site. Only emergency / minor repair work is permitted. A drip tray must be used to capture any spills during emergency / minor repair work. 	CON	

		<ul style="list-style-type: none"> • Construction vehicles must not be washed on site. 		
Material Storage Areas & Stockpiles	Sedimentation risk.	<ul style="list-style-type: none"> • Material stockpiles must not exceed 2m in height, must be covered, or grassed to prevent erosion caused by exposure to heavy wind or rain. • Stockpiling of material must not take place seaward of the existing dwelling where the bank drops down to the beach. 	CON	
Waste Management	Littering and improper storage / disposal of waste accumulating on site or within the adjacent coastal environment.	<ul style="list-style-type: none"> • All waste generated on site must be disposed of in the designated waste management area to ensure that it is not blown around the site onto the beach or into adjacent residential properties. • The waste management area must not be located at the edge of the platform where the dune drops down towards the beach. • All waste must be stored under cover to prevent rain ingress and/or waste from being blown around site. • No waste must be buried or burnt on site 	CON	
	Hydrocarbons or other liquids / chemicals entering the surrounding environment.	<ul style="list-style-type: none"> • Potentially hazardous substances⁶ to be stored in a fenced off area that is undercover to prevent contamination of rainwater. • All potentially hazardous substances must be stored, in a bunded area (110% capacity of largest container) with an impermeable surface to prevent soil contamination during handling. • The use of hydrocarbons and other potentially hazardous liquids on site must be managed in accordance with section 4.3 of the EMPr. • No bulk storage of fuel is permitted on site (>30m³). • A full inventory of all hazardous materials must be retained on site with the respective Material Safety Data Sheets. • Decanting of potentially hazardous substances must be carried out within the confines of a drip tray / similar or using a hand pump. • Hazardous waste must be disposed of at a registered hazardous landfill site. • Cement mixing must take place on a hard surface that is protected from stormwater runoff. 	CON	
	Improper placement and management of toilet facilities potentially impacting the coastal environment and becoming a nuisance to surrounding residents.	<p>Sufficient toilet facilities must be provided on site to prevent construction staff from utilising the surrounding areas.</p> <ul style="list-style-type: none"> • On-site toilets will be provided for domestic purposes during construction phase (chemical or connected to municipal sewerage pipeline). • Toilets must be located within the property boundaries (i.e. not near the fore dune in front of the house). 	CON	

⁶ Hazardous substances refer to substances scheduled in the Hazardous Substances Act (1973) and Hazardous Chemical Substances Regulations (1995) and include paint, oils, fuels, solvents, pesticides.

		<ul style="list-style-type: none"> • Staff must use the toilets provided and must not use any other areas on site as toilet facilities. • Toilets should be screened from the neighbours as far as is practically possible. • Ablution facilities must be checked regularly and kept in a clean state. • No pit latrines are permitted on site. 		
Spills Incidents	& Greywater / hydrocarbons / chemicals storage and use on site having the potential to pollute the adjacent beach environment.	<ul style="list-style-type: none"> • Any spills on site must be cleaned up immediately using the Spill Response Procedure provided in section 5.4.1 of the EMP. • The seven step Spill Response Procedure must be included in the ECO's environmental toolbox talk. • No vehicles or equipment must be washed on site. • Drip trays must be available near the hazardous storage area and where hazardous materials are being used on the site. • A Spill Kit / similar must be available near the hazardous storage area. 	CON	
Dust Emissions	& Dust & emissions becoming a nuisance to surrounding residents.	<ul style="list-style-type: none"> • During high winds, dust suppression must take place using water carts / hose to prevent excessive dust on site. • Any fine materials stockpiled on site must be covered to prevent dust from being blown around. • Material transported to site on the back of trucks must be covered, • A complaints register must be maintained on site and any complaints received addressed timeously. • A shade cloth fence / other screening techniques must be used to reduce dust from entering other properties, where required. • All construction vehicles and equipment must be well maintained to reduce emissions generated on site. 	CON	
Noise	Noise form construction machinery, equipment and staff becoming a nuisance to surrounding residents.	<ul style="list-style-type: none"> • All construction vehicles and equipment must be well maintained to reduce noise on site. • All construction vehicles and equipment must be fitted with standard silencers. • No construction vehicles or machinery to operate outside of construction working hours (06:00 – 18:00). • Neighbours to be advised prior to work being done outside the above times. • A complaints register must be maintained on site and any complaints received addressed timeously. 	CON	
Cultural Heritage	/ Items of historical, archaeological or cultural significance destroyed or disturbed during excavations.	<ul style="list-style-type: none"> • During earthworks, should any objects with historical, archaeological or cultural significance be uncovered, all work in this area must cease and the heritage authority, AMAFA, notified. • Objects with historical, archaeological or cultural significance must not be destroyed or removed from site without prior permission from AMAFA. 	CON	

		<ul style="list-style-type: none"> Should any human remains be discovered, all work in this area must cease and the South African Police contacted for further direction. 		
Alien Vegetation	Proliferation of exotic species on site and within adjacent dune environment.	<p>Construction activities, primarily vegetation clearance, typically provides an opportunity for the proliferation of exotic species within the disturbed area. The establishment and spread of alien invasive species within the disturbance footprint must be managed throughout the construction phase by the Contractor.</p> <ul style="list-style-type: none"> The “<i>Eradication of Alien Invasive Plant</i>” Management Plan must be implemented on site during construction (section 5.4.2 of the EMPr). Alien invasive species must not be permitted to establish on site or on the fore dune. 	CON	

4.4. REHABILITATION / POST CONSTRUCTION

Once construction is complete on site, the Contractor and ECO must ensure that the mitigation measures listed in the table below are adhered to. This will ensure that there will be no residual impacts on the environment remaining once construction is complete.

Table 7: Impact Management Actions to be Adhered to Once Construction is Complete.

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
Post-Construction Audit	To ensure the site is stable and there are no outstanding environmental non-compliances that need to be corrected by the Contractor.	<ul style="list-style-type: none"> The ECO must carry out a post-construction inspection of the site once construction is complete. Clearance from the ECO must be obtained to ensure there are no outstanding environmental non-compliances prior to the Contractor vacating the site. The following areas must be audited by the ECO in the post-construction inspection: <ul style="list-style-type: none"> No waste / litter remaining on site; There is no evidence of spills or building rubble remaining on site; There are no left over building material remaining on site; All exposed surfaces have been rehabilitated / landscaped to avoid sediment wash away; Stormwater management has been formalised; There is no evidence of erosion; and No environmentally sensitive areas, indicated in Figure 2, have been damaged. If damage is evident, rehabilitation measures must be prescribed by the ECO and carried out by the Contractor. 	CON & ECO	
Establishment of a geofabric wall as dune defence structure.	Loss of approximately 180m² of indigenous dune vegetation from within the critically endangered Northern Coastal Grasslands ecosystem.	During construction of the sea defence structure, backfilling will take place resulting in the loss of dune vegetation. As per the findings of the Beach and Coastal Assessment, the current state of the dune vegetation is highly transformed and is described as “ <i>gardenscape</i> ” being comprised of <i>Carissa macrocarpa</i> and <i>Chrysanthemoides monilifera</i> . Both species are related to leeward portions of the dune form. Other species present include <i>Gazania rigens</i> and <i>Carpobrotus dimidiatus</i> , which are more common	DEV	

		<p>seaward psammoseral species. The exotic <i>Sisal americana</i> is also evident. The loss of this vegetation is of negligible significance from a species diversity perspective. The stabilising function provided by dune vegetation will be replaced by the geofabric wall however:</p> <ul style="list-style-type: none"> • Once construction of the geofabric wall is complete, exposed sand surfaces must be rehabilitated using indigenous dune vegetation (see mitigation measures provided for Impact 3c below). 		
	<p>Planting of 180m² vegetation and placing of material on dune surface within the littoral active zone.</p>	<ul style="list-style-type: none"> • Once the sea defence structure has been established and dune sand repacked onto the slope, the bank must be re-vegetated with indigenous species common to the Subtropical Seashore vegetation type. • The choice of species must be done in consultation with the ECO and may include <i>Scaevola plumieri</i>, <i>Phyllocladus teretifolius</i>, <i>Gazania rigens</i> and <i>Canavalia rosea</i> (all common to the vegetation type). • The planted dune vegetation composition must align with the established dune vegetation on adjacent properties. • The applicant is responsible for ensuring the long-term survival of the dune species. • Any emergence and spread of exotic species must be addressed through the implementation of the Alien Invasive Plants Eradication Management Plan (section 5.4.2. of the EMPr). <p>The planting of indigenous dune species is a positive impact and will improve the current level of biodiversity on site.</p>	<p>DEV & CON</p>	
<p>Expansion of residential infrastructure & establishment of geofabric wall at 31 Little Maritzburg Road.</p>	<p>Placement of the structure within the shoreline altering drivers of coastal process (wind & wave), interruption of sediment transport regime; and alteration of habitat / eco-morphology (SDP, 2021).</p>	<p>As per the SDP Beach and Coastal Assessment, three eco-morphological drivers of coastal systems may be impacted by the proposed sea defence structure; wind and wave, sediment transport dynamics and biotic / vegetated dune form.</p> <p>Wind and wave action may disrupt the defence structure in the medium-term causing erosion.</p> <ul style="list-style-type: none"> • Once construction of the defence structure is complete, dune vegetation must be replaced immediately to stabilise the exposed sand (see recommendations provided above for species composition). <p>The study area is in a transformed portion of coastline and therefore the coastal specialist rates the significance of impacts on the biotic dune environment as low to very low.</p> <ul style="list-style-type: none"> • As stated above, species common to the Subtropical Seashore vegetation type must be replanted on the dune in line with established dune vegetation on the neighbouring properties. 	<p>DEV</p>	

4.5. OPERATION

Provided that the above mitigation measures /actions are adhered to, the operational phase of House Gotz will have a low impact on the surrounding environment. Table 8 provides mitigation measures which are ongoing through-out the lifespan of the project.

Table 8: Impact Management Actions to be Adhered to During the Operational Phase of House Gotz.

Aspect	Impact	Mitigation / Actions	Responsible Person	Compliant (Yes / No)
Expansion of residential infrastructure & establishment of geofabric wall at 31 Little Maritzburg Road.	Climate change and rising sea levels having a medium to long-term impact on infrastructure on site.	<p>Climate change is anticipated to include a rise in sea level as well as an increase in severe storm events. An approximate maximum increase in sea level of 0.8m is expected over the next 25 years.</p> <ul style="list-style-type: none"> The coastal specialist concluded that “the proposed <i>implementation of a coastal protection system on the sea frontage at 31 Little Maritzburg road is considered to be a suitable response to the need to address the potential risk of inundation and damage during any future extreme storm event</i>”. Provided that the geofabric wall across the front of the property is constructed in accordance with the mitigation measures provided above and ties into the existing defence structures on the neighbouring properties, the wall reduces the erosion risk of rising sea levels and severe storm events. Existing and proposed new infrastructure on the property will therefore be protected from the effects of climate change. 	DEV	
	Placement of the structure within the shoreline altering drivers of coastal process (wind & wave), interruption of sediment transport regime; and alteration of habitat / eco-morphology (SDP, 2021).	<p>As per the SDP Beach and Coastal Assessment, three eco-morphological drivers of coastal systems may be impacted by the proposed sea defence structure; wind and wave, sediment transport dynamics and biotic / vegetated dune form. Wind and wave action may disrupt the defence structure in the medium-term causing erosion.</p> <ul style="list-style-type: none"> The coastal specialist concluded that the geofabric wall “<i>will have little impact on prevailing supra tidal and sub tidal coastal processes</i>”⁷. <p>Minor deviations to the sediment transport dynamics are anticipated during construction with the excavation of the dune, beach and intertidal zone. Sediment mobilisation at the point of excavation through the dune may arise.</p> <ul style="list-style-type: none"> Provided the construction methodology used to construct the geofabric wall is adhered (see above), the coastal specialist states that the natural aeolian winnowing will naturally sculpt back the beach⁸. 	DEV	
Expansion of residential	Cumulative impact on the sand sharing system in Shakas	The alteration of the sand sharing system in this area is an existing impact which arose during the 1960’s with the development of the area into an urban complex. 31 Little	DEV	

⁷ Section 7.0 of the SDP “*Beach and Coastal Assessment: Establishment of Structures and Erosion Prevention Measures*” (April 2021).

⁸ Section 6.1.2 of the SDP “*Beach and Coastal Assessment: Establishment of Structures and Erosion Prevention Measures*” (April 2021).

<p>infrastructure & establishment of geofabric wall at 31 Little Maritzburg Road.</p>	<p>Rock, including the sub tidal, intertidal, beach and dune components.</p>	<p>Maritzburg Road is an existing, developed property which is one of the last properties along Little Maritzburg Road to not have a sea defence system to “defend” the frontal dune during high seas and storm events. As such, significant erosion and retreat of the dune towards the existing structure is evident. The establishment of an additional sea defence structure along this stretch of the shoreline has been rated as having very low significance provided that the mitigation measures above and in the EMP are adhered to. This very low significance rating is based on information drawn from the Beach and Coastal Assessment:</p> <ul style="list-style-type: none"> • The geofabric retaining system as a sea defence structure will have little impact on prevailing supra tidal and sub tidal coastal processes⁹; and • Given the implementation of the sea defence structure on the sea frontage of the property, it follows that all activities associated with the expansion of the existing residential infrastructure will have little to no influence on coastal processes¹⁰. 		
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⁹ Section 7.0 of the SDP “Beach and Coastal Assessment: Establishment of Structures and Erosion Prevention Measures” (April 2021).

¹⁰ Executive Summary of the SDP “Beach and Coastal Assessment: Establishment of Structures and Erosion Prevention Measures” (April 2021).

5.0. ENVIRONMENTAL AWARENESS PLAN

This Environmental Awareness Plan describes the manner in which the holder of the Environmental Authorisation must inform all Contractors and employees of the environmental risk which may result from their work; and that the risks must be dealt with to avoid pollution or the degradation of the environment.

5.1. INDUCTION

All Primary Contractors working at 31 Little Maritzburg Road must receive a copy of the Environmental Awareness Plan and sign the register attached stating that they have received a copy of the EMPr and are aware of the environmental risks. Contact details for the Environmental Control Officer (ECO) are provided below if Contractors require any clarification or assistance with the demarcation of sensitive areas (shown in Figure 2).

Table 9: Important Contact Information.

Designation	Company	Contact Person	Contact Details (to be completed on site)
Holder of the Environmental Authorisation	-	Peter Gotz	
Environmental Assessment Practitioner	Confluence Strategic Development	Stephanie Denison	
Environmental Control Officer			
Coastal Specialist	SDP Ecological & Environmental Services	Simon Bundy	
Consulting Engineer	Marula Consulting (Pty) Ltd	Tim Korving	

5.2. ENVIRONMENTALLY SENSITIVE AREAS

Please refer to section 1.3 of the EMPr and Figure 2, which provides a description of the environmentally sensitive areas associated with House Gotz. These areas must be demarcated and avoided during construction. Contractors must be aware of the primary Impact Management Outcome, which is ***to create a sustainable development by preventing construction activities from impacting the sand sharing system and ensuring the long-term defence of the property against climate change (sea level rise and more intense storm events)***.

5.3. BASIC ENVIRONMENTAL TRAINING POINTS

All staff working on site must receive basic environmental training, which includes the items listed below. Please note that the ECO must be available to conduct environmental training should the Contractor prefer.

- Context of House Gotz and the applicability of the EA and EMPr.
- The location of environmentally sensitive features (Figure 2).
- Restrictions associated with the environmentally sensitive features.
- Waste management (general & hazardous).
- No cement mixing directly on exposed soil outside of construction footprint.
- Management of hazardous substances (paint, oil, drip trays, spills etc.).
- Sanitation (i.e. the use of toilets).
- Nuisance to neighbouring properties.

5.4. PROCEDURES FOR HANDLING ENVIRONMENTAL RISKS

All construction staff working on House Gotz must be aware of the procedures listed below.

5.4.1. SPILL RESPONSE¹¹

In the event of a spillage, the following procedure must be adhered to so that there is minimal impact on the surrounding environment. Diesel and oil are the most likely hydrocarbons that will be spilled on the site.

1. **ASSESS THE RISK**
 - WHAT was spilled; and
 - HOW MUCH was spilled.
2. **SELECT THE RELEVANT PERSONAL PROTECTIVE EQUIPMENT (PPE)**
3. **CONFINE THE SPILL**
 - Block, Divert away from sensitive environmental areas and confine spill.
 - Use absorbents or boom in Spill Kit
 - Stop the flow of the spill.
4. **STOP THE SOURCE**
5. **EVALUATE THE SPILL AND IMPLEMENT APPROPRIATE CLEAN UP**
 - Re-assess the spill and decide on most appropriate method of clean up.
 - Absorb spill using materials in Spill Kit or soil / wood chips.
 - Using a broom, rag or other material, scrub the impacted area or using a spade, dig out the contaminated soil.
6. **DECONTAMINATE**
 - All PPE must be removed and disposed of as hazardous waste if contaminated.
 - All rags / materials used during the clean up as well as the actual spilled material must be disposed of as hazardous waste.
7. **REPORTING**
 - Responsible person to determine if the spill constitutes an “incident”, see definition below.
 - All incidents must be reported as per the procedure outlined in section 5.4.3.

¹¹ Seven Step Spill Procedure Accessed from Border Hazmat: Specialised Environmental Cleaning (<http://borderhazmat.co.za/7-step-spill-procedure/>). Accessed on 12th March 2021.



5.4.2. ERADICATION OF ALIEN INVASIVE PLANTS





Alien Invasive Plant (AIP) species rapidly establish in disturbed areas due to the lack of competition from other indigenous species. AIP species rapidly colonise and area and can spread to other areas outside of the development footprint. It is therefore important for construction staff to receive some training on how to identify and remove AIPs before they become a nuisance and negatively impact the rehabilitation efforts underway within the study area. The list below can also be used by the developer when eradicating AIP species during the operational phase of the development.

Notes:

- Mechanical removal of AIPs (i.e. hand pulling / slashing) is preferred above chemical control.
- All mixes given as a percentage (ml per 100 l water/diesel).
- Apply methods either by species or by area i.e. multiple areas, one species or one area, multiple species.
- Autumn and winter - basal stem and cut stump treatments, no foliar spraying.
- Spring and summer - foliar spraying can be done on suitable plants. Rule of thumb - don't spray anything over 1.5 m tall. Spray during the morning (8 am to 11 am) during calm conditions.
- NB PPE when spraying - rubber gloves, goggles, respirator, apron/chemical overall, rubber boots.
- NEVER use diesel for foliar application.
- If in doubt, check the herbicide label.
- Follow up treatment/clearance is essential for effective AIP management.

Table 10: AIP species likely to be associated with the House Gotz site.

Scientific Name	Common Name	Identification Image	Scientific Name	Common Name	Identification Image
<i>Chromolaena odorata</i>	Chromolaena		<i>Ricinis communis</i>	Castor Oil	

<p><i>Cardiospermum grandiflorum</i></p>	<p>Balloon Vine</p>		<p><i>Tithonia diversifolia</i></p>	<p>Mexican Sunflower</p>	
<p><i>Solanum mauritianum</i></p>	<p>Bugweed</p>		<p><i>Sisal americana</i></p>	<p>Sisal</p>	

5.4.3. REPORTING OF ENVIRONMENTAL INCIDENTS

Definitions

"Incident" as defined in NEMA	An unexpected, sudden and uncontrolled release of a hazardous substance, including from a major emission, fire or explosion, that causes, has caused or may cause significant harm to the environment, human life or property.
"Incident" as defined in NWA	Incident or accident in which a substance- (i) pollutes or has the potential to pollute a water resource: or (ii) has or is likely to have, a detrimental effect on a water resource.
"responsible person" as defined in NEMA & NWA	Includes any person who- (i) is responsible for the incident; (ii) owns any hazardous substance involved in the incident; or (iii) was in control of any hazardous substance involved in the incident at the time of the incident.
"relevant authority" as defined in NEMA	(i) a municipality with jurisdiction over the area in which an incident occurs; (ii) a provincial head of Department or any other provincial official designated for that purpose by the MEC in a province in which an incident occurs; (iii) the Director-General; (iv) any other Director-General of a national department.

Procedure should an *incident*, as defined above, occur on site:

The responsible person or, where the incident occurred in the course of that person's employment, his or her employer	Complete an Emergency Incident Report (template provided in Appendix 2). The report must be sent to the following personnel within 14 days of the incident occurring. (i) the Director-General of the Department of Environmental Affairs; (ii) the Director-General of the Department of Water & Sanitation; (iii) the South African Police Services and the relevant fire prevention service; (iv) the relevant provincial head of department or municipality; (v) The relevant catchment management agency, if applicable; and All persons whose health may be affected by the incident.
The responsible person or, where the incident occurred in the course of that person's employment, his or her employer, must, as soon as reasonably practicable after knowledge of the incident-	(i) Take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of persons; (ii) Undertake clean-up procedures; (iii) Remedy the effects of the incident; (iv) Assess the immediate and long-term effects of the incident on the environment and public health;

Should the responsible person fail to comply, or inadequately comply with a directive received by a relevant authority, there be uncertainty as to who the responsible person is; or there be an immediate risk of serious danger to the public or potentially serious detriment to the environment, a relevant authority may take the measures it considers necessary to contain and minimise the effects of the incident; undertake clean-up procedures; and remedy the effects of the incident. A relevant authority may claim reimbursement of all reasonable costs incurred by it in terms of subsection (8) from every responsible person jointly and severally.

APPENDIX 1

EMERGENCY INCIDENT REPORT TEMPLATE