



DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

In terms of the National Environmental Management Act (NEMA, Act 107 of 1998) as amended and EIA Regulations 2014, as amended.

PROPOSED MUIZENBERG BEACHFRONT REFURBISHMENT, MUIZENBERG, CAPE TOWN

DEA&DP REF NO.: 16/3/3/1/A2/22/3014/23

APPLICANT

CITY OF CAPE TOWN: COSTAL
MANAGEMENT AND ENVIRONMENT

MAY 2023

DRAFT FOR PUBLIC PARTICIPATION

17 MAY TO 15 JUNE 2023

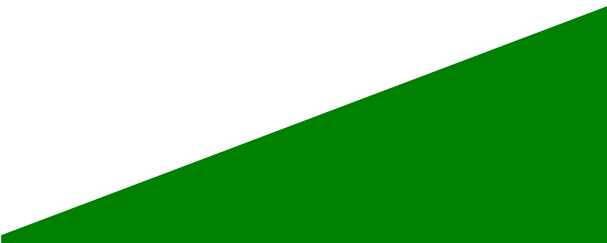
Written comments should be submitted to the
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REPORT DETAILS



DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

Report title:	Proposed Muizenberg Beachfront Refurbishment, Muizenberg, Cape Town: Draft Environmental Management Programme
Date:	May 2023
Prepared for:	City of Cape Town: Coastal Management Branch
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Author:	Tarryn Solomon (Registered E.A.P. no. 2019/1671)
Assisted by:	Tom Smyth B.Sc. (Hons) Biological Science B.Sc. Biology and Ocean & Atmospheric Sciences
Purpose of report:	<p>This Environmental Management Programme Proposed Muizenberg Beachfront Refurbishment, located on several erven in Muizenberg, Cape Town, is prepared as part of an Basic Environmental Impact Assessment of the proposed development.</p> <p>It prescribes control methods to mitigate and manage negative environmental impacts and enhance positive impacts associated with the construction and operation of the development, and provides a programme for monitoring the performance of personnel in applying such methods.</p>
Citation:	Infinity Environmental, 2023. Proposed Muizenberg Beachfront Refurbishment, Muizenberg, Cape Town: Draft Environmental Management Programme

EMPR OVERVIEW

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1 INTRODUCTION

This Environmental Management Programme (EMPr) has been prepared for the proposed Muizenberg Beachfront Refurbishment, in Muizenberg, Cape Town, Western Cape. The preparation of an EMPr is a requirement of the National Environmental Management Act (107 of 1998 as amended, NEMA) and the Environmental Impact Assessment Regulations, 2014 (as amended).¹ This EMPr will be submitted to the Western Cape Government Department of Environmental Affairs and Development Planning (DEA&DP) as part of an application for environmental authorisation for the proposed development referred to above. The project applicant is City of Cape Town: Coastal Management Branch.

Following a decision on the application for environmental authorisation, this EMPr is intended as a “living” document and should continue to be updated regularly, as needed. Importantly, the management actions can and should be reviewed regularly to ensure that the management outcomes defined in the EIA are still being effectively met by these actions.

The purpose of an EMPr is defined in the Integrated Environmental Management (IEM) Guideline Series (Department of Environmental Affairs and Development Planning, 2005) as “an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced”.

It must be noted, that the City of Cape Town has in place a City of Cape Town: Maintenance Management Plan: Dunes and Beaches. This maintenance management plan was prepared by the City of Cape town to enable the immediate and on-going management required for the maintenance and rehabilitation of the beaches along the CoCT coastline. This MMP has been submitted and approved by the environmental authorities and will be implemented for the ongoing maintenance and rehabilitation associated with the Muizenberg beachfront refurbishment.

1.1 OBJECTIVE

The overarching objective, from which the detail contained in this EMPr flows, is to construct and operate the project in a manner that -

- Reduces the risk of pollution or damage to ground and surface water, ecosystems, soils, sand and air;
- Minimises nuisance and disruption to people residing in, working in or commuting through the area; and
- Adheres to all relevant environmental legislation.

The objectives of this EMPr are therefore:

- to prescribe the best practicable control methods to mitigate and manage negative environmental impacts and enhance positive impacts associated with the construction and operation of the development; and
- to provide a programme for monitoring the performance of personnel in applying such methods.

¹ GN. No 326 of 2017

1.2 PROJECT DESCRIPTION

The proposed Muizenberg Beachfront refurbishment is a multifaceted project, comprising several (partially separate) components. These can be distinguished into two parts – (1) The replacement of the existing coastal defence structures (The wooden revetment, concrete seawalls, Surfers' Corner stone steps, and accompanying promenade) with a new coastal defence structure (and promenade) designed to withstand the impacts of climate change induced sea level rise and protect landward infrastructure in the area; (2) The refurbishment of the public space and facilities landwards of the coastal defence structures. The new coastal defence structure will comprise a concrete stepped revetment and 3m wide promenade. It will replace the entire length of the old coastal defence structures. The use of concrete is necessary in order to sustain the harsh marine conditions and expected increase in wave energy in future and to provide long-term robust coastal defence infrastructure.



Figure 1.1: Landscape Plan for the proposed refurbishment of the Muizenberg Beachfront area. Refer to Appendix B1.1 for a larger-scale drawing.

To mitigate the visual impact of introducing concrete, a sand-coloured exposed aggregate finish will be used for the promenade and stepped revetment as opposed to a typical grey concrete finish. This will provide a more natural earthy gravel look and feel, tying into the exposed aggregate concrete used in the beachfront area. Areas landward of the 3m wide concrete promenade will be surfaced with segmented clay pavers similar to the existing landward spaces.

The new coastal defence structure and associated promenade will provide effective protection

from the impacts of climate change induced sea level rise whilst also improving universal access to the beach and surrounding amenities. The central promenade will have a universal access ramp onto the beach to allow for greater inclusion and eased adaptive beach and surfing opportunities. The ablutions, showers, play area and entire promenade will be universally accessible. Additionally, a universal access ramp connecting the western parking lot to the promenade will be installed.

Concrete Stepped Revetment

The stepped revetment will provide a combination of general beach access steps, generous seating steps and larger open seating spaces, as well as the widened promenade. The stepped revetment provides the required coastal protection, recreational seating area as well as beach access along its length (Figure 3, 4). The main promenade will be set back two meters landward from the existing promenade. The alignment of the Point (corner) steps area will also be retreated landward of the existing alignment. Retreating the Point steps widens the beach at this, connecting the two beaches as it once was prior to the construction of the Point.

A modular pre-cast design has been used for the main (straight) section of the stepped revetment/promenade. The pre-cast concrete stepped revetment blocks have been designed in a way that allows them to be retreated or removed completely if necessary. While it is currently not predicted that any retreating or removal of the revetment/promenade will be necessary in the foreseeable future, this mobile design accounts for all future unpredictable possibilities. Additionally, the use of precast "modules" will minimize construction time along the main beachfront area, helping to prevent unnecessarily long inconvenience to the public. The Point section will be cast on site, thus will not be moveable due to various engineering and design-related complexities.

The concrete promenade and stepped revetment will include the following design features:

- The layout of the steps in the corner areas will have a round and smooth corner design as opposed to the jagged step widenings originally proposed.
- A fine, exposed aggregate surface finish and sandstone/light brown colour will be used as a concrete finish.
- The universal beach access ramp will be positioned at the central plaza and will be wide enough to allow easy deployment of a beach access mat.
- Seating steps of 0.5m (height) x 1.0m (width) will be implemented along the main longitudinal promenade area.
- Seven flights of 5m wide general beach access steps (0.167m x 0.333m) with handrails will be implemented. These will be incorporated into the stepped revetment and spread along the length of the beach.
- Large sandstone blocks from the historic corner steps will be reclaimed and incorporated as steps into the landscaping where applicable.
- The stepped revetment will be designed in such a way that the block units are removable and reusable in the future, if required.
- Articulated concrete black mattresses will be used for scour protection (to protect the toe of the structure). These scour protection structures are not expected to be exposed as they will be buried below the modelled storm erosion levels.

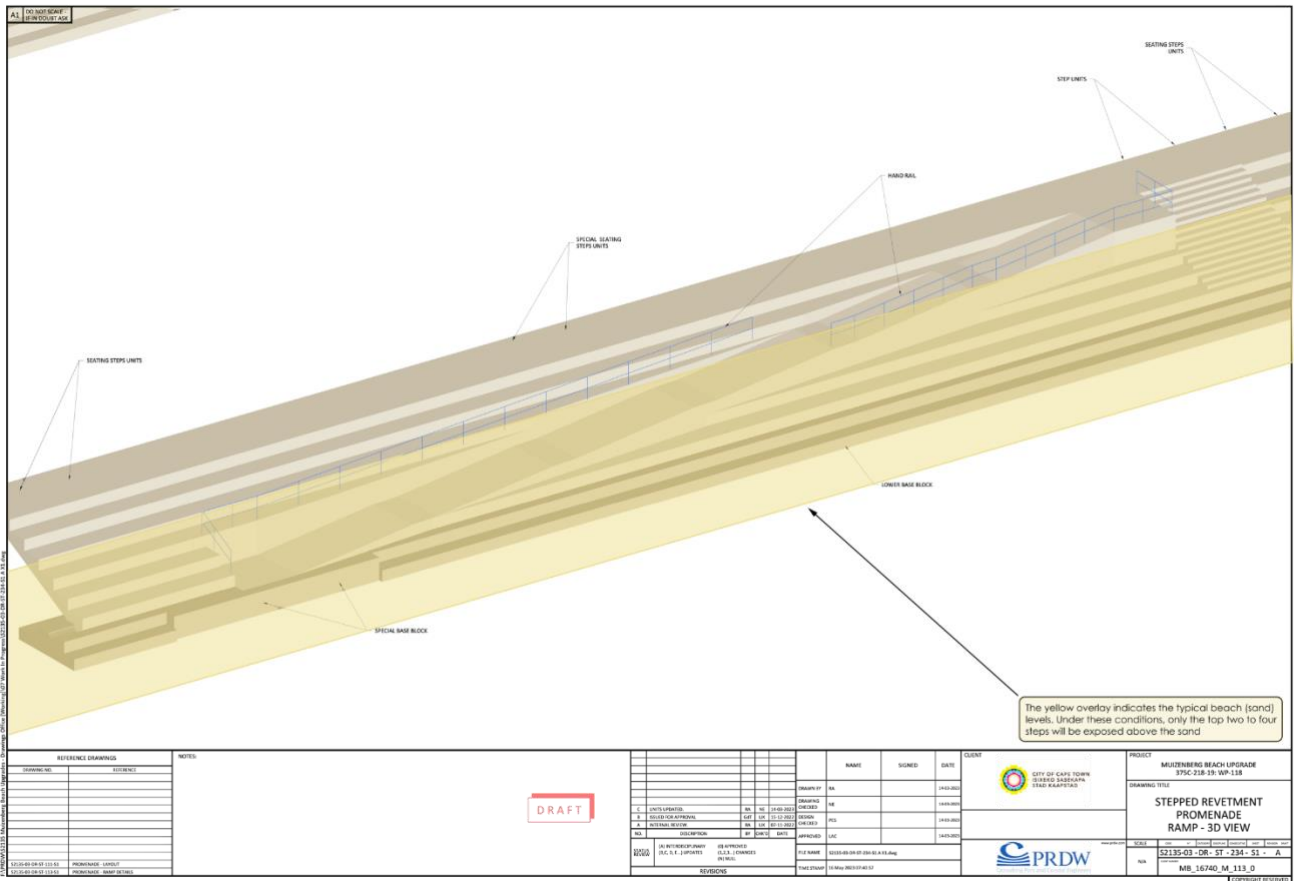


Figure 1.2: Three dimensional render of the central section of the proposed stepped concrete revetment with the universal beach access ramp. Most of the structure will remain buried under the sand. Under typical beach levels only the top two to four steps will be exposed (as indicated by the yellow overlay). The remaining structures allows for equal functionality during lower beach level scenarios. Refer to Appendix B1.2 for a larger-scale drawing.

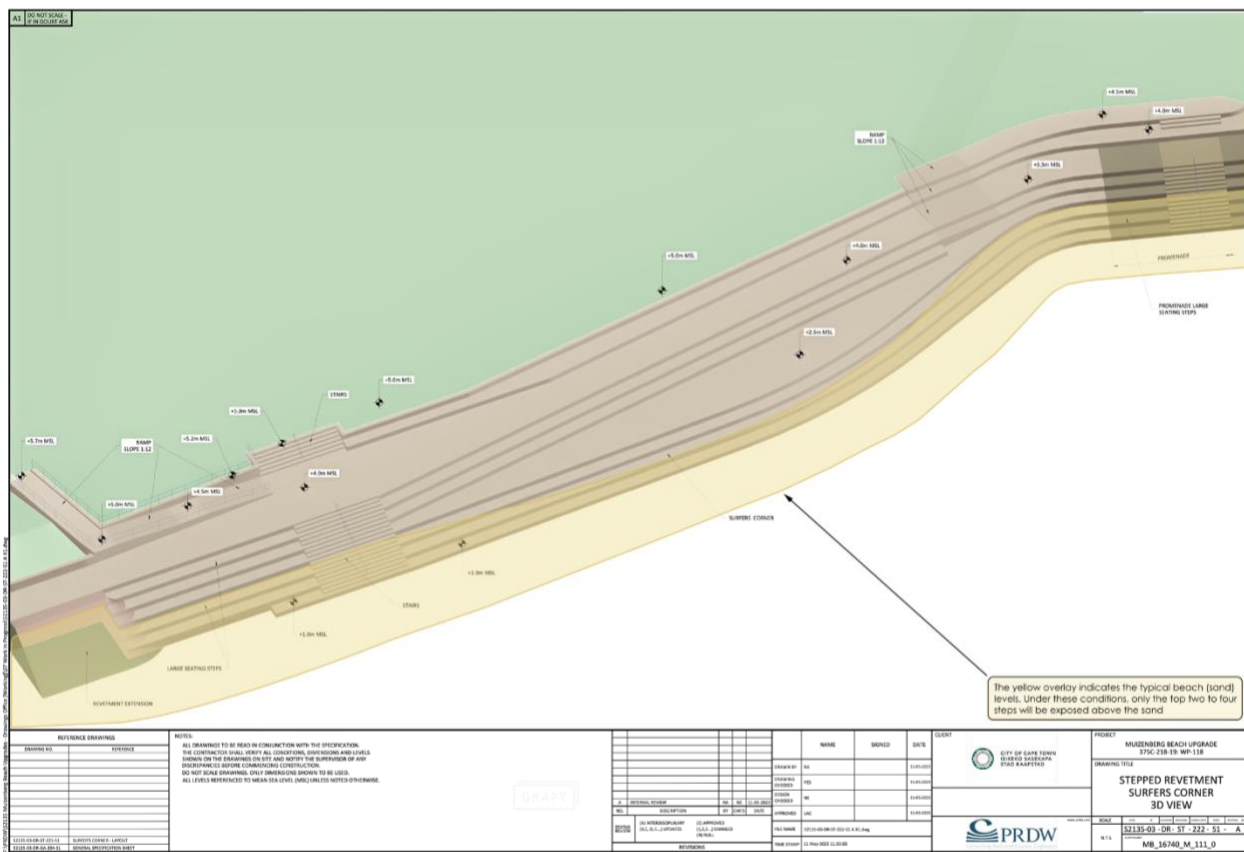


Figure 1.3: Three dimensional render of the curved Surfers' Corner section of the proposed stepped concrete revetment. Most of the structure will remain buried under the sand. Under typical beach levels only the top two to four steps will be exposed (as indicated by the yellow overlay). The remaining structures allows for equal functionality during lower beach level scenarios. Refer to Appendix B1.3 for a larger-scale drawing.

Parking areas

The proposed refurbishment will formalise the existing gravel parking area adjacent to the railway line (Figure 5). The parking area at the eastern end of the proposed development site (near the Pavilion) will be reconfigured, and additional parking bays will be demarcated. "Formalising" refers to the surfacing of the parking area, demarcation of parking bays, and optimization of traffic movement and circulation. Services such as area lighting and stormwater drainage will be added. The refurbishment will only be in spaces that are currently used for parking (the existing western gravel parking lot and paved areas next to the Pavilion).

The retreat and removal of the Surfers' Corner masonry steps will decrease the total area used for parking. By rationalising the parking layouts, approximately the same number of parking bays are provided on the reduced footprint. Rationalisation will enable the demarcation of parking and vehicle circulation routes, in addition to the implementation of pedestrian walkways and raised intersections. Additional parking bays will be demarcated in the eastern parking area next to the pavilion. This will reduce pedestrian-vehicle conflicts and provide a pedestrian-oriented area.

In order to maintain and enhance the character of the Muizenberg Beachfront, the parking area will be surfaced with the same clay pavers as the existing parking bays. These clay pavers perform well in coastal environments and will result in lower local temperatures compared to asphalt and dark gravel parking areas. All parking will remain free of charge. The total number of parking bays in the precinct will remain very similar, although a few parking bays may be lost in one area and added in another.

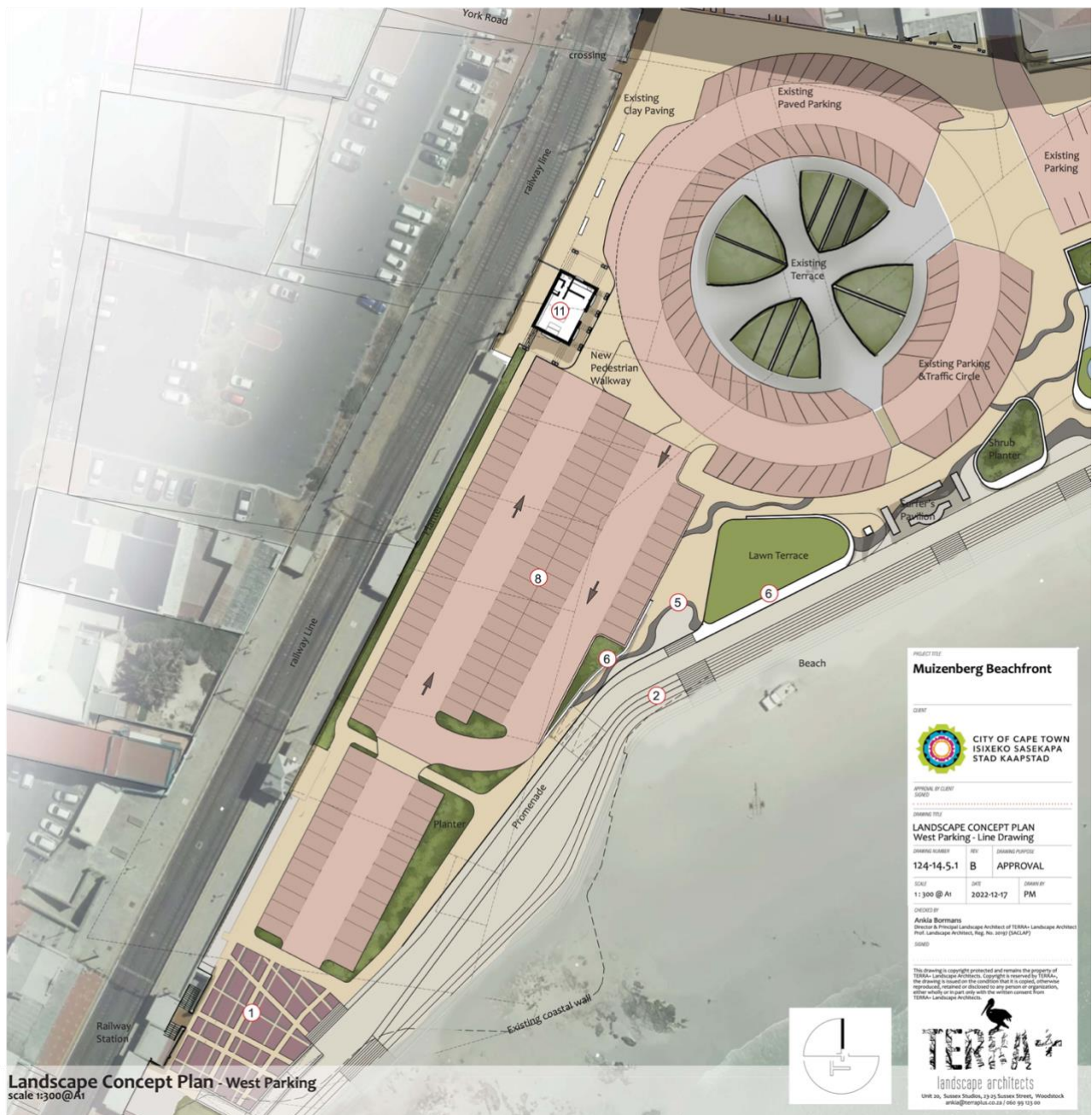


Figure 1.4: Proposed plan of the formalised western parking area and station forecourt area. Refer to Appendix B1.4 for a larger-scale drawing.

The station forecourt

The station forecourt on the east side of the railway line will be upgraded (Figure 5). New paved surfaces will provide a welcoming and safe pedestrian space and enhance the context of the historic railway station building. Paving patterns will complement existing and new alignments of the building and coastal steps and provide clear distinction between the pedestrian and vehicular zones. Lighting and street furniture will be added to the new paved grid.

Playground

The proposed project includes the refurbishment of the playground and surrounding landscape areas (Figure 6). The playground will include the following:

- Sandstone or Granite Boulders: Placed within planted 'dune'. For seating, pathway through vegetation, hopping and local material interest.
- Low Coastal/ Dune Vegetation: Mixed succulent ground cover and ornamental dune grasses.
- Artificial Lawn: 'Long blade' lawn to provide a soft and cooler surface. This also decreases irrigation requirements.
- Rubber Play Surfaces: Shades of blue and 'sand' colour rubber matting, to recommended safety thickness standards. These will be UV and weather resistant.
- Tinted in-situ cast concrete surface: Brushed concrete with tinted beige colour.
- Stone insets: Sandstone or granite stone laid flat into surface of artificial lawn or concrete. For steppingstones, and playful materials.
- Timber or Concrete 'Logs': Steppingstone logs placed at differing heights.
- 'Octopus' activity gym: Combination of netting, and log poles for climbing, balancing, pulling, swinging, hanging.
- 'Sea anemone' activity gym: Combination of log poles, custom made platform, tube slide, for crawling, sliding, exploring, viewing, climbing.
- 'Kelp forest': Combination of vertical log poles and netting.
- 'Sea Turtles': Sculptural objects for sitting, riding.

Due to the prevailing South-Easter wind, the design team had to choose between a visual linkage to the beach so that parents can observe children, or that parents seated in the playground could observe the sea and have wind shelter. The safety aspect of the visual linkage was prioritised. Note that the height of landscaping elements will be refined during the final design phases to further optimise view corridors. To prevent corrosion, steel use will be minimised, and corrosion resistant materials will be used where required.

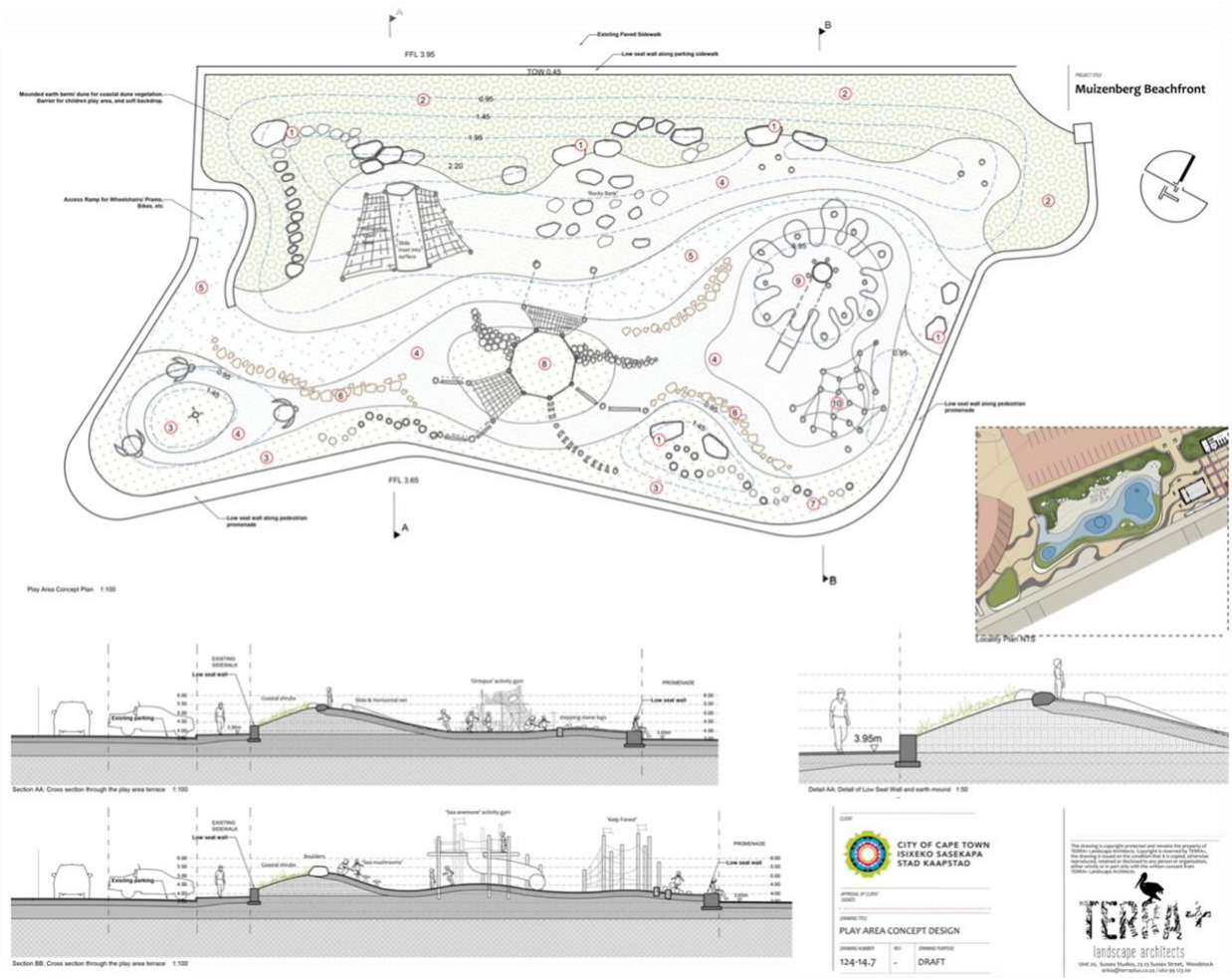


Figure 1.5: Proposed layout of the new playground. Refer to Appendix B1.5 for a larger-scale drawing.

Paved areas

All paved areas landward of the concrete promenade and stepped revetment will be surfaced with clay pavers, matching the existing paving style (Figure 7). Repairs to existing walkways will be undertaken where required. A short portion at the start of the St James walkway will be realigned to tie the new promenade and the existing walkway together.

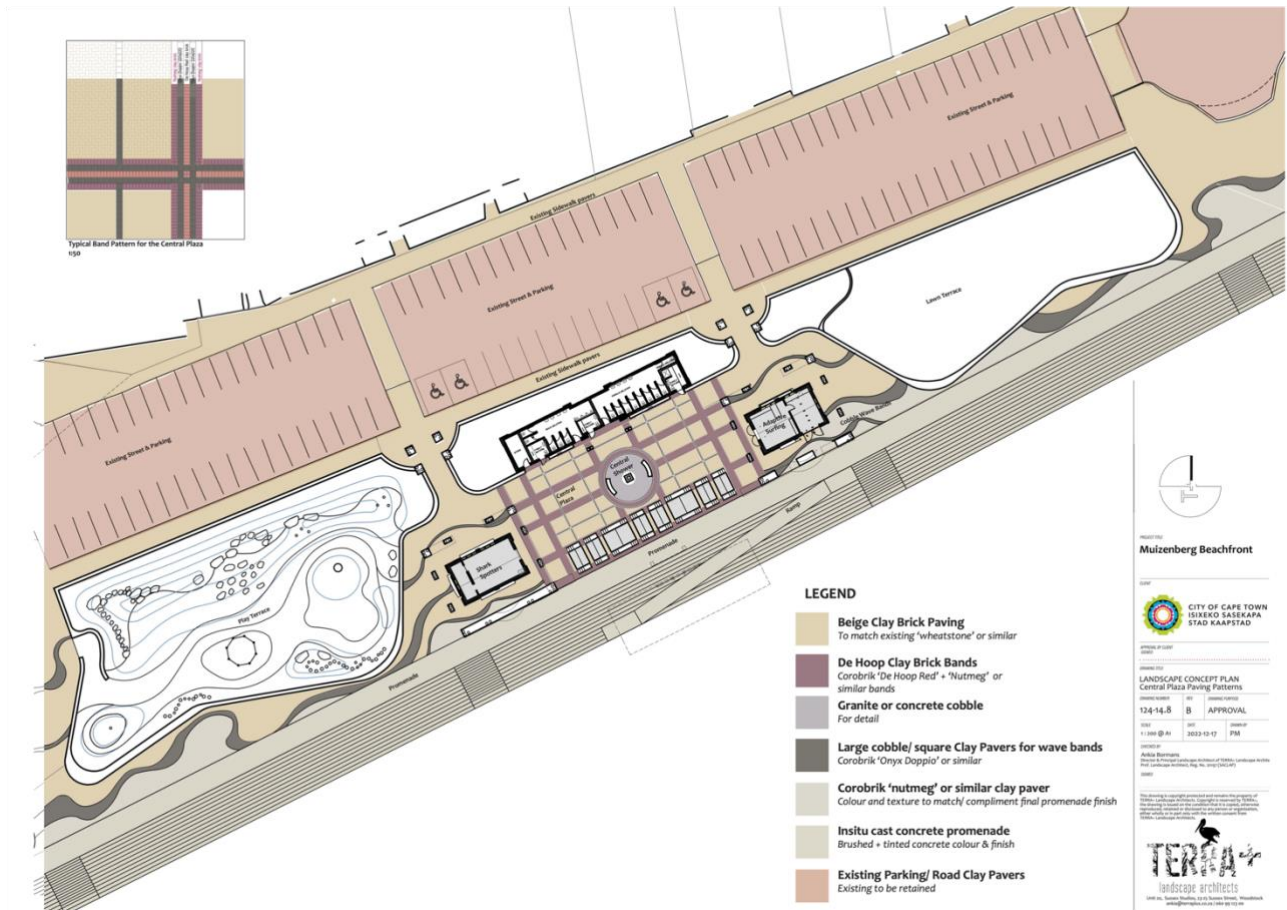


Figure 1.6: Proposed paving patterns of the central plaza area. Refer to Appendix B1.6 for a larger-scale drawing.

Soft landscaping

The soft landscaping of the area will also be refurbished. This includes the incorporation of locally indigenous vegetation and grassy areas in the project area. Lawn and indigenous vegetation will be planted as trees are not climatically suited to harsh coastal environments. Lawn areas will be kept to a minimum in order to reduce irrigation and maintenance requirements. Any lawn areas included will comprise of hardy indigenous coastal grass species that will be able to endure the harsh coastal climate of Muizenberg. Stormwater runoff will be directed into the planted areas for irrigation where possible. There will also be automatic irrigation for when there is not sufficient runoff.

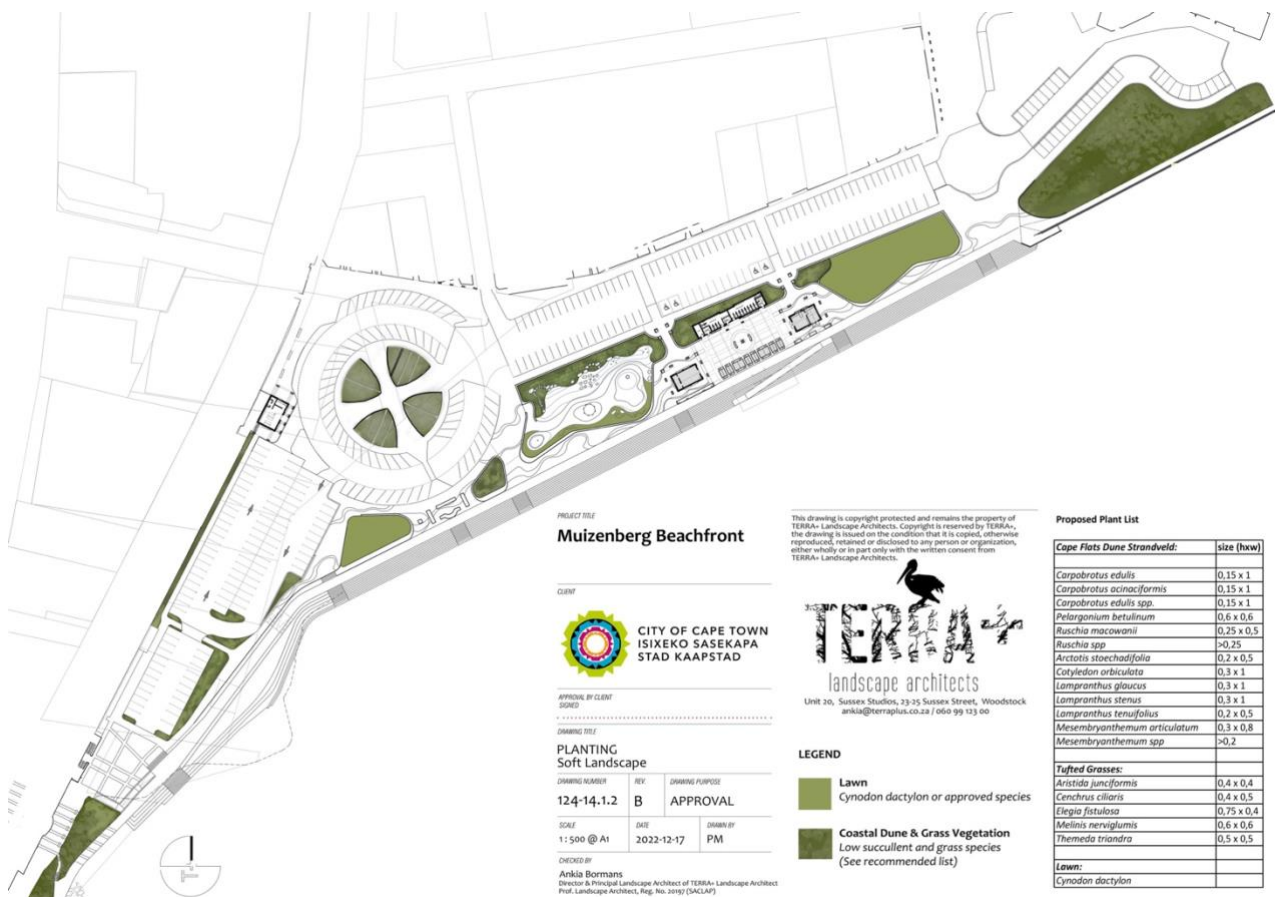


Figure 1.7: Proposed layout of the soft landscaping across the proposed Muizenberg Beachfront area. Refer to Annexure B1.7 for a larger-scale drawing.

Colourful beach huts

The City of Cape Town acknowledges the character value of the colourful beach huts and intends to keep all eight huts in the main beachfront area. They will be relocated in the refurbishment as their current location interferes with the construction of the proposed stepped revetment and promenade. All eight beach huts will be centrally located along the promenade, where they will act as a wind break to the central shower area. Their arrangement will follow the historical rhythm of small-small-large, as historically constructed and recently implemented at St James. The beach huts will be accessible from the shower plaza and the beach in order to create an inviting environment on both sides of the beach huts. Doors will have internal locks to ensure user safety.

Ablution facility

The proposed refurbishment will demolish the existing ablution building and construct a new ablution building landward of the proposed coastal defence structures. It will be located at the central shower plaza but will be shifted landwards of the shower area to be protected by the

proposed stepped revetment. The design shall maintain the existing architectural style and include universal access toilets/family changing rooms. The outside showers will be wheelchair accessible, and the ablution building will include a dedicated wheelchair accessible shower. A bench will be provided along the outside of the building for general use. Mosaic artwork will be incorporated into the ablution building interior as well as on the outdoor shower and other landscaping elements where applicable.

It is necessary to relocate the ablution building as it is currently built seaward of the coastal defence structures and is being damaged by sustained wave action as a result of being in the littoral active zone. Attempting to protect the building in its current location would result in the loss of beach around the building and negatively affect sediment dynamics in the area.

Pergola

Due to the alignment and setback of the proposed coastal defence structure (stepped revetment) and promenade, the pergola structure close to the corner will be demolished and rebuilt (like for like) a few meters landward of the current location. Details and design of the pergola will be maintained, conserving the heritage design and aesthetic features.

Buildings

The two existing small buildings (currently used by Shark Spotters and Waves for Change) in the central shower area will remain in place. The building currently in use by the Waves for Change NGO will be adapted to be used by an NGO that will provide universal beach access and adaptive surfing opportunities. This building will be used as it is near the universal beach access ramp and can be used to store necessary accessibility equipment such as the beach access mats. The Waves for Change NGO will move to a newly constructed building near the northern corner of the newly rationalized western parking area (by the main circle).

Services

The proposed refurbishment includes the realignment of underground sewer and storm water pipelines where needed. This is not an upgrade to service capacity in the area; the realignment of these services is required to enable the construction of the proposed coastal defence structures. This includes the realignment of 65m of the DN375 and 90m of the DN300 gravity sewer pipelines (currently located next to the concrete seawalls and in the stone steps in the South-West corner of the site), as well as the lengthening and realignment of a portion of the DN675 stormwater outlet. The function of these pipelines will remain the same following the refurbishment.

The refurbishment will add area lighting to the proposed formalised parking areas and along the promenade. Service connections to the new ablution and NGO buildings will also be included in the project.

See Appendix B7 for details on present and proposed area lighting across the site. See Appendix B8 for a full schematic of existing and proposed service layouts.

Central Plaza

The central plaza area will be shifted a few meters landward to allow for the installation of the new coastal defence structure. The key features of the plaza, such as the showers, open space, and unique paving patterns will be retained.

See Figures 1.1 and 1.6, and Appendix B1.10 for details on the layout of the central plaza.

1.3 ENVIRONMENTAL SENSITIVITIES AND SITE LAYOUT

A sensitivity map is provided in Figure 2.1, showing the proposed development footprint superimposed on the environmental sensitivities.



Figure 2.1. Layout alternative superimposed on Sensitivity Map

1.4 AUTHOR(S) OF THE EMPr

This EMPr has been compiled by the Environmental Assessment Practitioner (EAP) based on the assessment reports provided by various specialists on the team as well as best practice environmental management requirements. Details of the authors are as follows:

Table 1.1. Environmental Assessment Practitioner

EAP	Professional registration	Qualification	Years of experience
Tarryn Solomon	Registered E.A.P. # 2019/1671	B.Sc. Environmental and Water Science	15+

1.5 IMPACTS AND MITIGATION MEASURES IDENTIFIED DURING THE EIA

Based on the EAP assessment, and where relevant specialist studies, the potential direct impacts, as indicated in Table 1.3 have been identified, for the design, planning and construction phase of the project. Appropriate management and mitigation measures are included within the EMPr (where required) as per the recommendations made in the specialist studies and the EAP to ensure the potential impacts are adequately mitigated and managed during all phases of the project.

On-going maintenance and rehabilitation aspects will be covered by the approved City of Cape Town Maintenance Management Plan: Dunes and Beaches, dated November 2017.

It should be noted that other impacts for which specialist studies were not undertaken but where mitigation or management actions may be required, are also included in the EMPr.

Table 1.2. Key Impacts identified during the EIA process

Impacts identified and assessed		Mitigation measures
Geotechnical (Groundwater)	<ul style="list-style-type: none"> Wet soil as a result of a high groundwater table will be encountered during construction Beachfront construction will entail working with wet sand/soil as a result of tidal lag 	<ul style="list-style-type: none"> Dewatering to be used where necessary when working at depths below the water table or on the beachfront Ensure required structural quality is achieved despite wet sand/soil conditions
Coastal Environment (Specialist Coastal Modelling)	<ul style="list-style-type: none"> Effective mitigation of the risks posed to the Muizenberg Beachfront area as a result of climate change induced sea-level rise Negligible impact of the new concrete stepped revetment on wave dynamics and sediment transport Positive impact on preventing excessive scour (and resultant damages to coastal defence structures) 	<ul style="list-style-type: none"> No negative impacts were identified, thus mitigation measures are not necessary.
Socio-economic	<ul style="list-style-type: none"> Positive economic benefits on the local production, Gross Geographic Product, employment, and incomes Prevents negative impacts of the no-go alternative on local tourism, events, content creators, property owners, and business owners Positive impact on accessibility to the project area Positive impact on available public amenities Positive impact on opportunity Positive impact on perception of the area Positive impact on job creations (temporary) during the construction phase 	<ul style="list-style-type: none"> No negative impacts were identified, thus mitigation measures are not necessary
Traffic Impact Statement	<ul style="list-style-type: none"> Proposed parking layout will provide improved access and circulation to the parking area The formalization of the parking area will not negatively impact the number of parking spaces available or the amount of vehicle traffic in the area 	<ul style="list-style-type: none"> No negative impacts were identified, thus mitigation measures are not necessary

	<ul style="list-style-type: none"> Conflict between pedestrians and vehicles is effectively minimized by providing sufficient pedestrian walkways along the beachfront 	
Social	<ul style="list-style-type: none"> Impact on sense of place and visual character Land vulnerable to damage as a result of sea-level rise will be protected (both public and private land) It is unlikely that any items with heritage value are present on the site, but it may be possible that such items be discovered during construction. 	<ul style="list-style-type: none"> Special focus has been placed on ensuring the design of the refurbishment does not take away from the sense of place. Public consultation has informed design changes to ensure this. The design language of any buildings being rebuilt will be maintained to prevent significant changes to the character of the public facility buildings Using concrete only where absolutely necessary (coastal defence purpose). Clay paving will be used elsewhere landward of the coastal defence structures. Should any heritage resources, including evidence of graves and human burials, archaeological material or palaeontological material be discovered during the execution of the activities, all works must be stopped immediately, and Heritage Western Cape must be notified without delay.
Construction related impacts (temporary)	<ul style="list-style-type: none"> Negative impact on access to beach (and available beach area) Negative impact on waste generation Negative impact on Dust/wind-blown sand generation Negative impact on noise and vibration generation Negative impact on visual perception Negative impact on traffic Contamination and pollution risk associated with construction occurring in the littoral active zone 	<ul style="list-style-type: none"> Drip trays to be used under stationary vehicles and machinery where possible. A dewatering plan to be developed prior to construction (for construction on the beach and construction landward of the beach in areas that is below the water table). Vehicles must be maintained regularly and kept in a good working order.

	<ul style="list-style-type: none"> • Contamination risk of groundwater that will be exposed during construction • Contamination risk of soil exposed during construction • Berms for construction temporarily affecting wave and sediment dynamics • Decreased parking capacity due to construction • Closure of the public ablution building during reconstruction • Interruption to Waves for Change and Shark Spotters building use during certain construction phases • Positive impact on temporary job creation • Potential for damage or destruction of undiscovered archaeological material buried in the sand below the highwater mark 	<ul style="list-style-type: none"> • Dirty water should be captured, to be re-used where possible. No dirty water is allowed to be discharged into the surrounding environment. • No contaminated or dirty water should be allowed to be discharged to the natural environment. • Construction activities should be limited to the hours specified in the EMPr. • Measures contained in the EMPr to mitigate the generation of dust should be adhered to. • Disruptions to directly affected and adjacent landowners and tenants must be kept to a minimum. • The Occupational Health and Safety Act must be adhered to, to minimise the risk of exposure to occupational hazards. • A construction phasing plan will be implemented (specified in Appendix A the EMPr) to minimize public disruption to beach access • Necessary waste disposal procedures (specified in the EMPr) must be adhered to by all contractors • Necessary waste dust control procedures (specified in the EMPr) must be adhered to by all contractors • Necessary noise and vibration mitigation procedures (specified in the EMPr) must be adhered to by all contractors • The contractor will be responsible for creating detailed traffic accommodation plans (including ensuring necessary parking is available throughout construction) • Environmental training for beachfront construction must be provided to all on-site workers • Groundwater testing must be frequently conducted to ensure it is not being contaminated if spills occur.
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		<ul style="list-style-type: none"> • A strict spill reporting and clean-up procedure must be adhered to (specified in the EMPr). Sites of any spills should be examined by an ECO and necessary soil samples taken if necessary • The phased beachfront construction will ensure the entire beach is not being affected by potential wave and sediment dynamic impacts at once • Alternate parking near the Muizenberg Beachfront should be clearly signposted during construction • The contractor must provide temporary ablution facilities for the public whilst the ablution building is under re-construction • The contractor must provide temporary space (containers) for existing NGO's if and when required • The construction phasing plan will focus on providing the least disruption possible to the Shark Spotters and Waves for Change organisations • A programme of archaeological monitoring must accompany the works to be undertaken in the work area below the high water mark • An archaeologist must be appointed before any work in the Study Area commences. • Should archaeological material be encountered during the works in the Study Area, the archaeologist must assess the find and determine the need for further mitigation. • If human remains are uncovered on site, work must cease immediately, the remains must be left in place and made safe, and the project archaeologist and HWC must be notified in order for the significance of the material to be assessed and a decision taken as to how to deal with it.
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2 APPROACH TO THE EMPr

2.1 STRUCTURE OF EMPr

The EMPr is structured as a set of nested environmental management plans, as shown in Figure 3.1. Aspects of these will be supplemented by more detailed levels of planning as and when the proposed development is implemented, as indicated.

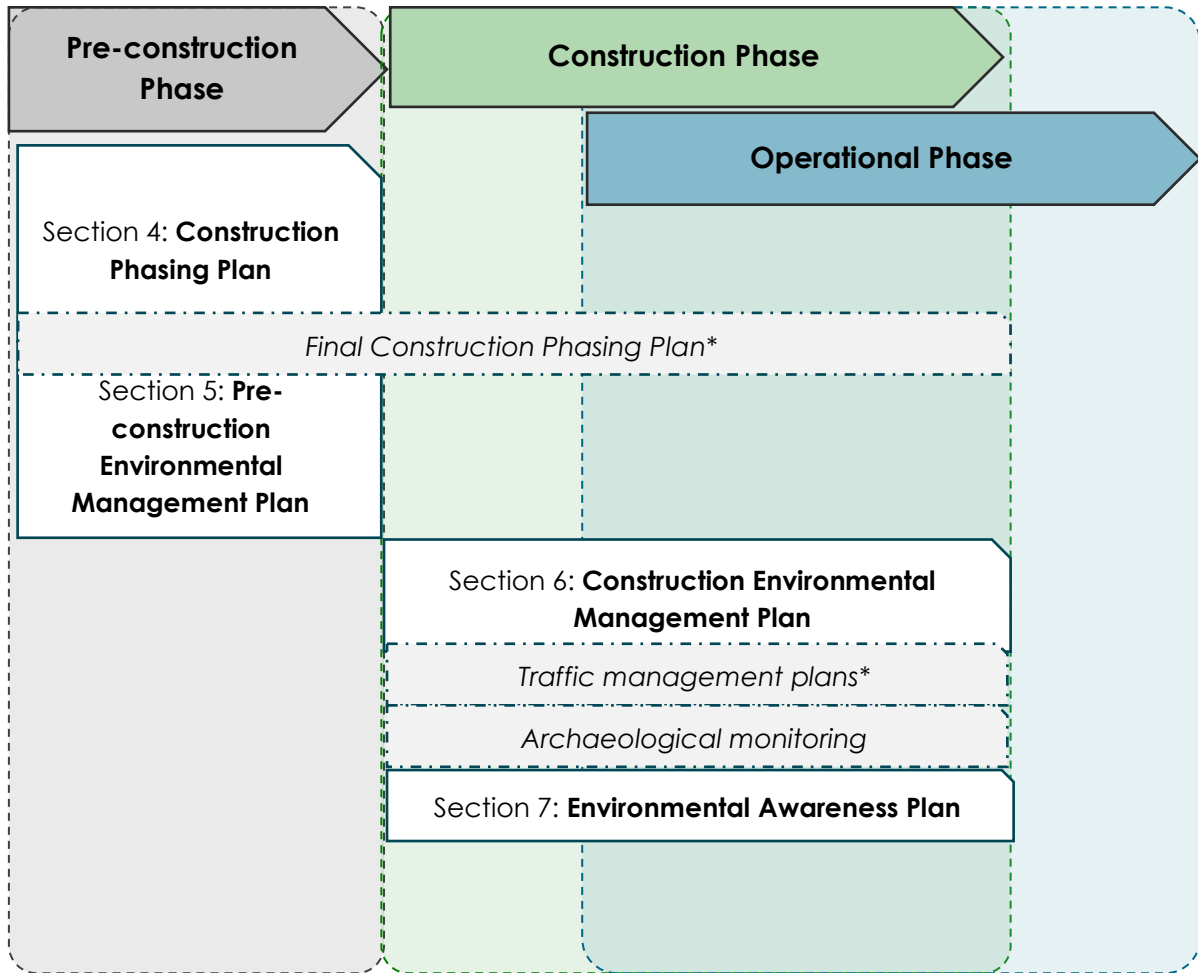


Figure 3.1. Schematic of EMPr content and structure

Aspects indicated with * may be prepared and finalised subsequent to environmental authorisation

2.2 LEGISLATIVE COMPLIANCE

A key objective of the EMPr is to satisfy the requirements of Section 24N of the NEMA, as amended, and Appendix 4 of the amended NEMA EIA Regulations published in Government Notice No. R 326 of 7 April 2017. These regulations prescribe the content of the EMPr and specify the type of supporting information that must accompany the submission of the report to the competent authority. An overview of where the requirements are addressed in this EMPr is presented in Table 2.1.

Table 2.1. Compliance with EIA Appendix 4 Requirements

Appendix 4 of EIA Regulations	EMPr section
1. An EMPr must comply with section 24N of the Act and include- (a) details of- (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 1.4
(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Sections 1.1, 1.2, 1.5 (Table 1.2, 2 nd Column, Figures 1.1 – 1.7) Sections 4, 5: 1 st column of table Section 6
(c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Figure 2.1
(d) a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including- (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities;	Sections 4, 5: 2 nd column of table
(f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;	Sections 4, 5: 3 rd column of table
(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Sections 4, 5: 4 th column of table
(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Sections 4, 5: 5 th column of table
(i) an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 3
(j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Sections 4, 5: 5 th column of table

(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Sections 4, 5: 4 th column of table
(l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Sections 4 to 10, responsible parties noted in Section 3.
(m) an environmental awareness plan describing the manner in which— (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 7
(n) any specific information that may be required by the competent authority	None requested to date

2.3 CONTENT OF THE EMPr

Where applicable, each section of the EMPr is divided into three phases of the project life cycle, namely:

- The Pre-construction Phase, which will partly coincide with and follow the EIA;
- The Construction Phase, which begins with commencement of physical activities on site and ends when the development has been fully constructed; and

There is likely to be overlap between the above phases. A decommissioning phase is not included, as it is not anticipated that the development will be decommissioned.

The EMPr includes the findings and recommendations of the EIA Process and specialist studies. The EMPr may be updated with additional information or actions during the design, construction, and operational phases if applicable. A standardised approach is followed, in which outcomes are set, followed by management actions aimed at achieving the objectives. Management actions are accompanied by monitoring requirements, responsibilities, and targets where applicable. A tabular format is used for ease of reference.

Key terms used in the EMPr include:

- **Impact or aspect:** The potential positive or negative impact of the development that needs to be enhanced, mitigated or eliminated (as appropriate) to a desired state
- **Impact management outcome:** The desired state after mitigation or management
- **Management Actions:** The actions needed to achieve the objectives of enhancing, mitigating or eliminating impacts; taking into consideration factors such as responsibility, methods, frequency, resources required and prioritisation
- **Monitoring:** The key monitoring actions required to check whether the outcomes are being achieved, taking into consideration methodology, frequency and responsibility.

2.4 AMENDMENT OF THIS EMPR

- Amendments shall be made as and when required to keep this EMPr up to date, and to provide for adaptive management in support of the management outcomes set out in the approved EMPr and the EIA.
- The EMPr may be amended due to:
 - Legislative changes;
 - Changes to the roles and organisational structure set out in chapter 3;
 - Amendments to the environmental authorisation;
 - Audits of the EMPr carried out in terms of the EIA Regulations;
 - Based on the annual reviews as set out below; or
 - Whenever deemed necessary by the competent authority.
- Amendments will be numbered sequentially (e.g. Amendment 001, Amendment 002, Amendment 003 etc.). The status of a particular page shall be reflected in the appropriate space of each page. Each amendment shall also have an effective date (the date on which the amendment was made).
- Amendments to the impact management **actions** may be effected immediately by the authorisation holder and must be reflected in the next environmental audit report submitted to the competent authority in terms of regulation 34 of the EIA Regulations. The record of revisions must be updated accordingly, and the revision number and status of a particular page shall be reflected in the appropriate space of each page.
- Amendments to the impact management **outcomes** stipulated in this EMPr are subject to an application for amendment to the competent authority, which must be submitted for approval by the authorisation holder and may require public participation. Such an amendment shall only become effective once approved by the competent authority.

2.5 REVIEW OF THIS EMPR

- The EMPr should be reviewed if there are changes in the outcomes and actions.
- The Authorisation Holder will keep a record of all dates of revision, even if revision did not necessitate an amendment to the EMPr.
- The review may take the form of an internal audit or may form part of the external audit conducted in terms of regulation 34 of the EIA Regulations.
- The main aims of a review of the EMPr for purposes of a revision will, among other things, be to determine the following:
 - Ability of the EMPr to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity on an ongoing basis
 - Conformity and adherence to the minimum legislative requirements;
 - Simplicity and clarity of the content and text; or
 - The incorporation of practical experience gained during implementation.

3 PROJECT ROLES AND ORGANISATIONAL STRUCTURE

The general roles to be defined are those of the:

- Authorisation holder
- Environmental Control Officer
- Contractor(s) (Principal Contractor / Project Manager); and
- Environmental Auditor

The specific titles referred to may vary, but the intent of this section is to broadly define expectations and responsibilities for key role players in the implementation of the EMPr.

Given the scale of the proposed development it is anticipated that multiple phases will be implemented; the below requirements must be understood to apply *mutatis mutandis* (with the necessary changes) to every phase or component of the development.

3.1 AUTHORISATION HOLDER

The project developer City of Cape Town: Coastal Management Branch will be the holder of the Environmental Authorisation, should it be issued, and will therefore be responsible for ensuring that the conditions of such authorisation are fully adhered to. It is expected that the authorisation holder will appoint the Environmental Control Officer and Contractor during the construction phase.

The authorisation holder remains ultimately responsible for the implementation of all environmental management actions, and shall implement such management systems and agreements as may be necessary to provide for oversight, monitoring, and assurance of compliance during all phases of the development. Commonly, responsibilities borne by the Authorisation Holder are delegated to a project manager.

Key responsibilities include ensuring that:

- The ECO is provided with the necessary information in order to adequately undertake their responsibilities;
- This EMPr is included in the contractual agreements with all contractors and subcontractors;
- Method Statements requested by the ECO are provided timeously;
- Corrective action is implemented as required;
- Appropriate records and information regarding compliance with the EMPr requirements are maintained and made available to the ECO;

3.2 ENVIRONMENTAL CONTROL OFFICER

An independent Environmental Control Officer (ECO) must be appointed at all times that construction is underway on the site to ensure compliance with the EMPr and conditions of the EA. The ECO's role also includes monitoring compliance with other environmental legislation, the monitoring of environmental impacts, and the keeping of accurate records.

The ECO shall update the EMPr when necessary, and shall compile a monitoring checklist or protocol based on the EMPr. The ECO's role includes the following aspects:

- Periodic environmental inspections (at least once per week) during the construction phase of the proposed project in order to monitor and record environmental impacts and nonconformances, and to monitor site activities to ensure adherence to the specifications contained in the EMPr, using a monitoring checklist. During beachfront construction, environmental inspections should be carried out at least twice per week. However, where works being undertaken have a higher risk of potentially having negative environmental pollution impacts, more frequent inspections should be undertaken. This should be determined by the ECO, in consultation with the engineers.
- Maintain a record of site visits and audits, a copy of the environmental authorisation (should it be granted) and other permits and licenses, a register of non-conformances, and a copy of previous environmental audits.
- A monthly environmental construction monitoring report must be compiled, documenting the site visit dates, highlighting site progress for the period (month), compliance matters, recommendations and close-out actions. This should be presented at the monthly site meeting, and distributed to the all relevant construction entities.
- Prior to construction commencement, the ECO must meet on site with the Contractor representative to confirm designated development and no-go areas and to confirm the method statements required.
- Request, review and approve Method Statements from the contractor and sub-contractors prior to the commencement of the activities concerned.
- Ensure that the contractors and sub-contractors and their employees have received the appropriate environmental awareness training.
- Meet with the contractors and subcontractors to discuss the implementation of this document.
- Identify appropriate corrective measures if transgressions occur.
- Keep a register of monitoring activities and results
- Assist in finding environmentally acceptable solutions to construction problems.
- Identify and make amendments to the EMPr where appropriate.
- Conduct an environmental inspection on completion of the construction period and prepare a close-out report.

The Contractor and individual contractors may designate Environmental Officers to liaise with the ECO on environmental matters.

3.3 ARCHAEOLOGIST

An independent archaeologist must be appointed prior to beginning any construction work below the high water mark (and for the entire duration of work below the high water mark). Their duties are listed below:

- The archaeologist shall compile a monitoring checklist based on the content of the HIA that was conducted for the BAR, as well as any other pertinent information.

- The archaeologist should have a section in the environmental training programme that all workers on site must attend. This should include summarizing what archaeological items may be found (how to identify) and what to do if something is found.
- During demolition and bulk excavation on the beachfront, the archaeologist must visit the site at least once per week.
- During all other construction activity below the highwater mark, a site visit must be conducted monthly or as needed (whichever is more frequent).

3.4 CONTRACTOR

The role of the Contractor is as follows:

- The Contractor shall ensure that all employees, contractors and sub-contractors are made aware of the EMPr and their responsibilities.
- Prior to construction commencement, the Contractor must meet on site with the ECO representative to confirm designated development and no-go areas and to confirm the method statements required.
- Liaise with the ECO and Authorisation Holder (or representative) and ensure that works on site are conducted in an environmentally sensitive manner in accordance with this EMPr.
- Maintain on site a copy of this EMPr and all environmental authorisations and licenses pertinent to the development on site.
- Ensure that all appointed contractors and sub-contractors repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in the EMPr, to the satisfaction of the Project Owner's ECO;
- Ensure that all employees (permanent and temporary) and all sub-contractors that work on the site for longer than two days, receive environmental awareness training within one week of being on site.
- Designate an Environmental Officer (or employ a designated suitably qualified individual to fulfil the role of an Environmental Officer) to monitor and report on the daily activities on-site during the construction period.

3.5 ENVIRONMENTAL AUDITOR

The environmental auditor is an independent environmental auditor appointed by the authorisation holder in compliance with Regulation 34 of the EIA Regulations at a frequency specified in the conditions of the environmental authorisation.

It is recommended that auditing frequency be undertaken as follows:

- Six months after the commencement of construction activities;
- Every year (12 month) thereafter; and
- At the end of the construction

The auditor shall be independent from both the EAP and the ECO and shall not have any financial or other interest in the activities being audited, other than fair remuneration. The primary objective is to audit compliance with the environmental authorisation and associated EMPr. Key requirements for an audit report would typically include:

- Verifiable findings on the level of compliance with the authorisation conditions;
- Findings on the ability of the EMPr to provide for avoidance, management and mitigation of impacts; and
- Recommendations for corrective actions to rectify any shortcomings that may be identified.

The auditor shall:

- Review the environmental authorisation, EMPr, and assessment reports to obtain an understanding of potential impacts, assessed significance and proposed avoidance, management and mitigation measures. Prepare an audit checklist against which audit findings can be determined, based on the conditions of authorisation, the EMPr, and any other considerations relating to potential impacts.
- Conduct a site inspection to verify physical compliance during construction.
- Audit construction-related documentation including Environmental Control Officer monitoring reports, construction progress reports, the contractor's environmental site records and files, and photographic records to identify any non-compliances and/or shortcomings.
- Prepare an audit report in line with the requirements of Appendix 7 of the EIA Regulations and the specific requirements of the environmental authorisation.

4 PRE-CONSTRUCTION ACTIVITIES

The outcomes, management measures, and monitoring requirements detailed in this section are applicable only to the pre-construction phase of the proposed development, defined as including the phase of the development before which demolition works, earthworks, the installation of civil services, and the construction of new structures.

Environmental aspect or impact	Impact Management Outcomes	Impact Management Actions	Monitoring Actions		
			Method	Frequency	Responsibility
4.1. Compliance with legislative and other requirements	Construction on the Muizenberg Beachfront site is conducted in compliance with all relevant legislation and is not in conflict with existing approvals and authorisations.	4.1.1. Confirm prior to commencement of construction that the following requirements in terms of other legislation, as identified in the EIA, have been addressed: <ul style="list-style-type: none"> • Processes underway to ensure protection and management of groundwater, beach and ocean included in the construction site • Provision of bulk services in line with the development phasing. 	Confirm approvals or amendments have been issued.	Prior to first construction contract or where approvals are relevant only to certain precincts on the site, prior to construction in such precincts.	Authorisation holder
4.2. Establishing working and no-go areas	Construction activities will be restricted to within the designated areas & environmentally sensitive areas (no-go areas) will be protected from disturbance.	4.2.1. Demarcation of working areas and no-go areas must be done as per the included below Figure 4. The buffer area is approximately 20meters seaward of the existing coastal defense structures. This must be adhered to in the construction implementation. 4.2.2. Reference must be made to the Annexure 1: Draft Phasing Plan	A method statement for the demarcation of no-go and working areas to be compiled and approved prior to work taking place.	Prior to commencement of construction activities.	Engineer, contractor and ECO.
4.3. Access to beach and other facilities	Ensuring that minimal public disruption to beach access and ablution facilities	4.3.1. The contractor must follow the construction phasing plan laid out in Appendix A to ensure partial public beach access is always possible. 4.3.2. The contractor will ensure that sufficient temporary ablution facilities are made available, during the demolition.	The phasing plan, appended, will be finalised prior to the commencement of construction activities.	Prior to commence of construction components.	Engineer, and contractor, ECO

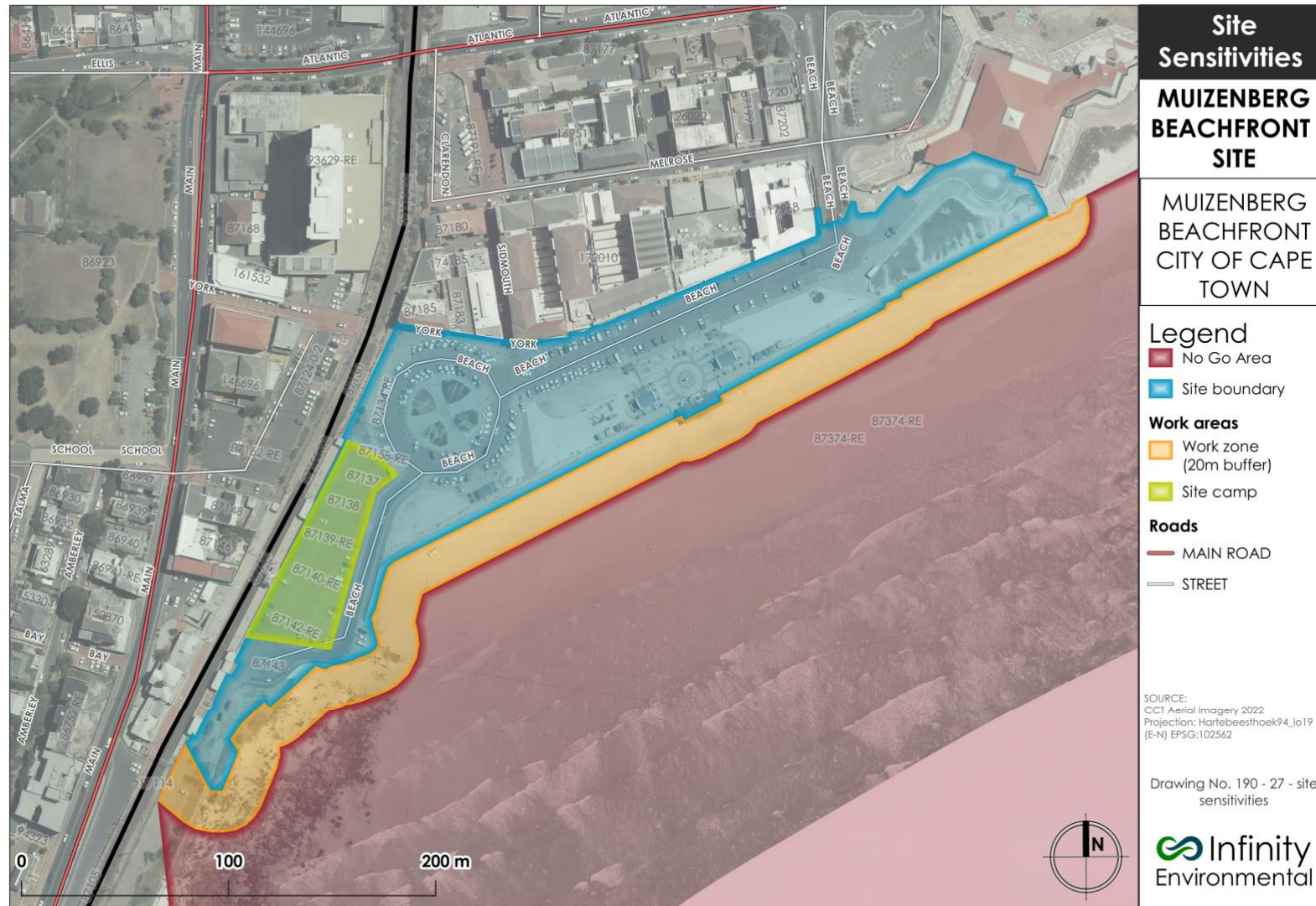


Figure 4.1. Working and no-go areas

5 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

The outcomes, management measures, and monitoring requirements detailed in this section are applicable only to the construction phase of the proposed development, defined as including any and all phases of the development during which land clearing, bulk earthworks, the installation of civil services, and the construction of new structures occur.

Environmental aspect or impact	Impact Management Outcomes	Impact Management Actions	Monitoring Actions		
			Method	Frequency	Responsibility
5.1 INTERRUPTION OF PUBLIC BEACH AREA ACCESS	<ul style="list-style-type: none"> Prevent any excessive impacts on public use of the area during construction 	5.1.1 Areas outside the development footprint must be clearly demarcated as no go areas during the construction phase to avoid accidental impacts.	Ensure that fencing is installed along the boundary of the works area for each construction contract. The fencing must be to a design approved by the ECO and at minimum, shall be sufficient to prevent accidental or intentional access by people, machinery, and vehicles.	Prior to each construction contract.	ECO
		5.1.2 The site camp, access roads and lay down areas must be established within the final development footprint. No construction-related activities shall extend further onto the beach area.	Confirm locations prior to establishment through a site establishment method statement, and during regular site inspections.	Prior to each construction contract and for the duration of the construction phase.	ECO
		5.1.3 Conduct Environmental Awareness Training and induction for all construction staff and personnel	Conduct audits of the signed attendance registers	Prior to each phase of construction, prior to any new staff member commencing work on the site, and as required by the ECO.	ECO and Contractor

Environmental aspect or impact	Impact Management Outcomes	Impact Management Actions	Monitoring Actions		
			Method	Frequency	Responsibility
		The contractor must follow the construction phasing plan laid out in Appendix A to ensure partial public beach access is always possible	Contractor		
5.2 Dust and wind blown sand	Prevent wind erosion and resultant dust and wind blown sand impacts on surrounding area.	5.2.1 Non-potable water should be used for short-term dust/sand stabilisation.	<ul style="list-style-type: none"> Monitor activities and record and report non-compliance 	Weekly	ECO and Contractor
		5.2.2 Stockpiles of sand and stone must be effectively stabilised and must be covered or sealed if dust generation is apparent.	Monitor activities and record and report non-compliance	Weekly	ECO and Contractor
		5.2.3 The impacts of dust/sand on neighbouring urban areas and residences must be minimised and an effective system for the recording and addressing of complaints must be put in place.	<ul style="list-style-type: none"> Record non-compliance and incidents Establish a complaint register in the site office 	As required during construction	ECO and Contractor
		5.2.4 Dust fall rates must not exceed 600mg/m ² /day on a 30 day average. Note two exceedance events per year are permissible, but not in sequential months	Ensure that contact information for the Contractor and ECO is prominently displayed on the site.		
		5.2.5 All vehicles transporting sand and spoil must have tarpaulins covering their loads to reduce spillage and windblown dust.	<ul style="list-style-type: none"> Record non-compliance and incidents Establish a complaint register in the site office Ensure that contact information for the Contractor and ECO is prominently displayed on the site. 	As required during construction	ECO and Contractor
		5.2.6 Stockpiles and exposed soils must be effectively stabilised and protected from erosion.	<ul style="list-style-type: none"> Monitor activities and record and report non-compliance Monitor activities and record and report non-compliance	As needed during the construction phase As needed during the construction phase	ECO ECO and Contractor
		5.2.7 Stockpiles and laydown areas may not be located within 50 m of the ocean on site	<ul style="list-style-type: none"> Monitor activities and record and report non-compliance 	As needed during the	ECO ECO and Contractor

Environmental aspect or impact	Impact Management Outcomes	Impact Management Actions	Monitoring Actions		
			Method	Frequency	Responsibility
		except where required for authorised activities in and around the beach.	<ul style="list-style-type: none"> Monitor activities and record and report non-compliance Check compliance of proposed construction programme with timing requirements 	construction phase As needed during the construction phase At the commencement of the construction phase for each phase of works	ECO
		5.2.8 Construction activities on the beach must be limited to the minimum possible extent	<ul style="list-style-type: none"> Record non-compliance and incidents Establish a complaint register in the site office Ensure that contact information for the Contractor and ECO is prominently displayed on the site. 	As required during construction	ECO and Contractor
5.3 Pollution of the beach and ocean		5.3.1 A method statement for the control of pollution and contamination must be compiled by the Contractor for approval by the ECO prior to any works within a watercourse or its buffer area.	Inspect and verify if a Method Statement for works on the beach has been compiled by the Contractor, and whether the proposed measures are likely to effectively prevent pollution and contamination		ECO
		5.3.2 Perform periodic inspections and maintenance of pollution and contamination measures.	<ul style="list-style-type: none"> Monitor activities and record and report non-compliance Inspect and verify if a Method Statement for Stormwater Management has been compiled by the Contractor via audits prior to the 	As needed during the construction phase <ul style="list-style-type: none"> Prior to construction 	ECO and Contractor <ul style="list-style-type: none"> Contractor

Environmental aspect or impact	Impact Management Outcomes	Impact Management Actions	Monitoring Actions		
			Method	Frequency	Responsibility
			commencement of the construction phase.	Once-off prior to construction	ECO
		5.3.3 The appointed Contractor should compile a Method Statement for Stormwater Management during the construction phase.			
Prevent contamination of the beach area and ocean		5.3.4 Provide secure storage for fuel, oil, chemicals and other waste materials to prevent contamination of stormwater runoff. Fuels and chemicals (i.e. any hazardous materials and dangerous goods) used during the construction phase must be stored safely on site and in bunded areas. Fuel and chemical storage containers must be inspected to ensure that any leaks are detected early.	Monitor the storage and handling of dangerous goods and hazardous materials on site via site audits and record non-compliance and incidents. Monitor if spillages have taken place and if they are removed correctly.	Weekly	ECO
Prevent discharge of sediment-laden water into the ocean		5.3.5 All stockpiles must be protected from erosion and stored on flat areas where runoff will be minimised. No stockpiling should take place within 50 m of a watercourse.	Monitor the excavations and stockpiling process throughout the construction phase via visual site inspections. Record noncompliance and incidents.	Weekly	ECO
		5.3.6 Littering and contamination of the beach area and ocean during construction must be prevented by effective construction camp management.	Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk inspections).	Weekly	Contractor and ECO
		5.3.7 Emergency plans must be in place to deal with potential spillages (especially those leading to the beach/ocean).	Check that plans are in place and a spill kit is present on site.	Monthly	ECO
		5.3.8 Ensure that the temporary site camp and ablution facilities are established at least 50 m away from the beach.	Monitor the placement of the site camp via visual inspections, and record and report any noncompliance.	Once-off prior to construction and as required during the	ECO

Environmental aspect or impact	Impact Management Outcomes	Impact Management Actions	Monitoring Actions		
			Method	Frequency	Responsibility
				construction phase.	
		5.3.9 Ensure that there is no ad-hoc crossing of the beach by vehicles during the construction phase. Access routes across the site should be strictly demarcated and selected with a view to minimise impacts the beach (and public)	Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk inspections).	Weekly	Contractor and ECO
5.4 Pollution of the surrounding environment as a result of the contamination of stormwater. Contamination could result from the spillage of chemicals, oils, fuels, sewage, solid waste, cement washwater, litter etc.	<ul style="list-style-type: none"> To prevent contaminated stormwater from entering into and adversely impacting the ocean To reduce risks of general stormwater pollution 	5.4.1 Ensure that no waste materials or sediments are left in the surrounding stormwater drainage lines (as a result of the construction).	<ul style="list-style-type: none"> Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk inspections). 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> Contractor and ECO
		5.4.2 If any concrete mixing takes place on site, this must be carried out in a clearly marked, designated area at the site camp on an impermeable surface (such as on boards or plastic sheeting and/or within a bunded area with an impermeable surface).	<ul style="list-style-type: none"> Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk inspections). 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> Contractor and ECO
		5.4.3 Bagged cement must be stored in an appropriate facility and at least 10 m away from the beach and stormwater drains.	<ul style="list-style-type: none"> Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk inspections). 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> Contractor and ECO
		5.4.4 A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted. It must be taken off site, not drained into stormwater lines or onto the beach.	<ul style="list-style-type: none"> Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk inspections). 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> Contractor and ECO
		5.4.5 Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licensed disposal facility. Proof of disposal (i.e. waste disposal slips or waybills) should be retained on file for auditing purposes.	<ul style="list-style-type: none"> Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents. 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> ECO
		5.4.6 Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site. Empty cement bags	<ul style="list-style-type: none"> Monitor via site audits and record non-compliance and incidents (i.e. by 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> Contractor

Environmental aspect or impact	Impact Management Outcomes	Impact Management Actions	Monitoring Actions		
			Method	Frequency	Responsibility
		must be collected from the construction area at the end of every day. Sand and aggregates containing cement must be kept damp to prevent the generation of dust.	implementing walk inspections).		and ECO
		5.4.7 Any excess sand, stone and cement must be removed from site at the completion of the construction period and disposed at a licensed waste disposal facility. Proof of disposal (waste disposal slips or waybills) should be retained on file for auditing purposes.	<ul style="list-style-type: none"> Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk inspections). 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> Contractor and ECO
		5.4.8 Ensure that adequate containment structures are provided for the temporary storage of liquid dangerous goods and hazardous materials on site (such as chemicals, oil, fuel, hydraulic fluids, lubricating oils etc.). Appropriate bund areas must be provided for the storage of these materials at the site camp. Bund areas should contain an impervious surface in order to prevent spillages from entering the ground. Bund areas should have a capacity of 110 % of the volume of the largest tank in the bund (tanks include storage of fuel/diesel).	<ul style="list-style-type: none"> Monitor the storage and handling of dangerous goods and hazardous materials on site via site audits and record non-compliance and incidents. 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> Contractor and ECO
5.5 Contamination of soil, groundwater, the beach, and the ocean through spillage of concrete and cement	<ul style="list-style-type: none"> To control concrete and cement batching activities in order to reduce spillages and resulting contamination of soil, groundwater and the vegetation and/or fauna. 	5.5.1 Monitor and inspect construction equipment and vehicles to ensure that no fuel spillage takes place. Ensure that drip trays are provided for construction equipment and vehicles as required.	<ul style="list-style-type: none"> Monitor the construction equipment and vehicles and monitor the occurrence of spills and the management process thereof. 	<ul style="list-style-type: none"> Daily During spill events 	<ul style="list-style-type: none"> Contractor ECO
		5.5.2 Contractor to compile a Method Statement for refuelling activities under normal and emergency situations. If on-site servicing and refuelling is required in emergency situations, a designated area must be created at the construction site camp for this purpose. Drip trays or similar impervious materials must be used during these procedures.	<ul style="list-style-type: none"> Verify if a Method Statement is compiled by reviewing approved and signed off reports. Monitor the refuelling/servicing process and record the occurrence of any spillages. 	<ul style="list-style-type: none"> Once-off prior to commencement of construction. During emergency 	<ul style="list-style-type: none"> ECO and Contractor

Environmental aspect or impact	Impact Management Outcomes	Impact Management Actions	Monitoring Actions		
			Method	Frequency	Responsibility
	<ul style="list-style-type: none"> To reduce risks of general stormwater contamination 			refuelling and servicing activities.	
		5.5.3 Spilled fuel, oil or grease must be retrieved and contaminated soil/sand removed, cleaned and replaced.	<ul style="list-style-type: none"> Monitor the handling and storage of fuels and oils via site audits and monitor if spillages have taken place and if so, are removed correctly. Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents 	<ul style="list-style-type: none"> Weekly Monthly 	<ul style="list-style-type: none"> ECO and Contractor
		5.5.4 Contaminated soil/sand to be collected by the Contractor (under observation of the ECO) and disposed of at a registered waste facility designated for this purpose. Proof of disposal (i.e. waste disposal slips or waybills) should be retained on file for auditing purposes. All material used to clean hazardous material spills must be considered as hazardous waste, together with contaminated soil. Moreover, if hazardous waste is mixed with general waste, the entire content of waste must be seen as hazardous and therefore be disposed at a licenced hazardous disposal facility.	<ul style="list-style-type: none"> Monitor the correct removal of contaminated soil. Monitor waste disposal slips and waybills via site audits and record non-compliance 	<ul style="list-style-type: none"> After spill events 	<ul style="list-style-type: none"> ECO
		5.5.5 Contamination of beach sand with unsuitable excavated material and rubble should be minimized by the contractors method statement. Beach sand should be preserved as far as reasonably possible.			
		5.5.6 A Spill Response Method Statement must be compiled by the Contractor for the construction phase in order to manage potential spill events.	<ul style="list-style-type: none"> Compile a Spill Response Method Statement. Audit signed and approved Spill Response Method Statement. 	<ul style="list-style-type: none"> Once-off at commencement 	<ul style="list-style-type: none"> Contractor ECO

Environmental aspect or impact	Impact Management Outcomes	Impact Management Actions	Monitoring Actions		
			Method	Frequency	Responsibility
		5.5.7 The Contractor must ensure that adequate spill containment and clean-up equipment are provided on site for use during spill events	<ul style="list-style-type: none"> Monitor via site audits and record incidents and non-compliance. 	<ul style="list-style-type: none"> Monthly 	<ul style="list-style-type: none"> ECO
5.6 Dewatering	<ul style="list-style-type: none"> Ensure the ground is not too wet (as a result of the high groundwater levels) for construction purposes Ensure there is no environmental contamination as a result of dewatering 	5.6.1 Use well points to effectively control the ground water table level when needed for construction 5.6.2 Implement strict control methods for ensuring only uncontaminated clean water is released into the ocean. 5.6.3 The contractor must have the capacity to store and remove any contaminated water (as a result of dewatering) from the site. 5.6.4 When dewatering the beach area for construction, special care must be taken to ensure no contaminated water is released into the ocean as a result of the demolition that will be occurring at the same time.	<ul style="list-style-type: none"> A method statement detailing dewatering methods to be undertaken must be submitted the ECO, prior to the implementation of works 	Prior to the commencement of dewatering activities	Contractor and ECO
5.7 Contamination of soil, groundwater, the beach, and the ocean, through spillage of fuels and oils.	<ul style="list-style-type: none"> To control and eliminate fuel and oil spillages which may result in soil, groundwater, beach, and ocean contamination 	5.7.1 Portable bioremediation kit (to remedy chemical spills) is to be held on site and used as required.	<ul style="list-style-type: none"> Ensure that a well maintained bioremediation kit is available on site and that construction personnel and contractors are aware of its location and instructions 	Monthly	ECO
		5.7.2 Any event resulting in the spill or leak of fuels or any other hazardous solvents into the ground and/or ocean (e.g. chemicals, oil, fuel, hydraulic fluids, lubricating oils, etc.), must be reported to all relevant authorities, including DEA&DP Directorate: Pollution and Chemicals Management, within 14 (fourteen) days.	<ul style="list-style-type: none"> Notify ECO and authorities and keep copies of written notification. 	<ul style="list-style-type: none"> After spill events 	<ul style="list-style-type: none"> ECO
		5.7.3 In case of a spillage of hazardous chemicals where contamination of soil occurs, depending on the degree and level of contamination, excavation and removal to a hazardous waste disposal facility could be necessary. If the spillage is widespread and the	<ul style="list-style-type: none"> Ensure that a suitably qualified specialist is appointed to collect and analyse the contaminated soil samples in terms of the 2014 Norms and Standards 	<ul style="list-style-type: none"> After spill events 	<ul style="list-style-type: none"> ECO

Environmental aspect or impact	Impact Management Outcomes	Impact Management Actions	Monitoring Actions		
			Method	Frequency	Responsibility
		<p>soil is considered to be significantly contaminated, a specialist will need to be immediately appointed to address the spillage. This will usually entail the collection of samples of the contaminated soil followed by analysis in terms of the 2014 National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (i.e. GN 331). If the soil is determined to be significantly contaminated, then compliance with Part 8 of the NEMWA should be achieved by the Applicant, including notifying the Minister of Environmental Affairs of the significant contamination.</p>	<p>(i.e. GN 331) in order to determine if the soil is significantly contaminated or not.</p> <ul style="list-style-type: none"> If the contaminated soil is considered to be significantly contaminated, then compliance with Part 8 of the NEMWA should be achieved by the Applicant. 		
		<p>5.7.4 The constructor in consultation with the ECO, must confirm acceptable requirements for concrete batching/casting in-situ and/or management of ready mix.</p> <p>5.7.5 The Contractor must record and document all significant spill events.</p>	<p>5.7.6 The Contractor must provide a method statement with regards to concrete batching/casting in-situ and/or management of ready mix delivery.</p> <ul style="list-style-type: none"> Monitor documentation and records of significant spill events via audits and record non-compliance and incidents 	<ul style="list-style-type: none"> After spill events 	<ul style="list-style-type: none"> Contractor Resident Engineer ECO
<p>5.8 Use of water for construction purposes</p>	<p>Minimise usage of water</p>	<p>5.8.1 The use of potable water for construction purposes is to be minimised, with alternative sources including treated effluent or rainwater to be prioritised.</p> <p>5.8.2 Hoses, tanks and water trucks are to be regularly checked for leaks and repaired immediately.</p> <p>5.8.3 The contractor is to monitor quantities of water used for construction purposes and report on this aspect during site meetings.</p>	<ul style="list-style-type: none"> Monitor documentation Check for leaks and misuse of water during site walkthroughs 	<ul style="list-style-type: none"> Monthly 	<ul style="list-style-type: none"> ECO / Contractor

Environmental aspect or impact	Impact Management Outcomes	Impact Management Actions	Monitoring Actions		
			Method	Frequency	Responsibility
5.9 Visual impacts	Minimise visual disturbance	5.9.1 Locate site camps and laydown areas away from visually sensitive receptors such as residences. 5.9.2 Screen site camps and laydown areas with shadecloth or similar, where possible and appropriate. 5.9.3 Manage stockpile and laydown areas for cleanliness and appearance. 5.9.4 Roof and screen waste areas. 5.9.5 Avoid unnecessary signage or advertisement on site.	<ul style="list-style-type: none"> Review method statement for site camp establishment for locational and visual management measures Monitor by visual inspections. 	<ul style="list-style-type: none"> Immediately prior to construction <p>Monthly</p>	<ul style="list-style-type: none"> ECO <p>ECO / Contractor</p>
5.10 Pest control	<ul style="list-style-type: none"> Avoid attracting, and effectively control, pests such as rodents and flies. 	5.10.1 Implement proper waste management as described in 5.11. 5.10.2 Install pest control measures in site camp and waste area as required and in consultation with the ECO to ensure that wild fauna are not negatively affected.	<ul style="list-style-type: none"> Monitor for the presence of rats and/or excessive flies Monitor effectiveness of pest control measures implemented 	<ul style="list-style-type: none"> Ongoing basis throughout construction period 	<ul style="list-style-type: none"> ECO / Contractor
5.11 Waste	<ul style="list-style-type: none"> Manage waste in accordance with legislation and best practice methods. Minimise the production of general waste Prevent pollution or contamination due to improper waste handling or storage on site. 	5.11.1 Implement a waste management plan for the construction phase, to be prepared by the contractor. 5.11.2 Designate a waste management area, which should be an area of hardstanding with a roof and sides, or consist of separate bins and skips. 5.11.3 Litter and construction waste should be collected on site by the end of each day and stored in bins, skips, or other suitable storage area. 5.11.4 Food waste must be stored in bins or skips that are covered and cannot be accessed by flies or rodents. 5.11.5 Waste should be separated into hazardous, general, and recyclable waste streams, with clearly designated bins and skips for each waste type. 5.11.6 Hazardous wastes, including materials contaminated with oils and hydrocarbons,	<ul style="list-style-type: none"> Waste removal and disposal to be monitored. Monitor via site audits and record noncompliance and incidents. Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents. 	<p>Monthly</p>	<p>Contractor and ECO</p>

Environmental aspect or impact	Impact Management Outcomes	Impact Management Actions	Monitoring Actions		
			Method	Frequency	Responsibility
		<p>must be removed from site by a suitably licensed contractor and manifests provided.</p> <p>5.11.7 Other non-hazardous solid waste (e.g. refuse) to be disposed of at a licensed landfill. A suitable waste contractor must be appointed to collect waste from site on a regular basis for correct disposal. Proof of disposal (waybills or waste disposal slips) must be retained and kept on file for auditing purposes.</p> <p>5.11.8 A suitable waste contractor must be appointed to collect waste from site on a regular basis for correct disposal. Proof of disposal (waybills or waste disposal slips) must be retained and kept on file for auditing purposes.</p> <p>5.11.9 If the volumes of waste stored exceed 80m³ for hazardous waste and/or 100m³ for general waste the National Environmental Management: Waste Act (NEM:WA) National Norms and Standards for the Storage of Waste in terms of Government Notice (GN) No. 926 of 29 November 2013 must be adhered to.</p>			
<p>5.12 Spoil and material handling</p>	<ul style="list-style-type: none"> Comply with environmental legislation regarding the disposal of waste, including construction waste and spoil Avoid contamination of excavated beach sand with spoil material or other unsuitable beach material. 	<p>5.12.1 If offsite spoil will be required during the construction period, identify potential spoil sites at the commencement of construction and ensure that spoiling of material will comply with the NEMA and the National Environmental Management: Waste Act.</p> <p>5.12.2 Use clearly demarcated areas for the storage of spoil material and clean beach sand.</p>	<ul style="list-style-type: none"> Method statement to be prepared at least two months prior to any anticipated spoiling, and ECO to confirm whether proposed sites are compliant. Monitor via site audits and record incidents and non-compliance. 	<p>At commencement and as required thereafter</p>	<p>Contractor and ECO</p>

Environmental aspect or impact	Impact Management Outcomes	Impact Management Actions	Monitoring Actions		
			Method	Frequency	Responsibility
	clear management of spoil material is important to preserve beach sand as much as possible.				
5.13 Noise	<ul style="list-style-type: none"> Avoid unnecessary noise generation Avoid causing a nuisance to adjacent landowners 	<p>5.13.1 All construction equipment utilised and activities undertaken must be compliant with the Western Cape Noise Control Regulations, P.N. 200/2013.</p> <p>5.13.2 Restrict construction activities generating noise outputs of 85 dB (A) or more to the hours of 08h00 to 17h00 Mondays to Fridays. Should the Contractor need to do this work outside of these hours, the approval of the ECO must be obtained and surrounding communities must be informed prior to the work taking place.</p> <p>5.13.3 No amplified music shall be allowed on Site. The use of audio equipment shall not be permitted, unless the volume is kept sufficiently low so as to be unobtrusive. The Contractor shall not use sound amplification equipment on Site, unless in emergency situations.</p> <p>5.13.4 If excessive noise is expected on the boundary of the site, neighbouring residents must be informed in writing and in advance of when the high noise levels will occur and for how long they will occur.</p> <p>5.13.5 If noise levels at the site boundary are excessively high (i.e. above 70 dBA during the day, as stipulated in SANS 10103 Table 2 for industrial districts), machinery must be fitted with silencers.</p> <p>5.13.6 The Contractor must post signage indicating contact details of the Contractor and/or ECO on the site to allow for reporting of complaints</p>	<ul style="list-style-type: none"> Monitor via site audits and record incidents and non-compliance. Maintain a complaints register on site. If two or more noise complaints are received, the ECO must investigate whether the noise generated on site exceeds thresholds outlined in the Western Cape Noise Control Regulations 	Ongoing throughout construction period	ECO and Contractor

Environmental aspect or impact	Impact Management Outcomes	Impact Management Actions	Monitoring Actions		
			Method	Frequency	Responsibility
<p>5.14 Archaeological disturbance/destruction</p>	<ul style="list-style-type: none"> Prevent excessive damage to or destruction of any items of archaeological significance 	<p>5.14.1 Archaeological monitoring must accompany any works to be undertaken below the highwater mark.</p> <p>5.14.2 Ensure all workers have attended environmental awareness training, including the section on archaeology</p> <p>5.14.3 Workers should be on the lookout for any items of archaeological importance</p> <p>5.14.4 Should archaeological material be encountered during the works in the Study Area, the archaeologist must assess the find and determine the need for further mitigation.</p> <p>5.14.5 If human remains are uncovered on site, work must cease immediately, the remains must be left in place and made safe, and the project archaeologist and HWC must be notified in order for the significance of the material to be assessed and a decision taken as to how to deal with it.</p>	<ul style="list-style-type: none"> Site visits Reporting method for workers if anything of importance is found or suspected 	<p>Weekly during bulk excavation and demolition.</p> <p>Monthly during other work below the highwater mark.</p>	<p>Archaeologist</p>

6 METHOD STATEMENTS

Method Statements for one or more construction-related activity, or any aspect of the management of the site, before the activity is undertaken or during the performance of the activity, if the activity is causing or may cause significant environmental damage, or pose a health and safety risk. Activities with potential impacts or risks have been identified in the Section 4 and 5 of this document.

Method Statements need not be complex and lengthy, but must clearly state how, when and where the activity concerned will be undertaken, and must specify who will be responsible for undertaking each component of that activity. Method Statements must be prepared by the Construction Contractor and submitted to the ECO for confirmation of acceptable methods being documented before undertaking the activity concerned. The Engineer will confirm and approve the implementation of the Method Statement.

Method Statements for the following activities must be prepared and submitted to the ECO for approval before undertaking the activities concerned. However, should it be deemed necessary, the ECO may request additional method statements for activities that may pose a potential impact or risk to the environment:

- Camp Site location and establishment (included lay-down areas, off-site batching plants (should they be utilised))
- Waste Management System.
- Cement/ concrete batching, disposal and emergency contingencies.
- Refuelling and Storage of fuels and hazardous chemicals and emergency contingencies.
- Storm water management and control
- Emergency preparedness plan / emergency response procedure
- Aspects related to working and no-go working areas, reference to the Construction Phasing Plan
- Control of pollution and contamination
- Spoil and material handling

7 ENVIRONMENTAL AWARENESS TRAINING PLAN

This section outlines the training by which the authorisation holder (via its appointed contractor during the construction phase) will inform its employees of environmental risks and the manner in which risks must be dealt with to avoid pollution or degradation of the environment. It may be adapted as needed to suit the circumstances in which it is implemented.

Course	Required attendees	Presented by	Course content	Timing	Records to be kept
7.1 Construction phase Environmental Awareness Training for managers	<ul style="list-style-type: none"> Project Manager appointed by the authorisation holder Principal contractor's contract manager, site agents, and assistant site agents (as applicable) Contractor's designated environmental officer or SHE representative 	ECO	<ul style="list-style-type: none"> Overview of environmental authorisations and permits granted Basic environmental law Roles of the ECO, authorisation holder, project manager, and contractor Purpose and content of method statements Site sensitivities, including beach and ocean related sensitivities Management actions and measures for the construction phase as detailed in this EMPr Record keeping requirements Emergency procedures Reporting and compliance monitoring 	Prior to commencement of construction	<ul style="list-style-type: none"> Declaration of adherence to Construction phase EMPr, signed by Contractor's representative Register of attendance
7.2 Environmental Awareness Training for site personnel	<ul style="list-style-type: none"> All site staff and personnel, including temporary staff and visitors to site Maximum of 20 attendees at any one session 	Contractor's designated environmental officer	Environmental do's and don'ts, including: <ul style="list-style-type: none"> Access to work areas, location and identification of no-go areas Smoking and fires Storing and handling fuels and oils Storing and handling chemicals Management of cement, cement bags, slurry, and wash water Dust and noise 	Before any staff member begins work on site	<ul style="list-style-type: none"> Register of attendance, identifying all attendees by name and ID number, the topics covered, the presenter, and the date and time.

Course	Required attendees	Presented by	Course content	Timing	Records to be kept
			<ul style="list-style-type: none"> • Water wastage • Waste management and litter • Waste site management • Ablution facilities • Plant and machinery maintenance and load management • Accident and incident reporting <p>Archaeological training:</p> <ul style="list-style-type: none"> • What to look for • Where to look • How to report a finding 		

8 LIST OF APPENDICES

Appendix No.	Contents	Revision date	Revised by	Effective Date
B	Draft Phasing Plan	March 2023	HHO	On approval by DEA&DP