

MAINTENANCE
ENVIRONMENTAL MANAGEMENT PROGRAMME
for TransNet Jetty and Shoreline Protection within the Port Area
Port Nolloth, Northern Cape Province, South Africa

This Environmental Management Plan is based on the framework of an Environmental Management Programme as detailed in Section 24N of the National Environmental Management Amendment Act (Act No. 62 of 2008), Regulation 34 of the EIA Regulations R.385 21 April 2006, Regulation 33 of the EIA Regulations R.543 18 June 2010.



Applicant Details

Transnet National Ports Authority (TNPA)
Mr. Stanley Yang
P O BOX 4245, Cape Town, 8001
021 449 2486 (w), 072 132 2838 (m)
stanley.yang@transnet.net

For submission to:

Department of Environmental Affairs (DEA)
Pretoria

Prepared by:

bluepebble independent environmental agency
www.bluepebble.biz

Jonathan Kingwill
EAPSA Certified, Member IAIA, SA,
MPhil. Environmental Management, BSc. Civil Engineering
+27 (0) 82 777 0705 (mobile)
+27 (0) 86 553 8837 (fax)
contact@bluepebble.biz

April 2014

TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	RESPONSIBILITY AND COMMUNICATION	1
1.1.1	Relevance of the Environmental Management Programme (EMPr)	1
1.1.2	Adoption of the EMPr	1
1.1.3	Implementation within the specific environmental context	1
1.1.4	Environmental Control Officer (ECO)/Environmental Site Agent (ESA)	2
1.1.5	Contractor's responsibility and the polluter pays principle	3
1.1.6	Environmental awareness training for site personnel	3
1.1.7	Communication procedures on-site	3
1.1.8	Environmental audit report	4
1.1.9	Record keeping	4
1.1.10	Claims	4
1.2	FINANCIAL ALLOWANCE	5
1.3	PENALTY CLAUSE FOR THE CONTRACTOR	5
1.4	EMPR AMENDMENT PROCESS	5
2	MAINTENANCE DESIGN PHASE	6
2.1	CONSIDERATION OF ALTERNATIVES	6
2.1.1	Alternative 1: Rock Revetment (Preferred Alternative)	6
2.1.2	Alternative 2: Reno Revetment	8
2.1.3	Alternative 3: Jetty Repairs	8
2.1.4	Alternative 4: No-Go Option	8
2.2	IMPACT ASSESSMENT	9
2.2.1	Impacts on and of coastal process	9
2.2.2	Impacts on the marine environment	9
2.2.2	Impact on existing operations	9
2.2.3	Impact on visual landscape	9
2.2.4	Impact on cultural heritage	9
2.3	PREFERRED OPTION	10
2.4	IMPACT STATEMENT	11
2.5	ENVIRONMENTAL MANAGEMENT OBJECTIVES	11
2.5.1	Relevant license requirements	11
3	CONSTRUCTION AND REHABILITATION PHASES	12
3.1	ENVIRONMENTAL MANAGEMENT OBJECTIVES	12
3.1.1	Contractor's camp	12
3.1.2	Use of local labour	12
3.1.3	Protection of flora, fauna and natural features	12
3.1.4	Demarcation of the site	12
3.1.5	Site access and vehicle control	12
3.1.6	Establishment of working and storage areas	13
3.1.7	Establishment of maintenance and service areas	13
3.1.8	Fuels and flammable materials	13
3.1.9	Appropriate use of machinery	13
3.1.10	Services	14
3.1.11	Earthworks	14
3.1.12	Blasting/drilling	14
3.1.13	Erosion and storm water management	14
3.1.14	Preparation and type of construction materials	14
3.1.15	Construction material and cement works	14
3.1.16	Handling of hazardous materials	15
3.1.17	Integrated waste management and pollution control	15
3.1.18	Dust and noise control	15
3.1.19	Fire prevention measures	16
3.1.20	Toilets	16
3.1.21	Stabilisation of construction site	16
3.1.22	Site clean up	16
4	OPERATIONAL PHASE	17
4.1	ENVIRONMENTAL MANAGEMENT OBJECTIVES	17
4.1.1	Management of geotechnical stabilisation and coastal erosion	17
4.1.2	Potential future maintenance activities	17
	APPENDIX A: ENVIRONMENTAL AWARENESS	18
	APPENDIX B: ENVIRONMENTAL MONITORING	21
	APPENDIX C: ENVIRONMENTAL METHOD STATEMENTS	22
	APPENDIX D: JETTY MAINTENANCE METHOD	23
	APPENDIX E: SHORELINE PROTECTION METHOD	26
	APPENDIX F: SHORELINE PROTECTION ALTERNATIVES	27
	APPENDIX G: ENVIRONMENTAL SCREENING REPORT	36
	APPENDIX H: DEA CONFIRMATION LETTER	37

1 INTRODUCTION

1.1 Responsibility and Communication

1.1.1 Relevance of the Environmental Management Programme (EMPr)

This Environmental Management Programme (EMPr) document describes the management, mitigation, protection and/or remedial objectives that will be met in order to address the identified environmental impacts of the proposed maintenance activities and to ensure that these impacts are minimised and/or prevented. This EMPr is based on the framework of an Environmental Management Programme as detailed in Section 24N of the National Environmental Management Amendment Act (Act No. 62 of 2008) and is in line with the prescribed environmental management standards and practices as described in the National Environmental Management Act, 1998 (Act No. 107 of 1998).

This EMPr details the Environmental Management Objectives for the Design and Pre-construction, Construction and Rehabilitation, as well as the Operation and Maintenance Phases of the activity, makes provision for compliance monitoring, specifies mitigation measures, objectives and measurable actions, stipulates applicable standards and timeframes where applicable, identifies specific people to undertake specific tasks, allocates responsibility and accountability, provides for verification of the effectiveness of the Environmental Management Objectives and aims to ensure that the environment affected by the activity is rehabilitated to an acceptable ecologically functional state with reference to the existing environmental context of the immediate area. Also described in this document are the specific control methods that will be implemented in the case of any action or process causing pollution or environmental degradation.

This EMPr is a "living document" and will be updated and/or amended at any time should it become clear that additional guidelines or requirements are necessary. Please refer to Section 1.4 for DEA requirements i.t.o. the submission of an Amendment Application to change the EMPr.

All potential future maintenance activities that may be necessary within the life-cycle of the operation, for instance in response to damage, fire etc., must be conducted in accordance with the provisions of this EMPr. Any expansions to the operation and/or any of its facilities may require further Environmental Authorisation and will require specific environmental screening.

This EMPr should form part of all contract documentation related to Pre-construction, Construction, Rehabilitation, Operation and/or Maintenance Phases.

1.1.2 Adoption of the EMPr

The holder of the environmental approval for the activity is legally bound to conduct the activity in line with the guidelines and objectives contained within this EMPr document.

1.1.3 Implementation within the specific environmental context

The guidelines and objectives contained within this EMPr are set up to serve as a framework for the management and mitigation of potential impacts of the activity on the environment and of the environment on the operation. The wide variety of receiving environments, including anticipated and unanticipated environmental patterns and processes, presents a need for flexibility in the implementation of EMPr in such a manner that the actual on the ground mitigation and management of the potential impacts is facilitated, rather than hindered by rigid documentation. The guiding principle that must inform the implementation of the EMPr is that such implementation must result in the best practice environmental management option that is suited to the specific environmental context on the ground.

1.1.4 Environmental Control Officer (ECO)/Environmental Site Agent (ESA)

An Environmental Control Officer (ECO) or Environmental Site Agent (ESA) must be appointed by the Port Authority to be responsible for on-site compliance monitoring, as well as monthly reporting, or as needed of the environmental requirements, during the Construction and Rehabilitation Phases. The ECO/ESA must be appointed prior to commencement of any construction activities, including site establishment. It is recommended that a suitably qualified Environmental Site Agent (ESA) who is independent of the Contractor company be appointed to monitor daily implementation of the EMPr during Construction and Rehabilitation Phases, in addition to the ECO and who must work in close co-ordination to the ECO. The role of the ESA can be fulfilled by the Project Engineer.

1.1.4.1 Qualifications

The ECO/ESA must be suitably qualified to perform the role of environmental monitoring. As a guideline, the ECO/ESA should be familiar with the various patterns and processes of the natural environment, the environmental sensitivities of the specific site, and have experience with ECO/ESA monitoring on similar operations and in similar environments.

1.1.4.2 Responsibilities

The ECO is responsible for conducting the following tasks:

- (a) Conduct environmental induction with the head Contractor prior to commencement of the activity, in which the environmental parameters of the EMPr are communicated and responsibility is formally handed over.
- (b) Assist, upon request from the Contractor and/or Engineer, with further environmental awareness training amongst all personnel on the site.
- (c) Conduct fortnightly site visits, in which the on-site activities are monitored in terms of each provision of this EMPr document.
- (d) Compile a monthly ECO Report regarding compliance, to be distributed to DEA national, DENC provincial, the Developer, Engineer, Contractor and other relevant stakeholders and personnel.
- (e) Attend the monthly technical site meetings to provide input on compliance with the Environmental Management Objectives, and recommend additional measures, as necessary.
- (f) Identify opportunities where potential plant/animal rescue may be conducted.
- (g) Maintain a photographic record of the on-site activities, including documentation of significant agreements made between the Contractor, Engineer, ECO, ESA and relevant authority in terms of mitigation measures and method statements.
- (h) Retain the authority to stop works if a serious threat to, or impact on, the environment is caused directly as a result of negligence or non-cooperation on the part of the Contractor. This authority of the ECO is to be limited to emergency situations where consultation with the Engineer is not immediately available. In the event of such stoppage the ECO will immediately inform the Engineer and site operator of the reasons for the stoppage.
- (i) Upon failure by the Contractor and/or his sub-contractors and employees to show adequate consideration to the environmental requirements of this contract, the ECO/ESA and/or Engineer may issue non-compliance fines and/or have the Contractor's representative or any employee(s) removed from the site and/or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the Contractor.

1.1.5 Contractor's responsibility and the polluter pays principle

The guidelines and objectives contained within this EMPr are binding on all Contractors, sub-contractors, and personnel on the property. In the event of any unnecessary environmental damage caused by any action, process or negligence of the Contractor, or any personnel under the Contractor's employ or commission, it is the responsibility of the person who caused the damage to rectify and rehabilitate the affected environment at own cost, in line with the 'polluter pays' principle. The Contractor is to immediately notify and report any and all infringements on the conditions of the EMPr to both the Engineer and ECO/ESA.

1.1.6 Environmental awareness training for site personnel

All contractor teams involved in work on the operation are to be briefed by the Contractor's site representative on their obligation towards environmental controls and mitigation and prevention methods in terms of this EMPr prior to the start of the on-site work. The briefing will usually take the form of an on-site talk and demonstration by the Contractor. The education/awareness programme should be aimed at all levels of management within the Contractor team and the ECO/ESA can assist upon request (See **Appendix A**: Environmental awareness 'Do's & Don'ts' multilingual summary sheets).

1.1.7 Communication procedures on-site

1.1.7.1 Site instruction book

The site instruction book is a record of the communication of significant instructions as they relate to the works on the site. It will also be used for the issuing of stop work orders for the purposes of immediately halting any particular activities of the Contractor regarding an environmental risk on hand. The function of the site instruction book may be fulfilled by any recorded correspondence including transcripts of personal communications, written notes, e-mail correspondence, site meeting minutes or other formal documentation.

1.1.7.2 Environmental monitoring reports

The purpose of environmental monitoring reports will be to record the comments of the ECO/ESA for presentation at the monthly site meetings, or on an as needed basis and as they relate to activities on the site. Each of these reports will be made available to the Engineer. These should also be available to the authorities for inspection or upon request. Site meeting minutes must reflect environmental queries, agreed actions and dates of eventual compliance. These minutes may form part of the official environmental record. (See the relevant checklist for each phase of the activity, contained in **Appendix B**: Environmental Monitoring Checklists).

1.1.7.3 Method Statements

All method statements that form part of the EMPr documentation are subject to all terms and conditions contained within the EMPr. General Environmental Method Statements (see **Appendix C**) for Jetty Repairs and Shoreline Protection respectively, form part of this EMPr already. Any further specific Method Statements required prior to or during site work from the Contractor for specific sensitive actions can be request by the ECO/ESA. The method statement itself is a 'living document' in that modifications are negotiated between the Contractor and ECO/ESA, as circumstances require.

A method statement details the scope of the intended work in a step-by-step description in order for the ECO/ESA and Engineer to understand the Contractor's intentions. The ECO/ESA and Engineer may then assist the Contractor in devising any specific mitigation measures for the intended work.

The Contractor must submit a method statement to the satisfaction of the ECO/ESA, using the format provided that should clearly indicate the following:

- **What:** a brief description of the work to be undertaken;
- **How:** a detailed description of the process of work, methods and materials;
- **Where:** a description/sketch map of the locality of work (if applicable); and
- **When:** the sequencing of actions with due commencement dates and completion date estimates.

The Contractor must submit the method statement upon request before the relevant construction activity is due to start. Work may not commence until the method statement has been approved by the ECO/ESA.

1.1.8 Environmental audit report

An environmental audit report is a completion statement compiled by the ECO/ESA and submitted to the relevant authorities as a verification mechanism detailing compliance with the conditions of the environmental approval and EMPr, as well as the effectiveness of the Environmental Management Objectives.

A final audit covering all aspects of construction and rehabilitation will be compiled upon completion of the Rehabilitation phase.

1.1.9 Record keeping

All records related to the implementation of this EMPr (e.g. site instruction book, method statements, environmental monitoring reports, interim environmental audits and penalties) must be kept together on the site by the Contractor for the duration of Construction and Rehabilitation Phases as well as in an office by the ECO/ESA where it is safe and can be retrieved easily. These records should be kept for a minimum of two years after submission of the final audit report and should at any time be available for scrutiny by any relevant authorities. Photographs will be taken of the site prior to, during and immediately after the commencement of each phase of the activity to provide a benchmark visual reference. These photographs should be stored with other records related to this EMPr.

1.1.10 Claims

Any claims relating to the Contractor and/or related Subcontractors must be handled through the Project Manager. Any other claims must be considered reasonably and dealt with accordingly.

1.2 Financial allowance

It is the Contractor's responsibility to ensure that there is sufficient financial allowance to meet the environmental management guidelines and objectives specified in this EMPr. Any additional environmental management objectives that are included into this EMPr as a result of the rapid assessment process and authority comments must also be allowed for in the project budget. Allowance for any unforeseen additional environmental management objectives that may become apparent during work on site, as necessary, can be negotiated between the ECO/ESA, Engineer and Contractor at the time.

1.3 Penalty clause for the Contractor

A retention amount of 5% of the contract value is to be held back for each Contractor and paid out only once the Rehabilitation Phase has been successfully completed, in line with the provisions set out in this EMPr. In the event of non-compliance on the part of the Contractor and/or any of their representatives, with any of the provisions contained within this EMPr, and depending on the significance and extent of environmental damage to the ECO's/ESA's discretion, a warning and/or fine ranging between R1 000 and R10 000 per incident may be issued by the ECO/ESA. Recurrent transgressions on similar issues will result in significant increases in penalty amounts of up to tenfold.

Usually the fines can simply be subtracted from the contractor's monthly payments. In the case when this is not applicable, a fine is issued for non-compliance with any of the provisions contained within this EMPr, the amount accrued is to be used according to an agreement established between the ECO/ESA and the relevant Department of Environmental Affairs. The agreed end-use of the fined monies may also take into account the suggestions of any local non-governmental or community organisations and/or interested and affected parties in the affected locality. The end-use of the fined monies should facilitate the remediation of the affected environment, or otherwise benefit the natural environment and local community. If no such use is available the funds should be donated to a local charity and proof of such donation be submitted to the relevant environmental and local authorities.

1.4 EMPr amendment process

Any significant deviations to the content of this EMPr that fall outside of ground-proofing the implementation of the management and mitigation measures within the specific environmental context of the site should be preceded by a public participation process followed by the submission of an Application for Amendment of the EMPr, as per Regulation 46 of the EIA Regulations R.543 18 June 2010. Deviations to the EMPr may be necessary or desirable:

- (a) To prevent deterioration or further deterioration of the environment;
- (b) To achieve prescribed environmental standards;
- (c) To accommodate demands brought about by impacts on socio-economic circumstances and where it is in the public interest to meet those demands;
- (d) In order to assess the continued appropriateness and adequacy of the Environmental Management Programme; or
- (e) When an Environmental Management Programme is in conflict with the principles set out in NEMA.

2 MAINTENANCE DESIGN PHASE

2.1 Consideration of Alternatives

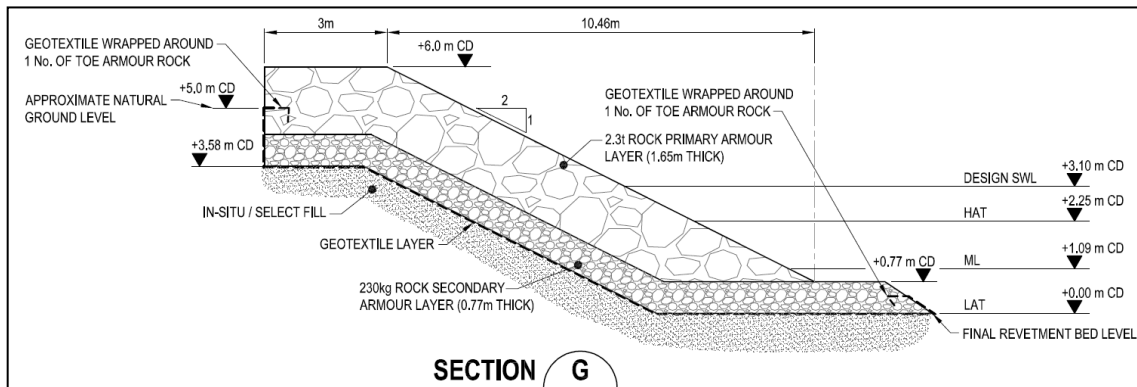
Design considerations in terms of alternatives can be found in Appendix F: Specialist Coastal Engineering Input on Alternatives as related to the shoreline protection. Maintenance design alternatives for the Jetty are not applicable, since no alterations will occur in maintaining the Jetty. Jetty maintenance alternatives are thus eliminated with the proposed method being included into the activities associated with Alternative 1 and Alternative 2 below. Refer to the Jetty Maintenance Method Statement in Appendix D.

In terms of the evaluation conducted by the coastal engineering specialists, the rock revetment and reno revetment are considered to be viable alternatives in terms shoreline protection. The remainder of the alternatives for shoreline protection, as detailed in Appendix F, have been eliminated due to being inappropriate from a technical point of view.

Alternative 1, being the Rock Revetment, is the preferred alternative.

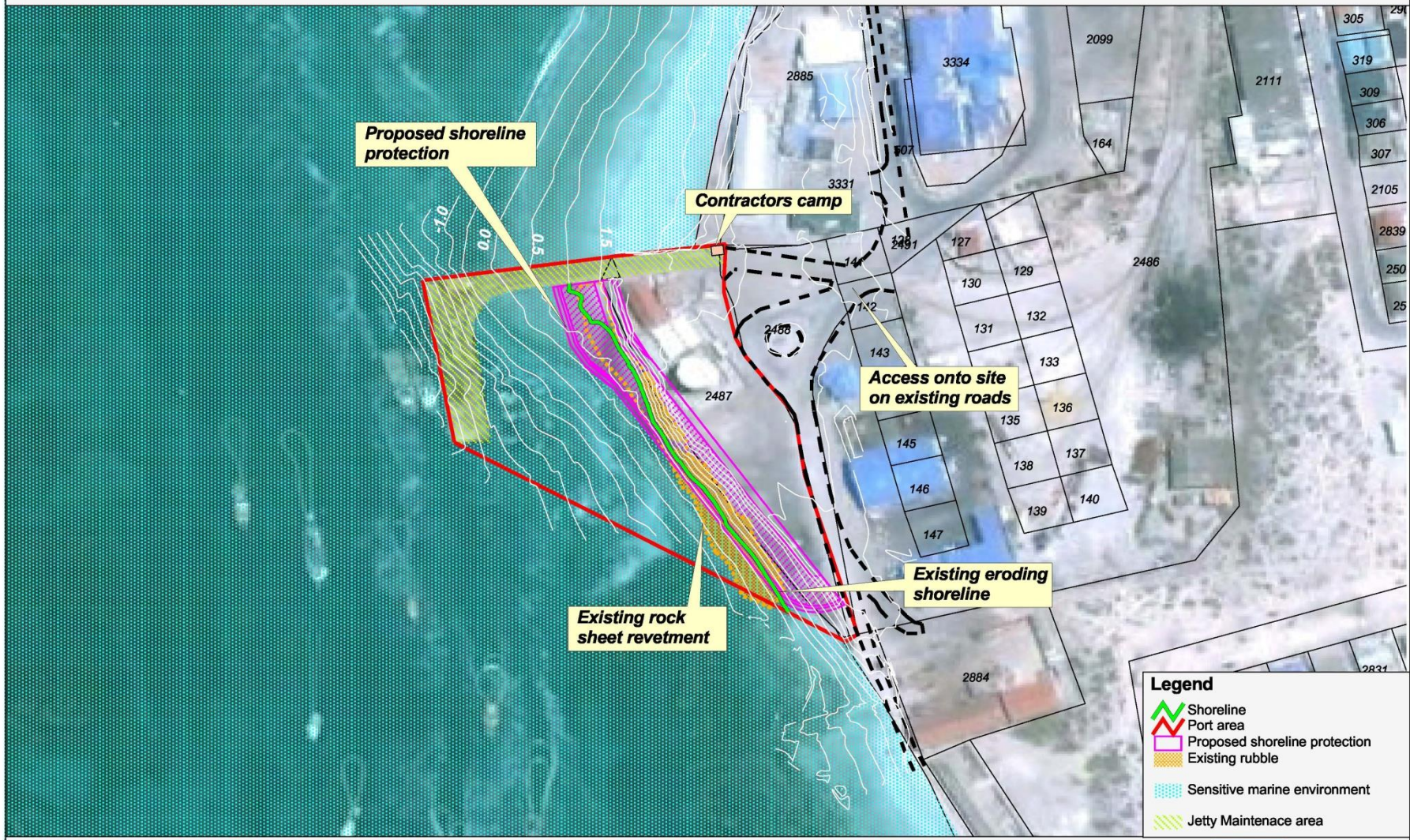
2.1.1 Alternative 1: Rock Revetment (Preferred Alternative)

The rock revetment is considered as the preferred method in terms of the shoreline protection.



The layout of the structure of the proposed rock revetment is depicted on the Site Plan overleaf.

Port Maintenance Activities, Port Nolloth



Legend

- Shoreline
- Port area
- Proposed shoreline protection
- Existing rubble
- Sensitive marine environment
- Jetty Maintenance area

1:2000
30 April 2014

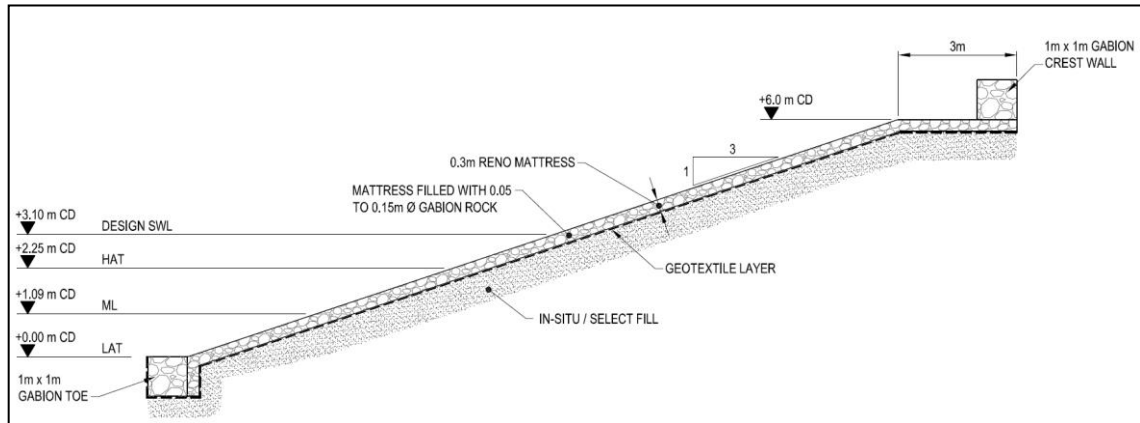
SITE PLAN

50 0 50 100 150 200 Meters

bluepebble
independent environmental agency

2.1.2 Alternative 2: Reno Revetment

The reno revetment is also considered as one of the preferred methods in terms of the shoreline protection. This option is a 2nd choice to the preferred option.



2.1.3 Alternative 3: Jetty Repairs

The Jetty Repairs are the preferred option in terms of Jetty Maintenance and are detailed in the Maintenance Method in Appendix D.

2.1.4 Alternative 4: No-Go Option

The No-Go option is included in order to draw comparison with the proposed alternatives. The No-Go option would essentially mean that nothing will be done. In other words no maintenance activities will be conducted on either the Jetty or the Shoreline Protection. This is of course a theoretical baseline, since maintenance work does need to be conducted in order to keep the facilities functional and allow for continual operations in the Port Area.

2.2 Impact Assessment

2.2.1 Impacts on and of coastal process

The impact of the proposed maintenance activity on coastal process is deemed to be **very low –** since the proposed activity will really replace an existing structure. The activity will not interfere with sedimentation dynamics or current flow in any significant manner.

The impact of coastal process on the structure can be **medium to high -**. Yet the impact related to 'no-go' is **very high -**, so protection is required. The protection itself may be altered by the coastal process over time and it must be monitored.

2.2.2 Impacts on the marine environment

The impacts on the marine environment are deemed to be **low –** as the activity is small in scale and can be managed effectively i.t.o. minimizing environmental degradation. Flamingoes do not breed in this area, and can easily move off to other areas close by the site, which already form part of their range and existing habitat.

2.2.2 Impact on existing operations.

The need for maintenance itself talks to the impact on operations if the facility is closed down due to ill-repair. The jetty itself and shoreline do require repair if the port is to be safely operated into the future. Maintenance thus has a **high +** impact on the operation of the facility.

2.2.3 Impact on visual landscape

Currently the visual landscape is marred by the collapsed infrastructure along the shoreline in the port area. Maintenance of proper protection will improve the visual landscape and assessed as **medium +**, which forms part of an important local tourism sector.

2.2.4 Impact on cultural heritage

The port itself dates back to the late 1800s and the maintenance to the jetty will involve 'patch and repair' type of work. There are no old buildings or most likely no archeological resources within the embankment protection area, since the site is completely transformed and the parking area has been filled up over time. The impact to cultural heritage is thus deemed **Low-**.

The above comments are tabulated overleaf in order to conduct simple comparative assessment across the alternatives, using common environmental criteria.

A concise assessment of impacts has been conducted on Alternatives 1, 2, 3 and 4 is presented in Table 1: Impact Matrix below. Additional aspects of impact assessment, such as the scale, extent, duration, degree of reversibility, etc. are not used in the comparative assessment since these provide limited additional value.

Table1: Impact Assessment Matrix

Impact Criteria	A1: Rock Revetment	A2: Reno Revetment	A3: Jetty Repairs	A4: No-Go Option
Impact of maintenance on coastal process	Very Low -	Very Low -	Insignificant	NA
Impact of coastal process on activity	Medium -	High -	Medium -	Very High -
Impact on marine environment	Low -	Low -	Very Low -	Low -
Impact on existing operation	High +	High +	High +	Very High -
Impact on visual landscape	Medium +	Medium to low +	Low +	High -
Impact on heritage aspects	Low -	Low -	Low -	Low to Medium -
Impact on construction cost	High -	Medium -	Medium -	Zero
Impact on maintenance cost	Zero	High -	Low -	NA
Impact on local job creation during maintenance	Low +	High +	Low +	High -
Cumulative impact on ecological goods and services	Low -	Low -	Low -	Low -
Cumulative impact on socio economic environment	High +	High +	Low +	Very High -

2.3 Preferred Option

Alternative 1, being the rock revetment is the preferred option for shoreline protection. The reno revetment is a secondary preferred method, and remains a 2nd choice to Alternative 1.

Alternative 3, being Jetty Repairs is the preferred option for Jetty maintenance.

Alternative 1 Rock Revetment and Alternative 3 Jetty Repairs 3 are thus proposed as suitable options for implementation.

2.4 Impact Statement

It is clear from the investigation and impact assessment that maintenance activities are required in order for the Port Area to remain functional over the medium to long-term.

The impact of the maintenance activities on coastal process is deemed **Very Low –** since the maintenance will not significantly change the situation in terms of coastal process.

The impact of coastal process on the maintenance activities and existing operation is deemed **Medium – to High –** since the coastal process, including the effects of global change and storm event intensification will over time provide challenges in terms of the operation of the Port Area.

The impact of the maintenance activities on the marine environment is deemed **Low –** since all maintenance activities will have to be carried out within the framework, which details good house-keeping and the prevention of any potential pollution. The red flag issue of flamingos in the immediate area has been investigated and the flamingos should not be affected significantly during the maintenance activities.

The impact on the existing operation will be **High +** since such is required in order to retain the operation of Port Area. The impact of the activities on the visual and heritage aspects will likely be positive and **low -**, since the current situation is unsightly. The use of the existing parking area for the public will thus be improved through the maintenance of the shoreline protection.

The impact of the construction and maintenance cost favours the rock revetment, which has a high initial cost and a low maintenance cost. The reno mattress has a low initial cost, yet high maintenance cost, and a lower life span i.t.o. durability.

The socio-economic aspects, including the cumulative impact, will be positive since the maintenance will generate income for the local economy. The placement of the reno mattress will create more hand work, and thus local labour can be employed.

2.5 Environmental Management Objectives

The Design and Pre-construction Phase consist of all design and planning considerations as well as forethought regarding site work during the phase. Refer to the Environmental Screening report dated 13 June 2013 for more detail. The following Environmental Management Objectives detail the mitigation measures that will be implemented and monitored in order to minimise the environmental impacts.

2.5.1 Relevant license requirements

License(s) in terms of the Off-Road Vehicle Regulations, 2001 and/or any other relevant legislation may need to be obtained prior to commencement and adhered to as necessary.

The Port Authority holds the responsibility of ensuring compliance with all other relevant legislation.

3 CONSTRUCTION AND REHABILITATION PHASES

3.1 Environmental Management Objectives

The Construction Phase consists of all site preparation activities, earthworks, physical construction and/or modification of infrastructure consisting of all roads and services, and includes site stabilisation/rehabilitation measures. The following Environmental Management Objectives detail the mitigation measures that will be implemented and monitored in order to minimise the environmental impacts.

3.1.1 Contractor's camp

There should be a single Contractor's camp for use by all Contractors involved with the Construction Phase; for the provision of staff facilities; and the storage of all materials and equipment. All mechanical equipment and work vehicles used on-site should be stored, serviced and refuelled only at designated areas within the Contractor's camp. The most suitable site must be confirmed by the Project Manager to the satisfaction of the ECO/ESA and should not be situated directly adjacent or near to any environmentally sensitive area.

3.1.2 Use of local labour

It is recommended that local labour is used during the Construction and Rehabilitation Phase where possible. Monthly records must be kept of all local labour including that of any subcontractors.

3.1.3 Protection of flora, fauna and natural features

Indigenous plants and/or wild animals (including reptiles, amphibians, mammals and birds etc.) within or outside of the development footprint may not be damaged or harmed. Damage to marine biodiversity within the site is to be minimised wherever possible and practical. All incidents of harm to any animal or natural vegetation (apart from the agreed areas) must be immediately reported to the ECO/ESA. No sensitive indigenous flora or natural features however occur directly on the proposed construction site and this provision relates more to periphery activities.

3.1.4 Demarcation of the site

The site must be suitably demarcated prior to the commencement of construction activities. Prior to commencement, the contractor must submit and compile a method statement that details working footprints, buffers and other significant demarcation details, as necessary. Areas should be suitably demarcated with shade-cloth fencing. Other demarcation such as orange plastic netting, and biddum cloth, danger tape, etc. may be used within the site, as agreed with the ECO/ESA. Temporary demarcation of sensitive areas identified on the site may be required. All demarcation must be securely erected to ensure that it cannot come loose, and is to be maintained until all construction activities have been completed and the associated risk of damage has passed. Access routes and storage areas should be identified by the Contractor and approved by the ECO/ESA, upon contractor appointment.

3.1.5 Site access and vehicle control

Site access must be restricted to existing access routes and should be monitored, controlled and clearly demarcated in order to minimise environmental impacts. A constant regard must be taken to safety and dangerous areas should be adequately cordoned off to prevent accidental injury.

The movement of vehicles on the site must be confined to clearly demarcated routes using existing roads. Any deviation should first be approved by the ECO/ESA, in consultation with the Engineer. No disturbance to the sensitive shoreline area will be allowed outside of the defined

footprint area of the proposed shoreline protection. The Contractor should ensure that vehicles leaving the site are clean and, wherever possible do not deposit mud and any other earth material on road surfaces. No new access routes may be constructed.

3.1.6 Establishment of working and storage areas

Working and storage areas need to be demarcated during site establishment. All construction on-site activities, including the storage and stockpiling of materials, should be contained within these identified and established work and storage areas.

3.1.7 Establishment of maintenance and service areas

No major service areas may be established on the site.

Minor maintenance and service areas should be demarcated during site establishment and all maintenance and service activities contained so as to avoid any contamination of soil and/or water. All vehicles and equipment should be maintained in a good condition that prevents leakage and possible contamination of soil or water supplies. No refuelling will be allowed within the site itself. Refuelling can be done at the local service station, and/or through the De Beers refuelling facility. Similarly such service areas can be used.

The construction service area situated outside of the site should be treated with a suitable hydrocarbon absorption or remediation product in the event of a spill. Absorbent spill mop-up products should be on hand (*Drizzit* and products from *Enretech* for instance). All servicing should be done with a drip tray present to prevent accidental spillage of oils and fuels. A suitable leak proof container for the storage of oiled equipment (filters, drip tray contents and oil changes, etc.) should be established. All spills to be immediately contained, reported to the ECO/ESA, and dealt with in terms of the provisions of integrated waste management and pollution control as detailed in **section 3.1.18** of this EMPr. The maintenance and service areas must be cleared and the area rehabilitated after completion of construction.

3.1.8 Fuels and flammable materials

No refuelling is to occur on the site and the nearby fuelling station can be used.

Any fuels and flammable materials should be stored in suitably equipped storage areas demarcated within the Contractor's camp. These areas must comply with general fire safety requirements. No fuels may be stored within drainage lines or areas. Impervious lining materials should be used in these storage areas to prevent contamination of the ground in the event of spillages or leaks, and automatic shut-off nozzles should be used on all dispensing units. Quantities of fuels and flammable/hazardous materials stored on the site should be appropriate to the requirement for these substances.

Fuels and oils should be safely located out of harm's way from the elements. No fuel/oil containers may be left unattended within drainage areas. All open containers containing used oil, etc., should be kept under roof or have adequate water tight lids. All spills to be immediately contained, reported to the ECO/ESA, and dealt with in terms of the provisions of integrated waste management and pollution control as detailed in **section 3.1.18** of this EMPr. Fuel and flammable storage areas must be cleared and the area rehabilitated after completion of construction.

3.1.9 Appropriate use of machinery

The Contractor shall at all times carefully consider what machinery is appropriate to the task while minimising the extent of environmental damage. The ECO/ESA may order the removal of equipment that is causing continual environmental damage (e.g. by leaking oil or diesel) until such equipment has been adequately repaired. All spills to be immediately contained, reported to the ECO/ESA, and dealt with in terms of the provisions of integrated waste management and pollution control as detailed in **section 3.1.18** of this EMPr.

3.1.10 Services

All services and maintenance to services affected during construction, including site connections, should be constructed in line with the provisions contained within this EMPr. Care and due consideration should be taken of existing services, service routes and service construction methods and restrictions. This aspect is often overlooked causing unnecessary environmental impacts and costs.

3.1.11 Earthworks

Any major earthworks with heavy machinery (e.g. bulldozers and back-actors) should be under constant supervision and operators are to be aware of all environmental obligations, as there is increased potential to damage the sensitive coastline and surrounding environment unnecessarily. The use and excessive movement of heavy machinery around sensitive coastal slopes should be avoided as far as possible. A method statement will be required from the Contractor prior to commencement of earthworks, detailing spoil material type, on-site storage provisions, disposal site and volumes.

The material removed from all earthworks should be securely stockpiled in a suitable site to prevent surface runoff and erosion. Fill material and spoil material must be sourced/disposed of at approved sites. Proof of such sourcing/disposal must be submitted to the ECO/ESA, prior to commencement of the activity.

3.1.12 Blasting/drilling

In the event that blasting or rock drilling is required, the Contractor should take all necessary precautions to prevent damage to special features and the general environment, which includes the removal of flyrock. Environmental damage caused by blasting/drilling shall be repaired at the Contractor's expense to the satisfaction of the ECO/ESA and Engineer. No blasting may be done on Sundays. Adequate warning should be provided prior to all blasting to all site staff and neighbours. All-clear signals should also be clearly given. The Engineer and ECO/ESA should be given 24-hour notice before blasting events.

3.1.13 Erosion and storm water management

The Contractor should take appropriate and active temporary and permanent measures to prevent erosion resulting from their own works, operations and activities as well as storm water control measures, to the satisfaction of the ECO/ESA. Restoration costs will be deducted from the Contractor's account, should these measures not be reasonably implemented. Aspects normally covered in construction contracts in terms of "protection of works" are standard and are not to be billed or confused with any details covered under environmental requirements.

3.1.14 Preparation and type of construction materials

An effort should be made to choose environmentally friendly construction materials wherever possible and feasible from financial and engineering quality perspectives. Construction materials should be prepared at the relevant batching plant wherever possible, to enable any negative environmental effects of cement and other substances for instance, as well as the resulting effluent, to be more easily managed.

3.1.15 Construction material and cement works

All construction materials and cement works requiring mixing should preferably be conducted off-site. If possible and appropriate, ready mix concrete should be used. Where this is not possible, mixing areas are to be carefully situated and demarcated in consultation with the ECO/ESA. All mixing areas should be bunded to avoid spillage of waste material and waste water. Contaminated water may not enter any natural or man-made water system and should not be allowed to be absorbed into the soil. Preventative measures include establishing sumps from where contaminated water can be either treated on-site or removed to an appropriate waste disposal site.

Empty cement bags should be frequently collected, and may not be burnt. Empty bags must be securely stored out of the elements (sun, wind and rain) and within the Contractor's camp. Excess or spilled cement should be confined within the demarcated works area and then removed to an approved waste disposal site in terms of the provisions of integrated waste management and pollution control as specified in **section 3.1.18** of this EMPr.

3.1.16 Handling of hazardous materials

In addition to the pollution and contamination measures detailed in other relevant sections of this EMPr, all site personnel should be made fully aware of the health effects of any potentially hazardous materials stored on-site during construction activities, and the suitable methods of handling these materials. All storage vessels for hazardous materials should be maintained in a good condition that prevents leakage and possible contamination of soil and/or water supplies. Such storage areas should be bunded and lined to prevent potential spills from contaminating the ground or water. In the event of a spill or contamination event, the Contractor and/or responsible person on the site must immediately inform the relevant Health and Safety Officer, Engineer and ECO/ESA. A suitable containment strategy must then be immediately implemented and the spill material disposed of in terms of integrated waste management and pollution control as specified in **section 3.1.18** of this EMPr. Should any environmental damage occur, it is the responsibility of the Contractor to rehabilitate the receiving environment (See **section 1.1.5** Contractor's responsibility and the polluter pays principle).

3.1.17 Integrated waste management and pollution control

It is the Contractor's responsibility to minimise the generation of waste where possible and implement the reduction, re-use, recycling and disposal of waste where appropriate. General waste produced during the Pre-Construction, Construction Phase and Rehabilitation Phases is the responsibility of the Contractor. Waste such as cement bags, gravel, rubble, cans, plastic, wire, etc. should be stockpiled in the area demarcated for this purpose, suitably stabilised and secured against the wind. This site should be approved by the ECO/ESA. No burying of waste or refuse on-site will be allowed.

The Contractor is responsible for the establishment of a refuse control system that is acceptable to the ECO/ESA. Where construction workers are allowed to eat on the construction site, other than within the Contractor's camp, the Contractor should provide adequate refuse bins at all such places and ensure that they are used. The Contractor should ensure that refuse, surplus food, food packaging and organic waste are not deposited by his employees anywhere on the site except in refuse bins. Refuse bins must be weather and animal-proof. In cases where significant quantities of recyclable waste are generated on-site, it is the Contractor's responsibility to implement the recycling effort. Recyclable materials should be separated out, with separate containers for paper, glass, and plastics and these containers should be placed near to the site office. The Contractor is responsible for the removal of all stockpiled recyclable material to a recycling facility on a weekly basis, or as necessary.

The Contractor is responsible for the removal of any solid waste collected on-site to a suitable landfill licensed in terms of section 20 of the Environmental Conservation Act, 1989 (Act No. 73 of 1989) or the National Environmental Management: Waste Act (Act No. 59 of 2008), on a weekly basis or as necessary. In the event of a spill or contamination event, the Contractor and/or responsible person on the site must immediately inform the relevant Health and Safety Officer, Engineer and ECO/ESA as well as relevant emergency response authorities if necessary. A suitable containment strategy must then be immediately implemented.

3.1.18 Dust and noise control

The Contractor is to take appropriate measures to minimise the generation of dust as a result of construction works, to the satisfaction of the ECO/ESA. Dust control methods on any cleared or exposed sections of the site include the use of suitable material like bidum cloth or similar prior to structure being put into place, should be implemented if dust is an issue. In order to

minimise the noise impact, all construction activities are to be limited to within regular working hours. No construction activities are to take place on Sundays.

3.1.19 Fire prevention measures

No fires may be allowed inside the construction area. Adequate fire fighting equipment should be available on-site, in good working order, and according to the fire hazard present during the Pre-construction and Services Construction phase (at least one type ABC all purpose 12.5kg extinguisher). Any welding, gas cutting or cutting of metal should only be permitted inside the demarcated working areas for this purpose and these areas should be approved by the ECO/ESA. The Contractor shall pay the costs incurred to organisations called to put out any fires started by him. The Contractor shall also pay any costs incurred to reinstate/rehabilitate burnt areas as deemed necessary by the Engineer and ECO/ESA.

3.1.20 Toilets

The Contractor should provide suitable sanitary facilities near his offices and all construction sites for his staff. A minimum of one toilet should be provided per 15 persons at each working area or as stipulated by local authority or other relevant legislation. Toilets should be of a neat construction and have doors and locks. Toilets should be secured to prevent them blowing over. Sanitation provision and servicing should be to the satisfaction of the Engineer. The Contractor shall ensure that toilets are emptied weekly, as well as before any builders' holidays.

3.1.21 Stabilisation of construction site

The Contractor is responsible for the stabilisation of all areas disturbed during the Pre-construction, Construction and Rehabilitation Phases. This includes all road reserves, pipeline routes, embankments, haul roads, exposed slopes and the Contractors' camp. This should take place before rehabilitation of these areas can take place. Any vegetated areas disturbed during construction must be rehabilitated fully.

3.1.22 Site clean up

The Contractor should ensure that all structures, equipment, materials and facilities used or created on-site for or during construction activities are removed once the Pre-construction and Construction Phase has been completed, to the satisfaction of the ECO/ESA.

4 OPERATIONAL PHASE

The Operation and Maintenance Phase of the Environmental Management Programme (EMPr) consists of all operational, maintenance and monitoring activities that occur after completion of the Pre-construction, Construction, and Rehabilitation Phase.

Where existing facilities, structures or infrastructure requires maintenance, due consideration is to be given to the environment in which the maintenance activity is proposed. This may take the form of a Section 28 Duty of Care assessment (in terms of NEMA), or through an Environmental Impact Assessment (EIA) (in terms of the EIA Regulations). Maintenance is defined in the EIA Regulations, 2010, to mean *the reconstruction of the same facility in the same location, with the same capacity and footprint.*

Such maintenance activities should be screened against the relevant EIA Regulations and any other relevant legislation as a precautionary measure prior to commencement. It is however likely that any maintenance activity, as defined in the EIA Regulations (2010), will not require Environmental Authorisation prior to commencement, yet it is recommended that the results of the environmental screening exercise be submitted to the relevant environmental competent authority to confirm such.

The guidelines contained in this EMPr should be consulted, and elements of the guidelines can be voluntarily implemented as feasible and practical, when conducting maintenance activities. Any site specific or sensitive activities can finally be managed through the approval of a Method Statement (refer to Appendix C) by the relevant environmental officer on the site.

4.1 Environmental Management Objectives

The following Environmental Management Objectives indicate the mitigation measures that are recommended to be implemented and monitored in order to minimise the environmental impacts:

4.1.1 Management of geotechnical stabilisation and coastal erosion

It is the responsibility of TransNet to ensure that the geotechnical stabilisation and coastal erosion protection measures are adequately maintained within the Port Area.

4.1.2 Potential future maintenance activities

Maintenance activities are to be conducted within the framework for the Design and Pre-Construction, Construction and Rehabilitation Phases as detailed in **section 2** of this EMPr.

APPENDIX A: Environmental Awareness

Environmental Awareness Do's and Don'ts

BASIC RULES OF CONDUCT

The following list represents the basic Do's and Don'ts towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid.

NOTE: **ALL new site personnel must** attend an environmental awareness presentation. Please inform your foreman or manager if you have not attended such a presentation or contact the ECO.

DO:

- USE THE TOILET FACILITIES PROVIDED – REPORT DIRTY OR FULL FACILITIES.
- CLEAR YOUR WORK AREAS OF LITTER AND BUILDING RUBBISH AT THE END OF EACH DAY – use the waste bins provided and ensure that litter will not blow away.
- REPORT ALL FUEL OR OIL SPILLS IMMEDIATELY & STOP THE SPILL CONTINUING.
- DISPOSE OF CIGARETTES AND MATCHES CAREFULLY. (Littering is an offence.)
- CONFINE WORK AND STORAGE OF EQUIPMENT TO WITHIN THE IMMEDIATE WORK AREA.
- USE ALL SAFETY EQUIPMENT AND COMPLY WITH ALL SAFETY PROCEDURES.
- PREVENT CONTAMINATION OR POLLUTION OF STREAMS AND WATER CHANNELS.
- ENSURE A WORKING FIRE EXTINGUISHER IS IMMEDIATELY AT HAND IF ANY 'HOT WORK' IS UNDERTAKEN e.g. welding, grinding, gas cutting, etc.
- REPORT ANY INJURY OF AN ANIMAL.
- DRIVE ON DESIGNATED ROUTES ONLY.
- PREVENT EXCESSIVE DUST AND NOISE.

DO NOT:

- REMOVE OR DAMAGE VEGETATION WITHOUT DIRECT INSTRUCTION.
- MAKE ANY FIRES.
- INJURE, TRAP, FEED OR HARM ANY ANIMALS – this includes birds, frogs, snakes, lizards, etc.
- ENTER ANY FENCED OFF OR MARKED AREA.
- ALLOW CEMENT OR CEMENT BAGS TO BLOW AROUND.
- SPEED OR DRIVE RECKLESSLY
- ALLOW WASTE, LITTER, OILS OR FOREIGN MATERIALS INTO THE STREAM.
- SWIM IN THE DAM.
- LITTER OR LEAVE FOOD LYING AROUND.

Notes:

1. Should any animals such as tortoises, chameleons or snakes be encountered then do not harm them. The ECO or RE should be contacted to remove these safely. The harming of any animal will result in disciplinary action.
2. Construction and heavy machine operators must be particularly sensitive to staying within access routes and prevention of unnecessary damage. Dust and noise is also of particular concern. Ensure that vehicles and machinery do not leak fuel or oils. Refuelling or maintenance must be done within the maintenance camp area only.
3. Alien plant clearing and control work teams must be closely supervised.

BASIESE GEDRAGSKODES

Die volgende lys verteenwoordig die Moets en Moenies vir omgewingsbewustheid wat alle deelnemers aan hierdie projek in ag moet neem tydens die uitvoer van hul take. Hierdie lys is nie volledig nie en dien slegs as 'n vinnige verwysing.

NOTA: **ALLE nuwe terreinpersoneel moet** 'n aanbieding ten opsigte van omgewingsbewustheid bywoon. Indien u nog nie so 'n aanbieding bygewoon het nie, lig asseblief u voorman of bestuurder in of kontak die Omgewings Terreinbeampte.

MOETS:

GEBRUIK DIE BESKIKBARE TOILET-GERIEWE – RAPPORTEER VUIL OF VOL GERIEWE.

- MAAK U WERKPLEK SKOON VAN ROMMEL OF BOUROMMEL AAN DIE EINDE VAN ELKE DAG – gebruik beskikbare vullisdromme en verseker dat rommel nie rondwaai nie.
- RAPPORTEER ALLE BRANDSTOF- EN OLIE STORTINGS ONMIDDELIK – STOP VERDERE STORTING.
- WEES VERSIGTIG MET DIE WEGDOEN VAN SIGARETTE EN VUURHOUTJIES. (Rommelstrooi is 'n oortreding.)
- BEPERK WERKAKTIWITEITE EN DIE STOOR VAN TOERUSTING TOT DIE ONMIDDELLIKE WERKAREA.
- GEBRUIK VEILIGHEIDSTOERUSTING EN VOLDOEN AAN ALLE VEILIGHEIDSMATREËLS.
- VOORKOM BESOEDELING VAN STROME EN WATERWEEË.

- VERSEKER DAT 'N BRANDBLUSSEER IN WERKENDE TOESTAND BYDERHAND IS WANNEER 'WARM WERK' VERRIG WORD bv. Sweis, wegslyp, gassny, ens.
- RAPPORTEER BESEERDE DIERE.
- RY SLEGS OP AANGEWEESE ROETES.
- VOORKOM OORMATIGE STOF EN GERAAS.

MOENIE:

- PLANTEGROEI VERWYDER OF BESKADIG SONDER DIREKTE INSTRUKSIE NIE.
- ENIGE VURE MAAK NIE.
- ENIGE DIERE DOODMAAK, BESEER, VANG OF VOER NIE, insluitende voëls, paddas, slange, akkedisse, ens.
- ENIGE OMHEINDE OF AFGESPERDE AREAS BETREE NIE.
- SEMENT OF SEMENTSAKKE LAAT RONDWAAI NIE.
- VINNIG OF ROEKELOOS BESTUUR NIE.
- ENIGE ROMMEL, AFVAL, OLIE OF ENIGE VREEMDE MATERIAAL IN STROME LAAT BELAND NIE.
- IN DIE DAM SWEM NIE.
- ROMMELSTROOI OF KOS LAAT RONDLÊ NIE.

Notas:

1. Indien enige diere soos skilpaaie, verkleurmanneljies of slange teëgekrom word, moet hulle nie beseer of doodmaak nie. Kontak die OTB of RI om hulle veilig te verwyder. Die besering van diere sal lei tot dissiplinêre optrede.
2. Operateurs van konstruksie- en swaar masjiene moet veral versigtig wees om binne toegangsroetes te bly en om enige onnodige skade te voorkom. Verseker dat voertuie en masjiene nie olie of brandstof lek nie. Brandstofaanvulling en voertuigonderhoud mag slegs binne die onderhoudsarea gedoen word.
3. Streng toesig moet gehou word oor indringerplantbeheerspanne.

EZIPPHAMBILI EKUNYANZELEKILEYO UKUBA ZENZIWE

Zonke ezi zinto zilandelayo zizinto ekufuneka zenziwe nekufuneka zingenziwanga.

Wonke umntu ofikayo kufuneka afundiswe ngemigaqo kupala. Needa yazisa iforman yakho ikuba awukhange uye kufundiswa.

IZINTO EMAZENZIWE

- SEBENZISA IZINDLU ZANGASESE, YAZISA XA KUKHO UMONAKALO.
- ZAMA UKUCOCA APHO UBUSEBENZA KHONA.
- SEBENZISA IMIGQOMO YENKUKUMA UNGAYEKI IPHAPHTIEKE.
- YAZISA XA UBONA IOIL ECHITHSKALAYO OKANYE IPETROL.
- CIMA LOZOLI CIGARETTE XA UGQIBIBILE UKUTSHAYA
- ZONKE IZIXHOBO USEBENZA ZIBUYISELE APHO ZIHLAKA KHONA XA UCGIBILE APHO ZIHLALA KHONA XA UGQIBILE UKUZISEBENZISA.
- ZISEBENZISE IZIKHUSELIXA UZINKIWE.
- SUKUGALELA IZINTO EMLANJENI.
- MASIBEKHO ISICIMA MLILO XAUSEBENZA NGOMLILO.
- YAZISA MSINYANE XA UBONE ISILWANYANA EZONZAKELEYO.
- XAUQHUBA ISITHUTHI HAMBA ENDLELENI QHA UNGAFATHULINJE.
- NAPHINA ZAMAUNGENZI THULI OKANYE INGXOLO XA USEBENZA.

EMAZINGENZIWA

- SUKUSUSA NESIPHINA ISITYALO UNGAKHANGE UXELELWE
- SUKWENZA MLILO NOKUBA SEKUBANDA
- AMAGQARA UKUBULALA IZILWANYANA NOKUZIFIDA AKUVUMELEKANGA
- SUKUNGENA XA KUVALIWE NGAPHANDLE KWE MVUME
- INGXOWA ZESAMENTE MAZINCEDWE ZINGALAHHLWA NJE
- SUKUQHUBA NGESANTYA ESIPHAKAMILEYO

- SUKUGALELE NAYIPHI INTO PHAYA EMLANJENI

- SUKUQUBHA EDAMENI Q OQOSHA YONK INKUKUMA

APPENDIX B: Environmental Monitoring Environmental Compliance Monitoring Checklists

Design and Pre-Construction Phase

Excellent	A
Acceptable	B
Not effective	C

Environmental management objectives:	Effectiveness
Ref. 2.4.1 Relevant license requirements	

Construction and Rehabilitation Phases

Excellent	A
Acceptable	B
Not effective	C

Environmental management objectives:	Effectiveness
Ref. 3.1.1 Contractors camp	
Ref. 3.1.2 Use of local labour	
Ref. 3.1.3 Protection of flora, fauna and natural features	
Ref. 3.1.4 Demarcation of site	
Ref. 3.1.5 Site access and vehicle control	
Ref. 3.1.6 Establishment of working and storage areas	
Ref. 3.1.7 Establishment of maintenance and service areas	
Ref. 3.1.8 Fuels and flammable materials	
Ref. 3.1.9 Appropriate use of machinery	
Ref. 3.1.10 Services	
Ref. 3.1.11 Top material removal and stockpiling	
Ref. 3.1.12 Earthworks	
Ref. 3.1.13 Blasting/drilling	
Ref. 3.1.14 Erosion and storm water management	
Ref. 3.1.15 Preparation and type of construction materials	
Ref. 3.1.16 Cement works	
Ref. 3.1.17 Handling of hazardous materials	
Ref. 3.1.18 Integrated waste management and pollution control	
Ref. 3.1.19 Dust and noise control	
Ref. 3.1.20 Fire prevention measures	
Ref. 3.1.21 Toilets	
Ref. 3.1.22 Stabilisation of construction site	
Ref. 3.1.23 Site clean up	

Operation and Maintenance Phase

Excellent	A
Acceptable	B
Not effective	C

Environmental management objectives:	Effectiveness
Ref. 4.1.1 Management of geotechnical stabilisation and erosion protection	
Ref. 4.1.2 Potential future maintenance activities	

APPENDIX C: Environmental Method Statements

ENVIRONMENTAL METHOD STATEMENT

Project:
Ref. No.:
ECO:



Date compiled:
Date approved by ECO:

Contractor: _____ Signature: _____

TITLE:

What (a brief description of the work to be undertaken)

How (a detailed description of the process of work, methods and materials)

Where (a description/sketch map of the locality of work, if applicable)

When (the sequencing of actions with due commencement dates and completion date estimates)

Comments:

Special conditions:

APPENDIX D: Jetty Maintenance Method

PORT NOLLOTH TRANSNET PORT AREA

1. JETTY MAINTENANCE

Maintenance Method

Current Note

The repair method will include:

- Patch repairs
- Cathodic Protection (probably impressed current type)

List of Abbreviations

CP	Cathodic Protection
CD	Chart Datum
MSL	Mean Sea Level
LAT	Lowest Astronomical Tide
MLWS	Mean Low Water Springs
MLWN	Mean Low Water Neaps
ML	Mean Level
MHWN	Mean High Water Neaps
MHWS	Mean High Water Springs
HAT	Highest Astronomical Tide
E	Engineer
C	Contractor
MCI	Migrating Corrosion Inhibitor

Note: Sea water levels

According to SA Tide Tables, Chart Datum (CD) is 0.925m below land levelling datum (MSL).

Tidal levels relative to CD are:

LAT	0.00m
MLWS	0.28m
MLWN	0.78m
ML	1.09m
MHWN	1.40m
MHWS	1.91m
HAT	2.25m

Due to waves breaking over the offshore reefs, there is an additional set-up superimposed on these levels. A current flows most of the time – generally towards the north.

Note: Deck levels of jetty

The level on top of the deck at its south end is +3.005m above MSL (+3.930m above CD) and marginally higher at the north end. Depth of deck structure is estimated to be about 1.97m. The levels of the beam soffits are therefore estimated to be in the range approximately +1.9m CD to 2.1m CD. *(To be confirmed.)*

It is clear that physical access periods to the underside of the deck will be limited.

Proposed Activities

1. An access platform (scaffold) will be installed which must be compatible with the tidal variation of seawater levels. (Ingenuity will be advantageous!)
2. If a barrier coating exists, this will be mechanically removed.
3. Areas of corroded/spalling concrete will be removed. (A hand and/or machine assisted activity.)
4. Affected concrete and reinforcing steel will be cleaned and treated. (Cleaning is done mainly using fresh water. Treatment mainly by brush-application of chemicals.)
5. Fresh concrete or repair mortar will be provided to replace removed concrete. (May be a plastering operation, or casting with the aid of formwork, or pneumatically spray-applied – shot blasting or “shotcrete” - operation.)
6. Chemical coatings will be applied, probably by paint brush, to cover replaced concrete and, possibly, original concrete.
7. Access platform will be relocated to a new area.

Please take note that the good intention and aim will be not to cause any pollution.

However, in practice, it must be accepted that some waste products and chemicals will inevitably end up in the sea. Fortunately, none of these are seriously toxic. Data sheets of chemicals are available.

All activities to be conducted in terms of the requirements of the related and approved Maintenance Environmental Management Program.

A. PATCH REPAIR

1. Areas that require repair will be identified by the Engineer (E).
2. The Contractor (C) will provide suitable access platforms to the repair area.
3. C will remove the specified amount of concrete and prepare the cut concrete faces in accordance with the Specification.
4. The following precautions shall apply during and between the activities described below: *Surfaces are to be cleaned with fresh, potable water between coatings/treatments to remove any salt build-up whenever surfaces are left exposed for periods exceeding 8 hours. This period may however need to be shortened should adverse weather conditions, such as strong winds whipping up salt sprays, make this necessary.*
5. C will clean, prepare and pacify the exposed reinforcement in accordance with the Specification.

6. After cleaning the exposed surfaces and reinforcement (as specified) C will apply the repair mortar (alternatively apply the shotcrete concrete) to replace the removed concrete in accordance with the Specification.
7. C will cure the materials referred to above in accordance with the Specification.
8. C will apply the migratory corrosion inhibitor (MCI) to the full surface area at the required dosage rate. This shall be applied in about 2-3 coats, depending on concrete porosity. (All three coats may be applied on the same day if weather conditions permit). Once the MCI has penetrated, wash the surfaces down with clean, fresh, potable water which helps the migration process.
9. After cleaning the exposed surfaces (as specified) C will apply the silane/siloxane coating(s) in accordance with the Specification.
10. C will remove the access platforms and move on to a newly identified repair area.

B. CATHODIC PROTECTION (CP)

1. Areas that require repair will be identified by the Engineer (E).
2. The Contractor (C) will provide suitable access platforms to the repair area.
3. C will remove the specified amount of concrete and prepare the cut concrete faces in accordance with the Specification.
4. The following precautions shall apply during and between the activities described below: *Surfaces are to be cleaned with fresh, potable water between coatings/treatments to remove any salt build-up whenever surfaces are left exposed for periods exceeding 8 hours. This period may however need to be shortened should adverse weather conditions, such as strong winds whipping up salt sprays, make this necessary.*
5. C will clean, prepare and pacify the exposed reinforcement in accordance with the Specification.
6. After cleaning the exposed surfaces and reinforcement (as specified) C will apply the shotcrete concrete to replace the removed concrete in accordance with the Specification.
7. C will cure the materials referred to above in accordance with the Specification.
8. C will install anodes as per detail/specification.
9. C will install wiring and electrical control systems as per detail/specification.

APPENDIX E: Shoreline Protection Method

PORT NOLLOTH TRANSNET PORT AREA 2. SHORELINE PROTECTION MAINTANENCE Maintenance Method

Current Note

A rock revetment has been chosen as the Preferred Alternative, with a Reno Revetment being a 2nd choice.

Anticipated Methodology

At present the revetment exists as a structure consisting of a random mixture of cobbles of various sizes, gravel and fragments of builder's rubble including chunks of concrete.

The anticipated scenario for creating a new revetment is the following:

1. The Contractor will be assigned a lay down area for his camp, offices and stores, on the land adjacent to the traffic circle/car park, near the revetment site.
2. The revetment area will be cleared to a certain extent to make it more accessible for earthmoving machines. The initial clearing will probably be done by front end loader and/or backactor and possibly be assisted by some dump trucks.
3. Material removed from the present revetment may temporarily be stockpiled close by or removed to an approved spoil site.
4. Access for construction vehicles (earthmoving machines, dump trucks etc.) to the revetment site will probably from the south end of the revetment – i.e. starting in the vicinity of the existing slipway.
5. The concrete fragments and building rubble may either be spoiled off-site or crushed for re-use in the new revetment – i.e. recycled.
6. Having achieved initial clearing and tidying up of the revetment site, reconstruction can commence.
7. Certain construction activities will be restricted to low tide conditions only.
8. Geotextiles may be required if the migration of sand is to be controlled.
9. The new revetment will include a surface lining consisting of rubble/rock.
10. Some of this rubble will be sourced from the stock pile, mentioned in item 3, above.
11. Additional rubble/rock, probably two or three sizes of fragments, will be imported from a commercial quarry.
12. A fleet of dump trucks will transport rubble/rock from the quarry to the site.
13. This material will, ideally, be tipped directly onto the revetment site, starting with the smallest size fragments.
14. Material will be spread and levelled by front end loader or backactor.
15. This process will be repeated for the next size of fragment until the final layer of rubble has been completed.
16. The complete site (revetment, adjacent road and car park, Contractor's lay down area) will be cleared, re-instated and made good before the Contractor finally departs.

All activities to be conducted in terms of the requirements of the related and approved Maintenance Environmental Management Programme.

APPENDIX F: Shoreline Protection Alternatives

Specialist Coastal Engineering Input on Alternatives

The existing shoreline protection includes a rock sheet layer that has been put in place over time since the beginning of the operation of this Port Area. The alternative shoreline protection measures considered include:

1. Rock or Concrete Revetment
2. GSC Revetment
3. Reno Mattress Revetment
4. Grout Mattress Revetment
5. Block Paving Revetment
6. Asphalt Revetment
7. Stepped Concrete Revetment
8. Sheet-pile Wall
9. Concrete Wall
10. Dune building

Please refer to information overleaf providing more detail on each of the alternatives considered in terms of viability from the coastal engineering specialists. The following alternatives are considered possible:

1. Rock Revetment
2. Concrete Cube Revetment
3. Geotextile Sand-filled Container Revetment
4. Reno Mattress Revetment
5. Grout Mattress Revetment

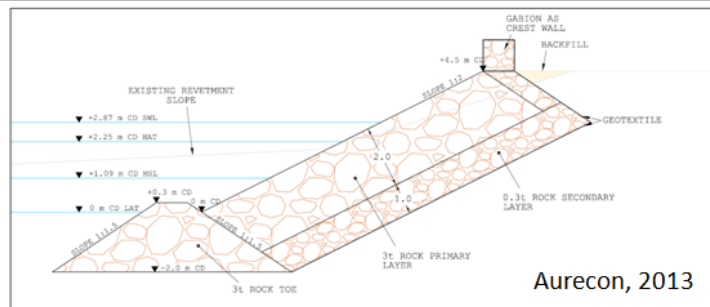
The above options have been evaluated by the coastal engineering specialists, as summarised below, in order to determine the viability of each and to inform the elimination of alternatives. Please refer to the Conceptual Options Comparison following.

					Alternative Options		
Heading	Evaluation Criteria	Rock Revetment	Concrete Revetment	GSC Containers	Reno Mattress	Grout-Filled Mattress	Weighting
PLP Criteria	Health and Safety	3	3	4	2	4	5.0
	Aesthetics	4	2	3	4	2	5.0
	Environmental impacts	4	2	3	3	2	5.0
	Sustainability	3	3	3	3	3	5.0
	Recreational impact	2	2	3	1	2	5.0
	Labour Requirements	1	2	3	5	4	5.0
Technical Feasibility	Proven track record	5	5	3	1	1	15
	Expected Lifetime/maintenance free	5	4	2	1	1	5
	Crest Wall Requirement/ Hydraulic Performance	4	4	2	1	1	5
Construction	Construction requirements plant	2	1	2	4	3	2.0
	Lead Time	4	4	2	4	2	2.0
	Construction Duration	3	2	3	3	1	2.0
	Installation complexity	3	1	1	4	3	5.0
	Preparation Yard Required	5	1	4	5	5	2.0
	Excavation Volume	2	2	3	4	4	2.0
Cost	Life Cycle Cost	4	2	5	3	1	30
Rating	Value	74.4	54	68.6	53	37	100.0
	Impact	Rating					
	Severely Negative/High Impact	1					
	Moderately Negative	2					
	Slightly Negative	3					
	Minor	4					
	Negligent/Positive	5					

Appendix F1: Conceptual Options Comparison

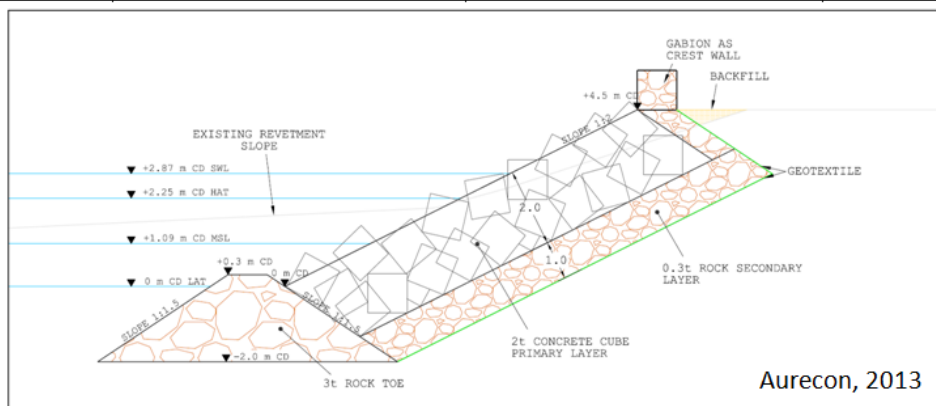
Rock Revetment

Option	Advantages	Disadvantages	Eliminate
Rock or Revetment	<ul style="list-style-type: none"> • Most suitable for installation on in-situ riprap • Rehabilitated revetment to be made of similar material to the current i.e. rock riprap • Requires minimal maintenance • Proven track record in large wave climate • Aesthetically pleasing solution 	<ul style="list-style-type: none"> • Rock may be expensive • Rock may need to be transported from far 	No



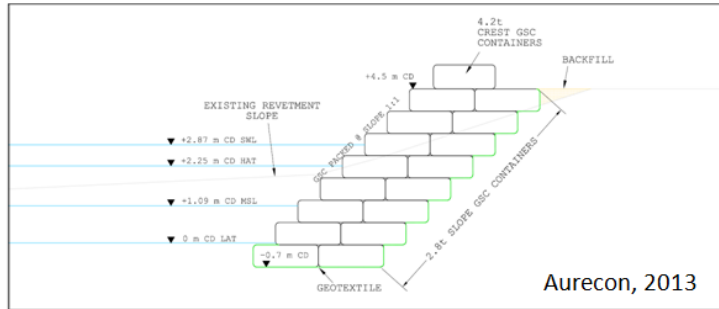
Concrete Cube Revetment

Option	Advantages	Disadvantages	Eliminate
Concrete Revetment	<ul style="list-style-type: none"> • Suitable for installation on in-situ riprap • Requires minimal maintenance 	<ul style="list-style-type: none"> • Concrete may be expensive • Need to be transported from far • Complexity of constructing armour units 	No



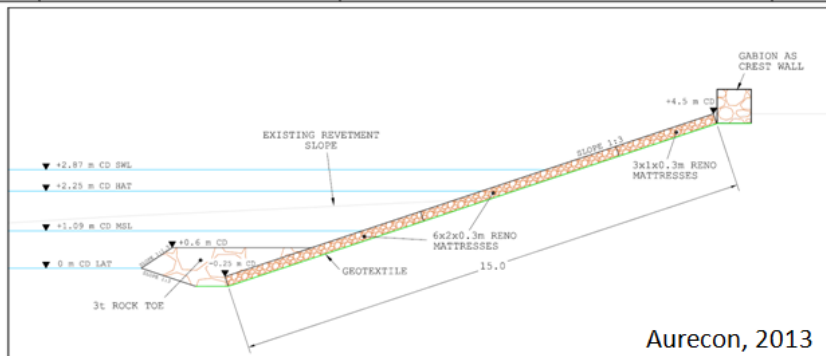
GSC Revetment

Option	Advantages	Disadvantages	Eliminate
GSC Revetment	<ul style="list-style-type: none"> Aesthetically pleasing solution Potentially cheapest solution Local sand could possibly be used 	<ul style="list-style-type: none"> Potentially unsuitable for installation on in-situ riprap May need to be protected from sharp riprap below it Is vulnerable to vandalism Requires maintenance and regular monitoring If exposed the revetment may need to be replaced more regularly due to UV damage Runup along the GSC revetment would most probably be more than for the current situation All sharp objects need to be removed Sourcing sand from outside port footprint could cause EIA 	No



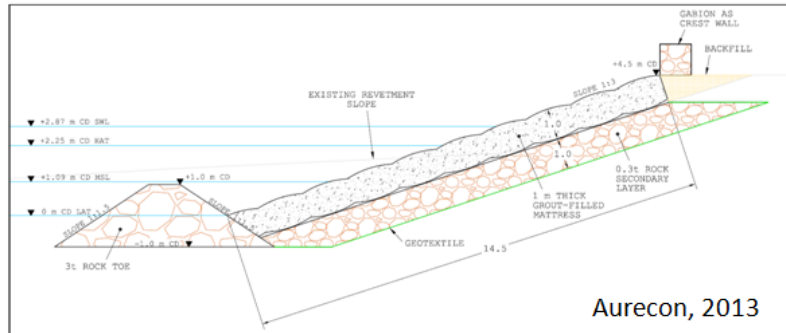
Reno Revetment

Option	Advantages	Disadvantages	Eliminate
Reno Revetment	<ul style="list-style-type: none"> Suitable for installation on riprap In-situ material could possibly be used to fill the mattress Labour intensive Cheapest installation cost 	<ul style="list-style-type: none"> Large maintenance requirement No proven track record in large wave climates Installation in large wave climate not supported by industry Steel elements (wire cages) prone to corrosion Could be dangerous and limit recreational use 	No



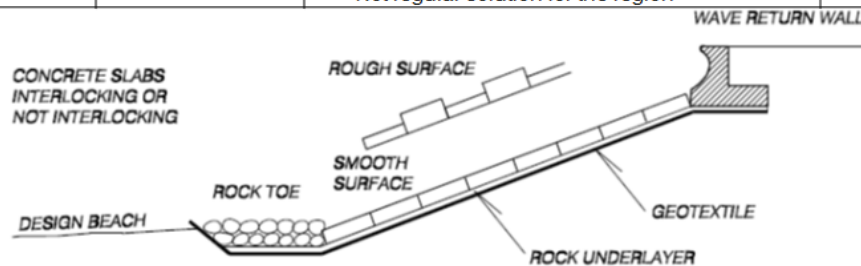
Grout Mattress Revetment

Option	Advantages	Disadvantages	Eliminate
Grout mattress Revetment	<ul style="list-style-type: none"> Suitable for installation on riprap for smoothed slope When geotextile disintegrates the grout still stays in shape Visually acceptable solution Second most labour intensive option Relatively safe for recreational access 	<ul style="list-style-type: none"> Not a generally a recommended installation along the open coast Could be expensive Potential minor environmental impact of grout leachate in ocean 	No



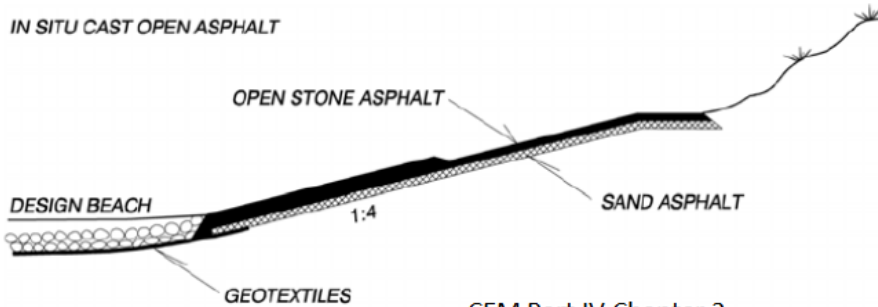
Block Paving Revetment

Option	Advantages	Disadvantages	Eliminate
Block paving revetment	<ul style="list-style-type: none"> Neat solution Safe for public access and recreational usage 	<ul style="list-style-type: none"> May be complex or impossible to implement over the relatively large in-situ rock due to uneven natural slopes Would increase the run-up and overtopping for the current profile A crest wall would be required to limit inundation Requires regular maintenance Visually unnatural solution and unnatural material for zone Not suitable for regular wave action Not regular solution for the region 	Yes



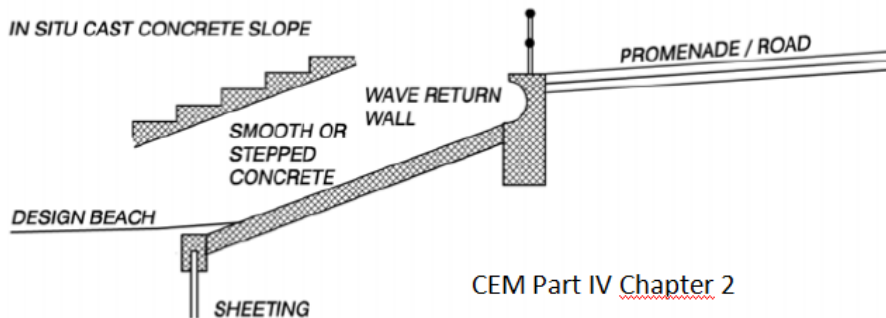
Asphalt Revetment

Option	Advantages	Disadvantages	Eliminate
Asphalt revetment	<ul style="list-style-type: none"> • Neat solution • Safe for public access and recreational usage 	<ul style="list-style-type: none"> • May be complex or impossible to implement over the relatively large in-situ rock • Difficult to construct in the tidal zone • Would increase the run-up and overtopping for the current profile • A crest wall would be required • Visually unnatural solution and unnatural material for zone • Potential pollution problems • Expensive 	Yes



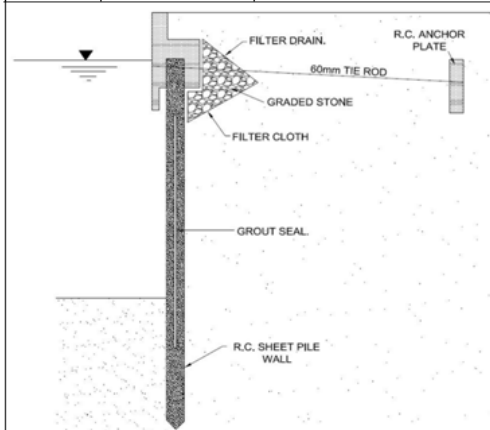
Stepped Concrete Revetment

Option	Advantages	Disadvantages	Eliminate
Stepped concrete revetment	<ul style="list-style-type: none"> • Neat solution • Safe for public access and recreational usage 	<ul style="list-style-type: none"> • Very expensive • Not suitable to implement above the potentially unstable in-situ rock revetment • May not be approved as a 'maintenance' procedure in the environmental process • May cause complex hydraulic movements • Not necessary • Very rigid and unnatural solution • Environmentally unfeasible would require full EIA • Complex construction • Termination of structure technically not suitable 	Yes



Sheetpile sea wall

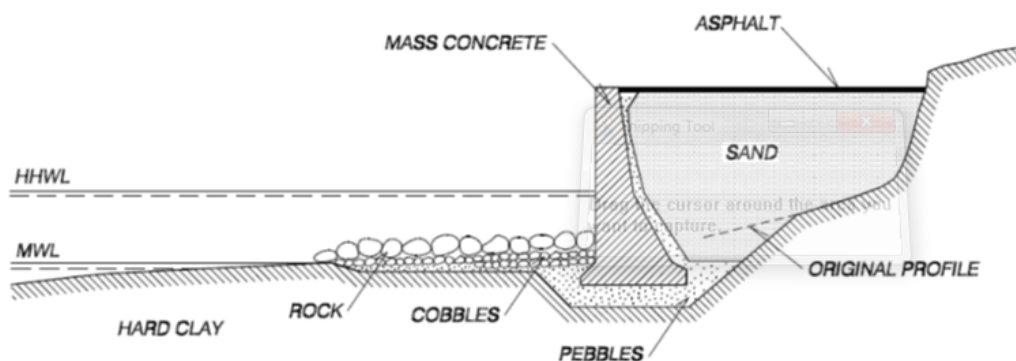
Option	Advantages	Disadvantages	Eliminate
Sheetpile wall	<ul style="list-style-type: none"> • Could be shortest solution to install 	<ul style="list-style-type: none"> • Potentially difficult to install with in-situ riprap and potentially rock layers located on site • Would require much more detailed geotechnical investigation • This solution will not improve the aesthetic appeal of the location as the revetment will be unchanged • Could trigger an formal EIA • Does not fall under the maintenance option • Could cause reflection and increased erosion 	Yes



Aurecon, 2012

Concrete wall

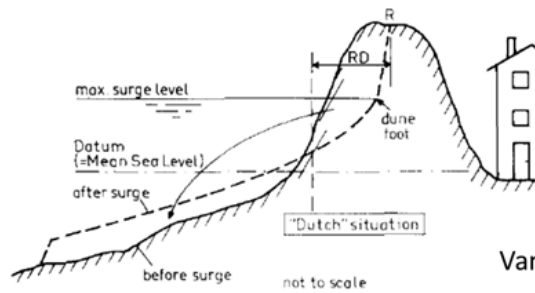
Option	Advantages	Disadvantages	Eliminate
Concrete wall	<ul style="list-style-type: none"> • Reclaim land 	<ul style="list-style-type: none"> • Excavation in rock riprap and layers may prove complex and expensive • Exorbitantly expensive solution • This solution will not improve the aesthetic appeal of the location as the revetment will be unchanged • There could be founding problems 	Yes



CEM Part IV Chapter 2

Dune Building

Option	Advantages	Disadvantages	Eliminate
Dune building	<ul style="list-style-type: none"> Natural/Environmentally friendly solution 	<ul style="list-style-type: none"> Sufficient vegetation may be difficult to establish on the dune in the local climate May cause an Aeolian sand transport problem Will require very regular maintenance Difficulty in sourcing suitable dune sand Could cause sedimentation of berths 	Yes



Van der Graaff, 1986

APPENDIX G: Environmental Screening Report Jetty and Shoreline Protection Maintenance

Submitted under separate cover.

APPENDIX H: DEA Confirmation Letter



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Private Bag X 447 · PRETORIA · 0001 · Fedsure Building · 315 Pretorius Street · PRETORIA
Tel (+ 27 12) 310 3911 · Fax (+ 2712) 322 2662

DEA Ref: 14/12/16/3/1/2

Enquiries: Ms Toinette vd Merwe

Tel: 012 395 1782 Fax: 012 320 7539 E-mail: tvandermerwe@environment.gov.za

Mr Johathan Kingwill
Bluepebble Independent Environmental Agency
Suite 41
Private Bag X31
KNYSNA
6570

Fax no: 086 553 8837

PER FACSIMILE / MAIL

Dear Mr Kingwill

APPLICABILITY OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT AND ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2010: PROPOSED MAINTENANCE ACTIVITIES TO TAKE PLACE AT THE TRANSNET PORT AREA, PORT NOLLOTH, NORTHERN CAPE PROVINCE

The correspondence dated 13 May 2013 as received by the Department on 18 June 2013 refers.

This letter serves to provide a response to your letter as received by the Department in terms of the applicability of the NEMA EIA Regulations, 2010 (GN R543, GN R544, GN R545, GN R546 and GN R547 of 18 June 2010).

It is hereby acknowledged that the port of Port Nolloth is managed (and maintained) by Transnet SOC Limited, but that it is operated by De Beers Marine. The eroded shoreline within the port area must undergo maintenance activities due to coastal erosion and due to the collapse of port infrastructure during a large storm event in 2009.

Be advised that, based on the information provided, the Department concurs with the findings of the correspondence and is of the opinion that the proposed activities does not constitute a listed activity/ies and to provide recommendations pertaining to the Maintenance Environmental Management Plan which must be submitted to the Department for acknowledgement. The table and responses below correspond with the table listed in your correspondence to the Department.

Listed Activity Item Number	DEA comment/confirmation
14, 43, and 45	The proposed activities will take place within an existing port/harbour and therefore fall within the exclusion clause of the listed activity in that the proposed activities will not increase the development footprint or throughput capacity of the port/harbour.
17	The proposed activities will take place within an existing port/harbour, the area are

	transformed and comprises of formalise industrial activities and parking area.
18	It is proposed to undertake maintenance activities within the existing port/harbour. The maintenance activities must be undertaken in accordance with a Maintenance Environmental Management Plan (MEMPr) to be agreed upon by this Department.

This determination is based on the following information provided to the Department:

- It is proposed to undertake maintenance activities at the existing jetty and along the existing shore line within the existing port of Port Nolloth;
- The proposed maintenance activities will not result in an increase of the development footprint of the throughput capacity of the harbour/port.
- The maintenance will take place in accordance with an approved MEMPr by this Department as competent authority.

This MEMPr must adhere to the minimum requirements of Regulation 33 of GN R543 dated 18 June 2010 and be approved by this Department prior to being implemented.

The MEMPr must, amongst other address the following:

- Impact/s on and of coastal process;
- Impact/s on the marine environment – potential red flag issues include the flamingos along the coast line;
- Impact/s on the existing operations;
- Impact/s on the visual landscape;
- impacts on the cultural heritage aspects of the area; and
- Alternatives methods for undertaking the maintenance activities. Clearly indicate preferred methods.

The public participation process must entail amongst other:

- Placement of an advertisement in two local newspapers;
- Placement of site notice/s and informing all direct landowners and lessees;
- Hold a public meeting with the Richtersveld Municipality and all the relevant stakeholders;
- Allow for a 30 day commenting period on the draft MEMPr;
- Ensure that all organs of state (Local Municipality, District Municipality, Provincial Environmental Affairs, DEA Oceans and Coasts Branch, Heritage Agency, if applicable, but not limited to) be informed of the proposed activities and request them to comment on the MEMPr;
- Be reminded that all Interested and Affected Parties has the right to comment on all final documentation forwarded to the Department for consideration.

However, should any revision of your proposed development comprise any activities that constitute a listed activity as defined in GN No R544, R545 or R546 of 18 June 2010, an application for environmental authorisation must be submitted to the competent authority and authorisation obtained before such activity(ies) may commence.

You are further reminded of your general duty of care towards the environment in terms of section 28(1) of NEMA which states: *"Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment."*

The Department will only consider the MEMPr on receipt of all the outstanding information requested. Kindly quote the abovementioned reference number in any future correspondence in respect of the application.

You are hereby reminded of Section 24F of the National Environmental Management Act, Act No 107 of 1998, as amended, that no activity may commence prior to the MEMPr being approved by the Department.

Yours faithfully



Mr Ishaam Abader
Deputy Director General: Legal, Authorisations, Compliance and Enforcement
Department of Environmental Affairs
Letter signed by: Ms Millicent Solomons
Designation: Director: Integrated Environmental Authorisations
Date: 02/08/2013.