N2 FORESHORE REHABILITATION

Port Elizabeth N2 Foreshore Rehabilitation: Short-Term Solution

Baseline Risk Assessment

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1. Definitions and Abbreviations

ABBREVIATION	DESCRIPTION
TNPA	Transnet National Ports Authority
PoPE	Port of Port Elizabeth
DSTI	Daily Safe Task Instruction
PPE	Personal Protective Equipment
H&S	Health and Safety
SWP	Safet Working Procedure
TRA	Task Risk Assessment

1.1 Project Background

The Port Elizabeth N2 Foreshore Rehabilitation: Short-Term Solution project addresses severe deterioration of the existing seawall, which has resulted in excessive wave overtopping and recurrent flooding of the N2 freeway, a critical transport corridor for Gqeberha. The 3.1 km seawall, comprising dolos and rock armour sections, has subsided significantly from its original crest level of +3.964 m MSL to approximately +2.5 m MSL (with some sections as low as 1 m MSL), reducing its protective capacity. Frequent storm events have caused hazardous conditions, infrastructure damage, and economic disruption, necessitating immediate intervention while a long-term solution is developed.

Although the revetment extends approximately 3.1 km, certain sections have deteriorated more severely. As such, approximately 1 km of the revetment has been identified as the priority focus area for the rehabilitation works.

The short-term design aims to reinstate the seawall to its original condition by restoring the crest level, repairing dolos and rock sections, and installing appropriate filter and underlayers to ensure structural integrity. The design is based on a five-year lifespan and a wave height for 50-year return period, which complies with TNPA standards and international guidelines. Proposed repairs will substantially reduce overtopping rates compared to current conditions, though some exceedance of freeway safety thresholds remains. Dolos units and armour rock of 3 tons are recommended for hydraulic stability, with limitations such as crest height restrictions acknowledged.

This intervention provides an effective interim measure to safeguard critical infrastructure and public safety, significantly mitigating immediate risks and ensuring operational continuity while

enabling time for a comprehensive long-term coastal protection strategy. Transnet National Ports Authority (TNPA) is both the Employer and Owner of the works.

2. Project Scope

The construction of the Port Elizabeth Foreshore Seawall is intended to restore the original seawall that was constructed in the 1960's. Due to inadequate maintenance and erosion of the foreshore in front of the seawall, it has been severely damaged and no longer adequately effective in doing its function of protecting the landside infrastructure waves and storm surges.

The *Works* that the *Contractor* is to perform include marine *Works* for the Port Elizabeth Foreshore Seawall. The Works include but are not limited to:

- Removal and stockpile of existing dolos and armour rock
- Excavating and dredging to the required depth for placing the geotextile, filter layer, and underlayer
- Procuring and placing the geotextile, filter layer, and underlayer
- Casting of new dolos and
- Placing of dolos and armour rock

3. Assessment

Risk Assessment Title	Baseline Risk Assessment for the Port Elizabeth N2 Foreshore Rehabilitation: Short-Term Solution

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Activities Covered
This baseline risk assessment focusses on the high-level health and safety hazards and risks anticipated during construction taking into consideration all construction methods.
Geographical location: Port Elizabeth N2, Eastern Cape
Risk Controls
Legal requirements pertaining to the specific task step's control measures are assumed to be implemented and will not be repeated in the baseline risk assessment. Proposed Risk Controls focus on unique risks anticipated, and/or specific client requirements.

Scope of Risk Assessment
The risks identified are those that will have a direct effect on the contractors during construction but also those that could have a detrimental effect on the project directly or indirectly from a time delay and / or cost point of view.

	Hazards, Associated Risks, and Ratings						
	Task Steps / Short risk name	Hazards	Associated risk event	Risk controls	Risk rating with controls		
					L	C	R
	Occupational Health & Hygiene						
1.	Working in extreme temperatures/ adverse weather conditions	Exposure to extreme ambient temperatures during winter and summer days, UV exposure, windy/rainy conditions	Overexposure may result in health conditions such as heat exhaustion and hypothermia. Lung/chest/eye infections from particles being blown into eyes and inhaled	Occupational hygiene monitoring and medical surveillance. Specialised PPE (e.g. lined gloves, balaclavas, eye protection, dust masks/specialised FFP1/FFP2), Compliance to Project Health and Safety Specification (i.e. drinking sufficient potable water). Weather forecast updates	**Possible**	**Minor**	**Medium**
2.	Ergonomics – including Manual handling	Working on awkward work positions (i.e. restricted space).	Musculoskeletal injuries due to manual handling, bending, twisting, prolonged, muscle strains; fatigue	Compliance to Project Health and Safety Specification (i.e., lifting techniques),	**Rare**	**Moderate**	**Low**

	Hazards, Associated Risks, and Ratings						
	Task Steps / Short risk name	Hazards	Associated risk event	Risk controls	Risk rating with controls		
					L	C	R
		Use of self-improved /improper tools and machinery. Heavy load manual handling; repetitive work		Task based risk assessment, DSTI and Toolbox Talks, Correct lifting and handling practices and ergonomic awareness.			
3.	Noise - Working close or adjacent to the moving of construction plant (equipment and machinery), Exposure to construction activities i.e., placing of dolas etc.	Noise exposure due to operation or working in close proximity of noisy mobile plant, equipment/machinery	Overexposure to noise levels - Short and long term may result in potentially permanent health impact (noise induced hearing loss)	Occupational hygiene monitoring and medical surveillance. Hearing conservation programme. PPE (Ear protection-ear muffs) Compliance to Project Health and Safety Specification	**Possible**	**Major**	**High**
4.	Vibration and fumes – earthworks, HCS related activities	Exposure to vibrations as well as fumes emitting from various construction activities such as earthworks, and associated plant/equipment. Fumes from various HCS.	Vibrations from various plant/equipment can result in carpal tunnel syndrome/white finger vibration as well as have an effect on employees kidneys.	Compliance to Project Health and Safety Specification, Occupational health assessment; Hygiene monitoring; Medical surveillance;	**Possible**	**Major**	**High**

	Hazards, Associated Risks, and Ratings						
	Task Steps / Short risk name	Hazards	Associated risk event	Risk controls	Risk rating with controls		
					L	C	R
			Inhalation exposure to fumes results in Respiratory infection (potentially permanent health impact). Lung Irritation / damage to eyes/ red eyes.	FFP2 masks and safety goggles and all other required PPE			
5.	Dust Particles – Earthworks such as excavation, loading/offloading operations	Excessive exposure to solid dust airborne particles from construction activities.	Inhalation exposure to solid dust results in Respiratory infection (potentially permanent health impact). Lung Irritation / damage to eyes/ red eyes.	Compliance to Project Health and Safety Specification, Occupational health assessment; Hygiene monitoring; Medical surveillance; Dust suppression; FFP2 dust masks and safety goggles. Ergonomics	**Possible**	**Major**	**High**
6.	Communicable and other infectious diseases (e.g. Influenza, common cold, HIV/AIDS, etc.)	Working near other employees. Contact with an infected person or area; Sneezing or coughing without closing the mouth; Unhygienic practices; unprotected sexual	Respiratory infections, fatalities, and diseases, running nose and fevers	Training on communicable and infectious diseases during DSTI and Toolbox talks; Practice social distancing; Washing of hands regularly; use of face masks; Employees	**Likely**	**Major**	**High**

	Hazards, Associated Risks, and Ratings						
	Task Steps / Short risk name	**Hazards**	**Associated risk event**	**Risk controls**	**Risk rating with controls**		
					L	**C**	**R**
		practices, working near water splashes		reporting to management when sick; Drink plenty of water and keep hydrated, Practice protected sex e.g., using protection. Ensure that clothes are changed when splashed by water bodies, rain coats to be issued to employees with steel toe gum boots.			
	Site Establishment						
7.	Transportation of personnel to site	Sub-standard/un-roadworthy vehicles; Driver under the influence of intoxicants; incompetent/unlicensed drivers; speeding by driver; overcrowding of vehicles, loading equipment and tools with employees, vehicle not fitted with seat belts.	Road accidents with potential for injuries and fatalities; property damage	Use of Vehicles to comply with the National Road Traffic Act (No. 93 of 1996); Compliance to Project Health and Safety Specification, maintenance and inspection records of the vehicles to be available; drivers to be appointed and have valid drivers' licence and relevant driving codes;	**Possible**	**Critical**	**High**

	Hazards, Associated Risks, and Ratings						
	Task Steps / Short risk name	Hazards	Associated risk event	Risk controls	Risk rating with controls		
					L	C	R
				drivers to ensure compliance to road and Port rules; all employees to undergo daily alcohol testing including drivers.			
8.	Use of equipment and tools	Improper use of tools and equipment Incompetent/untrained operators/users Substandard tools and equipment No safeguards where required Homemade tools	Pinch points, cuts, laceration incidents (caught by, in between) resulting in LTI's, medical treatment cases or First Aid Injuries; damage to property	Compliance to Project Health and Safety Specification; Correct tools for the job and correct use of the tools; All tools and equipment to be numbered and placed on registers and inspected when required by competent persons; Operators/users to have competency/training and experience. All machine guarding to be in place before equipment is used; PPE (use of suitable gloves mandatory, eye protection).	**Likely**	**Major**	**High**

	Hazards, Associated Risks, and Ratings						
	Task Steps / Short risk name	**Hazards**	**Associated risk event**	**Risk controls**	**Risk rating with controls**		
					L	**C**	**R**
9.	Lifting Operation- Placement of containers/offices/ ablution facilities/eating areas etc.	Incompetent crane drivers/operators and riggers performing lifting activities. Heavier loads exceeding lifting capacity of cranes. No rigging studies done before lifts where applicable. Mobile cranes /lifting equipment not in safe and serviceable condition. No valid inspections and load test certificates available; Sub-standard lifting tackle equipment being used may cause loads to fall; Incorrect use of lifting tackle may cause load to fall. Use of mobile cranes in high wind conditions; Employees falling from top of containers while tying/untying ropes;	Objects falling onto people (employees) and or property resulting in Fatalities, Injuries and Property Damage from crane failure/incapacity; incompetent operators resulting in property damage, injuries and death. Heavy winds can cause cranes to lose their loads and fall, resulting in property damage, injuries and fatalities.	Compliance to Project Health and Safety Specification; Crane operator and rigger competency to be verified before activities take place. Rigging studies to be done where required. Ground stability, weights and placement of outriggers to be verified and ensured. Load test certificates and Inspections by competent persons to be in place prior. Ensure registration and verification of LMI's and LME's. Wind monitoring tools to be available. Employees to undergo formal height work training.	**Possible**	**Critical**	**High**

	Hazards, Associated Risks, and Ratings						
	Task Steps / Short risk name	Hazards	Associated risk event	Risk controls	Risk rating with controls		
					L	C	R
		Uneven/unsuitable ground surfaces on which crane will stand; Soil contamination from crane operations.		Relevant MS, RA, SWP's, FPP's and other documents to be communicated before such activities take place.			
10.	Temporary Electrical Installations	Incompetent Installers; Unsafe installations due to faulty wiring; Lack of insulation & openings; Substandard electrical tools (e.g. portable electrical grinders, drills) being used; Contact with live electrical conductors Failure to adhere to isolation and lockout procedures	Fatality and Injuries resulting in permanent disabilities (electrocution, burns etc.) and property damage	Compliance to Project Health and Safety Specification; Ensure competency of electrical installers and use of certified equipment. Inspections of installations and fire safety equipment by competent inspectors. Task Risk assessment with SWP and work permits; Issuing of COC certificate upon completion	**Possible**	**Critical**	**High**
11.	Stacking and Storage	Employees may be exposed to dust from handling of construction Material such as rock; Incorrect method of	Injuries, LTI's, Damage to property from fallen/unstable material/articles.	Compliance to Project Health and Safety Specification.	**Rare**	**Moderate**	**Low**

	Hazards, Associated Risks, and Ratings						
	Task Steps / Short risk name	Hazards	Associated risk event	Risk controls	Risk rating with controls		
					L	C	R
		stacking; stacking articles/materials/rock which is inconsistent in weight and dimensions; bottom stacked articles not able to sustain the weight of articles stacked on top of it.		Stacking areas to be barricaded and personnel restricted entry. PPE compliance; Signage (warning signs) to be displayed			
12.	Site Access	Failure to obtain site access certificate; Failure to provide security or unauthorised person entering site. Failure to test for intoxication.	Injuries, property damage/loss and theft	Compliance to Project Health and Safety Specification. Security Management Plan including Site Access Control Plan; Mandatory alcohol testing.	**Possible**	**Minor**	**Medium**
	Project Construction Activities						
13.	Driving on N2 to site	Un-roadworthy vehicles. Intoxicated driver. Incompetent/unlicensed drivers. Driver disobeying road safety signs and rules. Speeding. Vehicle overloaded.	Road accidents with potential for injuries and fatalities; property damage.	Compliance to National Road Traffic Act (No. 93 of 1996), Service history of vehicles. Appointment of competent and licenced drivers. Daily alcohol testing to be carried out.	**Possible**	**Critical**	**High**

	Hazards, Associated Risks, and Ratings						
	Task Steps / Short risk name	Hazards	Associated risk event	Risk controls	Risk rating with controls		
					L	C	R
		Employees loaded with tools.		Employees not to be transported with tools. Transported material to be securely fastened and checked.			
14.	Conducting Surveys and rehabilitation of the eroded sections	Working next to the sea especially during high tides; Walking on the dolas/rock during surveys/inspection; Inclement weather; Freeway adjacent to site; Man/machine interface; slippery surfaces	Falling into water and drowning, Heat and cold stress from weather conditions, Struck by passing traffic and traffic within site camp due to restricted work areas; Incompetencies of personnel.	No employees to be allowed to walk on rock/dolosse's; Emergence procedure to be compiled and communicated to employees; signage next to work site on construction activities taking place; Weather to be monitored continuously as to determine safe periods of work as no work to be undertaken during high tides and inclement weather. Watches and flagman to be appointed to regulate man/machine interface PPE needs analyses to be done; Full Supervision on site; Demarcation of site	**Possible**	**Critical**	**High**

	Hazards, Associated Risks, and Ratings						
	Task Steps / Short risk name	Hazards	Associated risk event	Risk controls	Risk rating with controls		
					L	C	R
				and N2 using solid barricading.			
15.	Use of mobile Plant (i.e. LRE, TLB, tipper trucks, low bed trucks, cranes) for various construction activities (excavations/ dredging; transporting dolas/rock; offloading dolas and rock)	Defective mobile plant, incompetent operator, open/uneven surfaces; collision with other equipment; intoxicated operator; medically unfit operator; lack of plant inspection/maintenance history; man/machine interface; congested work areas; speeding of operators; property damage caused by operators; plant falling into water; plant running out of control; Sub-standard lifting tackle equipment being used may cause loads to fall; Incorrect use of Lifting tackle may cause load to fall; Use of mobile cranes in high wind conditions and high tides; overloading plant with material in	Multiple injuries/fatalities including drownings; property damage to plant falling into the sea and break downs from overloading; loads falling from excessive lifting, uneven surfaces and incorrect use of plant; possible road closures, noise-induced hearing loss.	Compliance to Project Health and Safety Specification, legislation, policies and procedures; Client inductions to be conducted before work to commence; Pre-use and daily inspections of Plant; Maintenance records of site plant to be available; Plant to be checked and approved for site before plant mobilisation on site; Competence verification of operators; valid medical assessments; solid barricading of potential hazards; daily alcohol testing of all personnel; required PPE to be worn and especially reflector vests for high visibility; appointment of spotters/flagmen at	**Possible**	**Major**	**High**

	Hazards, Associated Risks, and Ratings						
	Task Steps / Short risk name	Hazards	Associated risk event	Risk controls	Risk rating with controls		
					L	C	R
		excess of load capacity; noise emissions		strategic locations as per traffic management plan; Communication plan to be compiled with the identified stakeholders; designated walkways for personnel to prevent plant/people interface; speeding checks to be conducted.			
16.	Concrete works	Concrete chemical, concrete spillages, Slippery surface, reversing concrete trucks, Noise	Health complications due to inhalation, skin and or eye contact, environmental impact, slip and fall, struck by, noise induced hearing loss	SDS to be available and its guidelines should be adhered to Long sleeved overalls to be used. Safety gum boots to be worn on site during this activity All trucks to have reversing alarm. Medical surveillance of employees PPE needs analyses to be done and proper PPE to be used i.e. Earplugs	**Possible**	**Major**	**High**

	Hazards, Associated Risks, and Ratings						
	Task Steps / Short risk name	**Hazards**	**Associated risk event**	**Risk controls**	**Risk rating with controls**		
					L	**C**	**R**
17.	Local community strikes	Community riots.	Injuries. Project delays. Property damage. Theft (Looting).	Stakeholder engagement, Transnet SCS procedures. Security Management Plan. Emergency Preparedness Plan.	**Possible**	**Major**	**High**
18.	Public Safety/Protection of 3rd parties	Public gaining access into construction sites due to lack of security, gates not locked, and locks broken into; public stopping on side of the N2 as part of inquisitiveness; Lack of barricading or failure to adhere to barricading requirements.	Members of the public enter construction sites resulting in injuries and fatalities. Public could get injured/fatalities occur by construction plant and equipment.	Security to be appointed by the Contractor throughout the project duration, covering day/night shift. Signage to be placed at strategic places informing public of the dangers in languages relevant to the area.	**Possible**	**Critical**	**High**
19.	Close out of construction activities	Poor housekeeping	Injuries, falls, slips and trips, property damage	Adherence to project health and safety specification; close out checklist to be conducted before product handover to Client Site need to be in a clean condition and all waste to be removed.	**Possible**	**Minor**	**Medium**

Monitor and Review the Risk Controls
It is important to monitor risk controls and review risk assessments regularly. Review is required when there is a change in the process, relevant legal changes, and where a cause for concern has arisen. Reviews could be scheduled on an annual basis. If the risk assessment has substantially changed a new risk assessment is warranted.

4. Risk Matrix

Likelihood	**Consequence**				
	Insignificant	Minor	Moderate	Major	Critical
Almost Certain	Medium	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Possible	Low	Medium	High	High	High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Low	Medium

Assessed Risk Level	**Description of Risk Level**	**Action Required**
Low	If an incident were to occur, there would be little likelihood that an injury would result	Undertake the activity with the existing controls in place

Medium	If an incident were to occur, there would be some chance that an injury requiring First Aid would result	Additional controls may be needed
High	If an incident were to occur, it will be likely that an injury requiring medical treatment would result	Controls will need to be in place before the activity is undertaken
Extreme	If an incident were to occur it, it would be likely that a permanent or death would result	Consider alternatives to doing the activity. Significant control measures will need to be implemented to ensure safety

Likelihood	Desciption of Likelihood
1. Rare	Will only occur in exceptional circumstances
2. Unlikely	Not likely to occur within the foreseeable future, or withing the project lifecycle
3. Possible	May occur within the foreseeable future, or within the project lifecycle
4. Likely	Likely to occur within the foreseeable future, or within the project lifecycle
5. Almost Certain	Almost certain to occur within the foreseeavle future or within the project lifecycle

Consequence	Description of Consequence
1. Insignificant	No treatment required
2. Minor	Minor injury requiring First Aid treatment (e.g. minor cuts, bruises, bumps)
3. Moderate	Injury requiring medical treatment or lost time
4. Major	Serious injury (injuries) requiring specialist medical treatment or hospitalisation
5. Critical	Loss of life, permanent disability or multiple serious injuries