





Baseline Risk Assessment
Upgrade of Island View Seawalls in the Port of Durban – XDN.E.0035

Transnet National Port Authority
Baseline Risk Assessment
Upgrade of Island View Seawalls in the Port of Durban
Project Number: XDN.E.0035

Compiled by:	Ntombozuko Xama		28/08/2023
	Health & Safety Manager	Signature	Date
Reviewed by:	Abram Motshegare		04/09/2023
	Health & Safety Agent	Signature	Date
Approved by:	Asanda Dube		18/09/2023
	Project Manager	Signature	Date

00	29/08/2023	ISSUE FOR REVIEW AND APPROVAL
Rev No.	Date	Revision Details

**Island View Seawalls****Introduction and Background**

In 1920's the demand for petroleum products had grown to such an extent that the establishment of an oil storage facility in the port was a necessity. The Island View was earmarked for this function, in 1921 the first tanks were erected, and first wharf structure was built, followed in the next few years by five new berths. During the 1960's the increase in the bulk liquid traffic necessitated the building of 3 more berths in the Island View basin. The Island View sea walls formed part of the infrastructure that was constructed together with the new berths.

The sea walls protect the landside infrastructure such as the pipe racks, liquid gas and petroleum pipeline network and firefighting infrastructure. Any damage or collapse of the sea walls could result in a subsidence of the pipe racks and related landside infrastructure thus causing fire and catastrophic losses to TNPA and terminal operators. Historical information indicates that the sea walls are between 59 to 98 years old, have exceeded their design life span, and are overdue for an upgrade.

The rapid deterioration of the sea walls is further attributed to the Widening of the Entrance Channel project. Subsequent to the Widening of the Entrance Channel in 2010, the Port of Durban experienced an increased and excessive wave penetration through the channel into the port. The wave penetration coupled with excessive wave action caused by extremely high winds has caused extensive damage to the sea walls in and around the Island View precinct in the Port of Durban. This has led to undermining, collapsing and erosion of the ground behind the sea walls.



In addition to increased wave action, a storm event occurred during the period of 18th to 20th August 2009 and this event exacerbated the problem and caused a rapid, sudden collapse of large portions of the Bluff and Island View sea walls.

The assessment studies have shown significant deterioration of sections of the sea walls creating uncertainty regarding the continued safe operation of the sea walls. Once sea walls begin to deteriorate, they are unable to meet the following criteria:

- Ability to withstand the static and hydrodynamic forces.
- Provision of adequate protection to avoid settlement, toe failure, or loss of material from beneath or behind the armouring.

Primary Objectives

In terms of the Occupational Health and Safety Act No.85, 1993 (OHS Act), employers are required to perform the following General duties of employers to their employees:

- Each employer shall provide and maintain a workplace that is safe and without risk to the health of their employees.
- Eliminate or mitigate hazards before resorting to personal protective equipment.
- Establish hazards and apply precautionary measures in the use of articles, substances, plant and machinery.

Furthermore, Section 12 of the National Ports Act No.12 of 2005 regulates that the Authority must, in all its activities, aim to:

- Conduct business in a manner designed to achieve the objects of the Act and which does not jeopardise the national interest.
- Ensure that orderly, efficient, and reliable port services, including safe and secure cargo storage and cargo handling facilities are provided to port users.
- Promote and undertake the necessary measures to enhance safety and security of life and property in ports.

Risk Assessment Title	Upgrade of Island View Seawalls in the Port of Durban – XDN.E.0035
------------------------------	--

Risk Assessment Team				
	Name	Designation	Contact Number	E-mail
Facilitator	Ntombozuko Xama	Health & Safety Manager	031 361 1242	Ntombozuko.Xama@transnet.net
Team Member 1	Anand Naidoo	Principal Project Manager	031 361 1458	Anand.Naidoo@transnet.net
Team Member 2	Asanda Dube	Project Manager	031 361 3883	Asanda.Dube@transnet.net
Team Member 3	Gugu Mtambo	Project Planner	060 579 9002	Gugu.Mtambo@transnet.net
Team Member 4	Masupha Letsie	Marine Manager	083 256 7364	Masupha.Letsie@transnet.net
Team Member 5	Nkululeko Mthembu	Construction Manager	031 361 1462	Nkululeko.Mthembu@transnet.net
Team Member 6	Carl King	Quality Manager	083 254 7183	Carl.King@transnet.net
Team Member 7	Mitchel Tarin	Quality Officer	083 557 6774	Mitchell.Tarin@transnet.net
Team Member 8	Roxanne Payne	Document Controller	066 292 4801	Roxanne.Payne@transnet.net
Team Member 9	Aviwe Soyamba	Quantity Surveyor	031 361 2212	Aviwe.Soyamba@transnet.net
Team Member 10	Axola Qumba	Marine Engineer	031 361 1152	Axola.Qumba@transnet.net
Team Member 11	Ernest Mo	Marine Engineer	076 691 8179	Ernest.Monyemangene2@transnet.net
Team Member 12	Monica Nasha	Cost Engineer	031 361 1041	Monica.Nasha@transnet.net

Inherent Risk

- Traffic congestion.
- Working over water.
- Multiple Organisations operating within the Island View complex.
- Airborne chemical substances.

Activities Covered

- Site Establishment
- Demolition of existing structures,
- Marine Excavation
- Placement of armour rock
- Revetment, Extension of the storm water outfalls
- Grading and levelling of existing revetment with filter rock
- Scour protection, and
- Grading and levelling of existing revetment with filter rock
- Placing of armour rock
- Installation of Bidim geotextile
- External environmental conditions
- Handling, Storage & disposal of Hazardous chemical substances.
- Working adjacent to existing structures Load limitations for existing Berth structures.
- Existing sea walls and shoreline embankments.

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 cost point of view.

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
Access into the Island View complex	<ul style="list-style-type: none"> Non-compliance with port rule and National Key point Act. 	<ul style="list-style-type: none"> Port entry denied. 	<ul style="list-style-type: none"> All Contractor employees including visitors, suppliers and deliveries must undergo TNPA safety induction before entering the Island View complex. Cutler access permits to be requested through TNPA at the contractor's expense. 	MEDIUM
	<ul style="list-style-type: none"> Driving under the influence of alcohol and drugs. 	<ul style="list-style-type: none"> Injury to persons and property damage. Disruptions to Island View operations. 	<ul style="list-style-type: none"> All employees entering the Island View complex shall submit to an alcohol Breathalyzer or drug test if requested to do so; The contractor's drivers shall abide by all general road traffic rules found in the National Road Traffic Act (Act 93 of 1996) and Regulations thereto or otherwise. 	HIGH
	<ul style="list-style-type: none"> Speeding. 	<ul style="list-style-type: none"> Injury to persons and property damage. Suspension from the Port. 	<ul style="list-style-type: none"> All drivers shall abide by the speed limit of 20km/h inside Island View. The contractor's drivers shall abide by all general road traffic rules found in the 	MEDIUM

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
			National Road Traffic Act (Act 93 of 1996). <ul style="list-style-type: none"> Adherence to TNPA Vehicle and Transportation Management procedure HAS-P-0004 and the Road Traffic Act. 	
	<ul style="list-style-type: none"> Parking in areas not designated for parking. 	<ul style="list-style-type: none"> Obstruction to the road and lead to injury to persons/ property damage. Disruptions to Port operations. 	<ul style="list-style-type: none"> Contractor shall ensure that all their drivers' park in designated areas to avoid obstruction on the road due to high vehicle movement in Island View. Contractor's employees must ensure that they use designated routes to get to their respective site. Contractor must ensure that a traffic management plan is developed and implemented when activities affect Island view road traffic. 	MEDIUM
Site Establishment	<ul style="list-style-type: none"> Poor hygiene due to unavailability of ablution facilities. 	<ul style="list-style-type: none"> Spread of communicable disease due to lack of hygiene. 	<ul style="list-style-type: none"> Contractor to adhere to OHSACT ACT 85 of 1993 and Facilities Regulations of 1994, TNPA Health and Safety Project specification and Occupational Health Risk assessment. 	LOW
	<ul style="list-style-type: none"> Using drinking water from un-identified source/connection. 	<ul style="list-style-type: none"> Sickness of employees resulting from drinking water from unsafe sources. 	<ul style="list-style-type: none"> Drinking water must only be sourced from a connection identified as safe for drinking. 	MEDIUM

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
	<ul style="list-style-type: none"> Contractor failing to provide a designated eating area. Employees contracting diseases due to eating at hazardous areas on site. 	<ul style="list-style-type: none"> Ill-health or spread of communicable diseases amongst employees. 	<ul style="list-style-type: none"> Contractor to adhere to OHSACT ACT 85 of 1993 and Facilities Regulations of 1994, and TNPA Health and Safety Project specification. 	MEDIUM
	<ul style="list-style-type: none"> Temporary electrical connection. 	<ul style="list-style-type: none"> Electrocution and property damage. 	<ul style="list-style-type: none"> Electrical connection must be done by a MIE (Master Installation Electrician) who has been authorised. 	HIGH
	<ul style="list-style-type: none"> Defective tools used (drill, welding machine, grinders, and hand tools) 	<ul style="list-style-type: none"> Injuries to employees 	<ul style="list-style-type: none"> Contractor to ensure all electrical and hand tools are inspected before use. Contractor to comply with TNPA health and safety site specification. 	MEDIUM
Transportation of office containers and materials to site.	<ul style="list-style-type: none"> Overloading and speeding. 	<ul style="list-style-type: none"> Containers and materials falling off causing injuries and property damages. Road accidents. 	<ul style="list-style-type: none"> Contractor to ensure that loads are not overloaded. The contractor's drivers shall abide by all general road traffic rules found in the National Road Traffic Act (Act 93 of 1996). 	MEDIUM
	<ul style="list-style-type: none"> Incompetent driver. 	<ul style="list-style-type: none"> Property damage and injuries. 	<ul style="list-style-type: none"> Contractor's driver must be competent and appointed in writing. 	HIGH
Offloading of office containers and materials.	<ul style="list-style-type: none"> Substandard rigging and lifting practices. 	<ul style="list-style-type: none"> Loads falling causing injuries and property damages. Loads swinging causing injuries and property damages. 	<ul style="list-style-type: none"> Contractor must develop and implement a rigging study and lift plan. 	HIGH

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
	<ul style="list-style-type: none"> Possible mechanical failure of lifting equipment (mobile cranes/crane trucks) 	<ul style="list-style-type: none"> Loads falling causing injuries and property damages. Loads swinging causing injuries and property damages. 	<ul style="list-style-type: none"> Valid crane, hook, rope, load and calibration test to be completed. Competent Rigging and lifting equipment inspector appointed (LMI). Pre-use checks to be conducted by the appointed competent person. All lifting and rigging equipment tested and certified, proof to be kept on file. Storage of lifting and rigging equipment to be done in an approved manner. 	HIGH
	<ul style="list-style-type: none"> Poor ground stability 	<ul style="list-style-type: none"> Crane tipping over causing injuries to employees and damage to property 	<ul style="list-style-type: none"> Contractor to ensure inspection of ground stability before outriggers are extended 	HIGH
	<ul style="list-style-type: none"> High wind speeds 	<ul style="list-style-type: none"> Loads falling causing injuries and property damages. Loads swinging causing injuries and property damages. 	<ul style="list-style-type: none"> Contractor to take note of the weather prior to any lifting activities. Contractor to ensure that no lifting must take place when there is inclement weather and or the wind speed is equal or more than 30km/h 	HIGH
	<ul style="list-style-type: none"> Incompetent rigger and crane operator. 	<ul style="list-style-type: none"> Loads falling causing injuries and property damages. Loads swinging causing injuries and property damages. 	<ul style="list-style-type: none"> Competent operator and riggers with previous experience and competencies must be appointed. Contractor to comply with Driven Machinery regulations, 2015 and 18(11) Guide ropes to be used to control load. 	MEDIUM

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
	<ul style="list-style-type: none"> Employees working under suspended loads 	<ul style="list-style-type: none"> Loads falling causing injuries and possible fatalities 	<ul style="list-style-type: none"> Contractor to ensure that no person walks or works under suspended loads at all times. 	HIGH
	<ul style="list-style-type: none"> Incorrect manual Handling. 	<ul style="list-style-type: none"> Back injuries. Pinch points. 	<ul style="list-style-type: none"> Contractor to ensure employees are trained on correct manual lifting techniques. Employees to use appropriate gloves when doing manual handling. 	LOW
Transportation of Rocks from the quarry to site.	<ul style="list-style-type: none"> Overloading of trucks. 	<ul style="list-style-type: none"> Rocks falling off truck causing injuries on the road. 	<ul style="list-style-type: none"> Contractor to ensure that trucks are not overloaded before driving away. Loads to be covered before driving away. 	MEDIUM
	<ul style="list-style-type: none"> Incompetent truck operator 	<ul style="list-style-type: none"> Injuries Property damages 	<ul style="list-style-type: none"> Only competent truck operators will be appointed and authorised. 	MEDIUM
	<ul style="list-style-type: none"> Speeding 	<ul style="list-style-type: none"> Road accidents Property damages 	<ul style="list-style-type: none"> The contractor's drivers shall abide by all general road traffic rules found in the National Road Traffic Act (Act 93 of 1996). 	MEDIUM
Moving of barge to the Berths.	<ul style="list-style-type: none"> Disruptions to port operations 	<ul style="list-style-type: none"> Accidents Work delays 	<ul style="list-style-type: none"> Permission to move the barge to be obtained timeously from Harbour master and relevant personnel. Competent personnel to conduct the moving of the barge. 	LOW

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
Loading of materials to the barge. (Rock, plant and equipment)	<ul style="list-style-type: none"> No platform to access the barge from landside 	<ul style="list-style-type: none"> Risk of equipment and materials falling into the water Injuries 	<ul style="list-style-type: none"> Suitable platform must be identified for accessing the barge. An access ramp must be constructed to access the barge. Contractor to ensure the barge is not overloaded. Competent plant operators accessing the barge must be extra cautious when driving onto the barge. 	HIGH
Demolitions of Gabions using LRE (Long Reach Excavator), TLB or mobile Jack hammer	<ul style="list-style-type: none"> High tides 	<ul style="list-style-type: none"> Employees falling in the water drowning 	<ul style="list-style-type: none"> Demolition of Gabions from landside must only be done at low tide. Working over water procedure must be communicated to employees and implemented at all times. 	MEDIUM
	<ul style="list-style-type: none"> Incompetent operator to operate Long Reach Excavator, TLB or Jack hammer operators. 	<ul style="list-style-type: none"> Injuries Property damage 	<ul style="list-style-type: none"> Only competent operators will operate the Long Reach Excavator, TLB and the jack hammer. Rotation of operators as and when required. 	MEDIUM
	<ul style="list-style-type: none"> Vibration 	<ul style="list-style-type: none"> Hand arm vibration syndrome due to excessive vibration. 	<ul style="list-style-type: none"> Rotation of operators as and when required. Contractor to comply with Occupational Health Risk assessment. 	LOW
	<ul style="list-style-type: none"> Defective equipment such as Long Reach Excavator, TLB and jack hammer 	<ul style="list-style-type: none"> Injuries to operator or fellow co-workers 	<ul style="list-style-type: none"> Serviced and well-maintained Long Reach Excavator, TLB and jack hammer must be used. 	MEDIUM

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
			<ul style="list-style-type: none"> • Inspection of Long Reach Excavator, TLB jack hammer and other tools must be done before use. • Defective tools and equipment must be removed from site. 	
	<ul style="list-style-type: none"> • Using of LRE close to the pipe racks and other structures 	<ul style="list-style-type: none"> • Possible fire • Property damage 	<ul style="list-style-type: none"> • The use of the LRE from the barge must not pose a risk to hitting or coming into contact with pipe racks or any structures. • The acceptable working height of the LRE must be monitored closely at all times. 	HIGH
	<ul style="list-style-type: none"> • Unstable barge 	<ul style="list-style-type: none"> • Plant/equipment falling in the water • drowning 	<ul style="list-style-type: none"> • Spud barges to be used. 	HIGH
Rat proofing	<ul style="list-style-type: none"> • High tides 	<ul style="list-style-type: none"> • Employees falling in the water • drowning 	<ul style="list-style-type: none"> • Demolition of Gabions from landside must only be done at low tide. • Working over water procedure must be communicated to employees and implemented at all times. 	MEDIUM
	<ul style="list-style-type: none"> • Flying particles. 	<ul style="list-style-type: none"> • Injuries to eyes and body 	<ul style="list-style-type: none"> • Ensure operator and employees have been trained in safe work practices and appropriate PPE (e.g. eye protection.) • No employees must work close to the demolition area. 	LOW

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
	<ul style="list-style-type: none"> Using of LRE close to the pipe racks and other structures 	<ul style="list-style-type: none"> Possible fire Property damage 	<ul style="list-style-type: none"> The use of the LRE from the badge must not pose a risk to hitting or coming into contact with pipe racks or any structures. The acceptable working height of the LRE must be monitored closely at all times. 	HIGH
	<ul style="list-style-type: none"> Exposure to noise 	<ul style="list-style-type: none"> Noise induced hearing loss. 	<ul style="list-style-type: none"> The contractor must implement engineering control or personal control by ensuring that all employees wear hearing protection devices to decrease noise exposure levels lower than 85 dB Contractor to comply with Noise induced Hearing Loss regulations,2003 Contractor to comply with Occupational Health Risk assessment. 	MEDIUM
	<ul style="list-style-type: none"> Exposure to dust 	<ul style="list-style-type: none"> Respiratory diseases caused by dust inhalation. 	<ul style="list-style-type: none"> Ensure operator and other employees has been trained in safe work practices and appropriate PPE (e.g. dust mask). Contractor must comply with Hazardous Chemical Substances Regulations. 	LOW
Scour protection	<ul style="list-style-type: none"> Moving of machinery 	<ul style="list-style-type: none"> Machinery knocking employees resulting in injuries 	<ul style="list-style-type: none"> Employees to be aware and stay clear of moving machinery. Reverse sound to be fitted on moving machinery. Only competent and experienced operator shall operate machinery. Contractor to comply with Driven Machinery regulations,2015 and 18(11) 	MEDIUM

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
Welding	<ul style="list-style-type: none"> Undertaking hot work without a hot work permit in place. 	<ul style="list-style-type: none"> Work stoppage. 	<ul style="list-style-type: none"> The contractor shall apply for a hot work permit prior to commencement of the task. The hot work permit must be obtained from TNPA fire department. The contractor must allocate enough budget for these permits. The hot work permit cost R420.77 in year 2023. The Contractor must take note that the price increases every year in March. The contractor must obtain separate hot work permit for working on the landside and separate permit for water side. Permits and warning signs are to be displayed at entry points to hot work areas. Permits must be valid at the time work is being undertaken. 	HIGH
	<ul style="list-style-type: none"> Exposure to UV, IR Radiation and exposure to arc flashes 	<ul style="list-style-type: none"> Arc-eye. loss of vision 	<ul style="list-style-type: none"> Contractor to comply with section 9 of General Safety Regulations Contractor to ensure operators are trained in safe work practices and appropriate PPE (e.g. eye protection is worn during operation. The contractor shall compile a comprehensive risk assessment prior to commencement of task. Contractor to ensure that welders are trained, competent and experienced. 	MEDIUM

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
			<ul style="list-style-type: none"> Contractor to comply with Occupational Health Risk assessment. 	
	<ul style="list-style-type: none"> Welding sparks 	<ul style="list-style-type: none"> Possible fire Burns to employees 	<ul style="list-style-type: none"> Contractor to comply with regulation 9 of General Safety Regulations. Warning signs shall be posted around and at each level below the area of each overhead welding or burning operation. Fire extinguishers shall be available. Fire blankets shall be used for protection. The contractor to ensure appropriate screening is in place to protect the surrounding workspace. Ensure operator has been trained in safe work practices and appropriate PPE (e.g. eye protection/welding mask, gloves, apron is worn during operation). 	MEDIUM
	<ul style="list-style-type: none"> Defective welding machine 	<ul style="list-style-type: none"> Injuries to employees and possible property damage 	<ul style="list-style-type: none"> Contractor to ensure the inspection of welding equipment by a competent person. 	MEDIUM
Marine Excavation	<ul style="list-style-type: none"> Working over water 	<ul style="list-style-type: none"> Equipment falling in water 	<ul style="list-style-type: none"> Operator to exercise caution whilst excavating. Working over water procedure to be always complied with. 	MEDIUM

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
Placement of armour rock	<ul style="list-style-type: none"> Rock falling 	<ul style="list-style-type: none"> Injuries to nearby employees Damage to property 	<ul style="list-style-type: none"> Operator to take limited rock at a time. Adequate supervision to be available at all times. 	MEDIUM
	<ul style="list-style-type: none"> Employees working near rock placement operation 	<ul style="list-style-type: none"> Injuries Possible fatalities 	<ul style="list-style-type: none"> Contractor to ensure employees stay clear of rock placement activity. 	HIGH
	<ul style="list-style-type: none"> Using of LRE close to the pipe racks and other structures 	<ul style="list-style-type: none"> Possible fire Property damage 	<ul style="list-style-type: none"> The use of the LRE from the badge must not pose a risk to hitting or coming into contact with pipe racks or any structures. The acceptable working height of the LRE must be monitored closely at all times. 	HIGH
	<ul style="list-style-type: none"> Moving of machinery 	<ul style="list-style-type: none"> Machinery knocking employees resulting in injuries 	<ul style="list-style-type: none"> Employees to be aware and stay clear of moving machinery. Reverse sound to be fitted on moving machinery. Only competent and experienced operator shall operate machinery. Contractor to comply with Driven Machinery regulations, 2015 and 18(11) 	MEDIUM
Extension of the storm water outfalls	<ul style="list-style-type: none"> Manual lifting of HDPE pipe 	<ul style="list-style-type: none"> Back injuries Pinch points due to feet and hands being caught between objects. 	<ul style="list-style-type: none"> Contractor to ensure employees are trained on correct manual lifting techniques. Employees to use appropriate gloves when doing manual handling. 	MEDIUM

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
			<ul style="list-style-type: none"> Mechanical means to be used for heavy lifting. Employees not to lift anything heavier than 20kg alone. 	
	<ul style="list-style-type: none"> Defective lifting equipment 	<ul style="list-style-type: none"> HDPE pipe falling 	<ul style="list-style-type: none"> Pre-use checks to be conducted by the appointed competent person. All lifting and rigging equipment tested and certified, proof to be kept on file. Contractor to comply with Driven Machinery regulations, 2015 and 18(11) 	LOW
Grading and levelling of existing revetment with filter rock	<ul style="list-style-type: none"> Using of LRE close to the pipe racks and other structures 	<ul style="list-style-type: none"> Possible fire Property damage 	<ul style="list-style-type: none"> The use of the LRE from the badge must not pose a risk to hitting or coming into contact with pipe racks or any structures. The acceptable working height of the LRE must be monitored closely at all times. 	HIGH
Installation of Bidim geotextile	<ul style="list-style-type: none"> Incompetent divers 	<ul style="list-style-type: none"> drowning 	<ul style="list-style-type: none"> Diving regulations, 2009 must be complied with during diving activities. Contractor to ensure divers are experienced and trained. 	MEDIUM
	<ul style="list-style-type: none"> Divers struck by objects in the water 	<ul style="list-style-type: none"> Injuries 	<ul style="list-style-type: none"> Divers to exercise caution at all times. Rock placement must not be conducted simultaneously with diving operations. 	MEDIUM
	<ul style="list-style-type: none"> Defective diving equipment 	<ul style="list-style-type: none"> Could cause divers to drown 	<ul style="list-style-type: none"> Inspection of diving equipment must be done by a competent person prior to use. 	MEDIUM

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
External environmental conditions	• Snakes	• Snake bite	<ul style="list-style-type: none"> Emergency contact list to be conspicuously displayed on site Snake catcher contact detail on site. Toolbox talks to be conducted. 	MEDIUM
	• Heat	• Heat stroke - hot dry skin, confusion, convulsions and eventual loss of consciousness. This is the most severe disorder and can result in death if not detected at an early stage	<ul style="list-style-type: none"> Contractor to compile and implement a heat management procedure, practices and emergency procedures providing periodic rest breaks and rest facilities in cooler conditions must be implemented. Contractor to comply with Occupational Health Risk assessment. 	HIGH
	• Working in the sun without drinking liquids	• Dehydration	<ul style="list-style-type: none"> Provide cool water in the workplace and encourage workers to drink it frequently in small amounts before, during and after working. 	HIGH
Handling, Storage & disposal of Hazardous chemical substances.	• Incorrect storage and handling of hazardous waste	• Contamination to environment.	<ul style="list-style-type: none"> Waste storage as per project EMPr requirements Cradle-to-grave approach to be followed. Contractor to adhere to the OHSACT and HCS Regulations, when dealing with Hazardous Chemical Substances. Waste storage and separation to be implemented as per project EMPr Requirements Waste to be transported and disposed of as per National and Local Regulations 	MEDIUM

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
			<ul style="list-style-type: none"> Licensed waste contractor to be appointed. Correct PPE to be worn for the task Waste storage as per project EMP Cradle-to-grave approach to be followed when there is a spill on site. SDS to be read and adhered to when using Hazardous & Chemical substances 	
Working adjacent on existing structures	<ul style="list-style-type: none"> Working under berth decks and around berth structures such as piles and caissons. Berth infrastructure and pipe racks running behind the berths. 	<ul style="list-style-type: none"> There is a risk of working in confined and challenging areas and spaces. There is also a risk of damage to existing structures and potential collapse of structures. 	<ul style="list-style-type: none"> Contractor to ensure that a detailed structural assessment of the existing structures is undertaken prior to commencing work. Contractor to design and provide adequate temporary works, protection, shoring, propping, under pinning etc, to ensure the structures remain stable and the structural integrity of the structures is not compromised. Special care needs to be taken not to damage the berth infrastructure and pipe racks. 	MEDIUM
Load limitations for existing Berth structures. Existing sea walls and shoreline embankments	<ul style="list-style-type: none"> Existing berth structures and the stability of the existing shoreline protection (seawalls). 	<ul style="list-style-type: none"> There is a risk of damage to existing structures and potential collapse of structures. 	<ul style="list-style-type: none"> The Contractor shall take cognisance of the fact that limited information is available on the adjacent infrastructure and that its ultimate load carrying capacity is unknown and the Contractor shall take this into account in his 	MEDIUM

Hazards, Associated Risks, and Ratings				
Activity, step or action step	Hazards	Associated risk event	Risk controls	Risk Rating
			planning and designing of temporary works and the equipment that will be used during construction.	
Working at night	• Inadequate lighting	<ul style="list-style-type: none"> • Insufficient light - not enough (too little) light for the need. • Glare - too much light for the need. • Improper contrast. • Poorly distributed light. Flicker. 	• Contractor must conduct Lighting survey before initiating night work. Contractor to ensure the site is well lit at night as workers should not be allowed to work in the dark.	HIGH
	• Employees working long hours	• Injuries due to fatigue and lack of rest/sleep	<ul style="list-style-type: none"> • Contractor to develop and submit a plan for working at night to TNPA. • Contractor to have two teams for day and night work. • Contractor to adhere to Basic Conditions of Employment Act. 	HIGH

Annexure 1 – TNPA Risk Matrix and Descriptions

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	Description of Likelihood		Consequence	Description of Consequence
1. Rare	Will only occur in exceptional circumstances		1. Insignificant	No treatment required
2. Unlikely	Not likely to occur within the foreseeable future, or within the project lifecycle		2. Minor	Minor injury requiring First Aid treatment (e.g. minor cuts, bruises, bumps)
3. Possible	May occur within the foreseeable future, or within the project lifecycle		3. Moderate	Injury requiring medical treatment or lost time
4. Likely	Likely to occur within the foreseeable future, or within the project lifecycle		4. Major	Serious injury (injuries) requiring specialist medical treatment or hospitalisation
5. Almost Certain	Almost certain to occur within the foreseeable future or within the project lifecycle		5. Critical	Loss of life, permanent disability or multiple serious injuries