

BASELINE RISK ASSESSMENT: FOR THE PROVISION OF THE REHABILITATION AND UPGRADE OF ROADS IN THE PORT OF DURBAN

PROJECT NAME: FOR THE PROVISION OF THE REHABILITATION AND UPGRADE OF ROADS IN THE PORT OF DURBAN

Project Number: XDN.E.0032

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Owner: Transnet National Port Authority

Client: Transnet National Port Authority

Project Sponsor: Mpumi Dweba-Kwetana (Port Manager)

Project Manager: Nolonwabo Zamani

Revision Number: 01

Description of the Works: FOR THE PROVISION OF THE REHABILITATION AND UPGRADE OF ROADS IN THE PORT OF DURBAN

SIGNATORIES

| | | | |
|--------------|--|--|---------------------------|
| Compiled by: | <u>Philisiwe Ngidi</u> Health and Safety Practitioner |  Signed | <u>18/10/2022</u> Date |
| Approved by: | <u>Abram Motshegare</u> Health and Safety Agent |  Signed | <u>18/10/2022</u> Date |
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Scope of work

| | |
|------------------------------|--------------------------|
| Risk Assessment Title | Baseline Risk Assessment |
|------------------------------|--------------------------|

| Risk Assessment Team | | | | |
|-----------------------------|------------------|------------------------------|----------------|-------------------------------|
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Activities Covered

This baseline risk assessment focusses on the high-level Health and Safety risks anticipated during construction taking into consideration all construction methods.

- Establishment of the Contactor's Camp Site
- Preliminary Geotechnical Study, Survey and Design Report
- General
 - Accommodation of traffic
 - Clearing and grubbing
- Drainage
 - Cleaning and effecting repairs to the existing drainage systems (including inlet and outlet structures)
 - Diverting of stormwater flow as necessary to effect construction
 - Construction of new drainage structures
 - Repair or replacement of damaged drainage structures
- Roadworks
 - Earthworks
 - Breaking up existing pavement layers
 - Relocation and protection or removal of existing services
 - Strengthening pavement layer/s where necessary
 - Milling road surface where necessary
 - Re-surfacing with Asphalt Wearing Course Premix
 - Replacement of damaged precast and/or in-situ concrete kerbs
 - Installation of concrete edge beams on bell mouths and access ways
 - Provide sidewalks with asphalt surfacing
- Ancillary Roadworks
 - Painting of road markings
 - Installation and replacement of road signage
 - Installation of Guardrails

Geographical location:

The Port of Durban's road rehabilitation has been divided into three precincts: Maydon wharf, Bayhead Park, and Island View Precinct.

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Scope of Risk Assessment

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

The Baseline Risk Assessment is a theoretical assessment before the construction start to highlight the foreseen hazards, but this is not intended to be seen as an absolute 100% of hazards that may occur.

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| Activity, step or action step | Hazards | Associated risk event | Risk controls | Risk Rating |
|-------------------------------|---|---|--|---------------|
| Access to site | Entering site and driving under the influence of alcohol and drugs | Injury to persons and property damage. | <ul style="list-style-type: none"> All employees entering the site shall undergo 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. | MEDIUM |
| | Speeding (reckless and negligent driving) | Injuries to persons and property damage | <ul style="list-style-type: none"> All drivers shall abide by speed limit | MEDIUM |
| | Parking in areas not designated for parking | Obstruction of the roads and possible injuries and damage to property | <ul style="list-style-type: none"> Contractor must ensure that an approved Traffic Management Plan is implemented. | MEDIUM |
| | Incompetent drivers Vehicles not in good and serviceable condition Uneven road conditions Speed Fatigue Poor visibility due to dust/sunlight | Injuries resulting in permanent disabilities Fatalities | <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). Adherence to TNPA Vehicle and Transportation Management procedure and the Road Traffic Act. Ensure drivers are competent, including random verification. Strict speed control with use of 24-hour active satellite tracking. Inspections by competent inspector. Ensure selection of correct vehicle type for conditions, including tyre selection Fatigue management plan to be developed and approved. | MEDIUM |

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| | Congestion caused by contractor trucks and construction | Vehicle incidents which may lead to injuries, fatalities and/or property damage. | <ul style="list-style-type: none"> Contractor to develop a Traffic Management Plan. It must be communicated and implemented accordingly. | HIGH |
| Site establishment | Poor ground stability Substandard rigging and lifting practices Possible mechanical failure of lifting equipment Miscommunication between rigger and driver | Crane tipping over causing property damage and possible injuries Falling of container(s) which may lead to injuries and property damage | <ul style="list-style-type: none"> Rigger to conduct ground survey before offloading process. Operator competency, load test certifies and pre-operative checks Competent rigger to be appointed Adherence to Traffic Management Plan Clients site induction | MEDIUM |
| | Incompetent drivers offloading containers/offices. Mobile cranes not in safe and serviceable | Falling of container(s) which may lead to injuries and property damage | <ul style="list-style-type: none"> Rigger to use approved rigging signals and rigging safe work procedure Contractor to conduct rigging study Valid crane, hook, load, and calibration test to be completed. | |
| | No ablution facilities | Infectious diseases due to poor hygiene practices | <ul style="list-style-type: none"> Contractor to adhere to Facilities and Construction Regulations under Occupational Health and Safety Act No.85 of 1993 and TNPA Health and Safety Project Specification. | |
| | Using water from un-identified sources/connections | Ill-health resulting from drinking water from unsafe sources. | <ul style="list-style-type: none"> Drinking water must only be sourced from connections identified safe for human consumption. | |
| | No canteen / dining / sheltered eating areas available for employees on site. | Ill-health resulting from eating at hazardous/untidy areas. | <ul style="list-style-type: none"> Eating areas to be established at a safe and secure location on site as per Facilities Regulations. | |
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| Clearing and grubbing | Use of unsafe Heavy Mobile Equipment (HME). Damage of site fence due to site clearing operations. Damage to existing services not marked or pointed out to the Principal Contractor. Employees being struck by moving plant working in the area. Construction vehicle and mobile plants reverse hooters not working. Unauthorized removal of indigenous & endangered fauna & flora. | Biological conditions Extreme weather conditions (Cold and Heat) Incompetent person operating Heavy Mobile Equipment (HME) HME not in safe and serviceable condition | <ul style="list-style-type: none"> • All services on site must be pointed out by the client to the principal contractor. • Safe distance from site fence and services must be established by contractor and must be maintained and marked. • Dust control measures must be implemented by the principal contractor as determined by the environmental requirements. • All construction vehicles on site must be inspected when delivered to site to ensure adherence to the legal requirements before any usage of the plant | MEDIUM |
| Interface with adjacent construction activities of other contractors | No communication with other contractors on premises in close vicinity of work area. | Injuries resulting in permanent disabilities Fatalities | <ul style="list-style-type: none"> • Contractor must communicate daily regarding items that may affect 3rd party or site access. | MEDIUM |

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| Interface with existing tenants | <p>Insufficient protection of neighbouring premises by not using safety screens/ hoarding and barricading.</p> <p>No communication with neighbours regarding noise levels, dust levels and working hours.</p> <p>No / insufficient dust control.</p> <p>Services to premises not being protected.</p> <p>Poor communication with tenant regarding work effecting the premises.</p> | <p>Injuries resulting in permanent disabilities</p> <p>Fatalities</p> | <ul style="list-style-type: none"> • Communication with tenants regarding noise/ dust work. • Concerning items to be addressed immediately via tenant co-ordinators. | MEDIUM |
| Drainage | | | | |
| Cleaning and effecting repairs to the existing drainage systems (including inlet and outlet structures) | <p>High pressure water jetting units.</p> <p>Contact with stagnant and wastewater that harbor viruses, bacteria, fungi, parasites and numerous other micro-organisms (biological agents)</p> | <p>Possible injury to both operators and by-passers due to the pressure of the water jets</p> <p>Venting sewer gases</p> <p>Drowning</p> <p>Asphyxiation</p> | <ul style="list-style-type: none"> • All works should be undertaken by competent staff. • Safe Work Procedures (including jetting & inspection techniques). | HIGH |

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| Construction of new drainage structures | Existing underground services such as gas, water, electric and other utility apparatus. | Injuries resulting in permanent disabilities Fatalities | <ul style="list-style-type: none"> Underground services study Road service drawings | HIGH |
| Civil and Earthworks | | | | |
| Earthworks by means of Heavy Mobile Equipment (HME) | <p>Collisions/Man/Machine interface because of operator misconduct, poor visibility conditions (fog, rain, blind spots etc) or mechanical failure of HME.</p> <p>HME not in safe and serviceable condition.</p> <p>Incorrect position and concrete chute not correctly positioned.</p> <p>Danger offload (concrete) falling or rubble bucket hitting people.</p> <p>Overloading of surface with building rubble accumulating.</p> | Injuries resulting in permanent disabilities Fatalities | <ul style="list-style-type: none"> Ensure operator competency Traffic management plan including strictly controlled speed limits. Contractor emergency management plan. Occupation certificates must be obtained where there is a potential to come in contact with OHTE. Activity Specific Traffic Management Plan indicated on DSTI's. | HIGH |

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| <p>Breaking up existing pavement layers</p> | <p>Use of electrical jack hammer</p> <p>Use of compressor jack hammer</p> | <p>Hand and arm vibrations can cause white finger syndrome.</p> <p>Injury to back and joints from manual handling.</p> <p>Damage to hearing from constant noise.</p> <p>Electrocution from faulty equipment or from operating in wet areas.</p> <p>Operator losing control over the tool. -Foreign objects entering and injuring employees' eyes</p> <p>Damage to existing services.</p> | <ul style="list-style-type: none"> • Work to commence under competent supervision. • Employees must be trained on the equipment procedures to follow. • Material/equipment used for breaking must be inspected before and during use to ensure the safety of employees. • Employees must be provided with the PPE as determined in the task risk assessment | <p>MEDIUM</p> |
| <p>Handling, Storage & Disposal of Hazardous Chemical Substances</p> | | | | |

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| Painting of roads (road surface marking) | Chemical agents (toluene, xylene, acetone, ethyl acetate, butyl acetate etc) Ergonomics (working in awkward positions and kneeling for prolonged duration) | Exposure to solvent vapours may result in a number of health effects, e.g., the central nervous system, respiratory system. Skin conditions such as dermatitis Risk of eye injury from exposure to fumes Contamination of receiving environment Musculoskeletal disorders such as backaches | <ul style="list-style-type: none"> • Maintain good ventilation • Cradle-to-grave approach to be followed. • Contractor to adhere to the OHSACT and HCS Regulations, when dealing with Hazardous Chemical Substances. • Waste to be transported and disposed of as per National and Local Regulations • Licenced waste contractor to be appointed. • All painters must be trained, and proof of competency and previous experience be provided. • Appropriate PPE to be worn for tasks (specialized protective gloves, masks protective respiratory system, visors covering eyes etc). • MSD's to be read and adhered to when using Hazardous & Chemical substances • Rotation of workers and frequent breaks | HIGH |
| Diesel storage area, chemical usage and flammable store. | Incorrect storage and handling of hazardous waste | Spillage of chemical product Poor storage of products Fire outbreak and explosions resulting in property damage and injury | | |
| Manual handling of materials | Awkward postures whilst working Repetitive movements Prolonged standing | Musculoskeletal disorders e.g. back injuries Blood pooling which may lead to fainting Cuts/Abrasions and pinch points | <ul style="list-style-type: none"> • Safe lifting procedures • Contractor to ensure long sleeved clothing and appropriate gloves are worn by all employees handling roof trusses and sheets. • Appropriate PPE including gloves • Contractor to ensure sufficient labour available for manual lifting | HIGH |

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| | <p>Constant kneeling</p> <p>Sharp edges</p> <p>Heavy lifting of materials e.g., wall cabinets and ceramic tiles</p> | | | |
| Temporal Electrical Installations | <p>Incompetent installers, Unsafe installations due to faulty wiring, lack of insulation & openings.</p> <p>Fire</p> <p>Presence of water</p> <p>Flammable or explosive atmosphere.</p> | <p>Injuries</p> <p>Fatalities</p> | <ul style="list-style-type: none"> • Adherence to Electrical Installation Regulations, under the Occupational Health & Safety Act, Act 85 of 1993. • Contractor must adhere to SANS 10142 • Ensure competency of installers and use of certified equipment. • Inspections of installations and fire safety | HIGH |
| Operating portable electrical equipment and cell phones on an MHI / hazardous zone | <p>Potential ignition sources</p> | <p>Fatalities</p> <p>Serious injuries</p> <p>Property damage</p> | <ul style="list-style-type: none"> • Only intrinsically safe appliances approved by TNPA may be switched on or used in the berths. Owners of such devices will carry with them the approval certificate for use at all times | HIGH |
| Working on an MHI site | <p>Vapour Emission</p> | <p>Poor air quality</p> <p>Air pollution</p> | <ul style="list-style-type: none"> • Air quality monitoring by contractor • Compliance project health and safety specification requirements. | HIGH |

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| Excavations and trenching | <p>Unprotected excavations, unsafe access and egress into and from excavations</p> <p>Collisions are a result of operator misconduct, poor visibility conditions (fog, rain etc) or mechanical failure of machines (brakes, steering etc)</p> <p>Underground services being struck/damaged</p> <p>Use of defective tools and equipment (spades and forks)</p> | Injuries and fatalities | <ul style="list-style-type: none"> • Method statement for drainage of excavations, adequate drainage procedure, daily inspections, and inspections after inclement weather, monitor weather forecasts, ensure correct batter angles, shoring to prevent collapse • Ensure competent, trained personnel are used. • Contractor to ensure employees are trained on safe use of hand tools. • Pre-inspections of tools by Contractor • Contractor to ensure appropriate PPE is always worn. • Drawings of existing services to be available and communicated. • Adequate supervision to stop all excavation work at the first visible sign of foreign material (e.g., electric cable sheath, PVC piping material) • Appropriate approval/permits | HIGH |
| | Dust generated from blasting, construction activities and heavy machinery | Regular to dust may result in irritation to eyes and respiratory illnesses such as lung cancer, silicosis, occupational asthma and Chronic Obstructive Pulmonary Disease (COPD). | <ul style="list-style-type: none"> • Occupational health assessment • Hygiene monitoring • Medical surveillance • Effective ventilation • Dust suppression • Respiratory protective equipment (RPE) | HIGH |

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| | Noise exposure due to operation, or working in close proximity of, noisy mobile plant, equipment or machinery. | Overexposure to noise levels – short and long term may result in potentially permanent health impact (noise induced hearing loss) | <ul style="list-style-type: none"> Occupational hygiene monitoring Medical surveillance Hearing conservation programme | HIGH |
| | Lighting effects (stroboscopic effects), Improper lighting installation, maintenance, replacement and disposal Insufficient lighting/emergency lighting | Accident and injuries due to possible stroboscopic effects, insufficient lighting and poor lighting management. | <ul style="list-style-type: none"> Proper temporary lighting design to not interfere with other activities. Sufficient maintenance, replacement and disposal programme. Regular illumination measurements to match type of work to be done. | HIGH |
| | Awkward work positions Repetitive movements Self-improved tools and machinery Heavy load manual handling. | Musculoskeletal injuries due to manual handling, bending, twisting, prolonged, frequent, repetitive movements. Fatigue | <ul style="list-style-type: none"> Task risk assessment Correct lifting and manual practices Ergonomic awareness | HIGH |

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| | Vibration transmitted into hands and arms when using handheld/operated tools and machinery. | Excessive exposure can affect the nerves, blood vessel, muscles and joints of the hand, wrist and arm causing Hand-Arm Vibration Syndrome (HAVS) and other musculoskeletal conditions, such as Vibration-Induced White Finger (VWF) and Reynaud's disease. | <ul style="list-style-type: none"> • Appropriate tool selection • Well maintained equipment and mobile plant • Good work practices and education programs | HIGH |
| | <p>Extreme ambient temperatures during winter nights and summer days.</p> <p>Excessive UV radiation</p> | <p>Overexposure to heat may lead to heat-related conditions such as heat cramps, heat exhaustion and heatstroke which may be caused by dehydration and desalination.</p> <p>Hypothermia</p> <p>Premature skin ageing, precancerous and cancerous skin conditions, keratitis, weakening of immune system.</p> | <ul style="list-style-type: none"> • Occupational hygiene monitoring and medical surveillance. • Specialized PPE (e.g., lined gloves, balaclavas, winter jackets. • Scheduling of regular break times | HIGH |
| | Working between moving trains/on full occupation | Injuries because of accidental hit by moving trains. | <ul style="list-style-type: none"> • The use of flagman at all times when working on or close to railway line. • Compliance to TWR • Induction by rail operator | HIGH |
| | <p>Removal/Installation of existing of rails will lead to:</p> <p>Ergonomics:</p> | <p>Cumulative trauma disorders, muscular strain, lower back and neck pain.</p> <p>Employees frequently adopt and maintain awkward body postures during the course of their work.</p> | <ul style="list-style-type: none"> • Provide all employees with training and precautionary measures to be taken to prevent possible back injuries, musculoskeletal disorders. • Employees with Musculoskeletal disorders should not be exposed to lifting and manual handling of materials (An opinion of | HIGH |

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| | <p>Awkward / static body postures.</p> <p>Manual handling and lifting</p> <p>Welding fumes; Infrared radiation from thermit welding, Infrared and ultra-violet radiation from the sun.</p> | <p>Employees are required to bend down to operate.</p> <p>Inhalation exposure to welding fumes including asphyxiant gases during welding. Secondary exposure to welding fumes from nearby welding activities. Exposure to UV light flash can produce a condition known as arc eye which is extremely irritating but generally short-lived effect. Skin burns, inflammation of the eyes</p> <p>Skin burns, inflammation of the eyes and scarring of the retina. Exposure to ultra-violet rays of the sun presents a risk of skin cancer.</p> | <p>OMP/OHP should be sought before exposing employees)</p> <ul style="list-style-type: none"> • Perway procedures must be developed and implemented. • TWR to be complied with. • Proper rail lifting manual must be submitted to Transnet for approval • Welder training and Certification • Approved Thermit welding training • Welding procedures and guidelines to be developed and implemented. • Compliance to project health and safety specification. • Provide welders with welding masks, welding helmet, apron, span, gloves and safety shoes • The area around the welding should be declared a respiratory zone. • Proved training on health effects and precautionary measures to be taken by employees when exposed to welding fumes. • No employees without welding garments should not be allowed to enter welding area. | |
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| | Existing railway lines/ Existing level crossings not protected | <p>Accident between a train and construction vehicles, construction workers and/or pedestrians - Injuries and fatalities.</p> <p>Damage to infrastructure and assets.</p> <p>Damage to construction plan & machinery.</p> <p>Discontinuation of operations; delay in project schedule.</p> | <ul style="list-style-type: none"> • Ensure protection on level crossing as per Train Working Rules (TWR) requirements. • Protection of employees against moving trains. <p>Fatal Risk Control (FRC) standards to exist for project.</p> <p>FRC to include no rail crossings.</p> <p>Construction footprint should consider this risk.</p> <p>Emergency response plan to include this type of accident.</p> <p>HSMP to address this.</p> | HIGH |
| | Insufficient construction space | <p>Limited construction space.</p> <p>Working next to a railway line.</p> <p>Current structures closer to construction site.</p> | <ul style="list-style-type: none"> • Insufficient space between construction site and Man/machine interface must be managed properly and ensure compliance to project specification. | HIGH |

Annexure 1 – 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 |

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| 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 |
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| 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 |