



OCCUPATIONAL HEALTH & SAFETY (OHS) SPECIFICATION: BASELINE RISK ASSESSMENT

PROJECT NUMBER:	JW 14406
PROJECT LOCATION:	LINBRO PARK
PROJECT DESCR:	CONSTRUCTION OF LINBRO PARK TOWER AND PUMP STATION (WITH ASSOCIATED WORKS)

BASELINE RISK ASSESSMENT



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ACTIVITY: TRANSPORTATION OF MATERIALS TO SITE

Task	Hazard	Risk	Consequence	Rating	Controls
Transportation of material to site	<ul style="list-style-type: none"> ✓ Unsafe road conditions ✓ Un-road worthy vehicles ✓ Equipment and material not safely secured ✓ Incompetent drivers ✓ Driving under the influence of alcohol ✓ Inclement weather ✓ Speeding ✓ Slippery road 	<ul style="list-style-type: none"> ✓ Overturning vehicles ✓ Vehicle collisions ✓ Bumping pedestrians / employees 	<ul style="list-style-type: none"> ✓ Injuries ✓ Property damages ✓ Third party liability 	M	<ul style="list-style-type: none"> ✓ Adherence to the speed limit ✓ Only competent/ authorised drivers should operate the vehicle ✓ Inspection of vehicles ✓ Equipment and material to be properly secured ✓ Alcohol testing to be done ✓ The road to be paved to prevent accidents ✓ Traffic control to be implemented to avoid collisions
Offloading of material	<ul style="list-style-type: none"> ✓ Faulty lifting machinery & equipment ✓ Suspended load ✓ Poor housekeeping 	<ul style="list-style-type: none"> ✓ Malfunctioning ✓ Falling on employees ✓ Obstructed walkways by materials 	<ul style="list-style-type: none"> ✓ Injuries 	M	<ul style="list-style-type: none"> ✓ Inspect lifting equipment prior to use. ✓ Ensure the safe working load prior to use ✓ Train the employees in manual lifting ✓ Ensure proper housekeeping ✓ The correct PPE must be worn ✓ Designate the stacking areas and put signs ✓ Stacking and storage inspector must be appointed and in charge



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ACTIVITY: SITE ESTABLISHMENT

Task	Hazard	Risk	Consequence	Rating	Controls
Site establishment	<ul style="list-style-type: none"> ✓ Sharp objects/ wires ✓ Uneven surface ✓ Faulty connection ✓ Poor ergonomics ✓ Falling objects ✓ Inadequate security services ✓ Not enough welfare facilities e.g. toilets, change rooms and lockers 	<ul style="list-style-type: none"> ✓ Cuts ✓ Slips and trips ✓ Damage to services ✓ Using the environment as ablution facilities 	<ul style="list-style-type: none"> ✓ Injuries ✓ Back strains and injuries ✓ Crime, theft, fights ✓ Contracting of communicable diseases ✓ Soil, water pollution 	M	<ul style="list-style-type: none"> ✓ Supervisors to plan during site set up and induct employees ✓ A competent electrician must be appointed to connect electrical wires to the site offices and Distribution Board. ✓ Ensure there are welfare facilities on site for health and hygiene purposes ✓ Awareness on hygiene and use of ablution facilities ✓ Detailed Risk Assessment must be drawn before any work commences on site.
Installing containers	<ul style="list-style-type: none"> ✓ Using lifting equipment ✓ Faulty equipment ✓ Faulty slings / chains 	<ul style="list-style-type: none"> ✓ Wind ✓ Incompetent personnel ✓ Heavy load ✓ Failing of lifting equipment 	<ul style="list-style-type: none"> ✓ Serious injuries ✓ Property damage 	H	<ul style="list-style-type: none"> ✓ Check wind speed prior to using the crane. ✓ Inspect the crane, slings and chains before use. ✓ Load test the crane before use ✓ Only carry loads certified to be carried by the crane
Entry and exit	<ul style="list-style-type: none"> ✓ No access control 	<ul style="list-style-type: none"> ✓ Unauthorised entry into the construction site 	<ul style="list-style-type: none"> ✓ Injuries ✓ Theft 	M	<ul style="list-style-type: none"> ✓ Appoint a full time, registered security guard on site



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ACTIVITY: SITE ESTABLISHMENT

Task	Hazard	Risk	Consequence	Rating	Controls
Electrical installation	<ul style="list-style-type: none"> ✓ Electricity ✓ Incompetent personnel ✓ Wrong tools ✓ Damaged cables 	<ul style="list-style-type: none"> ✓ Contact with live electricity ✓ Incompetent person connecting electricity ✓ Electric shocks 	<ul style="list-style-type: none"> ✓ Electrocution ✓ Serious injuries 	H	<ul style="list-style-type: none"> ✓ Follow lock out procedure ✓ Ensure that equipment are earthed to an approved earthing point ✓ Ensure a zero potential test is performed for electricity is isolated ✓ Inspect all tools ✓ Use correct tools for the job ✓ Appoint a competent electrician/ technician ✓ Wear task specific PPE ✓ Ensure that there are no exposed wires on the cables
Stacking and storage	<ul style="list-style-type: none"> ✓ Unsafe stacks of materials or pallets 	<ul style="list-style-type: none"> ✓ Falling of pallets and material on employees ✓ 	<ul style="list-style-type: none"> ✓ Injuries ✓ Property damage 	H	<ul style="list-style-type: none"> ✓ Supervision of all stacking of materials on site ✓ Materials of same base and heights stacked together ✓ Barricade the stacking area ✓ Unsafe stacks to be removed immediately ✓ Never stack materials during knocking off time or late at night ✓ Use task specific PPE



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ACTIVITY: EXCAVATION

Task	Hazard	Risk	Consequence	Rating	Controls
Excavation	<ul style="list-style-type: none"> ✓ Deep excavations 	<ul style="list-style-type: none"> ✓ Collapse ✓ Falling ✓ Unsafe entry and exit 	Fatalities	H	<ul style="list-style-type: none"> ✓ Geotechnical surveys to be conducted prior to construction ✓ Shoring of the excavation ✓ No unauthorised entry into the project site. ✓ Fencing off of the excavation and prompt supervision of the area. ✓ Full time security on site to monitor entry and exit. ✓ Safe method of entry and exit to be provided for employees ✓ Spoil material to be stored at least 2m away from the excavation ✓ Signage to be displayed indicating deep excavations
	<ul style="list-style-type: none"> ✓ Incompetent operator ✓ Faulty excavator 	<ul style="list-style-type: none"> ✓ Overturning ✓ Bumping against people 	✓ Serious injuries	H	<ul style="list-style-type: none"> ✓ Only competent personnel may operate the excavator ✓ All excavators must be inspected prior to use
Mechanical excavation	<ul style="list-style-type: none"> ✓ Ignition on 	<ul style="list-style-type: none"> ✓ Accidental movement 	<ul style="list-style-type: none"> ✓ Fatalities ✓ Property damages 	H	<ul style="list-style-type: none"> ✓ Operators should ensure that the ignition is off prior to leaving the plant.



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ACTIVITY: EXCAVATION

Task	Hazard	Risk	Consequence	Rating	Controls
					✓ Keys should be removed from the ignition and returned to the office for safekeeping,
Mechanical excavation	<ul style="list-style-type: none"> ✓ Deep excavation ✓ Lack of safety signage 	<ul style="list-style-type: none"> ✓ Employees falling into excavations 	<ul style="list-style-type: none"> ✓ Fatalities 	H	<ul style="list-style-type: none"> ✓ Ensure that deep excavation signage is placed and visible. ✓ Deep excavations must be fenced off and access controlled.
	<ul style="list-style-type: none"> ✓ Spoil material 	<ul style="list-style-type: none"> ✓ Collapse of excavation walls. ✓ Entrapment 	<ul style="list-style-type: none"> ✓ Fatalities 	H	<ul style="list-style-type: none"> ✓ Excavated soil to be placed at least 2m away from the excavation wall.
	<ul style="list-style-type: none"> ✓ Underground service 	<ul style="list-style-type: none"> ✓ Contact with plant 	<ul style="list-style-type: none"> ✓ Injuries ✓ Property damages ✓ Electrocution 	H	<ul style="list-style-type: none"> ✓ All underground services to be identified and marked prior to excavation.
	<ul style="list-style-type: none"> ✓ Unsafe access and exit 	<ul style="list-style-type: none"> ✓ Falling 	<ul style="list-style-type: none"> ✓ Injuries 	H	<ul style="list-style-type: none"> ✓ TLB / Excavator may not be used by employees to access and exit the excavation



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ACTIVITY: CONTACT WITH UNDERGROUND SERVICES

Task	Hazard	Risk	Consequence	Rating	Controls
Working close to Eskom line	✓ High voltage	✓ Electrocution	<ul style="list-style-type: none"> ✓ Fatalities ✓ Power cuts ✓ Property damages 	H	<ul style="list-style-type: none"> ✓ Proper scanning of services prior to starting with excavations ✓ Obtain wayleaves from Eskom prior to starting with work ✓ Do not use lifting equipment in close proximity to power lines unless authorized to do so. ✓ Appoint an OHRVS to supervise all work done in close proximity to power lines ✓ Contact Eskom if services are identified for isolation ✓ Develop a method statement and risk assessment ✓ Train employees in the method statement as well as risk assessment ✓ Develop emergency response procedures for explosions
Working close to gas lines	✓ Gas leaks	<ul style="list-style-type: none"> ✓ Explosion ✓ Suffocation ✓ Inhalation 	<ul style="list-style-type: none"> ✓ Fatalities ✓ Property damages 	H	<ul style="list-style-type: none"> ✓ Proper scanning of services prior to starting with excavations ✓ Obtain wayleaves from service provider prior to starting with work ✓ Develop a method statement and risk assessment ✓ Develop emergency response procedures for leaks and explosions



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ACTIVITY: MECHANICAL LIFTING

Task	Hazard	Risk	Consequence	Rating	Controls
Lifting using a crane	✓ Overhead lines	✓ Contact with crane	✓ Electrocution ✓ Property damages	H	✓ All lifting activities to be planned at least 2m away from overhead lines ✓ Obtain wayleaves from Eskom ✓ Appoint ORHVS
	✓ Wind / Unfavourable weather	✓ Deflection ✓ Loss of control	✓ Injuries ✓ Property damages	H	✓ Do not use during unfavourable weather conditions
	✓ Incompetent operator	✓ Loss of control ✓ Hitting structures and people	✓ Injuries ✓ Property damages	H	✓ Only trained and competent operators may operate the crane
	✓ Overloading	✓ Collapse of material	✓ Injuries ✓ Property damages	H	✓ Display safe working load on the crane
	✓ Faulty crane	✓ Malfunctioning	✓ Injuries ✓ Property damages	H	✓ Cranes to be inspected by competent persons prior to being used ✓ All faulty cranes to be tagged and locked out



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ACTIVITY: FALSE WORK

Task	Hazard	Risk	Consequence	Rating	Controls
Transporting shutters	<ul style="list-style-type: none"> ✓ Defective strapping ✓ Incompetent driver ✓ No inspection ✓ Overloading of truck 	<ul style="list-style-type: none"> ✓ Falling load ✓ Loss of control of vehicle 	<ul style="list-style-type: none"> ✓ Injuries ✓ Property damages 	M	<ul style="list-style-type: none"> ✓ Ensure that the load is properly secured in the truck. ✓ Driver must have a valid PDP ✓ Driver must inspect truck and ensure that it is roadworthy ✓ Driver must keep the speed limit while driving
Offloading of shutters	<ul style="list-style-type: none"> ✓ No stop blocks ✓ Ignition on ✓ Untrained crane operator ✓ No load testing 	<ul style="list-style-type: none"> ✓ Accidental movement of truck ✓ Falling loads ✓ Uncontrollable movement of crane 	<ul style="list-style-type: none"> ✓ Fatalities ✓ Property damages 	H	<ul style="list-style-type: none"> ✓ Place stop blocks behind the wheels. ✓ Operators should ensure that the ignition is off prior to leaving the plant. ✓ Keys should be removed from the ignition and returned to the office for safekeeping. ✓ Ensure that crane operator and rigger are trained and medically fit to operate the crane. ✓ Ensure that the crane and all lifting equipment are load tested and SWL is displayed.
Installing shutters	<ul style="list-style-type: none"> ✓ Untrained personnel ✓ No PPE ✓ Poor housekeeping ✓ Defective hand tools ✓ Defective shutters 	<ul style="list-style-type: none"> ✓ Falling shutters ✓ Cuts ✓ Hitting employees 	<ul style="list-style-type: none"> ✓ Injuries 	M	<ul style="list-style-type: none"> ✓ Ensure that shuttering is only done by trained personnel. ✓ Provide employees with relevant PPE. ✓ Ensure proper housekeeping on site ✓ Inspect tools and shutters prior to installing
Dismantling shutters	<ul style="list-style-type: none"> ✓ No PPE ✓ No supervision 	<ul style="list-style-type: none"> ✓ Falling shutters ✓ Cuts 	<ul style="list-style-type: none"> ✓ Injuries 	M	<ul style="list-style-type: none"> ✓ Ensure that dismantling is done under supervision of a competent person.



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ACTIVITY: FALSE WORK

Task	Hazard	Risk	Consequence	Rating	Controls
	<ul style="list-style-type: none"> ✓ Untrained personnel ✓ Defective tools 	<ul style="list-style-type: none"> ✓ Hitting employees 			<ul style="list-style-type: none"> ✓ Ensure that dismantling is only done by trained personnel. ✓ Provide employees with relevant PPE. ✓ Ensure proper housekeeping on site. ✓ Inspect tools and shutters prior to installing



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ACTIVITY: STEEL FIXING

Task	Hazard	Risk	Consequence	Rating	Controls
Offloading of steel with mobile crane	<ul style="list-style-type: none"> ✓ Untrained operator ✓ Untrained rigger ✓ SWL of crane not indicated ✓ No guide ropes to control load 	<ul style="list-style-type: none"> ✓ Collapse of load onto people ✓ Uncontrollable movement of the crane 	<ul style="list-style-type: none"> ✓ Serious injuries ✓ Fatalities ✓ Property damages 	H	<ul style="list-style-type: none"> ✓ Ensure that the crane operator and rigger are trained and medically fit. ✓ Ensure that inspection on crane is conducted prior to use. ✓ Ensure that SWL is indicated ✓ Ensure that there is good communication and visibility between the operator and rigger. ✓ Guide ropes must be in place to control overhead loads ✓ Ensure that truck is parked in a zero-energy position and have stop blocks in place. ✓ Unauthorised persons not allowed when crane is in operation
Dismantling & installation of steel	<ul style="list-style-type: none"> ✓ Untrained personnel ✓ No PPE ✓ Poor housekeeping ✓ Defective hand tools ✓ Incorrect pushing and pulling of steel 	<ul style="list-style-type: none"> ✓ Steel falling on feet and legs ✓ Trips and falls 	<ul style="list-style-type: none"> ✓ Injuries 	M	<ul style="list-style-type: none"> ✓ Ensure that only trained employees are dismantling the steel ✓ Ensure that employees have the relevant PPE. ✓ Ensure proper housekeeping ✓ Ensure that hand tools are used prior to use. ✓ Ensure that the pulling and pushing system is correctly done and monitored.
Cutting steel with a grinder	<ul style="list-style-type: none"> ✓ Grinder ✓ Faulty connection points 	<ul style="list-style-type: none"> ✓ Electrocution ✓ Cuts 	<ul style="list-style-type: none"> ✓ Injuries ✓ Amputation 	M	<ul style="list-style-type: none"> ✓ Ensure all grinders and connections are inspected



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ACTIVITY: STEEL FIXING

Task	Hazard	Risk	Consequence	Rating	Controls
	<ul style="list-style-type: none"> ✓ No inspections ✓ Untrained operator ✓ No PPE ✓ Damaged cutting disc 				<ul style="list-style-type: none"> ✓ Ensure that safety guards are in place on the grinder ✓ Handle and switch of the grinder should be inspected and tested prior to use. ✓ Only trained employees may use grinders ✓ Proper PPE to be used ✓ Inspect cutting disc prior to use
Binding steel with wire (using nip pliers)	<ul style="list-style-type: none"> ✓ Defective tools ✓ No PPE 	✓ Cuts	✓ Injuries	L	<ul style="list-style-type: none"> ✓ Inspect tools prior to using ✓ Ensure that the wire used to bind steel is bent at the end to prevent eye injuries ✓ Ensure that proper PPE is provided



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ACTIVITY: CONCRETE WORKS

Task	Hazard	Risk	Consequence	Rating	Controls
Concrete works	✓ Moving bucket	✓ Hitting employees	✓ Injuries	M	✓ Workers to stand clear of the path of the bucket ✓ Banksman to direct the loading and offloading activities
	✓ Working at heights	✓ Falls from heights	✓ Injuries	H	✓ Only work on platforms that are fully boarded and handrails installed
	✓ Concrete splashing	✓ Skin contact	✓ Dermatitis ✓ Skin burns	M	✓ Use of skin protection ✓ Provide gloves and safety boots ✓ Have MSDS
	✓ Concrete splashing	✓ Eye contact	✓ Eye injuries	M	✓ Provide safety goggles
Operating concrete truck	✓ Incompetent operator	✓ Hitting employees; ✓ Bumping vehicles and properties	✓ Injuries ✓ Property damages	M	✓ Only trained, competent and appointed operators may operate a concrete truck ✓ Flagman to be posted to direct the operator
	✓ Speeding	✓ Hitting employees; ✓ Bumping vehicles and properties	✓ Injuries ✓ Property damages	M	✓ Site speed limits to be adhered to at all times
	✓ Manual handling of chutes	✓ Incorrect handling	✓ Injuries	M	✓ Training in correct handling methods ✓ Provide employees with gloves. ✓ Provide leather gloves for concrete chute



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ACTIVITY: CONCRETE WORKS

Task	Hazard	Risk	Consequence	Rating	Controls
Pouring concrete with a bucket by means of a mobile crane	Incompetent operator	<ul style="list-style-type: none"> ✓ Hitting employees; ✓ Bumping vehicles and properties 	<ul style="list-style-type: none"> ✓ Injuries ✓ Property damages 	M	<ul style="list-style-type: none"> ✓ Only trained, competent and appointed operators may operate a concrete truck. ✓ Flagman to be posted to direct the operator
	Unauthorised / unsuitable crane	<ul style="list-style-type: none"> ✓ Hitting employees; ✓ Collapse of material 	<ul style="list-style-type: none"> ✓ Injuries ✓ Property damages 	M	<ul style="list-style-type: none"> ✓ Crane to be inspected by a competent person prior to use. ✓ Unsuitable crane to be tagged and locked out
Crane parking	Unstable ground	<ul style="list-style-type: none"> ✓ Crane overturning 	<ul style="list-style-type: none"> ✓ Injuries ✓ Property damages 	M	<ul style="list-style-type: none"> ✓ Crane to be established on solid ground with outriggers fully extended and pads in place



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ACTIVITY: WORKING AT HEIGHTS

Task	Hazard	Risk	Consequence	Rating	Controls
Working at heights	<ul style="list-style-type: none"> ✓ Heights ✓ Unfit employees ✓ Using hand tools ✓ Unsecured tools and equipment 	<ul style="list-style-type: none"> ✓ Falls ✓ Falling onto employees 	<ul style="list-style-type: none"> ✓ Injuries 	M	<ul style="list-style-type: none"> ✓ Employees to use proper PPE including safety harnesses when working at heights. ✓ Inspect all tools prior to use. ✓ Provide training for using safety harnesses correctly. ✓ Employees working at heights must be certified fit to work. ✓ Hand tools must be attached to lanyards when working at heights. ✓ Use tool bags ✓ Use netting system below each level. ✓ No work should be done on the ground when work at heights is in progress. ✓ Proper signage to be displayed.



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ACTIVITY: SCAFFOLD WORK

Task	Hazard	Risk	Consequence	Rating	Controls
Scaffold work	Improper erection	<ul style="list-style-type: none"> ✓ Collapse ✓ Falling of employees and equipment 	<ul style="list-style-type: none"> ✓ Property damages ✓ Fatalities 	H	<ul style="list-style-type: none"> ✓ Only a competent scaffold erector may erect a scaffold. ✓ Scaffold to be erected on firm, stable base ✓ Check the stability of the scaffold prior to allowing employees to climb on them. ✓ Mobile scaffolds must have their wheels locked before any person is allowed to climb on them. ✓ All parts of the work platform and scaffold must have safe means of access ✓ Unattended or incomplete scaffold should be prevented against unauthorized access. ✓ Suitable access ladder must be provided ✓ A fall arrest harness must be worn. ✓ Never use worn out fall arrest equipment. ✓ Suitable equipment for rescue must be available ✓ Proper bracing of the scaffold ✓ Scaffold to be securely tied to a structure
Working on scaffold	Overloading	<ul style="list-style-type: none"> ✓ Collapse 	<ul style="list-style-type: none"> ✓ Property damage 	H	<ul style="list-style-type: none"> ✓ Display the safe working load of the scaffold



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ACTIVITY: SCAFFOLD WORK

Task	Hazard	Risk	Consequence	Rating	Controls
		✓ Falling of employees and equipment	✓ Fatalities		✓ Never exceed the SWL of the scaffold
Working on scaffold	Overhead lines	✓ Contact with overhead lines ✓ Contact with employees	✓ Property damages ✓ Electrocution	H	✓ Erect the scaffold away from power lines ✓ Keep tools away from overhead lines ✓ Fall arrest equipment to be attached
	Unstable ground conditions	✓ Collapsing of scaffold	✓ Injuries ✓ Property damage	H	✓ Ensure that the foundation / footing of the scaffold is stable and levelled ✓ Only trained and competent persons may erect a scaffold
	Non-compliant scaffolding	✓ Collapsing of scaffold	✓ Injuries ✓ Property damage	H	✓ All platforms to be fully boarded and boards used to comply with SANS 085 ✓ All components of the scaffold must comply with SANS 085
Work platform	Inadequate space	✓ Falling persons and objects	✓ Fatalities ✓ Property damages	H	✓ Work platform should be at least 1m wide and capable of carrying the load that the type of work carried out may require



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ACTIVITY: SCAFFOLD WORK

Task	Hazard	Risk	Consequence	Rating	Controls
					<ul style="list-style-type: none"> ✓ To prevent persons from falling from the outside edges of work platforms, guardrails and mid-rails must be fitted. ✓ If loose objects or other materials may be present on the platform, edge protection/ toe boards must be provided on work platforms.
Edge protection	Working close to edges	✓ Falling	✓ Fatalities	H	<ul style="list-style-type: none"> ✓ To prevent persons from falling, edge protection must be erected around the perimeter of the work. This must comprise the guardrail and mid-rail designed to withstand any reasonable force, which is expected to fall against it. ✓ Only a competent person may erect an edge protection system ✓ Edge protection can be in the form of hook on boards used as toe boards



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ACTIVITY: PIPE JACKING

Task	Hazard	Risk	Consequence	Rating	Controls
✓ Pipe jacking	✓ Working in confined spaces	<ul style="list-style-type: none"> ✓ Lack of oxygen ✓ Harmful gases ✓ Entrapment 	<ul style="list-style-type: none"> ✓ Asphyxiation ✓ Serious injuries ✓ Fatalities 	H	<ul style="list-style-type: none"> ✓ Develop a confined space procedure. ✓ Develop a permit to work system. ✓ Only authorized and trained personnel to enter confined spaces. ✓ Ensure that the gases are purged before entry. ✓ Provide employee with oxygen mask ✓ Have an employee trained in first aid ready. ✓ Confined space may not be smaller than 800mm in diameter.
	✓ Working at heights	✓ Falling	<ul style="list-style-type: none"> ✓ Fatalities ✓ Serious injuries 	H	<ul style="list-style-type: none"> ✓ Proper PPE to be issued ✓ Provide rigid edge protection.
	✓ Lifting operations	<ul style="list-style-type: none"> ✓ People hit by load ✓ Collapsing of pipe ✓ Incorrect slinging 	✓ Injuries	M	<ul style="list-style-type: none"> ✓ No people are allowed to be at the jacking site. ✓ Slinger to be identifiable and wear reflective PPE. ✓ Lifting machinery to be inspected prior to use. ✓ Lifting machinery to be load tested.
	✓ Deep excavation	✓ Falling	✓ Fatalities	H	<ul style="list-style-type: none"> ✓ Barricade the jacking pit ✓ No unauthorized entry ✓ Site should be fenced off and locked out. ✓ Signage should be put up
	✓ Jetting rig	<ul style="list-style-type: none"> ✓ Crushing by horizontal move of the rig; ✓ People hit by drop load 	✓ Injuries	M	<ul style="list-style-type: none"> ✓ Enter the shaft only once the load has reached the bottom. ✓ Signaler to make the people in the shaft aware of the moving load.



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ACTIVITY: PIPE LAYING & WELDING

Task	Hazard	Risk	Consequence	Rating	Controls
Pipe laying	<ul style="list-style-type: none"> ✓ Steel ✓ Employees working around the excavation 	<ul style="list-style-type: none"> ✓ Static electricity ✓ Rough edges ✓ Heavy steel ✓ Hit by pipe 	<ul style="list-style-type: none"> ✓ Electrocution ✓ Injuries 	M	<ul style="list-style-type: none"> ✓ Ensure that pipes are earthed ✓ Provide gloves to employees ✓ Heavy pipes to be lifted mechanically
Pipe laying	<ul style="list-style-type: none"> ✓ Crane 	<ul style="list-style-type: none"> ✓ Failure of the crane ✓ Employees 	<ul style="list-style-type: none"> ✓ Fatalities 	H	<ul style="list-style-type: none"> ✓ Inspect the crane prior to use. ✓ Only trained and competent person to operate the crane ✓ Employees to steer clear of lifting operations ✓ Faulty cranes to be tagged and not used ✓ Wind speed and direction to be considered before using the crane ✓ Crane to be load tested ✓ Only certified loads to be carried on the crane
Tie ins & pressure testing	<ul style="list-style-type: none"> ✓ Pressurized water 	<ul style="list-style-type: none"> ✓ Hitting employees ✓ Burst 	<ul style="list-style-type: none"> ✓ Fatalities ✓ High water losses 	E	<ul style="list-style-type: none"> ✓ Ensure that the water is shut down ✓ Ensure that the correct class of pipe is used as well as valve specifications are correct ✓ Develop and follow a method statement ✓ Use only competent person to perform the task. ✓ Don't exceed pipe operating pressure, ensure pipe is correct diameter and is not damaged.
Pipe welding	<ul style="list-style-type: none"> ✓ Welding equipment 	<ul style="list-style-type: none"> ✓ Poor maintenance ✓ 	<ul style="list-style-type: none"> ✓ Injuries 	M	<ul style="list-style-type: none"> ✓ Welding equipment is visually checked before each use;
	<ul style="list-style-type: none"> ✓ Welding 	<ul style="list-style-type: none"> ✓ Sparks 	<ul style="list-style-type: none"> ✓ Fire 	H	<ul style="list-style-type: none"> ✓ Welding screens to be used



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	✓	✓ Sparks	✓ Burns	L	✓ Fire resistant overalls and apron to be worn. ✓ Develop method statement for welding inside the pipe
	✓	✓ Glare	✓ Arc eyes	M	✓ Welding glasses to be used
	✓ Confined space	✓ Entrapment ✓ Inability to move	✓ Injuries ✓ Suffocation	H	✓ Develop method statement for welding inside the pipe. ✓ Ensure that the welder is able to fit in properly inside the pipe and move with ease ✓ Use a different method of welding where the pipe's internal diameter is less than 800mm.
Compacting	✓ Compactor ✓ Noise ✓ Dust ✓ Vibration	✓ Overexposure to noise and vibration ✓ Collapsing excavation wall ✓ Inhalation of dust	✓ Noise induced hearing loss ✓ Raynaud's Syndrome ✓ Injuries ✓ Respiratory problems	M	✓ Use of earmuffs by compactor operator ✓ Dust mask to be worn by compactor operator ✓ Compactor operator to be declared competent before using the machine ✓ Provide operator with anti-vibration gloves and provide rest periods in between.



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ACTIVITY: MECHANICAL WORKS

Task	Hazard	Risk	Consequence	Rating	Controls
Installation of pumps and valves	Heavy pumps and valves	Falling	<ul style="list-style-type: none"> ✓ Injuries ✓ Property damages 	M	<ul style="list-style-type: none"> ✓ Use proper lifting equipment ✓ Ensure that only the relevant people are in the work area. ✓ Ensure that lifting equipment is load tested. ✓ Only competent personnel to undertake this task
	Steel fixing	<ul style="list-style-type: none"> ✓ Falling ✓ Slip 	<ul style="list-style-type: none"> ✓ Injuries 	L	<ul style="list-style-type: none"> ✓ PPE, including safety boots and goggles must be used
Cutting and drilling	<ul style="list-style-type: none"> ✓ Drilling ✓ Drill bit ✓ Drill sharp metal fibres ✓ High Noise Levels ✓ Cutting Grinder/Disc 	<ul style="list-style-type: none"> ✓ Vibration ✓ Cutting edges ✓ Eye penetration ✓ Finger cuts ✓ Expose to high noise level area ✓ Uncontrolled disc ✓ Electrical equipment failure ✓ Sharp window edges 	<ul style="list-style-type: none"> ✓ Damaged hearing ✓ Carpal tunnel syndrome ✓ Cuts/ injuries ✓ Eye irritation / blindness ✓ Injuries ✓ Eye injuries 	M	<ul style="list-style-type: none"> ✓ Use hearing protection when exposed to excessive noise levels (greater than 85 dB over an 8-hour work period) ✓ Assess noise level with sound level meter if possibility exists that level may exceed 85dB. ✓ Rotate drilling tasks to minimize worker exposure to equipment vibration. ✓ Use right size of a drill to drill different layers of the ground ✓ Assess manual guide carefully to ensure correct usage of portable electrical devices.
Welding	<ul style="list-style-type: none"> ✓ Fumes 	<ul style="list-style-type: none"> ✓ Inhalation 	<ul style="list-style-type: none"> ✓ Respiratory problems 	M	<ul style="list-style-type: none"> ✓ Wear respiratory protection



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ACTIVITY: MECHANICAL WORKS

Task	Hazard	Risk	Consequence	Rating	Controls
	✓ Sparks	✓ Contact with skin	✓ Skin burns	L	✓ Personal Protective Equipment to include face, eye and skin protection
	✓ Sparks	✓ Fire	✓ Damage to property ✓ Fatalities	H	✓ Provide fire extinguisher ✓ Provide screens ✓ Remove all sources of combustion and hazardous chemicals from welding area
	✓ Welding arc	✓ Starring welding arc	✓ Eye irritation	L	✓ Safety goggles to be worn
Install generator	✓ Lifting equipment	✓ No SWL displayed ✓ Faulty equipment ✓ Employees standing around	✓ Serious injuries ✓ Property damages	M	✓ Load testing of lifting equipment ✓ Inspection of lifting tackle and equipment prior to use ✓ Display SWL ✓ Only competent people to operate the lifting equipment ✓ Access control to the lifting area
Fueling the generator	✓ Spillages	✓ Slips, trips, falls	✓ Injuries	L	✓ Prevent spillages ✓ Use drip trays ✓ Use funnels for fueling
		✓ Fire	✓ Injuries	M	✓ No smoking allowed near the generator



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ACTIVITY: MECHANICAL WORKS

Task	Hazard	Risk	Consequence	Rating	Controls
	✓ Diesel fumes	✓ Inhalation	✓ Respiratory problems	L	✓ Provide employees with respirators
		✓ Skin contact	✓ Skin irritation	L	✓ Provide employees with gloves, safety boots and overalls
	✓ Running engine	✓ Explosion	✓ Injuries	M	✓ Switch engine off before refueling and make sure fuel cap is replaced. ✓ No smoking allowed near the generator
	Running the engine	✓ Over-exposure	✓ Noise-induced hearing loss	M	✓ Provide employees with hearing protection ✓ Provide rest periods for employees
		✓ Over exposure	✓ Raynaud's Syndrome	L	✓ Provide employees with vibration gloves. ✓ Rotate employees or provide rest periods.
		✓ Inhalation	✓ Respiratory problems	L	✓ Provide employees with respirators ✓ Never use indoors



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ACTIVITY: ASBESTOS REMOVAL

Task	Hazard	Risk	Consequence	Rating	Controls
Removal of asbestos pipe	✓ Asbestos cement dust	✓ Inhalation of asbestos fibers	✓ Asbestosis	H	<ul style="list-style-type: none"> ✓ No asbestos pipe should be cut. The entire length of pipe should be removed (remove clamps) ✓ Appoint a registered Asbestos Contractor
Disposal of asbestos pipe	✓ Asbestos fibers	<ul style="list-style-type: none"> ✓ Inhalation of fibers ✓ Incorrect disposal 	✓ Asbestosis	H	<ul style="list-style-type: none"> ✓ Appoint a registered Asbestos Contractor for the removal and disposal of asbestos and asbestos containing waste. ✓ Appoint an AIA to conduct an asbestos survey to determine the level of exposure of the employees. ✓ Obtain a clearance certificate from the AIA ✓ Obtain a safe disposal certificate from the Asbestos contractor and keep records.
Disposal of asbestos pipe	✓ Asbestos waste	<ul style="list-style-type: none"> ✓ Inhalation of asbestos dust ✓ Contamination of materials 	✓ Lung infections	M	<ul style="list-style-type: none"> ✓ Ensure that asbestos waste is removed within 90 days of accumulation by a registered asbestos contractor. ✓ Provide employees with suitable dust masks ✓ Demarcate and cover asbestos waste (soils)



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ACTIVITY: TRAFFIC MANAGEMENT

Task	✓ Hazard	✓ Risk	✓ Consequence	Rating	✓ Controls
Pipe installation next to the road	<ul style="list-style-type: none"> ✓ Moving vehicles and pedestrians ✓ Improperly placed signage ✓ Incorrect signage displayed ✓ Poor communication between flagmen 	<ul style="list-style-type: none"> ✓ Road accidents ✓ People getting knocked down by cars ✓ 	<ul style="list-style-type: none"> ✓ Fatalities ✓ Serious injuries ✓ Property damages 	H	<ul style="list-style-type: none"> ✓ Adhere to traffic management procedures ✓ Proper training of flagpersons ✓ Ensure good communication between flagmen ✓ Display correct road signage, and put reflective barricades for additional visibility, especially at night and when it is dark / foggy. ✓ Employees should wear reflective PPE ✓ Keep area clean & clear of obstacles. ✓ Obtain wayleaves from the roads agency (JRA)
Pipe installation via trenchless methods under the road	<ul style="list-style-type: none"> ✓ Vibration 	<ul style="list-style-type: none"> ✓ Road collapse 	<ul style="list-style-type: none"> ✓ Fatalities ✓ Property damages 	H	<ul style="list-style-type: none"> ✓ Only experienced service providers for pipe jacking and horizontal directional drilling should be appointed. ✓ Pipe jacking and HDD to be done within the permitted timeframes issued by JRA and SANRAL. ✓ Ensure that wayleaves from JRA and SANRAL are always valid, and are complied with.



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ACTIVITY: GENERAL ACTIVITIES ON SITE

Task	Hazard	Risk	Consequence	Rating	Controls
✓ Working on site	✓ Unhappy community	✓ Community coming to survey site ✓ Violence against employees	✓ Property damages ✓ Serious injuries	H	✓ Develop an emergency response procedure ✓ Meet with the community and all stakeholders prior to commencement of the project ✓ Have the contact details of the nearest police station / JMPD offices
	✓ Unfavourable weather conditions	✓ Exposure to temperature extremes	✓ Heat exhaustion ✓ Frost bite	M	✓ Provide employees with water for cooling down. ✓ Provide employees with warm jackets and gloves during winter ✓ Provide 5-minute rest periods for every 30 minutes of exposure to temperature extremes. ✓ No work to be undertaken in rainy conditions
	✓ Housekeeping	✓ Trips and falls	✓ Injuries	M	✓ Ensure that proper housekeeping is maintained on site at all times.
✓ Working in open spaces	✓ Snakes	✓ Bites ✓ Poisoning	✓ Fatalities ✓ Serious injuries	H	✓ Inspect the area for snakes prior to entering ✓ Conduct snake awareness training ✓ Know the do's and don'ts of what to do when coming across snakes
✓ Working in open spaces	✓ Bees	✓ Bites	✓ Allergic reaction	M	✓ Inspect the area for bees / wasps prior to entering ✓ Conduct bees awareness training ✓ Know the do's and don'ts of what to do when coming across bees



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ACTIVITY: GENERAL ACTIVITIES ON SITE

Task	Hazard	Risk	Consequence	Rating	Controls
✓ Working in open spaces	✓ Sharp objects	✓ Getting pricked by sharp objects	✓ Tetanus ✓ Injuries	M	✓ All employees to get Tetanus vaccination. ✓ Provide employees with proper safety boots
✓ Working in open spaces	✓ Criminals	✓ Getting mugged ✓	✓ Loss of personal possession	M	✓ Personal belongings such as phones and car keys to be safely put in pockets while working. ✓ Employees to report any suspicious activities to the local police. ✓ Equipment to be safely stored while not in use
✓ Working in open spaces	✓ Criminals	✓ Employees being attacked	✓ Injuries ✓ Fatalities	H	✓ Ensure that employees do not work in isolation. ✓ Employees to report any suspicious activities to the local police. ✓ Develop an emergency response procedure
✓ Working in open spaces	✓ Open excavations	✓ Falling inside	✓ Injuries	M	✓ Employees to be vigilant while working on site
✓ Working in open spaces	✓ Water bodies	✓ Falling inside	✓ Serious injuries ✓ Fatalities	H	✓ Employees to be vigilant while working on site ✓ Emergency procedures to be developed



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RISK ASSESSMENT MATRIX

Likelihood	Consequences				
	Insignificant (minor problem easily handled by normal day to day processes)	Minor (Some disruption possible e.g., damage equal to R150k)	Moderate (significant time / resources required. E.g., damage equal to R500k)	Major (Operations severely damaged. E.g., damages equal to R1m)	Catastrophic (business survival is at risk. Damage equal to R5m – 10m)
Almost certain (90% chance)	High	High	Extreme	Extreme	Extreme
Likely (between 50-90%)	Moderate	High	High	Extreme	Extreme
Moderate (between 10-50%)	Low	Moderate	High	Extreme	Extreme
Unlikely (between 3-10%)	Low	Low	Moderate	High	Extreme
Rare (<3%)	Low	Low	Moderate	High	High