



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

PROJECT NUMBER:	JW14402
PROJECT LOCATION:	FOREST HILL
PROJECT DESCR:	CONSTRUCTION OF 2,5MI WATER TOWER AT FOREST HILL, JOHANNESBURG SOUTH

# BASELINE RISK ASSESSMENT



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**ACTIVITY: TRANSPORTATION OF MATERIALS TO SITE**

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



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**ACTIVITY: SITE ESTABLISHMENT**

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



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**ACTIVITY: SITE ESTABLISHMENT**

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



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**ACTIVITY: EXCAVATION**

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



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



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**ACTIVITY: CONTACT WITH UNDERGROUND SERVICES**

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



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**ACTIVITY: MECHANICAL LIFTING**

Task	Hazard	Risk	Consequence	Rating	Controls
<b>Lifting using a crane</b>	✓ Overhead lines	✓ Contact with crane	✓ Electrocution ✓ Property damages	<b>H</b>	<ul style="list-style-type: none"> <li>✓ All lifting activities to be planned at least 2m away from overhead lines</li> <li>✓ Obtain wayleaves from Eskom</li> <li>✓ Appoint ORHVS</li> <li>✓ Proper earthing</li> </ul>
	✓ Wind/ Unfavourable weather	✓ Deflection ✓ Loss of control	✓ Injuries ✓ Property damages	<b>H</b>	<ul style="list-style-type: none"> <li>✓ Do not use during unfavourable weather conditions</li> <li>✓ Lift Plan to be completed prior to any lift taking place by crane supervisor and engineer;</li> <li>✓ Method statements and risk assessments to be submitted and adhered to for technical and/or non-routine lifts;</li> </ul>
	✓ Incompetent operator ✓ Medically unfit operator	✓ Loss of control ✓ Hitting structures and people	✓ Injuries ✓ Property damages	<b>H</b>	<ul style="list-style-type: none"> <li>✓ Only trained and competent operators may operate the crane</li> <li>✓ Tower crane operator subject to regular health checks;</li> </ul>
	✓ Overloading	✓ Collapse of material	✓ Injuries ✓ Property damages	<b>H</b>	<ul style="list-style-type: none"> <li>✓ Display safe working load on the crane</li> <li>✓ Operator to adhere to crane safe working load limits, weight of load and COG established before lifting;</li> <li>✓ Crane load indicator to be functioning correctly, and not to be overridden under any circumstances;</li> </ul>
	✓ Faulty crane	✓ Malfunctioning	✓ Injuries ✓ Property damages	<b>H</b>	<ul style="list-style-type: none"> <li>✓ Cranes to be inspected by competent persons prior to being used</li> </ul>



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**ACTIVITY: MECHANICAL LIFTING**

Task	Hazard	Risk	Consequence	Rating	Controls
					<ul style="list-style-type: none"> <li>✓ All faulty cranes to be tagged and locked out</li> <li>✓ Ensure all lifting tackle and equipment have valid test certificate before use (6 monthly 3rd party inspections);</li> </ul>
	✓ Mast section / counterweight	✓ Collapse of Mast Section / Counterweight	<ul style="list-style-type: none"> <li>✓ Property damages</li> <li>✓ Fatalities</li> </ul>	H	<ul style="list-style-type: none"> <li>✓ Ensure proper placement and securing of mast sections and counterweights</li> </ul>
	✓ Limited space / access to worksite	<ul style="list-style-type: none"> <li>✓ Falling of material</li> <li>✓ Crane boom colliding with structures</li> </ul>	<ul style="list-style-type: none"> <li>✓ Property damages</li> </ul>	H	<ul style="list-style-type: none"> <li>✓ Proper planning and spacing of activities on site.</li> <li>✓ Determine the best route for the crane to access the work site</li> <li>✓ Maintain safe distances and use communication systems to coordinate with other cranes.</li> <li>✓ Temporary relocation of tower complex residents where required</li> <li>✓ Demarcate the site and not allow any movements where lifting operations are taking place</li> <li>✓ Develop a comprehensive lifting plan</li> <li>✓ Tower crane to be operated by a competent operator</li> </ul>



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**ACTIVITY: MECHANICAL LIFTING**

Task	Hazard	Risk	Consequence	Rating	Controls
					<ul style="list-style-type: none"> <li>✓ Proper communication with other teams on site</li> </ul>
Accessing the cabin	<ul style="list-style-type: none"> <li>✓ Heights</li> </ul>	<ul style="list-style-type: none"> <li>✓ Falling from heights</li> </ul>	<ul style="list-style-type: none"> <li>✓ Fatality</li> </ul>	<b>H</b>	<ul style="list-style-type: none"> <li>✓ Use safety harnesses and ensure proper anchoring points and access</li> </ul>
Tower Crane supervision	<ul style="list-style-type: none"> <li>✓ Lifting operations around workers;</li> <li>✓ Workers in crane operating radius;</li> </ul>	<ul style="list-style-type: none"> <li>✓ Persons underneath load struck by materials;</li> <li>✓ Load swinging / spinning uncontrolled;</li> <li>✓ Falling materials;</li> <li>✓ Damage to lifting slings from sharp edges;</li> <li>✓ Over-sailing of material over live traffic routes;</li> <li>✓ High winds – adverse weather;</li> </ul>	<ul style="list-style-type: none"> <li>✓ Injuries</li> <li>✓ Fatality</li> <li>✓ Property damages</li> </ul>		<ul style="list-style-type: none"> <li>✓ Lift controlled by designated trained rigger/banks man using approved hand signals only;</li> <li>✓ No personnel situated or walking under elevated loads, avoid over-sailing of personnel if practicable;</li> <li>✓ No over-sailing of loads over live traffic routes without road closure;</li> <li>✓ No lifts undertaken when wind speed exceeds 40kph;</li> <li>✓ No blind lifts without visual and communication aids, radios etc.;</li> <li>✓ Tag lines shall be used to guide materials while lifting, 2 lines minimum 10m in length;</li> <li>✓ Slings protected from sharp edges with rubber etc.;</li> <li>✓ Riggers to undertake visual inspection of all lifting equipment daily;</li> </ul>



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**ACTIVITY: MECHANICAL LIFTING**

Task	Hazard	Risk	Consequence	Rating	Controls
					<ul style="list-style-type: none"> <li>✓ Tower crane allowed to 'weathervane' in high winds;</li> </ul>
<ul style="list-style-type: none"> <li>✓ Jumping and dismantling of Tower Crane</li> </ul>	<ul style="list-style-type: none"> <li>✓ Works at Height;</li> </ul>	<ul style="list-style-type: none"> <li>✓ Fall from height;</li> <li>✓ Falling materials from height;</li> <li>✓ Use of untrained personnel;</li> <li>✓ Dismantling in adverse weather;</li> </ul>	<ul style="list-style-type: none"> <li>✓ Injuries</li> <li>✓ Fatality</li> </ul>		<ul style="list-style-type: none"> <li>✓ Ensure crane is jumped or dismantled to standards by trained competent erection personnel;</li> <li>✓ No dismantling or jumping in adverse weather or high winds;</li> <li>✓ Concise Dismantling Method Statement compiled and available in work area for review;</li> <li>✓ Area below works cleared and barriers implemented during jumping or dismantling;</li> </ul>



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**ACTIVITY: FALSE WORK**

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



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Task	Hazard	Risk	Consequence	Rating	Controls
	<ul style="list-style-type: none"> <li>✓ Untrained personnel</li> <li>✓ Defective tools</li> </ul>	<ul style="list-style-type: none"> <li>✓ Hitting employees</li> </ul>			<ul style="list-style-type: none"> <li>✓ Ensure that dismantling is only done by trained personnel.</li> <li>✓ Provide employees with relevant PPE.</li> <li>✓ Ensure proper housekeeping on site.</li> <li>✓ Inspect tools and shutters prior to installing</li> </ul>
<ul style="list-style-type: none"> <li>✓ Formwork installation</li> </ul>	<ul style="list-style-type: none"> <li>✓ Works at Height;</li> <li>✓ Manual Handling;</li> <li>✓ Worker competency;</li> <li>✓ Lifting materials to height; (crane)</li> </ul>	<ul style="list-style-type: none"> <li>✓ Fall from Heights;</li> <li>✓ Falling objects;</li> <li>✓ Manual Handling</li> <li>✓ Incorrect Design and Erection of formwork resulting in collapse;</li> <li>✓ Use of unsupervised or untrained personnel to erect formwork;</li> <li>✓ Erection of Formwork;</li> <li>✓</li> </ul>	<ul style="list-style-type: none"> <li>✓ Injuries</li> <li>✓ Property damages</li> </ul>	<b>M</b>	<ul style="list-style-type: none"> <li>✓ Safety harness and lanyard are to be used and hooked off to a secure anchor point when working around exposed edges;</li> <li>✓ No shock lanyard to be used below 6m in height;</li> <li>✓ All hand tools to be tied off when working at height over workers below;</li> <li>✓ Correct manual lifting techniques of formwork communicated to workers;</li> <li>✓ The erection of temporary structures shall be undertaken under supervision of a competent person under control of the designated Temporary Works Supervisor in accordance with the TW designer's requirements;</li> <li>✓ All formwork tie rods to be same design/make of wing nuts and not allow slippage under load, double nut in areas where a risk of collapse onto workers under load is possible;</li> </ul>



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

PROJECT NUMBER:	JW14402
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**ACTIVITY: FALSE WORK**

Task	Hazard	Risk	Consequence	Rating	Controls
					<ul style="list-style-type: none"> <li>✓ Formwork to be supported following a suitable proprietary bracing system as per design, inadequate or unsuitable fixings shall not be used;</li> <li>✓ Permit to load to be completed by designated persons before loading of concrete onto formwork;</li> <li>✓ Temporary Works register to be completed by designated person and available for review;</li> <li>✓ All workers to be briefed by supervision daily before shift commences;</li> <li>✓ Area below to be clear of workers during erection, barriers and signage to be implemented;</li> <li>✓ Formwork to be inspected daily before work by designated Temporary Works Co-ordinator;</li> <li>✓ Formwork inspected after damage or incident likely to affect structural stability such as high winds, heavy rain or electrical storm;</li> <li>✓ No overloading of formwork, TWC shall follow design SWL when distributing materials;</li> </ul>



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



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**ACTIVITY: STEEL FIXING**

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



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**ACTIVITY: CONCRETE WORKS**

Task	Hazard	Risk	Consequence	Rating	Controls
<b>Concrete works</b>	✓ Moving bucket	✓ Hitting employees	✓ Injuries	M	<ul style="list-style-type: none"> <li>✓ Workers to stand clear of the path of the bucket</li> <li>✓ Banksman to direct the loading and offloading activities</li> </ul>
	✓ Working at heights	✓ Falls from heights	✓ Injuries	H	<ul style="list-style-type: none"> <li>✓ Only work on platforms that are fully boarded and handrails installed</li> </ul>
	✓ Concrete splashing	✓ Skin contact	<ul style="list-style-type: none"> <li>✓ Dermatitis</li> <li>✓ Skin burns</li> </ul>	M	<ul style="list-style-type: none"> <li>✓ Use of skin protection</li> <li>✓ Provide gloves and safety boots</li> <li>✓ Have MSDS</li> </ul>
	✓ Concrete splashing	✓ Eye contact	✓ Eye injuries	M	<ul style="list-style-type: none"> <li>✓ Provide safety goggles</li> </ul>
<b>Operating concrete truck</b>	✓ Incompetent operator	<ul style="list-style-type: none"> <li>✓ Hitting employees;</li> <li>✓ Bumping vehicles and properties</li> </ul>	<ul style="list-style-type: none"> <li>✓ Injuries</li> <li>✓ Property damages</li> </ul>	M	<ul style="list-style-type: none"> <li>✓ Only trained, competent and appointed operators may operate a concrete truck</li> <li>✓ Flagman to be posted to direct the operator</li> </ul>
	✓ Speeding	<ul style="list-style-type: none"> <li>✓ Hitting employees;</li> <li>✓ Bumping vehicles and properties</li> </ul>	<ul style="list-style-type: none"> <li>✓ Injuries</li> <li>✓ Property damages</li> </ul>	M	<ul style="list-style-type: none"> <li>✓ Site speed limits to be adhered to at all times</li> </ul>
	✓ Manual handling of chutes	✓ Incorrect handling	✓ Injuries	M	<ul style="list-style-type: none"> <li>✓ Training in correct handling methods</li> <li>✓ Provide employees with gloves.</li> <li>✓ Provide leather gloves for concrete chute</li> </ul>



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**ACTIVITY: CONCRETE WORKS**

Task	Hazard	Risk	Consequence	Rating	Controls
<b>Pouring concrete with a bucket by means of a mobile crane</b>	✓ Incompetent operator	<ul style="list-style-type: none"> <li>✓ Hitting employees;</li> <li>✓ Bumping vehicles and properties</li> </ul>	<ul style="list-style-type: none"> <li>✓ Injuries</li> <li>✓ Property damages</li> </ul>	<b>M</b>	<ul style="list-style-type: none"> <li>✓ Only trained, competent and appointed operators may operate a concrete truck.</li> <li>✓ Flagman to be posted to direct the operator</li> </ul>
	✓ Unauthorised / unsuitable crane	<ul style="list-style-type: none"> <li>✓ Hitting employees;</li> <li>✓ Collapse of material</li> </ul>	<ul style="list-style-type: none"> <li>✓ Injuries</li> <li>✓ Property damages</li> </ul>	<b>M</b>	<ul style="list-style-type: none"> <li>✓ Crane to be inspected by a competent person prior to use.</li> <li>✓ Unsuitable crane to be tagged and locked out</li> </ul>
Siting and setting up of concrete pump	✓ Working in proximity to existing structures and services;	<ul style="list-style-type: none"> <li>✓ Overturning due to incorrect siting or incorrect pump outrigger extension;</li> <li>✓ Collision of jib with overhead services;</li> <li>✓ Blocking access routes with pump;</li> <li>✓ Jib striking stationary structures;</li> </ul>	<ul style="list-style-type: none"> <li>✓ Injuries</li> <li>✓ Property damages</li> </ul>	<b>M</b>	<ul style="list-style-type: none"> <li>✓ Ensure pump is set up/rigged out correctly, is on firm level ground as per siting plan with outriggers fully extended;</li> <li>✓ Solid barriers should be situated, where practicable, to protect pump from traffic routes around working radius of cab;</li> <li>✓ Consideration given to overhead services and existing structures when siting pump;</li> </ul>



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**ACTIVITY: CONCRETE WORKS**

Task	Hazard	Risk	Consequence	Rating	Controls
Pumping concrete  (Pump Operator)	<ul style="list-style-type: none"> <li>✓ Operator competency;</li> <li>✓ Pump planning;</li> <li>✓ High pressures;</li> </ul>	<ul style="list-style-type: none"> <li>✓ Incident due to use of defective hoses / equipment;</li> <li>✓ Concrete spillage;</li> </ul>	<ul style="list-style-type: none"> <li>✓ Injuries</li> <li>✓ pollution</li> </ul>	<b>M</b>	<ul style="list-style-type: none"> <li>✓ Pumping Plan to be completed prior to any pour taking place by Temporary Works Coordinator;</li> <li>✓ Method statements and risk assessments to be submitted and adhered to;</li> <li>✓ Pump load indicator to be functioning correctly, and not to be overridden under any circumstances;</li> <li>✓ Operator to adhere to safe working load limits;</li> <li>✓ Daily inspections of hoses, pipes, connections etc. prior to use. Damaged equipment immediately removed from service;</li> <li>✓ Pump hopper guards to be in place at all times;</li> <li>✓ Plastic sheeting placed under hopper to contain spills;</li> </ul>
Pumping operation supervision	<ul style="list-style-type: none"> <li>✓ Pumping operations around workers;</li> </ul>	<ul style="list-style-type: none"> <li>✓ Worker struck by delivery vehicle;</li> </ul>	<ul style="list-style-type: none"> <li>✓ Injuries</li> </ul>		<ul style="list-style-type: none"> <li>✓ No over-sailing of hose over live traffic routes without road closure;</li> </ul>



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**ACTIVITY: CONCRETE WORKS**

Task	Hazard	Risk	Consequence	Rating	Controls
	<ul style="list-style-type: none"> <li>✓ Workers in pump operating radius;</li> <li>✓ Reversing concrete delivery vehicles;</li> </ul>	<ul style="list-style-type: none"> <li>✓ Hose swinging / spinning uncontrolled;</li> <li>✓ Pump operator unable to see task – high level pumping;</li> <li>✓ Over-sailing of material over live traffic routes;</li> <li>✓ Use of concrete – protective gear;</li> <li>✓ Working on rebar – risk of injury;</li> </ul>	<ul style="list-style-type: none"> <li>✓ Property damages</li> </ul>		<ul style="list-style-type: none"> <li>✓ Supervision to undertake visual inspection of all pumping gear and equipment daily;</li> <li>✓ Workers to wear correct PPE at all times, nitrile gloves, wellingtons, glasses;</li> <li>✓ Flagmen controlling delivery truck movements;</li> <li>✓ Spotters to direct pump operators at high level in clear view at all times;</li> <li>✓ All concrete soaked workwear to be removed immediately;</li> <li>✓ Planks placed on rebar for worker access, clear access maintained</li> </ul>
Crane parking	Unstable ground	<ul style="list-style-type: none"> <li>✓ Crane overturning</li> </ul>	<ul style="list-style-type: none"> <li>✓ Injuries</li> <li>✓ Property damages</li> </ul>	<b>M</b>	<ul style="list-style-type: none"> <li>✓ Crane to be established on solid ground with outriggers fully extended and pads in place</li> </ul>



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**ACTIVITY: WORKING AT HEIGHTS**

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



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PROJECT NUMBER:	TBC
PROJECT LOCATION:	FOREST HILL
PROJECT DESCR:	CONSTRUCTION OF 2,5MI WATER TOWER AT FOREST HILL, JOHANNESBURG SOUTH

**ACTIVITY: SCAFFOLD WORK**

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



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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
<b>Working on scaffold</b>	Overhead lines	<ul style="list-style-type: none"> <li>✓ Contact with overhead lines</li> <li>✓ Contact with employees</li> </ul>	<ul style="list-style-type: none"> <li>✓ Property damages</li> <li>✓ Electrocution</li> </ul>	<b>H</b>	<ul style="list-style-type: none"> <li>✓ Erect the scaffold away from power lines</li> <li>✓ Keep tools away from overhead lines</li> <li>✓ Fall arrest equipment to be attached</li> </ul>
	Unstable ground conditions	✓ Collapsing of scaffold	<ul style="list-style-type: none"> <li>✓ Injuries</li> <li>✓ Property damage</li> </ul>	<b>H</b>	<ul style="list-style-type: none"> <li>✓ Ensure that the foundation / footing of the scaffold is stable and levelled</li> <li>✓ Only trained and competent persons may erect a scaffold</li> </ul>
	Non-compliant scaffolding	✓ Collapsing of scaffold	<ul style="list-style-type: none"> <li>✓ Injuries</li> <li>✓ Property damage</li> </ul>	<b>H</b>	<ul style="list-style-type: none"> <li>✓ All platforms to be fully boarded and boards used to comply with SANS 085</li> <li>✓ All components of the scaffold must comply with SANS 085</li> </ul>
<b>Work platform</b>	Inadequate space	✓ Falling persons and objects	<ul style="list-style-type: none"> <li>✓ Fatalities</li> <li>✓ Property damages</li> </ul>	<b>H</b>	✓ 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"> <li>✓ To prevent persons from falling from the outside edges of work platforms, guardrails and mid-rails must be fitted.</li> <li>✓ If loose objects or other materials may be present on the platform, edge protection/ toe boards must be provided on work platforms.</li> </ul>
<b>Edge protection</b>	Working close to edges	✓ Falling	✓ Fatalities	<b>H</b>	<ul style="list-style-type: none"> <li>✓ 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.</li> <li>✓ Only a competent person may erect an edge protection system</li> <li>✓ Edge protection can be in the form of hook on boards used as toe boards</li> </ul>



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



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**ACTIVITY: PIPE LAYING & WELDING**

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



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	✓	✓ Sparks	✓ Burns	<b>L</b>	<ul style="list-style-type: none"> <li>✓ Fire resistant overalls and apron to be worn.</li> <li>✓ Develop method statement for welding inside the pipe</li> </ul>
	✓	✓ Glare	✓ Arc eyes	<b>M</b>	<ul style="list-style-type: none"> <li>✓ Welding glasses to be used</li> </ul>
	✓ Confined space	<ul style="list-style-type: none"> <li>✓ Entrapment</li> <li>✓ Inability to move</li> </ul>	<ul style="list-style-type: none"> <li>✓ Injuries</li> <li>✓ Suffocation</li> </ul>	<b>H</b>	<ul style="list-style-type: none"> <li>✓ Develop method statement for welding inside the pipe.</li> <li>✓ Ensure that the welder is able to fit in properly inside the pipe and move with ease</li> <li>✓ Use a different method of welding where the pipe's internal diameter is less than 800mm.</li> </ul>
Compacting	<ul style="list-style-type: none"> <li>✓ Compactor</li> <li>✓ Noise</li> <li>✓ Dust</li> <li>✓ Vibration</li> </ul>	<ul style="list-style-type: none"> <li>✓ Overexposure to noise and vibration</li> <li>✓ Collapsing excavation wall</li> <li>✓ Inhalation of dust</li> </ul>	<ul style="list-style-type: none"> <li>✓ Noise induced hearing loss</li> <li>✓ Raynaud's Syndrome</li> <li>✓ Injuries</li> <li>✓ Respiratory problems</li> </ul>	<b>M</b>	<ul style="list-style-type: none"> <li>✓ Use of earmuffs by compactor operator</li> <li>✓ Dust mask to be worn by compactor operator</li> <li>✓ Compactor operator to be declared competent before using the machine</li> <li>✓ Provide operator with anti-vibration gloves and provide rest periods in between.</li> </ul>



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**ACTIVITY: MECHANICAL WORKS**

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



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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
<b>Install generator</b>	✓ 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
<b>Fueling the generator</b>	✓ 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
<b>Running the engine</b>	✓ Noise	✓ Over-exposure	✓ Noise-induced hearing loss	M	✓ Provide employees with hearing protection ✓ Provide rest periods for employees
	✓ Vibration	✓ Over exposure	✓ Raynaud's Syndrome	L	✓ Provide employees with vibration gloves. ✓ Rotate employees or provide rest periods.
	✓ Fumes	✓ 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"> <li>✓ No asbestos pipe should be cut. The entire length of pipe should be removed (remove clamps)</li> <li>✓ Appoint a registered Asbestos Contractor</li> </ul>
Disposal of asbestos pipe	✓ Asbestos fibers	<ul style="list-style-type: none"> <li>✓ Inhalation of fibers</li> <li>✓ Incorrect disposal</li> </ul>	✓ Asbestosis	H	<ul style="list-style-type: none"> <li>✓ Appoint a registered Asbestos Contractor for the removal and disposal of asbestos and asbestos containing waste.</li> <li>✓ Appoint an AIA to conduct an asbestos survey to determine the level of exposure of the employees.</li> <li>✓ Obtain a clearance certificate from the AIA</li> <li>✓ Obtain a safe disposal certificate from the Asbestos contractor and keep records.</li> </ul>
<b>Disposal of asbestos pipe</b>	✓ Asbestos waste	<ul style="list-style-type: none"> <li>✓ Inhalation of asbestos dust</li> <li>✓ Contamination of materials</li> </ul>	✓ Lung infections	M	<ul style="list-style-type: none"> <li>✓ Ensure that asbestos waste is removed within 90 days of accumulation by a registered asbestos contractor.</li> <li>✓ Provide employees with suitable dust masks</li> <li>✓ Demarcate and cover asbestos waste (soils)</li> </ul>



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



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**ACTIVITY: GENERAL ACTIVITIES ON SITE**

Task	Hazard	Risk	Consequence	Rating	Controls
✓ Working on site	✓ Unhappy community	<ul style="list-style-type: none"> <li>✓ Community coming to survey site</li> <li>✓ Violence against employees</li> </ul>	<ul style="list-style-type: none"> <li>✓ Property damages</li> <li>✓ Serious injuries</li> </ul>	<b>H</b>	<ul style="list-style-type: none"> <li>✓ Develop an emergency response procedure</li> <li>✓ Meet with the community and all stakeholders prior to commencement of the project</li> <li>✓ Have the contact details of the nearest police station / JMPD offices</li> </ul>
	✓ Unfavourable weather conditions	<ul style="list-style-type: none"> <li>✓ Exposure to temperature extremes</li> </ul>	<ul style="list-style-type: none"> <li>✓ Heat exhaustion</li> <li>✓ Frost bite</li> </ul>	<b>M</b>	<ul style="list-style-type: none"> <li>✓ Provide employees with water for cooling down.</li> <li>✓ Provide employees with warm jackets and gloves during winter</li> <li>✓ Provide 5-minute rest periods for every 30 minutes of exposure to temperature extremes.</li> <li>✓ No work to be undertaken in rainy conditions</li> </ul>
	✓ Housekeeping	<ul style="list-style-type: none"> <li>✓ Trips and falls</li> </ul>	<ul style="list-style-type: none"> <li>✓ Injuries</li> </ul>	<b>M</b>	<ul style="list-style-type: none"> <li>✓ Ensure that proper housekeeping is maintained on site at all times.</li> </ul>
✓ Working in open spaces	✓ Snakes	<ul style="list-style-type: none"> <li>✓ Bites</li> <li>✓ Poisoning</li> </ul>	<ul style="list-style-type: none"> <li>✓ Fatalities</li> <li>✓ Serious injuries</li> </ul>	<b>H</b>	<ul style="list-style-type: none"> <li>✓ Inspect the area for snakes prior to entering</li> <li>✓ Conduct snake awareness training</li> <li>✓ Know the do's and don'ts of what to do when coming across snakes</li> </ul>
✓ Working in open spaces	✓ Bees	<ul style="list-style-type: none"> <li>✓ Bites</li> </ul>	<ul style="list-style-type: none"> <li>✓ Allergic reaction</li> </ul>	<b>M</b>	<ul style="list-style-type: none"> <li>✓ Inspect the area for bees / wasps prior to entering</li> <li>✓ Conduct bees awareness training</li> <li>✓ Know the do's and don'ts of what to do when coming across bees</li> </ul>



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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	<b>M</b>	✓ All employees to get Tetanus vaccination. ✓ Provide employees with proper safety boots
✓ Working in open spaces	✓ Criminals	✓ Getting mugged ✓	✓ Loss of personal possession	<b>M</b>	✓ 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 safety stored while not in use
✓ Working in open spaces	✓ Criminals	✓ Employees being attacked	✓ Injuries ✓ Fatalities	<b>H</b>	✓ 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	<b>M</b>	✓ Employees to be vigilant while working on site
✓ Working in open spaces	✓ Water bodies	✓ Falling inside	✓ Serious injuries ✓ Fatalities	<b>H</b>	✓ 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