



education

Department:  
Education  
PROVINCE OF KWAZULU-NATAL



## **BASELINE RISK ASSESSMENT**

### **PROJECT TITLE**

**INFRASTRUCTURE DEVELOPMENT AND MAINTENANCE  
HEUWELLAND PRIMARY SCHOOL**

**PREPARED BY**



**PNHUNGASHE HEALTH AND SAFETY CONSULTING (PTY) LTD**

## **DOCUMENT INFORMATION**

<b>Document Title:</b>	<b>Baseline Risk Assessment</b>
<b>Project Name:</b>	<b>Infrastructure Development and Maintenance Heuwelland Primary School</b>
<b>End User Client:</b>	<b>KwaZulu Natal Department of Education</b>
<b>Implementing Agent:</b>	<b>Development Bank of Southern Africa (DBSA)</b>
<b>Principal Agent:</b>	<b>Paradox Young &amp; Associates</b>
<b>Construction Health: and Safety Agent</b>	<b>Phungashe Health and Safety Consulting (PTY) LTD</b>
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## **1. BACKGROUND**

Section 8 (2)(d) of the Occupational Health and Safety Act No.85 of 1993 states that an employer must establish as far as reasonably tractable, what hazards to the health or safety of persons are attached to any work which is performed, any article or substance which is produced, processed, used, handled, stored or transported and any plant or machinery which is used which is used in his business and he shall as far as reasonable practicable, further establish what precautionary measures should be taken with respect to such work, article, substance, plant or machinery in order to protect the health and safety of persons and shall provide necessary means to apply such precautionary measures.

Phungashe Health and Safety Consulting (PTY) LTD, the Construction Health and Safety Agent for this project has considered the geographic conditions and process or activities to be conducted to identify likely risk to be faced by the Contractor(s) and Public in executing the Infrastructure Development and Maintenance Heuwelland Primary School.

## **2. PROJECT SCOPE OF WORK**

Removal of Asbestos

Demolition of condemned structures

Construction of new multi-story buildings

Construction of sport fields

Services installation (electrical, mechanical and water)

Civil works

## **3. RISK RATING METHODOLOGY**

Semi quantitative risk rating method shall be used to rank the identified risks in order of priority. Semi quantitative risk assessment involves the use of a matrix based on the probability of exposure to a hazard and the consequence of such exposure as per table 1 & 2 below. This estimation enables us to position the hazard within the matrix so to determine the acceptability of the risk according to three categories:

- High where immediate action is required no matter what the cost, designated in the red area.

- Medium where risk should be should be reduced as low as reasonably possible, designated in amber area
- Low where future reduction of risk is unnecessary, designated in green area

**Table 1: Risk Rating Matrix**

<b>Consequence (C)</b>	<b>Probability (P)</b>				
	1	2	3	4	5
4	M	H	H	H	H
3	M	M	M	H	H
2	L	M	M	M	E
1	L	L	M	M	M

**Table 2: Risk Rating (R) Definitions**

<b>PROBABILITY CATEGORY</b>	<b>DEFINITION</b>
5	Possibly repeated incidents
4	Isolated incidents known to have occurred
3	Possibility of occurring sometime
2	Unlikely to occur
1	Practically impossible
<b>CONSEQUENCY CATEGORY</b>	<b>DEFINITION</b>
4	Serous long- or short-term safety and health effects that may be fatal
3	Serious adverse safety and health effects that would require offsite medical attention
2	Non-life-threatening safety and health effects that may require on site first aid treatment
1	Little if any adverse safety and health effects

### **3. CONTRACT BASELINE RISK ASSESSMENT**

#### **SITE ESTABLISHMENT**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Establishment of the site	Insufficient space for safe and adequate allocation of offices, staff facilities, parking, workshops and traffic movement  Unsafe ground conditions i.e., slopping ground	Property damage  Injuries  Fatalities	5	4	H	Adequate space to be allocated for site establishment in consideration to facilities to be provided. Access roads, office areas, employees' facilities, parking areas and stacking areas to be properly designated.  Ground surfaces to be stable with safe gradient and free from slipping, tripping and falling hazards.
Access control	Unauthorised access to sites	Loss of property  Disruptions to school and site  Injuries to unauthorised personnel  Injuries to site personnel	3	3	M	Site to be fenced with bonox fence of 1.6 to 1.8  Lockable gates to be provided to control access.  The site entrance to be provided with a warm body security who shall also record site entrance and exit activities.

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Placing of signs and notices	<p>Insufficient information and warning on site requirements</p> <p>Warning on site hazards and risk areas</p>	<p>Disruptions</p> <p>Injury to employees</p> <p>Injury to public</p> <p>Damage to property</p>	5	4	H	<p>Construction safety warning signs to be placed at the entrance of the site camp entrance and should contain the following information minimum:</p> <ul style="list-style-type: none"> <li>• Construction activities ahead</li> <li>• No unauthorised entry</li> <li>• Speed limit 20 km / h</li> <li>• Personal protective equipment signs which include “safety boots, reflective vests &amp; helmets signs”</li> <li>• Visitors to report to site office</li> </ul> <p>First aid kits, name of first aiders and fire extinguishers signs to be displayed where they are located. Assembly point sign and all other required warning signs as per hazards on site to be erected appropriately /where the hazard exists.</p> <p>Signs indicating offices, safe drinking water, ablution facilities and eating areas to be displayed.</p>

Delivery of containers	<p>Lack of planning; poor access routes and roads to site</p> <p>Soft, sloping grounds</p> <p>Non – complying delivery vehicles and machines</p> <p>Incompetent operators</p> <p>Existing services; overhead cables and underground services</p> <p>Employees walking under container once it is in the air</p> <p>Unsafe practices</p>	<p>Property damage</p> <p>Injuries</p> <p>Fatalities</p>	5	4	H	<p>Site access routes to be planned and be suitable for the vehicles/ plant safe access.</p> <p>Overhead cables and undergrown services to be assessed and offloading to be not done under / over any services. Alternative's areas to be considered</p> <p>Ground where containers are to be placed to be stable to bear the intended weight. Engineer to approve the area.</p> <p>Competent persons to operate construction vehicles and plant. Lifting machines to comply with the mass loads designed to carry.</p> <p>Ropes and chains for the lifting machine to have a safety factor with respect to load they designed to lift.</p> <p>Lifting machines operators to have competency certificates from an Organisation approved by the Chief Inspector.</p> <p>Inspections to ensure all plant and equipment in the operation are safe for use and records to be kept on the file.</p> <p>Supervisor to ensure that the task is done in a safe manner. Banksman to be provided.</p> <p>Area to be demarcated, unauthorised personnel to be not allowed.</p>
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ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
						<p>Full PPE by personnel involved in the task; reflector vests, overalls, boots, hard hats and gloves.</p> <p>Safe working procedures to be provided.</p>
Temporal electrical installation	<p>Uncertified installer</p> <p>Loose wires exposed</p> <p>Cables running over the ground</p> <p>Obtaining power from an unsafe source</p> <p>Poor maintenance of temporal electrical installations</p>	<p>Electrocution; injuries and fatalities</p> <p>Fire</p> <p>Property damage</p> <p>Tripping and falling</p>	3	4	H	<p>All electrical installations to be conducted by an electrician registered with Department of Labour.</p> <p>Power to be obtained from a safe source.</p> <p>All cables to run safely underground</p> <p>Certificate of Compliance to be provided for all installations.</p> <p>Temporal electrical installations to be inspected weekly by a competent person</p>
Provision of welfare facilities	<p>Not of having essential services for health and wellbeing</p>	<p>Disease &amp; infection</p> <p>Fatigue and dehydration</p> <p>Low moral</p> <p>Poor productivity</p>	3	4	H	<p>Safe drinking water to be provided</p> <p>Changerooms with shower facilities must be provided on site.</p> <p>Ablution facilities to be provided as per legislation requirements and chemical ablutions to be serviced weekly.</p> <p>Ablutions to have toilet paper and be maintained in a hygienic manner.</p> <p>Hand washing facilities to have soap and running water.</p> <p>Sheltered eating areas with seats to be adequately provided for employees on site.</p>



ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Emergency preparedness	<p>Inability to attend to emergencies on site</p> <p>Lack of adequate measures to attend to emergencies</p> <p>Fires</p> <p>Animal's encounter</p> <p>Drowning</p>	<p>Injuries</p> <p>Fatalities</p> <p>Property damage</p> <p>Emergency services taking long to reach site</p> <p>Health issues</p>	5	4	H	<p>Detailed emergency plan to be provided as per emergency situations that can be encountered which included:</p> <ul style="list-style-type: none"> <li>• Fire</li> <li>• Community unrests</li> <li>• Flash floods</li> <li>• Structure collapse</li> <li>• Animal's encounter (snakes [research to be done of common snakes found in the area], bees and scorpions)</li> </ul> <p>The following emergency equipment to be provided:</p> <ul style="list-style-type: none"> <li>• Warning alarms</li> <li>• First aid kits to be provided</li> <li>• Fire extinguishers to be provided (dry chemical powder 9 kg)</li> <li>• Spill kits to be provided</li> </ul> <p>Competent team which includes emergency coordinator, first aiders and fire fighters to be appointed.</p> <p>Emergency drills to be conducted every six months.</p> <p>Site camp to have fire breaks along parameters, width to be 2.5 m width or more.</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Stacking, storage and laydown of material	<p>Inadequate space for storage various materials.</p> <p>Poor / unsafe storage of material</p> <p>Poor housekeeping</p>	<p>Accidents</p> <p>Damage to property</p>	3	3	M	<p>Allow sufficient space for lay down and storage of material and waste during planning stage of site layout. All material to be stacked within the barricaded sites boundaries.</p> <p>Stacking, storage and laydown areas to have easy and safe access and be demarcated.</p> <p>Material that can roll down to be properly secured.</p> <p>Stacks to be not three times higher than the base.</p> <p>Hazardous chemical substances to be stored as per material safety data sheets.</p> <p>Good housekeeping to be maintained in the stacking areas</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Adverse weather conditions during works	<p>Extreme heat</p> <p>Slippery conditions during rain</p> <p>Thundering</p> <p>Extreme cold</p>	<p>Dehydration, fatigue, heat exhaust and heat stroke during extreme heat conditions</p> <p>Car accidents due slippery conditions and personnel slips and falls during rainy weather</p> <p>Personnel being struck by lightning</p> <p>Inability to properly grip hand tools due to cold weather thus injuries</p>	5	4	H	<p>Heat evaluation must be conducted on site. The following heat control measures must always be in place for works in hot environments:</p> <ul style="list-style-type: none"> <li>• Have certificates of medical fitness certifying them to work in that environment</li> <li>• Must be acclimatised for working in such environments</li> <li>• Must take 600 millilitres of water per hour</li> </ul> <p>First aid measures must be readily available for heat exhaust and heat stroke</p> <p>Works to be stopped during rainy and slippery days on the roads and site camp</p> <p>Works to stop during thundering and lightning conditions and employees to take shelter away from poles and trees.</p> <p>Employees to wear warm cloths and gloves during extreme cold days.</p>

**TRANSPORTATION OF EMPLOYEES**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Transportation of site employees	<p>Non – compliant vehicles transporting employees</p> <p>Vehicle overturning or running out of control with employees</p> <p>Employees falling from vehicles</p>	<p>Injuries</p> <p>Fatalities</p> <p>Property damage</p>	4	4	H	<p>Vehicles transporting employees to be road worthy and compliant Construction Regulation's requirements.</p> <p>All employees to be seated during transportation and have seat belts on.</p> <p>Vehicle to obey road rules during transportation of employees.</p> <p>The PC shall not allow employees to be transported in a goods vehicle unless the portion of the vehicle in which the employees are being conveyed is enclosed to a height of: –</p> <ul style="list-style-type: none"> <li>• at least 350 mm above the surface on which employees are seated; or</li> <li>• at least 900 mm above the surface on which employees are standing, in a manner and with a material of sufficient strength to prevent employees from falling from such vehicle when it is in motion.</li> </ul>

**SITE CLEARANCE**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Clearing and grubbing	Faulty vehicle and plant  Employees working in the vicinity of plant  Faulty equipment and hand tools  Animal's encounter (bees, snakes and scorpions encounter)  Noise  Dust	Property damage  Injuries  Fatalities  Hearing loss  Nose and throat irritation, allergic reactions, silicosis	4	4	H	Method statement for site clearance to be provided.  Construction plant and vehicle to adhere to legislation requirements.  Competent and authorised personnel to operate equipment.  Safe and SABS approved equipment and tools to be used for the tasks, inspection records to be in place.  Employees working in clearing and grubbing activities to wear PPE: <ul style="list-style-type: none"> <li>- Long sleeves overalls</li> <li>- Ankle covering safety boots and leg protectors / steel toed gum boots</li> <li>- Long sleeves leather gloves</li> <li>- Helmets/ sun hats</li> <li>- Reflective vests</li> </ul> Employees working near plan to be visible to operators and be vigilant,  Emergency procedures for animals encounter to be developed. Common snakes in the area to be identified.

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Waste Management	Excessive accumulation of waste on site  Improper storage of waste  Unapproved means of final disposal	Harbouring of animals i.e., snakes  Fire  Tripping, falling & injuries	3	3	M	Cradle to grave waste management method statement to be provided  Waste must be continuously removed from workstations and be placed in dedicated areas as per Environmental Management Program (EMPr)  Fire prevention plan must be developed  Fire extinguishers must be readily available in case of fire  Internal fire breaks must be implemented around stacking areas

**ASBESTOS REMOVAL**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Preparations for the Asbestos work	Lack of compliance with Asbestos Regulations, 2002 & Asbestos Abatement Regulations 2020	Employees and public exposure to asbestos fibres which can cause Asbestosis, increased risk of lung cancer and heart disease	5	4	H	<p>Inventory of asbestos work to be documented.</p> <p>The asbestos work to be carried out on site is type 2 asbestos work as more than 10 square meters of asbestos shall be removed in less than six months, the Client therefore must appoint an Asbestos Approved Inspection Authority (AAIA) for the works as the asbestos</p> <p>Asbestos building components must be removed by a Registered Asbestos Contractor.</p> <p>Notification of Asbestos work to be submitted to Department of Labour 7 days before works commencement.</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Removing asbestos building components including frames, roof and rain water goods	<p>Unsafe methods of removing asbestos</p> <p>Release of asbestos fibres to environment.</p>	Inhalation of asbestos fibres by employees and public which may result in irreversible and fatal diseases including Asbestosis, increased risk of lung cancer and heart disease	5	4	H	<p>Asbestos Plan compiled by an AAIA to be provided for the works.</p> <p>Safe working procedure for removing asbestos to be developed as per asbestos plan</p> <p>Asbestos work area to be cordoned off. Time to be allowed for asbestos work Asbestos area to display signage Only authorised and trained personnel to be allowed in the area.</p> <p>Asbestos Contractor to ensure the following: His employees must have certificates of medical fitness from an occupational health doctor which must include lung function tests and lung X rays.</p> <p>Employees must be issued with the following PPE:</p> <ul style="list-style-type: none"> <li>• Overalls, helmets, gloves</li> <li>• Safety boots</li> <li>• Gloves</li> <li>• Disposable dust masks FFP 2/ 3 - to be changed daily</li> <li>• Disposable full body covering suits</li> </ul> <p>All PPE must be handled in a hygienic manner as per asbestos plan</p>



ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Ensuring hygiene practices during asbestos demolishing	<p>Poor personal hygiene practices that can result in asbestos inhalation or ingestion</p> <p>Lack of provision of hygiene and welfare facilities</p> <p>Poor housekeeping practices</p> <p>Asbestos contaminating areas outside asbestos work area</p>	<p>Release and dispersal of asbestos fibres.</p> <p>Employees and public to asbestos fibres exposure fibres</p>	5	4	H	<p>Asbestos work area must be isolated by barricaded.</p> <p>Signs to be posted conspicuously, prohibiting people and warning people against entering the workplace and hazards associated with the working area.</p> <p>Employees to be provided with welfare facilities and personal hygiene requirements to be provided to employees.</p> <p>The contractor shall set up decontamination facilities to ensure employees to not contaminate outside areas.</p> <p>Contractor to provided working tools and equipment de-contamination measures.</p> <p>Contractor to provide housekeeping and de-contamination measures for the asbestos work area</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Temporal storage and final disposal of asbestos	Improper temporal storage of asbestos containing material  Unsafe disposal of asbestos material and waste	Release and dispersal of asbestos fibres.  Employees and public to asbestos fibres exposure fibres	5	4	H	Asbestos waste must be double bagged and sealed off when temporary stored on site.  Disposable PPE shall be treated as asbestos waste.  Ensure that asbestos is disposed of in an approved asbestos disposal site.  Asbestos to be transported for final disposal in a manner that will not create risk to the public.  Disposal certificates must be obtained and be kept in the file.
Decontamination of work places	Release of asbestos fibres Public and employee's exposure	Public and employee's exposure which results in fatal lung diseases	5	4	H	The employer must clean all surfaces in the workplace as per Asbestos Plan provided by the AAIA.  There shall be no unauthorised entry into the area until the AAIA has issued clearance certificate or site instruction.

**DEMOLISHING OF CONDEMNED STRUCTURES**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Preparations for demolition	<p>Existing services i.e., power, water, sewer and telephone lines</p> <p>Unexpected collapse of structure into personnel or equipment</p> <p>Faulty tools and equipment used</p> <p>Lack of information and warning</p>	<p>Injuries/ electrocutions</p> <p>Death</p> <p>Fire / Property damage</p>	5	4	H	<p>Structure to be assessed by a competent Engineer and demolition method statement on procedure to be followed to be developed.</p> <p>All existing services to be disconnected / isolated by competent personnel per trade before demolishing.</p> <p>Plant and equipment used to be safe and operated by competent personnel.</p> <p>Section under demolition to be cordoned off and signage indicating demolishing ahead and no unauthorised entry to be provided at the entrance.</p>
Demolishing old structures	<p>Building/ structures falling on employees</p> <p>Flying of heavy objects e.g., Bricks, concrete and metal strips</p> <p>Dust formulation</p> <p>Noise</p> <p>Improper waste management</p>	<p>Injuries and fatalities</p> <p>Dust inhalation which can lead to chest infections</p> <p>Short term or long-term hearing loss</p> <p>Property damage</p>	5	4	H	<p>Erect warning signs at the areas where demolition is to occur.</p> <p>Area where demolition is taking place to be demarcated.</p> <p>Demolishing to be done as per approved method</p> <p>Employees to wear full PPE for the works.</p> <p>Only personnel involved on trained on the task hazards to be allowed in the area.</p> <p>Waste management plan to be developed.</p>

**CONSTRUCTION VEHICLE OPERATION**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Construction vehicle selection	Vehicle without capacity to operate safely under site conditions	Accidents Injuries Fatalities	5	4	H	Construction vehicle selected for site operations must be able to be operated without any safety risks. An assessment must be conducted on site terrain and intended use; information obtained must be used to ensure plant selected shall operate safely
Parking of construction vehicles	Vehicle parking in non-designated areas  Vehicles running off during parking  Oil leaks on parked plant	Vehicles crashing  Property damage  Accidents with may result in injuries	3	3	M	Sufficient space to be provided for parking of construction vehicle and plant at site camp.  All vehicles and plant to park in designated areas.  Construction vehicles and plant to have wheel stoppers.  Drip trays to be placed under parked plant.
Construction vehicle operations near power lines	Clearance not determined  Plant hitting powerlines	Property damage  Electrocution; injuries & fatalities  Fire	5	4	H	Clearance of all powerlines from the ground to be determined.  Warning / controls such as goal posts and signage to be installed on both sides of the powerline for only plant that can pass through safely to be allowed.  Tipping under power lines to be prohibited.

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
General operation of construction vehicle and mobile plant on site	<p>Construction vehicle and plant driven by incompetent / unauthorised operators</p> <p>Faulty plant or vehicle</p> <p>Construction vehicles trucking or running over personnel</p> <p>Plat/ vehicle crushing other vehicles</p> <p>Construction vehicles or plant colliding with each other or public vehicles</p> <p>Vehicles overturning</p> <p>Vehicle running out of control</p> <p>Noise</p> <p>Dust</p>	<p>Accidents</p> <p>Property damage</p> <p>Injuries</p> <p>Fatalities</p> <p>Health effects; nuisance, allergic reactions, threshold shift, permanent hearing loss</p>	5	4	H	<p>Construction vehicle to be operated by competent operators. Only Authorised personnel to operate construction vehicle or plant</p> <p>Maximum speed to be as per traffic management plan</p> <p>Daily safety checks should be conducted on the plant, non-conformances to be immediately rectified</p> <p>Road and safety rules and signs to be obeyed during vehicle operations</p> <p>Parking in blind spots of plant / articulated dump trucks to be avoided</p> <p>Drugs testing to be conducted on operators and all personnel on site</p> <p>Construction vehicle operators to wear full PPE, which is overalls, reflective vests &amp; safety boots</p> <p>Plant to be maintained to ensure emitting noise is within safety standards</p> <p>Water spraying to be continuously implemented to control dust created by construction vehicles and plant</p>

**CONSTRUCTION OF ACCESS ROADS**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Traffic Controlling during construction of access roads	<p>Construction vehicle and plants collisions</p> <p>Construction plant crushing light duty vehicles</p> <p>Construction vehicle or plant crushing employees</p>	<p>Property damage</p> <p>Injuries</p> <p>Fatalities</p>	5	4	H	<p>Traffic management plan to be developed.</p> <p>Road work areas / work stations to be demarcated with delineators that are at least 5 meters apart.</p> <p>At work stations, traffic must controlled through installation signs and provision of a flagman.</p> <p>Traffic safety warning signs and speed control signs to be adequately displayed prior work stations on both entrances of the construction site.</p> <p>At inception of work station display prohibition of unauthorised entry sign, workman sign, station flag man, display speed reduction to 20 km /hour.</p>
Employees movement around construction sites	Employees struck by passing traffic and vehicles accessing or exiting to/from works site	<p>Injuries</p> <p>fatalities</p>	5	4	H	<p>All personnel on the road to wear safety boots and reflective vests/ jackets</p> <p>Employees to be always alert of construction vehicle and plant</p> <p>Construction vehicle and plant to be driven at speed stipulated for the site (20km / hour where there is activities)</p> <p>Construction vehicle to have functional audio and light warnings</p>

**CONSTRUCTION OF PLATFORMS**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Traffic management	<p>Construction vehicle and plant collisions</p> <p>Construction plant crushing light duty vehicles</p> <p>Construction vehicle or plant crushing employees</p> <p>Construction plant and vehicle overturning</p>	<p>Property damage</p> <p>Injuries</p> <p>Fatalities</p>	5	4	H	<p>Traffic management plan to be developed</p> <p>Speed to be maintained at 20km during works or 40 km /h upon consultation with site Engineer and Safety Agent</p> <p>Warning signs and speed control signs to be adequately displayed.</p> <p>Light duty vehicle to be provided with buggy whips for visibility to Construction plant.</p> <p>All personnel on site to wear reflective clothing.</p> <p>Operators to be adequately trained on the safety requirements for operations</p>
Construction of haul roads	<p>Poor visibility</p> <p>Inadequate width</p>	<p>Property damage</p> <p>Injuries</p> <p>Fatalities</p>	5	4	H	<p>Roads to be designed to ensure good visibility for all construction vehicles.</p> <p>Road's width to meet permissible standards for the plant and vehicles to be operated on it.</p>
Stormwater / excessive rainfall management	Damage to roads and working areas	<p>Accidents</p> <p>Property damage</p>	3	3	M	Temporal storm water controls during for construction to be designed to allow for adequate storm water management.

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Earthworks	<p>Soft grounds, unstable grounds or underground water courses</p> <p>Existing services</p> <p>Rollover for plant and equipment</p> <p>Falling into open excavations / dislodging of excavation</p>	<p>Property damage</p> <p>Injuries</p> <p>Fatalities</p>	5	4	H	<p>Ground conditions to be established by a survey to identify the type of ground in which the excavation is to be carried out. The need for support to be determined.</p> <p>Underground and overhead services to be identified and controlled.</p> <p>All excavations dipper than 1.5 meters to be sloped or battered to a safe angle of repose.</p> <p>Open excavations to be barricaded.</p> <p>Safe slope gradients to be designed for platforms and steep grades or high ledges to be avoided.</p>
Hauling of cut material	<p>Overloading material on trucks</p> <p>Speeding</p> <p>Poor visibility</p>	<p>Material falling along routes</p> <p>Accidents, injuries, property damage and fatalities</p>	5	4	H	<p>Traffic management to be provided and implemented, Construction traffic flow to be controlled as per site conditions. Signage indicating construction vehicle activity and speed limit requirement of 20km/h to be displayed.</p> <p>All construction vehicle to have warning lights and audio.</p> <p>Trucks to be not overloaded with material, controls to be in place.</p> <p>Housekeeping to be maintained, material fallen along the route to be continuously removed.</p>



ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Stockpiling of material	Unauthorised entrance to stockpile area  Poor storage of material, high stacks	Stacks collapse  Accidents, injuries and fatalities	3	3	M	Material stockpile area to be fenced.  Stacks to be kept at less than 2 meters high.  Housekeeping to be kept in the area.
Embankment maintenance	Unstable banks or walls  Banks being weathered from effects of water overtime.  Unstable material or rocks falling high walls.  Vehicles driving over embankments.	Injuries  Fatalities  Property damage	5	4	H	Banks to be constructed with safe gradient to mitigate collapse.  Banks that require retaining to prevent collapsed to be safely retained.  Lose material which includes stones that could fall from the overhead bank walls to be removed / secured.  Guardrails to be constructed along shoulder of unpaved roads with embankment.  Banks to be maintained and water to be drain away from banks face.  Warning signs to be provided in the vicinity

**USING OF HAND TOOLS AND EQUIPMENT**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Operating hand tools	Tools in poor condition  Substandard work and possible damage to plant and equipment.	Hand, foot, back injury. Substandard work and possible damage to plant and equipment.	4	3	H	Set standards of tools to be bought by buying department: only SABS approved tools to be used on site.  Monthly checks to be done on tools and records to be on file.  Employees to be trained on inspecting and reporting faulty tools daily before use

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Operating pneumatic powered tools	Incompetent operator Unsafe tools Improperly functioning tool Oil leaks Noise Vibration Dust Flying objects Ergonomics	Whipping hose Over speeding tool Under operating tool Injuries Noise induced hearing loss Blanching of fingers, loss of sensation and loss of grip strength Eye injuries Back injuries	5	4	H	<p>A trained and competent operator must operate pneumatic tools as per manufacturer's instructions.</p> <p>Pneumatic tools must be inspected for safety before use, and record to be kept on the file.</p> <p>Ensure air hose are properly fasted and correct pressure is used. The tool must be properly serviced before use.</p> <p>Employees to wear full PPE during equipment operation: safety boots, vibration reducing gloves, ear muff, dust masks and goggles.</p> <p>Training on PPE use by all in the vicinity of the hazard.</p> <p>Ensure proper spacing of employees Operators to properly grip the tools when in used.</p> <p>Employees to ensure their backs are straight during works.</p> <p>Employees to work in pair to take breaks and relieve another from body vibration.</p> <p>Employees to take 15 minutes breaks every hour during operation.</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Fuel powered tools / electrically powered tools	Incompetent operator Improper refuelling procedures Noise Vibration Dust Oil Leaks	Hands, arms vibration disorder Noise induced hearing loss Nose throat and lung irritation, allergic reactions Body and feet injuries Environmental contamination	5	4	H	Employees operating tools with vibration must wear vibration reducing gloves, earmuff, dust masks and safety boots. Machines to be well maintained and kept in safe working condition. No fuel / oil leaks on the machine. When the equipment has leaks, it should not be used and be fixed to prevent leaking Leaks must be cleaned from the environment, waste to be temporary placed in hazardous chemical subcases bin that must be emptied of in an approved landfill site. Tools must be inspected for safety before use, and record to be kept on the file.
Working in the vicinity of tools operations	Danger of exposure to hazards Noise Dust Flying objects	Body injuries Noise induced hearing loss Check infections and allergic Reactions Eye injuries	3	3	M	Employees to avoid working too close to others. Adequate space to be allowed between employees. Employees to take reasonable care of others at work. PPE to be used by employees exposed to hazards (ear protection and dust masks)

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Use of Nuclear Density Soil Gauge	Radiation exposure	Skin burns  Cancer / cardiovascular diseases	5	4	H	<p>Competent laboratory to conduct density tests.</p> <p>Before operating a nuclear gauge, a person must pass a Nuclear Safety course and be issued a thermoluminescent dosimeter (TLD) badge. The badge measures exposure to radiation and is to be worn whenever operating a nuclear gauge.</p> <p>Exposure to radiation must be limited through time, distance, and shielding.</p> <p>Safe storage and use of equipment to be in place.</p> <p>Safe working procedures to be developed and implemented.</p>

**EXCAVATIONS**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Opening of excavations by plant	<p>Encountering underground services</p> <p>Cave-ins</p> <p>Plant / employees falling into excavations</p> <p>Employees working in close proximity to plant</p> <p>Communities and animals falling into excavations</p> <p>Dust</p>	<p>Damaging underground services/ incidents due to encounter</p> <p>Plant striking employees</p> <p>Property damage</p> <p>Injuries and fatalities</p>	5	4	H	<p>Underground services to be detected before excavations are conducted.</p> <p>Soil composition must be identified and control systems to be designed as per condition.</p> <p>Excavation's dipper than 1.5 meters / with unstable material to be battered at an angle of repose. Or be provided with bracing or shoring.</p> <p>Construction vehicle and plant to keep a safe distance of 1 meter from the edges or as per Engineer's recommendations to prevent causing pressure on walls which may lead to collapse.</p> <p>Employees to keep a safe distance from plant, and be extra vigilant during opening of excavations.</p> <p>All personnel working in the area to wear reflector vests and masks where dust is produced.</p> <p>All excavations to be barricaded with a strong physical barrier to restrain person / animals from fall in.</p> <p>All personnel to wear PPE i.e., reflective vests and dust masks.</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Opening of excavations by hand tools	Striking underground services Unsafe hand tools Employees striking another by tools Hands injuries from using tools Accessing inside excavations Dust	Injuries Fatalities Nose, throats and lung irritations, allergic reactions and infections	5	4	H	Underground services to be detected before excavations and be addressed as per Engineer's specification. Tools used for excavating to be SABS Approved and be inspected for safety before use, employees to be trained on inspecting tools . Employees to keep a safe distance from each other when working in the same excavation, a minimum of 10 meters apart. Employees to wear PPE i.e., steel toed safety boots, leather gloves, dust masks and reflective vests Excavations more than 1.5 meters deep to be accessed using safe ladder

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Opening excavations using jackhammer	Noise	Noise induced hearing loss	5	4	H	Trained and competent personnel to operate jackhammer equipment
	Dust	Hand arm vibration syndrome				Manufacture's operating instructions to be strictly adhered to.
	Whole body vibrations	Crush injuries and disabilities				Equipment to be inspected before use and manufacture's maintenance program to be adhered to.
	Being struck by equipment	Strains, sprains & back injuries				Employees in the activity or and close proximity to wear PPE i.e., dust masks, reflective vests, steel toed safety boots and ear plucks / ear muffs.
	Ergonomics	Nose, throats and lung irritations, allergic reactions and infections				Operators to wear anti vibration gloves.
	Other employees working to close to machine					Steering wheels to be adjusted to meet height of operators, back to be maintained straight during operation, equipment to be kept close proximity to the body.
						Employees to be allowed regular breaks / take turns during operation to void exhaustion.
						Safe working procedure to be developed



ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Maintaining open excavations	<p>Employees, personnel or communities falling into excavations</p> <p>Waterlogged excavations</p> <p>Cave-ins</p> <p>Accessing inside excavations</p> <p>Construction vehicles getting into open excavations</p>	<p>Injuries</p> <p>Fatalities</p> <p>Property damage</p>	5	4	H	<p>Signage showing open excavations to be posted in the vicinity for warn personnel</p> <p>Open, unattended excavations to be barricaded with a strong physical that is clearly visible and more than 1 meters high.</p> <p>Excavations to be inspected daily, remedial actions to be taken for excavations with risks.</p> <p>Water logged excavations to be pumped out mechanically without details.</p> <p>Excavations with unstable or collapsing to be addressed as per Engineer's recommendations with bracing or shoring or battering</p> <p>All excavations dipper than 1.5 meters to be accessed using a compliant ladder.</p> <p>All plant and vehicles and material to keep a minimum distance of 1m for the excavation edges</p>

**BACKFILLING**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Backfilling of excavations by plant	Cave-ins  Burying personnel or equipment  Plant / employees falling into excavations  Employees working in close proximity to plant  Dust  Noise	Plant and personnel falling into excavations  Property damage  Injuries and fatalities  Nose, throats and lung irritations, allergic reactions and infections	3	4	M	Inspections to be conducted on excavations before backfilling  Personnel to keep away from excavations being backfilled.  Plant to keep a safe distance from the edges as per Engineer's recommendations to prevent causing pressure on walls which may lead to collapse.  All personnel working in the area to wear reflector vests.  All personnel to wear PPE i.e., reflective vests and dust masks and ear protection for plant with excessive noise above 85db  Task to be conducted under supervision.

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Backfilling of excavations manually	Unsafe hand tools  Employees striking another by tools  Burying of personnel or equipment  Hands injuries from using tools  Dust	Injuries  Fatalities  Nose, throats and lung irritations, allergic reactions and infections	3	4	M	Excavations to be inspected for safety before working and risk that may pose to be controlled.  Personnel not involved in the task to keep away from excavations being backfilled.  Tools used for backfilling to be SABS Approved and be inspected for safety before use, employees to be trained on inspecting tools.  Employees to keep a safe distance from each other when working on the same excavation, a minimum of 10 meters apart.  Employees to wear PPE i.e. steel toed safety boots, leather gloves, dust masks and reflective vests.  Task to be conducted under supervision.
Compacting by plant	Noise  Vibration  Plant striking employees  Dust	Noise induced hearing loss  Injuries and fatalities  Nose, throats and lung irritations, allergic reactions and infections  Vibration affecting nearby structures	5	4	M	Employees to keep away from plant and be extra vigilant.  Employees to wear PPE i.e., dust masks, reflective vests and ear plucks / ear muffs.  Assessment to be done to ensure protection safety of nearby structures from vibration.

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Compacting by hand held equipment	Incompetent operator Noise Whole body vibrations Being struck by equipment Ergonomics	Noise induced hearing loss Hand arm vibration syndrome Crush injuries and disabilities Strains, sprains & back injuries	5	4	H	Trained and competent personnel to operate compacting equipment Manufacture's operating instructions to be strictly adhered to.  Equipment to be inspected before use and manufacture's maintenance program to be adhered to. Employees in the activity or and close proximity to wear PPE i.e., dust masks, reflective vests, steel toed safety boots and ear plucks / ear muffs Operators to wear anti vibration gloves.  Steering wheels to be adjusted to meet height of operators, back to be maintained straight during operation, equipment to be kept close proximity to the body.  Employees to be allowed regular breaks / take turns during operation to void exhaustion.

**MANUAL HANDLING OF MATERIAL**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Lifting and moving loads by hand	<p>Handling loads that may be difficult to carry in terms of weight and shape</p> <p>Carrying loads for long distances</p> <p>Awkward posture during lifting and handling</p> <p>Poor grasping</p> <p>Pinch point</p> <p>Poor communication during handling</p> <p>Poor housekeeping</p>	<p>Back injuries</p> <p>Soft-tissue injuries to wrists, arms, shoulders, neck or legs.</p> <p>Strains, sprains</p> <p>Chronic pain</p>	5	4	H	<p>Manual handling to be avoided as reasonably practicable by using mechanical means i.e., use of pallet truck, forklift truck, powered hoists.</p> <p>Assess risk for every load to be handled. Prevent the risk of injury from manual handling operations that cannot be avoided, i.e.</p> <ul style="list-style-type: none"> <li>• Reduce carrying distances, material to be delivered as close to the working area as possible</li> <li>• Assessing the weight to be carried to carried and ensure sufficient man power.</li> <li>• Ensure proper grasping.</li> <li>• Ensure good handling and lifting techniques i.e., keep the load as close to the body, waist as far as possible, avoid twisting the back or leaning sideways, keeping the head up, moving smoothly</li> <li>• Plan for rest midway where the distance is long</li> <li>• Clear communication &amp; good coordination to be in place</li> </ul> <p>Good housekeeping to be implemented in routes used for handling.</p> <p>Training on manual handling procedures to be conducted on employees</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Putting down of loads	Unexpected dropping of loads Pinch point Placing of the loads at higher positions Poor housekeeping	Hands and fingers, legs and feet injuries	5	4	H	Throwing loads to the ground to be avoided, loads to put down smoothly. Good coordination when resting loads, safe placing of the load simultaneously. Ensure good housekeeping during place / stacking of material. Employees to be trained pf the procedures.

**BRICKWORK**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Preparing site for brickwork	Insufficient space and access problems.  Lack of stacking spaces, space for placing equipment during works i.e., height accessing equipment and walkways	Difficult to work and possible injuries fatalities	5	4	H	During planning, carry out full site inspection and evaluate requirements before starting work.  Ensure requirements for safety are in place  Conduct DSTI's to employees before starting works
Bringing and stacking of materials on site	Insufficient space/ stacking / access problems.	Poor housekeeping and causing congestion and difficult to work.	3	4	M	Only sufficient material / equipment brought on site as is required.  Remove any superfluous material and ensure housekeeping standard is maintained at all times.
Brickworks	Untrained personnel on the task  Handling bricks  Dust  Exposure to hazardous chemicals substances i.e., cement, brick seal  Falling objects  Ergonomics	Injuries  Dust inhalation which can lead to chest infections and allergic reaction  Skin allergic reactions and dermatitis  Back injuries	5	4	H	Trained and competent brick layers to conduct the task  Employees to be fully provided with SABS approved PPE works: Overalls, dust masks, leather gloves for handling rough objects, rubber gloves for hazardous chemicals substances in liquid state, helmets for falling objects and safety boots  Employees working in a stooping position to be allowed to take breaks at least 5 minutes per house / when needed  Safe working procedures and MSDS for the task to be provided

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Working at heights	Falls from heights  Dropping of material / equipment.  Overloading of platforms and or trestles.	Body injuries  Fatalities	5	4	H	Fall protection plan for the project to be developed and used.  Safe scaffolding that complies with SANS 10085 standards to be provided as a height working platform. Compliant ladders to be also used to access heights.  High working platforms to comply with load bearing weight limits.
Housekeeping	Material in improper positions; i.e., work stations, walk ways; improper placing of material in any form causing tripping and forming hazards  Lack of maintaining the working environment as it should	Injuries  Property damage	5	4	H	All material to be placed in correct positions safety  Time to be allowed to remove rubble from workstations to designated collection areas  Site to be kept neat



**WORKING AT HEIGHTS**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Accessing heights	Unsafe means of accessing heights  Open edges  Collapse of height accessing structure	Falling – Injuries to employees  Fatalities  Property damage	5	4	H	Fall protection plan to be developed and implemented for accessing and working elevated / below positions which starts from 1.5 meters and where the fall risk is present.  Scaffolding that complies with SANS 10085 standards should be used as a working platform for works at heights.  Compliant ladders with General Safety Regulations to be used to accessing heights.  All open edges with more than 1.5 meters high / below to be barricaded with a strong physical barrier of 1 meters high material that can restrain a person from falling.

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Working at heights	<p>Falling from heights</p> <p>Unsafe height accessing equipment</p> <p>Falling material</p>	<p>Injuries</p> <p>Fatalities</p> <p>Property damage</p>	5	4	H	<p>All elevated working positions at must have safe working platforms that have guard rails that are at 1meters high and be strong to prevent a person from falling.</p> <p>Where the elevated position requires provision of working platform; scaffolding must be used.</p> <p>Scaffolding platforms must be safe, stable and without openings.</p> <p>Fall arrest equipment which is a combination of safety harness attached an anchor point or lifeline must be used where it's not practical to install edge protection, Anchor points must be approved by the Engineer for stability.</p> <p>Double lanyard safety harnesses must be used and they must be of adequate height to prevent employee from hitting the surface.</p> <p>Positions below elevated positions maintained safe and protected from falling objects.</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Conducting roof work	Falling from heights  Dropping material	Injuries  Fatalities  Property damage	5	4	H	<p>Method statement and safe working procedure for roof work to be provided.</p> <p>Employees to have safe height accessing equipment.</p> <p>Fall arrest equipment which is a combination of safety harness attached an anchor point or lifeline as there shall be no edge protection.</p> <p>Ensure the length of the safety harness is safe and prevents employees from hitting the ground.</p> <p>Ensure safe handling of material to prevent dropping material.</p> <p>Employees working below overhead work to wear helmets</p>

**LADDERS**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Using of ladders	Poor planning Use of ladder with defects  Failure to secure or foot ladder correctly  Using ladder where to access heights instead of safety height accessing equipment  Unsafe means of handling tools while using ladder  High winds  Poor housekeeping	Slipping and falling  Injuries  Fatalities  Property damage	5	4	H	Assessment to be done to ensure suitability of a ladder for operation of a task.  Ladders to be of correct length and type for the indented job.  Ladder to be used according to manufactures instruction.  Ladders to be inspected before use and all ladders to have numbers.  Work supervisor to ensure the following when ladders are used: <ul style="list-style-type: none"> <li>properly secured at the top</li> <li>properly footed</li> <li>do not exceed 75-degree angle when erected</li> </ul> Working equipment to be carried on a suitable belt when working on a ladder.  Ladders to be not used when there's strong winds.  Good housekeeping to be maintained.  Ladders to be clean and free from grease and oil.

**LIFTING AND TACKLING**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Works' preparation	<p>Wrong selection of equipment</p> <p>Structural failure</p> <p>Crain failure</p> <p>Incompetent operator</p> <p>Site conditions</p> <p>Weather conditions</p> <p>Ground conditions</p>	<p>Crushes</p> <p>Injuries</p> <p>Fatalities</p> <p>Property damage</p>	5	4	H	<p>Engineer to specify lifting equipment.</p> <p>Lifting not to take place under power lines.</p> <p>Crane and its rigging and lifting accessories to be to be selected in accordance with the type, shape and size of steel to be lifted.</p> <p>Crain to be positioned in a stable foundation approved by a competent person; where doubt exists, professional engineer to be consulted.</p> <p>Crane to operate by competent personnel to carry out the work safely who has a valid certificate of medical fitness.</p> <p>Crane must have in its cab / operators station the following:</p> <ul style="list-style-type: none"> <li>• Operator's manual</li> <li>• Maintenance manual</li> <li>• Load chart</li> <li>• Current annual inspection and certification as follows: <ul style="list-style-type: none"> <li>▪ Annual load test of 110% of the rated load mass</li> <li>▪ 3 months' certificates of ropes, chains and hooks</li> </ul> </li> </ul> <p>The crane must be inspected on daily basis by a competent person wo's operating it and records must be kept o the plant.</p> <p>Crane must be fitted with wind speed device that provides operator with audible warning when wind speeds exceed the designer's specification.</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Hooking the load for lifting	Improper handling	Hands and finger crushes	5	4	H	<p>Task to be conducted by competent slinger / signaller.</p> <p>Path of the load must be planned to ensure there's no obstructions or workers under swinging loads</p> <p>To be conducted by a qualified rigger Appropriate PPE to be used i.e., leather gloves, safety boots and helmet</p> <p>Load to be fully secured before lifting</p> <p>Loads to be maintained within the capacity of the crane</p> <p>Crane operations to be stopped under the following adverse weather conditions:</p> <ul style="list-style-type: none"> <li>• Poor visibility</li> <li>• Rain</li> </ul>
Load lifting and swinging	Falling Caught up of suspended load Crane failure Toppling	Crushes Fatalities Property damage	5	4	H	<p>Competent slinger and signal man to control the operation</p> <p>Signs to be installed to warn workers of the operation. Area to be controlled and secured</p> <p>There must be no standing under suspended load</p> <p>Ensure crane operator, rigger and signalman have clear communication</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Swinging the load for proper positioning	Hitting by object Restricted Miscommunication	Property damage Injuries Fatalities	5	4	H	<p>Ensure installation of tagline</p> <p>Ensure sufficient manpower to handle tag line</p> <p>Audio warning (crane siren) to be used for area clearance and place signboard</p> <p>Employees working on the activity to wear reflector vests, helmets and leather gloves</p>
Load positioning and removal of gears	Falling from height Miscommunication	Crashes Hand and fingers injuries Body injuries Fatalities	5	4	H	<p>Rigger and Signalmen to properly communicate</p> <p>Landing position to be clear of obstructions and ensure stable and safe positioning of the load</p> <p>Use proper PPE i.e., leather gloves and helmets</p>

**STEEL REINFORCEMENT FIXING**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Task preparations	Inadequate planning and training improvisation  Poor access	Task based injuries  Slips, trips and falls	5	4	H	Competent and sufficiently skilled personnel to be involved in the task.  Planning for required equipment and sourcing out to be in place.  Competent supervisor to be provided for the task.  Clear access to working areas to be prepared; good housekeeping to be implemented and maintained.  Safe working procedure to be in place.
Lifting steel reinforcement to the workface	Poor choice of lifting methods  Unsafe equipment used  Material falling and striking personnel	Serious injury to person/s from loads being lowered onto the deck or uncontrolled fall of load	5	4	H	Mechanical lifting device i.e., crane to be used for lifting steel bundles.  Complying equipment to lift the load. All lifting equipment to comply with tackling and lifting requirements i.e., certified rigger to monitor the lifting activities, loads to meet lifting equipment capacity, chains and hooks used for lifting to be compliant.  Spotter to be provided to monitor lifting operations and communication to be clear.  Steel to be sorted out during to avoid double handling.  All objects that may be struck to be cleared.  Personnel to be prohibited from moving under lifted loads



ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Working with steel reinforcement	Flaky steel Sharp edges Struck by piece of steel Manual handling Constant bending over	Cuts Steel splinters Strains and sprains	5	4	H	Strong leather gloves to be used when handling steel. Employees to wear full body covering overalls. Employees to carry bars that can manage, team lifting to be implemented where necessary. Good coordination when carrying and placing steel Job rotation to allow break from ergonomics
Cutting of steel reinforcement	Operating electric/ gas angle grinder Noise Sparks generation	Electric shocks & electrocution Burns Noise induced hearing loss Eye's damage	5	4	H	Trained and competent personnel to operate grinder to cut steel. Inspection to be done on the electric equipment and electrical cords before use. Inspection to be done on gas hoses and all connection points before activity. Personnel cutting steel to wear PPE; welders' aprons, welders' gloves, face shields & ear protection (ear muff). Fire extinguisher to be less than 50 meters from the activity.

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Fixing of steel reinforcement	Repetitious bending, twisting and cutting  Insufficient rest periods between jobs  Working too fast	Sprains  Strains  Back pains  Muscle pain  Cuts	5	4	H	Job rotations to be implemented to allow rest periods.  Suitable pliers that minimise adding pressure to be selected for the job.  Work to be done at a safe phase.  Leather gloves to be worn.

**TEMPORARY WORKS**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Work's preparation	Poor design  Incompetent person designing temporary works	Structural failure  Accidents  Injuries, fatalities  Property damage	5	4	H	<p>Project Engineer's specification or guidelines must be used as a guideline for designing temporary works.</p> <p>Temporary works must be designed and signed off by a competent temporary works designer who is an Engineer registered with ECSA.</p> <p>Temporary works to be designed to withstand inclement weather without posing safety risks to personnel as per project engineer's specification</p> <p>Method statement for temporary works installation must be signed off by a temporary works designer.</p> <p>Fall protection plan for formworks to be developed.</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Temporary works installation	<p>Incompetent personnel supervising and operating in the task</p> <p>Lack of full adhering to the design and method statement</p>	<p>Structural collapse</p> <p>Crushed, injuries and fatalities</p> <p>Property damage</p>	5	4	H	<p>Temporary works to be installed under supervision of a competent temporary works supervisor.</p> <p>Temporary works designer to ensure that foundations are suitable for temporary works installation.</p> <p>All equipment used on temporary works must be as per temporary works designer drawings.</p> <p>All personnel involved in temporary works installation must be trained and fully instructed on their duties.</p> <p>Temporary works to be inspected and approved by the by a temporary works designer in writing before concrete placement.</p> <p>Temporary works must be inspected daily by temporary works supervisor daily during curing period</p> <p>Temporary works designer to issue authorisation on writing before temporary works is removed.</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Removal of temporary works	Manual handling  Temporary works striking employees	Injuries  Crushes  Fatalities	5	4	H	Safe working procedure signed by temporary works designer must be provided for removing temporary works.  Temporary works to be removed using suitable equipment.  Trained personnel to be involved in the operation.

**WORKING WITH CONCRETE**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Works' preparations	Poor planning Space availability Ground conditions	Vehicle accidents Ground collapse Accidents Injuries	5	4	H	<p>Works to be planned accordingly; temporary works and reinforcement steel to be completed.</p> <p>Method statement for the works to be activity to be provided.</p> <p>Traffic management plan for the activity to be developed, considering truck routes and parking.</p> <p>Safety files for the concrete supplier to be approved.</p> <p>Ground conditions where the pump truck shall be positioned to be stable, be able to withstand vibrations without safety risk and be approved by a competent person.</p> <p>Personnel involved in the operation to wear PPE; reflective vests, gum boots, long rubber gloves and waterproof aprons, hard hats and goggles.</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Concrete placement	<p>Obstructions</p> <p>Cement splashes resulting in eye, skin contact and environment contamination</p> <p>Concrete skin contacts</p> <p>Engulfment</p> <p>Noise</p> <p>Cement dust</p>	<p>Boom strutting personnel, equipment or structures</p> <p>Injuries, property damage</p> <p>Burns in the skin, dermatitis</p> <p>Eye irritation</p> <p>Nose, throat and lung irritation, silicosis, increased risks of Tuberculosis</p> <p>Environment contamination</p>	5	4	H	<p>Work area to be free of obstruction.</p> <p>Only authorised, trained and instructed personnel to be allowed in the area.</p> <p>Inspection to be done on the done on the structure before concrete pouring.</p> <p>Water to be readily available to clean concrete splashes.</p> <p>Spotter who shall clearly communicate with the pump operator to be provided.</p> <p>Personnel involved in the operation to wear PPE; reflective vests, gum boots, long rubber gloves and waterproof aprons, hard hats, goggles, ear plucks and dust masks.</p>
Vibrating concrete	<p>Unsafe generators and vibrators</p> <p>Untrained personnel operating equipment</p> <p>Cement splashes resulting in eye, skin contact and environment contamination</p>	<p>Crushes</p> <p>Injuries</p> <p>Burns in the skin, dermatitis</p> <p>Eye irritation</p> <p>Nose, throat and lung irritation, silicosis, increased risks of Tuberculosis</p> <p>Environment contamination</p>	3	4	H	<p>Generator and vibrator to be suitable and inspected for safety before use.</p> <p>Trained and competent personnel to vibrate concrete.</p> <p>Personnel involved in the operation to wear PPE; reflective vests, gum boots, long rubber gloves and waterproof aprons, hard hats, goggles, vibration reducing gloves, ear muffs and masks.</p> <p>Task to be done under supervision.</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Mixing concrete by hand	<p>Exposure to cement through inhalation of cement dust</p> <p>Eye contact with cement Powder</p> <p>Hands contact with dry or wet cement</p> <p>Mixing cement directly on the ground</p> <p>Incompetent operator of the concrete mixer</p>	<p>Nose, throat and lung irritation, silicosis, increased risks of Tuberculosis</p> <p>Burns in the skin, dermatitis</p> <p>Eye irritation</p> <p>Environment contamination</p> <p>Injuries</p>	5	4	H	<p>Competent operator to operate concrete mixer.</p> <p>Employees to avoid eye contact with dry powder cement.</p> <p>Employees to wear rubber gloves when working with cement.</p> <p>Employees to wear dust masks when working with powdered cement.</p> <p>Cement to be only mixed on a concrete of over an impermeable material to prevent environmental damage.</p>



**INSTALLATION OF SERVICES (ELECTRICAL & MACHANICAL)**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Services installations	<p>Incompetent and inexperienced team conducting the works</p> <p>Lack of proper control and safety measures relating to electrical installation</p>	<p>Injuries/ electrocutions</p> <p>Death</p> <p>Fire / Property damage</p>	5	4	H	<p>Method statement to be provided for all works to be done on services connected to buildings.</p> <p>Lock out procedures to be developed and documented.</p> <p>Services teams to be qualified and experienced as per designers' specification.</p> <p>All services work to be conducted as per engineers' drawings and specifications.</p> <p>Permits for operations to be obtained from client.</p> <p>Legislation requirements to be complied with.</p> <p>Electrical installation team to comply with CR 24 requirements and Electrical Installation Regulations, 2009 requirements.</p>

**HAZARDOUS CHEMICAL SUBSTANCES**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Use and storage of hazardous chemical substances (HCS)	Skin and eye contact Inhalation of HCS Ingestion of HCS Exposure to levels exceeded Fire / explosions	Burns Dermatitis Eye irritation Respiratory track problems Upset stomach Environmental damage Property damage	5	4	H	Site to have storage area designated for HCS MSDS to be available for chemicals and be strictly followed Containers must be properly labelled Safe storage as per MSDS and dispensing of chemicals should be practised Appropriate PPE as per MSDS should be provided and used Good hygiene standards should be in place and maintained by management Spillages should be cleaned up as per MSDS immediately and be disposed of in an approved site First aider to be familiar with chemicals on site and be able to attend emergencies relating to HCS

**FLAMMABLE SUBSTANCES USE AND STORAGE**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Handling and storage in small quantities of diesel, petrol and flammables	Fire Explosion Skin and eye contact Environmental pollution Slip/ falls from spillages	Injury to employee/ personnel Property damage Environmental damage Dermatitis Eye irritation	5	4	H	<p>Flammable should only be handled by trained personnel.</p> <p>Material safety data sheet (MSDS) for chemicals to be provided.</p> <p>PPE required when handling the flammable should be worn as per MSDS specifications.</p> <p>Flammable liquids to be stored as per supplier's recommendations in a ventilated room or cage.</p> <p>Fuel to be stored in suitable containers as per MSDS, in a secured and well-ventilated area.</p> <p>Sources of ignition should be not allowed in the storage area.</p> <p>Spills to be cleaned up immediately and prevented from environmental contamination.</p> <p>A spill kit shall be provided on site.</p> <p>No smoking / no naked flame sign should be displayed next to the storage area.</p> <p>Fire extinguisher should be placed or easily accessible from the area.</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Refuelling plant	Fire/explosion, static-ignition from refuelling operations	Injuries Fatalities Property damage and loss	5	4	H	<p>Store fuel only in approved containers / pumps</p> <p>Engine must be switched off when topping up fuel and lubrication oil.</p> <p>Locate fire extinguisher in vehicles</p> <p>No smoking permitted during refuelling activities.</p> <p>Carry out the work in well ventilated work area follow the MSDS instructions.</p> <p>Re-fuelling operations and Plant (machines) to be located in a designated fuelling area e.g. bunding/spill kit area, away from pedestrian movement and where practical, operations should take place in an open and well ventilated area away from buildings structures and shelters.</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Refuelling small plant items i.e. Generators and compactors	Fire/explosion, static-ignition from refuelling operations	Injuries Fatalities Property damage and loss	5	4	H	<p>PPE to be worn</p> <p>Re-fuelling operations to be located in a designated fuelling area e.g., Bunding/spill kit area, away from pedestrian movement and where practical, operations should take place in an open and well-ventilated area away from buildings structures and shelters.</p> <p>Approved fuel containers to be used Refuelling to be done in a flat surface Funnel to be used</p> <p>Before re-fuelling small plant items allow enough time for the cooling down of engine and exhaust</p> <p>Ensure location of fire extinguishers and spill kits in the vehicles and on site</p> <p>No naked flames or sources of ignition should be in the vicinity</p>

**GENERAL ACTIVITIES**

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Using of personal protective equipment	Hazards related to employees not wearing the required protective apparel.	Injuries  Death	5	4	H	<p>Ensure that employees have been issued with the appropriate protective equipment required and replace such apparel if damaged.</p> <p>Induct employees with regard to the potential dangers associated with not wearing the required protective equipment</p> <p>Train supervisors to ensure that the required protective equipment is indeed being worn by employees when the task is executed.</p> <p>Institute disciplinary action against employees who fail to wear the protective.</p>
General sanitation and hygiene; provision of welfare facilities	Hazards resulting from diseases related to poor sanitation and hygiene, and other diseases.	Diseases  Death	5	4	H	<p>Employee's facilities to be adequately provided at the workstations such as hygienically maintained ablutions, toilet paper, safe drinking water, sheltered eating areas and first aid kits.</p> <p>Induct employees with regard to sanitation and hygiene issues, and related diseases.</p> <p>Induct employees with regard to the necessity to seek immediate medical treatment with respect to any injuries sustained on site, however minor.</p> <p>Keep contact details for emergency services prominently displayed in the site office.</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Emergency evacuation of injured personnel in the case of life-threatening injuries	Hazards related to delays in providing appropriate medical attention.	Injuries  Permanent disability  Death.	5	4	H	<p>Plan then implement appropriate emergency evacuation procedures to be followed in such instances when there may not be time to await the arrival of the emergency services.</p> <p>Keep snakes antivenom on site</p> <p>Induct employees with regard to the procedures to be followed in such instances.</p> <p>Keep contact details for emergency services prominently displayed in the site office.</p> <p>Contact the staff at the relevant institution to forewarn them of the status quo of the casualty en route, so that they can prepare for their arrival and possibly even have paramedics intercept the casualty en route.</p>

ACTIVITY	POTENTIAL HAZARDS IDENTIFIED	HEALTH AND SAFETY AND RISKS	RISK ANALYSIS			CONTROL MEASURES
			P	C	R	
Housekeeping maintenance	<p>Material in undesignated positions</p> <p>Equipment and tools lying all over</p> <p>Scraps and rubble in undesignated positions</p>	<p>Trips and falls</p> <p>Injuries</p> <p>Low working moral</p>	5	4	H	<p>Good housekeeping to be implemented and maintained on site.</p> <p>All material to be placed in designated positions.</p> <p>Laydown, stacking and storage areas to be demarcated.</p> <p>Rubble to be continuously removed from workstations to designated collection areas which are demarcated</p> <p>Time to be allowed for housekeeping i.e., before each break and at the end of the shift.</p> <p>Waste to not be allowed to accumulate on site and be continuously removed for disposal at approved site.</p>



**DOCUMENT SIGNING**

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