BASELINE RISK ASSESSMENT
FOR
MECHANICAL ENGINEERING CONTRACTOR FOR THE MAJOR REFURBISHMENT AND CONSTRUCTION OF THE ROOIWAL WASTE-WATER TREATMENT EAST WORKS
RFP172/2024

OCCUPATIONAL HEALTH & SAFETY SERVICES		
Issue Date: 23-08-2024		
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CAPACITY:	**SIGNATURE:**	**DATE:**
Project Leader: OHS Practitioner		23/08/24

Task#	Task description	Hazard/ aspect/ failure	Potential risk	SHEQ category	Raw risk rating	Suggested mitigation/ control measures	Residual risk rating
	Introduction & training	Incident occurring due to uninformed individual	Injury Asset damage Environmental harm Quality non-compliance	S/H AD E QA	9(M)	• All employees, contractors & visitors to undergo site induction • Site induction to outline site hazards in the work area as well as the recommended precautionary measures • Site rules required PPE to be communicated • Employees to be trained on tools & equipment required for completing tasks assigned to them • Supervisors 'to be trained on process control procedure &required records. • Proof of conducted job specific training to be on file in safety office / head office • Training matrix to be generated to analyse training requirements for site employees • Training arranged according to needs analysis • Risk assessment to be communicated to all employees to which it is relevant. Record kept of discussion.	4 (L)
	COVID-19	Getting or spreading the virus by not washing hands or not washing them adequately	Ill health Fatality	S/H	25E	• Put in place monitoring and supervision to make sure people are following controls • Put up sighs to remind people to wash their hands • Provide information to workers about when and where they need to wash their hands • Identify if there is a need for addition hand washing facility • Provide workers with 70% alcohol based waterless hand sanitisers	5M
		Spreading the virus in common use areas such as toilet facilities, exit/entry points, eating areas, kitchen	Ill health Fatality	S/H	26E	• Put in place monitoring supervision to make sure people are following controls that are put in place e.g following hygiene procedures, washing hands • Near-miss reporting may also help identify where controls cannot be followed or people not doing what they should do. • Identify area where social distancing rules cannot be met. • Identify areas where workers and visitors frequently touched	5M

						• Put one way system at the entry/exit point, allowing one person to pass. • Put in place cleaning regimes to make sure that frequent touched areas are kept clean	
		Spreading the virus by not cleaning surfaces, equipment and work stations	Ill health Fatality		24 E	• Identify surfaces that are frequently touched and by many people, shared equipment and specify the level of cleaning and by whom • Avoid sharing work equipment by allocating it on personal issue or by putting a cleaning regime in place to clean between use • Keep surfaces clear to make it easier to clean and reduce the likelihood of contaminating objects	5M
		Contracting or spreading the virus by not social distancing	Ill health fatality		25 E	• Identify areas where under normal circumstances workers would not be able to maintain social distancing • Use marker or sticker on the floor with a distance of 1.5m • Create a one way system • Holding meetings virtually than face to face • Limit the number of people on site • Minimise contact at the security gate • Improve ventilation in a closed area	5M
		Poor workplace ventilation	Ill health Fatality	S/H		• Identify areas that need additional ventilation to increase air flow • Provide mechanical ventilation, desk fans and open windows and doors	5M
		Increased risk of infection and complications for vulnerable workers	Ill health Fatality	S/H		• Discuss with employees what their personal risk are and identify what needs to be done in each case • Protect the workers from the virus through social distancing and hygiene procedure	5M
		Working without a mask which will result in the worker contracting the virus	Ill health fatality	S/H	26E	• The employer should provide employees with reusable cloth masks • The employer must ensure that the cloth masks are washed daily after use • Anyone without should be prohibited from entering the construction site if they do not have a mask or are not wearing • Prohibit workers from taking off their masks while on duty	5M
2	Site establishment	Exposure to moving machinery & vehicles	Injury Asset damage	S/H AD	9 (M)	• Management to ensure the site layout is approved by RE • Layout to consider site traffic, plant movement & other interfacing contactor site layouts	4(L)

		Damage to fauna & flora	Environmental harm	EN	6(M)	• Site camp foot print & hauling routes to be established & confirmed with Client & RE • Bund wall to be built around hazardous storage areas to prevent run off into water system & ground pollution • Construct berms to direct construction site runoff from entering the storm water/ natural water system • Establish waste storage area	2 (L)
		Hazardous chemical storage	Injury Ground pollution	S/H EN	9(M)	• No open flames & no smoking signs to be displayed in the vicinity of hazardous chemical store • All safety data sheets (SDS) to be available at all times • Ensure that the person in charge of the chemical store is adequately and comprehensively informed and trained with regards to the potential risk to health caused by exposure etc. • Ensure hazardous chemical storage is bunded	4(L)
						• Ensure hazardous chemical store is well ventilated • Ensure the area is well demarcated and screened off • Ensure all spills are reported immediately • Liquid bulk storage tanks to be bunded • Each bund to be capable of containing the maximum volume of the tank + 10% • Fire extinguisher to be in 10 meter radius	
		Insufficient waste management	Water pollution Ground pollution Aesthetic pollution Air pollution	EN	6 (M)	• Ensure the waste storage area has sufficient capacity • Ensure that all loose materials & waste are covered & tied down to be prevent being dispersed by the wind • Ensure storage area clearly marked • Ensure all hazardous waste is removed to an approved dumping site/ facility • Colour code and label waste bins for waste separation	2 (L)
		Insufficient storm water management	Water pollution/ storm water system	EN	6(M)	• Evaluate existing storm water drainage patterns vs construction program • Implement temporary drainage channels and berms • Monitor effectiveness of temporary measures	2 (L)
		Testing services not available at start up	Production loss business disruption	QA BD	12 (M)	• Ensure sufficient water and electricity supply • All equipment to be calibrated and copies of certificates submitted to QC officer • Offsite laboratory service to be identified and appointed before construction commences	6 (M)

Unapproved material used in construction works	Production loss Business disruption	QA BD	12 (M)	• Sample of aggregates and mix designs to be tested and approved by RE before construction begins • Material approval register and requests established for record purposes	6(M)
Process control measures not planned	Production loss Business distribution	QA BD	12 (M)	• Method statement and quality control plans to be generated submitted to the client rep. for approval before construction activity commences • All supervisors trained in process control measures before construction activity commences	6 (M)
Restricted/ unsafe access/ egress to site	Injury Asset damage	S/H AD	9 (M)	• Implement traffic accommodation at site access points • Ensure required information and warning signage is erected at site access / egress points	6 (M)
Collision with vehicle/ individual while creating access through berm using TLB	Injury Property damage	S/H AD R/S/C	6 (M)	• Only certified and approved operators used • Daily plant pre-inspection checklist to be completed and signed off by supervisor • Toolbox talk and risk assessment conducted before activity commences (the risk assessment are communicated every 3 months – DSTI done daily) • DSTI to be completed and communicated before work commences and communicated before work commences and communication record signed by all employees working in that team. • Work area to be barricaded and flagman to control movement of public plant	2 (L)
Equipment failure during offloading and positioning of containers/ offices (mobile crane)	Injury Asset damage	S/H AD	9(M)	• Management (supervisor) to ensure that only certified and approved operator, crane and lifting tackle to be used. • All lifting equipment to be inspected and registered • Plant pre-inspection checklist to be completed • Supervisor to ensure level and solid ground free of underground services • Check for overhead obstruction (e.g. power lines, structures) • Clear layout map/ instruction to be provided to crane operator	4 (L)
Lifted container falling/generator	Injury Asset damage	S/H AD	9(M)	• Supervisor and rigger to ensure correct lifting tackle and attaching method/procedures applied • Correct PPE to be worn by all involved personnel • Access to the area to be controlled	4(L)
Load swinging and striking	Injury Assets damage	S/H AD	12 (M)	• Area to be barricaded off during lifting activities to prevent unauthorised entry • Two guide ropes to be used on load to ensure stable movement	6(M)

		employees/ other containers				• No lifting during high winds or inclement weather • Swing radius must be identified to ensure that the load can be offloaded in a safe manner • Ensure personnel stay out of the crane swing radius • Ensure there are barrier guards showing swing radius • A boom angle indicator must be on the crane • SWL should be clearly marked on the crane • No overhead lifting will be allowed EVER • Avoid sudden acceleration or breaking during traveling with a load which will cause the load to swing	
		Public and workers not informed due to inadequate and incorrect signage	Injury Asset damage	S/H AD R/S/C	12 (M)	• Legal required signage must be displayed and be clearly visible at all times • Information, prohibitive, mandatory and emergency signage explained to workers in tool box talks • Signage to be inspected daily to ensure that correct and sufficient signage erected	6 (M)
3	Ergonomics	Uncomfortable work positions	Body soreness: Back, shoulders, neck, hips, knees and/or feet	H	5(L)	• Conduct an ergonomic job specification assessment • Observe body movements and their frequency • Look for awkward movements that involve moving materials with bad postures away from neutral • Establish an ergonomics program that can be used to reduce injury by controlling hazards • Redesign or install adjustable workstations to reduce awkward joint angles • Encourage workers to change posture throughout work shifts • Position work in ways that eliminate long/excessive reach, decrease joint flexion/extension requirements and promote neutral postures • Avoid employees to work below knees and above shoulders • Provide tools that promote neutral joint angles • The greater the elbow angle the greater the stress • Train workers to keep elbows closer to body and in neutral posture as they work • Establish ergonomic training that is specific to the job to make workers aware of ergonomic hazards	3(L)
		Highly repetitive tasks	Fatigue	H	4(L)	• Establish system to rotate employees • Job rotations are best when each new task requires a different muscle group	6(M)

		Repetitive lifting of weights over 20 lbs and/or occasional lifting of weights over 50 lbs	Muscle strain, Fatigue and body soreness	H	5(L)	• Lifting materials to be used on site	6(M)
		Tools not suitable for a specific task	Injury	H	3(L)	• Redesign or install tools that promote neutral postures • Establish ergonomic training that is specific to the job to make workers aware of ergonomics hazards and ways to control them	7(M)
4	Site security	Theft/ unauthorised entry	Business disruption Asset damage	BD AD	12 (M)	• Fencing to be of minimum 1.8m height with 6m gates • Security service to be appointed to provide security and access control	6 (M)
		Employee (including contractor and supplier) under the influence of alcohol or illegal substances	Injury Fatality Asset damage Production loss	S/H AD BD QA	12(M)	• No employee to be allowed to work when under the influence of drugs or alcohol • Random alcohol testing to be conducted on entering site • Disciplinary action to be taken against offenders	6 (M)
5	Emergency preparedness	Insufficient firefighting equipment	Injury Asset damage production loss	S/H AD	9 (M)	• Firefighting equipment analysis to be conducted at site establishment • Firefighting equipment placed as per analysis • Identification signage must be clear and visible • All relevant equipment to be numbered, inspected and on a register • All equipment must be serviced annually or after use • Identified personnel to be trained in firefighting • No personnel shall intentionally or recklessly damage or misuse anything which is provided in the interest of health and safety.	4 (L)
6	First aid	Inadequate medical assassinate	Aggravated injury	S/H	6 (M)	• Sufficient first aid boxes to be available • Identified personnel trained in first aid • Identity of first aiders communicated	2 (L)

		Untreated injuries				• Ensure that appointed first aider is available during each shift • First aid boxes to comply with minimum requirements inspected and registered • First aid treatment register to be maintained	
7	Facilities	Insufficient Toilet Facilities	Unhygienic conditions	S/H	3 (L)	• Separate toilets for both genders, must be available and clearly identified	2 (L)
		Insufficient management of waste	Illnesses and ailments Aesthetic Pollution	S/H EN	6 (M)	• Separate waste bins for different waste categories to be available and identified • Waste disposal plan and schedule must be maintained • Bins must have lids	4 (L)
		Inadequate eating area	Poor hygiene Illnesses and ailments	S/H	6 (M)	• Adequate, cleaning and shaded eating area to be insured	2 (L)
		Inadequate drinking water provided	Water contaminated Employee dehydration	S/H	6 (M)	• Facilities or arrangements to be made to ensure sufficient available drinking water for employees in and out of site camp • Signage to be installed to identify drinking and non-drinking water facilities • Water supply to be increased in heat water conditions	2 (L)
		Unsafe electrical connection	Injury Electrocution	S/H	12 (M)	• All cables to be routed underground • Only qualified electrician to do installation and termination • Certificate of compliance to be issued by electrician	6 (M)
8	Supplier vehicles and deliveries to site by down area	Reckless driving uncertified driver	Injury Fatality Asset Damage	S/H AD	12 (M)	• All drivers to be qualified • Draws up a site specific document stating site routes, site rules and persons to contact upon arriving at site. This is sent to the service providers upon signing agreements • Vehicle warning/ safety devices to be in working order (construction lights, reverse hooter, etc)	6 (M)
		Substandard truck	Injury Asset Damage	S/H AD	9 (M)	• Vehicles to be approved and licenced to enter site • Vehicle construction lights to be fitted and working to improve visibility • No visible oil leaks	4 (L)
9	Delivery or loading of materials/	Restricted access and space in laydown/ loading area	Injury Asset damage	S/H AD	6 (M)	• Lay down area must be well planned to ensure adequate space • Access and offloading space must be included in site layout during site establishment • Storage area to be demarcated and barricaded • No material to protrude through or under the barricading netting	2 (L)

	suppliers on site	Poor tacks/ storage practices	Injury Asset damage	S/H QA	6 (M)	• Surface of stacking area must be levelled • Safe stacking heights adhered to • Stacking of material is not permitted to be more than three times higher than the smallest diameter of base • Material only to be removed from the top of the stack	2 (L)
		Employment falling whilst climbing onto truck load bed to offload truck	Injury	S/H	9 (M)	• Ladder to be used for mounting and dismounting of truck load bed • Additional worker to hold ladder below when worker climbing up and down ladder • Ladder to be numbered and colour coded • Ladder to be inspected on monthly basis and on register	4 (L)
		Insufficient dunnage	Asset damage	QA	4 (L)	• Timber poles/ wooden pallets (dunnage) to be used for stacking material susceptible to damp/ rust • Rebar, steel components should not be lying directly on the ground • Material to be stacked on wood cleared from ground and stacking must be secure	1 (L)
		Un-informed operator	Injury Property damage	S/H	6 (M)	• All trucks to report to the site camp for further instruction regarding the final delivery point • Draw up a site specific document stating site routes, site rules and persons to contact upon arriving at site. This is sent to the service provider upon signing agreements • Supervisor to escort truck to site if delivering directly to the work area	4 (L)
		Incorrect parking on site	Injury Asset damage	S/H AD	6 (M)	• Supervisor to ensure that there is enough space to off load before truck arrives on site • Traffic accommodation to be planned and implemented if delivery is offloaded close to or in live traffic	2 (L)
		Load secure	Asset damage	AD QA	9 (M)	• Delivery truck to be inspected for secure load before the truck is unloaded • Site agent/supervisor and safety officer agree on remedial action to have the load offloaded safely • Unstable load to be secured before offloading the consignment • Damaged goods to be recorded on delivery note and supplier informed for credit and resupply • NCR will then be raised against supplier	4 (L)
		Truck driver not equipped with stop blocks and PPE	Injury Asset damage	S/H AD	6 (M)	• Spare stop block to be provided • Engine to be switched off and park brakes engaged • Operator to remain in vehicle in case of the vehicle rolling back or forward • Operator or co-driver are no to be allowed to exit the vehicle without the correct PPE	2 (L)

		Employee cut whilst offloading/ loading	Injury	S/H	9 (M)	• Ensure all materials are free from sharp edges and protruding objects • Gloves to be worn at all times • Employees to offload from top level of load • Supervision at all times	4 (L)
10	Loading and off-loading of truck with crane truck or mobile crane	Unqualified personnel on site`	Injury	S/H	9(M)	• Ensure all personnel have be declared fit for duty by a medical practitioner • Personnel shall undergo site induction • Daily DSTI on task risks to be completed • All appointments to be up to date • Crane operator must be licenced by an authorised training institution • Only competent trained appointed banksmen to assist with lifting operations • All competency certificates to be kept with appointments in the safety office	4 (L)
		Incorrect PPE	Injury	S/H	9 (M)	• Correct PPE to be issued and worn by employees • Hard hats to be utilized during any lifting operations	4 (L)
		Crane truck/ crane/ lifting tackle not inspected before being sent to site	Injury Asset damage Soil contamination Loss of production	S/H AD EN BD	6 (M)	• All cranes to be checked and tested by accredited inspector • Crane to be inspected and approved by site appointment mobile equipment inspector • Non-compliant equipment to be corrected before entering site • Crane to have up to date and valid load test certificate, rope test certificate, LMI calibration certificate and crane hook certificate • Full maintenance record of crane on file • Relative crane documents to be kept in operators cab • Crane pre-use checklist available in crane cab, understood and used by operator	2 (L)
		Incorrect lifting equipment selected	Injury Asset damage	S/H AD	9 (M)	• Task assessed to confirm that lifting equipment is correct • Rigging study to be approved by site management and master rigger (5 tons and more)	4 (L)
		Lifting equipment failure	Injury Fatality Asset damage	S/H AD QA	12 (M)	• Lifting equipment to be inspected and on register with valid load certificate • Peruse inspection prior for use • No damage equipment to be used • All material/equipment that is to be lifted with a sling must be checked before lifting and after lifting from ground	6(M)

						• The site appointed person shall inspect and look after the lifting equipment and tools whilst on site • All ropes, chains, hooks or other attaching devices, sheaves, brakes and safety devices of the crane will be examined every 6 months • No steel on steel lifting (no chain sling to be used on rebar)	
		Falling from height when connecting lifting equipment	Injury	S/H	9 (M)	• Constant supervision of lifting operation • Personnel must be instructed not to walk on the edge of truck load bed • A ladder is to be used when ascending or descending truck from the truck, ensuring 3 point contact with ladder	4 (L)
		Employee pinned between load/load and truck or ground	Injury	S/H	6 (M)	• Ensure loads are stable when offloading • Workers to ensure proper footing • Limbs not to be tangled in the guide rope or chain • No person is allowed standing on, or working under a load while it is in suspension	2 (L)
11	Establishing mobile crane on site	Uneven ground condition	Asset damage Injury Fatality Loss of production	AD S/H BD	8 (M)	• Supervisor and crane operator to do a pre inspection of ground condition • Barricade crane operating area • Ensure all personnel are clear of outrigger extension area • Hands and feet to keep clear from outriggers and pads or sleepers when crane is levelled • Ensure ground where outriggers will be placed is levelled and cleared of obstruction • Outrigger pads or sleepers to be placed under outrigger to increase better ground stability • Crane to be 100% levelled/ horizontally	4 (L)
		Obstruction within boom swing radius	Injury Asset damage	S/H AD	9 (M)	• Supervisor/banks men to ensure area is free of any obstruction • The crane hook block and hook or load must never be slued over personnel of vehicles, especially if personnel are sitting in the vehicles	4 (L)
		Excavation	Injury Fatality	S/H	12 (M)	• Crane not to be established closer than 2 meters to any excavation to prevent possible side wall collapse • No material to be placed on the edge or near the edge of any excavation	4 (L)
		Contact between overhead power lines and crane (arch flash/ electrocution)	Injury Fatality	S/H	6 (M)	• No work to be conducted within 15 meters of any power line • Site manager to ensure a pre-plan meeting and site inspection conducted • Permit to work near power lines to be applied for, accepted and approved by local municipality/ Eskom, site manager and client representative	6 (M)

12	Operating mobile crane on site	Operating slipping whilst ascending or descending from crane	Injury	S/H	9 (M)	• Ensure operator maintain 3 point contact t all times when ascending and descending equipment • Operator to ensure access steps are clean and in good serviceable condition • Ensure safety shoes are clean of mud	4 (L)
		Banks man – slipping, tripping or falling while communicating with crane operator	Injury	S/H	6 (M)	• Ensure level working area free from tripping and slipping hazards • Provide safe working platforms where necessary	2 (L)
		Incorrect lifting equipment/ equipment failure	Injury Asset damage	S/H AD	9 (M)	• Pre-task assessment to be conducted to ensure that the correct lifting equipment and size crane is used • Correct PPE to be worn • Competent employee to be appointed to be responsible for equipment and inspection there off • Use correct and certified equipment • Work within crane and lifting equipment	6 (M)
		Crane toppling over	Injury Fatality Asset damage	S/H AD	8 (M)	• Ensure outriggers are in full extended position an on firm and stable ground using spreader boards • Load to be raised slowly to check load stability and centre of gravity • Banks man only person to communicate with crane operator • Operator must always head to an emergency STOP signal, no matter who gives it, except when specialised engineering lifting operations are conducted – then only the rigger • Banks man to communicate with hand signals or radio • Lifting not to take place during excessive wind • Banks man to remove gloves when giving hand signals • Banks man to ensure no person is beneath a suspended load • No person to be allowed within the crane swing radius • Crane not to travel with outriggers or boom in extended position	4 (L)
		Employee injured / property damage whilst load being	Injury Asset damage	S/H AD	9 (M)	• Ensure that operator hoist crane up slowly to rid equipment of slack • Lifting equipment to be connected according to procedures • All lifting equipment must have a valid load certificate • Inspection to be register	4 (L)

		prepared to be hoisted				• Hands to be clear when load hooked up • Banks msn to ensure all personnel are clear when hoisting • No overhead lifting will be allowed	
		Loading control of the hoisted load – striking employees, plant or structure	Injury Fatality Asset damage	S/H AD	12 (M)	• Work to lifting procedures/task analysis • Area to be barricaded during lifting activities tp prevent unauthorised entry • Area to be barricaded during lifting activities to prevent unauthorised entry • Banksman must wear high visibility vest during lifting operations • Banks man to communicate with staff manning guide ropes whistles to be utilized • Ensure sufficient guide ropes attached to ensure stable movement • Work to equipment specifications • Work in crane load chart specifications	4 (L)
		Inclement weather conditions (high winds; lighting; heavy rain)	Injury Fatality	S/H	12 (M)	• Work within wind guidelines – less than 25km per hr. – evaluate situation in conjunction with operator and site management • Do not work in thunderstorms and lightning • Do not work on elevated positions when raining • Suspended load to be lowered to ground level, outriggers to be retracted, crane to be switched off and operator to remain in cab during lightning storms until further notice • Do not work with any steel • Daily DSTI to include risks resulting from adverse weather • No electrical work is to be conducted on crane in were conditions	6 (M)
13	Hazardous chemical storage	Employees not familiar with SDS Liquid splashing Employees inhaling fumes Liquid spilling from container	Injury Disability Fatality	S/H EN	13 (S)	• Obtain formal approval of flammable store from the relevant local authority and display the certificate at the entrance to the store • Flammable liquid store to conform all legal requirements • Assessments to be carried out to determine the quantity of flammable liquid kept on site • No open flames and no smoking symbolic signs to be displayed in the vicinity of flammable liquid store • All safety data sheets (SDS) to be available at all times • Liquid bulk storage tanks to be bunded • Each bund to be capable of containing the maximum volume of the tank +10% • Fire extinguisher to be in 10 meter radius	5 (L)

		No information of hazardous substance					
14	Plant selection	Substandard Plant/incompetent operators	Injury Property damage Product loss	S/H AD	6 (M)	• All plant to report to safety officer upon arrival on site with the following: - Certified copy of ID - Valid medical certificate - Valid training certificate for the equipment she/he will be operating - Site induction to be done before any work commence - Legal appointment letter to be done and signed by the operator - Supervisor to be informed of arrival so that the operator can be informed of his duties - Plant to be inspected and taken photos for site register - Pre-start checklist to be done daily and signed off by the supervisor - All damages and fault to be reported immediately	3 (L)
15	Refuelling of plant	Fuel spillage during refuelling of plant	Soil contamination	EN	6 (M)	• Bonding or drip tray placed under stationary plant • Spill kit to be available at all times • SDS available on site • Personnel trained in spill cleaning procedure • Fire extinguisher and relevant required signage to be installed (no smoking, no open flames and hearing protection)	4(L)
16	Operating plant on site	Substandard plant	Injury Asset damage Production loss	S/H AD BD	6 (M)	• Plant to be inspected by site appointed inspector • Plant to be listed on equipment register • Daily pre-use checklist to be completed • Plant to be equipped with warning devices (construction light, reverse hooter, flag, etc.)	4 (L)
		Incompetent operator	Injury Fatality Asset damage Production loss	S/H AD BD	12 (M)	• Operator to be inducted and appointed • Proof of medical fitness to be available • Proof of qualification certificate available/ drivers licence (code EC) • Operator to attend risk assessment and DSTI discussions	6 (M)
		Speeding violation by plant on site	Injury Fatality	S/H AD	12 (M)	• Supervisor to monitor plant speed on site • Speed signage displayed on site	6 (M)

			Asset damage			• Operator to slow down if visibility is poor on site • Operator to adhere to stipulated following distance (40 meters)	
		Collision with other vehicle/equipment on site	Injury Fatality Asset damage Ground contamination Production loss	S/H AD EN QA	12 (M)	• Plant to be assigned to designated work area • Tipper truck/ ADTs' assigned to haul roads/ route • Plant / vehicle headlights to be on in bad visibility • Construction plant of the way rule enforced • Warning signage and traffic direction signage erected • Vehicles to stay within construction plant operators line of sight (part of site induction) • Site SHE officer to be informed immediately of incident • Incident scene not to be disturbed until investigation is completed • Spill kit to be used if any spillage caused by damaged plant or vehicle • Supervisor to inform client representative to inspect any damage to completed works	6 (M)
		Excessive dust caused by construction plant	Air pollution	EN	6 (M)	• Dust suppression application rate to be established • Supervisor to monitor dust in work area • Dust suppression application to be increased if excessive dust experience due to activity or weather conditions	2(L)
		Employee struck by flying objected from plant operation	Injury	S/H	6(M)	• Section24 – reportable incident • Personnel not to be allowed within 10 meters of operating plant (e.g. recycler, grader, roller, etc.)	4 (L)
17	Survey setting out points	Incorrect setting out points (demarcation)	Quality NCR Production loss	QA BD	6 (M)	• Ensure surveyor has latest "construction drawings" • Verify survey beacon integrity • Supervisor to confirm that construction as per survey point	4 (L)
18	Clearing and grubbing	Damage to flora, fauna and / or heritage items		EN	9 (M)	• Survey and fence any sensitive area that require protection within/adjacent to the works area in accordance with sensitive area plans and in consultation with the project ecologist • Fence areas of significant flora, fauna habitat or known archaeological sites that are to be retained (protected) • Fence areas of significant flora, fauna habitat or known archaeological sites that are to be retained (protected) • These sites are to be managed in accordance with the working near sensitive areas	3 (L)

						• Limit of clearing to be marked with Pegs/red and white danger tape at a maximum of 50m centres • Pegs marked clearly indicate clearing side • Limits of clearing to be set out by survey	
19	Top soil management	Failing to preserve top soil	Erosion	ENV	12 (M)	• Top soil will be stripped together with the grass, ground cover and sedges from all over the site here permanent and temporary roads are located • Top soil shall be stripped to the depth of 150mm or as specified in the spec • Top soil shall be stockpiled separately from fill material and not use as a fill	4 (L)
20	Clearing operations	Damage to watercourses and prepared areas	Water pollution	ENV	12 (M)	• Locate stockpiles clear of properties and away from watercourses where possible. • Provide protection that prevents vegetative material from falling into or entering any creek or stream • Where construction activities allow, only remove the upright trunk part of the tree within riparian zones, leaving the stump and roots within the ground to minimise disturbed areas • Access along identified paths and tracks, and vehicle movement plan in place • Transport of clearing plant and equipment across waterways to be undertaken at an approved established across point only	6 (M)
21	Exposing of existing services; Telkom lines Overhead power lines Electrical cables Water supply lines	Damage to existing services, unjury to employees, damage to assets	Injury Fatality Asset damage Community impact	S/H AD S/C	12 (M)	• Prior to executions commencing consult the utilities suppliers/ site owner about underground gas and electricity supplies, obtain copies of service plans • Before work begins, underground cables must be located, identifies and clearly marked • Clearing the area where service has been detected • Once a locating device has been used to determine cable positions and routes, excavation may take place, with trial holes dug using suitable hand tools as necessary to confirm this • Excavate alongside the service rather than directly above it • Final exposure of service by horizontal digging is recommended as the force applied to hand tools can be controlled more effectively • Insulted tools should be used when hand digging near electric cables • Ensure services are supported once exposed, • Identify the service and fulfil any specific reinstatement requirements when backfilling • Find out the maximum height and reach of your own and contractors equipment (include the height of radio aerials or flashing beacons in the measurements) • Create alternative access routes or work areas to avoid OHPLS entirely where possible • Use barriers and overhead goalposts to control access and traffic routes	6 (M)

						• Contact the Distribution Network Operator (DNO) to obtain the safe clearance distance. (your DNO can usually supply stickers describing emergency procedures and containing contact numbers that can be stuck in the cabs of vehicles likely to be used near overhead power lines) • Retract booms of telescopic handlers and lower crane jibs when they are moving on site • Plant working near overhead power lines is suspended from steel tower; or 9m (plus length of jib) if the lines is supported on wooden poles • Consider the risk of a flashover occurring between the power line and your equipment; actually touching the line is not necessary for an incident to occur and can be fatal	
22	Excavation	Uncontrolled moving plant	Injury Asset damage	S/H AD	6 (M)	• Equipment may not be left running without operator cabin • Excavator to be park in a safe manner before operator leaves cabin • Section 24	4(L)
		Pedestrian and vehicle/plant movement in close proximity to excavation	Injury Fatality Asset damage Production loss	S/H AD BD	12 (M)	• All excavations will be adequately shored and braced if not sloped • All excavation areas to be barricaded until backfill is complete • Daily excavation inspection conducted before work commenced in area appointed inspector (CR 13 (1)(a)) checklist to be handed to safety officer for filling • Hard hats to be worn when working in excavations deeper than 1.5m • Warning and prohibition signage to be installed at access to excavation • Restrict access to excavation area to authorized persons and plant only • Fence to be constructed if deep excavation close to public thoroughfare to reduce accessibility and increase visibility • Flagman to be used to control/ warn plant and pedestrian traffic	6 (M)
		Poor visibility of excavation area after dark	Injury Asset damage	S/H	9 (M)	• Excavate only what is required for immediate production • Excavation to be backfilled as soon as possible after work completed • Smaller holes, trenches and hollows must also be barricaded and backfilled as soon as practicable • Areas to be barricaded until backfilling can be executed • Reflectors to be placed on barricading for increased visibility • Reflective signage to be used around deep excavations close to public thoroughfares	6 (M)
		Decreased visibility in excavation	Injury Asset damage	S/H	9 (M)	• Positioning of excavator must be in order to facilitate maximum possible visibility • Vehicles in deep excavations must be identified by use of flag and signage • When poor visibility occurs a flagman/ spotter, should be dedicated to each plant	4(L)

						• Flagman to be behind soft berm/safety den (20m radius) • Construction lights and vehicle lights to be switched on • One way traffic flow in and around excavation • Reduce man and machine interface in excavation due to plan fumes	
		Over-excavation	Quality NCR Damage to Flora and Fauna	QA EN	6 (M)	• Excavation setting out points to be clearly marked and visible • Excavation only to take place within identified points • Depth of excavation to be measured regularly to reduce risk of over excavation • Client representative called if unsuitable material found at requires depth. Formal instruction to continue excavating to be requested from client representative.	2 (L)
		Poor or no access/egress to and from excavation	Injury Asset damage	S/H AD	6 (M)	• All excavation will be supplied with sufficient access/egress ladders or ramps for entry and exit • Ladders placed no further than 6m away from nearest workers and no further than 6m apart • Access ladder must extend at least 900mm above the top of the excavation level (checked numbered and on register) • Access and egress ramp must not exceed the safe operating parameters of required plant	2 (L)
		Excavation collapse			6(M)	• Never work in excavation 1.2m deep or over unless the sides have been suitably shored and braced, or have been benched to prevent collapse • The competent person on site must carry out a risk assessment to decide if shoring is required at depths less than 1.2m • Before entering any excavation, inspect the walls for signs of collapse, particularly after heavy rain • Do not go into unsupported excavations • Never work ahead of the support • Remember that even work in shallow trenches can be dangerous • You may need to provide support if work involves bending, or kneeling in the trench	3(L)
23	Generator installation	Biological hazards	Injury Skin Irritation Death	EN	4(L)	• The use of PPE reduces contact exposure • Calmly move away when one sees a snake • Take an employee to the clinic or give them aid treatment if one gets a sider or bee bit	6 (M)
24	Handling and storage of excavated material	Excess spoil limiting mobility (rocks, stone boulders etc.)	Injury Asset damage	S/H AD	6 (M)	• Excess spoil will be removed from excavation work area at least 2m from side of excavation • Spoil remaining in work area for backfilling purpose will be stockpiled in an identified safe area • Position of stockpile not to restrict access/egress of work area	5 (L)

		Material placed too closed excavation side resulting in sides collapsing	Injury Fatality Asset damage	S/H AD	12 (M)	• No excavated material will be placed within 2m from excavation edge • All excavation sides will be battered to prevent collapsing of materials • Spoil at edges will not exceed height of 2m and will be shored 1-2 at all times	7 (M)
24	Exposure to a water environment	Oil, petrol or diesel spillage	Ground water pollution	EN	4(L)	• Rehabilitate the ground after a spillage by removing the top layer of the soil and correctly dispose • Put drip trays on every plant on site	4 (L)
25	Exposure to noise	High pitch of noise from the operation	NIHL(Noise Induced hearing loss) TTS	S/H	8(M)	• Issue ear plugs or ear muffs • Give the employees time to move away from the noise for 15mins or more in every 3 hours	4 (L)
26	Exposure to vibration	Vibration	Restlessness Motion sickness Lower back pain Bone damage Impairment of ,balance or both	S/H	8(M)	• Give the employees time from any vibrating surface or machinery(at least 10mins or more in every 3 hours) • Train the employees to use the machinery in the correct way • Provide glove for your employees to reduce contact	6 (M)
27	Compaction of material	Incompetent operator Poor communication	Injury Property damage	S/H	9(H)	• Ensure trained competent operators at all times • Ensure supervision at all times	3 (L)

		Non-compliance to safety regulations					
	HIV/Aids and other diseases	Spill of blood on the equipment Dust	Disease	S/H	4(L)	• Induct the employees about HIV/Aids • Provide condoms for the employees • Provide dust musk's and make sure there is enough ventilation in the working environment	4(M)
28	Angle grinder	Ungraded grinder	Injury Death	S/H	4(L)	• Safeguard all your grinders before use • Only competent people are allowed to use the grinder • Provide training for the use of grinders	6 (M)
29	Construction of selected fill (identify tipping area and tipping area hazards	Cracks on the ground due to unstable slopes Heavy rain	Production loss	BD	4 (L)	• Always inspect the tipping areas for instabilities • Barricade and keep away machineries from unsafe, unstable surfaces • If practicable make use of berm if practicable to indicate to operators where to stop • Seek advice from supervisors on the control measure	4(L)
		Working in proximity of power lines Reversing of mobile machineries Overloading of trucks	Injury Disability Fatality	S/H	9 (M)	• Locate all loading and tipping area away from power line, even above raised bed – height • Training and coaching • Risk assessment to be done • Operator shall be trained on blind spot observation • The excavator operator to allow and ensure that no truck is overloaded with materials and rocks. To avoid injuries and damages	6 (M)
30	Trucks and driving around construction zones	Speeding Unsafe behaviour	Injury Disability Fatality	S/H	9(M)	• No over speeding will be allowed on site	6 (M)
		Men machinery interface External environment	Injury Disability Fatality	S/H	9 (M)	• Employees working in the vicinity of the machinery must approach if from the side not from the rear to allow the operator to see	7(L)

		Uneven surface for mobile machineries Weather				• Operators must stop, switch off the machinery when a person is on the exclusion zone of working machinery • Provision and use of reflective PPE	
31	Influence of adverse weather	Incidents due to strong winds, extreme dust obscuring visibility and rain	Injury Disabling injury Fatality	S/H	6 (M)	• Weather such as strong wind must be monitored before the operations starts • Dust suppression to be controlled by use of water carts • Sufficient weather must be insured for safe and quality and priming operation	3 (L)
32	Erecting Shutters	Not following proper safe work procedures	Injury	S/H	6(M)	• Supervisor to ensure more than one person handling heavy shutters • Crane to be used for placement of heavy shutters placed in deep excavation/ areas with difficult access	2 (L)
33	Parking of vehicles and mobile plant	Collision with employees Plants colliding	Injury Death Fatality	S/H	9 (M)	• All operators must be inducted to ensure safe driving is practised on site • Only competent person are allowed to operate plants on site	4 (M)
34	Placing concrete	Incorrect manual handling	Injury Back pain	S/H EN	8(M)	• Only trained and competent employees to conduct task • DSTI to be attended before commencement of task • Sufficient space must be allowed between workers to allow for swinging and movement radius • Long socks must be worn with gumboots • Safety glasses to be worn during concrete operations • Only approved and inspected hand tools to be used	6 (M)
35	Demolition	Not following demolition procedures	Injury Death Property loss	S/H	4(L)	• The task can only be performed after the demolition supervisor has given a permission • Employees must be in full PPE • All plants must keep a safe working distance • Only competent person is allowed to operate the plants • Earplugs must be provided or ear muffs	3 (L)
36	Electrical drilling machine	Incorrect use of the driller	Injury Cuts	S/H	7(M)	• Use guarded drillers • Only competent person is allowed to use the driller • Provide training for drilling	2 (L)

37	Circular saw	Incorrect use Irresponsible use of the circular saw	Injury Cuts	S/H	7(M)	• Use guarded or protected circular saw • Provide training for the use of circular saw • Only competent person is allowed to use the circular saw	6 (M)
38	Generator	Exposure to noise	NIHL TTS	S/H	2(L)	• Provide ear plugs or ear muffs	6 (M)
39	Welding including, but not limited to	Contact with the sparks	Injury Burns Eye irritation	S/H	5(M)	• Only competent or experienced person is allowed to weld • Provide training	6 (M)

41	Use of LP gas torches and appliances	Contact with the torch flame	Injury Burns	S/H	2(L)	• Provide safety glasses • Provide training • Only competent and experienced are allowed to use the torch	3 (L)
42	Manual handling	Brick masons	Cement dermatitis, awkward postures, heavy loads	S/H	3(L)	• Provide PPE • Avoid carrying loads by hands • Provide training • Test all employees for all possible allergies	4 (L)
43	Working on height	Not following working on height procedures	Injury and fatalities	S/H EN	13(S)	• Use scaffolds to access the roof • All employees who perform the task musk safety harness • Provide training	19 (S)
44	Hazardous waste workers	Heat, stress	Heat stress	S/H	4(L)	• Dumping is only allowed in areas identified the municipality • Good practise of waste accumulation must be practised at site • Hazardous waste must be neutralised before dumping	3 (L)
45	Mixing of grout / glue (tiling glue & water)	By not following proper safe work procedures or method statements	Injuries or fatalities.	S/H	17(S)	• All hand tools and equipment will be inspected prior to use and damaged hand tools or equipment will be reported to supervisor and removed from site. • Ensure that all hand tools and equipment used are on tool register and has checklists and registers done by a competent appointed Hand Tool Inspector.	4(L)
46	Demolition work, where applicable	Structure falling on employees Structure damaging property	Injury Disability Fatality Property loss	S/H	13 (S)	• A competent person must supervise the work • Only competent plant operators are allowed to do the work • PPE is a must when performing such work	3 (L)

RISK ASSESSMENT TABLE						
Likelihood		**Risk Rating**				
5 Almost Certain	The unwanted event has occurred frequently; has a 90% and higher probability of reoccurring	**11 Medium**	**16 Significant**	**20 Significant**	**23 High**	**25 High**
4 Likely	The unwanted event has a probability of between 60% and less than 90% of occurring	**7 Medium**	**12 Medium**	**17 Significant**	**21 High**	**24 High**
3 Possible	The unwanted event has a probability of between 30% and less than 60% of occurring	**4 Low**	**8 Medium**	**13 Significant**	**18 Significant**	**22 High**
2 Unlikely	The unwanted event has a probability of between 1% and less than 30% of occurring	**2 Low**	**5 Low**	**9 Medium**	**14 Significant**	**19 Significant**
1 Rare	The unwanted event has never occurred, has a probability of less than 1% of occurring	**1 Low**	**3 Low**	**6 Medium**	**10 Medium**	**15 Significant**