

RA NO:	SCM/19-152/S/2018-2019		
DATE:	19/1/2019		
DIRECTORATE:	INFRASTRUCTURE AND ENGINEERING		
SUB DIRECTORATE / DEPARTMENT:	ROADS AND STORMWATER	LOCATION / SITE:	VARIOUS
START DATE:			
RA CONDUCTED BY:	R COX , CHUMA HEADBUSH & CAYLIN CONSTABLE		

BRIEF DESCRIPTION OF PROCESS:

AGREEMENT FOR THE CONSTRUCTION OF ROADS AND STORMWATER WITH ASSOCIATED INFRASTRUCTURE IN NELSON MANDELA BAY MUNICIPALITY

BRIEF DESCRIPTION OF REQUIRED WORK/ ACTIVITY:

IDENTIFY EXISTING UNDERGROUND SERVICES, REROUTE AND INSTALL / LAYING OF STORM WATER PIPING AS PER PROJECT DIRECTIVES, PREPARE GRAVEL ROADS FOR SURFACE PRIMING, IMPORTING PREMIX AND LAY DOWN & FINISH. PREPARE INSTALL NECESSARY CULVERTS AND KERBING.

RISK RATING SCALE:

PROBABILITY SCALE		FREQUENCY SCALE		SEVERITY SCALE		
Inevitable	(5)	Critical Risk	(5)	Disaster	(Many fatalities / > 10 Million damage)	(20)
Has happened before	(4)	Frequent occurrence / daily	(4)	Critical	(Fatal injury / > 1 Million damage)	(15)
Very Likely	(3)	It has happened / monthly	(3)	Very Serious	(Reportable Accident & IOD-Disability Injury (LTI) > R100, 000 damage)	(10)
Quite possible	(2)	Could occur / yearly	(2)	Serious	(IOD-Non-disabling Injury / > R1, 000 damage)	(5)
Unlikely	(1)	Minor Risk	(1)	Important	(Minor injury / > R100 damage)	(2)
RISK RATING (Pure Risk)		ACTION				
Critical (C)	301-500	←	TERMINATE	→	MANAGEMENT ACTIONING	
Major (MR)	201-300	←				
Medium (M)	101-200	←	TREAT	→	SUPERVISOR/EMPLOYEE ACTIONING	
Low [L]	0-100	←				

Definitions:
PR = Probability
FR = Frequency
SV = Severity
PUR = Pure Risk
RR = Risk Rating
MR = Mitigating Risk
RIR = Residual Risk

No	TASK / ACTIVITY	HAZARDS	RISKS PEOPLE/ PROCESS EQUIPMENT/ MATERIAL ENVIRONMENT	S H E						PREVENTATIVE & CONTROL MEASURES TO MITIGATE RISK								
					P R	FR	SV	PUR	A - RR	6	5	4	3	2	1	B - MR	RIR	
					1	1	2	1		ENGINEERING	TRAINING	MONITOR	PREVENT	ADMIN	PPE	6 x 5 x 4 x 3 x 2 x 1	A-B	
1	PERMISSION TO ACCESS-CLIENT: <ul style="list-style-type: none"> Contractual Agreement Contractor appointment Obtain necessary way-leafs 	<ul style="list-style-type: none"> Unqualified / unregistered contractors on project NMBM tender / contract protocols by-passed Unauthorised commencement of activities Commencement of activities without the acquisition and study of latest revision of As-Built Information. Inaccuracy of As-built Plans pertaining to Project & existing services 	<ul style="list-style-type: none"> Exposures to legal liability Result in Legal Claims Prosecution Vicarious liability Compensation Damages to underground services Disruption of services Disrupting/ damaging infrastructure 	S	2	3	15	90	C			Supervisor to ensure necessary documentation, approval/permission is obtained and verified	<ul style="list-style-type: none"> Approval / Permission to be obtained from CLIENT prior to commencing work Necessary H&S legal compliance documents signed by both parties Acquisition of latest revision of As-Built information pertaining to the project and existing services. Contractor to verify the position of all services by means of hand exploratory holes/ excavations prior to commencement of activities in the area of construction. 	<ul style="list-style-type: none"> No work activities are to commence unless supervisor is in possession of written contract Contractor to be appointed as per CR 5(1) (k) Section 37 (2) H&S Mandatary Agreement No work activities are to commence without confirmation of latest Revision of As-Built information, and the study / interpretation thereof. Verify registration of company 			24	66
2	SITE CLEARANCE: <ul style="list-style-type: none"> Mobile plant, tools & equipment Traffic & pedestrian control Brush /soil removal & staging Stock pile / dispose of excess / interim topsoil. 	<ul style="list-style-type: none"> Unlicensed operator Defective equipment Lack of serviced equipment Speeding Vehicular road movement Unsafe mobile plant & equipment Unauthorised entry Fail to demarcate work areas effective Failure to place relevant symbolic signage / notice Ineffective or inefficient supervision Lack of proper traffic & pedestrian control measures 	<ul style="list-style-type: none"> Material/Equipment Damage MVA Fatality Multiple injuries Result in Legal Claims Compensation Plant, equipment damage Work stoppage Damages to underground services Disruption of services Disrupting/ damaging infrastructure 	S	3	3	15	135	M		<ul style="list-style-type: none"> Conduct Site Specific Safety, Health & Environmental Induction training for all employees. Only trained & competent persons to operate plant and equipment Employees to receive training in snake bite prevent measures 	<ul style="list-style-type: none"> Works supervisor to monitor and manage work progress CHSO to monitor and manage all SHE issues & progress 	<ul style="list-style-type: none"> Acquisition of latest revision of As-Built information pertaining to the project and existing services. Contractor to verify the position of all services by means of hand exploratory holes/ excavations prior to commencement of activities in the area of construction. Unauthorised persons not allowed within the work area, "No Unauthorised Entry Symbolic Signs" Positioned 	<ul style="list-style-type: none"> Mobile plant & equipment inspected as per register COF Medical Certificate Daily Inspection record PPE issued and inspection registers to be up to date. No work activities are to commence without confirmation of latest Revision of As-Built information, and the study / interpretation thereof. Obtain authorization pertaining to location of stock pile of surplus material. Supervision to ensure the project H&S file is submitted to the Client for assessment & approval, work may not commence prior to written approval from the client /clients agent 	<ul style="list-style-type: none"> Safety boots Leather glove Eye protection-sun Head protection – sun Overalls Reflective vest 	120	15	

No	TASK / ACTIVITY	HAZARDS	RISKS PEOPLE / PROCESS EQUIPMENT / MATERIAL ENVIRONMENT	S H E	P R	FR	SV	PUR	A - RR	PREVENTATIVE & CONTROL MEASURES TO MITIGATE RISK							B - MR	RIR
										6	5	4	3	2	1			
					1	1	2	1		ENGINEERING	TRAINING	MONITOR	PREVENT	ADMIN	PPE	6 x 5 x 4 x 3 x 2 x 1	A-B	
		<ul style="list-style-type: none"> ▪ Commencement of activities without the acquisition and study of latest revision of As-Built Information. ▪ Inaccuracy of As-built Plans pertaining to Project & existing services ▪ Unauthorised location / placement of stock pile ▪ Incomplete / un-approved SHE File on site. ▪ Illegal dumping /placing of waste/excess topsoil material ▪ Failure to conduct The Site Specific Health and Safety Induction for all employees working on the specific Site. 											<ul style="list-style-type: none"> ▪ DSTI's implemented, to consider other contractors in vicinity and potential damage to materials / equipment ▪ DSTI's to include hazards of moving equipment & vehicles ▪ Legal documentation to be at hand pertaining to mobile plant & equipment ▪ Mobile plant to be properly maintained and fully serviceable ▪ Flagman to be posted at strategic road crossovers ▪ Mobile plant & equipment to be staged securely ▪ No hydraulic or any fluid leakages, repairs to be effected immediately ▪ When stationary, drip trays to lay-down ▪ Any mobile plant / equipment staged at work site after hours, to be secured safely, keys removed, batteries removed and wheels chocked ▪ 600ml of liquid intake every hour ▪ Snake bite prevention measures guide must be available & adhered to at all times ▪ In the event of employee being bitten by a snake, the driver to evacuate the employee to nearest hospital speedily 	<ul style="list-style-type: none"> ▪ .Maintain records of employees receiving Site Specific Health and Safety Induction training- Induction Training Register – signed and dated. ▪ Traffic officer to inspect the signs and maintain ▪ Speed limit to be enforced by the supervisor 	<ul style="list-style-type: none"> ▪ Safety boots ▪ Leather glove ▪ Eye protection-sun ▪ Head protection – sun ▪ Overall ▪ Reflective vest 			

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										6	5	4	3	2	1			
										ENGINEERING	TRAINING	MONITOR	PREVENT	ADMIN	PPE			
3	SITE ESTABLISHMENT: <ul style="list-style-type: none"> Locate administration & office facilities Provide utility & hygiene facilities Establish lay down area Establish material, equipment, tools & similar storage facilities Establish mobile plant and equipment routes & staging area Secure site area with barricading / hoarding / fencing Establish waste / rubble / excess material removal controls Establish site remediation / reinstatement protocols Establish security services Establish traffic controls Establish pedestrian controls 	<ul style="list-style-type: none"> Unlicensed operators Defective equipment Lack of serviced equipment Vehicular road movement Unsafe mobile plant & equipment Unauthorised entry Fail to demarcate work areas effectively Failure to place relevant symbolic signage / notice Ineffective or inefficient supervision / security Lack of proper traffic & pedestrian control measures Moving plant equipment & vehicles Snakes & spiders Ergonomic Factors <ul style="list-style-type: none"> Restricted space Incorrect handling Incorrect Posture Inadequate Security surrounding Site Camp / materials & equipment Ineffective or inefficient planning of Site camp layout Commencement of activities without the acquisition and study of latest revision of As-Built Information. Inaccuracy of As-built Plans pertaining to Project & existing services 	<ul style="list-style-type: none"> Material/Equipment Damage MVA Fatality Multiple injuries Result in Legal Claims Compensation Plant, equipment damage Work stoppage Tripping & falling Snake & spider bite Heat exhaustion Poisoning- Snake & spider bite Theft of materials / Equipment Damages to underground services Disruption of services Disrupting/ damaging infrastructure 	S / H / E	4	3	15	180	M		<ul style="list-style-type: none"> Employees to have undergone the requisite HSE induction training Employees to receive training in snake bite prevent measures 	<ul style="list-style-type: none"> Works supervisor to monitor and manage work progress CHSO to monitor and manage all SHE issues & progress 	<ul style="list-style-type: none"> Prepare an effective and well-organized Site Camp Layout plan, establishing organisational infrastructure necessary for the movement of personnel, equipment, supplies and incidentals to the project site Integration of on-site and off-site vehicular and pedestrian access routes must be considered Vehicular access routes must be adequate to provide for the type of traffic that will have to be accommodated Ensure access into the lay-down area and the integration thereof with site roads Adequate parking facilities must be provided for the daily traffic of the vehicles of employees, visitors, suppliers and subcontractors Keep workers and heavy equipment apart Use flagmen whenever moving vehicles or equipment could endanger personnel, and post signs reminding drivers and operators that flagmen must be used 	<ul style="list-style-type: none"> Provide required H&S training records and other proof of training accordingly Registers must include Plant, equipment, machinery, tools, vehicles and personal protective equipment (PPE) Site management to ensure all required contractual and legal H&S documentation is provided and available Supervision to ensure the project H&S file is submitted to the Client for assessment & approval Mobile plant & equipment inspected as per register COF available Medical Certificate available Daily Inspection records PPE issued and inspection registers to be up to date Traffic officer to inspect the signs and maintain Speed limit to be enforced by the supervisor 	<ul style="list-style-type: none"> Safety boots Leather glove Eye protection-sun Head protection – sun Overalls Reflective vest 	120	45	

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										6	5	4	3	2	1	B - MR	RIR	
					1	1	2	1		ENGINEERING	TRAINING	MONITOR	PREVENT	ADMIN	PPE	6 x 5 x 4 x 3 x 2 x 1	A-B	
3	SITE ESTABLISHMENT: (con't)												<ul style="list-style-type: none"> ▪ Establish offices, containers and other facilities necessary for work on the project; and ▪ Establish the location of the area of the site that is allocated as lay-down area ▪ Lay down area size of the site is suitable for the project purposes ▪ Vehicular and pedestrian traffic routes must be separated ▪ Indicate planned connections to services, as well as the locations and layouts of pipelines, electrical cables, etc., on a diagrammatic site plan ▪ Ensure that the lay-down area and any work areas (including temporary offices, yards, storage areas, roads, paths, walkways, etc.) are adequately lit when involved in night work or where is inadequate ▪ Establish waste management arrangements ▪ Establish fire prevention measures and actions they will be taking and implementing to prevent fires from breaking out 					

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										6	5	4	3	2	1						
					1	1	2	1		ENGINEERING	TRAINING	MONITOR	PREVENT	ADMIN	PPE	6 x 5 x 4 x 3 x 2 x 1	A-B				
3	SITE ESTABLISHMENT: (con't)												<ul style="list-style-type: none"> ▪ Provide adequate and readily accessible workplace / welfare facilities for the workforce, where such facilities are not available at the worksite ▪ These facilities must include, as required, at least the following: <ul style="list-style-type: none"> - Toilets / change rooms / Washing facilities / including wash basins / showers / Lockers / shaded rest / eating areas / drinking water. - Establish emergency response and evacuation protocols ▪ Secure site area and establish security protocols ▪ In the event of employee being bitten by a snake, the driver to evacuate the employee to nearest hospital speedily 								

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										ENGINEERING	TRAINING	MONITOR	PREVENT	ADMIN	PPE	6 x 5 x 4 x 3 x 2 x 1	A-B	
4	RECEIPTING OF CONSTRUCTION MATERIALS: <ul style="list-style-type: none"> ▪ Off loading & staging of construction materials at lay down area (concrete piping /bedding stone-rock / bedding soil / bricks & cement) ▪ Load & transport construction materials to work / installation area ▪ Off load construction materials at work / installation area 	<ul style="list-style-type: none"> ▪ Unauthorised Access ▪ Untrained / incompetent operator ▪ Lack of supervision ▪ Uncontrolled swaying of load ▪ Exceeding SWL ▪ Unsafe slings ▪ Defective lifting equipment ▪ Uneven / loose ground ▪ Inadequate PPE ▪ Substandard equipment ▪ Insufficient manoeuvring space ▪ Inadequate traffic control ▪ Inadequate / poor Stacking & Storage procedures /protocols ▪ Bad /poor housekeeping 	<ul style="list-style-type: none"> ▪ Multiple injuries ▪ Equipment & material damage ▪ Slips & trips ▪ Fall upon ▪ Fatality ▪ Equipment failure 	S	3	3	15	135	M		<ul style="list-style-type: none"> ▪ Employees to be trained in manual handling techniques ▪ Training curriculum to include ergonomics ▪ Only trained & competent persons to operate ▪ Employees to receive training in snake bite prevent measures ▪ Employees to be trained in Stacking & Storage methods/ procedures 	Works, Stacking and Storage supervisor to monitor and manage work progress	<ul style="list-style-type: none"> ▪ Ensure firm and level ground ▪ Barricade off loading area ▪ Vehicle & lifting equipment operator licensed / competent ▪ Driver / operator medical available ▪ Guide rope to be attached on load to guide & prevent swaying ▪ Only lifting equipment in good order and state of repair ▪ Not to exceed SWL ▪ DSTI to include hazards of lifting equipment ▪ DSTI to include ergonomic factors ▪ Vehicle not to exceed site speed limit ▪ Drip trays to position during off loading ▪ Lifting equipment to be maintained as per manufacturer instructions ▪ In the event of employee being bitten by a snake, the driver to evacuate the employee to nearest hospital speedily 	<ul style="list-style-type: none"> ▪ Vehicle / lifting equipment COF available ▪ Daily inspection register available ▪ Appointment of competent Stacking and Storage Supervisor ▪ Traffic officer to inspect the signs and maintain ▪ Speed limit to be enforced by the supervisor 	<ul style="list-style-type: none"> - Safety boots - Leather glove - Eye protection -sun - Head protection – sun - Overalls - Reflective vest 	120	15	

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										ENGINEERING	TRAINING	MONITOR	PREVENT	ADMIN	PPE	6 x 5 x 4 x 3 x 2 x 1	A-B
5	EXCAVATING / TRENCHING: <ul style="list-style-type: none"> ▪ Locate existing services (telkom / electricity / water) ▪ Manually dig pilot holes to locate services ▪ Using mobile plant, continue excavating to prescribed depth ▪ Slope / batter excavation soil ▪ Shore and brace deep excavation walls 	<ul style="list-style-type: none"> ▪ Moving plant equipment & vehicles ▪ Snakes & spiders ▪ Material / Equipment Damage ▪ Damage to services ▪ Ineffective Supervision ▪ Snakes & spiders ▪ Ergonomic Factors <ul style="list-style-type: none"> - Restricted space - Incorrect handling - Incorrect Posture ▪ Unstable soil conditions ▪ Water logged excavations ▪ Untrained /incompetent machine/plant operators ▪ Commencement of activities without the acquisition and study of latest revision of As-Built Information ▪ Inaccuracy of As-built Plans pertaining to Project & existing services ▪ Un-barricaded / unprotected open excavations / trenches 	<ul style="list-style-type: none"> ▪ Multiple Injuries ▪ Tripping & falling ▪ Snake & spider bite ▪ Heat exhaustion ▪ Poisoning- Snake & spider bite ▪ Damages to underground services ▪ Disruption of services ▪ Disrupting/ damaging infrastructure ▪ Trench collapse 	S & H	4	3	15	180	M		Employees to receive training in snake bite prevent measures	Works supervisor / Excavation Supervisor to monitor and manage work progress Daily Excavation / trench inspections	<ul style="list-style-type: none"> ▪ Ensure certified & operable sonar detection equipment is available & utilised for detection activities on a continuous basis due to present conditional status of underground services installations ▪ Consider other contractors in vicinity ▪ DSTI- Hazards of moving equipment & vehicles to cover & risks communicated ▪ Only trained staff to perform tasks ▪ Hand tools and equipment inspected as per register ▪ Acquisition of latest revision of As-Built information pertaining to the project and existing services. ▪ Contractor to verify the position of all services by means of hand exploratory holes/ excavations prior to commencement of activities in the area of construction 	<ul style="list-style-type: none"> ▪ PPE issued and inspection registers to be up to date ▪ Site management to ensure that a geotechnical report is obtained from a professional engineer or professional technologist competent in excavations ▪ Maintain records of all trench / excavation inspections.(Registers updated daily) ▪ Traffic officer to inspect the signs and maintain ▪ Speed limit to be enforced by the supervisor 	<ul style="list-style-type: none"> - Safety boots - Leather glove - Eye protection -sun - Head protection – sun - Overalls - Reflective vest 	135	45

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										6	5	4	3	2	1				
					1	1	2	1		ENGINEERING	TRAINING	MONITOR	PREVENT	ADMIN	PPE	6 x 5 x 4 x 3 x 2 x 1	A-B		
5	EXCAVATING / TRENCHING (Con't)												<ul style="list-style-type: none"> ▪ Acquisition of latest revision of As-Built information pertaining to the project and existing services. ▪ Contractor to verify the position of all services by means of hand exploratory holes/ excavations prior to commencement of activities in the area of construction ▪ Side of trench stepped back 45Deg angle ▪ Trench sides to be kept clear for 1m from edge of trench ▪ Trenches, and excavations are to be properly braced, shored, barricaded, covered or isolated ▪ Ergonomic factors to consider ▪ DSTI's implemented, to consider other contractors in vicinity, moving vehicles, snake & spider bites and work environment risks ▪ Snake bite prevention measures guide must be available & adhered to at all times ▪ In the event of employee being bitten by a snake, the driver to evacuate the employee to nearest hospital speedily (refer guidelines) 						

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										6	5	4	3	2	1	B - MR		
					1 2 3 4 5	1 2 3 4 5	2 5 10 15 20	1 x 2 x 3		ENGINEERING	TRAINING	MONITOR	PREVENT	ADMIN	PPE	6 x 5 x 4 x 3 x 2 x 1	A-B	
5	EXCAVATING / TRENCHING (Con't)												<ul style="list-style-type: none"> 600ml of liquid intake every hour Dust containment measures De-watering of trenches / excavations Excavations to be inspected daily before being accessed, and after any rainfall or accumulation of water in the trenches/excavations 					
6	REROUTING EXISTING STORMWATER PIPING & INSTALLATION OF PRE-FABRICATED CONCRETE STORM WATER PIPES: <ul style="list-style-type: none"> Construct bedding foundation cradle layer Install pre-fabricated concrete pipes Construct bedding blanket layer Construct manholes 	<ul style="list-style-type: none"> Moving plant equipment & vehicles Snakes & spiders Ergonomic Factors <ul style="list-style-type: none"> Restricted space Incorrect handling Incorrect Posture Transportation / Manoeuvring and placement of Heavy Prefabricated Concrete Storm water Pipes Insufficient manoeuvring space Unstable soil conditions Water logged excavations Untrained /incompetent machine/plant operators. Existing intersecting services and infrastructure Ineffective Supervision Exceeding SWL Unsafe slings/chains Defective lifting equipment Uneven / loose ground 	<ul style="list-style-type: none"> Multiple Injuries Tripping & falling Snake & spider bite Heat exhaustion Poisoning- Snake & spider bite Material / Equipment Damage Damages to underground services Disruption of services Disrupting/ damaging infrastructure 	S & H	4	3	15	180	M		<ul style="list-style-type: none"> Employees to be trained in manual handling techniques Training curriculum to include ergonomics Only trained & competent persons to operate Employees to receive training in snake bite prevent measures 	Works supervisor / Excavation Supervisor to monitor and manage work progress	<ul style="list-style-type: none"> Only trained staff to perform tasks Hand tools and equipment inspected as per register Good housekeeping Side of trench stepped back 45Deg angle Trench sides to be kept clear for 1m from edge of trench Trenches, and excavations are to be properly braced, shored, barricaded, covered or isolated Ergonomic factors to consider DSTI's implemented, to consider other contractors in vicinity, moving vehicles, snake & spider bites and work environment risks Snake bite prevention measures guide must be available & adhered to at all times 	<ul style="list-style-type: none"> PPE issued and inspection registers to be up to date Vehicle / lifting equipment COF available –Chains – slings etc. Daily inspection register available/ updated daily before use Traffic officer to inspect the signs and maintain Speed limit to be enforced by the supervisor n 	<ul style="list-style-type: none"> Safety boots Leather glove Eye protection -sun Head protection – sun Overalls Reflective vest 	135	45	

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					1	1	2	1		ENGINEERING	TRAINING	MONITOR	PREVENT	ADMIN	PPE	6 x 5 x 4 x 3 x 2 x 1	A-B		
6	REROUTING EXISTING STORMWATER PIPING & INSTALLATION OF PRE-FABRICATED CONCRETE STORM WATER PIPES: (Con't)												<ul style="list-style-type: none"> ▪ In the event of employee being bitten by a snake, the driver to evacuate the employee to nearest hospital speedily (refer guidelines) ▪ 600ml of liquid intake every hour ▪ Barricade off loading area ▪ Vehicle & lifting equipment operator licensed / competent ▪ Driver / operator medical available ▪ Guide rope to be attached on load to guide & prevent swaying ▪ Only lifting equipment in good order and state of repair ▪ Not to exceed SWL ▪ DSTI to include hazards of lifting equipment ▪ Vehicle not to exceed site speed limit ▪ Drip trays to position during off loading ▪ Lifting equipment to be maintained as per manufacturer instructions ▪ MSDS for cement powder ▪ Ensure safe and clear walkway for use of wheel barrows 						

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										6	5	4	3	2	1		
					1 2 3 4 5	1 2 3 4 5	2 5 10 15 20	1 x 2 x 3		ENGINEERING	TRAINING	MONITOR	PREVENT	ADMIN	PPE	6 x 5 x 4 x 3 x 2 x 1	A-B
6	REROUTING EXISTING STORMWATER PIPING & INSTALLATION OF PRE-FABRICATED CONCRETE STORM WATER PIPES: (Con't)												<ul style="list-style-type: none"> ▪ Ensure rubble are removed on regular basis to prevent accumulation ▪ Responsible supervisor to ensure all tools and equipment to be used are identified & numbered ▪ De-watering of trenches / excavations ▪ Excavations to be inspected daily before being accessed, and after any rainfall or accumulation of water in the trenches/excavations ▪ Acquisition of latest revision of As-Built information pertaining to the project and existing services. ▪ Contractor to verify the position of all services by means of hand exploratory holes/ excavations prior to commencement of activities in the area of construction. 				

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										ENGINEERING	TRAINING	MONITOR	PREVENT	ADMIN	PPE	6 x 5 x 4 x 3 x 2 x 1	A-B
7	PREPARE ROAD WAY FOR APPLYING SURFACING MATERIALS: <ul style="list-style-type: none"> ▪ Apply prime by road tanker ▪ Warming up prime with built in gas heater ▪ Spray required road surface area ▪ Restricted areas, spray by hand ▪ Perform Slurry works ▪ Import premix-by trucks ▪ Spread premix by premix spreader ▪ Compact premix by Roller Vibrator 	<ul style="list-style-type: none"> ▪ Defective tanker ▪ HCS ▪ Overheating prime ▪ Prime liquid contact ▪ Prime liquid ignition ▪ Prime liquid spillage ▪ Vapours, fumes & odours ▪ Machine nip points ▪ Slurry mix spillages ▪ Defective premix spreader ▪ Premix spreader revolving parts ▪ Defective Roller Vibrator 	<ul style="list-style-type: none"> ▪ Multiple Injuries ▪ Tripping & falling ▪ Heat exhaustion ▪ MVA ▪ Burns ▪ Inhalation ▪ Equipment & material damage ▪ Slips & trips ▪ Fall upon ▪ Fatality ▪ Equipment failure 	S & H	4	3	15	180	M		<ul style="list-style-type: none"> ▪ Employees to be trained in manual handling techniques ▪ Training curriculum to include ergonomics ▪ Only trained & competent persons to operate 	Works supervisor to monitor and manage work progress	<ul style="list-style-type: none"> ▪ All employees medical done & where applicable, surveillance is in place ▪ Only trained staff to perform tasks ▪ Hand tools and equipment inspected as per register ▪ Good housekeeping ▪ Ergonomic factors to consider ▪ DSTI's implemented, to consider other contractors in vicinity, moving vehicles, and work environment risks ▪ A DCP fire extinguisher to be placed next to the tanker. ▪ Ensure no leaks on the gas heater pipes. ▪ MSDS available for reference. ▪ Trained fire fighters will be appointed ▪ Supervisor/ foreman to ensure that the thermometer is monitored ▪ Spillages to be cleared immediately ▪ Remaining slurry material must be disposed of in safe manner ▪ Flagmen to be placed to direct trucks and other traffic ▪ Haul roads to be well planned 	<ul style="list-style-type: none"> ▪ PPE issued and inspection registers to be up to date ▪ Vehicle equipment COF available ▪ Daily inspection register available/ updated daily before use. ▪ Traffic officer to inspect the signs and maintain ▪ Speed limit to be enforced by the supervisor 	<ul style="list-style-type: none"> - Safety boots - Leather glove - Eye / face shield protection -sun & splashes - Head protection – sun - Overalls – heat & chemical - Reflective vest - Respiratory protection 	135	45

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										6	5	4	3	2	1		
					1 2 3 4 5	1 2 3 4 5	2 5 10 15 20	1 x 2 x 3		ENGINEERING	TRAINING	MONITOR	PREVENT	ADMIN	PPE	6 x 5 x 4 x 3 x 2 x 1	A-B
7	PREPARE ROAD WAY FOR APPLYING SURFACING MATERIALS: (con't)												<ul style="list-style-type: none"> Necessary road traffic & pedestrian controls to be in place (SATRSM Vol.2 Ch 13) Unauthorised persons not allowed within the work area, "No Unauthorised Entry Symbolic Signs" Positioned Loose clothing in vicinity of revolving parts not allowed and guarded Defective tools and equipment to be reported and removed from site Hearing protection programme in place 				
8	PREPARE AND INSTALL CULVERTS AND KERBING: <ul style="list-style-type: none"> Steel fixing Setting out shutters Casting concrete, ready-mix or from concrete mixer on site Concrete finishing 	<ul style="list-style-type: none"> Unlicensed operator Defective equipment Lack of serviced equipment Speeding Vehicular road movement Unsafe mobile plant & equipment Unauthorised entry Fail to demarcate work areas effective Failure to place relevant symbolic signage / notice Ineffective or inefficient supervision Lack of proper traffic & pedestrian control measures HCS 	<ul style="list-style-type: none"> Multiple Injuries Tripping & falling Heat exhaustion MVA Burns Inhalation Equipment & material damage Slips & trips Fall upon Fatality Equipment failure Result in Legal Claims Compensation Work stoppage 	S	4	3	15	180	M		<ul style="list-style-type: none"> Conduct Site Specific Safety, Health & Environmental Induction training for all employees. Only trained & competent persons to operate plant and equipment 	<ul style="list-style-type: none"> Works supervisor to monitor and manage work progress CHSO to monitor and manage all SHE issues & progress 	<ul style="list-style-type: none"> Acquisition of latest revision of As-Built information pertaining to the project. Unauthorised persons not allowed within the work area, "No Unauthorised Entry Symbolic Signs" Positioned Temporary road signs (speed limit of 40, Man at work, delineators Trained flagmen will be stationed at strategic locations to control traffic and guide construction vehicles Only certified and competent operators Speed limit to be enforced by the supervisor 	<ul style="list-style-type: none"> Mobile plant & equipment inspected as per register COF Medical Certificate Daily Inspection record PPE issued and inspection registers to be up to date. No work activities are to commence without confirmation of latest Revision of As-Built information, and the study / interpretation thereof. Traffic officer to inspect the signs and maintain Speed limit to be enforced by the supervisor 	<ul style="list-style-type: none"> Safety boots Leather glove Eye / protection-sun & splashes Head protection – sun Overalls – heat & chemical Reflective vest Respiratory protection 	120	60

NO	TASK / ACTIVITY	HAZARDS	RISKS PEOPLE/ PROCESS EQUIPMENT/ MATERIAL ENVIRONMENT	S H E	P R	FR	SV	PUR	A - RR	PREVENTATIVE & CONTROL MEASURES TO MITIGATE RISK							B - MR	RIR
										6	5	4	3	2	1	B - MR		
					1 2 3 4 5	1 2 3 4 5	2 5 10 15 20	1 x 2 x 3		ENGINEERING	TRAINING	MONITOR	PREVENT	ADMIN	PPE	6 x 5 x 4 x 3 x 2 x 1	A-B	
	Remediation & landscaping: ▪ Trim & shape backfilled areas ▪ Lay down grass sods ▪ Uplift & remove excess spoil to waste disposal site	<ul style="list-style-type: none"> Moving plant equipment & vehicles Snakes & spiders Ineffective Supervision Ergonomic Factors <ul style="list-style-type: none"> - Restricted space - Incorrect handling - Incorrect Posture Illegal dumping of waste/excess material 	<ul style="list-style-type: none"> Multiple Injuries Tripping & falling Snake & spider bite Heat exhaustion Poisoning- Snake & spider bite Result in Legal Claims due to illegal dumping of waste/ excess material 	S	3	3	15	180	M		<ul style="list-style-type: none"> Employees to be trained in manual handling techniques Training curriculum to include ergonomics Employees to receive training in snake bite prevent measures 	Works supervisor to monitor and manage work progress	<ul style="list-style-type: none"> Responsible supervisor to ensure post operation clean up done Snake bite prevention measures guide must be available & adhered to at all times In the event of employee being bitten by a snake, the driver to evacuate the employee to nearest hospital speedily (refer guidelines <ul style="list-style-type: none"> 600ml of liquid intake every hour Dust containment measures 	<ul style="list-style-type: none"> PPE issued and inspection registers to be up to date Maintain accurate records of all waste disposal at an approved waste disposal site Waste management register. 	<ul style="list-style-type: none"> Safety boots Leather glove Eye protection -sun Head protection – sun Overalls Reflective vest 	120	45	
	Excess spoil staging & removal: ▪ Staging and securing excess spoil ▪ Uplift & remove excess spoil to waste disposal site	<ul style="list-style-type: none"> Moving plant equipment & vehicles Unroadworthied vehicles Ineffective Supervision Ergonomic Factors <ul style="list-style-type: none"> - Restricted space - Incorrect handling - Incorrect Posture Illegal dumping of waste/excess material 	<ul style="list-style-type: none"> Multiple Injuries Tripping & falling Heat exhaustion MVA Result in Legal Claims due to illegal dumping of waste/ excess material 	S	3	2	10	60	L			Works supervisor to monitor and manage work progress	<ul style="list-style-type: none"> Removal of all scrap/rubble/ materials by sub-contractor and area remediated Snake bite prevention measures guide must be available & adhered to at all times In the event of employee being bitten by a snake, the driver to evacuate the employee to nearest hospital speedily (refer guidelines <ul style="list-style-type: none"> 600ml of liquid intake every hour Dust containment measures 	<ul style="list-style-type: none"> PPE issued and inspection registers to be up to date Maintain accurate records of all waste disposal at an approved waste disposal site Waste management register. 	<ul style="list-style-type: none"> Safety boots Leather glove Eye protection -sun Head protection – sun Overalls Reflective vest 	24	36	

I/we, the undersigned, hereby declare that the responsible person in charge has made us familiar with the work-related hazards and risk and the measures that must be taken to eliminate, control and minimise those hazards and risks:

SURNAME	NAME	SIGNATURE