12.1Risk Assessment

Safety Management

BTCC-PTW-RSK-HSE-CMHS-HVAC-0009-R0 - Risk Assessment for Installation & Testing of Underground Chilled Water Preinsulated Pipes

Contract number and title:	RA number:	Element of work:	Risk assessment author:	Date:
ID: BP 2022 C 012 G	BTCC-PTW-RSK-HSE-CMHS-HVAC-0009-R0	Installation & Testing of Underground Chilled water Preinsulated Pipes	Ranjithkumar Thimmarayan	25-12-2024

Severity		Likelihood		Evaluation of risk		
NO INJURY	1	RARE	1	12 - 25	High	Action is required urgently to control the risk, further resources may be required, and work must stop immediately
MINOR	2	UNLIKELY	2			
MODERATE	3	OFTEN	3	5 – 10	Med	Action required to control the risk, interim measures may be necessary in the short term, able to proceed with work under supervision
MAJOR	4	LIKELY	4			
FATALITY	5	EXPECTED	5	1 – 4	Low	This represents a low risk, although control measures must be maintained

Job / What are the hazards?	Who might be harmed?	How?	Initial risk?			What controls are required?	Residual risk?			Action by
			Likelihood	Severity	Risk Rating		Likelihood	Severity	Risk Rating	
Pre-Installation stage (New Person in the Site) •Lack of Awareness on Hazards and Risk •Unsafe/Damage use of Equipment's and Tools, •Unsafe Acts due to Lack of Safety Awareness. •Newly Joined Employees or Young Employees. Unfamiliarity of the Workplace, •Unaware of the site safety rules. •Unaware of the emergency escape routes and assembly point.	Contractor Employee Others	Human Injury, Human error, Hand Injury, Ill health and sickness.	4	3	12	•Ensure all new employees had safety induction training recorded with a precise explanation of ongoing activities, hazards and risk awareness, basic facilities, safe usage of equipment, and appropriate use and importance of PPEs. •Provision of training •Before commencing the task, ensure that the work area is clear or there is no obstacle to prevent slips, trips, and falls. •Permit to work system must be applied before any hot /cold work activity. Close monitoring and supervision of newly joined employees.	1	3	3	Engineer Supervisor/ Foreman HSE Officer

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Transportation of Materials by using a truck/Telehandler (Transportation of Chilled Water Pipes) •Over Speed and not following site traffic rules. •Hit by/Struck by moving vehicles and other site equipment. •Driving through uneven surfaces / Poor Road conditions. •Over Loading of Materials •Poor Visibility/Illumination •Adverse weather condition •Blind spots	Contractor Employee Others	Property Damage, Fracture, Hand Injury.	4	3	12	•Ensure that workers assigned to drive have a VALID Qatar driver's license and that is appropriate for the type of vehicle to be driven. •Monthly Inspection shall be done. •Adhere to site traffic rules & regulations. •Make sure the reverse alarms and lights are in good condition and functional. •Once on the road the driver should examine the load and ensure that the load is secured in the vehicle. •Assess the weight of the object that needs to be lifted before lifting, ask help from others when lifting heavy objects. •Follow an appropriate safe system of work for manual lifting. •Take care to ensure that manual handling activities do not put others at risk. •Materials shall be stacked properly and protected by providing barricades or signs. •Third-party certified lifting gear and equipment shall be used. •Trained and competent employees can only use lifting equipment. •Make sure that the load is balanced and secured when the load is lifted. •Avoid the need for manual handling as far as reasonably practicable. •Do not stand beside or underneath the area of the lifted load. •Adequate fire protective measures should be made by the provision of the right type of fire extinguishers.	1	3	3	Engineer Supervisor/ Foreman HSE Officer

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						• Delivery vehicle must be escorted by a competent Flag man & should be parked in a safe area. Site speed limit (15km/hr.) signage should be fixed at the entrance and must be followed & monitored while shifting materials to the site. • Use only designated routes/roads at the site and Segregation of pedestrian walkways & vehicle routes.				
Manual Handling Overweight, Task is too Strenuous, Awkward Posture (Ergonomics) when lifting, Insufficient manpower engaged for manual handling and lifting, Poor handling of sharp-edged materials and accessories.	Contractor Employee Others	Sprains, Strains, Ligament Damage, or other type of Musculoskeletal Disorder (MSD)	3	3	9	1.Prior to commence the task, ensure that the work area is clear or there is no obstacle to prevent slip, trip, and fall. 2. Proper manual handling and manual lifting techniques of materials should be provided in the form of TBT. 3. All tools, ladders, and scaffolding must be inspected first by a competent person to ensure all are safe before the start of activity 4. Use of PPE's, Safety helmet, Goggles, Mask, Coverall, Hand Gloves, Safety Shoes	1	3	3	Engineer Supervisor/ Foreman HSE Officer
Installation of Underground Chilled Water Preinsulated Pipes in Excavation Pit • cave-in or collapse • muscle strain or back injuries • slips, trips, and falls • electrical shock	Contractor Employee Others	• Crushing injuries. • Fractures. • Suffocation. • Fatality. • Muscle strain. • Back injuries. • Sprains. • Bruises. • Fractures.	4	4	16	1.Ensure shoring, sloping, or trench box is installed as per geo technical report and inspect the trench on daily basis. 2.Use barricades to restrict unauthorized access.	1	4	4	Engineer Supervisor/ Foreman HSE Officer

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• falling objects from above • asphyxiation or toxic gases • heat stress or fatigue • struck-by the nearby machinery movement		• Head injuries. • Lacerations. • Burns. • cardiac arrest. • Concussions. • Asphyxiation. • Respiratory distress. • Unconsciousness. • Heat exhaustion. • Dehydration. • Heatstroke. • Internal injuries.				3.Provide manual handling training. Split loads into manageable sections. 4.Isolate power sources. Follow lockout/tagout (LOTO) procedures. Inspect tools and cables. Use double-insulated equipment. 5.Install barricades and warning signs. Provide hard hats to all workers. Assign spotters to control overhead activities. 6.Test air quality. Use forced ventilation if needed. Follow confined space entry permits. Provide breathing apparatus if required. 7.Schedule regular rest breaks and provide hydration. Ensure shaded rest areas. Rotate workers frequently. 8.Provide high-visibility vests. Implement proper traffic management. Maintain safe distances from machinery.				
Hot Works activity • Welding • Cutting • grinding.	Workers & Supervisor	• Fire • Skin burns • Eye injury	4	4	16	• PTW shall be obtained and verified by the supervising consultant • Welding machine must be inspected by the competent person. • Welding cables must free from any damage. • Ensure alligator clamp is attached in the welding cable.				

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						• Grounding shall also be used • Workplace shall be adequately isolated by the UV ray's protection preventing the disturbance of nearby works and provided with safety signage. • Assign trained fire watcher to monitor the hot work activities • Ensure that any combustible or flammable materials around before executing the works. • Cutting outfit shall fitted with flashback arrestor, including the gauge attached in the cylinders. • Ensure that the cylinders are chained in the trolley with cap. • Provision of designed spanner for acetylene cylinder valve for emergency purpose. • After the work is done, observe at least minimum of 30 minutes in the workplace to observe that the area is safe from fires. • Use of Personal Protective Equipment (safety shoes, safety helmet, safety goggles, double lanyard full body harness, welding apron, welding leather arm gloves, welding mask and others as required.				
Pre-testing stage Incompetency of Operatives to Perform the Task,	Contractor Employee Public Environment Others	• Serious Injuries to Fatality, Long term to Permanent Disability, Property Damage (Materials, Equipment	3	4	12	•Safety induction training for new arrivals. •Provision of trainings on proper usage of power tools and hand tools, manual handling of materials, use of PPE's, permit	1	4	4	Project Engineers, Supervisors and Safety Officer.

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Lack of Awareness on Hazards and Risk Unsafe use of Equipment's, Unsafe Acts due to Lack of Safety Awareness Newly Joined Employees or Young Employees. Unfamiliarity of the Workplace, Tools, Equipment's and Procedures.						to work system, safe use of ladders, scaffolds, LOTO System, etc. •Prior to commence the task, ensure that the work area is clear or no obstacle to prevent slip, trip and fall. •Permit to work system must be applied prior of any critical activity. •Risk assessment / safe working procedure to be communicated with concern operatives during Toolbox Talk •Close monitoring and supervision on newly joined employee. •Ensure adequate fire extinguishing equipment is located at the work site. •Provision of appropriate PPE's (Safety helmet, Goggles, Mask, Coverall, Hand Gloves, Safety Shoes).				
Pressure Testing Failure of Pipes and Connectors, Poor Supervision during Filing, pressurizing, Depressurization and Dewatering and Inadequate	Contractor employees, others	• Over pressurizing will lead to explosion, Damages to Plant and Equipment. • Minor to Major Injuries acquired from sudden release of energy/high water pressure.	4	4	16	• Permit to Work (Pressure Testing Permit) • must be applied prior of any testing activity & toolbox talk to be communicated. • Engineer/Supervisors or responsible persons shall ensure all equipment put into use are being complies with safety standard and certified to use. • Hoses, pipe connections and connectors shall be inspected on a routine basis to	1	4	4	Project Engineers, Supervisors and Safety Officer.

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Testing Procedures, Explosion / Release of Energy, Using of Pressure gauge, which is not calibrated, Unaware of other operatives about the pressure test.						check for any defects, which may have occurred through wear & tear or abuse. • Consider the forces that would be present if any of the portion of the system failed while filling, under testing, depressurizing, or dewatering. Also consider potential of water hammer, potential for leakage of isolation valves, variable system pressures. • Barricade the area of Pressure Points and provide signage's on all pressurized pipes.				
Use of Power & Hand Tools (Portable drill machine and other power tools)	Contractor Employee Others	• Fatigue • Trigger finger • Cuts and abrasions	3	3	9	1.Defective tools should not be issued or used to perform the task, to be checked by storekeepers 2.Dont extend the spanner by using a pipe as an extension bar 3.Hand tools shall be free from oil, grease &etc. 4. Avoid use of damaged & defective tools. Use the right tools for the right jobs. 5. Risk assessment & safe working procedure to be communicated with concern operatives during Toolbox Talk. 6. Continuously monitoring and supervision 7.. Use of PPE's, Safety helmet, Goggles, Mask, Coverall, Hand Gloves, Safety Shoes.	1	3	3	Engineer Supervisor/ Foreman HSE Officer

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Working at night: • Working Alone During night shift • Insufficient illumination • Adjacent traffic • Struct by equipment Working without supervision.	Contractor, Employee & Others	Human Injury, Human error, Hand Injury, Ill health and sickness.	4	4	16	• Activity-specific task briefing must be conducted • To provide the lighting meeting the QCS 2014, section 11, 1.5.3 • To check the illumination level as per requirement by lux meter from a competent person. • Lighting for the vehicle must be in good order • Obtain a night work permit, before starting the activity • Night-time work procedure to be followed. • No lone working policy to be implemented and enforced. • Banksman to have red and green light battens during night work activity. • Provide hard barricades/barriers/fencing and warning signage. • Cover / close all service holes/openings. • Ensure that the work area/access area is properly cleaned and free from obstruction.	1	4	4	Engineer Supervisor/ Foreman HSE Officer

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						• The object of area lighting should be to produce an overall level of illumination sufficient for workmen and vehicles to move safely. Every part of the area should receive light from at least two directions to avoid dangerous, dense shadows. • Ensure that welfare facilities are provided, especially rest shelter areas. • First aider and standby Emergency vehicle to be available full-time. • Suitable and sufficient accessway for emergency vehicles shall be maintained. • Good housekeeping being done at the site				
Working in Extreme temperature Expose to sunlight/ high temperature/ humidity- Heat Stress related illness, lone work, in adequate ventilation, lack of knowledge.	• Contractor • Employee • Public • Environment • Others	• Heat Stress • Heat stokes • Muscle cramp • Headache	4	4	16	• Reschedule work to cooler periods in the daytime and cooler places to avoid working in hot environments for prolonged periods as far as possible. Provide heat stress training to the workers. • Reduce the physical demand on workers by minimizing manual work through using of mechanical aids (such as forklifts, loaders, and mechanical hoists)	1	4	4	Engineer Supervisor/ Foreman HSE Officer

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						• All operatives shall be familiar with emergency procedures, First aid, and emergency procedures for heat stroke and its impact on health. • Provide adequate ventilation using Pedestal Fan • Encourage operatives to drink plenty of fluids to prevent dehydration. • Allow workers to take regular breaks or rotate to other duties to work in different locations to cool down and reduce their exposure to the hot environment. • No lone working is allowed during peak summer times. 8. Drink ORS to maintain body fluid levels and minerals in the body.				

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12.2 Inspection Checklist