Geotechnical Engineering Limited

SITE SPECIFIC RISK ASSESSMENT

PROJECT NAME	PWLL	CONTRACT NUMBER	37215	DATE	27-Jan-23
DEVELOPMENT TEAM (NAME & POSITION)		**REVIEWED BY (NAME & POSITION)**		**REVISION**	
CHRIS MORGAN	CONTRACT MANAGER	RICHARD DAVIES	CONTRACT MANAGER	2	

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CONTROL MEASURES FOR TASK-SPECIFIC REQUIREMENTS)

Cotton overalls; safety boots; safety helmet; safety gloves; light eye protection; high visibility vest / jacket

Minimum PPE not required for the following activities:

LIKELIHOOD	**(L)**	**L = Frequent (5) - Probable (4) - Occasional (3) - Improbable (2) - Remote (1)**
SEVERITY	**(S)**	**S = Catastrophic (5) - Major (4) - Reportable (3) - Serious (2) - Minor (1)**
RISK	**(R)**	**R = LIKELIHOOD x SEVERITY**

Activity	What are the hazards?	Who might be harmed and how?	Initial assessment			Risk control measure	Risk after controls		
			L	S	R		L	S	R
Access to and egress from site	Conflict with pedestrians, road traffic, and other site activities associated with an active rail network.	All site staff and the general public may suffer serious injury in the event of a collision	3	3	9	1. Site access and egress to be adequately planned and controlled by AMCO. 2. Site staff to adhere to specific instructions given during the AMCO site induction and by their works supervisors/co-ordinators on site. 3. Hazard lights and amber beacons are to be employed as necessary when entering and leaving access points that interface with the road network. 4. Access to work sites for operational plant is to be undertaken during a possession controlled by AMCO.	1	3	3

Activity	What are the hazards?	Who might be harmed and how?	Initial assessment			Risk control measure	Risk after controls		
			L	S	R		L	S	R
Working near wildlife	Conflict to wildlife	All site staff may cause harm to birds	4	3	12	1. Work will not be undertaken during high spring tides and during poor weather conditions where possible 2. Works will cease during periods of very cold weather (i.e. if temperatures of 0 Celsius or below for seven or more consecutive days). This is to prevent disturbance to overwintering bird features of the SPA and Ramsar Site. 3. If flocks of resting or feeding overwintering birds are observed within the working area, works will pause until the birds are no longer present so as not to cause disturbance to overwintering birds.	2	1	2
Working on operational sites	Conflict with other site activities - rail	All site staff may suffer serious injury in the event of conflict	3	5	15	1. Co-ordinate all works with AMCO site managers, third parties and others working on site. 2. All works shall be planned and recorded as part of the Works Package Plan. 3. Shifts will commence with a briefing given by site safety personnel (COSS) who will detail all rail specific hazards associated with the area of works on that given shift. 4. The COSS will control any interface between ground investigation activities and other works that may be being undertaken on the rail network. 5. Site staff will remain vigilant for any unauthorised access into the works area. If unauthorised access occurs, works will cease and plant will be isolated until the intruding person(s) has been moved to a position of safety.	1	5	5
Working on Network Rail Infrastructure	Interface with railway infrastructure	Damage may be caused to Network Rail infrastructure which may impact on the operation of the railway	3	4	12	1. Work sites and access routes to be inspected by the site team prior to works commencing. 2. Exploratory holes to positioned away from Network Rail infrastructure (overhead power lines, stanchions and cable troughs).	1	4	4

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			L	S	R		L	S	R
Working on Network Rail Infrastructure	General site activity	Staff unfamiliar with the Railway environment may be exposed to signififcant risk of personnal injury.	4	5	20	1. Only PTS trained personel (or those with a TVP) will be engaged on the project. 2. All PTS works must take place under the supervision of a SWL and appropriate safety critical staff provided by AMCO under an appropriate SSOW with a daily briefing. 3. Only use mobile phones in a position of safety. 4. Keep all equipment away from where any train movement may strike or move it. 5. Always wear all orange PPE with blue or white hard hat and lace up ankle boots with steel toe and mid-sole.	1	5	5
Working on Network Rail Infrastructure	Vegetation and fly tipped waste	Site staff may suffer injury from trip hazards obscured by vegetation or hazards associated with fly tipped waste	2	2	4	1. Site and vegetation clearance to be undertaken prior to intrusive works by AMCO. 2. Carefully check walking routes for voids or obstructions.	1	2	2
Working on Network Rail Infrastructure	Fatigue	Site operatives and third parties may suffer if lack of concentration leads to accident or incident	3	5	15	1. Managers to consider driving/working time when programming and planning works. 2. Ensure tachograph breaks are taken when applicable 3. Adhere to Client specific regulations (e.g. Network Rail working hours) and AMCO 12 hour door to door policy. 4. Take minimum rest periods between shifts. Staff to consult line manager if they are likely to exceed working hours.	1	5	5
Working on Network Rail Infrastructure	Train movements	Site staff may be seriously, even faltally injured if struck by a train.	4	5	20	1. Obey SWL briefing instructions. 2. Stay within site limits/PLBs. 3. Always know which lines (if any) are blocked. 4. Only start work on SWL instruction. 5. Avoid working in poor visibility conditions - make sure sighting distances are available. 6. Obey 10 second notice period to get to a position of safety. Use adequate lighting. 7. Keep communication lines open. 8. Wear clean correct PPE.	1	5	5

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Working on Network Rail Infrastructure	Plant access and egress	Falling rig can foul the line endangering staff and public	3	5	15	1. Use authorised barrow crossings or in protection/possession where possible. 2. Check the whole access route (cess, 4 foot, 6 foot and 10 foot) for any obsructions prior to tracking. 3. Use timbers to build up a staggered platform either side of, and between the running rails with a sufficient width for the tracks. 4. Have a contingency plan in the event of a breakdown (e.g. tirfor winch, jump leads and battery pack, etc.)	1	5	5
Working on Network Rail Infrastructure	Unloading / loading ancillary equipment	Staff could suffer back pain from lifting and moving heavy or awkward items	4	3	12	1. Staff to receive manual handling training. 2. Move vehicles as close to the working area to minimise carrying distances. 3. Break down loads to smaller units where possible. 4. Two operatives required for all rail trolley lifts. 5. Use mechanical means (powered or otherwise) as opposed to manual lifting wherever possible. 6. Assess any individual load and alternative means prior to completing any lifting operation.	1	3	3
All intrusive works - YELLOW category sites	Ground contamination	All site staff and the environment causing health issues or environmental damage	3	2	6	1. Stop work immediately if ground contamination concentrations are measured or suspected to exceed safe levels. Site staff to be empowered accordingly. 2. Adhere to site specific instructions. 3. Wear additional disposable PPE (tyvex coveralls and gloves)	1	2	2
All intrusive works	Protection and delineation of work sites	All site staff and the general public may suffer serious injury in the event of conflict	4	4	16	1. Vortok fencing will be established on site by AMCO. 2. Where works are proximal to the rail network, all works will be undertaken behind vortok fencing. 3. The COSS in control of the works area will ensure that no individual leaves the safe working zone.	2	4	8

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All intrusive works	Visibility of site staff to others	All site staff may suffer serious injury in the event of conflict	4	3	12	1. Wear full high visibility PPE in accordance with Network Rail requirements at all times. 2. Any PPE that becomes dirty or falls into disrepair will be replaced as soon as possible. 3. When working at night, head torches will be mandatory for all personnel.	1	3	3
Site security	Theft, vandalism or unauthorised access to plant and equipment	Unauthorised third parties may suffer serious injury if they climb on or tamper with plant	3	3	9	1. Do not leave keys in ignition when vehicle is not in use. 2. Lock vehicles and cabins when working remotely and between operational shifts. 3. Isolate plant and secure ancillary plant and equipment between shifts.	1	3	3
Drilling with Modular Rig	Loading / unloading rig on vehicle	Staff and third parties may suffer serious, possibly fatal, injury if struck by a vehicle	3	4	12	1. Vehicle movements to be kept to a minimum and local speed limits observed. 2. Reversing operations to be supervised by a third party / marshal. 3. Comply with site specific instructions.	1	4	4
Drilling with Modular Rig	Rig movements on site	Staff and third parties may suffer serious, possibly fatal, injury if struck by toppling plant	4	4	16	1. No gradient greater than 40° may be traversed with the equipment. 2. This gradient may need to be reduced further depending on the advice and opinion of the driller.	1	4	4
Drilling with Modular Rig	Rig stability	Staff and third parties could suffer serious possibly fatal injuries if the rig toppled or moved	4	4	16	1. Lead driller to ensure the borehole position is located on ground that it is stable enough to take the weight of the machine.	1	4	4

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			L	S	R		L	S	R
Drilling with Modular Rig	Setting up the rig and the work area	Staff could suffer eye irritation and breathing difficulties from toxic exhaust fumes, eg carbon monoxide	4	4	16	1. If possible, position the powerpack downwind from the borehole so that the crew are not subject to exhaust fumes.	1	4	4
Drilling with Modular Rig	Setting up the rig and the work area	Staff could suffer back pain from lifting and moving heavy or awkward items	4	3	12	1. If possible, position the powerpack downwind from the borehole so that the crew are not subject to exhaust fumes. 2 ground to be flat level, wide enough for rig legs, timbers under each leg.	1	3	3
Drilling with Modular Rig	Unloading / loading ancillary drilling equipment	Staff may suffer injuries such as fractures or bruising if they trip over objects	4	4	16	1. Staff to receive manual handling training. 2. Move vehicles as close to the working area to minimise carrying distances. 3. Break down loads to smaller units where possible. 4. Assess load prior to lifting.	1	4	4
Drilling with Modular Rig	Mechanical breakdown	Staff and third parties may suffer serious injury in the event of a mechanical breakdown	4	4	16	1. Only essential equipment needed for the operation to be unloaded from vehicles. 2. Drill string to be placed in a safe location and hand tools to be placed in tool box, buckets or containers when not in use.	1	4	4
Drilling with Modular Rig	Mechanical breakdown	Staff and third parties may suffer serious injury in the event of a mechanical breakdown	4	4	16	1. Rig serviced and maintained in accordance with the manufacturer's instruction / operators compliance. 2. Rig inspected annually by third party in accordance with LOLER & PUWER regulations. 3. Lead Driller to complete rig daily/weekly inspection prior to use to ensure the rig is in a serviceable and safe condition. 4. Drill crew to stay alert to any indication of mechanical fault developing during use e.g. exhaust fumes, vibrations, hydraulic leaks / hose wear or other symptoms. 5. Lead Driller to ensure he has a fully stocked spill kit in support vehicle.	1	4	4

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Drilling with Modular Rig	Unserviceable / missing safety devices	Operator may suffer serious, possible fatal injury if machine is unsafe	4	5	20	1. Lead Driller to complete a daily check of all emergency stops prior to commencing work to ensure they are in working order. 2. If defects are identified DO NOT START WORKS and arrange for repair or replacement.	1	5	5
Drilling with Modular Rig	Damaged or worn drill string	Staff could suffer splinters and cuts from worn/burred threads	5	2	10	1. Clean and lubricate drill string threads. 2. Check for sharp edges before use and file where necessary.	1	2	2
Drilling with Modular Rig	Adding and retrieving drill rod, conductor casings and barrels	Staff could suffer back pain from lifting and carrying drill string	4	3	12	1. Only lift / carry individual tooling items i.e. not rods attached to barrels etc. 2. Ensure gloves are free from grease etc when handling drill strings.	1	3	3
Drilling with Modular Rig	Adding and retrieving drill rod, conductor casings and barrels	Staff could suffer serious impact, trapping, pinching or crushing injuries when handling drill strings	4	4	16	1. Lead Driller to ensure he has a clear view of any crew member handling equipment or taking part in the activity. 2. Do not insert hands into the bottom of casing or barrels when lifting to of from rig. 3. Hands should never be placed on the bottom of barrels when inserting it into the top of the casing. 4. Hands should be clear of rod forks when rig is lifting string from hole	1	4	4
Drilling with Modular Rig	Adding and retrieving drill rod, conductor casings and barrels	Staff may suffer sprains or fractures if they trip or slip whilst walking drill string to and from rig	3	4	12	1. Keep walkways clear of tools and clear away used liners etc. 2. Drill sting to be placed away from the work area and hand tools to be put in toolbox, buckets or containers when not in use.	1	4	4

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Drilling with Modular Rig	Adding and retrieving drill rod, conductor casings and barrels	Staff could suffer with dermatitis or possibly skin cancer from prolonged contact with greases mineral oils	4	4	16	1. Drill crew to wear gloves. 2. Overalls to be worn as supplied.	1	4	4
Drilling with Modular Rig	Dynamic sampling	Staff and others may suffer hearing damage from exposure to noise from the hydraulic hammer	4	3	12	1. Hearing protection (SNR 30 dB helmet mounted ear defenders) must be worn by all crew members when dynamic sampling . 2. Warn other site users i.e. members of public other contractors etc if they are close to your work area. 3. Drill crew to keep good visual contact with each other and use hand signals as appropriate.	1	3	3
Drilling with Modular Rig	Breaking threaded connection	Staff my suffer sprains and strains from breaking drill strings	4	3	12	1. “Cheater” bars should not be used to extend the handle of any wrench to obtain more leverage. 2. Tap "fast" joints with hammer to loosen if they are tight, keeping fingers well clear.	1	3	3
Drilling with Modular Rig	Breaking threaded connection	Staff may suffer pinch or crushing injuries whilst breaking threaded connections	4	4	16	1. Lead Driller must ensure the Driller's hands are clear of the mushroom / drill head prior to operation. 2. Hands should never be placed on wrenches where they can be trapped between the wrench and the rig. 3. If the drill string or sample is accidentally or inadvertently released into the hole, do not attempt to grab with your hands or a wrench.	1	4	4
Drilling with Modular Rig	Removing core from barrels	Staff may suffer injuries such as fractures or bruising if they trip or slip whilst breaking string	4	4	16	1. Secure sample barrel in vice. 2. Maintain good housekeeping standards and clean up any spoil or water spillages immediately. Drill cuttings and general waste must be bagged-up and removed from working area.	1	4	4

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Drilling with Modular Rig	Removing core from barrels	Staff may suffer injuries such as fractures or bruising if air becomes compressed in sample barrel	5	3	15	1. When core is being removed from a barrel, personnel should keep their body and hands out of line of the end of the barrel. 2. Barrels should be cleaned after each run, all vent holes should be checked and cleaned as necessary.	1	3	3
Drilling with Modular Rig	Removing core from barrels	Staff my suffer sprains and strains if sample and liner becomes tight in barrel	3	3	9	1. Use barrel extension and tap end of barrel on wooden sleeper to free sample/liner.	1	3	3

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CHRIS MORGAN	CONTRACT MANAGER	RICHARD DAVIES	CONTRACT MANAGER	2	

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CONTROL MEASURES FOR TASK-SPECIFIC REQUIREMENTS)

Cotton overalls; safety boots; safety helmet; safety gloves; light eye protection; high visibility vest / jacket

Minimum PPE not required for the following activities:

Driving

LIKELIHOOD	**(L)**	**L = Frequent (5) - Probable (4) - Occasional (3) - Improbable (2) - Remote (1)**
SEVERITY	**(S)**	**S = Catastrophic (5) - Major (4) - Reportable (3) - Serious (2) - Minor (1)**
RISK	**(R)**	**R = LIKELIHOOD x SEVERITY**

Activity	What are the hazards?	Who might be harmed and how?	Initial assessment			Risk control measure	Risk after controls		
			L	S	R		L	S	R
All site activity	Vehicle movements on site	Staff and third parties may suffer serious, possibly fatal, injury if struck by a vehicle	3	4	12	1. Vehicle movements to be kept to a minimum and local speed limits observed. 2. Reversing operations to be supervised by a third party or marshal. 3. Comply with site specific instructions.	1	4	4
All site activity	Unknown hazards on site.	Staff and third parties may suffer serious injuries due to unknown hazards on site	4	3	12	1. Site engineer and / or lead driller to carry out site walkover with supervising Engineer /Client (if available), to ensure the site is suitable for vehicles, plant and personnel e.g. overhead services and obstructions, ground conditions, trip hazards, debris, sharps, slippery conditions etc.	1	3	3
All site activity	Dermatitis	Site operatives contracting skin disorders	4	3	12	1. Avoid direct contact with materials such as detergents, chemicals, solvents, cement and bentonite powder. 2. Dry hands thoroughly after washing. 3. Always wear gloves and long sleeved clothing when handling detergents, chemicals or solvents.	1	3	3

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Activity	What are the hazards?	Who might be harmed and how?	Initial assessment			Risk control measure	Risk after controls		
			L	S	R		L	S	R
All site activity	Leptospirosis and Weil's Disease	Site operatives contracting disease	3	4	12	1. Avoid working in areas infested with rats or occupied by cattle. 2. Cover all existing open wounds. 3. Wash cuts and grazes immediately with soap and water. 4. Use alcohol wipes and a sterilised dressing. 5. Wash hands prior to eating, drinking or smoking. 6. Keep arms and legs covered on potentially hazardous sites. 7. Inform supervisor immediately if you feel unwell.	1	4	4
All site activity	Poor standards of personal hygiene	Health issues affecting all site staff	4	2	8	1. Wash hands and forearms before eating, drinking or smoking.	1	2	2
All site activity	Contact with potentially contaminated materials	Staff may suffer ill health from contact with contaminated materials	3	4	12	1. If the presence of contaminated material is suspected or observed, unknown odours or unusual symptoms are experienced (such as headache or nausea), work must be suspended, the work area made safe and evacuated immediately and the Supervising Engineer and Contract Manager notified.	1	4	4
All site activity	Cross contamination and disturbance of soil and/or water	Environmental impact	3	4	12	1. All staff to be briefed on site specific protection measures. 2. Rods should be drained into the pit or tank. 3. Drill flush to be disposed of in line with instructions on Fieldwork Brief. 4. Do not drain to foul sewer. 5. Spoil to be bagged and/or disposed of in line with site specific instruction. 6. Skip hire via reputable hire companies with appropriate chain of custody paperwork in place.	1	4	4
All site activity	Contamination of waterways/drains	Environmental impact	3	3	9	1. Any near-water works should be bunded to prevent run off. 2. Do not drain fluids to foul sewer.	1	3	3

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Activity	What are the hazards?	Who might be harmed and how?	Initial assessment			Risk control measure	Risk after controls		
			L	S	R		L	S	R
All site activity	Fuel spillages	Environmental impact	3	3	9	1. Spill kits must be sited next to plant during refuelling operations. 2. Fuel must never be poured down drains or into watercourses or into any other areas harmful to the environment. 3. Waste fuels or cleaning-up materials must be stored in appropriate containers and disposed of in the appropriate manner.	1	3	3
Driving	Driver competence	Drivers, passengers and third parties may suffer serious injury in the event of road accident	3	4	12	1. Drivers only permitted to drive if they hold a valid UK driving licence that covers the class of vehicle to be driven. 2. Licences checked with DVLA periodically. 3. Provide driver training for all key drivers. 4. Speed limits to be adhered to for type and class of vehicle being driven.	1	4	4
Driving	Mechanical breakdown	Drivers, passengers and third parties may suffer serious injury in the event of road accident	3	2	6	1. Vehicles serviced and maintained in accordance with the manufacturer's instruction / operators compliance. 2. Vehicle checked by driver for defects prior to use. 3. During journey driver and passenger to be alert to any indication of vehicle fault developing e.g. Warning lights, excessive exhaust fumes, vibrations or other symptoms.	1	2	2
Driving	Driving an unstable/ overloaded vehicle	Drivers, passengers and third parties may suffer serious injury in the event of road accident	3	3	9	1. Vehicle payload and individual axles weights must not be exceeded. 2. Vehicle load to be distributed evenly across the axles and secured within the vehicle. 3. Drivers to take account of the vehicles weight and effect on handling and stopping distances. 4. Use weigh plates or weigh bridge if available.	1	3	3

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			L	S	R		L	S	R
Driving	Adverse weather conditions	Drivers, passengers and third parties may suffer serious injury in the event of road accident	3	4	12	1. Vehicle to be maintained for winter conditions. 2. Consider public transport. 3. Delay or avoid taking journey if possible. 4. Reduce speed to allow for weather conditions.	1	4	4
Driving	Driver fatigue	Drivers, passengers and third parties may suffer serious injury in the event of road accident	3	4	12	1. Managers to consider driving / working time when programming and planning works. 2. A break totalling at least 45 minutes to be taken for every $4^1/_2$ hours of continuous or accumulated driving. 3. Driving to be shared during long journeys where possible. 4. Ensure a minimum of 9 hours rest between shifts. 5. Driving is prohibited when drivers are suffering from fatigue. It's the driver's responsibility to stop and rest.	1	4	4
Driving	Influence of alcohol or drugs	Drivers, passengers and third parties may suffer serious injury in the event of road accident due to impaired reaction times	3	4	12	1. Driving company vehicles under the influence of drugs and/or alcohol is strictly prohibited (and will be classed as gross misconduct). 2. Drivers must not drive if they are taking prescribed medication which is know to cause drowsiness. 3. Conduct periodic drug and alcohol testing.	1	4	4
Driving	Driving when using a mobile phone	Drivers, passengers and third parties may suffer serious injury in the event of road accident	3	4	12	1. Do not use mobile telephone or similar device whilst driving. Stop and phone caller back when safe to do so. 2. Avoid calling staff members if they are known to be driving.	1	4	4

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Driving	Vehicle breakdown	Drivers, passengers and third parties may suffer serious injury in the event of road accident	3	4	12	1. Park vehicle away from the dangers of other road users. 2. Turn on vehicle hazard lights and amber beacon where fitted. 3. If on motorway, park vehicle on hard shoulder as far way from the live carriageway as possible. 4. Call for assistance if required and wait for recovery away from the vehicle in a safe place. 5. Wear a high visibility vest/coat.	1	4	4
Avoiding buried services	Insufficient planning	Staff and third parties may suffer serious, possible fatal injuries if a buried service is damaged	3	4	12	1. GEL Permit to Dig must be in place for the project or specific borehole location. 2. All available plans and other suitable information regarding underground services in the area of concern must be referred to when work is planned and made available on site when locating exploratory holes.	1	4	4
Avoiding buried services	Striking buried services	Staff and third parties may suffer serious, possible fatal injuries if a buried service is damaged	3	4	12	1. Visual inspection of proposed exploratory locations must be undertaken to identify potential underground hazards. 2. Positions must be set out to avoid the known or traced location of underground services. 3. Locations must be scanned with a CAT. If underground services are detected the Client or Site Supervising Engineer and Contract Manager must be informed immediately before continuing further. 4. At least one member of each operational crew shall be in possession of a current and valid service avoidance (CAT) training certificate. 5. Where suitable, routes of services to be marked on the ground surface with waterproof crayon, chalk or paint.	1	4	4

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Avoiding buried services	Uncovering a buried service	Staff and third parties (including members of public) may suffer serious, possible fatal injuries if a buried service is damaged	3	4	12	1. Use CAT at regular intervals where safe and practical to do so (i.e.. shallow and stable excavations). 2. Where a CAT indicates the presence of buried service, power tools should only be used to penetrate surface hardstanding. 3. It least one member of staff on site will be trained in safe digging practices. 4. If damage is suspected confirm with the utility company to verify the safety of the service before any further work takes place.	1	4	4
Excavating inspection pits and trenches by hand	Manual handling	Staff could suffer from back injury and long-term pain if regularly lifting/carrying heavy or awkward objects	4	3	12	1. Staff to receive manual handling training. 2. Park vehicles as close as possible to work area to minimise carrying distances. 3. Whenever possible use mechanical aids such as wheel barrows to assist with movement of loads.	1	3	3
Excavating inspection pits and trenches by hand	Slips trips and falls	Staff and third parties may suffer sprains or fractures if they trip over waste material or fall into open excavations	4	4	16	1. Good housekeeping to be maintained at all times. 2. Spoil and general waste to be bagged-up or stored in a safe area. 3. Excavations must not be left unattended unless suitable signage and fencing is in place.	1	4	4
Drilling with Pioneer Rig	Loading / unloading rig on vehicle	Staff and others may suffer serious, possible fatal, injury if rig fell from vehicle during loading operations	4	4	16	1. Load / unload rig in designated area on firm level ground. 2. Vehicle hand brake to be applied and ramps securely fitted to the body of the vehicle. 3. Operator to track unit onto and off vehicle remotely and NOT using the controls on the rig. 4. Personnel not directly involved in loading operations to remain at a safe distance.	1	4	4

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Drilling with Pioneer Rig	Securing rig on vehicle	Operator may suffer serious, possible fatal, injury if they fell from vehicle whilst attaching/detaching rig straps	4	4	16	1. Operator to maintain three points of contact when climbing on/off bed of vehicle. 2. Operator not to walk backwards on vehicle, or jump from rig or vehicle bed.	1	4	4
Drilling with Pioneer Rig	Driving to and from site	Staff and third parties may suffer serious, possibly fatal, injury if they had a vehicle accident.	4	4	16	1. Complete vehicle check prior to journey. 2. Speed limits must be observed. 3. Seat belts must be worn as per company policy/handbook. 4. Driving to/from site (single occupancy). Ring Contract Manager before leaving site/when arriving on site. 5. Department Manager to check vehicle tracker of driver is late arriving to site/office. 6. Take regular breaks. 7. Follow breakdown/accident procedures where required.	1	4	4
Drilling with Pioneer Rig	Vehicle movements on site	Staff and third parties may suffer serious, possibly fatal, injury if struck by a vehicle	3	4	12	1. Vehicle movements to be kept to a minimum and local speed limits observed. 2. Reversing operations to be supervised by a third party/marshal to oversee the manoeuvre. 3. Comply with site specific instructions.	1	4	4
Drilling with Pioneer Rig	Rig movements on site	Staff and third parties may suffer serious, possibly fatal, injury if struck by moving plant	3	4	12	1. Rig movements must be planned and supervised by a third party / marshal. 2. A safe distance (>5.0m) must be kept by personnel not directly involved in moving the rig.	1	4	4

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Drilling with Pioneer Rig	Setting up the rig and the work area	Staff and third parties could suffer serious possibly fatal injuries if the rig toppled or moved	4	4	16	1. Lead Driller to ensure the borehole position is located on reasonably level ground that is stable enough to take the weight and pullback of the machine. 2. Wooden blocks to be positioned under all hydraulic jacks to spread the ground load before raising the mast and levelling the machine.	1	4	4
Drilling with Pioneer Rig	Setting up the rig and the work area	Staff could suffer eye irritation and breathing difficulties from toxic exhaust fumes, eg carbon monoxide	4	3	12	1. If possible, position the engine downwind from the borehole so that the crew are not subject to exhaust fumes.	1	3	3
Drilling with Pioneer Rig	Unloading / loading ancillary drilling equipment	Staff could suffer back pain from lifting and moving heavy or awkward items	4	4	16	1. Staff to receive manual handling training. 2. Move vehicles as close to the working area to minimise carrying distances. 3. Break down loads to smaller units where possible. 4. Assess load prior to lifting.	1	4	4
Drilling with Pioneer Rig	Unloading / loading ancillary drilling equipment	Staff may suffer injuries such as fractures or bruising if they trip over objects.	4	4	16	1. Only essential equipment needed for the operation to be unloaded from vehicles. 2. Drill string to be placed on trestles and hand tools to be put in toolbox, buckets or containers when not in use.	1	4	4

RISK ASSESSMENT

Activity	What are the hazards?	Who might be harmed and how?	Initial assessment			Risk control measure	Risk after controls		
			L	S	R		L	S	R
Drilling with Pioneer Rig	Mechanical breakdown	Staff and third parties may suffer serious injury in the event of a mechanical breakdown	4	4	16	1. Rig serviced and maintained in accordance with the manufacturer's instruction / operators compliance. 2. Rig inspected annually by third party in accordance with LOLER & PUWER regulations. 3. Lead Driller to complete rig daily/weekly inspection prior to use to ensure the rig is in a serviceable and safe condition. 4. Drill crew to stay alert to any indication of mechanical fault developing during use e.g. exhaust fumes, vibrations, hydraulic leaks / hose wear or other symptoms. 5. Lead Driller to ensure he has a fully stocked spill kit at the site of works.	1	4	4
Drilling with Pioneer Rig	Failure of equipment / lifting accessories	Staff and third parties may suffer serious injury in the event of a equipment failure	4	4	16	1. Lifting accessories to be inspected and tested as necessary on a six monthly basis. 2. Equipment and lifting accessories to be visually inspected at the start of each shift. 3. Defective equipment or lifting accessories to be removed from service immediately.	1	4	4
Drilling with Pioneer Rig	Unserviceable / missing safety devices	Operator may suffer serious, possible fatal injury if machine is unsafe	4	4	16	1. Lead Driller to complete a daily check of all emergency stops prior to commencing work to ensure they are in working order. 2. Lead Driller to complete a daily check of the interlocking guard system prior to commencing work to ensure it is fully functional in both forward and reverse gears. 3. Lead Driller to ensure the winch cable stop is fitted. 4. If defects are identified DO NOT START WORKS and arrange for repair or replacement.	1	4	4
Drilling with Pioneer Rig	Damaged or worn drill string	Staff could suffer splinters and cuts from worn/burred threads	5	2	10	1. Clean and lubricate drill string threads. 2. Check for sharp edges before use and file where necessary.	1	2	2

RISK ASSESSMENT

Activity	What are the hazards?	Who might be harmed and how?	Initial assessment			Risk control measure	Risk after controls		
			L	S	R		L	S	R
Drilling with Pioneer Rig	Adding and retrieving drill rod, conductor casings and barrels	Staff could suffer back pain from lifting and carrying drill string	4	3	12	1. Use rig winch to assist with lifting drill string in and out of borehole. Do not complete this exercise manually. 2. Ensure gloves are free from grease, polymer, etc. when handling drill strings.	1	3	3
Drilling with Pioneer Rig	Adding and retrieving drill rod, conductor casings and barrels	Staff could suffer serious impact, trapping, pinching or crushing injuries when handling drill strings	4	4	16	1. Lead Driller to ensure he has a clear view of any crew member handling equipment or taking part in the activity. 2. Do not insert hands into the bottom of casing or barrels when lifting to or from rig. 3. Hands should never be placed on the bottom of barrels when inserting it into the top of the casing. 4. Staff should kept at a safe distance from wire ropes being used for hoisting and lowering. They should never straddle them or reach across them. 5. Ensure trestles are level and secure.	1	4	4
Drilling with Pioneer Rig	Adding and retrieving drill rod, conductor casings and barrels	Staff may suffer sprains or fractures if they trip or slip whilst walking drill string to and from rig	3	4	12	1. Keep walkways alongside trestles clear of tools and clear away used liners etc. 2. Drill string to be placed on trestles or away from the work area and hand tools to be put in toolbox, buckets or containers when not in use.	1	4	4
Drilling with Pioneer Rig	Dynamic sampling	Staff and others may suffer hearing damage from exposure to noise from the hydraulic hammer	4	3	12	1. Hearing protection (SNR 30 dB helmet mounted ear defenders) must be worn by all crew members when dynamic sampling. 2. Warn other site users i.e. members of public, other contractors etc if they are close to your work area. 3. Drill crew to keep good visual contact with each other and use hand signals as appropriate.	1	3	3

RISK ASSESSMENT

Activity	What are the hazards?	Who might be harmed and how?	Initial assessment			Risk control measure	Risk after controls		
			L	S	R		L	S	R
Drilling with Pioneer Rig	Breaking threaded connection	Staff my suffer sprains and strains from breaking drill strings	4	3	12	1. The break out system should be used, where possible for breaking thread connections. 2. “Cheater” bars should not be used to extend the handle of any wrench to obtain more leverage. 3. Tap "fast" joints with hammer to loosen if it is tight, keeping fingers well clear.	1	3	3
Drilling with Pioneer Rig	Breaking threaded connection	Staff may suffer pinch or crushing injuries to whilst breaking threaded connections	4	3	12	1. Lead Driller must ensure the Drillers hands are clear of the rod holder/breaker prior to operation. 2. Hands should never be placed on wrenches where they can be trapped between the wrench and the rig. 3. If the drill string or soil/core sample is accidentally or inadvertently released into the hole, do not attempt to grab with your hands or a wrench.	1	3	3
Drilling with Pioneer Rig	Breaking threaded connection	Staff may suffer injuries such as fractures or bruising if they trip or slip whilst breaking string	4	4	16	1. Maintain good housekeeping standards and clean up any spoil or water spillages immediately. 2. Drill cuttings and general waste must be bagged-up and removed from working area. 3. Use boards or mats if conditions become too slippery to work safely.	1	4	4
Drilling with Pioneer Rig	Removing core from barrels	Staff may suffer injuries such as fractures or bruising if air becomes compressed in sample barrel	5	3	15	1. When core is being removed from a barrel, personnel should keep their body and hands out of line of the end of the barrel. 2. Barrels should be cleaned after each run, all vent holes should be checked and cleaned as necessary.	1	3	3
Drilling with Pioneer Rig	Removing core from barrels	Staff my suffer sprains and strains if sample and liner becomes tight in barrel	3	3	9	1. Use barrel extension and tap end of barrel on wooden sleeper to free sample/liner.	1	3	3

RISK ASSESSMENT

Activity	What are the hazards?	Who might be harmed and how?	Initial assessment			Risk control measure	Risk after controls		
			L	S	R		L	S	R
Drilling with Pioneer Rig	Rotary core drilling / flushing casing	Staff may suffer injuries such as fractures or bruising if they slip on wet surfaces	4	3	12	1. Re-circulate drilling flush to avoid spillage. 2. Clean-up any water flush that returns to surface (brush from work area). 3. Use boards or mats if conditions become too slippery to work safely.	1	3	3
Drilling with Pioneer Rig	Rotary core drilling / flushing casing	Staff and third parties may suffer serious, possibly fatal, injury if drawn into rotating drill string	4	4	16	1. Drill fitted with a movable guard of steel frame and mesh construction with interlock system to cut power to the drill head when access is required to the danger zone. 2. The interlock guard MUST NEVER be bypassed under ANY circumstance.	1	4	4
Refuelling plant	Fire and explosion	Staff could suffer severe or fatal burns from fire or explosion	4	4	16	1. Only approved type of fuel containers to be used and all containers must be clearly labelled as to the contents. 2. Plant must be switched off before refuelling, or topping up. 3. Funnels with in-built screens must be used to prevent spillages and splashes. 4. Tanks and cans must not be overfilled and room must be left for possible expansion of fuel. 5. If fuel is spilled on the outside of tanks or cans during filling operations, it must be cleaned away immediately and cleaning materials placed in rubble sack and disposed of in an appropriate manner. 6. Any leaks in fuel tank/lines must be repaired immediately. 7. Fuel cans must be stored in support vehicle when not in use. 8. 2kg dry powder fire extinguisher must be carried in each support vehicle and checked regularly.	1	4	4

RISK ASSESSMENT

Activity	What are the hazards?	Who might be harmed and how?	Initial assessment			Risk control measure	Risk after controls		
			L	S	R		L	S	R
Refuelling plant	Skin contact with fuels	Skin contact can lead to staff getting dermatitis	4	2	8	1. Nitrile gloves to be worn when handling fuels. 2. Overalls replaced if contaminated with fuel. 3. Risks from dermatitis explained to staff, and staff trained to spot (and report) any early signs of dermatitis, ie dry, red, itchy skin 4. Wash off any splashes on skin immediately with soap and water.	1	2	2
Water bowsering	Instability of vehicle caused by movement of water in the vessel	Driver and third parties from road or site traffic incident or collision or vehicle instability	4	4	16	1. Use baffled water containers wherever possible. 2. Discharge excess water prior to travelling if possible. 3. Reduce speed, particularly when covering rough or uneven ground or manoeuvring. 4. Ensure load is secure before travelling. 5. Do not exceed carrying capacity of vehicle.	1	4	4
Logging and sub-sampling	Injury caused by lifting heavy or awkward loads	Site staff may suffer back or limb injuries from lifting core boxes or samples	3	3	9	1. Use mechanical aids where possible. 2. Staff to receive manual handling training. 3. Move vehicles as close to the working area to minimise carrying distances. 4. Take multiple smaller samples. 5. Assess load prior to lifting. 6. Ensure work areas are free from trip hazards.	1	3	3
Logging and sub-sampling	Splitting core / sample liner	Logging engineers / technicians sustaining cuts and wounds from knifes, sharp plastic or splinters	3	2	6	1. Use battery operated oscillating cutter wherever practical or a retractable safety knife with a sharp hooked blade and replace blades regularly. 2. Cut liner in one constant movement to prevent jagged edges. 3. Secure liner in box or trough prior to cutting. 4. When using a hooked blade, always cut away from hands or body. 5. Cut resistant gloves should always be worn when handling liner.	1	2	2

RISK ASSESSMENT

Activity	What are the hazards?	Who might be harmed and how?	Initial assessment			Risk control measure	Risk after controls		
			L	S	R		L	S	R
Moving filled core boxes	Manual handling	Staff could suffer back pain from lifting and moving heavy or awkward items	3	3	9	1. Move boxes using mechanical means where possible. 2. Use two person lifting techniques. 3. Lift box by the rope handle, replace if damaged. 4. Check rope handles are in good condition prior to lifting.	1	3	3

DYNAMIC RISK ASSESSMENT

PROJECT NAME	PWLL	CONTRACT NUMBER	37215	DATE	
DEVELOPMENT TEAM (NAME & POSITION)		REVIEWED BY (NAME & POSITION)		REVISION	

MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CONTROL MEASURES FOR TASK-SPECIFIC REQUIREMENTS)

Cotton overalls; safety boots; safety helmet; safety gloves; light eye protection

Minimum PPE not required for the following activities:

LIKELIHOOD	**(L)**	**L = Frequent (5) - Probable (4) - Occasional (3) - Improbable (2) - Remote (1)**
SEVERITY	**(S)**	**S = Catastrophic (5) - Major (4) - Reportable (3) - Serious (2) - Minor (1)**
RISK	**(R)**	**R = LIKELIHOOD x SEVERITY**

Activity	What are the hazards?	Who might be harmed and how?	Initial assessment			Risk control measure	Risk after controls		
			L	S	R		L	S	R

GENERAL

Geotechnical Engineering Limited has been instructed to carry out specified works to gather information about the site. The data obtained from the contract will form the basis of a formal report or daily record.

This method statement should be read in conjunction with the relevant risk assessment.

PERSONNEL AND SUPERVISION

All work will be carried out or supervised by competent personnel who have received training in line with the Company Training Policy. Each crew member holds a valid CSCS card. Staff will attend a site induction as instructed.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

The minimum PPE on site will be as follows:


SAFETY HELMET


LIGHT EYE PROTECTION


HI VISIBILITY TROUSERS


HIGH VISIBILITY VEST


SAFETY GLOVES


SAFETY BOOTS

FIRE

A dry powder extinguisher will be provided and maintained within each of support vehicle. When a fire breaks out that cannot be tackled by suitably trained staff with equipment that is readily available then a member of site staff shall contact the emergency services.

FIRST AID

A first aider from AGC will be on site at all times and will provide first aid. A first aid kit will be retained on site within a support vehicle. At least one member of the site team has attended a one day emergency first aid course. Where necessary the emergency services will be contacted.

WELFARE ARRANGEMENTS

AGC welfare unit we be on for the contract. They will extend to either site facilities or local public amenities for short duration projects.

ENVIRONMENTAL CONSIDERATIONS

Ground contamination may be encountered during the project and there is the potential for encountering asbestos and other harmful materials whenever Made Ground is to be investigated. Site operatives must prevent the generation of dust from the operations and ensure that site conditions are monitored.

The adequacy of PPE, Respiratory Protective Equipment (RPE) and working practices will be continually reviewed at each particular location as work proceeds, with the safe system of work revised should ground or site conditions dictate. All staff will be instructed that should they suspect or encounter any

unexpected or severe levels of contamination or any asbestos, work should cease until such times as a revised safe method of work has been established (in writing if necessary).

Where appropriate a spill kit will be readily available at the site of works.

REPORTING PROCEDURE

All incidents, accidents and unplanned events will be reported to the project team and investigated in line with the Company Policy.

MANAGEMENT OF CHANGE

Dynamic risk assessments will be carried out on site by staff when the need arises. These dynamic risk assessments will not be documented unless the hazard is likely to be encountered again, the risk is significant or where it is deemed appropriate by the site team and GEL Contract Manager.

Should any situation arise which cannot be managed with the immediate resources available, or if the Work Safe Policy is invoked, work shall cease and the site engineer or GEL Project manager shall be notified. Works will only recommence once a revised safe system of work has been established (and documented where necessary).

BACKGROUND

This Method Statement details the procedure to be followed for the avoidance of underground services and excavation of inspection pits in line with HS(G) 47 – Avoiding Danger from Underground Services and the GEL Procedure relating to Underground and Overhead Services (HSP08).

An inspection pit should always be excavated by hand to a minimum depth of 1.2m and deeper if in made ground or areas where services are known to exist. Mechanical breakers and concrete corers should only be used to penetrate hard standing and not over any known services. If the client or their site supervising engineer does not wish for an inspection pit to be excavated and this contradicts the instruction provided in the GEL Permit to Dig, then the GEL Site Engineer or Lead Driller should request for this instruction to be provided in writing and inform the Contract Manager before proceeding.

This Method Statement should be read in conjunction with the relevant Risk Assessment. Elements of this Method Statement shown in italics may apply according to site specific and contractual arrangements.

ADDITIONAL TASK SPECIFIC PPE

EAR DEFENDERS[1]

[1] Worn during breaking out activities.

TASK SPECIFIC TRAINING

At least one operative will hold a valid cable avoidance tool certificate. All GEL personnel will be trained in manual handling.

TASK SPECIFIC COSHH

- Petrol or diesel.
- Hydraulic oil.

TASK SPECIFIC EQUIPMENT

- Cable Avoidance Tool.
- Hand tools.
- *Hydraulic power pack or compressor complete with breaker, points, chisels etc (where appropriate).*
- Sampling and measuring equipment.
- *Plastic sheeting and soil sacks (where appropriate).*

SAFE SYSTEM OF WORK

This safe system of work will be undertaken sequentially in the order shown unless otherwise instructed.

1. The Lead Driller must be in receipt of a current and valid AGC Permit to Dig for the project or particular exploratory hole.

2. All materials and equipment should be taken to the work site by mechanical means were possible.

3. All available service plans and other suitable information regarding underground services in the area of concern (including hazard plan or hazard directory if available) must be referred to when the work is planned and should be available on site when locating exploratory hole positions. (It should be noted that service connections from a main service to a building or street light may not be shown on drawings).

4. A visual inspection of proposed exploratory location must be undertaken to identify potential underground hazards. For example, positions should be relocated if they fall within line of two inspection covers or are in close proximity to other signs of service connections (e.g. telegraph poles).

5. Locations must be set out to avoid the known or traced location of underground services by the site supervising engineer.

6. Locations must be scanned with a CAT by a trained operative prior to commencement of excavation. If underground services are detected the site supervising engineer should be informed immediately and before continuing further.

7. *If required, temporary fencing may be erected around the site of works to demarcate the working area and/or prevent access by unauthorised persons.*

8. *Where breaking out is required, visually inspect the equipment and hose connections prior to use. Ensure all steels are sharp. Replace if the equipment shows signs of damage or excessive wear. Check the oil and fuel levels and top up if necessary (off site where possible) ensuring a suitable fire extinguisher and spill kit are readily available.*

   The power pack should be placed on a level surface and only used in an area that is well lit and ventilated. The correct steel (e.g. chisel, point, elephant's foot, asphalt cutter) should be placed, hex connection upwards, into the socket on the base of the gun and secured. Hoses should be placed in such a way that they do not cause a trip hazard.

9. *The breaker should be only used in line with the manufacturer' instructions and the HAVS assessment (below). Gloves will be worn. Usage should alternate between operatives. On completion the equipment should be left to cool prior to handling.*

10. Excavation work must be carried out carefully and following safe digging practices. Shovels and spades must be used in a controlled manner to prevent breakage of plastic or clay pipes not located by the CAT, and to allow observation of the material being excavated. Picks and digging bars should only be used with care to free boulders etc, and to break up hard layers. Insulated shovels where electric cables may be encountered.

11. Arisings should be stockpiled adjacent to the inspection pit where they will not cause a trip hazard. Plastic sheeting or ground protection may be used or the arisings may be bagged as they are excavated.

12. Careful digging should be undertaken when water is encountered as a full visual inspection cannot be made beneath the standing water level.

13. If the sides of the pit start to collapse and undermine any existing hardstanding, the engineer should

be informed and a decision made by the site supervising engineer prior to continuation of the hole.

14. If a service is uncovered or it is suspected that one will be encountered, work must stop, the service should be assumed live and the site supervising engineer should be informed immediately. The operational crew must not proceed until they are instructed to do so and only when they consider it is safe to carry on.

15. The Permit to Dig must be signed off by the Lead Driller or the Site Supervising Engineer on completion of the final CAT scan for the exploratory hole(s) to which it refers.

16. When the inspection pit has been completed to 1.2m and the base of the inspection pit has been CAT scanned, the exploratory hole may be advanced if required as per the relevant method statement. If no further exploratory work is required, the hole will be backfilled in layers and hand tamped as the backfilling progresses in an effort to prevent any future settlement.

17. Where required, the surface should be reinstated like for like (e.g. site mix concrete, hand tamped cold lay macadam or replacement of topsoil and turf) so that it is flush with the surrounding ground level. The Lead Driller must be satisfied that the area does not pose a future trip hazard prior to leaving the site of works.

ADDITIONAL INFORMATION

Plant and equipment including all safety devices are inspected on a daily basis by the operator.

For modern installations, a national coding system for buried services has been agreed by most utilities. In summary, the system is as follows:
Black: Electricity, Red: Electricity – some high voltage cable
Orange: Street Lighting & Traffic Control Cables
Blue: Water
Yellow: Gas
Grey or White: Telecommunications
Green: Cable TV and some Telecommunications

Where there is any doubt about the identity of an exposed service it should be treated as an electricity cable or gas pipe until proved otherwise.

Noise:
Hydraulic breakers range between 106 and 108 dBA.

Hand Arm Vibration Syndrome:
This condition is also referred to as vibration white finger and is caused by prolonged exposure to vibrating tools which reduces the blood flow to the fingers. Action must be taken at the EAV (exposure action value) and work must stop at the ELV (exposure limit value). The EAV and ELV are calculated in accordance with the manufacturer's equipment specification relating to vibration (expressed m/s^2). For hydraulic breakers the following usage limits must be adhered to:

Item	Vibration Magnitude in m/s^2	EAV (in hours/mins) per man	ELV (in hours/mins) i.e. MAX per man
Large breaker gun	8	0:47	3:08
Small breaker gun	5.7	1:32	6:09

BACKGROUND

This method statement describes the procedures to be followed when constructing boreholes with a Modular Rig. The machine is capable of dynamic sampling through superficial soils and (where necessary) basic rotary drilling (usually of hardstanding). Samples and in situ testing can be carried out in accordance with site specific instructions.

The Modular rig is designed to be broken down in smaller parts to allow for access into locations that could not accommodate a standard rig. The parts have all been fitted with lifting points and all staff are trained and competent in the correct lifting and assembly procedure as per the operational manual.

The parts that the rig is broken down into are shown below:

The Modular Rig consists of a hydraulically driven drop hammer on a mast with feed generated by a hydraulic cylinder. The mast is raised, lowered and adjusted by hydraulic cylinders and the unit is mounted on a rubber tracked crawler chassis which is powered by an integral hydraulic power pack. The mast at full extension is 2.95m and an on-site assessment of the location will be carried out by the foreman to ensure the rig is not set up within 9m of overhead cables or obstructions to avoid collision.

The dynamic sampling system comprises a chain driven drop weight which is used to drive sampling tubes into the ground to recover soil samples in a plastic sleeve. Casings are installed to keep the borehole open whilst drilling through overburden and other unconsolidated formations which might otherwise collapse and impair progress. Standard penetration tests (SPT) and undisturbed sampling will be carried out as and when required.

This method statement should be read in conjunction with the relevant risk assessment.

ADDITIONAL TASK SPECIFIC PPE

EAR
DEFENDERS

TASK SPECIFIC TRAINING

All work will be carried out by competent personnel who have received training in line with the Company Training Policy in the task and manual handling. The Lead Driller either holds or are working towards an NVQ Level 2 in Land Drilling.

TASK SPECIFIC COSHH

- Petrol or Diesel.
- Hydraulic Oil.
- Cement.
- Bentonite pellets/powder.

TASK SPECIFIC EQUIPMENT

- Hand tools.
- Modular Rig.
- Sample barrels and casings.
- Sampling and testing equipment including an automatic trip hammer.
- Timbers.

SAFE SYSTEM OF WORK

This safe system of work will be undertaken sequentially in the order shown unless otherwise instructed.

1. The procedures detailed in MST03a must be adhered to prior to commencing exploratory holes.

2. The rig will be carried to position disassembled by a trained and competent crew of at least 2 people.

3. Before the Modular Rig is erected the area must be thoroughly inspected to ensure that it is stable enough to take the weight of the machine. The area must also be checked to ensure it is clear of overhead services or obstructions.

4. Place the HF (“H” frame) over the bore hole position with the 6 bolt flange facing upwards.

5. Fit all 4 LJ (levelling jacks) into the HF and fit retaining pins and clips.

6. Using 2 persons, position the mast section onto the HF’s 6 bolt flange

7. and connect the mast to HF using the 6 No. M12 nut and bolts. Whilst 1 person is attaching the mast

the other is required to hold and steady the mast until it is safely bolted to the HF.

8. Using the LJ, set the mast vertical in both axis.

9. The machine will be supplied with the drop weight all ready fitted into the DWC (Drop weight carriage). If you need to lighten the DWC on removing the drop weight.

10. Attach the 4 lifting handles into the DWC and using 2 persons lift the DWC onto the mast's DWC slide

11. Remove the rear left hand side lifting handle and fit the hinge shaft (the one on the left looking from the front of the rig) into the mastslide and DWC which in turn connects the DWC to the mast. Fit the lynch pin into the hinge shaft end.

12. Fit the hinge lock shaft (the one on the right looking from the front ofthe rig) into the mast slide and DWC which in turn locks the DWC hinge to the mast. Fit the lynch pin into the hinge shaft end.

13. Fit the control lever assembly into the HF socket on the right hand side and tighten the lock screw.

14. Attach the quick release couplings onto both the mast cylinder valve and DWC motor.

15. Attach the hydraulic power pack's quick release couplings to the control valves in and out ports either side of the control valve.

16. Attach the HEU (Hydraulic Extractor Unit) quick release couplings to the middle lever on the control valve (2 short flexi leads)

17. Front plates will be placed under each leg to ensure stability of the machine and prevent toppling. On soft and uneven ground the front plates will be supported on timber baulks. Where practicable non-crew members should be kept at least 5m away from the rig whilst it is being erected or taken down by the Lead Driller.

18. If possible, the engine will be positioned down-wind from the borehole so that the drill crew is not subjected to exhaust fumes.

19. The rig will be set up as recommended by the manufacturer's instructions.

20. Supervising engineers and site visitors will be instructed to stand well away from the moving parts and at least the distance of the height of the mast from the rig. They may only approach the borehole when the rig is not in operation and it is safe to do so or with the express permission of the Lead Driller.

21. The Lead Driller will ensure he is able to see, without any obstruction, the hands and feet of the Driller at all times whilst operating the rig. Hands must be kept clear of the top of the casing and barrels.

22. The borehole will be advanced using appropriate techniques in accordance with the Fieldwork Brief and as directed by the site supervising engineer by dropping the hammer until refusal (50 blows for 100mm) or until instructed. This may include coring hardstanding with a 150mm nominal diameter core bit.

23. Temporary casing will be used to assist with advancing the hole as dictated by the ground conditions

encountered and to prevent collapse of the hole to allow it to be progressed.

24. Working areas will be kept clean and clear underfoot, arisings will be moved to one side and placed in plastic bags. Hand tools will be kept in a safe location when not in use.

25. Where a deviation from standard working practice occurs such as barrels or casings becoming stuck in the borehole or rig becomes unstable etc, then an onsite dynamic risk assessment should be carried out by the Lead Driller prior to continuing. Where necessary, the Contract Manager should be informed.

26. On completion of the borehole at the specified depth, it will either backfilled (with arisings, grout, or bentonite pellets) or and instrument will be installed. Any temporary casing will be removed from the borehole during the backfilling process.

27. On completion of the borehole at the specified depth, it will be backfilled (with arisings, grout, or bentonite pellets or an instrument) as instructed. Any temporary casing will be removed from the borehole as the process continues.

28. On instruction, the rig will be dismantled and lowered prior to being moved to the next location or demobilised from site.

ADDITIONAL INFORMATION

The Modular Rig is fitted with a fixed guard of steel frame and perforated steel sheet construction to prevent access to the danger zone in accordance with PUWER 98 Regulations 11 and 12.

The rig and ancillary plant and equipment including all safety devices are inspected on a daily basis by the operator. The rig is also subject to a planned preventative maintenance scheme carried out at regular intervals in line with the manufacture's maintenance manual and in accordance with PUWER 98 Regulation 5.

Stop controls and emergency stop buttons are located at the operator's position in accordance with PUWER 98 Regulations 15 and 17.

All controls are clearly identified for the operation they carry out in accordance with PUWER 98 Regulation 17.

Warning notices and safety signs are displayed to identify potential hazards in accordance with PUWER 98 Regulation 24.

The rig has undergone a thorough examination within the last 12 month and all lifting accessories have had a thorough examination within the past 6 months in accordance with LOLER 98 Regulation 9. Certificates are available on request.