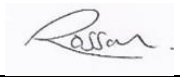
Stuart House, Hargham Road, Shropham, Norfolk NR17 1DT
Telephone: 01953 454540 Fax: 01953 451451 www.stuartwells.co.uk

RISK ASSESSMENT & METHOD STATEMENT

Project Title	Deep Well Dewatering – Menai Shellfish		
Contractor	Griffiths Construction Ltd		
Discipline	**DEEP WELL DEWATERING - WELLS INSTALLED BY CABLE PERCUSSION DRILLING**		
Method Statement Ref	MS/SWL24-074	Risk Assessment Ref	RA/SWL24-074
Date Generated	15th March 2024	Date Revised	Original
SWL Project No.	SWL24-074	Revision No.	01
Prepared by	Matt Rosson 	Approved by	David Wright 

Revision Number	Revision comments
01	Original issue

SIGN ON REGISTER

I have read and fully understand the Method Statement and Risk Assessment and will adhere to all its method of working and control measures detailed. If any part of works changes or deviate from the procedure detailed, I will stop and notify SWL management immediately.

PERSONS IN ATTENDANCE DURING THE WORK:

Name	Company	Signature	Date

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PROJECT OVERVIEW

Introduction

We are pleased to submit our method statement and risk assessment for the installation of a series of dewatering wells, followed by installation and commissioning of a deep well dewatering system, as part of the Menai Shellfish project in Bangor. The dewatering wells will be installed using cable percussion drilling techniques.

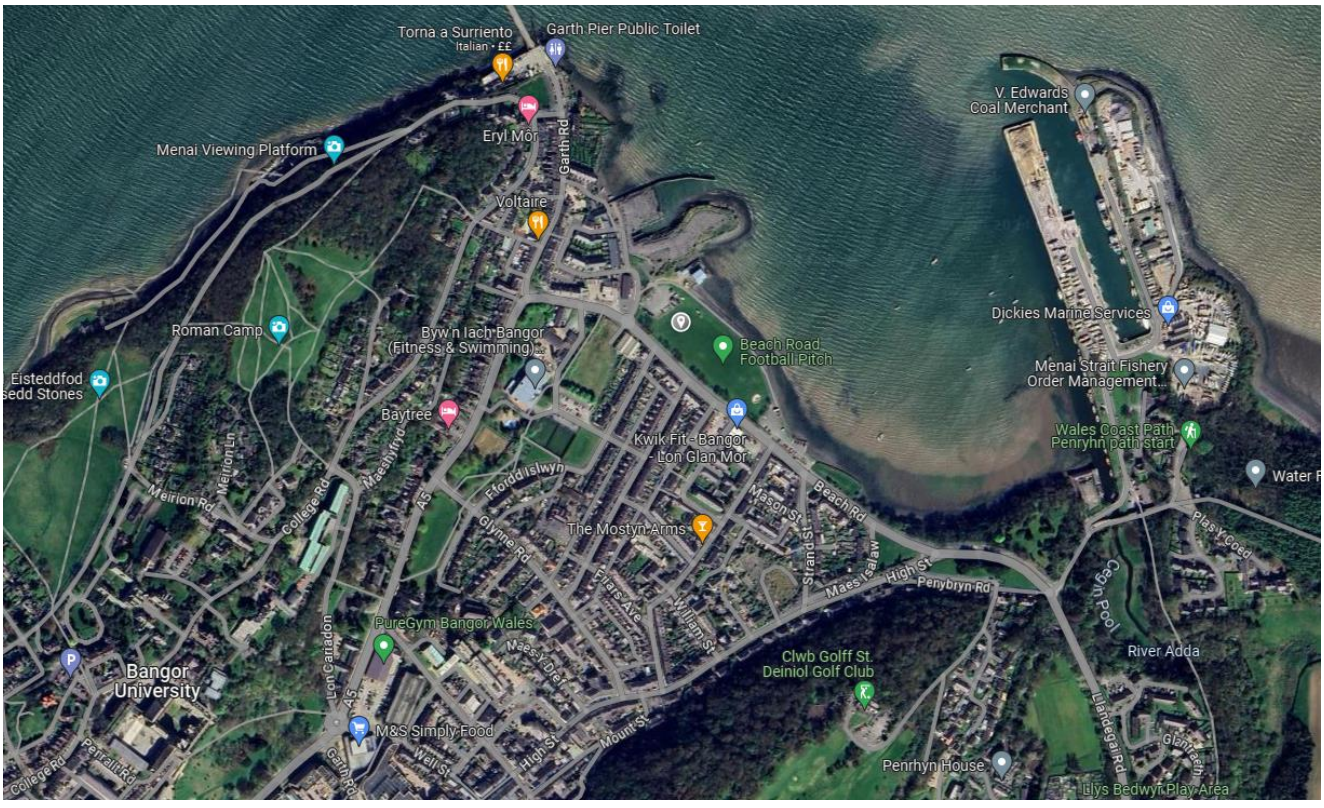
Once commissioned, the dewatering system will lower and control groundwater levels to enable the safe installation of a storm attenuation tank and connecting pipework.

The works are expected to be undertaken in two separate visits. The first visit to install dewatering for the sewer diversion, with a second visit to dewater the attenuation tank.

Site Location

Site Address:
Griffiths Construction
Beach Road
Bangor
LL57 1AT

Site Contact:
Joe Pritchard
07866 187147



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Scope of Works

In summary, our works include the following items activities:

- Mobilisation to site
- Installation of dewatering well by cable percussion drilling techniques
- Airlift development of well
- Installation of pumping equipment
- Testing and Commissioning of dewatering system
- Pumping phase maintenance and servicing
- Removal of pumping equipment
- Demobilisation from site
- Risk assessment and relevant COSHH sheets

Ground Conditions

The site investigation (Geotechnics, 2023) indicates that the typical ground conditions sequence encountered at the site will comprise Made Ground overlying the Coastal Zone Deposits with the Nant Ffrancon Subgroup at depth.

The ground conditions, as encountered during our drilling phase concurred with those presented in the ground investigation. A summary of the ground conditions is presented in Table 2.

Table 2: Summary of ground conditions encountered

Geotechnical Unit	Thickness (m)	Depth (m BGL)	Description
Made Ground	5.2	0.0 to 5.2	Variable rubble ash fill
Coastal Zone Deposits	2.6	5.2 to 7.8	Silt
Coastal Zone Deposits	4.2	7.8 to 12.0	Silty sandy GRAVEL

Standing groundwater levels at the site were recorded during pre-test monitoring to vary at the site between 3.3 to 3.9 m depth (2.1 to 2.4 mAOD).

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Indicative Programme

Sewer Diversion	
Activity	Estimated Duration
Mobilisation Date	25th March 2024
Installation of Wells	7 days
Development of wells	2 day
Installation of pumping equipment	3 day
Testing and commissioning of dewatering system	2 day
Pumping Phase	6.2 weeks (TBC)
Dismantle and collect equipment	2 day

Attenuation tank	
Activity	Estimated Duration
Mobilisation Date	TBC
Installation of Dewatering Wells	8 days
Installation of Recharge Wells	6 days
Development of wells	4 day
Installation of pumping equipment	3 day
Testing and commissioning of dewatering system	2 day
Pumping Phase	20 weeks (TBC)
Dismantle and collect equipment	2 day

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Works Detail

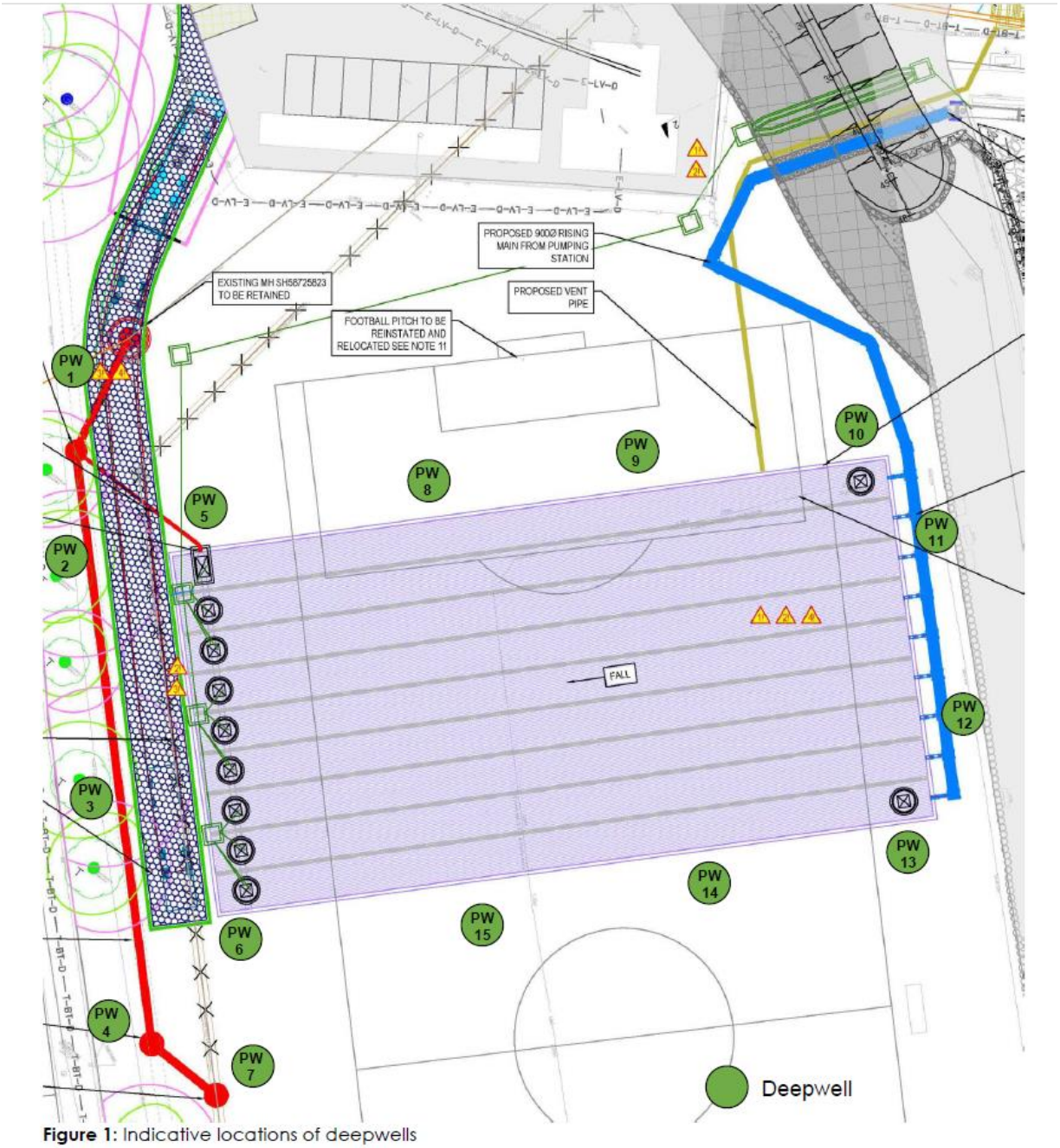

Figure 1: Indicative locations of deepwells

Well Location Plan

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Item	Detail
Drilling installation Level	Ground Level
Number of Pumping Wells	15no.
Number of Monitoring Wells	NIL
Number of Recharge Wells	6no.
Well Depth (all wells)	12m deep
Drilling bore diameter	250mmØ
Pumping Well liner size	140mm x 125mm
Monitoring Well liner size	NOT REQUIRED
Filtration	1-2mm silica filter sand
Pumping method	Up to 1.5kW B/H pumps
Power supply	415V generated power supply consisting of duty & standby units

Well Installation Plant & Equipment

Item	Quantity
Dando 4000 Cable Percussion Drilling Rig	1
250mmØ x 1.5m temporary steel casings	8
Drilling Tools	1
Pipe Stillage	2
4x4 vehicle	1

Dewatering System Main Components

Item	Approx. weight	Quantity
415v silenced duty generator	1300kg	1
415v silenced standby generator	1300kg	1
AMF power changeover panel	90kg	1
415v x 1.5kW submersible borehole pumps	20kg	15
415v DOL pump starter panels	20kg	15
415v power leads	10kg	15
V-notch inspection tank	650kg	1
Flowmeter	50kg	1
100mm x 6m bauer Pipe	25kg	35
Bauer type fittings	6kg	15

Personnel

The following personnel will be undertaking the works:

Provided by Stuart Wells Services	
Lead driller/ BDA NVQ2, CSCS	1no.
Drilling assistant / CSCS	Up to 2no.
Dewatering Project Manager / CSCS, SMSTS, NEBOSH	1no. (part time)
Dewatering Operative / CSCS	2no.

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Health, Safety, Environment & Welfare

General

- All personnel will be provided with a site-specific risk assessment for all planned activities prior to commencement of works. Personnel will be required to sign to confirm they understand and will comply with the control measures specified.
- All site personnel will be required to complete a site induction provided by the main contractor.
- Any changes of work procedures must be reported immediately to SWL management. The risk assessment will then be reviewed and amended, if necessary, prior to works re-commencing.
- Risk assessments for routine activities will be reviewed periodically or at intervals determined by any change.
- A permit to dig must be issued by the main contractor and signed by all personnel involved prior to works commencing.
- Security & fencing will be provided by the main contractor.

Training/Testing

- All personnel to attend site induction before commencing works.
- All operatives are to have a minimum CSCS certification.
- All operatives to have undertaken manual handling training.
- All equipment will be certified and tested as appropriate.

Delivery of equipment

- Where possible, SWL will ensure all equipment is suitably packaged on or fitted with forklift lifting points. Any equipment fitted with lifting eyes will be thoroughly examined prior to delivery.
- SWL will give advanced notice to the main contractor to any delivery arriving at site.
- All deliveries should be made to the main site entrance via Beach Road

First Aid, Emergency planning, and PPE

- All personnel will follow the site emergency procedures which will be highlighted during the site induction.
- Location of muster points to be highlighted during site induction.
- All personnel will be given working address in case they have to contact emergency services.
- Personnel will wear PPE specific for the task they are undertaking as specified in the risk assessment. The site induction will highlight minimum requirements which should always be worn.
- Hearing protection should be carried and worn if working with plant and/or equipment with an operative dB rating of 80dB or above as specified in the risk assessment.

Personal Protective Equipment (PPE)

A hierarchy of control to be followed for any specific hazard, with PPE not being the first option

The following PPE is the mandatory minimum on site:

- Hard Hat – to BS EN 13688:2013 (correct colour for appointed role)
- Safety Glasses – to BS EN 166:20021 or prescription eye wear
- Orange High visibility long sleeve top to EN ISO 2047 / orange trousers – to EN ISO 2047
- Gloves suitable for the task – to BS EN 388:2003
- Safety boots or wellies with steel toe cap and mid sole protection – to BS EN 20345:2011
- Hearing protection to BS EN 352 (to be always available and worn when noise level approaches, or likely to exceed 80 Db
- Eye Protection - Type EN166F – Light eye protection

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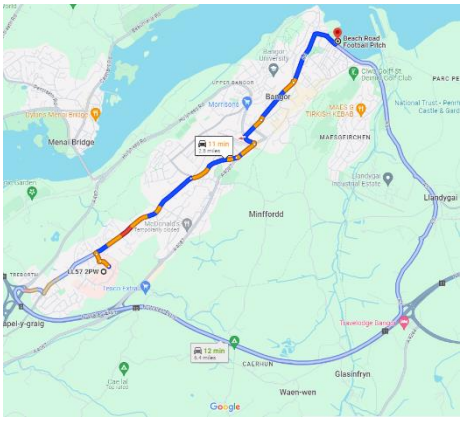
Nearest A&E Hospital

Ysbyty Gwynedd
Penrhosgarnedd
Bargor
Gwynedd
LL57 2PW

Tel: 01248 384384



Environment

- It has been identified that some asbestos may be present on the site. All drilling crew will be make aware of this risk and informed of what to look out for. If we encounter any material showing signs of contamination, included abnormal colouring, all personnel will immediately stop and inform SWL management and Griffiths and await further instruction.
- SWL will provide the most acoustically silenced plant and equipment available.
- Use appropriate filters and filter pack to facilitate the non-removal of fines.
- Ensure discharge water is clean and free from suspended solids.
- Any settlement system to be checked and maintained at regular intervals by others
- Ensure areas around discharge locations are kept clean
- Good housekeeping should always be maintained with general waste being disposed of in the correct bins/skips provided on site.

Welfare

- The main contractor is to provide welfare facilities for all SWL staff working at this site including:
    1. Toilet facilities
    2. Wash facilities
    3. Facilities to rest and to prepare and eat meals, including means to boil water
    4. Drinking water
- All welfare facilities are expected to be maintained by the main contractor to a satisfactory standard, with regards to accessibility, temperature, lighting, and cleanliness
- SWL employees are to leave any facilities in a good condition for others to use. Leave as you would expect to find.

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WELL INSTALLATION VIA CABLE PERCUSSION DRILLING METHODS

Access & Preparation

All site traffic will follow any Site/Traffic Management Plan specified by the main contractor prior to arrival. Site access and all deliveries will be to the main site entrance off Beach Road. Deliveries will not be unloaded outside of the site boundary.

The drilling locations are situated with the public highway. The main contractor will ensure the road is closed to all traffic and adequate fencing is provided to ensure the public cannot enter the work area and provide security overnight.

The main contractor is to ensure access into the work area is clear with all plant positioned to allow emergency access if required. The ground conditions at the drilling location are to be firm, level and stable prior to our arrival.

The drilling rig will be towed into site via 4x4 type vehicle. Drilling tools and support equipment will be delivered by lorry. The unloading of support equipment will only take place on hardstanding or safe level, away from other site operations. These offloading areas will be segregated from other works/third parties.

Prior to commencement of drilling the well locations will be marked out by Griffiths in conjunction with SWL. Griffiths will be responsible for marking out, exposing and, if necessary clearing any buried services to ensure our works can proceed safely and without delay.

Griffiths will cut and breakout a 0.5m x 0.5m access through any hardstanding material at each well location to enable drilling to progress through natural ground conditions.

A permit to dig must be issued prior to drilling.

Water Supply for Drilling

We will require a mains water supply for our drilling operations which is to be provided by an onsite supply as close as possible to our works. We initially estimate 1m³ of water required per borehole, but actual quantities will be confirmed based on geology encountered.

Set up of drill rig and starting drilling

All personnel are to stand clear during the erection of the rig with exception of the rig operator. The drilling rig will be erected to form the tripod arrangement using the winch to lift the frame. The driller will be instructed on the main strata to be drilled through, based on details from the site investigation borehole log available.

As drilling arisings are brought to the surface by the drilling shell, the deposits are tipped forward to be emptied which requires a clear working area in front of the rig. Once erected and operating, the drilling rig working area will encompass an area of approximately 7.0m x 3.0m.

Cable percussion drilling

The cable percussion drilling rig will drill the well at 300mm diameter to a depth of up to 12m below ground level. The bore is advanced by using drilling tools and weights suspended from the rig winch rope. The rig, winch, cable, and shackles are to be in good working order and relevant in date certificates provided.

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The drilling rig operator and assistant will connect the shell and weights to the rope manually using the shackles. Once securely connected the shell is raised above the first casing and steadied by the assist to stop from swinging. The rig operator will communicate verbally with the assistant to guide the shell into the casing while the rig operator allows the shell to be slowly lowered on the winch. The shell should be handled by the assistant with gloves and open handed so not to catch fingers in any opening as it is lowered.

The tools drive a 300mm diameter temporary steel casing into the ground by applying intermittent pressure to the casing head causes intermittent high levels of noise. All rig operators and those working in proximity will wear hearing protection.

The drilling rig assistant is to stand clear of the rope and tools when driving the casing. The rig operator must communicate that is it safe for the assistant to approach once the driving has ceased. Hand signals are most appropriate due to the noise levels.

Once the casing has been driven in to the ground, a 'shell' is used to retrieve and bail out the material within the casing leaving a hollow steel temporary casing in the ground. The shell is suspended from the rope. The assistant must stand clear of the casing and shell during this process. Once the shell is full of material, the rig operator will signal to the assist that it is clear to approach. The shell will be suspended above the casing and pushed to one side by the assistant. The operator will lower the shell and upturn forwards using the drilling rig to deposit the material to the ground. Communication between the assistant and operator can be safely completed verbally during this stage.

Each temporary casing is up to 1.5m in length and has square treaded ends to accept the next section of casing (to form the casing 'string'). Once a full length of casing has been driven into the ground, the next section is manually lifted and treaded on to the casing string already in the ground and the driving process is repeated.

The winch safety clamp/break should be applied before the rig operator leaves the operating handles and a check should be made to ensure the winch is secure. The rig operator will signal to the drilling assistant that it is clear to approach the casing string.

Each casing should be lifted by both the rig operator and drilling assistant and correct manual handling techniques adopted. Rubber, waterproof gloves with good grip should be worn when handling and the working area should be clear of any trip/slip hazards.

Clean water may be added to the bore during drilling as required to aid lubrication. Although quantities of water required cannot be determined until drilling commences, we anticipate a minimal supply could suffice in the form of jerry cans filled up from water bowser.

Temporary casings will be used to support unstable strata. If hard strata, obstructions or when within the strata, chiselling may be required to advance the bore.

As the bore progresses, drilling arising's within the shell are emptied and deposited at the surface adjacent to the well. The arising's are a mixture of material brought from below the surface and groundwater. The groundwater will be allowed to dissipate back into the ground and remaining arising's are to be disposed of by others.

When the drilling rope is under tension during works the second man will stand outside the A-frame of the rig.

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If drilling tools or casings become stuck in the borehole, one of the following techniques should be employed:

1). Move the drilling rope onto the smaller wheel at the winch, at ground level. This will generate additional pulling power. If this doesn't free the tool/casing, then:

2). Utilise a single extra pulley block to increase the effective pull of the rig. The lead driller must ensure that the correct size of pulley block is used, so to ensure that the lift does not exceed the Safe Working Load of the legs and rig assembly.
Use of the pull block involves reconfiguring the roping arrangement by placing it through the secondary straddle wheel at the top of the rig and through a pulley block. The mast will be lowered, in the first instance, to avoid working at height. If this is not possible, a safety harness clipped to the mast via a lanyard must be used when climbing the rig.
The pulley block is then attached to the casing or tool using an appropriate shackle, either directly or by threading a knocking bar through the casing head with the pulley block located within the inside of the casing head. Once reconfigured, the lead driller should check the rope is free from entanglement or obstruction before proceeding. The rig can then be operated with an additional pull of rope, thereby increasing the pulling capacity of the rig.
When removing the pulley block and reconfiguring the roping arrangement. Loosen/slack the rope from ground level prior to any work. Lower the mast/rig,in the first instance, to avoid working at height. If this is not possible, a safety harness clipped to the mast via a lanyard must be used when climbing the rig.

3). Should casing still be unable to be removed using these methods, then a suitable jacking system should be used to remove it. Extreme care should be taken when using jacks as they impart huge loads on the casings. Hydraulic jacks shall have all relevant in-date certification prior to use.
Use of jacks requires that the ground in the immediate proximity of the casing is level and provides a suitable stable base to position the jacks. Any soft ground or arisings shall be removed and hard-core or gravel placed instead.
A suitable bearing plate or arrangement of timber sleepers shall be placed adjacent to the casing and an appropriately sized casing clamp securely bolted to the casing. If necessary, an additional short length of casing should be added to the 'stuck' casing string to provide sufficient clearance for the jacks to operate. Two jacks of suitable capacity (typically 60-100 tonnes) are then placed and firmly located on the reaction bed and beneath the protruding legs of the casing clamps.
The jacks may then be operated by the Lead Driller and the casing eased gently out of the ground until it is free enough to be pulled by the rig. The jacks, sleepers and plate (if used) will then be removed and any remaining casing extracted using the rig in the normal way.

If the drilling rope snaps or needs cutting, undertake all work at ground level. A safety harness clipped to the mast via a lanyard must be used when climbing the rig to route the rope back through the crown wheel at top of the rig.

Should drilling of a well be at a critical stage at the end of normal working hours, it may be necessary, due to unstable ground conditions to continue working. On completion borehole spoil and arising's will be deposited adjacent to the well location.

Installation of the Well

The well completion is as per detail above along with observations made during the drilling. The lead driller will advise SWL of strata and levels encountered during drilling of the bore and the SWL design team will subsequently inform the lead driller of the final well completion.

Well liner will be lifted using the lifting head adaptor and drilling rope and lowered into the open bore ensuring that any filter sock or well liner is not damaged. Once within the bore, the liner will be supported manually or with clamps while the next section is added using the threaded sections.

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Once the well liner is at the required depth, the filter sand will be introduced by gravity feed down the outer annulus using the 25kg bags provided. As the filter pack is added, regular dips of the amount of filter fed will be taken to ensure bridging of the gravel is not occurring. A bentonite seal will be installed at the surface to prevent and surface water entering the bore.

The well is complete once the filter sand and bentonite is at the surface. The well liner will be left approximate 0.3m above ground level.

Removing the temporary casings

Once the well liner is installed within the bore, the temporary drilling casing must be removed from the ground. The casing head is screwed on to the top casing length manually by the operator and assistant the full length of the threaded section.

The shackle is fixed to the casing head and the tension is taken up on the rope using the winch. When the drilling rope is under tension the drilling assistant will stand outside the A-frame of the rig. The winch then pulls each section of casing above the ground and a chain wrench is used around the external of the casings to prevent from slipping back into the ground. A second set of chains are used to twist and free each casing section from the string manually.

Once the threads are undone the casing length is manually lifted off by both operator and assistant and placed out of the way. Correct manual handling techniques should be adopted, and the area should be free from trip hazards.

Maintenance on the drilling rig mast in the event of breakdown

If maintenance or repair is required to the drilling rig mast, the mast should always be lowered to the ground in the first instance to complete the work and avoid working at height.

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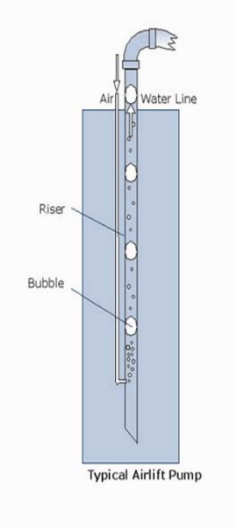
INSTALLATION OF THE PUMPING SYSTEM

Development of PumpingWells



Typical Airlift Pump

Following well drilling and installation of the well liner and gravel pack, well development procedures for the abstraction well can commence using traditional airlift techniques. The purpose is to remove the debris within the well generated during the drilling process and in turn increase the well yield.

An airlift shoe will be attached to an airline and flexible discharge riser pipe and placed to the base of the well. The airline will be coupled to a 125cfm compressor using 1.1/2" airline with crowsfoot connection. Whipchecks will be used between each connection.

The compressor will be turned on and the well will then be pumped by airlift for a minimum period of 1 hour or until the discharge water is free of drilling mud and/or fines. Initial development will only cease when fines removal is negligible.

All water generated during airlift development will be pumped to the ground to allow water to dissipate.

Pump & Pipework Installation

Once development is complete a 415V submersible borehole pump is coupled to a 32mmØ MDPE riser pipe. The pump and riser pipework are lowered into the well manually with one operative guiding the pump into the well and feeds the pump power cable into the well, while another uncoils the riser pipe.

Once the pump has reached to correct depth, the riser is connected to a wellhead and secured by a clamp at the surface. The wellhead consists of a 90-degree bend, control valve and sample tap, this in turn is coupled to individual 50mmØ bauer flexi hoses to tee into a 100mmØ discharge hose.

Discharge pipework will direct all abstracted groundwater to a v-notch settlement tank, which will be located as close as possible to the final outfall.
An in-line flowmeter will be positioned within the discharge hose to record flow rates during testing.

Discharge pipework will be a combination of flexible and rigid bauer type pipework with various fittings and adaptors.

Electrical Works

The pump will be powered by 415v generated power supply, consisting of a duty & standby generator and AMF (Auto-Mains Failure) switch over panel.

Drop cable from the borehole pump will be H07 which will be plugged directly into individual DOL pump starter panel to control and operate the pump. Each DOL panel connects to a multi-way MDU panel with RCD and RCB protection.

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Cables from the DOL pump starter panel will be 4 core SY contained within a thermoplastic coating to BS6346. The MDU will have a SWA cable extending to, with a 32 AMP 5-pin plug to connect to generator power supply.

All connections will be plug and socket extensions tested by our in house electricians prior to delivery. All equipment exposed to the elements will be at least IP45 rated. All surface cabling will be armoured and follow the route of the discharge pipework for additional protection.

Commissioning of the pumping system

Resting groundwater levels within each well will be recorded prior to any pumping.

The pumps will be started one at a time and a check will be made to ensure the pump rotation is correct and water levels within the wells are lowering.

The control valves on the well head arrangement will be used to increase/reduce the pumping flowrate to maintain pumping water levels at the desired level. It is important to ensure that the pumps remain submerged within groundwater at the base of the well to allow cooling of the electrical motor and prevent the pump from failing, whilst also maintaining the groundwater level as low as possible within the well. This controlling and water level balancing within the well will be closely monitored and checked throughout the commissioning phase.

Once the discharge pipework is full of water, the line will be checked for any leaks. Any damaged or leaking pipes will be exchanged.

If available, groundwater level within any monitoring wells will be recorded and checked over the first few hours/days of pumping to ensure water levels are responding to pumping. Where monitoring wells are not available, the main contractor should excavate within the centre of the excavation cautiously, checking for any groundwater as excavator progresses.

Decommissioning

Adequate access needs to be made for the safe removal of all dewatering pumps and equipment upon completion of the dewatering works. A flat stable, unrestricted working area is required. If our operatives are to be working near excavations, the main contractor is to ensure adequate edge protection/shoring is in place.

The power will be turned off, isolated and plug removed from the mains distribution board before decommissioning procedures can commence. Once the pumps have stopped the pressure will be allowed to dissipate within the pipework.

The bauer type coupling on each length of discharge hose will be manually uncoupled and each length stacked into various piles. Each pile will be lifted into pipe stillage to a single storage area ready for collection.

Borehole pump will be unplugged from the starter panel and manually removed from the wells. As the pump and riser pipe is lifted, the well head works will be walked away from the well and all pipework laid on the ground adjacent to the well. Once this is complete, the borehole pump and cable will be removed from the riser and stacked ready for collection. The riser pipe will be cut into manageable lengths for disposal on site.

Loose fittings and connections will be collected and contained within the settlement tank for removal from site in a single lift.

We will require the main contractor to provide adequate cranage for the loading of all dewatering equipment onto our transport at the end of the contract.

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Manual Handling

Wherever practically possible, SWL will always try to eliminate manual handling however, due to the nature of our work, eradicating manual handing completely is not possible. Mechanical lifting aids such as sack barrows, and pump trucks will be used whenever possible, along with the usage of any onsite cranage.

All operatives employed by and working for Stuart Wells Services at this site will have undertaken manual handling training. When no mechanical lifting device is available for specific task, operatives should only lift what they feel capable of lifting and should adopt the lifting techniques, procedures and practices demonstrated during their manual handling training.

COSHH Assessments

COSHH Assessments are attached for the following materials:

- Bentonite
- Engine oil
- Diesel

GENERAL SITE OPERATIONS AND REVIEW

Effects on others

Deliveries are to be made during working site hours and not before 8AM using only specified route/traffic management plan. We are FORS registered and our drivers have completed safe urban driving training.

Noise will be kept to a minimum by switching off engines when not in use and only running at high revs when required. Noise from the drilling rig will be generated during normal working site hours only.

During pumping operations, we will provide the most acoustically silenced generators available to minimise noise issues throughout the contract period. All plant supplied is regularly serviced and maintained to ensure engine fumes are kept to a minimum.

It should be noted that although our equipment is silenced and powered by electric motors, there will still be some mechanical noise generated. Due to the urban site location and adjoining properties, additional sound proofing may be required to our generator sets, such as acoustic panelling etc. This should be provided by others if deemed necessary.

Method Statement Monitoring and Review

Operatives will have had a briefing to ensure they are fully aware of the works required of them and the hazards they are likely to be exposed to. All operatives will be provided with a copy of the method statement and risk assessment prior to commencement of the works and are expected to sign to confirm their acceptance and understanding. Any changes or deviations from this method statement will be raised to management and work will stop until the risks have been re-assessed and method revised to suit.

A SWS Engineer will make a visit to site to ensure works are carried out as described in this document and undertake a full Health & Safety review and assessment as required.

Stuart House, Hargham Road, Shropham, Norfolk NR17 1DT
Telephone: 01953 454540 Fax: 01953 451451 www.stuartwells.co.uk

Contact

At all times a 24-hour contact service will be in place, in the event of any problems. We will respond immediately and can be contacted with the following telephone numbers:

- Office (08:00 – 17:30, Mon – Fri) Tel: 01953 454540
  Fax: 01953 451451
- Matt Rosson - Contracts Manager Mob: 07971 094187
  Email: matt.rosson@stuartwells.co.uk
- David Wright – Director Mob: 07831 121123
  Email: david.wright@stuartwells.co.uk

Risk Assessment

Project	Menai Shellfish	Job No:	SWC 24-074	Date: 15th March 2024	Stuart Wells Limited
Client	Griffiths Construction	Document Ref No:	RA-SWL24-074	Distribution: SWL Staff Main Contractor/Client	
Location	Bognor, Wales	Assessor:	Matt Rosson		
Discipline	Deep Well Dewatering	Checked By:	David Wright		

H&S Risk Assessment Matrix:

Probability			Severity			Risk Rating (P x S)	
Score	Category	Examples	Score	Category	Examples		
5	Frequent	Expected to occur during task/activity 9/10	5	Catastrophic	Fatality, Multiple Major Incidents; Property Damage >£1M, Structural collapse; Government intervention	15 to 25	Risk is unacceptable
4	Probable	Likely to occur during task/activity 1/10	4	Critical	Permanent impairment, Long term injury / illness; Property Damage>£250K to £1M; Media intervention		
3	Occasional	May occur during the task/activity 1/100	3	Major	Lost / Restricted Work; Property Damage >£10K to £250K; Owner Intervention	9 to 15	Stop and consider controls before proceeding. Can controls be improved?
2	Remote	Unlikely to occur during task/activity 1/1,000	2	Moderate	Medical Treatment; Property Damage>£1K to £10K; Community or local attention		
1	Improbable	Highly unlikely to occur, but possible during task/activity 1/10,000	1	Minor	First Aid; Property Damage </=£1K USD; Individual complaint	1 to 8	Risk is tolerable, no further action required

Hazard	1 Factors of Harm (Likelihood)	2 Risk (Severity)	3 RISK TOTAL	4 Control Measures	5 Likelihood	6 Severity	7 Residual Risk	8 Controls Monitored By
GENERAL WORKS RISKS Contact with Plant and vehicles	3	4	12	• All operatives and visitors shall sign onto RAMS and ensure that they hold a briefing from the foreman to highlight the main site risks on that particular day. • When vehicle movements are being conducted a banksman shall be in place to control vehicle movements • Access to and from site area by site vehicle only. • Suitable and sufficient signage shall be provided within the Compound and physical segregation	1	4	4	ALL
GENERAL WORKS RISKS Slips, trips, and falls	4	4	16	• Access to works area via designated routes • Ensure lighting is suitable and sufficient for the task and route to/from site. • Designated pedestrian and vehicle access routes to be well maintained and kept free from obstructions. • High levels of housekeeping to be always maintained in all areas. Works spaces shall be free of debris, unplanned materials and construction waste shall be managed • Weather conditions to be considered and additional risks briefed as necessary.	2	4	8	ALL

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				• Equipment and tools shall be cleared of works areas when not in use and returned to stores at the close of works activities or planned breaks in the construction schedule • During freezing conditions salt should be spread on pedestrian walkways to avoid personal injury.				
GENERAL WORKS RISKS Contact with moving plant and machinery	3	5	15	• Isolate heavy plant movements and limit access to authorised persons only. • Provide vehicle banks men if driver's visibility is compromised. • Ensure mobile plant have full complement of mirrors and vision aids. • Install one way traffic patterns to minimise reversing maneuvers. • Ensure High-Vis clothing is worn at all times.	1	5	5	All
GENERAL WORKS RISKS Exposure to Elements Long term skin conditions arising from exposure to UV	4	3	12	• Maintain long sleeved PPE • Wear a hat with a brim or a flap that covers the ears and the back of the neck. • Stay in the shade whenever possible, during your breaks and especially at lunch time. • Use a high factor sunscreen of at least SPF15 on any exposed skin. • Drink plenty of water to avoid dehydration. • Check your skin regularly for any unusual moles or spots. See a doctor promptly if you find anything that is changing in shape, size, or colour, itching or bleeding.	1	2	2	All
GENERAL WORKS RISKS Fire	3	4	12	• Establish and communicate fire plan to all site personal detailing emergency procedure • Establish muster point with signage • Suitable fire extinguishers around risk locations on site • No hot works • Review when new procedure, new site staff or change to products held are introduced	2	4	8	Operative and Supervisor
GENERAL WORKS RISKS Security/Protestors	4	1	4	• Main contractor to provide all security requirements. • Heras's fencing will be placed around any working area. • Stop work in event of security or protestor situation. • Non-confrontational approach	2	1	2	Operative and Supervisor
GENERAL WORKS RISKS Occupational Health Monitoring	3	4	12	• All site personal to complete a health questionnaire prior to commencing work. • Identify and manage potential hazards to health	1	4	4	Operative and Supervisor

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				• Control Measures or changes in work pattern to be put in place if health issues raised				
GENERAL WORKS RISKS Risks associated with Traffic/Logistics	2	4	8	• All logistics will be controlled by Site Supervisor and Lead Driller in agreement with Main Contractor foreman. • Any specific logistic and traffic requirements will be outlined by Main Contractor and incorporated within relevant site-specific RAMS/Task Specific documentation. • Reverse parking in car park • Banksman/assistance to be used during unloading	1	4	4	Operative and Supervisor
GENERAL WORKS RISKS Increased risk profile from working in low light conditions	3	4	12	• Ensure lighting provision • Access lighting to access point, especially where works at height require the use of access stairs • Task specific lighting to the works area • Any additional direct lighting through provision of mobile lights	1	4	4	Operative and Supervisor
ENVIRONMENTAL RISKS Environnemental incidents, i.e. fuel spillage,	3	3	9	• Ensure all delivery hoses and fuel caps are serviceable and in good condition, free of signs of wear and tear. • Ensure that there is a spill kit close to the refueling point and ops are trained in its use. • Plant nappy or suitable drip tray to be in place under static plant • All items which present a material exposure risk and have been assessed under COSHH with a Risk Assessment in place are to be stored as per their COSHH assessment. • All waste items are to be segregated and returned to the stores area for disposal. • Use of biodegradable fluids, grease, and oils if possible • Site Supervisor to undertake daily environmental checks	1	3	3	Work Supervisor
USE OF LIFTING DEVICES	3	5	15	• Use specified plant as detailed • Operators to be appropriately qualified and trained and competent in equipment use • Lifting and handling heights minimised • No working or walking under suspended loads • Works area to be kept clear during works • All lifting equipment shall carry 6 monthly check and inspection certification	1	4	4	All

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MANUAL HANDLING Injuries caused from incorrect manual handling	4	2	8	• All operatives to have undertaken manual handling training • Do not attempt to lift loads of which you do not know the weight • Only attempt to lift what you are comfortable with • Ensure the path of the load is clear • Lift with two or more operatives where specified in the task briefing or assessed through a point of work risk assessment • Avoid manual handling through proper use of lifting appliances. For the scope of this RAMS items to be handling by telehandler are: • Heavy Plant/Equipment • Stillage Materials & Tools • Palletised Materials/Equipment • All operatives will receive manual handling training and be competent and use correct manual handling technique. • Only lift from designated lifting points	2	2	4	All
ENVIRONMENTAL RISKS Noise from works causing Hearing loss in short or medium term	3	4	12	• Use of modern plant • If concerns around noise levels arise the supervisor will conduct a noise survey • Noise monitoring required along with action levels. • Noise exclusion zones and signage • Provision of ear plugs	1	4	4	All
ENVIRONMENTAL RISKS Handling of COSHH controlled substances –	3	2	6	• Any splashes to be washed off immediately with clean water. • COSHH assessments and data sheets for materials shall be maintained in site office and shall be available and briefed to operatives ahead of use or as part of this method statement briefing • COSHH materials shall be stored within dedicated and appropriate COSHH store.	1	1	1	Operative and Supervisor
ENVIRONMENTAL RISKS associated with COSHH assessed materials	3	2	6	• COSHH assessments and data sheets for materials shall be maintained in site office and shall be available and briefed to operatives ahead of use or as part of this method statement briefing • COSHH materials shall be stored within dedicated and appropriate COSHH store and indicated on site layout and compound plans • Spill kits shall be readily available, and locations signed and notified within works areas	1	2	2	Operative and Supervisor

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ENVIRONMENTAL RISKS associated with HAZARDOUS MATERIAL	4	2	8	• Main contractor to notify of any potential hazardous material on site prior to commencing works • If present control measures such as segregation or containment put in place • Lead drillers to have asbestos awareness training	2	2	4	Operative and Supervisor
ENVIRONMENTAL RISKS associated with WASTE MANAGEMENT, HOUSE-KEEPING	3	4	12	• Work areas will be kept clean and tidy at all times during the works process. The site supervisor will undertake minimum daily checks to ensure work areas are kept clean and tidy. • Bentonite and filter sand is contained within PVC bags so not deemed to require additional protective cover. Any cement bags will be stored in site storage container. • No hazardous waste is anticipated • Non-hazardous (general waste) will be segregated and contained in skip for disposal by main contractor. Solid/Spoil waste generated by the drilling will be disposed by main contractor using approved authorised methods. • Recyclable waste will be segregated and contained in containers or skip provided by main contractor. • Final Drilling Waste (drilling cuttings and any flush remaining in settlement tanks) will be removed using a gulley sucker or similar by the main contractor by authorised methods.	1	4	4	Operative and Supervisor
ENVIRONMENTAL RISKS associated with CONTAMINATED LAND	3	4	12	• Work to stop immediately if contaminated soil observed • If present, control measures such as segregation or containment put in place	1	4	4	Operative and Supervisor
ENVIRONMENTAL RISKS associated with CULTURAL HERITAGE	3	1	3	• Any cultural heritage requirements will be outlined by the main contractor and incorporated within relevant site-specific RAMS and communicated to site operatives • In the event of any Cultural Heritage findings/requirements being breeched. Work will stop and will not proceed until appropriate control measures are in place.	1	2	2	Operative and Supervisor
ENVIRONMENTAL RISKS associated with ECOLOGY/INVASIVE SPECIES	3	1	3	• Any ecology requirements will be outlined by the main contractor and incorporated within relevant site-specific RAMS and communicated to site operatives.	1	2	2	Operative and Supervisor

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DRILLING Towing of trailer and drilling rig	3	4	12	• Check to ensure all lights and indicators are working correctly prior to setting off • Number plate to of the towing vehicle to be displayed clearly • The tow bar to be securely attached to the towing bracket prior to setting off. Any stabilisers must be retracted prior to setting off • Any loose materials to be secured before setting off • Ensure the load is evenly distributed and firmly secured. • Check tyre pressures are correct and tyres in good condition • Trailer to be correctly coupled to the tow ball or pin. • Do no exceed speed limits.	1	4	4	Operative and Supervisor
DRILLING Injury to pedestrians or property damage during delivery of drilling rig or moving	2	4	8	• Use of designated traffic routes only for delivery and access into the site working location. • Ensure route to working location is clear of obstructions, plant and materials. • Pedestrians to keep to designated walkways • Use banksman during reversing and manoeuvring of drilling rig • Collective protection to be provided in advance of PPE	1	4	4	Works Supervisor
DRILLING Ground conditions provide unstable or inadequate working platform for the rig	4	4	16	• Ensure working area is level and clear of debris. • Rig to be set-up on firm ground • Any soft or uneven ground to be backfilled with stone or client to provide adequate platform such as track matting or bog mats. • Use timber beams beneath the rig chassis to spread and distribute the load	1	4	4	Lead Driller and Supervisor
DRILLING Moving to and setting up on borehole	4	3	12	• Contractor manager to ensure all site personnel are aware of the hazards before they mobilise to site. Segregate personnel movements from plant movements on all access routes. • The access route to site must be given to all drillers and delivery drivers. • Driller's assistant to act as banksman when moving to position. • Lead driller to hold NVQ Level 2 and rig set up in accordance with manufacturer's instructions and BDA code of practice. • All equipment to be serviced regularly	1	3	3	Lead Driller and Supervisor

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DRILLING Plant or equipment overturns	2	5	10	• Machinery not to drive close to unsupported edges of excavations. • Define ramp and unsupported edges with kerbs or stop logs if of significant heights. • Check pneumatic tyre pressure weekly and maintain recommended inflation pressures.	1	5	5	Lead Driller and Supervisor
DRILLING Unexpected movement of plant or machinery	2	4	8	• Plant and machines to have hand brake applied when parked or not in use, supplemented with chocks when stopped in steep slopes. • Do not leave engines running when machines are unattended. • Plant operators to be alert to soft spots and settlement in proximity of excavations. • Plant operators to secure and remove keys from plant when left unattended. • Plant to be parked up in an agreed designated secure area	1	4	4	Plant Operator, Lead Driller and Supervisor
DRILLING Work equipment	3	4	12	• Planned, preventative maintenance system, plus regular inspection of pulleys, drums surfaces and ropes must be noted on the Daily rig inspection sheets. Thorough examinations and testing carried out as appropriate. Driller must not allow rating of equipment to be exceeded. Any faults must be reported immediately to office. MACHINE MUST NOT BE USED IF DEEMED UNSAFE or a fault could affect the safe operation of the rig. • DO NOT OPERATE THE MACHINE IF THE EMERGENCY STOP DOES NOT WORK	1	4	4	Lead Driller and Supervisor
DRILLING Collapse of rig, contact/crushing/ trapping	3	4	12	• Lead driller to hold NVQ Level 2 and rig set up in accordance with manufacturer's instructions and BDA code of practice. • All equipment to be serviced regularly. • Rig bracing and frame supports to be installed and secured with split pin or similar • Ensure rig is setup on firm and adequate ground and load distributed	1	4	4	Lead Driller and Supervisor

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DRILLING Nips, cuts, and amputations	3	4	12	• BDA Safe code of practice must be followed at all times. • Gloves must be worn when handling rods, bits, etc. • Driller's assistants must never place hands on top of casing or stand beneath and look down boreholes when the tools are suspended above the hole. • Clear signals required between crew. • ALL GUARDS AROUND ROTATING RODS TO BE SECURLEY CLOSED TO PREVENT ACCESS TO ROTATING PARTS.	1	4	4	Lead Driller and Supervisor
DRILLING Excessive vibration transmitted to personnel	2	3	6	• Rig controlled remotely with control unit on arm extended away from machine • Contact with vibrating machine will be kept to a minimum.	1	3	3	Lead Driller and Supervisor
DRILLING Movement of drilling rods, casing, and associated tools	3	3	9	• Individuals must not exceed the ACOP guidelines for the lifting of loads. • Check the route is safe and clear prior to lifting. • Only trained, competent and fit personnel to carry out the task. • Follow safe working procedure for manual handling. • Do not lift if it is not safe to do so, get assistance if required. • Use mechanical lifting where possible and available. • Use corrects manual handling techniques. • Park vehicles as close to operations as possible to reduce carrying distances. • Roll tools to position. • Avoid twisting/turning and walk backwards while carrying a load. • Sandbags should be used to secure casings and drill rods on inclined areas. • Don't stop to talk while carrying a load.	2	3	6	Lead Driller and Supervisor
DRILLING Use of hand tools	3	3	9	• Hand tools to be checked prior to each use to ensure they are in good condition • Operatives must be competent to use relevant hand tool • All hand tools to be stored in tool bags / boxes	1	3	3	Lead Driller and Supervisor
DRILLING Working at height while setting up, making repair or	4	5	20	• The drilling rig mast should be lowered to the ground in the first instance. • If the mast cannot be lowered, operatives requiring access to top pulley must be trained and competent to wear safety harness EN 361 and clipped onto mast via lanyard.	1	5	5	Lead Driller and Supervisor

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adjusting – such as installing pulley.				• Set-up of leg safety braces to be undertaken from ground level. • Only use ladder rungs built into rig mast.				
DRILLING Movement of drilling rods, casing, and associated tools	3	4	12	• Check the route is safe and clear prior to lifting. • Only trained, competent and fit personnel to carry out the task. • Follow safe working procedure for manual handling. • Do not lift if it is not safe to do so, get assistance if required	1	4	4	Lead Driller and Supervisor
DRILLING Falls of equipment	2	4	8	• Inspect all lifting equipment at start of each shift and ensure all relevant equipment is tested and certified. • Stand rig on stable ground. • Use correct lifting techniques. • Only trained persons to use drilling equipment. Wear correct PPE.	1	4	4	Lead Driller and Supervisor
DRILLING Contact with underground services	3	4	12	• Main Contractor to locate and identify services • Ensure CAT scan carried out by main contractor • Ensure existing service drawing reviewed • Ensure correct permit to dig is in place and signed by relevant persons. • Undertake drilling only after permit to dig is issued • Follow any procedure identified in permit to dig • Communicate with main contractor	1	4	4	Lead Driller and Supervisor
DRILLING Drilling Rope Failure/Rope under tension	3	4	12	• Daily visual check on rope and shackle condition. • All lifting equipment shall carry 6 monthly check and inspection certification. • Drillers' Assistant to stand 4m from bore whilst drilling rope under tension	1	4	4	Lead Driller and Supervisor
DRILLING Tools/Casing Stuck – Rope whipping	3	4	12	• Lower rig mast to enable reconfiguration of roping arrangement at ground level, if possible. • Slack or loosen rope from ground level prior to any work. • Operatives requiring access to top pulley wheel or pulley wheel to wear safety harness EN 361 and clipped onto mast via lanyard. Only use ladder rungs built into rig mast.	1	4	4	Lead Driller and Supervisor
DRILLING Injury from defective plant	3	4	12	• Plant to have up to date maintenance records for machines. • Plant operatives to carry out daily pre-start safety checks. • Emergency stops were fitted to be tested daily. • Mobile plant to be removed from service if safety critical defects are noted.	1	4	4	Lead Driller and Supervisor

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DRILLING Injury from incorrect dismantling of rig	3	4	12	• All plant regularly maintained. • Only competent persons to undertake the task • Supervision of task to ensure correct methodology	1	4	4	Plant Operators , Lead Driller and Supervisor
DRILLING Creation of voids during drilling	2	4	8	• In event of blowing sands, ensure suitable water supply is available to maintain head of water within the borehole. • Ensure shell used is undersized to the temporary casing therefore reducing friction and vacuum within the bore • Ensure the load from the rig is spread and distributed correctly • Lead driller to regularly check the ground surrounding the casing for voids or signs of settlement	1	4	4	Lead Driller and Supervisor
DRILLING HAZARDOUS GAS	3	4	12	• If any odour present during drilling stop and report to management. • If odour present, use of gas monitor required and fitted to drilling rig cage during drilling & install works. Gas monitor located close to well during testing and airlift operations. • Warning when levels exceed limits. If this happens all personnel to exit the work area and cordoned off until the increase in gas level can be identified and controlled. • Pedestrian egress from the work area to be kept clear at all times. • No hot works adjacent to the borehole • No smoking on site	2	4	8	Operative & Supervisor
DRILLING & PUMPING INSTALLATION Injury caused from telehandler loss of load/overturning	3	4	12	• The plant must only be operated by competent person who has CPCS in Telehandler operations. No other untrained persons on site to operate the plant. • The safe working load must not be exceeded. • Passengers must not be carried. • LOLER 1998 reg9 (3) require periodic inspections of all lifting equipment, a valid certificate must be available on site. • PPE: Hard hats, safety boots, high visibility vests to be worn at all times when not in the cab. • Type of telehandler and ground conditions to be checked to ensure suitability for loads to be moved. • Weights being carried to be known. • Stabilisers to be used when lifting to heights	1	4	4	Lead Driller and Supervisor

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PUMPING SYSTEM INSTALLATION High pressure hoses	3	4	12	• Check airlines for defects before use. • Use whip-checks at all couplings/connections. • Ensure connections are securely connected • Appropriate care to be taken when using compressor and airlines • Separate hoses from other site activities to reduce risk of damage.	1	4	4	Operative & Supervisor
PUMPING SYSTEM COMMISSIONING Electric Shock	3	4	12	• Only trained and competent person to install the pumps. • Use warning signs on electrical control panels and lock off system when not in use. • All electrical equipment to be stored undercover until installed. • All exposed equipment element to be minimum IP45 rated. • All connections to be plug & socket • No hard wiring or alterations to connections by dewatering operatives	1	4	4	Operative & Supervisor
PUMPING SYSTEM COMMISSIONING Weils disease	4	4	16	• Wear PPE. Avoid skin contact with fuels and oils. • Wash hands prior to eating and drinking	1	4	4	Operative & Supervisor