

PROJECT MANAGEMENT PLAN

PMP SECTION 4 – WORKS PROCEDURE 2; Steel-fixing

v4.3

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3.5	Attendant excavator to be utilised to move cages from steel storage area to piling rig; reinforcement will be installed in accordance with Works Procedure 4.1.1: Part 4 / 4.1.2: Part 4.		Banks men / Steel fixer
	<i>Note: Depending on the weight of the cage, R&A require a certain 'number of ties' to ensure that the cage is safe to lift. This table can be seen on the next page.</i>		

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Calculation of maximum pile reinforcement cage weight that can be safely supported by hand tied wire

This calculation is in accordance with BS EN 1993

A Crown tie may be used

18 gauge tie wire is 1.8mm diameter

Steel type will be based on the lowest available grade i.e. S235

Reinforcement cage will have minimum 2 no helical turns and this table specifies the ties between the main bars and these 2 helical turns

Assumption is that the tie wire is tied so tight that the wire will either slip, break or shear before it could come undone

No of Main Bars	No of Ties per bar	Total No of Ties	Maximum Weight of Cage Tonnes	Maximum Weight of Cage Kg	Assuming Cage is not lifted evenly - assume 2/3 ties engaged	Steel Wire Strength N/mm2	Steel Wire Minimum Diameter to be used mm	Total Ultimate Tensile Resistance kN	Total Resistance to Slippage kN	Total Ultimate Shear Resistance kN	Minimum Ultimate Resistance kN	Load Factor	Material Factor
4	4	16	0.25	254	11	235	1.8	6.4	3.8	3.7	3.7	1.5	1.0
5	4	20	0.31	314	13	235	1.8	8.0	4.8	4.6	4.6	1.5	1.0
6	4	24	0.37	375	16	235	1.8	9.6	5.8	5.6	5.6	1.5	1.0
7	4	28	0.43	436	19	235	1.8	11.2	6.7	6.5	6.5	1.5	1.0
8	4	32	0.49	497	21	235	1.8	12.8	7.7	7.4	7.4	1.5	1.0

PROJECT MANAGEMENT PLAN

PMP SECTION 4 – W/P 3; Sampling & Testing Concrete

Rock & Alluvium 

Contract Title: 100, Woodside Avenue. N10 3JA	Contract No:	MS Reference:
Work Package: Sampling and Testing Concrete	9761	MS 03
Author: ND / WL	Date Produced: 09/11/2023	

Scope of Works	Sampling and testing concrete
Significant HS&E Risks	Refer to Full Risk Assessments, and COSHH Register (FM-HSS-H02-02) COSHH Assessments (FM-HSS-H02-01)
Personnel No. Competency level / qualification	Carried out by Concrete pump operator
Plant, equipment and material required	Sampling scoop Concrete cube moulds Tamping bar Trowel Curing tank Mould oil Power supply

	Key: R = Review, I = Inspect, H = Hold	Inspection	Responsible
	Note: On certain sites this may be carried out by an external company, cubes would then be made by a visiting technician and taken away the same day.		
1	Checking the Load		
1.1	The Foreman will be informed of the Concrete mix in the technical pack handed over at site start-up.		Supervisor
1.2	This information will be briefed to the Pump Operator.		Foreman
1.3	When a mixer truck arrives on site, the pump operator will check the delivery ticket <u>prior to discharge</u> to ensure the mix is as specified.	R (Delivery Ticket)	Pump Operator / Banksman
1.4	Random trucks may have the slump checked; slump is visually assessed for every delivery.		Foreman
2	Sampling		
2.1	Concrete from the beginning and end of the load should not be used; only the middle half is to be sampled. Take scoops at regular intervals into a clean bucket.		Cube maker
3	Cube Making		
3.1	Check the cube moulds for damage or out of square. Ensure they are oiled to prevent adhesion.	I	Cube maker
3.2	Fill the 100mm mould in two equal layers, tamping each 25 times, starting in a corner and working your way into the centre Note: A 150mm mould needs 35 tamps for each of its <i>three</i> layers; these are not used by R&A.		Cube maker
3.3	Remove surplus concrete with float and smooth off.		Cube maker
3.4	Seal the top of the mould with a wet cloth and/or plastic to prevent drying out.		Cube maker



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PMP SECTION 4 – W/P 3; Sampling & Testing Concrete

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3.5	Ensure the cubes are protected from frost damage overnight in the winter as this will have implications to the strength. Frost damaged cubes should be discarded.	I	Cube maker
4	Storage of Cubes		
4.1	Strip the mould carefully, tapping gently to break the bond. Take care with blended concrete as it may still be weak the following day.		Cube maker
4.2	Mark the cube with the Contract no, Pile no and date cast, recording this also on the dispatch note. Generally: 1No to be tested at 7days, 2No at 28days and 1No to be kept as 'spare' (to be tested at 56days if 28day results are low). 		Cube maker
4.3	 Place the cubes in the tank where they must be kept wet and warm; between 18° C & 22° C as standards dictate.		Cube maker
4.4	Formation Design & Build Ltd will need to supply 24hr electric power at all times, especially during cold months, for our concrete cubes to cure correctly. NOTE: Rock & Alluvium will not guarantee cube results if there is no 24hr power supply and curing conditions are unsuitable.		Formation Design & Build Ltd
5	Dispatch		
5.1	Cubes shall be dispatched for testing regularly and not allowed to accumulate on site. If no cubes have been collected within 4No days of piling commencing, R&A Foreman should contact the Contract Supervisor or SOCOTEC directly (01895 235235), quoting contract number and site address; generally, 2No collections per week are allocated per contract.	R (Dispatch Note)	Foreman

PROJECT MANAGEMENT PLAN

PMP SECTION 4 – W/P 4; Blowing Out CFA Piling Rig

v4.3

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Contract Title: 100, Woodside Avenue. N10 3JA	Contract No:	MS Reference:
Work Package: Blowing out of CFA Piling Rig	9761	MS 04
Author: ND / WL	Date Produced: 09/11/2023	

Scope of Works	Blowing out of CFA Piling Rig
Significant HS&E Risks	Refer to Full Risk Assessments, and COSHH Register (FM-HSS-H02-02) COSHH Assessments (FM-HSS-H02-01)
Personnel No. Competency level / qualification	Rig Driver/Foreman Pump Operator CPCS / CSCS
Plant, equipment and material required	CFA Piling Rig Air Compressor Blowing out Cannon Sponge Ball Blowing out Shield (Optional) Tarpaulin (Optional)

	Key: R = Review, I = Inspect, H = Hold	Inspection	Responsible
1	Where to blow out		
1.1	The piling rig should be positioned in a suitable location facing away from the site boundary; walkways; site entrance; cabins; site huts; other plant. A suitable 'designated' blow-out area is to be agreed with the 'Principal Contractor's supervisor daily, prior to blowing out.	I	Foreman
1.2	Blowing out must only be carried out facing away from the site hoarding (note that the 'T-piece' on the rear of the rig must also be facing away from the boundary for 'Stage 1' of the blowing out procedure), the activity is to be carried out as far away as possible from any public interface. As a general note, the foreman is to ensure that the site boundary is suitably protected (i.e. not heras fencing)	H	Foreman
1.3	The rig foreman or supervisor is to contact the site manager to ensure that site access and site boundaries are suitably protected and to ensure a safe work area is provided; if a requirement of the PC's management systems, the blowing out procedure will be carried out under their permit system.	H	Foreman
2	Blowing out – Stage 1 (Clearing of rig system)		
2.1	Upon completion of the last pile of the day shift, any excess concrete held in the agitator / concrete lorry will be pumped through to the piling rig.		Pumpman
2.2	The pump operator will then back pump the final hopper full of concrete to relieve pressure in the concrete hose.	H	Pumpman
	Note: Confirmation that concrete system no longer under pressure to be verbally communicated to rest of rig team.		
2.3	Rig Driver / Banksman to release cap on 'T-piece' on rear of piling rig; concrete in 'drop hose' & rig pipe system flows out freely due to gravity.	H	Rig Driver / Banksman
	Note: If no concrete comes out, refer to blockage procedure. Concrete system pressure must be removed prior to release of any hose couplings.		
3	Blowing out – Stage 2 (Clearing of land lines)		
3.1	Disconnect concrete hose from pump.		
3.2	Introduce a wet sponge blow-out ball into the concrete hose (pump end).		
3.3	A blow out cannon is then connected to the hose and then in turn connected to the compressor.		

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PMP SECTION 4 – W/P 4; Blowing Out CFA Piling Rig

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3.4	Airflow is tuned on; the sponge ball pushes concrete through the line and exits from the open 'T-piece' section; this is completed via use of the lowest sufficient pressure to ensure a slow controlled concrete flow.		
3.5	The blow out cannon is to be disconnected from the concrete hose.		Banksman
3.6	Rig to be moved (facing away from the boundary wherever practicable) to ensure clean ground conditions/access to rear of rig for operatives, avoiding the expelled concrete.		
3.7	Sponge ball placed in 'T-piece' section (ensuring it is 'pushed towards the front of the rig') end cap resecured to 'T-piece'.		
4	Blowing out – Stage 3 (Clearing system of residual concrete)		
4.1	The rig is tracked up to a heap of spoil ensuring that the auger is surrounded by sufficient spoil to ensure that the cementitious materials expelled when the sponge ball exits the auger during the blowing out is contained and does not eject from the spoil heap. (NOTE: The blow out shield (shown on the right) may be utilised if the above is deemed unsuitable).		Foreman
4.2	The foreman / banksman is to be located at the piling rig. The pump operator is to be located at the compressor next to the blow out cannon.	H	Rig Driver
	Note: A clear line of sight is required and must be maintained for communication between the pump operator and the site personnel attending the rig.		
4.3	The compressor is to be started and the air is gradually released to the blow out cannon. The blow out cannon valve is then released to move the concrete along the concrete hose		Rig Driver
4.4	The air pressure is to be controlled by the pump operator to allow the sponge ball to exit the auger tip in a controlled way.		Banksman
4.5	The concrete hose is to be monitored by the banksman / foreman and when the concrete has passed through the last hose in the line, the foreman / banksman will signal the pump operator to turn off the air supply to the blow out cannon.		Rig Driver / Pumpman
4.6	When the piling rig drop hose lifts and moves, the foreman is to signal the pump operator at the compressor and blow out cannon to release the remaining air in the concrete hose through the blow out cannon release valve, maintaining enough pressure to allow the sponge ball to pass through the auger and exit the tip. Any splashing / debris will be contained by the spoil / blow out shield.	H	Foreman / Rig Driver / Banksman
	Note: In this instance, you should expect: Concrete / Sponge Ball to come from the auger in quick succession.		
4.7	The concrete hoses and augers will now be empty of concrete/water.		Banksman
4.8	The blow out cannon is to be disconnected from the concrete hose.		Banksman
4.9	Two or three buckets of water are to be poured into the open end of the concrete hose followed by a wet sponge ball.	I	Banksman
4.10	Repeat Step 4.3 to 4.7.		Banksman

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PMP SECTION 4 – W/P 4; Blowing Out CFA Piling Rig

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4.11	The foreman / banksman will communicate to the pump operator that the blowing out procedure is complete.		
5	After completion of blowing out		
5.1	The blow out cannon is to be disconnected from the concrete hose.		Banksman
5.2	Unpin and remove the blow out shield (if used) from the front of the auger, remove the tarpaulin and retrieve the sponge blow out balls.		
5.3	Wash down all equipment.		Banksman

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PMP SECTION 4 – W/P 5; Setting Out

Rock & Alluvium 

Contract Title: 100, Woodside Avenue. N10 3JA	Contract No:	MS Reference:
Work Package: Setting Out	9761	MS 03
Author: ND / WL	Date Produced: 09/11/2023	

Scope of Works	Setting out and recording of pile as-builts
Significant HS&E Risks	Refer to Full Risk Assessments, and COSHH Register (FM-HSS-H02-02) COSHH Assessments (FM-HSS-H02-01)
Personnel No. Competency level / qualification	Full time setting out engineer
Plant, equipment and material required	Robotic 'total station' Setting out pins (typically H12-H16 x 300-400mm) Lump hammer Cemcap (plastic safety cover)

	Key: R = Review, I = Inspect, H = Hold	Inspection	Responsible
1	Prior to arrival to site		
1.1	Client to provide (co-ordinated) AutoCAD pile layout, and ideally an extractable list of all pile co-ordinates (Easting and Northing).		
1.2	Setting out sub-contractor to carry out QA check by cross-referencing pile co-ordinates with the Engineers pile layout drawing.	H	Contract Supervisor
1.3	Drawings are imported into a CSV file format (fully automated process) and loaded into 'total station'; note that fully automated process mitigates the potential for human error through data input.		
2	Upon arrival to site		
2.1	Existing site survey control information to be provided; minimum requirements are 3No base control stations; co-ordinates and height to be provided, these must lie within the site boundary. All site issued documents to be recorded.	I	
2.2	The 3No base stations are to be checked for accuracy; any deviations to be recorded & signed off by site manager.		Engineer
2.3	Piling platform level 'spot checks' to be carried out and verified with R&A foreman. PPL checks are to be carried out daily prior to commencement of the shift and any deviation from the scheduled level is to be raised with the Client.	I	Engineer
	Note: Permit to dig must be in place prior to any pins being driven into the ground		
3	Setting out		
3.1	Engineer sets up total station (with reference to the base stations/site control) and by use of the 'stake out' mode on the total station commence setting out.		
3.2	With the engineer working at the 'prism end' the pile position is located to within 20mm accuracy.		
3.3	Setting out pin (maximum 400mm) is driven into the ground (maximum penetration 350mm). Pin position is recorded on the total station.		
3.4	Pile number is clearly written on plastic safety cap which is placed on the setting out pin.		
4	As-builts		

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PMP SECTION 4 – W/P 5; Setting Out

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4.1	The as-built location of the pile is carried out directly after the cage has been surged into the pile. This is done by one of two methods; either by a 'six point circumference' or a template to record the centre of the pile. It is important that the platform level is recorded at the time of the pile as-built to ensure that the platform is not deteriorating through excessive scraping of pile arising's from the head of the pile. If the as-built shows a pile to be out of tolerance (75mm in plan) or the platform level is more than 50mm low R&A foreman <u>must</u> be informed.	H	Engineer / R&A Foreman
4.2	If pile as-built is more than 75mm out of position, R&A foreman is to contact head office as soon as possible to ensure that pile is suitable for inclusion into permanent works.		Foreman
4.3	All 'as-built' pin and pile positions (including height) are to be e-mailed to R&A on a weekly basis at minimum. Note that final as-built is ideally required prior to rig leaving site,		
	<i>In the case of rotary piling the casing position and casing level must be taken.</i>		
5	Sequencing		
5.1	Pile setting out to be in accordance with R&A foreman's requirements; generally a maximum of 6 – 10 pile positions ahead of the rig.		
	<i>Note: Setting out pins will be driven into the pile mat and will not penetrate 'natural' ground, the risk to operative from service strike, is effectively nil. Notwithstanding this, the setting out pin will only be driven into the pile mat on a pile position, which should be confirmed as 'clear of all services' prior to arrival of the piling rig.</i>		

PROJECT MANAGEMENT PLAN

PMP SECTION 4.6 – Guide for Safe Interaction Between Plant & Operations

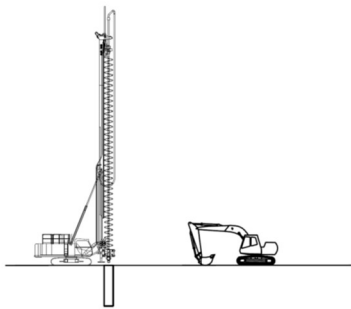
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Excavator, not under instruction from our Banksman, is required to sit in a default position, as shown left, to give good field of vision to all personnel.

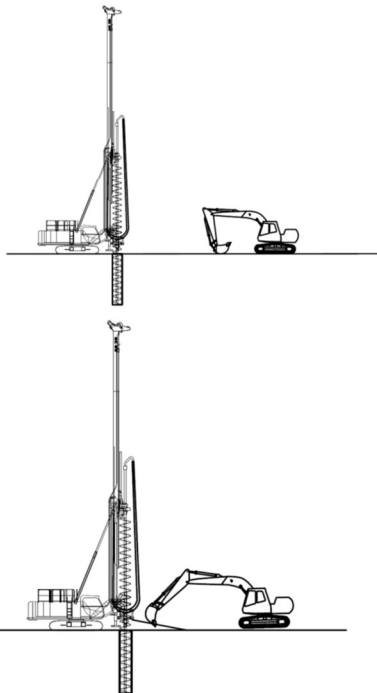
Important Notes:

- No machine should move without instruction from Banksman.
- Banksman should be aware of his surroundings and how visible he is to other operators.
- Where possible excavator under our instruction should slew away and place bucket on floor so driver and Banksman have a better field of vision to each other.
- Site personnel to not be within 2m of Excavator bucket max reach whilst Excavator is clearing spoil.
- Safe zones for Piling and Post Piling Operations are to be followed as shown below.



Banksman requires access around Piling Rig to facilitate the moving (banking) of the machine safely to enable setting up the rig on a pile position and checking positional tolerances at start of drilling; it is their responsibility to check the operation of the Piling Rig whilst drilling, i.e. for gate operation, deployment of extension pole etc.

NOTE: Ideally Excavator Parked in default position.



The mast of the Piling Rig creates a blind spot; the banksman must position themselves with clear line of site to both Piling Rig and Excavator Operators; it is the banksman's responsibility to visually monitor the auger, flight cleaner, rotary table and the position of both hydraulic and concrete hoses, during the construction of the piles. This is to ensure said hoses do not get caught or pinched as to cause a failure

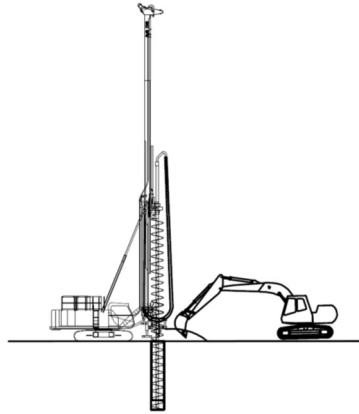
NOTE: Ideally Excavator Parked in default position.

Excavator to be under full instruction from Banksman to clear spoil around machine maintaining clear line of site with all operatives.

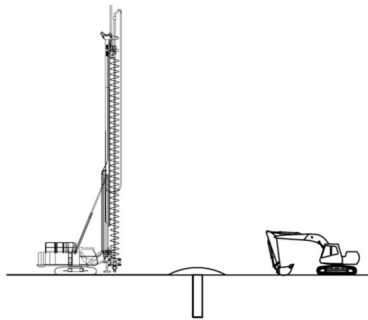
PROJECT MANAGEMENT PLAN

PMP SECTION 4.6 – Guide for Safe Interaction Between Plant & Operations

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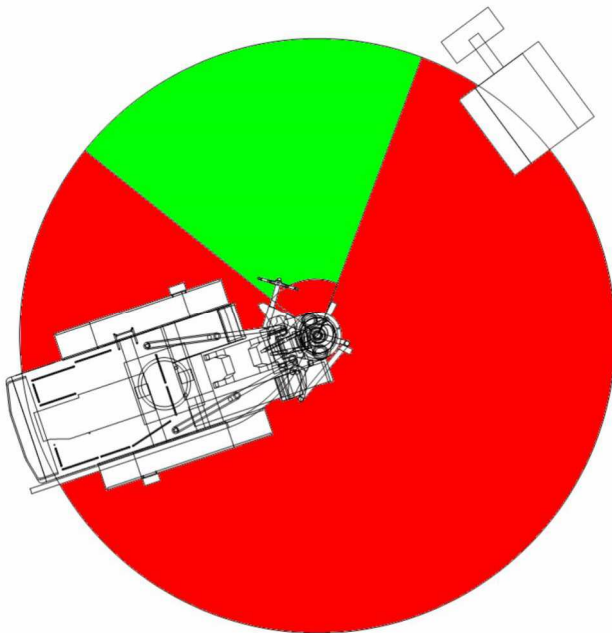
While concreting, clear line of site to be maintained with banksman, they are to ensure hoses are not caught on gates during auger extraction and that auger cleaner is effectively cleaning flights.

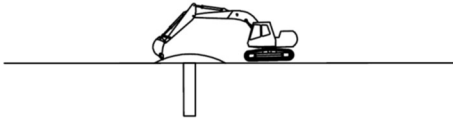


Banksman to instruct Piling Rig to move away from concreted pile. Excavator Operator to then be instructed by Banksman to remove remaining pile arising.

Banksman Safe-Zone (For Piling) Standing Location

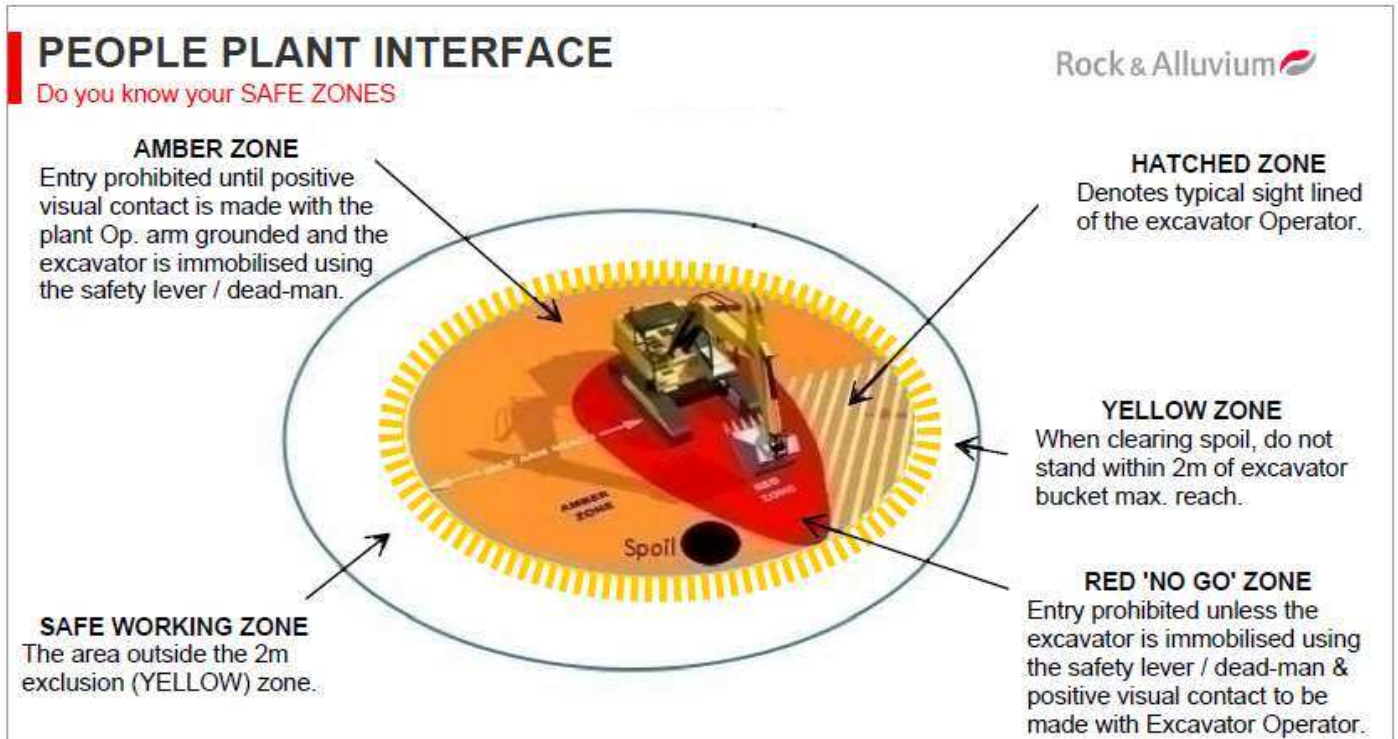
Banksman safe standing area (Green) this will maintain clear lines of sight with both Piling Rig and Excavator Operators.





Excavator under instruction to clear risings before installation of reinforcement cage, banksman to maintain the 2m exclusion zone as detailed below.

Safe Zones (Post Piling Operations)



The above guide has been read and understood by the people who have signed off the Briefing Record (Section 9 of Project Management Plan.)

The Briefing Record must therefore include signatures from the following as a minimum:

R&A Foreman
R&A Banksman
Excavator Operator.

PROJECT MANAGEMENT PLAN

PMP SECTION 5 – W/P 1; Erection & De-rigging SR45

Rock & Alluvium 

Contract Title: 100, Woodside Avenue. N10 3JA	Contract No:	MS Reference:
Work Package: Erection and De-rigging of Piling Rig	9761	MS 01
Author: ND / WL	Date Produced: 09/11/2023	

Scope of Works	Erection and de-rigging of Soilmecc SR-45 Piling Rig
Significant HS&E Risks	Refer to Full Risk Assessments, and COSHH Register (FM-HSS-H02-02) COSHH Assessments (FM-HSS-H02-01)
Personnel No. Competency level / qualification	Rig Driver/Foreman, Pump Operator, Piling Operatives (1or 2).
Plant, equipment and material required	Soilmec hydraulic Piling rig MEWP

	Key: R = Review, I = Inspect, H = Hold	Inspection	Responsible
1	Introduction		
1.1	This method statement has been written to assist piling operatives in the safe erection of a Soilmecc SR-45 piling rig.		
1.2	It is geared towards piling operatives that have limited knowledge of the piling rig and details the sequenced operations that must be followed to ensure that the rig is erected both correctly and safely.		
1.3	It will also act as a refresher course for experienced operatives who may have been badly trained or ill-advised in the past.		
2	Preparation of the Area		
2.1	Locate the Rig in an area of the site that is firm, level and clear of all other construction operations. This area will need to be at least 20m long and 7m wide.	I	Rig Driver
2.2	Ensure that there are no cables, trees or other overhead obstructions above the piling rig.		
3	Track Extension		
3.1	Change over switch in cab to flight cleaning to extend tracks, Banksman is to ensure that no one walks into the area until the tracks are fully extended. 		
3.2	Repeat the above operation to extend track back.		
4	Unfold and Lock Upper Mast Section (If required)		

PROJECT MANAGEMENT PLAN

PMP SECTION 5 – W/P 1; Erection & De-rigging SR45

4.1	An operative using a MEWP removes the travelling restraint devices. 		
4.2	The top section of the mast can then be hydraulically moved around to close up the gap on the mast hinge by connecting the hydraulic pipes & operating the ram from the cab. Care is to be taken to ensure that all operatives keep hands and arms clear of all crush zones.   Mast Section Connecting Bolts		
4.3	An operative then accesses up to the side of the hinge using a MEWP and inserts the locking pin which is secured with the bolts provided.		
5	Mast Elevation		
5.1	Check that all the ropes are free and they cannot be nipped, crushed or twisted when the mast is being raised.		
5.2	Raise the mast to approx. 45°, care should be taken here to ensure that the ropes are clear.		
5.3	Continue to raise the mast to the vertical.		
6	Fit Mast Foot if applicable		
6.1	The Mast foot is fitted and the locking bolts secured. Hydraulic pipe-work to adjustable foot to be connected. (note foot can also be left fitted on machine so section 6.1 would be not applicable) 		
7	De-rigging		

PROJECT MANAGEMENT PLAN

PMP SECTION 5 – W/P 1; Erection & De-rigging SR45

7.1	The de-rigging procedure is the reverse of the above.		
8	Augers		
8.1	Augers section to be placed in front of the piling rig using hi-ab / excavator ensuring the female couplings are facing the front of the piling rig	R	All Ops
8.2	Banksman to take spare line hook from the rig and place on the ground next to the female auger couplings.		
8.3	Collar chain connected to 1No section of auger minimum of 500mm from top of section spare line hook connected to collar chain.	H	Banks man
8.4	Once secure Banksman to signal to rig driver to start to lift section off the ground to approximately 1.2m. Banksman to check female coupling for any debris.		
8.5	Debris removed if required using suitable tools		
9	Lifting Auger section into place		
9.1	Ensure motors on rig are at a suitable height from the ground to take the auger section	I	Banks man
9.2	Rig gates to be opened manually / hydraulically depending on rig type		
9.3	Banksman to stand in a safe area to the side of the piling rig and signal driver to lift the auger section into place. Once auger section is vertical gates to be closed around the auger section. Spare line lowered enough to enable hook to be removed / auger rotated.	H	Banks man
9.4	MEWP to be moved into position next to the piling rig. IPAF operator to raise cherry picker up to the auger section / motors. Ensuring the MEWP basket is a minimum of 1m from the auger.		
9.5	Banksman / MEWP operator to signal rig driver to lower / spin auger as required to enable male & female couplings to be connected and lowered into position		
Note: There is no requirement for the auger to be touched, should this be necessary then the stem should be held; under no circumstances should the extremities of the flights be held.			
9.6	Once in position MEWP operator moves the cherry picker basket next to the auger section and insert 2No pins using a club hammer to secure the section.	H	Banks man
9.7	MEWP operator / Banksman to remove spare line from collar chain & collar chain from auger section. MEWP moved away from piling rig and lowered to ground		
	Above steps followed to install additional sections as required		