

JRL CIVIL ENGINEERING LTD

Ferry Island

Method Statement – CFA Piling

Doc Ref No: T22001-SSOW#001

Status: For Approval

Revision: 00

02nd September 2022

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00	02.09.22	First Issue	KMcQ		For approval
					

Safe System of Work Form SHE 4

To be completed when tasks involve multiple or complex activities that are not covered in their entirety by risk assessments and/or key procedures.

Note: This form is only valid when sections K and L are completed and signed by the manager responsible and all personnel involved.

Site/project name:	Ferry Island	Project no:	T22001
Address:	Tottenham Hale, London, N17 9FR		
Company:	JRL Civil Engineering Ltd - 4 Elstree Borehamwood, WD6 1RN		
Client:	JRL		
Method Statement No.	SSOW#01	Title:	CFA Piling
Contracts manager:	Kevin McQuarrie		
Site supervisor:	Daniel Wilkinson		
Prepared by:	K McQuarrie	Signature:	 Date: 02.09.22
Approved by:		Signature:	Date:
Revision:	00	Revised by:	Revision Date:

A: Brief description of work to be undertaken

750mm Secant Wall, 750mm and 900mm Bearing and Tower Crane Piles	
Site Start date: October 2022	25 Weeks Including Mob and Demob

B: Work equipment required for a safe working environment

Note: Include all equipment needed for a safe work environment, Do not include PPE – see section H. Casagrande B470 CFA Piling Rig - Diesel/Hydraulic Casagrande B360 CFA Piling Rig - Diesel/Hydraulic Sennebogen 6113 E Crane – Diesel/Hydraulic 2nr Compressors - Diesel/Pneumatic 2nr Concrete pumps (CFA Piling) - Diesel/Hydraulic 2nr Agitator – Diesel/Hydraulic MEWP (“Cherry Picker”) - Diesel/Hydraulic 2nr Excavators - Diesel/Hydraulic Dumper - Diesel/Hydraulic COSHH (See Appendices) Diesel Hydraulic Oil Grease Prime-a-pump Concrete

Safe System of Work Form SHE 4 (cont'd)

C: Sequence of main job tasks (identifying the work equipment required for health and safety, method and associated safety controls)

1. Scope of Works

The piling scope of works for Ferry Island includes:

- 250nr Primary and Secondary 750mm diameter Secant Piles
- 93nr 900mm diameter Bearing Piles
- 247nr 750mm diameter Bearing Piles
- 24nr 900mm diameter Tower Crane Piles

Testing

- 1nr 750mm diameter Prelim Test Pile

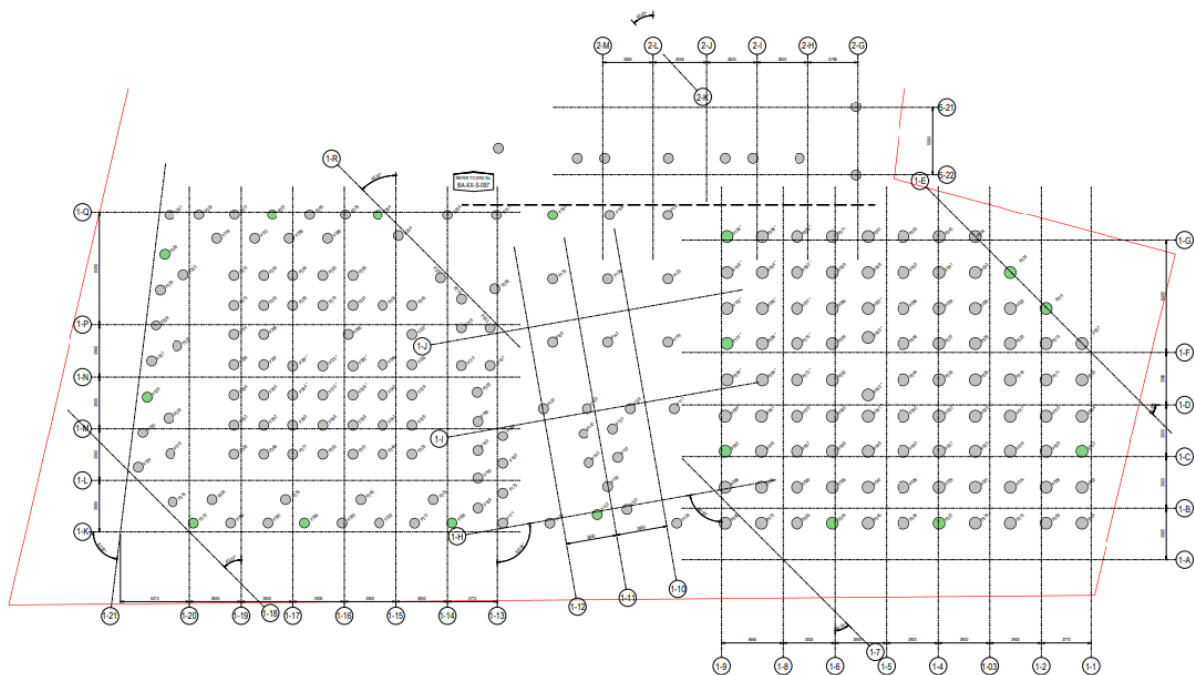


Figure 1: Building 1 Piling Layout

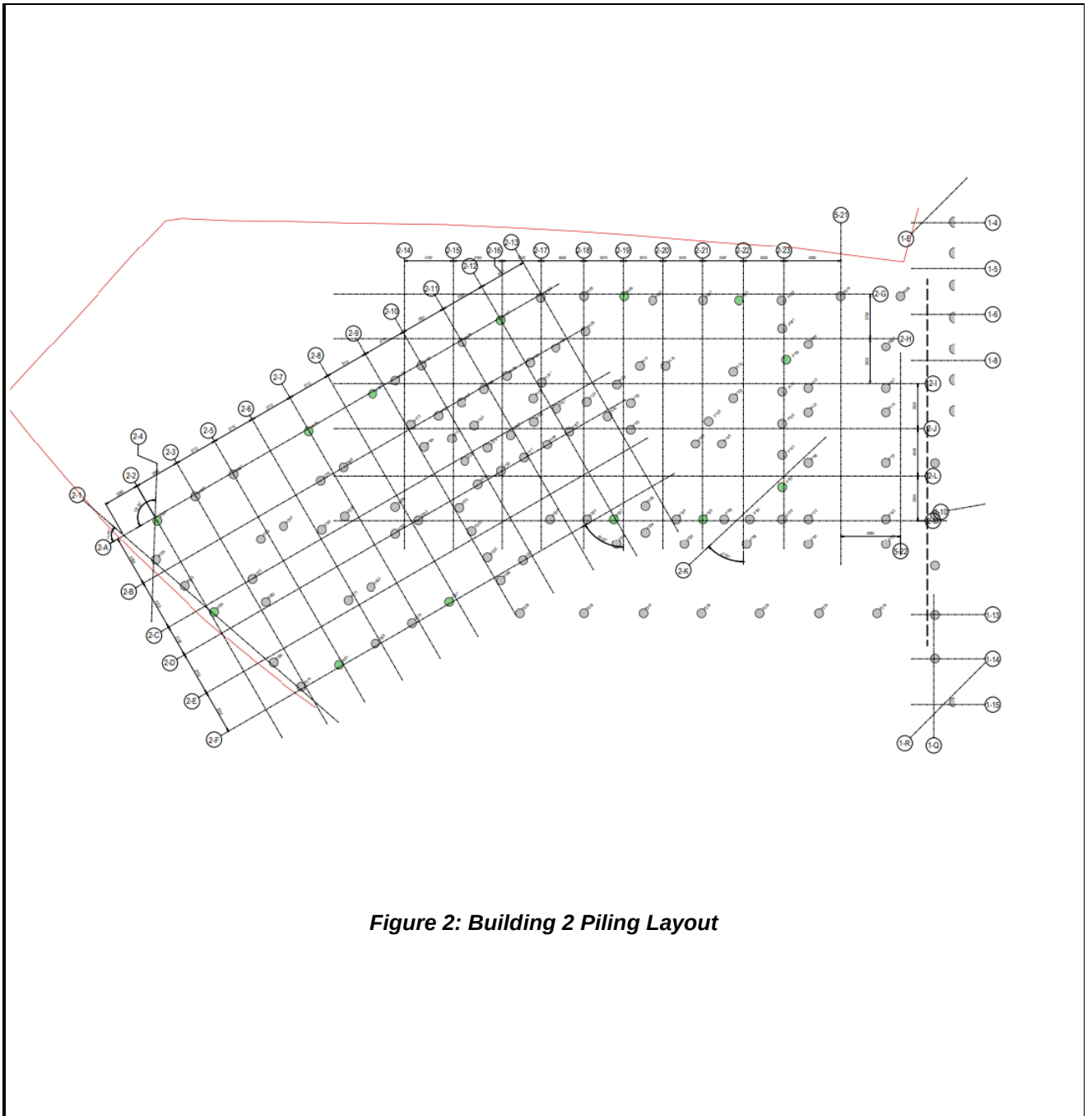


Figure 2: Building 2 Piling Layout

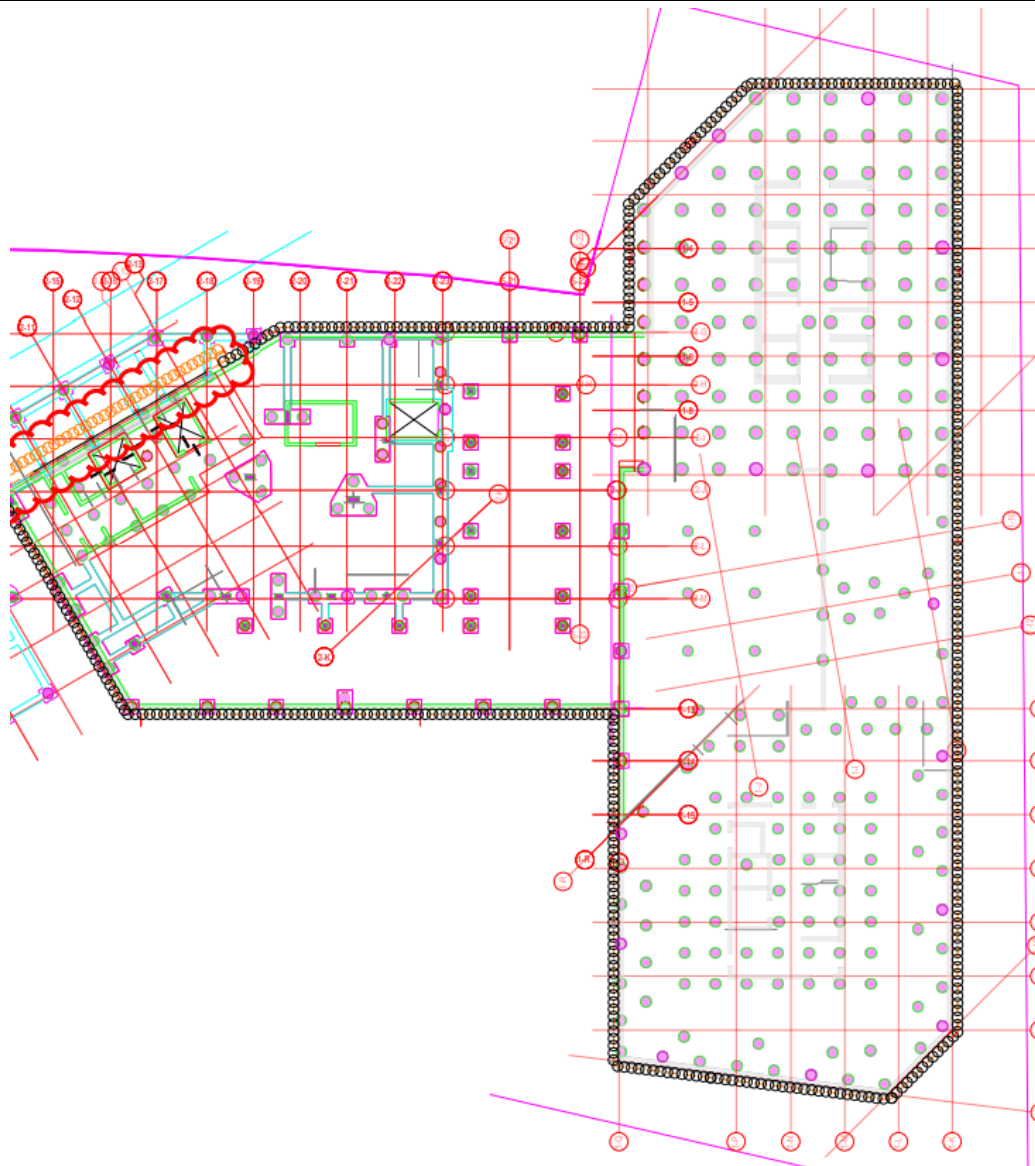


Figure 3: Secant Wall Layout

- Programme

The duration of CFA piling works is approximately 25 weeks including mob and demob

Working times are Monday to Friday 8am to 6pm. Currently we only envisage any weekend working to carry out routine maintenance, if we are required to work on weekends consent will be sought from the site management in advance.

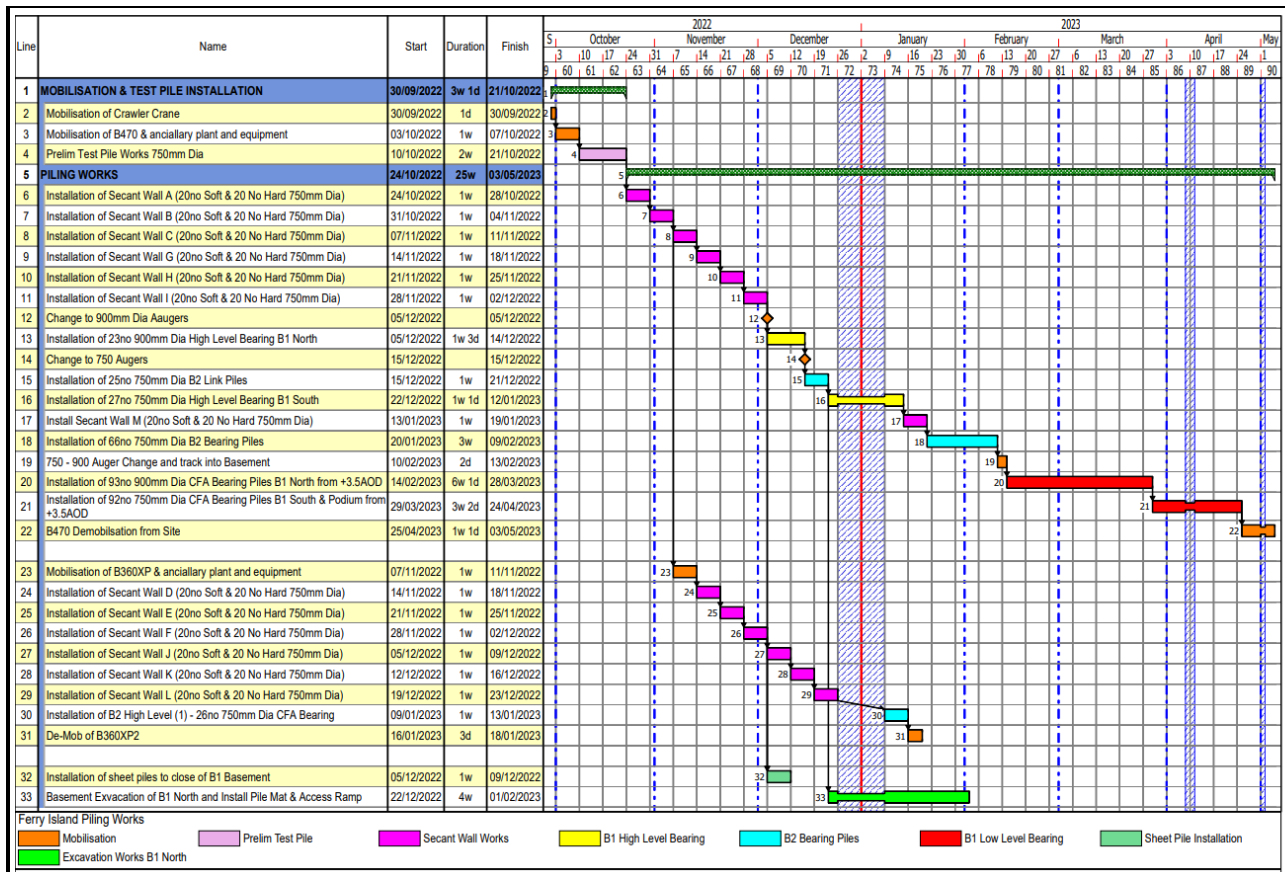


Figure 4: Piling Programme

• Significant risk and controls

Risk: Workforce coming into contact and spreading Covid 19

Controls: Anyone showing signs of the virus should be refused entry to site. Social distancing to be maintained. Communal areas such as toilets and canteens should be cleaned and disinfected frequently. Regular toolbox talks to be carried out to highlight the governments hands, face, space campaign.

Risk: Contamination of Aquifers through Piling Method

Controls: We note that planning condition B22 relates to the possible contamination of the underlying aquifer, with respect to this, please note: Environmental Guidelines With reference to National Groundwater & Contaminated Land Centre Report NC/99/73 "Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination, Guidance on Pollution Prevention" We would make the following general comments: Section 2.2 Environment Agency Concerns - Page 7 of the EA document states: "Where sites are underlain by aquifers, piling should be avoided wherever possible, where this is not possible and there is no alternative to piling, continuous flight auger piles probably pose the least risk of groundwater pollution." • The EA report refers to 6 no pollution scenarios summarized in table 5.1 of the report, these are discussed below:-

Pollution scenario 1 - Creation of preferential pathways, through a low permeability layer, to cause contamination of groundwater in an aquifer - CFA boring process will always drive the made ground upwards not downwards during construction. CFA process requires that during boring the weight of spoil on the auger and during concreting the head of concrete, both always exceed the head of groundwater so that there is no flow in to the bore. Displacement of the soil surrounding the pile is minimised and there is minimal radial and vertical soil movements. Concrete is cast directly on to the surrounding soil.

Pollution scenario 2 - Creation of preferential pathways to allow migration of landfill gas or contaminant vapours to surface - Refer to above.

Pollution scenario 3 - Direct contact with contaminated arisings which have been brought to the surface - This will apply to the CFA process and procedures / mitigation will need to be in place (by others). We have currently allowed for standard procedures and PPE.

Pollution scenario 4 - Direct contact with contaminated soil or leachate causing degradation of pile materials - Appropriate design sulphate class adopted to meet site conditions.

Pollution scenario 5 – The driving of solid contaminants down into an aquifer during pile driving - This does not apply to CFA and only applies to driven piles.

Pollution scenario 6 – Contamination of groundwater and, subsequently, surface waters by concrete cast, cement paste or grout - The document refers to this being localised and can be reduced by immediately removing spoil away from the location of the pile installation to an agreed location / skip or lorries.

'Piling and Penetrative Ground Improvement on Land Affected by Contamination: Guidance on Pollution Prevention' pp19 - 20 indicates regulatory intervention has led to the adoption of auger based piles in situations such as those at Ferry Island

- **Risk:** Debris falling from the auger.
Controls: Ensure mechanical auger cleaner is good condition and working properly. When piling close to footpaths an operative will be positioned on the footpath while installing these piles to divert passers-by away from the area.
- **Risk:** Mobile Plant tracking over Concrete Hoses causing Hose failure when under pressure.
Controls: Ramps to be put in place for vehicles / plant to cross over. Permission to be given by JCE operative before any vehicle or plant crosses over. Concrete hoses to be visually inspected and their condition recorded before the start of each shift.



Figure 6: Example of cross over ramp

• Mobilisation to site

Prior to the mobilisation of any equipment, FPS Platform Certificate is to be issued to JCE by JRL in compliance to FPS requirement.

A low loader will deliver the piling rigs to site. The rig will be tracked off the low loader and track over to designated area. The rigging and derigging of the rig is covered by separate method statement. The remaining plant and equipment will be driven onto site using either 40ft articulated or 28ft flatbed rigid wagons.

All equipment will be off loaded from the wagons either into a designated compound area or its permanent position on site with the aid of hiab or excavator. Any designated compound area will be clearly demarcated from the piling platform.

All loads will be either pre-slung with strops to ground level or lifting points are accessible safely without risk of working at height (edge protection on lorries).

• Plant and equipment

Machines to be switched off when left unattended and keys removed.

Piling rigs are not equipped with seat belts for safety reason in order to allow operator to escape in case of emergency. The rig will only move under the direction of a banksman. Piling rigs are not equipped with beacons.



Figure 7 : Casagrande B470 XP2 in CFA mode

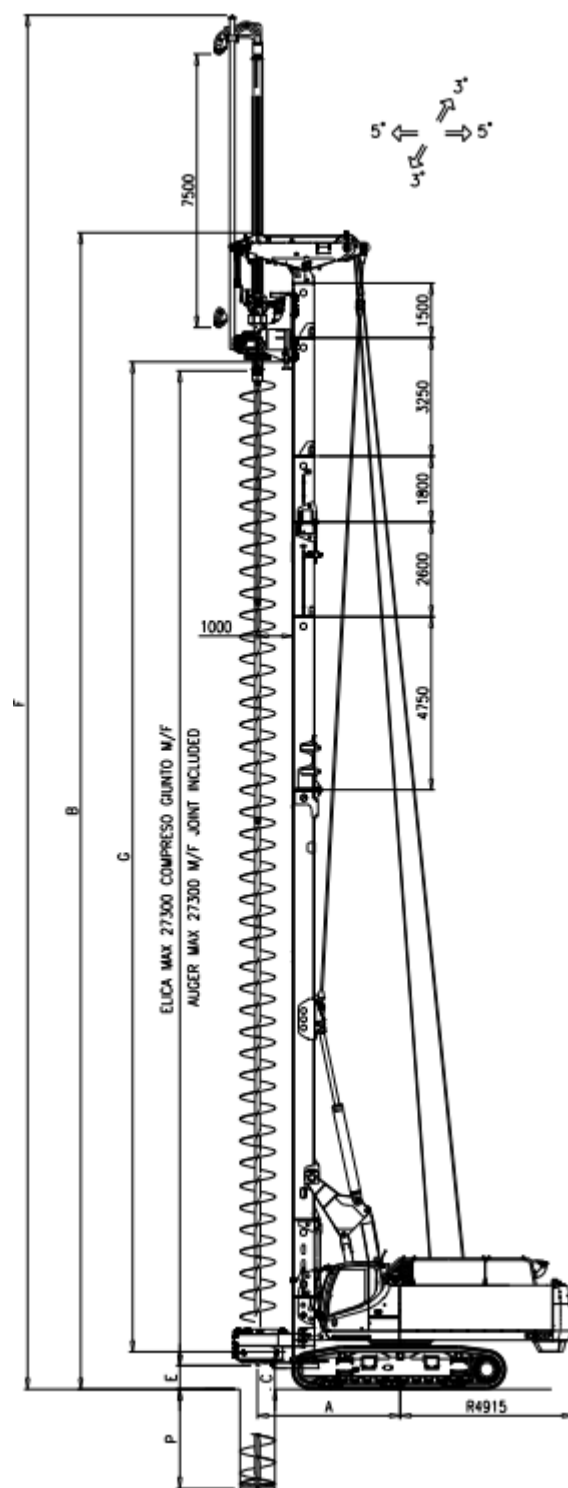


Figure 8 : Casagrande B470 XP2 in CSP mode

- Construction of a CFA Pile

Prior to breaking ground, a permit to work and a permit to dig will be obtained.

Any CAT and Genny scan required are to be carried out by others prior to piling commencement. The permit to dig shall be produced in line with HSG47 'Avoiding danger from underground services' Any services identified shall be clearly marked at platform level.

The main sequences of work will be as follows:

- On site, the CFA piling plant is set up as shown in the sketch below. The hose will not be buried but crossover ramps will be in place for crossing of vehicles.

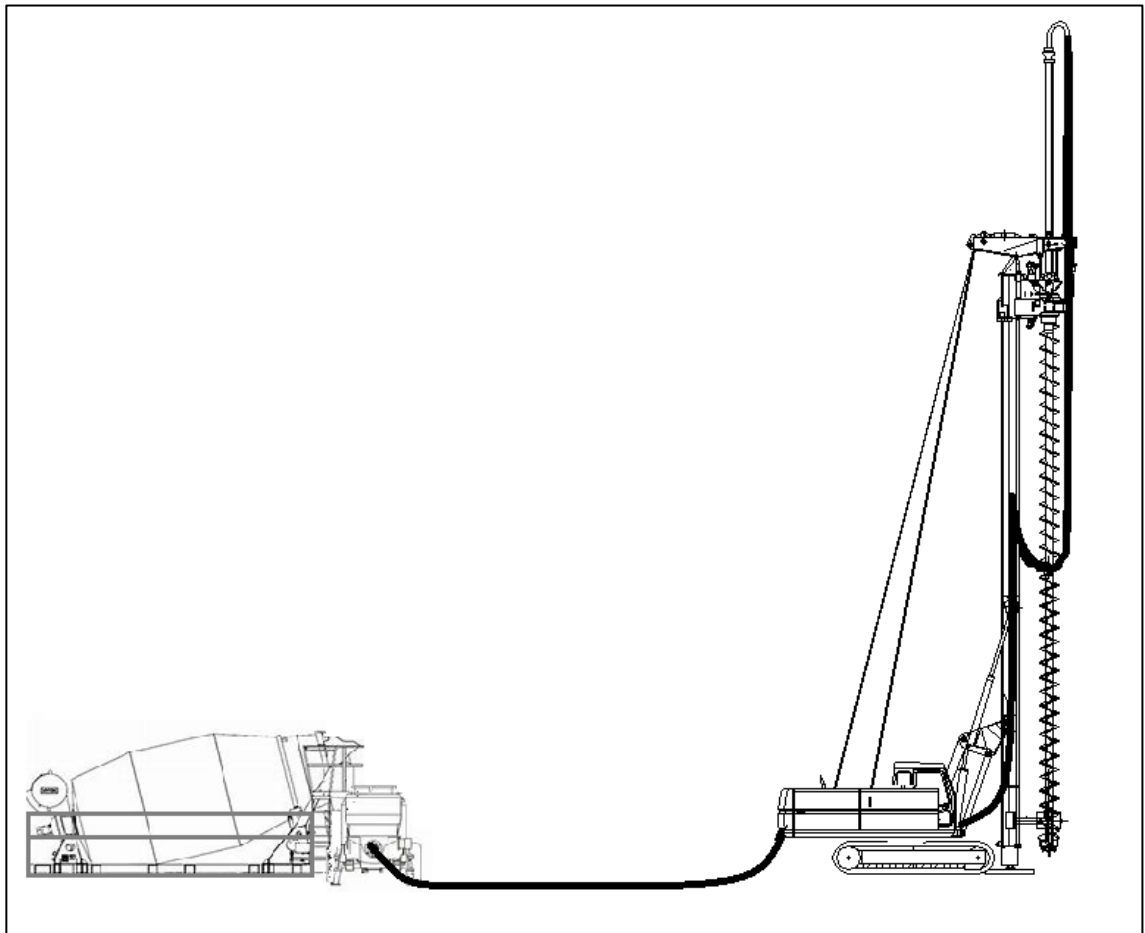


Figure 9: CFA Piling Set Up

- For the first pile of the day, the concrete line will be lubricated with prima pump. Prima pump will be inserted at the pump and then pumped through the length of the line and the rig. Once the prima pump exits the rig through the boring head the pumping will stop.
- The hollow stem at the base of the digging head is closed off using a steel flap or auger bung to prevent pile spoil entering the hollow stem.
- The auger string is pitched centrally over the pile position (as marked with a setting out pin). The mast is plumbed to ensure verticality and the instrumentation package, including target overbreak, is set up.
- The auger string is rotated in a clockwise direction down to the required depth, with both the rate of penetration and the hydraulic demand of the drilling motor observed.

- Pile bore stability is maintained due to the spoil being compacted between the continuous flights. Some spoil will inevitably arise at the head of the pile (approximately equivalent to the volume of the auger flights and stem). Boring continues until the auger reaches the design depth.
- Upon achieving the required depth, the auger string is withdrawn some 200-300mm, the piling rig operator will then signal the pump operator to commence pumping operations using previously agreed signals, concrete is then pumped to allow the opening of the flap or auger bung., the pile will be re-bored to full depth to clean the base prior to extraction.
- Concrete is pumped through the hollow stem to the base of the auger and the pile is constructed as the auger is withdrawn at a controlled rate. As necessary, the auger string will be cleaned with the aid of a mechanical auger cleaner. Should the spoil not be fully removed from the auger, the excavator will be used to remove any debris that has passed the auger cleaner.
- Once the auger tip reaches ground level the piling rig operator will signal the pump operator to stop pumping operations using previously agreed signals.
- Once the pile is complete the banksman will instruct the rig operator to reverse away from the pile position using agreed signals and on to the next position.
- The arising's will be completely removed from around the pile position by the attending excavator supplied by the client and the top of the concrete carefully cleaned off.
- A rebar cage will be lifted by the excavator and installed into the freshly cast pile to design level. Should any steel protrude above platform level, it will be protected by mushroom caps or barriered off..
- All freshly cast piles will be protected to prevent people falling into them.

This process will then be repeated.

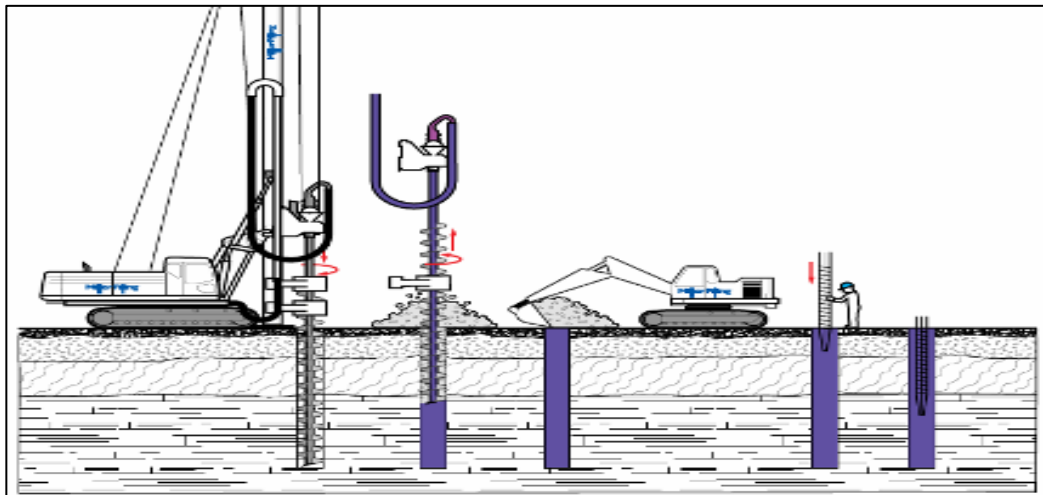


Figure 10: CFA Piling Process

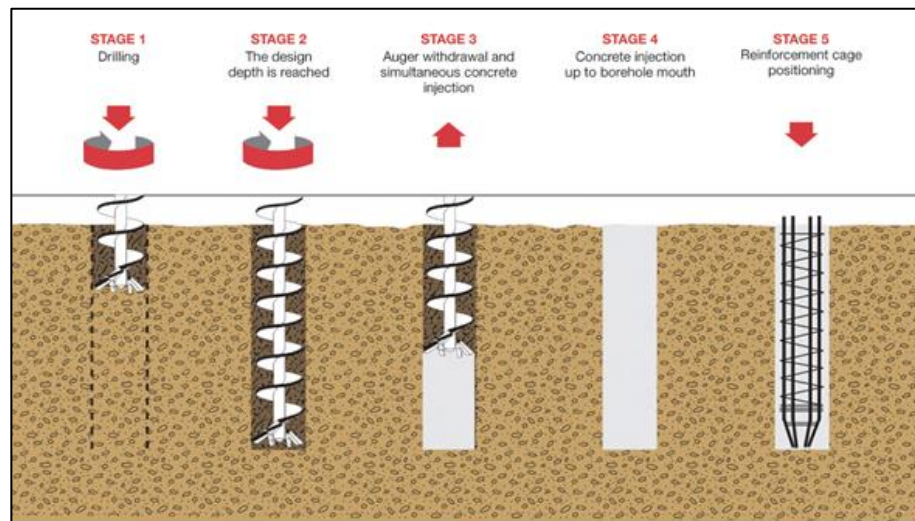


Figure 11: CFA Piling Stages

• Obstructions and blockages

There may be circumstances where it is necessary to abort the pile without concrete being injected. Causes of this may include:

- concrete blockage within the auger
- concrete pump breakdown
- obstructions

Because the auger is loaded with spoil that is providing support within the bore, it is important the auger is back-screwed to leave the spoil on the auger within the ground and backfill any resulting empty bores (at the top) with suitable material. This is particularly important, in drilling through made ground or granular material and where there is a group of piles within a limited area.

• COSHH

The Control of Substances hazardous to Health Regulations, 2002 (COSHH), requires that an assessment is undertaken of health risks created by work involving substances hazardous to health. The substance identification record is based on information obtained from a data sheet received from the substance supplier.

A copy of all the substance identification records are held on a central database with a copy maintained on site.

• First aid arrangements

A first aider will be on site whilst any work is carried out.

• Personal protective equipment (PPE)

A list of required PPE can be found in section H.

• Training & Supervision

- All operatives to undertake a site specific induction once on site.
- All operative to have valid and relevant CSCS cards (CPCS as relevant) and must bring them when attending the induction. Hiab operators must carry relevant ticket to operate the hiab.
- All managers to hold a SMSTS and supervisors SSTS
- Daily briefing to be held by JCE supervisors before work commences at the start of each shift.

• Manual handling

Mechanical plant is provided as far as possible to reduce manual handling to a minimum. The attendant excavator will carry out most of the lifts. Manual handling activities should be limited to carrying small tools.

• Medicals, Accidents, incidents and RIDDOR

The arrangements for reporting injuries, diseases and dangerous occurrences under the regulations are detailed in the company safety procedure HSP#15, a copy of which will be held on site. The ultimate responsibility for reporting/investigating is held by JCE Health and Safety Advisor. In the unfortunate event of any accident or near miss, the JCE Health and Safety Advisor will be informed immediately and in turn would forward all relevant details to ML Project Manager and if necessary, inform the HSE. All accident will be immediately reported.

The nearest hospital with A&E to site is:

North Middlesex University Hospital
Sterling Way
London
N18 1QX

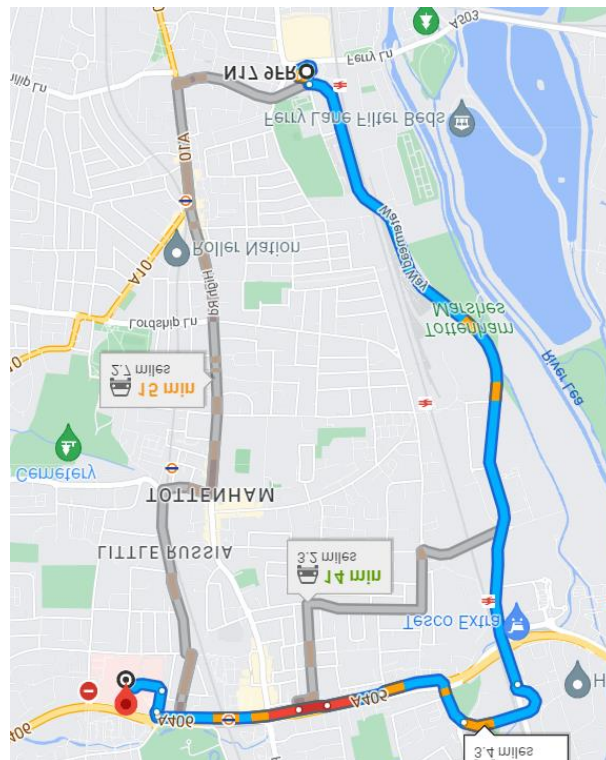


Figure 12: Route to closest A&E

• Existing services

A permit to work must be obtained prior to the start of any drilling operation as a control measure against drilling through services.

In the event where previously unknown services are discovered, all disused pipes or ducts shall be plugged off to prevent entry of concrete during pile construction.

• Manoeuvring rigs around the site

A firm, dry level all weather piling mat shall be provided as a stable working platform for the piling rig work. The mat shall be installed to BRE Specification 'Working platforms for tracked plant'. The maximum gradient of the working platform must not exceed 1 in 20. Any ramps to access the platform must not exceed 1 in 10 (for fully rigged up piling rigs) and 1 in 7 for rigs in transport mode.

The appointed banksman will supervise all rig manoeuvres and direct the attendant excavator in their duties. An exclusion zone will be provided around the rear of the rig. This will be demarcated using temporary barriers which can be repositioned easily as the rig moves around site. Entry to the area in front of the rig will be controlled by the banksman.

• Welfare

Welfare is provided by JRL including provision of changing room with drying facilities and offices.

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D: Key health and safety procedures (HSP) required

Note: Each relevant HSP to be briefed to site team.

HSP 3 - Work at Height
 HSP 4 - Selection of Safe Work Equipment
 HSP 9 - Noise & Vibration Procedure
 HSP 11 - Permits to work
 HSP 12 - Safe Use of Harnesses and Inertia Reels
 HSP 14 - Statutory Inspections of Plant and Equipment
 HSP 15 - Accident and Incident Reporting and Investigation
 HSP 16 - Management of Change Procedure
 HSP 17 - Oil & Pollution Control
 HSP 20 - Health, Safety and Environmental Training
 HSP 21 - First Aid Arrangements
 HSP 22 - Selection, Use and Control of Personal Protective Equipment (PPE)

Safe System of Work Form SHE 4 (cont'd)

F: Additional resources, specialised skills & competencies

Note: This may include other specialist trades/skills, in-house or external

Site Supervisor – SSSTS
 Piling Rig Driver – CPCS > 15 Tonne
 Concrete Pump Operator – CPCS Concrete Pump Operator
 Slinger/Signaller – CPCS – Slinger/Signaller
 360 Driver - CPCS
 Dumper driver - CPCS
 MEWP Operator – IPAF
 Setting-out Engineer - CSCS
 Traffic Marshall - CSCS

G: Details of work permits or authorisations required (tick ✓ and attach permits or other forms are required for the work activity)

Permit to work (general)	No	Permit to work (excavate)	Yes	Permit to work (hot work)	No	Permit to work (confined spaces)	N/A
Permit to work (electrical)	N/A	Permit to work (working platform certificate)	Yes	Permit to work (mobile crane authorisation)	No	Permit to work (other)	

If Other, please describe:

Safe System of Work Form SHE 4 (cont'd)

H: Personal protective equipment required

Description of PPE	Required Yes/No? (tick ✓)	Type of PPE (In accordance with PPE regulation or international standards)
Head protection Safety Helmet	✓	EN 397:2012+A1:2012
Foot protection - Boots - Wellington	✓	BS EN ISO 20345:2011
High visibility clothing - Vest, - Jackets - Trousers	✓ ✓ (cold weather)	EN 471
Hand protection - General - Chemical - Mechanical - Thermal	✓	EN 420 EN 374 EN 388 EN 407
Eye protection - Glasses - Goggles - Visor	✓ If required by RAG	EN 166
Hearing protection - Earmuff - Earplugs - Helmet Earmuff	If required by RAG	EN 352 – 1 EN 352 – 2 EN 352 – 3
Clothing - Waterproof/foul weather - Chemical resistant - Heat and flame	If required Welding only	EN 343 EN 465 EN 470-1
Respiratory protection - Filtering face-piece - Half face mask - Full face mask	No	EN 149 FFP3 EN 140 EN 136
Fall arrest protection - Full body harness - Fall arrest system - Fall restraint system	Only if working at height or as part of RAG	EN361 EN362 EN353
Other PPE required	No	

Safe System of Work Form SHE 4 (cont'd)

I: Are other contractors involved in the activity? (If so state name, address and key contact details). **Other site health and safety information**

Concrete testing and sampling – by Socotec
 Pile Setting out – JRL
 Muck away – by JRL
 Piling attendance – by JRL

J: Details of contacts, site management etc., or special emergency arrangements

JCE Managing Director – Jonathan Wilson – 07798 642073
JCE Contracts Supervisor – Daniel Wilkinson – 07551 395541
JCE Contracts Manager – Kevin McQuarrie – 07786 560394
JCE Safety Advisor – Hazel McNicholas – 07823 348615
JRL Safety Manager – Ben Dixon – 07789 957445
JRL Safety Department – 0208 953 7800

K: Name of person responsible for implementation of safe system of work
 (communications and monitoring compliance)

Name (please print):	
Position:	Contact no:
1. Check all sections and confirm correct.	
Signature: -	Date: -
2. Issue document to site team and ensure briefing.	
Signature: -	Date: -

Safe System of Work Form SHE 4 (cont'd)

L: Details of personnel involved and confirmation that information and instructions in this document have been satisfactorily communicated.

I, the undersigned, have been instructed and made aware of the contents of this 'Safe System of Work and Risk Assessments' and agree to comply with its requirements. If I am unable to carry out the work safely I agree that I must immediately stop work and inform my manager/supervisor.

[illegible]

Briefing given by:

Date: