Rock & Alluvium

100, Woodside Avenue. N10 3JA

Project Management Plan

CFA Piling

Revision **1**

Contract Number:	**9761**
Issue Date:	**09/11/2023**
Principal Contractor (P/C):	**Formation Design & Build Ltd**
P/C Main Contact:	**Bryan McNamee**
R & A Contract Supervisor:	**Peter Mallett**
Site Foreman:	**TBC**
Rig Type:	**SR45**

Contents

SECTIONS	
1	Contract Specific Details – including: 1.1 - Document Control 1.2 - Appointment of Personnel – FM-HSS-C01-03*
2	Work Packages - Method Statements – FM-HSS-H03-02
3	Contract Lifting Plan – FM-HSS-L02-02
4	Works Procedures for (but not limited to): CFAPiling 4.1 - Site Mobilisation 4.2 - Steel Fixing 4.3 - Sampling & Testing concrete 4.4 - Blowing Out of Piling Rig 4.5 - Setting Out 4.6 - Safe Interaction Between Plant & Operations
5	Erection and De-rigging of Piling Rig
6	Guidance on Pile Testing for Formation Design & Build Ltd
7	Inspection and Test Plan
8	Roles and Responsibilities
9	Briefing Record – FM-HSS-T03-01
10	Risk Assessments – FM-HSS-H03-03 including Spill Response Plan

Subcontractor Schedule		
1	Steel fixing	S&J
2	Integrity Testing	NDT Services
3	Load Testing	NDT Services
4	Pile Setting Out	Boundary Point
5	Guide Walls	None

Document Control

Date	R&A Revision (Template)	Revised By	Changes	Effects
03/02/21	3.3	ND/WL	Updates to Risk Assessments and HS&S Advisor	Issued from 04/02/21
27/04/21	3.3.1	ND	Hand tied cages weight limit changed.	Issued from 28/04/21
07/12/21	4.0	PC	Update document control (BMS2 Issue 09).	Issued from 01/02/22
08/04/21	4.1	ND	Amendments to Section 4, WP 2, Risk Assessment and other minor amendments.	Issued from 11/04/22
06/10/22	4.2	ND	Various amendments: exclusion zones, PPE, protection to rebar and eye care.	Issued from 06/10/22
27/07/23	4.3	ND	Amendments to blowing out procedure.	Issued from 29/08/23

Date	RAMS Revision	Prepared by	Approved by	Comments
09/11/2023	**1**	**N Dewey**	N Dewey	Thames Water Asset Info. Updated; Contact Info. Amended.
20/09/2023	**0**	**N Dewey**	N Dewey	

Site Address	**100, Woodside Avenue. N10 3JA**
Contract No.	**9761**
Business Unit	**Rock & Alluvium**
Date	**09/11/2023**

The following operations management team has been appointed for the project identified above:

Pre-Construction Manager

Nick Dewey	Signature of acknowledgement	

Construction Manager

Mark Gibson	Signature of acknowledgement	

Site Supervisor

Peter Mallett	Signature of acknowledgement	

General Foreman

TBC	Signature of acknowledgement	

Please refer to Section 2.12 and Section 8 for further details on roles and responsibilities

Your role is to operate and maintain appropriate systems and standards to ensure that the workplace and any operations under your control are carried out and delivered safely and without adverse impact to the environment or neighbours. You should supervise the work of contractors engaged in your operations and take appropriate action where they are working at unacceptable standards.

To assist you in this role, you need to ensure that you have read and understood the Company's Health, Safety and Environmental Policies and are familiar with the requirements outlined therein. You should have an up to date copy of these documents available for your use. If you do not have copies, or the copies you have are out of date, please contact your Line Manager who will arrange for the documents to be issued to you.

You must notify your line manager immediately in the case of absence due to ill health and also advise your line manager of any periods of planned absence so that we can ensure that a suitably experienced and competent person is designated to undertake this role in your absence.

Nick Dewey
Pre-Construction Manager

Rock & Alluvium

Contract Title: 100, Woodside Avenue. N10 3JA	Contract No:	MS Reference:
Work Package: CFAPiling	9761	MS/PMP 21
Author: ND / WL	Date Produced: 09/11/2023	

1.0	**Scope of Works**	CFAPiling
2.0	**Date(s)**	From / To: Refer to Technical Package
3.0	**Precise Location:**	100, Woodside Avenue. N10 3JA
4.0	**Personnel:**	The personnel allocated to this contract are identified on the Labour Allocation Sheet, issued Weekly; it is anticipated that 4 – 7 No. (minimum 3No.) personnel will be on site per rig. Qualification of the crew is produced on day of start (or earlier) by the Foreman using Site Personnel Training matrix.
5.0	**Communication & Responsibilities**	All operatives shall be briefed on the WP Method statement and each task briefings prior to commencing each phase of work. See PMP - Section 8 - Roles and Responsibilities.
6.0	**Significant HS&E Risks:**	As detailed in PMP - Section 10 Risk Assessment (FM-HSS-H03-03)
7.0	**Phase of Work:**	Refer to **Phase of Works (Methodology)** including HS&E Arrangements, Personnel, Plant and Risks/Hazards in this document.
8.0	**Access / Egress & Deliveries:**	Formation Design & Build Ltd is to provide safe means of access and egress to the site and all work areas, including pedestrian and vehicle segregation within the site. If other trades are working near the piling area, Formation Design & Build Ltd is to provide fencing to segregate the piling area from other operations, the R&A Foreman can stop piling works if it is deemed that follow-on trades are working too close and effecting the safety of himself and others. Any required exclusion zones/barriers around the auger at ground level are to be maintained in accordance with the agreed scope of works.
9.0	**List Plant & Equipment:**	Soilmec hydraulic Piling rig Trailer mounted concrete pump (CFA Only) Concrete agitator (CFA Only) Compressor (CFA Only) Bunded Vented Fuel bowser Storage container (normally 10ft/3m) Foreman's van Set Tower Lights (Winter only) Access Platform 3No crowd/chapter 8 barrier (to create exclusion zone) Refer to **Phase of Works (Methodology)** including HS&E Arrangements, Personnel, Plant and Risks/Hazards in this document. An attendant 360° tracked excavator (minimum 13 tonnes) is to be provided by Formation Design & Build Ltd . The piling foreman is to check the machine operator's CPCS (ideally blue) card is in date and covers the plant to be operated. He is also to ensure that the operator is included in the Rock & Alluvium inductions and all site safety tool box talks.

		As the attendant excavator will be required to work in close proximity to Rock & Alluvium personnel the foreman is under instructions to raise with Formation Design & Build Ltd any doubts as to the driver's abilities or communication skills, notwithstanding any formal qualifications the driver may have; the attendant 360° operator and the R&A banksman are required to sign up to the attached pictorial guide for the safe interaction between plant and operatives.
10.0	**Materials**	Ready-mixed concrete Reinforcement Oils, fuels, greases Prime-a-pump line lubricant
11.0	**Temporary Works:**	N/A
14.0	**Emergency Procedures:**	See PMP - Section 10 Risk Assessments and Spill Response Plan
15.0	**Permits to Work Required:**	Break Ground (RA-FM-07-032 Permit to Work)
16.0	**Hold Points:**	Site Health and Safety checks (as below) and Piling Operations are not to commence until Rock & Alluvium have received a signed copy of the Working Platform Certificate and Permit to Work from Formation Design & Build Ltd .

Phase of Works (Methodology) including HS&E Arrangements, Personnel, Plant and Risks/Hazards

This Project Management Plan is to be read in conjunction with the Site Specific Risk Assessment and Galliford Try (Parent Company) Health, Safety and Environmental Standards.

1. TASK

Rock & Alluvium Ltd as a Specialist Piling Sub Contractor are to construct piles using CFAtechniques at the above site. R & A will be working under the instruction of our Client - Formation Design & Build Ltd . A copy of the F10, confirming the appointment of Formation Design & Build Ltd is to be available on site.

2. SITE HEALTH and SAFETY

Before any piling operations commence, the piling foreman is to:

a) Review the site specific risk assessment, noting any special requirements and ensure that all piling operatives have received the necessary training to carry out their work.

b) Brief the piling operatives on the site health and safety requirements and check that they have all of the necessary PPE.

c) Check that Formation Design & Build Ltd is displaying all of the relevant HSE statutory notices.

d) Carry out daily checks of all piling equipment and complete both the "Record of Inspections LOLER" and "Record of Inspections PUWER" books / GT Forms on a weekly basis.

e) Ensure the weekly workplace inspection and safety harness inspection forms are up to date.

f) Check that the piling rig has been thoroughly inspected and certificated within the last 12 months and that the lifting equipment and fall arrest device have been thoroughly inspected and certificated within the last 6 months.

g) Formation Design & Build Ltd will carry out the Piling Team Site Induction on arrival

h) Ensure the following documents are in place:

- Platform Certificate

- Permit to Work
- Approved Method Statement
- Permit to Dig (Provided by Formation Design & Build Ltd)

The Contract Supervisor is to ensure that all of above are completed to their satisfaction before piling operations commence; see 'Role & Responsibilities' for a complete list of daily / weekly checks carried out by the site Foreman on his tablet.

3. WORKFORCE

The piling team is to be suitably trained. Copies of all plant operator, CPCS/CSCS cards and training certificates will be kept with the piling foreman and shown to the site manager on our arrival to site.

The Piling Team will consist of:

Piling Foreman/Rig driver
Concrete Ganger
Banksman (1 or 2No)

Additional operatives may include:

Steel fixers (up to 3No)
Setting Out Engineer

4. PLANT and EQUIPMENT

Our standard plant assembly supplied for piling operations comprises:

Soilmec hydraulic Piling rig
Trailer mounted concrete pump (CFA Only)
Concrete agitator (CFA Only)
Compressor (CFA Only)
Bunded Vented Fuel bowser
Storage container (normally 10ft/3m)
Foreman's van
Set Tower Lights (Winter only)

An attendant 360° tracked excavator (minimum 13 tonnes) is to be provided by Formation Design & Build Ltd . The piling foreman is to check the machine operator's plant operator's CPCS card is in date and covers the plant to be operated. He is also to ensure that the operator is included in **the** Rock & Alluvium inductions and all site safety tool box talks.

All relevant certificates for plant and ancillary equipment (excluding MEWP) can be issued via e-mail prior to arrival, these are also available on the day of mobilisation from the rig file; all daily/weekly inspection forms are completed electronically by the Foreman on his tablet; these can be sent directly to the client if required.

As attendant excavator will be required to work in close proximity to Rock & Alluvium personnel the foreman is under instructions to raise with Formation Design & Build Ltd any doubts as to the driver's abilities or communication skills, notwithstanding any formal qualifications the driver may have.

5. PUBLIC and ADJACENT PREMISES

The site boundary is to be kept secure by Formation Design & Build Ltd and is to prevent unauthorised access onto the site. In the event of unauthorised people entering the piling area, the piling foreman is to cease all piling operations and ask the people to leave. Piling is not to restart until the piling area is clear. Rock & Alluvium's Foreman is to ensure that this procedure is strictly enforced.

General Note: *Rock & Alluvium fully comply with the HSE endorsed FPS guidance on "Cleaning and Guarding of Augers on Piling Operations", however in extreme circumstances where auger guards cannot be utilised, R&A work in accordance with section 4.3 of the above mentioned document, i.e. the use of a physical barrier at a 2m radius from the centre of the pile, this physical barrier is to be supplied by Formation Design & Build Ltd .*

6. OTHER CONTRACTORS

All other personnel on site are to be notified of piling works by Formation Design & Build Ltd and told not to enter into the piling area unless specifically involved. In the event of unauthorised contractors entering the piling area, piling is to cease and the contractors asked to leave. Piling is not to restart until the piling area is clear. R & A Foreman is to ensure that this procedure is strictly enforced. It may be prudent for Formation

Design & Build Ltd to include a specific section within the site induction regarding Piling and the associated hazards; particularly with regard to hearing protection.

7. PILING PLATFORM

Formation Design & Build Ltd is to design, construct and maintain, a safe and adequate Piling Platform in accordance with BRE 470 'Working platforms for tracked plant'; this is to be confirmed by Formation Design & Build Ltd issuing a signed FPS "Working Platform Certificate".

Piling Operations are not to commence until Rock & Alluvium have received a signed copy of the <u>Working Platform Certificate</u> and <u>Permit to Work</u> from Formation Design & Build Ltd **.**

The Piling Platform is to be constructed to safely support the bearing pressures of the Rock & Alluvium piling rig allocated to the project in both its travelling (BRE Load case 1) and working (BRE Load case 2) modes. The rig to be used on site is given on page 1, for which the associated bearing pressures can be supplied by our Contracts Department.

8. SETTING OUT

The Pile positions are to be set out during the Piling by a full time Setting Out Engineer, provided by Boundary Point. The Principal Contractor is to provide either the main grid lines or a minimum of three base control stations and their co-ordinates. These three base stations must be within the site boundary.

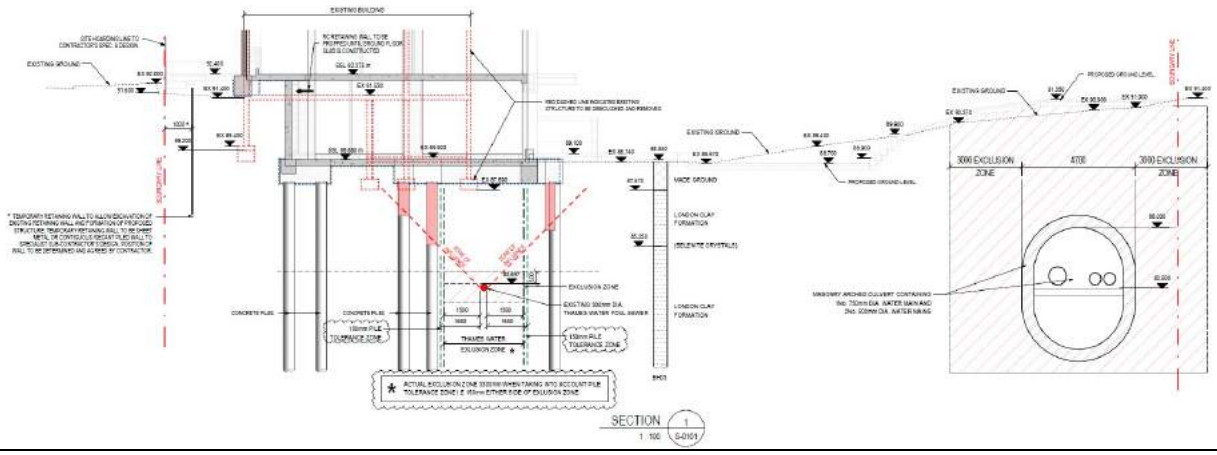
The setting out engineer is not to work in areas where piling operations are ongoing. The setting out engineer must also be included in the Rock & Alluvium site safety induction if he is present on site.

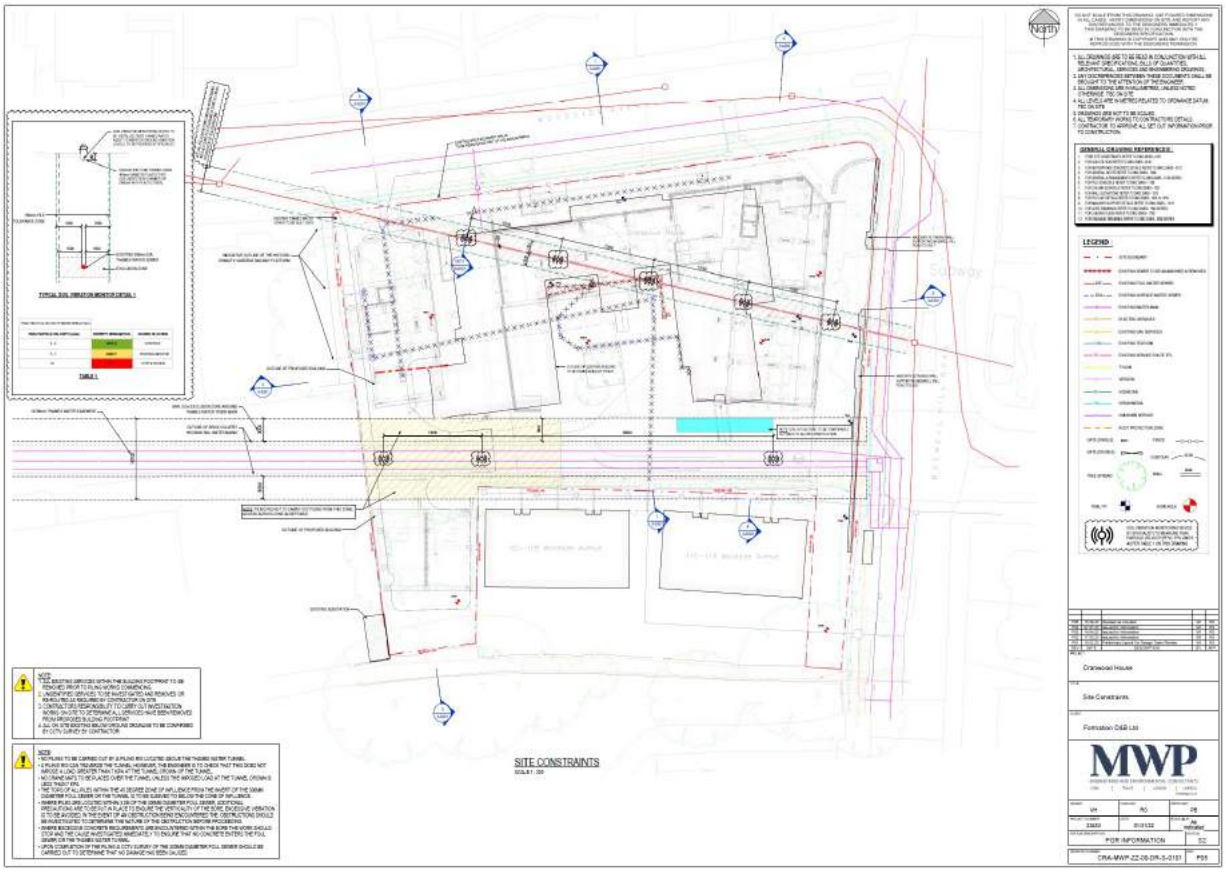
9. SERVICES

Formation Design & Build Ltd is to notify Rock & Alluvium of all known services within the piling area and to accurately mark these if they fall within 1.0m of any pile position. All redundant services are to be physically disconnected and capped off by Formation Design & Build Ltd at the site boundary.

Formation Design & Build Ltd and Rock & Alluvium are to visually check all piling areas and confirm any changes or additions to the "Permit to Work".

There are a number of key Thames Water assets that run into, through and adjacent to the site, these are all highlighted on MWP Site Constraints Drawing (CRA-MWP-ZZ-00-DR-S-0101 Rev P05), which can be found in Appendix A of this document (copy over the page), of particular interest are the 3No large diameter trunk mains (1No 750mm and 2No 500mm dia water mains) that run within a Masonry Arched Culvert through the site, which sits circa 5mbgl [internal crown level] and runs West to East through the site. There is also an existing 300mm dia Thames Water Sewer that runs diagonally from the North-West of the site through to just South of the Parkland Walk Underpass is subject to a built over agreement, this sits circa 5.5mbgl. All other existing assets are to be abandoned and removed / capped outside the proposed footprint of the new building. Sections through site showing the above assets can be found below.





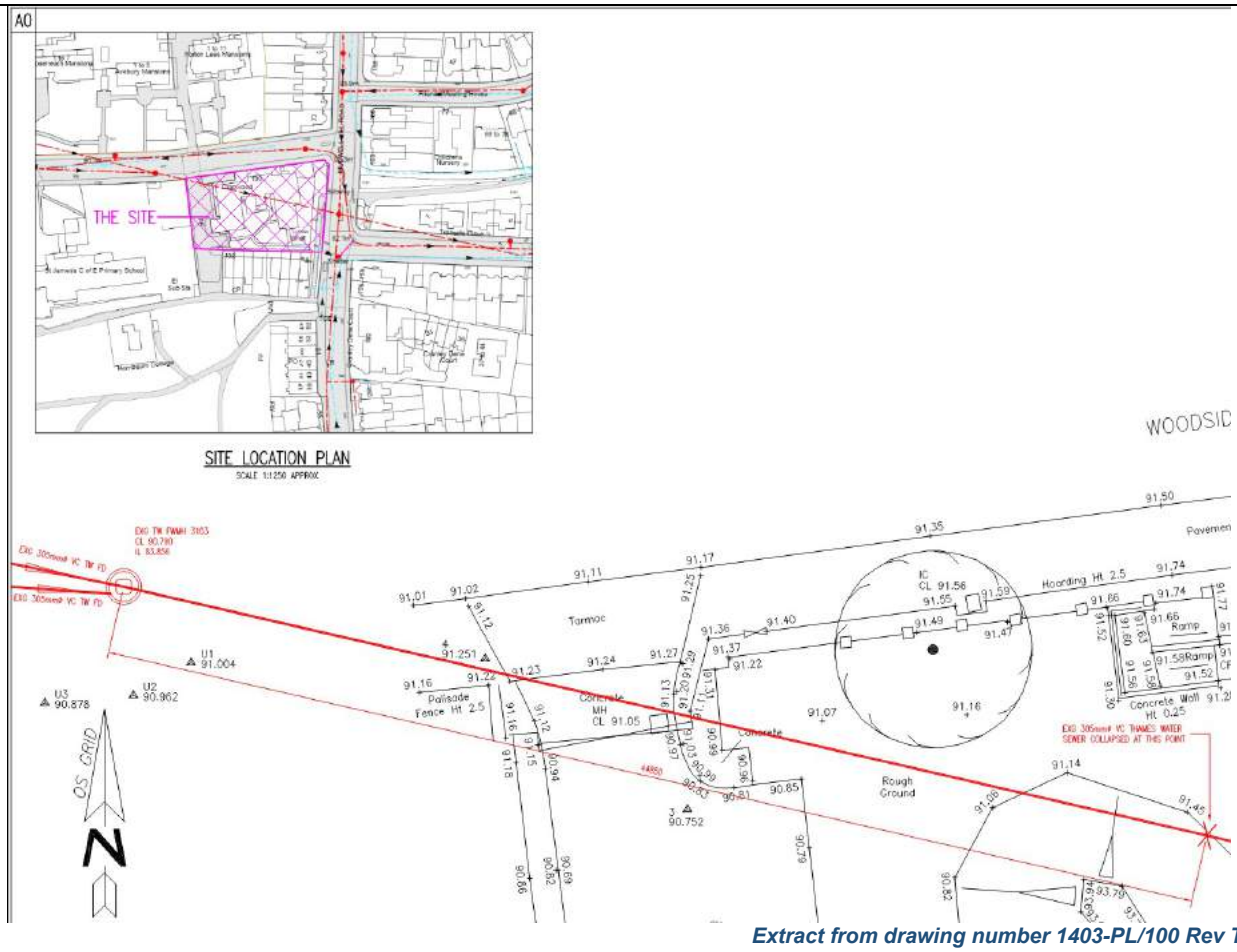
Rock and Alluvium work within the parameters outlined within the following Thames Water Documents:

- ‘Guidance on piling, heavy loads, excavations, tunnelling and dewatering’
- ‘Guidelines for working near our water mains and sewers’

Both the above documents outline the requirements for bored or augered piles to be at least 3m, or 1.5x the pile diameter (whichever is greatest), measured from the outside face of the pile to the outside face of the pipe, in this instance 3m is the critical dimension for the main culverted assets and 1.5m has been adopted for the 300mm asset subject to the build over agreement. It also states that a peak particle velocity of 10mm/s is the maximum that should be recorded at the face of the asset; CFA piling is regarded as the least intrusive, certainly in terms of vibration, normal CFA piling activities produce a PPV <3mm/s, hence should be regarded as the optimum piling discipline for working adjacent to any Thames water asset.

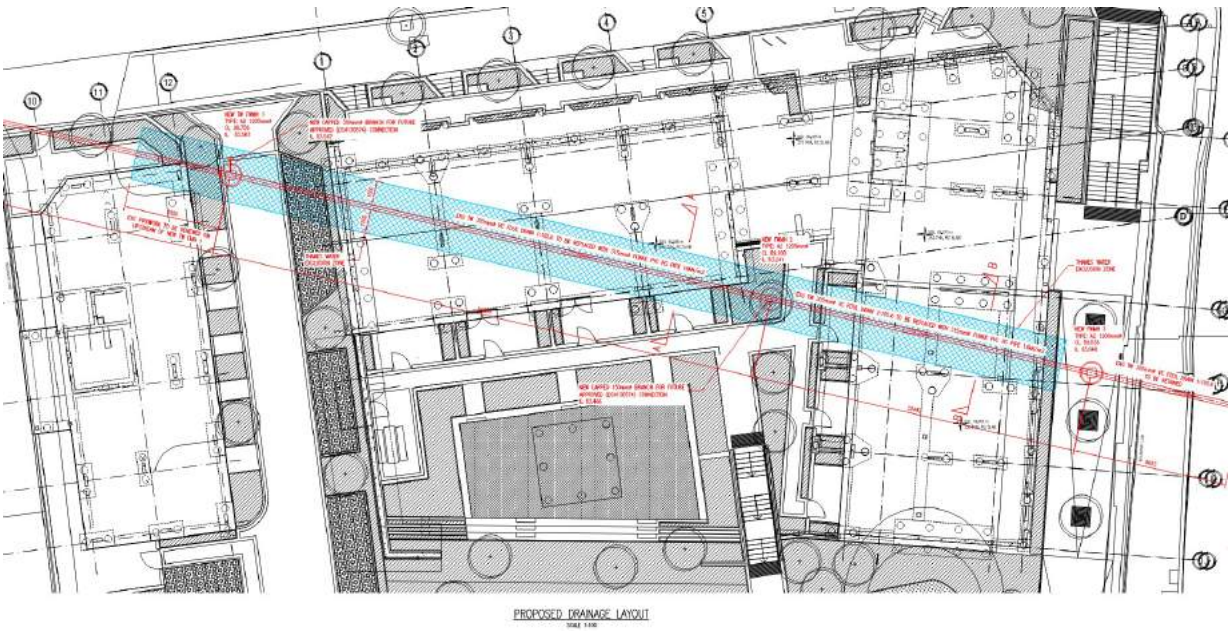
Any easement zones (to existing services) that are required around the assets, should be catered for within the pile layout drawing (by others) and any vibration monitoring (by others) required should be undertaken continuously from the point of site occupation through to a point in the construction program that can be seen to no longer produce vibrations that would be distributed into the ground.

It should be noted that the existing 300mm dia Thames Water Sewer, is to be ‘replaced’ due to it having collapsed at around 44.85m from existing Man Hole 3103; over the page is an extract from drawing number 1403-PL/100 Rev TW1, indicating the point of collapse. Note that copy of the full drawing can be found in Appendix B.



Extract from drawing number 1403-PL/100 Rev TW1

On the below extract from drawing number 1403-PL/101 Revision TW1 (full copy in Appendix C) the blue hatched area indicates the extent of the replacement sewer, including the construction of 3No new Man Holes.



Extract from drawing number 1403-PL/101 Revision TW1

10. SITE ACCESS

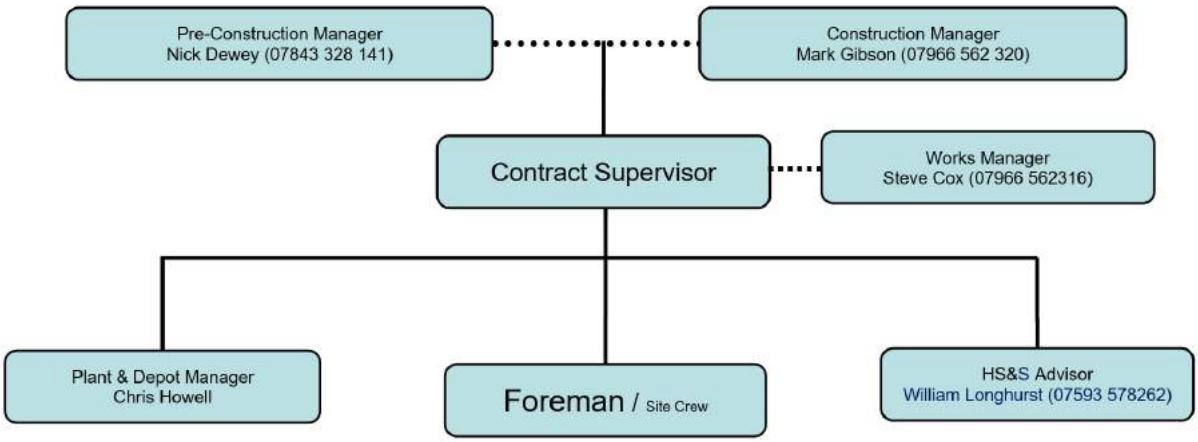
Clear unobstructed access from the road to the Rock & Alluvium work area is to be provided and maintained at all times by Formation Design & Build Ltd . Separate pedestrian access is required as indicated by current regulations

11. SITE RAMPS

All access ramps constructed by Formation Design & Build Ltd are to be a minimum of 5m wide and be at a maximum gradient of 1 in 10, unless specifically agreed in writing by Rock & Alluvium. Should the gradient be steeper than 1 in 10, it may be necessary to de-rig the piling rig and lay the mast down to travel safely up or down the ramp, causing unnecessary delay to the piling works; note that the rig should traverse the ramps with the ballast weight facing 'up-hill'.

The piling foreman is to check the access ramps and ensure that they are adequate for the purpose. In the event that the ramps are deemed inadequate then the travelling operations are to be suspended and Formation Design & Build Ltd notified.

12. SUPERVISION and ORGANISATION



The name of the Contract Supervisor / Foreman is given on the front of this Project Management Plan.
Quality audits are undertaken by Operations with review by Quality Manager.
Design issues are reported via Operations/Supervisor/Foreman to the Design Manager, Kayvan Kiany.

13. SAFETY MONITORING

The company Health, Safety & Sustainability Advisor will be carrying site visits on a Monthly basis and is available to deal with any matters Formation Design & Build Ltd may wish to raise, our Contract Supervisor's will carry out workplace inspections on one of their sites on a weekly basis.

14. FIRST AID

The Piling Foreman is to ensure that at least one person in his gang has been on a First Aid at Work course within the last 3 Years and that an adequately stocked First Aid kit is available. Any further first aid requirements are to be provided by Formation Design & Build Ltd .

15. WELFARE FACILITIES

These are to be provided by Formation Design & Build Ltd and are to be in line with the CDM Regulations (2015); it is anticipated that R&A will have 3-7No personnel on site per rig.
The requirements include:

- Washing facilities, including hot and cold running water, soap and drying facilities.
- Toilet facilities regularly cleaned and serviced.
- Drinking Water and drinking vessels.

- Suitable clothes changing and overnight drying facilities, including lockers for security.
- Messing area. (Food preparation and heating, and means for boiling water).

The CDM Regulations make the specific point that full welfare facilities are to be available prior to bringing subcontractors to site. No exemptions are available for small sites. If the supplied Welfare is deemed unacceptable the R&A Foreman can cease piling operations until suitable Welfare has been provided.

16. SITE ESTABLISHMENT/SEQUENCE OF WORK

Rock & Alluvium Ltd are to notify Formation Design & Build Ltd at least seven days before our intended arrival date to allow adequate time for the local residents to be notified.

a) Men and equipment to arrive on agreed date.
b) Sequence of work to be agreed with Formation Design & Build Ltd .
c) Piling team sets up piling rig, concrete pump and agitator.
d) Concrete delivered by approved supplier, normally 7 or 8 trucks daily (can be 12+).
e) Reinforcement cages are made by steel fixers or delivered prefabricated (delivery tickets for prefabricated cages are to be checked against cage drawings).
f) All certification records submitted to Formation Design & Build Ltd before start of works.

17. BANKSMAN

All piling rig, crane, excavator and delivery vehicle movements on site are to be controlled by trained, competent and certificated banksman / slinger / signallers. The attendant 360° operator and the R&A banksman are required to sign up to the attached pictorial guide for the safe interaction between plant and operatives.

Lifting Operations will be carried out in accordance with the Non-Crane Lift Plan given in Section 3.

The Piling Foreman is to ensure that all Lifting equipment is inspected and entered into the "Record of Inspections" LOLER Weekly, and that each item of Lifting Equipment and accessory receives a Thorough Inspection, Test and Certification every 6 months by a competent person. A copy of all the certification for the lifting equipment is kept on site by the piling foreman.

18. PILING

The piling operation will be carried out in accordance with Works Procedure 1; CFAPiling, in Section 4.

19. PILE LOGS

Pile logs will be issued via e-mail to Formation Design & Build Ltd daily; the R&A Foreman will require an 'electronic signature' from your site manager prior to issuing the logs.

20. PILE REINFORCING CAGES

These may be either delivered prefabricated or fixed on site by steel fixing subcontractor, who come under the direct supervision of the Rock & Alluvium Foreman.
It is Rock & Alluvium's policy that any reinforcement cages that are a maximum of 450mm OD, up to 12m long and weigh no more than 497kg's can be fabricated on site; cages weighing in excess of 200kg's and less than 497kg's, will be fabricated on site, but will require mechanical aid (attendant excavator), cages that do not meet the above criteria will be prefabricated. Prefabricated cages will be subject to random checks (above those within the ITP) against the CARES approved suppliers cage drawings by the visiting Contract Supervisor/Foreman, any non-conforming cages will be returned to the supplier.
NOTE: Cage details are provided by R&A for the supplier to produce cage drawings, these are then approved by R&A for manufacture.

Site fixing of cages will be carried out in accordance with Works Procedure 2; Steel fixing, found in Section 4 of this Project Management Plan.

De-bonding
To avoid the hazards of HAVS resulting from the manual breakdown of pile heads with percussive tools, we draw Formation Design & Build Ltd 's attention to the practice of providing de-bonding foam as per ICE tolerances (unless otherwise agreed), to enable the concrete above the cut-off level to be removed with ease. Where this is specified, the foam will be fitted as part of the cage assembly.

21. OBSTRUCTIONS

If an obstruction is encountered during the boring operation, piling will be suspended and Formation Design & Build Ltd notified and an Instruction sought from the following options:
NOTE: Generally normal CFAPiling will not drill through obstructions

- **Move to another pile position while the obstruction is cleared**
  We will move to another pile position and record the abortive time spent on the obstructed pile.
- **Attempt to bore through the obstruction**

In these circumstances, we do not accept responsibility for the pile position remaining within tolerance. We will also record the time spent on boring through the obstruction and we will seek additional payment for this time and any abnormal damage to the auger flights and Piling rig.

If Rock & Alluvium can drill through the obstruction, then pile construction will proceed as before.

If Rock & Alluvium are unable to drill through the obstruction within a reasonable time, Formation Design & Build Ltd will be notified and asked for a further Instruction. The abortive time spent on pile to be recorded.

Any abandoned pile positions will be backfilled with suitable material. Formation Design & Build Ltd is responsible for backfilling any areas where obstructions have been removed. It is vital the backfilled area is properly compacted and the piling platform fully reinstated, including any geo-textile interface; the FPS Platform Certificate will require re-signing once reinstatement is completed. A number of recent piling rig over-toppling incidents have been due to inadequately backfilled excavations.

22. CONCRETE

The concrete characteristics will be as specified in the approved pile and concrete mix designs.

23. CUBE TESTING

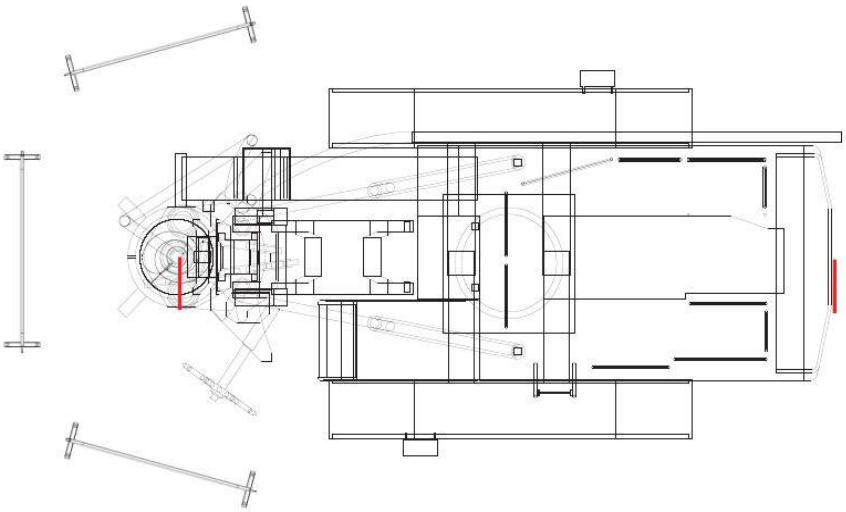
BS8500 identifies that where a standard mix is supplied by a ready-mix company their compliance testing methods will be sufficient and no site testing will be necessary. Rock & Alluvium only use QSRMC accredited suppliers who adhere to BS EN 206 having a defined conformity control procedure and are required to inform the specifier and user of any non-conformity. Site testing is therefore not necessary and identity testing will only be introduced for cases where there is doubt over the concrete.

Concrete sampling and testing, if explicitly requested will be carried out in accordance with the 2007 ICE Specification for Piling and Embedded Retaining Walls (SPERW) and Works Procedure 3; Sampling & Testing Concrete, given in Section 4, for clarity 1 set of cubes per day or per 75m^3 with one being tested at seven days, two at 28 days and a spare being held in the event of failure of the 28-day result to reach the characteristic specified strength.

Where we are contracted to make on site concrete cubes, suitable concrete curing facilities are to be provided by the Principle Contractor to ensure cubes are stored in-line with the requirements of BS EN 12390-2. Key requirements are that cubes are stored inside at room temperature (15-25°C) whilst in their moulds and 24/7 power is provided for our heated curing tank. This aside, as on site cubes will not be made in laboratory conditions, we would still stress that reliance is to be placed on our QSRMC supplier to demonstrate concrete conformity and not the results of site made concrete cubes as these cannot be wholly relied upon.

24. DEMARCATION

Any demarcation problems relating to our working area will be referred to Formation Design & Build Ltd . On every pile position the exclusion zone will be set up around the front of the rig, by use of 3No crowd / chapter 8 barriers, as shown below and defined in the relevant sections (12 & 20) of the risk assessment contained within this document; there may be an element of variation in the positioning of the barriers depending on proximity to the boundary or permanent structures. It is imperative that if anyone (including trained R&A operatives) enter the exclusion zone, then the rotation of the auger must cease, entry into the exclusion zone must be agreed directly with the rig operator.



25. RISK ASSESSMENT

A Risk Assessment relating to our work has been carried out and will be passed to Formation Design & Build Ltd for review, in particular to ensure that the interface between Rock & Alluvium and other contractors are managed satisfactorily.

The Piling Platform is to be designed, installed and maintained by Formation Design & Build Ltd . All excavations are to be backfilled with suitable granular material and compacted so as not to leave any soft spots.

Formation Design & Build Ltd is to advise of any specific hazards identified/known to them so that any measures necessary to ensure the works can be carried out in a safe environment can be agreed and implemented.

Rock & Alluvium operatives are provided with the following personal protective equipment:

- Head Protection (Helmets to EN 397 / EN12492, with chin straps)
- Hearing Protection
- Protective Overalls / Hi Viz (EN 20471)
- Gloves (typically to EN388: 3121)
- Safety Glasses (EN166: FT-CE; Mandatory)
- Safety 'Goggles' (EN166: 3-4-5-BT-CE for jet-washing / blowing out operations / abrasive wheel usage / dealing with blockages)
- Safety Footwear with Mid-sole protection (Boots to EN 20345)
- Wet Weather Clothing
- The Piling Rig and Container contain fire extinguishers in case of fire

No climbing as MEWP to be used. Eye protection is also provided for appropriate tasks.

Formation Design & Build Ltd is to provide and advise of any special protective measures that may be required (for example due to any site contamination) and deal with the overall protection of site, the workforce and the general public.

This example Lifting Plan has been drawn up to meet the requirements of the Federation of Piling Specialists (FPS) Code of Industry Best Practice guide to LOLER, the LOLER Regulations (1998) ACoP and BS7121, "Safe use of Cranes."

A FPS Platform Certificate will be requested for the site

Please note that one third of Dangerous Occurrences reported by FPS members to the HSE are related to inadequate working platforms leading to a piling rig or crane overturning, each one of which is a potential fatality. The HSE has worked closely with the FPS on this initiative and supports the principle of reducing accidents by the certification of properly designed constructed and maintained working platforms.

Work Supervisor	Site Foreman	**Approved by**	**Andrew Ruff CPCS 40367323** (Appointed Person – Lifting Operations)
Brief Description of the Work	Loading and unloading Plant and Equipment delivered to and loaded away from the site. Lifts by lorry Hiab (specified below) and excavator. Lifting of equipment and materials during piling operations by excavator. Lifting equipment and materials using the Piling Rig auxiliary Winch. See notes regarding restrictions on this equipment. Tag lines to be used on all lifts.		

Schedule of 'Routine' Lifts

Description of load	***Approx. Weight (Kg)***	***Load Characteristic***	**Method of Lifting**	**Centre of gravity**	**Lifting points/or method of slinging**
Reinforcement Cages	H8, 0.40kg/m H16, 1.58kg/m H20, 2.47kg/m H25, 3.85kg/m H32, 6.31kg/m H40, 9.86kg/m (Completed cage weights as per steel schedule)	Cylindrical	Horizontal lift: two chain lift; Vertical lift: Secure lifting points to be provided. Single leg drop-chain to be used.	Central	2 leg chains / Nylon slings Vertical lift, secure at tied intersection of helical and main bar, use drop-chain.
Reinforcement (Straight bars and helical)	As above	Bundled steel bars Or Helical	Horizontal lift: two chain lift. Two chain lift.	Central	2 leg chains Chain must pass through, helicals.
Drilling Auger	1.7t max depending on diameter	Up to 6.0m long Spiral	Two chain choke lift (horizontal).	Central	2 leg chain.
Concrete pump	4.2 tonnes	Engine/hopper	Lifting point on top	Central	Chain
Agitator [Hiab lift]	6 – 9 tonne	Cylinder on frame	4No. lifting points	Central	4 leg chain
Diesel bowser	1.5 tonnes (when full)	Cube	4No. lifting points	Central to tank	4 leg chain
Generator, compressor, power-pack etc	3.5 tonnes	Steel box	Lifting Points (on top)	Central	Nylon slings or single chain
Welfare cabins and containers. [Hiab lift only]	7 tonnes	3m x 6m cabin or container	Lifting points Ensure container loads are evenly distributed and secure	Central	4 leg chains

Equipment to be used for the Lift	**1) Excavator**
Make, Model, Attachments, Test Certificates, etc	Excavator supplied by **Formation Design & Build Ltd** . It is their responsibility for Checking all Documentation before releasing it to work to Rock and Alluvium

Equipment to be used for the Lift	**2) Hi-ab (Lorry Loader – Max boom length 12.5m)**
Make, Model, Attachments, Test Certificates, etc	Hi-abs supplied by Haulage Contractor (normally Hallet Silberman) who is responsible for Checking all equipment and documentation before releasing it to work to Rock and Alluvium

Equipment to be used for the Lift	**3) Piling Rig Auxiliary Hoist**
Note: The ancillary winch on the Piling Rig is designed to assist in "normal piling operations", including assembling and de-rigging the auger string and lifting rebar cages into the bore. The manufacturer's operational capacity of the winch is as follows: SF50=2.7t; SR30=3.2t; SF65=6.5t; SR75=12.7t, SR45=6.5t. It is not designed for general craneage duties. (*Ancillary rope capacities for SF50 / SR30=25.6t, SF65 / SR45=30.8t & SR75=44.6t)*; ***R&A limit operational capacities to a maximum of 1 (one) tonne.***	
Date of Last inspection:	See LOLER Book / GT Form.
Date of Last Examination	Covered by Rig Annual Examination; Certification is retained by the Rig Operator or available from the Plant Yard. [01708 862121]
Max Safe Working Load (tonnes)	The manufacturer's operational capacity of the winch is as follows: SF50=2.7t; SR30=3.2t; SF65=6.5t.; SR75=12.7t, SR45=6.5t ***R&A limit operational capacities to a maximum of 1 (one) tonne.***

Hazards Identified / Known on Site
Refer to General Risk Assessment (FM-HSS-H03-03)
Note: **Unloading of Lorries / where crash mats are required for unloading lorry's Formation Design & Build Ltd to supply.** Attach chains to load from ground where possible. Access to lorry bed by footed or fixed ladder All R&A Piling equipment to be delivered on lorries fitted with handrails and rebar to be pre-slung in 1tonne (Max) bundles.

Operator Competence
Excavator Driver: The competence of the driver supplied by **Formation Design & Build Ltd** or their subcontractor will be checked by **Formation Design & Build Ltd** prior to releasing the operative to attend Rock and Alluvium (must include lifting
Hi-ab Operator. The Haulage Contractor (normally Hallett Silberman) is responsible to ensure the driver supplied is competent to operate the hi-ab on his machine.
Rig Driver. The Rig Driver will be a holder of a CPCS or CSCS (Piling Operations) card. The card will be available from the driver
Slinger Signaller: All the site crew involved in slinging and signalling operation will be holders of a CSCS Slinger/Signaller Card, which will be presented on request.

A 'Schedule of Common Lifts' can be supplied to facilitate the attendant excavator provider to update their excavator lift plan accordingly.
If an attendant Crawler Crane is required for site operations, a lift plan will be provided under separate cover.

Contract Title: 100, Woodside Avenue. N10 3JA	Contract No:	MS Reference:
Work Package: Site Mobilisation / De-Mobilisation	9761	MS 01
Author: ND / WL	Date Produced: 09/11/2023	

Scope of Works	Site Mobilisation / De-Mobilisation
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), Low Loader Driver (& mate).
Plant, equipment and material required	Soilmec hydraulic Piling rig Trailer mounted concrete pump Concrete agitator Compressor. Bunded Vented Fuel bowser Storage container (normally 10ft/3m) Low Loader Hi-ab (rigid) delivery wagons.

	Key: *R = Review, I = Inspect, H = Hold*	**Inspection**	**Responsible**
	NOTE: R&A and its respective hauliers are a minimum of FORS Silver and hence are fully CLOCS compliant.		
1	**Prior to Mobilisation to Site**		
1.1	Access checked by R&A representative, if unsure, haulier contacted and instructed to visit site to ascertain access restrictions.	I	
2	**Arrival to site –** *it is the responsibility of the* ***Formation Design & Build Ltd*** *to provide safe means of access to site.*		
2.1	Low loader and delivery vehicles to access site via site entrance and park up on the piling mat (level firm ground). If access is not possible with low loader, refer to section 3.1.		
2.1.1	Ensure all personnel are clear of trailer prior to tractor unit to be disconnected from low loader trailer. Rig to be un-chained and tracked off trailer under full control of a certified, competent banksman.	H	
2.2	Rigid hi-ab lorries to access site and unload piling equipment. All slinging and signalling to be carried out by competent certified operatives.		
2.2.1	In the event of an 'out-of-hours' (early or late) mobilisation to site, final site set up will not be carried out until R&A operatives have attended **Formation Design & Build Ltd** 's site induction. We would request that these be carried out as soon as our piling operatives have arrived on site.	R	
3	**If low loader cannot gain access to site.**		
3.1	Low loader to be parked as close to site entrance as possible, ensuring that the road is not blocked. Traffic marshals to be provided by **Formation Design & Build Ltd** .	I	
3.2	Section 2.1.1 applies.		
3.3	Rig to be tracked on 'tracking boards' to the site, under full control of certified competent banksmen.		
3.4	Section 2.2 onwards apply.		
4	**Sequencing**		
4.1	Deliveries may be staggered to suit the constraints of the site	R	

	See Next Page for De-Mobilisation works procedure		
5	**Removal from Site (for De-Mobilisation)**		
5.1	Piling rig will be de-rigged by competent site team as per Rock & Alluvium RAMS Doc Ref MS-01 “PMP SECTION 5 – W/P 1; Erection & De-rigging”, ready for transportation.		
5.2	Low Loader will come on to site and park on (level firm ground). It is responsibility of **Formation Design & Build Ltd** to provide a safe means of access to site.	I	
5.3	Ensure all personnel are clear of trailer prior to tractor unit being disconnected from low loader trailer. Low Loader driver will bank piling rig on to trailer in their preferred orientation.	H	
5.4	Machine will be chained down securely then connected back to tractor unit where it will be banked off site.	R	

Contract Title: 100, Woodside Avenue. N10 3JA	Contract No:	MS Reference:
Work Package: CFA Piling	9761	MS 01
Author: ND / WL	Date Produced: 09/11/2023	

Scope of Works	CFA Piling
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) CPCS / CSCS
Plant, equipment and material required	CFA Piling Rig Concrete Pump Concrete Agitator Air Compressor Ancillary plant as required Access Platform

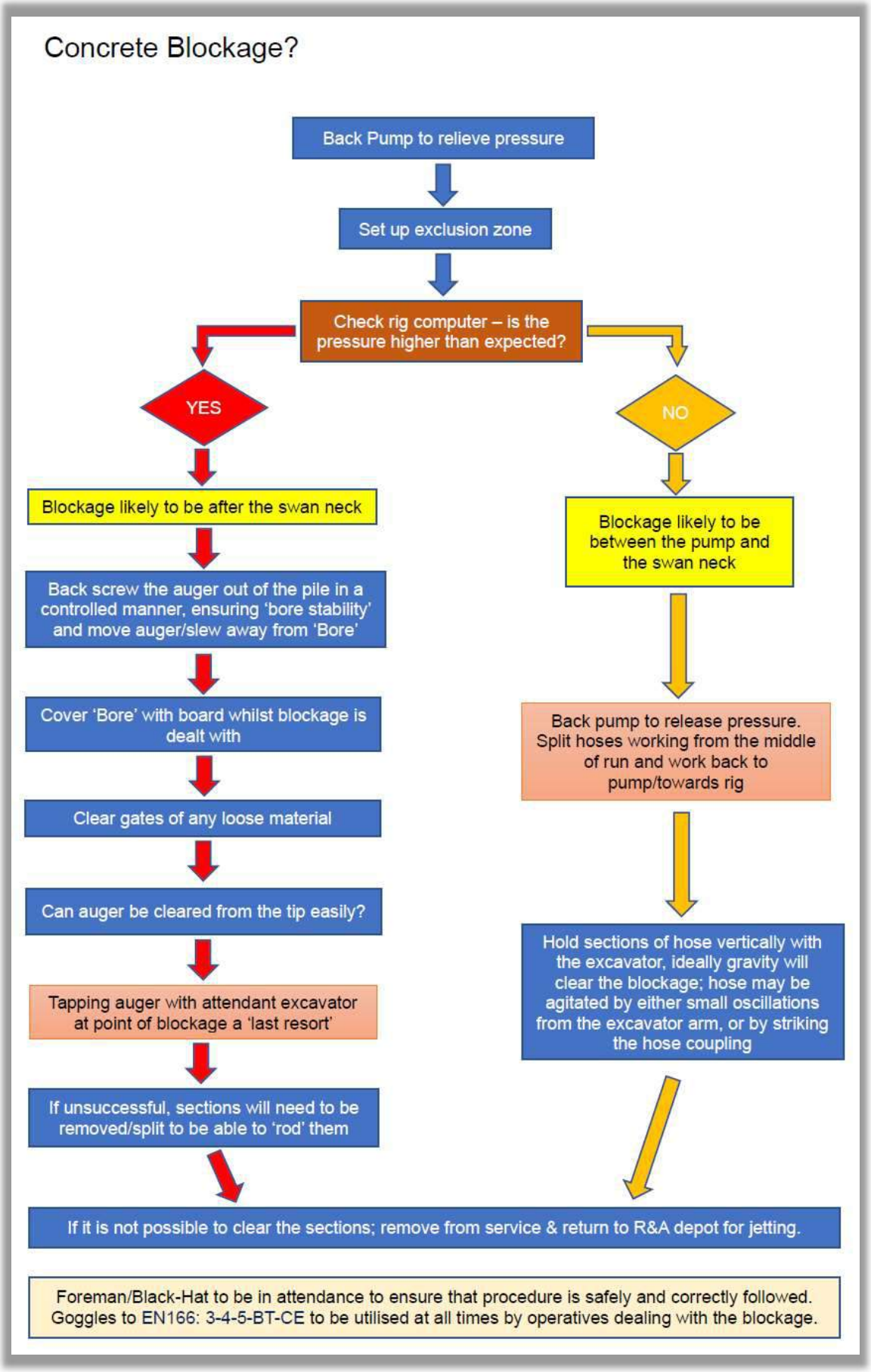
	Key: *R = Review, I = Inspect, H = Hold*	**Inspection**	**Responsible**
1	**Shift Commencement**		
1.1	Prior to commencing works a daily prestart briefing will be held between all R&A operatives and attendees, statutory PUWER inspections are carried out and any required exclusions zones are checked, to ensure that they are still in place and suitable for the foreseeable works.		
1.2	The pump operator lubricates the concrete pump and pumping line		Pumpman
1.3	The foreman checks drawing and design and starts data input into the pile monitoring computer	R	Foreman
2	**Set Up and Boring**		
2.1	The auger set up over pile pin position by the rig operator, guided by the banksman who needs to check from the front and side of the rig. Reference pins are set up in two directions at right angles using the spacing bar.		Banksman
2.2	The concrete discharge flap at the auger tip is closed by one of the following means: • The flap at the tip of the auger is closed and secured using a short length of rope or similar material. The banksman then stands clear and signals the rig driver to lower the tip of the auger to ground level, then signals the rig driver that he can proceed with drilling. or • The flap is held in the closed position by the banksman using a rod longer than 1m in length. The banksman must remain within clear view of the rig driver. The banksman signals the rig driver to lower the auger until the flap is held closed by the ground. He then withdraws the rod and stands clear and then signals the rig driver that he can proceed with drilling. *Note: Side exit flights require disposable bungs.*		Banksman
2.3	When the foreman is satisfied all is in order, the physical exclusion zone (3No barriers) will be positioned at the front of the rig and auguring to the required depth can commence. During boring, the gates are kept in the closed position until either: 1) Sufficient spoil has built up at the pile head to provide a natural barrier to the auger 2) Construction of a deep pile necessitates the need to open the gates to allow the rig to achieve the required depth.		Rig Driver / Banksman

	3) The attendant excavator is required to remove spoil from the pile head. Before the gates are open, the offset markers are used to check the pile position; auger rotation must cease for this operation as operative required to enter the physical exclusion zone.		
2.4	One banksman is to be on duty in front of the rig at all times that it is working to ensure that all is in order and other personnel are kept clear.		
2.5	If obstructions are encountered, piling will be suspended and the procedure for obstructions followed (see Section 21, page 7, of main M/S).		Foreman
2.6	Dependant on depth and diameter of the pile, the attendant excavator may be required to remove pile arisings from the pile head at various intervals throughout the drilling phase; this must not be undertaken without being under the full control from the attending Banksman.	H	Banksman
2.7	Dependent on pile depth, it may be necessary to use the auger extension. The extension pole is deployed by the following operation: The rig driver stops the forward rotation of the auger, lowers the rotary table to unlock the rotary drive from the 'key', i.e. the weight of the auger string is transferred from the rotary table to the end of the auger string, the motors are then back screwed to fully unlock the rotary table from the key, the rotary table is then free to slide up the extension pole and is locked in to the 'key' at the top of the pole by rotating forward. Boring of the pile then continues to the required depth. The same process is followed to retract the extension pole when required during the concreting phase. To remove the risk of the auger extension falling back through the rotary table it is important to always spin the augers forward prior to raising the rotary table to ensure that the rotary drive is fully engaged with the key on the extension pole.	H	Rig Driver
3	**Concreting**		
	Notes: ***I. The Concrete pump and agitator should be set up such that clear sight lines can be maintained between the pumpman and the rig operator and/or banksman.*** ***II. Standard maximum length of flexi-hose to be limited to 72lin.m (12No, 6m sections), with an additional 2No sections available on site – these can only be added for short duration works and should be removed when no longer required.***		
3.1	Prior to the commencement of concreting, whilst under the control of the banksman, the attendant excavator will clear much of the spoil from around the auger/pile head.	H	Banksman
3.2	At the target depth, the auger is rotated to allow spoil to rise and the auger is lifted a maximum of 150mm to allow concrete to exit (depending on ground conditions and auger type).	I	Rig Driver
3.3	The concrete pump is operated to supply concrete through the delivery hoses and down the auger central stem to form the pile as the auger is withdrawn. Once over-pressure is noted by the rig operator, the auger is lifted, slowly at first. In granular materials the auger is re-drilled to the scheduled depth to ensure a good 'base' is formed on the pile.		Pumpman
3.4	The concrete pressure, flow rate and overbreak percentage is monitored throughout the pile construction operation by the rig instrumentation.		Rig Driver
3.5	During withdrawal of the flight the operator operates the mechanical auger cleaner. The piling team are to ensure that the working area is kept clear of unauthorised personnel. On certain ***very*** *exceptional* occasions the piling gang may be required to manually clear the auger flight of all spoil to prevent this going above head		Banksman

	height; generally, should the auger cleaner not be effective, the extraction will cease and the auger advanced back into the bore until the auger cleaner is above any remaining spoil and the process recommenced. This will be under the direct control of the piling foreman and / or banksman who ensure that the auger is not rotated when it is being lifted		
3.6	As the auger reaches the surface pumping will cease		Rig Driver / Pumpman
3.7	In the event of a tip blockage (that is a blockage experienced at the commencement of the concreting phase) the rig operator will notify Formation Design & Build Ltd and ensure that any required exclusion zone (to be advised by Formation Design & Build Ltd) is in place and then back screw the auger out of the pile in a controlled manner, thus ensuring that as much spoil is replaced as possible into the bore. Bore must be covered with a board whilst the blockage is removed. Refer to: 1) ***Flow Chart at the end of this section for actions if blockage occurs*** 2) ***Section 16 of Risk Assessment for control measures while clearing the blockage***	H	Foreman / Rig Driver / Banksman
3.8	The rig operator will be directed by the banksman onto the next pile position		Banksman
3.9	The attendant excavator, under control of the banksman will continue to clear the spoil and concrete slurry from the pile position to a stockpile for disposal. Once spoil has been removed, the attending excavator must rotate 90° to the pile face and place the bucket on the ground; this will expose the *open* driver's door to the work area, providing a greater all-round view of piling operations and will maintain clear lines of communication. The excavator will be controlled by the R&A trained banksman and will not raise his bucket until instructed to do so. 	H	Banksman
4	**Reinforcement Insertion**		
	Calculations are available to prove that a 'hand tied' cage, weighing up to 497kg's can be lifted if there is a minimum of 32No ties; R&A limit hand tied cages to 497kg's, any hand tied cages over 200kg's will require mechanical aid during the tying process. All lifting points on the cages will be sprayed to ensure they are lifted correctly.		
4.1	The attendant excavator will continue to clear the spoil and concrete slurry from the pile position, until the pile head can be identified by the banksman.		Banksman
4.2	The pile head will be located by the piling crew and a small amount of concrete dug out to define the pile position. The reinforcement cage is then either manually lifted into position, lowered by the excavator (if less than or equal to 11m in length) or the service crane into the wet concrete and pushed / tapped in by the attendant excavator, stepping on the helical binder to insert the cage is acceptable, in some circumstances, as long as the pressure is adjacent to a tie/weld and does not affect the spacings of the helical binder. The banksman will check the reinforcement cage on completion to ensure it is central in the pile. All reinforcement cages will be fitted with spacers (minimum 4No every 4m) to ensure correct concrete cover (standard 75mm).	I	Banksman
4.3	Cages will be installed flush with top of piling platform, as this is best practice and mitigates the associated H&S risks, unless instructed by Formation		Banksman

	Design & Build Ltd after notifying them of the risks i.e. cage/pile damage, trip/stab/puncture hazard and restricted plant movement. **Note:** All reinforcing (vertical) bars are to have yellow plastic protective caps fitted, post installation, by Rock & Alluvium operatives to protect against stab, puncture and trip hazards.		
4.4	The piling rig then sets up onto a new position with the aid of the banksman and the process is repeated.		Banksman
4.5	***If piles are subject to high tension loads and require central tension steel; items 4.5.1 OR 4.5.2– 4.5.4 4.6 must be followed.***		
4.5.1	Long central tension steel should be spliced/coupled on the ground, prior to being lifted and inserted in a single lift; central bars must be lifted by aux. line on the rig or the attendant crawler (if available) and lowered to the desired level and tied off.	R	Foreman
4.5.2	If, due to site constraints, the above (4.5.1) cannot be carried out to ensure the safety of those installing these bars the following method will be used.	R	Foreman
4.5.3	First section of bar to be lifted and lowered into place with the piling rig; bar to be choked with a cloth strop (collar chain should not be used in this instance). Coupler must be attached to this bar prior to lifting into place.		Foreman / Banksman
4.5.4	Bar to be 'trapped' over the centre of the bore using the bar trapper under the coupler.		Banksman
4.5.5	Second section of bar to be lifted as per 4.5.3 and coupled to the first section. Bar is then lifted and the bar trapper removed, bar is then lowered to the desired level and tied off.		Foreman / Banksman
	Note: Central bars up to 11m in length may be inserted as a single length; anything over this will be spliced.		
5	**Horizontal Distribution of Reinforcement on Site**		
5.1	Loose straight bar (including central tension bars) will be unloaded from the delivery wagon using the pre-slung strops (certificates for these will be available from the delivery driver). These will be transported in the horizontal position to the reinforcement storage area using double chains.		
5.2	Central tension bars will be transferred from the reinforcement storage area to the piling rig horizontally by means of double chains.		
5.3	Central bars must be installed with the single (aux.) line on the piling rig or the attendant crane (if applicable). Bars must be choked with a cloth strop, lifted vertically and inserted into the centre of the pile.		
	Note: The area around the 'lift' must be kept clear of non-essential personnel & tag lines to be used at all times.		
6	**Sequencing**		
6.1	Works to be sequenced so that site traffic does not cross the concrete hose. A crossover point can be prepared (if required) by either burying the hose or by placing half sleepers / ramps on each side of the hose at the dedicated crossing point, thus minimising damage to concrete delivery hoses.	I	Foreman
6.2	Trimming of piles to cut off level should be left a minimum of 7days from casting; this may be reduced subject to cube results. It should be noted that cutting down of the piles is at the discretion of Formation Design & Build Ltd .	R	Formation Design & Build Ltd 's Site Manager
7	**In the Unlikely Event of a 'Flash Set'**		
7.1	Split land line and remove pipe work from rig		All R&A piling operatives
7.2	Sections of flexible concrete hose to be held vertically with the excavator (closed link collar chain to be used) to allow gravity to clear the blockage;		

	the hose may be agitated by either small oscillations from the excavator arm or by striking the hose coupling.		
7.3	Flexible hose sections that cannot be cleared will be moved to one side for disposal/jetting at R&A depot.	I	Foreman
7.4	Steel sections of pipework on the rig will be 'rodded' to try to remove the blockage, if this is not possible, they will be removed from the rig (replaced) and returned to R&A depot for jetting.		
	Note: The piling schedule will outline the diameter, depth and reinforcement requirements for each individual pile; this will be submitted once the scope has been finalised.		
	See next page for Concrete Blockage action flow chart.		
8	**End of shift**		
8.1	Ensure auger is clear and clean from all potential falling debris.	R	Foreman / Chargehand
8.2	Plant to be parked on stable level ground in an area designated by Formation Design & Build Ltd ; where practicable under CCTV coverage and / or immobilised by "strategic parking".	H	Foreman / Chargehand
8.3	Key to be removed by the Foreman / Chargehand and pump operator and stored in the lockable site toolbox	H	Foreman / Chargehand
8.4	Responsible person(s) designated for checking plant at end of shift, to ensure all items of plant are fully secured and isolated prior to leaving site.	I	Foreman / Chargehand
8.5	Toolbox key to be retained by the Foreman / Chargehand	R	


Concrete Blockage?
Back Pump to relieve pressure
Set up exclusion zone
Check rig computer – is the pressure higher than expected?
YES
NO
Blockage likely to be after the swan neck
Back screw the auger out of the pile in a controlled manner, ensuring 'bore stability' and move auger/slew away from 'Bore'
Cover 'Bore' with board whilst blockage is dealt with
Clear gates of any loose material
Can auger be cleared from the tip easily?
Tapping auger with attendant excavator at point of blockage a 'last resort'
If unsuccessful, sections will need to be removed/split to be able to 'rod' them
Blockage likely to be between the pump and the swan neck
Back pump to release pressure. Split hoses working from the middle of run and work back to pump/towards rig
Hold sections of hose vertically with the excavator, ideally gravity will clear the blockage; hose may be agitated by either small oscillations from the excavator arm, or by striking the hose coupling
If it is not possible to clear the sections; remove from service & return to R&A depot for jetting.
Foreman/Black-Hat to be in attendance to ensure that procedure is safely and correctly followed. Goggles to EN166: 3-4-5-BT-CE to be utilised at all times by operatives dealing with the blockage.

Contract Title: 100, Woodside Avenue. N10 3JA	Contract No:	MS Reference:
Work Package: Steel-fixing of reinforcement cages	9761	MS 02
Author: ND / WL	Date Produced: 09/11/2023	

Scope of Works	Steel-fixing (Cage Making)
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**	Steel fixers (1-3 as appropriate)
Plant, equipment and material required	Steel-fixing stands and Tying wire

	Key: *R = Review, I = Inspect, H = Hold*	**Inspection**	**Responsible**
	Note: Any slinging for lifting of bars, helical or cages is to be carried out by a competent, certified slinger/signaller.		
1	**Purchasing**		
1.1	All reinforcement to be supplied by a CARES approved supplier, on the approved suppliers list.		Buyer
2	**Fixing Area**		
2.1	**Formation Design & Build Ltd** shall set aside a suitable area for the assembly of reinforcement cages, together with an adjacent area for storage of reinforcement bars, helical and completed cages. This area needs to be physically segregated from traffic by fencing (or similar) and be away from access / egress routes, to avoid danger to steel fixers or damage to cages.		
3	**Cage Fixing**		
3.1	The Leading Steel fixer is to be given details of the Cages required.		Foreman
3.2	The bars and helical will be assembled into cages using purpose made stands onto which bars are loaded to give stability. Bars are tied by hand with ring ties or double crown ring ties. As each cage is completed it is removed from the assembly stands either by hand in the case of lightweight cages or by excavator for cages over 200kg's, note that the lifting points are to be clearly identified.		Steel fixer
	Note: Double wire will always be used for fixing the main bars to the helical. ***Ring Tie:*** *Ring-slash or wall ties prevent bar displacement and are often used to tie smooth stirrups to main deformed bars.* ***Crown Tie:*** *Crown tie, cross tie or figure-eight tie is a common tie used on main bars for setting up and tying springy bars.*		
3.3	After fabrication, the cages are to be stored on firm level ground, on timbers or clean hardcore to avoid contamination by soil. They should be away from access / egress routes, wedges should be used to increase stability of 'stacked' cages, which should not be more than 1.5m in height.	H	Steel fixer
3.4	Heavyweight cages need to comply with the table on the next page to ensure they are safe to move and lift. **Note:** C*ages weighing 497kg's or over, of large diameter or length, will be prefabricated.*		Operations / Design

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
	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.		

Rock and Alluvium

Rev 0
23/03/2021

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 guage 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

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 prior to discharge 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* ***three*** *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

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

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.		

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

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

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)

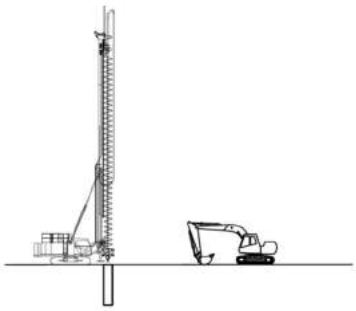
	Key: *R = Review, I = Inspect, H = Hold*	**Inspection**	**Responsible**
1	**Prior to arrival to site**		
1.1	Client to provide (co-ordinated) AutoCAD pile layout, and ideally an extractable list of all pile co-ordinates (Easting and Northing).		
1.2	Setting out sub-contractor to carry out QA check by 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**		

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 (75m in plan) or the platform level is more than 50mm low R&A foreman must 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,**		
	In the case of rotary piling the casing position and casing level must be taken.		
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.		
	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.		

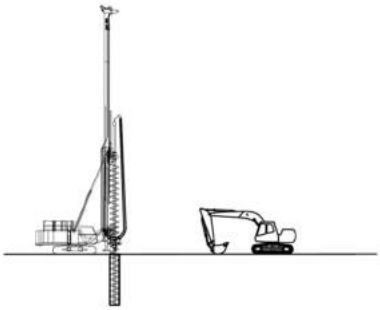
Excavator, not under instruction from our Banksman, is required to sit in a default position, as shown left, to give good field of vision to all personnel.

Important Notes:

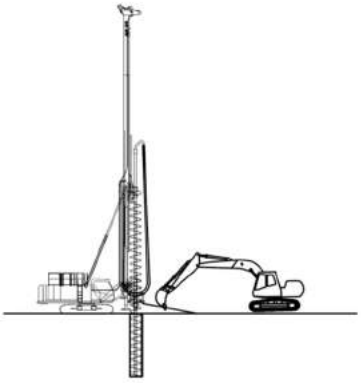
- No machine should move without instruction from Banksman.
- Banksman should be aware of his surroundings and how visible he is to other operators.
- Where possible excavator under our instruction should slew away and place bucket on floor so driver and Banksman have a better field of vision to each 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.



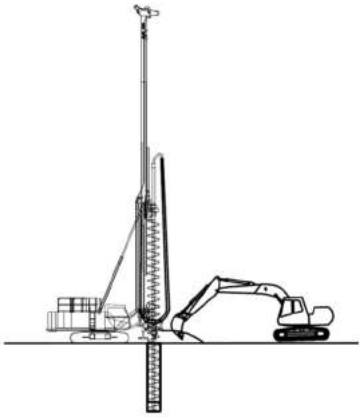
Banksman requires access around Piling Rig to facilitate the moving (banking) of the machine safely to enable setting up the rig on a pile position and checking positional tolerances at start of drilling; it is their responsibility to check the operation of the Piling Rig whilst drilling, i.e. for gate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



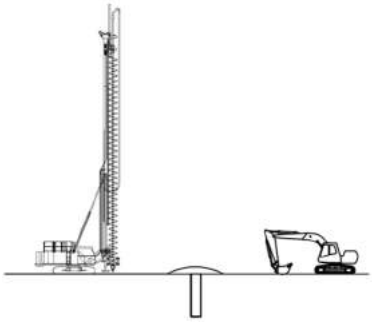
The mast of the Piling Rig creates a blind spot; the banksman must position themselves with clear line of site to both Piling Rig and Excavator Operators; it is the banksman's responsibility to visually monitor the auger, flight cleaner, rotary table and the position of both hydraulic and concrete hoses, 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.

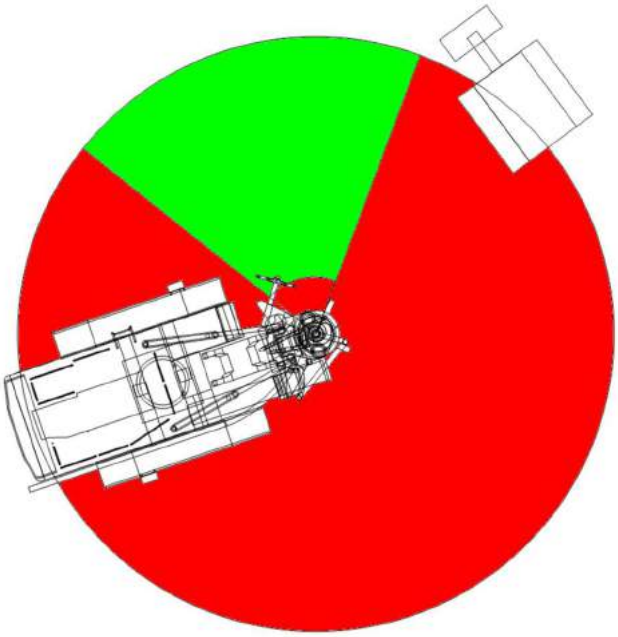


While concreting, clear line of site to be maintained with banksman, they are to ensure hoses are not caught on gates during auger extraction and that auger cleaner is effectively cleaning flights.



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

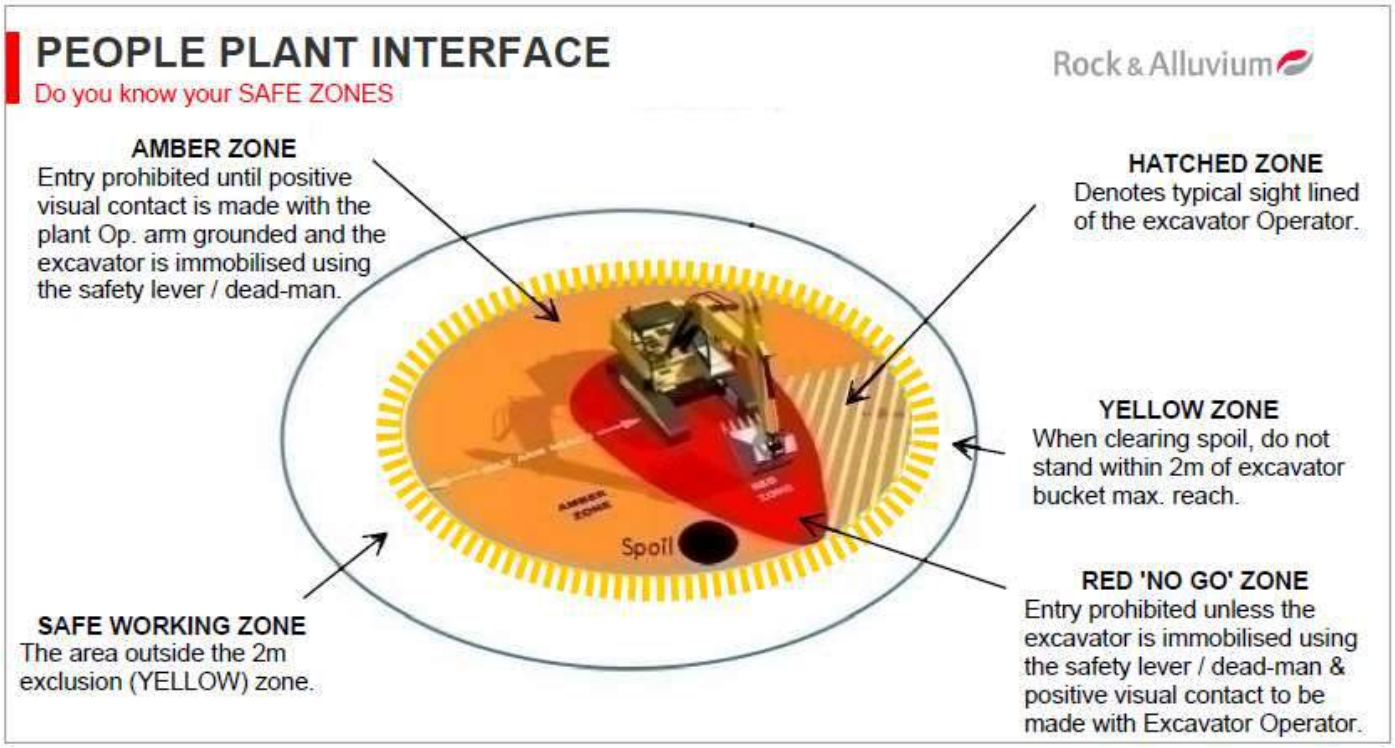
Banksman Safe-Zone (For Piling) Standing Location



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

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 Soilmec 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 Soilmec 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)*		

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**		

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		

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

Scope of Works	The safe removal of flights from the extension (in an un-locked/extended position) on a Soilmec SF50
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 Trailer mounted concrete pump Concrete agitator Compressor. Bunded Vented Fuel bowser Storage container (normally 10ft/3m) Low Loader Hi-ab (rigid) delivery wagons.

	Key: *R = Review, I = Inspect, H = Hold*	**Inspection**	**Responsible**
	The safe operating procedure for removing the flights from the extension (in an un-locked/extended position) on a Soilmec SF50		
1	Locate safe position agreed by Principal Contractor and R&A to position flight in the ground	I	Rig Driver
2	Set rig over position and proceed to drill auger into the ground until the top 6m auger section coupling is accessible from ground level.		
3	Lower motors and unlock extension		
4	Raise motors	H	Banksman
5	Remove retaining pins from the lower coupling on the top 6m section		
6	Lift motors to separate top section and extension from auger string drilled in the ground.		
7	Track rig to safe position for removing auger section		
8	Lower auger to the floor for pin removal		
9	Gain access to the top section joint (6m) using a MEWP and remove pins. Rotate auger to enable pin removal if necessary (pins can only be driven out from one direction).		
10	Raise collar chain up to operative using the auxiliary winch. Choke auger with collar chain and re connect to auxiliary winch. Take slack out of auxiliary winch and collar chain		
11	Raise motors to separate 6m section from unlocked extension. Lower section of flight to floor using auxiliary winch and remove collar chain taking care to avoid drop hose.		
12	Re-position rig over auger already drilled into the ground and re-connect augers with retaining pins	I	Banksman
13	Extract and back screw auger clear of bore		
14	Ensure that the open bore is backfilled, compacted and cordoned off in case of any settlement.		
15	Move machine to safe position to remove remaining augers		

16	Proceed to remove auger starting with cutting head		
17	Auger lowered to the ground		
18	Rotate auger so that the pins can be removed from the cutting head (can only be removed in one direction).		
19	Remove pins using punch and club hammer		
20	Choke cutting head with collar chain and connect to auxiliary winch using collar chain		
21	Take slack out of auxiliary winch and collar chain, lift augers to part cutting head from lower auger section and lower cutting head to floor using auxiliary winch		
22	Lower auger to floor to enable the pins to be removed from the next coupling joint (at height of 6m)		
23	Gain access to the first coupled joint (6m) using a MEWP and remove pins. Rotate auger to enable pin removal if necessary (pins can only be driven out from one direction).		
24	Raise collar chain up to operative using the auxiliary winch.		
25	Choke auger with collar chain and re-connect to auxiliary winch		
26	Take slack out of auxiliary winch and collar chain		
27	Lift auger to separate 6m section from remaining auger section and attached extension		
28	Lower section of flight to floor using auxiliary winch and remove collar chain taking care to avoid drop hose.		
29	Repeat process items 22-28 to remove last auger section from extension.		
30	Lower auger extension with motors to the floor.		
31	Run motors down auger extension but not completely to the stops of the mast.		
32	Move the rig to plumb the extension and guide pole to vertical		
33	Remove location pin on guide pole		
34	Using MEWP attach auxiliary winch to guide pole and remove and set down on ground		
35	Spilt concrete hose at joint		
36	Access top of extension using MEWP and attach auxiliary winch to lifting point on back of swan neck ensuring that the winch is positioned correctly between main winch ropes.		
37	Take off slack in auxiliary winch, lower motor to mast stops and lift extension through rotary table and lower to ground. Care to be taken when lifting extension to ensure it is clear of rotary table and winch ropes		
38	De-rig machine as per Soilmec Use and Maintenance manual and R&A document PMP Section 5 – W/P _; Erection & De-rigging SF50.		
NB: If site constraints dictate that the auger cannot be drilled into the platform then the auger **must only be rotated forward** to ensure that the locking mechanism on the extension pole remains locked.			
Please also note that the backfilling of any residual void left from the above de-rigging procedure must be carried out in accordance with section 24 of the CFA risk assessment; document reference FM-HSS-H03-03.			

Business Unit	Rock & Alluvium	Site Address	100, Woodside Avenue. N10 3JA	Principal Contractor	Formation Design & Build Ltd	Con. No:	9761
HS&S Assessor	William Longhurst	Operation	RIGGING & DE-RIGGING OF PILING RIG	Date:	09/11/2023	Ref. No:	Revision v4.3

This Risk Assessment relates to Method Statements MS-00, MS-01, MS-02 and MS-03.
The Rigging and de-rigging procedures must be adhered to at all times.

HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
		L	S	R		L	S	R
Site Specific Hazards: (additional site specific hazards identified below, if any)								
Thames Water Assets ***Please see next page***					Information appertaining to the assets are detailed within this document, ensure that we rig-up / de-rig outside of any easement zones.			

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
1	Instability of ground	Rig team	2	4	M	Rig to be rigged and de-rigged on suitable piling mat, copy of the working platform certificate to be signed and design must be available on site prior to commencement of rigging.	1	4	L
2	Rig failure due to mechanical or operator error	Rig team	3	4	H	Operators to be qualified and competent; equipment to be checked and certified regularly. Rigging and de-rigging procedure to be followed.	1	4	L
3	Rig Instability	Rig team	2	3	L	Mast not to be fully erected beyond 45 degrees until track extension pins inserted	1	3	L
4	Use of MEWP (CFA rigs)	Refer to Main Site Risk Assessment where this is covered							
5	Fitting Augers	Rig team	2	4	M	Augers to be slung using spare line and fitting pins inserted into each joint before next section added. Procedures outlined in section 5.1 Rigging and de-rigging to be followed.	1	4	L
6	Ladder slipping	Ladder user	2	3	L	Ladder to be footed at all times in use; most duties that require the use of a ladder (ensuring that '3points of contact' are maintained) will be carried out by using the MEWP.			
7	Rig may slip off low loader during loading / off-loading	Rig team and low-loader operators	3	3	M	Use ramps and stand clear of the low loader bed during the operation. If on public highway ensure public is kept clear of the operation; PC should provide suitable loading / off-loading area with appropriate traffic management.	2	3	L
'LIVE RISKS' TO BE RECORDED BELOW									

High Risk Operation NO	Temporary Works NO If Yes – refer to STD-HSS-T01	The above control measures have been implemented (I*f not signed on briefing record*) Workplace Manager …… Date ……

Amendment Log

Revision	By	Amendment	Date
4	PC	Issue 09 (BMS2).	01/02/22
4.1	ND	No amendments to this document.	08/04/22
4.2	ND	No amendments to this document.	06/10/22
4.3	ND	No amendments to this document.	29/08/23

RISK RATING = Likelihood (L) x Severity (S)		HAZARD SEVERITY (S)				
		1	2	3	4	5
		Negligible Negligible injury, no absence from work	**Slight** Minor injury requiring first aid treatment	**Moderate** Injury leading to a lost time accident	**High** Involving a single persons serious injury/death	**Very High** Multiple serious injuries/death
1	**Very Unlikely** A freak combination of factors would be required for an incident / accident to result	LOW	LOW	LOW	LOW	LOW
2	**Unlikely** A rare combination of factors would be required for an incident /accident to result	LOW	LOW	LOW	MEDIUM	MEDIUM
3	**Possible** Could happen when accidental factors are present but otherwise unlikely	LOW	LOW	MEDIUM	HIGH	HIGH
4	**Likley** Not certain to happen but an additional factor may result in an incident/accident	LOW	MEDIUM	HIGH	HIGH	HIGH
5	**Very Likely** Almost inevitable that an incident / accident would result	LOW	MEDIUM	HIGH	HIGH	HIGH

Likelihood
How often could the hazard occur? Consider the task, frequency, duration, method of work, employees involved.

Severity
How serious would the hazard's effects be if realised? Consider the type of hazard, biological, ergonomic, physical and chemical.

Risk = Likelihood x Severity

E.g. Likelihood (4) X Severity (3) = 12 **HIGH RISK**

LOW RISK (Score 1-6)	**May be acceptable, however, review task to see if risk can be reduced further**
MEDIUM RISK (Score 8-10)	**Task should only proceed with appropriate consultation with specialist personnel and HS&E team. Where possible the task should be refined to take account of the hazards involved or the risks should be reduced further prior to task commencement**
HIGH RISK (Score 12-25)	**Task must not proceed. It should be redfined further control measures put in place to reduce risk. The controls should be re-assessed for adequacy prior to work commencement.**

Pile Load Testing and Integrity Testing

Guidance for Formation Design & Build Ltd

1 Pile Load Testing

Introduction

The piling work on this site may include one or more pile load tests. These tests can be one of two types:

- **Preliminary Tests**: This is a test carried out in advance of the main piling work. The pile is usually tested until it fails and the results are used to refine the design of the subsequent working piles. If a test can be left for a long period of time (4-5 weeks) better results will be obtained.

- **Working Pile Test**: This is a test on a working pile and the test load is usually limited to 50% over the design load to avoid overstressing the pile or ground. This test is to check that the piles are capable of bearing the loads imposed on them. It is not intended as a check on workmanship, but on design.

The piles and anchorages for the test will be installed by Rock and Alluvium Ltd. The loading test will be carried out by a specialist subcontractor from our Approved List. After installation, the piles are left for a minimum period of 14 days or longer to enable the concrete to gain sufficient strength (minimum period subject to 7 day cube results).

Pile Protection between Installation and Testing

Between installation and testing, the test pile and anchors must be protected from damage and interference, specifically:

- The anchor piles are reinforced with “Dywidag bars” which protrude from the piles to allow connection to the test beams. The bars are formed from high grade steel which can be damaged by heat or bending. The test area must therefore be **barriered off** from plant movement and no hot work allowed in the vicinity. In the unfortunate event of a bar being bent, it must never be straightened, but we should be informed so we can re-end the bar.
- No excavations must take place around the anchors as these have been designed assuming ground level remains undisturbed. Excavations or loosening of the ground can cause the anchors to pull out, stopping the test. A repeat test will severely disrupt your program

Pile Test

The test contractor will need road access from the public road to the test location for his lorry which contains his test beams and data-logging cabin. The lorry needs to be able to park adjacent to the test pile to enable the data cables run from the data cabin to the test assembly without interference. The lorry will also need to be able to park a safe distance from the pile test assembly under load.

The area around the test must be made suitable for the technician to safely work, i.e. levelled, hard-cored and without trip hazards or excavations.

During the test, the area about 2m from the beam will need to have a barrier around it. This zone becomes a no-go area for all personnel, except those directly involved with the testing procedure.

During the test, no work that could cause vibration should be carried out adjacent to the test as the settlement of the pile under load is measured by accurate electronic instrumentation that is easily disrupted.

Formation Design & Build Ltd can usually mitigate the disruptive effects of complying with the above requirements by careful selection of the pile(s) to be tested.

Overnight Unmanned - Static Pile Load Testing

The Engineer's Specification for the load testing requires the load to be maintained with measurements taken continuously from the commencement through to the completion of the test; over a period of approximately 19 hours for a working test pile and a period of approximately 27 hours for a Preliminary or Expendable test pile. This will invariably mean that automatic monitoring will continue overnight. This type of testing is monitored remotely at our Sub-Contractors office. Should any problems arise during out of hours an alarm will notify the office and the test will be terminated.

All relevant Method Statements and Risk Assessments shall be issued to Formation Design & Build Ltd prior to mobilisation of the testing Sub-Contractor; please note that it is the responsibility of Formation Design & Build Ltd to induct the technician prior to allowing testing to commence.

2 Integrity Testing

It is normal practice to carry out a test on the integrity of the piles after they have been trimmed to cut-off level. To enable this test to be carried out, Formation Design & Build Ltd needs to note:

- The pile need to be trimmed down to cut-off level.
- A safe access needs to be provided for the test technician to gain access to the head of each pile.
- The pile cap/ground beam excavations must be clear of any standing water.
- The pile cap or ground beam reinforcement must not be in place.
- Although a thin layer of blinding can be in place around the pile, it must neither cover the pile nor be greater than 75mm thick.

Relevant Method Statements and Risk Assessments shall be issued prior to the first visit; it is the responsibility of Formation Design & Build Ltd to ensure that technician is inducted prior to allowing works to commence.

Notes:

- Integrity testing of wall piles is not required.
- At least **FIVE** working days' notice is required to book the testing technician.
- Please e-mail testing@rockal.com to book your integrity testing.

Please note: Five clear days' notice is required for Integrity Testing.
Testing to be booked via e-mail at Testing@rockal.com.

Appendix 6
Inspection and Test Plan
CFA Piling

Key: W – Work available to be witnessed; **R** – Review Documents; **I** – Implement Test or Inspection; **A** – Approval Granted

No	Construction Stage	Spec / Standard Ref	Inspection or Test	Acceptance criteria	Frequency	Procedure Ref / Method of testing	Person Responsible	Type of Record	RA Inspection	Remarks
A	**Preliminary**									
A1	Subcontractor approval	BS 4449 BS EN206 / BS8500	Check approved subcontractors and suppliers list	On list	Prior to commencement		Buyer	Correspondence	R	
A2	Steel-fixing s/c start up		Check operative's competency	CPCS/CSCS Card	Prior to commencement		Foreman	Inspect	R	
A3	Approval of material suppliers		Check approved subcontractors and suppliers list	On list	Prior to commencement		Buyer	Correspondence and Certificates	R	Steel to be from CARES Approved Supplier; Concrete to be from QSRMC Approved Depot
A4	Approval of testing laboratory	ICE B21.8	UKAS Accredited	On list	Prior to commencement		Buyer	Correspondence and Certificates	R	Test Lab to be UKAS Registered
A5	Concrete mix	Contract Spec / ICE B21.3	QSRMC Certificate	Clients Engineer to not disapprove	Prior to commencement of main works		Buyer	QSRMC Certificate from supplier		Mix Design to be Approved Prior to Commencing the Works
B	**Site Start up**									
B1	Check for services and utilities		Check Service Drawings and Scan Area	Permit to Work to be received from P/C	Prior to commencement		Principal Contractor / Client	Permit to work / dig	R	PC/Client to issue Permit to Work
B2	Platform	FPS Guidance Notes / BRE 470	Check Platform has been Constructed Correctly for Relevant Plant	Firm and Level and Designed to withstand bearing pressures of rig - provided	Daily informal Inspection, minimum weekly sign off on FPS cert.		R & A Foreman	Working Platform Certificate	R	Piling Platform to be Designed and Installed correctly and Working Platform Certificate must be signed prior to commencing work
B3	Setting out	ICE B1.8.1	Engineering check	Within +/- 10mm, tagged with pile no.	Each pile		Engineer / Surveyor	As-built survey / Surveying book	A	Calibration Certificate for Instrument to be obtained
C	**Site Construction**									

No	Construction Stage	Spec / Standard Ref	Inspection or Test	Acceptance criteria	Frequency	Procedure Ref / Method of testing	Person Responsible	Type of Record	RA Inspection	Remarks
C1	Positioning rig	ICE B1.8	Check verticality and position of rig mast	ICE table B1.4	Each pile		Front Man		I	Position and verticality to be corrected until within tolerance
C2	Sequence of work	ICE B1.13.3	Ensuring not boring near a recently cast pile	No damage to adjacent piles	Each structure / part of structure		Foreman		I	Nearby piles to be monitored during pile construction.
C3	Pile Positioning	ICE B1.8	Check Auger Position	Within 25mm	Each Pile	Use of Reference Pegs	Banksman		R	Position to be corrected until within tolerance.
C4	Depth at toe	ICE B4.4.1, B4.4.5 & B4.5.1	Pile depth to be checked at completion of boring	Toe level to be at or below target depth	Each pile	Rig Instrumentation	Rig Driver	Pile Log / Electronic Rig Printout	I	Checked against pile schedule
C5	Concrete delivery	ICE B21.6	Check delivery ticket before acceptance.	Correct mix	Each delivery		Pump man	Delivery Ticket	R	If nonconforming reject
C6	Workability	ICE B4.4.6.1	Visual inspection *(Flow/slump tests can be carried out by supplier upon request)*	BS 8500-1 table B.1 (180mm +/- 30mm)	Each delivery		Pump Man *(NOTE: Contract Supervisor to arrange testing)*		I	If nonconforming reject
C7	Delivery or Assembly of pile cages	ICE B21.9	Visual inspection	Steel not excessively rusted. Cage sturdily constructed	Each batch		RA Foreman	Delivery Ticket	I	Cages checked against Technical Package / Cage Drawings
C8	Cage type		Dimensional check, length, bar diameter, no. bars, helical, pitch, debonding	Compliance with Technical Package /Cage Drawings	Each cage		Banksman		I	Check pile schedule
C9	Spacers / cage formers	ICE B21.9.4	Visual inspection	min 4 no every 4m	Each cage		Front man		I	If possible, use 1No spacer per vertical bar and additional spacers at the top
C10	Cage installation	ICE B4.4.8, B11.4.4 & B12.4.4	Check cage has been installed at the correct level (PPL) and is centralised.	+150/-50mm	Each pile		R & A Foreman	Pile Log	I	Check pile schedules, cages placed to Ground level (PPL critical)
D	**Concrete Sampling and Testing**									

No	Construction Stage	Spec / Standard Ref	Inspection or Test	Acceptance criteria	Frequency	Procedure Ref / Method of testing	Person Responsible	Type of Record	RA Inspection	Remarks
D1	Strength	ICE B21.8 (BS EN206 & BS 8500-1 and 2)	QSRMC Certificate	BS EN206 & Complimentary codes BS 8500-1 and 2	Each batching plant used		Buyer	QSRMC Certificate	R	QSRMC Certificate is the mark of product conformity for ready mixed concrete and is applicable to all specifications / ie confirms that the batching plant(s) meet the requirements of the concrete specification.
D2	Concrete temp. (Concrete placed in air temp <2°C)	ICE B21.7	Concrete temperature at start of discharge to be not less than 5°C. Constituents used in mix shall be free from Ice, Frost & Snow.	Concrete temperature to be ≥5°C	Each delivery where air temperature is <2°C.	Measure temperature of concrete at start of discharge with a probe thermometer.	R&A Foreman	Note / recorded in diary.	I	BS8110 is intended for the casting of concrete above ground level utilising shuttering, piling requirements are covered by ICE B21.7. Potential slight effect on early strength gain, any frost damaged concrete will be removed when pile broken down.
E	**Instrumentation**									
E1	Depth Indicator	ICE B4.4.10	Ensure rig regularly serviced **OR** Manual check with tape, and/or check against mast increments	Rig service record **OR** at full auger length +/- 100mm	Start of each contract		Foreman		I	
E2	Concrete Flow	ICE B4.4.10	Compare daily delivered concrete to on-board computer **OR** Pass a known volume through the system	+/- 5%	Once during contract (on setup / change plant)		Foreman, Supervisor		I	

No	Construction Stage	Spec / Standard Ref	Inspection or Test	Acceptance criteria	Frequency	Procedure Ref / Method of testing	Person Responsible	Type of Record	RA Inspection	Remarks
E3	Instrumentation - failure	ICE B4.4.10.2	In case of Instrument failure, pile to be completed if concreting has commenced, otherwise aborted and auger backscrewed out of ground. Supervisor to be contacted and instructions sought		Every instrument breakdown		Foreman		I/S	Pile construction not to commence if electronic instrumentation is not working
F	**Post Construction**									
F1	All piles cast	Drawings and Pile Schedule	Check all piles have been constructed	Drawing/Schedule	End of piling		Foreman	Note in diary and on pile logs		
F2	Post Construction Survey	As-built Pile Layout drawing & survey.	Resurvey of pile positions	Within Tolerance (normally 75mm)	Once piles have been exposed		Principal Contractor	As built Schedule		Copy to be sent to Client for O&M Manual
F3	After piles trimmed	ICE B15	Integrity Testing	No defects	Each pile	As NDT Procedure	Principal Contractor responsible for arranging through R&A	Integrity Test Report		Copy to be sent to Client for O&M Manual
G	**Load testing (working & preliminary)**									
G1	Anchor Construction	Anchor Layout Drawing	Piles to be constructed to correct depth. Correct, cage, tension bars and Dwyidag bars to be installed	As per layout drawing and technical pack	Each Pile		Foreman			Anchor and test piles to be left a minimum of 14 days before loading. This may be superseded by the strength requirement
H	**Screw Jointed Bars**									
H1	Use of screw jointed anchor bars	R&A RAMS, Section 4 – Works Procedure 1.1 (CFA Piling)	Bar joint to be inspected for tightness	No further movement between sections	Each bar joint	Wrench	Banksman		I	

No	Construction Stage	Spec / Standard Ref	Inspection or Test	Acceptance criteria	Frequency	Procedure Ref / Method of testing	Person Responsible	Type of Record	RA Inspection	Remarks
KEY										
W	Work available to be Witnessed									
R	Review documents									
I	Implement Test or Inspection									
A	Approval (authorise)									

Roles and Responsibilities

Foreman's Responsibilities

Form Number	Form Title	Completed by	Comments
Start of project:			
FM-HSS-P01-01	Plant checklist and authorised user	Rig foreman/competent person when non-R&A plant is brought onto site	
Daily:			
RA-FM-01-082	Morning Brief (TBT)	Rig Foreman	To include everybody that is included in piling activities
RA-FM-P01-03	Mobile Plant daily checklist – Rig / MEWP	Plant Operator	
CBAB SBD Register	Safety Behavioural Discussions	Rig Foreman	Ops and management to complete on site visits.
Weekly:			
WPC (FPS)	Piling Platform Regular Check	Client	Weekly as a minimum.
RA-FM-01-082	Toolbox Talk	Rig Foreman	1No Environ. Toolbox Talk every 4 weeks.
FM-HSS-L02-04	Lifting Equipment inspection	Rig Foreman	Can delegate to competent person but remains ultimately the foreman's responsibility
RA-FM-P01-RA1	Mobile Plant and equipment inspection form	Rig Foreman	Can delegate to competent person but remains ultimately the foreman's responsibility
FM-HSS-P01-07	Work Equipment Inspection	Rig Foreman	Can delegate to competent person but remains ultimately the foreman's responsibility
FM-HSS-W03-06	Harness Inspection	Rig Foreman	Can delegate to competent person but remains ultimately the foreman's responsibility
Monthly:			
HS&S-FRM-F0-RA (page 1)	The First Aid Check sheet	Rig Foreman	Can delegate to competent person but remains ultimately the foreman's responsibility
HS&S-FRM-F0-RA (page 2)	Spill Kit check	Rig Foreman	Can delegate to competent person but remains ultimately the foreman's responsibility
HS&S-FRM-F0-RA (page 3)	Fire Extinguisher Check	Rig Foreman	Can delegate to competent person but remains ultimately the foreman's responsibility

Supervisors Responsibilities

Form Number	Form Title	Completed by	Comments
Start of project:			
FM-HSS-H03-02	Project Management Plan (incorporating Method Statement)	R&A operations supervisor and R&A rig foreman	Reviewed and accepted by client.
FM-HSS-P04-02	Project Environmental Plan	Client and R&A	Client to sign
WPC (FPS)	Platform Certificate	Client	See above; page 2 must be signed at minimum, weekly to confirm piling platform is being checked and maintained if required.
RA-FM-07-032	Permit to Work	Client and R&A	To be signed off by Client and R&A Contract Supervisor, Foreman.
FM-HSS-H03-03	Risk Assessments	R&A	To be signed off by R&A Contract Supervisor.
FM-HSS-T03-01	Record of HS&S briefing	To be signed by R&A operatives, steel fixers, engineers, attendant excavator and dumper operators etc	

Business Unit:	Rock & Alluvium	Contract Number:	**9761**
Contract Name:	**100, Woodside Avenue. N10 3JA**		
Briefings Reviewed:	Method Statements for Works Packages, Risk Assessments, Spill Response Plan, Roles and Responsibilities; Inspection and Test Plan and **Safe Interaction Between Plant & Operatives**;		
Other *(Please State)*:			
Briefing Title(s) / References(s):	Project Management Plan (inc. Risk Assessment) and Safe Interaction Between Plant & Operatives (PMP section 4.6)		
Briefing Delivered By:			

Name	Date & Start Time	Piling Crew	Sub-Con.	Other *(Please Specify e.g. Company Name)*	Signature

… Continued

… Continued from previous page

Name	Date & Start Time	Piling Crew	Sub-Con.	Other *(Please Specify eg Company Name)*	Signature

Business Unit	Rock & Alluvium	Site Address	100, Woodside Avenue. N10 3JA	Principal Contractor	Formation Design & Build Ltd	Con. No:	9761
HS&S Assessor	William Longhurst	Operation	PILING	Date:	09/11/2023	Ref. No:	Revision v4.3

Notes: If any of the following situations apply, append the relevant Risk Assessment.
Adjacent to Rail: No **Contaminated Ground: No**

HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
		L	S	R		L	S	R
Site Specific Hazards: (additional site-specific hazards identified below, if any)								
Thames Water Assets ***Please see next page***					Information appertaining to the assets are outlined within this document, we must ensure that working practices are in line with the requirements of the Thames Water guidance and we observe correct working practices with regards to the easement zones.			

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
1	Site Access / Egress	Piling Crew, visitors and other operatives on site	3	4	H	Formation Design & Build Ltd to erect suitable pedestrian barriers to reduce the interaction between vehicles / plant and any site operatives and/or the general public. Employees to conform to site segregation rules and not block walkways. R&A operatives to Supervise and direct the piling rig and piling equipment delivery vehicles across public footpaths and access routes; Formation Design & Build Ltd to provide Traffic Marshals. Formation Design & Build Ltd to provide security at site entrance to prevent unauthorised persons gaining access to the site and supervise delivery vehicles entering and leaving the site. Security Container to be positioned away from traffic routes. **HSS Standard H01 is to be complied with in full.**	1	4	L
2	Congested Working	Piling Crew, visitors and other operatives on site	2	4	M	Equipment that is not required for current piling operations is to be stored outside of the piling area. Where spoil is to be loaded away, this is to be moved away from the piling rig before loading vehicles.	1	4	L
3	Use of Mobile phones or other mobile devices causing a distraction from site hazards	Piling Crew, visitors and other operatives on site	2	2	L	Foreman who uses mobile phone are only to do so in a place of safety and when safe to do so. Mobile phones must not be used when engaged in activities where distraction could pose a risk, e.g., rig manoeuvring. When using a Mobile phone, all operatives should move to a place of safety, such as a designated area.	1	2	L
4	Storage and Security	Piling Crew, visitors and other operatives on site	3	3	M	R&A operatives to stack piling equipment & materials in such a way as to not become unstable when moved / used. Formation Design & Build Ltd to provide a secure site with lockable gate and provide, erect & maintain suitable boundary fencing (hoarding) to prevent unauthorised access at all times. Formation Design & Build Ltd to provide site security to guard against loss/theft of property and machinery. **HSS Standard S01 is to be complied with in full.**	2	3	L

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
5	Storage of pile cages: Cages falling, crushing / striking personnel.	Piling crew / Steel fixers.	3	3	M	Cage storage to be agreed prior to placement between Principal Contractor and Foreman/Supervisor. Cages to be stored away from access/egress routes. Cages to be stored on firm level ground. Cages to be stored on timber. When cages are stored on ground, wedges to be used to prevent movement. Cages to be stacked no more than 1.5m.	2	3	L
6	Striking services, electric cables, gas mains, telecoms, water supply and drainage.	Piling crew, visitors and other operatives on site Nearby residents if gas main	2	4	M	Formation Design & Build Ltd to review service drawings. Formation Design & Build Ltd to scan for, locate, expose, divert, protect as necessary all existing underground services prior to the start of any piling operations and issue "Permit to Dig". R&A to notify Formation Design & Build Ltd of any pressure loss / anomalies whilst drilling / injecting piles. All works to cease if electric cable strike suspected – Rig operator to stay in cab or Jump well clear,	1	4	L
7	Slips, trips and falls	Piling Crew, visitors and other operatives on site	2	3	L	Site and all walkways to be kept clear and tidy, with particular attention to designated pedestrian routes. Materials to be stacked and stored properly. Formation Design & Build Ltd to provide background safety lighting in periods of darkness in areas used by R&A, including walkways and access routes	1	3	L
8	Drowning when working near deep water	Piling Crew, visitors and other operatives on site	2	4	M	Formation Design & Build Ltd to provide, install and maintain suitable fencing and/or guard rails to prevent R&A operatives from falling into adjacent water. Formation Design & Build Ltd to provide life jackets and rescue plan. **HSS Standard W04 is to be complied with in full.**	1	4	L

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
9	Electrocution	Piling Crew	3	4	H	All portable electrical equipment to be a maximum voltage of 110volts dc. All portable electrical equipment to be checked before it is used and thoroughly inspected every 3 months by a competent person. PAT testing is required see MS/047 for colour coding test schedule. Damaged / Faulty equipment to be removed from use. **HSS Standard E01 is to be complied with in full.**	1	4	L
10	**Lifting operations.** Falling plant and materials, Collisions with plant, persons and Overhead services Failure of lifting appliance	Piling Crew, visitors and other operatives on site	3	4	H	Lift Plan to be followed at all times (PMP Section 3) Only Fully Trained Banksman / Slingers are to control lifting operations on site and ensure that the loads are properly slung prior to any lift commencing; tag lines to be used on all lifts. Banksmen to ensure that the lift path / route is clear of other site operatives and overhead services in particular H.V Cables and overhead pipe racks. Whilst lifting augers (during rigging), ensure that the 'female' coupling is facing the rig and the lift path is clear; do not pick up augers when 'male' coupling is facing the rig. Plant Manager to ensure that all rigs receive their 12-monthly thorough examination and that any defects are corrected Foreman to ensure rig is inspected after rigging and LOLER register completed. R&A foreman is to ensure that all Lifting Accessories have been given an examination every 6 months and certificates available. Banksman / Slinger to assess all loads before they are lifted to ensure that the Safe Working Load of the lifting equipment is not exceeded at any point during the lift Damaged slings to be cut-up and not used/discarded **HSS Standard L02 is to be complied with in full.**	1	4	L

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
11	Use of attended excavator Accidental unlatching of bucket using "quick hitch " attachment mechanism	Piling Crew, visitors and other operatives on site	2	4	M	The attendant 360° operator and the R&A banksman are required to sign up to the attached pictorial guide for the safe interaction between plant and operatives. Foreman is to check that bucket and excavator are a "matching pair" (many systems are in use); all excavator operators must have received training on the type of quick hitch being used. Driver must be competent to operate system supplied, by demonstration if required and must hold the relevant lifting category. Where a locking pin is specified in the system, it must be in fitted in the correct place by the excavator Operator (R&A site team to check). **HSS Standard P01 is to be complied with in full.**	1	4	L

12	Plant / Vehicle operation Contact between plant and persons such as to cause injury.	Piling Crew, visitors and other operatives on site	4	4	H	Formation Design & Build Ltd to erect suitable signage and barriers to prevent any unauthorised site operatives gaining access into the 'greater' piling area, an immediate exclusion zone at the front of the rig must be in place and auger rotation must cease if entry into this zone is granted by the rig operator. R&A to cease all piling operations if any unauthorised persons enter the piling area. When lowering cages into a freshly concreted pile, the operation must be controlled by a competent slinger/signaller. Where mechanical assistance is required to push/tap cages into the concreted bore, operatives are to stand, at least twice the distance of estimated cage length left above ground, clear of the area; if the cage can't be pushed or tapped into the pile without the assistance of a piling operative holding the cage steady, then re-drilling the pile should be considered. Foreman to check all plant, machinery and equipment to ensure that guards are secured in place to prevent any physical contact with moving parts. The FPS Working Platform Certificate provided by Rock & Alluvium is to be signed by Formation Design & Build Ltd and/or the Planning Supervisor and returned prior to Piling Operations commencing; confirming the design is in order and the platform construction is in accordance with the design. Rock & Alluvium personnel are not permitted to unsecure any load, handle or unfold concrete chutes of concrete delivery vehicles. In line with Plant Standards P01, red card rig operators to be assessed by R&A employer or blue card operator. The attendant 360° operator, dumper operator and the R&A banksman are required to sign up to the attached pictorial guide for the safe interaction between plant and operatives, as a further measure R&A's Site Foreman, is to be available 'on the ground', when required, to control all the works within R&A's exclusion zone (working area) and co-ordinate operations including (but not limited too) lifting of cages & positioning of the attendant excavator. NOTE: blue carded operator preferred for the attendant excavator. **HSS Standard P01 is to be complied with in full.**	1	4	L

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
12 Cont.	Plant / Vehicle operation Contact between plant and persons such as to cause injury (Forward Tipping Dumper)	Piling Crew, visitors and other operatives on site.	4	4	H	If deemed necessary; Formation Design & Build Ltd or Ground Works Contractor will supply a forward tipping dumper to remove spoil from the piling area to a 'central' spoil heap; the location of which must be planned and agreed between all parties. Formation Design & Build Ltd and/or Ground Works Contractor to ensure forward tipping dumper driver holds relevant CPCS certification (ideally blue card) and are competent with piling operations, R&A Foreman will assess competency during operations, if deemed unsuitable the operator will be removed from the piling area; note, preferred maximum size of forward tipping dumper is 6T, this ensures better line of sight for the driver. Traffic Management routes to be planned and communicated between all parties. R&A Foreman to discuss and notify all operatives under R&A control of the traffic route in the morning briefing and/or when necessary. 5mph speed limit to be set and communicated to the dumper driver while operating in the piling area. Ideally the dumper should operate outside the immediate piling area. Operator of the forward tipping dumper must ensure they exit the vehicle to a safe location while being loaded. Seatbelts are to be in good condition and are worn when traversing the piling area (when ROPS are fitted). Plant Maintenance and checks are to be carried out by the attendant groundworker to ensure the plant is fit for purpose. If gradients are present in the designated piling area and/or forward tipping dumper route, they should not exceed the maximum permissible gradient of 1 in 4. Formation Design & Build Ltd and/or Ground Works Contractor are responsible for provision of banksman for dumper operations in & out of the piling area as required.	1	4	L

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
13	**Use of Abrasive Wheel Cutter (Stihl Saw).** **Cutting Rebar only**	Piling Crew, visitors and other operatives on site	2	2	L	Only persons holding a Competence Certificate to use saw or change wheel. Additional PPE. Goggles to BS EN 166 B must be worn. Suitable gloves and ear protection to be worn. Use of this type of tool is to be limited to 1 hour per day. Tools must not to be used near combustible materials. If any fuel spillage on clothing, tool must not to be used. **HSS Standard P01 is to be complied with in full.**	1	2	L
14	**Working at Height** (Ladders may be used by fitters)	Piling Crew, visitors and other operatives on site	4	4	H	Ladders are not to be used on site, MEWP to be used at all times. If ladder required, it must be Industrial Class 1 EN131 (Blue Label), it must be inspected for damage prior to use, be adequately footed and three points of contact to be maintained at all times. Any persons climbing into the agitator basket to ensure that the safety rail is reinstated. **HSS Standard PW03 is to be complied with in full.**	2	4	M
15	Loading and off-loading Vehicles	Piling Crew, visitors and other operatives on site	2	2	L	Lifting chains to be prefixed to Containers. Piling Equipment, Rebar or Cages to be delivered in vehicles with side rails and pre-slung with slings easily accessible from ground level. R&A to use unloading bay when available on site Where possible, items to be slung/un-slung from ground level. Where vehicle's flatbed is to be accessed, use appropriate access point. After slinging load, operative to dismount the vehicle's bed or stand at the headboard. Fall/edge protection must be used; tag lines to be used on all lifts.	1	2	L

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
16	Rig instability / platform failure	Piling crew	2	4	M	Formation Design & Build Ltd or R&A to design platform, Formation Design & Build Ltd to Install & Maintain Piling Platforms to safely support bearing pressure of piling rig in its Working Mode. Copy of the FPS Working Platform Certificate to be signed and pile mat design must be available on site along with material grading certification prior to commencing work. Weekly piling platform inspections must be carried out and the FPS platform certificate is to be signed off weekly by Formation Design & Build Ltd . Pile platform level checks are undertaken every morning by the setting out engineer and any discrepancies will be raised with the client, it should also be noted that the level is also recorded at the time of taking the as-built pile position. All excavations to remove existing foundations / underground obstructions should be backfilled with suitable material and compacted in accordance with the pile mat design. Formation Design & Build Ltd is responsible for backfilling these areas, it is vital that the area is fully reinstated in accordance with the piling platform design and the platform certificate is to be signed off.	1	4	L

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
17	Auger tip blockage, extracting the augers after boring, pile shaft filled with disturbed material. Bore may become unstable.	Third parties and piling crew	4	4	H	Pre-charge the concrete line to a maximum of 15bar, if tip has not opened then stop pumping and back pump. Set up/extend exclusion zone (as advised by PC) then back screw the augers out of the bore in a controlled manner ensuring as much spoil is replaced as possible, until the tip can be accessed. Move auger/slew away from pile, cover the bore whilst blockage is dealt with, ensure all spoil and debris is removed from the gates by piling operative using a grafter, once loose material has been removed the gates can then be opened. Any remaining spoil within the gates to be removed using the grafter. Once all material is removed & there is no risk of falling debris the Operative can then access the auger tip to remove the blockage using a pin to clear the blockage from the tip. If auger cannot be cleared from the tip, then sections will need to be removed to be able to 'rod' them. Once clear the tip is closed and auger secured within the gates, during this operation additional operative is to have a watching brief at front of rig. Re-drill pile 500mm beyond its scheduled design depth. All tip blockages shall be recorded. The pump operator and rig operator must maintain eye contact at all times during pre-charging of the augers. Flow chart contained within section 4.1.1 of these RAMS should be referred to for clarity: NOTE: Goggles conforming to BS EN166: 3-4-5 BT-CE must be worn by operative dealing with the blockage at all times.	2	4	M
18	Plant Breakdown	Individual repairing item of plant	4	3	H	If an item of plant breaks down the R&A plant department should be contacted so that a qualified fitter can be arranged to visit site if required. Under no circumstances should anyone not properly trained and authorised attempt to carry out any repairs to plant; persons not properly trained would not have the ability to recognise an unsafe situation and run the risk of harming the health and safety of themselves and others. Works can only continue when the plant has been repaired by a competent operative.	2	3	L

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
19	Manual handling muscular-skeletal injuries. Note this applies to levering, pulling lifting and other manual tasks.	Piling Crew, visitors and other operatives on site	4	3	H	Manual Handling is to be reduced to a minimum by the use of the attendant excavator provided by Formation Design & Build Ltd and R&A Hiab delivery vehicles or other mechanical means. Should the above not be possible**;-** Heavy loads are to be split into loads that the operative is comfortable with lifting. If this is still not possible**;-** The loads are to be lifted by multiple operatives ensuring that all operatives are aware what is required of them and that the weight of the item does not exceed the ability of the person lifting. If there are any manual handling tasks, ensure sufficient numbers of operatives are used, to spread the load. Operatives to "walk the route" before they carry any loads to ensure that there are no trip hazards / uneven surfaces / width restrictions / vehicle crossing points that could impede the Manual Handling Operations, muddy and slippery areas are to be avoided where possible. Operatives to wear protective equipment provided by R&A, this includes gloves suitable for the task being undertaken, typically to EN388: 3121. **HSS Standard M01 is to be complied with in full.**	3	3	M
20	Contact with rotating auger	Piling Crew and other operatives on site	2	4	M	Guarding to the CFA rig is to be in accordance with the FPS / HSE Guidance on PUWER (Regulations 11 & 12), section 4.1; i.e. the bottom of the guard/gates to be no more than 750mm above ground level and top of the guard to typically be 1.8m from ground level. In accordance with the above guidance (section 3.3) the guard/gates need to be opened to allow the piling rig to achieve its full depth; this is acceptable if the auger rotation stops when anyone enters the immediate exclusion zone at the front of the rig; the banksman <u>must</u> police the 'danger zone' in front of the rig.	1	4	L

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
21	**Control of Substances Hazardous to Health (COSHH), particularly Ready-mixed Concrete.** **[Full COSHH Assessments available as Separate Document.]** **Fire risk**	Piling Crew, visitors and other operatives on site	4	2	M	**Wet Concrete can cause cement burns to the skin** Operatives to avoid direct contact. PPE listed on COSHH assessment is to be worn. Should any operative come into contact with wet concrete – they should thoroughly wash skin and clothing immediately. Should there be any eye contact with dust or concrete – the affected eye should be thoroughly irrigated with cold clean water preferably a proprietary eyewash solution; in the event of concrete contamination, immediate treatment should be sort at an A&E department at the nearest hospital. Flammable substances (mainly fuels, oils & greases) to be returned to and secured in the COSHH cage, particularly during out of hours. **HSS Standard H01 is to be complied with in full**	2	2	L
22	Noise [Noise Assessments are available for all Piling Plant]	Piling Crew, visitors and other operatives on site and persons working nearby during working day	4	3	H	R&A operatives are provided with hearing protection and have been instructed they are to be worn when working near piling rig, pump or agitator. Piling rig / equipment is to be kept in good working order. Principal Contractor to ensure R&A works are segregated from other contractors and that the rig and pumping area noise assessments are reviewed. Mandatory noise protection signage to be set up near the rig and pumping area. Noise related toolbox talk to be included within toolbox talk list. **HSS Standard N01 is to be complied with in full**	2	3	L
23	**Injury from Soil falling from auger flights, gates and auger cleaner.**	Piling Crew, visitors and other operatives on site	4	4	H	Mechanical Auger cleaner to be used, this is approximately 2m (head height) from ground level to minimise the risk. An exclusion zone will be in place around front of rig, strictly no admittance inside the barriers unless the auger rotation has been ceased. R&A operatives are to ensure that there is no spoil / concrete / debris taken up on the flight and that the gates/auger cleaner remain clear from excessive build-up of spoil (clean off with grafter). **[Refer to FPS/HSE Guidance on the Guarding and Cleaning of Augers]**	1	4	L

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
24	**Piling Work – Protection of adjacent premises and personnel when working near site boundary**	Piling Crew, visitors and other operatives on site **MEMBERS OF PUBLIC**	3	2	L	When piling operations are in close proximity to the site boundary, Formation Design & Build Ltd is responsible for providing any exclusion/protection measures necessary to protect the general public. Formation Design & Build Ltd to provide, erect & maintain polythene sheeting / debris netting to perimeter walls / fencing to prevent Mud / Concrete / Slurry splashing members of the public; strictly in accordance with FPS / HSE Guidance on PUWER (Regulations 11 & 12), section 4.3 ***CFA Piling: Exception*** **HSS Standard S01 is to be complied with in full.**	2	2	L
25	Creation of open bore caused by use of additional bore to park auger string where two diameters being used	Piling Crew, visitors and other operatives on site	2	4	M	Where a redundant bore has been created after parking an auger string not in use; it should be drilled in over half the full length of the string. Empty bores must be covered whilst on site and backfilled before leaving site. The area must be thoroughly checked after the backfilling has been carried out and the area must be left at a similar level to the piling platform to ensure that the empty bore has been suitably filled and not just masked by spoil	1	4	L
26	Bursting of concrete hoses and or Hose joints causing damage and injury during concrete pumping	Piling Crew, visitors and other operatives on site	2	3	L	The rig location and placement of the pump/agi to be placed and managed by the Foreman & Supervisor to ensure that Rig and Concrete Pump set up are as close as reasonably practicable to allow a clear line of sight and communications. Hoses to be inspected by pump man daily at start of shift; if during the daily inspection it is noted that the hose is worn by more than 2No layers of reinforcement, it will be removed from service, sprayed and dispose of. ***NOTE: All flexible concrete hoses are pressure tested at six monthly intervals.*** All concrete hoses fitted to the mast of the piling rig must have whip checks fitted at all times. Joints to be secured by R Clips or Split Pins. Rig “drop hoses” to be fitted with sleeved hoses for additional protection. Newer sections of hoses are to be used adjacent to the rig and pump. Hose runs to be planned and managed to ensure that plant does not track over hoses. Hoses to be buried under road, or ramps to be placed to prevent damage.	1	3	L

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
27	Clearing concrete pumping lines and auger at the end of a shift by compressed air.	Piling Crew, visitors and other operatives on site	2	3	L	Blowing out operations are to be under direct control of a trained Foreman. The area for blowing out is to be agreed with the client's supervisor daily, if there is a permit system this must be in place prior to blowing out. Foreman to remain at piling rig during procedure, banksman to control the compressor. Rig lines to be blown out facing away from the perimeter fencing at all times. Foreman to monitor concrete lines as the concrete moves through the lines, when the ball passes the back of the piling rig the air flow should be turned off and surplus air released through the exit valve. All persons not involved in this operation to be kept at a safe distance. Whip-checks to be used at all air hose joints including at both compressor and the blow-out gun. Operator to check adaptors are clear of debris before fitting to hose. **Refer to Section 4 of PMP (FM-HSS-H03-02 MS-04 Blowing-Out CFA Piling Rig.)**	1	3	L
28	Dealing with blockages in the concrete pumping lines	Piling Crew, visitors and other operatives on site	3	3	M	Before releasing any joints, pressure should be released where possible by back-pumping. Eye protection to EN166: 3-4-5-BT-CE goggles or full-face protection must be worn to protect eyes from injury. Helmet visors are not adequate for this operation. To prevent the free end of a concrete hose "whipping", it must be restrained by fixing a strop to the pipe and securing it e.g. the excavator lifting point or the rig; holding the hose down with an excavator bucket is not effective and should not be used as the only means of restraint, although it can be used in addition to the strop; in this instance a ball catcher may be fitted to the free end of the hose run; this can cause concrete to spray over a large area and may not be suitable for site constraints Once the ground hoses are stripped into sections they can be secured with a collar chain to the excavator, individual section can then be lifted to remove remaining concrete.	2	3	L

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
29	Dealing with 'Flash Set' in concrete delivery pipelines	Piling Crew and other operatives on site	1	4	L	Outline process within 'Works Procedure 1.1; CFA Piling' to be adhered to; ensure that 'agitation by excavator' is minimal and carried out in a controlled manner – exclusion zone to be set-up to protect operatives from concrete splatter / remove risk of being struck by hose. Attendant excavator to manage & prevent concrete build up as per instruction of the Banksman. Risk Assessment (section 20) to be followed.	1	4	L
30	Falling from rig mast	Person climbing	2	4	M	MEWP to be used. Operator to have IPAF or CPCS Card and wear short restraint lanyard Rigs are not to be climbed even if mast has a fixed ladder.	1	4	L
31	Fall from tracks.	Person climbing onto/ off tracks	2	3	L	Do not climb tracks unnecessarily. When both climbing and descending, use proper step.	1	3	L
32	'Steel-fixing' of rebar cages for piling	Piling Crew, visitors and other operatives on site 'Steel-fixer'	3	3	M	'Steel-fixing' Area to be demarked off and segregated from trafficked areas. Heavy cages (greater than 497kg's or of large diameter) to be prefabricated off-site. Hand tied cages more than 200kg's will require mechanical assistance. Correct lifting ring or secured helical to be used to hoist the cages into the vertical position for insertion into the bore.	2	3	L

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
33	Use of Mobile Elevated Work Platform (MEWP), Risk of overturning and 'crushing'	Piling Crew, visitors and other operatives on site MEWP operator	3	4	H	Only person qualified with an IPAF or CPCS certificate are to use MEWP. Full harness with short restrain lanyard to be used and attached to correct attachment point. Only stand on the platform floor, not on the rails. Check for presence of ramps, trenches, slopes, manhole covers, ground obstructions, overhead cables, building projections, vehicles etc. Before travelling in the MEWP, ensure platform is in recommended travelling position. Tool tethering kits to be used at all times. Only travel with an appointed banks-man and at correct speed Before raising the boom, check that the machine is level and on firm surface; crush protection not required as there are no 'overhead obstructions'. Do not overload the platform or use it for lifting duties. In the event that MEWP operator requires rescuing, trained (IPAF/CPCS) MEWP operator is to lower the basket by use of the controls on the body of the plant, in line with their training and the MEWP rescue plan "Annex B – Rescue from MEWPs Hierarchy" from the "Rescue of Persons from MEWPs" document. **HSS Standard P01 is to be complied with in full.**	1	4	L
34	Risk of 'falling' into fresh pile	Piling Crew and other operatives on site	3	3	M	Piling platform to be maintained and cleared of surplus water/slurry by Formation Design & Build Ltd , access to the immediate piling area to be controlled by the piling crew; recently constructed piles to be covered by boards or cones, work to be sequenced to minimise the risk, note that yellow plastic protective caps are to be placed on all vertical rebar once installed into fresh pile.	1	3	L
35	Working in warm weather conditions.	Piling crew, visitors and other operatives on site	3	3	M	Workers to wear close woven fabric shirts and full-length trousers. Principal contractor to ensure drinking water is readily available. Operatives to be encouraged to take frequent breaks by the Foreman, operatives to be briefed in the morning regarding adverse weather conditions. Operatives to ensure that they use sun protection creams.	1	3	L

Section	HAZARDS	PERSONS AFFECTED	RISK			CONTROL MEASURES (List control measures that are provided and those required)	RISK		
			L	S	R		L	S	R
36	Information Security – Unauthorised access; environmental damage; malicious insider; IT system failure	Piling crew, visitors and other operatives on site; Office Staff	3	4	H	Ensure confidentiality, integrity and availability of data, following company I.T/I.S policies and procedures with IT system security managed by Group IT. Site security to restrict access and is provided by P/C including sign in/out process. Fire safety measures provided by R&A eg fire extinguishers and provided for site by P/C. Incident management process in place. Sub-contractors yearly performance review includes info.sec discussion.	1	4	L
'LIVE RISKS' TO BE RECORDED BELOW									

High Risk Operation: NO	Temporary Works: NO If Yes – refer to STD-HSS-T01	The above control measures have been implemented (Sign here **if not signed on Briefing Record** – Section 9 PMP) Workplace Manager …… Date ……

ENVIRONMENTAL RISK ASSESSMENT (NOTE: See Project Environmental Plan)

Section	HAZARDS	ENVIRONMENTAL IMPACT	RISK			CONTROL MEASURES	RISK		
			L	S	R		L	S	R
E1		Environmental Noise	2	2	L	Piling Rig and ancillary equipment is to be kept in good mechanical order. Where damage or wear to silencing system occurs, maintenance to receive priority.	1	2	L
E2	Ecological damage	Damage to protected trees	2	2	L	Trees needing protection to be fenced off by Formation Design & Build Ltd with relevant signage.	1	2	L
E3	Water Pollution	Contamination of watercourse from silt laden groundwater generated by piling process	3	3	M	Formation Design & Build Ltd to install a protective bund to prevent water/slurry from entering watercourse.	1	3	L
E4	Air pollution from exhaust gasses	Degeneration of air quality	2	2	L	Plant to be kept in good mechanical order, machines to be switched off when not in use; avoid long idle times, ensure compliance with NRMM requirements.	1	2	L
E5	Vandalism of hydrocarbons storage	Ground and water pollution	3	3	M	All lubricants to be locked in COSHH cage within the container when not in use, overnight and at weekends. Bunded Diesel bowser to be lockable, including lockable hose storage. To be locked outside site hours and when not in use.	1	3	L
E6	Spillage of fuels and oils during recharging	Ground and water pollution	3	3	M	Fuel only to be stored in lockable bunded bowser or 205 litre (45 gallon) drums on spillage trays. Refuelling to be via syphon delivery hose from rig; engine to be switch off during refuelling. Oil and lubricants to be filled by funnel. Spill Kit to be available in case of spillage.	2	3	L
E7	Inadequate waste Management	Visual Intrusion of litter	3	1	L	R&A foreman to ensure that all general rubbish is placed in the skips provided by Formation Design & Build Ltd . Formation Design & Build Ltd to set up, Site Waste Management Plan, and brief to R&A personnel.	1	1	L

Section	HAZARDS	ENVIRONMENTAL IMPACT	RISK			CONTROL MEASURES	RISK		
			L	S	R		L	S	R
E8	Washing out ready-mixed concrete and clearing out pump and concrete delivery hoses at end of shift	Ground and water contamination.	3	3	M	The Formation Design & Build Ltd is to construct/provide a lined pit/skip into which ready-mixed concrete trucks can wash off their delivery chutes. R&A to treat wastewater with 'pH Blue' to reduce the alkalinity; target pH levels of 8 – 9. 'pH Blue' to be added at end of shift, pH re-checked the following morning, prior to disposal of water. Formation Design & Build Ltd or R&A to construct an area of approximately 5m x 8m with heavy gauge visqueen under 300mm of crushed for the pump & agitator set-up with the additional use of a large drip tray under the pump's hopper.	2	3	L
'LIVE RISKS' TO BE RECORDED BELOW									

Amendment Log

Revision	By	Amendment	Date
4.0	PC	Issue 09 (BMS2)	01/02/22
4.1	ND	New section '5' added, subsequent sections re-numbered and section 14 amended.	08/04/22
4.1.1	ND	Section 26 updated and section 35 added.	15/07/22
4.2	ND	Sections 12, 20, 21 & 23 updated.	06/10/22
4.2.1	ND	Section 33 updated. (Note added section 36 as 05/05/23)	07/03/23
4.2.2	ND	References to tag lines added in sections 10 & 15	09/06/23
4.3	ND	Amendments to section 28.	29/08/23

RISK RATING = Likelihood (L) x Severity (S)		HAZARD SEVERITY (S)				
		1	2	3	4	5
		Negligible Negligible injury, no absence from work	**Slight** Minor injury requiring first aid treatment	**Moderate** Injury leading to a lost time accident	**High** Involving a single persons serious injury/death	**Very High** Multiple serious injuries/death
1	**Very Unlikely** A freak combination of factors would be required for an incident / accident to result	LOW	LOW	LOW	LOW	LOW
2	**Unlikely** A rare combination of factors would be required for an incident /accident to result	LOW	LOW	LOW	MEDIUM	MEDIUM
3	**Possible** Could happen when accidental factors are present but otherwise unlikely	LOW	LOW	MEDIUM	HIGH	HIGH
4	**Likley** Not certain to happen but an additional factor may result in an incident/accident	LOW	MEDIUM	HIGH	HIGH	HIGH
5	**Very Likely** Almost inevitable that an incident / accident would result	LOW	MEDIUM	HIGH	HIGH	HIGH

LOW RISK (Score 1-6)	**May be acceptable, however, review task to see if risk can be reduced further**
MEDIUM RISK (Score 8-10)	**Task should only proceed with appropriate consultation with specialist personnel and HS&E team. Where possible the task should be refined to take account of the hazards involved or the risks should be reduced further prior to task commencement**
HIGH RISK (Score 12-25)	**Task must not proceed. It should be redfined further control measures put in place to reduce risk. The controls should be re-assessed for adequacy prior to work commencement.**

Likelihood
How often could the hazard occur? Consider the task, frequency, duration, method of work, employees involved.

Severity
How serious would the hazard's effects be if realised? Consider the type of hazard, biological, ergonomic, physical and chemical.

Risk = Likelihood x Severity

E.g. Likelihood (4) X Severity (3) = 12 **HIGH RISK**

5.1 Site Address	**100, Woodside Avenue. N10 3JA**

5.2 Location(s) of Spill Response Equipment	
Spill Kit	Site Security Container

5.3 Spill Response Equipment Trained / Competent Person(s)	
All site crew	

5.4 Frequency of Spill Tests:	**N/A**	**Issue Date:**	**N/A**
Completed by:	-	**Position:**	-

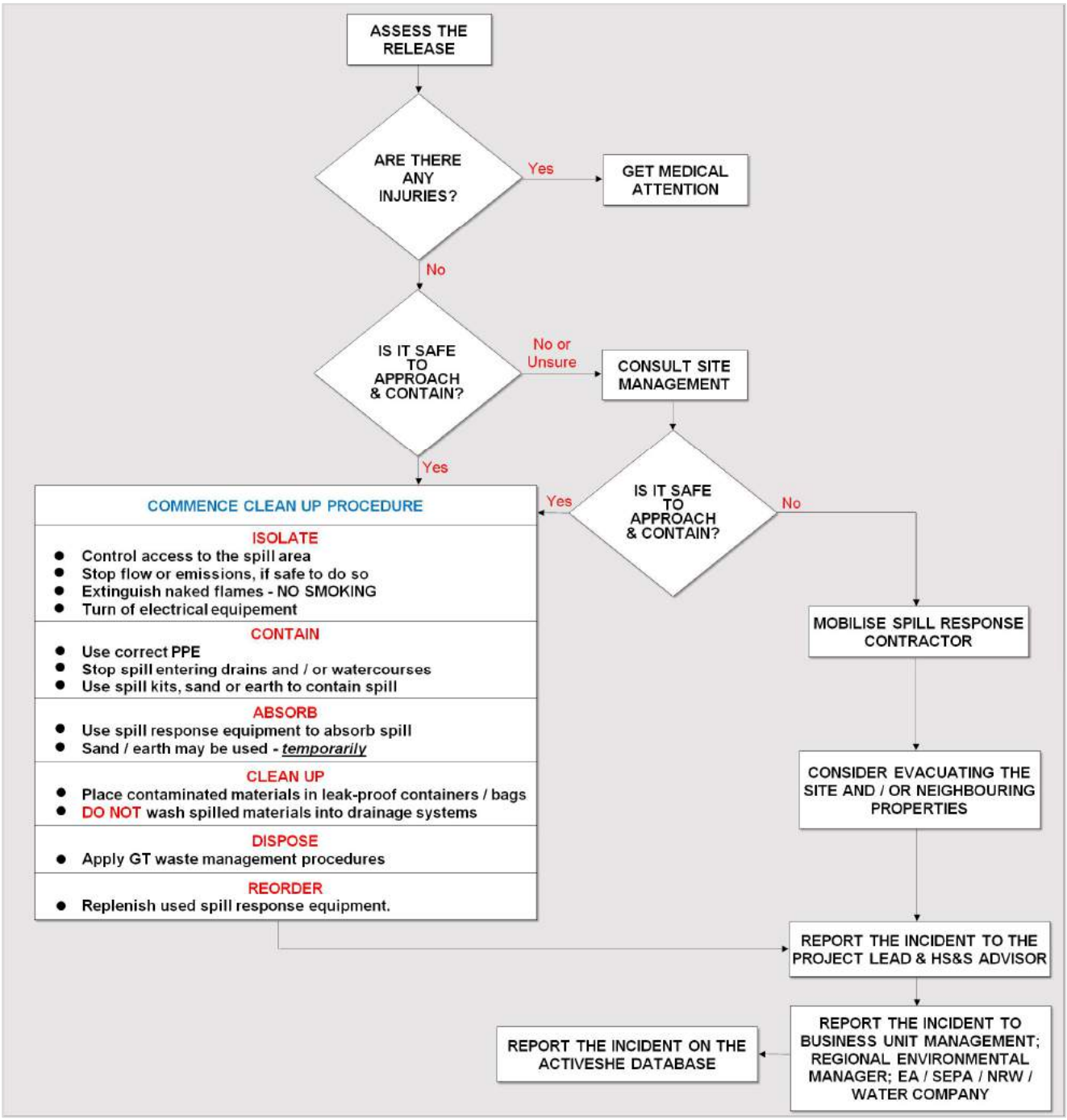
Client / Landowner	Principal Contractor - Formation Design & Build Ltd

5.5 Spill Response Contractor	**0800-592-827** Adler & Allan Ltd.	**Membership Number:** **GAL014**

5.6 Environment Agency	**0800 80 70 60** (24 hr Emergency Hotline)
Local EA / SEPA Office	Refer to Rock and Alluvium Area Office
5.7 Local Authority	Not Applicable
5.8 Additional Contact(s)	**William Longhurst, HS&S Advisor, 07593 578262 (GT)**
	Peter Ward, Depot & Material Manager, 07966 562317
	Chis Howell, Plant Manager, 07966 562321
	Contract Supervisor, see documentation

5.9 Rock and Alluvium / Galliford Try Contacts	
Pre-Construction Manager	Nick Dewey: 07843 328 141
Construction Manager	Mark Gibson: 07966 562 320
Regional Office	Head Office - Leatherhead: 01372 389 333
Regional HS&S Advisor	William Longhurst: 07593 578262 (GT)
Regional Environment Advisor	Lucy Barrett - Environmental Manager (GT) <Lucy.Barrett@gallifordtry.co.uk> Mob: 07593561840

Spill Response Process



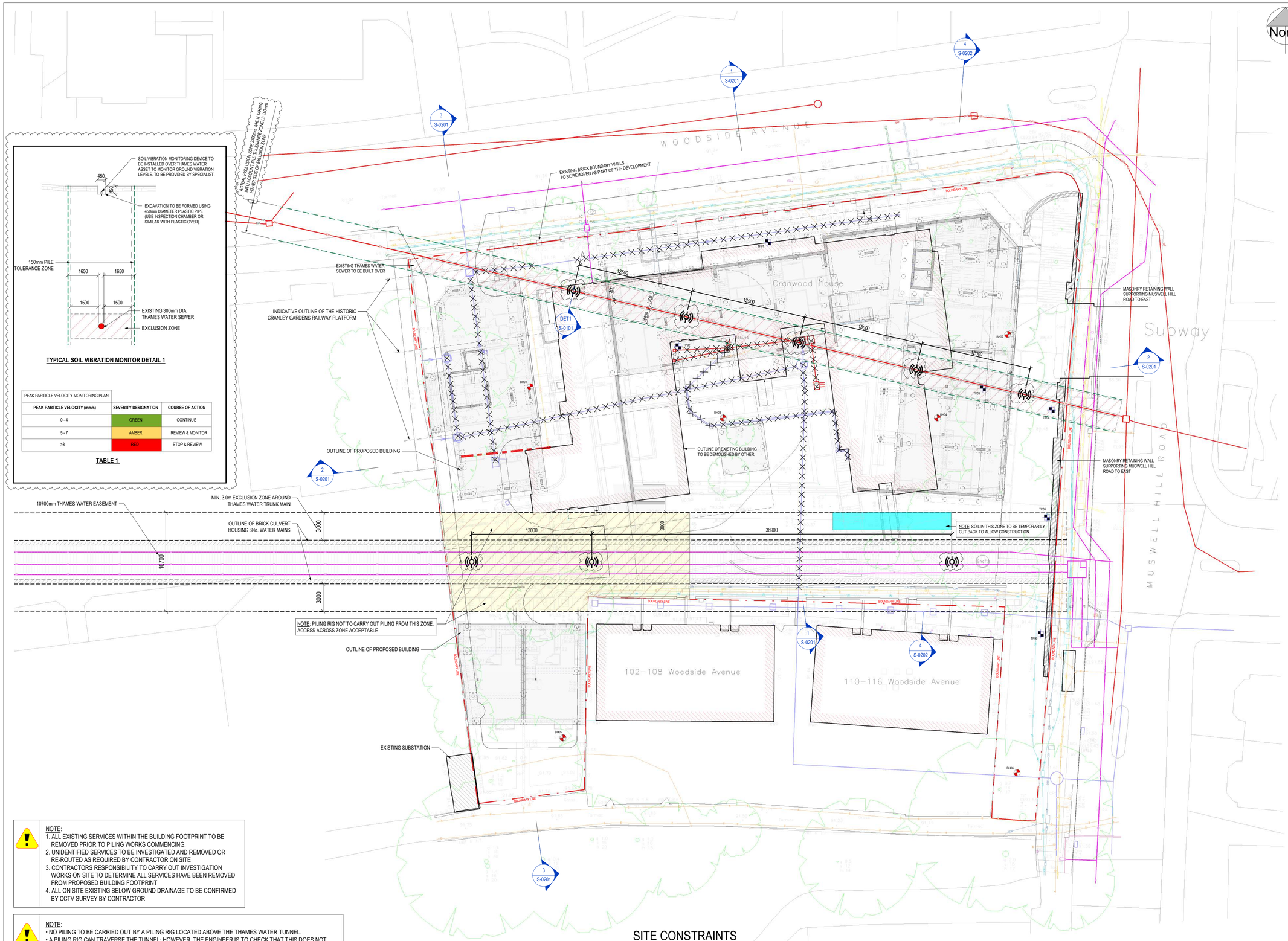
IF IN DOUBT OR YOU REQUIRE ASSISTANCE CONTACT YOUR HS&S ADVISOR OR REGIONAL ENVIRONMENTAL MANAGER

- **Assess Release**: Determine the size of the spill and whether there are any injuries to any person(s) involved.
  - If there are injuries medical attention should be sought and the most senior person on site informed
  - If there are no injuries, an assessment should be made as to whether the spillage is safe to approach and contain. If there is doubt, the most senior person on site should be consulted
  - Consideration should be given of the need to evacuate the site and / or neighbouring buildings. If necessary, the police and / or fire service should be contacted
  - If the competent or trained person cannot handle the hazardous material spill then Galliford Try's spill response contractor should be contacted.
- **Isolate:**
  - Control access to spill
  - Do not allow unauthorised access to spillage area
  - Identify the source of pollution and stop the flow or emissions as quickly as possible, if it does not endanger the health and safety of people
  - Switch off or suppress any potential sources of ignition
  - Extinguish naked flames and ensure there is no smoking
  - Turn off electrical equipment.
- **Contain:**
  - Ensure the correct PPE is used
  - If the incident involves liquids, steps should be taken to stop it spreading, using earth, sand, or impervious material such as polythene
  - If the incident involves liquids, the flow should be diverted from drains and / or watercourses
  - Consideration should be given to the use of absorbent materials and / or booms, as a precaution, in environmentally sensitive locations
  - Use absorbent materials (sand or earth, as an alternative) to assist spill containment.
- **Absorb:**
  - Spill response pads, sheets, booms and granules should be used to absorb the spilt material
  - Sand and earth may be used, as a temporary alternative.
- **Clean Up:**
  - Contaminated sand, earth or absorbent materials should be placed into sacks or leak-proof containers, as appropriate
  - Spilled materials should **not** be washed into drainage system(s).
- **Dispose:**
  - Waste contaminated materials should be disposed of appropriately, refer to STD-HSS-W01; Waste Management
  - All used absorbent materials are classified as hazardous / special waste.
- **Reorder:**
  - Replace used spill response equipment supplies.

Client specific spill response procedures should be adhered to when working on client site(s) or when stipulated in the contract.

Appendix A:

MWP Engineering and Environmental Consultants drawing #: CRA-MWP-ZZ-00-DR-S-0101 Site Constraints (Rev P05).



TYPICAL SOIL VIBRATION MONITOR DETAIL 1

PEAK PARTICLE VELOCITY MONITORING PLAN		
PEAK PARTICLE VELOCITY (mm/s)	**SEVERITY DESIGNATION**	**COURSE OF ACTION**
0 - 4	GREEN	CONTINUE
5 - 7	AMBER	REVIEW & MONITOR
>8	RED	STOP & REVIEW

TABLE 1

NOTE:
1. ALL EXISTING SERVICES WITHIN THE BUILDING FOOTPRINT TO BE REMOVED PRIOR TO PILING WORKS COMMENCING.
2. UNIDENTIFIED SERVICES TO BE INVESTIGATED AND REMOVED OR RE-ROUTED AS REQUIRED BY CONTRACTOR ON SITE
3. CONTRACTORS RESPONSIBILITY TO CARRY OUT INVESTIGATION WORKS ON SITE TO DETERMINE ALL SERVICES HAVE BEEN REMOVED FROM PROPOSED BUILDING FOOTPRINT
4. ALL ON SITE EXISTING BELOW GROUND DRAINAGE TO BE CONFIRMED BY CCTV SURVEY BY CONTRACTOR

NOTE:
- NO PILING TO BE CARRIED OUT BY A PILING RIG LOCATED ABOVE THE THAMES WATER TUNNEL.
- A PILING RIG CAN TRAVERSE THE TUNNEL; HOWEVER, THE ENGINEER IS TO CHECK THAT THIS DOES NOT IMPOSE A LOAD GREATER THAN 7 KPA AT THE TUNNEL CROWN OF THE TUNNEL.
- NO CRANE MATS TO BE PLACED OVER THE TUNNEL UNLESS THE IMPOSED LOAD AT THE TUNNEL CROWN IS LESS THAN 7 KPA.
- THE TOPS OF ALL PILES WITHIN THE 45 DEGREE ZONE OF INFLUENCE FROM THE INVERT OF THE 300MM DIAMETER FOUL SEWER OR THE TUNNEL IS TO BE SLEEVED TO BELOW THE CONE OF INFLUENCE.
- WHERE PILES ARE LOCATED WITHIN 3.0M OF THE 300MM DIAMETER FOUL SEWER, ADDITIONAL PRECAUTIONS ARE TO BE PUT IN PLACE TO ENSURE THE VERTICALITY OF THE BORE, EXCESSIVE VIBRATION IS TO BE AVOIDED, IN THE EVENT OF AN OBSTRUCTION BEING ENCOUNTERED THE OBSTRUCTIONS SHOULD BE INVESTIGATED TO DETERMINE THE NATURE OF THE OBSTRUCTION BEFORE PROCEEDING.
- WHERE EXCESSIVE CONCRETE REQUIREMENTS ARE ENCOUNTERED WITHIN THE BORE THE WORK SHOULD STOP AND THE CAUSE INVESTIGATED IMMEDIATELY TO ENSURE THAT NO CONCRETE ENTERS THE FOUL SEWER OR THE THAMES WATER TUNNEL.
- UPON COMPLETION OF THE PILING A CCTV SURVEY OF THE 300MM DIAMETER FOUL SEWER SHOULD BE CARRIED OUT TO DETERMINE THAT NO DAMAGE HAS BEEN CAUSED.

SITE CONSTRAINTS

SCALE 1 : 200

DO NOT SCALE FROM THIS DRAWING. USE FIGURED DIMENSIONS IN ALL CASES. VERIFY DIMENSIONS ON SITE AND REPORT ANY DISCREPANCIES TO THE DESIGNERS IMMEDIATELY.
THIS DRAWING TO BE READ IN CONJUNCTION WITH THE DESIGNERS SPECIFICATION.
© THIS DRAWING IS COPYRIGHT AND MAY ONLY BE REPRODUCED WITH THE DESIGNERS PERMISSION.

1. ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT SPECIFICATIONS, BILLS OF QUANTITIES, ARCHITECTURAL, SERVICES AND ENGINEERING DRAWINGS.
2. ANY DISCREPENCIES BETWEEN THESE DOCUMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
3. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE. TBC ON SITE
4. ALL LEVELS ARE IN METRES RELATED TO ORDNANCE DATUM. TBC ON SITE
5. DRAWINGS ARE NOT TO BE SCALED.
6. ALL TEMPORARY WORKS TO CONTRACTORS DETAILS.
7. CONTRACTOR TO APPROVE ALL SET OUT INFORMATION PRIOR TO CONSTRUCTION.

GENERAL DRAWING REFERENCES :

1. FORE SITE CONSTRAINTS REFER TO DWG 23453 - 0101
2. FORE SUB-STATION REFER TO DWG 23453 - 0120
3. FOR WATERPROOF CONCRETE DETAILS REFER TO DWG 23453 - 0110
4. FOR GENERAL NOTES REFER TO DWG 23453 - 1000
5. FOR GENERAL ARRANGEMENTS REFER TO DWG 23453 - 1100 SERIES
6. FOR PILE SCHEDULE REFER TO DWG 23453 - 1105
7. FOR COLUMN SCHEDULE REFER TO DWG 23453 - 1301
9. FOR WALL ELEVATIONS REFER TO DWG 23453 - 1310
8. FOR PILE CAP DETAILS REFER TO DWG 23453 - 1401 to 1410
9. FOR MASONRY SUPPORT DETAILS REFER TO DWG 23453 - 1415
10. FOR CORE DRAWINGS REFER TO DWG 23453 - 1500 SERIES
11. FOR LOADING PLANS REFER TO DWG 23453 - 1700
12. FOR DRAINAGE DRAWINGS REFER TO DWG 23453 - 2000 SERIES

LEGEND :

- SITE BOUNDARY
- EXISTING SEWER TO BE ABANDONED & REMOVED
- EXF — EXISTING FOUL WATER SEWER
- EXS — EXISTING SURFACE WATER SEWER
- W — EXISTING WATER MAIN
- E — ELECTRIC SERVICES
- GAS — EXISTING GAS SERVICES
- COM — EXISTING TELECOM
- TFL — EXISTING SERVICE ROUTE TFL
- TY — TYCOM
- VZ — VERIZON
- VF — VODAFONE
- VM — VIRGIN MEDIA
- ? — UNKNOWN SERVICE
- ROOT PROTECTION ZONE
- GATE (SINGLE)
- FENCE
- GATE (DOUBLE)
- CONTOUR 22.50
- TREE SPREAD
- WALL bkwl
- TRIAL PIT
- BOREHOLE
- SOIL VIBRATION MONITORING DEVICE BY SPECIALIST) TO MEASURE PEAK PARTICLE VELOCITY(PPV). PPV LIMITS AS PER TABLE 1 ON THIS DRAWING

REV	DATE	DESCRIPTION	BY	APP
P05	15.08.23	Revised as Clouded	VH	RS
P04	07.07.23	Issued for Information	VH	RS
P03	14.04.23	Issued for Information	VH	RS
P02	17.03.23	Issued for Information	SR	RS
P01	10.02.23	Preliminary Layout For Design Team Review	VH	RS

PROJECT: Cranwood House

TITLE: Site Constraints

CLIENT: Formation D&B Ltd

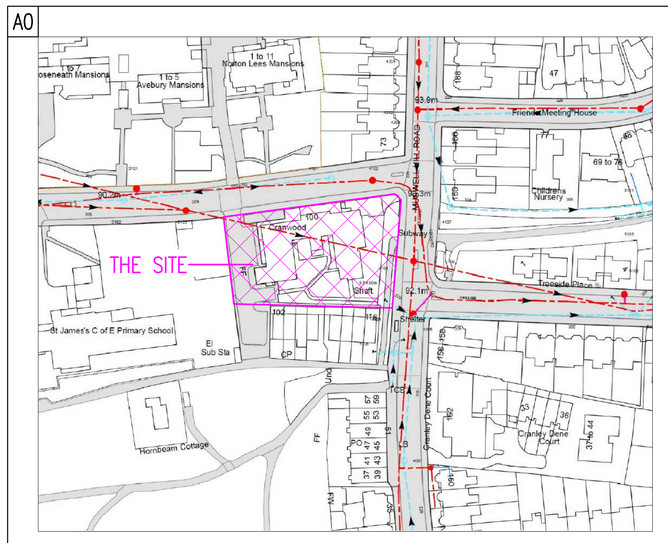
MWP
ENGINEERING AND ENVIRONMENTAL CONSULTANTS
CORK | TRALEE | LONDON | LIMERICK
mwpeng.co.uk

DRAWN:	CHECKED:	APPROVED:
VH	RS	PB
PROJECT NUMBER: 23453	DATE: 01/31/22	SCALE @ A1: As indicated
STATUS DESCRIPTION: FOR INFORMATION		STATUS: S2
DRAWING NUMBER: CRA-MWP-ZZ-00-DR-S-0101		REV: P05

Appendix B:

PURA Design Ltd, Environmental Services Engineers drawing #: 1403-PL/100 'Drainage Services Existing Drainage Layout' (Rev TW1).

A0


THE SITE
Aylesbury Mansions
Walton Lees Mansions
Fairbury Mansions
Fairbury Mews
Woodside Avenue
Muswell Hill
Trinity Gardens
Trinity Close
Trinity Close Court
Trinity Close Court Garages
Trinity Close Court Garage Block
Trinity Nursery
Trinity Lodge
Trinity Lodge Garages
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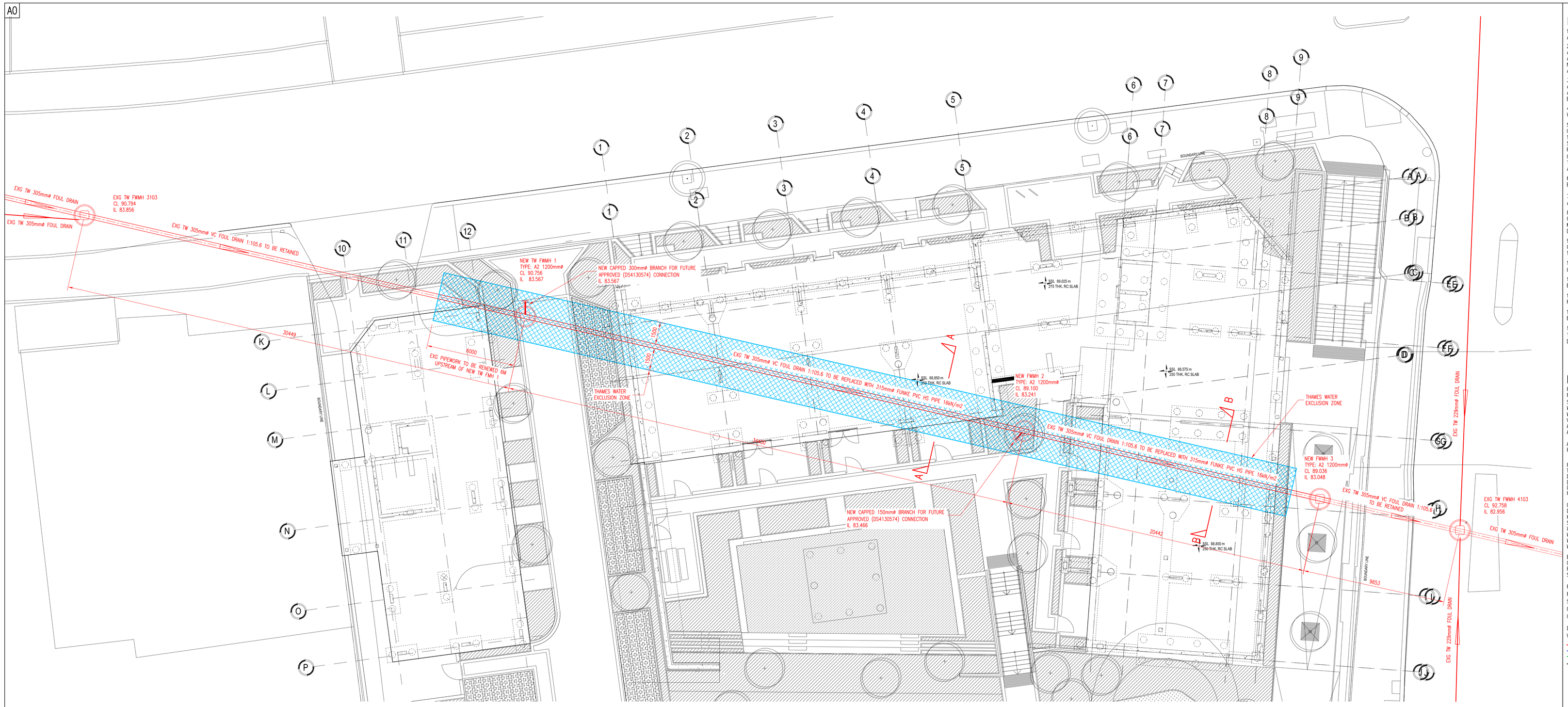
Appendix C:

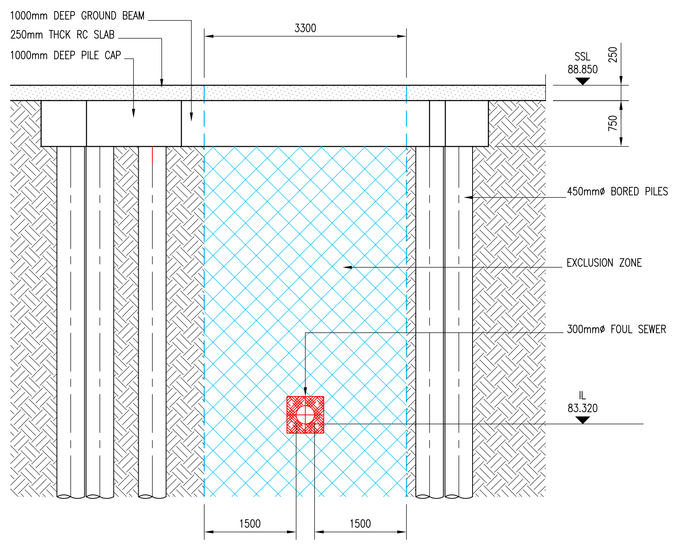
PURA Design Ltd, Environmental Services Engineers drawing #: 1403-PL/101 'Drainage Services Proposed Diversion' (Rev TW1).

A0



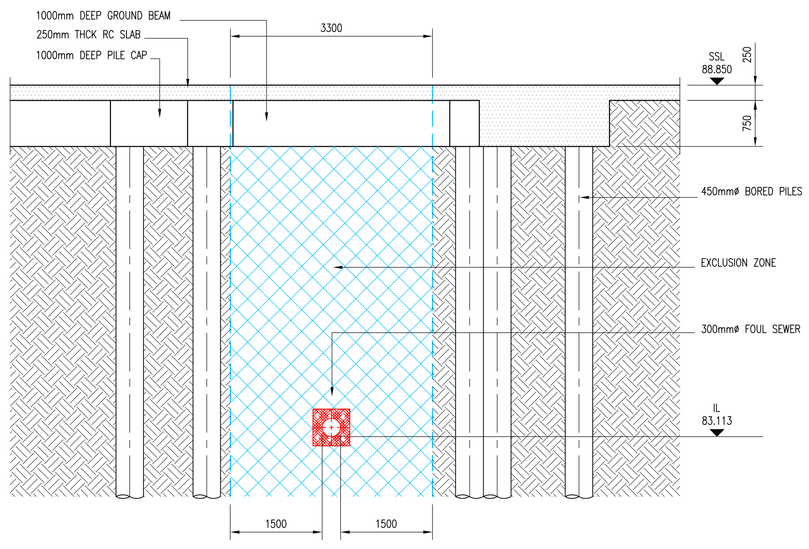
PROPOSED DRAINAGE LAYOUT

SCALE 1:100



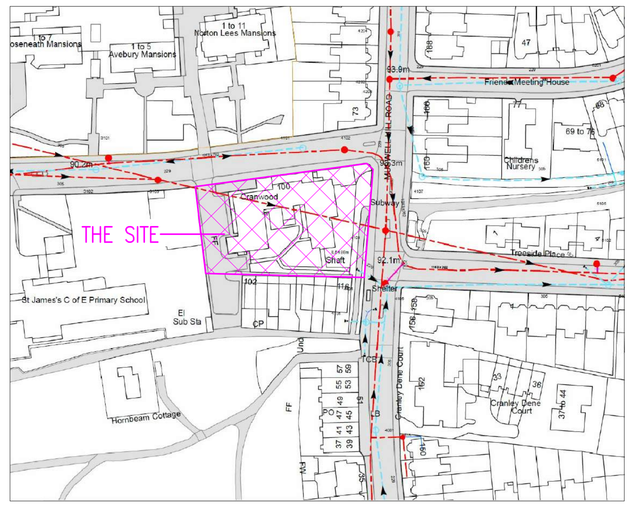
SECTION A – A

SCALE 1:50



SECTION B – B

SCALE 1:50



SITE LOCATION PLAN

SCALE 1:1250 APPROX

FOR ADDITIONAL SECTIONS SHOWING RELATIONSHIP OF THAMES WATER SEWER TO PROPOSED STRUCTURE
SEE MWP DRAWINGS Nos CRA–MWP–ZZ–00–DRS–S–0101!P05!Site Constraints,
CRA–MWP–ZZ–00–DRS–S–0201!P05!Site Constraints Sections – Sheet 1 AND
CRA–MWP–ZZ–00–DRS–S–0202!P05!Site Constraints Sections – Sheet 2

DO NOT SCALE

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL AND ENGINEERING DRAWINGS AND SPECIFICATIONS.

2. THE CONTRACTOR IS TO VERIFY THE LINE, LEVEL AND LOCATION OF ALL EXISTING SERVICES BEFORE THE COMMENCEMNET OF ANY WORK. ANY DISCREPANCIES OR SERVICES ENCOUNTERED ON SITE THAT ARE NOT SHOWN ON THE DRAWINGS OR DESCRIBED IN THE SPECIFICATIONS ARE TO BE REPORTED TO THE ENGINEER.

3. THE CONTRACTOR IS TO FAMILIARISE HIMSELF WITH THE DRAWINGS AND THE SPECIFICATION BEFORE THE COMMENCEMENT OF ANY WORK. ANY IRREGULARITIES OR ANOMALIES ARE TO BE RAISED WITH THE ENGINEER BEFORE THE COMMENCEMENT OF ANY WORK.

4. ALL NEW WORKS TO BE CONSTRUCTED ARE TO BE IN ACCORDANCE WITH CURRENT LEGISLATION AND BS EN STANDARDS APPLICABLE.

5. ALL NEW BELOW SLAB AND EXTERNAL DRAINAGE WORKS ARE TO BE INSTALLED IN ACCORDANCE WITH BS EN 752, BS EN 1610 AND BS EN 12056 AND THE DESIGN AND CONSTRUCTION GUIDANCE FOR FOUL AND SURFACE WATER SEWERS OFFERED FOR ADOPTION UNDER THE CODE FOR ADOPTION AGREEMENTS FOR WATER AND SEWERAGE COMPANIES OPERATING WHOLLY OR MAINLY IN ENGLAND ("THE CODE") INCLUDING THE SPECIFICATION FOR CIVIL ENGINEERING WORKS AND INCLUDING ANY AMENDMENTS BY THAMES WATER.

6. ALL EXTERNAL PRIVATE DRAINAGE PIPEWORK TO BE CLAYWARE TO BS EN 295–1 OR PVC–U TO BS EN 1401 AND KITEMARKED.

7. ALL NEW DRAINAGE PIPEWORK TO BE OFFERED FOR ADOPTION TO BE AS PER MESSRS FUNKE PVC HS PIPE 16kN/m2.

8. FLEXIBLE JOINTS AND ROCKER PIPES ARE TO PROVIDED AT ALL CONSTRUCTION JOINTS, TRANSITIONS THROUGH OR UNDER FOOTINGS, AT MANHOLES AND ANY OTHER LOCATIONS WHERE THERE MAY BE DIFFERENTIAL SETTLEMENT.

9. ALL PIPEWORK TO BE TESTED BEFORE PLACEMENT OF BACKFILL OR CONCRETING IN. ALL TESTING TO BE IN ACCORDANCE WITH BS EN 1610:2015 CLAUSE 13.2.

10. CONCRETE HAUNCHING FOR BED AND SURROUND TO BE GEN3 C16/C20.

11. ALL MANHOLES COVERS TO BE POSITIONED ORTHOGONAL TO THE BUILDING.

12. ALL MANHOLES COVERS IN AREAS OF BLOCK PAVING ARE TO BE RECESSSED TO SUIT THE SURFACE FINISIH.

13. ALL MANHOLES COVERS IN AREAS OF BLACK TOP PAVING ARE TO BE SOLID TOP DUCTILE IRON.

14. ALL MANHOLE COVERS IN TRAFFICKED AREAS TO BE GRADE D400 TO BS EN 124 AS PER MESSRS PAM SAINT–GOBAIN "TRI–GLIDE" DOUBLE RECTANGULAR NON–ROCKING SLIDE OUT.

LEGEND

RWO	RAINWATER OUTLET
RWP	RAINWATER PIPE
SVP	SOIL VENT PIPE
WVP	WASTE VENT PIPE
WP	WASTE PIPE
VP	VENT PIPE
ASP	ANTI SIPHON PIPE
AAV	AUTOMATIC AIR ADMITTANCE VALVE
A/C	ACCESS CAP OR DOOR
R/E	RODDING EYE
FA	FROM ABOVE
TB	TO BELOW
DTB	DROP TO BELOW
DTD	DROP TO DRAIN
LL	LOW LEVEL
HL	HIGH LEVEL
CS	CLEANERS SINK
DW	DISH WASHER
KS	KITCHEN SINK
SH	SHOWER
UR	URINAL
WC	WATER CLOSET
WHB	WASH HAND BASIN
WM	WASHING MACHINE
BIG	BACK INLET GULLY
G	GULLY
FMH	FOUL MANHOLE
SWMH	SURFACE WATER MANHOLE
FFL	FINISHED FLOOR LEVEL
FGL	FINISHED GROUND LEVEL
SSL	STRUCTURAL SLAB LEVEL
CL	COVER LEVEL
IL	INVERT LEVEL
DI	DUCTILE IRON
VC	VITRIFIED CLAYWARE

FOUL DRAIN
SURFACE WATER DRAIN
WATERPROOFING DRAINAGE
PIPEWORK AT HIGH LEVEL

PREMIER DRAINAGE SOLUTIONS

ALL ADOPTABLE DRAINAGE WORKS ARE TO BE CONSTRUCTED AS DETAILED IN THE DESIGN AND CONSTRUCTION GUIDANCE FOR FOUL AND SURFACE WATER SEWERS OFFERED FOR ADOPTION UNDER THE CODE FOR ADOPTION AGREEMENTS FOR WATER AND SEWERAGE COMPANIES OPERATING WHOLLY OR MAINLY IN ENGLAND ("THE CODE") AND THAMES WATER'S LOCAL PRACTICE.

NOT FOR CONSTRUCTION

REV	DATE	BY	DESCRIPTION	CHK	APD
TW1	19.10.23	JS	SUBMITTED TO TW FOR APPROVAL.		

DRAWING STATUS: APPROVAL

PURA DESIGN LTD
ENVIRONMENTAL SERVICES ENGINEERS
3 Castle Avenue, Hythe, Kent, CT21 5HD
Tel: 01303 268618
http://www.puradesignltd.co.uk

CLIENT:

ARCHITECT:

PROJECT:
CRANWOOD WOODSIDE AVENUE
MUSWELL HILL N10 3JA

TITLE:
DRAINAGE SERVICES
PROPOSED DIVERSION

SCALE @ A0:	CHECKED:	APPROVED:
1:100		
CAD FILE:	DESIGN/DRAWN: JHGS	DATE: SEP 2023

PROJECT No:	DRAWING No:	REV:
1403	PL/101	TW1

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