7- 4.1 KF F2 CFA Works Package Plan

1-1.6K Project HSEQ Management

Work Package Plan

CFA Piling

Apex Building, Camden

CFA Bearing and Contig Wall Piles

100-2000621

St Pancras Way

London

NW1 0QG

KELLER

Revision History

Revision	Prepared by	Date	Description
-	EJC	20/05/21	For Approval

Table of Contents

A Work Package Details

A1 Scope of work

This Works Package Plan is to cover the installation of Continuous Flight Auger (CFA) for the project at Apex Building, Camden The works will be completed by 1No. rig in 1No. visits:

For RAMS approval only Approx Sequence of works:

- 49No. 900mm Contig Wall on a PPL of 23.45mOD adject to the Canal Boundary

Reduce dig to 21.55mOD

- 45No. 600mm Contig Wall adject to the Studio Building
- 69No. 600mm Contig Wall adject to the Sewer
- 113No. 600mm diameter bearing piles at 21.55mOD
- 4No cubes per day (tested at 7, 28, 28 and 56 days)
- Site-fixing of all reinforcement cages
- Setting out to all piles from coordinated stations

The piling platform has been designed so the piling rig can track and operate in any orientation to suit the works. There are no restrictions when piling over the live sewer.

Main site attendances to be provided by VFP as follows:

- Full welfare facilities (Section A13)
- Concrete washout area
- Water supply
- Excavator and dumper in attendance for removal of pile arising - (Note Excavator Duties)
- Background lighting
- Skips for site waste (segregated)
- Wheel washing/road cleaning
- Platform installation and testing
- Service scanning, demarcation, protection and/or diversion

Our works are based upon being able to track our rigs fully erect between all pile positions and all locations. Therefore, we will require ramped access to be installed, modified and maintained as necessary by others to the various piling platform levels. A maximum gradient of 1:10 is allowable when fully rigged.

A1.1 Excavator Duties and attendance provided by VFP

- Trained and competent operator for CFA piling including relevant lifting training (This attendance will be working closely with the CFA site team and all associated equipment)
- Min tracked +13.0t excavator and must be supplied with the appropriate digging buckets and attachments for CFA piling complete with quick hitch and load hooking device
- Specification (Keller will provide a lift plan for the excavator)
- The supplied excavator & operator are for Keller sole use only
- Excavator operator to work to Keller Instruction and contractual hours (08:00 to 18:00 Mon-Thurs & 08:00 to 14:00 Fri) with the option of working Saturday should the contract require.
- In the event of an earlier start i.e. 07:30 and unplanned overrun, the excavator & operator must work to the instruction of the Keller supervisor.
- Lifting Operations, 360 excavator pick and carry ticket

- Operator shall be briefed and signed on the Keller CFA WPP specific to the works
- The attending excavator shall be utilised for lifting CFA piling gear Inc. reinforcement installation and general logistics, general maintenance, offloading and loading piling equipment and, reinforcement and tandem lift in conjunction with crawler crane where specified in the lift plan.

A2 Construction of the CFA piles

A CFA piling rig will be used to form piles using a hollow auger string. The hollow stem is closed of using a small expendable cap in the base of the digging head and the auger is bored to the design depth. The auger string is raised 200-300mm from the base of the pile and the concrete is pumped through the auger to blow the cap before reboring to the full depth. Concrete is pumped as the augers are extracted up to platform level. Spoil is cleared to expose the clean, wet pile shaft and a steel reinforcement cage is plunged into the wet bore.

Working test groups as a reaction system –each test pile location will require a number of anchors installing around the test pile. Keller will discuss possible test locations with VFP and confirm the required anchor arrangement for acceptance. A copy of the RAMS for the testing of the pile will be supplied.

The CFA system is fully instrumented in terms of controlling the auger depth and the placing of the concrete.

A3 Control of Activity Risks

A site specific hazard assessment will also be completed prior to piling, please see Appendix A.

Key hazards are detailed below, full task risk assessments and COSHH data for the scope of works can be found in our CFA Risk Assessment pack.

Hazard	Controls Specified	Hazard briefing required for:		
		Piling Operations	Lifting operations	Attendant excavator/ banksmen
Rotating machine parts	Guards to be used at all times	X		X
Open excavations	Piles to be covered immediately following construction	X	X	X
Lifting of cages	Operation to be carried out by slinger/signaller only.	X	X	X
Concrete burns	PPE to be worn. Eye wash points to be identified	X		X
Environmental	Spill kits to comprise plant nappies, spill granules, booms and drip trays	X	X	
Party Wall Agreements	The CFA wall shall be installed as a standard wall. On a hit one miss 3 approach. Should the spacing be increased this will be carried out under inspection from the Keller Supervisor	X		X

Working Platform	The WPC shall be designed and installed by others. All rigs loading need to be taken into account when design the platform next to adjacent party walls and the live sewer	X		

A4 Resources

Plant

- 1No. CFA crawler mounted hydraulic drilling rig, SR75
- 1No. 50ton Crawler Crane
- 55/70m3/hr Trailer concrete pump
- 125cfm Compressor
- CFA stores unit
- MEWP
- Telehandler (Optional)
- 20ft office unit

All operators conducting duties with the use of the MEWP shall be in accordance with the manufacturers operating instructions at all times. All operators shall be IPAF qualified.

Labour

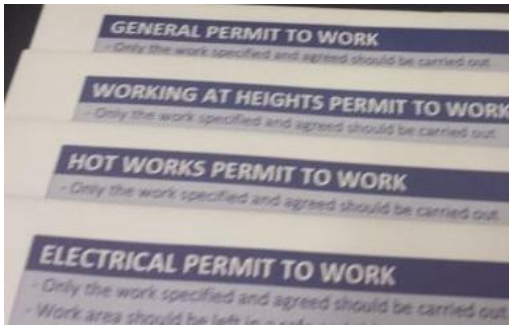
- Non-Working Supervisor
- Rig Operator
- Banksman (Rig)
- Pumpman /rig
- Engineer (Surveyor)

All site personnel will have as a minimum a CSCS card and where applicable a CPCS card. All personnel will have their CSCS/CPCS cards for inspection during the induction.

The Supervisor will be FPS/CITB accredited and competent to manage the works on site. The piling supervisor is qualified to the Federation of Piling Specialists Supervisor Health, Safety and Environment (H.S.E) Awareness Course (course covers all topics by Construction Skills Site Supervisors Safety Training Scheme (SSSTS)).

A5 Permits

Prior to commencement of piling works, the following permits must be obtained:



- Working platform certificate - issued weekly and following any reinstatement of the platform, such as following removal of obstructions. This also needs to include the access ramps between works areas
- Permit to dig – issued to last no more than 7 working days, must be relevant to the area we are working in and must confirm there to be no services in the area.

- Hot works permit for use of welding equipment or abrasive wheels.

These documents must be signed by the client or his representative prior to undertaking our works. A copy of the Working platform certificate (WPC4) is attached in Appendix B.

A6 Working hours

Keller site working hours will be:

Monday to Thursday	08:00 to 18:00
Friday	08:00 to 15:00

A7 Handover of completed works

Daily Report Sheet detailing the pile No's completed, their lengths and diameters and the cube samples taken will be completed by Keller's Supervisor and issued daily.

A8 Key Personnel and Contacts

Mark Bragg	Construction Manager	07770 801 974
Edd Collis	Operations Manager	02476 511 266
Simon Jones	HSEQ Manager	02476 511 266
TBC	Project Manager (PM)	TBC

B Site Details

A9 Access arrangements for materials & plant

Delivery of material to site must follow the Traffic Management Plan set out by the principal contractor. All deliveries to site must obey any site speed limits or other signage and use the appropriate gate – we are aware that vehicles need to go via a holding area. Concrete will be delivered direct to site to avoid delays to the supply - wagons will be booked via the VDC noting that they will be delivered direct. The rig will also be sent direct to site in compliance with the routing and transport movement orders.

The piling rig will be mobilised to site on a low-loader using the abnormal load procedure, the approved transport routes and also in line with Quintain discussions to account for the weight limit on roads around the Wembley Stadium. Due to Highways/Local Authority restrictions, the rig may be subject to out of hours delivery times. The low loader will drive onto the site where the tractor unit will detach itself from the trailer. The piling rig will be manoeuvred off the trailer and tracked to an area with a firm, level platform suitable for rigging up by the piling crew.

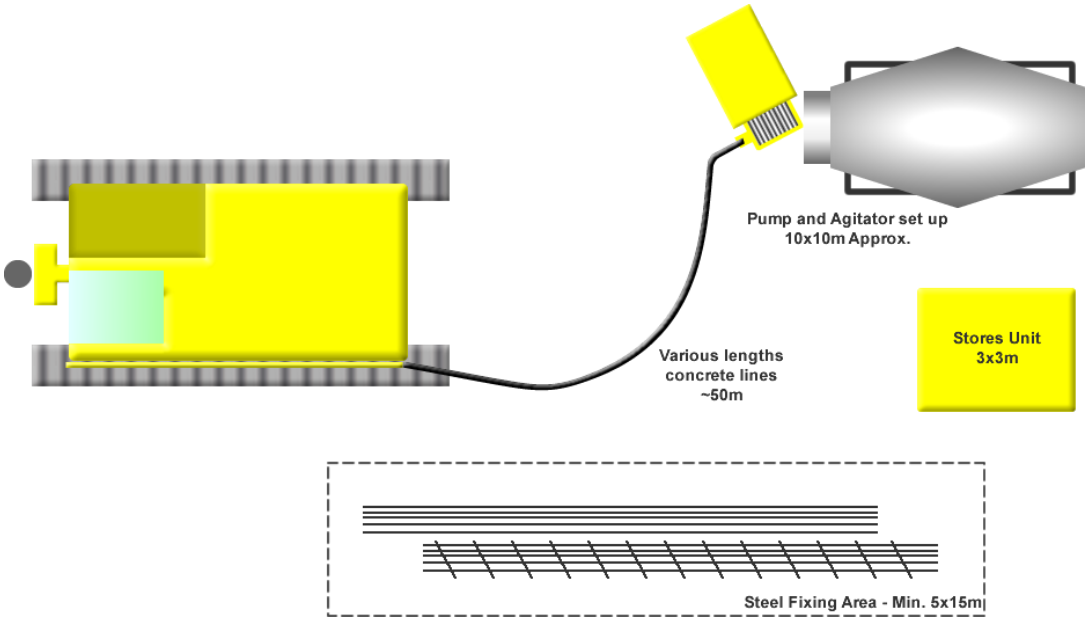
The remaining plant and equipment will be delivered using either 40ft articulated or 28ft flat-bed rigid wagons. Keller will ensure all deliveries are pre-slung, have fall protection or can be unloaded with a telehandler.

Wagons to be pre-slung where possible

Fall protection/side rails to be used if access to the bed of the wagon is required

The site layout for each rig is shown on the marked up drawing in Appendix D. Further details of the location of Keller's static plant will be discussed following a site visit by the Construction Manager, and a plan marked to show agreed set-down areas.

A general CFA site setup is as shown in the diagram below:



A10 Control of Site Hazards

In addition to the task specific controls above, Site specific hazards will be noted within the Site Hazard Assessment completed during the prestart site visit or on arrival by our Supervisor. A copy of the form is included in Appendix A.

A11 Communication & Contact Details

Client Contacts

Rakesh Chavda Rakesh.Chavda@volkerfitzpatrick.co.uk	Senior Project Manager	07785 385 508
Paul Yardley Paul.Yardley@volkerfitzpatrick.co.uk	Design Manager	07876 875 987

A12 Emergency Arrangements

First Aid

Keller Supervisors are trained First Aiders who will assess and provide minor treatment. If required, the injury may be taken to the nearest A&E Department. All incidents will be recorded in Keller's site Accident book.

A route map to the nearest A&E is included in Appendix C and a copy of this should be displayed on the notice board in the site office.

Nearest A & E:

Tel: 020 3456 7890

University College Hospital

235 Euston Road

London

NW1 2BU

A13 Welfare

All welfare facilities are to be provided by the principal contractor and must include as a minimum:

- Toilets
- Hot running water
- Cold drinkable water
- Canteen area for preparation of food
- Covered rest area to include seating
- Drying room

These are generally located at the shared E03/E05 compound.

A14 Interfaces

Public	Hoarding/similar to be provided by principal contractor and access to site should be restricted. Personnel to be aware of public when banking delivery wagons etc. off the highway onto site and should be aware of proximity to site boundaries while piling. Where possible, wagons will drive forwards on and off site. Boundary to First Way may require additional protection – Keller to set out closest piles to confirm if additional debris netting/screen required.
Other trades & construction site vehicles	 Use pedestrian walkways and dedicated plant crossing points

Environment		There is no significant environmental interface for this project. Good housekeeping at all times and concrete washout skips to be used to wash out delivery wagons
Statutory and Enforcement Authorities		No noisy plant to be used before 8am.

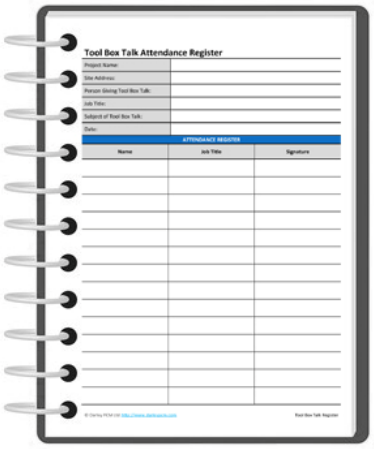
B Management of Health and Safety

B1 Briefing Arrangements

The site supervisor will ensure all Keller site personnel receive the following briefings:

- Site Induction (principal contractor/client)
- Works Package Plan
- Daily Briefing
- ToolBox Talks (To Keller schedule)

Reference to be made to Work Instructions where appropriate.



B2 COSHH and Hazard Assessments

C.O.S.H.H and Hazard Assessments for all substances used on the site can be found in our CFA Risk Assessment pack.

B3 Personal Protective Equipment

As a minimum, the following PPE will be made available to all personnel attending site:

						
✓	✓	✓	✓	✓	TASK SPECIFIC	TASK SPECIFIC

Safety Harnesses for the piling rig masts will be worn for the rigging up of the CFA augers and also general maintenance tasks where required. Safety harness must be clipped on to designated attachments points in the MEWP at all times whilst access platform is in use.

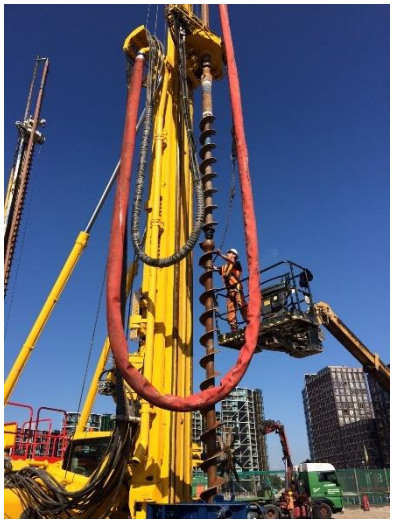
Working at Height

All operators conducting duties with the use of the MEWP shall be in accordance with the manufacturers operating instructions at all times. All operators shall be IPAF qualified.

During operations, all trained occupants in the platform will wear a lanyard and safety harness to the authorised anchorage points. 6 monthly thorough examination certificates will be provided,

The MEWP is required during rigging up to connect augers, and to attach the bagged concrete hoses to the swan neck of the rig.

It will also be used when undertaking the daily checks and maintenance on the rig where working at height is required.



Appendix A – Site Hazard Assessment

Intentionally left blank – await site visits

Contract No.		Contract		Postcode			
Main Contractor		System		Start date			
Site Agent		Contact number		Site hours	From		To

	Checklist of Hazards	Assessment Yes/ No/ NA	Control measures required
1	**Site access**		
a	Adequately prepared and protected?		
b	Adequate width and headroom?		
c	Adequate protection to kerbs, footpaths, services?		
2	**Site working area - General**		
a	Is the site securely fenced to prevent unauthorised entry?		
b	Adequately prepared to allow the complete mobility of the proposed plant? E.g. FPS specification		
c	Adequate working platform for the workforce?		
d	Adequate lighting?		
e	Will plant be safe near holes, excavations or embankments?		
f	Have excavations and cellars been adequately backfilled?		
g	Is the site free from confined spaces?		
h	Is the work to be carried out near a railway line or tramway?		

	Checklist of Hazards	Assessment Yes/ No/ NA	Control measures required
i	Will Keller operations affect the stability of any nearby buildings or structures?		
j	Is the Keller working area free of adjacent roads, paths, or other public rights of way? If not, what hoardings will be erected?		
k	Is the working area free from scaffolding?		
l	Is the site free from tunnels?		
m	Is there a risk from Working at Height, Slips Trips & Falls, Traps?		
n	Is the site free from other hazards to safety? If not specify.		

3 Site safety Personnel

a	Adequate provision of welfare facilities including Toilets / Drying Room / Mess / Canteen / Hot & Cold Water as a minimum?		
b	Is there any special PPE required (other than High viz vest, boots, hat, gloves, eye protection, ear protection)? If so, specify.		
c	Is there any risk to operatives from Manual Handling?		
d	Is there any risk to operatives from Noise & Vibration?		
e	Is there adequate segregation provided for pedestrians / plant?		
f	Are all materials and substances used covered by Keller COSHH assessments?		
g	Has the Construction Phase Plan been issued to Keller by the Principal Contractor (where projects are notifiable to HSE)		
h	Are all training requirements in place for the anticipated activities?		

	Checklist of Hazards	Assessment Yes/ No/ NA	Control measures required
4	**Plant contact with underground services**		**The Client (or Keller) permit to dig must be completed before site works commence**
a	Has a Site Survey been carried out to determine the location of any underground services		
b	Free from underground gas mains?		
c	Free from underground sewerage, water or drainage services?		
d	Free from underground electric / telecom / fibre-optic cables?		
e	Free from other services? If not - specify which services are present.		
f	Have existing services been marked on the ground?		
g	Has the site representative of the Main Contractor signed the “Permit to Dig”?		
5	**Plant contact with Overhead services**		
a	Free from electricity cables?		
b	Free from telecom cables?		
c	Free from other overhead services or obstructions?		
d	Other? - Specify		
6	**Environmental hazards**		
a	Is there any concern on site regarding ground contamination?		
b	Are there any hazards on site from asbestos?		

	Checklist of Hazards	Assessment Yes/ No/ NA	Control measures required
c	Are there any hazards on site from gases and vapours?		
d	Are there any environmental hazards resulting from the proximity to Coastal Waters, Lakes, Rivers, Streams on site or close by?		
e	Is the site close to a Fishery, Wildlife sanctuary, SSSI or any water sports?		
f	Is there any Water abstraction close by from well or surface waters		
g	Are there any expected hazards from airborne dust?		
h	Is there a designated area for refuelling? State where.		
i	Are there other environmental issues identified for this site? E.g. Protected species present		

7 Noise and vibration

a	Are there particular hazards to persons living / working in the vicinity of our works regarding noise or vibration restrictions? If yes, please state control measures.		

8 Emergency response

a	Name, address and telephone number of A and E Hospital (for display on the Site Emergency Information Sheet):	

Additional notes

Name		
Signature	For Keller	For Client

Yellow (Site), Blue (Contracts), White (Client)

Appendix B – Working Platform Certificate

FEDERATION OF PILING SPECIALISTS

Working Platform Certificate (FPS/WPC/4d)

Project Name	
Work area covered by this certificate	

(A sketch or marked up pile layout drawing may be attached to this certificate. Include haul roads and grid lines.)

Part 1 – WORKING PLATFORM DESIGN (INCLUDING RAMPS AND ACCESS ROUTES)

Equipment to be used on site.	
Maximum plant loading	

(Note: BR470 'Working Platforms for Tracked Plant: Good practice guide to the design, installation, maintenance and repair of ground-supported platforms' is available from IHS BRE Press – Tel 01344 328 038)

Designer Name		**Tel No.**
Designer Organisation		
Specification of testing required to verify the design		

Part 2 – VERIFICATION BY PRINCIPAL CONTRACTOR

The working platform detailed above has been designed, installed to the design and, if specified, tested to safely support the equipment detailed in Part 1 above. The limits of the platform have been clearly identified on site as necessary.

The working platform will be REGULARLY INSPECTED, MAINTAINED, MODIFIED, REPAIRED, and REINSTATED to the as-designed condition after any excavation or damage, throughout the period when the equipment is on the site. A completed copy of this certificate signed by an authorised person from the Principal Contractor shall be given to each user of the working platform prior to commencement of any works on site.

Name & Position		Date
Organisation		Signature

The HSE has worked closely with the FPS to develop this initiative and supports the principle of reducing accidents by the certification of properly designed, prepared and maintained working platforms

WPC/4d – June 2015 www.fps.org.uk

FEDERATION OF PILING SPECIALISTS

Working Platform Certificate (FPS/WPC/4d)

Guidance on working platforms for tracked plant

1. Design

1.1. The HSWA 1974 and CDM Regulations 2015 require the Principal Contractor to appoint competent Designers in respect of Working Platform design. This legislation explains how competence can be assessed by reference to professional qualifications or professional memberships and by reference to practical experience of the design of working platforms. Principal Contractors must be satisfied that a competent Designer has been appointed by them in accordance with the relevant legislation before they complete and sign the WPC.

1.2. The stability of tracked plant is fundamentally dependent upon the provision of a suitable and sufficient working platform. It must be properly designed and installed to a recognised standard. Whilst the same type of rig may be operated by different companies, the design bearing pressures may differ due to the specific operating configuration of the rig and/or any modifications. Details of the plant to be used and bearing pressures will be provided by the specialist contractor in advance of work commencing.

1.3. Working platform design is extremely sensitive to the bearing pressure and type of fill used in the platform. (For example, changing the angle of friction of the fill from 35 degrees to 45 degrees can halve the platform thickness.) It is therefore advised that the Designer may have to adopt conservative/cautious estimates of platform shear strength unless higher values can be demonstrated by testing or with reference to appropriate published data.

1.4. The working platform must be safe for pedestrian access and free draining to prevent the build-up of water and slurry. It must be free from harmful materials and contaminants. In the case of fine-grained sub-grades, a separation/filter membrane should be installed beneath the platform material to inhibit 'pumping' and infiltration of the fine-grained soils up into the platform material during wet weather (which can impair platform performance and increase maintenance costs).

1.5. Proof testing of the platform can be carried out with a suitably sized circular plate subjected to the maximum design loading. Such testing, as part of an appropriately designed testing regime, should highlight any gross inconsistencies in platform performance. Potentially, significant savings in platform thickness and cost may be realised by adopting a more detailed testing strategy.

1.6. The working platform must have a design life which starts before delivery of the piling equipment and ends on completion of all piling works. This includes load testing, integrity testing, investigation of non-conformances and any remedial works.

1.7. The specialist contractor is to advise the Principal Contractor at the earliest practicable opportunity should the specialist contractor become aware of any circumstances relating to the working platform that renders it unsafe.

2. Installation

2.1. The FPS Working Platform Certificate is mandatory for all sites where a rig or attendant plant operates. It must be signed by an authorised representative of the Principal Contractor. This signature confirms that the legal duties required under CDM have been carried out.

2.2. If the working platform is to be constructed or removed in phases while piling works are ongoing, then the extent of the platform must be clearly defined on the certificate and, in accordance with good practice, physically on site. This is particularly important where the platform material is removed from an area previously made available to the specialist contractor.

2.3. The working platform must provide safe access for all plant deliveries, sub-contractors and personnel associated with the specialist operations. Properly designed and installed, the working platform could also provide suitable and safe access for following trades for the whole project.

2.4. Poor definition of the edge of the working platform is a major cause of tracked plant instability. It is good practice that the working platform should extend at least 2m beyond the pile position/edge of the building to ensure sufficient safe working area for the specialists personnel and attendant plant. Where having to work within this 2m zone is unavoidable the Designer is to be informed of the requirement to design the platform for working up to its edge.

2.5. Where access ramps are used to move between working levels these must be of sufficient gradient and width to allow the plant to move safely with the stability constraints of the machine. Ramps must be in a straight line between working areas. Rigs and cranes cannot change direction on ramps. Where a change in direction is required, this must be on a flat level platform.

3. Maintenance, modification, repair and reinstatement

3.1. The working platform must be kept free draining. Water and slurry which is allowed to build up on the working platform can hide such hazards as recently constructed piles, trip hazards, uneven or unstable ground, services and excavations. Slurry can be transferred to work equipment which increases the risk of slips on steps as well as difficult handling of work tools.

3.2. Obstructions encountered during installation of the piling works will generally require excavation to remove them. This can create a 'soft spot' which can result in the rig overturning. It is essential, therefore, that any excavations made in the working platform are reinstated to the designed standard, including any reinforcement and separation filter/membrane.

3.3. The working platform shall be subject to regular inspection by a competent individual appointed by the Principal Contractor (e.g. the Temporary Works Co-ordinator) throughout its design life and after any reinstatement or any works which might have modified it. Any damaged or inadequate areas identified must be reinstated to the designed standard. Following the regular inspection, the Working Platform Regular Inspection Log shall be signed by an authorised representative of the Principal Contractor and issued to the specialist contractor with a layout drawing of the working platform amended as appropriate.

4. Working Platform Layout

4.1 Items that must be included and properly located on the working platform layout drawing and be notified by the Principal Contractor to the specialist contractor would include: detail of platform edges and 2m delineation, trial pits, services or voids, areas of backfilling, known underground basements; areas that are covered by the certificate or permit; test locations (if specified by the Designer of the platform) and any other feature that may affect the safety of operations.

Appendix C – Hospital Route Map

Tel: 020 3456 7890

University College Hospital

235 Euston Road

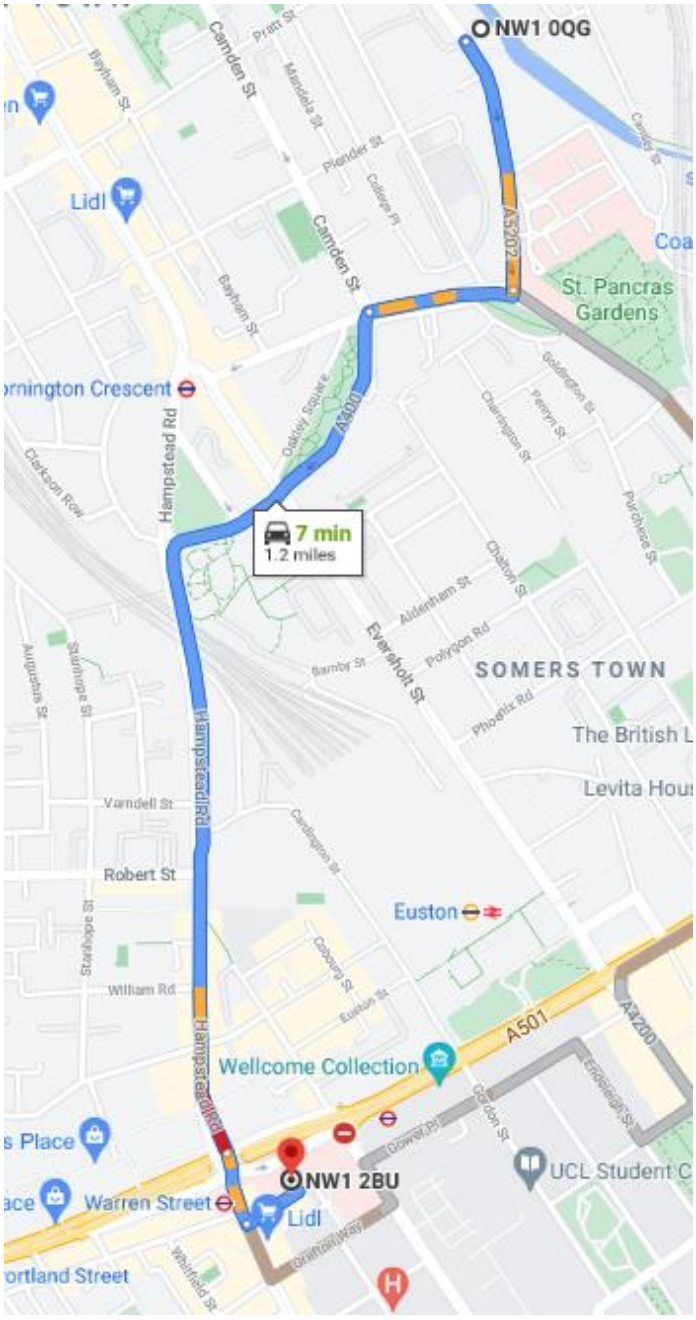
London

NW1 2BU

NW1 0QG
St Pancras Way, London

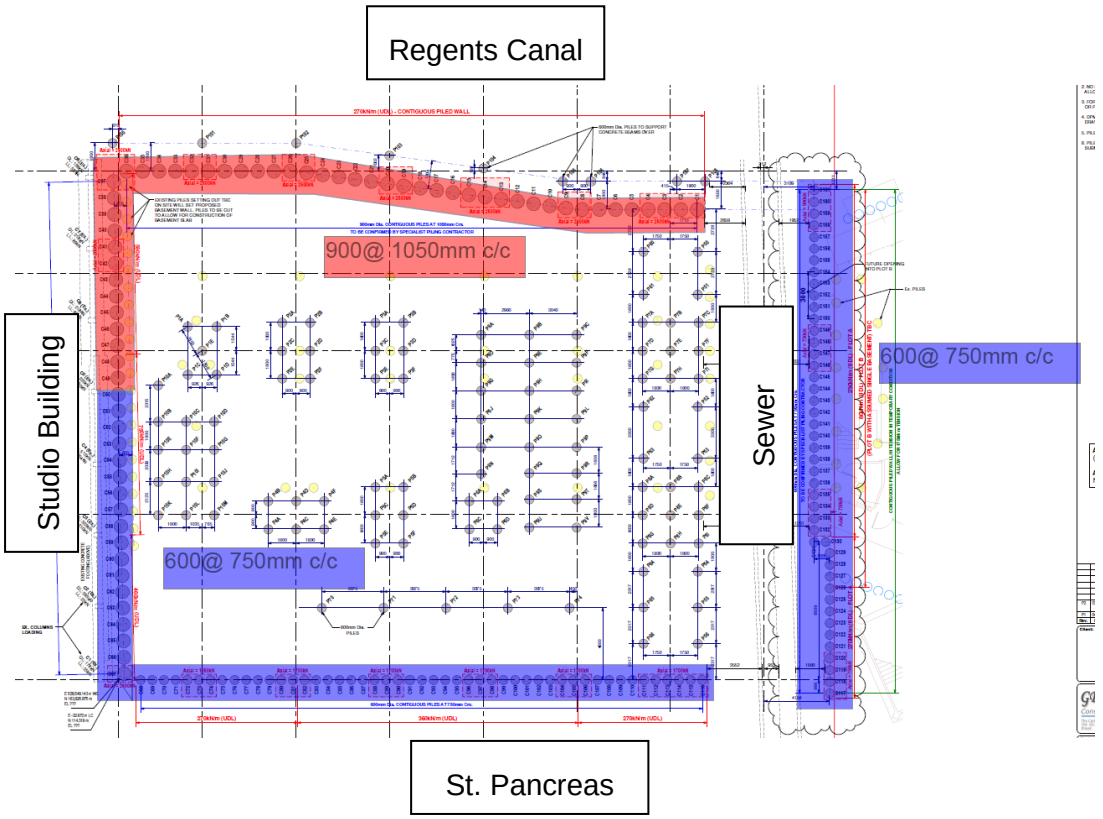
- Head south-east on St Pancras Way/A5202 towards College Grove NW
  0.2 mi
- Turn right onto Crowndale Rd/B512
  0.1 mi
- Turn left onto Oakley Square/A400
  Continue to follow A400
  0.8 mi
- Continue straight onto Tottenham Court Rd/A400
  Parts of this road are closed Mon–Sat 8:00 AM – 7:00 PM
  331 ft
- Turn left onto Beaumont Pl
  Destination will be on the left
  262 ft

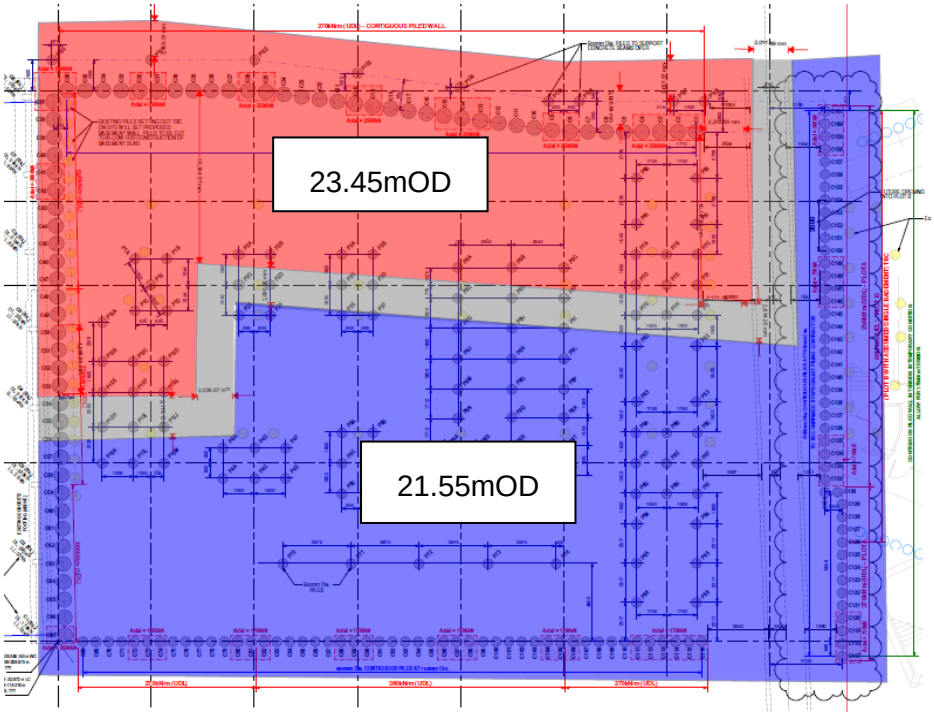
NW1 2BU
Euston Rd, London

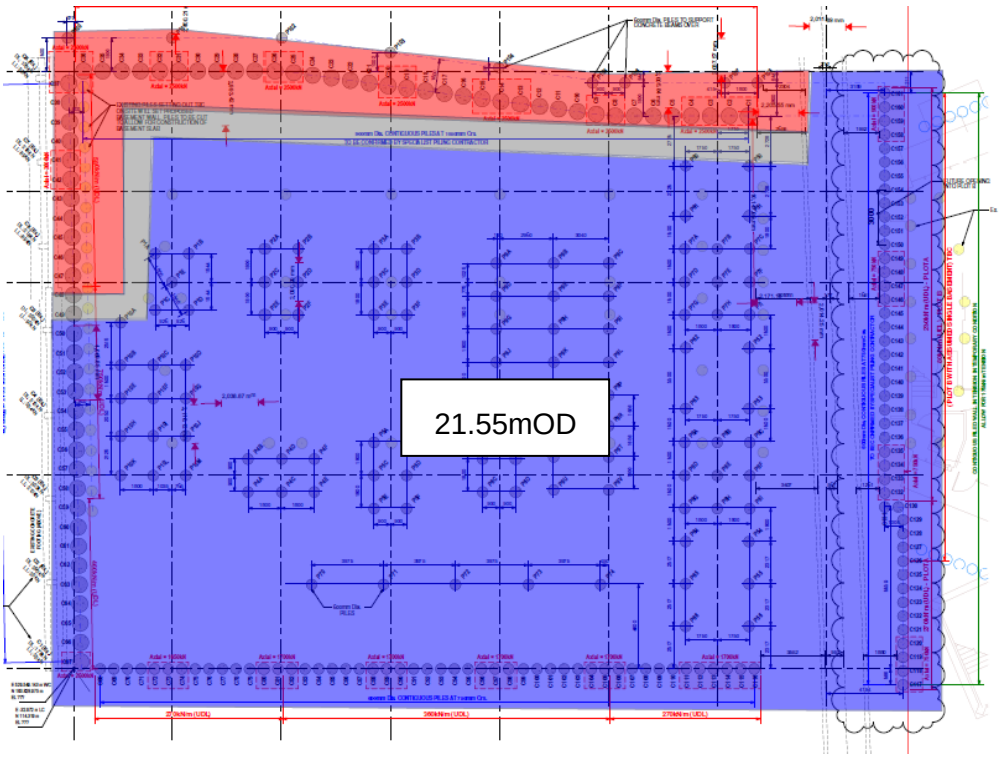


Appendix D – Site Plans

Additional site plans will be made available in due course






21.55mOD

Appendix E – Rig Details

Schedule of Piling Rig Component Weights, Dimensions, Forces and Pressures

Note: The disclaimer on the first worksheet applies to all tables in this workbook

Rig Manufacturer :	**Soilmec**	**Rig Type & Serial No.**	**SR-75 3205**
Operation mode:	**CFA**	**Date:**	**12/12/2017**
Completed by:	AH	**Checked by:**	**FP**

Main Components - Slewing:

Item	Mass (kg)	Weight (kN)	X - Coordinate	Y - Coordinate	Moment Mx (kNm)	Moment My (kNm)
Slewing Components Totals/Resultant (with θ=0)						
UPPER WORKS	17,673	173	0.00	3.10	-537	0
LOWER WORKS	18,326	180	0.00	-0.83	149	0
SUSPENDED EQUIPMENT CONNECTED TO CROWD SYSTEM	16,459	161	0.00	4.46	-720	0
COUNTERWEIGHT	9,000	88	0.00	-4.11	363	0
OTHER	0	0	0.00	0.00	0	0
TOTAL/RESULTANT (with θ=0)	61,458	603	0.00	1.24	-745	0

Foot Pads - Slewing :

Description (Forces must be -ve)	Bearing Area	Max. Pad Loading	X - Coordinate	Y - Coordinate	Actual Shape	Actual Dimension
	m^2	kN	m	m		
Front Pad 1	2.04	-940	0.00	3.50	2085mmx1105mm	Rectangular
Front Pad 2	0.00	0.00	0.00	0.00	None	None
Rear Pad 1	0.00	0.00	0.00	0.00	None	None
Rear Pad 2	0.00	0.00	0.00	0.00	None	None

Forces - Slewing

		Force	X - Coordinate	Y - Coordinate	
		kN	m	m	
Maximum Extraction Force (kN)		787	0.00	4.46	Must be inline with suspended equip't.
Maximum Penetration Force (kN)		-100	0.00	4.46	-ve Must be inline with suspended equip't.
Maximum Auxillary Force (kN)		127	0.00	4.00	

Main Components - Non-Slewing:

Item		Mass (kg)	Weight (kN)	X - Coordinate	Y - Coordinate	Moment Mx (kNm)	Moment My (kNm)
Lower Works Non-Slewing (undercarriage/tracks etc)	Tracks & Undercarriage	21000	206	0.00	0.00		
				0.00	0.00		
				0.00	0.00		
TOTAL/RESULTANT (with θ=0)		21,000	206	0.00	0.00	0	0
TOTAL RIG MASS		82,458					

Front Foot Pads - Non-Slewing

Description	Bearing Area	Max. Pad Loading	X - Coordinate	Y - Coordinate	Actual Shape	Actual Dimension
	m^2	kN	m	m		
Front Pad 1						
Front Pad 2						
Rear Pad 1						
Rear Pad 2						

Tracks			Slewing		
Track bearing length (m)	4.60		Can the Rig Slew?	**YES**	
Track pad width (m)	0.90				
Distance between centrelines of tracks (m)	3.58				

	Pressure Summary for Platform Design (unfactored)			BRE LOAD CASE (1 or 2)	Eccentricity Index		Winch Forces
MODE	**Equiv. Track Length (m)**	**Equiv. Track Width (m)**	**Equiv. Uniform Bearing Pressure, q_{eq} (kPa)**		**Eccentricity index - X direction (sideways)**	**Eccentricity index - Y direction (forwards/backwards)**	**Algebraic sum of forces (kN)**
Standing	3.00	0.90	188	1	0.51	0.40	0
Travelling	3.00	0.90	188	1	0.51	0.40	0
Handling	3.80	0.90	123	1	0.32	0.25	127
Penetrating	3.27	0.90	113	2	0.43	0.33	-100
Extracting	1.58	0.90	330	2	0.87	0.68	787
Other	Not Used	-	-	0	-	-	0

MODE	ERROR FOR TRACK	ERROR MESSAGES FOR LINE FORCES		
	Zero Pressure	Auxillary Line	Extraction Force	Penetration Force
Standing	Track(s) lifting	Auxiliary Line Force OK	Extraction Force OK	Penetration Force OK
Travelling	Track(s) lifting	Auxiliary Line Force OK	Extraction Force OK	Penetration Force OK
Handling	None	Auxiliary Line Force OK	Extraction Force OK	Penetration Force OK
Penetrating	Track(s) lifting	Auxiliary Line Force OK	Extraction Force OK	Penetration Force OK
Extracting	Track(s) lifting	Auxiliary Line Force OK	Extraction Force OK	Penetration Force OK
Other	Track(s) lifting	Auxiliary Line Force OK	Extraction Force OK	Penetration Force OK

MODE	ERROR MESSAGES FOR FOOT PAD FORCES		ERROR MESSAGES FOR FOOT PAD PRESSURES	
	INPUT DATA		OUTPUT DATA	
Standing	Slewing Footpad Forces OK	Non-Slewing Footpad Forces OK	Slewing Foot Pad Pressure OK	Non-Slewing Foot Pad Pressure OK
Travelling	Slewing Footpad Forces OK	Non-Slewing Footpad Forces OK	Slewing Foot Pad Pressure OK	Non-Slewing Foot Pad Pressure OK
Handling	Slewing Footpad Forces OK	Non-Slewing Footpad Forces OK	Slewing Foot Pad Pressure OK	Non-Slewing Foot Pad Pressure OK
Penetrating	Slewing Footpad Forces OK	Non-Slewing Footpad Forces OK	Slewing Foot Pad Pressure OK	Non-Slewing Foot Pad Pressure OK
Extracting	Slewing Footpad Forces OK	Non-Slewing Footpad Forces OK	Slewing Foot Pad Pressure OK	Non-Slewing Foot Pad Pressure OK
Other	Slewing Footpad Forces OK	Non-Slewing Footpad Forces OK	Slewing Foot Pad Pressure OK	Non-Slewing Foot Pad Pressure OK

Note: The disclaimer on the first worksheet applies to all tables in this workbook

Notes

SR-75 CFA 900mm auger max 9.4T (29.0m total; Auger 20.7m, Extension 8.5m)

Hydraulic Rotary Rig

SR-75

soilmec
Drilling and Foundation Equipment

SR-75 Hydraulic Rotary Rig

LDP APPLICATIONS

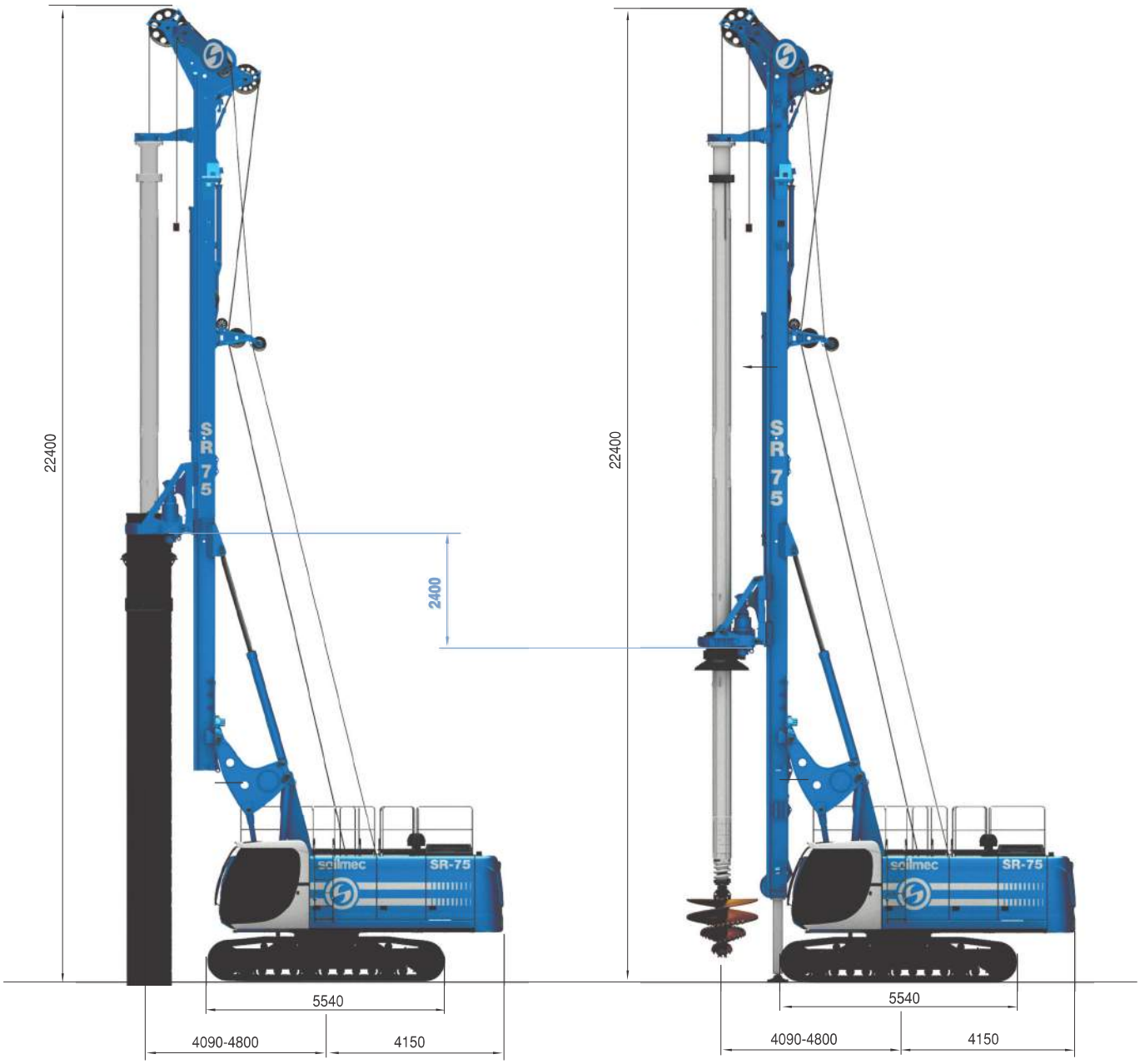
LDP - Large Diameter Piles - **WCS version**		
Operating weight c/w 4x10,5 kelly bar - WCS version	**75700 kg**	*166889.7 lb*
Max pile diameter-WCS version	**1750 (2500)* mm**	*68.9 (98.43)* in*
Max pile depth-friction kelly	**77 m**	*252.62 ft*
Max pile depth-locking kelly	**62 m**	*203.4 ft*

** tool below mast*

SR-75 Hydraulic Rotary Rig

LDP APPLICATIONS

Crowd cylinder double positioning



LDP - Large Diameter Piles - **CCS version**		
Operating weight c/w 4x10,5 kelly bar - CCS version	**74300 kg**	*163803 lb*
Max pile diameter-CCS version	**2000 (2500)* mm**	*78.3 (98.43)* in*
Max pile depth-friction kelly	**77 m**	*252.62 ft*
Max pile depth-locking kelly	**62 m**	*203.4 ft*

** tool below mast*

SR-75 TECHNICAL DATA SHEET

Rotary drive	**Single gear, spin-off type**	*Single gear, spin-off type*
Max torque	**292 kNm**	*215368 lbf*ft*
Speed of rotation (max)	**25,1 rpm**	*27.2 rpm*
Spin-off speed	**130 rpm**	*130 rpm*
Rotary drive	**Multi gear version**	*Multi gear version*
Max torque	**293 kNm**	*216105 lbf*ft*
Speed of rotation (max)	**27,2 rpm**	*27.2 rpm*
Crowd system	**Cylinder**	*Cylinder*
Crowd force pull (down/up)	**201/281 kN**	*45187/63171 lbf*
Stroke	**6500 mm**	*256 in*
Speed up	**10 m/min**	*61.7 ft/min*
Fast speed down	**4,5/11,4 m/min**	*27.6/61.7 ft/min*
Crowd system	**Winch**	*Winch*
Crowd force pull (down/up)	**408/408 kN**	*91720/91720 lbf*
Stroke	**15800 mm**	*622 in*
Speed up	**18,8 m/min**	*35.4 ft/min*
Fast speed down	**8,4/18,8 m/min**	*11.5/35.4 ft/min*
Main winch	**Control descent**	*Control descent*
Line pull (1st layer)	**246 kN**	*55302 lbf*
Rope diameter/lenght	**30 mm**	*1.18 in*
Line speed (max.)	**81 m/min**	*266 ft/min*
Auxiliary winch	**Control descent**	*Control descent*
Line pull (1st layer)	**127 kN**	*28550.7 lbf*
Rope diameter	**22 mm**	*0.87 in*
Line speed (max.)	**70 m/min**	*230 ft/min*
Engine	**CAT C13**	*CAT C13*
Rated output ISO 3046-I	**328 kW @ 1800 rpm**	*440 HP @ 1800 rpm*
Engine conforms to Exhaust emission Standard	**EU stage III B, US EPA Tier 4i and EU stage III A, US EPA Tier 3 available**	*EU stage III B, US EPA Tier 4i and EU stage III A, US EPA Tier 3 available*
Hydraulic system		
Hydraulic pressure	**30 Mpa**	*4851 psi*
Flow rates (main circuits)	**2x 304 l/min**	*2x 80.3 US gal/min*
Hydraulic oil tank capacity	**800 l**	*211 US gal*
Undercarriage	**variable gauge, telescoping sides frames**	*variable gauge, telescoping sides frames*
Overall width of crawlers retracted/extended	**2830/4330 mm**	*111.4/170.5 in*
Width of triple grouser track shoes	**750 mm**	*29.6 in*
Overall length of crawlers	**5540 mm**	*218 in*
Traction force	**495 kN**	*111280 lbf*
Travel speed	**1,6 km/h**	*1 mph*
Mast inclination (Backward/ Forward/Lateral)	**10 /4 /3**	*10 /4 /3*

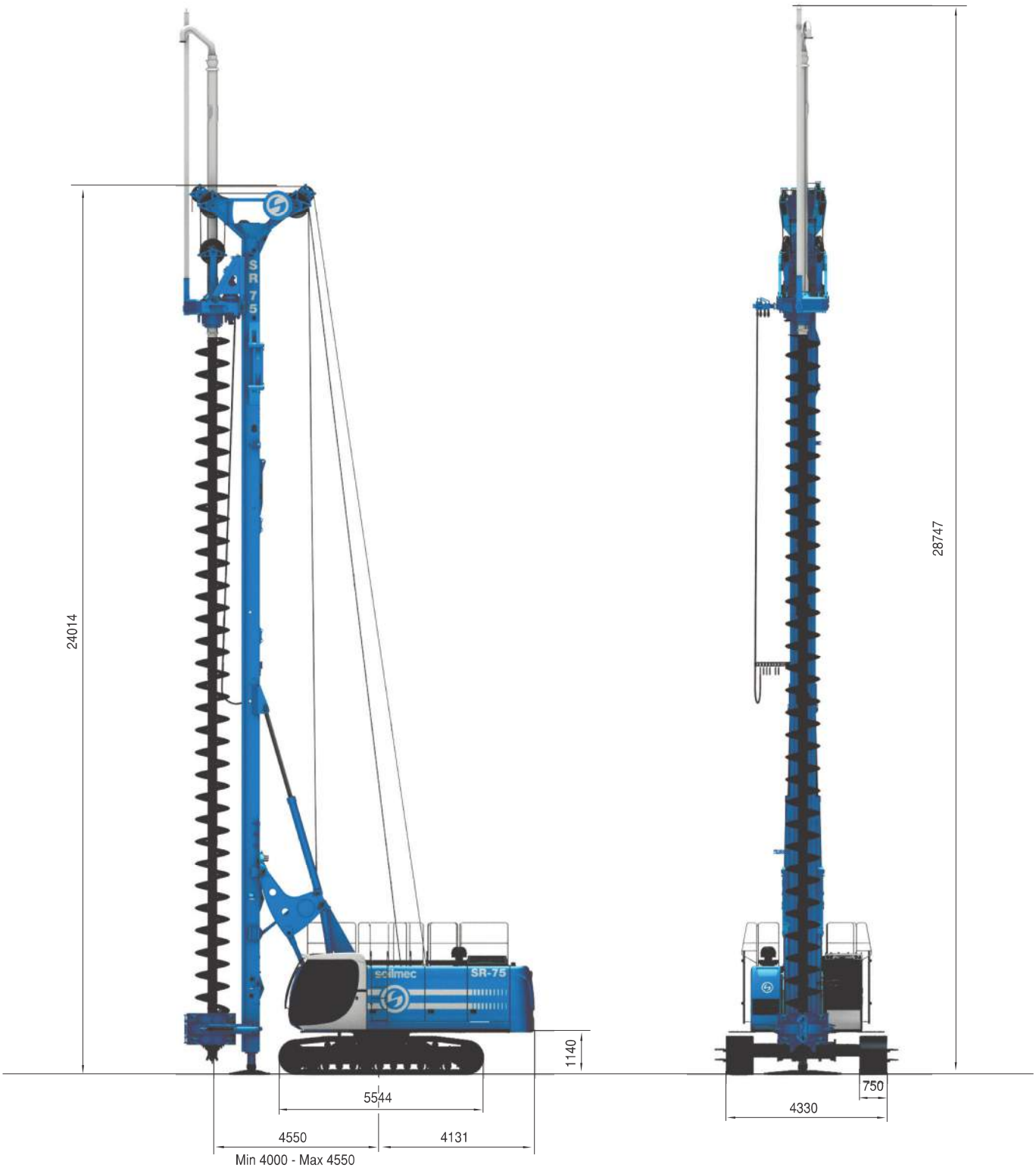
STANDARD EQUIPMENT

- *Main and auxiliary winch controlled descent type with special grooving*
- *Hoist limit switch on main rope*
- *Swivel for main rope*
- *Service rope parking point*
- *DMS system electronic monitoring and visualization system*
- *Mast inclination measurement on X/Y axes (digital/analog display)*
- *Automatic vertical mast allignment*
- *Depth measuring device on main winch*
- *Speed measuring device on rotary*
- *Oscillator attachment brackets*
- *Central lubrication system*
- *Emergency mode of operation for engine*
- *Engine diagnostic system*
- *Diagnostic panel for hydraulic functions*
- *Removable counterweight*
- *Transport securing lugs on crawler units*
- *Access ladder on upper carriage and guardrails*
- *On board lighting set*
- *On board tool set*
- *Electric refuelling pump*
- *High comfort operator's cab*
- *Protective roof grate (FOPS compliant)*
- *Air conditioning system*
- *Radio and CD player*
- *Cat walks*
- *GSM-GPRS-GPS modem*

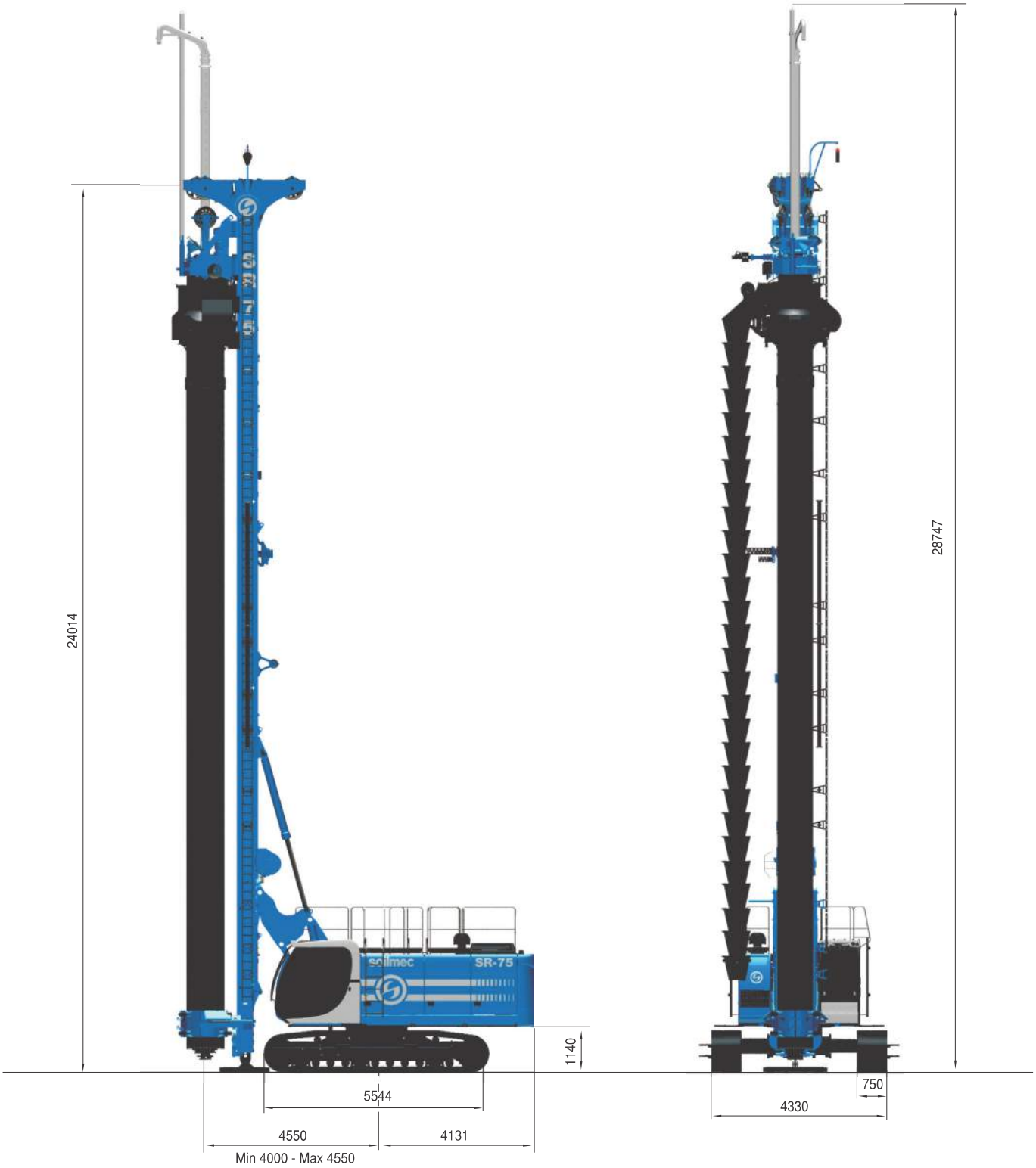
OPTIONAL EQUIPMENT

- *Biodegradable oil*
- *Freefall auxiliary winch*
- *Swivel for auxiliary rope*
- *Videocamera set*
- *Wider triple grouser track shoes (900 mm)*
- *VTH-1 vibrator*
- *Main winch load cell*

CFA - Continuous Flight Auger - **Quick conversion kit**		
Max pile diameter	**1200 mm**	*203926 lb*
Max pile depth	**23,4 m**	*76.7 ft*
Max pile depth with auger cleaner	**22 m**	*72 ft*
Extraction force	**800 kN**	*179847 lbf*
Crowd force on auger (optional)	**408 kN**	*91722 lbf*



CFA_Continuous Flight Auger - 4¡ Line pull		
Operating weight (c/w auger ext, w/o auger)	**71400 kg**	*157408 lb*
Max pile diameter	**1200 mm**	*47.24 in*
Max pile depth	**25,5 (19,5 + 6) m**	*83.66 (63.98 + 19.68) ft*
Max pile depth with auger cleaner	**24 (18 + 6) m**	*78.74 (59.06 + 19.68) ft*
Extraction force	**984 kN**	*221208 lbf*
Extraction force on auger (opt.)	**100 kN**	*22481 lbf*



CAP/CSP_Cased Augered & Secant Piles - 4¡ Line pull		
Max pile diameter	1000 mm	*39.37 in*
Max pile depth	23,0 (17 + 6) m	*75.5 (55.77 + 19.8) ft*
Max pile depth with auger cleaner	22,0 (16 + 6) m	*72.2 (52.49 + 19.68) ft*
Max cased depth c/w - w/o auger cleaner	16 / 17 m	*52.49 / 55.77 ft*
Casing max torque (theoretical, restricted, intermittent)	292 kNm	*215365 lbf*ft*
Casing speed of rotation (max)	11 rpm	*11 rpm*
Casing pull up/down	408	*108807.5 lbf*

SR-75 DP APPLICATIONS

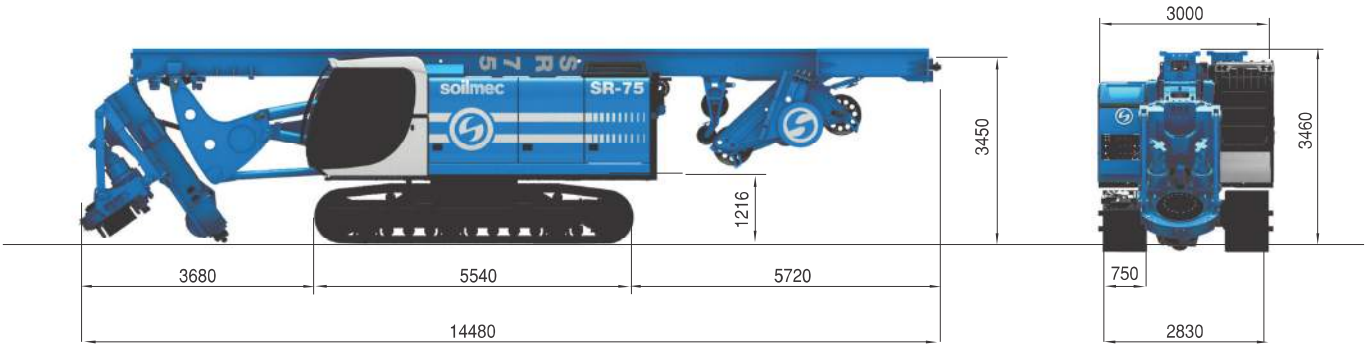
DP - Displacement Piles		
Max drilling diameter DP / TCT	**600 / 800 mm**	*23.62 / 31.50 in*
Max pile depth c/w 8 m sleeve extension	**23,0 m**	*75.5 ft*
Mast extension length available	**15,515 m**	*51 ft*
Max pile depth c/w mast extension	**30,5 m**	*98.4 ft*

SR-75 TJ APPLICATIONS

TJ - Turbojet ¤		
Max treatment diameter	1500 mm	*59.06 in*
Bauma version, max treatment depth c/w 8 m sleeve extension	23 m	*75.5 ft*
Mast boom extension length	15,515 m	*51 ft*
Max depth with boom mast extension	30.5 m	*98.4 ft*

SR-75 Hydraulic Rotary Rig

TRANSPORT, DIMENSIONS AND WEIGHTS



Transport configuration		
Transport width	3000 mm	*118.2 in*
Transport Height	3450 mm	*135.8 in*
Transport length	14480 mm	*570 in*
Transport weight **CCS** / **WCS**	52200 / 58200 kg	*115081 / 123899 lb*
Min transport weight **CCS** / **WCS**	49500 / 55450 kg	*109128 / 122246 lb*

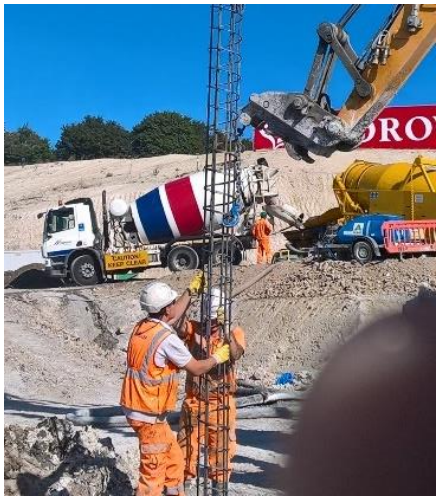
Appendix F – Detailed Methodology

Installation of piles

HOLD POINT: Ensure the working platform certificate and permit to dig are signed and issued by the principal contractor / client and the working area is adequately segregated from other trades.

Signage to be placed to denote Keller work area

The hollow stem at the base of the digging head will be closed off with an expendable cap.	
The piling rig is tracked into position under the instruction of the banksman/ganger ensuring the auger string is positioned centrally over the pile position.	

Bore the augers to the required depth observing the rate of penetration of the auger. Should it not be possible to progress the augers down to the required depth, the auger string shall be reverse screwed out of the pile bore, the shaft backfilled to avoid the risk of open bores being left and further instruction sought.	
The auger gates will remain closed for as long as possible during the boring of the pile. The banksman/ganger will remain with the rig to ensure no unauthorised persons can enter this area.	
Concrete is pumped through the hollow stem to the base of the auger and the pile constructed as the auger is withdrawn at a controlled rate. The rig instrumentation will be used to monitor the input volumes of concrete and pressure of the concrete as it is placed. As necessary, the auger string will be cleaned with the mechanical auger cleaner.	
Once extracted the rig is backed away and spoil carefully cleared off the top of the pile to expose the clean, wet pile shaft using the attendant excavator. principal contractor / client are to remove the spoil off site/to a stockpile as required. The reinforcement cage will be installed by lifting and plunging it into the wet bore with the aid of the attendant excavator into the vertical position as show in the Keller excavator lift plan using a single drop chain c/w hook.	

The back of the excavator bucket will then be used to progress the cage to platform level.	
Reinforcement Checks: It is the responsibility of all on site to ensure that they know exactly where the cage is within the pile and that the cage remains in its correct position. An automated staff will not be used by any Keller operative at all in any stage of the operation. Whenever a cage is installed into wet concrete, the following action must be taken to ensure the cage cannot sink:- 1. If there is any concern about the concrete slump or any instances of cages slumping, the ganger must report it to the site Supervisor at the time it happens. 2. The Supervisor MUST notify their Project Manager/Contract Engineer immediately to make them aware of the issue. 3. The Supervisor and PM/CE will discuss and agree a solution to ensure the cages are placed in the right place – this will be either by a change to the concrete mix design and / or use a trapping aid on all piles considered at risk. 4. As an interim measure whilst the investigation is being carried out, the cages MUST be trapped at platform level and checked hourly until the concrete has set. 5. At the end of the shift piles completed before 3pm that day MUST be inspected by the supervisor and the setting out engineer to ensure the cage is visible in all piles and that they remain in the correct position. The engineer is to record seeing the cage in their as built record. 6. For ALL piles completed after 3pm, the cage MUST be trapped and inspections made by the supervisor and the setting out engineer the next morning to ensure the cage is in the right position. If not, the PM/CE must be notified immediately. If the cage is visible, the engineer is to record seeing the cage in their as built record.	 

Bore cover placed over the completed pile	

Appendix G - Task Briefing - Cage Manufacture

Cages will be fabricated by a site steel fixer from straight bar and helical for all bearing piles. A dedicated steel fixing area is to be located on site.

Site fabrication

HOLD POINT: Ensure working area is adequately protected for the steel fixer to work.

The site-fabricated cages will be made as per the cage detail noted on the latest pile schedule. All cages will be made to the following specification by our on-site steel fixer.

- Top 4No - all helical/bar intersections to be tied
- Double-tie 4th helical down. Spray mark this as the lifting point
- Helical bar sections to be tied hit and miss thereafter.
- Bottom 4No. – all helical/bar intersections to be tied using single tie

During the manufacture, the individual bars will be lifted onto the cage trestles to support the cage at a comfortable working height and the helical 'spun' onto the cage to the correct location. Ties will be looped before attaching to the cage, and will be twisted using wire nips. Excess tying wire will be removed and the loose ends will be bent in towards the cage. Cages will then be transported to the pile position by the attendant excavator and lifted into position over the wet bore with a drop chain. Any operatives handling the cage must ensure gloves are worn and replaced if damaged.

Cages will be lifted by the attendant excavator into the vertical position as show in the Keller excavator lift plan using a single drop chain c/w hook. The reinforcement will then be installed into the pile bore and the drop chain removed once the hook reaches ground level. The back of the excavator bucket will then be used to progress the cage to platform level and will be 'levelled in' by the setting out engineer.

Control of the activity

The steel fixer will have the relevant CPCS/CSCS Card to confirm his trade and will wear the minimum PPE requirements; in particular they will be required to wear gloves and glasses while undertaking the cage manufacture, along with the Hi-vis vest and boots. Gloves are of particular importance for this trade due to the possibility of burred ends to the steel.

Cage to be slung only by trained and competent slinger/signaller at the sprayed designated lifting point.

TEMPLATE CHANGE RECORD

Revision	Changes	Author
-/2015-08-07	Initial issue following WPP	BE / EC
-/2016-12-05	Reviewed	EC
-/2018-04-20	Reviewed	EC
2021 Mar	Change history retained in SharePoint	