Draft Work Package Plan
New Development at The Ugly Brown Building

CFA piling to be carried out adjacent to existing buildings and a Thames Water Sewer

						Acceptance by Customer		
Revision	Prepared by	Date	Checker	Date	Description	Required Y/N	Acceptance by	Date
0		11/5/20		11/5/20	For Approval	Y		

Notes:

Subcontractor: Keller

Client: Reef Estates

The following documents have intentionally been left out but are available upon request:

- COSHH Assessments
- Additional CFA standard risk assessments
- Monitoring Requirements

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A Work Package Details

A1 Scope of work

This WPP (works package plan) will address all of the associated risks when piling adjacent Thames Water sewer infrastructure and lists mitigating measures in order to reduce the risk or potential harm to any personnel or infrastructure surrounding the site.

The site in North London is located over an existing major sewer belonging to Thames Water. The piling however is being carried out inside the easement zone in the area of the structure but at a safe distance from the sewer.

This WPP is to cover the installation of the Continuous Flight Auger (CFA) and, if necessary some Restricted Access piling operations for the project at the Ugly Brown Building (UBB).

The total complete works are subject to detailed design but at this stage are expected to be

- 600/900mm diameter CFA bearing piles
- 450/600mm diameter Contiguous CFA piles
- 300mm/450mm dia. Restricted Access Piles

A2 Planned Sequence of Works

Demolition of Plot A down to the ground level.

The planned sequence of works at this stage is not known.

A3 Construction of Bearing Piles

The SF-65 CFA or SR75 piling rig will be used to form open site piles using a hollow auger string which allows the pile to be concreted as the auger is extracted. The piling rig will be delivered to site using the abnormal load procedure and the approved transport routes. The piling rig will manoeuvre itself off the trailer and track over to the piling platform. All equipment will be off loaded into an agreed compound area with the aid of lorry-mounted hiabs. All loads will be off-loaded by the telehandler.

A Klemm 701 or similar will be used to construct the piles in a similar way in any restricted areas with the difference being that sectional auger strings will be used. This may include where rig loadings or larger rigs cannot be imposed- i.e. if a rig has to locate over the sewer.

Rigging of the machines takes approximately 1 day and requires an area to bore the augers into the ground as part of the rigging up sequence, this area will be located outside the piling area.

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

The pile reinforcement may be brought to site as loose bar for the bearing piles. All cages/reinforcement will be required to be stored on-site in an agreed location with the Principal Contractor

Permit to lift is required for all lifting operations, which shall be in accordance with the approved lift plan and LOLER documentation.

Good housekeeping will be employed at all times.

A.3.1 CFA Sequence of Operations – General

HOLD POINT: Works shall not commence until all approvals from all authorities have been granted. The principal contractor is to issue a working platform certificate (Appendix D) and a permit to dig. Keller shall undertake daily briefings and will ensure any exclusion zones are communicated to its staff.

The piling rigs will only move into position when the Permit to Dig is signed by the principal contractor. Keller will require to see that the Piling Layout is approved by Thames Water. Additionally, if required by Thames Water Keller can install a monitoring system that can detect movement i.e. heave/ displacement of the sewer at site level so that operations could be suspended if necessary. TW may choose to implement such a system themselves in lieu of Keller undertaking this. See Appendix C.

1. 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. REFER TO SECTION A.3.2 FOR DETAILS OF RIG MANOEUVRING ADJACENT TO THAMES WATER INFRASTRUCTURE.
2. The hollow stem at the base of the digging head will be closed off with an expendable cap. During this operation the mast will be raised a suitable distance vertically above the foot and a lock off switch will be activated by the rig operator.
3. 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, and further instruction sought.
4. During the boring process the attending excavator shall clear away the spoil from the auger, at no point shall the auger stop for the operation to occur. A watch will be kept on the auger string to ensure there are no signs of deflection- i.e. evidence of kick off against a hard obstruction/underground infrastructure.
5. Upon achieving the required depth the auger string is withdrawn some 200 to 300mm and a small amount of concrete pumped to allow the expendable cap to be blown clear of the digging head. The pile will be re-bored to full depth to clean the base prior to extraction.
6. 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. As necessary, the auger string will be cleaned with the mechanical auger cleaner. At no point will the auger be spun to clear spoil.
7. As per the above, on extraction of the auger the attending excavator shall clear away spoil, relieving the potential of spoil travelling up the stem auger. At no point shall the auger stop for the operation to occur.
8. Once the auger is extracted the rig is backed away and the top of concrete is carefully cleared off to expose the clean, wet pile shaft. The prefabricated reinforcement cages will be installed by lifting and plunging the cage in to the pile with the aid of an excavator.
9. Following installation, the cage must be centralised and secured in place with mushroom caps placed over all exposed bars prior to completing the pile. See section A.3.3 Lifting Sequence.

A.3.2 CFA piling close to Thames Water Services

Due to the vicinity of the site to TW infrastructure, compliance with any guidance given to Keller by TW/Principal Contractor. **Any no go zone MUST be marked out on the ground**. Additionally, Keller will take cognisance of any monitoring system that may be in place and immediately cease work should movement be detected or alarms sounded.

The Principal Contractor shall ensure that a designed piling platform is correctly installed and tested prior to Keller arriving on-site. The working platform will be designed to take the imposed loads of the Soilmec SF-65 or Klemm rig.

The Principal Contractor shall ensure that the designed piling platform is correctly installed and tested prior to Keller arriving on-site, in accordance with FPS requirements.

The piling platform shall be designed and constructed to be 2m greater in width and length than the theoretical working area.

The rig will track into position under the guidance of a qualified and competent Keller banksman, in charge of controlling all rig movements only.

The piling rig shall incorporate a deadmans switch to the controls so in the event of the driver losing consciousness there is no possibility of the rig leaving the piling mat.

The piling rig shall be located within an agree area when it is parked overnight.

All flexible hoses are to be certified by Keller Plant. The flexible hoses on the rig are to be double bagged, should the hose burst at height, concrete shall be contained within the bagged pipe work.

A.3.3 Lifting sequence for installing reinforcement cages

All lifting operations will be undertaken in accordance with the agreed excavator lift plan. All lifting operations will be supervised by a suitably qualified and competent person (CPCS qualified). All lifting equipment will be certified.

The cages at Station Approach, Sydenham are relatively small in length with a maximum cage length of 10.0m. Therefore the attending excavator shall be used to install the cages into the freshly cast concrete.

Stage 1. Each cage shall be inspected by the Keller Lift supervisor before lifting to ensure all connections are intact and secure. Lifting tackle shall be attached to the designed lifting band.

Stage 2. The cage will be lifted from the reinforcement storage area and carried towards the pile position in a horizontal position low to the platform. Once at the correct pile location, the excavator shall lift the pile to the vertical.

Stage 3. The cage will then be centred over the wet pile shaft and plunged into the pile to the depth of the top lifting band.

Stage 4. The lifting chains will be detached and the cage will be further lowered into the pile to the required depth by means of the attending excavator.

Stage 5. This sequence shall then be repeated for all piles throughout the works.

A.3.4 Vibrations

CFA piles have similar levels of vibration to standard site tracked plant so the level of vibration anticipated as a result of the works considered as negligible. At present we have no plans to use a cage vibrator.

Near to the site there is a live wet well that will need to be reviewed by others on the condition of this structure.

Please refer to report for Vibration Monitoring as in Appendix H. This demonstrates vibration levels will be low.

As with CFA it has the lowest levels of vibration in any piling technique. Usually we would expect the ground worker with excavators, rollers and heavier faster machine to create great levels of vibration.

A4 Control of Activity Risks

Site specific hazard assessments and appropriate mitigating control measures have been prepared by the Keller Project Manager – See Appendix B. This document will then be updated as required by the Supervisor to reflect any changes in the working environment as the project progresses.

Key hazards are detailed below, full risk assessments and COSHH data for the scope of works can be found in Appendices C.

Hazard	Controls Specified	Task where hazard needs to be briefed (or personnel)		
		Piling Operations	Lifting operations	Attendant excavator/ banksmen
Rig Overturning / collapse	• A signed working platform certificate (WPC) **MUST** be in place, before rig arrives to site • Limit the amount of spragging of the machine at all times • Ensure the rig is continually maintained as per the manufactures guidance • Rig can only operate when a banksmen of the machine is in attendance	X		
Pipe Work	• All hoses certified • All hoses to be checked at the start and during the shift as part of routine daily maintenance • Flexible hoses on the rig are to be bagged, should the hose burst at height, concrete shall be contained within the bagged pipe work.	X		
Lifting of cages	• Operation to be carried out by slinger/signaller only • All cages must have a dedicated lifting band on the cages	X	X	X
Light Pollution	• Keller static lighting rig is to be located away from the nearby railway so it does not interfere with any railway activity.	X		
Live TW infrastructure	• Approved WPP must be in place, ANY NO Pile Zone Must be marked on the ground	X		

	• Any monitoring either by TW/Keller of the tunnels must be relayed to Keller Supervisor so operations can be ceased if necessary.			
Rotating machine parts	• Auger cleaners must be fully operational at all times • Guards to be used at all times during the piling operations	X		X
Open excavations	• Piles to be covered immediately following construction. Plant or MEWPs must not pass over a covered excavation or freshly concreted piles. • Covers and cones will be in place to indicate the location of the pile.	X	X	X
Concrete burns	• PPE to be worn. • Eye wash points to be identified.	X		X

Due to the nature of the plant on site, spillages are a potential hazard. Spill kits will be kept within the stores units of the rigs which will compromise plant nappies, spill granules booms and drip trays.

A5 Resources

Plant

- 1No. CFA crawler mounted hydraulic drilling rig – Soilmec Sf65
- 1 No Klemm or similar Rig
- 2 No. 55-70m³/hr Trailer concrete pumps
- 1No. 125cfm Compressor
- Various lengths of 4" and 5" Concrete hoses and double bagged hoses
- 1 No. CFA store unit
- Various ancillary Piling equipment (augers, cement, spacers etc)
- 40ft articulated – Cage deliveries
- 40ft articulated or 28ft flat-bed rigid wagons – for associated piling equipment
- 1No. Telehandler c/w manrider (See note)

Note: The telehandler and man rider basket is a purpose design platform and has been designed by the plant manufacturer Caterpillar. The front forks detach from the telehandler and the basket then fixes direct to the front of the telehandler. Control is switched from the telehandler to the man-rider mounted controls which are then used to operate the basket to allow working at height. All operators conducting duties with the use of the manrider basket shall be in accordance with the manufacturers operating instructions at all times. During operation, all trained occupants in the platform will wear a lanyard and safety harness to the authorised anchorage points. Six monthly thorough examination certificates will be produced to Bellway prior to arrival to site. The man rider basket is required during rigging up and when undertaking maintenance on the rig.

All operators shall be IPAF (International Powered Access Federation) qualified.

Note – we will not require the use of an attendant crane.

Plant Mitigation Measures:

- Operator Failure (Rig) – Keller operator must have a medical and has undergone D&A testing (issued to FDL/CN prior to arrival). In the unlikely event of a driver falling unconscious, the rig can only be operated with hands of the operator on the levers.
- Power Failure - Should the rig engine cut out for any reason, the machine automatically goes into safe mode as per manufactures standard requirements.
- Hydraulic Failure - Should the hydraulics fail or hose burst the safety break automatically come on and lock off the hydraulics. All valves have check valves fitted as per the manufactures standard requirements.

Labour

All site personnel will have as a minimum a CSCS card and where applicable a CPCS card. Our site team will be:

- 2No. Supervisors– TBA (only when both rigs are working)
- 2No. Rig Operator - TBA
- 2No. Banksman (Rig) – TBA
- 2No. Pumpman – TBA

Optional personnel:

- 1No. Visiting Construction Manager
- 1No. Visiting Contracts Manager
- 1No. Visiting General Manager
- 1No. Visiting HSEQ Representative

A minimum of 1no site visit will be made by the HSEQ Representative during the course of the contract.

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)).

A6 Permits

Prior to commencement of piling works, the following permit must be issued by to Keller:

- Working platform certificate must be obtained before loading the working platform, renewed weekly and following any reinstatement of the platform, such as following removal of obstructions.
- Permit to dig – issued daily by Bellway to the piling supervisor, confirming no services in the area there to be no services in the area.

These documents must be signed by the Principal Contractor and the Keller supervisor prior to undertaking works. A copy of the Working Platform Certificate (WPC4) is attached in Appendix D.

A7 Working hours

Keller site working hours will be:

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

A8 Handover of completed works

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

A9 Key Personnel and Contacts

Mark Snell	Director	02476 511266
TBA	Project Manager	02476 511266
Mark Bragg	Construction Manager	07770 801974
Edward Collis	Contracts Manager	07834 461618

B Site Details

B1 Access

The access is:

Off St Pancras Way

London NW1 0TB

The site traffic management plan should be adhered to at all times including the use of segregated walkways for access on to and around the site.

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.

The piling rigs will be mobilised to site on a low-loader using the abnormal load procedure and the approved transport routes. Please note that due to Highways/Local Authority restrictions, the rig could be subject to out of hours delivery times. Once known, the delivery times for all plant will be notified to Bellway in particular with regard to the deliveries of the rigs. The low loader will drive onto the site where the tractor unit will detach itself from the trailer. The piling rig will be maneuvered off the trailer and tracked to an area with a firm, level platform suitable for rigging up by the piling crew.

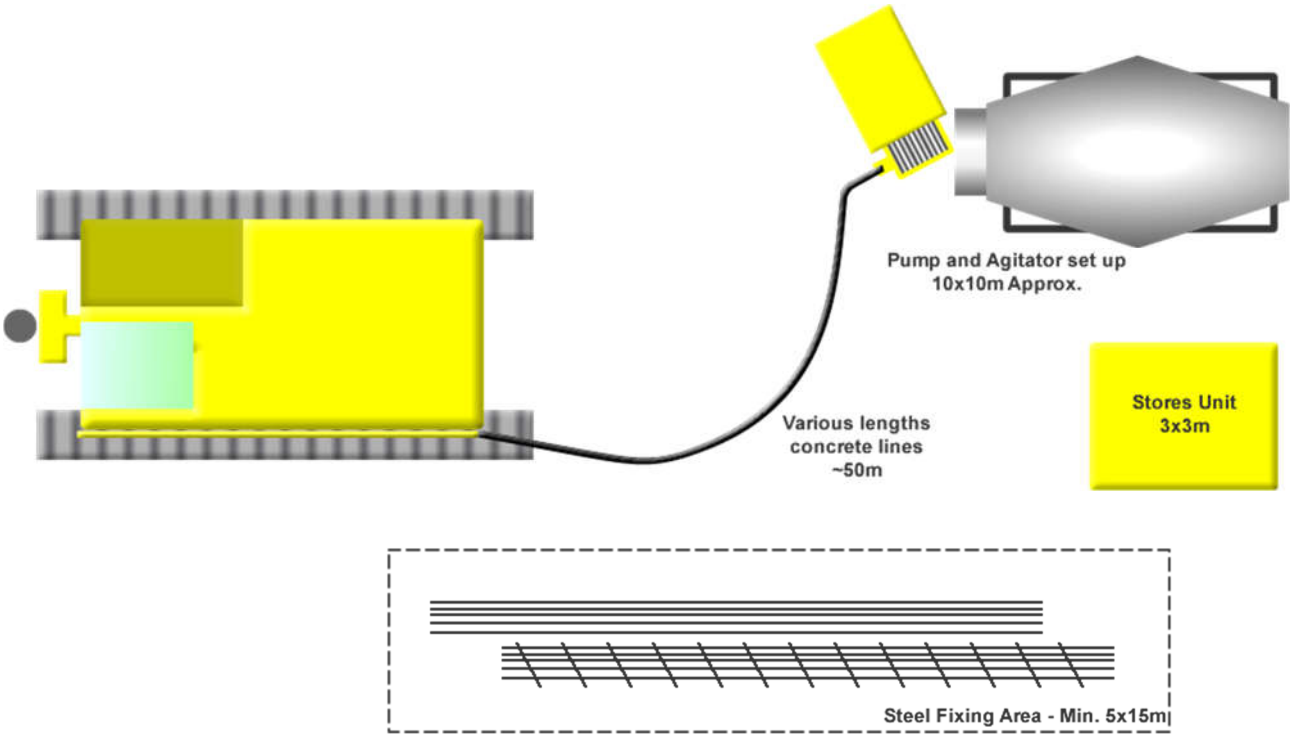
Excavators will also be mobilised to site and will be used for the installation of the reinforcement cages and may assist with other lifting duties as required and detailed in the lift plan.

The remaining piling plant and equipment will be driven onto site using either 40ft articulated or 28ft flat-bed rigid wagons and will be unloaded using the telehandler and lorry mounted hiabs.

B2 Site Layout

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 site setup for the rig is as shown in the diagram below:



B3 Control of Site Hazards

Below is a list of the main hazards which are to be communicated to the site team and in particular any personnel interfacing with the piling works such as excavator drivers, ground-workers and other personnel who may need to be aware of the hazards which are presented by their works adjacent to the piling works. These should be communicated across the wider site team.

Hazard	Controls Specified
Rotating machine parts	Any site workers not involved in the piling operation should remain outside of the work area. Rig guards to be used.
Open excavations	Piles to be covered immediately following construction.

Moving plant – plant strikes	Rigs to be banked at all times, pedestrian walkways to be adhered to.

B4 Communication & Contact Details

Client Contacts

TBA	Project Manager	TBA

B5 Emergency Arrangements

First Aid

In case of any accidents please refer to Appendix G - Emergency and Accident Action Information - DRC-1112- 00.

Keller Supervisors are trained First Aiders. In the first instance, the first aider should be contacted. Following treatment, the incident should be recorded in Keller's site Accident book. Additionally, the accident will be reported to Bellway. All near misses or accidents should be reported in this way.

The nearest A&E hospital address is:

University College Hospital, Marylebone Road

Environmental considerations

Spill kits will be available for emergency use including plant nappies will be provided and drip trays used for all static plant.

B6 Welfare

All welfare facilities are to be provided by O Keefe and must include as a minimum:

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

B7 Interfaces

TW	All approvals must be in place (including an approved WPP Refer to section A4 - Control of Activity Risks
Public	Hoarding/similar to be provided by Main 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.
Environment	The only significant environmental interface for this project is proximity to the Grand Union Canal
Statutory and Enforcement Authorities	Not applicable

C Management of Health and Safety

C1 Briefing Arrangements

All personnel will attend an induction by the Principal Contractor, after which they will be given a Works Package Plan briefing by our site Supervisor for which this document forms the basis. Records of this induction will be made and any further personnel will be inducted in the same way. The site Supervisor will brief the crews daily in their duties on site and their activities for the day including interaction with other trades. This will make particular reference to any changes on site as appropriate. Reference can be made to Work Instructions where appropriate.

Toolbox talks will be carried out weekly and a training record will be made. These generally follow a schedule which is common across all Foundations sites; however they may be substituted to account for current topics, such as working near railways, asbestos etc if these are considered more appropriate for the current site or recent activities.

C2 COSHH

The Control of Substances Hazardous to Health Regulations, 1999, (C.O.S.H.H. Regulations), require that an assessment is undertaken of health risks created by work involving substances hazardous to health. The risk assessments for substances are included in the task assessments. These refer to the use of chemicals on a site and state that the precautions to be taken are recorded on a Substance C.O.S.H.H. Record. The Substance Identification Record is based on information obtained from a data sheet received from the substance supplier.

C.O.S.H.H Assessments for all substances used on the site can be found in Appendix D.

C3 Personal Protective Equipment

As a minimum requirement to meet site rules the following PPE will be worn by all Keller personnel:

High Visibility vests

Disposable Overalls

Safety Helmets

Safety Harness for working on piling rig masts.

Eye Protection

Ear Protection

Protective Gloves

Protective Footwear

Operatives must ensure that they use and look after the items listed responsibly. Any damaged Personal Protective Equipment will be replaced as required during the contract.

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. Access to the rig mask will be via the MEWP.

Appendix A – Final Pile Layout Plan When Available

Appendix B – Risk Assessments

Appendix C – Monitoring Requirements

The Use of a wireless network of tiltmeters will provide accurate reliable data on heave / settlement of the sewer throughout piling project duration.

Precise levelling, tape extensometer and track trolley surveys may be required to verify the automated tiltmeter data

The above could be undertaken by Geo Instruments or TW.

Appendix D – Working Platform Certificate

Appendix E – SF65 Rig Details

Appendix F – Hospital Route Map

To Follow

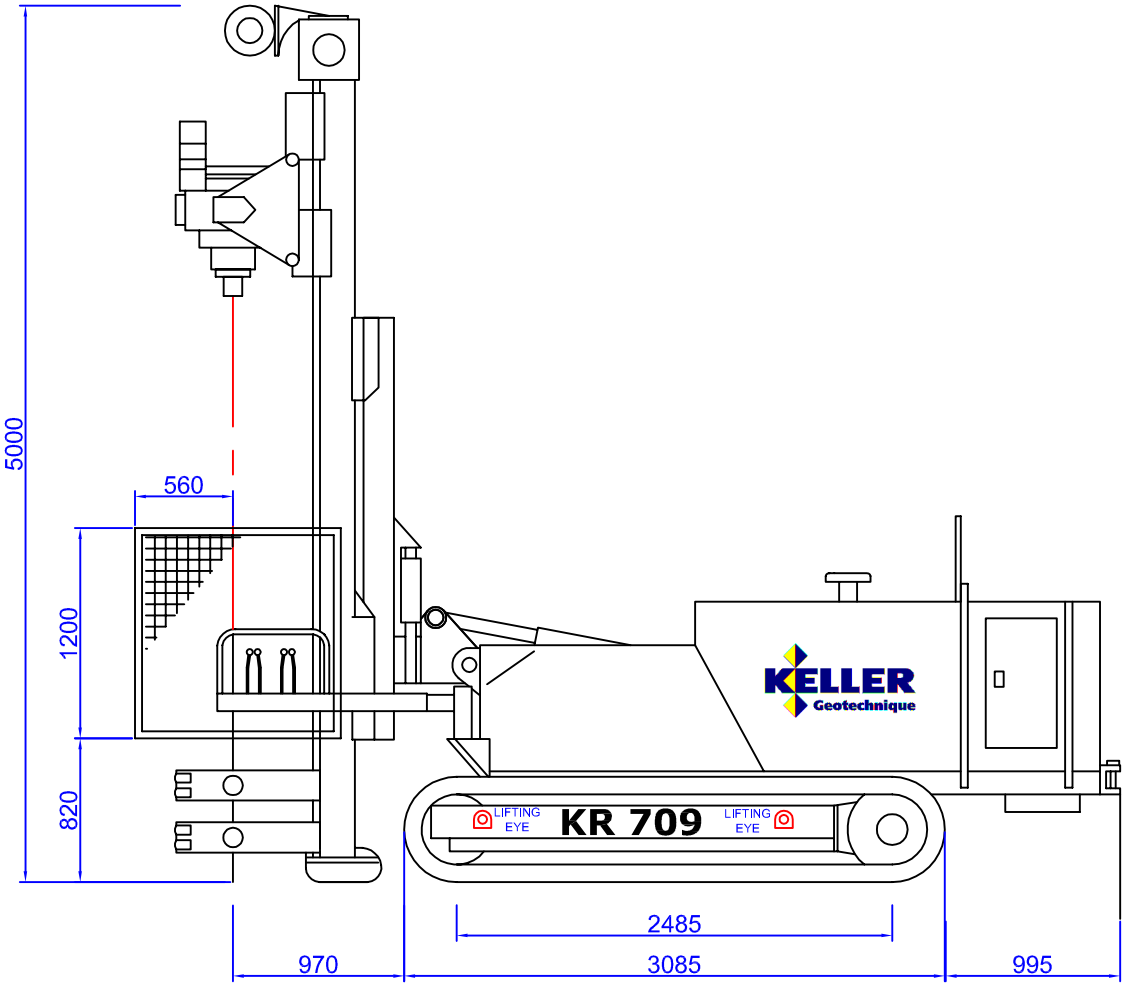
Appendix G – Emergency and Accident Action Information - DRC-1112- 00.21

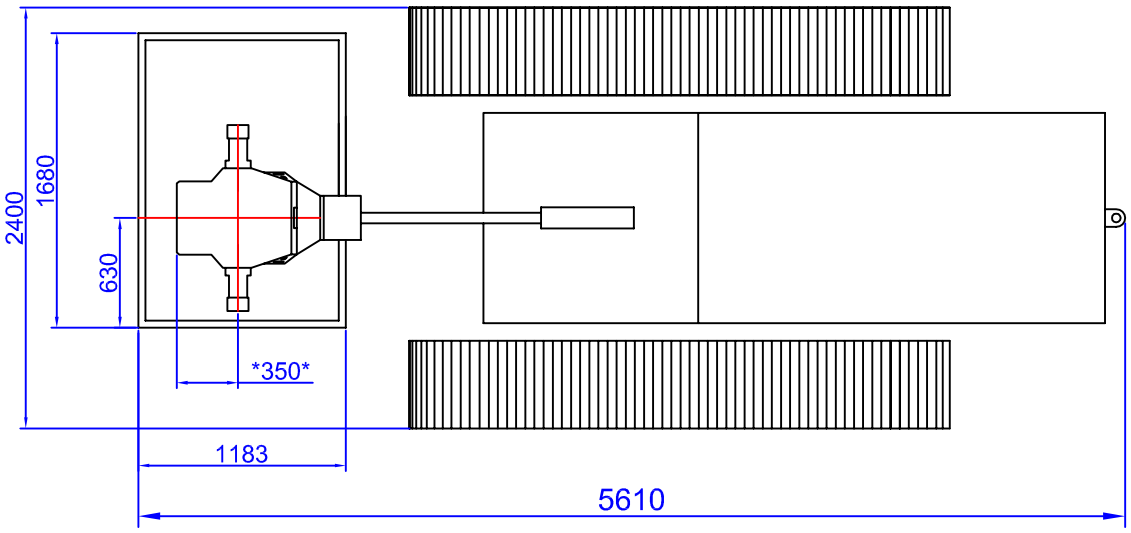
Appendix H – Vibration Level Report

The following report summarises data taken from our CFA site in Hedge end, Southampton. The machine being used was an SF-50 CFA piling rig therefore provides evidence of the expected vibrations levels

We were only piling between the 12th to 19th March, so any data outside of these parameters would be classified as general site vibration.

As with CFA it has the lowest levels of vibration in any piling technique. Usually we would expect the ground worker with excavators, rollers and heavier faster machine to create great levels of vibration.





* DIMENSION* = 430mm IF USING 660mm CASING

KELLER Geotechnique

Thorp Arch, Wetherby,
West Yorkshire, England, LS23 7FS
Phone 01937 541118
Email geotechnique@keller.co.uk

Unit 5, Weyside Park
Newman Lane,Alton,GU34 2PJ
Phone 01420 590328
Email geotechnique@keller.co.uk

Ground Floor, 108 Mere Grange
Leaside Road, St Helens, WA9 5GG
Phone 01744 818009
Email geotechnique@keller.co.uk

Tower Business Park,
Derby Road, Clay Cross
Phone 01246 860988
Email geotechnique@keller.co.uk

Rig Data

Rig Weight	13500Kg
Maximum Pile Diameter	508/660mm
Maximum Pile Length	30m
Drilling Techniques	Rotary Case & Auger Flight Auger DTH Hammer
Power	Diesel
Power Pack Dimensions (mm)	- - -
Power Pack weight	-
Noise Levels	TBC Leq at 5m
Rig Transport Dimensions (mm)	5140L 3155H 2400W
Mast Articulation	
Forward	5°
Back	90°
Side	±15°

Notes

All KG Drilling rigs are equipped with fully interlocked guards in accordance with the PUWER regulations

FPS Platform design

Working Platform Certificate required to operate all KG Drilling Rigs

TITLE
KLEMM KR 709

SCALE	ORIG. SIZE	DRAWN	CHECKED	AUTHORISED
N/A	A4	J.D.T. 09/11/10		

DRAWING NUMBER

REV -

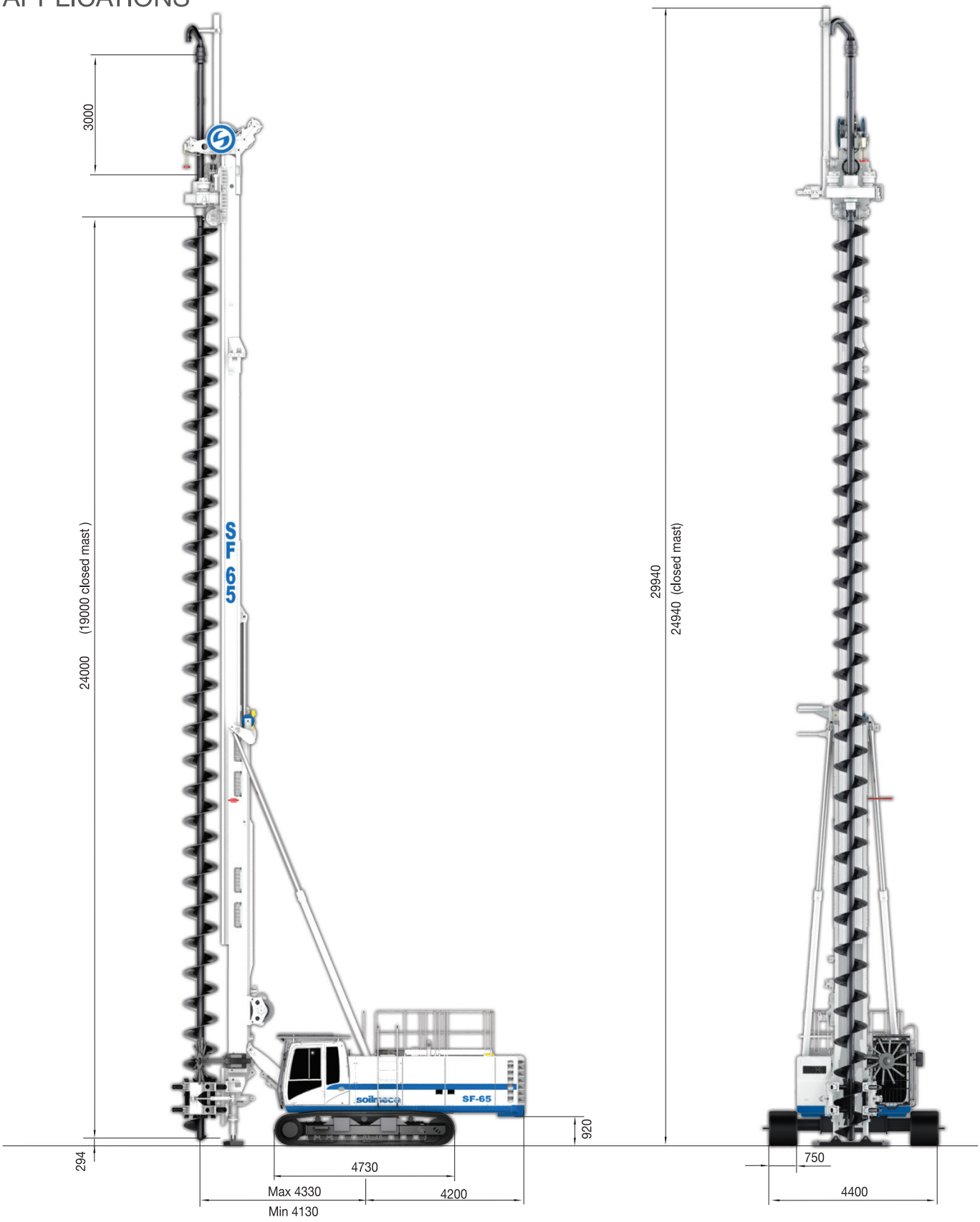
Hydraulic CFA Rotary Rig

SF-65

soilmec
Drilling and Foundation Equipment

SF-65 Hydraulic CFA Rotary Rig

APPLICATIONS



CFA - Continuous Flight Auger		
Operating weight w/o auger	**51500 kg**	*113538 lb*
Auger cleaner	**star type**	*star type*
Max pile diameter	**1000 mm**	*39.4 in*
Max pile depth w/o auger extension	**24 m**	*79 ft*
Max pile depth with 6 m auger extension	**30 m**	*98 ft*
Max extraction force	**572 kN**	*128500 lb*

SF-65 Hydraulic CFA Rotary Rig

TECHNICAL DATA SHEET

Rotary Drive		
- Max torque (intermittent)	**165 kNm**	*121698 lbf*ft*
- Rated torque	**151 kNm**	*110600 lbf*ft*
- Speed of rotation	**31 rpm**	*31 rpm*
Main winch	**controlled descent**	*controlled descent*
- Line pull (1st layer)	**143 kN**	*32100 lbf*
- Rope diameter	**22 mm**	*0.87 in*
- Line speed (max.)	**68 m/min**	*223 ft/min*
Auxiliary winch	**controlled descent**	*controlled descent*
- Line pull (1st layer)	**65 kN**	*14600 lbf*
- Rope diameter	**18 mm**	*0.71 in*
- Line speed (max.)	**67 m/min**	*220 ft/min*
Pull down winch	**optional**	*optional*
- Pull down force	**97 kN**	*21800 lbf*
- Rope diameter	**16 mm**	*0.63 in*
Engine	**CAT C7 ACERT**	*CAT C7 ACERT*
- Rated output ISO 3046-I	**205 kW @ 1800 rpm**	*295 HP @ 1800 rpm*
- Engine conforms to Exhaust emission Standard	**EU stage IV / US EPA Tier 4f**	*EU stage IV / US EPA Tier 4f*
- Diesel tank capacity	**385 l**	*102 US gal*
Hydraulic system		
- Main pump	**468 l/min**	*85 US gal/min*
- Auxiliary pump flow	**135 l/min**	*37 US*
- Hydraulic oil tank capacity	**895 l**	*236 US gal*
Undercarriage (retractable crawler frames)		
- Track shoes width	**750 mm**	*30 in*
- Overall width of crawlers retracted	**2980 mm**	*117 in*
- Overall width of crawlers extended	**4440 mm**	*175 in*
- Overall length of crawlers	**4730 mm**	*186 in*
- Traction force	**294 kN**	*66094 lbf*
- Travel speed	**1,4 km/h**	*0.9 mph*

** Soilmec integrates high quality level components: Berco, Rexroth, Trasmital.*

STANDARD EQUIPMENT

- Emergency mode of operation for engine
- Engine diagnostic system
- Diagnostic panel for hydraulic functions
- Transport securing lugs on crawler units
- Access ladder on upper carriage
- Hydraulic openable
- Lower guide
- On-board lighting set
- On-board tool set
- Electric refuelling pump
- 360° turret rotations
- Concrete pipe alongside the mast foot
- High-comfort operator's H-CAB (width: 1050 mm)
- Protective roof grate *(FOPS compliant)*
- Air conditioning system
- Radio and CD player

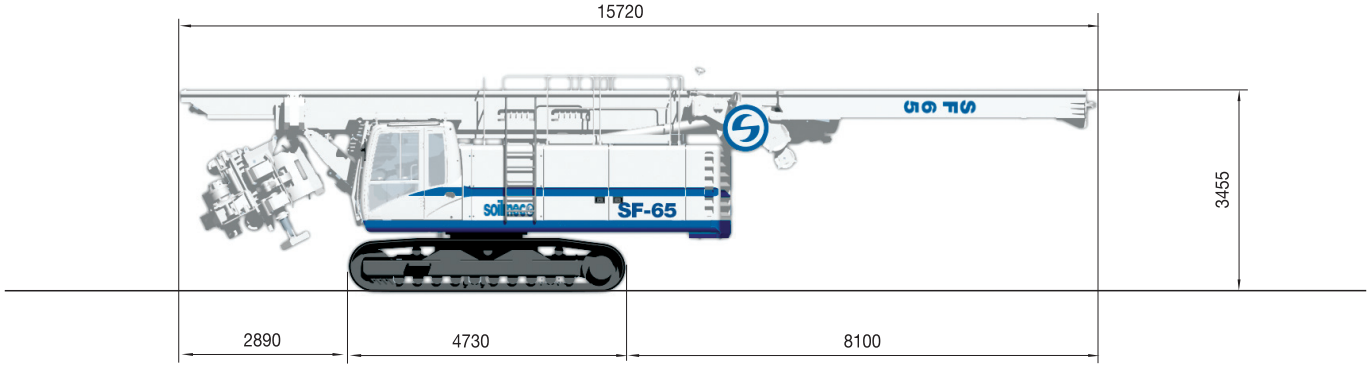
OPTIONAL EQUIPMENT

BASE CARRIER
- Central lubrication system
- Biodegradable oil
- Handrails for upper structure
- Radio control for tramming
- Pressurized air conditioning system
- Turret area guard
- EU stage IIIA, US EPA Tier 3 diesel engine

DRILLING EQUIPMENT
- Swivel for auxiliary rope
- Videocamera attachment

SF-65 Hydraulic CFA Rotary Rig

TRANSPORT, DIMENSIONS AND WEIGHTS



Transport configuration		
Width	**2980 mm**	*117.3 in*
Length	**15720 mm**	*619 in*
Weight	**50000 kg**	*110231 lb*
Minimum transport weight (w/o counterweight, rotary)	**36500 kg**	*80469 lb*