OFFICIAL



Project Ref: PP9652/Lon

Jakeer Mohammad Network Rail West side Offices Euston Road Kings cross N1C 4AP Tel: 02079 224922 07709 483135

Method Statement Cover Sheet

CONTRACTORS METHOD STATEMENT

Method Statements will require a minimum of 10 days for review and comment. For works undertaken in a possession or where an associated Form -F002/F003- for temporary works is required 20 days should be allowed. A Method statement ACCEPTED BY Network Rail must be in place 10 days prior to work commencing on site.

Project Title:	Rotary Piling @ 156 West End Lane, West Hampsted			
Contractor:	OH Piling Ltd			
Method Statement Numb	ber: 1			
As part of the works ass that we propose to carry affect the operations of	ociated with the abo out the following op the Railway	ve Contract we wish to i erations of work, which	nform you may	
Activity:	Rotary Piling for Bear	ing Piles		
Proposed Start Date:	WC 31/01/22 TBC	;		
Approximate Duration:	6 – 7 Weeks			
Description of Works:	Installation of 600mm Section	Diameter Rotary Bearing	Piles with UC or CHS	
Prepared by (Contracto				
Jonathan Wilson	JWilson		26/01/21	
Jonathan Wilson Name	<i>GWilson</i> Signature	Designation	26/01/21 Date	
Jonathan Wilson Name Checked By (Contracto	<i>GWilson</i> Signature	Designation	26/01/21 Date	
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Jonathan Wilson Name Checked By (Contracto Name	Signature Signature	Designation	26/01/21 Date	
Jonathan Wilson Name Checked By (Contractor Name Approved By (CRE Co Name Registered Office	Signature Signature Signature nstruction_/ Principal Signature Network Rail Infrastructure : Network Rail Infrastructure	Designation Designation Designation Designation Designation Designation e Limited ersholt Street, London, NW1 2DN	26/01/21 Date Date tive) Date	

www.networkrall.co.uk



Client	Henry Construction Projects Ltd				
Project/Task	156 West End Lane, Wes	t Ham	ostead, NW6 1l	JF	
Job No.	Date 14/12/21				
OH Contacts	Operations	Jonathan Wilson		Tel no.	07450262517
	Site Supervisor	Daniel Wilkinson		Tel no.	07854474187
	HSQE Dept	Luke Hands		Tel no.	020 8754 1227

Revision Status

Initial	Name	Position	Date	Signature
Prepared by	Jonathan Wilson	Operations	14/12/21	JWilson
Reviewed by	Adrian O'Grady	Director (OH)		
Client Acknowledgement by				

Rev no.	Revised by	Date	Amendments
А	J Wilson	26/01/22	Revised for installing piles through RW Toe

EMERGENCY CONTACT DETAILS			
Jonathan Wilson	07450262517		
Adrian O'Grady (Managing Director)	07809 146710		
Site location is:			
156 West End Lane, West Hampstead, London, NW6 1UF			
Hospital location is:			
Royal Free Hospital, Pond Street, London, NW3 2QG			
(Distance from site 1.6miles)			



BRIEFING SHEET

By signing this method statement, I confirm that I have been briefed on its contents and understand my personal responsibilities to work in accordance with the RAMS and to **not undertake** anything which adversely affects my own safety, or that of others

I understand that I must stop work and notify my Line Manager if I cannot complete my work in accordance with this method statement.

I understand that I have a responsibility to challenge & report unsafe acts and conditions; copies of any reports shall be passed to the site manager and to OH Piling's H&S Dept.

All accidents must be reported directly to the OH HSQE Dept. on 020 8754 1227

I understand that mp3 players, or other personal entertainment items must not be used in operational areas. Telephone calls must only be taken from a position of safety. Mac	:hines
must be brought to a halt before calls are taken.	

A OH Permit to Work must be completed fully and signed off.	Date	Name	Signature	Job Role	First Aider?
You must wear your PPE in accordance with the site rules and this RAMS. PPE must be maintained in a reasonable condition.					
You must not attempt to start work if you are in possession of, under the influence of alcohol or illegal substances. You may be tested at any time under the OH Policy.					
Your work must stop and be reviewed if it is putting members of the public or other contractors at risk.					
Make sure other contractors are excluded from your work area.					
You must only carry out work for which you are trained and competent.					
All plant & vehicles movements must have a Banksman in attendance.					
Edge protection or fall arrest must be in place for work at height.					
All plant & equipment must be inspected and maintained in good working order.					
Use the correct tools & equipment for the task at hand. Do Not Improvise.					
All work areas must be kept clean & tidy. All debris to be placed in the correct waste skip.					

	Title	Combined Method & Risk Rotary Piling	Piling Ltd
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Amendments to RAMS

List below any changes in site	e specific hazards that have	been introduced
What additional controls have been implemented to address the risks? Any changes which may impact Network Rail will require a resubmission of the document.		ess the risks? a resubmission of the
Briefed By:		
Name	Signature	Date



Dynamic Risk Ass	essment
	Before You Start
a	
Complete at the place of	Do you have a nisk assessment, method statement or work instruction covering the task?
work, before you start	
,	2 Does everyone have the correct PPE?
	3 Do you have the correct tools / equipment, in good condition & PAT tested
Anousan blan WB afana	If appropriate?
Answer the "Before	4 Are other people (including the public) protected from your work?
You Start" questions	5 Are health risks such as dust, noise, HAVS, and manual handling controlled?
	6 Do you have sendrable fire estimationals, first aid kit and call kit?
	7 Do you know who your 1* Alder is?
Review the "Hazards"	B Do you have safe access and egress for pedestrians and machines?
list	9 Does everyone have the necessary competences to complete the task?
	10 How measures have not in place to contact the endowment from
	pollution etc?
	11 Are all the necessary Permits to Work in place?
· · · ·	a ne al lie necessary remits to work in pacer
Are the	12 Do you have copies of all relevant (and current) plans / drawings?
Hazards	
adequately	+(No)
controlled?	
T T	
1	STOP WORK
Nes	STOP WORK
Tes	
—	
1	
All team members briefed and	Inform your Line Manager.
signed onto the risk segerement	Agree a Cafe Suctors of Work
signed onto the risk assessment	Agree a Sare System of work
Start work.	
Keen checking for new bararde	
Reep checking for new nazards	1
Are these Harards / Bisks present # MOT on	atrailed Are these Hazards / Risks present & NOT controlled
Are clear natares / hats present a NUT co	in the most material present a nor controlled
1 Falls from height	16 Poor storage / housekeeping
2 Falling or flying objects.	17 Underground / Overhead Services
 Chemicals or harmful substances 	18 Manual handling
	10 Processing
 Heat, fire or explosion 	29 Poor lighting
4 Work near water	20 Temperature (High / Low)
6 Risk to plant / property	21 Adverse weather (high winds, ice, snow)
7 Contact with stationary object	22 Defective or uncertified equipment
4 Object overturning or collapsing	23 Risk to you from the work of others
d Clier tries of fulls on the same level	24 This should be for an and
 Slips, trips or faits on the same rever 	Risk to others / public from your work
30 Entry into a continedapace	25 Stored energy
31 Dust / Furnes / Vapours	26 Moving plant or vehicles
32 Deep Eccavations (>1.2metres)	27 Security
33 Noise / Vibration	28 Temporary works
34 Poor ground conditions	29 Other (state)
15 Electricity	and the factor
22 LINCOLLY	30 Training / Supervision



Scope of Works

The installation of 17 No 600mm Dia Rotary Bearing Piles with either a 254x254x89 UC section or CHS 273x12 both x 10m. & 16no 600mm Bearing Piles constructed to the required design depths for the East Block. The site is located off West End Lane, West Hampstead behind Wickes DIY Store. Piles to be installed with the use of a Rotary Piling Rig. The rig will be working adjacent to live Network Rail's West Hampstead Thameslink track – all protection to be provided and arranged by HCPL. All OH Site Operatives are to make themselves familiar with the NR standard CP0063 Appendix A and the CPA guide Mobile Cranes alongside Railways Appendix B.

These works will be carried out over in one visit.

Plant List:

- 1No. Casagrande B175 Hydraulic Piling Rig
- 1No. 22T 360 Excavator c/w minimum 1T lifting eye + operator (in full time attendance 10hr shift, Henry Construction to supply) When using the 22T 360 excavator in a location where it could collapse within 4m of the NR boundary, then it must be derated by 25%.
- 1No. Diesel Jet Wash Bowser
- 1No Diesel Bowser
- 1No Z45 Cherry Picker

All services, including existing public fowl sewer to be diverted to mitigate any issues with the piling works. To assist with minimising any potential damage to subsurface sewage infrastructure, all services to be relocated/diverted within the piling mat areas, any services within close proximity are to be clearly marked and protected by Henry Construction Projects.

OHP permit to work to be signed by Henry Construction prior to any piling commencing on all sites.

Testing:

- 100% integrity testing
- 1No. set of 4No. concrete cubes per piling day. Cubes to be tested at 7, 28, 28 & 56 days
- Load Testing N/A

Pile mat thickness to be monitored regularly as works progress due to rutting, spragging, inclement weather, excavator scraping away pile spoil on a daily basis which may reduce the design thickness.

Setting Out Engineer to be in full time attendance to carry out spot levels at regular intervals to check any deterioration in the pile mat thickness as works progress. Engineer to also mark out and check positioning of piles both before and after installation.

Rig	Commencement Date	Approx duration of works
Casagrande B175	WC 31/01/22	4 Weeks

Method of Work and Control Measures

Prior to work commencing

Member of Contracts shall ensure:

- A visit to site is carried out prior to work commencing & a copy of visit report to be provided to site.
 - Site specific hazards (eg underground services, overhead services & contamination etc) are identified and suitable control measures identified.
 - Platform requirements are communicated to the client/main contractor.

Combined Method & Risk Rotary Piling



That crew deployed to site have necessary competencie	es
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eren acproyed to site nave necess	
Piling Foreman / Supervisor	CPCS / NVQ Piling Operations
Piling Rig Operator	CPCS / NVQ Piling Operations
Banksman	CPCS Slinger Signaller
Concrete Pump Operative	CPCS Trailer Mounted Concrete Pump
Excavator Driver	CPCS Excavator (180° or 360° depending on site) Supplied by Henry
	Construction Ltd.

The Main Contractor / Client will be responsible for

- In accordance with HSE guidance HSG47, the location, identification and marking of underground services within the working area and taking the necessary precautions to protect and avoid them. (eg isolation, diversion, shrouding etc)
- Providing a suitably designed, constructed and maintained working platform for the duration of the contract. Test
 information shall be passed to the designer for review. The FPS Working Platform Certificate shall be signed by an authorised
 person from the Main Contractor to confirm that the installed platform is capable of providing a stable base for the rig
 deployed to site. This must be signed prior to the rig being erected. The Working Platform Regular Inspection Log shall be
 completed after any platform disturbance or at least once per week.
- Advising on known or likely ground contamination.
- Signing the OH Permit to Work to confirm the above has been completed.
- Protection of public / 3rd parties from concrete / falling spoil going beyond site boundary. If public footpaths or parking areas are adjacent to the piling area then additional precautions (eg watching/divisions/protection) should be employed
- Protection of road surfaces, pavements, buildings & services

The Foreman shall:

- Walk the work area & confirm that all hazards are adequately controlled prior to work commencing.
- Ensure that client/main contractor has signed off the Working Platform Certificate to verify that the platform has been installed in accordance with the platforms design.
- Check that the client / main contractor has carried out checks / protection for underground services.
- Ensure that sufficient PPE provisions are available & that it is worn in accordance with OH & Main Contractor requirements. Mandatory PPE is safety helmet, safety footwear, light eye protection and & hi-viz clothing. Other PPE in accordance with risk assessment.
- Check that the rig, lifting accessories and other plant have in-date certification before use.
- Ensure that daily inspections are carried out on all plant and equipment & a record of inspection completed. Any problems/defects must be reported to the Contracts Manager immediately. All machinery shall only be operated by trained & competent persons.
- Ensure that a suitable excavator with lifting point has been supplied in full time attendance. The Foreman will induct the attendant driver into the piling process & check certification. Excavator Induction Checklist to be completed.
- Ensure that the Permit to Work is signed prior to work commencing, and thereafter on a WEEKLY basis.
- The OH Permit & WPC must be signed before erecting the rig.

Mobilisation & site set up

All vehicles will be supervised by a Banksman and enter site as per the designated route agreed at Pre-Start Meeting.

The foreman shall

- Make sure any building, services or footpath is protected before any unloading takes place.
- All loading, unloading and maintenance will take place towards the middle of the site as far as practical from the NR boundary



- Assess the area designated for unloading & storage, taking into consideration surrounding buildings, other contractors, pedestrians, traffic routes etc. Safety barriers may need to be used to segregate the lift from other activities and/or pedestrians.
- Make sure that all loads are checked for security before unloading commences. In the event of a load having moved or become unstable in some way during transport, unloading will not continue until a safe means of unloading has been determined. Unstable loads should not be allowed to tip or fall to the ground unless there are no other safe options & only after a risk assessment has been completed with the Line Manager.
- Agree a sequence of unloading with the delivery driver. All instructions regarding unloading of equipment and materials to come from one nominated person.

Where possible equipment & materials will be pre-slung to facilitate offloading. Edge protection shall be fitted to trailers, or soft landing systems deployed to prevent injury by falls from height. Access to trailers will be from a secured or footed ladder.

Avoid unloading rigs on inclines. The Banksman will position himself forward of the loading process so that all rig movements and the rig operator are clearly visible. NO ONE must be allowed to stand at the side or behind the vehicle being unloaded. All instructions to the rig operator must come from a single Banksman.

The crew shall maintain good housekeeping at all times to reduce slip/trip hazards.

Waste materials will be kept to a minimum & disposed of in accordance with the site's waste management plan.

Fuels will be stored in double-skin fuel bowsers or jerry cans at a designated point agreed by the Main Contractor

Setting Out

Setting out shall be carried out on site by coordination with the site foreman. The engineer shall set out positions on the platform, denoting each position with a setting out pin covered with a mushroom cap, and the pile reference clearly marked.

The sequence will be agreed by the site foreman and carried out prior to piling commencing. Where the engineer is required to take measurements in the vicinity of the rig or concrete pump, this shall be under guidance from the banksmen, and always greater than 5 metres away.

Rigging & de-rigging, attaching & securing augers / casing

The rig will be rigged up in accordance with the manufactures instructions (refer to operators manual).

Working at height to be avoided where possible.

 *Cherrypicker (MEWP) – These will be operated by a competent operative wearing a work restraint harness. Plant movements will be controlled by the Banksman. The excavator will lift sections of auger & remain stationary. Excavators will not move whilst cherry pickers are adjacent to the rig. An operative will be at ground level to operate the ground controls in the event of an emergency.

Rig Operation

The position of each Pile will be set out by Henry Construction and referenced with the Pile number prior to drilling.

A trained and competent Operator and Banksman must be in attendance when operating and/or moving the rig.

A Banksman must be in attendance with the rig driver when operating or moving the rig.

Throughout the piling process a minimum 10metre exclusion zone around the rig will be safeguarded by physical barrier or policed by the Banksman to prevent access by other contractors. The piling area shall be dedicated to piling personnel; with other contractors excluded without permission to enter.

The piling rig will tracked into position under the supervision of the Banksman. Prior to the commencement of drilling, the mast will be checked for verticality in both orientations by reference to a spirit level.

Whilst the mast of the Rig is in a vertical position the tip of the boring tool will be lowered and manoeuvred to be directly into the centre of the relevant Pile location pin.



Based on the Soil Investigation Report, casing may be used. If used, the boring tool will pre-drill to permit the temporary casing to be placed as necessary. The casing will be lifted by the Piling Rig and inserted into the bore to achieve a seal by the operation of the Rig.

Installation of Bearing Piles Through Wall Toe

The pile bore will be extended by the Piling Rig to the top of the man-made obstruction by the use of segmental casing. Once the auger has reached the top of the obstruction a variety of drilling tools will be used to bore through the obstruction. When the rig has bored through the obstruction the pile will progressed to the required depth in accordance with the relevant drawing and Pile schedule.

During boring, the boring tool will be extracted and the spoil will be deposited adjacent to the bore. At regular intervals during boring, spoil arisings built up adjacent to the bore will be cleared by the attendance excavator. This will be removed at a later date by Henry Construction to a designated stockpile.

ORIENTATION OF PILING RIG ADJACENT TO THE RAILWAY

Henry Construction to appoint a 360° excavator for handling waste materials and Pile arisings.

Once the correct depth has been reached this will be checked by tape and recorded on the Pile record sheet.



Concreting

Concrete of the specified mix shall be used to construct the Piles. The concrete will be delivered in ready mix trucks using the designated access routes and will be routed through the site to the Pile head position with a Banksman in attendance at all times.

Prior to concreting, a OH Piling operative will inspect the concrete ticket, ensuring the concrete is of the correct specification.

The concrete will then be visually inspected to confirm its satisfactory condition prior to each discharge into the bore. This stage of the operation will be directly controlled by the OH Piling Banksman using signals to the concrete wagon driver.



Concrete will be placed by direct discharge into the Pile and will finish below the base of the retaining wall toe with sufficient distance to accept the installation of the UC or CHS Section.

The UC or CHS Section which will have pre-drilled holes at the top will be lifted and placed into the bore by the Tower Crane. The UC or CHS Section will be placed at the correct level and suspended in the bore by the use of hanging chains

The concrete level will then be topped up as required to finish below the RW Toe as required.

The suspended UC or CHS section will be suspend until such time the hanging chains can be removed and the remaining pile bore can be filled with pea gravel. The pea gravel will be topped up as required during the removal of the temporary casings.

When Piling operations have been completed the process shall be repeated at the next Pile position. No Piles will be left open hole, and an exclusion zone must be maintained around recently cast Piles for safety reasons.

Installation of Bearing Piles

The pile bore will progressed to the required depth in accordance with the relevant drawing and Pile schedule by the use segemental casing to achieve the necessary seal and a variety of drilling tools.

During boring, the boring tool will be extracted and the spoil will be deposited adjacent to the bore. At regular intervals during boring, spoil arisings built up adjacent to the bore will be cleared by the attendance excavator. This will be removed at a later date by Henry Construction to a designated stockpile.

Henry Construction to appoint a 360° excavator for handling waste materials and Pile arisings.

Once the correct depth has been reached this will be checked by tape and recorded on the Pile record sheet.



ORIENTATION OF PILING RIG ADJACENT TO THE RAILWAY INFRASTRUCTURE DURING NORMAL RAILWAY OPERATIONS.

Preparation & installation of reinforcing

Reinforcement cages shall be:



Produced on site will be constructed on fabrication trestles by CSCS trained personnel, working within a fabrication area on the piling mat. Subcontract Steel fixers will be required to work to our risk assessments.

Reinforcement will be lifted by the attendant excavator or crane. The weight of reinforcement carried by an excavator shall not exceed 1000Kg. A separate Lift Plan shall be produced where a crane is deployed.

Chains of sufficient capacity will be attached to the excavator's specified lifting eye on the dipper arm by means of a shackle. Lifting accessories must not be wrapped around excavator buckets. Cages shall be transported around site horizontally on two leg chains.

Tag lines will be used where necessary

Chains will be securely attached to the reinforcement cage at the designated lifting point and lifted and placed into the pile. Cages without lifting points will be lifted with the chain or strop choked around the rebar and the helical, or link on the cage.

Operatives who do not hold a Slinger/Signaller card must not sling any loads unless under the direct supervision of a competent Slinger/Signaller.

In the event of crane usage on site for this discipline the following considerations are to apply: -

The chains will be securely attached to the reinforcement cage at the designated lifting points and tag line attached.

Cages without lifting points will be lifted with the chain or strop choked around the rebar and the helical, or link on the cage.

Operatives who do not hold a Slinger/Signaller card must not sling any loads unless under the direct supervision of a competent Slinger/Signaller.

Debonding foam will be placed on the reinforcement cage projection bars if requested and allowed for. OHP cannot be held responsible for debonding foam that slides off the projection bars during the concreting operation.

Debonding foam is placed to ease the breaking down of concrete; concrete will still need to be broken down by hand for at least the final 300mm above cut off level without debonding foam (The use of mechanical crunchers may snap off reinforcement projection bars and fracture the Pile shaft).

The cage will be lifting by the attendant excavator or piling rig and suspended in the pile bore at the correct level by the use of hanging chains.

Concreting

Concrete of the specified mix shall be used to construct the Piles. The concrete will be delivered in ready mix trucks using the designated access routes and will be routed through the site to the Pile head position with a Banksman in attendance at all times.

Prior to concreting, a OH Piling operative will inspect the concrete ticket, ensuring the concrete is of the correct specification.

The concrete will then be visually inspected to confirm its satisfactory condition prior to each discharge into the bore. This stage of the operation will be directly controlled by the OH Piling Banksman using signals to the concrete wagon driver.

Concrete will be placed by direct discharge into the Pile.

When the concrete has reached the hanging chains for both the pile cage and permanent sleeve these will be removed.

When Piling operations have been completed the process shall be repeated at the next Pile position. No Piles will be left open hole, and an exclusion zone must be maintained around recently cast Piles for safety reasons.

Once the Piles have been trimmed to cut-off level, integrity testing may be undertaken.

Cube Making & Testing

Concrete cube samples will be taken on site and tested (off-site) in a UKAS accredited laboratory. The frequency of concrete sampling, cube making and testing will be in accordance with the ICE Specification for Piling and Embedded Retaining Walls.



A minimum of four cubes shall be made from each sample. Unless otherwise stated in the Project Specification, a minimum number of samples shall be taken as follows: -

- Each of the first three piles on site
- One sample per shift
- Every 75m3 of concrete cast during the same shift
- At least one sample for each pile requiring concrete of strength class C35/45 or above
- Two additional samples after interruptions of the works longer than 7 days.

One cube shall be tested at an age of 7 days, two at 28 days and one at 56 days.

Cubes and sampling; the hazards and risks associated are contained within the concrete pumping Risk Assessment of this document.

Throughout the Pile construction process, the appropriate construction and inspection records and activities will be maintained in accordance with the Safety Management System, Works Procedures and the Specification

On Site Fabrication of Augers

On site fabrication of augers etc. shall be carried out in a separate area free from combustible materials. The area shall be surrounded by screens to protect others from arc-eye etc.

Gas cylinders shall be stored securely upright to prevent damage/accidentally being knocked over.

The fabricator shall wear the correct PPE: full face shield, long sleeve flame retardant overalls, leather gauntlets, safety boots and respiratory protection when required.

At least 1 no. 2kg extinguisher in proper working order must be kept in the immediate area of the work and used immediately smoke or smouldering or flames are detected.

The work area must be inspected approximately 60 minutes after the completion of work and immediate steps taken to extinguish any smouldering or flames

Security

Foreman will make sure that adequate measures are taken to prevent the theft or unauthorised use of equipment/materials. This will include locking away all tools in the van or lock up, removing keys from plant & equipment where fitted, when not in use and left unattended & using cab guards if fitted.

All plant be moved away from the NR boundary when not in use.

Leaving site

The work area shall be left in a clean & tidy manner

The Foreman will make sure that the rig is configured for transport in accordance with the manufacturer's instructions, making sure all securing bolts & pins are correctly fitted and that the rig is safe to transport.

All excessive spoil must be cleaned off the rig, augers and associated plant.

The Foreman shall make sure his Foreman's Completion Form is signed off by the main contractor before leaving site.

Communication and liaison

OH site operations will be under the full-time supervision of a competent and experienced Foreman who has completed Supervisor Training (NVQ3 / SSSTS). The Site Foreman for this project will be identified in due course upon specific request.

The Foreman will be responsible for daily routine operation; preparation and submission of all daily records; receiving and acting upon formal site instructions; and reporting site conditions which may require variations to this method statement.

The Foreman will report directly to the Jonathan Wilson on a regular routine basis or on specific instances when necessary.

The Manager responsible for this project is **Jonathan Wilson**

Site safety tours are carried out at regular intervals by our Safety Dept and Management personnel



Emergency plans

Main contractor will induct all site operatives into the site specific emergency arrangements.

OH crews are equipped with a number of 2kg dry powder extinguishers and first aid provisions to complement the main contractor's arrangements.

Emergency First Aid & Fire Awareness training has been completed by the crew.

Spill kits will be provided and our crews instructed in their use.

All accidents & near misses must be reported directly to the OH **HSQE Dept. on 020 8754 1227** and the Main contractors site manager.

NETWORK RAIL EMERGENCY PROCEDURE

London, 156 West End Lane - new development

TO STOP TRAINS IN AN EMERGENCY

- 1) TELEPHONE West Hampstead Signal Box Panel 2 : ON **020 7644 8577** VIA SITE PHONE or MOBILE PHONE.
- 2) STATE THAT IT IS AN EMERGENCY.
- 3) GIVE YOUR NAME, TELEPHONE NUMBER AND COMPANY.
- 4) STATE LOCATION INCLUDING MILEAGE.

From 3M 60Ch to 4 M 05 ch (ELR: SPC1) Signals Down Slow: WH882 to WH439 UP Slow: WH218 to WH235/WH222 Down Fast : WH31 to WH 35 Up Fast: WH 22 to WH18 Up Hendon : WH444 to WH31 Down Hendon: WH31 to WH441 Run Round Road: Buffer stop to WH441

- 5) STATE TRACKS AFFECTED AND SAY WHAT HAS HAPPENED.
- 6) SAY WHICH EMERGENCY SERVICES (IF ANY) ARE REQUIRED.
- 7) REMAIN IN CONTACT UNTIL YOU ARE ASSURED THAT NO FURTHER INFORMATION IS REQUIRED.



Phonetic Alphabet							
A lpha	G olf Y ankee	Mike	Sierra				
Bravo Charlie Delta Echo Foxtrot	Hotel India Juliet Kilo Lima	November Oscar Papa Quebec Romeo	Tango Uniform Victor Whiskey X-ray	Zulu			
8) IF OVERH TELEPHC	IEAD POWER SU NE OVERHEAD	IPPLY NEEDS TO I ELECTRIFICATION	BE TURNED OFF				

01904 525952

STATING LOCATION: London, West End Lane (SPC1@ 03M 7 Ch)







Our Lifesaving Rules

Safe behaviour is a requirement of working for Network Rail. These Rules are in place to keep us safe and must never be broken. We will all personally intervene if we feel a situation or behaviour might be unsafe.

Working responsibly

competent.

Working with electricity



Always be sure the required plans and permits are in place, before you start a job or go on or near the line.



Always use equipment that is fit for its intended purpose.

Never undertake any job unless you

have been trained and assessed as

Never work or drive while under the

influence of drugs or alcohol.



Driving

Always obey the speed limit and wear a seat belt.

device, while driving.

Never use a hand-held or hands-free

phone, or programme any other mobile

Working at height



Always use a safety harness when working at height, unless other protection is in place.

Working with moving equipment



Never enter the agreed exclusion zone, unless directed to by the person in charge.



Always test before applying earths or straps.



Never assume equipment is isolated – always test before touch.

We will always comply with our Lifesaving Rules

For more information about our Lifesaving Rules go to safety.networkrail.co.uk/LSR

> everyone home safe every day



Directions to Nearest Hospital



SERVICE STRIKES

- **Electric** Switch machine off & evacuate all personnel on the ground. The rig operator must remain in the rig. Do not attempt to disengage the cable from the auger. Do not touch exposed cables.
- Gas Switch all machinery off & evacuate all personnel to safe distance. Extinguish all naked flames. No smoking. Gas emergency number is 0800 111 999

SPILLS

Eliminate sources of ignition. Contain spillage in booms or sand or absorbents. All contaminated items & oil must be returned to your office/depot & be disposed of at an authorised disposal facility.

Mechanical / structural failure that puts persons at risk

In the event of a failure, stop all operations and if possible bring the machine to a safe condition. Isolate the machine (eg key out) and if possible, set up an exclusion zone.

MEWP Rescue Plan

LONE WORKING SHALL NEVER BE CARRIED OUT. THERE MUST ALWAYS BE A SECOND AUTHORISED PERSON AT GROUND LEVEL THAT IS FAMILIAR WITH THE MEWP'S OPERATIONS

A separate briefing on this emergency plan shall be carried out to ensure that a crew member at ground level can take control of the MEWP.

Emergency Situation	Proposed Action
Failure of basket control functions while elevated	Operator will utilise the auxiliary controls from the platform to lower the boom back down to safety
Failure of basket auxiliary controls	Operative at ground level to use the normal ground controls
Operator in basket is incapacitated	Operative at ground level to use the normal ground controls



Operative at ground level to use the emergency auxiliary controls

Suspension Trauma

A Person suspended upright in a harness should work lower body muscles in order to pump blood back up to the heart. Lift legs as high as possible and head as close to the horizontal as possible & frequently push down vigorously with legs to assist circulation. Push against any available footholds to raise body and minimise the body weight.

RESCUERS SHOULD notify emergency services advise of potential suspension trauma. If the suspended person has lost consciousness do <u>not</u> move them to a horizontal position too rapidly. Take 30-40 minutes to move them from kneeling to sitting before placing them in a horizontal position in order that the heart can re-adjust to the increase in blood flow. <u>NEVER</u> <u>LAY THEM FLAT!</u> Treat all fall situations as medical emergencies unless rescue is almost immediate.

<u> Covid - 19</u>

Covid-19 is a new illness that can affect your lungs and airways. It is caused by a virus called Coronavirus. Symptoms can be mild, moderate, severe or fatal.

What is COVID-19

Coronavirus disease (COVID-19) is an infectious disease. Most people infected with COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease and cancer are more likely to develop the disease.

The best way to slow down and prevent transmission is to be well informed about COVID-19, the disease itself and how it spreads. Protect yourself and others by washing your hands or using an alcohol-based rub frequently and prevent touching your face at all times.

COVID-19 Symptoms

- High Temperature/fever feeling hot to touch on chest or back
- New, continuous cough coughing a lot more than an hour or three or more episodes in 24 hours.
- Shortness of breath change in normal breathing routine
- Loss of taste no longer taste food or drink
- Loss of smell no longer smell, may lead to sore/blocked nose

Anyone who feels at risk, concerned for their own health, is experiencing any symptoms listed above and are concerned for their wellbeing and that of their friends and family are to contact Jonathan Wilson 07450262517 and are advised to self-isolate, then contact 111 immediately.

All operatives shall:

- Ensure a minimum of 2 meters is kept between any persons at all times
- All operatives are required to carry a safety mask at all times in case the need to wear one arises
- Wash hands at regular intervals for at least 30 seconds



- Monitor their own and others health on site, ensuring any operatives showing symptoms of COVID-19 leave site and isolate for a minimum of 2 weeks
- Ensure correct safety gloves are worn at all times
- Travel to and from work following government guidelines
- For any further advice or information please visit https://www.nhs.uk/conditions/coronavirus-covid-19/



RISK ASSESSMENT				
Persons Affected: Piling Crev	w, other	contractors on site, members of the public		
Significant hazards	Initial risk	Control Measures	Residual risk	Responsibility
Site wide risks	Medium	 Site visit by contracts. Site induction. Mandatory PPE at all times – safety helmet, high visibility clothing, protective footwear, eye protection, gloves 	Low	All
Contact with underground services		Permit to Work to be signed by the Clients senior representative on site or by a senior manager employed by OH prior to any drilling work commencing. In accordance with our Permit to Work System, if for any reason the following cannot be achieved, the office will be notified before work commences.		
	High	 Drawings shall be available on site for utility providers The working area and 5 m surrounding the working area has been scanned with Cable Avoidance Tool used by a competent person 	Low	All
		• Any services within the working area and 5 m surrounding have been exposed and their location marked clearly across the whole of the working area		
		• Rigs must not be operated within 1000mm of a service (15metres for gas unless client has contacted the service provider and specific instructions issued in writing)		
		Underground Services will always be assumed to be live		
• Overturning rig or machinery due to		 Qualify working platform requirements and responsibilities prior to work commencing. 		Contracts
 Overturning fig of machinery due to poor design, poor installation & 		• Maintenance of working platform in accordance with the contractual requirements throughout the contract.	Low	Manager
maintenance, Removal of	High	 Correct reinstatement of platform disturbances to the original specification 		
obstructions	Hign	 OH Foreman not to enter on to piling platform until completed. Foreman to monitor during our operations & report to Main Contractor / OH Manager 		Main Contractor
		 Any area of a piling platform that has been disturbed will require an additional Working Platform Certificate to be signed off by the Principal Contractor 		Foreman
Rig overturning due to underground collapse / funnelling of non-cohesive or		• Use S.I information & previous experience of working in particular areas to establish whether there is an increased risk of underground collapse.		Contracts
granular materials	High	• Prevent rigs tracking over or drilling down close to fresh piles. Do not leave boreholes open. Avoid repeatedly drilling down and removing the auger from an open bore.	Low	Manager
		 Any interruption to the drilling process (eg blockage, obstruction etc) ensure auger is removed by back-screwing slowly to leave as much spoil within the bore as possible and minimise disturbance of surrounding ground. Do not lift augers directly out of the ground. Checks on platform thickness to make sure it hasn't been reduced. 		Foreman
Plant & vehicle movements		Access routes for lorries will be agreed with the Main Contractor before work commences		Contracts
 Obstruction of footpaths at site access and egress points: 	tion of footpaths at site	Site speed restrictions will be adhered to	Low	Driver /
Other road / site traffic movements,		• Consideration for room required for maneuvering the machine. Check for obvious hazards such as soft ground, narrow gaps, limited head-room, gradients and excavations		Machine operator



Collision with surrounding structures				
or plant/equipment during rig movements		 All reversing vehicles & rig/plant movements will be directed by a Banksman 		Banksman
Unloading piling rigs		 At pre-start meetings, identify what provisions/requirements the MC has, such as dedicated unloading areas, platforms &/or air mats that must be used 		Contracts
Damage to road surfaces / pavements		• Establish suitable safety zone. Warn people not involved in the mobilisation to stay clear. Safety barriers may need to be used to segregate the lift from other activities and/or pedestrians. Vehicle warning beacons will be used in public areas		
Plant or equipment falling from		 Load/unload on level and stable ground. 		
transport vehicle		 Check security of loads & agree sequence of unloading. 		Foreman
Slips, trips falls		• Plant & machinery offloaded by lorry mounted winches shall be secured by swaged ends or Thimbles & bulldog grips with a D-shackle. Open hooks must not be used under any circumstances		
Environmental conditions near	High	 All loading & unloading will be conducted under the direction of a trained Slinger/Signaller (CPCS) 	Low	
visibility, heavy rain, high winds, snow &	i ngri	 Protection of roadways and footpaths when rig/plant equipment is being loaded/unloaded on the highway. 	2011	
ice		• Trailer posts or kingposts used down the trailer edge to prevent items rolling off. Items that are liable to roll will also be chocked if they do not already have them.		
		• Inspect trailer bed for signs of damage or spills to ensure it is safe to walk on. Report missing or damaged equipment / boards on vehicles & trailers.		Driver
		• Track mats will be used where there is steel on steel e.g. steel tracks on a steel trailer bed, this will prevent the rig/plant equipment from sliding off the side of the low loader		
		• No one will be allowed to stand at the side of the vehicle being loaded/unloaded including the slinger/signaller.		
		• The ramp (if fitted) will be used to access the vehicle or trailer. (Access will not be allowed via the side bars) Climbing up the sides of trailers is not permitted. No-one should ever jump onto or off a vehicle – always use steps & handholds.		All Staff
Fall from Height.		• Where possible, avoid work at height by using tele-handlers or pre-slinging of loads.		
Whilst accessing trailer.Struck by moving or falling loads		• Prevent falls by using edge protection fitted to the sides of trailers. Where edge protection is not fitted, minimise injury from falls by the provision of soft landing systems.		Foreman
		• Safe access and egress from trailer in the form of a proprietary ladder or step system that forms part of the lorry, or a properly secured ladder. Inspect ladders for signs of damage & be free from mud or grease. Extend ladders past the trailer bed to enable you to step off whilst still having 3 points of contact		
	High	• LOOKING where you're going - DO NOT walk backwards whilst on the trailer. DO NOT RUSH! DO NOT USE A MOBILE PHONE	Low	
	Ŭ	• Where possible, the physical unloading should take place without anybody being on the vehicle. When this is unavoidable:		All Staff
		• Keep the number of persons at height a minimum - only those who need access to the vehicle for unloading should be allowed onto it.		
		• Ensure that the person on the deck/trailer bed is well out of the way when the load is being lifted.		
		o The initial instruction to lift the load must be given by the person on the deck/trailer bed		
		• Trained & competent operatives to be deployed.		Contracts
		• Rig must have a current 12-monthly Thorough Examination. Certificate must be available on site for inspection.		

	Title	Combined Method & Risk Rotary Piling		
 Rigging & De-Rigging Trapping, crushing or significant injury as a result of 	• All • Wł • Att • Rig	non-piling personnel to be kept clear during rigging operations. Exclusion zone to be put in place beforehand. here possible, working at height will be avoided by drilling down cending 360 excavator to be used to lift auger sections. The Safe Working Load of the excavator will not be exceeded. g controls will only be activated following clear audible instruction from Slinger/Signaller. Where possible, all rig controls to be		Foreman
head or mast controlled or uncontrolled movement of	iso • Saf	lated during work fety Devices will not be by-passed, nor be relied upon by the operator.		
 auger Fall from height Falling tools and materials Failure of auxiliary winch 	• Au, kno • The	ger to be held in the gate and remain attached to the excavator whilst the person in the MEWP is in position where they will ock in the pins. Top auger to be held in with split pins. e excavator will remain in position until the person in the MEWP has descended.		Slinger Signaller
 during operation Suspension Trauma Falls from height & falling objects 	• Ins wh	pect fall arrest equipment / safety harness before use and used whilst in MEWP. All tools and equipment to be stored safely ile climbing and descending.		Person Climbing
Lorry mounted crane operations	• All	crane movements & lifts will be completed under the direction of a Banksman		Foreman
 Overturning of the crane may occur through the following; Ground conditions. Tampering with safety devices. Lifting of loads above the Safe Working Limit. Collision with surrounding structure Failure of lifting equipment Damage or injury to passing vehicles & pedestrians by the position of outriggers, crane or load movements or when visibility is restricted 	 The is s Ful gro Out accontribution When the state of the st	e crane, lifting accessories and all safety devices to be inspected daily & the daily check sheet completed. All lifting equipment subject to a thorough examinations/testing. Ily extended outriggers will be used at all times. Outriggers must not be positioned where the ground could collapse e.g. on soft ound, at the edge of excavations, on or over manholes, etc. trigger mats must be placed under outriggers on all lifts. Scaffold boards or other off-cuts of wood found on site are not ceptable alternatives. here a HIAB has factory-fitted remote controls, these must be used at all times to allow the operator to stand in a position of fety nduct a test lift to make sure the lift can be carried out safely e.g. to check levels, outriggers don't sink, load is stable etc. I loads will be left suspended. ting points on loads shall be checked for signs of damage prior to being lifted. I vecognised slinging techniques will be used; Tag lines will be used when necessary.	Low	Crane Operator
	• Cra SW • Sta • Do • Lift	ane operator & Slinger signaller to ensure they are aware of the safe working load before the lift commences. Do not overload /L of crane or lifting accessories and clear of side of the vehicle being loaded/unloaded including the slinger/signaller not allow the load to swing over or into live traffic lanes or over people ting equipment will not be used for towing or pulling		All Staff
Piling Rigs operation	• Pre	event spoil & concrete going beyond the boundary of the site. If public footpaths or parking areas are adjacent to the piling area		Main contractor
Clearing spoilFailure of auxiliary winch during operation	High the	en additional precautions (watching/divisions/protection) should be employed Rig must have a current Thorough Examination. Certificate must be available on site. Trained & competent operators of piling rig. (CPCS) Trainees can operate rig under direct supervision of experienced rig operator.	Low	Foreman



	Piling Ltd		
 Noise Hit by flying or falling materials 	• Rigs to be fitted with interlock guards to prevent access to the rotating auger. Guards to extend from 500mm from g to 2m. Rigs to operate at slow rotation / inching when gate is opened	round level	
 Slins trins & falls 	Ensure that guard dimensions are considered at planning stage to allow guards to remain in place		
 Open boreholes Draigsting rainforcements 	• Rig inspection on a daily basis before use and during use by the rig operator. Record of inspection to be maintained guards are in place and all emergency stop buttons are functioning correctly.	. Ensure all	
 Frojecting remote the rotating auger Entanglement with rotating auger Contact /entanglement with moving parts of rig (eg track) 	• All rig movements will be completed under the direction of a trained and competent slinger/signaller.(eg CPCS) Mast til per manufacturer's instructions when tracking around site	ted back as	
	• Where fitted, hydraulic stabiliser legs to be used at all times when drilling. On soft ground, steel road plate to be used a front of the rig including both stabilisers when drilling	to span the	
Inhalation of dusts and exhaust fumes	• Where site specific risk assessment has determined that guards are not practicable a 2metre exclusion zone will be around the drill head using lightweight barriers. Two trip devices to be positioned 150mm from rotating auger.	established	
 Fluid / air injection from burst pneumatic hoses 	• Access within the exclusion zone will not be permitted when the auger is rotating. Ensure area is clear before activa Auger. No loose clothing to be worn by the Driller or Banksman.	tion of the	
	• Rig will not be used on gradients steeper than 5 degrees. Ramps should be 1:10 & of solid construction. The width of should be sufficient for the rig to track safely upon.	the ramps	
	Lifting equipment must not be used for towing or pulling		
	• Safety devices must not be by-passed but will not be relied upon by the operator.		
	• Prevent spoil travelling up the auger above head height. Augers must not be rotating when spoil is being removed by personnel should be away from the front of the rig when spoil is being removed by an excavator.	shovel. All	
	• Be aware of excavations adjacent to the platform. Ensure they have been protected / secured before approaching with	the rig	
	• Where possible site power pack in a well-ventilated area. Provision of ventilation or extraction equipment along with gas equipment fitted with an audible alarm. Ventilation to be maintained in accordance with the contractual require Foreman to monitor during operations & report to Main Contractor / OH Management Team.	monitoring ments. OH	
	• Piling area shall be guarded & policed by the Banksman to ensure that third parties do not injure themselves on freshly piles. If necessary, spray pile tops with marker paint upon completion	completed	
	• All non-piling personnel to be kept at least 5metres away from the rig during operations. Ensure area is clear before a the auger	ctivation of	Slinger Signaller
	All personnel should be away from the front of the rig when spoil is being removed by the excavator		
	Wire rope/hoist hook will be kept away from the auger when not in use.		
	 Personnel on ground to keep clear of rig whilst moving; 		
	Open boreholes to be covered		
	• Noise - All engine covers and panels on the power pack are to be kept closed during operation. Acoustic barriers to be built up confined areas. Operatives to wear ear protection when noise levels are above 85dB(A). Mandatory signs to be	erected in displayed	All staff
	• All steel should be placed to ground level whenever possible to minimise trip & piercing hazards. Protect all exposed platform level with protective caps e.g. mushroom caps.	bars above	
	• Check all hydraulic couplings are secure and all hoses for wear and tear on a daily basis. All hoses in operating area to be protective covers. Release all pressure and turn off the machine before uncoupling any hydraulic hose.	fitted with	

	Title	Combined Method & Risk Rotary Piling		
 Concrete Pumping (General) Burns & irritation from contact with wet concrete Entanglement in moving parts of plant Fall from height when operating mixer drum Manual handling Hit by moving hose 	 Irrsl A tr T C b Irr H 	Ispect all plant & concrete hoses before being used. All damaged equipment shall be returned to the Plant Dept. for repair. Hoses hould be moved wherever possible by mechanical means using lifting straps & not with an excavator bucket Il machinery will be adequately guarded and where necessary appropriate safety devices will be fitted e.g. emergency stop switches, ip wires etc. he site will be kept clear of trip hazards e.g. concrete hoses kept tidy and away from pedestrian areas concrete drums shall have appropriate length access ladder maintained in good order leading to work platform surrounded by arriers he previous PPE to be worn i.e. gloves, footwear, leggings (Shorts will not be allowed) and arms and legs will be covered. oses will be cleaned out thoroughly after use.	Low	Foreman Pump Operator
 siips, Irips ana Falls Hose blockages Hose whipping Strike by high pressure water/air/concrete 	High High	rent blockages by Use of smaller size aggregates for last load of concrete for the day. Use of steel pipe to reduce friction and allow concrete to flow easier The length of hose between the pump and rig to be kept as short as possible. Slump testing of all loads to determine volume of water that can be added to maintain a pumpable mix ling with blockages correctly Stop pumping immediately & release pressure inside the hose as much as possible Operative dealing with blockages to wear goggles or full face visor Treat system as though it is pressurised until confirmed otherwise. Never manually open or attempt to open the hose under pressure. Make sure the blow out valve is not directed at anyone, including yourself. Use gravity to empty as much concrete as possible from the rig & hose. Use mechanical means to free the blockage (eg with excavator bucket or auxiliary winch). Protect people against uncontrolled hoses & ejected concrete with minimum 10metre exclusion zone; Use boarding or the bucket of the excavator to shield against ejected concrete & strap or chain hose to rig or excavator bucket to prevent whipping Compressed air should only be used as a last resort when clearing blockages.	Medium	Foreman / Pump operator
 Cleaning out Hoses Hose whipping Strike by high pressure water/air/concrete 	• W High • S • P • C	/ash out adaptor to be fitted with a pressure relief valve and in good working order ump as much concrete as possible into a specified area. ecure catch basket to the free end of the hose to catch the sponge ball. ump water through the hose until it is backing up before inserting the ball onfirm all pressure has been released BEFORE opening lines	Low	Pump operator
Hose bursts	High • A • R	ll hoses should be date-stamped ig steels & swan neck to be examined during servicing for wear/thinning of walls	Low	Contracts / Foreman

	Title	Combined Method & Risk Rotary Piling		
 Injury /property damage from material ejected at high pressure Burns & irritation from contact with wet concrete 	• I c a r	high risk areas replace rubber hoses with steel pipes; run the concrete hose through a plastic sleeve i.e. Heave Sleeve (Any oncrete ejected during a burst would then be contained.) Position the pump outlet channel away from high risk areas; Use dditional bunding to contain spillages & screens to protect from ejected material; Use higher site fencing and if Herras type t ust be covered	this	
	• E i s • A s	nsure that hoses don't get kinked and protect them against other site vehicles Daily inspection by crew. Make sure the hoses good condition. Check daily for abrasions, deep cuts, damaged steel reinforcement. Also check end collars, couplings and ru eals for wear. Il hoses will be clamped & pinned. Hoses connected to the rig above head height will have secondary protection (whip che eals to be in good condition	s are bber ecks).	Pump Operator
 Attendant excavator - Lifting operations: unloading & setting up concrete pump, drum & cabin, transporting cages, clearing spoil Injury due to poor condition of equipment Contact with Collision with overhead cables or surrounding structure. Collision with pedestrian & other plant Competence of operators Driver falling or being thrown from machine Machine overturning due to Unstable ground conditions, overloading when lifting, tampering with safety devices Injury from plant movements. Crushing between the excavator & surrounding structures Restricted visibility Pedestrian struck by falling object (bucket, other attachment or load) due to Failure of lifting equipment, Poor slinging, Lifting of loads above SWL, Poorly maintained, Incorrect equipment 	 N Q Q<	Tachine to be operated by trained & competent drivers (eg CPCS) Third party drivers must be inducted into the OH procedur peratives who do not hold a CPCS Card Slinger/Signaller must not sling any loads unless under the direct supervision of a tra- inger/Signaller. Use recognised slinging methods Il excavator movements will be supervised by a trained and competent Slinger Signaller. Iake sure no one (pedestrians/ground workers etc) enters the danger zone while the machine is in operation. nder no circumstances will the machine or lifting accessories be overloaded se of barriers where a 600mm wide clearance cannot be maintained adjacent to surrounding structures where a person might apped heck lifting accessories for signs of damage/wear & that they have current 6-month thorough examination heck lifting points for signs of damage prior to being lifted. Tag lines will be used when necessary bad to be kept as low to ground as possible. long loads to be transported horizontally bads that are not identified in the lift plan will not be lifted. Confirm that the loads do not exceed the lifting capacity of the mac onduct pre-use checks & complete the Daily Inspection Sheet. Do not attempt to operate the machine if faults are found. ttaching & detaching of Quick Hitch devices must always follow the manufacturer's instructions. Safety pins must always be n semi quick hitch attachments. assengers must not be carried on excavators. Excavators must not be used to lift people. Always use the seatbelt he machine operator will make sure they know the lift capacity of the machine. revent unauthorised use, leave machine in a secure manner when not in use; switch off the engine & place the bucket or round. Keys must be removed. All loads to be removed from the hook.	es ined nt be <u>chine</u> used n the e. Do	Foreman Machine operator All Staff
 Operation by untrained / unauthorised persons Petrol cut-off saws 	High • (/orking below excavator buckets is prohibited nly authorised and trained operatives to use abrasive wheels. (trained to change abrasive disks)	Low	All staff

	Title	Combined Method & Risk Rotary Piling		
 Fire, Injury from wheel bursts & kickbacks Contact with rotating wheel or disk, Clothing/hair entanglement with moving parts, Inhalation of dust / fumes, Pressure washers	•	Inspect saw & discs for damage prior to use. Ensure operating speed is indicated. Loose clothing will not be worn by operators; Long hair to be tied back. Stand to one side of saw when cutting – do not stand in line Keep all persons clear of areas where sparks or dust is directed. Shield work area where possible; refuel at least 5 metres from cutting area Users will not use undue pressure and will use the right disc/wheel. Additional PPE: Hearing protection, overalls, goggles, and gloves. The operator will make sure that guards are fitted. Guards will not be removed except for maintenance purposes only Complete regular checks for signs of damage. Record on CON15.		
 Direct water jet injuries Electric shock from using damaged equipment or spraying water onto live electrics Risk of being hit by ejected material General health considerations Slips & trips from wet surfaces Risk of injury from kickback during startup Noise risks 	• High • •	Do not use a faulty pressure washer. Report any faults that you find to your line manager. Use only hose and accessories rated for pressure higher than the pressure washers' p.s.i. If the engine does not start after two pulls, squeeze trigger of gun to relieve pump pressure. Pull starter cord slowly until resistance is felt. Then pull cord rapidly to avoid kickback and prevent hand arm injury Goggles, waterproof gloves & clothing, safety wellington/boots, and ear defenders when necessary i.e. noise levels 85db and above. Use RPE where necessary Do not use any chemicals in the washer Do not stand in front of the cleaning jet. Hands must not be placed directly in front of the nozzle. Spray will be always directed from self and others. Consider neighbouring properties and windblown spray During operation, only touch the control surfaces e.g. Trigger & insulated areas provided on the Lance. Grip gun/wand firmly with both hands. The operator must not hold onto the hose or fittings. When not in use, relieve pressure by shutting off the engine or electricity supply; turning off water supply, and pulling the trigger until the water stops flowing. Unplug the pressure washer before attempting to clean it. Wand/Lance or hose fittings will not be attached or removed while the system is pressurised. Never leave a pressurised unit unattended Good housekeeping. Keep hoses tidy & clear of walkways. Exclude all non OH persons from area	Low	Operator
 Security Unauthorised use of plant by other contractors or trespassers 3rd party damage Theft of plant, equipment and materials 	Medium	Reduce risk of theft of plant & equipment. Eg. removing one wheel or fitting wheel clamps, chaining plant equipment to a fixed object; removing batteries, Fitting control arm covers; Lock small tools that are on hire in the property or van or secure store every night Remove keys from plant & equipment when not in use and left unattended. Hydraulic pressure to be relieved on control levers Store materials safely. e.g. pallets of cement stored at one level only to prevent them toppling over if kids climb on them. Diesel bowsers to be locked Where OH are responsible for the site, adequate security fencing and sufficient number of construction/mandatory warning signs will be deployed All plant to be moved away from the NR Boundary when not in use.	Low	All staff
Refuelling plant & machinery Fire & burns 	Medium	Engines to be switched off prior to refuelling; Re-fuel in well ventilated area and away from the NR Boundary	Low	All staff

	Title	Combined Method & Risk Rotary Piling		
 Irritation of skin through prolonged contact. Irritation of respiratory tract 		 No smoking/no naked flames when refuelling; Mobile phones must not be used. Fire extinguishers to be available in vicinity. Practice good hygiene; Wear impervious gloves. Do not overfill tanks. 		
MEWPSOverturning due to overreaching	_	 Selection of suitable machine for task with regards to S.W.L, required working height & outreach. Check that a maintenance certificate has been provided by the supplier. 		Contracts
 beyond machine limits. Collapse or overturning of machine due to soft, muddy or uneven ground conditions, trenches, obstacles, overloading, etc Overturning due to travelling with 		 Warning signs and barriers where there is a risk of passing vehicles or pedestrians being struck by the platform or falling materials. Platform must have guard rails and toe boards or other suitable barriers fitted; Banksman to direct all movements where visibility is restricted. Instructions required at ground level on how to lower the platform from ground position. Lone working is not permitted. 		Foreman
 Overturning due to travening with basket raised Collision with overhead cables, pedestrians, surrounding structures, other mobile plant & equipment Falls from height & falling objects Adverse weather Misuse by unauthorised personnel. Mechanical failure / emergencies 	High	 Conduct pre-use checks & complete the daily inspection sheet. Check working area for obvious hazards before starting work. (soft ground, blind corners, narrow gaps, limited head-room, steep gradients and excavations.) Work restraint harness must be worn; Exit & enter basket only when fully lowered. Set MEWP up on firm and level ground. Use stability devices or outriggers if fitted Do not overload platform with equipment or people Positioning of platform immediately alongside to allow operative to reach object without reaching/leaning over handrails. Do not use additional equipment/objects ie ladders, boxes etc to gain extra height/reach if task is beyond reach of platform. MEWPS only to be used as work platforms and not as a means of access to elevated levels or as lifting equipment Do not operate beyond maximum safe wind speed from manufacturer's documents. Inspect before use after severe weather Do not move the equipment with the platform in the raised position unless the equipment is designed to allow this to be done safely (check the manufacturer's instructions). Leave platform in a secure manner and clear of tools and equipment when not in use. 	Low	Operator
 Steel Fixing Slips, trips Lacerations & crush injuries Hands & legs Eye injuries due to flying tie wire; Infections in cuts Falling cages Collapse / overturning of trestles 	Medium	 The work area and access routes shall be cleared of obstructions and trip hazards. Collect excess tying wire. Trestle tables to be suitably strong and placed on firm level ground; makeshift trestle tables from tied re-bar are not permitted Stack re-bar in approved laydown areas. Use barriers to segregate from other work activities Hard hats, Hi-vis clothing, Eye protection, gloves and steel toe capped boots to be worn at all times. Gloves should offer adequate protection but maintain dexterity Tails on tie wire to be bent over 	Low	Steel Fixers

	Title	Combined Method & Risk Rotary Piling		
 Fabrication Use of damaged equipment Injury from falling gas cylinders Flashbacks Respiratory problems from inhaling gases, dust & fumes Fire Exposure to infra-red or UV radiation; arc eye Burns from metal splatter Poor storage Self-ignition of acetylene by knocking/ dropping cylinder 	High High High High	All equipment must be inspected & maintained. Check for leaks. Damaged or defective equipment must be removed from service & reported to line manager. All cylinders must be secured upright & correctly shut off when not in use. Do not drop, roll or drag cylinders Acetylene cylinders must only be used in an upright position Acetylene cylinders that have been laid down must be left upright for minimum 1 hour before use to prevent liquid contents coming through regulator. When transporting gas cylinders with a forklift truck, make sure that suitable precautions are taken to prevent them from alling— use suitable cradles, slings, clamps or other effective means Protect cylinders from being struck by other objects. Do not lift cylinders by their valves, shrouds or caps 'lashback arrestors must be installed on the outlets of both regulators, and/or torch inlets. Check valves should be installed on both torch inlets and operating properly 'iollow the correct start-up / shut down procedure. If using Acetylene, keep the pressure below 15 pounds. Purge your hoses before lighting the torch. Never light your torch with a mixture of fuel and Oxygen. After purging the line, light the torch with only the fuel gas valve only. insure adequate ventilation to reduce the risk of inhaling harmful fumes. Use air-fed respiratory protective equipment if equired. Always use acetylene in a well-ventilated area. Do not take acetylene cylinders into a confined space before applying heat, ensure that no residues of hazardous or flammable substances are on the metal; remove all flammable ubstances from the immediate area. 'irre resisting screens around work area to protect others A suitable extinguisher must be in close proximity to the working area Aever let oil or grease come into contact with cylinder NI burning must stop 1 hour before end of shift Wear the appropriate protective clothing welding gauntlets, flame retardant overalls, boots Welding visor or brazier glasses hear estore cylinders near open flames or electrical equipment.	Low	User

	Title	Title Combined Method & Risk Rotary Piling						
 COVID - 19 Contracting Coronavirus Spreading the virus to others Becoming severely ill Experiencing COVID-19 symptoms 	High	Ensure a minimum distance of 2m is kept from all other persons on and off site Travel in separate vehicles when possible Wash/hand sanitise hands frequently (ensuring the 20 second rule is applied) Avoid touching your mouth nose and eyes Ensure exclusion zones are managed and maintained through all required works Ensure correct PPE is worn at all times Ensure all emergency contact details are kept up to date in both the RAMS and on all working sites Only use the welfare facilities when completely necessary and the amount of people using them at the same time to be the minimum All site briefings/conversations to be carried out outside if possible If travelling to work on public transport, a safety mask must be worn If shops are visited, ensure a safety mask is worn Ensure hands are thoroughly washed when arriving and leaving site Operatives must bring own food and drink to limit interaction and discourage the spread of COVID-19 All operatives and site personnel to enter and exit site (via pedestrian gates) at staggered times to ensure 2m social distancing rule is followed	Low	All operatives/site personnel				



Task Covered: Installation of piles using readymix concrete or manual grout mixing. Operatives will be exposed daily, and for long periods to cementitious materials.

Hazard	Who is harmed & how?	Initial Risk	Specific Control Measures	Emergency Procedures	Residual Risk
Batched concrete & admixtures Contains various chemicals including lime, calcium silicates and alkalis plus Soluble chromium (VI)	Inhalation can lead to developing acute rhinitis and localised irritation. Risk of chronic respiratory problems. When dry, Respirable Crystalline Silica is a risk via inhalation Contact with skin and eyes can lead to irritation & burning due to the corrosive properties. Prolonged & repeated exposure may also lead to Irritant and allergic dermatitis developing Ingestion – the swallowing of small amounts of concrete products and admixture is unlikely to cause any significant reaction. Larger doses may result in irritation to the gastrointestinal tract, nausea, diarrhoea & vomiting	High	 Standard Working Practices Keep exposed skin to a minimum to avoid contact – wear impervious gloves and protective clothing, including overalls with long sleeves and long trousers. Do not allow concrete to become trapped between the skin & clothing All concrete spills must be cleaned up Gauntlets must be worn when mixing grout, but do not allow grout/cement to become trapped between the glove and skin. If mixing cement by hand, Wear respiratory protection with minimum standard of FFP3. Must be clean shaven and fit tested Airborne dust should be prevented by only opening bags when needed and by not shaking bags completely empty them 	Standard First Aid measures. Prevent entry into drains and watercourses. Allow to dry before disposing of as hardcore	Low
Mould Release Oil	Not classed as a health hazard however contact with eyes may cause irritation & smarting. May cause discomfort if swallowed. Not considered to be an environmental hazard however contamination of watercourses or the land should be avoided	Medium	Standard Working Practices Keep exposed skin to a minimum to avoid contact – wear impervious gloves Store in well ventilated areas in suitable canisters away from naked lights and heat sources. Use funnels when decanting liquids Storage of containers on drip trays	Toxic fumes will evolve if involved in a fire Only attempt to fight fires if safe to do so. Evacuate if smoke is affecting your breathing, you cannot see the way out, or the fire continues to grow Turn leaking containers leak-side up to prevent further escape. Contain spillages using spill granules, sand or other inert absorbent. Protect drains.	Low
Pump Primer	Slight irritant properties towards the eyes & may lead to redness & stinging. Swallowing of large amounts may result in localised burning	Medium	Standard Working Practices Keep exposed skin to a minimum to avoid contact – wear impervious gloves Use powder mixes in well ventilated areas	Standard First Aid measures	Low

Combined Method & Risk Rotary Piling



Task Covered: Various tasks related to the on site inspection and basic maintenance of equipment. Includes refuelling, topping up fluids etc . Operatives will be exposed infrequently and for short periods

Hazard	Who is harmed & how?	Initial Risk	Specific Control Measures	Emergency Procedures	Residual Risk
Engine Oil	Fitters can suffer skin irritation from contact with engine oil. (long-term repeated) exposure to used oil may lead to the production of skin tumours. Hot oil may produce irritant fumes	Med	 Standard Working Practices Do not perform oil change on excessively hot oil Do not breathe in oil mist from hot oil – Ensure good ventilation throughout oil change. No contaminated materials (oily rags) in pockets Storage on drip travs / bunded areas 	Turn leaking containers leak-side up to prevent further escape. Contain spillages using spill granules, sand or other inert absorbent. Protect drains. Once dry, sweep up and transfer to suitable, labelled containers for disposal.	Low
Hydraulic Oil	Not classified as hazardous however can become highly toxic if oil becomes injected into the body In common with most mineral oils, prolonged and repeated skin contact may cause dermatitis.	Med	 Standard Working Practices Prevention of injection injuries in accordance with hydraulic safety work instruction Avoid generating & breathing in mists No contaminated materials (oily rags) in pockets Storage on drip trays / bunded areas 	Seek immediate medical assistance if hydraulic oil is injected into the body Turn leaking containers leak-side up to prevent further escape. Contain spillages using spill granules, sand or other inert absorbent. Protect drains. Once dry, sweep up and transfer to suitable, labelled containers for disposal.	Low
Grease	Continuous & prolonged exposure to grease may cause skin irritation	Med	Standard Working Practices	Standard First Aid measures.	Low
Petrol	Operator may be harmed if vapours are inhaled. May cause irritation to the respiratory system. Prolonged exposure to vapours may cause drowsiness and narcosis. May cause skin irritation and inflammation; prolonged or repeated contact may result in dermatitis. May also cause cancer.	Med	 Standard Working Practices Use in well ventilated areas Keep chemicals away from heat sources, open flames & other sources of ignition. 	Ingestion of petrol can lead to unconsciousness. If this occurs, place injured person in recovery position and protect airway. Seek immediate medical attention Turn leaking containers leak-side up to prevent further escape. Use foam extinguisher to smother spills to prevent ignition	Low
Diesel and exhaust fumes	Irritation of your eyes & respiratory tract; headaches and convulsions. Repeated contact with your skin can cause de- fatting & in some cases, dermatitis. Irritation of the mucous membranes, throat and stomach, nausea and vomiting. Liver and kidney damage is possible Continuous exposure to exhaust fumes can cause long term, or chronic, respiratory ill health including cancer. Exhaust fumes in poorly	High	 Turn off engines when not required; All re-fuelling to be carried out in well-ventilated areas- preferably outdoors and away from sources of ignition. Store in well ventilated areas away from naked lights & heat sources. Store in bunded bowsers or jerry cans. Drums must be stored upright in a bunded area. Do not allow to enter water supplies or soil. 	Standard first aid measures Turn leaking containers leak-side up to prevent further escape. Contain spillages using spill granules, sand or other inert absorbent. Protect drains. Once dry, sweep up and transfer to suitable, labelled containers for disposal CO Poisoning – don't put yourself at risk – make sure the area is ventilated before you enter. get the casualty to fresh air before taking to casualty	Low

Combined Method & Risk Rotary Piling



	ventilated areas can lead to Carbon Monoxide poisoning		For smaller rigs, locate powerpacks in well ventilated areas. Use mechanical ventilation &/or tail-pipe filters when working in poorly ventilated areas		
Linemarker Spray Paints	Can cause asphyxiation, irritating to the respiratory system, skin and eyes when used in areas with poor ventilation. Repeated & prolonged exposure to the propellant can result in the de-fatting of the skin.	Med	 Standard Working Practices Pressurised containers - Do not use or store in close proximity to sources of ignition. Wear gloves to prevent paint coming into contact with skin. Ensure good ventilation. Do not inhale aerosol mist 	Burning produces irritating, toxic and obnoxious fumes Only attempt to fight fires if safe to do so. Evacuate if smoke is affecting your breathing, you cannot see the way out, or the fire continues to grow	Low

	Good housekeeping to be maintained in all work areas and welfare facilities.						
	Use the welfare provided to dry clothes and change clothes regularly						
	Change out of heavily soiled / contaminated clothing and wash hands & face before eating or drinking						
	Regularly wash the skin with warm water and soap and dry the skin afterwards.						
	Refrain from touching face with soiled hands.						
Standard Working	Do not eat or smoke in areas where there is likely to be exposure.						
Practices	Cuts or wounds must be covered						
	Apply work creams to exposed skin regularly						
	Wear long-sleeved protective clothing.						
	Wearing impervious vinyl or nitrile gloves when handling chemicals or contaminated equipment						
	Eye protection must be worn at all times.						
	Always store in original containers that are correctly labelled.						
	FOLLOW MANUFACTURERS INSTRUCTIONS						
	All operatives briefed on routes of entry, skin checks and health risks of working with hazardous substances as part of 1-day Safety Awareness training						
	Foremen completed 2-day SSSTS course which covers COSHH						
Instruction	All staff briefed on correct fitting of respiratory protection as part of fit test programme						
	Regular toolbox talks delivered on occupational health issues delivered by foreman fitter						
Supervision	Copies of Safety Data Sheets kept on file. Instruction given that if a new product is being used, the COSHH assessment will need to be reviewed						
Supervision	Regular manager visits carried put to ensure controls are being implemented						
	Instruction given that if the product is being used in a manner different from the way specified, a separate risk assessment will be needed						
	Cement has a Workplace Exposure Limits (WEL's) of 10mg/m3 total inhalable dust and 4mg/m3 respirable dust (8 hour TWA)						
Exposure limits	Exposure limits are not exceeded during normal operating conditions & due to the quantities involved at any one time it is unlikely that the limits be exceeded in the event of an accidental release.						
	Previous monitoring of airborne dust identified levels of dust that were significant but were below their respective limits						
Health Surveillance	Health screening with occupational nurse covers dermatitis checks & spirometry.						

Title



	Safety Awareness training includes instruction to carry out self-checking
Thorough Examination & Testing	Not required. No LEV in operation
Emergency Provisions	Emergency First aid trained personnel present; Eye wash & first aid facilities shall be kept in an easily accessible place. Fire extinguishers (dry powder) maintained and readily accessible Spill granules and absorbent pads readily accessible. Use correct waste stream
Standard First Aid	In all cases should exposure be excessive, or symptoms develop seek medical attention. Ingestion - wash mouth / nose out with water and give patient plenty of water to drink. DO NOT induce vomiting. Seek medical attention Skin - Remove contaminated clothing as soon as possible and wash with soap and water. If irritation, pain or other skin conditions occur, seek medical advice
	Eyes – Do not rub eyes, remove any contact lenses. Hold the eyes open and wash with emergency eye wash solution (if available) or clean water for up to 15 minutes. Seek medical attention
	Inhalation - Remove casualty from exposure ensuring your own safety whilst doing so. If possible, remove any excess substances from the nasal passages. Keep casualty warm & at rest. Seek medical attention



Manual Handling - Adding 8	rem	oving auger sections w	/hilst	carrying out restricted access piling				
Task involves adding and remov	ing sł	nort sections of auger from	m pili	ng rigs. Mainly covers 300mm and 350mm auger sections up to	Duration of task			
1.5metres in length. Augers are	posit	ioned close to front of rig	befo	re being lifted on top of the auger already drilled into the	Less than 2 hours 4 to 8 hours			
ground and aligned so that they	can l	oe joined. Removing auge	ers is r	reverse process.	2 to less than 4 hours Over 8 hours			
Load considerations				Notes	Control measures			
Uneven distribution of weight		Bulky / unwieldy	1	Auger sections weighing up to 80Kg. SWL100 augers are much	• Risk reduction at the design / planning stage.			
Unstable / contents likely to shift		Difficult to grasp?	✓	heavier than different types of auger of similar size	Engineers & Contracts staff must take into			
				300mm x 1000 = 50kg – 75kg; 300mm x 1500 = 58kg	consideration the moving and handling of augers			
Intrinsically harmful (sharn/hot)?	1			350mm x 1000 = up to 59kg; 350mm x 1500 = 69kg	contracts. Where possible manual handling of augers			
	•			Wet spoil reduces friction & grip on auger	is to be avoided by using excavators or rigs fitted with			
Teslesse		4		Larger augers than this are lifted by excavator or auxiliary winch	an auxiliary winch.			
lask con	sidei	rations	1	Notes	• Design of piles for restricted access parts of site for			
Holding load away from trunk		Strenuous	✓	Process can be mechanised however this depends on type of rig, site	example in tight basements, or when piles are tight to			
				Use of auxiliary winch still requires moderate / high forces to be	walls. to enable smaller augers to be used			
lwisting	•	Repetitive handling		exerted to pull auger clear of front of rig before it is lowered to	Clear communications			
Stooping		Carrying distances	1	ground.	 Reducing impact on individuals through team lifting. Lift to be controlled by single person 			
		(10m+)		Frequency of handling is affected by programme and rate of drilling.	Communication of the second seco			
Reaching above head height		Lifting from floor level	✓	Work is punctuated by frequent breaks during drilling process. No	 Carry distance kept to a minimum through positionin / storage of augers as close to rig as possible 			
Frequent/ prolonged physical	1	Large vertical		issues with keeping up with the work.	• To reduce bending / stooping, lift top of auger so that			
effort		movements		Constraints on posture are site specific & depend on site layout and	auger is vertical rather than horizontal before lifting			
Work organisation / pace	✓	Force exerted		Arm movements are frequent with regular nauses with motion	from floor (but consider dirt getting into joint)			
Deer coordination				patterns repeated 10 times/min or less	 Check stability before lifting. Position hands clear of 			
communication & control?	✓	insufficient rest		Head/neck is bent or twisted part of the time; back is bent or twisted	ends of augers to prevent trapping if hands slip			
				part of the time; wrists are bent or deviated part of the time	• Gloves to be worn at all times.			
Individu	ial fa	ctors	1	Notes	• Ensure ground is scraped and kept firm & level. Excess			
Unusual strength / height		Risk to the pregnant?		Requires information on positioning of hands & coordination of	spoil must not be allowed to build up in the area			
required				movements with machine operators.	Ensure task lighting is available and operational. Check			
Risk to those with health	1	Requires special	1		for shadow areas for trip hazards.			
problems /disability		information or training?	,		Completion of manual handling training - use good			
Movement affected by PPE					lifting techniques. Toolbox talks			
Environmenta	l Cor	siderations		Notes	Health screening including musculoskeletal assessment			
Slippery ground?	✓	Strong air movements		Increased risk of slips/trips during wet weather if ground conditions	Awareness of own limitations			
Variations in levels? (steps/slopes)		Poor lighting?	✓	deteriorate. This will be affected by quality of main contractor				
Extreme heat / cold?	✓	Postural constraints		Cold is an issue when working during winter				

		Title	Combined Method & Risk Rotary Piling	Piling Ltd	
Uneven ground?	✓	Dust & fumes			



Manual Handling - Grout mix	king							
Task involves transferring cemer	nt bag	gs weighing 25kg bag s fro	m pal	lets onto the grid on top of a grout mixer. Duration &	-	Duration of task		
frequency is determined by the g	grout	take of boreholes/mines	hafts	or the number/design of the piles being installed.	_	Less than 2 hours	4 to 8 hours	
						2 to less than 4 hours	Over 8 hours	
Load con	side	rations	1	Notes	Со	ntrol measures		
Uneven distribution of weight		Bulky / unwieldy	✓	Bags do not have handholds but are not considered difficult to grasp.	٠	Walking around pallet to	move bags closer to mixer instead	
Unstable / contents likely to shift		Difficult to grasp?		Full weight of bag is not taken until they are lifted from stock		Deduce banding (steen	ing by setting platform so that top of	
Intrinsically harmful (sharp/hot)?				onto the mixer.	 Reduce bending / stooping by setting platform so that top of the mixer is at waist height 			
Task con	side	rations	1	Notes	•	Stack comont so that the	mixer operator doos not have to	
Holding load away from trunk		Strenuous pushing/pulling		Frequency of handling is affected by number of piles / boreholes and their grout take. Work is punctuated by	•	bend or stretch to lift ce chest height at all times.	ment bags. ie between waist and either stacked on pallets or left on	
Twisting	✓	Repetitive handling	✓	frequent short breaks during mixing process. No issues with keeping up with the work		telehandler so working h	neight can be adjusted as necessary.	
Stooping	~	Carrying distances (10m+)		Stooping increases as operative is lifting lower layers of cement bags on pallet. Also reaching across the pallet to	•	Positioning of pallets alo Repetitive work broken	ngside mixer to prevent twisting up by rest periods between batches	
Reaching above head height		Lifting from floor level	✓	bring bags closer to them increases risk of overreaching		and changes in activity		
Frequent/ prolonged physical effort	~	Large vertical movements		Arm movements are frequent with regular pauses with motion patterns repeated 10 times/min or less		Job rotation with colleag mixes	gues. Additional labour for large	
Work organisation / pace	~	Force exerted	✓	Moderate/high forces are exerted to move load Head/neck is bent or twisted part of the time: back is bent	٠	Where large volumes re-	quire mixing, cement silo can be	
Poor coordination, communication & control?		insufficient rest	~	or twisted more than half of the time; wrists are bent or deviated part of the time	•	Ensure ground is scraped	d and kept firm & level.	
					•	 Ensure task lighting is available and operational. Check for shadow areas for trip bazards 		
Individu	al fa	ctors	1	Notes	•	Thermal clothing listed o	on PPE register: welfare facilities by	
Unusual strength / height required		Risk to the pregnant?		Ability to function is affected by requirement to wear helmet, eye & ear protection.		main contractor		
Risk to those with health problems /disability	✓	Requires special information or training?	~	Generation of dust requires respiratory protection to be worn which will affect ease of breathing.	•	Completion of manual h techniques. Toolbox talk	andling training - use good lifting s	
Movement affected by PPE	✓			Gauntlets need to be worn to protect against grout burns	•	Health screening includi		
Environmenta	Cor	siderations	•	Notes				
Slippery ground?	~	Strong air movements		Increased risk of slips/trips during wet weather if ground				
Variations in levels? (steps/slopes)		Poor lighting?	✓	conditions deteriorate. This will be affected by quality of				
Extreme heat / cold?	✓	Postural constraints		Cold is an issue when working during winter				
Uneven ground?	✓	Dust & fumes						



Environmental Asso	essment	Risk		Residual
Aspect	Impact	rating	Control Measures	risk
Mobilisation & deliveries	 HGVs block roads causing delays; potential for noise & disruption to local community particularly during early deliveries to avoid peak traffic; vehicles or plant being transported are not cleaned prior to leaving site then contamination of the highways & surface drains is possible. Fuel consumption & exhaust emissions 	High	 Considerate driving & parking - large vehicles parked up clear of site and only brought in when vehicle can be accommodated on site Neighbour notifications & planning around busy times Cleaning down plant prior to transport if required Use low emission fuels, ADBLUE. Switching vehicles off when not in use Lodging in hotels close to work area; Use of crew cabs & van sharing instead of each person using their own vehicle 	Low
Piling operations	 Generation of large volumes of spoil. Likely for some of the spoil to be contaminated, particularly on brownfield / reclaimed land which may need to be treated as hazardous waste 	High	 Choice of work method to minimise spoil generation; Correct disposal route; Re-use spoil on site provided any contaminant is separated; Ensure type of ground to be encountered on site has been ascertained i.e. contaminated. If contaminated set up safe regime to deal with 	Low
Concrete pumping	 Large volumes of raw materials to produce concrete Concrete pumping may cause pollution of drains, & watercourses particularly when washing down of wagons and pumps May also be an issue if blockages occur & concrete is ejected across site. Use of water within concrete plant - wetting down mix & cleaning down drum/pump 	High	 Reduction at design stage; accurate ordering; mix design & site set up to minimise blockages. Careful placing of concrete to avoid unnecessary spills; Positioning equipment away from watercourses; Wash out skips or other bunding away from watercourses and surface water drains. Maintenance of plant & machinery; protection of hoses from damage & containment of hose bursts; Good water connections and hoses in good condition, switch off water supply when not being used Sending excess concrete back to batching plant. Placing in designated area to allow the concrete to cure without polluting the ground or watercourses. 	Low
Mobile plant operations	 Exhaust emissions; Black smoke if machine is poorly maintained rigs use large volume of fuel during operations Noise & vibration nuisance when working in urban areas, 	Medium	 Servicing of machinery Reducing noise levels from all plant whenever possible; switching off plant when not in use; All plant will be fitted with efficient silencers; Restricted hours of operation 	Low
Storage & use of fuels & oils	 Pollution of water courses, drains & sewers through accidental spills, hose bursts and poor storage 	High	 Store fuel in secure, vandal proof bunded tanks (at least 10m away from watercourses) Carry out refuelling safely & prevent spills. Spill kits are available on site with personnel instructed in their use 	Low
Poor storage & handling waste	 Waste being mixed or sent to incorrect landfill Leaching into ground and entering drains & watercourses. Damage to plants/animals, unsightly windblown rubbish 	High	 Segregation of waste & recycling; site waste management plans, use of licensed disposal routes; Provision of suitable waste containers. Housekeeping 	Low
Material Handling	 Poor handling and storage of materials leading to excess waste to landfill, Materials becoming damaged & unusable; poor stock control 	Medium	• Order correct amounts of materials; avoid accepting incorrect deliveries; avoid double handling; Re-use/recycling materials, segregation of waste	Low
Title

Combined Method & Risk Rotary Piling



Lift Schedule

Lifting Equip	oment	Configuration			Ground Bearings	Boom Length	S.W.L	
Lorry Mounted	l Crane	Set up on fully extended outriggers placed on ; 450mm square pads		n square pads	~20Tonne/m ²	11m max	Minimum 5000kg @ 5metres	
13 Tonne Exca	13 Tonne Excavator Context 13 Tonne Excavator Excavators must bave a current Machine operators		with a suitable lift point on the boom with min. 5T shackle. Excavators ct handling capacity table available inside the cab urrent Thorough Examination certificate rators must be competent to undertake lifting operations		<10Tonne/m ²	N/A	Require info from principal contractor	
Piling Rig	ß	As per manufacturers i	instructions; mast vertical, foot down; near vertical lifting only. (max 25°)		As per spec sheet	N/A	Minimum 3000kg	
Des	scription of	Load	Weight	Centre of Gravity	Method of Lifting / No. & Position of lift points		f lift points	Lifting Gear Required
	Standard agitat	or	5000kg	Uniform	4 lift points on chassis		6.5T 4-leg chain	
	Large agitator		8000Kg	Uniform	4 lift points on chassis		4No. 5T webbing straps	
	Concrete Pum	0	3000kg	Uniform	Single point on top		4.25T twin leg	
	Site Cabin		4000kg	Uniform	4 lift points, pre-slung			6.5T 4-leg chain
	Diesel Cube (Fu	ll)	1200Kg	Uniform	Lift points on top			4.25T twin leg
	Jet wash		<200kg	Uniform	No lift points. Choke			3.15T twin leg
	Compressor		<500Kg	Uneven	Lift points on top		3.15T single leg	
	Concrete Hose	2	10kg/m	Uniform	No lift points; Choke		3.15T twin leg	
Casings	Casings 508mm		130kg/m 154Kg/m 200Kg/m	Uniform Uniform Uniform	No lift points. Attach clamps on opposite sides of casing		2 no. lift clamps; 3.15T twin leg	
		660mm	Kg/m	Uniform				
	300	mm \emptyset x 1metre	84kg	Uniform	No lift points; Augers are lifted with a lifting dolly secured by a single leg drop chain to the lifting point on the attendant excavator or choke between flights		4.25T twin leg for offloading	
Augers	450	mm Ø x 1metre	110Kg	Uniform			3.15T single leg for rigging	
	600mm ∅ x 1metre		130Kg	Uniform	Chains must hang vertically during lifting to prevent damage		Auger dolly	
Cage (single)		Max 1000Kg	Long, flimsy			4.25T twin leg		

	Title	C	Combined Mo Rotary	ethod & Risk Piling	Piling Ltd	
Cage (bundle)		Max 1000Kg	Long, flimsy	 Lift horizontally when transporting chain hooked in line, or choked. Lift vertically with single leg chain helicoil joint. 	g around site with twin leg secured around rebar /	3.15T single leg

Initial Assessment completed by:______ Date:______ Briefed to:______

Identify all Pile/Borehole position(s) where interlock quards are NOT practicable.

Pile / Borehole position(s)	Give reason why Interlock Guards cannot be fitted	Identify the control measures to be implemented

Ongoing Assessment by:_____

Where site conditions dictate that the standard of guarding (above) cannot be achieved, the foreman shall notify their Contracts Manager & agree any changes to the risk assessment. All site operatives shall be briefed on the new arrangements.

Pile / Borehole position(s)	Give reason for change to standard of guarding	Identify the control measures to be implemented	Changes agreed with	Date



APPENDIX A - NR STANDARD CP0063

Ref:	NR/L3/INI/CP0063
Issue:	1
Date:	06/03/2010
Compliance date:	05/06/2010

Level 3

Piling adjacent to the running line

Endorsement and Authorisation

Endorsed by:

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Authorised by:

David Hughes, Steering Group Chair

Accepted for issue by:

11111

Mick McManus, National Standards Manager

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Issue record

Issue	Date	Comments
1	March 2010	First issue

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 05/06/2010.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 4 to continue to comply with the Issue of any relevant Network Rail Standards current when GRIP Stage 4 was reached and not to comply with requirements contained herein, unless the designated Standard Owner has stipulated otherwise in the accompanying Briefing Note.

Reference documentation

GE/RT8000	Rule Book
NR/SP/CIV/003	Technical Approval of Design, Construction and Maintenance of Civil Engineering Infrastructure
NR/L2/INI/02009	Engineering Management for Projects
NR/L3/INI/CP0044	Work package plan process
NR/L3/INI/CP0063/F0007	Working Platform Certificate
NR/L2/EBM/088	Responsibility for the maintenance of changes assets
NR/L1/AMG/1010	Policy on working safely in the vicinity of buried services
NR/BS/LI/045 (Issue 3)	Monitoring track over or adjacent to Civil Engineering works: procedure and intervention levels.

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Introduction

The following methodology addresses the situation where piling operations are taking place adjacent to railway infrastructure that is operating normally. It is advised that only competent Piling Specialists companies should be used to undertake works adjacent to a live operational railway i.e. whilst trains are running. This standard has been developed in order to generate a safe system of work (relating to the piling operation) that maintains the safety of the railway so far as is reasonably practicable.

This standard has been prepared by Network Rail in conjunction with the Federation of Piling Specialists and defines the minimum standards and considerations for all piling works to be undertaken adjacent to an operational railway. It is also intended to assist designers and operational teams, of both Network Rail and outside party constructors/developers, involved in this type of construction to understand at an early stage the constraints imposed on the design solution selected.

Further, this document outlines modern methods and procedures in order that the risk of undertaking piling operations adjacent to an operational railway can be minimised to the extent that works may be progressed as far as practicable without resorting to possessions and electrical isolation.

1 Purpose

This document is mandatory and sets the minimum standards and processes to be applied whenever piling operations are to be carried out on or adjacent to Network Rail's Operational Infrastructure where, in the event of mishandling or failure, any part of the equipment in use or its load may fall within 3m of Network Rail's infrastructure during normal train operations.

This document covers the safe installation of piles and not the effect of piles on the infrastructure.

2 Scope

This standard applies to all piling operations adjacent to the operational railway and does not cover on **or near the line** piling operations.

The contents of the document are applicable to all projects where, in the event of mishandling or failure, any part of the equipment in use, or its load, may fall within 3 metres of the nearest rail of Network Rail's operational infrastructure, notwithstanding whether the works are for the railway infrastructure itself or for structures / developments adjacent to the railway.

This document does not cover Signal sighting, radio signals and OLE implications.

The document specifically considers piling works where the safety of the operational railway may be affected as a consequence of:

- a) Plant operator or workforce error.
- b) The failure of the ground supporting the piling or support equipment.
- c) Equipment or accessory failure.

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- d) The piling system and its interaction with the existing ground (including vibration, displacement and loosening affects).
- e) Collapse radius of the attendant crane(s).

3 Abbreviations

BRE

Building Research Establishment

DPE

Network Rail's Designated Project Engineer

LOLER

Lifting Operations and Lifting Equipment Regulations 1998

OLE

Overhead Line Equipment

PUWER

Provision and Use of Work Equipment Regulations 1998

4 Definitions

Adjacent

For the purpose of this standard adjacent refers to piling works being undertaken in areas defined as 'on the line side and/or 'high street environment.

Ancillary Plant

All Plant (apart from the Piling Rig that is addressed separately) involved in the piling process (e.g. crane, concrete pump, RRV (Road Rail Vehicles etc).

Asset Management Plan

A documented agreement between a project and the maintainer produced in accordance with NR/L3/EBM/089.

Competent Person

An individual engaged in the Piling work who is recognised by the organisation requiring the task(s) to be carried out as having sufficient training, knowledge and experience to complete the task(s) safely and efficiently.

Form C

A certificate of Design and Checking of Temporary Works as defined in Network Rails Technical Approval Process.

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High Street Environment (in the Network Rail context)

A 'High Street' environment in the Network Rail context is a site of work outside Network Rail managed infrastructure (NRMI) which may be created at a station, structure or depot where safety risks arising from the work cannot be transferred to NRMI or to activities carried out on it. The site is segregated from NRMI by a physical barrier or a Site Keeper.

Isolation

Electrical isolations of the AC Overhead Line Equipments and/or DC 3rd Rail. The isolation certificate forms part of the Safe System of Work.

Method Statement (does not apply to Network Rail delivered projects see WPP)

An independently checked document detailing a comprehensive step-by-step account for an activity, or range of activities which identifies hazards, resource requirements and method of working to control the risk from the work activity to the public, construction organisation's personnel, and Network Rail's operations and which demonstrates that the execution will be in accordance with the Design.

Lifting Accessories

Devices temporarily attached between lifting equipment and the load being raised or lowered, i.e. equipment by which a load is suspended, for example slings and shackles. Lifting accessories shall be noted in Lift Plans.

Lifting Equipment

Mechanical equipment used for lifting or lowering loads (e.g. cranes).

On or near the line

- a) within 3 metres of the nearest rail
- b) on the line itself

On the lineside

- a) between the railway boundary fence and the point that is called
- b) on or near the line and
- c) in view of the driver of any approaching train or movement.

Piling

The installation of bearing, friction and lateral-restraint (wall) piles. For the purposes of this document, this includes, but is not limited to, the following piling techniques: Continuous Flight Auger, Rotary Bored, Driven Cast-In-Situ, Driven Pre-cast Concrete, Driven Steel Sections, Auger Displacement and Helical Type (screw) piles and ground improvement piles e.g. soil mixing. Additionally retaining wall techniques including Diaphragm Walling, Secant and Contiguous Pile Walling, and Sheet Piling are included. The relevance of this document to other piling systems such as minipiling, soil nailing and soil anchors, requires consideration on a project by project basis due, typically, to the smaller scale of equipment involved.

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Piling Accessories

Specialist equipment used in the piling process eg casings and chisels.

Piling Platform

The designed surface on which the Piling Rig and Ancillary Plant is supported and operated.

Piling rig

The principal machine used to install the piles as defined under Piling.

Possession

A defined period of time and location on the network where engineering work is performed and operation is ceased. A possession can contain one or more work sites belonging to one or more project.

Protection

Protection is a process of allowing limited access on or about the railway, either by stopping train movements or working between train movements to allow certain activities to take place. To set up a protected system of work extensive planning will be required and could typically be up to 1 year ahead of the works.

Spoil

Soil and waste arising from the piling operation.

Sprag

The means of steering a crawler based machine by applying the brake to one track whilst driving with the other.

Work Package Plan (WPP)

A plan detailing the arrangements to safely manage all work. This includes description of the work, risk assessments and/or Risk Control Sheets, process, interfaces, competencies, and equipment.

5 Selection of the Piling Method

5.1 Introduction

In order that the most appropriate solution can be identified at the earliest opportunity and prior to finalising the design concept, it is recommended that advice is sought from a piling specialist.

In particular it is noted that the method finally selected shall not only be safe to construct, in particular with respect to the operational railway, but also be appropriate for the geotechnical/soil conditions existing at the particular site.

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5.2 Design Check and Acceptance

All piling platforms shall require a Category 3 design check and shall be in accordance with the requirements of Network Rail's Technical Approval Process or the equivalent Technical Approval Process of similar bodies for outside parties schemes.

All piling methodologies are subject to Network Rail's acceptance and shall be in strict compliance with this document.

5.3 Factors to be Considered

5.3.1

Ground conditions.

5.3.2

Available working space and access to the site.

5.3.3

Location of Network Rail infrastructure, particularly if it may be sensitive to the works to be undertaken.

5.3.4

Limitations to movement (lateral, heave or settlement), these being specified at an early stage, together with any noise and/or vibration limits, as these will have an ultimate bearing on the method selected. It is noted that the effects of vibration are particularly important where driven, displacement or vibratory piling techniques are being proposed.

5.3.5

The effects of ground displacement and/or soil loosening.

5.3.6

The frequency and speed of trains can in certain situations be considered to be a factor. This can also include standing trains adjacent to the works, for example in sidings or platforms.

6 General Requirements

6.1 Introduction

The piling contractor shall demonstrate to the Principal Contractor and/or Network Rail, that they have the capability to carry out the work. The piling contractor shall provide evidence of a commitment to carry out the work safely, of having management competence, relevant experience and adequate resources, together with the ability to undertake the work in accordance with the requirements of this document and the ability to produce a methodology which is acceptable to the Principal Contractor and/or Network Rail.

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6.2 Factors to be Addressed

NOTE: The actual methods by which movement, noise and vibration are monitored before, during and after the piling works, including the monitoring of adjacent structures and the railway tracks are not part of this document.

6.2.1 Review of requirements

In undertaking a review of the general requirements, the Principal Contractor in conjunction with the Piling Contractor and Network Rail shall consider the factors **6.2.2.** to **6.2.9**.

6.2.2

The management and planning of the site area shall include the arrangements for all of the ancillary operations (e.g. off-loading of materials, reinforcement fabrication areas, pile storage areas, drilling fluid (bentonite) plant, accommodation units).

6.2.3

An appropriate protection shall be placed between the piling operation and the track. This may simply take the form of a fence/barrier designed to prevent personnel straying on to the tracks. Alternatively in situations where the piling machinery lights can distract and/or dazzle train drivers, then a more substantial screen to provide a visual barrier for train drivers shall be erected.

6.2.4

Action shall be taken to prevent the over-sailing of the railway infrastructure and specifically prevent encroachment within 3 metres of the nearest rail, by any crane and its load attendant to the piling rigs. Slew restrictors shall be utilised that will limit the arc of rotation in their working position. These may be electronic, hydraulic or mechanical. Cranes may operate with their boom either facing away from the running line, parallel to it or slightly obliquely provided that the collapse radius of the jib or its load is prevented from falling within 3 metres of the nearest running rail.

6.2.5

Additional measures shall be taken where it is not possible to prevent the boom of attendant cranes from facing the railway.

6.2.6

Particular considerations, such as arcing distances, that may apply on electrified railways (O.H.L.E. / 3rd Rail).

6.2.7

Location of HV and signalling and telecommunications cables.

6.2.8

Location of existing and proposed Road Rail Access Points (RRAP).

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7 Risk/Hazard Identification and Management

7.1 Introduction

Prior to any works commencing on site, a detailed Risk/Hazard Identification and Management Document shall be drawn up by the Principal Contractor together with a methodology in which the following points in **7.2.1** to **7.2.7** shall be addressed.

Appendix A summarises, but not limited to, the specific points which shall be addressed within the Work Package Plan (Method Statement for 3rd party schemes) for specific piling operations.

7.2 Factors to be Considered

7.2.1

The design, construction and maintenance of the Piling Platform (see Section 8 of this document).

7.2.2

Normally piling operations shall be undertaken during daylight hours. For works undertaken during hours of darkness adequate lighting is shall be provided with attention being paid to the position of these lights with reference to both the piling operations and the train drivers.

7.2.3

Specific attention shall be paid to all lifting operations. In general terms modern hydraulic piling rigs may sit at any orientation, including facing the railway track, but jib-cranes shall work with their jib either parallel to or facing away from the railway. A slew restrictor shall be used to limit the permitted arc of operation of all cranes and their load in situations where the collapse radius of the jib or its load could fall within 3 metres of the nearest rail.

7.2.4

The general position of the piling rig, movement of the piling rig when undertaking pile installation and the sequencing of the works shall be planned to reduce the need for repeated changes in the orientation of the tracks of the piling rig and crane (in particular, the elimination of frequent "spragging").

7.2.5

The method for the lifting of pile / diaphragm wall cages, pile elements (e.g. precast concrete, steel sections) and other materials shall be reviewed in detail within the methodology. Where items could fall within 3 metres of the nearest rail, the incorporation of a secondary restraint shall be required (e.g. back-up sling). Tag lines shall be used to control loads, these being properly deployed and controlled at all times. The collapse radius of the attending crane should also be taken into account as in 7.2.3.

7.2.6

All lifting operations shall be undertaken in accordance with the requirements of LOLER.

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7.2.7

Arrangements shall be in place to so that, at the end of each shift, all plant is left in a safe and secure manner. Attendant jib cranes shall be stabled overnight with their jibs facing away from the railway.

8 Management of the Piling Platform

8.1 Introduction

In analysing accidents reported by its members to the FPS, it has been noted that the most serious accidents involving the failure of a piling rig, or a crane whilst on piling duties, have been caused by a failure of the platform supporting that rig or crane or by a failure in the maintenance of that platform, not by mechanical failure of the machine itself or by human error.

In recognition of this the FPS, with the support of the HSE, have introduced a procedure outlining the responsibilities for the design, construction and maintenance of piling platforms. This procedure, which is detailed in BRE document 'Working platforms for tracked plant', together with the FPS 'Working Platform Certificate'(see NR/L3/INI/CP0063/F0007) have together become a standard construction industry requirement.

8.2 General Requirements

Completion of the 'Working Platform Certificate' shall be mandatory for all Network Rail projects to which this document applies. This 'Working Platform Certificate' shall be issued in conjunction with a Form C.

Installation of the platform, in accordance with the design, shall be undertaken by the Principal Contractor or a competent contractor appointed by the Principal Contractor as agreed with Network Rail.

Once the installation of the piling platform has been completed, the "Working Platform Certificate" shall be completed and a copy shall be held on site.

The piling contractor shall provide all relevant rig and equipment loadings and bearing pressure calculations in advance of the piling platform being designed. If the rig and equipment which is delivered to site is not the same as that for which the loadings have been supplied, then the piling platform shall be redesigned for the actual loads.

8.3 Piling Platforms - Factors to be Considered

8.3.1

The size and position of the piling platform shall be determined by the Principal Contractor and the Piling Contractor and shall include for the rigging and de-rigging of the piling rig and ancillary plant.

8.3.2

All piling platforms shall be designed and constructed to be at least 2m greater in width/length than the theoretical working area. Physical demarcation (typically timber baulks or similar) shall be placed to effectively delineate the edge of the working area.

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8.3.3

Platforms shall be designed for the full capacity of piling rigs, cranes and other equipment proposed to be used. Where appropriate consideration can be given to the use of lean mix/reinforced concrete platforms as these can provide additional safety margins. Special consideration should, however, be given to the use of rigid platforms when ground collapse beneath the platform can be a factor. Also the bearing pressure for tracked plant may be greater for a rigid platform than for a flexible granular platform.

8.3.4

All piling platforms shall be constructed with positive drainage.

8.3.5

Access to the piling site and in particular the provision of any sloped access. This access shall allow for the delivery of materials as well as for the specialist rigs, cranes and other equipment.

8.3.6

A programmed piling platform inspection, testing and maintenance regime shall be proposed by the platform designer. The frequency of inspections, which shall be approved by the Principal Contractor and accepted by Network Rail, may be daily or at the most weekly dependent on the programme of works and operations being undertaken. Testing may include Plate Bearing Tests on completion of platform installation and/or when major repairs have been undertaken. Maintenance should include the levelling of the platform and building up where thickness has been reduced. Deviation from this regime shall result in the suspension of the works until such time that Network Rail accepts the proposed, revised regime and any additional restrictions.

8.3.7

The project shall be planned such that there shall be no excavation/removal of the piling platform until piling operations have been completed. In the event that an unforeseen obstruction/event necessitates the excavation/removal of a section of the platform, a procedure shall be put in place whereby an addendum to the Works Package Plan and Form C is produced and approved by the Platform Designer, Piling Contractor and Principal Contractor and accepted by Network Rail, prior to the works recommencing.

8.3.8

It is noted that peak loading often occurs under the mast foot of piling rigs and not always beneath the tracks. Similarly where equipment with outriggers is being considered, the loading beneath these outriggers shall be taken into account. These factors to be taken in to account by the platform designer.

8.3.9

Any unsupported pile shafts (for example piles with low cut-off level) shall be correctly backfilled following the completion of pile construction such that no hole is left open at end of the shift so that there is no localised reduction in the bearing

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capacity of the piling platform. This shall be included in the methodology, WPP and Safe System of Work and approved by the Platform Designer, Piling Contractor and Principal Contractor and accepted by Network Rail. Any pile bores in which concrete has been placed but not yet achieved sufficient strength to support plant shall be clearly demarcated by the provision of surrounding bunting or screening until such times that concrete has sufficiently cured to a designed value and backfill can be placed and compacted.

8.3.10

Where required monitoring of the track and other affected assets shall be carried out by the Principal Contractor in accordance with the approved AMP (Asset Management Plan), NR/L2/EBM/088 and NR/BS/LI/045 (Issue 3): Monitoring track over or adjacent to Civil Engineering works: procedure and intervention levels.

9 Competency

9.1 Introduction

All personnel participating in the piling works and associated operations shall have as a minimum the industry accepted competencies for the task(s) which they will be performing.

9.2 Factors to be Considered

9.2.1

Only competent personnel who are experienced in the techniques/equipment shall be employed on the works.

9.2.2

All Plant Operators (piling rig, handling crane etc) shall prove they are competent to operate the relevant type of plant. Evidence shall be provided by the Piling Company to confirm recent experience on similar plant.

9.2.3

All piling operatives shall prove they are competent to undertake their tasks. Experience and training records shall be provided by the Piling Contractor for approval by the Principal Contractor prior to start on site.

10 Selection of Plant

10.1 Introduction

The selection of Plant shall be primarily dependent on the system of piling that is to be undertaken. A full understanding by all parties, including but not limited to Network Rail, Designer and Principal and Piling Contractors, of the range of piling equipment that shall be used and the positions from where it shall operate shall be required to identify those pieces of equipment which could adversely affect the safety of the operational railway.

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10.2 Factors to be Considered

10.2.1

All piling equipment brought to site shall bear the CE mark indicating conformity with the relevant CEN standard.

10.2.2

All equipment brought to site shall be in a serviceable condition with documentary evidence of statutory controls regarding thorough examinations having been complied with. These documents shall include:-

- a) The Piling Company's Written Scheme for the Examination of Piling Equipment and Accessories.
- b) Where required evidence of a 4-yearly load test.
- c) Written report of Thorough Examination (dated within one year or more frequently, as described within the Piling Company's Written Scheme).
- d) Once the equipment has been erected into its working configuration: confirmation of "start-up" checks, as described in the Piling Company's Written Scheme.
- e) For all lifting accessories a report of thorough examination within the previous 6 months (or more frequently, as described in the Piling Company's Written Scheme).
- f) Evidence shall be provided of an appropriate specific pre-contract plant inspection.

10.2.3

All plant and equipment shall be carefully selected with due regard to its history and performance for the operation to be undertaken.

10.2.4

Piling rigs and cranes shall generally be modern hydraulic machines not greater than seven years old. In the case of piling rigs, where it has been demonstrated that either there is a specialist requirement for which only a unique piece of equipment can undertake the works or alternatively that no machine is available which is less than seven years old, then the machine being offered shall have a full service record and in particular have undergone a 'thorough examination', as defined under Regulation 9 of LOLER, following erection on site and that an 'overload test' has been undertaken within the twelve months prior to the machine arriving on site. Further, at all times, whilst the machine is working on site, the period since the last test shall not exceed 18 months.

10.2.5

All plant and equipment shall be thoroughly maintained and inspected in accordance with PUWER and LOLER regulations and the operating company's plant and equipment testing procedures.

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10.2.6

The stability of piling rigs, cranes, and other equipment shall, at all times be a main consideration in their selection. This shall be at minimum in accordance with the manufacturer's recommendations. No artificial aids shall be used to increase their capacity or stability.

10.2.7

All cranes and lifting accessories shall be down-rated from their normally rated capacity to 75% of Safe Working Load.

10.2.8

When it is possible for the boom of a crane or alternative lifting device to encroach within 3 metres of the nearest rail, then the crane shall be fitted with an appropriate slew restrictor to prevent this from occurring.

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Appendix A: Specific requirements

The following shall be specifically considered when assessing the following piling operations:

A .1 Bored Piles (including bored secant and contiguous piled retaining walls)

- a) Torque capability/size/bearing pressure of piling rig required.
- b) Capacity of equipment.
- c) Working space requirements.
- d) Protection when 'spinning off' spoil.
- e) Guarding as may be required of any rotary parts of the piling equipment.
- f) General handing of spoil / positioning of ancillary plant (excavators, dumpers etc).
- g) Handling of temporary/permanent casing.
- h) Method of placing temporary casings (e.g. rotate in, drive, vibrate).
- i) Management of fluids (e.g. bentonite, polymer).
- j) Length/weight of reinforcement cages.
- k) Placing of reinforcement cages.
- I) Method of placing concrete (e.g. direct discharge from readymix truck, pump, skip, tremie).
- m) Management of any water or other fluids displaced during concreting operation.
- n) Extraction of temporary casings...see note below.
- o) Construction and stability of guide walls including potential effects of forces from oscillators and extractors.

NOTE: The extraction of temporary casing may involve the application of significant forces and has been the cause of crane jib failures in the past. The method of temporary casing to be adopted for the works together with the equipment selected should be the subject of a specific detailed assessment. Casing must only be freed by the use of jacking mechanisms, torsional devices, vibrating devices or upwards impact extractors. The piling rig may be used for this application where appropriate. Additionally the piling rig or attendant crane may be used to support the casing whilst it is being freed and thereafter for its subsequent removal. Where long casings are required the use of sectional casings should be considered as an alternative to single wall casings. The assessment, which should be undertaken by the piling contractor, should include but not be limited to; the diameter and depth of the casing, the type of casing (single wall, segmental etc), the soil parameters, the depth of concrete within the casing, the method of installation of the casing. The assessment should include consideration of the use of casing extractors and the capacity of any craneage and lifting accessories to be used. Serious consideration shall be given to leaving the casings in place (un-extracted), which will be subject to detail design, if deemed necessary for the safety of the operational railway.

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A .2 Continuous Flight Auger Piles (including CFA secant and contiguous piled retaining walls)

- a) Torque capability/size/bearing pressure of piling rig required.
- b) Capacity of equipment.
- c) Working space requirements.
- d) Guarding as may be required of any rotary parts of the piling equipment.
- e) Selection of auger cleaner.
- f) Concrete pumping operation including age/condition of concrete hoses and any secondary restraint techniques (e.g. double-bagging).
- g) General handling of spoil / positioning of ancillary plant (excavators, dumpers, etc).
- h) Method to be adopted should a blockage occur.
- i) Auger extraction forces.
- j) Stiffness of reinforcing cage and method of placement.
- k) Construction and stability of guide walls including potential effects of forces from CFA auger.
- I) Method and control of cleaning of concrete lines at interruptions in the work or at close of shift.

A .3 Diaphragm Walls

- a) Control of diaphragm wall grabs
- b) Site planning including location of support fluid plant, laydown area for reinforcing cages.
- c) Construction of guide wall.
- d) Temporary propping of guide wall.
- e) Length of panel.
- f) Capacity of equipment.
- g) General handling of spoil / positioning of ancillary plant (excavators, dumpers etc).
- h) Management of support fluid (bentonite, polymer).
- i) Placing of reinforcement cages.
- j) Placing and removal/extraction of stopends.
- k) Management of spoil.
- I) Method of placing concrete (e.g. direct discharge from readymix truck, pump, skip, tremie).

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A .4 Driven Precast / Steel / Cast-in-Situ Piles

- a) Capability/size/bearing pressure of piling rig required including hammer size/energy.
- b) Area for offloading piles consideration of position/orientation of rig/crane in undertaking this operation.
- c) General handling of pile elements to the rig and subsequently by the rig.
- d) Pitching of piles.
- e) Height of hammer in the leaders whilst moving between pile positions (recommended in lower third).
- For driven cast-in-situ piling the following should also be considered: method of placing reinforcement cage; method of placing concrete; extraction of casing.

NOTE: The extraction of temporary sheet / steel piles may involve the application of significant forces and the method of removal, where required, to be adopted for the works together with the equipment selected should be the subject of a specific detailed assessment. Sheet/steel piles must only be freed by the use of jacking mechanisms, vibrating devices or upwards impact extractors. The piling rig or attendant crane may be used to support the pile whilst it is being freed and thereafter for its subsequent removal. The assessment, which should be undertaken by the piling contractor, should include but not be limited to; the size and depth of the pile, the type of pile (sheet, 'H' etc), the soil parameters, the method of installation of the pile. The assessment should include consideration of the use of pile extractors and the capacity of any craneage and lifting accessories to be used.

A .5 Driven Sheet Piles

In addition to A.4 the following shall be considered:

- a) Where a specialist rig is to be used its capacity/size/bearing pressure together with hammer size/energy.
- b) Where a crane and pitching frame are to be used the size and positioning of the crane and location of pitching frame.
- c) Position of any attendant craneage.
- d) Method of setting piles into frame clutching of piles.
- e) Wind speed limitations.

NOTE: The extraction of temporary sheet / steel piles may involve the application of significant forces and the method of removal, where required, to be adopted for the works together with the equipment selected should be the subject of a specific detailed assessment. Sheet/steel piles must only be freed by the use of jacking mechanisms, vibrating devices or upwards impact extractors. The piling rig or attendant crane may be used to support the pile whilst it is being freed and thereafter for its subsequent removal. The assessment, which should be undertaken by the piling contractor, should include but not be limited to; the size and depth of the pile, the type of pile (sheet, 'H' etc), the soil parameters, the method of installation of the pile. The assessment should include consideration of the use of pile extractors and the capacity of any craneage and lifting accessories to be used.

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A .6 Grouting, Mini-piling, Anchors

NOTE: It is not intended within this document to address in detail the above activities. However, in so far that these operations may be undertaken in association with piling operations the following should be considered:

- a) Torque capability/size/bearing pressure of piling rig required.
- b) Fluid flush.
- c) Working space requirements.
- d) Guarding as may be required of any rotary parts of the piling equipment.
- e) Placing anchors.
- f) Manual handling.
- g) Stability of access platforms.
- h) Handling of grout.

A .7 Screw/Helical Piling

As for Grouting, (see A.6), is not intended within this document to address in detail screw piling. However in so far that these operations may be undertaken in association with piling operations the following should be considered:

- a) Where used type of RRV and capabilities.
- b) Manual handling.
- c) Placing of grillages.
- d) Fitting and handling of Torque head attachments and adaptor plates.

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Appendix B: Diagrams

ORIENTATION OF CRANE ADJACENT TO THE RAILWAY INFRASTRUCTURE DURING NORMAL RAILWAY OPERATIONS.





BOTH ENDS OF LOAD

NOTE :-

- 1.) IN ALL CASES APPROPRIATE MITIGATION MEASURES SHOULD BE IMPLEMENTED - PARTICULARLY WITH REGARD TO THE PILING PLATFORM CONSTRUCTION.
- 2.) PLATFORM TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATION.
- 3.) NO ARTIFICIAL AIDS ALLOWED TO INCREASE STABILITY REFER TO DIAGRAM 5.

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ORIENTATION OF PILING RIG ADJACENT TO THE RAILWAY INFRASTRUCTURE DURING NORMAL RAILWAY OPERATIONS.



RIG MAY SIT AT THIS ORIENTATION



RIG MAY SIT AT THIS ORIENTATION (SUBJECT TO MANUFACTURERS SPECIFICATION)



RIG MAY SIT AT THIS ORIENTATION



INDEPENDENT TIE BACKS OR ANY OTHER ARTIFICIAL STABILITY AIDS MUST NOT BE UTILISED



THIS ORIENTATION

NOTE :-

- 1.) IN ALL CASES APPROPRIATE MITIGATION MEASURES SHOULD BE IMPLEMENTED -PARTICULARLY WITH REGARD TO THE PILING PLATFORM CONSTRUCTION.
- 2.) PLATFORM TO BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATION.
- 3.) NO ARTIFICIAL AIDS ALLOWED TO INCREASE STABILITY - REFER TO DIAGRAM 5.

Network Rail Standards	Awareness Bri	efing Note	Teams that require briefing:	
			(A-Awareness, T-Technical)	A T
Ref: NR/L3/INI/CP0063		Issue: 1	Corporate Development	
Litle: Piling Adjacent to the Running Line	Compliance Date:	05/06/2010	CTRL	
Standard Owner: D. I. Hughes, Principal Assurance, Specialist			Executive Management Group	
Non-Compliance rep (NRNC): P Clark,	Senior Programme E	Engineering Manager	Govt & Corp Affairs	
Further information contact: Stephen W	/hitmore	Tel: 07786 150131	Human Resources	
Purpose:			Legal Services	
-			National Delivery Service	
This document will define the minimum sta	andards which must I	be adopted for all	Network Development	
plling works to be undertaken adjacent to	an operational railwa	y. It is also intended Pail and outside party	Planning	
constructors/developers to understand, at	an early stage, the c	constraints which may	Safety and Compliance	
be imposed on the design solution selecte	d.	,,,	Strategic Sourcing Westwood	
			Engineering	
			Asset Performance [Track & Plant]	
			Asset Performance [Buildings & Civils]	
Scono:			Engineering Programme Management	
Scope.			Ergonomics Network Electrification	
The scope of the document will apply to a	I piling works underta	aken adjacent to the	Professional Head [Track]	
running line.			Professional Head [Plant and T&RS]	
			Professional Head [5&1] Professional Head [Flectrical Power]	
			Professional Head [Buildings & Civils]	
			Switch & Crossing Engineering	
			Technology Management [Track]	
			Technology Management [Plant]	
			Technology Management [T&RS]	
What's New/Changed:			Technology Management [Signalling]	
			Technology Management [Telecoms]	
This is a new standard that specifically co	nsiders piling works,	that are not on or	Technology Management [Structures]	
near the line but where the safety of the operational railway may be affected as a		T&RS Systems		
			Asset Information Asset Systems	
		Asset Reporting		
			Buried Services	
			Data Control	
			Rail Vehicle Asset Knowledge	
Affected documents:			Asset Head Asset Management [Buildings & Civils]	
Reference	Impact		Asset Protection	
N/A			Head of Asset Management [Track]	
			Head of Asset Management [E&P]	
Implementation requiremental (The felle	vina naota hava anaaifi	a raananaihilitiaa within	SP&C Delivery	
this standard and shall receive technical briefin	a as part of the Implem	entation Programme)	Track Design Track Delivery	
			Investment Projects	
Post	Т	eam	Buildings & Civils	
Senior Programme Engineering	Investment Project	s and	Crossrail	
Managers Brogramma Engineering Managera	Asset Managemen	t a and	Enhancements	
	Asset Managemen	t anu	FTOCS	
Senior Project Engineer	Investment Project	s and	Signalling & Electrification	
	Asset Managemen	t	I hameslink Project Delivery Support	
Project Engineer	Investment Project	s and	Contracts & Procurement	\boxtimes \Box
Principal Design Engineers	Asset Managemen	t s and	HSEA	
	Asset Managemen	t	Infrastructure Maintenance	
Construction Managers	Investment Project	s and	Central Team	
	Asset Managemen	t	Contingent Labour Contractors	
			Infrastructure Support Services	
			National Programme Team	
			Operational Property Overhead Condition Renewals	
			Plant Contractors	
			Route Teams	
			Telecoms	



APPENDIX B - CPA GUIDE MOBILE CRANE ALONGSIDE RAILWAYS

GOOD PRACTICE GUIDE



Requirements for Mobile Cranes Alongside Railways Controlled by Network Rail





Requirements for Mobile Cranes Alongside Railways Controlled by Network Rail

CPA Good Practice Guide



Working in Partnership

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NOTE: Whilst every care has been taken to ensure the accuracy of the material contained within this booklet, no liability is accepted by the Construction Plant-hire Association in respect of the information given.

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1.0 Introduction

Network Rail has for many years had requirements for all mobile cranes operating alongside the railway. This guide brings these requirements together in one document with an explanation of those requirements and how they may be complied with. The guide does not introduce any additional requirements and is aimed at producing an easily accessible document which has been endorsed by Network Rail.

1.1 General

Lifting operations by their very nature involve risk. The starting point for the reduction of risk should always begin with consideration of the need to carry out lifting operations, or whether other, less hazardous, techniques can be used.

It is essential that the person requiring lifting operation(s) to be undertaken ensures that these are effectively planned. This will be undertaken by the appointed person (see BS 7121-3) in consultation with the Principal Designer on construction projects.

Mobile cranes and other mobile lifting equipment may present a risk to railways during rigging, use, maintenance and de-rigging. Both Network Rail and crane users have a duty to ensure the safety of the railway. If the crane or its load falls onto the track, a catastrophic accident may well result that could include multiple fatalities. <u>It is therefore essential that</u> <u>best practice is followed to eliminate or reduce this risk to as low as reasonably</u>

practicable. In doing so, the crane user will be able to demonstrate to Network Rail and other regulators that adequate measures have been put in place. The requirements specified in this document should be adhered to when mobile cranes are rigged and used alongside Network Rail assets. Early consultation with Network Rail will ensure that any issues are identified and addressed well before any lifting operation starts.

NOTE: Annex E of BS 7121-1:2016 gives additional recommendations for operation of cranes on or adjacent to sites of exceptional hazards which include railways.

This guidance covers temporarily installed non-rail mounted lifting equipment including wheeled mobile cranes, lorry loader cranes, crawler mobile cranes, mini/compact cranes, chassis mounted mobile self-erecting tower cranes, and both telehandlers and excavators used for lifting suspended loads. In this document, the term *mobile crane* will include all these types of lifting equipment.

The guidance does not cover top slewing and self-erecting tower cranes, gantry cranes, piling rigs or rail mounted cranes, nor road/rail units where they are on rail.

NOTE: Tower cranes are covered by the CPA guidance document "Requirements for Tower Cranes Alongside Railways Controlled by Network Rail" (free download from www.cpa.uk.net)

NOTE: The use of rail mounted lifting equipment is covered by "RIS-1700-PLT Rail Industry Standard for Safe Use of Plant for Infrastructure Work" (free download from http://www.rssb.co.uk/railway-group-standards)

1.2 Liaison With Network Rail

Network Rail should be consulted by the crane user in all circumstances where the compound collapse radius of the mobile crane and its load is within 4m of a railway asset or property boundary. In these circumstances the following hierarchy of measures (see **3.0**) should be observed. As part of the consultation, Network Rail asset protection staff will need to see the lift plan for the proposed lifting operation(s).

If the compound collapse radius is greater than 4 metres (m) from the railway asset or property boundary, the lift plan demonstrating that this is the case should be sent to Network Rail, who may require further details to be submitted.

Where it is necessary to carry out lifting operations over or adjacent to a live railway, Network Rail infrastructure or railway public areas, a line block or isolation may be required, and Network Rail should be consulted at the earliest stage of planning. There will be a considerable lead time for a line block and, if needed, isolation.

NOTE: The crane user may either be the person hiring in a crane from a supplier or a person using a crane which they own.

NOTE: Network Rail asset protection contact details can be found at <u>http://www.networkrail.co.uk/National-asset-protection-contacts.pdf</u>

2.0 Definitions

compound collapse radius (CCR)

the crane collapse radius plus the load collapse radius (see Figure 10)

crane collapse radius (CR)

the diagonal dimension from the centre of slew at ground level to the end of the jib, (see Figures 2, 3, 4, 5, 6, 7 & 8)

foundation

load bearing structure designed and constructed to be in direct contact with the ground and transferring loads from the crane outriggers or tracks to the ground

isolation

planned and documented switch-off of railway traction electrical power supply from overhead power lines or third rail

lift plan

information provided to the person supervising the lifting operation to enable them to complete the operation safely **NOTE:** This normally consists of at least the risk assessment, method statement and any relevant drawings.

line block

where the rail track is closed to rail traffic (except engineering trains in some cases) **NOTE:** This may be achieved by either a line block or between trains working.

load collapse radius

the longest dimension of the load (see Figure 9)

loader crane

powered crane comprising a column which slews about a base, and a boom system which is attached onto the top of the column

lorry loader

commercial vehicle or trailer, fitted with a loader crane, which normally has a load-carrying capability

method statement

document produced by the appointed person to describe how the lifting operation is to be carried out

Network Rail asset or property boundary

the boundary of plant, machinery, property, buildings, vehicles and other assets owned or used by Network Rail

vehicle exclusion zone

zone around the crane from which vehicles are excluded to minimise the risk of collision

3.0 Hierarchy of Risk Elimination and Reduction

When planning the installation of a mobile crane alongside a Network Rail boundary, the hierarchy of measures in **3.1** to **3.3** should be observed (see **Section 9**, **Figure 1**).

3.1 Level 1 - Elimination of Risk by Position

The crane is positioned so that if it does fail, the compound collapse radius in any direction is at least 4m from a Network Rail boundary.

Collapse could be due to causes such as structural failure, tipping through excessive overturning moment and tipping due to ground collapse.

The Compound Collapse Radius "CCR" (see **Section 9**, **Figure 10**) is defined as the maximum extent of a collapse as follows:

• The Crane Collapse Radius "CR" - The diagonal dimension from the centre of slew to the end of the jib, (see Section 9, Figures 2, 3, 4, 5, 6, 7 & 8);

plus

• The Load Collapse Radius "L" - The longest dimension of the load (see Section 9, Figure 9).

NOTE: If the load is slung horizontally about the mid-point, "L" may be halved.

3.2 Level 2 - Reduction of the Risk of Collapse by De-rating and Slew Limiting

If the crane cannot be positioned as specified in **3.1**, Network Rail Asset Protection <u>may</u> consider allowing the mobile crane to be positioned and rigged if all lifts are planned to ensure that the crane lifts no more than 75% of the manufacturer's specified rated capacity for the crane configuration chosen.

In this case, up-rating of the crane's outrigger/track loads will also be required (see 4.5)

In addition, the edge of the CCR shall be prevented from encroaching a line 4 metres (m) from the Network Rail boundary by the use of slew limiters (see **4.3**).

NOTE: When line blocks and isolation are in place or possible collapse is on to non-operational land, de-rating may not be required by Network Rail.

3.3 Level 3 - Reducing the Consequences of Collapse by Line Blocking

Network Rail may be prepared to consider a line block to prevent trains running during times when there is a risk of the crane and or load falling on Network Rail assets (see **4.4**).

4.0 Detailed Requirements

4.1 General

Ideally, mobile crane operations, positioning etc. should be configured to eliminate any risk to Network Rail infrastructure; operations etc (see **3.1**).

Should however, such operation, positioning etc. prove to be impossible and there is a risk that a crane collapse could potentially affect Network Rail infrastructure, operations etc. additional measures should be put in place. Where the crane jib does not oversail Network Rail infrastructure, risk reduction by down-rating the crane, up-rating the loads imposed on the ground etc. should be implemented (see **3.2** and **4.5**).

The oversailing of Network Rail infrastructure by mobile cranes and their loads should not be undertaken unless it is unavoidable due to the inherent risks to Network Rail operations, personnel, the travelling public etc. Any proposed oversailing will be subject to strict site control measures which should be approved by Network Rail. This will always require a line block and, if necessary, isolation (see **3.3**).

4.2 Elimination of Oversailing

Unless specific permission is given by Network Rail, no part of the crane and/or any part of the load shall over-sail the railway asset or property boundary under any circumstances.

4.3 Slew and radius restriction - Level 2

Where an operating area restriction is required, the lift plan should identify the required areas of restriction. These should be followed by the crane operator, under the instruction of the Slinger Signaller and supplemented by an appropriate restriction system.

Once the crane has been positioned on the site, restrictors should be set to prevent any part of the crane and/or the load being lifted encroaching within 4m of the Network Rail boundary (see **Section 9**, **Figure 10**). Restriction should be achieved with a limiter, linked to the crane's control system which should be set at the minimum arc required to enable the lift to be carried out safely, in order to maximise the distance from the 4m position.

NOTE: Following discussion with Network Rail, it may be possible in certain circumstances to use physical stops.

Special care should be taken when using crawler cranes as any movement of the crane undercarriage, such as turning or travelling, will invalidate the settings of the limiter.

The limiter should be checked and the result recorded in writing before the start of each shift.

The lift plan should include a drawing of the site with the Network Rail boundary, showing the crane position with the extent and position of the pre-warning and exclusions zones.

4.4 Where Oversailing is unavoidable - Level 3

The oversailing of the Network Rail boundary by mobile cranes and their loads should not be undertaken unless it is unavoidable, due to the inherent risks to Network Rail operations, personnel, the travelling public etc. Any proposed oversailing will be subject to strict site control measures which should be approved by Network Rail. This will always require a line block. In addition, an isolation will be required on electrified sections of the railway. Line blocks and isolation will be arranged through Network Rail and require considerable advance notice (frequently in excess of 12 months).

4.5 *Outrigger/track loads*

The maximum outrigger/track loads for a crane in the configuration in which it is rigged for the lifting operation, or during rigging/de-rigging, should either be obtained from the crane supplier/manufacturer or by using calculation software approved by the crane manufacturer. All the loading conditions for the given configuration should be considered (e.g. laden with the maximum load to be lifted, unladen with actual required counterweight and during

rigging, all over the full 360° arc of slew). These loads should be multiplied by a factor of 1.33 to increase the level of safety of the foundation absorbing these loads. **NOTE:** *Maximum outrigger loads may occur when the crane is unladen at minimum radius or during rigging.*

4.6 *Outrigger foundation design*

The appointed person should, in consultation with the person in charge of the site, verify that the ground has sufficient bearing capacity to take the factored loads from **4.5** and agree on the spreader pads or other measures to be taken to transfer the loads into the ground.

Unless otherwise agreed by Network Rail, foundations should be subject to design submission in accordance with the requirements of Network Rail Civil Engineering Assurance standard NR/L3/CIV/003, including the presentation of F002 *Design Intent* and F003 *Certificate of Design and Check.* Design submissions are to be submitted well in advance of the proposed installation date.

NOTE: Each outrigger foundation should be designed using the largest outrigger load for any of the crane's outriggers. This load should be increased by the factor specified in **4.5**.

NOTE: The design check for mobile cranes alongside Network Rail lines should be to Category 3 of Table 1 in BS 5975.

NOTE: Details of ground assessment, together with methods or ground improvement and imposed load reduction, are given in the Strategic Forum for Construction Good Practice Guide on Ground Conditions for Construction Plant (free download from <u>www.cpa.uk.net</u>).

4.7 Site Checks for Foundations

Before the mobile crane is rigged, checks should be completed on foundations to confirm that they have been installed or constructed as designed. The recognised industry form *Mobile Crane Base/Foundation Pre-rigging Inspection Report* (see **Annex B**) should be completed and a copy given to Network Rail.

NOTE: A Network Rail F005 (Certificate of Fitness to be Taken into Use) may also be used instead of the form in Annex B.

4.8 Periodic Check of Foundations

Where the crane is to be in one location for a long period, foundations should be checked at least weekly, after foundation modifications and in periods of bad weather. The check should be recorded.

4.9 Design of Bespoke Lift Accessories and Load Attachment Points

Where the crane user is intending to use bespoke (non-standard) lifting accessories and load attachment points, the design of these should be submitted to Network Rail when requested.

4.10 *Planning for De-rigging*

As part of the lift planning process, the de-rigging operation should be evaluated, at least in outline, to ensure that changes to the site between rigging and de-rigging do not impede the de-rigging operation; for example - building on the area required to stand the assisting mobile crane on for de-rigging.

If a line block and/or isolation is needed for the de-rigging operation, the lead time for these will be considerable.

4.11 Crane Collision Protection

Where there is a risk of impact from vehicles and mobile equipment travelling on site, the Traffic Management Plan should provide a vehicle exclusion zone ensuring that traffic is routed away from the mobile crane. If this is not achievable, an adequate vehicle containment barrier should be provided.

4.12 Mobile Cranes in the Vicinity of Aerodromes: Notification and En-route Obstacle Lighting

Mobile cranes which are to be erected in the vicinity of aerodromes require notification to the aerodrome manager and may be required to be fitted with aviation warning lighting. In addition to any aerodrome-related requirement, any structure (temporary or otherwise and regardless of location) of a height of 90m (300ft) or more needs to be notified for aviation purposes.

Where aviation warning lights are fitted, Network Rail should be consulted to avoid dazzling or giving false signals to train drivers.

NOTE: Further detailed requirements are given in:

- Technical Information Note TIN 039 Operating Tower Cranes in the Vicinity of Aerodromes, Notification and En-route Obstacle Lighting, Construction Plant Hire Association (free download from www.cpa.uk.net)
- Civil Aviation Authority CAP 1096 Guidance to crane operators on aviation lighting and notification (free download from <u>www.caa.co.uk</u>).

4.13 Anemometers

All cranes working alongside the railway should be provided with an anemometer fitted at the jib head.

4.14 Assisting Crane Requirements

Wheeled mobile cranes are commonly used to assist with the rigging of large mobile cranes. The requirements of this document apply equally to them.

NOTE: Details of the assisting crane should be included in the submission to Network Rail.

4.15 Submission to Network Rail

Well in advance of the lift taking place, the lift plan (see **6.1**) and the foundation design (see **4.6**) should be submitted to Network Rail for review and approval.

NOTE: Network Rail may wish to be in attendance during the lift.
5.0 Positioning, Rigging, Alteration and De-rigging

5.1 Correct Crane Configuration and Position

It is essential that the crane supervisor ensures that the crane specified in the lift plan is both delivered to site and positioned correctly. Any deviation from the specified crane may well invalidate the planning and increase the risk to the railway assets. Any changes to the lift plan should be approved by the appointed person.

NOTE: It is beneficial for the planning process to include alternative cranes to allow for non-availability of a given crane.

5.2 *Rigging, Alteration and De-rigging*

The rigging of mobile cranes should be planned and carried out by competent and authorised personnel. A risk assessment should be carried out for each rigging operation in a new location and a job specific method statement prepared, including the measures to be taken against falls from height. The method statement should address potential problems, such as equipment failure and rising wind speed, specifying appropriate contingency measures. All members of the rigging team should be briefed on the method to be used and confirm that they are aware of their specific duties and have adequate information to undertake their tasks effectively. The rigging operation will be controlled by the rigging supervisor who should have the authority to suspend operations at any time that he/she judges that it would be unsafe to continue.

The de-rigging of mobile cranes is not just the reversal of the rigging process. Before derigging is carried out, a risk assessment should be undertaken to identify any changes to the site or the surrounding area which may impinge on the operation. These may include adjacent structures, access for transport and assisting mobile cranes, and mobile crane set up areas.

The method statement for rigging, alteration and de-rigging should consider the risk to railway assets from the process, including the use of assisting mobile cranes. It should also include consideration of the route from the site entrance to the set-up position and also the set-up position(s) to the site exit (which may not be the same).

Network Rail should be notified in advance of the date and time of any rigging, alteration or de-rigging operations.

Further information on the rigging and de-rigging of mobile cranes is given in:

• BS 7121-3:2017, Code of practice for safe use of cranes – Part 3: Mobile cranes.

6.0 Lift Plan

6.1 General

The use of mobile cranes alongside railways requires particular care to ensure that neither the crane, nor the load it is lifting or moving, will overturn, fall or collapse. This is best accomplished by strict adherence to the planning, supervision and use requirements of BS 7121-1 and BS 7121-3 and in particular, the assessment of the complexity of the load, lifting operation and the environment in which it is being carried out.

The lift plan should include the following items:

- Any lift adjacent to railway assets should be supervised by a Crane Supervisor and measures put in place for adequate briefing of that person; **NOTE:** BS 7121-1:2016 requires a crane supervisor for all lifts. It is however possible to combine roles, depending on the complexity of the lift.
- The need for hold points in the lift plan to ensure that certain actions are confirmed before the lift proceeds e.g. confirmation that a line block and/or isolation is in place;
- Location, date, starting time and expected duration of rigging, lifting and de-rigging operations;
- Any night time working should consider lighting and the effects of shadows, cut-off and dazzle;
- Communications during night time working should always be through the use of radios;
- Assessment of the loads to be lifted, including position of centre of gravity, lifting accessory attachment points, lifting accessories (type and configuration), and competence of the Slinger/Signaller;
- A dimensioned drawing showing the crane load pick up and set down points, the direction of slew and any no-slew area.
- Mobile crane foundation arrangements including any spreader pads or crane mats (size and type)
- The requirement to obtain site specific weather forecasts and monitoring of wind speeds;
- Specification of the limiting wind speeds for rigging and operation of the crane;
- Ensuring that the forecast wind speed for long duration lifting operations is taken into account before starting the lift;
- Taking account of additional wind loads on loads with a large wind area; *NOTE:* Additional information is given in Technical Information Note TIN 101 The Effect of Wind on Mobile Cranes In-service, Construction Plant Hire Association (free download from <u>www.cpa.uk.net</u>) and Influence of wind on crane operation, Liebherr-Werk Ehingen GmbH (free download from <u>http://www.liebherr.com/AT/en-GB/default_at.wfw/measure-metric/tab-94354</u>).
- Consideration of the possibility of lightning strikes.
 NOTE: Guidance on protection against lightning is given in BS EN 62305-1:2011, Protection against lightning, General principles.
- Any crane or load that is at risk of touching, or coming within 2.75m of live o/h power equipment should be bonded to a 'suitable earth' (earth requirement not to be unnecessarily restricted to railway network earth). To be agreed with the Network Rail E&P Engineer.

NOTE: This earthing point may, with the agreement of Network Rail, be used to provide lightening protection.

- Any requirement for the lifting of persons by the mobile crane in exceptional circumstances;
- Ensuring the crane is fitted with a sufficient length of hoist rope where lifting below ground level e.g. shaft work; **NOTE:** If additional hoist rope is fitted to the crane to reach below ground level, further de-rating of the

NOTE: If additional hoist rope is fitted to the crane to reach below ground level, further de-rating of the rated capacity may be required to take account of the additional weight of the hoist rope suspended from the jib.

 A schedule of lifts showing the percentage of manufacturer's original rated capacity required for each lift;

NOTE: This should not exceed 75% for Level 2.

- A requirement that no loads or lifting accessories are left on the hook when the crane is out-of-service;
- Requirements for leaving the crane out-of-service, including the limiting wind speed before which the crane superstructure should be lowered;
- The route for the crane to and from the set-up position on site;
- Arrangements for establishing and maintaining an exclusion zone around the crane;
- The need for aircraft warning lights (if required);
- Additional down rating for tandem or multiple lifts in accordance with BS 7121-1 and BS 7121-3.

NOTE: If the lift is a Level 2 lift, this down rating will be additional to the derating to 75% specified in 3.2.

- Where there is a risk of overrun of the work, Network Rail may require a line block overrun contingency plan showing break points in the work to be submitted in advance for Network Rail agreement;
- Any requirement by Network Rail for their personnel to be in attendance during the lift.

6.2 *Lift plan retention on site*

A copy of the lift plan prepared by the appointed person shall be retained on site.

Detailed guidance is given in:

- BS 7121-1:2016, Code of practice for safe use of cranes Part 1: General.
- BS 7121-3:2017, Code of practice for safe use of cranes Part 3: Mobile Cranes.

7.0 Maintenance, Inspection and Thorough Examination

7.1 General

The effective maintenance of mobile cranes is vital in ensuring that cranes remain safe and free from defects whilst on site. Maintenance activities include inspection, preventive maintenance and repair of breakdowns. For cranes scheduled to be on site for extended periods, adequate time should be allowed in the construction programme to ensure that these activities can be carried out as and when required.

Thorough examination is a separate activity from maintenance, but again sufficient time should be allowed for thorough examination to be carried out periodically at intervals not exceeding six months and after the occurrence of exceptional circumstances. **NOTE:** This is a Network Rail requirement which exceeds the maximum periodic thorough examination interval specified in Regulation 9 of LOLER.

It is essential that both maintenance and thorough examination are carried out by competent and authorised personnel who are familiar with the make and model of mobile crane and have adequate information to undertake their tasks effectively. It is essential that thorough examination is undertaken by a competent person who is sufficiently independent from the rigging and maintenance activities.

7.2 Records

Records of thorough examination, supplementary testing and maintenance should be held on site.

Detailed guidance on both maintenance and through examination is given in:

- Best Practice Guide on the Maintenance, Inspection and Thorough Examination of Mobile Cranes, Construction Plant-hire Association, (free download from www.cpa.uk.net)
- BS 7121-2-1:2012, Code of practice for the safe use of cranes, Part 2-1: Inspection, maintenance and thorough examination General
- BS 7121-2-3:2012, Code of practice for the safe use of cranes, Part 2-3: Inspection, maintenance and thorough examination Mobile cranes.

8.0 Records

It is essential that the records listed in **Annex A** are available on site for inspection by Network Rail.





















Annex A – Documents to be held on site for Network Rail inspection

- Approved Network Rail F002/F003 for temporary works covering mobile crane base/foundation(s);
- Rigging Method Statement;
- Outline de-rigging plan;
- In-service lift plan;
- Network Rail non-objections to rigging method statements and in-service lift plans;
- Complex foundation and pile drawings and construction photographs;
- Cube and pile test results (continuity) (if applicable);
- Complex foundation design and construction records (inc check certificates);
- Notification to airfields (if required);
- Notification to CAA (if required);
- Build configuration of crane and load charts;
- Drawings for zoning, radius and slew limiting systems;
- Certificate of setting of zoning, radius and slew limiting systems;
- Records of checking of daily zoning, radius and slew limiting system settings;
- Records of periodic checks of crane base;
- Lifting team training and competence assessment;
- Records of near miss investigations;
- Reports of thorough examinations (crane and lifting accessories);
- Maintenance schedule and records.

Annex B - Mobile Crane Base Form

Mobile Crane Complex Foundation Pre-rigging Inspection Report									
Site:									
Mobile Crane No/Location:		Mal	re:			N	lodel:		
Fly jib angle:		Jib	Length:						
Outrigger base dimensions: Counterweight:									
Base Type:								1	
Items Checked				Measurement Results	Ass	As Specified?		Inspected	Date
			Yes		No	n/a	Dy		
All Foundations	Compliance w drawings/spec	ith design ification							
	Level check - Within tolerance								
Concrete	Correct grade								
	Sufficient maturity								
	Rebar- grade, diameter, quantity and position prior to pour								
Piles	Satisfactory pile tests								
	Reinforcemen	t bond length							
Steelwork	Steel grade								
	Weld quality								
	Bolts – grade,	torque, tightness, qu	uantity						
Spreader Pads/Mats	Specified size	of pad/mat							
	Specified thick	ness of pad/mat							
	Ground prepar	ration as specified							
	Location as specified								
Documents against which foundation has been checked (drawing nos./document references):									
Notes and Observations:									
I confirm the crane f carried out.	oundation has bee	en constructed to the sp	pecifications	and that a satisfa	actory post o	construc	tion insp	pection has bee	n
Name:		Si	gned:					Date:	
Position:				Company:					

Annex C - Additional Information

Legislation and Approved Codes of Practice

Health and Safety at Work etc. Act 1974. London: The Stationery Office.

The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER).

The Provision and Use of Work Equipment Regulations 1998 (PUWER).

The Construction (Design and Management) Regulations 2015.

The Work at Height Regulations 2005.

L113 Safe use of lifting equipment, HSE Books (free download from <u>www.hse.gov.uk</u>).

L22 Safe use of work equipment, HSE Books (free download from www.hse.gov.uk).

Standards

BS 5975:2008 + A1:2011, Code of practice for temporary works procedures and the permissible stress design of falsework.

BS 7121-1:2016, Code of practice for safe use of cranes — Part 1: General.

BS 7121-2-1:2012, Code of practice for the safe use of cranes, Part 2-1: Inspection, maintenance and thorough examination – General.

BS 7121-2-3:2012, Code of practice for the safe use of cranes, Part 2-3: Inspection, maintenance and thorough examination – Mobile cranes.

BS 7121-3:2017, Code of practice for safe use of cranes — Part 3: Mobile cranes.

BS EN 62305-1:2011, Protection against lightning, General principles.

Other Publications

Best Practice Guide on the Maintenance, Inspection and Thorough Examination of Mobile Cranes, Construction Plant-hire Association (free download from <u>www.cpa.uk.net</u>).

Good Practice Guide on Ground Conditions for Construction Plant, SFfC Plant Safety Group (free download from <u>www.cpa.uk.net</u>).

Good Practice Guide on Medical Fitness to Operate Construction Plant, SFfC Plant Safety Group (free download from <u>www.cpa.uk.net</u>).

Good Practice Guide on Safe Use of Telehandlers, SFfC Plant Safety Group (free download from <u>www.cpa.uk.net</u>).

Good Practice Guide on Lifting Operations with 180° and 360° Excavators, SFfC Plant Safety Group (free download from <u>www.cpa.uk.net</u>).

Requirements for Tower Cranes Alongside Railways Controlled by Network Rail, Construction Plant-hire Association (free download from <u>www.cpa.uk.net</u>).

Mobile Crane Technical Information Note series, Construction Plant-hire Association (free download from <u>www.cpa.uk.net</u>).

Crane Stability on Site, 2003. CIRIA C703. Construction Industry Research and Information Association.

RIS-1700-PLT, Rail Industry Standard for Safe Use of Plant for Infrastructure Work, Rail Safety and Standards Board (free download from <u>http://www.rssb.co.uk/railway-group-standards</u>).

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Annex D - Working Group Membership

Member	Employer
Neil Berry	Berry Cranes
Steve Bradby	Select Cranes
Paul Milgate	Network Rail (High Speed)
Jake Sharlotte	Select Cranes
lan Simpson	Health and Safety Executive
Bob Watts	Network Rail (High Speed)
Gavin Wilson	Select Cranes
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NOTE: The above list includes all those who have kindly given freely of their time and expertise to work on the any of the versions of the guidance document and does not necessarily reflect the current membership of the Working Group.



Working in Partnership

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