

On behalf of
Watkin Jones & Son Limited

Date
May 2018

Project Number
1700001374

THAMES QUARTER, READING FOUNDATION WORKS RISK ASSESSMENT & METHOD STATEMENT

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Made by:



Checked/Approved by:



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EXECUTIVE SUMMARY

Ramboll Environment and Health UK Limited (Ramboll) was instructed by Watkin Jones & Son Limited (the "Client") to develop a Foundation Works Risk Assessment for the Thames Quarter development at King's Meadow, Reading, RG1 8BN (the "site"). The report is required in connection with the proposed development of the site by the Client for residential apartment end use.

This report has specifically been produced to support the discharge of condition 14 of the development's planning permission that states: "No piling or any other foundation designs using penetrative methods shall take place until details including plans and a method statement has been submitted to and approved in writing by the Local Planning Authority. The development shall thereafter only be carried out in accordance with the approved details."

A pollution incident is known to have occurred at the site in 2013, whilst in use as a car dealership. It is understood that an underground oil storage tank in the centre-east of the site leaked into the ground. There have been several phases of site investigation and remediation associated with the oil leak that are discussed in Ramboll's Preliminary Risk Assessment report, Site Investigation and Remediation Strategy. The site is well characterised and previous remediation works have been successful. Remaining oil is present in previously inaccessible areas and this will be remediated as part of the pre-piling remediation work.

This report contains a risk assessment that considers the potential risks of piling on a source - pathway - receptor basis and considers the risks of:

- the creation of preferential pathways, through the underlying strata, to allow potential contamination of the underlying chalk aquifer; and
- the driving of solid contaminants down into the deeper chalk aquifer during pile driving.

The risk assessment concludes that residual risks will be low given that:

- remediation of localised oil and impacted soil and shallow groundwater will take place prior to the piling works happening;
- the proposed pile techniques of non-displacement continuous flight auger techniques will inherently reduce the residual risks associated with piling and mobilisation or drawdown of materials to low levels.

This report contains a Method Statement that sets out the steps required to undertake penetrative piling work at the site, broadly this will involve:

- Remediation of oils / soils / groundwater in accordance with the proposed Remediation Strategy (which has been agreed with the Environment Agency);
- CFA Piling will take place and the Piling Contractor will check the arisings during drilling into the Made Ground to verify that oil contamination is not present. The Client and Environment Agency will be contacted if oil is found at any locations during the early stages of pile formation at any location;
- A round of groundwater monitoring will be completed by an Environmental Consultant after the piling work is complete to verify that the groundwater conditions have not changed significantly post piling; and
- Pile arising will be stockpiled on-site by the Piling Contractor in a safe manner.

Overall Ramboll considers that, on completion of the remediation, and, with the works being completed using CFA techniques, that the potential for mobilisation of shallow contamination to the deeper chalk aquifer will be low. No further remediation work over and above that proposed in the Remediation Strategy is expected and the pile contractor will keep a watching brief during the works to verify that significant contamination (i.e. oil) is not encountered during the works.

1. INTRODUCTION

1.1 Instruction

Ramboll Environment and Health UK Limited (herein 'Ramboll') was instructed by Watkin Jones & Son Limited (the "Client") to develop a Foundation Works Risk Assessment and Method Statement for the Thames Quarter development at King's Meadow, Reading, RG1 8BN (the "site"). The report is required in connection with the proposed development of the site by the Client for residential apartment end use.

This report has specifically been produced to support the discharge of condition 14 of the development's planning permission that requires:

- "No piling or any other foundation designs using penetrative methods shall take place until details including plans and a method statement has been submitted to and approved in writing by the Local Planning Authority. The development shall thereafter only be carried out in accordance with the approved details. Reason: to ensure that there is no resultant unacceptable risk to groundwater from pollution. Piling at this site could potentially mobilise shallow contamination into the underlying chalk principal aquifer (groundwater) and such risk would need to be assessed and addressed. This may necessitate additional remediation of existing contamination. Policies: NPPF para. 109, CS34."

The Planning Permissions covers the:

- "Erection of a part 12 storey, part 23 storey building comprising 315 apartments in a mix of studio, one-bedroom, two-bedroom and 3-bedroom units; residents' lounges, tech-hub, dining room, and cinema room, various rooftop outdoor amenity spaces, concierge/reception with coffee meeting area, residents' storage facilities, postroom, ancillary back-of-house facilities, 315 secure cycle parking spaces, 49 car parking spaces, landscaping, and associated works. Demolition of existing multi-storey car park."

This report has been prepared in accordance with the relevant available guidance documents including:

- Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention - National Groundwater & Contaminated Land Centre report NC/99/73 – dated May 2001.

1.2 Objective

The key objective of the work was to consider whether potential adverse environmental effects may occur as a result of the proposed piling works for the development and to set out potential mitigation measures that may be required.

1.3 Scope of Works

The scope of works has involved:

- a review of the available piling information and understanding of the foundation design and piling techniques to be used;
- a review of the ground conditions and contaminant concentrations across the site and consideration of the potential for piling to mobilise or allow migration of said contaminants (where present); and
- production of a method statement setting out how the works will be undertaken including the controls that will be in place to mitigate environmental risks.

1.4 Existing Ground Contamination Documents

In accordance with UK Guidance a number of previous ground contamination assessments have been undertaken at the site, including a Preliminary Risk Assessment (Desk Study), Site Investigations and a Remediation Strategy that are referenced as follows:

- Preliminary Risk Assessment, King's Meadow Road, Reading, Phase II Environmental Site Investigation, prepared for Watkin Jones & Son Limited, R1700001734, Version 02, dated 5th February 2018.
- Thames Quarter, King's Meadow Road, Reading, Phase II Environmental Site Investigation, prepared for Watkin Jones & Son Limited, R1700001734, Version 03, dated 5th February 2018.
- Thames Quarter, Reading, Remediation Strategy, prepared for Watkin Jones & Son Limited, R1700001734, Version 02, dated 5th February 2018.

This document should be read in conjunction with the above reports for a more complete understanding of the ground conditions and contamination status of the site.

1.5 Limitations

This report has been prepared for the exclusive use of Watkin Jones and Son Limited and should not be used in whole or in part by any third parties without the express permission of Ramboll in writing.

The risk assessment has been undertaken based on the available information provided by Watkin Jones and Sons Limited and their associated advisors. If the proposed method of piling or foundation design is significantly altered beyond the information provided to date this risk assessment should be reviewed and, if required, revised to take account of such changes. The report has been prepared on the understanding that the piling will be undertaken using continuous flight auger methods.

2. EXISTING INFORMATION

2.1 Pertinent Information

The site is located on the southern side of the King's Meadow Road in Reading, approximately 140m south of the River Thames, at National Grid Reference 471830, 173870. Access to the site is via King's Meadow Road.

The site is currently in use as a pay and display car park that will be subject to development activities shortly. The south-eastern area of the site is currently occupied by a three-level multi-storey car park and the remainder of the site provides outdoor ground level car parking. The site will be cleared of existing structures including obstructions in the ground prior to development works (including piling) taking place.

The site is generally flat, as is the surrounding area, and extends to an area of approximately 0.59 hectares. The site location and layout are shown in Figures 1 and 2.

Historically, the site was railway land and tanks were noted to have been present in one location in the east of the site. Prior to the current car park activities, the site was a BMW car dealership, which included a showroom and workshop building in the west of the site, which was demolished in May 2016. A pollution incident is known to have occurred at the site in 2013, whilst the site was in use as a car dealership. It is understood that an underground oil storage tank in the centre-east of the site leaked into the ground. Since this occurred there have been several phases of ground contamination investigations and remediation to clean-up the oil leak, which are discussed in more detail in Ramboll's Preliminary Risk Assessment Report, Site Investigation and Remediation Strategy.

As a summary, the underground storage tank that leaked has been decommissioned and removed from the ground and much of the contamination has been successfully remediated. Residual contamination as free phase product (i.e. neat oil) is known to remain close to the spill in the centre-east of the site within 5m of the former tank location at positions that have not been possible to remove to date due to the presence of nearby drainage and building structures. This residual contamination is intended to be removed or encapsulated as part of the development works and which is programmed to take place prior to any penetrative piling work occurs on-site.

To date no evidence of significant contamination relating to the pollution incident has been identified migrating across the site or within the deeper underlying Chalk Principal aquifer.

2.2 Environmental Setting

The geological and hydrogeological sequence encountered beneath the site is summarised in Table 2.1 below.

Table 2.1: Summary of Geology and Hydrogeology				
Formation	Description	Thickness	Groundwater Depth and EA Designation	Hydrogeological Significance
Made Ground	Generally formed of inert sandy gravel or gravelly sand with fragments of concrete and brick throughout and locally fragments of coal, clinker, slag, chalk, and plastic.	1-2m thick (up to 2.7m thick in places)	No designation	Not classified as an aquifer.

Table 2.1: Summary of Geology and Hydrogeology				
Alluvium	Grey / blue sandy clay with some fine to medium flint gravel	1.0m to 1.5m thick	Secondary A 0.84m bgl* and 2.05m bgl 35.60m AOD to 36.74m AOD	Permeable formations with potential to support localised abstractions.
River Terrace Gravels (RTG)	Very sandy light brown fine to medium flint gravel. Gravely sand in places.	Up to 4.6m thick	Secondary A 1.85m bgl and 2.23m bgl 35.70 to 35.78m AOD	Permeable formations with potential to support localised abstractions.
Seaford Chalk Formation and Newhaven Chalk Formation	Identified as a white structureless chalk	Up to 200m thick	Principal Groundwater depth and elevations similar to RTG	Highly permeable, with significant water storage. Able to support large abstractions.
bgl = below ground level				

The site is located within an EA defined groundwater Source Protection Zone (SPZ) III, which relates to the abstraction of groundwater from the Chalk at Reading University approximately 2 km south-east of the site. The Alluvial groundwater and River Terrace Gravels are not abstracted for use in the immediate vicinity of the site. Groundwater in the River Terrace Gravels and the Chalk is likely to be in direct hydraulic connectivity based on the previous monitoring data and groundwater elevations. Groundwater in the alluvium appears to largely be disconnected from the river terrace gravels and chalk based on the available groundwater data obtained to date.

2.3 Hydrology

The nearest identified main surface water body is the River Thames, an inland river located 140 m north of the site. The Vastern Ditch, a surface water body that runs along the southern bank and that ultimately drains into the River Thames, is located from 130m to the north of the site. A Thames Water surface water culvert runs from north to south through the site and discharges into the Vastern Ditch and the River Thames.

Section 3 below provides a summary of the ground contamination status of the site.

3. SUMMARY OF GROUND CONTAMINATION STATUS

3.1 Soil and Groundwater Conditions

An overview of the soil and groundwater conditions at the site is provided in Section 3 of the Remediation Strategy. This discusses the previous remediation works that have taken place on the site and provides the results of the most recent site investigation. In summary, the previous site investigations have confirmed that the majority of the site is suitable for the proposed residential apartment use. It is acknowledged that residual PAH contamination is present in the Made Ground and locally in the alluvial groundwater, which is typical for much urban development land in the UK and is expected to relate to the presence of anthropogenic material in the Made Ground. In one location cyanide was also detected in the alluvial groundwater at a concentration of 0.12mg/l. However, the residual PAH and cyanide concentrations appear to be sporadic and in general are present at low concentrations.

In localised areas close to the former underground tank remediation is still required under what has been termed the 'Long Term (Remediation) Works' (i.e. the final clean-up works relating to the oil spill). Potentially mobile free phase product (neat oil) has been identified as follows:

- adjacent to an interceptor and manhole ring close to the location of the former tank;
- in the two Sumps 1B and 1C from previous phases of remediation work that are installed in the river terrace deposits near to the culvert;
- in WS410 where a vein of free phase product was identified in soil in the alluvium (this is near to Sumps 1B and 1C);
- in WS407 where free phase product was identified in soil and groundwater in the alluvium. This is close to the historic UST fill point; and
- there is a potential that oil may remain present in the bedding material of the culvert, which may have extended along the culvert beneath the remaining building on-site.

The above locations are shown in Figure 3, Appendix 1. This figure was included with the Remediation Strategy for the site and defines the areas that are known or strongly suspected to require remediation (red coloured areas), or where further delineation is required to verify that mobile hydrocarbon contamination is not where evidence of staining was recorded previously (amber coloured areas).

However, no visual observations of neat oil product was encountered in the amber coloured areas and additional delineation in these areas is proposed under the Remediation Strategy to provide additional verification, as part of the remediation works, and, prior to piling, that oil is not present in these areas. The targeted areas are localised and includes the location of the former railway tanks on the east side of the site.

In terms of dissolved phase petroleum hydrocarbon concentrations in the underlying alluvium and river terrace gravel aquifers have already been subject to chemical treatment of groundwater conditions and, outside of the locations where neat oil remains, which is the majority of the site, dissolved phase concentrations are low and mostly below laboratory detection limits for total petroleum hydrocarbons.

The most recent round of groundwater monitoring only recorded a positive detection of petroleum hydrocarbons in one location at a concentration of 0.17mg/l in CP01 (a chalk borehole) on the eastern side of the site located outside of the area affected by the oil spill. The hydrocarbons were recorded in the longer chain fractions that have a low mobility and the result was considered to be an isolated occurrence.

3.2 Remedial Targets

The remedial targets for the site are based on the removal of oil (as far as is reasonably practicable), and for removal of impacted soil and the treatment of groundwater at the locations where free phase product remains. Remedial targets have been set to guide this remediation that are set out in Table 3.1 below.

Table 3.1: Remedial Targets – Soil and Groundwater		
Contaminant	Soil Remedial Target[^]	Groundwater Remedial Target
Benzene	0.37	0.01
Toluene	370	N / A
Ethylbenzene	34	0.02
Xylene	34	0.09
MTBE	39	0.012
Aliphatic C5-6	24	0.145
Aliphatic C6-8	53	0.15
Aliphatic C8-C10	13	0.18
Aliphatic C10-12	62	Removal of FPP
Aliphatic C12-16	510	Removal of FPP
Aliphatic C16-21	42,000	Removal of FPP
Aliphatic C21-35		
Aromatic C5-7 (Benzene)	0.37	0.01
Aromatic C7-8 (Toluene)	340	0.2
Aromatic C8-10 (Xylene)	22	0.09
Aromatic C10-12	120	0.14
Aromatic C12-16	1,100	0.14
Aromatic C16-21	1,900	0.14
Aromatic C21-35	1,900	0.25
Note – FPP = Free Phase Product		

3.3 Culvert Remediation

As a culvert runs through the centre-east of the site and previously there has been evidence of oil in the culvert bedding material the Remediation Strategy for this structure is to remove as much oil as is reasonably practical from around the culvert. This is given the fact that the culvert structure must remain in-situ and it is not possible to excavate significant volumes of material from beneath the culvert without affecting its structural integrity. To encapsulate any residual contamination in the inaccessible bedding material beneath the culvert a grout wall will then be placed either side of the culvert. In future the piles will be formed around the culvert and will not penetrate immediately adjacent to or through the culvert structure.

3.4 Post – Remediation Groundwater Sampling

It has previously been agreed with the Environment Agency, and as referenced in Ramboll's Remediation Strategy, that two rounds of groundwater monitoring will be completed from selected available monitoring wells on completion of the remediation works to verify that the remediation works have been successful and that no further remediation is required to allow the development and penetrative piling works to proceed.

The proposed piling and foundation design is provided in Section 4 below.

4. PROPOSED FOUNDATION & PILE METHOD

4.1 Development Foundation Design

Given the height of the proposed structure piled foundations will be required to provide a secure foundation for the proposed apartment buildings. The foundation design has been completed by Tier Consult and the design and layout is documented in the following drawings that are included in this report as Appendix 2:

- Drawing: Foundation Design, Project T-2008, Drawing Number 15-02, Rev P1 dated 19-04-18.
- Drawing: Piling Matt Layout, Project T-2008, Drawing Number 13-01, Rev P1 dated 13-03-18.
- Drawing: Pile Layout, Project T-2008, Drawing Number 13-02, Rev P1 dated 13-03-18.
- Drawing: Pile Schedule, Project T-2008, Drawing Number 14-01, Rev P1 dated 13-03-18.
- Drawing: Foundation Plan, Project T-2008, Drawing Number 15-01, Rev P2 dated 19-04-18.

4.2 Proposed Piling Method

The pile will be formed using non-displacement piling techniques, specifically using a Continuous Flight Auger (CFA) pile rig.

As background, non-displacement piling techniques involve the extraction of a core of soil and its subsequent replacement by the pile. The pile will be formed by casting concrete in situ behind the auger head as it is extracted from the ground. This method results in minimal displacement of the soil surrounding the pile and there is minimal radial or vertical soil movement or densification as a result of this method. Excavated soil is brought to the ground surface in the form of arisings for collection and safe disposal off-site. Piling arisings are not intended to be re-used on-site.

The use of a non-displacement pile methodology (such as CFA) is preferable to the use of driven piles on potentially contaminated sites as it minimises the risk of driving contaminated material to deeper horizons. With the CFA method, arisings are instead brought to the surface by the auger action.

The CFA piling method allows the concrete (from which the pile will be formed) to be introduced through the hollow stem of the auger filling the void space created by the augers as the auger is withdrawn. This technique does not leave an open hole during the piling (an open hole could act as a temporary pathway for contamination).

Pile diameters are as follows:

- 4500mm: 254
- 6000mm: 93
- 7500mm: 87
- Total number of piles: 434

Pile completion depths have not been confirmed at this point, however, given the height of the proposed structure it is understood that piles will need to be formed into the chalk bedrock beneath the site. This FWRA assumes that piles penetrate into the chalk and into the chalk's groundwater table.

5. RISK ASSESSMENT

5.1 Risk Assessment Methodology

The risk assessment has been undertaken using a source – pathway - receptor approach in line with risk management framework set out in the Environment Agency's Model Procedures for the Management of Land Contamination (CLR 11),

A qualitative approach to the risk assessment has been undertaken that takes into account:

- the known contaminant concentrations on-site in soil and groundwater;
- the geological and hydrogeological conditions on-site; and
- the proposed piling techniques, pile layout and expected completion depths.

The risk assessment specifically considers the following scenarios:

- the creation of preferential pathways, through the underlying strata, that could allow potential contamination of the underlying chalk aquifer from shallow mobile contamination; and
- the driving of solid contaminants down into the deeper chalk aquifer during pile driving.

The risk assessment is presented in Table 4.1 on the following page.

Table 4.1 Foundation Works Risk Assessment

Risk Scenario	Source	Pathway – Receptor.	Current Risk	Mitigation	Residual Risk
Driving of contaminants into deeper aquifer.	Residual oil	Piling can disturb and move material from shallow ground into deeper ground, which in this case is a sensitive receptor as the chalk aquifer.	High (in areas that require remediation)	- Remediation of neat oil and impacted soil and groundwater will be completed in advance of piling works in accordance with the Remediation Strategy. - Groundwater monitoring will be completed post piling to validate that the remediation has been completed and that the resultant ground conditions are suitable for piling. - CFA piling techniques displace material laterally and return displaced soil to the surface through the inherent rotary action of the augers thereby minimising vertical drawdown of shallow soil and groundwater media.	Low
	Made Ground and shallow groundwater outside of remediation areas	As above.	Low to Moderate (in areas outside of remediation areas)	- The site has been subject to extensive site investigation and characterisation. There is no current evidence of significant mobile contamination outside of the known remediation areas and further delineation trial pitting will take place as part of the proposed remediation works to verify areas outside of the remediation locations do not contain residual oil. - CFA piling techniques displace material laterally and return displaced soil to the surface through the inherent rotary action of the augers. This will restrict the potential for shallow soil and perched water to be drawn down into the underlying aquifers.	Low
Creation of preferential pathways through augering a pile hole into the ground.	Residual oil	Augering creates a vertical pathway from the ground surface to the pile completion depth, which in this case is a	Moderate - High (in areas that require remediation)	- Remediation of neat oil and impacted soil and groundwater to be completed in advance of piling works in accordance with the Remediation Strategy. - Groundwater monitoring will be completed post piling to validate that the remediation has been completed	Low

Table 4.1 Foundation Works Risk Assessment

		sensitive receptor as the chalk aquifer.		and that the resultant ground conditions are suitable for piling. The external steel casing of the hollow stem auger will effectively prevent shallow alluvial groundwater or soils laterally directly entering the open hole created by the pile augers. The potential for contaminants to migrate vertically down the side of the auger is considered to be limited given the rotary auger action returns arisings to the surface. The augers are then gradually removed and concrete emplaced directly behind the drill head as the auger is extracted to fill the hole.	
	Made Ground and shallow groundwater outside of remediation areas	As above.	Low (in areas outside of remediation areas)	- The site has been subject to extensive site investigation and characterisation. There is no current evidence of significant mobile contamination outside of the known remediation areas and further delineation trial pitting will take place as part of the proposed remediation works to verify areas outside of the remediation locations do not contain residual oil. - The external steel casing of the hollow stem auger will effectively prevent shallow groundwater or soils from directly entering the open hole created by the pile augers. The potential for contaminants to migrate vertically down the side of the auger is considered to be limited given the rotary auger action returns arisings to the surface. The augers are then gradually removed and concrete emplaced directly behind the drill head as the auger is extracted to fill the hole.	Low

In accordance with the above risk assessment, on completion of the remediation work and taking into account the proposed piling methods that will be used the risk to the underlying chalk aquifer is considered to be low.

A Method Statement has been created to support the Client's management of the piling works, which is presented in Section 6 below.

6. PILING METHOD STATEMENT AND ENVIRONMENTAL RISK MITIGATION

The following provides an over-arching method statement for the management of environmental risks relating to the piling works. The piling works are expected to be completed in accordance with this method statement and the Client will be responsible for ensuring the relevant parties undertake the necessary works for each required task.

The Remediation Contractor will undertake the Remediation Works in accordance with the Remediation Strategy and the associated Contractor's Remediation Implementation Plan.

On completion of the Remediation Work an Environmental Consultant will undertake two rounds of groundwater monitoring and sampling to provide chemical analysis data for the groundwater conditions post piling. As set out in the Remediation Strategy the groundwater monitoring events will be spaced one week apart.

The results of the groundwater monitoring will be provided to the Environment Agency in a letter format for their review and agreement. Should the groundwater monitoring not demonstrate that the groundwater conditions are acceptable there may be a need to undertake further remediation until such a time that the results are satisfactory to the Environment Agency.

The Piling Matt will be placed and formed by the Piling Contractor to a thickness of 750mm as specified by Tier Consult. The formation of the piling matt is not expected to result in intrusive penetration into the ground and therefore the risk of contaminant mobilisation during this phase of work is considered to be negligible. The piling matt will be re-used and the re-use of such material will be completed in accordance with the CI:aire Definition of Waste: Development Industry Code of Practice. A Materials Management Plan will be produced to document the associated re-use of material on-site.

The Piling Contractor will form the piles on-site using non-displacement Continuous Flight Auger techniques. The pile will be formed as follows:

- The Pile Contractor is responsible for the provision and set-up of all equipment at the site.
- At each location it is expected that the Pile Contractor will set the rig at the required location, prepare the rig, load the augers and begin intrusive piling into the ground.
- The Pile Contractor will be required to pay close attention to the soil arisings during the early stages of the augering and if any evidence of mobile oil is observed the Pile Contractor will be required to stop work and report the findings to the Client immediately for discussion with their advisors and the Environment Agency.
- Where oil is not identified, the piling rig will drive the augers to the required pile depth and in stages will retract the augers and inject concrete mix from the base of the annulus upwards as the auger is retracted. This process will be followed until the augers are fully extracted from the borehole annulus and the re-enforcement cage will be inserted into the pile.
- This method will be repeated for each pile until all piles have been installed at the site.

Pile arisings will be temporarily stockpiled on-site for future off-site disposal at a suitable disposal site or treatment facility. Prior to disposal off-site the arisings will be characterised in accordance with prevailing waste legislation and records of waste transfer documentation retained by the Client in accordance with statutory timescales.

On completion of the piling works a round of groundwater monitoring will be completed by the Environmental Consultant within the timeframe of one month after the piling works are completed. The results will be provided to the Environment Agency as a record that piling has not affected the groundwater conditions on-site.

7. CONCLUSION

Overall Ramboll considers that, on completion of the remediation, and, with the works being completed using CFA techniques, that the potential for mobilisation of shallow contamination to the deeper chalk aquifer that could subsequently result in significant contamination to the chalk aquifer would be unlikely and of a low risk. No further remediation work over and above that already proposed in the Remediation Strategy is expected. This is considered on the basis that the remediation targets for the remediation works are already stringent and that prior phases of remediation work have successfully remediated oil and dissolved phase groundwater contaminants to low concentrations.

The proposed non-displacement type piling methodology is also intended to minimise the risks of residual ground contamination, if present, being mobilised and drawn down into the deeper aquifers or for creating a preferential pathway for flow of contaminants vertically downwards. Furthermore, the Pile Contractor will keep a watching brief during the works to verify that significant mobile contamination (i.e. oil) is not encountered during the works.

The work will need to be undertaken in accordance with the Method Statement provided in this document. In accordance with the Method Statement if unexpected mobile oil contamination is encountered during the works this should be reported to the Client by the Piling Contractor immediately.

On completion of the piling works a round of groundwater monitoring will be completed as a record that piling has not affected the groundwater conditions on-site.

APPENDIX 1 FIGURES

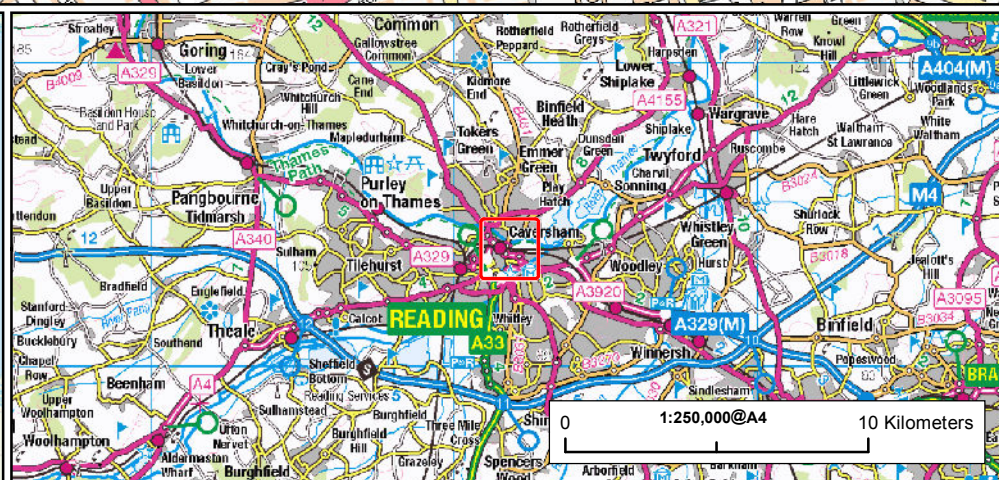
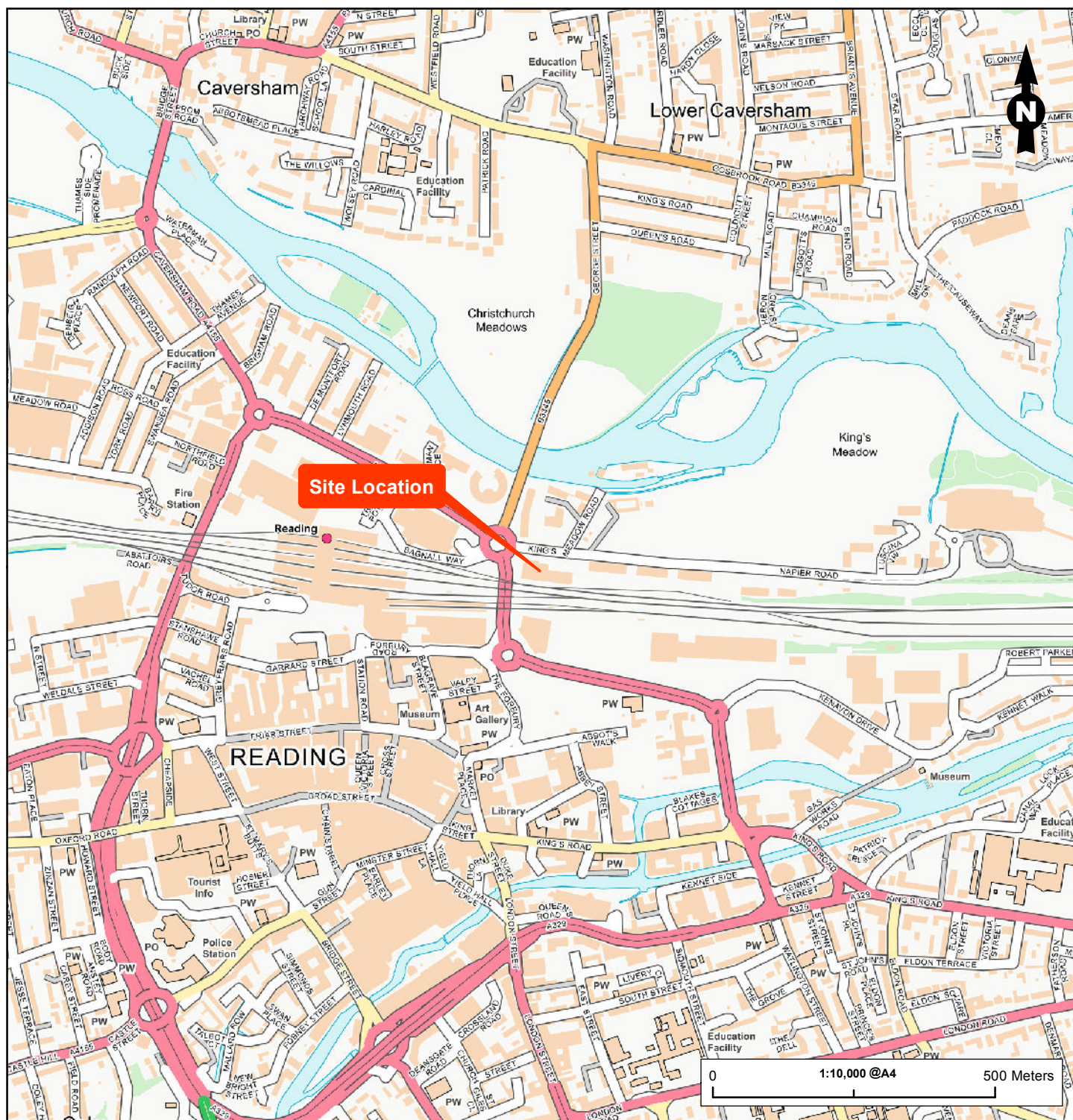
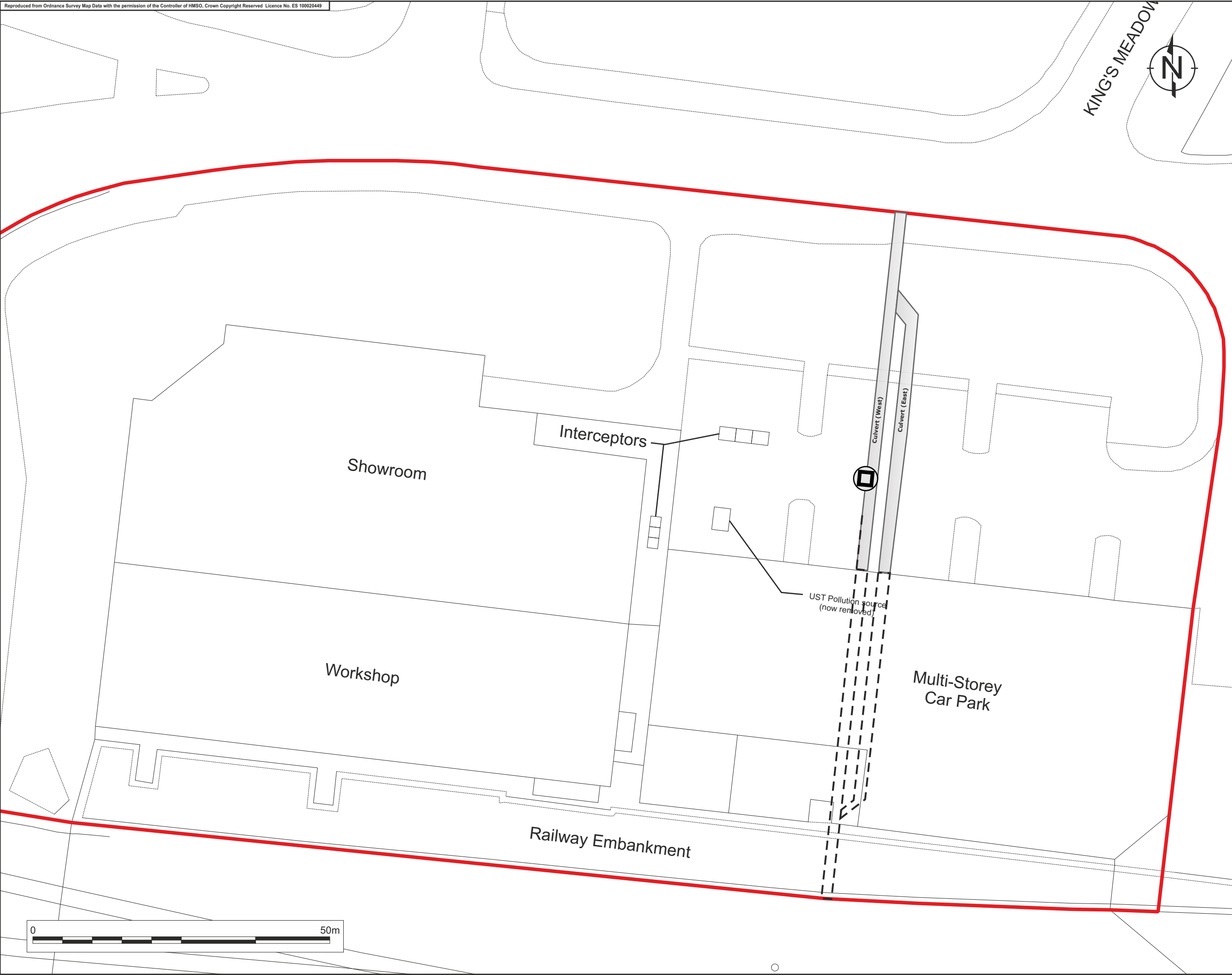
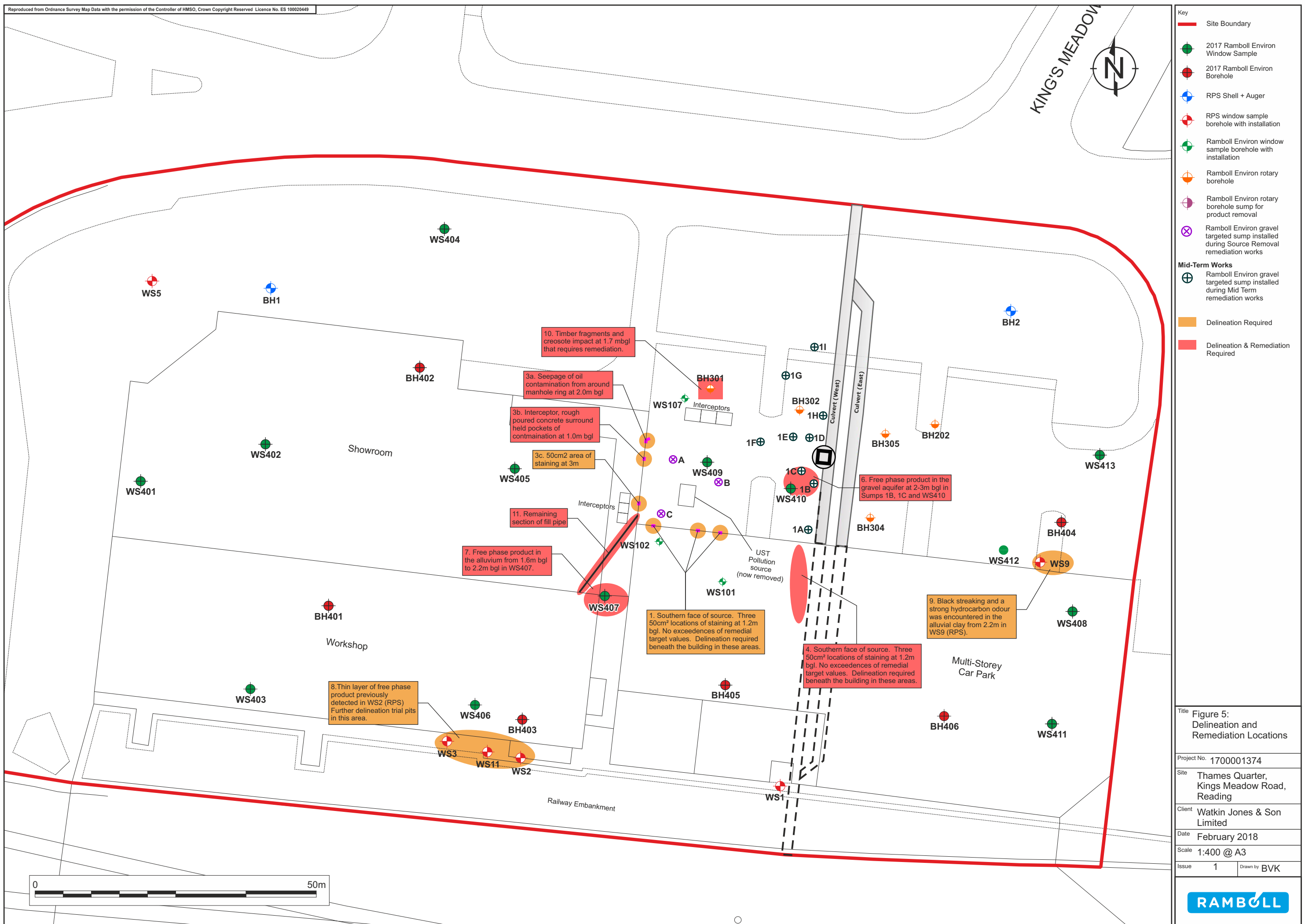


Figure Title Figure 1: Site Location	Project Name Thames Quarter, Kings Meadow Road, Reading	Date February 2018	
Project Number 1700001374	Client Watkin Jones & Son Limited	Scale As shown	
		Issue 1 Prepared By DM	

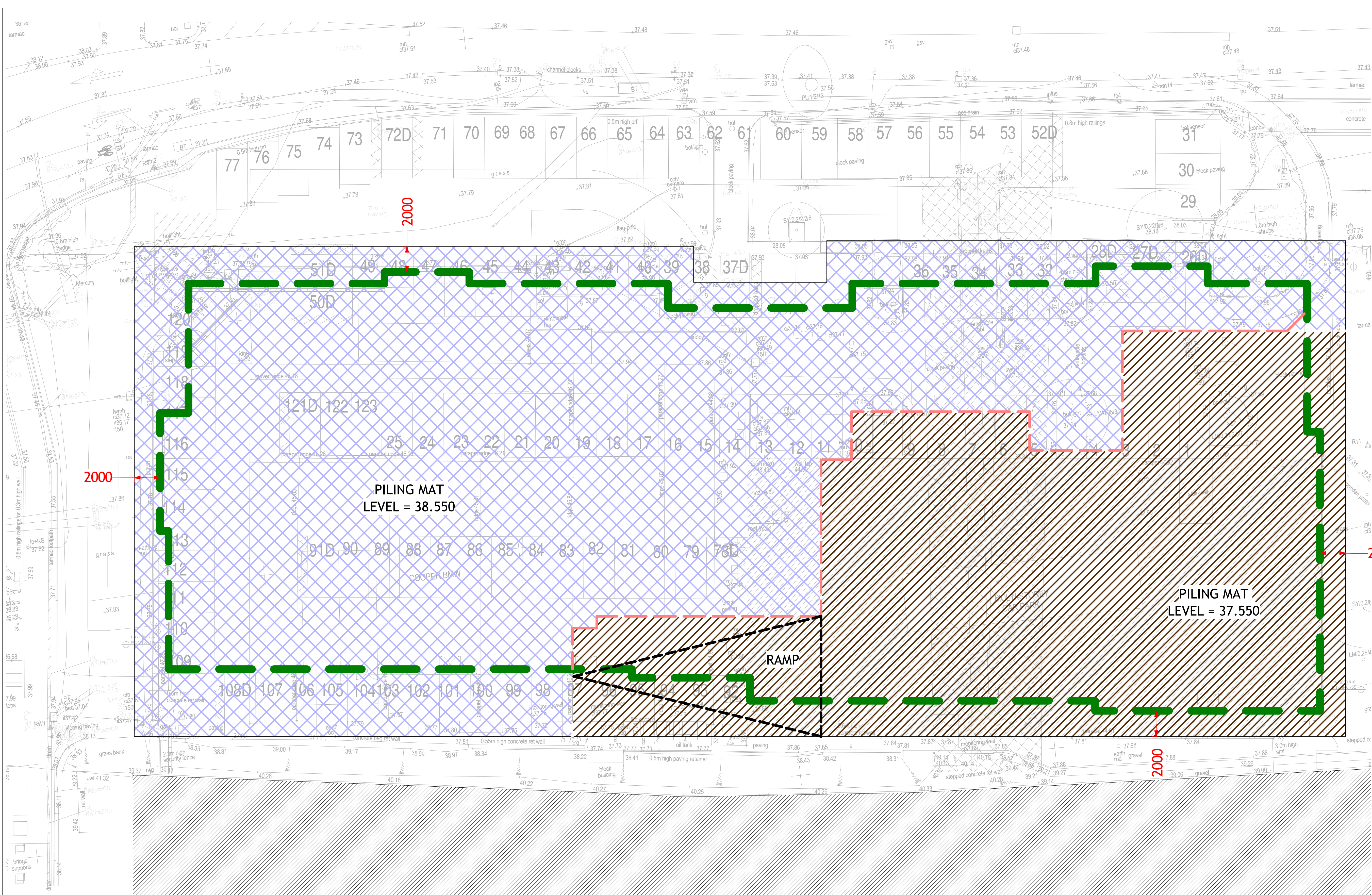


Key	
	Site Boundary
Title Figure 2: Site Layout	
Project No. 1700001374	
Site Thames Quarter, Kings Meadow Road, Reading	
Client Watkin Jones & Son Limited	
Date February 2018	
Scale 1:400 @ A3	
Issue 1	Drawn by MI



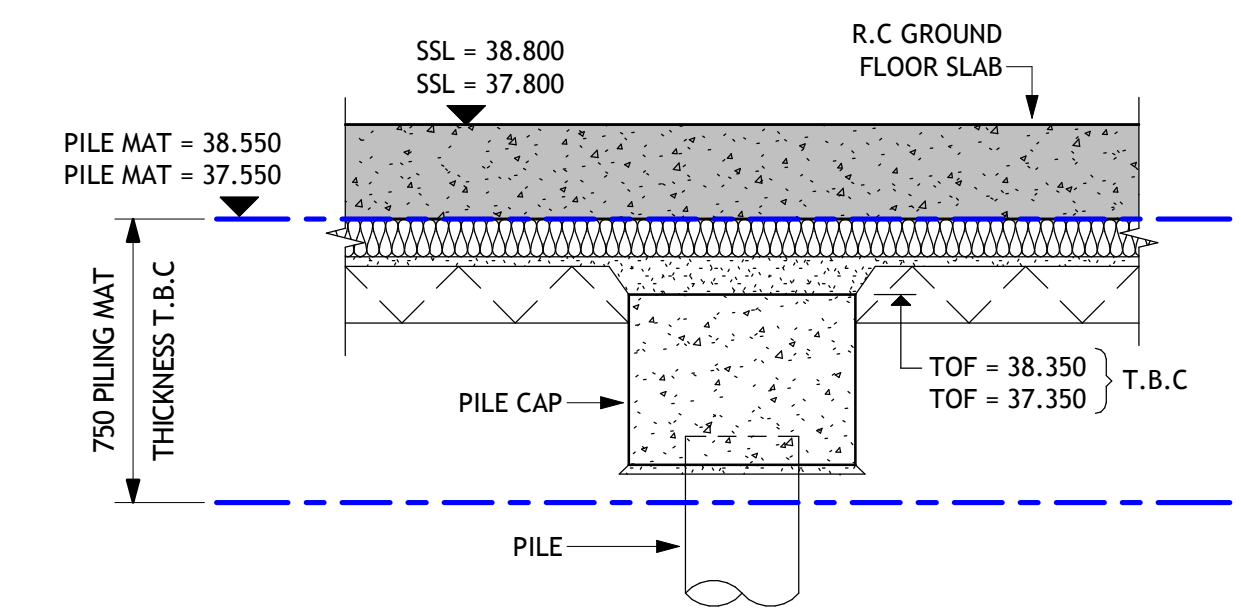
APPENDIX 2

PILE AND FOUNDATION DRAWINGS



PILING MAT PLAN
1: 150

PILING MAT DEPTH CURRENTLY DESIGNED AS
750mm THICK, DEPTH OF PILING MAT
SUBJECT TO RECEIPT OF PILING RIG LOADS



TYPICAL PILING MAT SECTION
1: 20

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECT'S, ENGINEER'S AND SPECIALIST'S DRAWINGS TOGETHER WITH THE APPROPRIATE SPECIFICATION.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK ALL DIMENSIONS ON SITE. DIMENSIONS MUST NOT BE SCALED FROM THIS DRAWING. ANY DISCREPANCIES TO BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT IN WRITING.
3. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTES OTHERWISE.
4. ALL LEVELS ARE IN METRES, UNLESS NOTES OTHERWISE.

PILING MAT KEY:

- DENOTES EXTENT OF BUILDING FOOTPRINT
- DENOTES LEVEL STEP IN GROUND FLOOR SLAB
- DENOTES PILING MAT LEVEL = 38.550
- DENOTES PILING MAT LEVEL = 37.550

PILING MAT SPECIFICATION

1. ALL RECYCLED DEMOLITION MATERIAL USED FOR THE PILING MAT IS TO BE CRUSHED AND GRADED TO CLASS 6F2 AS PER 'SPECIFICATION FOR HIGHWAY WORKS' TABLE 6/1.
2. THE PILING MAT IS TO BE PLACED AND COMPACTED IN ACCORDANCE WITH 'SPECIFICATION FOR HIGHWAY WORKS' TABLE 6/4 - METHOD 6.
3. ANY AMENDMENT TO THE LEVELS INDICATED ON THIS DRAWING MUST BE AGREED IN ADVANCE WITH THE MAIN CONTRACTOR WATKIN JONES.
4. PILING MAT TO BE A MINIMUM THICKNESS OF 750mm (NOTE THIS IS SUBJECT TO CONFIRMED RIG LOADS)

P1	PRELIMINARY ISSUE.	A.W	P.J.B	14-02-18
REV	DESCRIPTION	BY	APP.	DATE

ISSUE STATUS

PRELIMINARY

Tier Consult

Tier Consult
Richmond House
Sandpiper Court
Chester Business Park
Chester
CH4 9QZ
Tel: 01244 684 900
Fax: 01244 684 901
Email: info@tieruk.com

CLIENT

Watkin Jones
BUILD TO RENT

ARCHITECT

STRIDE TREGLOWN

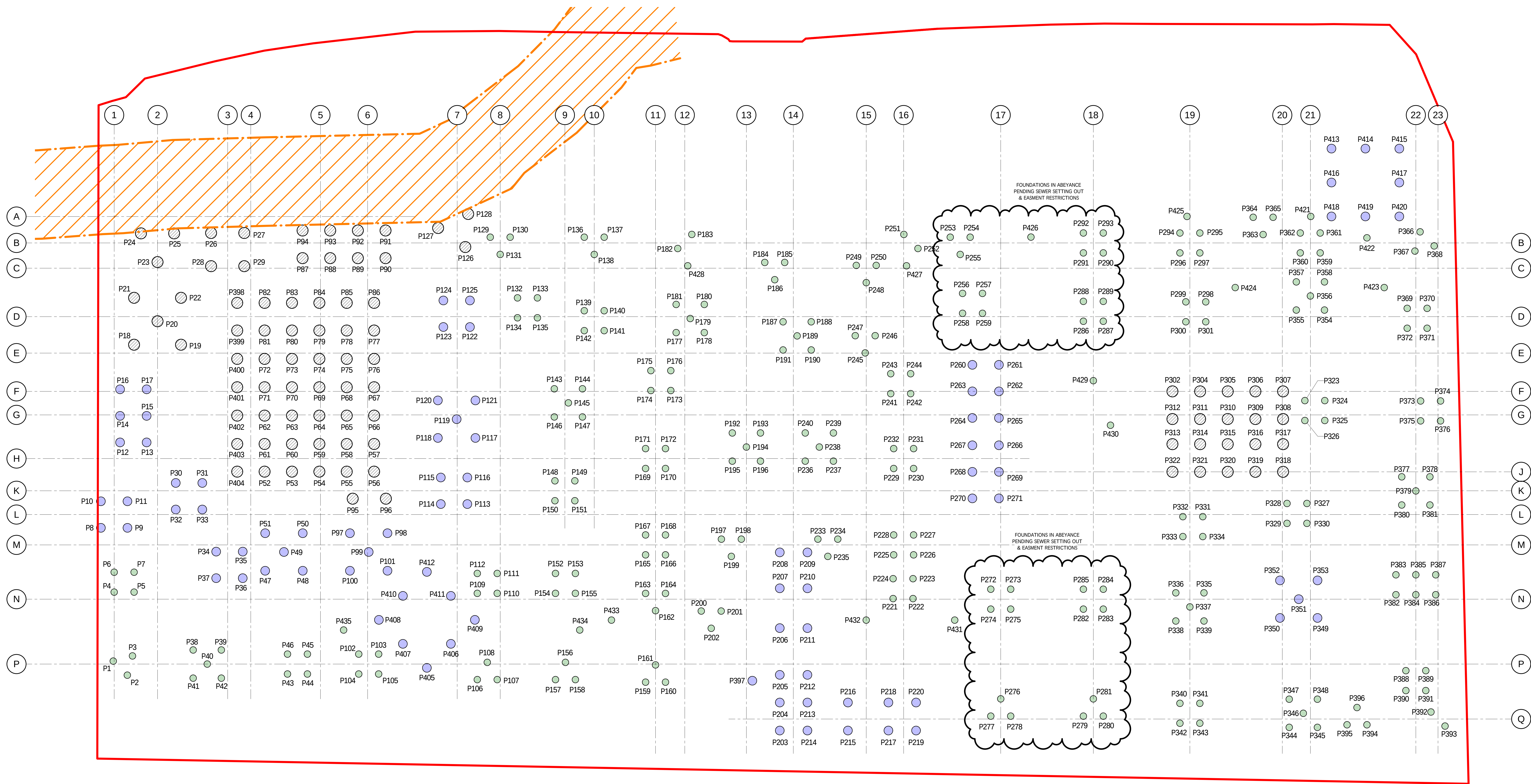
PROJECT

THAMES QUARTER , READING

TITLE

PILING MAT LAYOUT

FIRST ISSUE	FEB '17	DRAWN BY	A.W
SIZE	A1	Checked	P.J.B
SCALE	AS SHOWN	Approved	P.J.B
PROJECT NUMBER	T-2008	DRAWING NUMBER	13-01
		REV	P1



GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTS, ENGINEERS AND SPECIALISTS' DRAWINGS TOGETHER WITH THE APPROPRIATE SPECIFICATION.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK ALL DIMENSIONS ON SITE. DIMENSIONS MUST NOT BE SCALED FROM THIS DRAWING. ANY DISCREPANCIES TO BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT IN WRITING.
3. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTES OTHERWISE.
4. ALL LEVELS ARE IN METRES, UNLESS NOTES OTHERWISE.

NOTE: LOCAL COORDINATES CURRENTLY SHOWN, WORLD COORDINATES TO BE AGREED WITH ARCHITECT

1. ALL PILE LOADS ARE UNFACTORED IN KN.
2. ALL PILE CAPACITIES MUST BE CONFIRMED BY PILING CONTRACTOR PRIOR TO COMMENCEMENT ON SITE.
3. NO DEVIATION FROM PILE SPECIFICATION STATED IN SCHEDULE IS PERMITTED, UNLESS APPROVED BY TIER CONSULT.

PILES KEY:

- DENOTES 450mm Ø PILES
- DENOTES 600mm Ø PILES
- DENOTES 750mm Ø PILES

BEARING PILE QUANTITIES

PILE DIA (mm)	COUNT
450	254
600	93
750	87
Grand total: 434	434

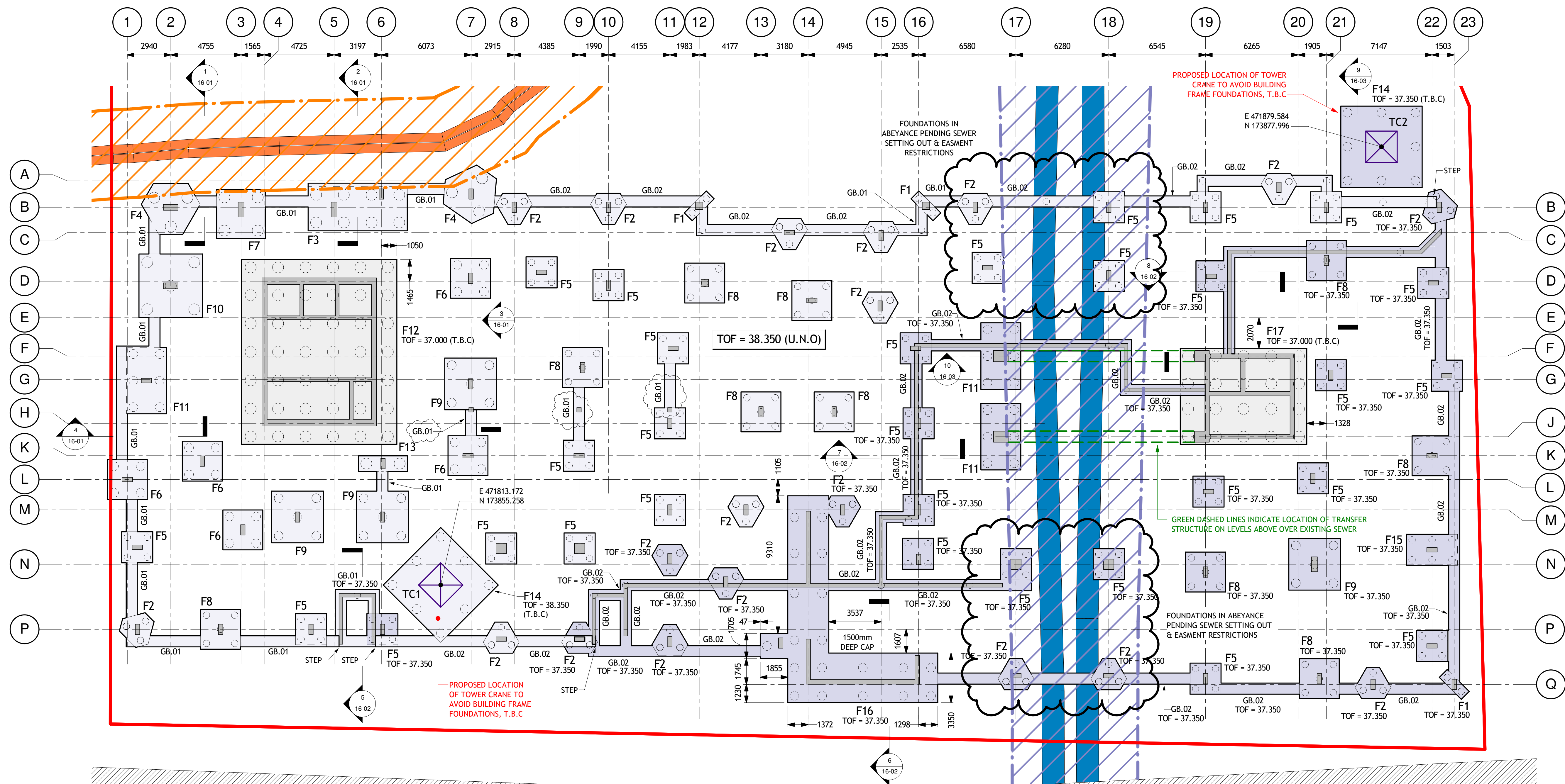
PILE LAYOUT

1:100

P1	PRELIMINARY ISSUE.	A.W	E.P	13-03-18
REV	DESCRIPTION	BY	APP.	DATE
ISSUE STATUS				
PRELIMINARY				
		Tier Consult Richmond House Sandpiper Court Chester Business Park Chester CH4 9QZ Tel: 01244 684 900 Fax: 01244 684 901 Email: info@tieruk.com		
CLIENT				
WATKIN JONES				
ARCHITECT				
STRIDE TREGLOWN				
PROJECT				
THAMES QUARTER , READING				
TITLE				
PILE LAYOUT				
FIRST ISSUE	MARCH '18	DRAWN BY	A.W	
SIZE	A0	Checked	E.P	
SCALE	AS SHOWN	Approved		
PROJECT NUMBER	T-2008	DRAWING NUMBER	13-02	REV
				P1

BEARING PILE SCHEDULE						
PILE REF	VERTICAL LOAD (kN)	HORIZONTAL LOAD (kN)	TENSION LOAD (kN)	PILE DIA (mm)	EASTING	NORTHING
P1	820			4500	471791.733	173854.734
P2	820			4500	471792.581	173853.683
P3	820			4500	471793.067	173854.943
P4	900			4500	471792.292	173859.377
P5	900			4500	471793.634	173859.234
P6	900			4500	471792.435	173860.719
P7	900			4500	471793.777	173860.576
P8	1175			6000	471791.059	173863.807
P9	1175			6000	471793.649	173863.615
P10	1175			6000	471792.597	173865.597
P11	1175			6000	471793.840	173865.405
P12	1475			6000	471793.766	173869.429
P13	1475			6000	471795.556	173869.238
P14	1475			6000	471793.957	173871.219
P15	1475			6000	471795.147	173871.028
P16	1475			6000	471794.148	173873.009
P17	1475			6000	471795.938	173872.818
P18	2000			7500	471795.413	173875.915
P19	2000			7500	471796.577	173875.578
P20	2000			7500	471797.184	173877.328
P21	2000			7500	471795.750	173879.079
P22	2000			7500	471798.914	173878.742
P23	2050			7500	471797.589	173881.317
P24	2050			7500	471796.677	173883.374
P25	2050			7500	471800.914	173883.135
P26	2075			7500	471801.408	173882.894
P27	2075			7500	471803.645	173882.656
P28	2075			7500	471801.169	173880.657
P29	2075			7500	471803.407	173880.418
P30	1475			6000	471797.228	173886.284
P31	1475			6000	471799.018	173886.103
P32	1475			6000	471797.037	173886.504
P33	1475			6000	471798.827	173886.313
P34	1475			6000	471799.459	173881.375
P35	1475			6000	471801.049	173881.184
P36	1475			6000	471801.058	173889.384
P37	1475			6000	471799.268	173889.585
P38	825			4500	471797.201	173884.908
P39	825			4500	471799.099	173884.705
P40	825			4500	471796.049	173883.857
P41	825			4500	471796.988	173883.000
P42	825			4500	471798.897	173882.807
P43	1000			4500	471803.386	173882.609
P44	1000			4500	471804.729	173882.465
P45	1000			4500	471804.872	173883.808
P46	1000			4500	471803.529	173883.951
P47	1325			6000	471802.625	173889.732
P48	1325			6000	471805.156	173889.462
P49	1325			6000	471804.026	173890.802
P50	1325			6000	471805.426	173891.993
P51	1325			6000	471802.095	173892.263
P52	2000	65		7500	471803.299	173896.418
P53	2000	65		7500	471805.145	173896.221
P54	2000	65		7500	471806.991	173896.025
P55	2000	65		7500	471808.838	173895.828
P56	2000	65		7500	471810.682	173895.631
P57	2000	65		7500	471810.881	173897.495
P58	2000	65		7500	471809.035	173897.692
P59	2000	65		7500	471807.189	173897.889
P60	2000	65		7500	471805.344	173898.086
P61	2000	65		7500	471803.498	173898.283
P62	2000	65		7500	471803.702	173870.196
P63	2000	65		7500	471805.548	173899.999
P64	2000	65		7500	471807.394	173899.802
P65	2000	65		7500	471809.239	173899.605
P66	2000	65		7500	471811.085	173899.408
P67	2000	65		7500	471811.289	173871.321
P68	2000	65		7500	471809.443	173871.518
P69	2000	65		7500	471807.598	173871.715
P70	2000	65		7500	471805.752	173871.912
P71	2000	65		7500	471803.906	173872.109
P72	2000	65		7500	471804.110	173874.021
P73	2000	65		7500	471805.956	173873.825
P74	2000	65		7500	471807.802	173873.628
P75	2000	65		7500	471809.648	173873.431
P76	2000	65		7500	471807.794	173873.234
P77	2000	65		7500	471811.697	173875.147
P78	2000	65		7500	471809.852	173875.344
P79	2000	65		7500	471808.006	173875.541
P80	2000	65		7500	471806.160	173875.737
P81	2000	65		7500	471804.314	173875.930
P82	2000	65		7500	471804.513	173877.739
P83	2000	65		7500	471806.359	173877.602
P84	2000	65		7500	471808.205	173877.405
P85	2000	65		7500	471810.051	173877.208
P86	2000	65		7500	471811.896	173877.011
P87	2025			7500	471807.935	173880.540
P88	2025			7500	471809.258	173880.341
P89	2025			7500	471811.122	173880.142
P90	2025			7500	471812.987	173879.943
P91	2025			7500	471813.186	173881.808
P92	2025			7500	471811.321	173882.007
P93	2025			7500	471809.457	173882.206
P94	2025			7500	471807.592	173882.405
P95	1925			7500	471809.042	173883.960
P96	1925			7500	471811.280	173883.721
P97	1275			6000	471808.698	173861.654
P98	1275			6000	471811.139	173861.384
P99	1275			6000	471809.738	173860.253
P100	1275			6000	471808.337	173859.122
P101	1275			6000	471810.869	173858.852
P102	925			4500	471808.552	173853.439
P103	925			4500	471809.675	173853.295
P104	925			4500	471808.189	173852.096
P105	925			4500	471809.531	173851.953
P106	450			4500	471816.141	173850.886
P107	450			4500	471817.493	173850.721
P108	450			4500	471816.936	173851.957
P109	725			4500	471816.761	173856.683
P110	725			4500	471818.104	173856.539
P111	725			4500	471818.247	173857.882
P112	725			4500	471816.945	173858.025
P113	1450			6000	471816.733	173862.775
P114	1450			6000	471814.943	173862.966
P115	1450			6000	471815.134	173864.756
P116	1450			6000	471816.924	173864.565
P117	1425			6000	471817.753	173867.174
P118	1425			6000	471815.222	173867.444
P119	1425			6000	471816.622	173868.575
P120	1425			6000	471815.492	173869.705
P121	1425			6000	471818.023	173869.705
P122	1475			6000	471819.180	173874.694
P123	1475			6000	471816.390	173874.885
P124	1475			6000	471816.581	173876.675
P125	1475			6000	471818.371	173876.484
P126	1725			7500	471818.444	173880.119
P127	1725			7500	471816.748	173881.588
P128	1725			7500	471818.877	173882.327
P129	825			4500	471820.196	173880.603
P130	825			4500	471821.538	173880.460
P131	825			4500	471820.743	173879.369
P132	1000			4500	471822.316	173876.316
P133	1000			4500	471822.939	173876.172
P134	1000			4500	471821.453	173874.973
P135	1000			4500	471822.796	173874.830
P136	1000			4500	471826.535	173879.927
P137	1000			4500	471827.877	173879.783
P138	1000			4500	471827.082	173878.680
P139	850			4500	471826.006	173874.969
P140	850			4500	471827.349	173874.826
P141	850			4500	471827.205	173873.484
P142	850			4500	471825.863	173873.637
P143	975			4500	471823.424	173869.020
P144	975			4500	471825.322	173869.718
P145	975			4500	471824.272	173868.870
P146	975			4500	471823.221	173868.022
P147	975			4500	471825.120	173867.619
P148	1000			4500	471822.804	173863.711

BEARING PILE SCHEDULE							
PILE REF	VERTICAL LOAD (kN)	HORIZONTAL LOAD (kN)	TENSION LOAD (kN)	PILE DIA (mm)	EASTING	NORTHING	PILE OUT OFF LEVEL (m)
P149	1000			4500	471824.146	173863.568	37.425
P150	1000			4500	471822.661	173862.369	37.425
P151	1000			4500	471824.003	173862.226	37.425
P152	700			4500	471822.175	173867.463	37.425
P153	700			4500	471823.517	173867.320	37.425
P154	700			4500	471822.032	173866.120	37.425
P155	700			4500	471823.374	173865.977	37.425
P156	375			4500	471822.206	173851.395	36.425
P157	375			4500	471821.411	173850.304	36.425
P158	375			4500	471822.753	173850.161	36.425
P159	750			4500	471827.466	173849.484	36.425
P160	750			4500	471828.808	173849.341	36.425
P161	750			4500	471828.261	173850.575	36.425
P162	800			4500	471828.651	173854.233	36.425
P163	800			4500	471828.104	173855.467	36.425
P164	800			4500	471829.446	173855.324	36.425
P165	750			4500	471828.381	173858.008	37.425
P166	750			4500	471828.724	173857.925	37.425
P167	750			4500	471828.525	173859.410	37.425
P168	750			4500	471829.867	173859.267	37.425
P169	1000			4500	471829.003	173863.890	37.425
P170	1000			4500	471830.345	173863.746	37.425
P171	1000			4500	471829.146	173865.232	37.425
P172	1000			4500	471830.488	173865.089	37.425
P173	1000			4500	471831.264	173866.966	37.425
P174	1000			4500	471829.922	173869.109	37.425
P175	1000			4500	471830.065	173870.452	37.425
P176	1000			4500	471831.007	173870.308	37.425
P177	875			4500	471832.042	173872.833	37.425
P178	875			4500	471833.940	173872.631	37.425
P179	875			4500	471833.092	173873.681	37.425
P180	875			4500	471834.147	173874.509	37.425
P181	875			4500	471832.244	173874.732	37.425
P182	1000			4500	471832.753	173876.492	37.425
P183	1000			4500	471833.804	173879.340	37.425
P184	800			4500	471838.519	173876.926	37.425
P185	800			4500	471839.847	173876.765	37.425
P186	800			4500	471839.067	173875.692	37.425
P187	875			4500	471839.326	173872.792	37.425
P188	875			4500	471841.224	173872.589	37.425
P189	875			4500	471840.174	173871.741	37.425
P190	875			4500	471841.022	173870.891	37.425
P191	875			4500	471839.123	173870.893	37.425
P192	950			4500	471835.106	173865.662	37.425
P193	950			4500	471837.004	173865.459	37.425
P194	950			4500	471835.953	173864.611	37.425
P195	950			4500	471834.903	173863.763	37.425
P196	950			4500	471836.801	173863.561	37.425
P197	925			4500	471833.605	173858.581	37.425
P198	925			4500	471834.948	173858.438	37.425
P199	925			4500	471834.153	173857.347	37.425
P200	925			4500	471831.143	173853.678	36.425
P201	850			4500	471833.073	173853.735	36.425
P202	850			4500	471832.278	173852.644	36.425
P203	1400	50	50	6000	471836.164	173845.257	35.925
P204	1400	50	50	6000	471836.365	173847.147	35.925
P205	1400	50	50	6000	471836.564	173849.031	35.925
P206	1400	50	50	6000	471836.901	173852.163	35.925
P207	1400	50	50	6000	471837.187	173854.848	35.925
P208	1400	50	50	6000	471837.467	173857.270	35.925
P209	1400	50	50	6000	471839.310	173857.071	35.925
P210	1400	50	50	6000	471839.052	173854.640	35.925
P211	1400	50	50	6000	471838.765	173851.964	35.925
P212	1400	50	50	6000	471838.429	173848.812	35.925
P213	1400	50	50	6000	471838.230	173846.948	35.925
P214	1400	50	50	6000	471838.028	173845.058	35.925
P215	1400	50	50	6000	471840.718	173844.967	35.925
P216	1400	50	50	6000	471840.569	173846.656	35.925
P217	1400	50	50	6000	471843.487	173844.476	35.925
P218	1400	50	50	6000	471843.689	173846.365	35.925
P219	1400	50	50	6000	471845.352	173844.277	35.925
P220	1400	50	50	6000	471845.553	173846.165	35.925
P221	750			4500	471844.752	173853.339	36.425
P222	750			4500	471846.095	173853.196	36.425
P223	750			4500	471846.238	173854.538	36.425
P224	750			4500	471844.895	173854.682	36.425
P225	800			4500	471845.107	173856.263	36.425
P226	800			4500	471846.449	173856.140	36.425
P227	800			4500	471846.592	173857.482	36.425
P228	800			4500	471845.250	173857.626	36.425
P229	900			4500	471845.728	173862.105	36.425
P230	900			4500	471847.067	173861.967	36.425
P231	900			4500	471847.213	173863.304	36.425
P232	900			4500	471845.871	173863.448	36.425
P233	875			4500	471840.109	173857.887	36.425
P234	875			4500	471841.451	173857.744	36.425
P235	875			4500	471840.658	173846.653	36.425
P236	925			4500	471839.820	173863.239	37.425
P237	925			4500	471841.718	173863.036	37.425
P238	925			4500	471840.871	173864.087	37.425
P239	925			4500	471841.921	173864.585	37.425
P240	925			4500	471840.023	173865.137	37.425
P241	850			4500	471846.068	173867.175	36.425
P242	850			4500	471847.410	173867.032	36.425
P243	850			4500	471846.211	173868.518	36.425
P244	850			4500	471847.553	173868.374	36.425
P245	875			4500	471844.040	173870.104	37.425
P246	875			4500	471845.435	173871.195	37.425
P247	875			4500	471844.093	173871.338	37.425
P248	825			4500	471845.215	173874.835	37.425
P249	825			4500	471844.680	173876.069	37.425
P250	825			4500	471846.011	173875.925	37.425
P251	650			4500	471848.098	173877.815	37.425
P252	650			4500	471848.946	173877.764	37.425
P253	975			4500	471851.205	173877.295	37.425
P254	975			4500	471852.347	173877.151	37.425
P255	975			4500	471851.752	173876.090	37.425
P256	975			4500	471851.631	173873.417	37.425
P257	975			4500	471852.973	173873.274	37.425
P258	975			4500	471851.488	173872.074	37.425
P259	975			4500	471852.302	173871.931	37.425
P260	1150			6000	471851.778	173868.520	36.225
P261	1150			6000	471853.568	173868.339	36.225
P262	1150			6000	471853.377	173866.549	36.225
P263	1150			6000	471851.587	173866.740	36.225
P264	1150			6000	471851.387	173864.950	36.225
P265	1150			6000	471853.186	173864.759	36.225
P266	1150			6000	471852.990	173862.914	36.225
P267	1150			6000	471851.200	173863.105	36.225
P268	1150			6000	471851.009	173861.316	36.225
P269	1150			6000	471852.799	173861.125	36.225
P270	1150			6000	471850.818	173859.526	36.225
P271	1150			6000	471852.608	173859.335	36.225
P272	750			4500	471851.405	173853.268	36.425
P273	750			4500	471852.747	173853.126	36.425
P274	750			4500	471851.362	173851.938	36.425
P275	750			4500	471852.604	173851.783	36.425
P276	500			4500	471851.287	173845.803	36.425
P277	500			4500	471850.492	173844.712	36.425
P278	500			4500	471851.834	173844.569	36.425
P279	500			4500	471856.724	173844.045	36.425
P280	500			4500	471858.076	173843.903	36.425
P281	500			4500	471857.529	173845.137	36.425
P282	800			4500	471857.504	173851.260	36.425
P283	800			4500	471858.946	173851.117	36.425
P284	800			4500	471858.989	173852.459	36.425
P285	800			4500	471857.647	173852.602	36.425
P286	1025			4500	471859.574	173870.669	37.425
P287	1025			4500	471860.917	173870.526	37.425
P288	1025			4500	471859.718	173872.011	37.425
P289	1025			4500	471861.060	173871.868	37.425
P290	850			4500	471861.409	173875.135	37.425
P291	850			4500	471860.066	173875.278	37.425
P292	850			4500	471860.209	173876.621	37.425
P293	850			4500	471861.552	173876.478	37.425
P294	850			4500	471866.717	173876.535	37.425
P295	850			4500	471868.060	173875.783	37.425
P296	850			4500	471866.574	173874.584	37.425



- GENERAL NOTES:**
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECT'S, ENGINEER'S AND SPECIALIST'S DRAWINGS TOGETHER WITH THE APPROPRIATE SPECIFICATION.
 2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK ALL DIMENSIONS ON SITE. DIMENSIONS MUST NOT BE SCALED FROM THIS DRAWING. ANY DISCREPANCIES TO BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ARCHITECT IN WRITING.
 3. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTES OTHERWISE.
 4. ALL LEVELS ARE IN METRES, UNLESS NOTES OTHERWISE.
- FOUNDATION NOTES:**
1. READ IN CONJUNCTION WITH THE ARCHITECTS AND SERVICES ENGINEERS DRAWINGS AND THE SPECIFICATION.
 2. ALL EXCAVATIONS SAHLL BE CARRIED OUT IN A SAFE MANNER, COMPLYING WITH THE REQUIREMENTS OF THE HEALTH AND SAFETY REGULATIONS, BS 8000:PART 1 AND ANY LOCAL BY-LAWS
 3. THE FORMATION OF ALL THE FOUNDATIONS IS TO BE INSPECTED BY THE STRUCTURAL ENGINEER PRIOR TO CONCRETING.
 4. BASES TO CENTRED ON COLUMN POSITIONS U.N.O.
 5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN AND COORDINATE THE RELEVANT INFORMATION ENDURE THAT ALL NECESSARY HOLES, REBATES, DRIPS, TUCKS, EMBEDDED ITEMS AND FIXES ARE CAST INTO THE CONCRETE AT THE TIME OF POURING.
 6. REINFORCED CONCRETE TO BE DESIGNATED MIX RC40.
 7. CONCRETE COVER TO BE 40mm U.N.O.
 8. MINIMUM LAP TO SHEETS OF MESH TO BE 400mm.
 9. REFER TO ARCHITECT'S DRAWINGS FOR FULL D.P.M DETAILS.
 10. REFER TO ARCHITECT'S DRAWINGS FOR DETAILS OF ALL REBATES AND CHAMFERS.
 11. ALL SPECIFIED PRODUCTS MAY BE REPLACED WITH SIMILAR PRODUCTS APPROVED BY THE STRUCTURAL ENGINEER. THE CONTRACTOR SHALL SUBMIT ALL DOCUMENTATION / CALCULATIONS TO DEMONSTRATE THE SUITABILITY OF ANY SUBSTITUTE PRODUCT.

FOUNDATION PLAN

1 : 150

GROUND BEAM SCHEDULE				
REF	GROUND BEAM SIZE (WIDTHxDEPTH)	CONCRETE GRADE	VOLUME	REINFORCEMENT QUANTITY
GB.01	750x600	C32/40	35.50 m³	205kg/m³
GB.02	750x900	C32/40	117.71 m³	220kg/m³

PILE CAP SCHEDULE					
REF	PILE CAP SIZE (WIDTHxLENGTHxDEPTH)	CONCRETE GRADE	COUNT	CONCRETE VOLUME	REINFORCEMENT QUANTITY
F1	2100x750x1000	C32/40	3	4.65 m³	105kg/m³
F2	TRIANGULAR CAP - 450Ø PILES - 1000dp	C32/40	19	70.09 m³	105kg/m³
F3	6700x3000x1400	C32/40	1	28.14 m³	95kg/m³
F4	TRIANGULAR CAP - 750Ø PILES - 1400dp	C32/40	2	28.24 m³	95kg/m³
F5	2100x2100x1000	C32/40	30	130.87 m³	105kg/m³
F6	2700x2700x1200	C32/40	5	43.32 m³	75kg/m³
F7	3300x3300x1400	C32/40	1	15.11 m³	95kg/m³
F8	2700x2700x1000	C32/40	10	72.30 m³	105kg/m³
F9	3500x3500x1200	C32/40	4	58.38 m³	75kg/m³
F10	4300x4300x1400	C32/40	1	25.72 m³	95kg/m³
F11	4500x2700x1200	C32/40	3	43.36 m³	75kg/m³
F12	12500x10500x1600	C32/40	1	209.93 m³	63kg/m³
F13	3300x1050x1400	C32/40	1	4.78 m³	95kg/m³
F14	5500x5500x1700	C32/40	2	102.52 m³	95kg/m³
F15	2100x3450x1000	C32/40	1	7.17 m³	105kg/m³
F16	SEE PLAN	C32/40	1	99.51 m³	60kg/m³
F17	6505x8550x1500	C32/40	1	82.76 m³	60kg/m³
Grand total: 86			86	1026.86 m³	

P2	3No GROUND BEAMS ADDED TO SUPPORT NEW COLUMNS. PRELIMINARY ISSUE.	A.W	E.P	19-04-18
P1		A.W	E.P	13-03-18
REV	DESCRIPTION	BY	APP.	DATE

ISSUE STATUS

PRELIMINARY

Tier Consult
Richmond House
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Chester Business Park
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Email: info@tieruk.com

CLIENT

WATKIN JONES
BUILD TO RENT

ARCHITECT

STRIDE TREGLOWN

PROJECT

THAMES QUARTER , READING

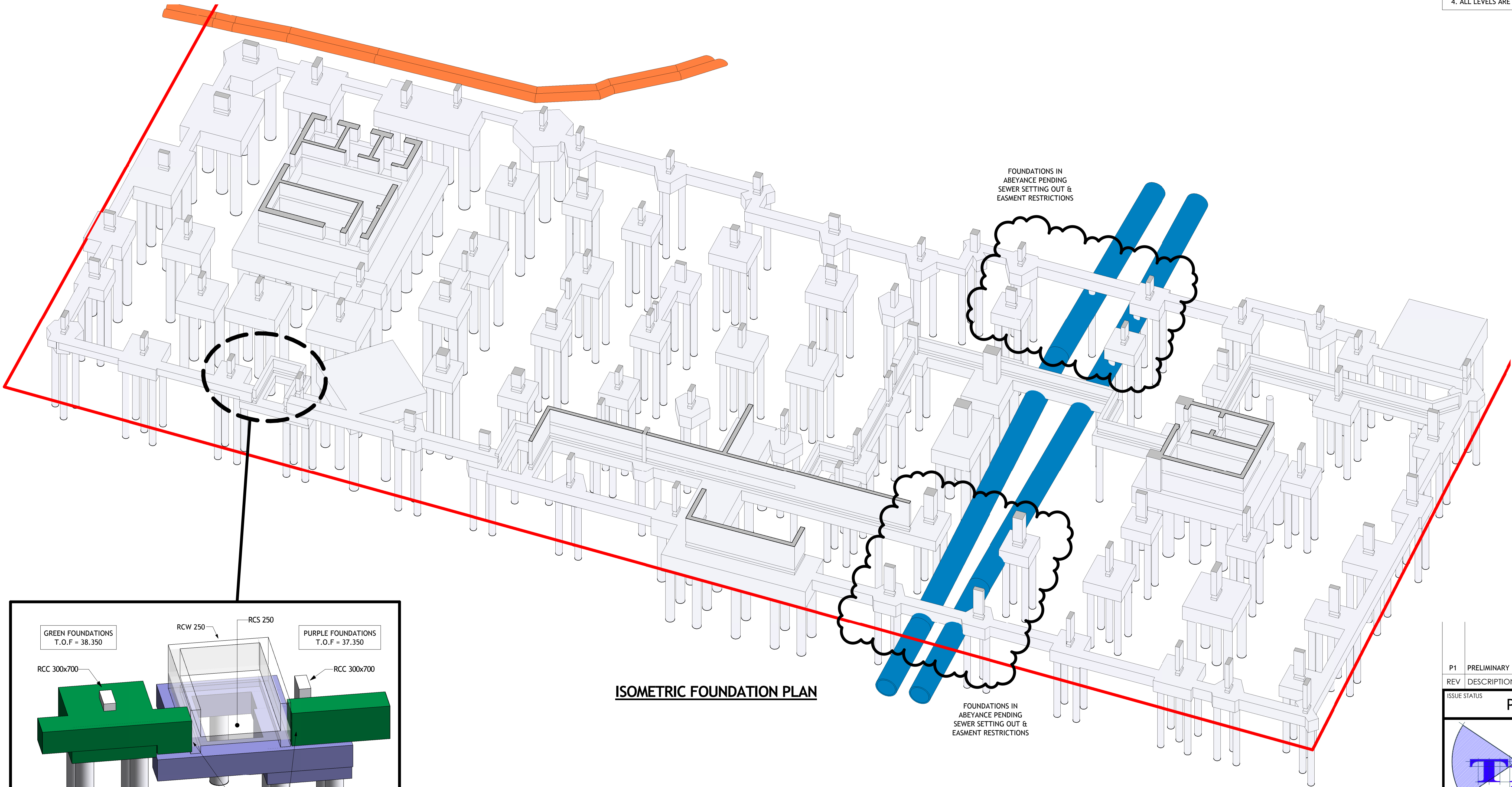
TITLE

FOUNDATION PLAN

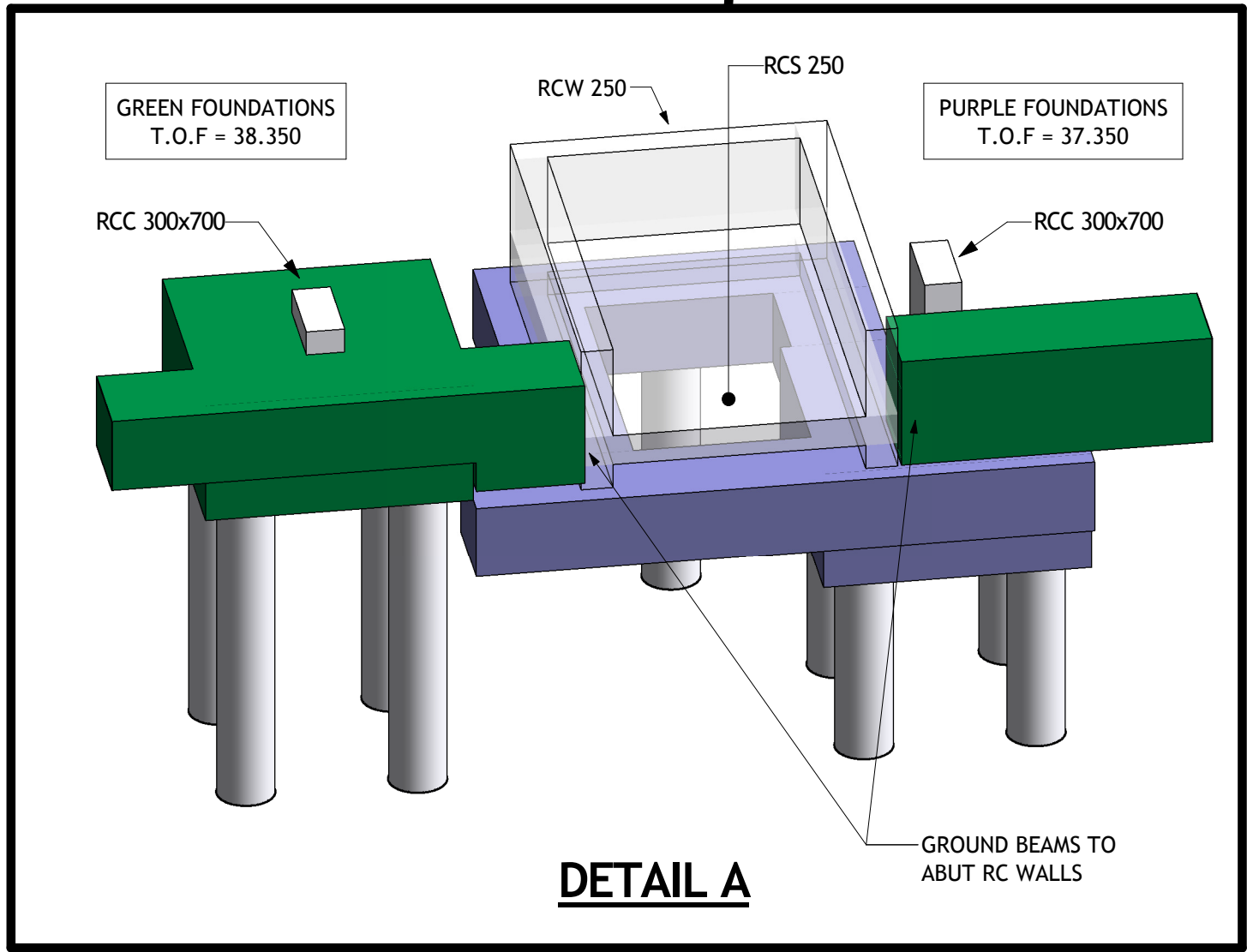
FIRST ISSUE	NOV '17	DRAWN BY	AW
SIZE	A1	Checked	EP
SCALE	AS SHOWN	Approved	PJB
PROJECT NUMBER	T-2008	DRAWING NUMBER	15-01
		REV	P2

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECT'S, ENGINEER'S AND SPECIALIST'S DRAWINGS TOGETHER WITH THE APPROPRIATE SPECIFICATION.
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3. ALL DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTES OTHERWISE.
4. ALL LEVELS ARE IN METRES, UNLESS NOTES OTHERWISE.



ISOMETRIC FOUNDATION PLAN



P1	PRELIMINARY ISSUE.	A.W	E.P	19-04-18
REV	DESCRIPTION	BY	APP.	DATE
ISSUE STATUS				
PRELIMINARY				
Tier Consult Richmond House Sandpiper Court Chester Business Park Chester CH4 9QZ Tel: 01244 684 900 Fax: 01244 684 901 Email: info@tieruk.com				
CLIENT				
 BUILD TO RENT				
ARCHITECT				
STRIDE TREGLOWN				
PROJECT				
THAMES QUARTER , READING				
TITLE				
FOUNDATION ISOMETRICS				
FIRST ISSUE	APRIL '18	DRAWN BY	AW	
SIZE	A1	Checked	EP	
SCALE	AS SHOWN	Approved	PJB	
PROJECT NUMBER	DRAWING NUMBER	REV		
T-2008	15-02	P1		