



DRAINAGE STATEMENT
George & Dragon, 162 Bath Road,
Reading, RG30 2HA

Document History

Issue	Date	Description	Prepared By	Checked By
1	31 Jan 23	Issued to Client	D Steenkamp	S McNair/ K Rayner
2	10 Mar 23	Updated Site Layout	S McNair	K Rayner
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6	20 Sep 23	Updated Site Layout	J Dunesby	K Rayner
7	30 Nov 23	Updated Site Layout	L Moxon	L Moxon

Glanville

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Contents

1.0	Introduction.....	1
2.0	Site Description and Development Proposals.....	2
3.0	Surface Water Drainage Strategy	4
4.0	Foul Water Drainage Strategy	7
5.0	Summary & Conclusions	8

Appendices

Appendix A:	Site Location Plan
Appendix B:	Topographical and CCTV Survey
Appendix C:	CCTV Survey Report Extracts and Thames Water Records
Appendix D:	Site Investigation Report Extracts
Appendix E:	Proposed Site Layout
Appendix F:	Drainage Strategy
Appendix G:	MicroDrainage Calculations
Appendix H:	Thames Water Pre-planning Enquiry Response Letter

1.0 Introduction

- 1.1 This Drainage Statement has been prepared by Glanville on behalf of Greene King Brewing and Retail Limited to support a planning application for the demolition of the former George & Dragon public house and the erection of a new Greggs Restaurant.
- 1.2 The purpose of this report is to assess the existing drainage regime currently serving the application site and put forward suitable proposals for draining surface water run-off and foul effluent flows from the proposed development.
- 1.3 This assessment has been prepared in accordance with the National Planning Policy Framework (NPPF), dated March 2012, and the Planning Practice Guidance (PPG) to the NPPF, dated March 2014.
- 1.4 Given the site is under 1 hectare in area, is located entirely within Flood Zone 1 (and at low risk of all other sources of flooding identified) and does not propose a change to a higher flood risk vulnerability classification, a site-specific Flood Risk Assessment is not required to accompany a planning application. Nonetheless, in accordance with local guidance, a drainage strategy for the proposed development has been developed.
- 1.5 Local guidance concerning drainage strategies and the incorporation of Sustainable Urban Drainage System (SuDS) has been used in the preparation of this note, with reference made to the following documents, published by Reading Borough Council (RBC):
- RBC Sustainable Design and Construction Supplementary Planning Document
 - Reading Borough Council Strategic Flood Risk Assessment
 - RBC Local Plan

2.0 Site Description and Development Proposals

Site Description

- 2.1 The site is located at the former George & Dragon public house, 162 Bath Road, Reading, RG30 2HA. The site is located to the north of A4 Bath Road and the approximate centre of the site is found at National Grid Reference SU 68191 72174. The site extends to approximately 0.25 Ha in area, with vehicular access gained to the existing car park from an access along Bath Road in the south-western corner of the site. A site location plan is provided in Appendix A of this report.
- 2.2 The site is irregular in shape. The former George & Dragon public house is located in the centre of the site, fronting onto Bath Road. The western area is dominated by an asphalt-surfaced car park. The eastern area is formed of a vacant plot, formerly occupied by No. 158 Bath Road which has since been demolished.

Topographical Survey and Existing Drainage Regime

- 2.3 A topographical survey of the site was performed by Midland Survey Ltd in February 2022 (Drawing Ref: 41024A / 1). The site was found to be generally flat, with falls generally from the boundaries of the site towards the centre. The majority of the site was found to be entirely impermeable, consisting of the existing public house and car park. A tree canopy overhangs the northern boundary of the site behind the existing building, while dense foliage covers the northern boundary of the car park.
- 2.4 A CCTV survey of the existing drainage on-site was undertaken by Midland Survey Ltd in April 2022. The survey found the existing car park to be drained via a series of gulleys discharging to two soakaways located beneath the existing car park. The rainwater pipes on the east façade of the existing public house proved traceable, which confirmed that runoff from the roof drained to a soakaway located behind the building.
- 2.5 The CCTV survey found the foul water system serving the existing public house discharges to a Thames Water sewer located to the east of the site. A copy of the topographical survey and CCTV survey is included in Appendix B.
- 2.6 A copy of the accompanying CCTV Survey report is included in Appendix C, alongside sewer records obtained from Thames Water.

Site Geology and Infiltration Testing

- 2.7 Geological mapping published by the British Geological Survey (BGS) indicates the site is underlain by a bedrock of Lambeth Group – Clay, Silt and Sand. According to the published geology reports, superficial deposits are not present beneath the site.

- 2.8 An intrusive site investigation was undertaken by Remada Ltd in January 2023 and included infiltration testing within the underlying soils in accordance with BRE 365. The site works included excavating four trial pits and three boreholes. The boreholes were sunk to a depth of 10.0m below ground level (bgl). Combined Groundwater and Ground gas monitoring standpipes were installed in all three boreholes to a depth of 5m bgl and confirmed the BGS mapping of Lambeth Group formation beneath made ground to a depth of between 4.2m bgl (BH3) and 4.5m bgl (BH1). No groundwater was encountered within any of the standpipes over the course of the monitoring programme, indicating that groundwater lies in excess of 5.0m bgl.
- 2.9 Infiltration testing within the trial pits was conducted at depths of approximately 0.6m bgl and 1.35m bgl. The infiltration rates recorded were generally favourable, with recorded rates ranging from 1.51×10^{-5} to 7.42×10^{-5} m/s, which indicates infiltration drainage techniques will be feasible on-site.
- 2.10 Contamination testing also undertaken as part of the site investigation concluded that the existing contaminant concentrations are considered unlikely to present a risk to underlying groundwater sources. A copy of the Site Investigation report is included in Appendix D.

Development Proposals

- 2.11 The proposals comprise the demolition of the former George & Dragon public house and erection of a new Greggs restaurant, alongside reconfiguration of the existing car park and incorporation of additional landscaping and infrastructure. A copy of the proposed site layout is included in Appendix E of this report.

3.0 Surface Water Drainage Strategy

Design Guidance and SuDS

- 3.1 The PPG to the NPPF recommends that priority should be given to the use of Sustainable Drainage Systems (SuDS) as they are designed to control surface water run-off where it falls and mimic natural drainage characteristics as closely as possible. Sustainable drainage systems (SuDS) also provide opportunities for the following:
- Reducing the causes and impacts of flooding;
 - Removing pollutants from urban run-off at source;
 - and Combining water management and green space with benefits for amenity, recreation and wildlife.
- 3.2 The Building Regulations part H3 stipulates that rainwater from roofs and paved areas is carried away from surface to discharge to one of the following, listed in order of priority:
- a) An adequate soakaway or some other adequate infiltration system; where that is not practical;
 - b) A watercourse; or, where that is not practical
 - c) A sewer.

Surface Water Drainage Strategy

- 3.3 As stated in Section 2, favourable infiltration rates were found on-site. It is therefore considered feasible to utilise infiltration drainage techniques to dispose of surface water run-off generated on-site. The proposed strategy strives to utilise sustainable drainage techniques in accordance with the guidance described in CIRIA C753 and the published RBC guides. With this in mind, the strategy employs a soakaway consisting of geocellular crates to facilitate the discharge of surface water run-off via infiltration to the underlying soil strata.
- 3.4 The lowest infiltration rate recorded at the depth in which the soakaway will be constructed was 2.45×10^{-5} m/s, therefore this rate has been adopted through the surface water drainage strategy. While an infiltration rate of 5.45×10^{-7} m/s was recorded within Trial Pit (TP) 2, it is considered that this is an anomalous result given that TP2 is immediately adjacent to TP1, which completed three repeat tests with the lowest recorded rate being 2.47×10^{-5} m/s. It should also be noted that TP4 was excavated to a similar depth (0.65m bgl) as TP2 and also completed three repeat tests with favourable results, further emphasising the test within TP2 as an anomaly.
- 3.5 Surface water run-off from the proposed highway and car park will be collected via a combination of drainage channels and gulleys discharging via catchpit manholes, which will help prevent sediment from entering the system and siltation of the soakaway. The proposed drainage strategy is illustrated on drawing 8220244-SK04, included in Appendix F.
- 3.6 MicroDrainage calculations included in Appendix G show the proposed soakaway has been sized to provide sufficient storage for the 1 in 100-year storm event, with a 40% allowance for the effects of climate change.

Pollution Control

- 3.7 Surface water flows will be directed to trapped gullies in the first instance, before entering catchpit manholes in order to separate out sediment and metals. A class 1 retainment interceptor system will also be incorporated upstream of the soakaway as an additional control measure in order to separate out any remaining pollutants, such as metals and hydrocarbons.
- 3.8 Groundwater was not encountered within the three boreholes during any of the groundwater monitoring visits, indicating that groundwater lies in excess of 5m below ground level (bgl). The invert level of the soakaway will be approximately 1.40m bgl, therefore the soakaway will provide a minimum 1m unsaturated depth of soils from the base of the components to groundwater, providing additional treatment and protection to groundwater. The proposed surface water drainage strategy is therefore considered to provide suitable protection to underlying groundwater sources.

Maintenance and Responsibilities

- 3.9 All new surface water infrastructure will be designed and constructed in accordance with Building Regulations and best practice as appropriate.
- 3.10 The drainage system will remain under private ownership and responsibility for the maintenance of all drainage infrastructure on-site will lie with a management company to be appointed by the store operator. Suitable maintenance regimes for SuDS, incorporating advice from system manufactures and installers will be developed and implemented prior to opening of the restaurant. A summary of typical items to be included is given in the Tables below. Specialist maintenance information for the retainment interceptor should be obtained from the manufacturer.

Table 1: Geocellular Soakaway* – Typical Maintenance Activities

Schedule	Maintenance Activity	Inspection Frequency
Monitoring	Initial inspection.	Monthly for 3 months after installation.
	Inspect for evidence of poor operation and signs of clogging or build-up of debris/dirt/silt within the catchpits, gulleys and soakaway.	3-monthly, and 48 hours after large storms in the 6 months.
	Monitor inspection chambers.	Annually.
Regular Maintenance	Ensure inlets and pre-treatment structures are clear and free of debris.	Annually.
	Inspect and remove any sediment, debris and silt from upstream network, including all gullies, silt traps and catchpit chambers.	Monthly or as required.
	Ensure silt does not enter the soakaway during maintenance activities.	Monthly or as required.
Remedial Actions	Jet crates by: removing sediment, debris and silt from catchpit manhole upstream of each entry point and jetting crates to remove clogging or build-up of silt.	As required.
	Clear pipework of blockages	As required
	Replacement of system.	At end of design life, or as required.

* Refer to manufacturer's guidance for specific maintenance instructions.

Table 2: Gullies, Channels and Conventional Pipes * – Typical Maintenance Activities

Schedule	Maintenance Activity	Inspection Frequency
Regular Maintenance	Inspect and remove any sediment, debris and silt from gullies, silt traps and catchpit chambers.	Annually, or as required.
	CCTV survey to inspect pipework for blockages, root ingress, displaced joints, or other signs of differential settlement.	Annually, or as required.
	Ensure silt does not enter the soakaway during maintenance activities.	Monthly or as required.
Remedial Actions	Clear pipework of blockages, root ingress, repair joints or repair other signs of differential settlement.	As required.
	Replacement of gullies / pipe system.	As required.

* Refer to manufacturer's guidance for specific maintenance instructions for proprietary treatment devices.

4.0 Foul Water Drainage Strategy

- 4.1 This section identifies the existing foul water drainage infrastructure on and in the vicinity of the site in order to assess the impact of the development on the existing infrastructure, and how the development could dispose of foul water.

Existing Foul Water Drainage

- 4.2 As discussed in Section 2, foul water is drained from the existing public house via a foul water system, discharging to a Thames Water sewer located to the east of the site. The CCTV survey found this sewer to be in reasonable condition capable of serving the proposed development.

Proposed Foul Water Drainage Strategy

- 4.3 The proposed development will retain and reuse the existing foul water connection to the Thames Water sewer located to the east of the site.
- 4.4 A Pre-Planning Enquiry has been made to Thames Water outlining the proposed drainage strategy. Thames Water have provided confirmation that their foul water network contains sufficient capacity to accommodate flows from the proposed development. A copy of this confirmation is included in Appendix H.
- 4.5 All existing sewers serving the existing public house which are not required post-development will either be stopped up or infilled. The foul water sewer retained as part of the proposals will remain under private ownership, alongside all new foul water infrastructure serving the proposed restaurant.

5.0 Summary & Conclusions

Summary

- 5.1 This Drainage Statement has been prepared by Glanville on behalf of Greene King Brewing and Retail Limited to support a planning application for the demolition of the former George & Dragon public house and the erection of a new Greggs Restaurant.
- 5.2 This report has been prepared in accordance with the requirements of National and Local Planning Policy to accompany a planning application and demonstrate a suitable surface water and foul water drainage strategy for the proposed development.
- 5.3 A CCTV survey of the existing drainage regime on site found surface water flows discharged to a combination of soakaways located on site. Foul water was found to discharge to a Thames Water sewer located to the east of the site via the existing foul sewer serving the existing public house.
- 5.4 An intrusive site investigation found favourable infiltration rates. It is therefore deemed feasible to dispose of surface water flows generated by the proposed development via infiltration to ground. The surface water drainage strategy therefore employs a soakaway consisting of geocellular crates.
- 5.5 MicroDrainage calculations included in this report show the proposed soakaway has been sized using the lowest recorded infiltration rate and to provide sufficient storage for the 1 in 100 year storm event, with a 40% allowance for the effects of climate change.
- 5.6 Foul water effluent generated by the proposed development will drain to the existing Thames Water sewer located to the east of the site via the existing foul sewer serving the existing public house.

Conclusions

- 5.7 In conclusion, this report has demonstrated that the proposed development:
- Is in accordance with the National Planning Policy Framework;
 - Will employ a surface water drainage strategy based on the principles of sustainable drainage;
 - Will employ a suitable foul water drainage strategy.
- 5.8 The proposals are therefore considered to fully comply with national, regional and local planning policy.

Appendices

Appendix A

Site Location Plan

NOTES

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Contractors are to check all sizes and dimensions before setting out any site or shopwork. Any errors or discrepancies to be reported to the designer.

Do not scale off this drawing.

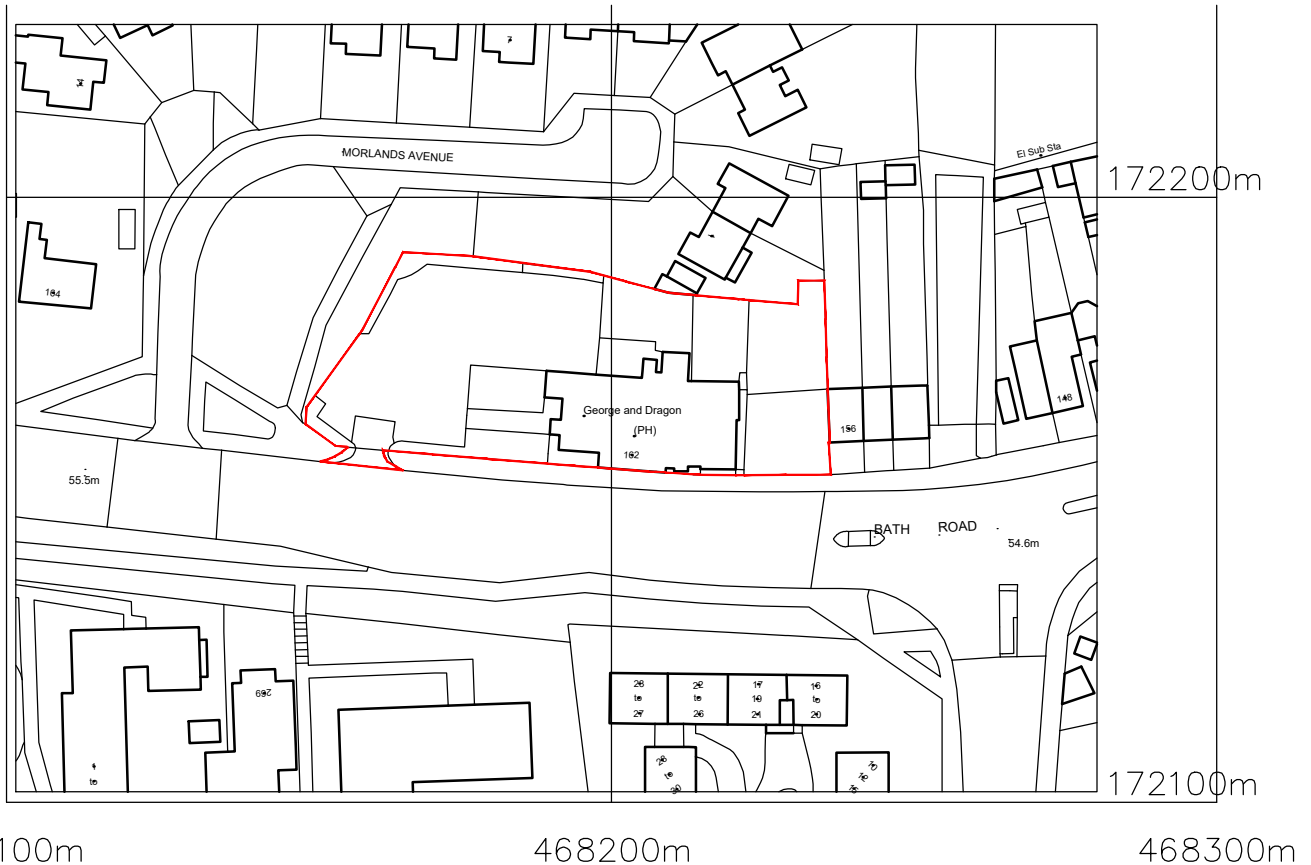
REVISIONS

DATE

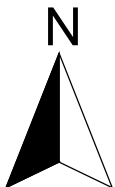
REV A - Updated for planning application

8.2.23 MT

APPLICATION SITE



0 5 10 20 30 40 50
1-1250 Scale Bar (metres)



DRAWING DESCRIPTION

LOCATION PLAN

JOB TITLE

GEORGE AND DRAGON
162 BATH ROAD
READING RG30 2HA

CLIENT

GREENE KING

PLANNING

DRAWN BY JAA

SCALE 1:1250

DATE JULY 2022

DRAWING NO.

2136 - 00

REVISION

A

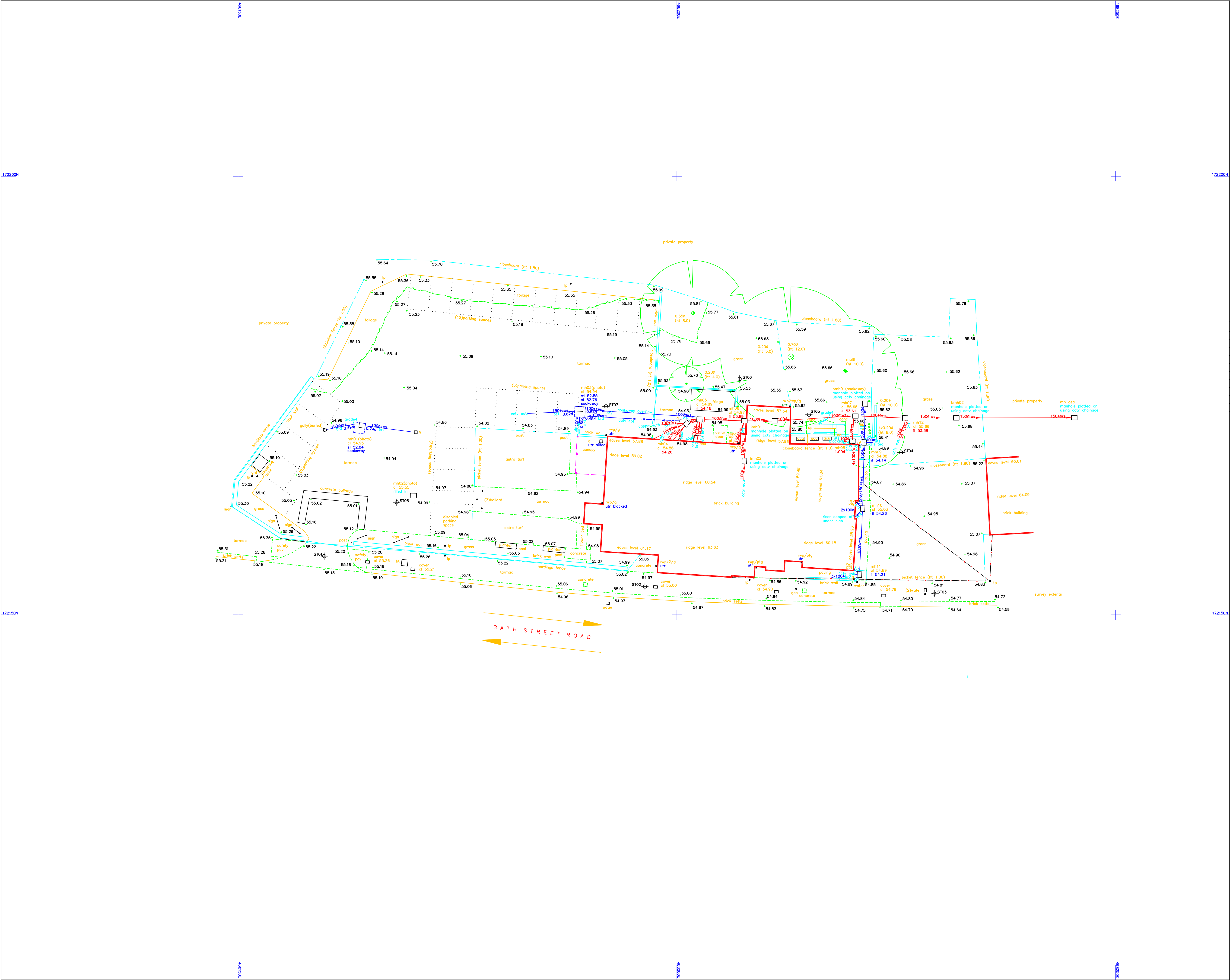
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Appendix B

Topographical and CCTV Survey



NOTES

GENERAL NOTES :-

ALL LEVELS ARE IN METRES DERIVED FROM GPS TRANSFORMATION.
GRID COORDINATES ARE ORDNANCE SURVEY NATIONAL GRID, DERIVED FROM GPS TRANSFORMATION.
GPS COORDINATES AND LEVELS SET AT ST01 (NO SCALE FACTOR APPLIED).
THIS DRAWING HAS BEEN PRODUCED WITH A PLOT SCALE ACCURACY OF 1:200.
SERVICE COVERS INDICATED WHERE VISIBLE. PIPE INVERTS / DETAILS SURVEYED FROM SURFACE.
INSPECTION ONLY. GENERALLY DAMAGED COVERS AND COVERS WITHIN HIGHWAYS WILL NOT BE LIFTED.
TREE SPECIES SHOULD BE CONFIRMED BY TREE SPECIALIST IF CRITICAL.
OVERHEAD CABLES ARE INDICATED USING REMOTE SURVEY METHODS AND ARE SUBJECT TO SEASONAL VARIATION, AND SHOULD BE TREATED AS APPROXIMATE.
THE SURVEYOR WILL NOT BE RESPONSIBLE FOR THE OMISSION OF DETAILS OBSERVED DURING SITE SURVEY.
RICS PROFESSIONAL STANDARDS 3RD EDITION RULE 1.19 APPLIES TO THIS SURVEY.

TOPOGRAPHICAL SURVEY/UTILITY KEY :-

(ht) = height	of = off set
Ø = diameter	osa = off survey area
o/g = above ground	OSBM = ordnance survey bench mark
o/r = assumed route	p & r fence = post & rail fence
ov = off valve	pr = pipe riser
ba = bellha beacon	plg = pipe to ground
bd = back drop	pls = pipe to surface
bl = bed level	re = rodding eye
bol = bollard	res = retaining wall
bot = bottom of shaft	rs = road sign
bt = telecom	rep = rain water pipe
c/b fence = closeboard fence	s/birch = silver birch
c/box = control box	s/b = safety point
cstv = cable television	sep = seeping
con = conifer	sfc = soil filled chamber
cr = conifer	sp = soil pipe
cw = combined water sewer	st = stop top
d/chan = drainage channel	sv = stop valve
elb = electric junction box	swp = soil vent pipe
elec = electric	sws = storm water sewer
end = end of trace	TBM = temporary bench mark
ep = electric pole	tfr = taken from records
er = earth rod	tl = threshold level
f/bed = flower bed	top = top of cap
fh = fire hydrant	top = top of pipe
fl = floor level	tot = top of tank
fs = fire switch	tp = telecom pole
fws = foul water sewer	ts = traffic signal
g = gully	top = top of pipe
g/run = gully run	ts = traffic signal
h/chestnut = horse chestnut	ts = traffic signal
h/thorn = hawthorn	ts = traffic signal
ic = inspection cover	ts = traffic signal
il = invert level	ts = traffic signal
int = illuminated	ts = traffic signal
ip = intercept	ts = traffic signal
ip = temp post	ts = traffic signal
mh = manhole cover	ts = traffic signal
mk = marker	ts = traffic signal
o/h = over head	ts = traffic signal

SURVEY CONTROL :-

STATION	EASTINGS	NORTHINGS	LEVEL
ST01	468159.816	172156.689	55.192
ST02	468196.359	172153.215	54.992
ST03	468229.335	172152.412	54.807
ST04	468225.539	172168.507	55.015
ST05	468215.043	172172.810	55.706
ST06	468207.152	172176.888	55.590
ST07	468191.920	172173.787	54.921
ST08	468168.073	172162.830	55.008

NORTH POINT :-

UTILITY SURVEY KEY :-

	N	N	ELECTRIC CABLE
	N	N	WATER PIPE
	N	N	FOUL SEWER
	N	N	STORM SEWER
	N	N	COMBINED SEWER
	N	N	DUCTS
	N	N	CABLE TELEVISION
	N	N	DATA CABLE
	N	N	TELECOM CABLE
	N	N	GAS PIPE
	N	N	UNIDENTIFIED SERVICE
	N	N	OTHER
	N	N	CCTV
	N	N	TRAFFIC LIGHT
	N	N	OFFSET
	N	N	VENT
	N	N	FUEL PIPE
	N	N	GAUGE LINES
	N	N	PIPE
	N	N	ASSUMED ROUTE
	N	N	TREN

DISCLAIMER :-

Electromagnetic techniques have been used in the location of underground services. The results are not infallible and trial excavations should be carried out to confirm service identification, positions and particularly depths, where these are critical. The completeness of the underground services information cannot be guaranteed.

This method of survey does not differentiate between live and dead services, and as such all services should be treated as live. This drawing may not include the location of all public services that may cross the site, therefore the relevant service drawings should be obtained from the appropriate utility company and used in conjunction with this drawing.

Private service pipes and cables in highways are not shown, but their presence should be anticipated.

Additional below ground structures or obstructions not shown on this drawing may be present. Reference should be made to historical plans and on-site drawings. Excavations in the vicinity of services should be carried out with due diligence ref: HSG47 document avoiding dangers from underground services.

Please note that factors such as ground conditions, proximity of other utilities, material and method of construction have an influence on the quality of the data collected on site.

ISA Standards - "A utility mapping survey can be considered a 100% accurate depiction of the sub-surface environment, and the use of these drawings does not remove the requirement for the use of safe digging techniques at all times, in line with requirements of HSG47 and current CDM regulations".

UTILITY NOTES

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Client: GREEN KING PLC

Project: GEORGE & DRAGON 162 BATH STREET ROAD, READING, RG30 2HA

Title: TOPOGRAPHICAL SURVEY & CCTV DRAINAGE SURVEY

Date: FEBRUARY 2022	Revisions:
Scale: 1:200@A1	
Dwg No: 41024A /1	
Surveyor: K.B./A.C	
Checked: J.C./R.P	

TOPOGRAPHICAL (LAND) SURVEYORS / UTILITY SURVEYORS
BUILDING MEASUREMENT SURVEYORS / 3D LASER SCANNING

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Appendix C

CCTV Survey Report Extracts and Thames Water Records

Drainage Report

Prepared For

Greene King

Site

**George & Dragon
162 Bath Road
Reading**

RG30 2HA

**MIDLAND SURVEY LTD.
Adam Cliffords
cctv@midlandsurvey.co.uk
01926 810811**

Total Defects for Project



Total DRB Grades for Project



41024B George And Dragon - CCTV Survey Report : 29/04/22

Name : MIDLAND SURVEY LTD.
 Contact : Ryan Pearson
 Location : Cromwell House, Westfield Road
 Town : Southam
 Region : West Midlands
 Postcode : CV47 0JH
 Email : cctv@midlandsurvey.co.uk
 Contact Number : 01926 810811
 Surveyor : Adam Cliffords
 Valid Certification No :

Client Information

Name : Greene King
 Contact : Shane McNulty
 Location :
 Town :
 Region :
 Postcode :
 Tel :
 Mobile : 07974132984
 Email : shanemcnulty@greeneking.co.uk
 Fax :

Site Information

Name : George & Dragon
 Contact :
 Location : 162 Bath Road
 Town : Reading
 Region :
 Postcode : RG30 2HA
 Tel :
 Mobile :
 Email :
 Fax :

Total Defects for Project



Total DRB Grades for Project



Overview

Section: 1 From: mh01 photo To: mh01 photo	DRB Grade A	Structural Grade: 0 Service Grade: 0 DRB Grade: A Pipe Size: 150 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water
Section: 2 From: mh01 br1 To: Gully	DRB Grade B	Structural Grade: 3 Service Grade: 2 DRB Grade: B Pipe Size: 150 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water
Section: 3 From: mh01 br2 To: Gully	DRB Grade C	Structural Grade: 4 Service Grade: 4 DRB Grade: C Pipe Size: 150 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water
Section: 4 From: mh02 photo To: mh02 photo	DRB Grade A	Structural Grade: 0 Service Grade: 0 DRB Grade: A Pipe Size: 150 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water
Section: 5 From: mh03 photo To: mh03 photo	DRB Grade A	Structural Grade: 0 Service Grade: 0 DRB Grade: A Pipe Size: 150 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water
Section: 6 From: mh03 br1 To: sa	DRB Grade C	Structural Grade: 5 Service Grade: 5 DRB Grade: C Pipe Size: 150 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water
Section: 7 From: mh03 br2 To: mh05	DRB Grade A	Structural Grade: 0 Service Grade: 0 DRB Grade: A Pipe Size: 100 Material: Polyvinyl Chloride Use: Surface Water
Section: 8 From: mh03 br3 revers To: sa	DRB Grade C	Structural Grade: 2 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water

Total Defects for Project



Total DRB Grades for Project



Section: 9 From: mh03 br4 photo To: mh03 br4 photo	DRB Grade C	Structural Grade: 0 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water
Section: 10 From: mh04 ds To: mh05	DRB Grade C	Structural Grade: 4 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 11 From: mh04 us To: Trap	DRB Grade C	Structural Grade: 3 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 12 From: mh04 br1 To: Downpipe	DRB Grade C	Structural Grade: 2 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 13 From: mh04 br2 To: sa	DRB Grade C	Structural Grade: 2 Service Grade: 4 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 14 From: mh05 ds To: mh06	DRB Grade B	Structural Grade: 3 Service Grade: 3 DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 15 From: mh05 br1 To: Downpipe	DRB Grade B	Structural Grade: 2 Service Grade: 3 DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 16 From: mh05 br2 To: Trap	DRB Grade A	Structural Grade: 2 Service Grade: 2 DRB Grade: A Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul

Total Defects for Project



Total DRB Grades for Project



Section: 17 From: mh05 br3 To: sa	DRB Grade C	Structural Grade: 2 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 18 From: mh06 ds To: imh01	DRB Grade B	Structural Grade: 3 Service Grade: 2 DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 19 From: imh01 ds To: mh07	DRB Grade C	Structural Grade: 4 Service Grade: 3 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 20 From: mh06 br1 To: Downpipe	DRB Grade B	Structural Grade: 0 Service Grade: 3 DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 21 From: mh06 us To: imh02	DRB Grade C	Structural Grade: 2 Service Grade: 4 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 22 From: imh02 us revers To: sa	DRB Grade C	Structural Grade: 0 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 23 From: mh07 ds To: mh12	DRB Grade A	Structural Grade: 0 Service Grade: 2 DRB Grade: A Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 24 From: mh07 us To: mh08	DRB Grade C	Structural Grade: 2 Service Grade: 4 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul

Total Defects for Project



Total DRB Grades for Project



Section: 25 From: mh08 us To: Downpipe	DRB Grade B	Structural Grade: 1 Service Grade: 3 DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 26 From: mh08 br1 To: Downpipe	DRB Grade B	Structural Grade: 1 Service Grade: 3 DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 27 From: mh08 br2 To: Downpipe	DRB Grade C	Structural Grade: 0 Service Grade: 4 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 28 From: mh08 br3 To: downpipe	DRB Grade C	Structural Grade: 0 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 29 From: mh08 br4 photo To: mh08 br4 photo	DRB Grade A	Structural Grade: 0 Service Grade: 0 DRB Grade: A Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 30 From: mh09 ds To: bmh01	DRB Grade C	Structural Grade: 0 Service Grade: 5 DRB Grade: C Pipe Size: 150 Material: Polyvinyl Chloride Use: Surface Water
Section: 31 From: mh09 br1 To: gully	DRB Grade C	Structural Grade: 0 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water
Section: 32 From: mh09 br2 To: sa	DRB Grade C	Structural Grade: 0 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water

Total Defects for Project



Total DRB Grades for Project



Section: 33 From: mh10 ds To: mh09	DRB Grade B	Structural Grade: 0 Service Grade: 3 DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water
Section: 34 From: mh10 us To: mh11	DRB Grade B	Structural Grade: 1 Service Grade: 3 DRB Grade: B Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water
Section: 35 From: mh10 br1 To: Downpipe	DRB Grade A	Structural Grade: 0 Service Grade: 0 DRB Grade: A Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water
Section: 36 From: mh10 br2 To: downpipe	DRB Grade C	Structural Grade: 1 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Polyvinyl Chloride Use: Surface Water
Section: 37 From: mh11 br1 To: sa	DRB Grade C	Structural Grade: 0 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water
Section: 38 From: mh11 br2 To: sa	DRB Grade C	Structural Grade: 0 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water
Section: 39 From: mh11 br3 To: Downpipe	DRB Grade C	Structural Grade: 0 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Surface Water
Section: 40 From: mh12 ds To: bmh02	DRB Grade B	Structural Grade: 3 Service Grade: 2 DRB Grade: B Pipe Size: 150 Material: Vitrified Clay (i.e. all clayware) Use: Foul

Total Defects for Project



Total DRB Grades for Project



Section: 41 From: bmh02 ds To: mh osa	DRB Grade B	Structural Grade: 0 Service Grade: 3 DRB Grade: B Pipe Size: 150 Material: Vitrified Clay (i.e. all clayware) Use: Foul
Section: 42 From: mh12 br1 To: sa	DRB Grade C	Structural Grade: 1 Service Grade: 5 DRB Grade: C Pipe Size: 100 Material: Vitrified Clay (i.e. all clayware) Use: Foul

Total Defects for Project



Total DRB Grades for Project



Scores

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh01 photo	mh01 photo	150	Vitrified Clay (i.e. all clayware)	0	0	0	0	0

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh01 br1	Gully	150	Vitrified Clay (i.e. all clayware)	3	2	0.23	1	40

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh01 br2	Gully	150	Vitrified Clay (i.e. all clayware)	4	3	4.36	2	80

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh02 photo	mh02 photo	150	Vitrified Clay (i.e. all clayware)	0	0	0	0	0

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh03 photo	mh03 photo	150	Vitrified Clay (i.e. all clayware)	0	0	0	0	0

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh03 br1	sa	150	Vitrified Clay (i.e. all clayware)	5	4	5.83	5	165

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh03 br2	mh05	100	Polyvinyl Chloride	0	0	0	0	0

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh03 br3 revers	sa	100	Vitrified Clay (i.e. all clayware)	2	4	5.1	5	10

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh03 br4 photo	mh03 br4 photo	100	Vitrified Clay (i.e. all clayware)	0	4	Infinity	5	0

Total Defects for Project

Total DRB Grades for Project



Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh04 ds	mh05	100	Vitrified Clay (i.e. all clayware)	4	3	7.5	2	80

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh04 us	Trap	100	Vitrified Clay (i.e. all clayware)	3	4	6.36	5	40

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh04 br1	Downpipe	100	Vitrified Clay (i.e. all clayware)	2	4	5.69	5	10

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh04 br2	sa	100	Vitrified Clay (i.e. all clayware)	2	4	3.57	5	10

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh05 ds	mh06	100	Vitrified Clay (i.e. all clayware)	3	3	1.08	2	40

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh05 br1	Downpipe	100	Vitrified Clay (i.e. all clayware)	2	3	1.72	2	10

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh05 br2	Trap	100	Vitrified Clay (i.e. all clayware)	2	2	0.53	1	10

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh05 br3	sa	100	Vitrified Clay (i.e. all clayware)	2	4	5.6	5	10

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh06 ds	imh01	100	Vitrified Clay (i.e. all clayware)	3	2	0.71	1	40

Total Defects for Project

Total DRB Grades for Project



Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
imh01 ds	mh07	100	Vitrified Clay (i.e. all clayware)	4	3	1.56	2	80
Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh06 br1	Downpipe	100	Vitrified Clay (i.e. all clayware)	0	3	1.71	2	0
Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh06 us	imh02	100	Vitrified Clay (i.e. all clayware)	2	4	3.75	5	10
Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
imh02 us revers	sa	100	Vitrified Clay (i.e. all clayware)	0	4	5.26	5	0
Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh07 ds	mh12	100	Vitrified Clay (i.e. all clayware)	0	2	0.48	1	0
Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh07 us	mh08	100	Vitrified Clay (i.e. all clayware)	2	3	2.73	2	10
Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh08 us	Downpipe	100	Vitrified Clay (i.e. all clayware)	1	3	0.98	2	1
Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh08 br1	Downpipe	100	Vitrified Clay (i.e. all clayware)	1	3	2.22	2	2
Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh08 br2	Downpipe	100	Vitrified Clay (i.e. all clayware)	0	3	3.33	2	0

Total Defects for Project

Total DRB Grades for Project



Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh08 br3	downpipe	100	Vitrified Clay (i.e. all clayware)	0	3	6.25	2	0

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh08 br4 photo	mh08 br4 photo	100	Vitrified Clay (i.e. all clayware)	0	0	0	0	0

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh09 ds	bmh01	150	Polyvinyl Chloride	0	5	6.63	15	0

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh09 br1	gully	100	Vitrified Clay (i.e. all clayware)	0	4	12.5	5	0

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh09 br2	sa	100	Vitrified Clay (i.e. all clayware)	0	4	Infinity	5	0

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh10 ds	mh09	100	Vitrified Clay (i.e. all clayware)	0	3	0.65	2	0

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh10 us	mh11	100	Vitrified Clay (i.e. all clayware)	1	3	2.04	2	1

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh10 br1	Downpipe	100	Vitrified Clay (i.e. all clayware)	0	0	0	0	0

Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh10 br2	downpipe	100	Polyvinyl Chloride	1	3	5	2	1

Total Defects for Project

Total DRB Grades for Project



Start Ref	End Ref	Dia.	Material	Peak Structural Grade	Peak Operational Grade	Mean Operational Score	Peak Operational Score	Peak Structural Score
mh11 br1	sa	100	Vitrified Clay (i.e. all clayware)	0	4	17.5	5	0
mh11 br2	sa	100	Vitrified Clay (i.e. all clayware)	0	4	33.33	5	0
mh11 br3	Downpipe	100	Vitrified Clay (i.e. all clayware)	0	4	10	5	0
mh12 ds	bmh02	150	Vitrified Clay (i.e. all clayware)	3	2	0.39	1	40
bmh02 ds	mh osa	150	Vitrified Clay (i.e. all clayware)	0	3	0.55	2	0
mh12 br1	sa	100	Vitrified Clay (i.e. all clayware)	1	4	5.45	5	1

Total Defects for Project



Total DRB Grades for Project



Site: 162 Bath Road, Reading

Section 40

Client:	Location (Street Name):	City/Town/Village	Cust Job Ref.	Surveyors Name:	Date:
Greene King Plc	162 Bath Road	Reading		Adam Cliffords	29/04/2022

Start Node Ref:	mh12 ds	Finish Node Ref:	bmh02	Direction:	D	Height/Dia:	150
Start Node Depth:	0.00	Finish Node Depth:	0.00	Use:	F	Shape:	C
Start Node Coordinate:		Finish Node Coordinate:		Material:	VC	Cleaned	N

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	Remarks
A				D	N	5.1	

Structural Peak Grade	3	Operational Grade	2	DRB Grade	B
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Position	Code	Description	CD	Pic	Video Ref	
00.0	MH	Start node type, manhole		39_	0:00:00	
00.3	FC	Fracture circumferential 12-12		39_	0:00:01	
00.3	RF	Roots fine		39_	0:00:01	
05.1	MHF	Finish node type, manhole		39_		

Total Defects for section

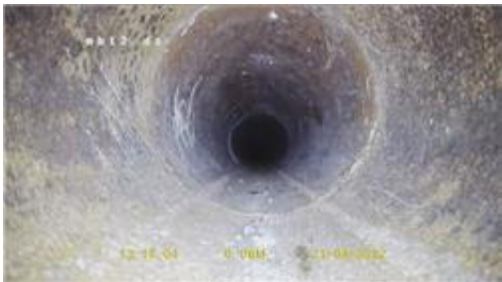
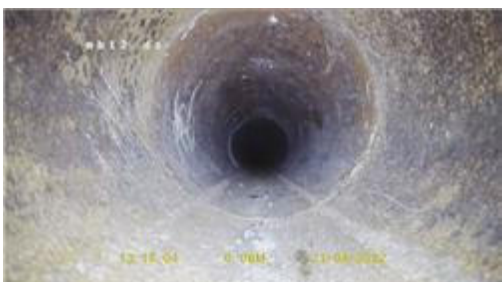


DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 40

Pos	Video Ref	Code	Cont.	Description	Image
00.0m	0:00:00	MH		Start node type, manhole, reference mh12 ds mh12 ds	Image Provided - Ref: 39_0 
00.3m	0:00:01	FC		Fracture circumferential from 12 o'clock to 12 o'clock - Severity 3	Image Provided - Ref: 39_2 
00.3m	0:00:01	RF		Roots fine - Severity 1	Image Provided - Ref: 39_3 
05.1m		MHF		Finish node type, manhole, reference bmh02 bmh02	Image Provided - Ref: 39_9999 

Total Defects for section



DRB Grade for Section



Site: 162 Bath Road, Reading

Section 41

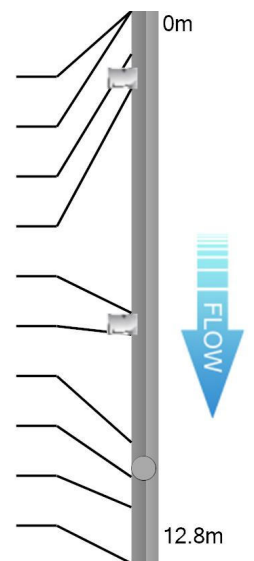
Client:	Location (Street Name):	City/Town/Village	Cust Job Ref.	Surveyors Name:	Date:
Greene King Plc	162 Bath Road	Reading		Adam Cliffords	29/04/2022

Start Node Ref:	bmh02 ds	Finish Node Ref:	mh osa	Direction:	D	Height/Dia:	150
Start Node Depth:	0.00	Finish Node Depth:	0.00	Use:	F	Shape:	C
Start Node Coordinate:		Finish Node Coordinate:		Material:	VC	Cleaned	N

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	Remarks
A				D	N	12.8	

Structural Peak Grade	0	Operational Grade	3	DRB Grade	B
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Position	Code	Description	CD	Pic	Video Ref	
00.0	MH	Start node type, manhole		40_	0:00:00	
00.0	VR	Vermin Rat		40_	0:00:00	
01.0	DEX	Other settled deposits 5%		40_	0:00:10	
01.8	JN	Junction 01 : 100mm Diameter		40_	0:00:14	
07.0	DEX	Other settled deposits 5%		40_	0:00:48	
07.5	JN	Junction 02 : 100mm Diameter		40_	0:00:50	
10.0	DEF	S1 Attached deposits, fouling 12-12 5%	S1	40_	0:01:07	
10.8	JN	Junction 12 : 100mm Diameter		40_	0:01:09	
11.5	DEF	F1 Attached deposits, fouling 12-12 5%	F1	40_	0:01:07	
12.8	MHF	Finish node type, manhole		40_		



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 41

Pos	Video Ref	Code	Cont.	Description	Image
00.0m	0:00:00	MH		Start node type, manhole, reference bmh02 ds bmh02 ds	Image Provided - Ref: 40_0 
00.0m	0:00:00	VR		Vermin Rat - Severity 1	Image Provided - Ref: 40_2 
01.0m	0:00:10	DEX		Other settled deposits: 5% cross-sectional area loss - Severity 3 Settled Fouling	Image Provided - Ref: 40_3 
01.8m	0:00:14	JN		Junction at 01 o'clock: 100mm Diameter	Image Provided - Ref: 40_4 
07.0m	0:00:48	DEX		Other settled deposits: 5% cross-sectional area loss - Severity 3 Settled Fouling	Image Provided - Ref: 40_5 

Total Defects for section

DRB Grade for Section



Pos	Video Ref	Code	Cont.	Description	Image
07.5m	0:00:50	JN		Junction at 02 o'clock: 100mm Diameter	Image Provided - Ref: 40_6 
10.0m	0:01:07	DEF	S1	Attached deposits, fouling 10m - 11.5m from 12 o'clock to 12 o'clock: 5% cross-sectional area loss - Severity 2	Image Provided - Ref: 40_7 
10.8m	0:01:09	JN		Junction at 12 o'clock: 100mm Diameter	Image Provided - Ref: 40_8 
11.5m	0:01:07	DEF	F1	Attached deposits, fouling Defect End from 12 o'clock to 12 o'clock: 5% cross-sectional area loss - Severity 2	
12.8m		MHF		Finish node type, manhole, reference mh osa mh osa	Image Provided - Ref: 40_9999 

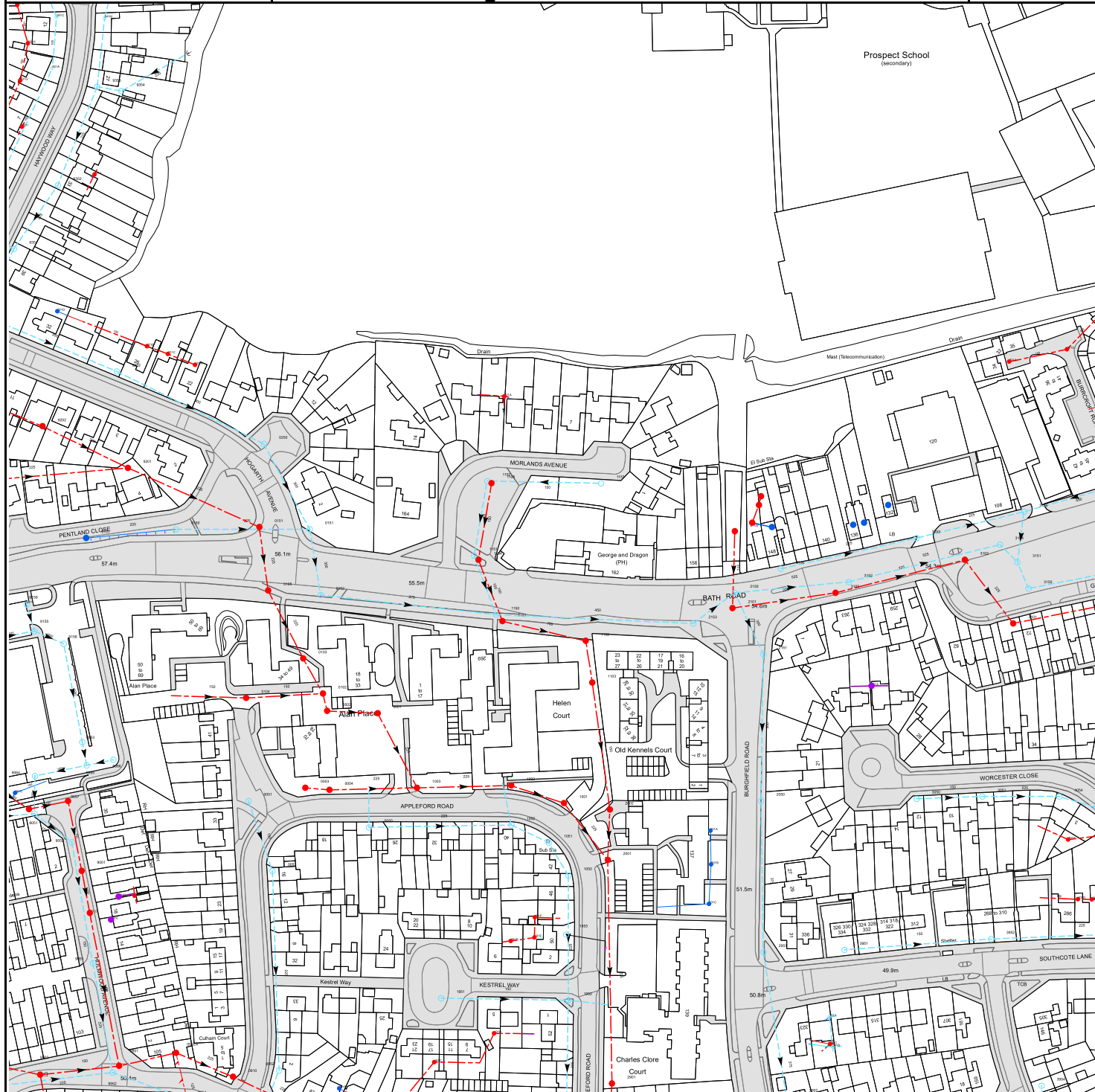
Total Defects for section



DRB Grade for Section



Asset Location Search Sewer Map - ALS/ALS Standard/2022_4576025



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 468176,172169

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map (2020) with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
3954	48.48	47.78
4054	49.66	48.37
401F	n/a	n/a
401D	n/a	n/a
401E	n/a	n/a
4053	49.08	48.05
3155	n/a	n/a
3150	52.39	49.37
421D	n/a	n/a
421C	n/a	n/a
2901	51.02	48.04
391B	n/a	n/a
391C	n/a	n/a
391A	n/a	n/a
1952	50.81	48.39
2951	51.29	49.1
3951	50.27	n/a
3952	n/a	n/a
1953	50.97	49.52
201C	n/a	n/a
1050	51.32	49.32
201B	n/a	n/a
2001	51.41	49.62
201A	n/a	n/a
2002	51.82	49.92
2050	52.49	50.39
3050	51.59	49.79
3051	50.68	49.08
311A	n/a	n/a
1103	52.7	50.51
2151	54	51.76
1102	n/a	n/a
2153	54.79	52.25
3101	51.96	49.88
2101	54.5	n/a
0152	55.37	53.1
3103	54.25	51.05
2150	54.65	n/a
3152	54.4	51.95
2152	54.46	53.6
3151	53.79	51.3
1104	55.35	53.12
3102	54.14	50.66
1151	55.36	53.37
3154	54.32	51.34
3153	54.29	52.85
2102	55.13	52.59
21MK	n/a	n/a
31NH	n/a	n/a
21MJ	n/a	n/a
31NC	n/a	n/a
31NJ	n/a	n/a
21MH	n/a	n/a
21MF	n/a	n/a
1153	56.06	54.72
1105	55.4	53.56
1152	55.6	54.1
121A	n/a	n/a
321A	n/a	n/a
9156	n/a	53.035
9057	n/a	51.92
9052	53.17	51.98
9001	52.75	51.21
9063	n/a	52.94
9065	n/a	52.925
901D	n/a	n/a
991E	n/a	n/a
9066	n/a	52.95
901B	n/a	n/a
901A	n/a	n/a
0104	54.05	52.55
0051	52.78	n/a
0052	51.7	n/a
0103	53.97	52.67
0003	52.67	50.43
0102	53.13	52.17
0002	52.97	51.93
0004	52.52	50.36
0050	52.02	n/a
0001	52.52	51.21
1003	52.29	50.15
1150	n/a	n/a
1101	54.61	52.11
1052	n/a	n/a
1002	52.1	49.9
191F	n/a	n/a
1051	51.46	49.62
1001	51.94	49.76
9202	n/a	n/a
931A	n/a	n/a
941C	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
921D	n/a	n/a
9352	n/a	n/a
9151	58.21	n/a
931J	n/a	n/a
9353	64.19	62.82
941M	n/a	n/a
9252	60.15	58.42
9354	63.92	62.91
9201	192.41	190.41
921B	n/a	n/a
921C	n/a	n/a
0150	57.43	54.95
021A	n/a	n/a
0101	56.43	54.32
0250	57.77	55.92
0105	55.98	53.4
0151	56.43	54.19
9051	53.68	52.68
9056	53.68	52.2
901C	54.1	53.69
9064	n/a	52.875
9155	n/a	53.06
9159	n/a	55.5
9351	n/a	n/a
931I	n/a	n/a
931G	n/a	n/a
931H	n/a	n/a
941D	n/a	n/a
091B	n/a	n/a
0910	50.08	47.5
9902	49.88	48.7
9952	50.03	48.72
0952	n/a	n/a
9901	50.05	48.48
191C	n/a	n/a
0902A	n/a	n/a
191B	n/a	n/a
1951	50.18	48.98
9951	51.48	50.23
191D	n/a	n/a
191E	n/a	n/a

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.



Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

	Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	Storm Sewer
	Sludge Sewer
	Foul Trunk Sewer
	Surface Trunk Sewer
	Combined Trunk Sewer
	Foul Rising Main
	Surface Water Rising Main
	Combined Rising Main
	Vacuum
	Thames Water Proposed
	Vent Pipe
	Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

	Sewer		Culverted Watercourse
	Proposed		Decommissioned Sewer
	Content of this drainage network is currently unknown		Ownership of this drainage network is currently unknown

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plan are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

	Air Valve		Meter
	Dam Chase		Vent
	Fitting		

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

	Ancillary		Drop Pipe
	Control Valve		Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

	Inlet		Outfall
	Undefined End		

Other Symbols

Symbols used on maps which do not fall under other general categories.

	Change of Characteristic Indicator		Public / Private Pumping Station
	Invert Level		Summit

Areas

Lines denoting areas of underground surveys, etc.

	Agreement
	Chamber
	Operational Site

Ducts or Crossings

	Casement	Ducts may contain high voltage cables. Please check with Thames Water.
	Conduit Bridge	
	Subway	
	Tunnel	

5) 'na' or '0' on a manhole indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

Appendix D

Site Investigation Report Extracts

Executive Summary

Remada Ltd was commissioned by Greene King to conduct a Phase 2 Ground Investigation at the George and Dragon, Bath Road, Reading, RG30 2HA. This report follows a Phase 1 Preliminary Risk Assessment (Remada report reference 936.01.01 dated February 2022).

Summary of Phase 1 Desk Study

The earliest available historic map dated 1878 records the site containing a public house called St. George & Dragon and a smithy in the east of the site. The current car park had been established in the west of the site by the mapping of 1961, whilst by 1972 the smithy had been relabelled as a works. Extension of the public house appears to have taken place by 1977 and the works building (No. 158 Bath Road) demolished between 1999 and 2022. At the time of writing, the George & Dragon public house on-site is recorded as being closed.

Published geological maps record that the site is underlain by the Lambeth Group, a Secondary (A) Aquifer. The site is located within an area which may not be affected by coal mining activity. Superficial deposits are not mapped to be present beneath the site.

Intrusive Investigation

The investigation comprised the drilling of three cable percussion boreholes (BH1 to BH3) to a depth of approximately 10m bgl, excavation of four trial pits (TP1 to TP4) (2 No. to approximately 0.6m bgl and 2 No. to approximately 1.3m bgl), execution of 13 soakaway tests at four locations within trial pits and execution of four CBR tests. Four ground gas monitoring visits were scheduled for the site to provide the minimum required by C665.

The ground conditions generally comprised a thin layer of hardstanding and/or made ground to a maximum depth of 0.5m bgl underlain by loose becoming medium dense gravelly clayey SAND to a maximum depth of 4.5m bgl (BH1) with a structureless CHALK (Grade Dc) below to at least 10m bgl. The chalk was indicated to be low density by geotechnical laboratory testing. These deposits are likely representative of the Lambeth Group bedrock and Chalk bedrock designated as a Secondary A and Principal Aquifer respectively. The site is not located within a Groundwater Source Protection Zone.

Human Health Assessment

The results of soil chemical analysis were compared to Human Health Generic Assessment Criteria for commercial land use. None of the analytes tested were detected at concentrations that exceeded the human health GAC protective of on-site workers.

Water Resources Assessment

The results of the soil chemical analysis undertaken has identified that concentrations of metals and inorganic contaminants are within the range of typical made ground. Detectable concentrations of TPH and PAHs were encountered in some samples. However, the contaminants identified are of low solubility and mobility and as such are unlikely to present a risk to groundwater beneath the site. In addition, it should be noted that the site will be predominantly covered with the building and areas of hardstanding. Therefore, the risk of leaching of contaminants as a result of infiltration of groundwater is likely to be limited. Therefore, the risk to groundwater from contaminants within the made ground at the site is considered to be low and does not warrant further consideration.

Waste Classification

In general, the results of the chemical analysis were varied with two samples of made ground indicating material would be classified as hazardous waste and one sample of made ground along with the two samples of natural deposits indicating material would be classified as non-hazardous waste.



The two asphalt samples were analysed for concentrations of PAH compounds. Coronene was not detected above the laboratory MDL in either of samples two samples tested and benzo(a)pyrene was detected below 50 mg/kg at 38 mg/kg and 31 mg/kg respectively. Therefore, the bituminous asphalt surfacing represented by these samples is likely to be classified as non-hazardous waste and suitable for reuse.

Geotechnical Assessment

Preliminary calculations indicate that for a traditional pad foundation (up to 1.5m wide) at a minimum of 2m depth, bearing within the medium dense granular materials with a minimum angle of shearing resistance $\phi = 32^\circ$ and overlying Grade Dc chalk a design bearing resistance of 345 kN/m² will be appropriate in order to satisfy the ultimate and serviceable limit states in accordance with BS EN 1997-1: 2004. This is only applicable for foundations with loads that are applied vertically and centrally. To satisfy the serviceable limit state settlement has been limited to 25mm.

If pad foundations are selected as described above, then a layer of compacted 6F2 capping overlying the existing but re-compacted made ground to a minimum specified bearing capacity is considered to be suitable beneath a ground bearing floor slab.

A Design Sulphate Class DS-1 is considered appropriate for buried concrete and an ACEC Class of AC-1 is considered appropriate for the location.

A total of 13 soakaway tests were conducted within four trial pits located across the site with infiltration rates varying between 5.45×10^{-7} and 1.51×10^{-5} indicating that soakaways maybe possible as a potential drainage solution at the site.

During the ground investigation collapse of excavation sidewalls were noted from approximately 1.3m bgl and SPT N values at depths of 1.2m bgl were all <10. Therefore, any excavations into the granular deposits at shallow depth are unlikely to remain stable even in the short term without support or without being battered back to a safe slope gradient. A detailed inspection of the side slopes should be made during excavation and a risk assessment carried out to fully assess the support measures required.

Ground Gas

The results of four rounds of gas monitoring visits placed the site into Characteristic Situation 1 and therefore ground gas protection measures will not be required within the proposed buildings.

5 GEOTECHNICAL & ENVIRONMENTAL INVESTIGATION FINDINGS

5.1 Ground Conditions

A brief description of the published geology is provided together with a summary of the ground conditions encountered during the intrusive investigation. Exploratory logs are presented at the end of the report.

5.1.1 Published Geology

The geological mapping suggests that there are no superficial deposits present directly beneath the site.

The bedrock directly underlying the site is formed of the Lambeth Group. The BGS describes this as typically comprising '*Vertically and laterally variable sequences mainly of clay, some silty or sandy, with some sands and gravels, minor limestones and lignites and occasional sandstone and conglomerate. The Lambeth Group was deposited in fluvial, estuarine, lagoonal or proximal marine environments. Late Palaeocene to Early Eocene (late Thanetian to early Ypresian)*'. The Lambeth Group is designated as a Secondary A Aquifer. The site is not located within a Groundwater Source Protection Zone.

5.1.2 Made Ground

Made ground was encountered at all exploratory hole locations to a maximum depth of 0.5m bgl (BH1 and BH3). The made ground was a heterogenous mix of materials however could generally be described as one of the following types:

- A black tarmac was encountered from ground level to a maximum depth of 0.1m bgl (BH1) at all exploratory hole locations except BH3. The average thickness of tarmac was recorded as 0.09m.
- A grey concrete was encountered between 0.07m bgl and 0.2m bgl in TP1 and TP2 only.
- A clayey sandy gravel was encountered beneath tarmac to a depth of 0.5m bgl in BH1, a depth of 0.45m bgl in TP3 and TP4 and a depth of 0.4m bgl in TP1 and TP2. Gravels were typically described as brick, concrete, flint and paving slab with occasional metal fragments and cobbles of brick.
- A clayey gravelly sand was encountered beneath tarmac to a depth of 0.4m bgl in BH2 and from ground level to a depth of 0.3m bgl in BH3. Gravels were typically described as brick, asphalt, concrete, tile and clinker with occasional cobbles of brick.
- A gravelly ashy sand was encountered between 0.3m bgl and 0.5m bgl in BH3 only with gravels described as clinker, brick and sandstone with rare metal fragments.

5.1.3 Superficial Deposits

According to the published geology superficial deposits are not present beneath the site and they are not thought to have been encountered during the ground investigation.

5.1.4 Bedrock

Lambeth Group

According to the published geological maps bedrock deposits of the Lambeth Group are present beneath the site and material likely representative of the Lambeth Group was identified beneath made ground to a depth of between 4.2m bgl (BH3) and 4.5m bgl (BH1).

The material likely representative of Lambeth Group was generally described as one of the following types:

- Loose becoming medium dense to dense slightly gravelly clayey SAND.
- Loose slightly gravelly very clayey SAND.
- Loose becoming medium dense slightly gravelly slightly clayey SAND.
- Medium dense gravelly SAND.
- Soft sandy CLAY.

A total of 12 SPT tests were undertaken within material considered to represent Lambeth Group with uncorrected SPT N values recorded of between 0 and 45.

Chalk

Whilst not published to be present beneath the site on the geological maps material representative of Chalk bedrock has been encountered beneath the Lambeth Group at the site to a depth of at least 9.95m bgl. Where encountered the material was generally described as a structureless CHALK composed of slightly sandy silty angular to subrounded fine to coarse GRAVEL Gravel is weak, low to medium density and white. Matrix is light brown and white. Rare to frequent angular to subangular flint gravels and cobbles (Grade Dc).

A total of 12 SPT tests were undertaken within material considered to represent Chalk bedrock with uncorrected SPT N values recorded of between 16 and 45.

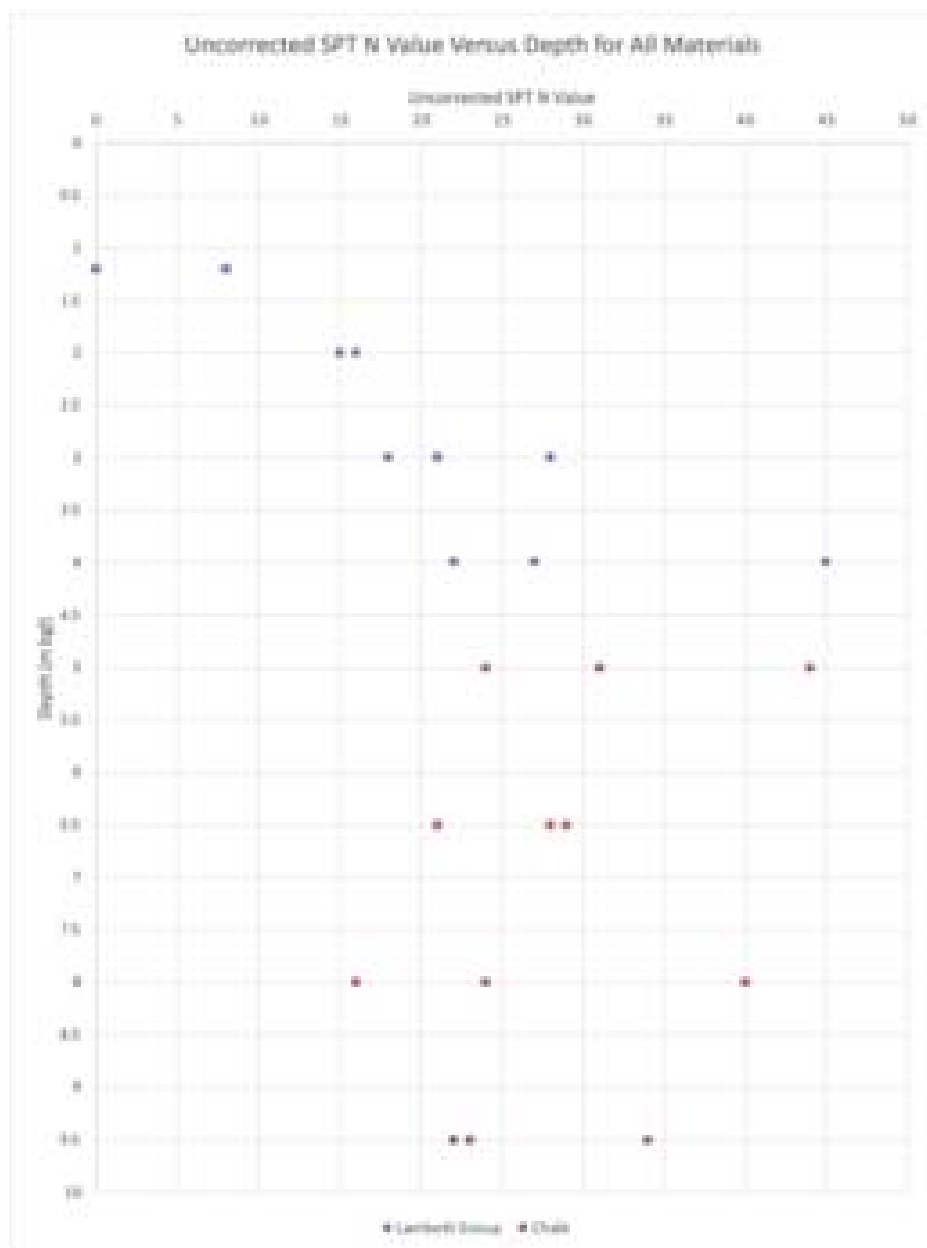
Based upon the SPT N values and material descriptions the higher SPT N values are likely to have been caused by the presence of flint gravels and cobbles.

The base of the chalk deposits were not encountered.

5.2 In-situ Testing

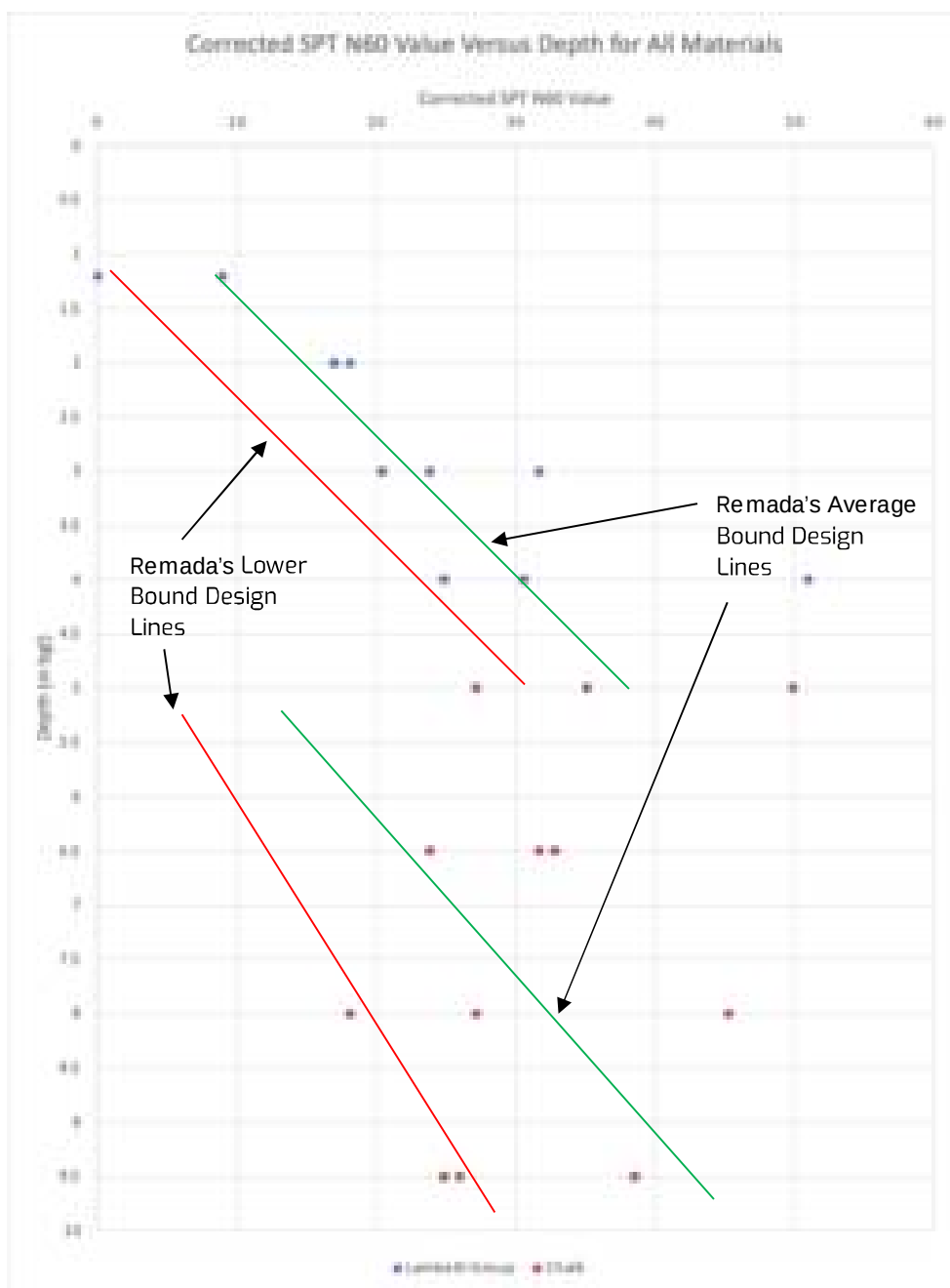
5.2.1 Standard Penetration Tests (SPTs)

In-situ SPTs were undertaken to assist with the interpretation of strata encountered. The results of uncorrected N-values versus depth are plotted in the graph below:



Graph 1: Plot of Uncorrected SPT N-Values Versus Depth

The following graph depicts the corrected SPT N60 values. The graph also shows the design lines used by Remada during the geotechnical assessment for both the Lambeth Group and Chalk deposits.



Graph 2: Plot of Corrected SPT N-Values Versus Depth and Remada's Design Lines

5.2.4 Infiltration / Soakaway Test

A total of 13 soakaway tests were undertaken in general accordance with BRE Digest 365, Soakaway Design, 2016 within TP1 to TP4. Infiltration rates are presented in the table below and test results are presented in **Appendix B**.

Location	Test Number	Strata	Infiltration rate (m/s)
TP1	1	Lambeth Group	7.42×10^{-5}
	2		4.18×10^{-5}
	3		2.74×10^{-5}
	4		2.74×10^{-5}
TP2	1	Made Ground and Lambeth Group	5.45×10^{-7}
TP3	1	Lambeth Group	2.84×10^{-5}
	2		2.55×10^{-5}
	3		2.45×10^{-5}
	4		2.47×10^{-5}
TP4	1	Made Ground and Lambeth Group	4.46×10^{-5}
	2		4.21×10^{-5}
	3		1.95×10^{-5}
	4		1.51×10^{-5}

Table 3 – Summary of Soakaway Infiltration Rates

5.2.5 CBR Tests

The results of the four DCP tests were variable. DCP1 generally recorded high values of >26.5% in the upper 425mm before dropping to values of >5% below this depth to 950mm apart from one blow at 670mm which recorded a value of 4.8%.

DCP2 generally recorded values >17.3% in the upper 290mm before dropping to values >5% below this depth to 940mm.

DCP3 generally recorded low values <3% to a depth of 900mm with a value of 0.9% being recorded at 560mm. Beyond 900mm values of 7% and 12.7% were recorded to 960mm.

DCP4 generally recorded values >5% to a depth of 960mm other than between 470mm and 610mm and between 840mm and 915mm where values <5% were recorded with a value of 2.9% at 610mm.

5.3 Soil Observations

Made Ground was recovered at all locations as a heterogeneous granular material containing a variety of man-made materials including brick, concrete, ash, paving slab and metal fragments.

There were no visible or olfactory indicators of contamination within the sampled soils.

5.4 Groundwater Observations

Groundwater was added to enable drilling through the sands encountered in the upper 4m at the site, therefore it was difficult to accurately ascertain the presence of groundwater during drilling.

Groundwater was not encountered within the three monitoring wells during any of the groundwater monitoring visits, indicating that groundwater lies in excess of 5m bgl.

5.5 Chemical Analysis

5.5.1 Soils

Results of the soil chemical analysis are presented in **Table 4** and summarised as follows.

The average FOC and pH were 0.024 and 8.2 respectively. Asbestos was not detected in the samples analysed. Detectable concentrations of metals were identified, although these are generally within the range that would typically be expected for made ground and natural soils respectively.

Concentrations of TPH were detected above method detection limit (MDL) in one sample only from TP3 at 0.3m bgl. The hydrocarbons were generally heavy end hydrocarbons within the range C16 to C44 carbon range. However, detectable concentrations of hydrocarbons in the C12 to C16 carbon range were also encountered. The sample from TP3 at 0.3m bgl was taken from made ground and had no visual or olfactory evidence of contamination.

Concentrations of PAHs were generally low (<20 mg/kg) within the soil samples with a maximum concentration of 64 mg/kg recorded within TP3 at 0.3m bgl from a sample of made ground. The two samples of asphalt tested recorded total PAH concentrations of 430 mg/kg and 460 mg/kg respectively with benzo(a)pyrene concentrations of 38 mg/kg and 31 mg/kg, both samples recorded coronene less than the MDL.

5.6 Geotechnical Testing

Results of the geotechnical testing are summarised below:

- BH1 1.0m bgl slightly gravelly very silty/clayey SAND.
- BH1 6.0m bgl CHALK. Moisture Content = 29%. Saturated Moisture Content = 32%. Dry Density = 1.45 Mg/m³. Density based on CIRIA C574 = Low Density.
- BH1 9.0m bgl CHALK. Moisture Content = 30%. Saturated Moisture Content = 34%. Dry Density = 1.41 Mg/m³. Density based on CIRIA C574 = Low Density.
- BH2 3.5m bgl to 4.0m bgl slightly silty/clayey gravelly SAND.
- BH3 2.5m bgl to 3.0m bgl slightly silty/clayey very gravelly SAND. Produced a peak angle of shearing resistance $\phi = 36^\circ$, effective cohesion = 6kPa.
- BH3 7.5m bgl CHALK. Moisture Content = 31%. Saturated Moisture Content = 32%. Dry Density = 1.45 Mg/m³. Density based on CIRIA C574 = Low Density.
- TP1 0.9m bgl slightly gravelly very silty/clayey SAND.
- TP3 0.7m bgl silty/clayey SAND. This sample was tested to ascertain whether silty/clayey SAND at the site behaved as a cohesive material, however it was indicated to be non-plastic and as such does not behave as a cohesive material and therefore is not likely to be shrinkable.
- TP3 0.7m bgl to 0.9m bgl gravelly very silty/clayey SAND.

The water-soluble sulphate contents varied from 0.017 to 0.033 g/l in the four soil samples analysed with pH varying from 7.6 to 8.5. The total sulphur content varied from 0.01 to 0.02% and acid soluble sulphate varied from 0.03 to 0.06%.

5.7 Ground Gas Monitoring Results

The results of the ground gas and groundwater monitoring programme are summarised below:

- Methane concentrations were recorded at less than the instrument detection limit within all monitoring wells on all monitoring visits at the site.
- A maximum steady state concentration of carbon dioxide was recorded as 2.6% v/v in BH2 on 8th December 2022. Detectable concentrations of carbon dioxide were recorded in all the monitoring wells.

Therefore, a Design Sulphate Class DS-1 is considered appropriate for buried concrete and an ACEC Class of AC-1 is considered appropriate for the location.

7.9 Soakaway Tests

A total of 13 soakaway tests were conducted within four trial pits located across the site with infiltration rates varying between 5.45×10^{-7} and 1.51×10^{-5} indicating that soakaways may be possible as a potential drainage solution at the site.

In accordance with BRE Digest 365, Soakaway Design, 2016 soakaways should not be constructed within 5m of building or structure foundations to ensure that ground beneath the foundations is not adversely affected, if the soakaways are constructed in chalk then this distance should be increased.

7.10 General Construction Advice

All formations should be cleaned, and subsequently inspected, by a suitably qualified engineer prior to placing concrete. Should any soft, compressible or otherwise unsuitable materials be encountered they should be removed and replaced by blinding concrete.

Foundation concrete, or alternatively, a blinding layer of concrete, should be placed immediately after excavation and inspection in order to protect the formation against softening and disturbance.

Generally, all formations should be placed wholly within the same material type, unless specific geotechnical inspection and assessment have been undertaken.

Where applicable ground beneath the proposed building footprint and potentially car parking may require to be stripped to reveal localised areas of made ground and structures. Excavations should be backfilled with suitably re-compacted materials to achieve formation level.

During foundation excavation works arisings should be constantly monitored for the presence of contamination.



EXPLORATORY LOGS

Percussion Drilling Log

Project Name: George and Dragon		Client: Greene King		Date: 29/11/2022	
Location: Bath Road, Reading		Contractor:		Co-ords: E 468196.00 N172810.00	
Project No. : 936		Crew Name:		Drilling Equipment:	
Borehole Number BH1	Hole Type CP	Level 55.00m AoD	Logged By JJ	Scale 1:50	Page Number Sheet 1 of 1

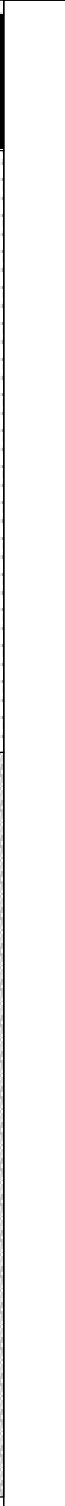
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10	54.90		MADE GROUND: Black tarmac.	
		0.40	ES		0.50	54.50		MADE GROUND: Brown clayey sandy angular to subrounded fine to coarse gravel of flint, brick and concrete.	
		1.00 - 1.20	B					Loose becoming medium dense to dense orangish brown and brown slightly gravelly very clayey fine to medium SAND. Gravel is subangular to subrounded fine to coarse of flint and quartz.	1
		1.20 - 1.65	D						
		1.20	SPT	N=8 (1,1/2,2,2,2)					
		2.00 - 2.45	D						2
		2.00	SPT	N=15 (1,0/4,3,4,4)					
		3.00 - 3.45	D						3
		3.00	SPT	N=28 (2,2/4,5,5,14)					4
		4.00 - 4.45	D						
		4.00	SPT	N=45 (1,0/7,7,7,24)					
		5.00 - 5.45	D		4.50	50.50		Structureless CHALK composed of silty angular fine to coarse GRAVEL. Gravel is weak, low density and white. Frequent subangular fine to coarse flint gravels. Matrix is light brown and cream (Grade Dc).	5
		5.00	SPT	N=44 (6,6/10,10,10,14)					
		6.00	D		6.00	49.00			6
		6.50 - 6.95	D					Structureless CHALK composed of slightly sandy silty angular to subrounded fine to coarse GRAVEL. Gravel is weak, low density and white. Rare subangular fine to coarse flint gravels. Matrix is white (Grade Dc).	7
		6.50	SPT	N=21 (3,3/5,5,5,6)					
		8.00 - 8.45	D						8
		8.00	SPT	N=16 (4,4/3,4,4,5)					9
		9.00	D						
		9.50 - 9.95	D						10
		9.50	SPT	N=22 (3,3/5,5,6,6)	9.95	45.05		End of Borehole at 9.950m	

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks 1. CAT scanned prior to drilling. Hand dug inspection pit to 1.2m bgl. Cable percussion drilling to 10m bgl. 2. Groundwater not thought to have been encountered during drilling. 3. Installed with 4m plain pipe and 4m slotted pipe.										
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Percussion Drilling Log

Project Name: George and Dragon		Client: Greene King		Date: 30/11/2022	
Location: Bath Road, Reading		Contractor:		Co-ords: E468188.00 N172164.00	
Project No. : 936		Crew Name:		Drilling Equipment:	
Borehole Number BH2	Hole Type CP	Level 54.95m AoD	Logged By JJ	Scale 1:50	Page Number Sheet 1 of 1

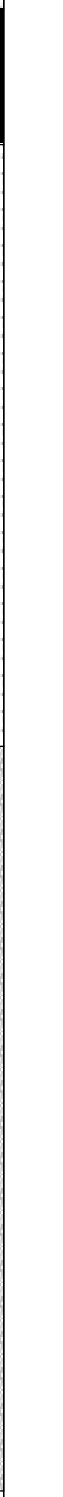
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.09 - 1.00	B	N=8 (2,2/2,2,2,2)	0.09	54.86		MADE GROUND: Black tarmac.	1
		1.00 - 1.20	D		0.40	54.55		MADE GROUND: Greyish brown slightly clayey very gravelly sand. Gravel is subangular to subrounded fine to coarse of brick, asphalt and concrete.	
		1.20 - 1.65	D						
		1.20	SPT					Loose brown slightly gravelly very clayey fine to medium SAND. Gravel is subrounded to rounded fine to coarse of flint and quartzite.	
		2.00 - 2.45	D	N=15 (2,2/3,4,4,4)	2.00	52.95		Medium dense orangish brown slightly gravelly slightly clayey fine to medium SAND. Gravel is angular to subrounded fine to coarse of flint and quartzite.	2
		2.00	SPT						
		3.00 - 3.45	D	N=21 (2,2/4,5,6,6)					3
		3.00	SPT						
		3.50 - 4.00	B	N=27 (2,2/5,7,7,8)	3.50	51.45		Medium dense orangish brown slightly clayey gravelly fine to medium SAND. Gravel is angular to subrounded fine to coarse of flint and quartzite.	4
		4.00 - 4.45	D						
		4.00	SPT						
		5.00 - 5.45	D	N=24 (3,3/6,10,4,4)	4.40	50.55		Structureless CHALK composed of slightly sandy silty angular to subrounded fine to coarse GRAVEL. Gravel is weak, low density and white. Frequent angular to subangular flint gravel and cobbles. Matrix is light brown and white (Grade Dc).	5
		5.00	SPT						
		6.50 - 6.95	D						
		6.50	SPT						
		7.50	D	N=40 (4,6/7,8,10,15)					6
		8.00 - 8.45	D						
		8.00	SPT						
		9.50 - 9.95	D	N=34 (6,6/8,8,9,9)					7
		9.50	SPT						
					9.95	45.00		End of Borehole at 9.950m	10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks 1. CAT scanned prior to drilling. Hand dug inspection pit to 1.2m bgl. Cable percussion drilling to 10m bgl. 2. Groundwater not thought to have been encountered during drilling. 3. Installed with 4m plain pipe and 4m slotted pipe.										
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Percussion Drilling Log

Project Name: George and Dragon		Client: Greene King		Date: 01/12/2022	
Location: Bath Road, Reading		Contractor:		Co-ords: E 468233.00 N 172167.00	
Project No. : 936		Crew Name:		Drilling Equipment:	
Borehole Number BH3	Hole Type CP	Level 55.10m AoD	Logged By JJ	Scale 1:50	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.40	ES		0.30 0.50	54.80 54.60		MADE GROUND: Grass over brown slightly clayey gravelly fine to coarse sand with low cobble content. Gravel is angular to subrounded fine to coarse of brick, tile and clinker. Cobbles are angular of brick.	
		1.20 - 1.65 1.20	D SPT	N=0 (1,0/0,0,0,0)				MADE GROUND: Black gravelly ashy fine to coarse sand. Gravel is angular to subrounded fine to coarse of clinker, brick and sandstone with rare metal fragments.	1
		2.00 - 2.45 2.00	D SPT	N=16 (2,2/4,4,4,4)				Loose becoming medium dense orangish brown and brown slightly gravelly slightly clayey fine to medium SAND. Gravel is subangular to subrounded fine to coarse of flint and quartzite.	2
		2.50 - 3.00	B						
		3.00 - 3.45 3.00	D SPT	N=18 (3,2/4,4,5,5)					3
		4.00 - 4.45 4.00	D SPT	N=22 (4,4/5,5,6,6)	4.20	50.90			4
		5.00 - 5.45 5.00	D SPT	N=31 (3,6/7,8,8,8)				Structureless CHALK composed of slightly sandy silty angular to subrounded fine to coarse GRAVEL. Gravel is weak, low density and white. Rare angular flint gravels and cobbles. Matrix is light brown and white (Grade Dc).	5
		6.50 - 6.95 6.50	D SPT	N=28 (4,4/7,7,7,7)					6
		7.50	D						7
		8.00 - 8.45 8.00	D SPT	N=24 (3,4/5,5,6,8)					8
		9.50 - 9.95 9.50	D SPT	N=23 (4,5/5,5,6,7)					9
				9.95	45.15		End of Borehole at 9.950m	10	

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks 1. CAT scanned prior to drilling. Hand dug inspection pit to 1.2m bgl. Cable percussion drilling to 10m bgl. 2. Groundwater not thought to have been encountered during drilling. 3. Installed with 4m plain pipe and 4m plated pipe.										
---	--	--	--	--	--	--	--	--	--	---

Trial Pit Log

Project Name: George and Dragon		Client: Greene King		Date: 29/11/2022	
Location: Bath Road, Reading		Contractor:		Co-ords: E 468180.00 N 172178.00	
Project No.: 936		Crew Name:		Equipment:	
Location Number TP1	Location Type TP	Level 55.05m AoD	Logged By JJ	Scale 1:10	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES		0.07	55.05		MADE GROUND: Black tarmac.	1
					0.20	54.98		MADE GROUND: Grey concrete.	
		0.45	ES		0.40	54.85		MADE GROUND: Brown and pinkish red clayey sandy angular to subrounded fine to coarse gravel of brick, concrete and flint.	
					0.50	54.65		Soft grey sandy CLAY. Sand is fine to medium.	
		0.90	B		1.30	54.55		Light brown and orangish brown slightly gravelly very clayey fine to medium SAND. Gravel is subrounded to rounded fine to medium of flint.	
								Excavation ceased at 1.3m bgl due to collapse of sidewalls. End of Borehole at 1.300m	
									2

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks										
1. CAT scanned prior to excavation. 2. Groundwater not encountered.										

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Trial Pit Log

Project Name: George and Dragon		Client: Greene King		Date: 29/11/2022	
Location: Bath Road, Reading		Contractor:		Co-ords: E 468182.00 N172166.00	
Project No. : 936		Crew Name:		Equipment:	
Location Number TP3	Location Type TP	Level 54.90m AoD	Logged By JJ	Scale 1:10	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.09	54.90		MADE GROUND: Black tarmac.	
		0.30	ES					MADE GROUND: Brown and pinkish red slightly clayey sandy angular fine to coarse gravel of concrete and brick with low cobble content. Cobbles are angular of brick.	
		0.45				54.81			
		0.60	ES					Brown gravelly very clayey fine to medium SAND. Gravel is subrounded to rounded fine to medium of flint and quartzite.	
		0.70 0.70 - 0.90	D B						
		1.00				54.45		Yellowish brown and brown slightly clayey fine to medium SAND.	1
		1.10	D						
					1.35	53.90		Excavation ceased at 1.35m bgl due to collapse of sidewalls. End of Borehole at 1.350m	2

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks 1. CAT scanned prior to excavation. 2. Groundwater not encountered.						
---	--	--	--	--	--	---

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Appendix B

Soakage Test Results

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Soakaway Test Report

Client: Greene King
Job Name: George and Dragon
Job No.: 936.02

Test Date: 29/11/2022 to 01/12/2022

Soil Description: 0-0.2m tarmac and concrete, 0.2-0.4m made ground, 0.4-0.5m sandy clay, 0.5-0.6m slightly gravelly clayey sand

Trial Pit No. TP2
Test No. 1
Coordinates:

Weather Conditions: Overcast, dry and windy

Time	Elapsed Time (min)	Depth to water from ground level (m)	(mm)
12:20	0	0.330	330
12:21	1	0.340	340
12:22	2	0.350	350
12:23	3	0.360	360
12:24	4	0.370	370
12:25	5	0.370	370
12:30	10	0.380	380
12:35	15	0.380	380
12:50	30	0.385	385
13:06	46	0.400	400
13:23	63	0.400	400
14:20	120	0.410	410
15:36	196	0.430	430
16:06	226	0.440	440
07:36	1156	0.520	520
10:01	1301	0.530	530
12:21	1441	0.530	530
14:39	1520	0.540	540
08:45	2665	0.570	570

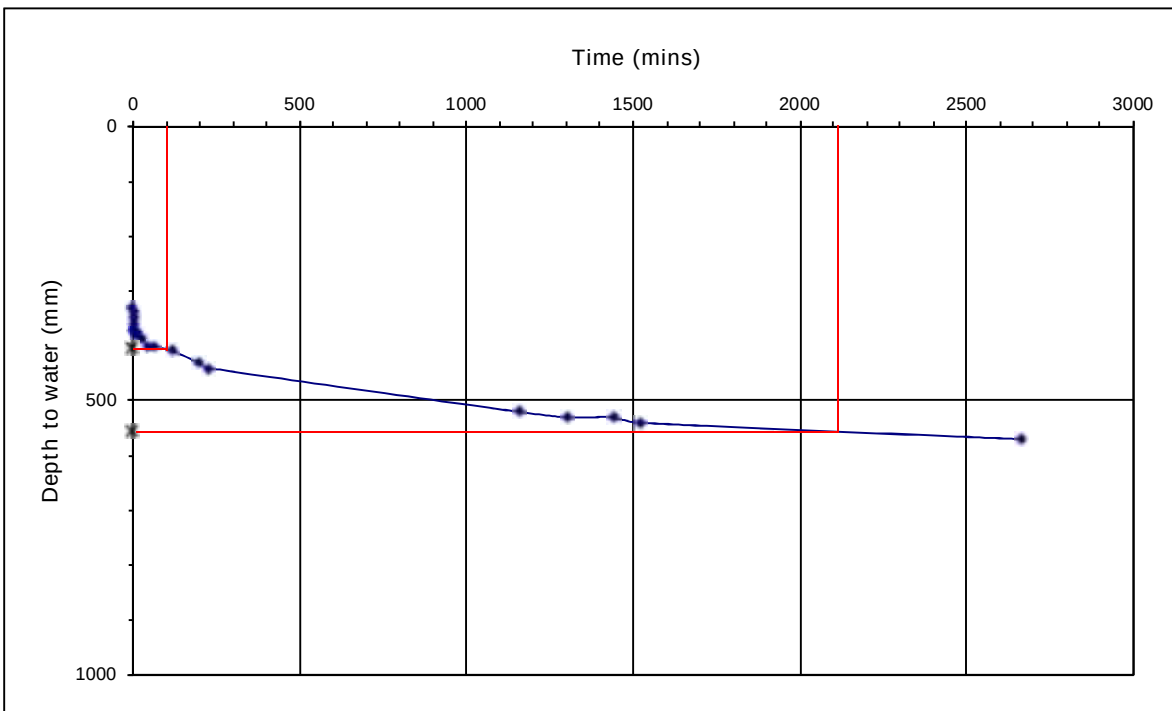
Soakaway Dimensions	(m)	(mm)
Length =	0.70	700
Width =	0.40	400
Depth =	0.63	630

Effective depth (empty)	m	mm
25% =	0.56	555.0
50% =	0.48	480.0
75% =	0.41	405.0

Depth at start of test (mm)	=	330
Depth at end of test (mm)	=	570

Base area of pit	=	0.28
a_{p50} - 50% internal surface area inc. base	=	0.61
Porosity Factor	=	0.95
V_{p75-25} - Volume 75 - 25%	=	0.04

t_{p75} (min) = (Read from graph)	100
t_{p25} (min) = (Read from graph)	2100
t_p values extrapolated from graph data =	2000
t_p value (seconds) =	120000



Soil infiltration rate, f , (m/s) =	5.45E-07	(normal test)
Soil infiltration rate, f , (m/s) =		(pit filled with soakaway crate)

Notes:

Logged By

JJ

Checked by

GSJ

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Weather Conditions: Overcast, dry and windy

Trial Pit No.	TP4
Test No.	2
Coordinates:	

[illegible]

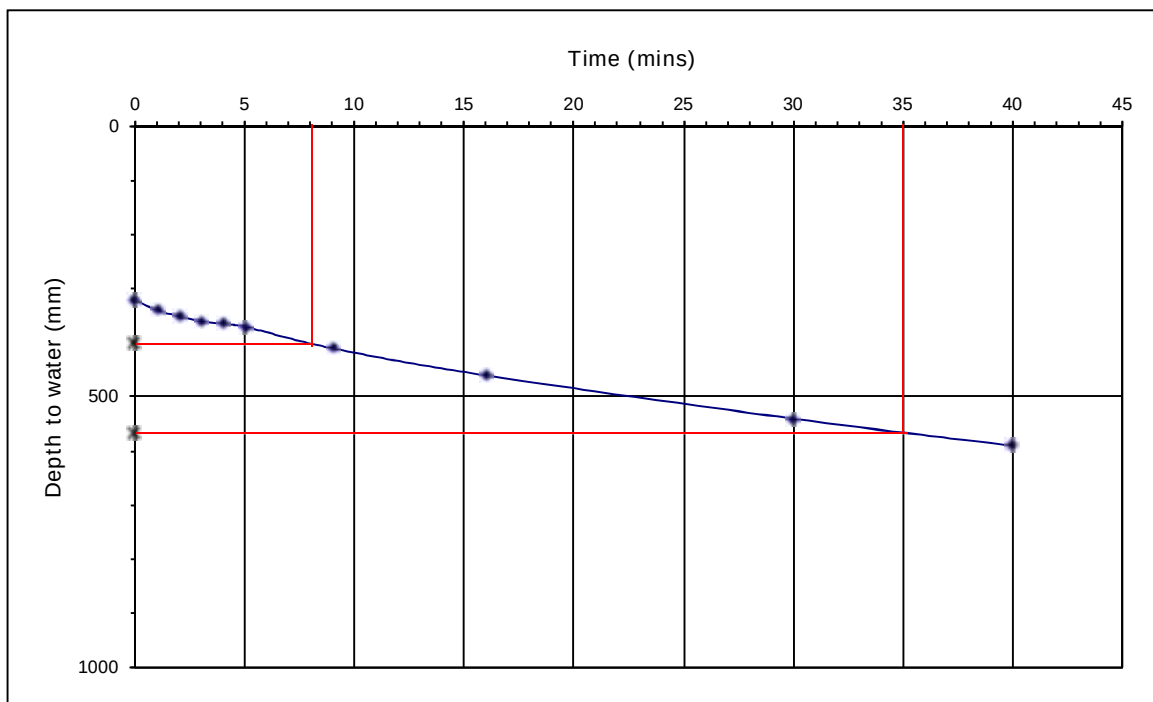
Soakaway Dimensions		(m)	(mm)
Length	=	0.70	700
Width	=	0.40	400
Depth	=	0.65	650

Effective depth (empty)		m	mm
25%	=	0.57	567.5
50%	=	0.49	485.0
75%	=	0.40	402.5

Depth at start of test (mm)	=	320
Depth at end of test (mm)	=	590

Base area of pit	=	0.28
a_{p50} - 50% internal surface area inc. base	=	0.64
Porosity Factor	=	0.95
V_{p75-25} - Volume 75 - 25%	=	0.04

$t_{p\ 75}$ (min) = (Read from graph)	8
$t_{p\ 25}$ (min) = (Read from graph)	35
t_p values extrapolated from graph data =	27
t_p value (seconds) =	1620



Soil infiltration rate, f , (m/s) =	4.21E-05	(normal test)
Soil infiltration rate, f , (m/s) =		(pit filled with soakaway crate)

Notes:

Logged By

JJ

Checked by

GSJ

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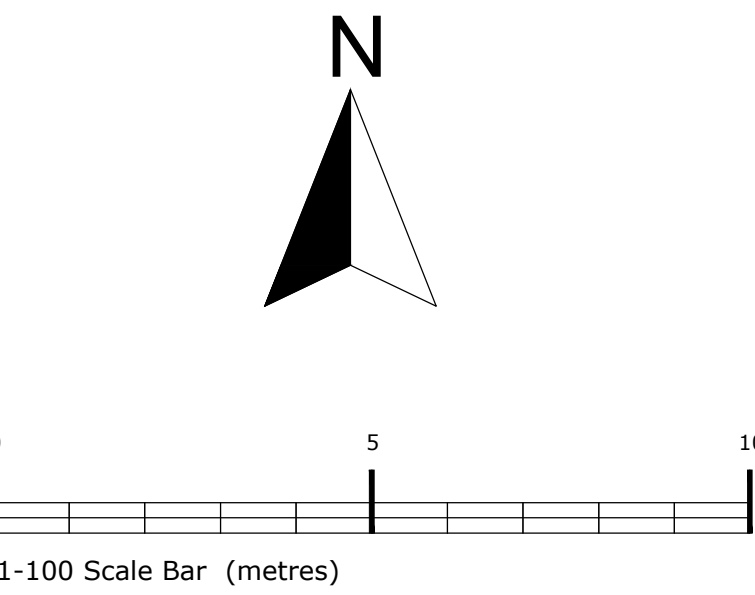
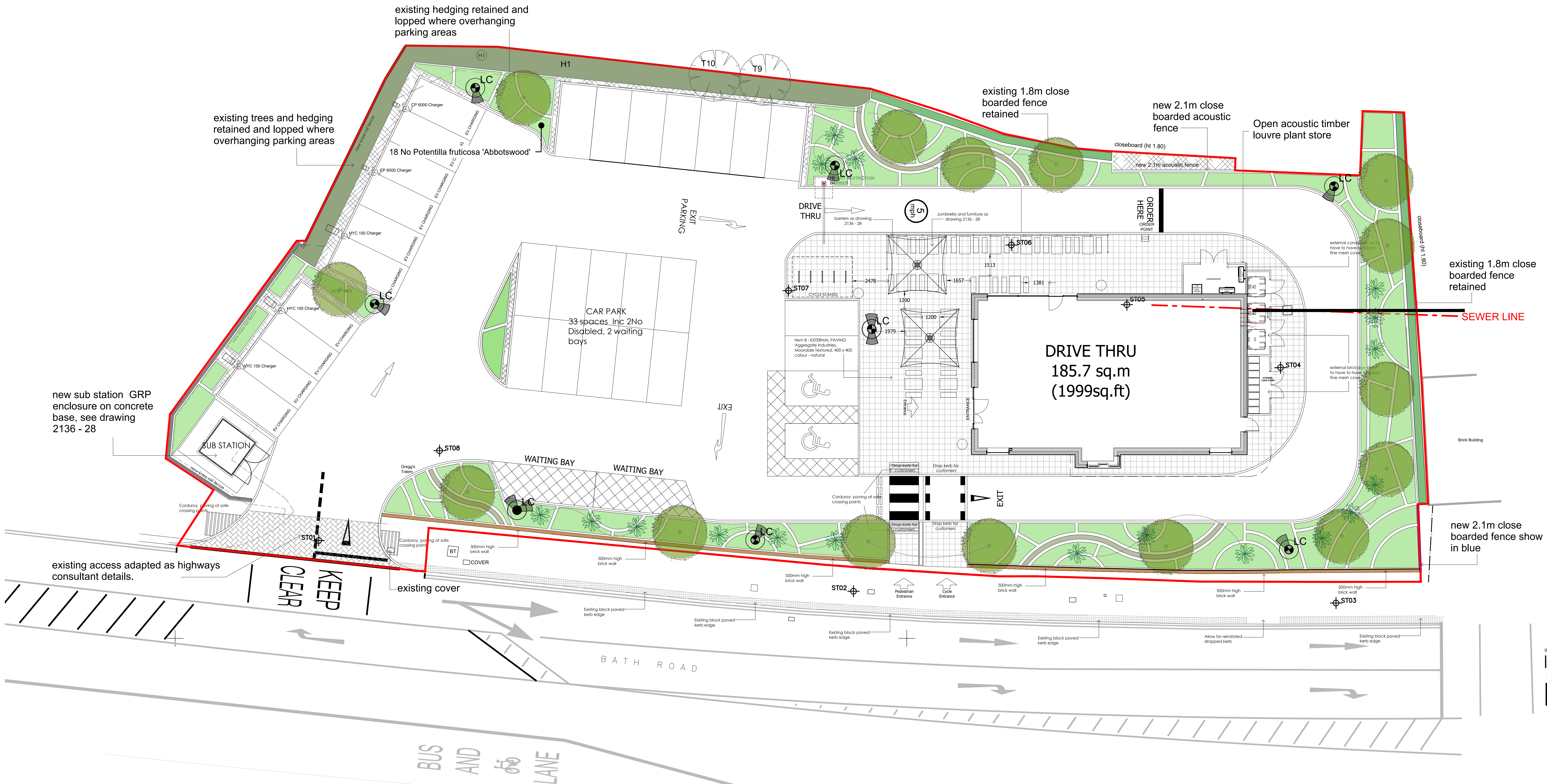
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Appendix E

Proposed Site Layout

NOTES
The designs and details on this drawing are copyright and must not be reproduced without the written permission of the designer.
Contractors are to check all sizes and dimensions before setting out any site or shopwork. Any errors or discrepancies to be reported to the designer.
Do not scale off this drawing.

REVISIONS	DATE
REV - A Boundary treatments updated, landscaping updated site entrance updated	24/02/23 MT
REV - B Minor amendments as agreed with planning consultant	02/03/23 MT
REV - C Kneer rail fence added back to western boundary lighting columns 5.6 & 9 adjusted Sub station updated. Condenser store relocated	23/03/23 MT
REV - D Changing points updated	28/03/23 MT
REV - E Bin Store layout updated	31/03/23 MT
REV - F Plant area amended	03/07/23 ML
REV - G Cropping and access amended	04/07/23 ML
REV - H2 Path widened, cycle store moved. Drive thru lane moved closer to building	15/08/23 ML
REV - I Cycle store reinstated, kerb line updated. New car parking spaces reinstated	16/08/23 ML
REV - J Car park lighting omitted	16/08/23 JAA
REV - K Existing brick wall reinstated. New brick wall to match existing added.	13/09/23 ML
REV - L Brick wall boundary notes added along with mesh to bin stores	14/09/23 JAA
REV - M Brick wall to boundary hatched and position adjusted prime with 3m cycle path	14/09/23 JAA
REV - N Landscaping updated	20/09/23 MTL
REV - O Lighting columns updated	26/09/23 MTL
REV - P Furniture positions adjusted and dimensioned to ensure 1200 clearance	03/11/23 MTL
REV - Q Furniture positions adjusted to side patio 24x covers omitted	08/11/23 JAA
REV - R Totem added along with site bins	08/11/23 JAA
REV - S Plan updated to suit access elevation windows	22/11/23 CP
REV - T Plan updated to have new windows as elevations, Landscaping Updated	24/11/23 JAA
REV - U Tree protection removed	28/11/23 MTL



PLANNING

DRAWING DESCRIPTION
PROPOSED SITE PLAN
GREGGS DRIVE THRU

JOB TITLE
GEORGE & DRAGON
162 BATH STREET ROAD
READING RG30 2HA

CLIENT
GREENE KING

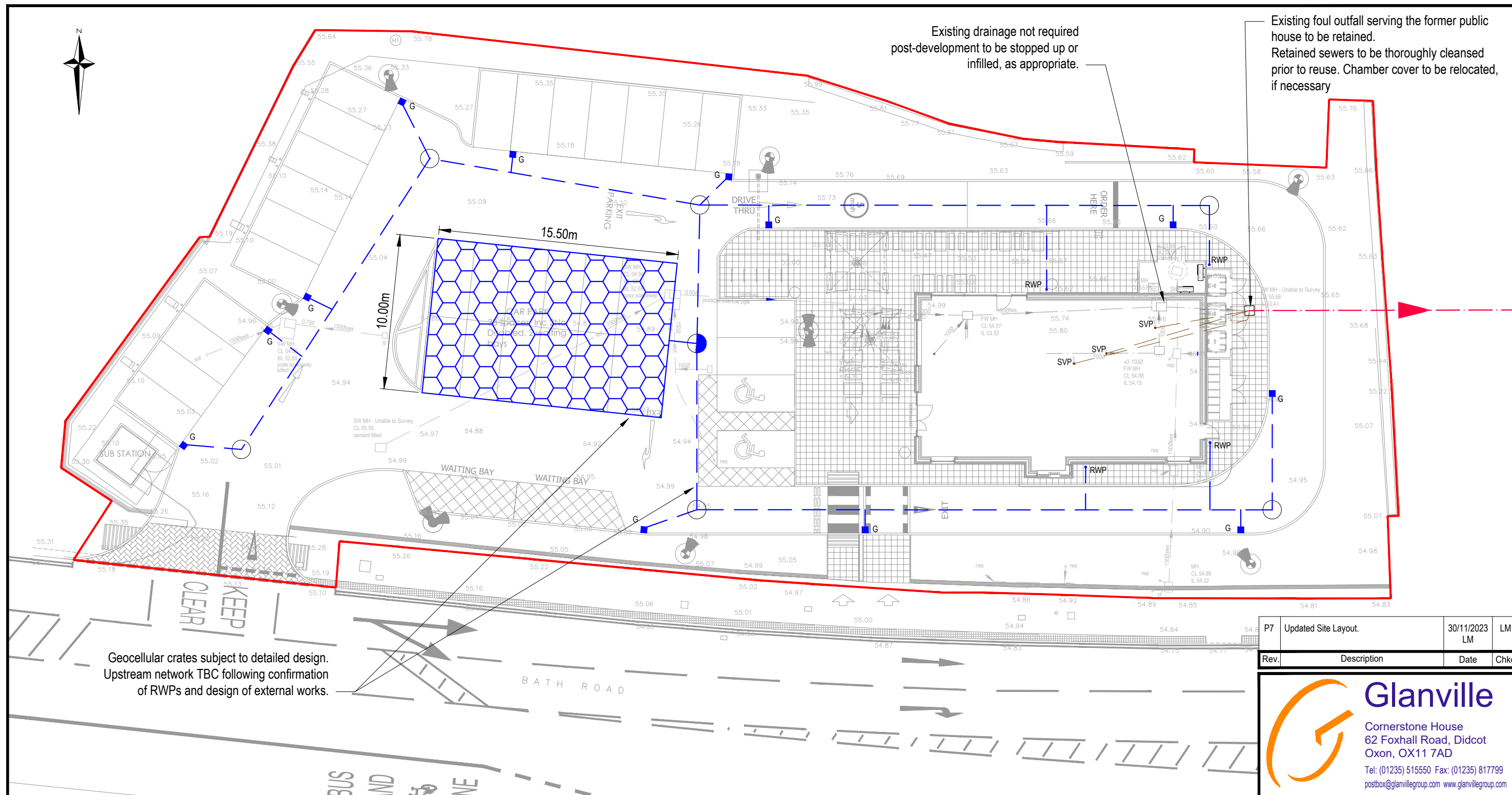
DRAWN BY	M. Taylor	SCALE	1:100@A0
DATE	Apr 2022	DRAWING NO.	2136 - 23
CHECKED		REVISION	U

John Dixon & Associates Ltd,
Unit 211
Chambers Business Centre,
Chapel Road,
Oxford
OX4 4QG
TEL : 0161 682 0964
FAX : 0161 683 4106
E-MAIL : info@johndixon.co.uk
WEB : www.johndixon.co.uk

jda
architecture
interior design
project management

Appendix F

Drainage Strategy



NOTES

- This drawing to be read in conjunction with all other drawings and specifications.
- Dimensions not to be scaled for construction purposes.
- Site layout from John Dixon & Associates drawing 2136-23M - Proposed Site Plan (Planning), date September 2023.
- Topographical Survey and Existing Drainage information taken from Midland Survey Ltd (dwg no. 41024A /1), dated February 2022.
- An infiltration rate of 2.45×10^{-5} m/s is used based on results from soakage testing on site.
- This drawing is indicative and not intended for construction.
- SuDS sizing based on MicroDrainage calculations.
- All drainage to be installed in accordance with Building Regulations part H and BS8582.
- RWP and SVP locations to be confirmed at detailed design stage to verify surface water drainage design.
- All levels, including FFL, subject to detailed external works design.
- Class 1 retainment interceptor system TBC at detailed design stage.

KEY

- Site Boundary
- Proposed Surface Water Sewer
- Proposed Foul Water Sewer
- Existing Foul Water Sewer (To be Retained)
- Existing Surface Water Sewer (To be Abandoned)
- Existing Foul Water Sewer (To be Abandoned)
- Class 1 Full Retention Separator
- Proposed Gully

Geo-cellular Crate Soakaway
Area: 155.0m^2 (i.e. $10\text{m} \times 15.5\text{m}$)
Depth: 0.80m - 2No. Aquacell Plus units
IL: 53.42m AOD
Min CL: 54.82m AOD
Inf. rate through base / side: 0.088m/h
(i.e. 2.45×10^{-5} m/s)
Max. Water level: 54.215m AOD (1%AEP+40%CC)
Max. Water depth: 0.773m (1%AEP+40%CC)
Max. Water volume: 113.1m^3 (1%AEP+40%CC)
Soakaway crate to be wrapped in permeable geotextile membrane to prevent infiltration of fines.

Scale = 1:250 @ A3

P7	Updated Site Layout.	30/11/2023 LM	LM
Rev.	Description	Date	Chkd

Glanville
Cornerstone House
62 Foxhall Road, Didcot
Oxon, OX11 7AD
Tel: (01235) 515550 Fax: (01235) 817799
postbox@glanvillegroup.com www.glanvillegroup.com

Client :
Greene King and Retailing Limited

Project :
George & Dragon, 162 Bath Road, Reading, RG30 2HA

Title :
Drainage Strategy

Project Engineer : S McNair Scale : 1:250 @ A3
Project Director : K Rayner Date : April 2023
Status : **PLANNING**

Drawing No. 8220244-SK04 Rev P7

Appendix G

MicroDrainage Calculations

Glanville Consultants				Page 1																																																																																																																																																																																																																			
Cornerstone House 62 Foxhall Road Didcot OX11 7AD		8220244 George & Dragon, 162 Bath Rd Reading, RG30 2HA																																																																																																																																																																																																																					
Date 31/01/2023 File Geocellular Soakaway.SRCX		Designed by DSteenkamp Checked by SMCnair																																																																																																																																																																																																																					
Innovyze		Source Control 2020.1.3																																																																																																																																																																																																																					
<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 424 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>53.824</td><td>0.404</td><td>2.1</td><td>59.2</td><td>O K</td></tr><tr><td>30 min Summer</td><td>53.946</td><td>0.526</td><td>2.2</td><td>76.9</td><td>O K</td></tr><tr><td>60 min Summer</td><td>54.063</td><td>0.643</td><td>2.3</td><td>94.1</td><td>O K</td></tr><tr><td>120 min Summer</td><td>54.117</td><td>0.697</td><td>2.3</td><td>102.0</td><td>O K</td></tr><tr><td>180 min Summer</td><td>54.137</td><td>0.717</td><td>2.3</td><td>104.9</td><td>O K</td></tr><tr><td>240 min Summer</td><td>54.139</td><td>0.719</td><td>2.3</td><td>105.2</td><td>O K</td></tr><tr><td>360 min Summer</td><td>54.118</td><td>0.698</td><td>2.3</td><td>102.1</td><td>O K</td></tr><tr><td>480 min Summer</td><td>54.092</td><td>0.672</td><td>2.3</td><td>98.3</td><td>O K</td></tr><tr><td>600 min Summer</td><td>54.066</td><td>0.646</td><td>2.3</td><td>94.5</td><td>O K</td></tr><tr><td>720 min Summer</td><td>54.042</td><td>0.622</td><td>2.3</td><td>91.1</td><td>O K</td></tr><tr><td>960 min Summer</td><td>53.998</td><td>0.578</td><td>2.2</td><td>84.6</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>53.924</td><td>0.504</td><td>2.2</td><td>73.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>53.827</td><td>0.407</td><td>2.1</td><td>59.6</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>53.747</td><td>0.327</td><td>2.1</td><td>47.8</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>53.627</td><td>0.207</td><td>2.0</td><td>30.2</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>53.548</td><td>0.128</td><td>2.0</td><td>18.7</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>53.500</td><td>0.080</td><td>1.9</td><td>11.7</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>53.475</td><td>0.055</td><td>1.9</td><td>8.0</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>53.467</td><td>0.047</td><td>1.8</td><td>7.0</td><td>O K</td></tr><tr><td>15 min Winter</td><td>53.848</td><td>0.428</td><td>2.1</td><td>62.6</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>143.360</td><td>0.0</td><td>22</td></tr><tr><td>30 min Summer</td><td>94.360</td><td>0.0</td><td>37</td></tr><tr><td>60 min Summer</td><td>59.220</td><td>0.0</td><td>66</td></tr><tr><td>120 min Summer</td><td>33.950</td><td>0.0</td><td>124</td></tr><tr><td>180 min Summer</td><td>24.535</td><td>0.0</td><td>184</td></tr><tr><td>240 min Summer</td><td>19.460</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>13.977</td><td>0.0</td><td>344</td></tr><tr><td>480 min Summer</td><td>11.035</td><td>0.0</td><td>396</td></tr><tr><td>600 min Summer</td><td>9.176</td><td>0.0</td><td>456</td></tr><tr><td>720 min Summer</td><td>7.887</td><td>0.0</td><td>520</td></tr><tr><td>960 min Summer</td><td>6.197</td><td>0.0</td><td>656</td></tr><tr><td>1440 min Summer</td><td>4.428</td><td>0.0</td><td>926</td></tr><tr><td>2160 min Summer</td><td>3.158</td><td>0.0</td><td>1324</td></tr><tr><td>2880 min Summer</td><td>2.491</td><td>0.0</td><td>1704</td></tr><tr><td>4320 min Summer</td><td>1.800</td><td>0.0</td><td>2424</td></tr><tr><td>5760 min Summer</td><td>1.444</td><td>0.0</td><td>3112</td></tr><tr><td>7200 min Summer</td><td>1.228</td><td>0.0</td><td>3752</td></tr><tr><td>8640 min Summer</td><td>1.083</td><td>0.0</td><td>4408</td></tr><tr><td>10080 min Summer</td><td>0.980</td><td>0.0</td><td>5136</td></tr><tr><td>15 min Winter</td><td>143.360</td><td>0.0</td><td>22</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	53.824	0.404	2.1	59.2	O K	30 min Summer	53.946	0.526	2.2	76.9	O K	60 min Summer	54.063	0.643	2.3	94.1	O K	120 min Summer	54.117	0.697	2.3	102.0	O K	180 min Summer	54.137	0.717	2.3	104.9	O K	240 min Summer	54.139	0.719	2.3	105.2	O K	360 min Summer	54.118	0.698	2.3	102.1	O K	480 min Summer	54.092	0.672	2.3	98.3	O K	600 min Summer	54.066	0.646	2.3	94.5	O K	720 min Summer	54.042	0.622	2.3	91.1	O K	960 min Summer	53.998	0.578	2.2	84.6	O K	1440 min Summer	53.924	0.504	2.2	73.7	O K	2160 min Summer	53.827	0.407	2.1	59.6	O K	2880 min Summer	53.747	0.327	2.1	47.8	O K	4320 min Summer	53.627	0.207	2.0	30.2	O K	5760 min Summer	53.548	0.128	2.0	18.7	O K	7200 min Summer	53.500	0.080	1.9	11.7	O K	8640 min Summer	53.475	0.055	1.9	8.0	O K	10080 min Summer	53.467	0.047	1.8	7.0	O K	15 min Winter	53.848	0.428	2.1	62.6	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	143.360	0.0	22	30 min Summer	94.360	0.0	37	60 min Summer	59.220	0.0	66	120 min Summer	33.950	0.0	124	180 min Summer	24.535	0.0	184	240 min Summer	19.460	0.0	242	360 min Summer	13.977	0.0	344	480 min Summer	11.035	0.0	396	600 min Summer	9.176	0.0	456	720 min Summer	7.887	0.0	520	960 min Summer	6.197	0.0	656	1440 min Summer	4.428	0.0	926	2160 min Summer	3.158	0.0	1324	2880 min Summer	2.491	0.0	1704	4320 min Summer	1.800	0.0	2424	5760 min Summer	1.444	0.0	3112	7200 min Summer	1.228	0.0	3752	8640 min Summer	1.083	0.0	4408	10080 min Summer	0.980	0.0	5136	15 min Winter	143.360	0.0	22
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status																																																																																																																																																																																																																		
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960 min Summer	53.998	0.578	2.2	84.6	O K																																																																																																																																																																																																																		
1440 min Summer	53.924	0.504	2.2	73.7	O K																																																																																																																																																																																																																		
2160 min Summer	53.827	0.407	2.1	59.6	O K																																																																																																																																																																																																																		
2880 min Summer	53.747	0.327	2.1	47.8	O K																																																																																																																																																																																																																		
4320 min Summer	53.627	0.207	2.0	30.2	O K																																																																																																																																																																																																																		
5760 min Summer	53.548	0.128	2.0	18.7	O K																																																																																																																																																																																																																		
7200 min Summer	53.500	0.080	1.9	11.7	O K																																																																																																																																																																																																																		
8640 min Summer	53.475	0.055	1.9	8.0	O K																																																																																																																																																																																																																		
10080 min Summer	53.467	0.047	1.8	7.0	O K																																																																																																																																																																																																																		
15 min Winter	53.848	0.428	2.1	62.6	O K																																																																																																																																																																																																																		
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																				
15 min Summer	143.360	0.0	22																																																																																																																																																																																																																				
30 min Summer	94.360	0.0	37																																																																																																																																																																																																																				
60 min Summer	59.220	0.0	66																																																																																																																																																																																																																				
120 min Summer	33.950	0.0	124																																																																																																																																																																																																																				
180 min Summer	24.535	0.0	184																																																																																																																																																																																																																				
240 min Summer	19.460	0.0	242																																																																																																																																																																																																																				
360 min Summer	13.977	0.0	344																																																																																																																																																																																																																				
480 min Summer	11.035	0.0	396																																																																																																																																																																																																																				
600 min Summer	9.176	0.0	456																																																																																																																																																																																																																				
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960 min Summer	6.197	0.0	656																																																																																																																																																																																																																				
1440 min Summer	4.428	0.0	926																																																																																																																																																																																																																				
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4320 min Summer	1.800	0.0	2424																																																																																																																																																																																																																				
5760 min Summer	1.444	0.0	3112																																																																																																																																																																																																																				
7200 min Summer	1.228	0.0	3752																																																																																																																																																																																																																				
8640 min Summer	1.083	0.0	4408																																																																																																																																																																																																																				
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Glanville Consultants				Page 2	
Cornerstone House 62 Foxhall Road Didcot OX11 7AD		8220244 George & Dragon, 162 Bath Rd Reading, RG30 2HA			
Date 31/01/2023 File Geocellular Soakaway.SRCX		Designed by DSteenkamp Checked by SMCnair			
Innovyze		Source Control 2020.1.3			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	53.977	0.557	2.2	81.4	O K
60 min Winter	54.102	0.682	2.3	99.7	O K
120 min Winter	54.163	0.743	2.3	108.7	O K
180 min Winter	54.187	0.767	2.4	112.2	O K
240 min Winter	54.193	0.773	2.4	113.1	O K
360 min Winter	54.177	0.757	2.3	110.7	O K
480 min Winter	54.145	0.725	2.3	106.1	O K
600 min Winter	54.115	0.695	2.3	101.7	O K
720 min Winter	54.086	0.666	2.3	97.4	O K
960 min Winter	54.028	0.608	2.3	88.9	O K
1440 min Winter	53.923	0.503	2.2	73.6	O K
2160 min Winter	53.785	0.365	2.1	53.4	O K
2880 min Winter	53.673	0.253	2.0	37.0	O K
4320 min Winter	53.520	0.100	1.9	14.7	O K
5760 min Winter	53.468	0.048	1.8	7.0	O K
7200 min Winter	53.461	0.041	1.6	5.9	O K
8640 min Winter	53.456	0.036	1.4	5.2	O K
10080 min Winter	53.453	0.033	1.3	4.8	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	94.360	0.0	36		
60 min Winter	59.220	0.0	64		
120 min Winter	33.950	0.0	122		
180 min Winter	24.535	0.0	180		
240 min Winter	19.460	0.0	236		
360 min Winter	13.977	0.0	346		
480 min Winter	11.035	0.0	446		
600 min Winter	9.176	0.0	476		
720 min Winter	7.887	0.0	552		
960 min Winter	6.197	0.0	704		
1440 min Winter	4.428	0.0	998		
2160 min Winter	3.158	0.0	1408		
2880 min Winter	2.491	0.0	1788		
4320 min Winter	1.800	0.0	2460		
5760 min Winter	1.444	0.0	2936		
7200 min Winter	1.228	0.0	3664		
8640 min Winter	1.083	0.0	4408		
10080 min Winter	0.980	0.0	5088		
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Cornerstone House 62 Foxhall Road Didcot OX11 7AD	8220244 George & Dragon, 162 Bath Rd Reading, RG30 2HA	
Date 31/01/2023 File Geocellular Soakaway.SRCX	Designed by DSteenkamp Checked by SMCNair	
Innovyze Source Control 2020.1.3		
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Glanville Consultants		Page 4
Cornerstone House 62 Foxhall Road Didcot OX11 7AD	8220244 George & Dragon, 162 Bath Rd Reading, RG30 2HA	
Date 31/01/2023 File Geocellular Soakaway.SRCX	Designed by DSteenkamp Checked by SMCNair	
Innovyze Source Control 2020.1.3		

Model Details

Storage is Online Cover Level (m) 54.820

Cellular Storage Structure

Invert Level (m) 53.420 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.08800 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.08800

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	154.0	154.0	0.900	0.0	194.0
0.800	154.0	194.0			

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Appendix H

Thames Water Pre-planning Enquiry Response Letter



Glanville,

Kerin Hulse,
62 Foxhall Road
Didcot, Oxfordshire,
OX11 7AD



30 January 2023

Pre-planning enquiry: Confirmation of sufficient capacity (Foul water only)

Dear Kerin,

Thank you for providing information on your development on 162 Bath Road, Reading, Berkshire, RG30 2HA for the proposed developments of 231 drive in capacity restaurant and 2229 sqm car park to be build. Existing 440 sqm manufacturing unit and 2020 sqm car park to be demolished. Proposed Foul water to be discharged into Foul water manhole SU68722102 via gravity.

Surface water is not to be discharged into the Thames water's sewer.

We have completed the assessment of the foul water flows based on the information submitted in your application with the purpose of assessing sewerage capacity within the existing Thames Water sewer network.

Foul Water

If your proposals progress in line with the details you've provided, we're pleased to confirm that there will be sufficient sewerage capacity in the adjacent foul water sewer network to serve your development.

This confirmation is valid for 12 months or for the life of any planning approval that this information is used to support, to a maximum of three years.

You'll need to keep us informed of any changes to your design – for example, an increase in the number or density of homes. Such changes could mean there is no longer sufficient capacity.

Surface Water

In accordance with the Building Act 2000 Clause H3.3, positive connection of surface water to a public sewer will only be consented when it can be demonstrated that the hierarchy of disposal methods have been examined and proven to be impracticable. Before we can consider your surface water needs, you'll need written approval from the lead local flood authority that you have followed the sequential approach to the disposal of surface water and considered all practical means.

The disposal hierarchy being:

- 1) rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
- 2) rainwater infiltration to ground at or close to source
- 3) rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)
- 4) rainwater discharge direct to a watercourse (unless not appropriate)
- 5) controlled rainwater discharge to a surface water sewer or drain
- 6) controlled rainwater discharge to a combined sewer.

Where connection to the public sewerage network is required to manage surface water flows we will accept these flows at a discharge rate in line with CIRIA's best practice guide on SuDS or that stated within the sites planning approval.

Please see the attached 'Planning your wastewater' leaflet for additional information.

What happens next?

Please make sure you submit your connection application, giving us at least 21 days' notice of the date you wish to make your new connection/s.

If you've any further questions, please contact me on 07747642636.

Yours sincerely

Nathanael Bryant Sanjaya

Adoption Engineer

Developer Services



Cornerstone House, 62 Foxhall Road
Didcot, Oxfordshire OX11 7AD

01235 515550
postbox@glanvillegroup.com
www.glanvillegroup.com

- Structural Engineering
- Transport and Highways
- Civil Engineering
- Geomatics
- Building Surveying

Site Waste Management Plan (SWMP)



Project: George & Dragon – Demolition and New Build
Greggs Drive-Thru

Client: Greene King Commercial Investments Limited

Principal Contractor: PCA Build (N.I.) Ltd

Document Control Sheet

Project	George & Dragon – Demolition and New Build Greggs Drive-Thru		
Approved by	Johann Barnard, Project Manager		
Issue No: 1 Signed	<i>J. Barnard</i>	Dated	24 th July 2024
Issue No: 2 Signed		Dated	
Issue No: 3 Signed		Dated	

Amendment Record

Issue Number	Section Number	Reason for Change	Date of Amendment
1.	All Sections	New Document.	24 th July 2024
2.			
3.			
4.			
5.			

Contents

- 1. Introduction**
- 2. Description of Project**
 - 2.1. Project Name
 - 2.2. Project Address
 - 2.3. Site Description
 - 2.4. Description of works and timescales
 - 2.5. Principal Contractor
 - 2.6. Demolition Contractor
- 3. Scope of Works**
- 4. Waste Management Objectives**
- 5. Removal of Materials**
 - 5.1. General Debris
 - 5.2. Plasterboard
 - 5.3. Timber
 - 5.4. Scrap Metals
 - 5.5. Concrete / Brick / Masonry (Hard Inert Arisings)
- 6. Post-Demolition Waste Management**
- 7. Monitoring and Reporting**
- 8. Conclusion**

Appendices

Appendix 1: Tool Box Talks - Waste management

1.0 Introduction

This Site Waste Management Plan outlines the procedures for managing waste materials arising from the demolition activities at the site. The aim is to minimize waste sent to landfill and to facilitate recycling and reuse of materials wherever possible.

2.0 Description of Project

2.1 Project Name:
Redevelopment of George & Dragon – Demolition and New Build Greggs Drive-Thru
2.2 Project Address:
162 Bath Road Reading Berkshire RG30 2HA
2.3 Site Description:
The site is located on Bath Road (A4) leading into the centre of Reading on the approach to a set of traffic lights. Residential housing surrounds, there is a Lidl and Aldi to the west and a school to the north.
2.4 Description of Works and Timescales:
The works involve the demolition of the existing George & Dragon public house and the construction of a new Greggs Drive-thru shell and associated external works. In summary: • Stripping out and demolition of the existing public house structure • New substation and enclosure • Strip foundations and ground bearing slab (with recess in slab for freezer room) to the structural engineer's details • Erection of new single storey masonry drive thru unit with canopies and trussed pitched roof over with slate covering and associated rainwater goods, steelwork to structural engineer's specifications • External doors and windows including shop front system and drive-thru window • Louvred enclosures to plant and cage store slabs • Associated drainage and services works • Interceptor and geo-cellular crate soakaway • External works, including creation of drive-thru road and car park, height barrier, cycle shelter, new fencing, low level brick wall to front boundary, new paths and paving, external lighting and soft landscaping • Signage works
Construction Start Date: 5th August 2024 Practical Completion Date: 3rd February 2024 Overall Project Duration: 24 weeks build programme plus 2 weeks for Xmas & New Year Break

2.5 Principal Contractor:		
PCA Build (N.I.) Ltd Unit 8 Elagh Business Park Buncrana Road Derry BT48 8QH T: 0330 223 4177 E: info@pcabuild.co.uk W: www.pcabuild.co.uk		
Key Contacts:		
Director: Patrick Curran T: 0330 223 4177 E: patrick@pcabuild.co.uk	Contracts & Project Manager: Johann Barnard PCA Build (NI) Ltd M: 07568 391 923 E: johann@pcabuild.co.uk	Commercial Manager: Mike Blewett M: 07444 775 109 E: mike@pcabuild.co.uk
Site Manager: Seosamh McLaughlin M: 07552 716356 E: Sitemanager1@pcabuild.co.uk  First Aider	Health and Safety Advisor: Jonathan Williams CMIOSH Direct Safety Solutions Ltd M: 07506 230365 E: jonathan@directsafetysolutions.co.uk	
2.6 Demolition Contractor:		
J Mould Reading Reading Quarry Berrys Lane Burghfield Reading RG30 3EY T: 0118 957 5555 E: info@jmouldreading.co.uk	Contact: Jay Mould Director M: 07795567212 E: jay@jmouldreading.co.uk	

3.0 Scope of Work

The plan covers the removal and management of various types of materials generated during the demolition process.

4.0 Waste Management Objectives

- To segregate and recycle materials to minimise waste.
- To ensure compliance with relevant waste management regulations.
- To promote sustainable construction practices.

5.0 Removal of Materials

5.1 General Debris

- All debris arising from the demolition will be segregated and processed on-site as part of the demolition process.
- Materials that cannot be recycled, such as ceiling tiles and loose debris, will be loaded into 35-yard roll-on/off containers and transported off-site to a licensed landfill facility. Each bin will be covered with netting to prevent dust emissions.

5.2 Plasterboard

- Plasterboard will be kept separate and placed into containers specifically designated for this type of waste to ensure proper recycling.

5.3 Timber

- All timber waste will be segregated and loaded into a 35-yard roll-on/off bin for transportation to a waste transfer station for recycling.

5.4 Scrap Metals

- All scrap metal will be segregated into various grades/types and loaded into scrap trailers or roll-on/off containers. These will be removed from the site and sent to a licensed scrap processing plant for recycling as part of the demolition process.

5.5 Concrete / Brick / Masonry (Hard Inert Arisings)

- Initially, all hard inert arisings will be crushed and left on-site for reuse.
- If materials cannot be reused on-site, they will be removed and disposed of at a recycling centre, where they will be crushed for future reuse.

Issued: 24/7/2024	Site Waste Management Plan (SWMP)	Page: 6 of 8
Issue No: 1	Redevelopment of George & Dragon, Reading	

6.0 Post-Demolition Waste Management

Following the demolition, waste will be removed in enclosed or sheeted skips to prevent any spillage or dust emissions during transport.

7.0 Monitoring and Reporting

- Regular audits will be conducted to ensure compliance with this SWMP.
- Records of all waste removed from the site will be maintained, including quantities and disposal/recycling destinations.

8.0 Conclusion

This SWMP aims to provide a structured approach to managing waste generated during the demolition process, promoting recycling and reuse while ensuring compliance with environmental regulations.

Appendix 1

Tool Box Talks - Waste management

Prepare	Location? Distractions? Talk aids?
Reason	Good housekeeping is an essential part of site safety.
Why	Accumulated waste materials and substances can turn into risks to health and safety in several ways.
Outline	This talk will cover: the risks to health and safety resulting from poor housekeeping.

General precautions

- 1 Separate different types of waste into separate skips if there is such a system.
 - 2 If there is a COSH skip, make sure that all used containers of substances are put in it. **Do not mix with general waste.**
 - 3 Remove all nails from scrap timber to avoid foot injuries to other people.
 - 4 Securely bag or bundle lightweight waste to prevent it being scattered by the wind.
 - 5 Waste created at height must be returned to ground level in a safe manner, not thrown down.
- Q: Where would you dispose of used substance containers on this site?**

Skips

- 1 If a skip is to be positioned in the road, a council permit is required.
- 2 A skip on the road must be coned off at all times with adequate light at night.
- 3 Don't overload skips – load up to the top of the sides.
- 4 Don't attempt to ride in a skip – waste material could move and injure you.

Fire

- 1 The accumulation of combustible material could provide the fuel for a large fire.
 - 2 Dispose of combustible waste in the skips or bins provided as soon as practical after you create it.
 - 3 Don't dispose of used LPG cylinders or aerosol cans with general waste.
 - 4 The burning of waste materials is banned on most sites – don't light bonfires and don't light fires in skips.
- Q: Where on this site should waste timber and cardboard be disposed of?**

Special waste

- 1 Special arrangements have to be made for the removal of certain hazardous substances, such as asbestos, from site.
- 2 These substances must not be mixed in with general waste.

Food waste

- 1 Discarded food waste will encourage the presence of rats and other vermin.
 - 2 The presence of rats brings with it the possibility of catching Weil's disease.
 - 3 Dispose of food waste in secure bins – do not leave it lying about.
- Q: How can the presence of rats be discouraged?**

Do you have any questions for me?

Issued: 24/7/2024	Site Waste Management Plan (SWMP)	Page: 8 of 8
Issue No: 1	Redevelopment of George & Dragon, Reading	