

DRAINAGE STRATEGY REPORT
PREMIER INN HORSHAM NORTH
NORTH STREET
HORSHAM
RH12 1RB

PREPARED FOR:



JOB NO: P24-0548

DATE: 4th February 2026

ISSUE NO: 1



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1. INTRODUCTION

- 1.1 This report has been prepared by Simpson TWS on behalf of Premier Inn Hotels Ltd. to accompany a planning application for a proposed conversion & extension to the existing restaurant comprising new hotel reception area, restaurant, and bedrooms.
- 1.2 The report details a strategy for the disposal & management of surface & foul water runoff that will be generated by the development.

2. SITE LOCATION AND TOPOGRAPHY

- 2.1 The site is located on North Street, Horsham as shown on *Figure 1*, below. The site is centred on Ordnance Survey grid reference TQ 17848 31034 and co-ordinates X: 517848; Y: 131034. The site's post code is RH12 1RB.

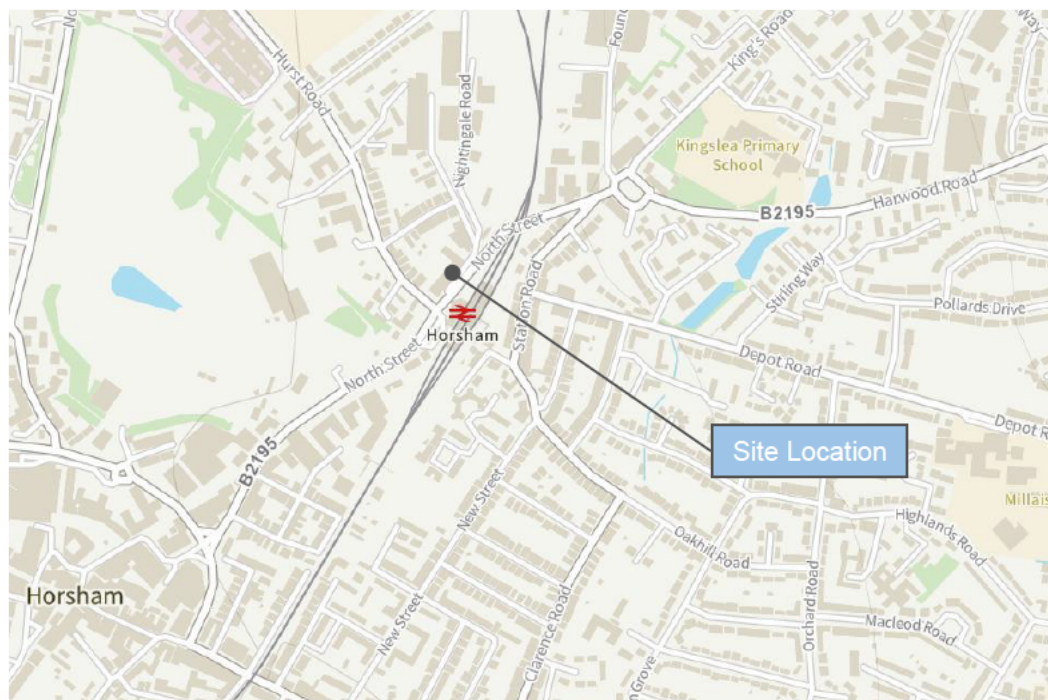


Figure 1: Site Location

Site Description

- 2.2 The existing site comprises a Premier Inn hotel & The Staton, Beefeater Restaurant, with associated parking and seating areas. Vehicular access is gained from Nightingale Road, off North Street, at the east of the site. Vehicular egress is located at the south-western corner of the site, off Hurst Road. A copy of the topographical survey is included in *Appendix A*.

Topography

- 2.3 Levels on the topographical survey show the site to generally fall in a westerly direction, with a high point of 56.62mAOD in the north-eastern corner of the site, to a low point of 53.36mAOD at the north-western area of the site. The survey looks to show a general fall away from the existing buildings, including a slight fall in a southerly direction at the southern boundary of the site.

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Existing Drainage Characteristics

- 2.4 The topographical survey identifies that the site is currently drained via two separate networks serving surface water and foul water.
- 2.5 Roof water from the existing hotel is conveyed via gutters and downpipes to the private surface water network, which discharges by gravity to an existing soakaway located to the north-west corner of the site. This soakaway was constructed as part of a previous extension to the hotel in 2007.
- 2.6 Roof water from the existing Beefeater restaurant is conveyed via gutters and downpipes and discharges to 2 no. outfalls. The eastern elevation of the building discharges directly onto the ground which in turn makes its way to the nearby Southern Water surface water sewer, whilst the remaining roof area discharges to the private foul water network on site.
- 2.7 Surface water runoff from the car park is discharged partly to the existing soakaway, with the remaining area discharging to Southern Water's surface water sewer via a gully connection along Hurst Road, adjacent to the southern boundary of the site.
- 2.8 Foul flows generated by the existing hotel and restaurant are served by a below-ground drainage network, with an associated pumping station constructed as part of the extension in 2007, prior to discharge to Southern Water's foul sewer.

Flood Risk

- 2.9 The site is in Flood Zone 1 and is not affected by fluvial flooding. The site is also considered to be at low risk from all other sources of flooding.

3. SURFACE WATER DRAINAGE PRINCIPLES

Surface Water Disposal

- 3.1 An assessment of potential surface water discharge methods has been undertaken in accordance with the drainage hierarchy and is summarised in *Table 1*.

Table 1: Surface Water Runoff Discharge Method

System	Assessment
Collection of surface water runoff for re-use	The existing restaurant is not currently served by a rainwater harvesting system. Therefore, since the proposed development comprises a partial knock-down rebuild of a new hotel annexe to replace the restaurant, it is not considered appropriate to retrofit a system to the retained section of the existing building or incorporate a new system for the annexe. In addition, it is unlikely that rainwater harvesting would contribute to a significant reduction in surface water runoff volumes as the development would have limited requirement for recycled rainwater. Therefore, it is not considered appropriate to use rainwater harvesting for the disposal of roof water runoff.

Discharge to ground by infiltration	In <i>Section 2</i> , it was established that the site utilises infiltration drainage methods in the existing scenario, suggesting the site to be suitable for infiltration techniques. However, after reviewing Geo-Environmental Assessment ref. GEA-G3272-06-45 produced in 2007, alongside borehole records taken from the British Geological Survey, the underlying geology is shown to comprise of clay soils which typically do not allow infiltration drainage techniques. This is not to say soakage does not exist, soils may differ in the existing soakaway location or testing that is not available to us may have been carried out to confirm soakage. Given that we have no infiltration rate to design a new soakaway to, or indication of soakage viable soil classifications, it is not proposed to install a new soakaway for the proposals until BRE 365 soakage testing is carried out. Therefore, we have proposed discharge of runoff to the existing soakaway via an attenuation tank and flow control, providing restriction of runoff rates and storage as to not overwhelm the existing soakaway.
Discharge rainwater direct to a watercourse	No rivers or watercourses are present in the surrounding areas of the site, therefore, discharging directly to a watercourse would not be feasible.
Discharge rainwater to a surface water sewer / drain	As mentioned in <i>Section 2</i> , an existing portion of the car park discharges off site to the Southern Water surface water sewer along Hurst Road. On the basis that there are no changes to the car park layout it is proposed for this connection to remain, although the area it drains will reduce as a result of demolition of the restaurant and construction of the annexe in its place.
Discharge rainwater to a combined sewer	As mentioned in <i>Section 2</i> , the survey indicates that a portion of the existing restaurant roof discharges to the Southern Water foul water sewer along Hurst Road. To reduce downstream flood risk in the foul water sewer network it is proposed to remove any surface water connections to the foul water sewer as part of proposals.

- 3.2 No soakage tests were conducted during the previous ground investigation assessment, included in *Appendix B*; therefore, no infiltration rates have been provided. Cross-referencing borehole data soil descriptions with *Table 4.4* from *CIRIA 156 – Infiltration Drainage – Manual of good practice*, suggests a typical infiltration coefficient that would not provide suitable drainage for a soakaway to serve the proposed impermeable area.
- 3.3 Based on assessment in *Table 1*, the disposal of surface water to ground by infiltration via the existing soakaway, incorporating attenuation upstream to store and discharge proposed impermeable area at a restricted rate, is the preferred destination for surface water disposal recommended in the National and Local drainage standards, as well as The Building Regulations.
- 3.4 It is suggested that a BRE 365 soakage test is carried out in the location of the proposed attenuation tank to assess the viability of a new soakaway, alongside verification that the existing soakaway is operating as intended.

4. SURFACE WATER MANAGEMENT & DRAINAGE STRATEGY

- 4.1 A drainage strategy has been developed for the scheme and is shown on the drainage strategy drawing included in *Appendix C*. A description of the main principles is provided below.

- Roof water from proposed knock-down rebuild would be captured by a combination of rainwater gutters and downpipes that would discharge directly into a below ground network comprising traditional pipework.
- Partial rerouting of roof water runoff from existing hotel. Rainwater pipes along southern and eastern elevation of the building are to be diverted to the proposed below ground network comprising traditional pipework.
- Footpaths and associated hard landscaping areas surrounding the proposed extension would be drained by linear drainage channels. Where possible, with levels designed elsewhere to allow runoff to discharge to the existing car park which is already formally drained and discharges to the nearby Southern Water surface water sewer.
- As stated in Section 2, the existing site discharges surface water to various outfalls, including car park areas discharging to public sewer, existing hotel discharging to soakaway, and existing restaurant discharging to both the private foul network and onto the ground which in turn makes its way to the nearby Southern Water surface water sewer along the eastern boundary. Therefore, it is proposed to drain runoff from the proposed impermeable area to the existing soakaway, removing existing connections to the foul water network. The proposals comprise an attenuation tank, located beneath the car park to the west of the proposed annexe, upstream of the existing soakaway with a 50mm orifice outflow that would limit flows to a maximum of 4.5 l/s. The attenuation tank would store flows from an area of approx. 1053m², a sum of 817.5m² from the proposed impermeable areas and 235.9m² of existing hotel roof area to be diverted to the attenuation tank.
- A catchpit chamber is proposed upstream of the attenuation tank for the capture of silt and debris prior to surface water entering the attenuation tank.
- A manhole fitted with a 50mm orifice flow control is proposed downstream of the attenuation tank before draining to the existing private surface water network which discharges to the existing soakaway.

4.2 Table 2 below shows discharge rates and volumes for the areas of the site currently discharging to the existing soakaway, with reduced area in the post-development scenario.

Table 2: Estimated Runoff Rates & Volumes

Return Period (Year)	Pre-Development Brownfield Unattenuated to Soakaway (0.2116 Ha)		Post-Development Brownfield Unattenuated to Soakaway (0.1880Ha)	
	Peak Runoff Rate (l/s)	6hr Runoff Volume (m3)	Peak Runoff Rate (l/s)	6hr Runoff Volume (m3)
2	14.3	60.5	12.2	53.7
30	28.4	120.6	24.8	107.1
100	37.6	159.4	33.4	141.6
100+45%	54.5	231.1	48.4	205.3

4.3 As stated in Section 2, surface water runoff from the existing restaurant is drained partly via the private foul water network on site and partly discharges onto the ground which in

turn makes its way to the nearby Southern Water surface water sewer. A portion of the existing car park also discharges to his sewer. The proposed drainage strategy includes;

- Removing the surface water connections to the foul water network, reducing volumes being discharged to Southern Water's foul water sewers and therefore decreasing downstream flood risk.
- Rainwater pipes along the eastern elevation of the existing restaurant, discharging onto the ground and eventually to the Southern Water surface water sewer, being removed as part of the proposed annexe.
- A reduction in car park area discharging to the surface water sewer from approx. 702.5m² to 584m², a decrease of 118.5m².

Hydraulic Design

4.4 The Source Control facility in the 'MicroDrainage' software package by 'Innovyze' has been used to design and size the geocellular attenuation tank based on the following parameters:

- Total drained area of 1053m²
- As shown in *Figure 2* below, there is a 1 in 100 year storm return period with 45% allowance for potential future increases in rainfall intensities associated with climate change in line with the following peak rainfall climate change allowance for the Arun and Western Streams Management Catchment.

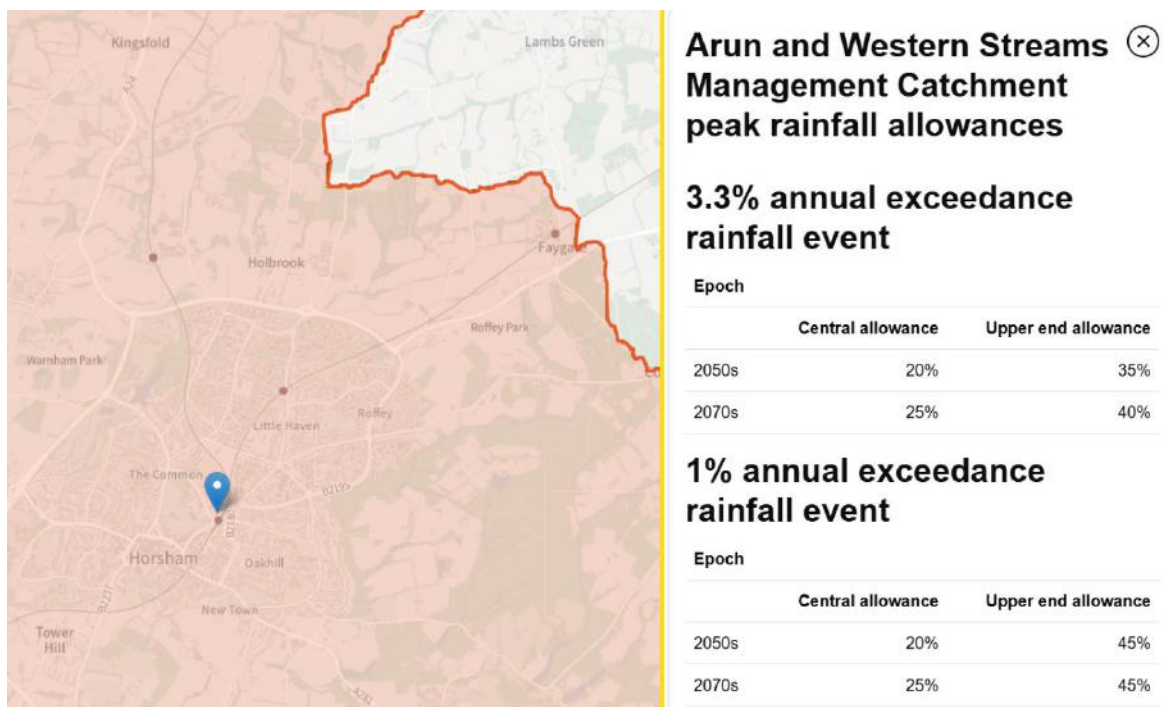


Figure 2: DEFRA peak rainfall climate change allowances

- Cv value of 0.95.
- FEH rainfall point data (2013) GB 517838 131016.

- 4.5 The design results for the geocellular attenuation tank are included in *Appendix D*. The results demonstrate that the proposed attenuation tank would have sufficient capacity to store runoff for all rainfall events up to and including the required 1 in 100 year event with 45% allowance for climate change, before discharging at a restricted rate to the existing soakaway.
- 4.6 *Table 3* below provides the peak runoff rates and the 6-hour runoff volumes for the proposed impermeable area, comprising of the proposed annexe's roof area, associated hard landscaping areas, and approx. 235m² of the existing hotel's roof area, that will be discharged to the existing soakaway.

Table 3: Attenuated Runoff Rates & Volumes

Return Period (Year)	Drained Area (Ha)	Peak Runoff Rate (l/s)	6hr Runoff Volume (m3)
2	0.105	2.1	11.9
30	0.105	3.2	23.6
100	0.105	3.7	30.6
100+45%	0.105	4.5	47.5

- 4.7 *Table 4* below provides a comparison between the pre-development unattenuated brownfield rates discharging to the existing soakaway from *Table 2*, and the post-development attenuated rates discharging to the existing soakaway as calculated in the MicroDrainage results, included in *Appendix D*.

Table 4: Comparison of Discharge Rates

Return Period (Year)	Pre-Development		Post-Development						% rate difference
			Unattenuated		Proposed Network (Attenuated)		Totals		
	Rate (l/s)	Volume (m3)	Rate (l/s)	Volume (m3)	Rate (l/s)	Volume (m3)	Rate (l/s)	Volume (m3)	
2	14.3	60.5	12.2	53.7	2.1	11.9	14.3	65.6	-
30	28.4	120.6	24.8	107.1	3.2	23.6	28.0	130.7	-1.4%
100	37.6	159.4	33.4	141.6	3.7	30.6	37.1	172.2	-1.3%
100+45%	54.5	231.1	48.4	205.3	4.5	47.5	52.9	252.8	-2.9%

- 4.8 The above table confirms that there would be a reduction in flow rate to the existing soakaway for all return periods up to and including the 1 in 100 year plus 45% CC event.

Exceedance

- 4.9 If the capacity of the surface water drainage network was exceeded, site levels would allow surface water to be channelled off-site in a westerly direction, towards northwest corner of the site where flooded volumes could be temporarily stored within kerbs prior to exceedance flows receding. Runoff that could collect in the southwest of the site would be directed to Hurst Road. Exceedance flood flow route arrows have been shown to demonstrate this on the drainage strategy drawing included in *Appendix C*.

5. FOUL WATER DRAINAGE STRATEGY

- 5.1 This section of the report outlines an approach for the disposal and management of foul water runoff from the development.
- 5.2 Southern Water have been consulted regarding the existing foul sewer systems ability to accommodate foul water flows from the development. We are currently awaiting response from Southern Water. To be appended upon receipt.
- 5.3 A foul water drainage strategy has been developed for the scheme and is shown on the drainage strategy drawing included in *Appendix C*. In summary, the annexe would utilise the retained existing private foul water network comprising of a traditional gravity network of below ground pipework, ultimately connecting to the Southern Water foul sewer along Hurst Road via gravity connection.

6. CONCLUSIONS

- 6.1 The existing site is currently drained via a combination of private foul and surface water networks, ultimately discharging to Southern Water infrastructure and the existing soakaway. The site is located within Flood Zone 1 and is therefore considered to be at low risk of fluvial flooding and low risk from other sources of flooding.
- 6.2 A review of site constraints and ground investigation information has confirmed that new infiltration systems are not currently deemed suitable for managing surface water from the proposed development due insufficient information being available on potential infiltration rates and details of underlying geology. Consequently, discharge to the existing soakaway with appropriate flow control has been identified as the most appropriate destination for surface water runoff, in accordance with National and Local drainage standards.
- 6.3 A surface water drainage strategy has been produced for the proposed development, incorporating a geocellular attenuation tank located beneath the car park. The system will provide temporary storage for surface water runoff and regulate flows to the existing soakaway at a restricted rate, thereby ensuring the existing soakaway isn't overwhelmed in the post-development situation.
- 6.4 Hydraulic modelling undertaken using MicroDrainage demonstrates that the proposed attenuation system provides sufficient capacity to accommodate surface water runoff for all design storm events up to and including the 1 in 100 year event with an allowance for climate change. The system is designed to limit discharge rates to a maximum of 4.5 l/s, to ensure proposed runoff rates to the existing soakaway are not exceeded in the post-development situation.
- 6.5 The proposed drainage strategy will result in a beneficial impact on downstream drainage infrastructure. Comparison of pre- and post-development runoff rates confirms that peak discharge rates will be reduced in the post-development situation for all storm events up to and including the 1 in 100 year plus 45% CC event, ensuring flood risk is not increased as a result of the development.
- 6.6 Foul water drainage for the proposed development will connect to the retained private foul water network, which discharges via gravity connection to the Southern Water foul sewer. Confirmation has been requested from the sewer authority that the local sewer

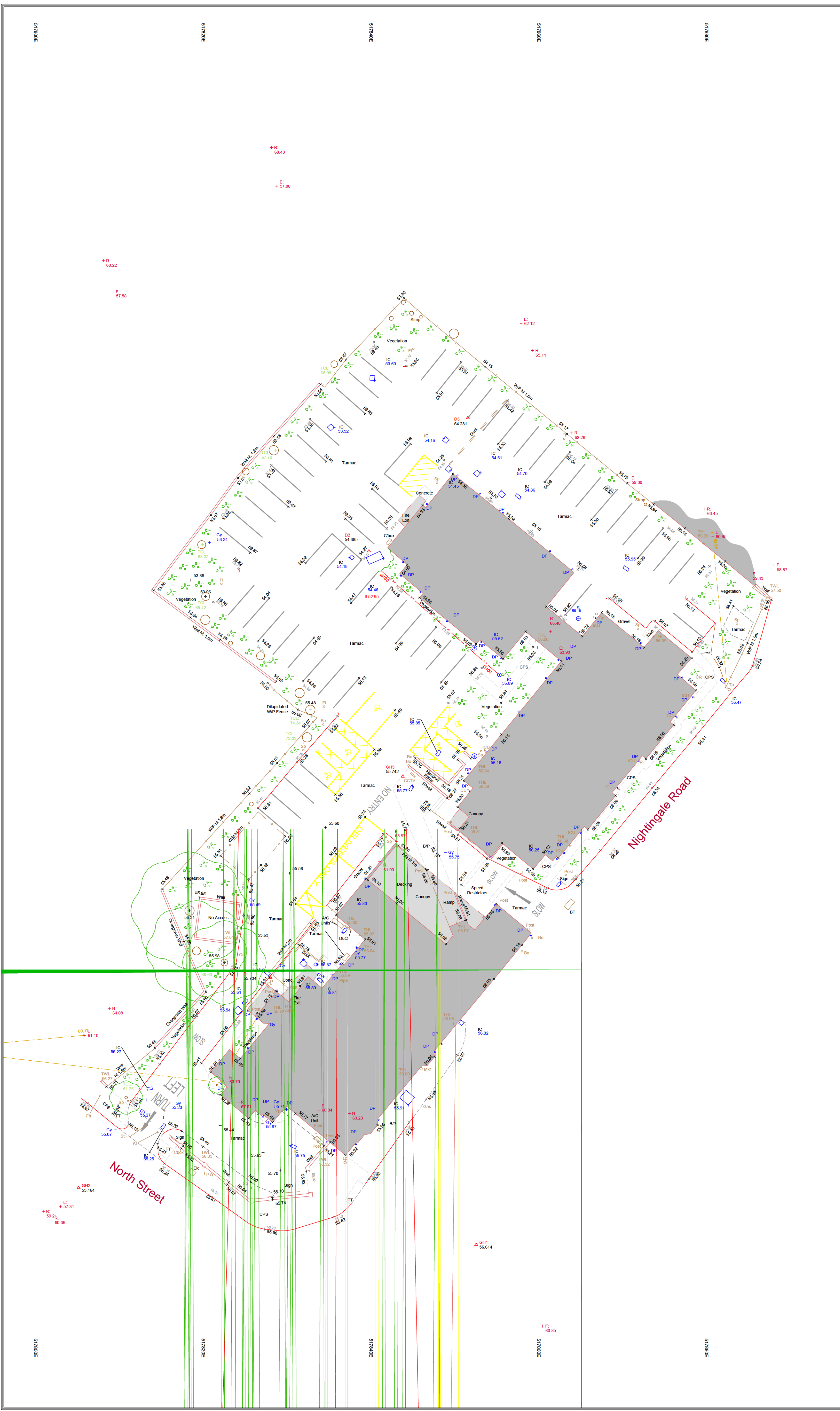
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network has sufficient capacity to accommodate the change of flows generated by the development.

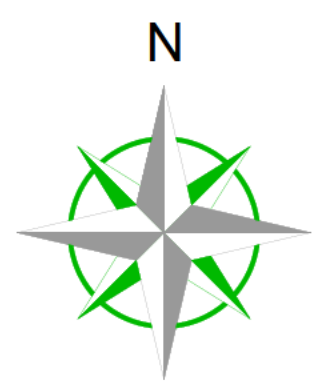
- 6.7 It is therefore concluded that the proposed surface water and foul drainage strategy complies with relevant national and local guidance and will not increase flood risk on-site or to neighbouring properties. The development is considered acceptable in drainage strategy and flood risk.

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APPENDIX A
TOPOGRAPHICAL SURVEY



131140N
517800E
131120N



Station Information:

Station	Easting (m)	Northing (m)	Level (m)
D1	517828.403	131026.006	55.734
D2	517840.145	131076.848	54.385
D3	517851.929	131092.726	54.231
GH1	517852.928	130994.175	56.614
GH2	517805.518	131000.947	55.164
GH3	517844.179	131049.990	55.742

OS Note:

This survey has been oriented to the Ordnance Survey (OS) National Grid OSGB36(15) via Global Navigation Satellite Systems (GNSS) and the O.S. Active Network (OS Net).
A true OSGB36 coordinate has been established near to the site centre via a transformation using the OSTN15GB & OSGB15GB transformation models.
The survey has been correlated to this point and a further one or more OSGB36 (15) points established to create a true O.S. bearing for angle orientation.
No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.
Please refer to Survey Station Table to enable establishment of the on-site grid and datum.
Some services may have been omitted due to parked vehicles.

Legend:

Buildings	Overhead Cable	IC	Cover (generic)	DDust	Drainage duct
Wall	Concrete edge	IC	Inspector chamber	Bo	Subsoil
Walls line	Tarmac edge	Gy	Pipe invert	Bo	Illuminated bollard
Line marking	Green verge	Gy	Gully	Bo	Rubbish bin
Drop kerb	Canopy/Overhang	Bo	Back slope	Bo	Vent pipe
Centre line	Verge	Bo	Down pipe	Bo	Ground light
Top of bank	Bottom of bank	Bo	Pipe above ground	Bo	Letter box
Station and name	Station level	Bo	Water level	Bo	Tree stump
100.000	Station level	Bo	Flood light	Bo	Internal floor level
Area of Undergrowth	Area of Undergrowth	Bo	Lamp post	Bo	Threshold level
Woodland	Woodland	Bo	Telegraph post	Bo	Sign post
Ridge Level	Ridge Level	Bo	Electricity post	Bo	Threshole
Eaves Level	Eaves Level	Bo	Stop sign	Bo	Bombhole
Flat Roof Level	Flat Roof Level	Bo	Earth rod	Bo	Electric
Fence types	Fence types	Bo	Water meter	Bo	Brick paved
Iron Railings	Iron Railings	Bo	Close valve	Bo	Concrete paving slabs
Wire Mesh	Wire Mesh	Bo	Air valve	Bo	Cover
Post & Rail	Post & Rail	Bo	Unidentified inspection	Bo	Retaining wall
Chain Link	Chain Link	Bo	Wash out	Bo	Top of Wall Level
Wooden Panels	Wooden Panels	Bo	Roofing gyp	Bo	Tarmac canopy level
Close Boarded	Close Boarded	Bo	Belisha beacon	Bo	Girth
Steel Palisade	Steel Palisade	Bo	Cable tv	Bo	Multi girth
		Bo	Marker post	Bo	Inspection chamber
		Bo	Gas marker post	Bo	Cover level
		Bo	Soft	Bo	Insert level
		Bo	Fire hydrant	Bo	Unable to relate

Rev

Date

Description

Drawn

Q. Ref.

☐ Topographical Surveys

☐ Site Engineering

☐ Utility / CCTV Surveys

☐ Measured Building Surveys

☐ 3D Laser Scanning

☐ Revit & BIM Models

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**Simpson Associates
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PROJECT

**Horsham Premier Inn,
North Street,
RH12 1RB**

TITLE

**Topographical
Survey**

SCALE

A1@ 1: 200

DATE SURVEYED

25.09.24

DRAWN

DH

QUALITY REF

GH22334

Level datum

See note

Grid orientation

See note

Job number

52035

Drawing No.

52035_T

Rev.

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Comments

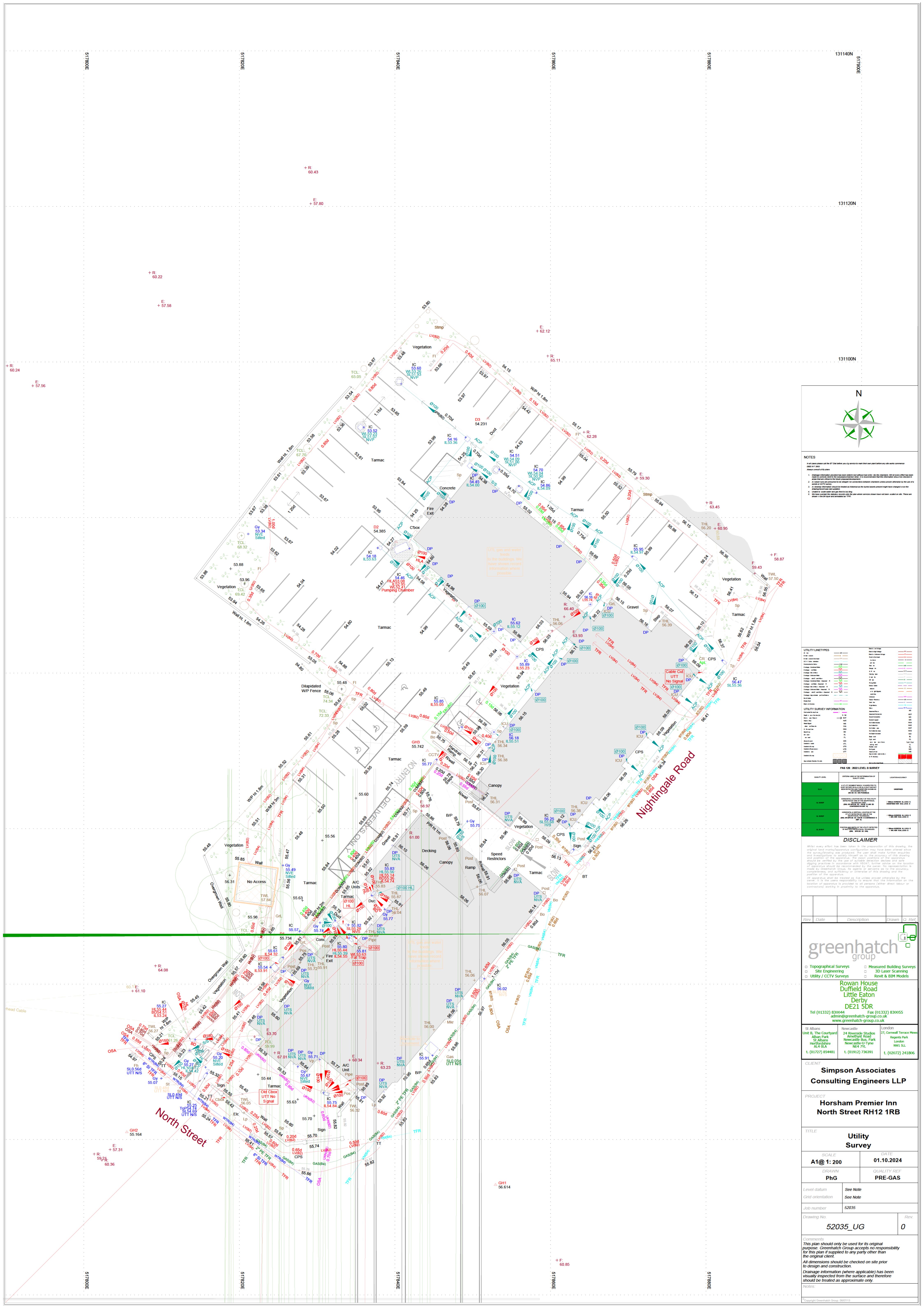
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Notes:

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UTILITY LINE TYPES	Symbol	Notes
Water	Blue line	Water
Gas	Red line	Gas
Electricity	Yellow line	Electricity
Telecommunications	Green line	Telecommunications
Drainage	Orange line	Drainage
Other	Purple line	Other

UTILITY SURVEY INFORMATION

Utility	Survey	Notes
Water	AS12	Water
Gas	AS12	Gas
Electricity	AS12	Electricity
Telecommunications	AS12	Telecommunications
Drainage	AS12	Drainage
Other	AS12	Other

DATE	DESCRIPTION	DRAWN	Q. REF.
01.10.2024	Utility Survey	PhG	PRE-GAS

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Rev	Date	Description	Drawn	Q. Ref.
1	01.10.2024	Utility Survey	PhG	PRE-GAS

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Topographical Surveys, Site Engineering, Utility / CCTV Surveys, Measured Building Surveys, 3D Laser Scanning, BIM & GIS Models

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Consulting Engineers LLP

PROJECT

Horsham Premier Inn
North Street RH12 1RB

TITLE

Utility Survey

SCALE	DATE
A1@ 1:200	01.10.2024

DRAWN	QUALITY REF
PhG	PRE-GAS

Level datum	See Note
Grid orientation	See Note
Job number	52035
Drawing No	52035_UG
Rev	0

Comments:

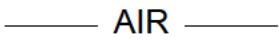
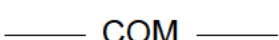
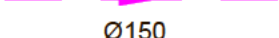
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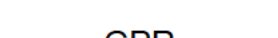
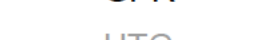
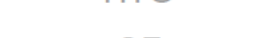
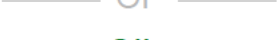
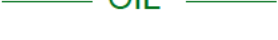
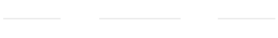
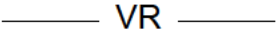
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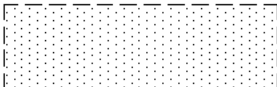
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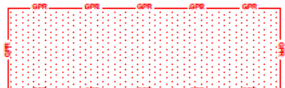
UTILITY LINETYPES

Air Line	
British Telecom	
British Telecom Overhead	
CCTV / Cable Television	
Communication Cable	
Drainage - Combined Water	
Drainage - Foul Water	
Drainage - Storm Water	
Drainage - Unknown Water	
Drainage - Trade Effluent Water	
Drainage - Combined Water - Assumed/TFR	
Drainage - Foul Water - Assumed/TFR	
Drainage - Storm Water - Assumed/TFR	
Drainage - Unknown Water - Assumed/TFR	
Drainage - Trade Effluent Water - Assumed/TFR	
Drainage - Approximate Pipe Size/Extents	
Earth Cable	
Empty Duct	
Electric & Comms	

Electric Low Voltage	
Electric High Voltage	
Electric - Unknown Voltage	
Electric Overhead	
Fibre Optic	
Fuel Line	
Gas Line	
Gauge Line	
GPR Line	
Heating Pipes	
Offset Fills	
Oil Pipe	
Rising Main	
Sensor Cable	
Telecom	
Traffic Light Signals	
Trench Scar	
Unknown	
Vapour Recovery	
Vent Line	
Virgin Media	
Water	

UTILITY SURVEY INFORMATION

Contracted Survey Area	
Depth to Top of Service (m)	0.40d
End of Trace / Record	 EOT
Head of Run	HoR
Weak Signal	WS
Taken From Records	TFR
Off Survey Area	OSA
Back Drop	BD
Silt Level	SL
Flow Level	FL
Above Ground	A/G
Unable to Locate	UTL
Unable to Survey	UTS
Unable to Raise (cover)	UTR
Unable to Trace	UTT
Unable to Survey	
Approximate Chamber Extents	

Assumed Route	AR
Assumed Connection	ACP
Sound Connection	S/C
Sonde Stopped	S/S
No Visible Access	NVA
No Visible Exit	NVE
No Visible Pipes	NVP
No Visible Services	NVS
No Depth Indicated	NDI
Base Level	BL
High Level	HL
Top of Pipe / Top of Valve	ToP / ToV
Landing Level	LL
Rubble Level	RL
No Signal	N/S
Heavily Silted	H/S
Approximate Location (ApL)	
GPR Anomaly	
Multiple Services Route	

APPENDIX B
GROUND INVESTIGATION EXTRACT

WHITBREAD GROUP PLC
PROPOSED PREMIER TRAVEL INN EXTENSION
NORTH STREET, HORSHAM
GEO-ENVIRONMENTAL ASSESSMENT

Report Reference	Date of Issue	Author	Checked	Approved
GEA-G3272-06-45	15 Jan 2007	GD	DCE	SAH



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GEO-ENVIRONMENTAL ASSESSMENT



SECTION 1 INTRODUCTION

- 1.1 Whitbread Group PLC (Whitbread) proposes to develop an area of land adjacent to Horsham Station, at North Street, Horsham, in West Sussex. It is understood that the development will comprise a new three-storey extension to an existing Premier Travel Inn Hotel.
- 1.2 Merebrook Geo-Services Limited (Merebrook) has been commissioned by Simpson Associates, on behalf of Whitbread, to undertake site investigation works for the proposed development. The scope of work undertaken was in accordance with the brief provided by Simpson Associates in a letter (Reference BB/kgb/8684) dated 19 October 2006 and was undertaken on 21 November 2006.
- 1.3 This report has been prepared for Simpson Associates and Whitbread for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult Simpson Associates, Whitbread and Merebrook to the extent to which the findings are appropriate for their use.

SECTION 2 THE SITE

2.1 GENERAL

SITE	
NGR	TQ 178 310
Location	The site is located within the centre of Horsham, adjacent to the railway station. The location of the site is indicated on Drawing No. G3272/001/001/A0, presented in Appendix 1.
Description	The site is currently occupied by an existing three storey Premier Travel Inn and associated customer car parking.
GEOLOGY	
References: BGS Sheet 302, 1:50,000 scale (Solid & Drift)	Geological references indicate the presence of the Tunbridge Wells Sand, underlain by the Wadhurst Clay. Within the Horsham area, the Tunbridge Wells Sand is described as comprising sandstone with beds of silty clay and can vary in thickness between 60 and 100 m. The Wadhurst Clay consists of dark grey mudstones and silty mudstones which weather to greenish grey/yellow brown clay.
HYDROGEOLOGY	
References: Environment Agency Groundwater Vulnerability Map 45, West Sussex and Surrey.	The site is classified as a Minor Aquifer, a designation relating to the presence of the Tunbridge Wells Sand. Due to the urban location of the site, the soils are stated as being of unclassified leaching potential and should thus be assumed to have high leaching potential with the ability to readily transmit liquid discharges.
HYDROLOGY	
Nearest surface water course	The nearest surface watercourse is a stream located approximately 1.8 km to the west of the site, a tributary of the River Arun.



SECTION 3 SITE INVESTIGATION

MEREBROOK INVESTIGATION	
DATE	21 November 2006
EXPLORATORY HOLES	Four windowless sample holes (MWS1 – MWS4) to a maximum depth of 3.45 metres below ground level (m bgl). Three hand dug trial pits (MTP1 – MTP3) to a maximum depth of 0.25 m bgl. Exploratory hole locations are indicated on Drawing No. G3272/304/001/A0, presented in Appendix 1, whilst exploratory hole locations are contained in Appendix 2.
INSTALLATIONS	A monitoring standpipe was installed to 3.0 m bgl in MWS1.
METHODOLOGY	Investigations were undertaken using hand tools for the trial pits, whilst a tracked windowless sampling rig was used for the windowless sample holes. The hand dug trial pits were dug in order to inspect the foundations of the existing building. Logging and sampling of the exploratory holes was undertaken by a Merebrook Geotechnical Engineer. Standard Penetration Tests (SPTs) were performed in the windowless sample holes at 1 m intervals. The tests involved driving a steel split spoon sampling tube and a series of rods into the ground over a distance of 450 mm using the repeated blows of a 63.5 kg weight allowed to free fall over a distance of 760 mm. The total number of blows required for the final 300 mm penetration (the 'N' value) is recorded on the windowless sample logs.
ANALYSIS	Representative soil samples were taken from various depths and strata. Soil samples were subjected to chemical and geotechnical analysis in accordance with the clients brief. Results certificates are included within Appendices 3 and 4.
MONITORING	Groundwater and hazardous gas monitoring was undertaken on 23 November 2006. The results are included in Appendix 5.

SECTION 4 GROUND CONDITIONS

4.1 SURFACE GROUND CONDITIONS

- 4.1.1 At the time of the investigation the land surface comprised a flat bituminous-surfaced car park with a heavily vegetated area immediately to the south. Additional areas of trees/bushes were present along the northwest and southeast borders of the site.

4.2 SUBSURFACE GROUND CONDITIONS

- 4.2.1 The ground investigation has confirmed the anticipated near surface geology of the Tunbridge Wells Sand. The ground conditions differed by way of deposits of made ground overlying the natural soils. A summary of the ground conditions encountered is presented in the table below, whilst a more detailed assessment of the strata is contained in the following sections of the report.

GEO-ENVIRONMENTAL ASSESSMENT



Stratum	Depth to Top – range (m bgl)	Thickness – range (m)
Made Ground	0.0	> 0.20 – 1.00
Tunbridge Wells Sand	0.75 – 1.00	> 2.55

4.2.2 Made Ground

- 4.2.2.1 Made ground was revealed in all of the exploratory holes to depths of between 0.75 and 1.0 m bgl. The made ground was typically found to comprise a layer of flint and concrete gravel beneath bituminous road surfacing, which was in turn underlain by soft or firm brown silty clay with variable amounts of brick and glass gravel. Rootlets and or organic fragments were noted in MWS2, 3 and 4. Made ground encountered in MWS1 initially consisted of soft brown sandy clay with brick, flint and concrete gravel. Trial pits MTP1 and 2 revealed made ground comprising brown sandy topsoil, underlain by mass concrete at 0.25 m bgl, whilst in MTP3 lean mix concrete was encountered above mass concrete to 0.2 m bgl.

4.2.3 Tunbridge Wells Sand

- 4.2.3.1 This stratum was encountered below made ground at depths ranging from 0.75 to 1.0 m bgl, and typically comprised orange brown mottled grey clayey sand. A maximum proven thickness of 2.55 m was recorded in MWS1 and 4. Occasional pockets of black organic fragments were noted locally, whilst variable amounts of siltstone gravel were also noted at depth. Stiff orange brown mottled grey very sandy clay was encountered initially in MWS1 to a depth of 2.5 m bgl, whilst in MWS4 clay was revealed between 2.0 and 2.3 m bgl, overlying clayey sandy silt. A weak grey sandy siltstone was encountered below sand at 2.8 m bgl in MWS2.
- 4.2.3.2 Atterberg limit tests carried out on seven samples of clay indicate that the soil can typically be classified as clay of low plasticity. The plasticity index of the soil typically ranged from 7 to 13 %, with an average value of 11 %. A plasticity index value of 20 %, suggesting clay of intermediate plasticity, was obtained on a sample from 3.0 m bgl in MWS2. These results indicate that the clay is of low volume change potential in accordance with NHBC guidelines. Moisture contents were also determined and ranged between 15 and 18 %, with an average value of 17 %.
- 4.2.3.3 SPTs carried out within cohesive materials revealed 'N' values ranging from 15 to 19, indicating firm or stiff ground. In MWS4 an 'N' value of 50 was recorded at 3.0 m bgl within clayey sandy silt, whilst at 3.0 m bgl in MWS2 an SPT recorded 50 blows for 240 mm penetration in siltstone.
- 4.2.3.4 SPTs carried out at depths of 1.0 and 2.0 m bgl within granular materials revealed 'N' values ranging from 9 to 21. These results indicate predominantly medium dense conditions. Very dense ground was encountered in MWS1 and 2 at depths



of 3.0 and 1.0 m bgl, respectively. In MWS1 an SPT recorded 49 blows for 180 mm penetration, whilst in MWS2 an 'N' value of 53 was obtained. In MWS3 an 'N' value of 40 was recorded at 3.0 m bgl, suggesting dense ground.

4.2.4 Groundwater

4.2.4.1 Groundwater was not encountered in any of the exploratory holes.

4.2.4.2 Groundwater was encountered during the monitoring visit in MWS1 at a depth of 1.0 m bgl.

SECTION 5 ENVIRONMENTAL ASSESSMENT

5.1 SOIL QUALITY

5.1.1 In accordance with the specification of the client, a total of four samples were submitted to a laboratory for chemical analysis. The samples comprised made ground from the upper metre of the strata. Laboratory certificates for the chemical analysis are included within appendix 3.

5.1.2 For the purposes of initial comparison a set of screening level thresholds have been adopted for the standard land use scenario of commercial/industrial end use. Chemical test results are presented in the table below.

Summary of Soils Chemical Analysis Results

Determinand	Units	Max.	No. of Tests	Screen Level (SL)	No.Ex. SL ¹
pH	pH units	6.9 (min)	4	5 (min)²	0
Arsenic	mg.kg ⁻¹	14	4	500	0
Water Soluble Boron	mg.kg ⁻¹	1.5	4	3³	0
Cadmium	mg.kg ⁻¹	<0.5	4	1400	0
Chromium	mg.kg ⁻¹	24	4	5000	0
Copper	mg.kg ⁻¹	43	4	200³	0
Lead	mg.kg ⁻¹	230	4	750	0
Mercury	mg.kg ⁻¹	0.9	4	480	0
Nickel	mg.kg ⁻¹	14	4	5000	0
Selenium	mg.kg ⁻¹	<2.5	4	8000	0
Zinc	mg.kg ⁻¹	220	4	450³	0
Total Cyanide	mg.kg ⁻¹	<1	4	160³	0
Naphthalene	mg.kg ⁻¹	<0.5	4	1440	0
PAH (Total 16)	mg.kg ⁻¹	13.15	4	40¹	0
Phenol	mg.kg ⁻¹	<0.1	4	78100	0

Notes: (SL) Screening level for commercial/industrial end use.

¹ Number of samples exceeding screening level.

² Minimum value for pH.

Bold Values relate to published CLEA SGVs.



³ - Phytotoxic screening levels (with the exception of Boron) obtained from guidelines contained in the Ministry of Agriculture Fisheries and Food (MAFF) 'Code of Good Agricultural Practice for the Protection of Soil'.

⁴ CLEA derived Screening Level.

5.2 RISK ASSESSMENT

5.2.1 The results indicate that of the contaminants analysed for, none were recorded in excess of screening levels for commercial land use. In view of this, the site is not deemed to pose a risk as a result of soil contamination.

5.2.2 Whilst EN 14473/02 Waste Acceptance Criteria tests have not been carried out as part of this investigation, chemical analysis results obtained to date indicate that the soils can be classified as inert for the purposes of determining the type of landfill material to be removed from site.

5.2.3 As with any sampling exercise, it is possible that groundworks will discover conditions or soils different to those found to date. Construction managers and supervisors should be aware that remediation measures may be required if such conditions are found.

5.2.4 Any observations of ground conditions atypical of those already described should be reported to Merebrook immediately so that an assessment of appropriate action can be made.

5.3 GROUNDWATER

5.3.1 Groundwater was encountered during the monitoring visit in MWS1 at a depth of 1.0 m bgl.

5.4 HAZARDOUS GAS

5.4.1 Gas monitoring was undertaken on one occasion on 23 November 2006. Levels of methane, carbon dioxide and oxygen were recorded in the standpipe, together with associated parameters including borehole flow and ambient air pressure. The results of the gas monitoring are contained in Appendix 5.

5.4.2 Positive borehole flow was recorded in MWS1 with a value of 0.02 l/h. Methane was recorded below the detection limit with a value of 0.1 % v/v, whilst carbon dioxide was also recorded below the detection limit at 0.1 % v/v. Despite the presence of carbon dioxide there is no obvious in-ground source from which this could be occurring.

5.4.3 Gas levels recorded (methane at 0.1 % v/v and carbon dioxide at 0.1 % v/v) are not considered to pose a significant risk of ingress to unprotected structures.

5.4.4 The Characteristic Situation (CS) has been calculated in accordance with guidance given in Wilson and Card 1999, based on the limiting gas volume flow. Based on the recorded flow and concentration of soil gas a CS1 is applicable for which no special precautions are required.



SECTION 6 GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS

6.1 FOUNDATIONS

- 6.1.1 It is understood that the proposed development will comprise a new three-storey extension to an existing Premier Travel Inn Hotel.
- 6.1.2 As discussed in Section 4.2 the ground investigation carried out at the site has revealed relatively thin deposits of made ground typically underlain by medium dense clayey sands and firm or stiff sandy clays of the Tunbridge Wells Sand Formation to depths of at least 3.45 m bgl.
- 6.1.3 Based on the low rise nature of the proposed development, and the presence of competent soils at shallow depth across the site, traditional shallow strip footings are considered to be suitable. All footings should be excavated beneath made ground and soft/loose natural soil to found within underlying competent strata. In view of the predominantly granular natural soils a minimum footing depth of 0.75 m is required. Based on the findings of the investigation, it is likely that footings will need to be locally deepened in order to found within competent natural material. Foundation depths of approximately 1.0 m are anticipated.
- 6.1.4 Where cohesive soils are present beneath the proposed footprint of the building, the presence of existing or proposed trees will need to be taken into consideration with respect to excavating footings. Plasticity test data indicates that the cohesive soils are typically of low volume change potential, therefore, a minimum foundation depth of 0.75 m will be required in accordance with NHBC guidelines. This depth will need to be increased depending on the proximity of foundations to existing or proposed trees. A young maple tree was noted to be present in the southern corner of the site, and is situated close to MWS1 where cohesive soil was encountered. In accordance with NHBC guidelines footing depths of up to 1.5 m may be required in the vicinity of this tree.
- 6.1.5 Allowable bearing pressures of 100 kN/m² are considered to be acceptable for shallow footings. This will enable 600 mm wide foundations to be constructed, whilst total settlements and differential settlements are considered to remain within acceptable limits. If higher allowable bearing pressures are required then deepening all footings should enable greater allowable bearing pressures to be achieved. Ideally footings should not cross between granular and cohesive soils. Based on the ground investigation carried out, it is possible that this will occur beneath the footprint of the proposed structure. It is therefore recommended that mesh reinforcement is incorporated into the strip footings.
- 6.1.6 Three trial pits were hand dug in order to inspect the foundations of the existing hotel building. The excavations revealed mass concrete at depths of 0.2 and 0.25 m bgl, which prevented the pits being dug deeper to determine the nature and depth of foundations. In the likelihood that new footings are deeper than the foundations of the existing building, and in order to avoid potential differential



settlement problems between the existing building and the proposed extension, the two structures should ideally be kept physically separate.

6.2 EXCAVATIONS AND GROUNDWATER

6.2.1 Based on the ground conditions observed at the site, shallow excavations are considered likely to remain stable in the short term. Despite the relative stability, all excavations must be supported by shoring or otherwise battered back to a safe angle in order to protect the workforce from possible collapse.

6.2.2 Groundwater was not encountered in any of the exploratory holes, however, during the monitoring visit water was recorded at 1.0 m bgl in MWS1. It is unlikely that groundwater ingress will occur in shallow excavations, however, as a precaution, provision for dewatering during the construction period should be considered.

6.3 FLOOR SLABS

6.3.1 In view of the presence of made ground and locally cohesive natural soils at shallow depth, it is recommended that a suspended floor slab is adopted for the proposed structure.

6.4 BURIED CONCRETE

6.4.1 Recommendations given in BRE Special Digest 1:2005 "*Concrete in aggressive ground*" have been followed in order to give recommendations with respect to buried concrete.

6.4.2 Water soluble sulphate analysis was carried out on seven soil samples obtained from depths of between 0.2 and 3.0 m bgl with soil pH determination also carried out on these samples. Water soluble sulphate contents ranged between 0.02 and 0.25 g/l. In accordance with BRE guidelines the characteristic value is determined by calculating the mean of the highest two results. In this case the characteristic value is 0.21 g/l. On this basis the Design Sulphate Class is DS-1.

6.4.3 The pH values in the soil samples varied between 5.6 and 8.1. The mean of the lowest two values is 6.25 which represents the characteristic value. Mobile groundwater conditions have been assumed and on this basis the Aggressive Chemical Environment for Concrete (ACEC) class for the site is AC-2z.

6.4.4 In accordance with BRE guidelines further chemical testing has been carried out on samples of natural clay in order to determine total sulphate content and total sulphur content. These tests will determine whether pyrite is present in the materials. When disturbed and exposed to air and mobile groundwater, oxidation can occur leading to the formation of sulphates.

6.4.5 The results indicate that significant levels of pyrite do not exist and that no adjustment to the Design Sulphate Class and ACEC class is required for the site.

6.5 ROADS AND PAVED AREAS

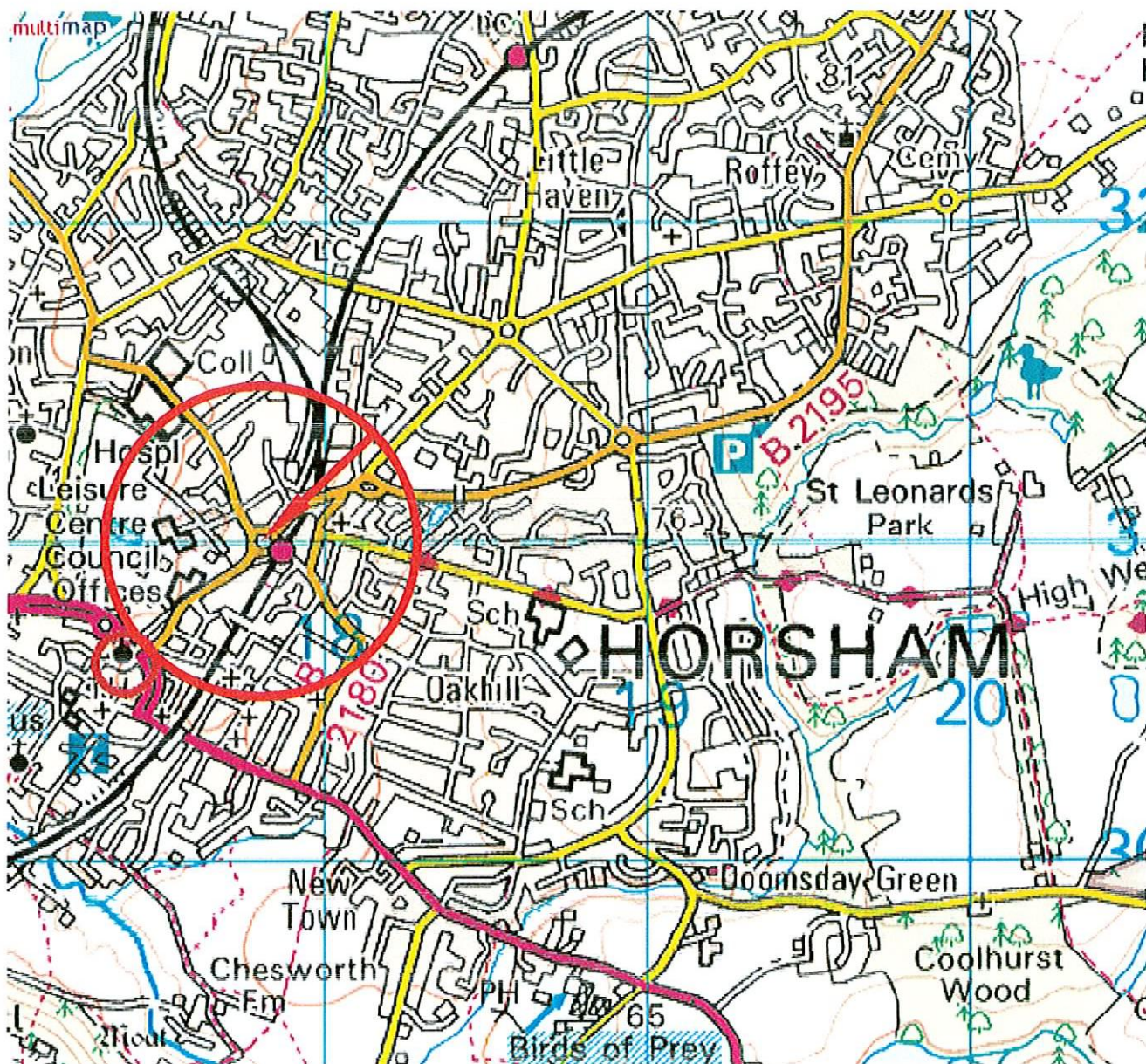
GEO-ENVIRONMENTAL ASSESSMENT



- 6.5.1 During the investigation it was not possible to undertake *in situ* Mexecon probe tests in shallow hand dug pits due to the presence of mass concrete. It is understood that new car parking areas are not proposed for the new development, however, in the event that new hardstanding or paved areas are required, it is recommended that CBR values of 2 % are assumed.



- APPENDIX 1**
- Drawings
 - G3272/001/001/A0
 - G3272/304/001/A0



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Merebrook Projects Limited AL 100015912



Whitbread Group Plc
Proposed Premier Travel Inn Extension
Horsham
Site Location

Revision Details		By	Date	Suffix
Based upon scanned image		BM	07/12/06	A0
		TJG3272-001-001-A0.dwg		
Job No.	G3272	Dwg No.	001-001	Revision
Scale	NTS	Date	December 2006	Frame Dimensions mm (A4) 250x181
Drawn	BM	Checked	SF	Approved
				SH



Existing Travel Inn Structure
(3 Storey)

MTP3

MTP2

MTP1

Manhole
Cover

MWS2

MWS3

MWS4

MWS1

Heavily Vegetated
Area

BL

Footprint of proposed
extension

Approximate location of
5 m tall sycamore
(broad leaf - moderate
water demand)

BL

Approximate location of
3 x 3/4 m tall cypress
(high water demand coniferous)

Approximate location of
3/4 m tall young (semi-mature) maple
(broad leaf - moderate water demand)

Legend



Approximate location of Merebrook trial pits
with reference



Approximate location of Merebrook
windowless samples with reference

Revision Details

base drawing

By	Date	Suffix
IA	23/11/06	A0
TJ G3272-304-001-A0.dwg		

Client/Project

Whitbread Group PLC
Proposed Premier Travel Inn
Extension Horsham

Dwg Title

Approximate
Site Investigation
Locations

Job No.	Dwg No.	Revision
G3272	304/001	A0
Scale	Date	Frame Dimensions mm
N.T.S.	November 2006	(A3) 400 x 280
Drawn	Checked	Approved
IA	JFT	CBD

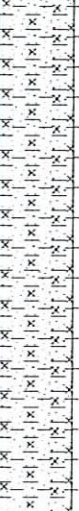
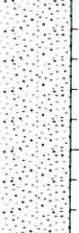
Merebrook Geo-Services Limited
Suite 2B East Mill
Bridgefoot
Belper
Derbys. DE56 2UA
Telephone: 01773 829988
Facsimile: 01773 829393

merebrook





APPENDIX 2 ■ Exploratory Hole Logs

Window Sample Log		Window Sample No.		MWS1				
Equipment and Methods Tracked Geo-Rig		Project No. G3272 Project Name: Proposed Premier Travel Inn Extension Location: Horsham, West Sussex						
Client details Whitbread Group PLC		Ground Level -		Coordinates - Dates 21/11/2006				
Description	Reduced Level (m)	Legend	Depth (thickness)	Samples/Tests			Field Records / Results	
				Depth	Sample			Test
					Type	No		
Soft brown very sandy gravelly CLAY. Gravel is brick, flint and rare concrete. MADE GROUND.			(0.30)	0.20	D	D1		
Loose grey flint and concrete GRAVEL. MADE GROUND.			0.30					
			(0.35)					
Soft brown very silty CLAY with rare brick and glass gravel. MADE GROUND.			0.65					
Stiff light brown/orange and grey mottled very sandy silty CLAY/very clayey silt. Sand is fine. Occasional grey/white siltstone gravel and rare pockets of organic gravel.			0.75	1.00	D	D2	S N=19	
			(1.75)					
				2.00	D	D3	S N=19	
			2.50					
Dense light brown/grey silty clayey fine SAND with pockets of cemented siltstone. Becoming very dense with depth.			(0.80)	3.00	D	D4		SPT - 9, 12, 14, 21, 14/30 mm = 49/180 mm
WINDOW SAMPLE ENDS AT 3.30 m			3.30					
Remarks 1. Groundwater was not encountered. 2. A 50mm standpipe was installed, comprising slotted pipe and gravel from 3.0 to 1.0m bgl, plain pipe and bentonite from 1.0 to 0.0m bgl and gas tap and flush cover finished with concrete.						D - Small disturbed sample B - Bulk disturbed sample J - Amber glass jar W - Water sample V - Hand vane MP - Mackintosh probe		Logged by CBD Scale 1:25 Sheet 1 of 1

Window Sample Log		Window Sample No.		MWS2			
Equipment and Methods Tracked Geo-Rig		Project No. G3272 Project Name: Proposed Premier Travel Inn Extension Location: Horsham, West Sussex					
Client details Whitbread Group PLC		Ground Level -		Coordinates - Dates 21/11/2006			
Description	Reduced Level (m)	Legend	Depth (thickness)	Samples/Tests			Field Records / Results
				Depth	Sample Type	Sample No	
Dark grey/black bituminous road surfacing. MADE GROUND.			0.15				
Loose light grey very sandy GRAVEL. Gravel is flint, concrete and rare brick. MADE GROUND.			(0.45)	0.30	D	D1	
Firm brown silty CLAY with black organic gravel and rare brick gravel. MADE GROUND.			0.60				
			(0.30)	0.70	D	D2	
Very dense orange brown mottled blue grey clayey very silty fine SAND. Occasional lenses of gravelly sandy clay and bands of grey siltstone. Rare pockets of black organic gravel. From 2.0 m: medium dense.			0.90	1.00	D	D3	S N=53
			(1.90)	2.00	D	D4	S N=22
Very weak grey sandy SILTSTONE. Sand is fine.			2.80	3.00	D	D5	SPT - 8, 13, 16, 14, 16, 4/15 mm = 50/240 mm
			(0.59)				
WINDOW SAMPLE ENDS AT 3.39 m			3.39				

Remarks

1. Groundwater was not encountered.
2. The borehole was backfilled with arisings on completion.

D - Small disturbed sample
B - Bulk disturbed sample
J - Amber glass jar
W - Water sample
V - Hand vane
MP - Mackintosh probe

Logged by CBD

Scale 1:25

Sheet 1 of 1

Window Sample Log		Window Sample No.		MWS3				
Equipment and Methods Tracked Geo-Rig		Project No. G3272 Project Name: Proposed Premier Travel Inn Extension Location: Horsham, West Sussex						
Client details Whitbread Group PLC		Ground Level -		Coordinates -				
				Dates 21/11/2006				
Description	Reduced Level (m)	Legend	Depth (thickness)	Samples/Tests			Field Records / Results	
				Depth	Sample			Test
					Type	No		
Dark grey/black bituminous road surfacing. MADE GROUND.								
Loose grey sandy GRAVEL. Gravel is flint and concrete. MADE GROUND.			0.20	0.30	D	D1		
Soft brown very silty gravelly CLAY with rootlets. Gravel is organic and glass. Rare flint gravel. MADE GROUND.			0.40					
			(0.60)	0.70	D	D2		
Medium dense orange brown mottled grey silty fine SAND.			1.00	1.00	D	D3	S N=10	
			(0.80)					
Medium dense orange brown mottled grey very clayey gravelly fine SAND. Gravel is grey siltstone.			1.80	1.75	D	D4		
			(0.60)	2.10	D	D5	S N=17	
Medium dense, becoming dense orange grey mottled brown very clayey and gravelly SAND. Gravel is siltstone.			2.40					
			(1.05)	3.00	D	D6	S N=40	
WINDOW SAMPLE ENDS AT 3.45 m			3.45					

Remarks 1. Groundwater was not encountered. 2. The borehole was backfilled with arisings on completion.	D - Small disturbed sample B - Bulk disturbed sample J - Amber glass jar W - Water sample V - Hand vane MP - Mackintosh probe	Logged by CBD Scale 1:25 Sheet 1 of 1
---	--	---

Window Sample Log		Window Sample No.		MWS4				
Equipment and Methods Tracked Geo-Rig		Project No. G3272 Project Name: Proposed Premier Travel Inn Extension Location: Horsham, West Sussex						
Client details Whitbread Group PLC		Ground Level -		Coordinates -				
				Dates 21/11/2006				
Description	Reduced Level (m)	Legend	Depth (thickness)	Samples/Tests			Field Records / Results	
				Depth	Sample			Test
					Type	No		
Dark grey/black bituminous road surfacing. MADE GROUND.			(0.30)					
Loose light grey very sandy concrete gravel. MADE GROUND.			0.30	D	D1			
Soft, locally firm brown silty sandy CLAY with brick and glass gravel, and rootlets. MADE GROUND.			0.50	D	D2			
			(0.40)					
Loose, becoming medium dense brown/orange and grey mottled clayey fine SAND/sandy clay. Occasional angular coarse siltstone gravel.			0.90	D	D3	S N=9		
			(1.10)	1.50	D	D4		
			2.00	D	D5	S N=15		
			(0.30)					
Firm, becoming stiff orange brown very sandy CLAY. Occasional siltstone gravel.			2.30	D	D6	S N=50		
Stiff orange brown very clayey sandy SILT. Becoming fine sandy siltstone at depth.			(1.15)	2.50				
			3.45					
WINDOW SAMPLE ENDS AT 3.45 m								
Remarks 1. Groundwater was not encountered. 2. The borehole was backfilled with arisings on completion.						D - Small disturbed sample		Logged by CBD
						B - Bulk disturbed sample		
						J - Amber glass jar		Scale 1:25
						W - Water sample		
						V - Hand vane		Sheet 1 of 1
						MP - Mackintosh probe		

Trial Pit Log		Trial Pit No. MTP1			merebrook 		
Equipment and Methods Hand Tools		Project No. G3272 Project Name: Proposed Premier Travel Inn Extension Location: Horsham, West Sussex					
Client details Whitbread Group PLC		Ground Level - Coordinates - Dates 21/11/2006					
Description	Reduced Level (m)	Legend	Depth (thickness)	Samples/Tests			Field Records / Results
				Depth	Sample		
Type	No						
Brown slightly clayey sandy Topsoil with occasional flint gravel. MADE GROUND. At 0.25 m: mass concrete. ----- TRIAL PIT ENDS AT 0.25 m			0.25				
Remarks				D - Small disturbed sample B - Bulk disturbed sample J - Amber glass jar W - Water sample V - Hand vane MP - Mackintosh probe			Logged by CBD
							Scale 1:25
							Sheet 1 of 1

Trial Pit Log		Trial Pit No. MTP2						
Equipment and Methods Hand Tools		Project No. G3272 Project Name: Proposed Premier Travel Inn Extension Location: Horsham, West Sussex						
Client details Whitbread Group PLC		Ground Level - Coordinates - Dates 21/11/2006						
Description	Reduced Level (m)	Legend	Depth (thickness)	Samples/Tests			Field Records / Results	
				Depth	Sample			Test
					Type	No		
Brown slightly clayey sandy Topsoil with occasional flint gravel. MADE GROUND. At 0.25 m: mass concrete. ----- TRIAL PIT ENDS AT 0.25 m			0.25					
Remarks 1. Groundwater was not encountered. 2. The trial pit was terminated at 0.25 m due to concrete. 3. The trial pit was backfilled with arisings on completion.				D - Small disturbed sample B - Bulk disturbed sample J - Amber glass jar W - Water sample V - Hand vane MP - Mackintosh probe			Logged by CBD Scale 1:25 Sheet 1 of 1	

Trial Pit Log		Trial Pit No. MTP3						
Equipment and Methods Hand Tools		Project No. G3272 Project Name: Proposed Premier Travel Inn Extension Location: Horsham, West Sussex						
Client details Whitbread Group PLC		Ground Level	Coordinates			Dates 21/11/2006		
Description	Reduced Level (m)	Legend	Depth (thickness)	Samples/Tests			Field Records / Results	
				Depth	Sample			Test
					Type	No		
Grey paving slab. MADE GROUND.			0.05					
Yellow fine to medium sand. MADE GROUND.			0.15					
Lean-mix concrete blinding. MADE GROUND. At 0.2 m. mass concrete.			0.20					
TRIAL PIT ENDS AT 0.20 m								
Remarks 1. Groundwater was not encountered. 2. The trial pit was terminated at 0.2 m due to concrete. 3. The trial pit was backfilled with arisings on completion. D - Small disturbed sample B - Bulk disturbed sample J - Amber glass jar W - Water sample V - Hand vane MP - Mackintosh probe Logged by CBD Scale 1:25 Sheet 1 of 1								



APPENDIX 3 ▪ Chemical Laboratory Test Certificates

Colin Dickson
Merebrook Science and Environment Ltd
1st Floor Argosy House
161a-163a High Street
Orpington
Kent
BR6 0LN

10 January 2007

TEST REPORT

Our Report Number: 06-24058

Your Order Reference: BW/LAB/01/356

4 soil samples submitted for analysis on 24/11/2006

Project Name: Premier Travel Inn - Horsham

Project Code: G3272

Analysis started on 02/01/2007

Analysis completed by 08 January 2007


Rexona Rahman
Analytical Reporting Manager
ALCONTROL TECHNICHEM


Sharon Googh
Project Co-Ordinator
ALCONTROL TECHNICHEM

Test methods are documented in house procedures or where appropriate standard methods. Non accredited tests (if applicable) are identified on each page. Procedures for sampling are outside the scope of the laboratory UKAS accreditation. Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation. All samples connected with this report, including any 'on hold', will be stored and disposed of according to company policy. A copy of this policy is available on request.

Matrix: Soil
Project Name: Premier Travel Inn - Horsham

Matrix: Soil
Project Name: Premier Travel Inn - Horsham

Matrix: Soil
Project Name: Premier Travel Inn - Horsham

ALcontrol Technichem

Table Of Results

Job Number : 06-24058
Matrix : Soil
Project Code: G3272

Project Name: Premier Travel Inn - Horsham
Client : Merebrook Science and Environment Ltd

Sample Reference	MWS1	MWS2	MWS3	MWS4		Method No	Units	LOD
Sample Depth (m)	0.20	0.70	1.00	0.60				
Date Sampled	21/11/06	21/11/06	21/11/06	21/11/06				
Date Scheduled	24/11/06	24/11/06	24/11/06	24/11/06				
Laboratory Reference No	195332	195333	195334	195335				
Analysis								
Moisture Content (Dry Weight)	19.0	20.9	17.9	25.2			%	0.1
Moisture Content (Wet Weight)	16.0	17.3	15.2	20.1			%	0.1
Stones Content (% Wet Weight)	< 1	< 1	< 1	4.6		021	%	1
Stones Content (% Dry Weight)	< 1	< 1	< 1	5.8		021	%	1
Arsenic	9.4	9.5	7.3	14		069S ^{IM}	mg/kg	3
Boron (W/S)	0.7	0.8	< 0.5	1.5		016S ^{IM}	mg/kg	0.5
Cadmium	< 0.5	< 0.5	< 0.5	< 0.5		069S ^{IM}	mg/kg	0.5
Chromium	24	12	13	14		069S ^{IM}	mg/kg	10
Copper	18	26	6.8	43		069S ^{IM}	mg/kg	5
Lead	50	170	17	230		069S ^{IM}	mg/kg	10
Mercury	< 0.6	0.9	< 0.6	0.8		069S ^{IM}	mg/kg	0.6
Nickel	14	8.2	11	13		069S ^{IM}	mg/kg	4
Selenium	< 2.5	< 2.5	< 2.5	< 2.5		069S ^{IM}	mg/kg	2.5
Sulphate (Total Acid Soluble) as SO4	520	860	< 200	1200		025a ^{IM}	mg/kg	200
W/S Sulphate as SO4	0.04	0.25	0.02	0.17		074 ^{IM}	g/l	0.02
Sulphur (Total)	280	490	< 100	490		069S	mg/kg	100
Zinc	81	220	36	130		069S ^{IM}	mg/kg	10
Total Cyanide	< 1	< 1	< 1	< 1		061S ^{IM}	mg/kg	1
pH	8.1	6.9	7.1	7.2		009S ^{IM}	pH Units	
** RAPID TPH SUITE **								
TPH (C10-C20)	< 25	< 25	< 25	39		065	mg/kg	25
TPH (C20-C30)	< 25	< 25	< 25	58		065	mg/kg	25
TPH (C30-C40)	< 25	< 25	< 25	< 25		065	mg/kg	25
TPH (C10-C40)	37	< 25	< 25	120		065	mg/kg	25
** RAPID PAH SUITE **								
Naphthalene	< 0.5	< 0.5	< 0.5	< 0.5		022R ^{IM}	mg/kg	0.5
Benzo(a)pyrene	< 0.5	< 0.5	< 0.5	1.0		022R ^{IM}	mg/kg	0.5
Rapid PAH (Total 16)	ND	3.35	ND	13.15		022R ^I	mg/kg	2
** PHENOLS SUITE **								
Phenol	< 0.1	< 0.1	< 0.1	< 0.1		020S ^{IM}	mg/kg	0.1
Total Monohydric Phenols	< 1	< 1	< 1	< 1		020S ^I	mg/kg	1

^I ISO 17025 accredited.

^{*} MCERTS accredited for sand, loam and clay.

ALcontrol Technichem

Table Of Results - Appendix

Job Number : 06-24058

Project Code: G3272

Project Name: Premier Travel Inn - Horsham
Client : Merebrook Science and Environment Ltd

Summary of methods contained within report :

Method No.	Reference	Description	Wet/Dry Analysis
061S	In-house method based on Method 4500-CN, "Standard Methods for the Examination of Water and Waste Water", APHA AWWA WEF, Edition 18, 1992	Determination of cyanides and thiocyanate in soil samples by continuous flow colorimetry (Skalar)	W
022R	In-house method	Determination of PAH compounds in soil samples by hexane / acetone extraction followed by GC-MS detection	W
020S	In-house method based on Second Site Property: Environmental Assessment Guidance Version 3: March 2003	Determination of methanol/water based mobile phase extractable phenols in soil samples by HPLC with electrochemical detection	W
009S	In-house method referencing BS1377: Part 3: 1990 and Second Site Property: Environmental Assessment Guidance Version 3: March 2003	Determination of pH by addition of water followed by electrometric measurement	W
065	In-house method	Determination of total petroleum hydrocarbons in soil samples using hexane:acetone extraction and GC-FID detection. Note: UKAS accreditation only applies to C8-C40 and excludes other carbon banding.	W
074	In-house method based on BS1377 Part 3, "Chemical and Electrochemical Tests", 1990	Determination of 2:1 water soluble sulphate in soil samples by Inductively Coupled Plasma - Optical Emission Spectrometry (ICP-OES)	D
069S	In-house method based on MEWAM "Methods for the Determination of Metals in Soil", HMSO, 1986	Determination of metals in soil samples by aqua-regia digestion followed by ICP-OES detection	D
025a	In-house method based on BS1377 Part 3, "Chemical and Electrochemical Tests", 1990	Determination of hydrochloric acid soluble sulphate in soil samples by Inductively Coupled Plasma - Optical Emission Spectrometry (ICP-OES)	D
016S	In-house method	Determination of water soluble boron by 2:1 extraction in hot water followed by ICP-OES detection	D

ALcontrol Technichem

Table Of Results - Appendix

Project Name: Premier Travel Inn - Horsham
Client : Merebrook Science and Environment Ltd

Job Number : 06-24058

Project Code: G3272

Summary of methods contained within report :

Method No.	Reference	Description	Wet/Dry Analysis
021	In-house method	Determination of stones content by gravimetry (material retained on an 11.2mm sieve)	

Soil results are expressed on a dry weight basis. Where the test uses as-received sample, a moisture correction factor is applied to the wet weight result. This factor is determined gravimetrically using weight loss on drying at 30° (+/-5) C.



APPENDIX 4 ▪ Geotechnical Laboratory Test Results

Site Analytical Services Ltd.

Site Investigations, Analytical & Environmental Chemists, Laboratory Testing Services.



Units 14 + 15, River Road Business Park,
33 River Road, Barking, Essex IG11 0EA

Directors: J. S. Warren, M.R.S.C., P. C. Warren, J. I. Pattinson, BSc (Hons) MSc
Consultants: G. Evans, BSc., M.Sc., P.G. Dip., FGS., MEnvSc. A. J. Kingston, BSc C.Eng. MIMM
F. J. Gibbs, F.I.B.M.S. F.I.F.S.T., F.R.S.H. K. J. Blanchette

Tel: 0208 594 8134

Fax: 0208 594 8072

E-Mail: services@siteanalytical.co.uk

Your Ref: CBD/G3272/06/B472
MR DANIEL BROCKMAN

Our Ref: 06/12658
JSW/BA

SAMPLES OF SOIL
RE: PREMIER TRAVEL INN, HORSHAM

SUBMITTED BY MEREBROOK PROJECTS LIMITED

RECEIVED ON 30th NOVEMBER 2006

INTRODUCTION

Seven samples of the above material were received into the laboratory for the following determinations:

1. Moisture Content
2. Plasticity Index including moisture content
3. Water Soluble Sulphate / pH Value

RESULTS

The plasticity index and moisture content results are presented on Table 1.

The Water soluble sulphate / pH value results are presented on Figure 2.

p.p. SITE ANALYTICAL SERVICES LIMITED

18th December 2006



J S Warren M.R.S.C.
DIRECTOR

Reg Office: Units 14 + 15, River Road Business Park,
33 River Road, Barking, Essex IG11 0EA
Business Reg. No. 2255616





**PLASTICITY INDEX &
MOISTURE CONTENT
DETERMINATIONS**

BH/TP No.	Depth m	Natural Moisture %	Liquid Limit %	Plastic Limit %	Plasticity Index %	Passing 425 μ m %	Class
MWS 1	1.00	17	32	20	12	77	CL
MWS 1	2.00	15	31	19	12	94	CL
MWS 2	1.00	17	32	21	11	55	CL
MWS 2	3.00	17	40	20	20	95	CI
MWS 3	1.75	17	31	18	13		CL
MWS 4	1.50	17	24	17	7	77	CL
MWS 4	2.50	18	34	22	12	97	CL

TESTED IN ACCORDANCE WITH BS 1377-2:1990. CLAUSES 3.2, 4.3, 5.3 AND 5.4



**SULPHATE & pH
DETERMINATIONS**

BH/TP No.	DEPTH BELOW GL m	SOIL SULPHATES		WATER SULPHATES		pH	CLASS	SOIL - 2mm %
		AS SO ₄ TOTAL %	AS SO ₄ WATER SOL g/l	AS SO ₄ g/l	AS SO ₄ g/l			
MWS1	2.00	0.01	0.03			7.0	DS-1	100
MWS2	3.00	0.02	0.07			5.6	DS-1	100
MWS4	1.50	0.02	0.08			6.9	DS-1	100

Classification – Tables C1 and C2 : BRE Special Digest 1 : 2005

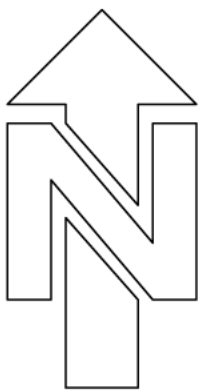


APPENDIX 5 ▪ Field Monitoring Record

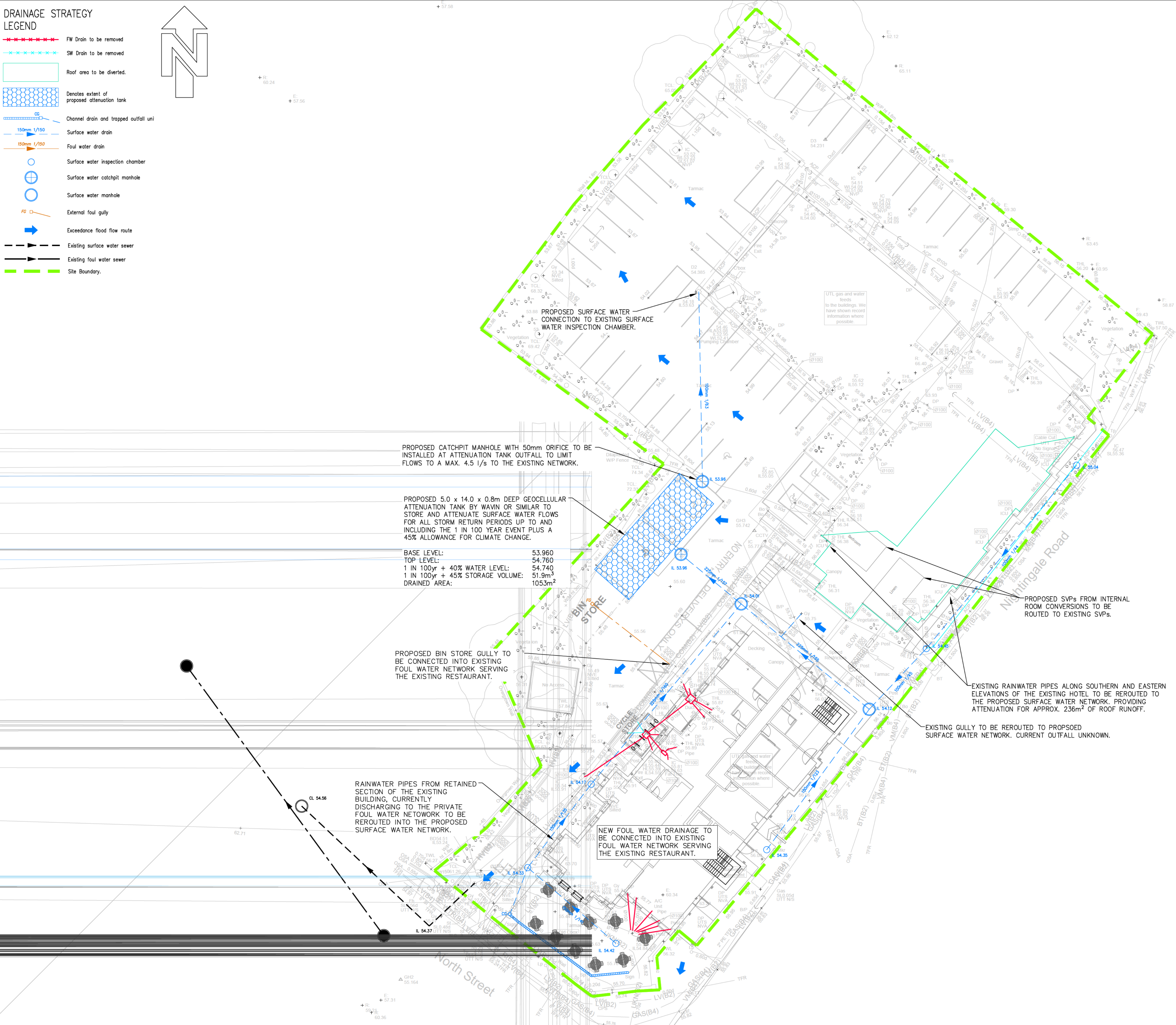
APPENDIX C
DRAINAGE STRATEGY

DRAINAGE STRATEGY
LEGEND

- FW Drain to be removed
- SW Drain to be removed
- Roof area to be diverted.
- Denotes extent of proposed attenuation tank
- Channel drain and trapped outfall unit
- Surface water drain
- Foul water drain
- Surface water inspection chamber
- Surface water catchpit manhole
- Surface water manhole
- External foul gully
- Exceedance flood flow route
- Existing surface water sewer
- Existing foul water sewer
- Site Boundary.



DO NOT SCALE



PROPOSED CATCHPIT MANHOLE WITH 50mm ORIFICE TO BE INSTALLED AT ATTENUATION TANK OUTFALL TO LIMIT FLOWS TO A MAX. 4.5 l/s TO THE EXISTING NETWORK.

PROPOSED 5.0 x 14.0 x 0.8m DEEP GEOCELLULAR ATTENUATION TANK BY WAVIN OR SIMILAR TO STORE AND ATTENUATE SURFACE WATER FLOWS FOR ALL STORM RETURN PERIODS UP TO AND INCLUDING THE 1 IN 100 YEAR EVENT PLUS A 45% ALLOWANCE FOR CLIMATE CHANGE.

BASE LEVEL: 53.960
TOP LEVEL: 54.760
1 IN 100yr + 40% WATER LEVEL: 54.740
1 IN 100yr + 45% STORAGE VOLUME: 51.9m³
DRAINED AREA: 1053m²

PROPOSED BIN STORE GULLY TO BE CONNECTED INTO EXISTING FOUL WATER NETWORK SERVING THE EXISTING RESTAURANT.

RAINWATER PIPES FROM RETAINED SECTION OF THE EXISTING BUILDING, CURRENTLY DISCHARGING TO THE PRIVATE FOUL WATER NETWORK TO BE REROUTED INTO THE PROPOSED SURFACE WATER NETWORK.

NEW FOUL WATER DRAINAGE TO BE CONNECTED INTO EXISTING FOUL WATER NETWORK SERVING THE EXISTING RESTAURANT.

PROPOSED SURFACE WATER CONNECTION TO EXISTING SURFACE WATER INSPECTION CHAMBER.

UTL gas and water feeds to the buildings. We have shown record information where possible.

PROPOSED SVPs FROM INTERNAL ROOM CONVERSIONS TO BE ROUTED TO EXISTING SVPs.

EXISTING RAINWATER PIPES ALONG SOUTHERN AND EASTERN ELEVATIONS OF THE EXISTING HOTEL TO BE REROUTED TO THE PROPOSED SURFACE WATER NETWORK, PROVIDING ATTENUATION FOR APPROX. 236m² OF ROOF RUNOFF.

EXISTING GULLY TO BE REROUTED TO PROPOSED SURFACE WATER NETWORK. CURRENT OUTFALL UNKNOWN.

P1	FIRST ISSUE	GL	04.02.26
MK	REVISION	BY	DATE

DRAWING STATUS

PRELIMINARY

DRAWING TITLE

DRAINAGE STRATEGY

PROJECT

PREMIER INN
HORSHAM NORTH
57 NORTH STREET
RH12 1RB



8 Friday Street
Henley-on-Thames
Oxfordshire, RG9 1AH
T: 01491 576 221
E: mail@simpsoneng.com
W: www.simpsoneng.com

London, Henley-on-Thames and Gloucester

Drawn	Chkd	Scales	Date
GL	PB	1:200@A1	JAN 2026

Purpose of Issue

FOR PLANNING

Project Number	Drawing Number	Revision
P24-0548	SK01	P1

APPENDIX D
MICRODRAINAGE ATTENUATION DESIGN RESULTS

Simpson Associates

Page 1

1 Market Place Mews
Henley-on-Thames
RG9 2AH

Date 29/01/2026 17:06
File P24-0548 Attenuation

Designed by George.Lewington
Checked by

Micro Drainage

Source Control 2019.1

Summary of Results for 2 year Return Period

Half Drain Time : 64 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	54.079	0.119	0.0	1.6	1.6	7.9	O K
30 min Summer	54.106	0.146	0.0	1.8	1.8	9.7	O K
60 min Summer	54.123	0.163	0.0	1.9	1.9	10.9	O K
120 min Summer	54.146	0.186	0.0	2.1	2.1	12.4	O K
180 min Summer	54.151	0.191	0.0	2.1	2.1	12.7	O K
240 min Summer	54.149	0.189	0.0	2.1	2.1	12.6	O K
360 min Summer	54.139	0.179	0.0	2.0	2.0	11.9	O K
480 min Summer	54.127	0.167	0.0	2.0	2.0	11.1	O K
600 min Summer	54.115	0.155	0.0	1.9	1.9	10.3	O K
720 min Summer	54.104	0.144	0.0	1.8	1.8	9.6	O K
960 min Summer	54.086	0.126	0.0	1.7	1.7	8.4	O K
1440 min Summer	54.061	0.101	0.0	1.4	1.4	6.7	O K
2160 min Summer	54.040	0.080	0.0	1.2	1.2	5.3	O K
2880 min Summer	54.029	0.069	0.0	1.1	1.1	4.6	O K
4320 min Summer	54.019	0.059	0.0	0.9	0.9	3.9	O K
5760 min Summer	54.013	0.053	0.0	0.7	0.7	3.5	O K
7200 min Summer	54.009	0.049	0.0	0.6	0.6	3.3	O K
8640 min Summer	54.007	0.047	0.0	0.6	0.6	3.1	O K
10080 min Summer	54.005	0.045	0.0	0.6	0.6	3.0	O K
15 min Winter	54.079	0.119	0.0	1.6	1.6	7.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	35.184	0.0	8.6	17
30 min Summer	23.095	0.0	11.4	31
60 min Summer	14.567	0.0	14.5	50
120 min Summer	9.622	0.0	19.1	82
180 min Summer	7.407	0.0	22.1	118
240 min Summer	6.110	0.0	24.3	152
360 min Summer	4.617	0.0	27.6	218
480 min Summer	3.768	0.0	30.0	282
600 min Summer	3.213	0.0	32.0	346
720 min Summer	2.819	0.0	33.7	408
960 min Summer	2.289	0.0	36.4	530
1440 min Summer	1.711	0.0	40.8	768
2160 min Summer	1.283	0.0	46.0	1124
2880 min Summer	1.053	0.0	50.4	1472
4320 min Summer	0.810	0.0	58.1	2204
5760 min Summer	0.682	0.0	65.2	2936
7200 min Summer	0.602	0.0	72.0	3672
8640 min Summer	0.548	0.0	78.7	4400
10080 min Summer	0.510	0.0	85.3	5136
15 min Winter	35.184	0.0	8.6	17

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Simpson Associates

Page 2

1 Market Place Mews
Henley-on-Thames
RG9 2AH

Date 29/01/2026 17:06
File P24-0548 Attenuation

Designed by George.Lewington
Checked by

Micro Drainage

Source Control 2019.1

Summary of Results for 2 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control E (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	54.106	0.146	0.0	1.8	1.8	9.7	O K
60 min Winter	54.123	0.163	0.0	1.9	1.9	10.8	O K
120 min Winter	54.142	0.182	0.0	2.1	2.1	12.1	O K
180 min Winter	54.142	0.182	0.0	2.1	2.1	12.1	O K
240 min Winter	54.136	0.176	0.0	2.0	2.0	11.7	O K
360 min Winter	54.119	0.159	0.0	1.9	1.9	10.6	O K
480 min Winter	54.102	0.142	0.0	1.8	1.8	9.5	O K
600 min Winter	54.087	0.127	0.0	1.7	1.7	8.5	O K
720 min Winter	54.075	0.115	0.0	1.6	1.6	7.6	O K
960 min Winter	54.055	0.095	0.0	1.4	1.4	6.3	O K
1440 min Winter	54.033	0.073	0.0	1.1	1.1	4.8	O K
2160 min Winter	54.020	0.060	0.0	0.9	0.9	4.0	O K
2880 min Winter	54.013	0.053	0.0	0.7	0.7	3.5	O K
4320 min Winter	54.005	0.045	0.0	0.6	0.6	3.0	O K
5760 min Winter	54.001	0.041	0.0	0.5	0.5	2.7	O K
7200 min Winter	53.998	0.038	0.0	0.4	0.4	2.5	O K
8640 min Winter	53.995	0.035	0.0	0.4	0.4	2.3	O K
10080 min Winter	53.994	0.034	0.0	0.4	0.4	2.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	23.095	0.0	11.4	30
60 min Winter	14.567	0.0	14.5	50
120 min Winter	9.622	0.0	19.1	88
180 min Winter	7.407	0.0	22.1	126
240 min Winter	6.110	0.0	24.3	162
360 min Winter	4.617	0.0	27.6	230
480 min Winter	3.768	0.0	30.0	296
600 min Winter	3.213	0.0	32.0	360
720 min Winter	2.819	0.0	33.7	420
960 min Winter	2.289	0.0	36.4	540
1440 min Winter	1.711	0.0	40.8	766
2160 min Winter	1.283	0.0	46.0	1124
2880 min Winter	1.053	0.0	50.4	1484
4320 min Winter	0.810	0.0	58.1	2208
5760 min Winter	0.682	0.0	65.2	2928
7200 min Winter	0.602	0.0	72.0	3672
8640 min Winter	0.548	0.0	78.7	4408
10080 min Winter	0.510	0.0	85.3	5104

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Simpson Associates		Page 3																														
1 Market Place Mews Henley-on-Thames RG9 2AH																																
Date 29/01/2026 17:06 File P24-0548 Attenuation	Designed by George.Lewington Checked by																															
Micro Drainage		Source Control 2019.1																														
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Simpson Associates		Page 4																		
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1 Market Place Mews
Henley-on-Thames
RG9 2AH

Date 29/01/2026 17:07
File P24-0548 Attenuation

Designed by George.Lewington
Checked by

Micro Drainage

Source Control 2019.1

Micro Drainage

Source Control 2019.1

Summary of Results for 30 year Return Period

Half Drain Time : 89 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	54.230	0.270	0.0	2.6	2.6	17.9	O K
30 min Summer	54.301	0.341	0.0	2.9	2.9	22.7	O K
60 min Summer	54.352	0.392	0.0	3.2	3.2	26.1	O K
120 min Summer	54.359	0.399	0.0	3.2	3.2	26.5	O K
180 min Summer	54.353	0.393	0.0	3.2	3.2	26.1	O K
240 min Summer	54.342	0.382	0.0	3.1	3.1	25.4	O K
360 min Summer	54.314	0.354	0.0	3.0	3.0	23.6	O K
480 min Summer	54.287	0.327	0.0	2.9	2.9	21.8	O K
600 min Summer	54.263	0.303	0.0	2.8	2.8	20.2	O K
720 min Summer	54.242	0.282	0.0	2.6	2.6	18.7	O K
960 min Summer	54.206	0.246	0.0	2.5	2.5	16.3	O K
1440 min Summer	54.156	0.196	0.0	2.2	2.2	13.0	O K
2160 min Summer	54.109	0.149	0.0	1.8	1.8	9.9	O K
2880 min Summer	54.081	0.121	0.0	1.6	1.6	8.0	O K
4320 min Summer	54.049	0.089	0.0	1.3	1.3	5.9	O K
5760 min Summer	54.033	0.073	0.0	1.1	1.1	4.9	O K
7200 min Summer	54.026	0.066	0.0	1.0	1.0	4.4	O K
8640 min Summer	54.021	0.061	0.0	0.9	0.9	4.1	O K
10080 min Summer	54.018	0.058	0.0	0.8	0.8	3.8	O K
15 min Winter	54.230	0.270	0.0	2.6	2.6	18.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	78.103	0.0	19.3	18
30 min Summer	51.941	0.0	25.7	32
60 min Summer	33.005	0.0	32.9	58
120 min Summer	19.491	0.0	38.8	88
180 min Summer	14.272	0.0	42.6	122
240 min Summer	11.427	0.0	45.5	158
360 min Summer	8.339	0.0	49.8	226
480 min Summer	6.667	0.0	53.1	292
600 min Summer	5.608	0.0	55.9	356
720 min Summer	4.871	0.0	58.2	420
960 min Summer	3.907	0.0	62.3	546
1440 min Summer	2.882	0.0	68.9	792
2160 min Summer	2.141	0.0	76.8	1148
2880 min Summer	1.742	0.0	83.3	1500
4320 min Summer	1.314	0.0	94.3	2208
5760 min Summer	1.084	0.0	103.8	2936
7200 min Summer	0.936	0.0	112.0	3672
8640 min Summer	0.834	0.0	119.7	4400
10080 min Summer	0.760	0.0	127.2	5128
15 min Winter	78.103	0.0	19.3	17

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1 Market Place Mews
Henley-on-Thames
RG9 2AH

Date 29/01/2026 17:08
File P24-0548 Attenuation

Designed by George.Lewington
Checked by

Micro Drainage

Source Control 2019.1

Summary of Results for 100 year Return Period

Half Drain Time : 100 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	54.303	0.343	0.0	2.9	2.9	22.8	O K
30 min Summer	54.401	0.441	0.0	3.4	3.4	29.3	O K
60 min Summer	54.477	0.517	0.0	3.7	3.7	34.4	O K
120 min Summer	54.478	0.518	0.0	3.7	3.7	34.4	O K
180 min Summer	54.468	0.508	0.0	3.6	3.6	33.8	O K
240 min Summer	54.453	0.493	0.0	3.6	3.6	32.8	O K
360 min Summer	54.421	0.461	0.0	3.4	3.4	30.6	O K
480 min Summer	54.389	0.429	0.0	3.3	3.3	28.5	O K
600 min Summer	54.360	0.400	0.0	3.2	3.2	26.6	O K
720 min Summer	54.334	0.374	0.0	3.1	3.1	24.9	O K
960 min Summer	54.291	0.331	0.0	2.9	2.9	22.0	O K
1440 min Summer	54.230	0.270	0.0	2.6	2.6	17.9	O K
2160 min Summer	54.169	0.209	0.0	2.2	2.2	13.9	O K
2880 min Summer	54.130	0.170	0.0	2.0	2.0	11.3	O K
4320 min Summer	54.082	0.122	0.0	1.6	1.6	8.1	O K
5760 min Summer	54.056	0.096	0.0	1.4	1.4	6.4	O K
7200 min Summer	54.040	0.080	0.0	1.2	1.2	5.3	O K
8640 min Summer	54.030	0.070	0.0	1.1	1.1	4.7	O K
10080 min Summer	54.025	0.065	0.0	1.0	1.0	4.3	O K
15 min Winter	54.304	0.344	0.0	2.9	2.9	22.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	98.766	0.0	24.5	18
30 min Summer	66.318	0.0	32.9	32
60 min Summer	42.559	0.0	42.4	60
120 min Summer	24.722	0.0	49.2	92
180 min Summer	17.958	0.0	53.7	126
240 min Summer	14.317	0.0	57.0	160
360 min Summer	10.423	0.0	62.3	228
480 min Summer	8.335	0.0	66.4	294
600 min Summer	7.018	0.0	69.9	362
720 min Summer	6.106	0.0	73.0	426
960 min Summer	4.915	0.0	78.3	550
1440 min Summer	3.652	0.0	87.3	796
2160 min Summer	2.729	0.0	98.0	1164
2880 min Summer	2.223	0.0	106.4	1528
4320 min Summer	1.664	0.0	119.4	2244
5760 min Summer	1.357	0.0	129.9	2944
7200 min Summer	1.155	0.0	138.2	3672
8640 min Summer	1.015	0.0	145.7	4400
10080 min Summer	0.912	0.0	152.8	5136
15 min Winter	98.766	0.0	24.5	18

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1 Market Place Mews
Henley-on-Thames
RG9 2AH

Date 29/01/2026 17:08
File P24-0548 Attenuation

Designed by George.Lewington
Checked by

Micro Drainage

Source Control 2019.1

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	54.402	0.442	0.0	3.4	3.4	29.4	O K
60 min Winter	54.479	0.519	0.0	3.7	3.7	34.5	O K
120 min Winter	54.476	0.516	0.0	3.7	3.7	34.3	O K
180 min Winter	54.459	0.499	0.0	3.6	3.6	33.2	O K
240 min Winter	54.437	0.477	0.0	3.5	3.5	31.7	O K
360 min Winter	54.390	0.430	0.0	3.3	3.3	28.6	O K
480 min Winter	54.347	0.387	0.0	3.1	3.1	25.7	O K
600 min Winter	54.310	0.350	0.0	3.0	3.0	23.2	O K
720 min Winter	54.277	0.317	0.0	2.8	2.8	21.1	O K
960 min Winter	54.225	0.265	0.0	2.6	2.6	17.6	O K
1440 min Winter	54.157	0.197	0.0	2.2	2.2	13.1	O K
2160 min Winter	54.099	0.139	0.0	1.8	1.8	9.2	O K
2880 min Winter	54.066	0.106	0.0	1.5	1.5	7.1	O K
4320 min Winter	54.034	0.074	0.0	1.2	1.2	4.9	O K
5760 min Winter	54.023	0.063	0.0	0.9	0.9	4.2	O K
7200 min Winter	54.017	0.057	0.0	0.8	0.8	3.8	O K
8640 min Winter	54.012	0.052	0.0	0.7	0.7	3.5	O K
10080 min Winter	54.009	0.049	0.0	0.6	0.6	3.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	66.318	0.0	32.9	31
60 min Winter	42.559	0.0	42.4	58
120 min Winter	24.722	0.0	49.2	96
180 min Winter	17.958	0.0	53.7	134
240 min Winter	14.317	0.0	57.0	172
360 min Winter	10.423	0.0	62.3	244
480 min Winter	8.335	0.0	66.4	314
600 min Winter	7.018	0.0	69.9	380
720 min Winter	6.106	0.0	73.0	446
960 min Winter	4.915	0.0	78.3	576
1440 min Winter	3.652	0.0	87.3	822
2160 min Winter	2.729	0.0	98.0	1172
2880 min Winter	2.223	0.0	106.4	1528
4320 min Winter	1.664	0.0	119.4	2208
5760 min Winter	1.357	0.0	129.9	2936
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1 Market Place Mews
Henley-on-Thames
RG9 2AH

Date 29/01/2026 17:08
File P24-0548 Attenuation

Designed by George.Lewington
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Micro Drainage

Source Control 2019.1

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 127 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	54.463	0.503	0.0	3.6	3.6	33.5	O K
30 min Summer	54.610	0.650	0.0	4.1	4.1	43.2	O K
60 min Summer	54.732	0.772	0.0	4.5	4.5	51.3	O K
120 min Summer	54.740	0.780	0.0	4.5	4.5	51.9	O K
180 min Summer	54.730	0.770	0.0	4.5	4.5	51.2	O K
240 min Summer	54.714	0.754	0.0	4.5	4.5	50.1	O K
360 min Summer	54.675	0.715	0.0	4.3	4.3	47.5	O K
480 min Summer	54.634	0.674	0.0	4.2	4.2	44.8	O K
600 min Summer	54.595	0.635	0.0	4.1	4.1	42.3	O K
720 min Summer	54.560	0.600	0.0	4.0	4.0	39.9	O K
960 min Summer	54.500	0.540	0.0	3.7	3.7	35.9	O K
1440 min Summer	54.410	0.450	0.0	3.4	3.4	29.9	O K
2160 min Summer	54.317	0.357	0.0	3.0	3.0	23.7	O K
2880 min Summer	54.253	0.293	0.0	2.7	2.7	19.5	O K
4320 min Summer	54.172	0.212	0.0	2.3	2.3	14.1	O K
5760 min Summer	54.124	0.164	0.0	1.9	1.9	10.9	O K
7200 min Summer	54.093	0.133	0.0	1.7	1.7	8.9	O K
8640 min Summer	54.072	0.112	0.0	1.5	1.5	7.5	O K
10080 min Summer	54.058	0.098	0.0	1.4	1.4	6.5	O K
15 min Winter	54.463	0.503	0.0	3.6	3.6	33.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	143.211	0.0	35.6	18
30 min Summer	96.161	0.0	47.8	32
60 min Summer	61.710	0.0	61.5	60
120 min Summer	35.847	0.0	71.4	98
180 min Summer	26.039	0.0	77.8	130
240 min Summer	20.760	0.0	82.8	164
360 min Summer	15.113	0.0	90.4	232
480 min Summer	12.086	0.0	96.4	302
600 min Summer	10.177	0.0	101.4	368
720 min Summer	8.854	0.0	105.9	434
960 min Summer	7.127	0.0	113.6	562
1440 min Summer	5.295	0.0	126.6	810
2160 min Summer	3.957	0.0	142.1	1172
2880 min Summer	3.223	0.0	154.3	1532
4320 min Summer	2.413	0.0	173.2	2248
5760 min Summer	1.968	0.0	188.4	2992
7200 min Summer	1.674	0.0	200.4	3680
8640 min Summer	1.471	0.0	211.2	4408
10080 min Summer	1.323	0.0	221.6	5144
15 min Winter	143.211	0.0	35.6	18

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1 Market Place Mews
Henley-on-Thames
RG9 2AH

Date 29/01/2026 17:08
File P24-0548 Attenuation

Designed by George.Lewington
Checked by

Micro Drainage

Source Control 2019.1

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	54.611	0.651	0.0	4.1	4.1	43.3	O K
60 min Winter	54.736	0.776	0.0	4.5	4.5	51.6	O K
120 min Winter	54.740	0.780	0.0	4.5	4.5	51.8	O K
180 min Winter	54.724	0.764	0.0	4.5	4.5	50.8	O K
240 min Winter	54.698	0.738	0.0	4.4	4.4	49.1	O K
360 min Winter	54.641	0.681	0.0	4.2	4.2	45.3	O K
480 min Winter	54.584	0.624	0.0	4.0	4.0	41.5	O K
600 min Winter	54.532	0.572	0.0	3.9	3.9	38.0	O K
720 min Winter	54.486	0.526	0.0	3.7	3.7	35.0	O K
960 min Winter	54.409	0.449	0.0	3.4	3.4	29.9	O K
1440 min Winter	54.302	0.342	0.0	2.9	2.9	22.8	O K
2160 min Winter	54.205	0.245	0.0	2.4	2.4	16.3	O K
2880 min Winter	54.147	0.187	0.0	2.1	2.1	12.4	O K
4320 min Winter	54.084	0.124	0.0	1.6	1.6	8.2	O K
5760 min Winter	54.053	0.093	0.0	1.4	1.4	6.2	O K
7200 min Winter	54.035	0.075	0.0	1.2	1.2	5.0	O K
8640 min Winter	54.027	0.067	0.0	1.0	1.0	4.5	O K
10080 min Winter	54.022	0.062	0.0	0.9	0.9	4.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	96.161	0.0	47.8	32
60 min Winter	61.710	0.0	61.5	60
120 min Winter	35.847	0.0	71.4	100
180 min Winter	26.039	0.0	77.8	138
240 min Winter	20.760	0.0	82.8	176
360 min Winter	15.113	0.0	90.4	250
480 min Winter	12.086	0.0	96.4	320
600 min Winter	10.177	0.0	101.4	390
720 min Winter	8.854	0.0	105.9	456
960 min Winter	7.127	0.0	113.6	588
1440 min Winter	5.295	0.0	126.6	838
2160 min Winter	3.957	0.0	142.1	1208
2880 min Winter	3.223	0.0	154.3	1556
4320 min Winter	2.413	0.0	173.2	2252
5760 min Winter	1.968	0.0	188.4	2992
7200 min Winter	1.674	0.0	200.4	3680
8640 min Winter	1.471	0.0	211.3	4360
10080 min Winter	1.323	0.0	221.6	5136

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1 Market Place Mews Henley-on-Thames RG9 2AH		
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Micro Drainage		Source Control 2019.1

Simpson Associates		Page 4																		
1 Market Place Mews Henley-on-Thames RG9 2AH																				
Date 29/01/2026 17:08 File P24-0548 Attenuation	Designed by George.Lewington Checked by																			
Micro Drainage		Source Control 2019.1																		
<u>Model Details</u> Storage is Online Cover Level (m) 55.560 <u>Cellular Storage Structure</u> Invert Level (m) 53.960 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>70.0</td><td>70.0</td><td>0.801</td><td>0.0</td><td>97.2</td></tr><tr><td>0.800</td><td>70.0</td><td>97.2</td><td></td><td></td><td></td></tr></tbody></table> <u>Orifice Outflow Control</u> Diameter (m) 0.050 Discharge Coefficient 0.600 Invert Level (m) 53.960			Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	70.0	70.0	0.801	0.0	97.2	0.800	70.0	97.2			
Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)															
0.000	70.0	70.0	0.801	0.0	97.2															
0.800	70.0	97.2																		
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