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FLOOD RISK ASSESSMENT
& DRAINAGE STRATEGY REPORT

PREMIER INN LONDON UXBRIDGE HOTEL

PHASE, RIVERSIDE WAY

UXBRIDGE

UB8 2YF

PREPARED FOR:

JOB NO: P24-0616

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CONTENTS

APPENDICES

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 hotel extension comprising additional bedrooms, minor alterations to the interior of the existing hotel, alterations to the car parking arrangement and associated hard and soft landscaping works.

1.2 This report assesses flood risk associated with the development proposals and outlines a strategy for the disposal of foul and surface water runoff from the development, following guidance set out in the following local and national planning policy documents:

- The National Planning Policy Framework (NPPF) & associated Planning Practice Guidance
- London Borough of Hillingdon Local Plan: Part 1 (Adopted November 2012) – Policy EM6: Flood Risk Management
- West London Strategic Flood Risk Assessment - 2018
- Hillingdon London Local Flood Risk Management Strategy - 2015

2. SITE AND DEVELOPMENT CHARACTERISTICS

<u>Site Location</u>

2.1 The existing Premier Inn Hotel is located on Riverside Way as shown on *Figure 1* below. The site is centred on Ordnance Survey grid reference TQ 04795 83687 and co-ordinates X: 504795; Y: 183687. The post code for the existing hotel is UB8 2YF.

Figure 1: Site Location

<u>Site Description</u>

2.2 The site is currently occupied by an existing Beefeater restaurant and Premier Inn hotel with associated car parking facilities.

2.3 To the north and west the site is bounded by commercial units. To the south, the site is bounded by undeveloped forests with the River Colne beyond. To the east, the site is bounded by the River Colne with St John's Road beyond.

2.4 Vehicular access to the site is gained from Riverside Way north and west of the development.

<u>Topography</u>

2.5 The topographical survey is included in *Appendix A*. The survey indicates that levels generally fall in a northerly direction from a level of approximately 31.35m AOD in the southern part of the car park to a level of 30.70m AOD in the northern part of the car park. There linear drainage channels and trapped gullies located at the topographical low points of the car park to drain runoff.

Existing Ground Conditions

2.6 A site investigation was carried out by REC in 2018 for a proposed extension to the hotel (not constructed), which reported the following ground conditions on site. An extract of the SI is included in *Appendix B*.

- Made Ground was encountered within all exploratory holes to depths of between 1.70m and 2.00mbgl and typically comprised clay, sand and gravel.
- Alluvium deposits were encountered in some of the window samples beneath the Made Ground to depths of 2.00mbgl and comprise clay.
- The Taplow Gravel Member was encountered within all window sample boreholes to a maximum depth of 4.10mbgl and generally comprised clayed sandy gravel.
- Groundwater was encountered at depths between 2.00m and 3.00mbgl.

2.7 Permeability testing was not completed due to the presence of Made Ground between 1.70 and 2.00m deep, and shallow groundwater between 2.00 to 3.00mbgl. Due to the presence of Made Ground and the need for infiltration features to be set 1m above the highest groundwater level recorded it is not anticipated that soakage testing would warrant successful results which would permit the use of infiltration drainage techniques.

Existing Drainage Arrangements

2.8 The topographical survey in *Appendix A* shows the site to be drained by separate networks of foul and surface water pipework.

2.9 Surface water runoff from the existing buildings is collected by a rainwater gutters which discharge below ground via rainwater down pipes. Runoff from the parking areas is collected by a network of trapped gullies and linear drainage channels. The existing surface water network is split into two separate networks which both discharge to the River Colne to the east of the site. These networks can be clearly seen on the as-built drawing included in *Appendix C* from the 2014 original build.

2.10 One network drains the northern parking area and restaurant which discharges to the River Colne via an outfall to the northeast of the development. This portion of the network is unattenuated and is served by a bypass separator upstream of the outfall.

2.11 The other network drains the southern parking area, service yard and hotel which discharges to the River Colne via an outfall to the southeast of the development. This portion of the network is restricted via a flow control chamber upstream of the outfall which limits flows to a maximum discharge rate of 40.0 l/s. Excess runoff is stored and attenuated in an existing attenuation tank beneath the parking area to the south of the hotel, this network is also served by a bypass separator.

2.12 Foul water generated by the existing development is drained by a traditional network of 150mm dia. below ground pipework which discharges off site to the north, to a Thames Water foul water sewer located north of the development along Riverside Way. An extract of the Thames Water sewer records is shown in *Figure 2* below.

Asset Location Search Sewer Map - ALS/ALS Standard/2017_3611507

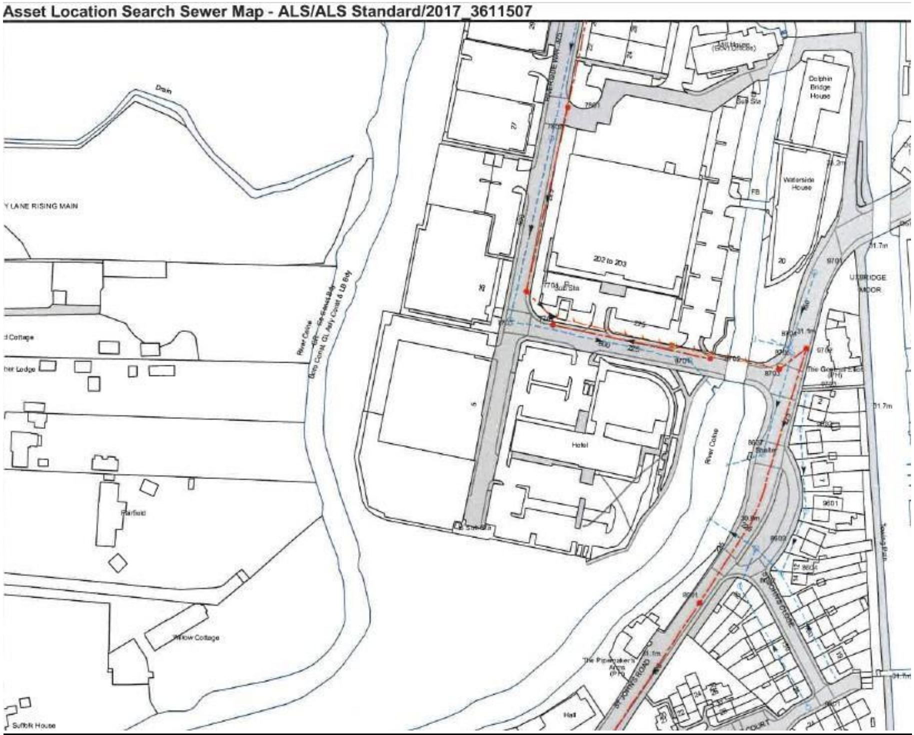

Figure 2: Thames Water Sewer Records

<u>Development Proposals</u>

2.13 It is proposed to construct an extension extending south from the southern boundary of the existing hotel. A site plan and floor plans showing the development proposals is included in *Appendix D*.

3. FLOOD RISK PLANNING POLICY & GUIDANCE

National Planning Policy Framework (NPPF)

3.1 The NPPF establishes the Flood Zones as the starting point for assessment with the overarching aim to steer new development to areas with the lowest probability of flooding. Flood Zone maps are available on the GOV.UK website and the definitions of the Flood Zones extracted from the National Planning Policy Framework (NPPF) are described below:

- Flood Zone 1 – Low probability. This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).
- Flood Zone 2 – Medium probability. This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% - 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% - 0.1%) in any year.
- Flood Zone 3a – High probability. This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
- Flood Zone 3b – The functional floodplain. This zone comprises land where water has to flow or be stored in times of flood. Typically, land which would flood with an annual probability of 1 in 20 (0.5%) or greater in any year, or is designed to flood in an extreme (0.1%) flood.

3.2 The NPPF and the Planning Practice Guidance (PPG) seek to ensure flood risk is considered at all stages of the planning process, to avoid inappropriate development in areas at risk of flooding and to direct development towards areas at lowest flood risk. The NPPF retains a risk-based approach to the planning process and uses the Flood Zones as the basis for applying the sequential test, as well as flood risk vulnerability classifications, which define the type of development that is considered appropriate within each zone. It advises local planning authorities to demonstrate that there are no reasonably available sites in areas with a lower probability of flooding that would be appropriate to the type of development or land use proposed.

London Borough of Hillingdon Local Plan: Part 1 Strategic Policies Adopted November 2012 – Policy EM6: Flood Risk Management

Policy EM6: Flood Risk Management

The Council will require new development to be directed away from Flood Zones 2 and 3 in accordance with the principles of the National Planning Policy Framework (NPPF).

The subsequent Hillingdon Local Plan: Part 2 -Site Specific Allocations LDD will be subjected to the Sequential Test in accordance with the NPPF. Sites will only be allocated within Flood Zones 2 or 3 where there are overriding issues that outweigh flood risk. In these instances, policy criteria will be set requiring future applicants of these sites to demonstrate that flood risk can be suitably mitigated.

The Council will require all development across the borough to use sustainable urban drainage systems (SUDS) unless demonstrated that it is not viable. The Council will encourage SUDS to be linked to water efficiency methods. The Council may require developer contributions to guarantee the long term maintenance and performance of SUDS is to an appropriate standard.

West London Strategic Flood Risk Assessment (SFRA) 2018

3.3 The West London Boroughs of Barnet, Brent, Harrow, Hillingdon and Hounslow have commissioned a production of a joint Level 1 Strategic Flood Risk Assessment (SFRA). This provides details of sources of flood risk within the local area. The following section of this report reviews flood risk associated with sources of flooding identified within the SFRAs and by flood maps from other sources.

4. SOURCES OF FLOODING

Historical Flooding

4.1 The Local Flood Risk Management Strategy advises that fluvial flooding has occurred in Hillingdon a number of times over the last few years. These events were mainly located in discrete locations across the Borough. Following these flooding events, a number of flood defences have been put in place to manage the fluvial flood risk across the borough. The DEFRA historic flood map is shown in *Figure 3* below. It shows the area of the development to be outside any of the historic flood extents.

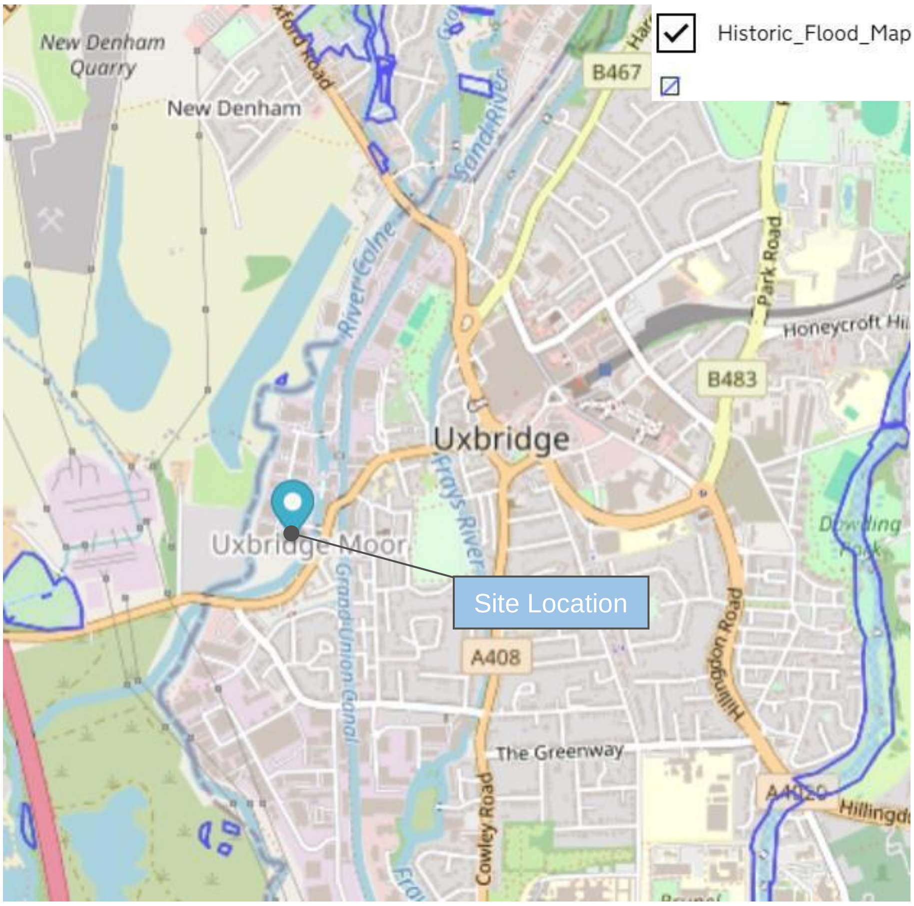

Figure 3: DEFRA Historic Flood Records

Fluvial / Tidal Flooding

4.2 The Environment Agency (EA) has derived flood maps of England, from which it is possible to initially identify whether a site is located within an area that is at risk of tidal / fluvial flooding. The maps, which are available on the 'gov.uk' website, categorise land as being within Flood Zone 1, Flood Zone 2, or Flood Zone 3, with Flood Zone 1 being all land falling outside of the floodplain and Flood Zone 2 and 3 being all land within the floodplain. Flood Zone 3 is split into two further categories, namely Flood Zone 3a and Flood Zone 3b with Flood Zone 3b considered to be the functional floodplain.

4.3 The flood zone map in *Figure 4* below has been taken from the 'gov.uk' website and shows the site to be in Flood Zone 1, which is representative of land that has a low probability of flooding from rivers and the sea. This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

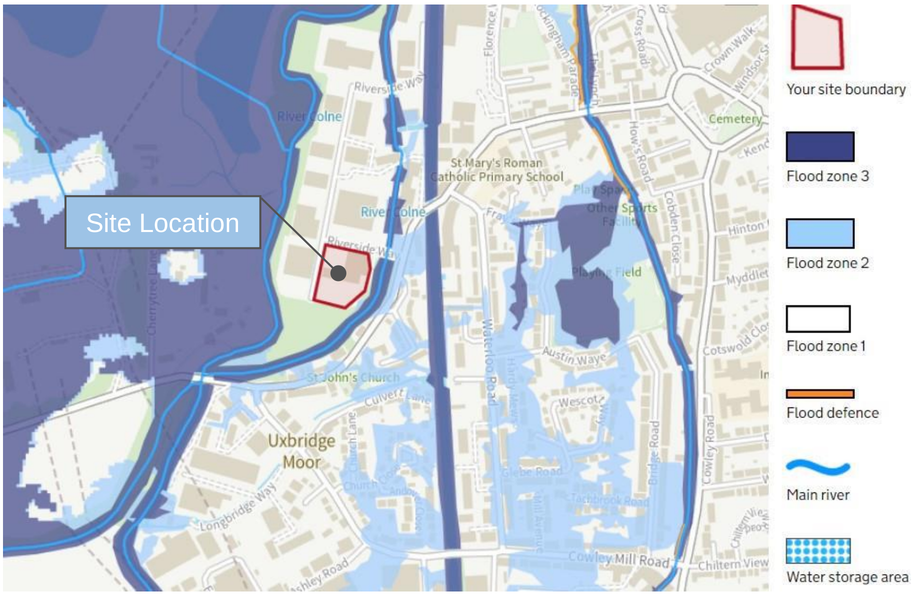

Figure 4: EA Flood Zone Map for Planning

4.4 *Figure 5* below shows the detailed EA Flood Zone Map which shows that the site is not at risk of flooding from rivers and the sea.

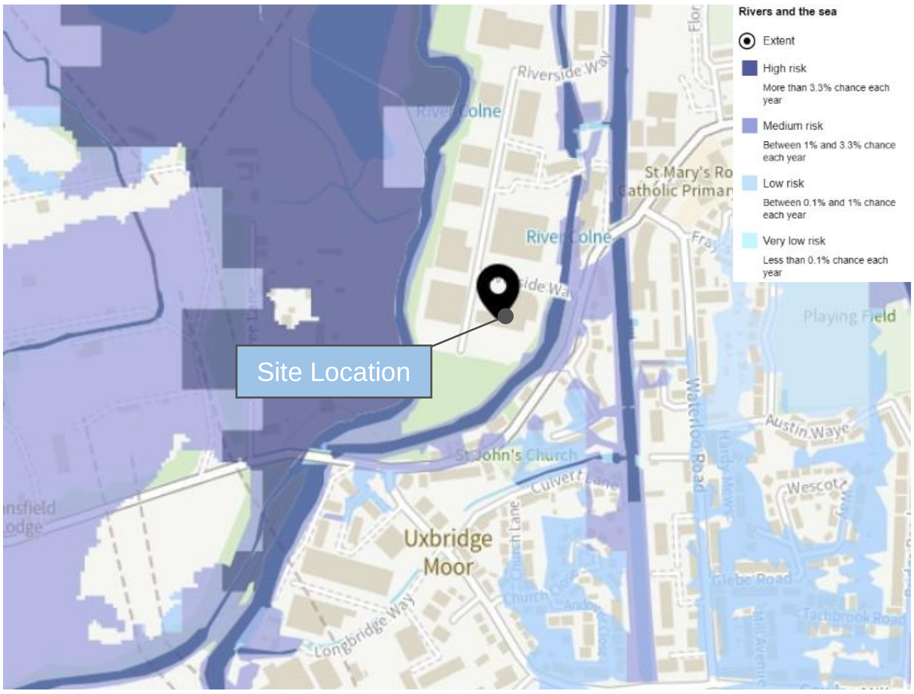

Figure 5: EA Risk of Flooding from Rivers and the Sea

4.5 *Figure 6* shows the Flood Zone mapping extracted from the SFRA which concurs with the EA Flood Zone mapping.

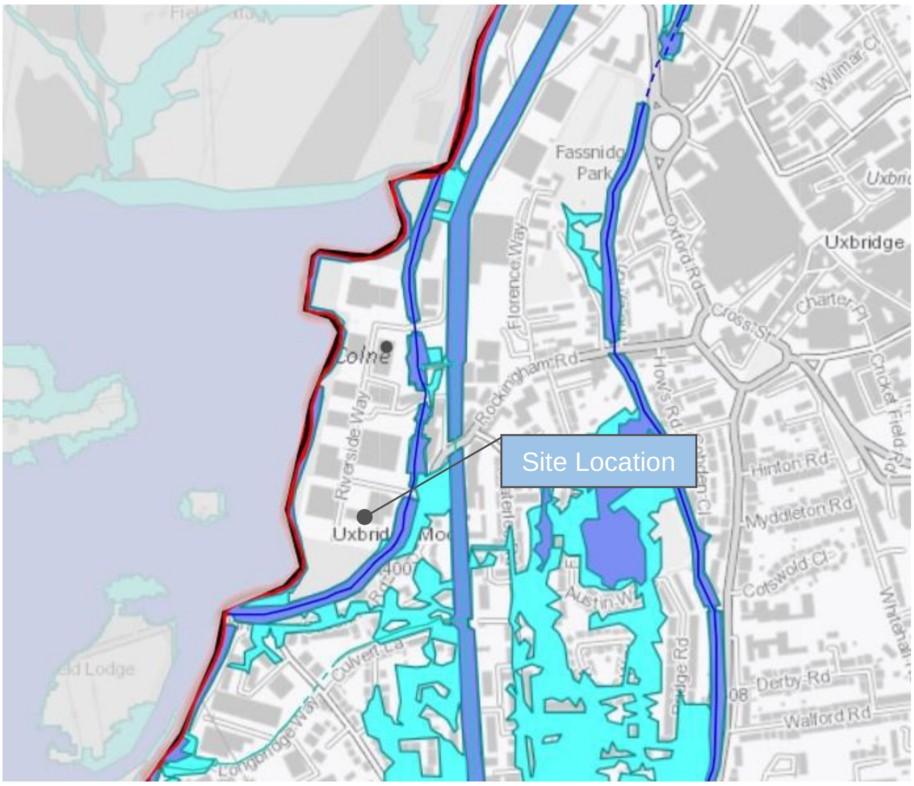

Figure 6: SFRA Flood Zone Mapping

4.6 The SFRA also advises that the main river catchments affecting the Hillingdon Borough is River Crane and River Colne.

4.7 Based on the review of the EA & SFRA flood maps shown above the site and immediate surrounding area are not identified to be at risk from fluvial / tidal flooding.

Surface Water Flooding

4.8 The SFRA states that flooding from surface water occurs as a result of high intensity rainfall when water ponding or flowing over the ground surface occurs before it enters the underground drainage network or a watercourse. Surface water flooding is often exacerbated by the intensity or duration of the rainfall event overwhelming drainage points; leaving soil, drainage channels and other drainage systems incapable of draining water away at a sufficient rate.

4.9 The EA's Risk of Flooding from Surface Water mapping provides an understanding of the areas, which may be at greater risk from surface water flooding, with the maps showing critical flow paths and areas situated in topographic depressions that could flood following an extreme rainfall event. A surface water flood risk map downloaded from the 'gov.uk' website is shown in *Figure 7*. The map shows that the site generally has a low risk of surface water flooding.

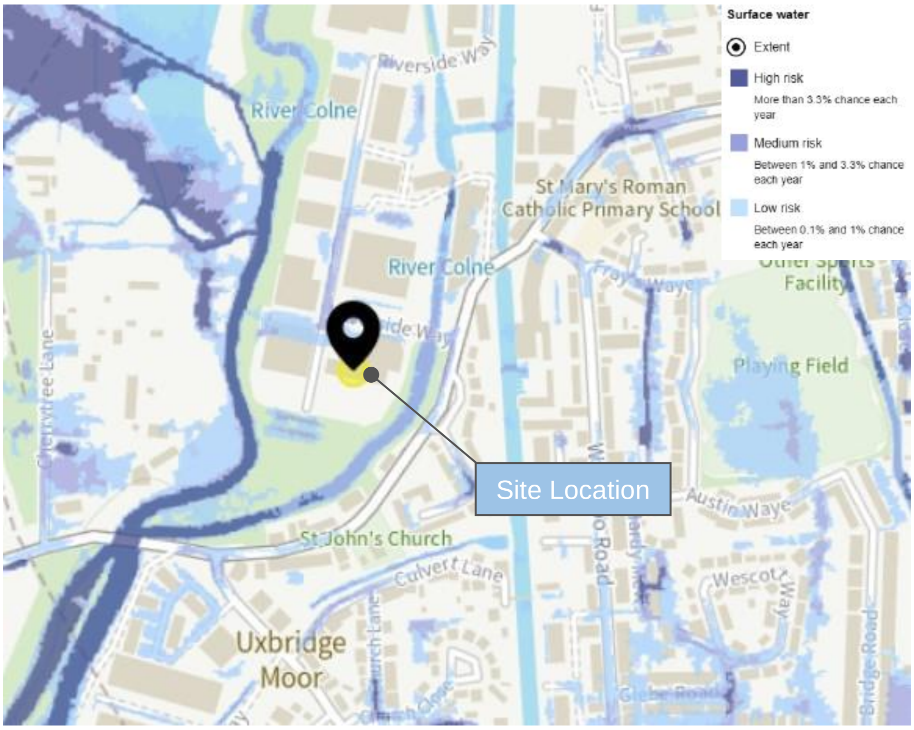

Figure 7: EA Surface Water Flood Risk Map

4.10 The surface water flood risk map shown in *Figure 8* is extracted from the SFRA and concurs with the EA mapping. Majority of the site is shown to not be at risk of surface water flooding with some areas in the northern portion of the site to be at medium risk of surface water flooding.

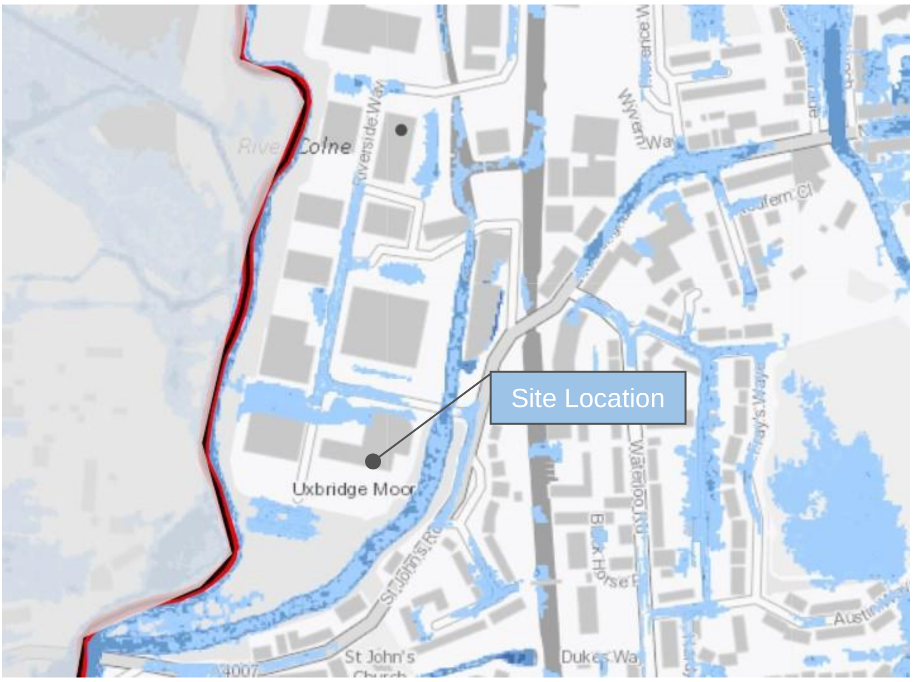

Figure 8: SFRA Surface Water Flood Risk Map

4.11 The proposed development is located outside the surface water flood extents. Based on this information no further assessment of flood risk is required in relation to existing surface water flood routes and no measures are deemed necessary to manage flood risk from this source. Additionally, surface water runoff from the extension will need to be managed using Sustainable Drainage Systems (SuDS) to ensure that the development does not alter the risk of surface water flooding to the site and surrounding area. In addition, the floor level of the extension would be set above surrounding ground levels to protect the building from potential overland surface water flows caused by exceedance of the surface water drainage system.

<u>Groundwater Flooding</u>

4.12 The SFRA advises that groundwater flooding occurs because of the underground water table rising, which can result in water emerging through the ground and causing flooding in extreme circumstances. This source of flooding tends to occur after extensive periods of heavy rainfall. During these periods, a great volume of water infiltrates through the ground, causing underlying aquifers to rise above its regular depth below the ground's surface. Springs and low-lying areas, where the water table is likely to be closer to the surface, pose greater risks of groundwater flooding.

4.13 The SFRA advises that the majority of the region is underlain by London Clay which has a generally low hydraulic conductivity which means that water does not easily move through it. However, because of this and poor drainage, ponding can occur if London Clay is downhill of aquifer outcrops.

4.14 *Figure 9* below shows the susceptibility to groundwater flooding map extracted from the SFRA. It shows the site to be above a 75% risk of groundwater flooding.

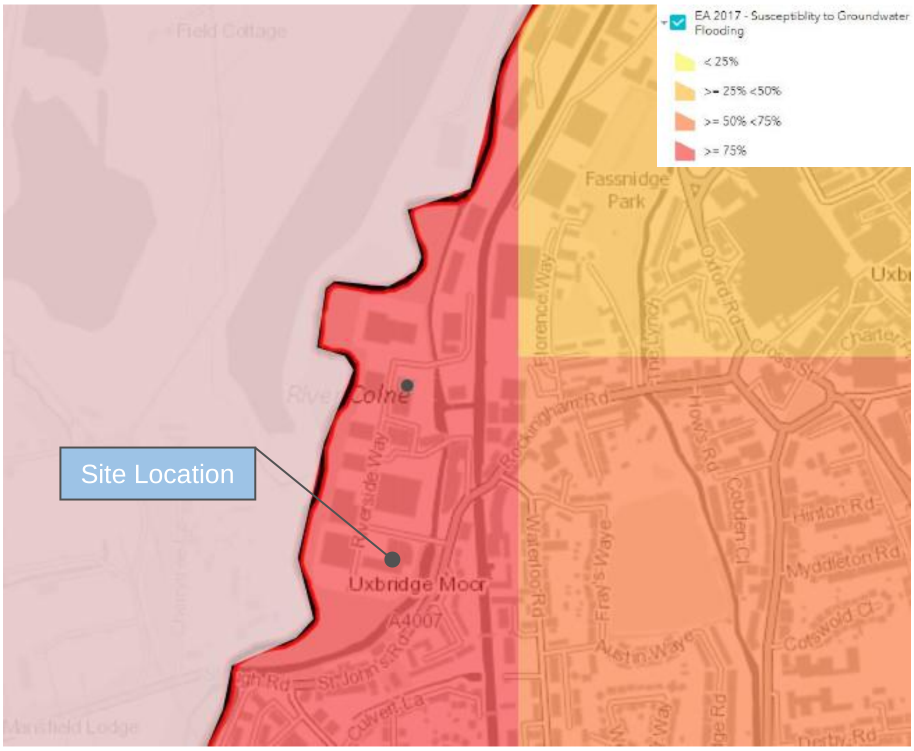

Figure 9: SFRA Susceptibility to Groundwater Flooding Map

4.15 Despite this, the EA website states that groundwater flooding is unlikely in this area.

4.16 Additionally, while the site is shown to be in an area susceptible to groundwater flooding the site investigation has confirmed groundwater levels to be approximately 2.00m below ground level, the majority of the site is also covered by hardstanding and there is no basement development proposed which would normally be at higher risk from groundwater flooding. On this basis, the development is considered to be at a low probability of flooding from this source, although appropriate sump / pump techniques may need to be used to de-water excavations during construction.

<u>Sewer Flooding</u>

4.17 Sewer flooding occurs due to sewer infrastructure failure or due to an increased flow and volume of water entering a sewer system which exceeds its hydraulic capacity, causing the system to surcharge. If sewer outfall points are either blocked or submerged due to high water levels, water can back up in a sewer system and cause flooding. These issues can result in water overflowing from gullies and manholes, causing flooding in the local area.

4.18 Thames Water is the sewerage undertaker for the sub-region. *Figure 10* below shows the sewer flooding records map extracted from the SFRA. It shows the site to not have experienced any sewer flooding incidents.

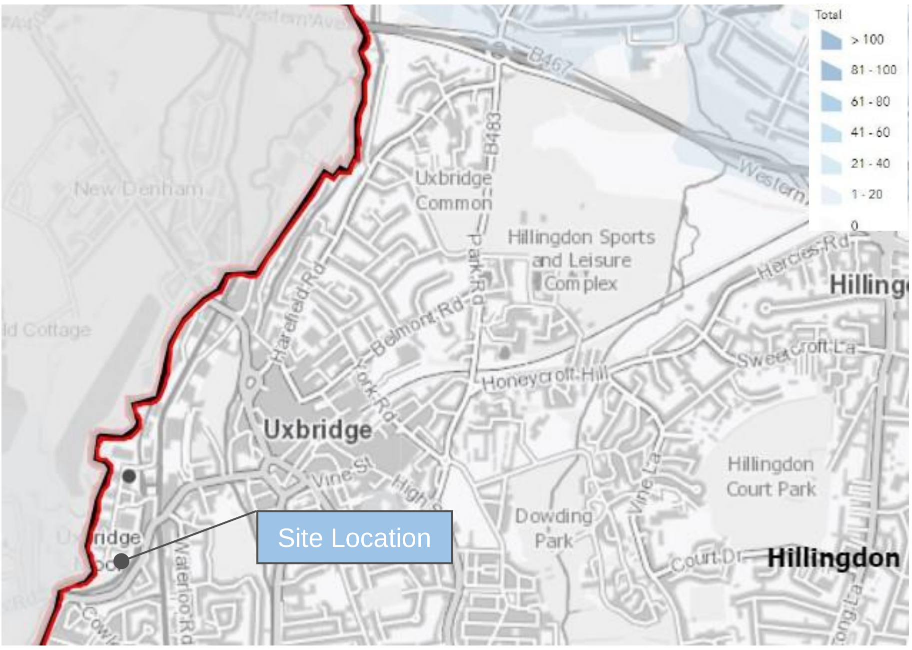

Figure 10: SFRA Sewer Flooding Records Map

4.19 A sewer capacity check has been submitted to Thames Water and a response is still awaited at the time of writing this report, although it should be noted that the foul water drainage scheme will be developed in accordance with the findings of Thames Water's assessment to ensure that there is no increase in the risk of sewer flooding to the site or neighbouring properties.

4.20 On this basis, it is considered that the residual risk of sewer flooding would be low. Therefore, no further assessment of flood risk is required in relation to existing sewer flooding issues and no measures are deemed necessary to manage flood risk from this source.

Flooding from Artificial Sources

4.21 Flooding from artificial sources, is most likely to result from burst water mains or from infrastructure failure in an artificial watercourse or water body, i.e., canals or other water features such as reservoirs. These systems are maintained, improved, and regularly inspected by relevant authorities so flood risk from these sources is generally considered to be low.

4.22 Flood maps associated with large reservoirs that hold over 25,000 cubic meters of water are available on the 'gov.uk' website. The maps help to identify areas that could potentially be affected by reservoir flooding and display a realistic worst-case scenario of the largest area that may be flooded if a reservoir were to fail and release the water it holds. *Figure 11* below shows a Reservoir Flood Map produced by the EA. The map shows the site and surrounding area to be within the reservoir flood extents.

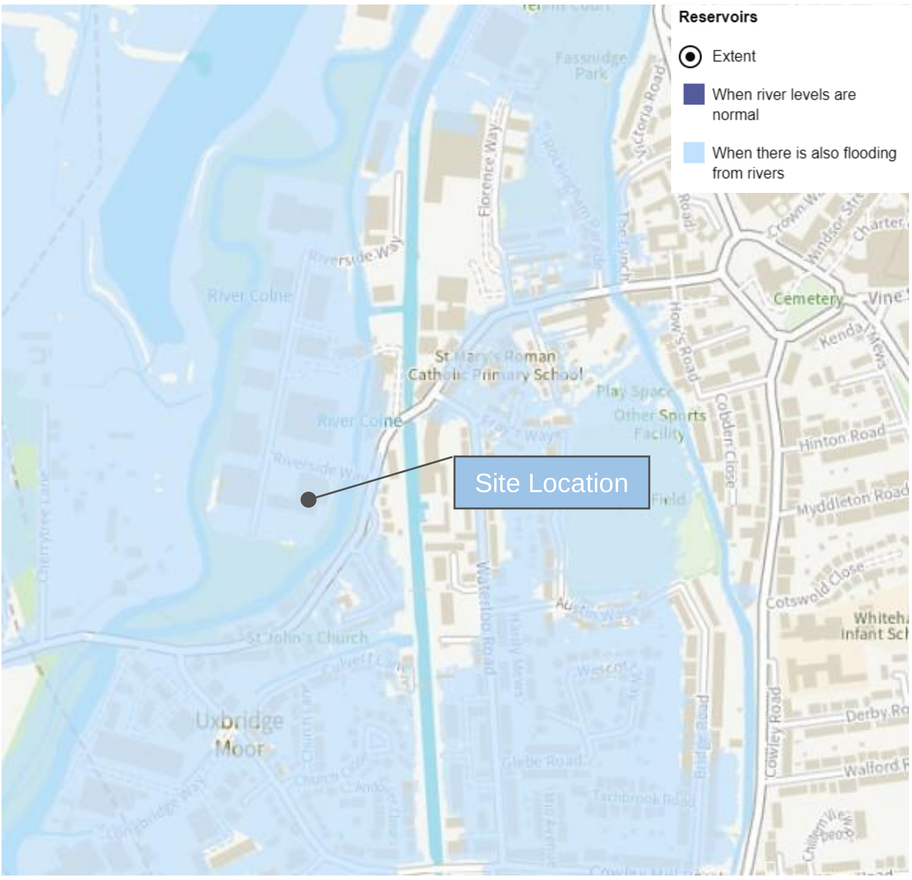

Figure 11: EA Reservoir Flood Map

4.23 Reservoirs in the UK have an extremely good safety record and are regulated by the EA under the Reservoirs Act 1975 in England and Wales. All large reservoirs are inspected and supervised by reservoir panel engineers on an annual basis. On this basis, the risk of reservoir flooding is considered to be low.

4.24 Flood patterns associated with burst water mains would typically be similar to surface water flood patterns and would generally be limited to existing roads where water main infrastructure is normally located. The proposed development is not in the surface water flood routes and the floor level of the extension would be raised above surrounding ground levels to protect the building from potential flooding caused by burst water mains.

4.25 *Figure 11* below shows the artificial flood risk map extracted from the SFRA. It shows the site to be within the flood extents. However, the SFRA advises that the probability of a structural breach is low.

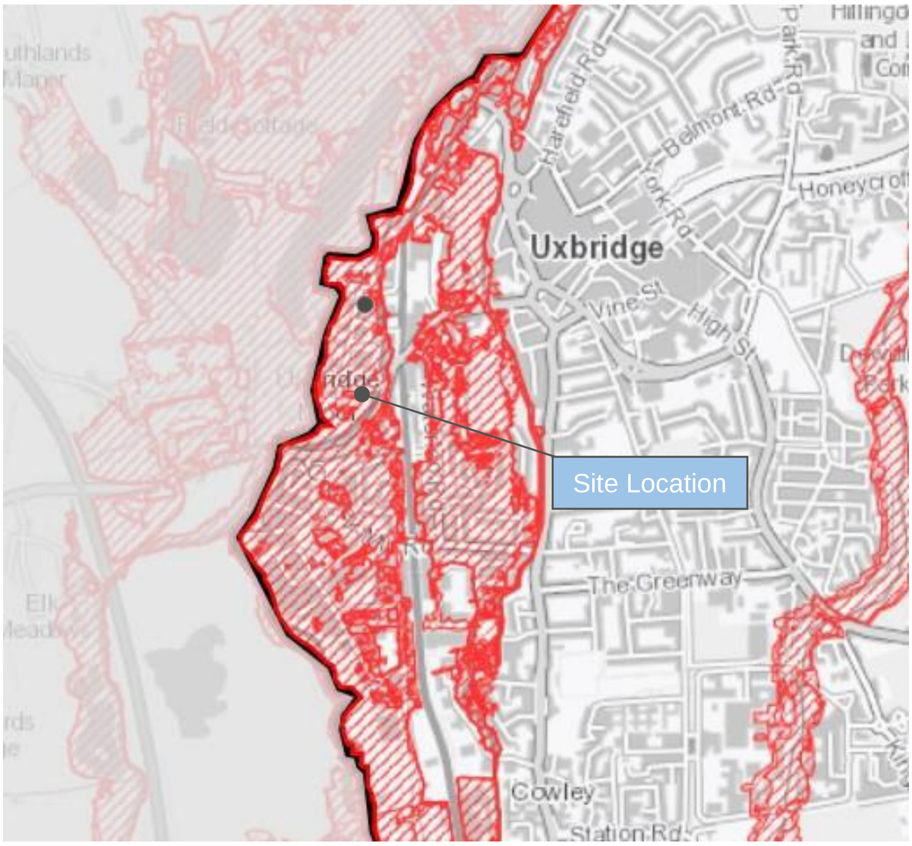

Figure 12: SFRA Artificial Flood Risk Map

4.26 Based on the review of mapping relating to flooding from artificial sources, the site and immediate surrounding area are not identified to be at risk from flooding from these sources.

5. MANAGING THE RISK OF FLOODING

5.1 The National Planning Policy Framework (NPPF) Planning Practice Guidance for Flood risk and coastal change National Planning Policy Framework (NPPF) advises that the objectives of a site-specific flood risk assessment are to establish:

- Whether a proposed development is likely to be affected by current or future flooding from any source;
- Whether it will increase flood risk elsewhere;
- Whether the measures proposed to deal with these effects and risks are appropriate;
- The evidence for the local planning authority to apply (if necessary) the Sequential Test, and;
- Whether the development will be safe and pass the Exception Test, if applicable.

5.2 *Table 1* below provides a summary of the probability of flooding from each source in *Section 4*, along with proposed measures to deal with the effects and risks posed.

Table 1: Summary of sources of flooding and recommended management measures

Source	**Probability**	**Management Measures**
Fluvial / Tidal Flooding	Low	▪ Not applicable.
Surface Water Flooding	Low	▪ SuDS would be used to minimise the rate of discharge, volume, and environmental impact of surface water runoff from the development. ▪ The floor level of the extension would be set above surrounding levels for protection from surface water flooding.
Groundwater Flooding	Low	▪ Not applicable.
Sewer Flooding	Low	▪ Not applicable.
Reservoir Flooding	Low	▪ Not applicable.
Canal Flooding	Low	▪ Not applicable.
Watermain Flooding	Low	▪ The floor level of the extension would be set above surrounding levels for further protection from overland surface water flooding.

5.3 In *Section 4* it was established that the site lies in Flood Zone 1. The NPPF and Local Policy advises development is appropriate in Flood Zone 1 where the risk can be demonstrated to be low. Therefore, the development is considered appropriate in terms of the sequential test, with it not necessary to apply the exception test.

5.4 The provision of a surface water drainage system as part of the proposed development would reduce the risk of surface water flooding in comparison to the existing situation, whilst the inclusion of Sustainable Drainage System's (SuDS) as part of a surface water drainage strategy would further reduce surface water flood risk to the site and surrounding area as they could be designed to minimise the rate of discharge, volume, and environmental impact of surface water runoff in comparison to the existing situation. The following section of this report outlines an approach for the disposal and management of surface water runoff from the development using SuDS.

6. SURFACE WATER MANAGEMENT & DRAINAGE STRATEGY

6.1 In *Section 2* it was established that the existing site is drained by separate networks of foul and surface water drainage. Surface water runoff is discharged to the River Colne to the east of the site via two outfalls, one which drains the northern parking area and restaurant, and one which drains the southern parking area, service yard and hotel. Both networks are served by bypass separators upstream of the outfalls; the network that drains the northern areas is unattenuated, whereas the network that drains the southern areas is attenuated via a flow control chamber which limits flows to a maximum discharge rate of 40.0 l/s with excess runoff stored and attenuated in an attenuation tank beneath the parking area to the south of the hotel.

6.2 It is assessed that the most appropriate discharge location for surface water drainage from the extension and rearranged car parking areas is to the existing networks which connect to the River Colne via existing outfalls.

6.3 Whilst impermeable areas have been assessed to reduce by 61m^2 as a result of the extension, the existing attenuation tank installed for the 2014 original build, associated with the network that drains the southern areas is located beneath the proposed extension. This tank will therefore need to be removed and relocated to allow for the extension.

6.4 As shown on the as-built drawing for the 2014 original build, included in *Appendix C*. The existing flow control chamber is set to a maximum allowable discharge rate of 40.0 l/s and the below ground geocellular attenuation tank sized at 9.0 x 20.0 x 0.8m deep. As shown on the areas layout included in *Appendix E*, it has been assessed that the drained area contributing to this tank in the existing situation is 3,712m^2 and 3,661m^2 in the proposed situation.

6.5 The areas layout included in *Appendix E* also shows that the drained area contributing to the network that drains the northern areas is 2,325m^2 in the existing situation and 2,315m^2 in the proposed situation.

6.6 A drainage strategy has been developed for the scheme and is shown on the drainage strategy plan included in *Appendix F*. A description of the main principles is provided below.

- Roof water from the proposed extension will be captured by a combination of rainwater gutters and downpipes that would discharge directly into the network that drains the southern areas upstream of the flow control chamber.
- Surface water runoff from the adjusted southern car parking areas would be captured by either existing gullies / linear drainage channels or new linear drainage channels that would discharge directly into the network that drains the southern areas upstream of the flow control chamber.
- The existing below ground geocellular attenuation tank installed for the 2014 original build is located beneath the footprint of the proposed extension and will be replaced with a new below ground geocellular attenuation tank located within the parking area to the west of the extension. This tank will ensure no flooding occurs on site for all events up to and including a 1 in 100 year event with a 40% allowance for climate change whilst also ensuring a maximum discharge rate of 40.0 l/s from this network. The tank will be wrapped in an impermeable geomembrane to prevent groundwater from entering.
- As demonstrated by the areas layout included in *Appendix E* there is a slight reduction in drained area for the network that drains the northern areas. Runoff rates and volumes will therefore be lower when compared to the existing situation and as such it is not proposed to introduce any restriction of runoff rates or attenuation for this network.
- All runoff from the development would be connected upstream of the existing bypass separators, ensuring that appropriate treatment of runoff is provided.

Hydraulic Results

6.7 Brownfield runoff calculations using the Modified Rational Method for the existing unattenuated area of 0.2325 Ha have been completed and a copy of the calculations is included in *Appendix G*. The calculations have been summarised below in *Table 2* for the 2, 30, 100 year, and 100 year plus 40% climate change return periods.

Table 2: Existing Unattenuated Area Brownfield Runoff Rates and Volumes

Return Period	Cv	I (peak) (mm)	I (ave) (mm)	A (Ha)	Peak Runoff Rate (l/s)	6hr Runoff Volume (m^3)	Rainfall Data
2	0.95	19.654	5.014	0.2325	15.7	66.4	FEH
30	0.95	39.182	9.995	0.2325	31.2	132.5	FEH
100	0.95	51.798	13.214	0.2325	41.3	175.1	FEH
100+40%	0.95	72.517	18.500	0.2325	57.8	245.2	FEH

6.8 MicroDrainage calculations for the flow control and attenuation tank installed for the 2014 original build have been included in *Appendix H* for the existing area of 0.3712 Ha*.* The calculations have been summarised below in *Table 3* for the 2, 30, 100 year, and 100 year plus 40% climate change return periods.

Table 3: Existing Attenuated Area MicroDrainage Runoff Rates and Volumes

Return Period	Peak Runoff Rate (l/s)	6hr Runoff Volume (m^3)	Rainfall Data
2	24.1	106.0	FEH
30	29.7	211.2	FEH
100	33.9	279.6	FEH
100+40%	52.0	390.8	FEH

6.9 *Table 4* below shows the combined runoff rates and volumes which currently discharge to the River Colne using the information in *Tables 2* and *3* above*.*

Table 4: Combined Existing Runoff Rates and Volumes

Return Period	Peak Runoff Rate (l/s)	6hr Runoff Volume (m^3)
2	39.8	172.4
30	60.9	343.7
100	75.2	454.7
100+40%	109.8	636.0

6.10 Brownfield runoff calculations using the Modified Rational Method for the proposed unattenuated area of 0.2315 Ha have been completed and a copy of the calculations is also included in *Appendix G*. The calculations have been summarised below in *Table 5* for the 2, 30, 100 year, and 100 year plus 40% climate change return periods.

Table 5: Proposed Unattenuated Area Brownfield Runoff Rates and Volumes

Return Period	Cv	I (peak) (mm)	I (ave) (mm)	A (Ha)	Peak Runoff Rate (l/s)	6hr Runoff Volume (m^3)	Rainfall Data
2	0.95	19.654	5.014	0.2315	15.6	66.2	FEH
30	0.95	39.182	9.995	0.2315	31.1	131.9	FEH
100	0.95	51.798	13.214	0.2315	41.1	174.4	FEH
100+40%	0.95	72.517	18.500	0.2315	57.6	244.1	FEH

6.11 MicroDrainage calculations for the flow control and replacement attenuation tank have been included in *Appendix J* for the proposed area of 0.3661 Ha. 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 40% allowance for climate change. The calculations have been summarised below in *Table 6* for the 2, 30, 100 year, and 100 year plus 40% climate change return periods.

Table 6: Proposed Attenuated Area MicroDrainage Runoff Rates and Volumes

Return Period	Peak Runoff Rate (l/s)	6hr Runoff Volume (m^3)	Rainfall Data
2	24.0	104.6	FEH
30	29.2	208.7	FEH
100	33.2	275.8	FEH
100+40%	39.5	386.1	FEH

6.12 *Table 7* below shows the combined runoff rates and volumes in the proposed situation using the information in *Tables 5* and *6* above.

Table 7: Combined Proposed Runoff Rates and Volumes

Return Period	Peak Runoff Rate (l/s)	6hr Runoff Volume (m^3)
2	39.6	170.8
30	60.3	340.6
100	74.3	450.2
100+40%	97.1	630.2

6.13 *Table 8* below compares the rates and volumes from *Tables 4* and *7* above for the pre and post development situation.

Table 8: Comparison of Runoff Rates and Volumes

<table>
<tr><th rowspan="2">Return Period</th><th colspan="2">Pre-development</th><th colspan="2">Post-development</th><th colspan="2">% Difference</th></tr>
<tr><th>Peak Runoff Rate (l/s)</th><th>6hr Runoff Volume (m^3)</th><th>Peak Runoff Rate (l/s)</th><th>6hr Runoff Volume (m^3)</th><th>Peak Runoff Rate</th><th>6hr Runoff Volume</th></tr>
<tr><td>2</td><td>39.8</td><td>172.4</td><td>39.6</td><td>170.8</td><td>-1%</td><td>-1%</td></tr>
<tr><td>30</td><td>60.9</td><td>343.7</td><td>60.3</td><td>340.6</td><td>-1%</td><td>-1%</td></tr>
<tr><td>100</td><td>75.2</td><td>454.7</td><td>74.3</td><td>450.2</td><td>-1%</td><td>-1%</td></tr>
<tr><td>100+40%</td><td>109.8</td><td>636.0</td><td>97.1</td><td>630.2</td><td>-11%</td><td>-1%</td></tr>
</table>

6.14 The above table confirms that the surface water drainage scheme would not exceed the rate or volume of discharge from the development prior to redevelopment for all storm events analysed. It also demonstrates that there is up to a 11% reduction when compared to the pre-development rates for the 100 year plus 40% climate change return period.

<u>Exceedance</u>

6.15 If the capacity of the proposed surface water drainage network was exceeded, site levels would allow surface water to be channelled in the direction of the exceedance flood flow route arrows on the drainage strategy plan included in *Appendix F*.

6.16 The extension's finished floor level would be raised above surrounding levels, to minimise the risk from overland flows.

Implementation

6.17 During construction, it is normal practice for a drainage system to be installed at an early stage in the programme. As such, runoff from the construction site, which can be heavily laden with silt, are likely to restrict flow within the drainage system. Therefore, the following measures will be considered to address this issue:

- A catchpit chamber will be installed for the attenuation tank to prevent sediments such as soil and mud from transferring into the drainage system downstream. The catchpit is to be regularly inspected throughout construction.
- Protective coverings will be used to help prevent runoff stripping material stockpiles.
- Surfaces used as access roads and storage areas during construction will be swept regularly to prevent the accumulation of dust and mud.
- Should groundwater be encountered in excavations, the water will not be discharged to the drainage systems until the amount of suspended solids has been reduced through the controlled use of skips or tanks, which will act as stilling basins.
- To prevent contamination associated with the use of oils and hydrocarbons during construction, the contractor shall ensure that the following precautionary measures are employed during construction:
    - Regular maintenance of machinery and plant.
    - Use of drip trays.
    - Regular checking of machinery and plant for oil leaks.
    - Use of correct storage facilities.
    - Regular checks for signs of wear and tear on tanks.
    - Specific procedures are followed when refuelling.
    - Emergency spill kit to be located near refuelling area.
    - Regular emptying of bunds.
    - Tanks should be located in secure areas to stop vandalism.

6.18 On occupation of the development, it is recommended that each element of the as-built drainage system is maintained by Premier Inn Hotels Ltd.'s appointed management company in accordance with the regime set out in the tables below.

Table 9: Below Ground Drainage System - Operation and Maintenance Requirements

Maintenance schedule	Required action	Frequency
Regular maintenance	Remove all litter and debris from external hard landscaped areas and adjacent landscaping, which may pose a risk to the performance of the system.	Monthly.
	Remove build-up of sediment / silt in catchpits and dispose of oils / petrol residues using safe standard practices.	As required.
	Stabilise and mow adjacent landscaped areas and remove weeds.	
Remedial actions	Repair or rehabilitate inlet and outlets to ensure they are in good condition and operating as designed.	
	Remediate any landscaping, which has raised to within 50mm of the level of adjacent hard landscaping.	
Monitoring	Check of all inlets / outlets for blockages or evidence of physical damage with any necessary remedial action or clearance carried out if required.	On a monthly basis for the first 3 months of operation, thereafter every 6 months & following severe rainfall events.
	Inspect all surfaces for ponding, or silt accumulation. Record areas where water is ponding for more than 48 hours and carry out any remedial work deemed necessary.	After severe storms.

Table 10: Geocellular Storage Tank - Operation and Maintenance Requirements

Maintenance schedule	Required action	Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for first 3 months of operation, then every 6 months.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly.
	Where rainfall infiltrates into blocks from above, check surface of filter for blockage by silt, algae or other matter. Remove and replace surface infiltration medium as necessary.	Monthly / after severe storms.
	Remove sediment from pre-treatment structures.	Annually, or as required.
Remedial actions	Repair/rehabilitation of inlets, outlet, overflows and vents.	As required.
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually and after large storms.

Table 11: Existing Flow Control Chamber - Operation and Maintenance Requirements

Maintenance schedule	Required action	Frequency
Regular maintenance	Cleaning off the flow control device of any debris/ sediment.	As required.
Remedial actions	Flow control device repairs.	As required.
	Repair of erosion damage, or damage to chamber.	
Monitoring	Inspection of the chamber for debris and sediment build up.	Monthly for first 3 months, thereafter, every 6 months and following severe storm events.

Table 12: Existing Bypass Separator - Operation and Maintenance Requirements

Maintenance schedule	Required action	Frequency
Regular maintenance	Cleaning of interceptor, inlets, and outlets of retained pollutants & silt.	Every 3, 6 or 12 months depending on site conditions (or following poor performance).
Remedial actions	Repair of erosion damage, or damage to tank.	As required.
	Interceptor repairs.	
Monitoring	Inspection of the tank for pollutants and silt.	Every 3, 6 or 12 months depending on site conditions (or following poor performance).
	Inspection of inlets and outlets.	
	Inspection of areas receiving overflow, for evidence of erosion.	

7. FOUL WATER DRAINAGE STRATEGY

7.1 This section of the report outlines an approach for the disposal and management of foul water runoff from the development.

7.2 As reported in *Section 2* of this report, foul water generated by the existing development is drained by a traditional network of 150mm dia. below ground pipework which discharges to the Thames Water foul water sewer network to the north.

7.3 A capacity check has been submitted to Thames Water and a response is still awaited at the time of writing this report, although it should be noted that the foul water drainage scheme will be developed in accordance with the findings of Thames Water's assessment to ensure that there is no increase in the risk of sewer flooding to the site or neighbouring properties.

7.4 A foul water drainage strategy has been developed for the scheme and is shown on the drainage strategy drawing included in *Appendix F*. In summary, the extension would be provided with a new foul water drainage system comprising of a traditional gravity network of below ground pipework. This would discharge to the existing 150mm dia. private foul water drainage network on site.

8. SUMMARY & CONCLUSIONS

8.1 It has been established that the site is located in Flood Zone 1, which is land assessed to not be at risk of fluvial flooding. However, the site has been established to be potentially affected by surface water flooding; although the mapping for surface water flooding does not account for the presence of gullies and linear drainage channels in the areas shown to be at risk which would alleviate the flooding shown and as such the actual risk is anticipated to be low. In addition, the use of SuDS as well as a raised floor level for the extension would protect the extension from such flooding, the extension is also located away from the surface water flood risk zones.

8.2 The site is assessed to be at low risk of flooding from all other sources considered in the Strategic Flood Risk Assessment. On this basis, no measures are deemed necessary to manage flood risk on the development other than the use of SuDS.

8.3 It has been established to be appropriate to discharge surface water runoff from the development to the River Colne via the sites existing surface water drainage network. A surface water drainage scheme has been developed, which demonstrates that the existing flow control chamber set at a rate of 40.0 l/s would be retained and the existing attenuation tank installed for the 2014 original build would be replaced with a new attenuation tank. Due to a reduction in overall drained areas in the proposed situation there is a betterment to the existing runoff rates and volumes from the surface water drainage system.

8.4 The proposed extension would be provided with a new foul water drainage system comprising of a traditional gravity network of below ground pipework that would discharge to the existing foul water drainage network on site.

8.5 In terms of flood risk and drainage strategy, it is concluded that the development can be occupied and operated safely and that there will be no increase in the level of flood risk to the site or neighbouring sites as a result of the proposed development.

APPENDIX A
TOPOGRAPHICAL SURVEY

Notes

1. Surveyed May 2018.
2. Survey related to Ordnance Survey "OS Net" at control point STN05, using realtime correction received via Trimble Navigations "VRS Now" service. Survey plotted to flat plane metric grid with no local scale factor applied, i.e. LSF 1.00.
3. Levels related to GPS Orthometric height, converted to MSL (Newlyn) by OSGM15.

Control

STN	East	North	Level	Type
STN01	504854.307	183735.866	31.120	Nail
STN02	504806.432	183729.600	30.832	Nail
STN03	504763.186	183713.355	31.118	Nail
STN04	504750.462	183649.624	31.409	Nail
STN05	504744.543	183667.751	31.432	Nail
STN06	504815.045	183639.889	31.185	Nail
STN07	504833.903	183660.428	30.676	Nail

** Note **

A range of Electromagnetic location (EML) and Ground Probing Radar (GPR) detection methods are used to obtain the underground information produced in this drawing. Variations in the ground conditions will affect the quality of the data and therefore an absolute affirmation cannot be guaranteed.

The identification of any located service should not be treated as infallible. The originating source may not have been traced.

The location and/or identification of a service will not necessarily indicate whether it is live or dead or identify whether it is a single or multiple service where one or more services may be situated above, below or in close proximity of the indicated line.

All depths of metallic features are to centre of the service, depths on drainage runs are to the pipe invert at the manhole and should be treated as an approximate indication.

Underground drainage has been proven for position using traceable sonde methods, unless otherwise stated. No allowance has been made for sub surface entry into manholes or other chambers or voids below ground level, therefore any details relating to depths, sizes etc, are taken from above ground and as such will be approximate only.

Features not traceable by electromagnetic or sonde techniques, have been located using GPR. Scan boxes indicate locations of recorded progressive GPR scans. Features identified in other areas by "Immediate Mark Out" methods only.

These results are not infallible and trial holes should be carried out to confirm service identification, position and particularly depths, where these are critical, in accordance with HSG47 : 2014 - "Avoiding Danger from Underground Services".

This drawing must be read in conjunction with all available statutory undertakers information. It is advised that such information should always be obtained.

Statutory Record Searches

Record drawings have been received from the following statutory undertakers and have been used for background information only, unless indicated otherwise on this drawing:
Scottish & Southern Electricity Networks (HV & LV) - 02.06.17
National Grid - 07.06.17
Cadent Gas - 06.06.17
Affinity Water - 05.06.17
Openreach BT "EGIO2507Y" - 01.06.17
Thames Water Sewer - Undated

	Utilities Survey Boundary
ELEC	Power Carrying Feature
WATER	Water Main
GAS	Gas Main
	Sewer Foul Water
RISING MAIN	Sewer Rising Main
	Sewer Surface Water
	Sewer Grey Water
TELCM	Telecom
TEL FO	Telecom (Fibre Optic Cable)
COMMS	Communications
CATV	Cable Television
CCTV	Closed Circuit Television
DUCT	Duct
DUCT EMPTY	Duct (Empty)
	Traffic Signalling
	GPR Detected Feature
?	Unknown Metallic Feature
PIPE	Pipe (use unknown)
	Chamber
	Taken From Records (Any Service)
DUCT EMPTY 1.20m	Depth to service (applicable to all types)
EoT	End of Trace
EoS	Extent of survey (service continues)
	GPR Scan Box Area (with reference letter)

General

- Every effort is made to identify all visible above ground features. However, it should be borne in mind that at the time of survey, some surface features may have been obscured.
- Visible features in the vicinity of the site extents, as detailed on this survey, may not represent the legally conveyed ownership boundaries.

Legend

Top / Bottom of Bank
Building / Overhead Canopy
Wall
Solid Surface Feature / Road Edge
Hard / Soft Surface Change
Kerb / Dropped Kerb
Combined Kerb & Drainage System
Drainage Channel
Fence Line -

BW	Barbed Wire	HR	Hand Rail	PR	Post & Rail
CB	Close Boarded	IR	Iron Railings	SB	Safety Barrier
ChNut	Chestnut	Mtl PR	Metal Post & Rail	SF	Security Fence
CL	Chain Link	OB	Open Boarded	TF	Temporary Fence
CP	Concrete Panel	PA	Paling Fence	WM	Wire Mesh
(D)	Dilapidated	PC	Post & Chain		

Hedge Line
Tree / Scrub Canopy Line
O/H Telephone / Electric Cable(s)
Rock Face
Pipe Line (Above Ground)

Bush
Tree
Conifer

T.PIT 22.5 Trial Pit (with level)
BH 26.5 Borehole (with level)
Survey Station
10.1 Spot Level
Woodland Area (Deciduous)
Gate
Level Datum
Woodland Area (Coniferous)
Electric Pylon
Marsh Land

Feature Abbreviations

ACU	Air Conditioning Unit	FH	Fire Hydrant	NP	Name Plate	SVP	Soil Vent Pipe
BB	Belisha Beacon	FP	Fence Post	PB	Post Box	TAP	Stand Pipe
BO	Bollard	FL	Flood Light	PM	Parking Meter	TCB	Telephone Box
BO(L)	Bollard (Lit)	G	Gully (with Level)	RBB	Rodent Bait Box	TEL	Telecom's Cover
BP	Boundary Post	GP	Gate Post	RE	Rodding Eye	TL	Traffic Light
BS	Bus Stop	GAS	Gas Cover	RS	Road Sign	TP	Telephone Pole
CATV	Cable TV Cover	KO	Kerb Offlet	RS(L)	Road Sign (Lit)	VP	Vent Pipe
CCTV	Close Circuit TV	LB	Lighting Beacon	RWP	Rain Water Pipe	WM	Water Meter
COL	Column	LBIN	Litter Bin	SNR	Sensor	WO	Wash Out
CP	Concrete Post	LP	Lamp Post	SP	Sign Post	WV	Water Valve
DWB	Dog Waste Bin	ME	Meter	SP(L)	Sign Post (Lit)	UC?	Unknown Cover
EL	Electric Cover	MH	Manhole	SPDC	Speed Camera	UTL	Unable to Lift
EP	Electricity Pole	MP	Marker Post	STAY	Cable Stay	Ø	Diameter
ER	Earth Rod	MEP	Metal Post	SV	Stop Valve		

Description Abbreviations

Asmd Rt	Assumed Route	Flw Bd	Flower Bed	O/H	Overhead
BkDrp	Back Drop	FW	Foul Water	OSBM	Ordnance Survey Bench Mark
Bk	Brick	GTrp	Grease Trap		
BusStKb	Bus Stop Kerb	Ht	Height	RetWall	Retaining Wall
Bldg	Building	Hg	Hedge	Rd Edg	Road Edge
CDrnKbS	Combined Drainage & Kerb System	Intcpr	Interceptor	Spd Rtr	Speed Retarder
		Lvl	Level	St	Stone
Conc	Concrete	m	Metres	STN	Station
CPit	Catch Pit	mm	Millimetres	SW	Surface Water
DrpKB	Drop Kerb	MSL	Mean Sea Level	Tac	Tactile Paving
Drn Chnl	Drainage Channel	No.	Number	Tmc	Tarmac

Level Prefix

AL	Arch Level	RL	Roof / Ridge Level	ToS	Top of Steel Level	FFL	Finished Floor Level
CL	Cover Level	SL	Soffit Level	ToW	Top of Wall Level	1st.FFL	1st Finished Floor Level
DPC	Damp Proof Course	SprL	Springing Level	SILL	Sill Level		
EL	Eaves Level	TL	Threshold Level	WL	Water Level (inc.date & Time)		
IL	Invert Level	ToC	Top of Concrete Level				
PL	Parapet Level	ToP	Top of Pipe Level				

Digital File 4391_10_2D.dwg Original Size A0

No.	Description	Date	Signed

Revisions

Drawing Status FINAL

Surveyed WM	Date 25.05.18	Scale 1:200
Drawn WM	Sheet 1 of 1	Approved CS

Client Whitbread Group Plc

Title Topographical & Utilities Survey

Project Premier Inn Uxbridge
Riverside Way
Greater London

Drawing No. 4391/10/001 Rev. -

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APPENDIX B
SITE INVESTIGATION REPORT EXTRACT

8.0 GROUND AND GROUNDWATER CONDITION

8.1 Ground Conditions

8.1.1 Summary of Ground Conditions

The ground investigation generally confirmed the published geology and identifies the strata set out in Table 8.1 below. Exploratory hole logs are included in Appendix IV.

Table 8.1 Summary of Ground Conditions Encountered

Stratum	Min Depth to Top of Strata (m)	Max Depth to Top of Strata (m)	Max Thickness (m)
Made Ground	Ground Level	Ground Level	2.00 (WS101)
Alluvium Deposits	1.70	1.80	0.20 (WS102)
Taplow Gravel Member	1.80	2.00	>2.10 (WS101) NP

*NP – *Not Proven*

8.1.2 Made Ground

Made Ground was encountered within all exploratory holes to depths of between 1.70m and 2.00mbgl and typically comprised CLAY, SAND and GRAVEL of varying proportions with gravels comprising flint, brick, concrete, wood, asphalt and metal.

No evidence of gross contamination was identified within this stratum.

8.1.3 Alluvium Deposits

Alluvium deposits were encountered within WS102 and WS103 beneath the Made Ground to depths of 2.00mbgl and comprised of firm dark grey organic CLAY with slight organic odour throughout. Sand is fine to coarse.

No evidence of gross contamination was identified within this stratum.

8.1.3 Taplow Gravel Member

The Taplow Gravel Member was encountered within all window sample borehole locations to the base of the boreholes and generally comprised medium dense to very dense greyish brown slightly clayey sandy GRAVEL. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint.

No evidence of gross contamination was identified within this stratum.

8.1.5 Lambeth Group

The underlying Lambeth Group was not encountered during the ground investigation.

Table 8.4 Summary of pH and Sulphate Data

Location	Depth (m)	pH Value	Water soluble SO4 (mg/l)	Geological Stratum	Concrete Classification
FIP101	0.30 - 0.40	8.9	180	MG	DS-1, AC1
WS102	0.50 – 0.60	9.8	290	MG	DS-1, AC1
WS102	1.20 – 1.30	8.4	170	MG	DS-1, AC1
WS103	0.20 – 0.30	9.0	90	MG	DS-1, AC1
WS102	1.80 – 1.90	7.7	50	Al	DS-1, AC1
WS102	1.90 – 2.00	8.2	50	Al	DS-1, AC1
WS102	2.50 – 3.00	8.7	140	TGF	DS-1, AC1
WS101	3.50 – 3.80	8.0	70	TGF	DS-1, AC1

MG - Made Ground, Al - Alluvium, TGF – Taplow Gravel Formation

8.1.9 Particle Size Distribution (PSD)

Selected samples were scheduled for Particle Size Distribution via the wet sieve method with the results presented in Table 8.5 below:

Table 8.5 Summary of Particle Size Distribution Test

Location	Depth (m)	Cobble (%)	Gravel (%)	Sand (%)	Silt/Clay (%)
WS101	2.00-3.00	0	91	9	0
WS103	2.00-3.00	0	82	17	1

The particle size distribution tests carried out on representative samples generally confirmed the on-site engineer’s descriptions.

8.2 Groundwater Conditions

Groundwater was encountered at depths ranging between 2.00 and 3.00mbgl during the ground investigation. During the return monitoring visits, groundwater was encountered at depths ranging from 2.00m to 2.13mbgl.

8.2.1 Permeability testing

Due to the presence of deep Made Ground with thickness ranging from 1.70 and 2.00m, and shallow groundwater with standing water observed at depths ranging from 2.12 and 2.13mbgl, it was not suitable to undertake testing.

8.3 Ground Gas

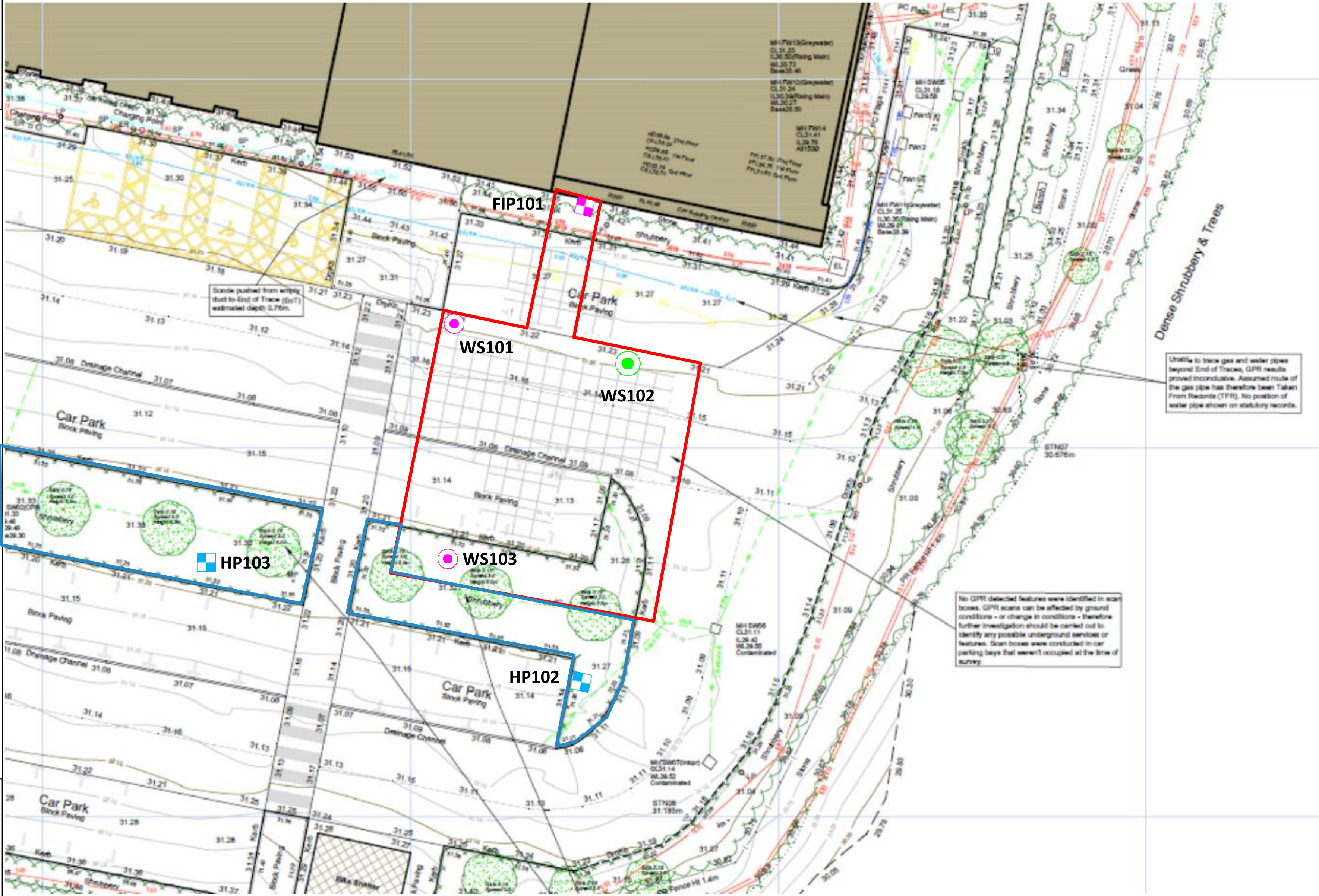
Table 8.6 Summary of ground gas and groundwater monitoring results

Date	Well	Flow (l/hr)		Low O_2 %v/v	Concentration CH_4		CH_4 Qhg l/hr	Concentration CO_2		CO_2 Qhg l/hr	Atmospheric Dynamic	Response Zone (mbgl)	Depth to Water (mbgl)	Response zone flooded?	In-Situ Volatile Reading (ppm)
		Peak	Steady		Peak %v/v	Steady %v/v		Peak %v/v	Steady %v/v						
13/06/2018	WS102	<0.1	<0.1	16.5	<0.1	<0.1	<0.0001	1.4	1.4	0.0014	Steady	1.00 - 2.00	2.13	No	10.1
20/06/2018	WS102	<0.1	<0.1	17.1	<0.1	<0.1	<0.0001	0.5	0.5	0.0005	Steady	1.00 - 2.00	2.12	No	8.9

N

KEY:

- Window sample location
- Window sample location (Installed)
- Foundation Inspection Pit location
- Hand Pit location to take samples for CBRs
- Approximate outline of proposed building extension
- Approximate outline of proposed car park extension



REC

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Job Title:	1CO104321 Premier Inn Uxbridge
Client:	Whitbread Plc
Job No:	1CO104321
Drawn By:	MR
Approved by:	TC
Notes:	Extracted from Clugston Drawing ref. 4391/10/001
Drawing Title:	1CO104321-003 Exploratory Hole Location Plan

Trial Pit Log

Project Name: Premier Inn Uxbridge	Proj. ID: 1CO104321	Easting: Northing:	Borehole No. **FIP101** Sheet 1 of 1
Location: Uxbridge	Plant: Insulated Hand Tools	Level (m AOD): Final Depth (m): 0.60	Hole Type: IP Scale: 1:10
Client: Whitbread plc	Crew: GSTL	Start Date: 04/06/2018 End Date: 04/06/2018	REC Engineer: MR

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.40			Flint gravel and cobbles over dry and friable dark grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse flint. [MADE GROUND]
					0.60			Dark grey fine to coarse grey SAND. [MADE GROUND] *...At 0.50mbgl: Warning tape.*
								End of Borehole at 0.60m

Scale: 1, 2

Remarks:
Location cleared for buried services using a Cable Avoidance Tool [CAT]. Inspection pit to expose foundations. Location terminated upon encountering services. No groundwater encountered. Location backfilled with arisings and compacted in layers upon completion.
Stability: Pit sides stable

Pit Dimensions *(m)*	
Length:	0.80
Width:	0.60
Depth:	0.60

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

Trial Pit Log

REC DELIVERING SOLUTIONS	ISO 9001 / ISO 14001 / OHSAS 18001	**Trial Pit Log**	Borehole No. **HP102** Sheet 1 of 1
Project Name: Premier Inn Uxbridge	Proj. ID: 1CO104321	Easting: Northing:	Hole Type IP
Location: Uxbridge	Plant: Insulated Hand Tools	Level (m AOD): Final Depth (m): 0.60	Scale: 1:10
Client: Whitbread plc	Crew: REC Ltd	Start Date: 04/06/2018 End Date: 04/06/2018	REC Engineer: MR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20			Dry and friable grey slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint. [MADE GROUND]
		0.40 - 0.60	B1		0.60			Brownish grey slightly clayey sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint, brick and concrete. Cobbles are angular to rounded brick and concrete. [MADE GROUND]
								End of Borehole at 0.60m

Scale: 1, 2

Remarks:
Location cleared for buried services using a Cable Avoidance Tool [CAT]. Location terminated at proposed road founding depth. No groundwater encountered. Location backfilled with arisings and compacted in layers upon completion.
Stability: Pit sides stable

Pit Dimensions (m)	
Length:	0.25
Width:	0.25
Depth:	0.60

CONCEPT LIFE SCIENCES
DELIVERING SCIENCE

Trial Pit Log

REC DELIVERING SOLUTIONS	Trial Pit Log		Borehole No. **HP103** Sheet 1 of 1
Project Name: Premier Inn Uxbridge	Proj. ID: 1CO104321	Easting: Northing:	Hole Type IP
Location: Uxbridge	Plant: Insulated Hand Tools	Level (m AOD): Final Depth (m): 0.60	Scale: 1:10
Client: Whitbread plc	Crew: REC Ltd	Start Date: 04/06/2018 End Date: 04/06/2018	REC Engineer: MR

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Dry and friable dark grey slightly gravelly sandy CLAY with abundant rootlets. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint. [MADE GROUND]
		0.40 - 0.60	B1		0.30			Brownish grey slightly clayey sandy GRAVEL. Sand is fine to coarse Gravel is angular to rounded fine to coarse flint, brick, concrete and metal fragments. [MADE GROUND]
					0.60			End of Borehole at 0.60m

Depth scale: 1, 2

Remarks:
Location cleared for buried services using a Cable Avoidance Tool [CAT]. Location terminated at proposed road founding depth. No groundwater encountered. Location backfilled with arisings and compacted in layers upon completion.
Stability: Pit sides stable

Pit Dimensions *(m)*	
Length:	0.25
Width:	0.25
Depth:	0.60

CONCEPT LIFE SCIENCES DELIVERING SCIENCE

Borehole Log

Borehole No.	WS101
Sheet	1 of 1
Project Name:	Premier Inn Uxbridge
Proj. ID:	1CO104321
Easting:	
Northing:	
Hole Type	WS
Location:	Uxbridge
Plant:	Dando Terrier
Level (m AOD):	
Final Depth (m):	4.10
Scale:	1:30
Client:	Whitbread plc
Crew:	GSTL
Start Date:	04/06/2018
End Date:	04/06/2018
REC Engineer:	MR

Sample and In Situ Testing

Depth (m)	Type	Results
0.20 - 0.30	ES1	
0.70 - 0.80	ES2	
1.20 - 1.65	D1	
1.20	SPT	N=10 (2,2/3,3,2,2)
1.50		HVP=40
1.70 - 1.80	D2	
2.00	SPT	N=12 (2,2/1,2,4,5)
2.60 - 3.00	ES3	
3.00 - 3.80	B1	
3.00	SPT	N=21 (2,3/5,5,5,6)
3.50 - 3.80	D3	
3.80	SPT	N=50 (10,11/50 for 225mm)

Water Strikes: water strike indicated at approx. 2.80–3.00 m.

Depth (m)	Level (m)	Stratum Description
0.05		Asphalt [MADE GROUND]
0.10		Concrete [MADE GROUND]
0.40		Brown slightly clayey sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is very angular to rounded fine to coarse flint, brick, concrete, asphalt and wood. Cobbles are angular to rounded flint, brick and concrete. [MADE GROUND]
0.60		Light brown sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse flint, brick and concrete. [MADE GROUND]
0.90		Dark grey slightly sandy clayey GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to rounded, fine to coarse flint, brick, and concrete. Cobbles are subangular to subrounded brick. [MADE GROUND]
2.00		Soft dark grey slightly sandy gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint brick and concrete. Cobbles are subangular brick. [MADE GROUND] ..*At 0.90mbgl: geotextile membrane*
2.60		NO RECOVERY
4.10		Medium dense to very dense light brown sandy GRAVEL. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint. [TAPLOW GRAVEL MEMBER]

End of Borehole at 4.10m

Remarks:
Location cleared for buried services using a Cable Avoidance Tool [CAT]. Inspection pit advanced to 1.20mbgl to clear for buried services. Location terminated following SPT refusal at 4.10mbgl. Water strike at 3.00mbgl rising to 2.80mbgl after 20 minutes. Borehole collapsed to 2.00mbgl upon backfilling. Location backfilled with arisings and made safe upon completion.

CONCEPT LIFE SCIENCES

Borehole Log

Project Name: Premier Inn Uxbridge	Proj. ID: 1CO104321	Easting: Northing:	Borehole No. WS102 Sheet 1 of 1 Hole Type: WS
Location: Uxbridge	Plant: Dando Terrier	Level (m AOD): Final Depth (m): 3.00	Scale: 1:30
Client: Whitbread plc	Crew: GSTL	Start Date: 04/06/2018 End Date: 04/06/2018	REC Engineer: MR

Sample Depth (m)	Type	Results	Depth (m)	Level (m)	Stratum Description
			0.05		Asphalt [MADE GROUND]
			0.10		Concrete [MADE GROUND]
0.50 - 0.60	ES1		0.40		Greyish brown slightly clayey sandy GRAVEL. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint, brick, concrete and asphalt. [MADE GROUND]
1.20 - 1.30 1.20	ES2 SPT	N=10 (3,1/3,3,2,2)	1.80		Medium dense brown slightly sandy clayey GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint, brick and concrete. Cobbles are angular to subrounded brick and concrete. [MADE GROUND]
1.80 - 1.90 1.85	D1	HVP=72	1.90		Firm dark grey sandy organic CLAY with slight organic odour throughout. Sand is fine to coarse. [ALLUVIUM]
1.90 - 2.00 2.00	D2 SPT	N=21 (4,4/5,6,5,5)	2.00		Grey slightly gravelly clayey SAND. Sand is fine to coarse. Gravel is subangular to rounded flint. [ALLUVIUM]
			2.50		NO RECOVERY
2.50 - 3.00	D3		3.00		Very dense light brown sandy GRAVEL. Sand is fine to coarse. Gravel is angular fine to coarse flint. [TAPLOW GRAVEL MEMBER]
3.00	SPT	N=50 (8,8/10,11,14,15)			End of Borehole at 3.00m

Remarks:
Location cleared for buried services using a Cable Avoidance Tool [CAT]. Inspection pit advanced to 1.20mbgl to clear for buried services. Location terminated following SPT refusal at 3.00mbgl. Water strike at 2.00mbgl rising to 1.80mbgl after 20 minutes. Borehole collapsed to 2.25mbgl upon backfilling. Location installed and fitted with a flush cover set in concrete upon completion

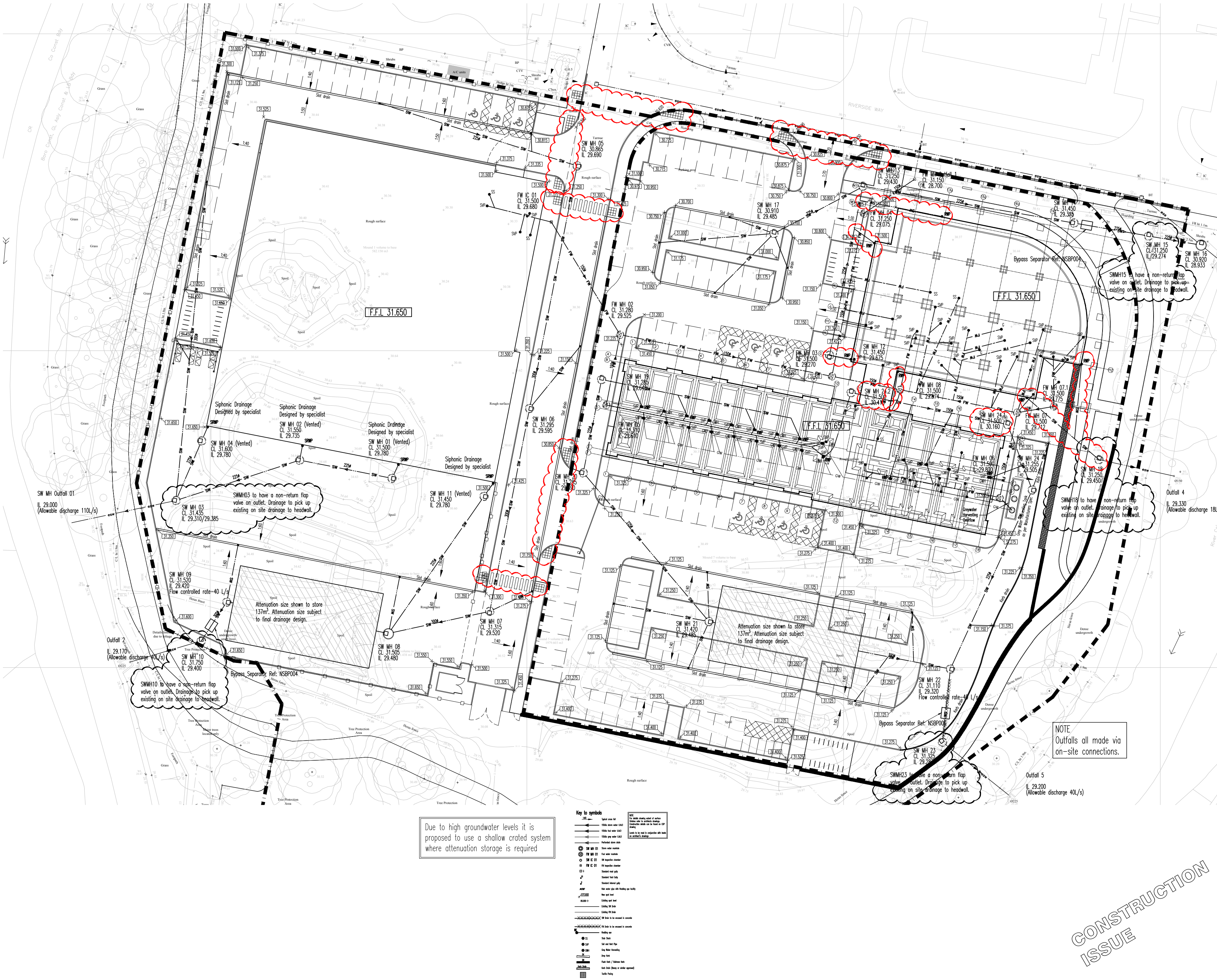
Borehole Log

Project Name: Premier Inn Uxbridge	Proj. ID: 1CO104321	Easting: Northing:	Borehole No. WS103 Sheet 1 of 1 Hole Type: WS
Location: Uxbridge	Plant: Dando Terrier	Level (m AOD): Final Depth (m): 3.00	Scale: 1:30
Client: Whitbread plc	Crew: GSTL	Start Date: 04/06/2018 End Date: 04/06/2018	REC Engineer: MR

Well	Water Strikes	Sample Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.00 - 0.30	ES1		0.30			Dry and friable grey slightly gravelly sandy CLAY with high rootlet content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint. [MADE GROUND]
		0.40 - 0.50	ES2		1.70			Medium dense greyish brown slightly clayey sandy GRAVEL with medium cobble content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint, brick and concrete. Cobbles are angular to rounded brick, concrete and ceramic. [MADE GROUND]
		1.20 - 1.30	D1					*...Below 1.20mbgl: Cobbles absent.*
		1.20	SPT	N=14 (2,2/3,3,4,4)				
		1.80		HVP=58	1.80			Firm dark grey organic CLAY. Organic odour throughout. [ALLUVIUM]
		1.90 - 2.00	D2					
	▼	2.00 - 3.00	B1		3.00			Medium dense to very dense greyish brown slightly clayey sandy GRAVEL. Sand is fine to coarse. Gravel is angular to rounded fine to coarse flint. [TAPLOW GRAVEL MEMBER]
		2.00	SPT	N=20 (3,5/5,5,5,5)				
		3.00	SPT	N=50 (8,11/50 for 150mm)				End of Borehole at 3.00m

Remarks:
Location cleared for buried services using a Cable Avoidance Tool [CAT]. Inspection pit advanced to 1.20mbgl to clear for buried services. Location terminated following SPT refusal at 3.00mbgl. Water strike at 2.00mbgl remaining static after 20 minutes. Borehole collapsed to 1.80mbgl upon backfilling. Location backfilled with arisings and made safe upon completion.

APPENDIX C
AS-BUILT DRAWING



RESIDUAL RISK REGISTER		
No.	Description of Hazard	Control Measures
	Standard Construction	

Topographical survey as provided by Greenhatch Group (Drg No. 19482_OGL Rev 3)

DRAINAGE

These drawings are to be read in conjunction with Complete Design Partnership's Specifications.

NOTE:

Where existing services are present, these may require relocation/protection during and post construction. Where these are encountered the Engineer/Architect should be contacted to confirm action to be taken. Where existing sockets, gullies etc which will not be used these should be adequately capped/sealed. The existing pipe runs where shown should be verified on site before any work is carried (runs shown are approximate positions only).

ALL DRAINAGE TO BE MIN 150MM DIA UNLESS NOTED OTHERWISE

1. For typical construction details see details provided, where these do not exist please contact the Engineer/Architect for clarification.
2. All foul and storm water drains which are not to be adopted as public sewers under a section 104 agreement must be constructed in accordance with the Building Regulation B.S. 8301:1985 and where appropriate the relevant Agreement certificates.
3. Inspection chambers on private drains are to be pre-formed polypropylene or clay-ware depending on location, depth and number of connections. Where the above criteria do not apply, manholes should be constructed to Sewers for Adoption specification.
4. Drains are to be constructed using uPVC/clay pipes bedded and back-filled in accordance with the manufacturer's instructions and with the correct capabilities to meet the performance requirements of their locations.
5. All new building drainage to be laid at a minimum gradient of:
   100mm (FW) 1 in 40 150mm (FW) 1 in 60
   (SW) 1 in 60 (SW) 1 in 80
   unless otherwise shown.
6. Sewers and drains of different diameters should be laid soffit to soffit.
7. Rainwater downpipes to be connected direct to drain via adapter, removable to permit access for rodding, where the connection is to be via an existing downpipe and below ground systems. All pipe work and joints are to be retained where possible, enovated/upgraded as required.
8. Rainwater downpipe positions to be checked against Architects drawings to ensure compatibility, or existing whichever is required.
9. Positions of yard and manhole gullies are nominal and may be adjusted on site, providing correct falls are maintained.
10. All gully gratings and manhole covers in drives and parking areas should be of sufficient strength to withstand vehicular loading. Where pipe depth is less than 1.2m below the roadway they should be concrete surround as detailed.
11. Where back inlet gullies are used they should be roddable and fitted with a water trap.
12. Lintels or sleeves are to be provided for drains passing through foundation brickwork.
13. Cover levels shown are approx. Covers should be adjusted to suit surrounding finish levels.
14. Design of drainage channels where shown is indicative only. Detail design shall be undertaken by channel manufacturer/supplier, design and supporting calculations will be supplied to the Engineer for approval.
15. The Contractor is to protect existing buried pipes (particularly shallow pipes) and tree roots from damage caused by construction plant.

MANHOLE SCHEDULE

Manhole reference	Size	Cover level	Cover type	Pipe out (size)	Pipe out (I.L)	Pipe in (size)	Pipe in (I.L)	Comments
SW MH 01	1200Ø	31.500	E600	225Ø	29.780	TBC	TBC	VENTED
SW MH 02	1200Ø	31.550	E600	225Ø	29.735	225Ø	29.735	VENTED
SW MH 03	1200Ø	31.435	E600	300Ø	29.310	300Ø	29.310	
						225Ø	29.385	
SW MH 04	1200Ø	31.600	E600	225Ø	29.780	TBC	TBC	VENTED
SW MH 05	1200Ø	30.865	D400	300Ø	29.690			
SW MH 06	1200Ø	31.295	D400	300Ø	29.595	300Ø	29.595	
SW MH 07	1200Ø	31.315	D400	300Ø	29.520	300Ø	29.520	
SW MH 08	1500Ø	31.505	E600	300Ø	29.480	300Ø	29.480	
						225Ø	29.555	
SW MH 09	1200Ø	31.520	E600	300Ø	29.420	300Ø	29.420	TO MANUFACTURER SPEC
SW MH 10	1200Ø	31.750	B125	225Ø	29.400	300Ø	29.400	EXISTING OUTFALL
SW MH 11	1200Ø	31.450	E600	225Ø	29.780	TBC	TBC	VENTED
SW MH 12	1200Ø	31.450	B125	225Ø	29.675			
SW MH 13	1200Ø	31.250	B125	225Ø	29.430	225Ø	29.430	
SW MH 14	1200Ø	31.450	B125	225Ø	29.315	225Ø	29.315	
SW MH 15	1200Ø	31.250	B125	225Ø	29.274	225Ø	29.274	
SW MH 16	1500Ø	30.920	B125	600Ø	28.933	225Ø	28.933	EXISTING OUTFALL
SW MH 17	1200Ø	30.910	C250	225Ø	29.485			
SW MH 18	1200Ø	31.250	B125	150Ø	29.450			EXISTING OUTFALL
SW MH 19	1200Ø	31.285	D400	225Ø	29.640			
SW MH 20	1200Ø	31.285	D400	225Ø	29.590	225Ø	29.590	
SW MH 21	1200Ø	31.420	B125	300Ø	29.410	225Ø	29.485	
SW MH 22	1200Ø	31.110	D400	300Ø	29.320	300Ø	29.320	TO MANUFACTURER SPEC
						225Ø	29.395	
SW MH 23	1200Ø	31.325	B125	225Ø	29.287	300Ø	29.287	EXISTING OUTFALL
SW MH 24.2	1200Ø	31.500	B125	150Ø	30.415	150Ø	30.415	
SW MH 24.1	1200Ø	31.500	B125	150Ø	30.160	150Ø	30.160	
SW MH 24	1200Ø	31.325	B125	225Ø	29.287	300Ø	29.287	

MANHOLE SCHEDULE

Manhole reference	Size	Cover level	Cover type	Pipe out (size)	Pipe out (I.L)	Pipe in (size)	Pipe in (I.L)	Comments
FW IC 01	450Ø	31.500	B125	150Ø	29.680			
FW MH 02	1200Ø	31.280	D400	150Ø	29.525	150Ø	29.525	
FW MH 03	1200Ø	31.500	B125	150Ø	29.270	150Ø	29.270	
FW MH 04	1200Ø	31.250	C250	150Ø	29.075	150Ø	29.075	
FW MH 05	1200Ø	31.310	D400	150Ø	29.610	150Ø	29.610	
FW MH 06	1200Ø	31.500	B125	150Ø	29.800	150Ø	29.800	
FW MH 07	1200Ø	31.500	B125	150Ø	29.712	150Ø	29.712	
FW MH 08	1200Ø	31.500	B125	150Ø	29.574	150Ø	29.574	
FW MH 07.1	1200Ø	31.500	B125	150Ø	29.775	150Ø	29.775	

DO NOT SCALE DRAWING
Dimensions provided are indicative only, and should be confirmed and read in conjunction with the Architect's construction drawings at such times as they are available, and/or from site measurement.
All setting out to be in accordance with the Architect's drawings, any ambiguities to be raised prior to construction.

Rev	By	Details	Date
C7	AM	External RWP's picked up, internal RWP's removed, slight SW amends Tactiles added.	04.02.15
C6	AM	Manhole Schedule amended	03.02.15
C5	AM	Internal drainage amended to suit revised layouts	02.02.15
C4	AM	Internal drainage amended to suit revised layouts	28.01.15
C3	AM	Greywater Harvesting added & Internal drainage amended to suit latest foundations	22.01.15
C2	AM	Notes added	07.01.15
C1	AM	Construction Issue, MH's renumbered & mh schedule added	22.12.14

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Client: McLAREN

Project: Riverside Way, Uxbridge

Drawing Title: General Arrangement External works & Drainage Layout

Date: June 2014
Scale: 1:200 @ A0
Drawn: AMG
Chkd:

Drawing No. 14-6049-001

Issue Rev. C 7

(P=Preliminary, T=Tender, C=Construction, R=Record)

APPENDIX D
PROPOSED SITE PLAN & FLOOR PLANS

01 Proposed Site Plan
Scale: 1:500

Notes:

	Proposed
Parking Total:	139
Extension GEA Total:	2626
Extension GIA Total:	2416
Existing Rooms:	80
Proposed Rooms:	72
Total Rooms:	150

Legend:

- Title Boundary
- Existing Premier Inn
- Proposed Work / Extension
- Existing tree to be retained
- Proposed native tree

Refer to Landscape Architects drawing 1207-MP-01 for the full landscaping proposal

Rev	Date	Description	By	Chk
E	23/09/24	Design update	AW	AB
D	16/09/2024	11no cycle stands added.	AB	
C	11/09/2024	Landscaping updated following landscape architects revides proposal.	AB	

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Client
WHITBREAD GROUP PLC

Project
PREMIER INN LONDON UXBRIDGE
500 RIVERSIDE WAY
UXBRIDGE, UB8 2YF

Drawing
Proposed Site Plan

Scale	Date	Drawn	Checked
1:500@A3	22/08/24	AW	AB

Drawing No.: **6262-P- 010**
Revision: **E**

Status
PLANNING

01 Proposed Ground Floor
Scale: 1:250

0 10 15 20 25 M

N

Legend:

- Existing Retained
- Proposed Works

Rev	Date	Description	By	Chk
A	23/09/24	Design update	AW	AB

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Drawing
Proposed Ground Floor Plan

Scale	Date	Drawn	Checked
1:250@A3	02/09/24	AW	AB

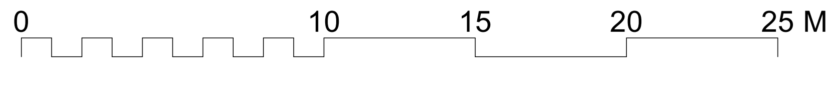
Drawing No. 6262-P- 110 **Revision** A

Status
PLANNING

Legend:

- Existing Retained
- Proposed Works

01 Proposed First Floor Plan
Scale: 1:250



Rev Date Description By Chk

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Drawing
Proposed First Floor Plan

Scale	Date	Drawn	Checked
1:250@A3	02/09/24	AW	AB

Drawing No. Revision
6262-P- 111

Status
PLANNING

N

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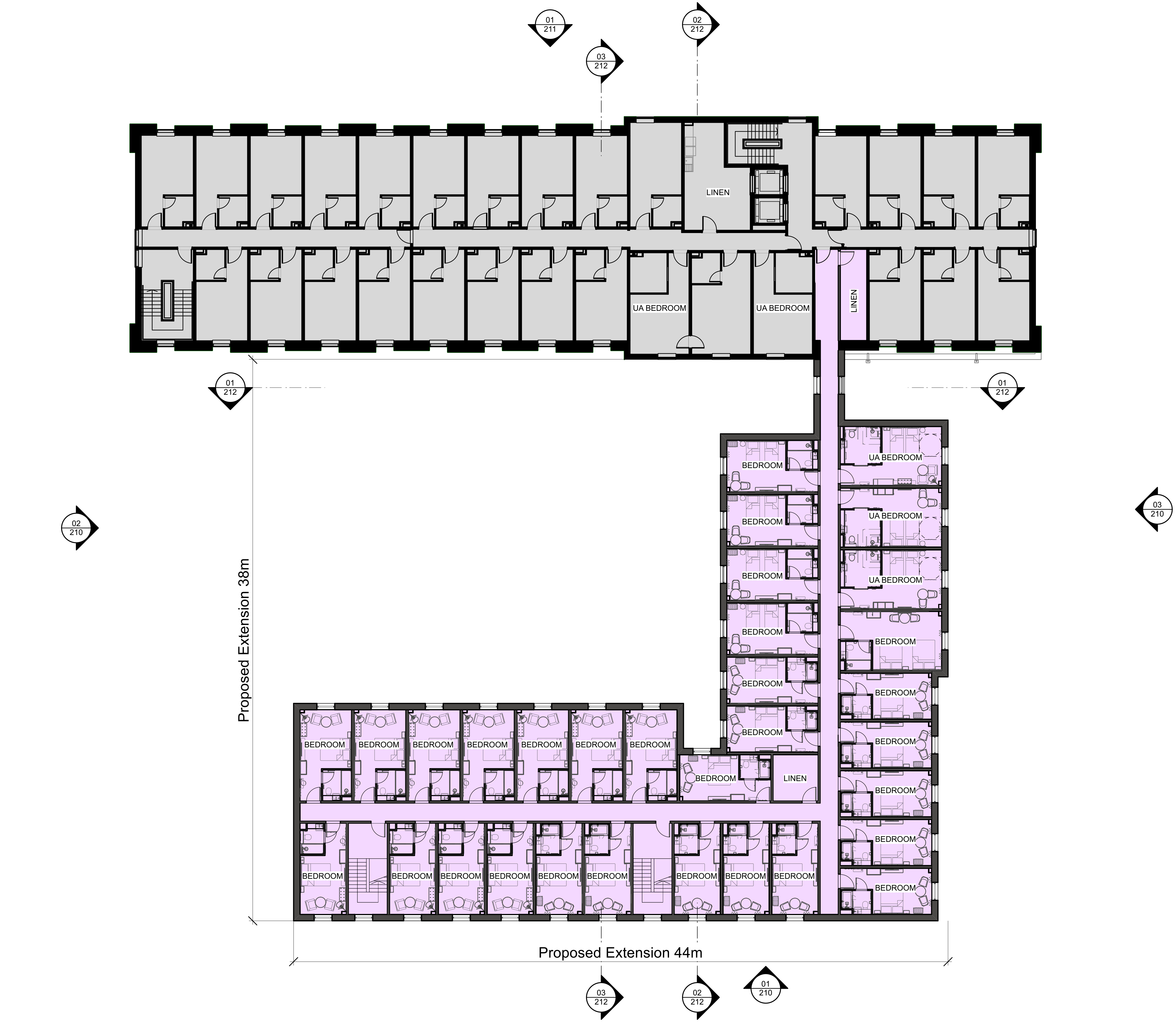
Legend:

- Existing Retained
- Proposed Works



01 Proposed Second Floor Plan
Scale: 1:250

0 10 15 20 25 M

Rev	Date	Description	By	Chk

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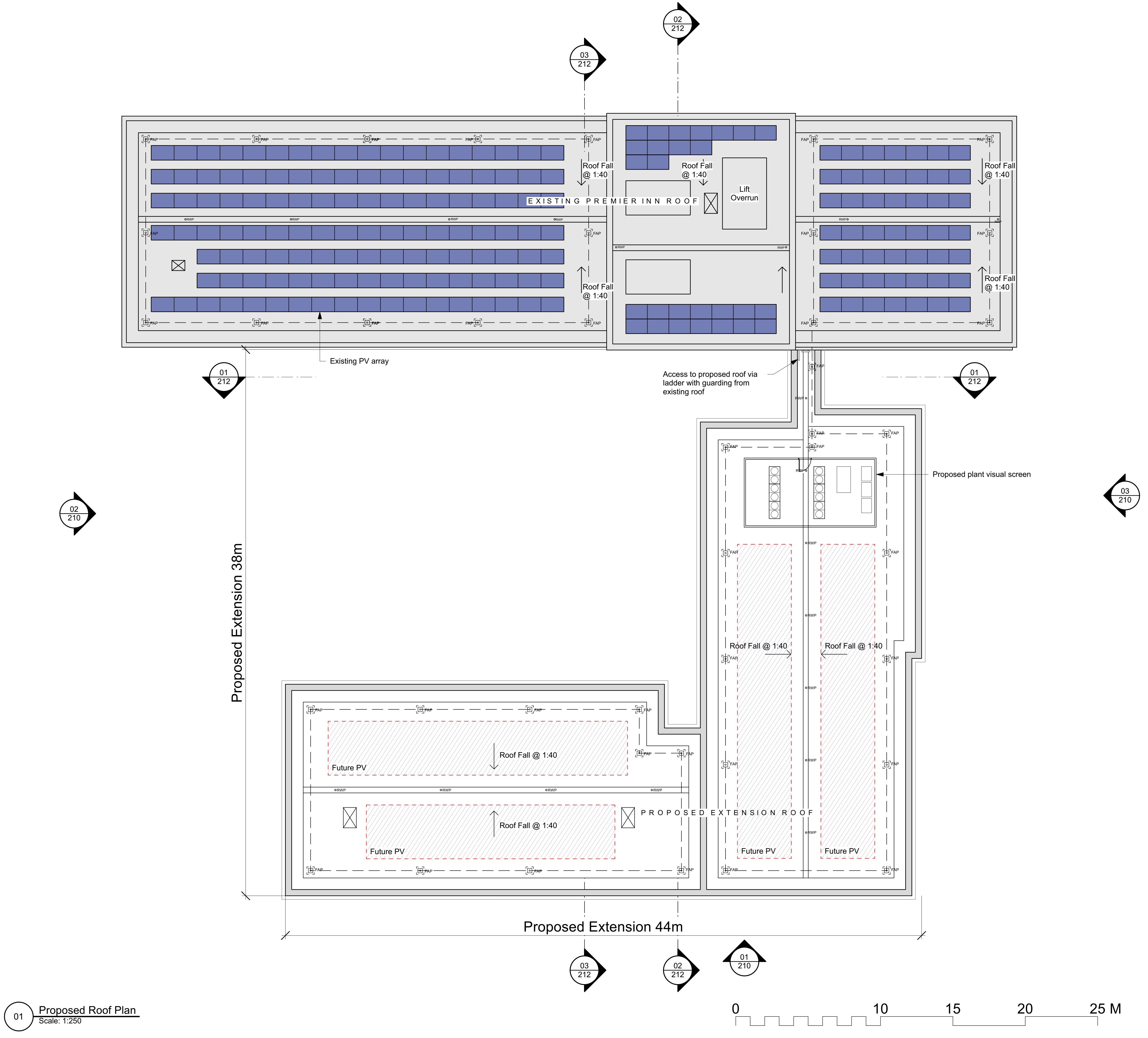
Drawing
Proposed Second Floor Plan

Scale	Date	Drawn	Checked
1:250@A3	02/09/24	AW	AB

Drawing No. **Revision**
6262-P- 112

Status
PLANNING



01 Proposed Roof Plan
Scale: 1:250

Rev	Date	Description	By	Chk
A	23/09/24	Design update	AW	AB

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Drawing
Proposed Roof Plan

Scale	Date	Drawn	Checked
1:250@A3	02/09/24	AW	AB

Drawing No. 6262-P- 113 **Revision** A

Status PLANNING