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Status Park, Nobel Drive, Harlington

Drainage Statement

On behalf of **MBH Heathrow Ltd**

Project Ref: 44303/2001 | Rev 2 | Date: December 2018

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This report has been prepared by Peter Brett Associates LLP ('PBA') on behalf of its client to whom this report is addressed ('Client') in connection with the project described in this report and takes into account the Client's particular instructions and requirements. This report was prepared in accordance with the professional services appointment under which PBA was appointed by its Client. This report is not intended for and should not be relied on by any third party (i.e. parties other than the Client). PBA accepts no duty or responsibility (including in negligence) to any party other than the Client and disclaims all liability of any nature whatsoever to any such party in respect of this report.

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1 Introduction

1.1 Scope of the Report

- 1.1.1 Peter Brett Associates LLP (PBA), now part of Stantec, has prepared this Drainage Statement on behalf of MBH Heathrow Ltd to provide an outline drainage strategy for a 5 storey, 140-unit hotel development in support of a planning application.
- 1.1.2 The site covers an area of 0.33 hectares (ha) of brownfield land, currently used for car parking purposes at Status Park, Nobel Drive, Harlington, UB3 5EY.
- 1.1.3 The findings of this Drainage Statement are based on data available at the time of the study, and on a high-level assessment that has been undertaken to date. The findings of this Drainage Statement may be subject to change following receipt of further data supplied by the statutory authorities.
- 1.1.4 An outline surface water and foul water drainage strategy has been developed which is presented within this report alongside a high level flood risk review of the site.
- 1.1.5 The site is located within Flood Zone 1 and is less than 1 hectare, and therefore an FRA is not required for planning, which has been confirmed through pre-application discussions with the Local Planning Authority (LPA) in September 2018.

1.2 Planning Policy Context

National Policy

- 1.2.1 The National Planning Policy Framework (NPPF) details current national planning policy for flood risk in England. The NPPF has strict tests to protect people and property from flooding which all local planning authorities are expected to follow. The accompanying Planning Practice Guidance (PPG) to the NPPF advises on how planning can take account of the risks associated with flooding and coastal change.
- 1.2.2 The EA Flood Maps are used to assign a flood risk classification to all land throughout England with PPG defining the vulnerability of development and land use.
- 1.2.3 PPG Table 3 contains a table detailing appropriate development within each of the flood zones based on the vulnerability classification in addition to further planning requirements (e.g. the Sequential and Exception Test) to assess if the development is at an acceptable risk of flooding.
- 1.2.4 PPG requires that climate change is taken into account when assessing flood risk and that appropriate measures are included within the development's design.

Regional Policy

London Plan

- 1.2.5 The drainage strategy has been prepared in accordance with The London Plan (consolidated with alteration since 2011) (Greater London Authority, March 2016) which provides the spatial development strategy for Greater London. The relevant policies are:

Policy 5.12 (Flood Risk Management)

- Requires the development to comply with the London Plan and supplementary guidance (listed below), the Thames Estuary 2100 (EA, 2012 and relevant Catchment Flood Management Plans.

Policy 5.13 (Sustainable Drainage)

- Requires sustainable urban drainage systems (SUDS) to be used unless there are practical reasons for not doing so. The importance of controlling surface water runoff in order of priority is set by the policy.

1.2.6 Guidance is also provided within Sustainable Design and Construction – The London Plan Supplementary Planning Guidance (Greater London Authority, 2014):

Paragraph 3.4.8 (Flooding)

- Requires the development to restrict the rate of runoff and attenuate surface water runoff onsite.

Paragraph 3.4.10 (Flooding)

- Sets a maximum runoff of three times the equivalent greenfield rate for previously developed sites.

1.2.7 The **Draft New London Plan** (published November 2017 proposed to be finalised for 2019/2020) amends some of the previous recommendations with respect to flood risk and drainage. Relevant policies are listed below:

Policy SI12 Flood Risk Management

- *Current and expected flood risk from all sources across London should be managed in a sustainable and cost effective way in collaboration with the Environment Agency, the Lead Local Flood Authorities, developers and infrastructure providers.*
- *Development Plans should use the Mayor's Regional Flood Risk Appraisal and their Strategic Flood Risk Assessment as well as Surface Water Management Plan, where necessary, to identify areas where particular flood risk issues exist and develop actions and policy approaches aimed at reducing these risks. Boroughs should co-operate and jointly address cross-boundary flood risk issues including with authorities outside London.*
- *Development proposals which require specific flood risk assessments should ensure that flood risk is minimised and mitigated, and that residual risk is addressed. This should include, where possible, making space for water and aiming for development to be set back from the banks of watercourses.*
- *Development Plans and development proposals should contribute to the delivery of the measures set out in Thames Estuary 2100 Plan. The Mayor will work with the Environment Agency and relevant local planning authorities, including authorities outside London, to safeguard an appropriate location for a new Thames Barrier.*
- *Development proposals for utility services should be designed to remain operational under flood conditions and buildings should be designed for quick recovery following a flood.*
- *Development proposals adjacent to flood defences will be required to protect the integrity of flood defences and allow access for future maintenance and upgrading. Where possible, development proposals should set permanent built development back from flood defences to allow for any foreseeable future upgrades.*

Policy SI13 Sustainable Drainage

- *Amends the drainage hierarchy to introduce blue and green roofs as options for above ground attenuation and rainwater harvesting. This policy recommends the refusal of impermeable paving where appropriate, including on small surfaces such as front gardens and driveways.*

Local Policy

- 1.2.8 Relevant local planning policies for London Borough of Hillingdon have been assessed. Hillingdon Local Plan: Part 1 – Strategic Policies (Adopted November 2012): ‘Core Policy 8 Environmental Improvements’ presents the following key policies:

Policy EM1: Climate Change Adaptation and Mitigation

The Council will ensure that climate change mitigation is addressed at every stage of the development process by:

- *Locating and designing development to minimise the probability and impacts of flooding.*
- *Giving preference to development of previously developed land to avoid the loss of further green areas.*
- *Promoting the use of living walls and roofs, alongside sustainable forms of drainage to manage surface water run-off and increase the amount of carbon sinks.*
- *Promoting the inclusion of passive design measures to reduce the impacts of urban heat effects.*

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 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.*

2 Stakeholder Consultation

LLFA

- 2.1.1 A data request has been issued to Hillingdon Council (HC) in their role as Lead Local Flood Authority (LLFA). The LLFA responded to this request on 26.11.18 which is included within **Appendix C**.

Thames Water Utilities Limited (TWUL)

- 2.1.2 A pre-development enquiry has been issued to TWUL to confirm the sewerage network in the area has capacity for the proposed flows. A response was received from TWUL on 10.12.18 which confirmed sufficient foul sewerage capacity was present to serve the development. In regard to surface water discharge TWUL's response stated that 'If you agree and adhere to Local Authority stipulation then TWUL will be able to accommodate that agreed discharge'. TWUL's response is included within **Appendix C**.

3 Site Overview

3.1 Site Description

3.1.1 A site location plan is presented below (**Figure 3.1**) produced by ColladoCollins Architects.

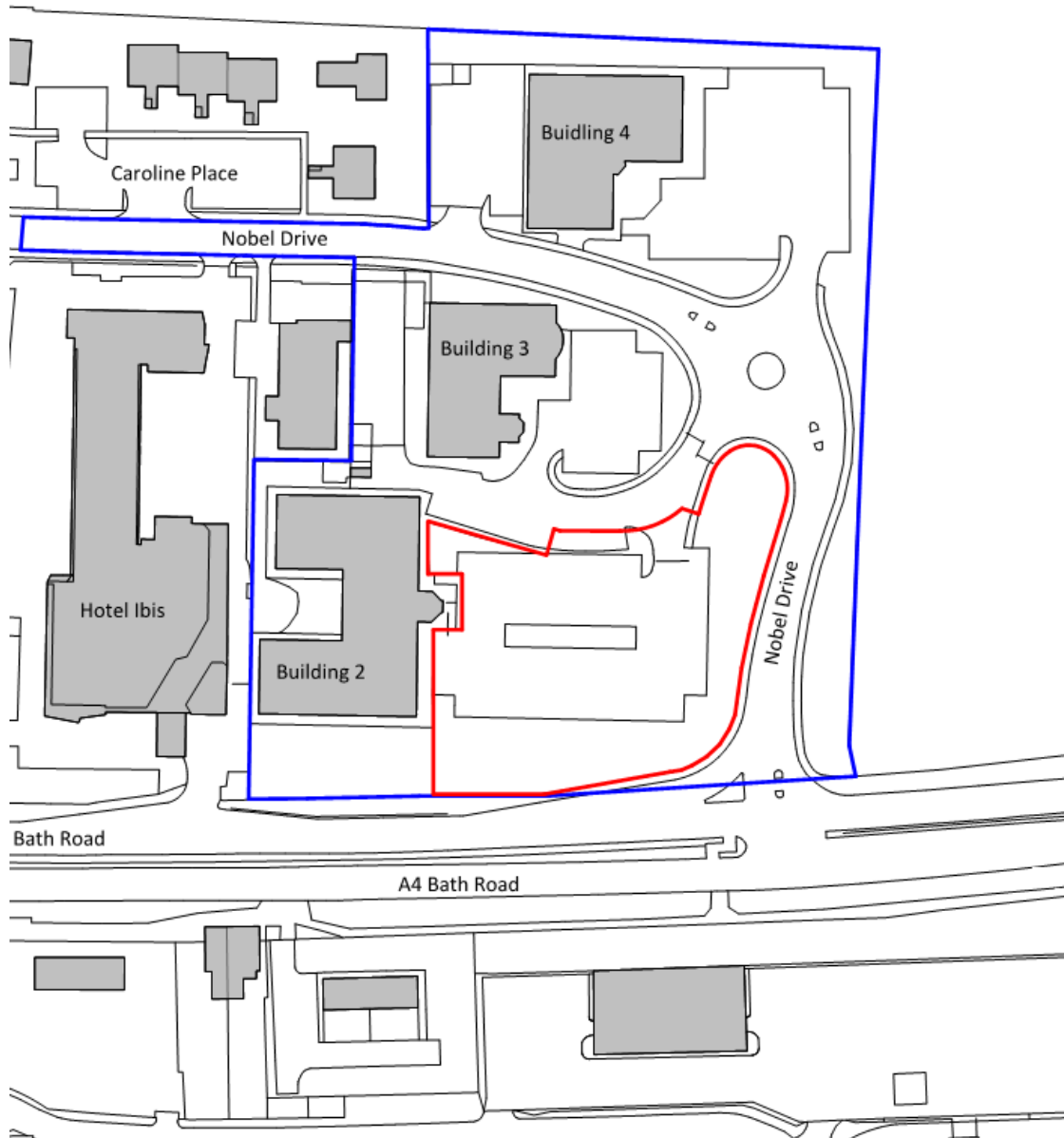


Figure 3.1 Site Location Plan

(ColladoCollins Architects' proposed site plan (E0-001_P6_Site Plan))

3.1.2 The current development proposals are for a 140 bed hotel provided over 5 floors, with a plan area of approximately 885m². The Architect's (ColladoCollins) proposed layout is shown in **Figure 3.2** and included within **Appendix B**.

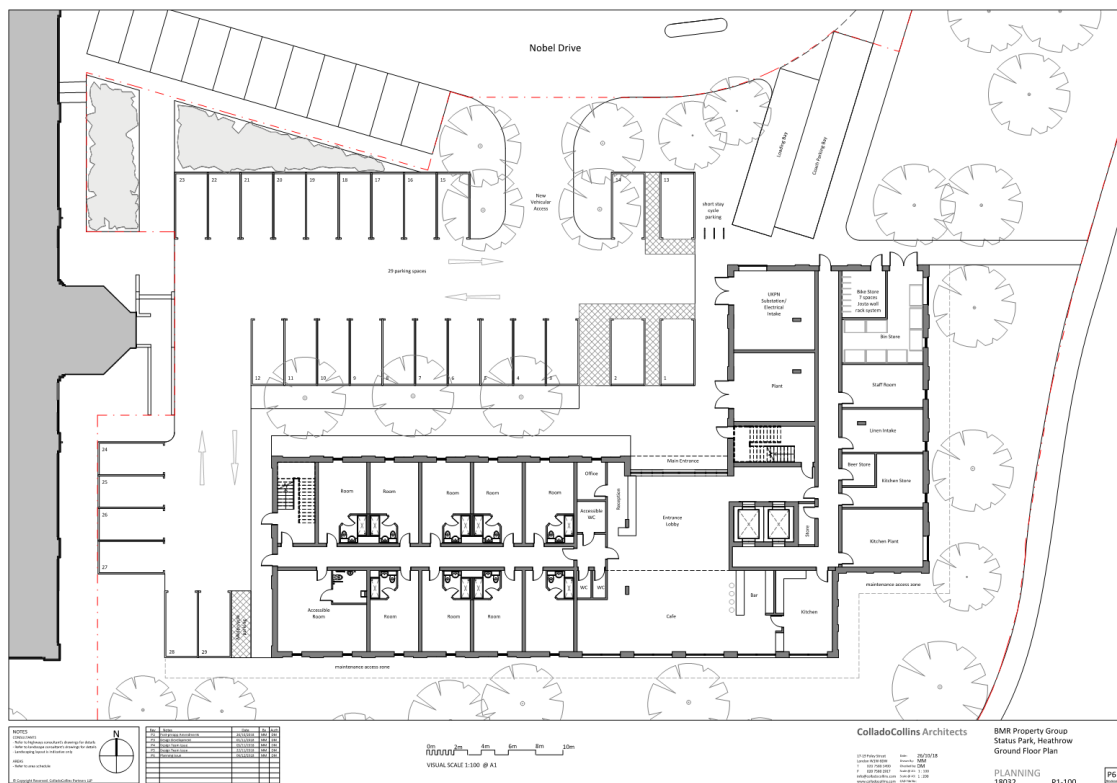


Figure 3.2 Proposed Ground Floor Plan

(ColladoCollins Architects' proposed Ground Floor Plan (P1-100_P6))

3.2 Hydrological Setting

3.2.1 A review of Ordnance Survey (OS) mapping indicates that the River Crane, an Environment Agency (EA) defined 'Main River' is located approximately 750m to the east of the site. 'Ordinary Watercourse' named Frogs Ditch is also located approximately 700m to the east. Farmland is located immediately to the north and east of the site, which is likely to be drained by land drains, draining to a local watercourse. A balancing pond is also identified on OS mapping approximately 800m to the north of the site.

3.3 Topography

3.3.1 A topographical survey of the site was undertaken by NGM Surveys in March 2018 and provides a 2-dimensional drawing of the site's existing features.

3.3.2 The topographic survey has been undertaken to a local coordinate system (X and Y) and a local level system (Z). At the next design stage, it is advised that this topographic survey is updated to tie the survey's 'local levels' into the Ordnance Newlyn Datum levels which provide a level datum for much of the UK and will allow the site's exact positioning and levels to be tied into the surrounding area.

3.3.3 The topographical survey indicates that ground levels generally fall towards the north-east towards south-west.

3.3.4 Levels fall approximately 0.5m from the north of the site to the south, and 0.5m from the east of the site to the west. The southern and eastern sides of the site are boundary by a low earth embankment approximately 1.0m above the existing carparks level.

3.4 Geology and Hydrogeology

- 3.4.1 A review of the 1:50,000 scale British Geological Survey (BGS) online digital viewer indicates that the site is underlain by bedrock geology of the 'London Clay Formation' comprising of Clay, Silt and Sand. This is classified as an unproductive stratum by the EA.
- 3.4.2 A review of the 1:50,000 scale BGS online digital viewer indicates that the site is underlain by superficial deposits of the 'Langley Silt Member' comprising of Clay and Silt. Farmland immediately to the north and east of the site is underlain by superficial deposits of the 'Taplow Gravel Member' comprising of Sand and Gravel. The 'Langley Silt Member' superficial deposits are classified as an unproductive Stratum by the EA. The 'Taplow Gravel Member' superficial deposits which are located to the north and east of the site are classified as a Principal Aquifer by the EA.
- 3.4.3 Borehole data available on the BGS website undertaken within the same superficial deposits as the site suggest that the groundwater is located at approximately 3.0m, although this information is dated and it is recommended that site investigation (SI) is undertaken post planning.
- 3.4.4 The National Soil Resources Institute (NSRI) Soilscape viewer indicates that the site is situated on 'freely draining slightly acid loamy soils'.
- 3.4.5 The site is not located within an EA Groundwater Source Protection Zone (SPZ).

4 Flood Risk Overview

4.1 Online Flood Maps

4.1.1 Based on the information reviewed at the time of writing, this section sets out a high-level review of each potential source of flood risk which may pose a development constraint, including discussion of any further assessment which may be required.

Fluvial/Tidal Flood Risk

4.1.2 The online Flood Map for Planning indicates that the site is located within Flood Zone 1 defined as having less than a 1 in 1000 (0.1%) Annual Probability of flooding from rivers and the sea.

4.1.3 The River Crane is the nearest EA defined 'Main River' located approximately 750m to the east of the site.

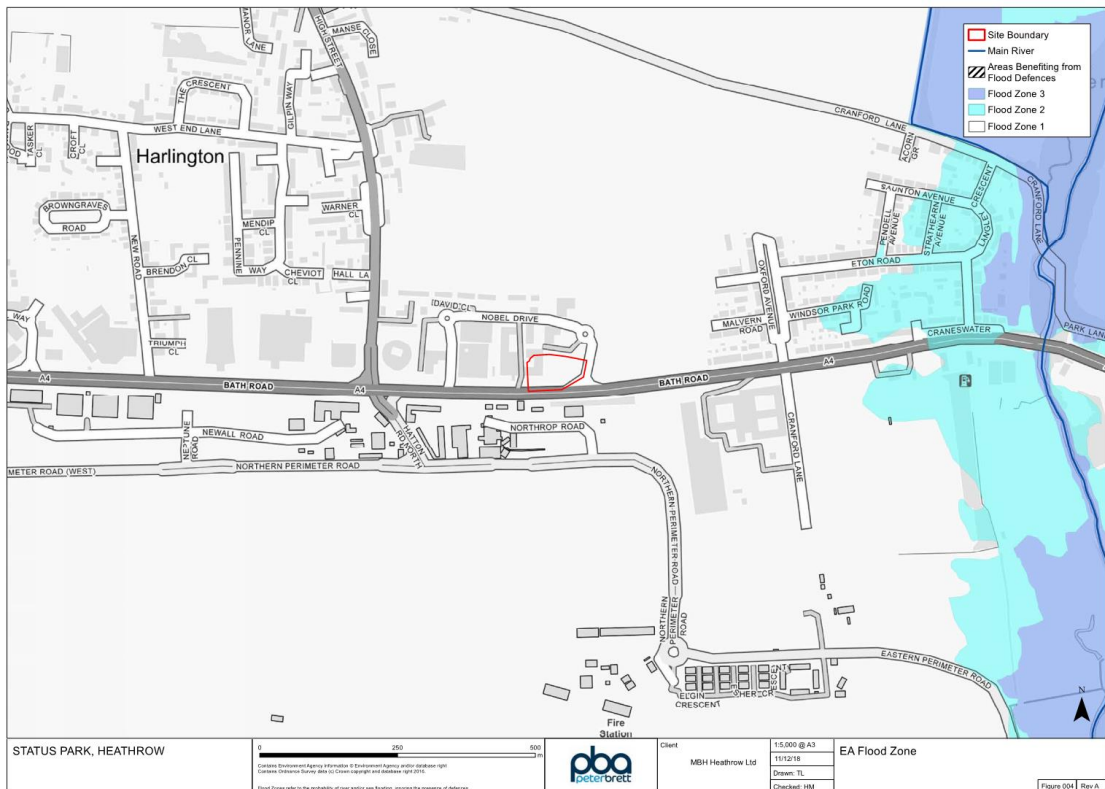


Figure 4.1 Extract from the online Flood Map for Planning

Contains Environment Agency Information © Environment Agency and/or database right

Contains Ordnance Survey data © Crown Copyright and database right 2016

Surface Water Flood Risk

4.1.4 The online Risk of Flooding from Surface Water map indicates that the majority of the site is considered as being at a 'Low' susceptibility to surface water flooding. This is defined as having between a 1 in 1000 (0.1%) and 1 in 100 (1%) Annual Probability of flooding. A small portion of the site in the south-west corner is located in an area defined as being at a 'Medium' and 'High' susceptibility to surface water flooding. Defined respectively as having between a 1 in 100 (1%) and 1 in 30 (3.3%) Annual Probability of flooding, and greater than a 1 in 30 (3.3%) Annual

Probability of flooding. The online Risk of Flooding from Surface Water map indicated that for the 'High' and 'Medium' Risk flood events surface water flooding will be at a depth of below 300mm. For the 'Low' Risk flood events surface water depth is indicated as between 300mm and 900mm.

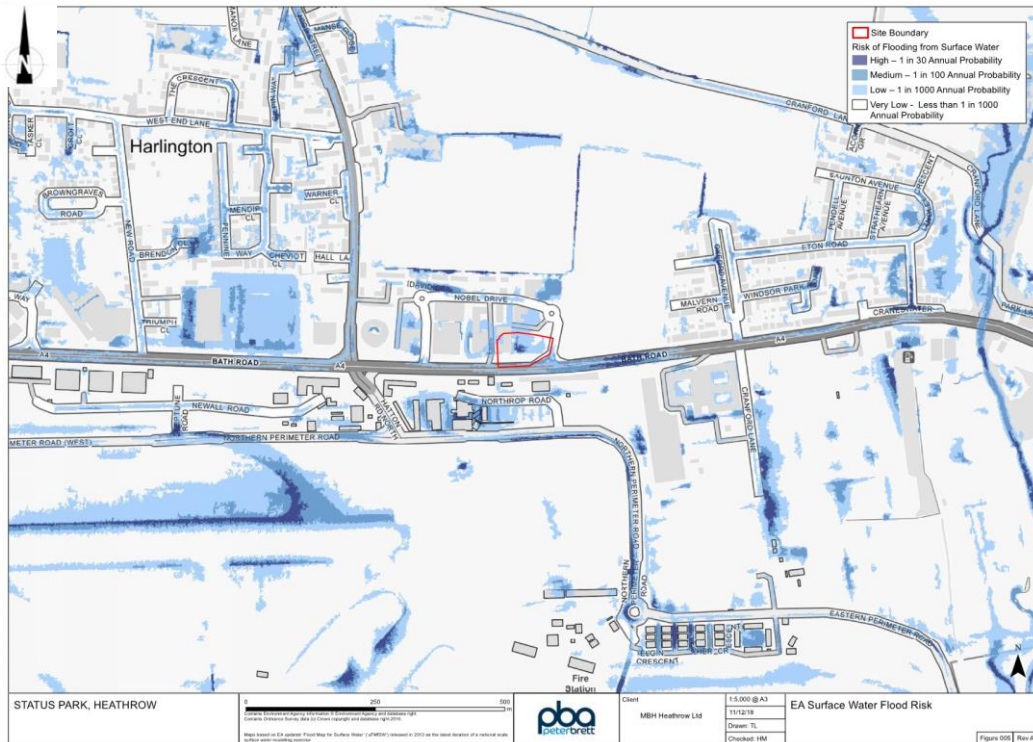


Figure 4.2 Extract of the online Risk of Flooding from Surface Water Map

Contains Environment Agency Information © Environment Agency and/or database right

Contains Ordnance Survey data © Crown Copyright and database right 2016

4.1.5 It should be noted that these maps are generated using relatively coarse methodology whereby rainfall inflows are routed over a ground surface model. The analysis assumes a suitable 'typical' approach to represent the effects of urban drainage infrastructure and highlights low lying areas of topography and preferential flow paths that may be more susceptible to surface water flooding in the event of extreme rainfall.

4.1.6 The site is not located within a Critical Drainage Area (CDA) as identified within the London Borough of Hillingdon's Surface Water Management Plan (SWMP), the nearest CDA being Group1_024 approximately 1.5km to the west of the site. Local borough surface water modelling as presented within the SWMP on map '1 in 100 year rainfall event depth and recorded surface water flood incidents', presented within **Appendix E** and generally reflects the surface water flood risk that is identified above on **Figure 4.2** for the site.

Groundwater Flood Risk

4.1.7 The Preliminary Flood Risk Assessment's (PFRA) 'Summary Map of Past Floods – Ground Water Incidents' did not contain any specific information with regards to ground water flood incidents in proximity to the site.

Reservoir Flood Risk

- 4.1.8 The online Risk of Flooding from Reservoirs Map indicates the risk of flooding in the event of a breach from reservoirs, based only on large reservoirs (over 25,000 cubic metres of water). The maps indicate that the site is located in an area which is not considered at risk in the event of reservoir breach.

Canals, Ponds and other Artificial Watercourses

- 4.1.9 There are no canals or other artificial watercourses located within the vicinity of the site.
- 4.1.10 OS mapping indicates the presence of a pond to the north of the site but due to the small and isolated nature of this feature, it is not considered to pose a risk to development at the site.

Sewer Flooding

- 4.1.11 Hillingdon's PFRA's 'Summary Map of Past Floods - Sewer Incidents' does not contain any specific information with regards to flooding from sewers in proximity to the site. This is also the case within 'Thames Water Sewer Networks' presented within the borough's SWMP which is included within **Appendix E**.

5 Foul Water Drainage

5.1 Existing Foul Water Drainage

- 5.1.1 As the site is currently used as a car parking facility it is not thought to be served by a foul water drainage connection.
- 5.1.2 PBA were provided with TWUL asset records on 17.07.18 (ref – ALS/ALS Standard/2018_3835252). These show TWUL's assets on and around the site, a PDF of these is included within the **Appendix A**. These asset records show that two TWUL foul water sewers run within the site's red line boundary, a 150mm sewer to the west and a 225mm sewer to the south. The depths of these sewers while inside the site boundary is not recorded on TWUL's asset records, although both discharge into TWUL's 1524mm diameter foul water sewer located within Bath Road along the southern boundary of the site which is at a depth of approximately 9.4m below ground level.
- 5.1.3 It may also be the case that private foul water drainage serving the surrounding buildings also flow through the site which would not be shown on TWUL's asset records. To confirm no further foul water infrastructure crosses within the site boundary further surveys would be required as part of Stage 3 design. Possible diversions to existing drainage infrastructure will need to be evaluated as part of the next stage.

5.2 Proposed Foul Water Drainage

- 5.2.1 It is proposed foul water flows from the development are discharged into private inspection chambers surrounding the building. These chambers will connect into a private drain which will ultimately discharge into TWUL's adoptable foul water network. It is proposed to make a new foul water connection into the existing TWUL Manhole 1904, located within the site boundary. This proposal is subject to confirmation of the existing foul water networks invert levels and capacity confirmation from TWUL. PBA's Drainage drawing 44303-PBA-XX-C-DR-511-S0-2 presents the proposed this strategy and is included within the **Appendix F**.
- 5.2.2 The peak foul water flow estimated from the 140 bed development is based on 95% of the potable demand +10% infiltration factor. The potable water demand for the 5 storey 140 bed hotel calculated at 135 litres/person/day is 21.29m³/day, this corresponds to a daily peak demand of 1.48 litres/second.
- 5.2.3 Therefore, the total peak foul water flow from the development is estimated at **0.7 l/s**.

6 Surface Water Drainage

6.1 Existing Surface Water Drainage

- 6.1.1 PBA's drawing 44303-PBA-XX-C-DR-500-S0-1 and 44303-PBA-XX-C-DR-501-S0-1 shows the existing sites drainage catchments and existing drainage features respectively. Both are presented in **Appendix F**.
- 6.1.2 The existing site's surface water drainage strategy is two-fold:
- 6.1.3 Surface water run-off which falls onto the site's hard-standing (impermeable) surface flows overland with the surface's gradients towards existing private surface water gullies which are generally located with the car park's aisles. Gullies then discharge via a private surface water network, which will eventually convey surface water to a TWUL surface water sewer. It is assumed that the existing site's surface water run-off eventually discharges to TWUL's 750mm surface water sewer which is located within Bath Road, located at a depth of 1.7m below the surface level.
- 6.1.4 Surface water run-off which falls onto the site's soft landscaping (permeable) will either slowly infiltrate into the ground in lower intensity storm events, or in higher intensity storm events where the ground is already saturated, surface water run-off will flow overland towards a positive drainage feature (i.e a carpark gully).
- 6.1.5 The full extents of the existing site's private surface water network are not currently known; neither is the existing site's eventual surface water connection point to TWUL's surface water sewer. It is recommended that a CCTV survey of the site's existing surface water network is undertaken to ascertain this connection point, which could be to the south or the east of the site. It is recommended that this is undertaken at the earliest opportunity so an assessment on drainage to be retained can be undertake.

6.2 Surface Water Drainage Proposals

- 6.2.1 The proposed surface water strategy complies with the London Plan Sustainable Design and Construction SPG section 3.4.10. 'All developments on Greenfield sites must maintain Greenfield run-off rates. On previously developed site, run-off rates should not be more than three times the calculated Greenfield rate'. As the area of the site that is undergoing development has been previously used as a car parking facility the site is classed as a brownfield site, and therefore a rate of three times Greenfield run-off rate is proposed.
- 6.2.2 The London Borough of Hillingdon's Core policy also states:
- *'The management of surface water drainage for new developments comes in the form of Sustainable Urban Drainage Systems (SUDS). These seek to manage storm water as close to its source as possible, mimicking storm water flows arising from the site, prior to the proposed development. Typically, this approach involves a move away from piped systems to softer engineering solutions inspired by natural drainage processes'*
 - *'SUDS should be designed to take into account the surface run-off quantity, rates and also water quality ensuring their effective operation up to and including the 1 in 100-year design standard flood including an increase in peak rainfall of up to 30% to account for climate change. (See section 6.2.17 for further information).*
 - *'SUDS come in a variety of different types, from infiltration techniques through to water harvesting. Wherever possible, a SUDS technique should seek to contribute to each of the three goals identified below with the favoured system contributing significantly to each objective. Where possible SUDS solutions for a site should seek to: Reduce flood*

risk (to the site and neighbouring areas), Reduce pollution and Provide landscape and wildlife benefits.'

- 6.2.3 The surface water drainage strategy for the proposed development is presented on PBA drawing 44303-PBA-XX-C-DR-511-S0-2 (**Appendix F**).
- 6.2.4 The positioning of the surface water drainage network has been designed based on ColladoCollins Architects' proposed building layout (P1-100 Rev P6) and BD Landscape Architects' proposed layout (BD 0205 SD801 R02). Both of which are included within **Appendix B**.
- 6.2.5 The most appropriate method of surface water discharge has been determined based on the hierarchy of surface water disposal as set out within Building Regulations – Approved Document H (H3), as described below:
- Infiltration
 - Watercourse
 - Public Sewer
- 6.2.6 Due to the presence of the London Clay formation and the Langley Silt Member underlying the site, infiltration is not considered a viable method of surface water disposal. However, soakaway testing is proposed post-planning to confirm that these assumptions are correct. The Infiltration SUDS Suitability Map presented within Hillingdon's SWMP shows the site located within an area 'potentially unsuitable for infiltration'. This is presented within **Appendix E**.
- 6.2.7 The only watercourses in proximity to the site are located over 750m to the east of the site across privately owned land. It is therefore not a feasible to discharging surface water directly into a watercourse.
- 6.2.8 It is therefore proposed that surface water run-off is discharged from the development at a controlled rate to TWUL's surface water network. The proposed methodology for surface water disposal is set out below.
- 6.2.9 The proposed surface water strategy is to intercept surface water run-off close to source using a range of drainage features which will then convey surface water run-off via a below ground drainage network, or in some areas, SuDS features if spatially permitted. The proposed surface water management strategy for the new development is to consist of a combination of Sustainable Drainage Systems (SuDS) some of which are listed below:
- Introduce porous parking areas (at source control measure)
 - Introduce tree pits within the private parking areas (at source control measure)
 - Introduce a landscaping depression incorporating an underdrain to provide a mixture of biodiversity, amenity, water quality and water quantity benefits
- 6.2.10 It is proposed to introduce a 300mm – 500mm deep depression to the soft landscaped area to the south of the site to act as an attenuation feature for surface water run-off from storm events exceeding the 1 in 30 (3.3%) Annual Probability event. For storm events up to the 1 in 30 (3.3%) Annual Probability event surface water attenuation will be provided by the surface water network, below-ground attenuation crates and where possible porous paving subbase. Required attenuation volumes are outlined below in **Table 6.4**.
- 6.2.11 It is intended that the landscaping depression will also provide amenity space for the developments users and will incorporate gentle gradients falling towards a central infiltration trench which will be positively connected to the surface water network, this will avoid permanent

standing water being present. It should be noted that the site is located within close proximity to London’s Heathrow airport to the south of the site and although the proposed landscaping depression would not be designed with as a permanent water feature, approval from the Civil Aviation Authority would be required due to possible concerns the proposals may increase the site’s attraction to bird life. Appropriate consideration must be given to the selection of planting and landscaping features to avoid encouraging birds to the site. Should it not be possible to provide surface water attenuation for more extreme flood events within an open feature, it will be the case the below-ground attenuation crates will be required within the soft landscaped area to the south of the site. Provision of attenuation crates will be subject to confirmation of the site’s ground water levels.

- 6.2.12 SuDS features such as porous paving and tree pits will be incorporated into the design to achieve the necessary water quality improvement. These features will assist in removing suspended solids, metals and hydrocarbons from the surface water run-off prior to discharging into TWUL’s adoptable network.
- 6.2.13 **Table 6.1** presents the contributing surface water catchment areas for the existing and proposed site, which are also presented on PBA drawing 44303-PBA-XX-C-DR-500 and 44303-PBA-XX-C-DR-510 (**Appendix F**). This demonstrates that there is no material change in permeable or impermeable area for the proposed development when compared against the existing. It should be noted that the areas proposed for porous paving has been treated as impermeable at this stage of the design.

Table 6.1 Comparison of Existing and Proposed Impermeable Areas

	Total Area (m ²)	Permeable Area (m ²)	Impermeable Area (m ²)
Existing Site	3389	1756	2133
Proposed Site	3389	1745	2144

- 6.2.14 Greenfield runoff rates for the site has been calculated using 2008 Qmed equation, the methodology for which is set out in SuDS Manual 24.4.3. Rainfall and catchment descriptors have been determined using the Flood Estimation Handbook’s (FEH) catchment data for the area. The calculated Greenfield run-off rates are presented in **Table 6.2** with full calculation shown in **Appendix G**.
- 6.2.15 It is proposed that surface water discharge rates are restricted to a maximum of 3 x Greenfield Run-off Rate for the 1 in 100 (1%) Annual Probability plus 40% Climate Change (CC) event. A minimum discharge rate of 3 l/s will be used to ensure that the flow control device is less prone to blockages.
- 6.2.16 It is currently proposed that the site’s surface water network discharges via gravity to a new adoptable manhole located on the existing TWUL’s 750mm surface water sewer within Bath Road’s footway. Confirmation of a gravity outfall will need to be verified at Stage 3 design where further information on the site’s existing surface water network and outfall can be assessed in tandem with further developed proposed level information. It may be the case that to provide the required surface water attenuation volume below-ground, a pumped surface water connection is required.
- 6.2.17 **Table 6.3** details existing surface water discharge rates for the site and proposed run-off rates for the development are based on a proportion of the Site’s greenfield run-off rates which have been calculated using the FEH method as outlined above.

Table 6.2 – Existing and Greenfield Runoff Rates

	Existing Run-off Rate (l/s)	FEH (2008) Greenfield Rate (l/s)
1 in 1-yr	28.4	0.3
1 in 30-yr	85.1	0.8
1 in 100-yr	124.5	1.0
1 in 100-yr + 40% CC	-	1.0

Table 6.3 – Proposed Discharge Rates

	Maximum Proposed Discharge Rate from Proposed Development (l/s)	Betterment against existing Discharge Rates (%)
1 in 1-yr	3	90%
1 in 30-yr	3	96%
1 in 100-yr	3	98%
1 in 100-yr + 40% CC	3	-

6.2.18 In accordance with the NPPF, PPG and guidance from LBH's website the rainfall used to calculate surface water storage has been modelled with an additional 40% climate change increase in intensity to accommodate any impacts of future climate change. The surface water attenuation volume this provides is a conservative estimate based on a worst case scenario. As the development is for commercial use a 20% climate change increase would be more appropriate with the design sensitivity tested to 40%. This approach being further developed as part of the Stage 3 design.

6.2.19 To ensure that flooding does not affect properties or discharge from the development, flows up to and including the 1 in 100 (1%) Annual Probability plus 40% climate change event will be managed on site. This will be achieved through the provision of a combination of SuDS measures (attenuation storage within the drainage system) and level design, which will direct flows away from the proposed buildings and towards open external areas within the site (i.e. parking areas or communal landscaping) where temporarily shallow flooding can occur.

6.2.20 An Innovyze Microdrainage network model (System 1) has been created to approximately size the development's surface water network and the required attenuation volume. Indicative surface levels have been used within the model which demonstrates that the proposed development will not flood in critical areas within the 1 in 100 (1%) Annual Probability plus 40% climate change event. Output from this model is included within **Appendix G**.

6.2.21 **Table 6.4** presents the required surface water attenuation volume based on the development's proposed surface water discharge rate. Attenuation volumes are based on output from the development's proposed surface water network as modelled in Innovyze's Microdrainage software.

Table 6.4 Required Attenuation Volumes

Storm Event	Proposed Maximum Discharge Rate (l/s)	Surface Water Attenuation (m ³)
1 in 1-year	3	8
1 in 30-year	3	80
1 in 100-year	3	135
1 in 100-year + 40% CC	3	240

6.2.22 The London Borough of Hillingdon require a 'Technical Assessment' proforma to be completed as part of the drainage and SUDS calculations. This has been included within **Appendix G**.

6.2.23 A SuDS maintenance plan which cover those proposed for the development is included within **Appendix G**.

7 Potential Flood Risk Mitigation Measures

- 7.1.1 The site is located within Flood Zone 1 and as identified within **Section 5** the site is at 'Very Low' susceptibility to flooding from Fluvial mechanisms.
- 7.1.2 The online Risk of Flooding from Surface Water map indicates that the south-west of the site is at risk of surface water flooding to a depth of less than 300mm during 'High' and 'Medium' risk events, and between 300mm – 900mm for 'Low' risk events. The existing site's levels direct overland flows towards soft landscaping in the south-west of the site, this strategy will continue to be implemented with the site's proposed levels. This will continue to direct overland exceedance flows away from the proposed building towards car parking and soft landscaped areas to the south-west the site.
- 7.1.3 The risk of flooding is considered to be low but it is recommended that the development's Finished Floor Levels (FFL) are raised 300mm above existing ground levels.

8 Conclusion

8.1.1 This Drainage Statement has been prepared by PBA, now part of Stantec to support a planning application for a proposed 0.33ha commercial development (140-unit hotel) at Status Park, London Borough of Hillingdon, and concludes that:

- The online Flood Map for Planning indicates that the site is located within Flood Zone 1 'Low Probability' of flooding (as defined in PPG Table 1).
- The site is proposed for hotel use, classified as 'More Vulnerable' which are considered appropriate for Flood Zone 1.
- The online Risk of Flooding from Surface Water map indicates that the south-west of the site is at risk of surface water flooding to a depth of less than 300mm during 'High' and 'Medium' risk events, and between 300mm – 900mm for 'Low' risk events.
- The proposed foul water strategy will connect the proposed foul water flows into TWUL's existing foul water network which is located within the site boundary. A Section 106 application will be required before this new connection can be made. Existing TWUL foul water sewers are located within the site boundary, until their exact positioning is confirmed and a clash check undertaken in relation to the proposed building position it may be that a Section 185 application for sewer diversion is required.
- The location, depth and extents of existing surface water drainage infrastructure across the site is not currently known. It might be the case that the existing surface water network can be used to some extent, in-particular the existing outfall. However, as there is currently limited information on this a new surface water connection has been proposed to connect flows to TWUL's surface water network. A Section 106 application will potentially be needed if a new connection is to be made. A CCTV survey of the existing drainage will need to be undertaken to understand the existing networks full extents.
- In accordance with Building Regulations – Approved Document H, the most appropriate means of surface water discharge has been determined based on the drainage hierarchy. On this basis, surface water is proposed to be discharged to TWUL surface water sewer to the south of the site.
- It is proposed to discharge surface water run-off from the site at a maximum of 3x Greenfield run-off rate (3 l/s) during the 1 in 100 (1%) Annual Probability plus 40% climate change event which will require 190m³ of surface water attenuation.
- The proposed drainage strategy will use a combination of SuDS features (tree pits, porous paving, below-ground crates and soft landscaped areas) to provide amenity, water quality and water quantity benefits to the development.
- It is currently proposed that a landscaping depression acting as a temporary surface water storage features for storm events exceeding the 1 in 30 (3.3%) Annual Probability event is located along the southern boundary of the site within the soft landscape. This feature is subject to further design development and approval from local stakeholders.
- At this stage the size and location of these features has been based on design assumptions which are appropriate for Planning, as part of Stage 3 design, the proposals will require further refinement as the design develops.

Appendix A Surveys and Asset Records

Appendix B Masterplan

Appendix C Correspondence

Appendix D GIS Plans

Appendix E PFRA & SWMP

Appendix F Drainage Strategy

Appendix G Drainage Calculations