

**CONDITION 10 REPORT - DRAINAGE**  
*CHESSINGTON WORLD OF ADVENTURES RESORT*  
*LODGE ACCOMMODATION SCHEME*

**PREPARED FOR:**

Merlin Attractions Operations Ltd

**JOB NO:** 13730  
**ISSUE NO:** 1  
**DATE:** 22 October 2021



## DOCUMENT HISTORY

Issue No.	Description	Date
1	Issued for discharge of planning condition 10.	22.10.2021

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## 1. INTRODUCTION

- 1.1. This report has been prepared by Simpson Associates, on behalf of Merlin Attractions Operations Ltd to assist with the discharge of Condition 10 associated with the planning permission ref. 18/10413/FUL for the proposed lodge accommodation at Chessington World of Adventures Resort (CWoAR) in Chessington, Kingston.
- 1.2. Condition 10 requires that *“prior to any groundworks (excluding site investigations and demolition), the applicant must submit a final detailed drainage design strategy including drawings to the Lead Local Flood Authority for review and approval. The strategy should demonstrate that the London Plan drainage hierarchy has been applied, the site will achieve a maximum runoff rate no higher than the greenfield rate (including in the calculations the whole site area) as well as confirmation of the features and site’s sustainable drainage system final layout. The strategy will need to include storage volume calculations, an annotated map of the exceedance routes, evidence calculations showing that there will be no onsite flooding and a detailed maintenance plan. The maintenance plan must confirm how and who will maintain each of the components of the proposed drainage scheme for the lifetime of the development.”*
- 1.3. The full planning permission letter is included in *Appendix A*. The following sections of this report provide the information and details required to discharge this condition.
- 1.4. A drainage strategy for the scheme was outlined within the Flood Risk Assessment & Drainage Strategy Report, CWOAR Ref. 13730-JDC which was subsequently approved under the planning Ref. *18/10413/FUL*.
- 1.5. The content of this report confirms the proposed drainage design is in full accordance with the approved drainage strategy.

## 2. SURFACE WATER DRAINAGE

- 2.1. The proposed scheme comprises 34 new lodges, disabled parking spaces and vehicle and pedestrian access routes together with associated landscaping. A site layout plan, which shows the overall development proposals, is included in *Appendix B*.

### London Plan

- 2.2. The London Plan is the overall strategy plan for London, setting out integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years. The policies of the London Plan are consistent with those in the NPPF and have been developed to reflect the intent of the NPPF, in particular the presumption in favour of sustainable development.
- 2.3. Chapter 5 of The London Plan sets out a comprehensive range of policies to underpin London’s response to climate change. The London Plan states that development should utilise Sustainable Drainage Systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water runoff is managed as close to its source as possible in line with the following drainage hierarchy:
  1. Store rainwater for later use.
  2. Use infiltration techniques, such as porous surfaces in non-clay areas.

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3. Attenuate rainwater in ponds or open water features for gradual release.
4. Attenuate rainwater by storing in tanks or sealed water features for gradual release.
5. Discharge rainwater direct to a watercourse
6. Discharge rainwater to a surface water sewer / drain.
7. Discharge rainwater to the combined sewer.

2.4. The methods of disposal are summarised in *Table 1* with an assessment of each method's suitability also provided.

*Table 1: SUDS Assessment*

<b>System</b>	<b>Assessment</b>
Rainwater Harvesting	It is considered that Rainwater Harvesting is unlikely to contribute to the reduction in surface water runoff volume as the nature of the development would have limited requirement for recycled rainwater. Therefore, rainwater harvesting has not been considered as part of the surface water management strategy.
Soakaway / Infiltration Systems / Infiltration Trenches	Infiltration drainage techniques are infeasible due to the site being underlain with superficial deposits of Clay and the underlying London Clay Formation. On this basis, infiltration drainage techniques have not been considered as a means of surface water disposal in accordance with the approved drainage strategy. Borehole logs confirming the underlying strata are included in <i>Appendix C</i> .
Swales, basins, ponds, wetlands, and below ground attenuation tanks	Given the nature of the development which comprises of 34 holiday accommodation lodges situated on a steeply sloping site there are limited locations for above ground SuDS features. It has however been deemed appropriate to provide a pond to control the rate of discharge within the site. The use of a below ground storage tank is considered the most appropriate technique for the attenuation and storage of surface water volumes.
Discharge direct to a watercourse.	The existing surface water drainage network consists of a series of ponds and drainage ditches which discharge off-site into the public surface water sewer. It is therefore deemed appropriate to utilise these drainage ditches to discharge surface water to the surface water sewer, mimicking the site's existing characteristics.
Discharge to a surface water sewer / drain	It is deemed appropriate to utilise the on-site drainage ditches for disposal of surface water runoff generated from the development prior to discharge into the public surface water sewer system.
Discharge to a combined sewer.	It has been established that it would be appropriate to discharge surface water runoff to the existing on-site drainage ditches which in turn discharge to the surface water sewer network. Therefore, it is not necessary to consider the discharge of surface water runoff to a combined sewer.

- 2.5. Based on the assessment in *Table 1*, it is assessed to be appropriate to discharge surface water runoff from the development to the existing 525mm dia. pipe upstream of an existing drainage ditch towards the east end of the proposed access road.

Runoff Management

- 2.6. Surface water runoff generated from the development is to be managed in accordance with the approved Drainage Strategy which are in accordance with the suggested procedures set out in the March 2015 DEFRA report “*Sustainable Drainage Systems: Non-statutory technical standards for sustainable drainage systems.*”
- 2.7. The site is predominantly greenfield in nature. For developments on greenfield sites Policy S2 of the DEFRA report advises that the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate for the same event. Policy S4 of the DEFRA report advises that where reasonably practicable, for greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event, should never exceed the greenfield runoff volume for the same event.
- 2.8. Greenfield runoff rates have been estimated based on the IH124 method of calculation, which is included in the Source Control design facility of the MicroDrainage software package by Innovyze. The calculations recommend that greenfield rates should be calculated using an area of 50 Ha in the formula, which should then be adjusted by the ratio of the site area to 50 Ha. Copies of the IH124 design results are included in *Appendix D*, while the calculated rates for a variety of storm events up to the 100 year return period are summarised in *Table 2* below.

*Table 2: IH124 Greenfield Runoff Rates*

Return Period	Peak Greenfield Runoff Rate for 50 Ha Area (l/s)	Peak Greenfield Runoff Rate of Development Areas of 0.98 Ha (l/s)
1 year	70.8	1.4
30 year	188.7	3.7
100 year	265.6	5.2

- 2.9. Policy S4 of the DEFRA report advises that where reasonably practicable, for greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should not exceed the greenfield runoff volume for the same event.
- 2.10. Greenfield runoff volumes have been calculated using the Greenfield Runoff Volumes Calculator, which is included in the Source Control design facility of the MicroDrainage software package by Innovyze. Copies of the design results are included in *Appendix D*, while the calculated volumes for a variety of storms events up to the 1 in 100 year return period are summarised in *Table 3*.

*Table 3: Greenfield Runoff Volumes*

<b>Return Period</b>	<b>Greenfield Runoff Volume (m<sup>3</sup>)</b>
1 year 360 minute	48.1
30 year 360 minute	115.3
100 year 360 minute	161.8

### Sustainable Drainage Systems (SUDS)

- 2.11. The proposed surface water drainage design has considered the use of SuDS intended to minimise the rate of discharge, volume and environmental impact of runoff.
- 2.12. The site topography favours runoff being collected from the roads and buildings via filter drains that will discharge into a balancing pond and a below-ground attenuation tank which will store and attenuate excess surface water runoff from the development prior to discharging into the drainage ditch at greenfield runoff rates.
- 2.13. In addition to providing attenuation, these SuDS techniques would help to protect the quality of water discharged from the site by providing up to 2 levels of treatment, the first level of treatment would be provided by the filter drains which will capture the surface runoff, enabling flows to percolate through the filter medium, and the detention basin offering the second level of treatment.
- 2.14. The proposed Drainage Layout incorporates these measures of SuDS and is included in *Appendix E*. A summary of the Drainage Layout, which is in full accordance with the approved drainage strategy, includes:
- It is proposed to discharge surface water runoff generated from the development to the existing 525mm dia. surface water pipe immediately upstream of the existing drainage ditch.
  - A flow control chamber is shown immediately upstream of the outfall connection, which would control and limit flows from the development to rates matching or less than greenfield runoff rates for all rainfall events up to including the 1 in 100 year event with a 40% allowance for climate change.
  - Roof water runoff is drained by rainwater downpipes and suspended drainage / traditional network of below ground pipework into a series of filter drains following the proposed vehicle access and pedestrian routes.
  - The proposed access routes are shown to be drained using filter drains which would in turn discharge into the detention basin via below ground pipework.
  - A proposed geocellular storage crate tank encroaches within the footprint of an existing conveyance swale resulting in the suitable diversion of existing flows via manholes and large diameter pipework.

### Hydraulic Analysis

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- 2.15. The Source Control facility in the MicroDrainage software package has been used to design the surface water drainage system. The design results for a variety of storm events up to and including the 1 in 100 year return period with 40% allowance for increases in peak rainfall intensity over the lifetime of the development are included in *Appendix F*. The design results confirm that the surface water drainage system would store and attenuate surface water flows for all analysed storm events with no surface water flooding identified.
- 2.16. *Table 4* compares the maximum rate of discharge / volume analysed for each storm event to the greenfield runoff rates / volumes identified in *Tables 2 & 3*.

*Table 4: Comparison of Discharge Rates & Volumes*

Return Period (year)	Greenfield		Post Development	
	Peak Runoff Rate (l/s)	6 hr Runoff Volume (m <sup>3</sup> )	Peak Runoff Rate (l/s)	6 hr Runoff Volume (m <sup>3</sup> )
1	1.4	48.1	0.9	54.16
30	3.7	115.3	1.0	119.0
100	5.2	161.8	1.1	154.7
100 + 40%	N/A	N/A	1.4	216.3

- 2.17. The above table confirms that the surface water drainage design complies with policy S2 of the DEFRA report as the peak runoff rate from the development to the existing drainage ditch for the 1 in 1, 1 in 30 and 1 in 100 year rainfall event would not exceed the peak greenfield runoff rate for the same event. Furthermore, the post-development peak runoff rates are shown to be slightly lower than the approved surface water drainage strategy, offering an improvement.
- 2.18. While *Table 4* shows the surface water drainage scheme would discharge at a greater volume than the greenfield volume for the 1 in 1, and 1 in 30 year 6 hour rainfall events, the scheme is deemed to comply with Policy S6 of the DEFRA Report as the runoff volume would be discharged at rates not exceeding greenfield runoff rates which are considered not to adversely affect flood risk.
- 2.19. Surface water runoff from the development has been limited to rates less than greenfield runoff rates with excess surface water runoff being stored and attenuated. Therefore, the development will not increase the risk of surface water flooding on site or to neighbouring properties in accordance with the approved Flood Risk Assessment.

#### Exceedance

- 2.20. In the event that the capacity of the surface water drainage network was exceeded, surface water runoff would naturally drain overland in accordance with the topography of the site towards the existing drainage ditch as shown on the overland flood exceedance plan included in *Appendix E*. The proposed lodges are raised above the proposed access routes to minimise the risk from overland flows.

Implementation

- 2.21. The surface water drainage system is implemented in accordance with the SUDS Implementation Plan included in *Appendix G* with the Contractor’s Construction Health and Safety Plan to incorporate the measures proposed in the plan.

Management & Maintenance Plan

- 2.22. The surface water drainage system is to be maintained in accordance with the SUDS Maintenance Plan included in *Appendix H*. The Plan should be incorporated into the site’s Operation and Maintenance Manual.
- 2.23. Maintenance for the on-site drainage systems will be carried out by CWoAR Operations Team, in accordance with the SUDS Maintenance Plan.

**3. FOUL WATER DRAINAGE STRATEGY**

- 3.1. It is proposed to dispose of foul water runoff generated from the development to the existing drainage network serving CWoAR via a traditional underground drainage network.
- 3.2. A detailed foul water drainage layout has been developed on this basis, in accordance with the approved drainage strategy, and is shown on the drainage layout plan included in *Appendix E*.

**4. CONCLUSIONS**

- 4.1 The proposed scheme was granted full planning permission (Planning application reference *18/10413/FUL*), with relevant drainage details submitted and approved as part of this application.
- 4.2 *Condition 10* of the planning condition states “prior to any groundworks (excluding site investigations and demolition), the applicant must submit a final detailed drainage design strategy including drawings to the Lead Local Flood Authority for review and approval. The strategy should demonstrate that the London Plan drainage hierarchy has been applied, the site will achieve a maximum runoff rate no higher than the greenfield rate (including in the calculations the whole site area) as well as confirmation of the features and site’s sustainable drainage system final layout. The strategy will need to include storage volume calculations, an annotated map of the exceedance routes, evidence calculations showing that there will be no onsite flooding and a detailed maintenance plan. The maintenance plan must confirm how and who will maintain each of the components of the proposed drainage scheme for the lifetime of the development.”
- 4.3 The content of this report confirms that the proposed detailed drainage layout has been designed in full accordance with the drainage strategy approved as part of the planning submission. This report provides all suitable information required for the discharge of *Condition 10*.

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**APPENDIX A**  
PLANNING PERMISSION LETTER

**Assistant Director of Strategic Planning & Infrastructure**  
Alex Chrusciak

Our Ref: 18/10413/FUL



# Decision Notice

Date of Decision: 24 December 2018

Royal Borough of Kingston upon Thames  
Guildhall 2, High Street  
Kingston upon Thames  
KT1 1EU

**TOWN AND COUNTRY PLANNING ACT, 1990 (AS AMENDED)**

**TOWN AND COUNTRY (MANAGEMENT PROCEDURE ORDER) (ENGLAND)  
2015 (AS AMENDED)**

**LOCATION:** Chessington World Of Adventures Resort , Leatherhead Road,  
Chessington, KT9 2NE

**PROPOSAL:** Erection of 34 lodges providing visitor accommodation,  
theming features, boardwalks, internal access road, boundary  
treatment and landscaping works, plant enclosure, and  
associated infrastructure works (including surface water  
drainage).

Under the provisions of part III of the Act the Council hereby GRANTS  
PERMISSION for the development described above.

PERMIT subject to the following conditions:

- 1 The development hereby permitted shall be commenced within 3 years from the date of this decision.

Reason: In order to comply with Section 91 of the Town and Country Planning Act, 1990. (As amended)

- 2 The development hereby permitted shall be carried out in accordance with the following approved plans:

263_64_1 Site Location Plan(2)	Received	31/10/2018
263_64_11 Standard Lodges Site Plan Existin(2)	Received	31/10/2018
263_64_12 Standard Lodges Constraints(2)	Received	31/10/2018
263_64_13 Standard Lodges Site Plan Proposed(2)	Received	31/10/2018
263_64_16 Sections AA-DD as Existing(1)	Received	31/10/2018
263_64_17 Sections AA-DD Proposed(1)	Received	31/10/2018
263_64_2 Block Plan Extg(2)	Received	31/10/2018
263_64_3 Site Plan showing Constraints(2)	Received	31/10/2018
263_64_4 Site Plan Proposed(2)	Received	31/10/2018
263_64_5 Entrance Area Existing(2)	Received	31/10/2018
263_64_6 Entrance Area Constraints(2)	Received	31/10/2018
263_64_7 Entrance Area Site Plan Proposed(2)	Received	31/10/2018
A-1323_550_Typical Standard Lodge_REV_-(1)	Received	31/10/2018
A-1323_551_Standard Accessible Lodge_REV_-(1)	Received	31/10/2018
A-1323_552_Plant Enclosure_REV_-(1)	Received	31/10/2018
CWoAR Lodges Air Quality Assessment (April 2017)	Received	31/10/2018
CWoAR Lodges Air Quality Assessment Addendum Note (October 2018)	Received	31/10/2018
CWoAR Lodges Arboricultural Method Statement (October 2018)	Received	31/10/2018
CWoAR Lodges DAS Addendum (October 2018)	Received	31/10/2018

CWoAR Lodges Design and Access Statement (Part 1) (April 2017)	Received	31/10/2018
CWoAR Lodges Design and Access Statement (Part 2) (April 2017)	Received	31/10/2018
CWoAR Lodges Ecological Survey and Appraisal (October 2018)	Received	31/10/2018
CWoAR Lodges Economic Infographic (October 2018)	Received	31/10/2018
CWoAR Lodges Economic Statement (April 2017)	Received	31/10/2018
CWoAR Lodges Energy Strategy (April 2017)	Received	31/10/2018
CWoAR Lodges Energy Strategy Addendum Note (October 2018)	Received	31/10/2018
CWoAR Lodges Historic Environment Desk-based Assessment (updated October 2018) Part 2	Received	31/10/2018
CWoAR Lodges Landscape and Visual Appraisal (April 2017)	Received	31/10/2018
CWoAR Lodges Landscape and Visual Assessment Addendum Note (October 2018)_Part_1(1)	Received	31/10/2018
CWoAR Lodges Landscape and Visual Assessment Addendum Note (October 2018)_Part_2(1)	Received	31/10/2018
CWoAR Lodges Landscape and Visual Assessment Addendum Note (October 2018)_Part_3(1)	Received	31/10/2018
CWoAR Lodges Landscape and Visual Assessment Addendum Note (October 2018)_Part_4(1)	Received	31/10/2018
CWoAR Lodges Lodges Management Plan (October 2018)	Received	31/10/2018
CWoAR Lodges Noise Assessment Addendum Note (October 2018)	Received	31/10/2018
CWoAR Lodges Planning Statement (October 2018)	Received	31/10/2018
CWoAR Lodges Statement of Community Involvement Addendum Note (October 2018)	Received	31/10/2018
CWoAR Lodges Sustainability Statement (April 2017)	Received	31/10/2018
CWoAR Lodges Sustainability Statement Addendum Note (October 2018)	Received	31/10/2018
CWoAR Lodges Transport Technical Note (October 2018)	Received	31/10/2018
CWoAR Lodges Tree Protection Plan (October 2018)	Received	31/10/2018

CWoAR Lodges Tree Survey and Impact Assessment (October 2018)	Received	31/10/2018
CWoAR Lodges Utility Strategy (October 2018)	Received	31/10/2018
CWoAR Lodges- Statement of Community Involvement (April 2017)_Part_2	Received	31/10/2018
CWoAR Lodges- Statement of Community Involvement (April 2017)_Part_3	Received	31/10/2018
CWoAR Lodges- Statement of Community Involvement (April 2017)_Part_4	Received	31/10/2018
CWoAR Lodges- Statement of Community Involvement (April 2017)_Part_5	Received	31/10/2018
CWoAR Lodges- Statement of Community Involvement (April 2017)_Part_6	Received	31/10/2018
CWoAR Lodges- Statement of Community Involvement (April 2017)_Part_7	Received	31/10/2018
CWoAR Lodges- Statement of Community Involvement (April 2017)_Part_8	Received	31/10/2018
CWoAR Long Term Plan (September 2016)_Part_1	Received	31/10/2018
CWoAR Long Term Plan (September 2016)_Part_2	Received	31/10/2018
CWoAR Long Term Plan (September 2016)_Part_3	Received	31/10/2018
CWoAR Preliminary Ecological Appraisal (March 2017)	Received	31/10/2018

3 Full details of the materials, colour and texture of the external finish of the buildings shall be submitted to and approved in writing by the Local Planning Authority before development commences and the development shall be constructed in accordance with the approved finishes.

Reason: To ensure a satisfactory appearance on completion of the development in accordance with Policy DM10 (Design Requirements for New Developments including House Extensions) of the LDF Core Strategy Adopted April 2012.

4 Before the first use of the development takes place, details of external lighting shall have been submitted to and approved in writing by the Local Planning Authority. The external lighting shall be installed in accordance with the approved details and thereby retained as such unless a variation is

subsequently submitted to and approved in writing by the Local Planning Authority.

Reason: To protect the character of the area and nature conservation interests in accordance with Policy DM10 of the LDF Core Strategy

5 Prior to the commencement of development the developer/construction contractor shall sign up to the Non-Road Mobile Machinery Register. The development shall be carried out in accordance with the NRMM Regulations and the inventory of all NRMM used on site shall be maintained and provided to the Local Planning Authority upon request to demonstrate compliance with the regulations.

Reason: To reduce the emissions of construction and demolition in accordance with the Mayor of London Control of Dust and Emissions during Construction and Demolition SPG July 2014. Compliance is required to be prior to commencement due to the potential impact at the beginning of the construction.

6 Prior to commencement of any development on site, a Construction Management Plan (CMP) and Delivery and Servicing Management Plan shall be submitted to the planning authority for written agreement. The development shall only be implemented in accordance with the details and measures approved as part of the approved details, which shall be maintained throughout the entire construction period.

The CMP should include the following:

- a) Provision for loading/unloading materials;
- b) Storage of plant, materials and operatives vehicles;
- c) Temporary site access;
- d) Signing system for works traffic;
- e) Measures for the laying of dust, suppression of noise and abatement of other nuisance arising from development works;
- f) Location of all ancillary site buildings;
- g) Means of enclosure of the site; and
- h) Wheel washing equipment.

Reason: In order to safeguard the amenities of the surrounding residential occupiers and to safeguard highway safety and the free flow of traffic in accordance with Policy DM10 (Design Requirements for New Developments including House Extensions) of the LDF Core Strategy Adopted April 2012. These details are required prior to commencement of development because the relevant works would take place at the beginning of the construction phase.

7 The site and building works required to implement the development shall be only carried out between the hours of 08.00 and 18.00 Mondays to Fridays and between 08.00 and 13.00 on Saturdays and not at all on Bank Holidays and Sundays.

Reason: In order to protect residential amenity.

8 A remedial strategy shall be submitted to and agreed in writing by the Local Planning Authority, prior to the commencement of the development works and remedial works. On completion of the agreed remedial works, a closure report and certificate of compliance endorsed by the interested party/parties, shall be submitted to and agreed in writing by the Local Planning Authority, prior to the occupation of the site by end users.

Reason: To prevent harm to human health and pollution of the environment. These details are required prior to commencement of development because the relevant works would take place at the beginning of the construction phase.

9 If during implementation of this development, contamination is encountered which has not previously been identified, the additional contamination shall be fully assessed and a specific contaminated land assessment and associated remedial strategy shall be submitted to and agreed in writing by the Local Planning Authority before the additional remediation works are carried out. The agreed strategy shall be implemented in full prior to completion of the development hereby approved.

Reason: To prevent harm to human health and pollution of the environment.

10 Prior to any groundworks (excluding site investigations and demolition), the applicant must submit a final detailed drainage design strategy including drawings to the Lead Local Flood Authority for review and approval. The strategy should demonstrate that the London Plan drainage hierarchy has been applied, the site will achieve a maximum runoff rate no higher than the greenfield rate (including in the calculations the whole site area) as well as confirmation of the features and site's sustainable drainage system final layout. The strategy will need to include storage volume calculations, an annotated map of the exceedance routes, evidence calculations showing that there will be no onsite flooding and a detailed maintenance plan. The maintenance plan must confirm how and who will maintain each of the components of the proposed drainage scheme for the lifetime of the development.

Reason: To prevent the risk of flooding to and from the site in accordance with the Non-Statutory Technical Standards for Sustainable Drainage Systems, the National Planning Policy Framework (Paragraph 103), the London Plan (Policies 5.12 and 5.13) along with associated guidance to these policies and DM4 of Kingston's Core Strategy.

11 Prior to occupation, evidence (photographs and installation contracts) must be submitted to demonstrate that the sustainable drainage scheme for the site has been constructed in accordance with the submitted details. The sustainable drainage scheme shall be managed and maintained thereafter in accordance with the agreed management and maintenance plan.

Reason: To comply with the the Non-Statutory Technical Standards for Sustainable Drainage Systems, the National Planning Policy Framework

(Paragraph 103), the London Plan (Policies 5.12 and 5.13) along with associated guidance to these policies and DM4 of Kingston's Core Strategy.

12 The disabled car parking accommodation shown upon the approved drawings shall be provided before the development to which it relates is occupied and thereafter it shall be kept free from obstruction at all times for use by disabled users of the development and shall not thereafter be used for any purposes other than the parking of vehicles for the occupiers of the development and visitors to it.

Reason: To ensure the provision of adequate off-street parking accommodation and to avoid the congestion of surrounding roads by parked vehicles in accordance with Policy DM10 (Design Requirements for New Developments including House Extensions) of the LDF Core Strategy Adopted April 2012.

13 Refuse storage facilities and recycling facilities shall be provided prior to the occupation of the development hereby permitted in accordance with details which shall have been submitted to and approved in writing by the Local Planning Authority prior to the commencement of the development, such facilities to be permanently retained at the site.

Reason: To ensure the provision of refuse facilities to the satisfaction of the Council in accordance with Policy DM10 (Design Requirements for New Developments including House Extensions) of the LDF Core Strategy Adopted April 2012.

14 The development shall be carried out in accordance with the recommendations as set out in Section 5 of the submitted Ecological Survey and Appraisal, dated October 2018.

Reason: To safeguard and protect the sites biodiversity and nature conservation value in accordance with Policy DM6 (Biodiversity) of the LDF Core Strategy Adopted April 2012.

15 The development shall be implemented in accordance with the details of the submitted Energy Strategy Technical Note (October 2018), unless otherwise agreed in writing by the Council.

Reason: In the interests of sustainability and energy conservation in accordance with Policies 5.2 (Minimising Carbon Dioxide Emissions) and 5.3 (Sustainable Design & Construction) of the London Plan (July 2011) and Policy DM1 (Sustainable Design and Construction Standards) of the LDF Core Strategy Adopted April 2012.

16 Prior to commencement of any development on site, a Construction Environmental Management Plan (CEMP) shall be submitted to the planning authority for written agreement. The development shall only be implemented in accordance with the details and measures approved as part of the CEMP, which shall be maintained throughout the entire construction period.

The CEMP should include the following:

- a) Risk assessment of potentially damaging construction activities;
- b) Identification of "biodiversity protection zones";



- c) Practical measures (both physical measures and sensitive working practices) to avoid or reduce impacts during construction (may be provided as a set of method statements).;
- d) The location and timing of sensitive works to avoid harm to biodiversity features;
- e) The times during construction when specialist ecologists need to be present on site to oversee works;
- f) Responsible persons and lines of communication;
- g) The role and responsibilities on site of an ecological clerk of works (ECoW) or similarly competent person;
- h) Use of protective fences, exclusion barriers and warning signs.

Reason: To safeguard and protect the sites biodiversity and nature conservation value in accordance with Policy DM6 (Biodiversity) of the LDF Core Strategy Adopted April 2012. These details are required prior to commencement of development because the relevant details need to be agreed before the construction phase.

17 No fans, louvres, ducts or other external plant other than those shown on the drawings hereby approved shall be installed without the prior written approval of the Local Planning Authority.

Reason: To safeguard the amenities of the occupiers of the neighbouring properties and the visual amenities of the area in accordance with Policy DM10 (Design Requirements for New Developments including House Extensions) of the LDF Core Strategy Adopted April 2012.

18 An updated Travel Plan for the Chessington World of Adventures site to include the Safari Lodge facilities hereby approved, shall be implemented upon the development being brought into first use and in accordance with details to be submitted to and approved by the Local Planning Authority prior to the development being brought into first use.

Reason: To ensure that sustainable transport methods are encouraged and implemented in accordance with Policies CS5 (Reducing the Need to Travel) and CS6 (Sustainable Travel) of the LDF Core Strategy Adopted April 2012.

19 The rating level of the noise emitted from any plant and equipment within the area to which this permission relates shall be at least 5dBA lower than the existing background noise level at any given time of operation. The noise levels shall be determined 1m externally to any window at the nearest residential façade. Measurements and assessment shall be carried out in accordance with British Standard 4142: 1997.

Reason: To safeguard the amenities of the occupiers of the neighbouring properties in accordance with Policy DM10 (Design Requirements for New Developments including House Extensions) of the LDF Core Strategy Adopted April 2012.

20 A landscaping and planting scheme including where applicable the retention of the existing trees shall have been submitted to and approved in writing by the Local Planning Authority before any above ground level works

on site are commenced. The approved scheme shall be implemented within the first planting season following completion of the development and the tree planting and landscaping shall thereafter be maintained for five years to the satisfaction of the Local Planning Authority. Any trees or shrubs which die during this period shall be replaced in the first available planting season, and the area shown to be landscaped shall be permanently retained for that purpose only.

Reason: In the interests of visual amenity and also that the Local Planning Authority shall be satisfied as to the details of the development in accordance with Policy DM10 (Design Requirements for New Developments including House Extensions) of the LDF Core Strategy Adopted April 2012.

21 The development shall be constructed in accordance with the submitted and approved Arboricultural Method Statement and Tree Protection Plan dated October 2018.

Reason: In the interests of visual amenities/ tree protection and so that the Local Planning Authority shall be satisfied as to the details of the development in accordance with Policy DM10 (Design Requirements for New Developments including House Extensions) of the LDF Core Strategy Adopted April 2012.

22 The no. 3 accessible lodges as shown on dwg no. 263/64 4, shall be constructed to meet requirement M4(3) of Part M of Building Regulations, and shall remain as such in perpetuity, unless otherwise agreed in writing by the Local Planning Authority.

Reason: To ensure that the development provides a range of accommodation to meet different needs and to ensure compliance with Policies 3.5 and 3.8 of the London Plan March 2015.

23 No demolition or development shall take place until a written scheme of investigation (WSI.) has been submitted to and approved by the local planning authority in writing. For land that is included within the WSI, no demolition or development shall take place other than in accordance with the agreed WSI, which shall include the statement of significance and research objectives, and

A. The programme and methodology of site investigation and recording and the nomination of a competent person(s) or organisation to undertake the agreed works

B. The programme for post-investigation assessment and subsequent analysis, publication & dissemination and deposition of resulting material. This part of the condition shall not be discharged until these elements have been fulfilled in accordance with the programme set out in the WSI.

Reason: Important archaeological remains may exist on this site. Accordingly the planning authority wishes to secure the provision of archaeological excavation and the subsequent recording of the remains prior to development, in accordance with Policy DM 12 (Development in Conservation Areas and Affecting Heritage Assets) of the LDF Core Adopted April 2012.

24 The levels of buildings, roads, parking areas and pathways within the site shall only be in accordance with details which shall have previously been submitted to and approved in writing by the Local Planning Authority before development is commenced.

Reason: To ensure that the appearance and functioning of the development is satisfactory and to safeguard the amenities of adjoining occupiers in accordance with Policy DM10 (Design Requirements for New Developments including House Extensions) of the LDF Core Strategy Adopted April 2012 and comply with Supplementary Planning Document 'Access for All' (July 2005).

#### INFORMATIVE(S)

- 1 In dealing with the application the Council has implemented the requirement in the National Planning Policy Framework to work with the applicant in a positive and proactive way. We have made available detailed advice in the form of our statutory policies in the Core Strategy, Supplementary Planning Documents, Planning Briefs and other informal written guidance, as well as offering a full pre-application advice service, in order to ensure that the applicant has been given every opportunity to submit an application which is likely to be considered favourably.
- 2 The development approved by this planning permission will be liable to pay the Mayor of London's Community Infrastructure Levy (MCIL) and Kingston Community Infrastructure Levy (KCIL). We have calculated the amount of MCIL liability to be £28,280 and the amount of KCIL liability to be £40,400.

Payment will be due once the owner/developer serves a development Commencement Notice on the Council, and a payment Demand Notice has been received by the owner. Failure to submit a Commencement Notice will incur a surcharge of 20% of the chargeable amount or £2,500, whichever is the lower amount.

When you have received approval of all reserve matters / discharged all pre-commencement conditions the Council will issue a Liability Notice to the owner setting out the MCIL and CIL calculation. Accompanying the Liability Notice will be a blank Commencement Notice and if necessary a blank Assumption of Liability form, both of which need to be completed and returned to the Council prior to development commencing. A failure to do so will incur a surcharge.

Should you have any questions in respect of the contents of this letter or the MCIL more generally, please contact the Council's Contact Centre 0208 547 5002.

- 3 The works shall be of such a nature so as to render harmless the identified contamination given the proposed end-use of the site and surrounding environment including any controlled waters. The closure report shall

include details of the proposed remedial works and the quality assurance certificates to show that the works have been carried out in full in accordance with the approved methodology. Details of any post remediation sampling and analysis to show the site has reached the required clean up criteria shall be included in the closure report together with the necessary "Duty of Care" documentation detailing what waste material have been removed from the site.

All work should be in accordance with the HSE document "Protection of workers & the general public during the development of Contaminated Land".

- 4 The written scheme of investigation will need to be prepared and implemented by a suitably qualified professionally accredited archaeological practice in accordance with Historic England's Guidelines for Archaeological Projects in Greater London. This condition is exempt from deemed discharge under schedule 6 of The Town and Country Planning (Development Management Procedure) (England) Order 2015.

**Your attention is drawn to your rights of appeal (attached) and to the fact that this decision relates only to the Town & Country Planning Acts and to no other enactment or The Building Regulations.**

## **TOWN AND COUNTRY PLANNING ACT 1990 (as amended)**

### **Appeals to Secretary of State**

- If you are aggrieved by the decision of your local planning authority to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State for Environment, Transport and the Regions under section 78 of the Town and Country Planning Act 1990.
- If you want to appeal, then you must do so within six months of the date of this notice, using forms and guidance which can be downloaded from The Planning Inspectorate web site <https://www.gov.uk/appeal-planning-inspectorate>. Alternatively they can be obtained from the following address:- The Planning Inspectorate, Room 3/13, Temple Quay House, 2 The Square, Temple Quay, Bristol BS1 6PN.
- The Planning Inspectorate has introduced an online appeals service which you can use to make your appeal online. You can find the service through the Appeals area of the Planning Portal – see <https://www.planningportal.co.uk/info/200207/appeals>. The Inspectorate will publish details of your appeal on the internet (on the Appeals area of the Planning Portal). This may include a copy of the original planning application form and relevant supporting documents supplied to the local authority by you or your agent, together with the completed appeal form and information you submit to the Planning Inspectorate. Please ensure that you only provide information, including personal information belonging to you that you are happy will be made available to others in this way. If you supply personal information belonging to a third party please ensure you have their permission to do so. More detailed information about data protection and privacy matters is available on the Planning Portal.
- The Secretary of State can allow a longer period for giving notice of an appeal, but he will not normally be prepared to use this power unless there are special circumstances which excuse the delay in giving notice of appeal.
- The Secretary of State need not consider an appeal if it seems to him that the local planning authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.
- In practice, the Secretary of State does not refuse to consider appeals solely because the local planning authority based their decision on a direction given by him.





















## **Purchase Notices**

- If either the local planning or the Secretary of State for Environment, Transport and the Regions refuses permission to develop land or grants it subject to conditions, the owner may claim that he can neither put the land to a reasonably beneficial use in its existing state nor render the land capable of a reasonably beneficial use by the carrying out of any development which has been or would be permitted.
- In these circumstances, the owner may serve a purchase notice on the Council in whose area the land is situated. This notice will require the Council to purchase his interest in the land in accordance with the provisions of Part VI of the Town and Country Planning Act 1990 (as amended).

**APPENDIX B**  
**SITE LAYOUT PLAN**

100m grid/1ha

Key: See Important Notes on 263/64/P1

-  Existing tree canopies and i/d. For detail see Arboriculturist's report
-  New indigenous tree & shrub planting details to be conditioned
-  New indigenous tree & shrub planting (details to be conditioned) and maintained as coppice
-  New safari themed tree & shrub planting details to be conditioned
-  New Lodge accommodation showing Finished Floor levels in red. & = Accessible Associated buildings showing Finished Floor levels in red.
-  New siteworks features & levels. Contours show areas of cut.
-  Slopes at 1:3
-  Retaining Walls
-  Existing 2.4m Outer Zoo Fence
-  New 2.4m Outer Zoo Fence
-  New 2.0m Animal Fence
-  New 1.1m Personal Fence
-  New porous block or tarmac surfaces
-  New porous boardwalks & decks
-  Existing asphalt
-  Accessible routes at flatter than 1:20
-  Parking for disabled guests
-  Ownership Boundary
-  Major Development Site Boundary
-  Planning Boundary includes outlier drain runs which are shown 600mm wide except at manholes.

C

B

A

Play 700sqm Turfed  
34 Standard Lodges

Play Equipment 12m x 6m x 5m h on Play surface

Existing Paddock fence line

Up 3m in 64.5m at 1:12.0

New SUDS 3 Storage Crates

New SUDS 2

Safari Hotel

Maintenance

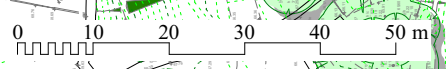
Canteen

Giraffe

Zebras

Azteca Hotel

Existing Hotel Car Park comes to here



23.10.18

**NICHOLS BROWN WEBBER LLP**  
ARCHITECTS AND LANDSCAPE PLANNERS

PONDHOUSE, NORTHEAD, HENLEY-ON-THAMES, OXON RG9 6LG  
TEL: +44 (0)1491 638 536 EMAIL: enquiries@nbwarchitects.co.uk

PROJECT  
Chessington World of Adventures/Lodges Ph1

DRAWING TITLE  
Proposed Site/Block Plan inc. Landscape

PLOT DATE  
23.10.18

SCALE  
1/500 @ A1  
1/1000 @ A3

PROJECT NO  
263/64

DRAWING NO  
4





**APPENDIX C**  
**BOREHOLES LOGS**



Unit 8, Paddock Barn Farm

Godstone Road, Caterham,

Surrey CR3 6SF

Tel: 01883 343572

Fax: 01883 344060

email: [enquiries@riskmanagementltd.co.uk](mailto:enquiries@riskmanagementltd.co.uk)

Web: [www.riskmanagementltd.co.uk](http://www.riskmanagementltd.co.uk)

**PROJECT No. RML 5949**

**SITE INVESTIGATION  
AT  
CHESSINGTON WORLD OF ADVENTURES**

**ON BEHALF OF  
CHESSINGTON WORLD OF ADVENTURES**

**April 2016**



**Risk Management Limited**

Registered Office: 344 Croydon Road, Beckenham, Kent BR3 4EX Registered in England 03752505



# BOREHOLE NO. BH1

**Site** : Chessington World of Adventures.  
**Method** : Premier Tracked Rig  
**Casing** : 98mm

**Job No.** : RML 5949  
**Date** : 1st April 2016  
**Level** : Approx 58.50m A.O.D.

## Sheet 1 of 2

(m)	Description	Strata Depth (m)	Legend	O.D. Level (m)	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level			58.5					
0	<i>Grass over Topsoil</i>	0.10				0.15	D1		
0.50						0.50	D2		
1.00						1.00	D3	SPT	N = 5
1.50						1.50	D4		
2.00						2.00	D5		
2.50						2.50	D6		
3.00	<b>Superficial Clay</b> Soft to firm, orange-brown, silty sandy CLAY with pockets of coarse orange-brown and grey silt and roots.					3.00	D7	SPT	N = 12
3.50						3.50	D8		
4.00						4.00	D9		
4.20			4.20		54.3		4.50	D10	
5.00	<b>Weathered London Clay</b> Firm to stiff, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.					5.00	D11	SPT	N = 18
5.50						5.50	D12		
6.00						6.00	D13		
6.50						6.50	D14		
7.00						7.00	D15	SPT	N = 26
7.50						7.50	D16		
8.00						8.00	D17		
8.50						8.50	D18		
9.00						9.00	D19		
9.50						9.50	D20		
10.00						10.00	D21		

Remarks : Service pit excavated.  
 : Groundwater encountered at 3.00m depth  
 : Standpipe installed to 7.00m depth.  
 :

Key: D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

SPT Standard Penetration test  
 CPT- Solid Cone SPT  
 U - Undisturbed sample



# BOREHOLE NO. BH1

**Site** : Chessington World of Adventures.

**Job No.** : RML 5949

**Method** : Premier Tracked Rig

**Date** : 1st April 2016

**Casing** : 98mm

**Level** : Approx 58.50m A.O.D.

## Sheet 2 of 2

(m)	Description	Strata Depth (m)	Legend	O.D. Level (m)	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
11	<p><b>London Clay</b> Stiff to very stiff, dark grey, fissured, silty CLAY with pockets of grey silt, selenite crystals and occasional mudstone and shell fragments.</p>	15.00		43.5		10.50	D22		
						11.00	D23		
						11.50	D24		
						12.00	D25		
						12.50	D26		
						13.00	D27		
						13.50	D28		
						14.00	D29		
						14.50	D30		
						15.00	D31		
15						End of Borehole			
16									
17									
18									
19									
20									

Remarks : Service pit excavated.  
: Groundwater encountered at 3.00m depth  
: Standpipe installed to 7.00m depth.  
:

Key: D - Disturbed sample  
W - Water sample  
B - Bulk sample

SPT Standard Penetration test  
CPT- Solid Cone SPT  
U - Undisturbed sample



# BOREHOLE NO. BH2

**Site** : Chessington World of Adventures.  
**Method** : Premier Tracked Rig  
**Casing** : 98mm

**Job No.** : RML 5949  
**Date** : 12th March 2016  
**Level** : Approx 58.30m A.O.D.

## Sheet 1 of 2

(m)	Description	Strata Depth (m)	Legend	O.D. Level (m)	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level			58.3					
0	<b>Grass over Topsoil</b>	0.15				0.15	D1		
1	<b>Superficial Clay</b> Soft to firm, orange-brown, silty sandy CLAY with pockets of coarse orange-brown and grey silt and roots.					0.50	D2		
1						1.00	D3		
1						1.50	D4		
2		2.00		56.3		2.00	D5	SPT	N = 7
2						2.50	D6		
3						3.00	D7		
3	<b>Weathered London Clay</b> Firm to stiff, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.					3.50	D8		
4						4.00	D9	SPT	N = 14
4						4.50	D10		
5						5.00	D11		
5		5.50		52.8		5.50	D12		
6						6.00	D13	SPT	N = 16
6						6.50	D14		
7						7.00	D15		
7						7.50	D16		
8						8.00	D17		
8						8.50	D18		
9						9.00	D19		
9						9.50	D20		
10						10.00	D21	SPT	N = 25

Remarks : Service pit excavated.  
 : Groundwater encountered at 2.50m depth  
 : Standpipe installed to 7.00m depth.  
 :

Key: D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

SPT Standard Penetration test  
 CPT- Solid Cone SPT  
 U - Undisturbed sample



# BOREHOLE NO. BH2

**Site** : Chessington World of Adventures.

**Job No.** : RML 5949

**Method** : Premier Tracked Rig

**Date** : 12th March 2016

**Casing** : 98mm

**Level** : Approx 58.30m A.O.D.

## Sheet 2 of 2

(m)	Description	Strata Depth (m)	Legend	O.D. Level (m)	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
11	<p><b>London Clay</b> Stiff to very stiff, dark grey, fissured, silty CLAY with pockets of grey silt, selenite crystals and occasional mudstone and shell fragments.</p>	15.00		43.3		10.50	D22	SPT	N = 30
						11.00	D23		
						11.50	D24		
						12.00	D25		
						12.50	D26		
						13.00	D27		
						13.50	D28		
						14.00	D29		
						14.50	D30		
						15.00	D31		
15						End of Borehole			
16									
17									
18									
19									
20									

Remarks : Service pit excavated.  
: Groundwater encountered at 2.50m depth  
: Standpipe installed to 7.00m depth.  
:

Key: D - Disturbed sample  
W - Water sample  
B - Bulk sample

SPT Standard Penetration test  
CPT- Solid Cone SPT  
U - Undisturbed sample



# BOREHOLE NO. BH3

**Site** : Chessington World of Adventures.  
**Method** : Premier Tracked Rig  
**Casing** : 98mm

**Job No.** : RML 5949  
**Date** : 13th March 2016  
**Level** : Approx 63.50m A.O.D.

## Sheet 1 of 2

(m)	Description	Strata Depth (m)	Legend	O.D. Level (m)	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level			63.5					
0.15	<b>Grass over Topsoil</b>	0.15				0.15	D1		
1.00	<b>Superficial Clay</b> Soft to firm, orange-brown, silty sandy CLAY with pockets of coarse orange-brown and grey silt and roots.	1.00		62.5		0.50	D2		
1.00						1.00	D3	SPT	N = 6
1.50						1.50	D4		
2.00						2.00	D5		
2.50						2.50	D6		
3.00						3.00	D7	SPT	N = 10
3.50						3.50	D8		
4.00						4.00	D9		
4.50						4.50	D10		
5.00						5.00	D11	SPT	N = 17
5.50						5.50	D12		
5.80		5.80		57.7		6.00	D13		
6.50						6.50	D14		
7.00						7.00	D15		
7.50						7.50	D16		
8.00						8.00	D17	SPT	N = 23
8.50						8.50	D18		
9.00						9.00	D19		
9.50						9.50	D20		
10.00						10.00	D21		

Remarks : Service pit excavated.  
 : Groundwater encountered at 3.30m depth  
 : Standpipe installed to 7.00m depth.  
 :

Key: D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

SPT Standard Penetration test  
 CPT- Solid Cone SPT  
 U - Undisturbed sample



# BOREHOLE NO. BH3

**Site** : Chessington World of Adventures.

**Job No.** : RML 5949

**Method** : Premier Tracked Rig

**Date** : 13th March 2016

**Casing** : 98mm

**Level** : Approx 63.50m A.O.D.

## Sheet 2 of 2

(m)	Description	Strata Depth (m)	Legend	O.D. Level (m)	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
11	<b>London Clay</b> Stiff to very stiff, dark grey, fissured, silty CLAY with pockets of grey silt, selenite crystals and occasional mudstone and shell fragments.	15.00		48.5		10.50	D22		
						11.00	D23		
						11.50	D24		
						12.00	D25		
						12.50	D26		
						13.00	D27		
						13.50	D28		
						14.00	D29		
						14.50	D30		
						15.00	D31		
15						End of Borehole			
16									
17									
18									
19									
20									

Remarks : Service pit excavated.  
 : Groundwater encountered at 3.30m depth  
 : Standpipe installed to 7.00m depth.  
 :

Key: D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

SPT Standard Penetration test  
 CPT- Solid Cone SPT  
 U - Undisturbed sample





# BOREHOLE NO. BH4

**Site** : Chessington World of Adventures.

**Job No.** : RML 5949

**Method** : Premier Tracked Rig

**Date** : 31st March 2016

**Casing** : 98mm

**Level** : Approx 65.00m A.O.D.

## Sheet 1 of 2

(m)	Description	Strata Depth (m)	Legend	O.D. Level (m)	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level			65					
0	<b>Grass over Topsoil</b>	0.10				0.15	D1		
1	<b>Superficial Clay</b> Soft to firm, orange-brown, silty sandy CLAY with pockets of coarse orange-brown and grey silt and roots.					0.50	D2		
1						1.00	D3		
2						1.50	D4		
2						2.00	D5	SPT	N = 12
3						2.50	D6		
3						3.00	D7		
3						3.50	D8		
4	<b>Weathered London Clay</b> Firm to stiff, brown silty CLAY with pockets of orange-brown and grey silt, mudstone gravel and occasional fine selenite crystals.	3.50				4.00	D9		
5						4.50	D10		
5						5.00	D11	SPT	N = 15
6						5.50	D12		
6						6.00	D13		
7						6.50	D14		
7						7.00	D15	SPT	N = 18
8						7.50	D16		
8	8.00	D17							
9	8.50	D18							
9	9.00	D19							
9	9.50	D20							
10	10.00	D21							

Remarks : Service pit excavated.  
: Groundwater encountered at 3.50m depth  
: Standpipe installed to 7.00m depth.  
:

Key: D - Disturbed sample  
W - Water sample  
B - Bulk sample

SPT Standard Penetration test  
CPT- Solid Cone SPT  
U - Undisturbed sample



# BOREHOLE NO. BH4

**Site** : Chessington World of Adventures.

**Job No.** : RML 5949

**Method** : Premier Tracked Rig

**Date** : 31st March 2016

**Casing** : 98mm

**Level** : Approx 65.00m A.O.D.

## Sheet 2 of 2

(m)	Description	Strata Depth (m)	Legend	O.D. Level (m)	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
11	<b>London Clay</b> Stiff to very stiff, dark grey, fissured, silty CLAY with pockets of grey silt, selenite crystals and occasional mudstone and shell fragments.	15.00		50		10.50	D22	SPT	N = 29
						11.00	D23		
						11.50	D24		
						12.00	D25		
						12.50	D26		
						13.00	D27		
						13.50	D28		
						14.00	D29		
						14.50	D30		
15						End of Borehole			
16									
17									
18									
19									
20									

Remarks : Service pit excavated.  
 : Groundwater encountered at 3.50m depth  
 : Standpipe installed to 7.00m depth.  
 :

Key: D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

SPT Standard Penetration test  
 CPT- Solid Cone SPT  
 U - Undisturbed sample



# BOREHOLE NO. BH5

**Site** : Chessington World of Adventures.  
**Method** : Premier Tracked Rig  
**Casing** : 98mm

**Job No.** : RML 5949  
**Date** : 17th March 2016  
**Level** : Approx 63.00m A.O.D.

### Sheet 1 of 2

(m)	Description	Strata Depth (m)	Legend	O.D. Level (m)	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level			63					
0	<b>Grass over Topsoil</b>	0.10				0.15	D1		
1						0.50	D2		
1						1.00	D3		
2						1.50	D4		
2						2.00	D5		
3						2.50	D6		
3	<b>MADE GROUND</b> (brown silty sandy clay with brick, chalk gravel, clinker, ash, crushed concrete and gravel).					3.00	D7		
4	..... grey staining from 2.50m depth.					3.50	D8		
4	..... decaying timber from 3.00m depth.					4.00	D9		
5	..... grey and black oil staining around large piece of timber at 7.00m depth.					4.50	D10		
5						5.00	D11		
6						5.50	D12		
6						6.00	D13		
7						6.50	D14		
7						7.00	D15		
8		8.00		55		7.50	D16		
8						8.00	D17		
9	<b>Weathered London Clay</b> Firm to stiff, brown silty CLAY with pockets of orange-brown and grey silt, mudstone gravel and occasional fine selenite crystals.					8.50	D18		
9						9.00	D19		
9						9.50	D20		
10						10.00	D21		

Remarks : Service pit excavated.  
 : Groundwater encountered at 3.50m depth  
 : Standpipe installed to 7.00m depth.  
 :

Key: D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

SPT Standard Penetration test  
 CPT- Solid Cone SPT  
 U - Undisturbed sample



# BOREHOLE NO. BH5

**Site** : Chessington World of Adventures.  
**Method** : Premier Tracked Rig  
**Casing** : 98mm

**Job No.** : RML 5949  
**Date** : 17th March 2016  
**Level** : Approx 63.00m A.O.D.

### Sheet 2 of 2

(m)	Description	Strata Depth (m)	Legend	O.D. Level (m)	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
11	<b>London Clay</b> Stiff to very stiff, dark grey, fissured, silty CLAY with pockets of grey silt, selenite crystals and occasional mudstone and shell fragments.	10.50		52.5		10.50	D22		
						11.00	D23		
						11.50	D24		
						12.00	D25		
						12.50	D26		
						13.00	D27		
						13.50	D28		
						14.00	D29		
						14.50	D30		
15						End of Borehole	15.00		48

Remarks : Service pit excavated.  
 : Groundwater encountered at 3.50m depth  
 : Standpipe installed to 7.00m depth.  
 :

Key: D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

SPT Standard Penetration test  
 CPT- Solid Cone SPT  
 U - Undisturbed sample



# BOREHOLE NO. BH6

**Site** : Chessington World of Adventures.  
**Method** : Premier Tracked Rig  
**Casing** : 98mm

**Job No.** : RML 5949  
**Date** : 11th March 2016  
**Level** : Approx 59.00m A.O.D.

## Sheet 1 of 2

(m)	Description	Strata Depth (m)	Legend	O.D. Level (m)	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level			59					
0	<b>Grass over Topsoil</b>	0.08				0.15	D1		
1	<b>MADE GROUND</b> (dark brown silty clay with chalk fragments, brick, brick fragments, clinker, ash and gravel).					0.50	D2		
1						1.00	D3	SPT	N = 4
2	..... grey staining and odour from 1.50m depth.					1.50	D4		
2	..... pockets of organic matter from 2.00m depth.					2.00	D5		
3						2.50	D6		
3		3.40		55.6		3.00	D7	SPT	N = 8
4						3.50	D8		
4	<b>Weathered London Clay</b> Firm to stiff, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.					4.00	D9		
5						4.50	D10		
5						5.00	D11	SPT	N = 20
6						5.50	D12		
6						6.00	D13		
7		6.50		52.5		6.50	D14		
7						7.00	D15	SPT	N = 22
8						7.50	D16		
8						8.00	D17		
9						8.50	D18		
9						9.00	D19		
9						9.50	D20		
10						10.00	D21		

Remarks : Service pit excavated.  
 : Groundwater encountered at 3.20m depth  
 : Standpipe installed to 7.00m depth.  
 :

Key: D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

SPT Standard Penetration test  
 CPT- Solid Cone SPT  
 U - Undisturbed sample



# BOREHOLE NO. BH6

**Site** : Chessington World of Adventures.

**Job No.** : RML 5949

**Method** : Premier Tracked Rig

**Date** : 11th March 2016

**Casing** : 98mm

**Level** : Approx 59.00m A.O.D.

## Sheet 2 of 2

(m)	Description	Strata Depth (m)	Legend	O.D. Level (m)	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
11	<b>London Clay</b> Stiff to very stiff, dark grey, fissured, silty CLAY with pockets of grey silt, selenite crystals and occasional mudstone and shell fragments.	15.00		44		10.50	D22		
						11.00	D23		
						11.50	D24		
						12.00	D25		
						12.50	D26		
						13.00	D27		
						13.50	D28		
						14.00	D29		
						14.50	D30		
						15.00	D31		
15						End of Borehole			
16									
17									
18									
19									
20									

Remarks : Service pit excavated.  
 : Groundwater encountered at 3.20m depth  
 : Standpipe installed to 7.00m depth.  
 :

Key: D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

SPT Standard Penetration test  
 CPT- Solid Cone SPT  
 U - Undisturbed sample



# BOREHOLE NO. DIS1

**Site** : Chessington World of Adventures.  
**Diameter** : 75mm/60mm  
**Method** : Drive-in-Sampler

**Job No.** : RML 5949  
**Date** : 1st March 2016

## Sheet 1 of 1

(m)	Description	Strata Depth (m)	Legend	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level							
	<b>Grass over Topsoil</b>	0.15			0.15	D1		
	<b>Superficial Clay</b> Soft to firm, orange-brown, silty sandy CLAY with pockets of coarse orange-brown and grey silt and roots.				0.50	D2		
1		1.20			1.00	D3		
	<b>Weathered London Clay</b> Firm to stiff, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.				1.50	D4		
2					2.00	D5		
					2.50	D6		
3		3.00			3.00	D7		
	End of Borehole							
4								
5								
6								
7								
8								
9								
10								

**Remarks** : Service pit excavated.  
 : Groundwater encountered at 1.20m depth

**Key:** D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

V - Vane test  
 PP - pocket penetrometer  
 U - 38mm undisturbed sample



# BOREHOLE NO. DIS2

**Site** : Chessington World of Adventures.  
**Diameter** : 75mm/60mm  
**Method** : Drive-in-Sampler

**Job No.** : RML 5949  
**Date** : 29th February 2016

## Sheet 1 of 1

(m)	Description	Strata Depth (m)	Legend	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level							
	<b>Grass over Topsoil</b>	0.20			0.15	D1		
	<b>Superficial Clay</b> Soft to firm, orange-brown, silty sandy CLAY with pockets of coarse orange-brown and grey silt and roots.	0.90			0.50	D2		
1					1.00	D3		
	<b>Weathered London Clay</b> Firm to stiff, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.				1.50	D4		
2					2.00	D5		
					2.50	D6		
3		3.00			3.00	D7		
	End of Borehole							
4								
5								
6								
7								
8								
9								
10								

**Remarks** : Service pit excavated.  
 : Groundwater encountered at 1.60m depth

**Key:** D - Disturbed sample      V - Vane test  
 W - Water sample                      PP - pocket penetrometer  
 B - Bulk sample                         U - 38mm undisturbed sample





# BOREHOLE NO. DIS3

**Site** : Chessington World of Adventures.  
**Diameter** : 75mm/60mm  
**Method** : Drive-in-Sampler

**Job No.** : RML 5949  
**Date** : 1st March 2016

## Sheet 1 of 1

(m)	Description	Strata Depth (m)	Legend	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level							
	<b>Grass over Topsoil</b>	0.15			0.15	D1		
	<b>Superficial Clay</b> Soft to firm, orange-brown, silty sandy CLAY with pockets of coarse orange-brown and grey silt and roots.	1.00			0.50	D2		
1					1.00	D3		
					1.50	D4		
2	<b>Weathered London Clay</b> Firm to stiff, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.	3.00			2.00	D5		
					2.50	D6		
3	End of Borehole				3.00	D7		
4								
5								
6								
7								
8								
9								
10								

**Remarks** : Service pit excavated.  
 : Groundwater encountered at 2.50m depth

**Key:** D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

V - Vane test  
 PP - pocket penetrometer  
 U - 38mm undisturbed sample



# BOREHOLE NO. DIS4

**Site** : Chessington World of Adventures.  
**Diameter** : 75mm/60mm  
**Method** : Drive-in-Sampler

**Job No.** : RML 5949  
**Date** : 1st March 2016

## Sheet 1 of 1

(m)	Description	Strata Depth (m)	Legend	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level							
	<b>Grass over Topsoil</b>	0.20			0.15	D1		
	<b>Superficial Clay</b> Soft to firm, orange-brown, silty sandy CLAY with pockets of coarse orange-brown and grey silt and roots.	1.10			0.50	D2		
					1.00	D3		
					1.50	D4		
	<b>Weathered London Clay</b> Firm to stiff, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.	3.00			2.00	D5		
					2.50	D6		
					3.00	D7		
3	End of Borehole							
4								
5								
6								
7								
8								
9								
10								

**Remarks** : Service pit excavated.  
 : Groundwater not noted during boring.

**Key:** D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

V - Vane test  
 PP - pocket penetrometer  
 U - 38mm undisturbed sample



# BOREHOLE NO. DIS5

**Site** : Chessington World of Adventures.  
**Diameter** : 75mm/60mm  
**Method** : Drive-in-Sampler

**Job No.** : RML 5949  
**Date** : 29th February 2016

### Sheet 1 of 1

(m)	Description	Strata Depth (m)	Legend	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level							
	<b>Grass over Topsoil</b>	0.15			0.15	D1		
	<b>Superficial Clay</b> Soft to firm, orange-brown, silty sandy CLAY with pockets of coarse orange-brown and grey silt and roots.	0.50			0.50	D2		
1		1.00			1.00	D3		
		1.40			1.50	D4		
2	<b>Weathered London Clay</b> Firm to stiff, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.				2.00	D5		
					2.50	D6		
3		3.00			3.00	D7		
	End of Borehole							
4								
5								
6								
7								
8								
9								
10								

**Remarks** : Service pit excavated.  
 : Groundwater encountered at 2.00m depth

**Key:** D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

V - Vane test  
 PP - pocket penetrometer  
 U - 38mm undisturbed sample



# BOREHOLE NO. DIS6

**Site** : Chessington World of Adventures.  
**Diameter** : 75mm/60mm  
**Method** : Drive-in-Sampler

**Job No.** : RML 5949  
**Date** : 29th February 2016

## Sheet 1 of 1

(m)	Description	Strata Depth (m)	Legend	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level							
	<b>Grass over Topsoil</b>	0.18			0.15	D1		
	<b>Superficial Clay</b> Soft to firm, orange-brown, silty very sandy CLAY with gravel and roots.				0.50	D2		
1		1.20			1.00	D3		
	<b>Weathered London Clay</b> Soft to firm, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.				1.50	D4		
2					2.00	D5		
					2.50	D6		
3		3.00			3.00	D7		
	End of Borehole							
4								
5								
6								
7								
8								
9								
10								

**Remarks** : Service pit excavated.  
 : Groundwater encountered at 2.20m depth

**Key:** D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

V - Vane test  
 PP - pocket penetrometer  
 U - 38mm undisturbed sample






# BOREHOLE NO. DIS7

**Site** : Chessington World of Adventures.  
**Diameter** : 75mm/60mm  
**Method** : Drive-in-Sampler

**Job No.** : RML 5949  
**Date** : 1st March 2016

Sheet 1 of 1

(m)	Description	Strata Depth (m)	Legend	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level							
	<i>Grass over Topsoil</i>	0.20			0.15	D1		
					0.50	D2		
1					1.00	D3		
	<b>MADE GROUND</b> (brown silty sandy clay with gravel, brick fragments, crushed concrete and roots).				1.50	D4		
2					2.00	D5		
					2.50	D6		
3		3.00			3.00	D7		
	End of Borehole							
4								
5								
6								
7								
8								
9								
10								

**Remarks** : Service pit excavated.  
 : Groundwater not noted during boring.

**Key:** D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

V - Vane test  
 PP - pocket penetrometer  
 U - 38mm undisturbed sample

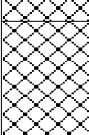
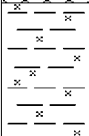
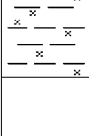



# BOREHOLE NO. DIS8

**Site** : Chessington World of Adventures.  
**Diameter** : 75mm/60mm  
**Method** : Drive-in-Sampler

**Job No.** : RML 5949  
**Date** : 1st March 2016

## Sheet 1 of 1

(m)	Description	Strata Depth (m)	Legend	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level							
	<b>Grass over Topsoil</b>	0.15			0.15	D1		
	<b>MADE GROUND</b> (brown silty sandy clay with gravel, brick fragments and roots).				0.50	D2		
1		1.20			1.00	D3		
	<b>Weathered London Clay</b> Soft to firm, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.				1.50	D4		
2					2.00	D5		
					2.50	D6		
3		3.00			3.00	D7		
	End of Borehole							
4								
5								
6								
7								
8								
9								
10								

**Remarks** : Service pit excavated.  
 : Groundwater not noted during boring.

**Key:** D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

V - Vane test  
 PP - pocket penetrometer  
 U - 38mm undisturbed sample



# BOREHOLE NO. DIS9

**Site** : Chessington World of Adventures.  
**Diameter** : 75mm/60mm  
**Method** : Drive-in-Sampler

**Job No.** : RML 5949  
**Date** : 1st March 2016

## Sheet 1 of 1

(m)	Description	Strata Depth (m)	Legend	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level							
	<b>Grass over Topsoil</b>	0.15			0.15	D1		
	<b>MADE GROUND</b> (brown silty sandy clay with gravel, brick fragments and roots).	0.50			0.50	D2		
1		1.00			1.00	D3		
	<b>Weathered London Clay</b> Soft to firm, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.	1.50			1.50	D4		
2		2.00			2.00	D5		
		2.50			2.50	D6		
3		3.00			3.00	D7		
	End of Borehole							
4								
5								
6								
7								
8								
9								
10								

**Remarks** : Service pit excavated.  
 : Groundwater not noted during boring.

**Key:** D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

V - Vane test  
 PP - pocket penetrometer  
 U - 38mm undisturbed sample



# BOREHOLE NO. DIS10

**Site** : Chessington World of Adventures.  
**Diameter** : 75mm/60mm  
**Method** : Drive-in-Sampler

**Job No.** : RML 5949  
**Date** : 2nd March 2016

Sheet 1 of 1

(m)	Description	Strata Depth (m)	Legend	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level							
	<b>Grass over Topsoil</b>	0.15			0.15	D1		
	<b>MADE GROUND</b> (dark brown silty sandy clay with gravel, brick fragments and roots).	0.50			0.50	D2		
1		1.00			1.00	D3		
	<b>Weathered London Clay</b> Soft to firm, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.	1.30			1.50	D4		
2		2.00			2.00	D5		
		2.50			2.50	D6		
3		3.00			3.00	D7		
	End of Borehole							
4								
5								
6								
7								
8								
9								
10								

**Remarks** : Service pit excavated.  
 : Groundwater seepage at 2.00m.

**Key:** D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

V - Vane test  
 PP - pocket penetrometer  
 U - 38mm undisturbed sample





# BOREHOLE NO. DIS11

**Site** : Chessington World of Adventures.  
**Diameter** : 75mm/60mm  
**Method** : Drive-in-Sampler

**Job No.** : RML 5949  
**Date** : 2nd March 2016

Sheet 1 of 1

(m)	Description	Strata Depth (m)	Legend	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level							
	<b>Grass over Topsoil</b>	0.20			0.15	D1		
	<b>MADE GROUND</b> (dark brown silty sandy clay with gravel, brick fragments, crushed concrete and roots).				0.50	D2		
1					1.00	D3		
		1.50			1.50	D4		
2	<b>Weathered London Clay</b> Soft to firm, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.				2.00	D5		
					2.50	D6		
		3.00			3.00	D7		
3	End of Borehole							
4								
5								
6								
7								
8								
9								
10								

**Remarks** : Service pit excavated.  
 : Groundwater seepage at 2.50m.

**Key:** D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

V - Vane test  
 PP - pocket penetrometer  
 U - 38mm undisturbed sample



# BOREHOLE NO. DIS12

**Site** : Chessington World of Adventures.  
**Diameter** : 75mm/60mm  
**Method** : Drive-in-Sampler

**Job No.** : RML 5949  
**Date** : 2nd March 2016

Sheet 1 of 1

(m)	Description	Strata Depth (m)	Legend	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level							
	<b>Grass over Topsoil</b>	0.20			0.15	D1		
					0.50	D2		
1	<b>MADE GROUND</b> (dark brown silty sandy clay with gravel, brick fragments, crushed concrete and roots).				1.00	D3		
					1.50	D4		
2	<b>Weathered London Clay</b> Soft to firm, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.	2.00			2.00	D5		
					2.50	D6		
3		3.00			3.00	D7		
	End of Borehole							
4								
5								
6								
7								
8								
9								
10								

**Remarks** : Service pit excavated.  
 : Groundwater seepage at 1.50m.

**Key:** D - Disturbed sample      V - Vane test  
 W - Water sample                  PP - pocket penetrometer  
 B - Bulk sample                    U - 38mm undisturbed sample



# BOREHOLE NO. DIS13

**Site** : Chessington World of Adventures.  
**Diameter** : 75mm/60mm  
**Method** : Drive-in-Sampler

**Job No.** : RML 5949  
**Date** : 2nd March 2016

Sheet 1 of 1

(m)	Description	Strata Depth (m)	Legend	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level							
	<b>Grass over Topsoil</b>	0.25			0.15	D1		
	<b>MADE GROUND</b> (dark brown silty sandy clay with gravel, brick fragments, crushed concrete and roots).				0.50	D2		
1		1.30			1.00	D3		
	<b>Weathered London Clay</b> Soft to firm, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.				1.50	D4		
2					2.00	D5		
					2.50	D6		
3		3.00			3.00	D7		
	End of Borehole							
4								
5								
6								
7								
8								
9								
10								

**Remarks** : Service pit excavated.  
 : Groundwater encountered at 1.20m.

**Key:** D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

V - Vane test  
 PP - pocket penetrometer  
 U - 38mm undisturbed sample



# BOREHOLE NO. DIS14

**Site** : Chessington World of Adventures.  
**Diameter** : 75mm/60mm  
**Method** : Drive-in-Sampler

**Job No.** : RML 5949  
**Date** : 2nd March 2016

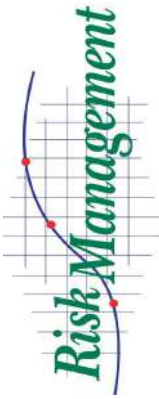
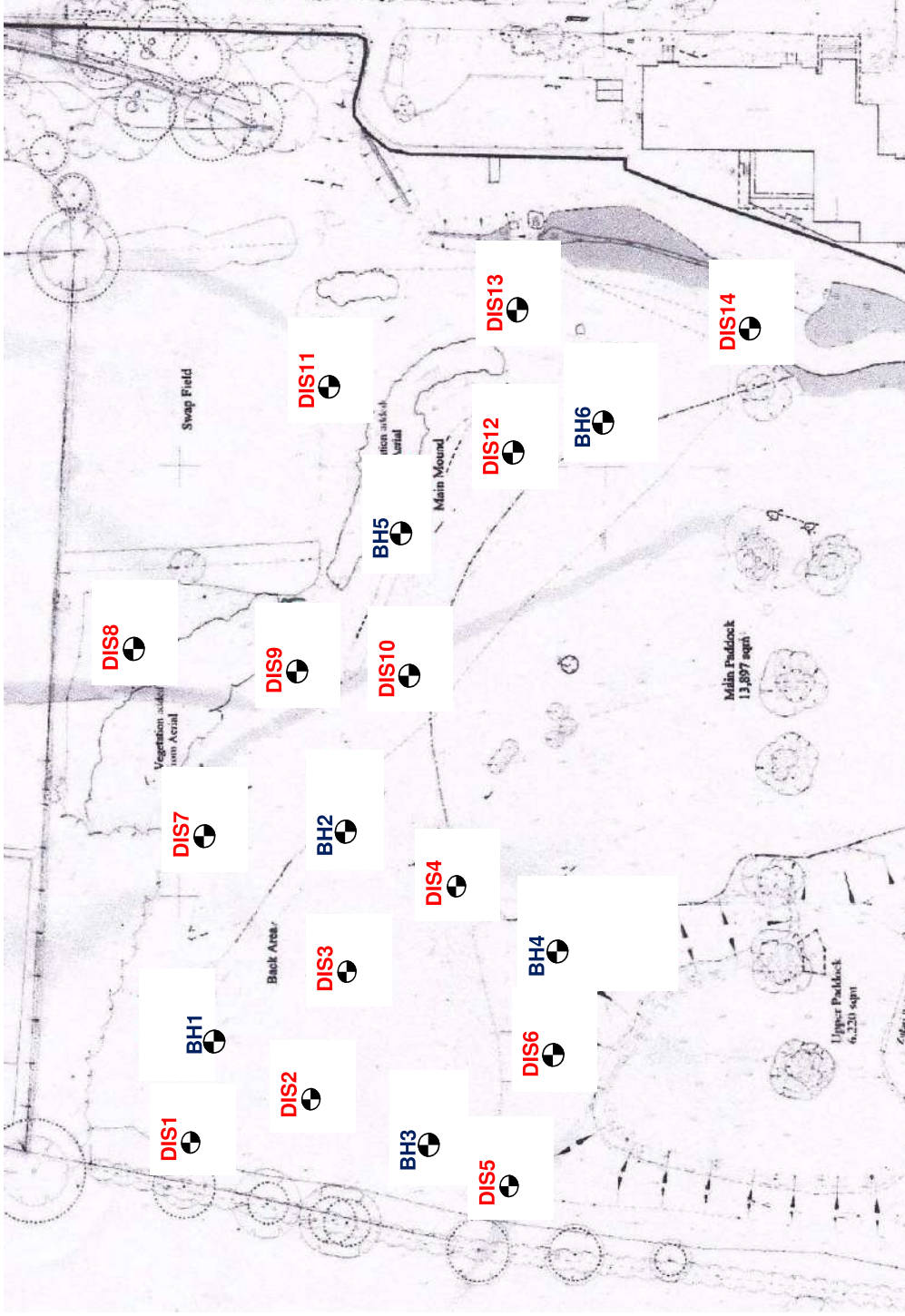
### Sheet 1 of 1

(m)	Description	Strata Depth (m)	Legend	Ground water	Sample Depth (m)	Sample Type	Test	Remarks
0	Ground Level							
	<b>Grass over Topsoil</b>	0.20			0.15	D1		
	<b>MADE GROUND</b> (dark brown silty sandy slightly organic clay with gravel, brick fragments, crushed concrete and roots).				0.50	D2		
1					1.00	D3		
		1.50			1.50	D4		
2	<b>Weathered London Clay</b> Soft to firm, brown silty CLAY with pockets of orange-brown and grey silt and occasional fine selenite crystals.				2.00	D5		
					2.50	D6		
3		3.00			3.00	D7		
	End of Borehole							
4								
5								
6								
7								
8								
9								
10								

**Remarks** : Service pit excavated.  
 : Groundwater encountered at 1.00m.

**Key:** D - Disturbed sample  
 W - Water sample  
 B - Bulk sample

V - Vane test  
 PP - pocket penetrometer  
 U - 38mm undisturbed sample



**SKETCH FIELDWORK LOCATION PLAN**

Title :

**RISK MANAGEMENT LIMITED**

Tel : 01883 343572  
 Fax : 01883 344060

Project Location : Chessington World of Adventures

Report Date : April 2016

Scale : NTS

Drawn By : MSP

Drg. No. RML 5949 /1

**APPENDIX D**  
GREENFIELD RUNOFF RATES / VOLUMES

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

CWoAR Lodges



Date 26/06/2016 09:59  
File

Designed by JDC  
Checked by

Micro Drainage Source Control 2015.1

IH 124 Mean Annual Flood

Input

Return Period (years)	100	Soil	0.300
Area (ha)	50.000	Urban	0.000
SAAR (mm)	648	Region Number	Region 6

**Results    l/s**

QBAR Rural    83.3  
QBAR Urban    83.3

Q100 years    265.6

Q1 year       70.8  
Q2 years      73.3  
Q5 years      106.6  
Q10 years     134.9  
Q20 years     166.8  
Q25 years     178.8  
Q30 years     188.7  
Q50 years     218.1  
Q100 years    265.6  
Q200 years    312.2  
Q250 years    327.2  
Q1000 years   429.6

4TH FLOOR  
43 EAGLE STREET  
LONDON WC1R 4AT



Date 06/12/2018 17:54  
File

Designed by jamescook  
Checked by

XP Solutions

Source Control 2016.1.1

### Greenfield Runoff Volume

#### FSR Data

Return Period (years)	1
Storm Duration (mins)	360
Region	England and Wales
M5-60 (mm)	20.000
Ratio R	0.400
Areal Reduction Factor	1.00
Area (ha)	0.980
SAAR (mm)	643
CWI	94.740
Urban	0.000
SPR	30.000

#### Results

Percentage Runoff (%)	22.44
Greenfield Runoff Volume (m <sup>3</sup> )	48.098



4TH FLOOR  
43 EAGLE STREET  
LONDON WC1R 4AT



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### Greenfield Runoff Volume

#### FSR Data

Return Period (years)	30
Storm Duration (mins)	360
Region	England and Wales
M5-60 (mm)	20.000
Ratio R	0.400
Areal Reduction Factor	1.00
Area (ha)	0.980
SAAR (mm)	643
CWI	94.740
Urban	0.000
SPR	30.000

#### Results

Percentage Runoff (%)	24.40
Greenfield Runoff Volume (m <sup>3</sup> )	115.265

4TH FLOOR  
43 EAGLE STREET  
LONDON WC1R 4AT



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### Greenfield Runoff Volume

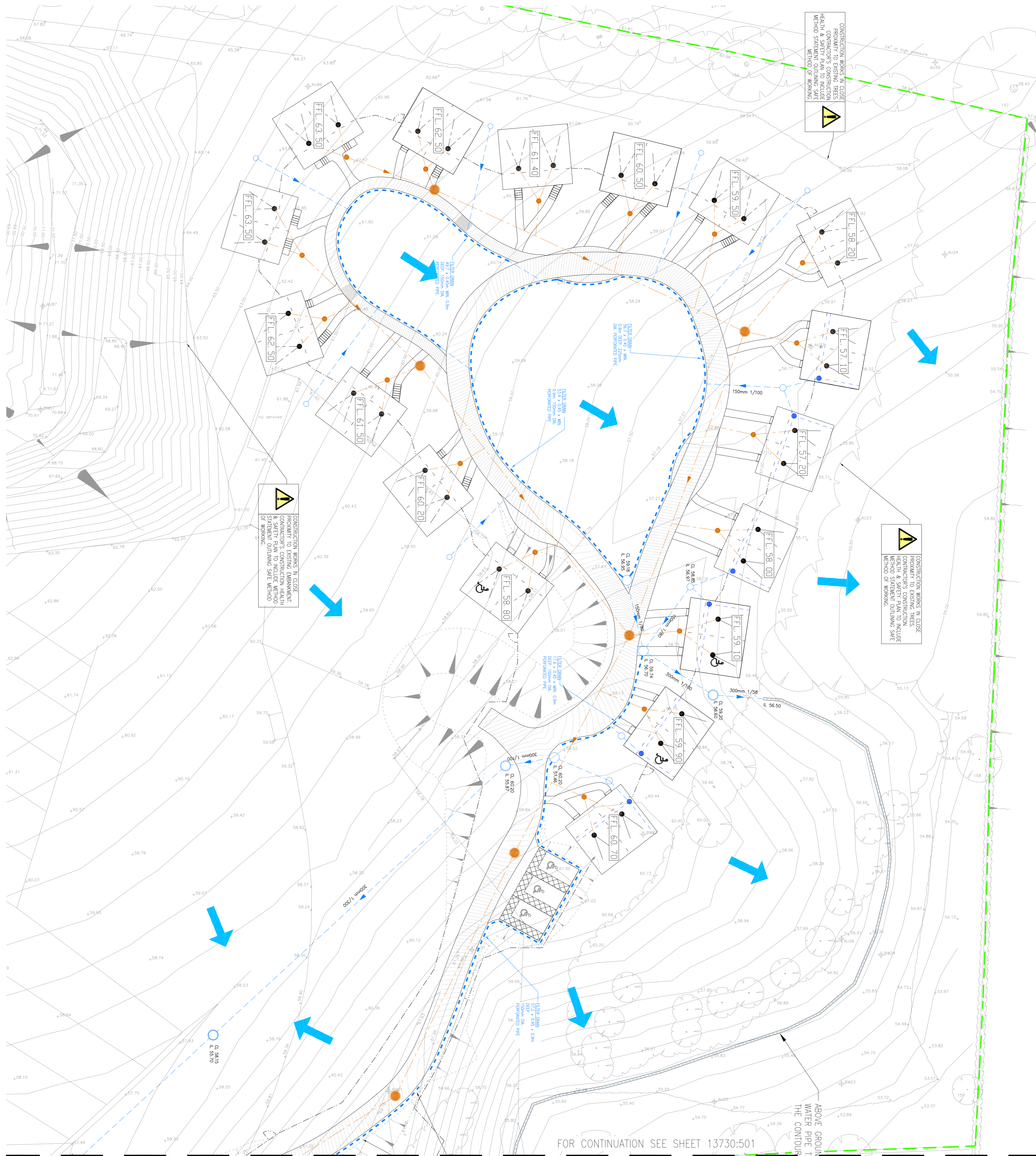
#### FSR Data

Return Period (years)	100
Storm Duration (mins)	360
Region	England and Wales
M5-60 (mm)	20.000
Ratio R	0.400
Areal Reduction Factor	1.00
Area (ha)	0.980
SAAR (mm)	643
CWI	94.740
Urban	0.000
SPR	30.000

#### Results

Percentage Runoff (%)	26.41
Greenfield Runoff Volume (m <sup>3</sup> )	161.806

**APPENDIX E**  
DRAINAGE LAYOUT PLAN



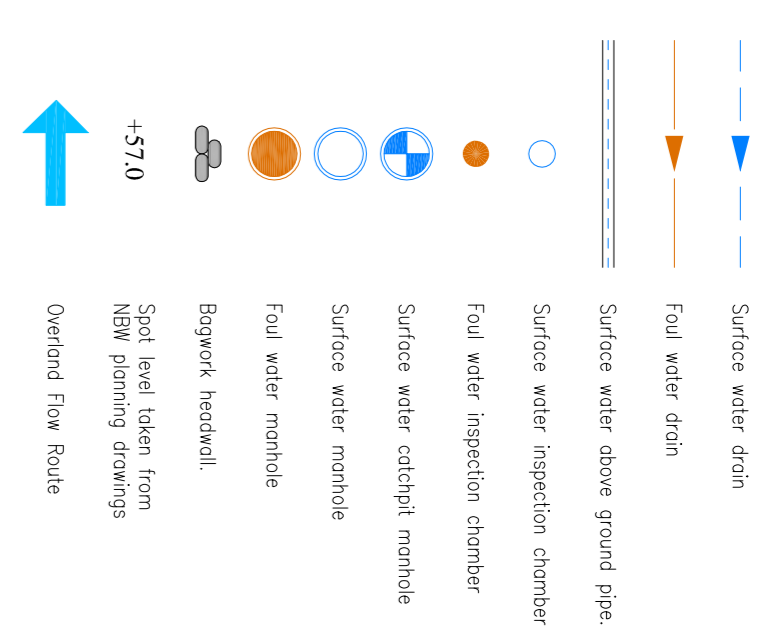
DESIGNERS RESIDUAL RISK SCHEDULE

CONSTRUCTION

- EXISTING SERVICES / DRAINAGE / SERVICES:
  - Refer to existing services layout (ref: 13730:03) / topographical survey (ref: 6548W/6) / statutory undertaker's records for location of existing drainage / services and overhead cables.
  - Works in close proximity to existing services / services. Contractor's outlining safe method of working agreed with relevant statutory undertaker where necessary.
  - Works affected by existing services. Contractor should arrange for necessary prior to commencement of works.
- EXCAVATIONS & EARTHWORKS:
  - Refer to geotechnical report (ref: 13730:03) for details of underlying soils. Where ground conditions are found to deviate from those reported in the site investigation report, the engineer should be contacted immediately for advice on how to proceed.
  - Excavations shall be supported by shoring / trench boxes / soldier piles / sheet piling well back and monitored at a safe angle.
  - Contractor's Construction Health & Safety Plan should include method statement outlining safe method of working in / or adjacent to deep excavations adjacent to boundaries / structures / embankments / bulk excavations.
  - Contractor's Health & Safety Plan should include method statement outlining safe method for dewatering excavations during groundworks.
- WORKS ON OR ADJACENT TO EXISTING CAR PARK:
  - Contractor should ensure site personnel have appropriate training & use appropriate PPE when carrying out works adjacent to the car park and that all works are carried out in accordance with the relevant standards that apply best practice health and safety policies for all site personnel throughout the duration of the works on / adjacent to existing vehicular routes.
- CONNECTING TO EXISTING DRAINAGE:
  - Contractor's Construction Health & Safety Plan should include method statement that details best practice health and safety policies for all site personnel throughout the duration of the works on / adjacent to existing vehicular routes.
  - Contractor should ensure site personnel have appropriate training & use appropriate PPE when making connections to existing drainage.

FOR CONTINUATION SEE SHEET 13730:501

DRAINAGE STRATEGY LEGEND



ENGINEERING NOTES

- This drawing to be read in conjunction with all relevant Architect, Engineer and Subcontractor drawings and details. On Centre Surveys: Drawing Number 6548W/6 Dated June 2016
- All levels refer to levels given on survey drawing.
- Refer to Architects drawings for details of all soft landscaping, fences, gates & bollards.
- For lighting, service supplies & ducting requirements, refer to M&E drawings.
- All works to be carried out in accordance with BS EN 752 "Urban and sewer systems outside buildings" and the current edition of the Building Regulations "Approved document H".
- New drainage connections are to be made with appropriate lengths of rubber pipes & couplings.
- All manhole chamber covers to be installed parallel to road axis, except for building lines or appropriate floor level, for details of drainage above finished floor level, refer to Architects drawings.
- All stack connections under buildings to be minimum 100mm diameter solid PVC-U to BS EN 1401-1/BS4660 & laid at a stack is greater than 100mm than the diameter of the connection as to be increased to match it.
- All RMP connections to be minimum 100mm diameter solid PVC-U to BS EN 1401-1/BS4660 & laid at a minimum gradient of 1 in 80 unless otherwise noted. If the RMP is greater than 100mm then the diameter of the connection is to be increased to match it.
- All private foul water pipework up to 150mm in diameter to be PVC-U to BS EN 1401-1/BS4660.
- All private surface water pipework up to 150mm in diameter to be solid PVC-U to BS EN 1401-1/BS4660. All private surface water pipework 225mm and above to be structured pipe connecting with clause 316 of the specification for highway works.
- Concrete manholes shall comply with BS EN 1917 and BS 5911-3.
- Plastic chambers shall comply with BS 7158.
- On completion of development all drainage shall be jet cleaned and CCTV surveyed.
- Redundant drainage & services marked to be removed one to 1 meter to clause 803 & 805.
- All existing services shown are based on topographical survey and are not to be used for any other purpose. All pits under supervision of statutory undertaker & in accordance with RSC document "Avoiding Danger from Underground Services".

NO.	REVISION	BY	DATE
01	FIRST ISSUE	RCT	22/10/21

DRAWING STATUS: FINAL

DRAWING TITLE: DRAINAGE LAYOUT SHEET 1 OF 2

PROJECT: Chessington World of Adventures Lodges  
Project Number: 13730

PROJECT: CHESSINGTON WORLD OF ADVENTURES LODGES

Project Number: 13730



London, Henley-on-Thames and Gloucester	Drawn: CMK	Scale: @ A1	Date: OCT 21
Checked: LMC	Scale: @ A1	Date: OCT 21	
Project Ref: 13730			
Drawing Number: 13730 : 500	Revision: P1		