Land at Leys Hill, Walford

Ross on Wye

Drainage Strategy

September 2023





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Client:	Dwell Ahead Ltd			
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Document History					
Revision	Date	Comment			
01	31/07/2023	First issue			
02	02/08/2023	Second issue – Report updated following Client review			
03	11/09/2023	Third issue – Report updated following further percolation testing			

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This report will remain valid for a period of twelve months (from the date of last issue) after which the source data should be reviewed in order to reassess the findings and conclusions on the basis of latest available information.

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Introduction

Waterco has been commissioned to undertake a Drainage Strategy in relation to a residential development at land at Leys Hill, Walford, Ross on Wye, Herefordshire, HR9 5QU.

Herefordshire Council as Lead Local Flood Authority (LLFA) is a statutory consultee for major planning applications in relation to surface water drainage, requiring that all planning applications are accompanied by a Sustainable Drainage Strategy. The aim of the Sustainable Drainage Strategy is to identify water management measures, including Sustainable Drainage Systems (SuDS), to provide surface water runoff reduction and treatment.

Existing Conditions

The site covers an area of approximately 1.52 hectares (ha) and is located at National Grid Reference (NGR): 358651, 218813. A location plan and an aerial image are included in Appendix A.

Online mapping (including Google Maps / Google Streetview imagery, accessed September 2023) shows that the site comprises a former spa with associated hardstanding, tennis courts and an access road. The westernmost extent of the site comprises landscaped grounds.

The site is bordered by undeveloped land to the north and east, residential dwellings and agricultural land to the south, and an unnamed road to the west.

Local Topography

A topographical survey has been provided by Scott Donald Architecture, dated March 2023. The topographical survey shows that the site slopes from 107.5 metres Above Datum in the north to 88.3m Above Datum in the south. By comparison with ordnance datum, it appears that the topographical survey is relative to an arbitrary site datum.

Topographic levels to metres Above Ordnance Datum (m AOD) have been derived from a 1m resolution Environment Agency (EA) composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). The LiDAR data shows that the site slopes from approximately 83m AOD in the north to 65m AOD in the south.

Topographical information is provided as Appendix B.

Ground Conditions

Published Geology

The British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the site is underlain by the Tintern Sandstone Formation, comprising sandstone. No superficial deposits are identified.

The geological mapping is available at a scale of 1:50,000 and as such may not be accurate on a site-specific basis.



Hydrogeology

According to the EA's Aquifer Designation data, obtained from MAGIC's online mapping [accessed September 2023], the underlying Tintern Sandstone Formation is classified as a Secondary A Aquifer. Secondary A Aquifers are 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers'.

The EA's 'Source Protection Zones' data, obtained from MAGIC's online mapping [accessed September 2023], indicates that the site is not located within a Groundwater Source Protection Zone.

Ground Investigations

Pennell Associates Investigations

Infiltration testing in accordance with the BRE365 specification together with percolation testing in accordance with Building Regulations Part H has been undertaken by Pennell Associates in August 2016 (job no. 2504) and submitted in support of a previous planning application (planning reference P16189/F).

Infiltration Testing

The results of the soakaway testing show that infiltration rates across the site ranged from 1.10×10^{-5} m/s (0.0396 m/hr) to 1.13×10^{-5} m/s (0.04068 m/hr).

Percolation Testing

The percolation testing comprised 2no. trial pits within the southern extent of the site. The percolation test results show that an average percolation value of 60.47 s/mm was recorded across the 2no. trial pits.

In August 2023, additional percolation testing was undertaken in accordance with Building Regulations Part H, by the Client. The percolation testing comprised 3no. trial pits located within the southern extent of the site. The percolation test results show that an average percolation value of 130s/mm was recorded across the 3no. trial pits. An average percolation value of 72s/mm was recorded at trial pit 3.

A trial pit location plan is included in Appendix C.

Local Drainage

Public sewer records have been obtained from Dwr Cymru Welsh Water (DCWW) and are included in Appendix D. The DCWW sewer records show that there are no public sewers within the immediate vicinity of the site. The nearest public sewer is located in Goodrich, approximately 1.2km from the site.

Anecdotal information from the Client suggests that the existing spa drains to a septic tank and drainage field. Existing surface water flows are assumed to discharge to soakaway.

Development Proposals

The proposed development is for demolition of the existing spa building and the erection of 8no. dwellings with associated driveways and landscaped areas. A proposed development plan is included in Appendix E.



Development proposals also include the retention of the existing access road.

New hardstanding areas (excluding the existing road) cover an area of approximately 2,175m². All measurements have been taken from a .PDF copy of the 'Proposed Site Plan' (drawing no. 137 / A.L.004 Rev A) and are approximate only.

Planning Policy

The Herefordshire Local Plan 2011-2031 (adopted October 2015) contains the following policies relating to drainage:

'Policy SD3 – Sustainable Water Management and Water Resources:

Measures for sustainable water management will be required to be an integral element of new development in order to reduce flood risk; to avoid an adverse impact on water quantity; to protect and enhance groundwater resources and to provide opportunities to enhance biodiversity, health and recreation. This will be achieved by ensuring that:

...5. development includes appropriate sustainable drainage systems (SuDS) to manage surface water appropriate to the hydrological setting of the site. Development should not result in an increase in runoff and should aim to achieve a reduction in the existing runoff rate and volumes, where possible;

...7. the separation of foul and surface water on new developments is maximised;

...9. development should not cause an unacceptable risk to the availability or quality of water resources; and

10. in particular, proposals do not adversely affect water quality, either directly through unacceptable pollution of surface water or groundwater, or indirectly through overloading of Wastewater Treatment Works. Development proposals should help to conserve and enhance watercourses and riverside habitats, where necessary through management and mitigation measures for the improvement and/or enhancement of water quality and habitat of the aquatic environment. Proposals which are specifically aimed at the sustainable management of the water environment will in particular be encouraged, including where they are required to support business needs such as for agriculture. Innovative measures such as water harvesting, winter water storage and active land use management will also be supported. In all instances it should be demonstrated that there will be no significant adverse landscape, biodiversity or visual impact.

Policy SD4 – Wastewater Treatment and River Water Quality:

Development should not undermine the achievement of water quality targets for rivers within the county, in particular through the treatment of wastewater.

In the first instance developments should seek to connect to the existing mains wastewater infrastructure network. Where this option would result in nutrient levels exceeding conservation objectives targets, in particular additional phosphate loading within a SAC designated river, then proposals will need to fully



mitigate the adverse effects of wastewater discharges into rivers caused by the development.

...Where evidence is submitted to the local planning authority to indicate connection to the wastewater infrastructure network is not practical, alternative foul drainage options should be considered in the following order:

• provision of or connection to a package sewage treatment works (discharging to watercourse or soakaway);

• septic tank (discharging to soakaway). With either of these non-mains alternatives, proposals should be accompanied by the following:

• information to demonstrate there will be no likely significant effect on the water quality, in particular of designated national and European sites, especially the River Wye SAC and the River Clun SAC; or

• where there will be a likely significant effect upon a SAC river, information to enable the council, in its role as a competent authority, to ascertain that the development will have no adverse effect on the integrity of the SAC;

• in relation to water courses with national or European nature conservation designations, the inclusion of measures achieving the highest standard of water quality discharge to the natural drainage system including provision for monitoring.

The use of cesspools will only be considered in exceptional circumstances and where it can be demonstrated that sufficient precautionary measures will ensure no adverse effect upon natural drainage water quality objectives'.

Consultation

A consultation request was submitted to the LLFA in July 2023. The LLFA's response is included in Appendix F and is summarised below:

Surface Water Drainage

- The LLFA agree in principle to the use of individual property soakaways and permeable surfacing within the driveway. The LLFA also agree to the proposed drainage system being sized to accommodate the 1 in 100 year plus 45% Climate Change (CC) event.
- The LLFA agree to the use of the infiltration rates from planning application P16189/F being used to size the individual property soakaways.
- The Drainage Strategy must demonstrate that there is no increased risk of flooding to the site or downstream of the site as a result of development between the 1 in 1 year event and up to the 1 in 100 year event and allowing for the potential effects of climate change.



- The Cranfield University 'Soilscapes' map identifies the soils within the proposed development area to be freely draining and as such, infiltration techniques may be viable. Infiltration testing should be undertaken in accordance with BRE365 should be undertaken to determine whether the use of infiltration techniques is a viable option.
- Soakaways should be located a minimum of 5m from building foundations, that the base of soakaways and unlined storage/conveyance features should be a minimum of 1m above groundwater levels and must have a half drain time of no greater than 24 hours.

Foul Drainage:

- Percolation testing has been previously undertaken as part of planning application P16189/F and found acceptable Vp rates. However, the LLFA note that the tests were conducted in a very spatially constrained area of the site and do not provide a full representation of the onsite soakaway. Therefore, additional localised testing in accordance with BS 6297 is required by the LLFA in the location of the proposed foul drainage infrastructure to confirm the local ground conditions can support a foul water discharge to ground.
- Before conducting the tests, the LLFA recommend that the Applicant considers the geometric aspects of the proposed installation, with close attention to details in the Building Regulations Part H (the pipes are typically installed with minimum 500mm cover, thus 600mm to invert). Section 1.42 of the Building Regulations identifies the need to install distribution pipes a minimum of 500mm below the surface. Conversely, BS 6297 Figure 4 identifies the minimum cover as 300mm (200mm + 100mm gravel).
- If percolation testing results prove soakage is viable, the following must be adhered to for Drainage Fields:
 - The drainage field should be located a minimum of 10m from any watercourse, 15m from any building (where serving multiple properties) or 7m where serving an individual property, 50m from an abstraction point of any groundwater supply and not in any Zone 1 groundwater protection zone. The drainage field should be sufficiently far from any other drainage field, to ensure that overall soakage capacity of the ground is not exceeded.
 - The drainage field should be no less than 2m from adjoining land.
 - Drainage fields should be constructed using perforated pipe, laid in trenches of uniform gradient which should not be steeper than 1:200. The distribution pipes should have a minimum 2m separation.
 - Drainage fields should be set out in a continuous loop, i.e., the spreaders should be connected. If this feature is missed, it will gradually clog with debris and the field will become increasingly ineffective.
 - If drainage fields are to be used in the foul water drainage strategy, the LLFA recommend individual package treatment plants and individual corresponding drainage fields serve each



property.

If due to site constraints, such as available area, one package treatment plant and/or one drainage field will serve multiple properties, then the LLFA ask that the following is considered and detailed within the planning application:

1. How maintenance and eventual replacement of the package treatment plant will be funded.

2. Which party will retrieve inorganic debris from the package treatment plant when this is discharged down the drains.

3. Who will be responsible for communicating with new residents (e.g., new tenants) to advise them to dispose of inorganic debris using bins.

4. Who will maintain the package treatment plant and which drains will be owned by respective property owners or a third party. If a private management company is proposed, then the land on which the package treatment plant is built and the plant itself will need to be owned by all of the property owners. This policy is consistent with our SuDS guidance and will ensure continuity if the management company went into administration.

5. In the event of electrical power failure, the Residual Current Device may isolate the package treatment plant. In this scenario pollution will occur. The RCD would need to be installed in a dry place, please confirm where. Which party will be responsible for switching the package treatment plant on after an electrical power failure.

6. If a water company operated a remote pumping station, then they would install telemetry so that their maintenance team could respond to pump failure within 3 hours to mitigate the risk of pollution. Because there will be multiple users, the residents will not be immediately accountable and so will rely on any management company to resolve a problem. A method will need to be developed to ensure that failure of the package treatment plant will be communicated to those who maintain it.

Surface Water Management

The site currently comprises an existing spa, tennis courts and access road. Surface water is currently assumed to drain by infiltration. There are no watercourses or public surface water sewers within 250m of the site.

In order to comply with the non-statutory standards for sustainable drainage systems and local policy, surface water runoff will be managed on site to accommodate the 1 in 100 year plus climate change event. In accordance with the EA 'Flood Risk Assessment: Climate Change Allowances' guidance (May 2022), a 45% climate change allowance should be applied when sizing the drainage system.



Discharge Method

Paragraph 056 of the NPPG: Flood Risk and Coastal Change sets out the following hierarchy of drainage options: into the ground (infiltration); to a surface water body; to a surface water sewer, highway drain or another drainage system; to a combined sewer.

Infiltration

The first consideration for the disposal of surface water is infiltration (soakaways and permeable surfaces).

Infiltration testing has been carried out by Pennell Associates in August 2016 and has been submitted in support of planning application P16189/F. The infiltration tests were carried out in accordance with the BRE365 specification.

2no. trial pits (TP) were advanced in the centre of the site. Infiltration testing was successful with a minimum infiltration rate of 1.10×10^{-5} m/s (0.0396 m/hr) recorded.

The following infiltration-based drainage system is therefore proposed:

- The proposed driveways will be formed from permeable surfacing.
- Runoff from dwelling roofs will drain to individual property soakaways.

Soakaway Sizing

Soakaway sizing has been based on an infiltration rate of 0.0396 m/hr (the slowest infiltration rate recorded).

Soakaway sizing estimates for each property have been undertaken using MicroDrainage and are included in Appendix G. A summary of the required soakaway dimensions is provided as Table 1. A 95% void ratio has been used within the soakaway design which is applicable to geo-cellular style soakaways. The soakaways have been designed to accommodate the 1 in 100 year plus 45% climate change (CC) event.

Table 1 – Individual Soakaway Sizing

Plot	MicroDrainage Reference	Contributing Roof Area (m²)	Infiltration Rate	Required Soakaway Dimensions (m)		
			(m/hr)	Length	Width	Depth
1,2 and 7	Soakaway 1	118	0.0396	9.5	1	1.2
3, 4, 5 and 6	Soakaway 2	243	0.0396	18.5	1	1.2
8	Soakaway 4	232	0.0396	18	1	1.2

Permeable surfaces will be used for all driveways with infiltration occurring through the sub-grade material. A minimum 200mm sub-grade depth is recommended for all permeable surfaces.



Concept Surface Water Drainage Scheme

Surface water runoff will be disposed of via individual private soakaways and permeable surfacing. Soakaways will be sized to accommodate the 1 in 100 year plus 45% CC event. The proposed drainage system will ensure no increase in flood risk elsewhere.

A Concept Surface Water Drainage Sketch is included in Appendix H.

Exceedance Event

Storage will be provided for the 1 in 100 year plus 45% CC event. Storm events in excess of the 1 in 100 year plus 45% CC event should be permitted to produce temporary shallow depth flooding within the access road and landscaped areas. Finished floor levels will be set above surrounding ground levels ensuring exceedance flooding will not affect the buildings.

Surface Water Treatment

In accordance with the CIRIA C753 publication 'The SuDS Manual' (2015), residential roofs have a 'very low' pollution hazard level, with low traffic roads and individual property driveways classified as having a 'low' pollution hazard level. Table 2 shows the pollution hazard indices for each land use.

Table 2 -	- Pollution	Hazard	Indices
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Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Low Traffic Roads	Low	0.5	0.4	0.4

Table extract taken from the CIRIA C753 publication 'The SuDS Manual' – Table 26.2

* Indices values range from 0-1.

Runoff from the roofs will be directed to soakaways. Driveways will be formed from permeable surfacing. Table 3 demonstrates that soakaways and permeable surfacing provide sufficient treatment. Sediment traps will be placed upstream of the soakaways for ease of sediment removal.

Table 3 – SuDS Mitigation Indices

	Mitigation Indices					
Type of SuDS	Total Suspended Solids (TSS) Metals Hydrocarbons					
Soakaway	0.4	0.4	0.4			
Permeable Surfacing	0.7	0.6	0.7			

Table extract taken from the CIRIA C753 publication 'The SuDS Manual' – Table 26.3



Maintenance

Maintenance of soakaways and permeable surfacing serving individual properties will be the responsibility of the property owner(s). Maintenance schedules for a soakaway and permeable surfacing are included in Appendix I.

Maintenance of the shared access road will be arranged through a site management company.

Foul Drainage

The existing spa is currently served by a septic tank with effluent drained to a drainage field. Due to the increase in foul flows from the proposed development the existing foul drainage system will not be retained.

The nearest public foul network is located in Goodrich approximately 1.2km west of the site. Due to the distance required to achieve a connection (approximately 1.45km) and requirement to pump flows beneath the River Wye, a connection to the public foul network within Goodrich is not considered financially viable.

As there are no readily accessible public sewers within the immediate vicinity of the site, a private sewage treatment system is proposed.

Based on the site layout, it is proposed to incorporate individual package treatment plants for each dwelling. The treatment plants will therefore be maintained by individual property owners. Sufficient space is available within property gardens for the treatment plants whilst achieving a 7m easement from buildings.

Insufficient space is available to provide individual drainage fields within property curtilages. Treated effluent will therefore be drained to a communal drainage field within a landscaped area (public open space) within the southern extent of the site.

Indicative Drainage Field Sizing

Percolation testing has been undertaken by Pennell Associates in August 2016 in support of a previous planning application for the site (P16189/F). The percolation test results identified an average percolation value of 60.47 s/mm.

Correspondence from the LLFA (Appendix F) states: 'We will require additional localised testing to be undertaken, in accordance with BS 6297, in the proposed foul drainage infrastructure location to confirm the local ground conditions can support a foul water discharge to ground'.

As per LLFA requirements, additional percolation testing, in accordance with BS6297, was undertaken by the Client in August 2023. Three trial pits were dug in the southern extent of the site. The percolation test results identified that the percolation rate in the south-western extent of the site is not sufficient to support a drainage field. However, sufficient percolation is available in the south-eastern extent of the site to support a drainage field.

A percolation value of 66.57 s/mm (the average percolation value of Pennell Associates trial pits 1 and 2 and



trial pit 3 of the August 2023 tests) has been used to inform drainage field sizing.

The size of the drainage field is based on the percolation value and population served. In accordance with the guidance contained in British Water Code of Practice Flows and Loads 4, a population of 5 is applicable for 3 bedroom properties. A population of 6 is applicable for 4 bedroom properties. Three 3no. bed properties are proposed and five 4no. bed properties are proposed. A total population of 45 is therefore estimated.

Using the equation in Building Regulations Part H (population x percolation value x 0.2), a drainage field size of 599.13m² is estimated.

The drainage field and the shared piped drainage system conveying treated effluent to the drainage field will be maintained by a site management company.

A Concept Foul Drainage Sketch is included in Appendix J.



Conclusions

The proposed development is for demolition of the existing spa and tennis courts and the erection of 8no. dwellings with associated driveways and landscaped areas. Development proposals include the retention of the existing access road.

All methods of surface water discharge have been considered. There are no watercourses or public sewers within the immediate vicinity of the site and as such, an infiltration-based drainage system appears to be the only option. Infiltration testing has been undertaken by others and confirms that infiltration techniques are feasible.

The following infiltration-based drainage system is therefore proposed:

- The proposed driveways will be formed of permeable surfacing.
- Runoff from dwelling roofs will drain to individual property soakaways.

All infiltration features will be sized to accommodate the 1 in 100 year plus 45% CC event.

As there are no readily accessible public sewers within the immediate vicinity of the site, a private sewerage treatment system is proposed. It is proposed to incorporate individual package treatment plants for each dwelling. The treatment plants will therefore be maintained by individual property owners. Treated effluent will be drained to a communal drainage field within a landscaped area (public open space) within the southern extent of the site.

A Concept Designer's Risk Assessment (cDRA) has been prepared to inform future designers of any identified hazards associated with the scheme. The cDRA has been included in Appendix K.

Recommendations

1. Submit this Drainage Strategy to the Planning Authority in support of the Planning Application.



Appendix A Location Plan and Aerial Image





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	Notes: 1) All dime above Ord	ensions are Inance Datu	in metres a um unless s	nd all le tated of	evels in metres therwise	
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Appendix B Topographical Information





Notes Do not scale from this drawing - use figured dimensions only.
All setting out dimensions to be checked on site by contractor before work commences.
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Project CATS Client David Hartley Drawing title Existing Topographical survey Drawing number 137 / A.L.001 Revision Issued for PLANNING Scale 1:250 @ A0 Date March 2023

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Appendix C Trial Pit Location Plan





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Notes: 1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND



Site Boundary Approximate Location of Pennell Associates Percolatiotion Testing Trial Pits Approximate Location of August 2023 Percolation Testing Trial Pits Approximate Location of Pennell Associates Infiltration Testing Trial Pits



Dwell Ahead Ltd



www.waterco.co.uk

SCHEME:

Land at Leys Hill, Walford, Ross on Wye

PLOT TITLE:

Trial Pit Location Plan

FINAL					<u>.</u> -09-2023
drawn: RM	<u>CHECKED:</u> AW	APPROVED: MW	PLOT SCA	LE AT	<u>A3:</u> 000
<u>PLOT NAME:</u> 15470	REVISION:				

Appendix D DCWW Sewer Plan





Appendix E Proposed Development Plan





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Revision A 30.03.23 PRE APLICATION ADVICE

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Project CATS Client David Hartley Revision A Issued for PLANNING Scale 1:250 @ A0 Date March 2023

Drawing title Proposed Site Plan Drawing number 137 / A.L.004

Appendix F LLFA Correspondence



Herefordshire Council

Directorate/Division: Economy and Environment Team: Development Management Our Ref: 231092/CE Please ask for: Mrs G Webster Direct line: 01432 261803 Email: Gemma.Webster3@herefordshire.gov.uk Date: 14/07/2023

Mr Donald 42 Winstanley Road M33 2AR

Dear Mr Donald / Mrs Rawlings

SITE:	Land at Leys Hill, Walford, Ross on Wye, Herefordshire, HR9 5QU
DESCRIPTION:	Pre-application advice request for 8 nos. dwellings (comprising a mix of three and four bedrooms) - to replace the approved application.
APPLICATION NO:	231092/CE
APPLICATION TYPE:	Pre App Advice

I refer to your pre-application advice request received on 31 March 2023.

My advice in respect of your request is as follows:-

Site location and proposal

The site is located on the southern side of Leys Hill road, it is a 1.5 hectare plot. The site is within the Wye Valley AONB, and is fairly steep sloping up towards the north east.

The site has the benefit of planning permission for 5 dwellings across the site.

The pre-application proposal is seeking to submit an application for 8 new dwellings. The total floorspace would be 2500sqm with a footprint of 1326sqm. (the approved 5 dwellings has a total footprint of 1740sqm and a total floorspace of 2787sqm).

The diagram below shows the footprint comparison between the two schemes.



Planning Services, PO Box 4, Hereford. HR4 0XH herefordshire.gov.uk | facebook: hfdscouncil | twitter: @hfdscouncil | instagram: hfdscouncil There have been no detailed elevation plans submitted with this pre-application and therefore only the principle of development for 8 dwellings on this site will be assessed.

Officer appraisal

Herefordshire Core Strategy Policy RA2 sets the context for new residential development across the county, the site is located within the Ross-on-Wye Housing Market Area (HMA). This site is within Bishopswood Village which is defined as a settlement within Figure 4.15 (Other settlements where proportionate housing is appropriate).

Core Strategy policy RA1 – *Rural housing distribution* sets out the strategic way housing is to be provided within rural Herefordshire and to deliver a minimum 5,600 dwellings. Herefordshire is divided into seven Housing Market Areas (HMAs) in order to respond to the differing housing needs, requirements and spatial matters across the county.

Core Strategy policy RA2 – *Housing outside Hereford and the market towns* identifies the settlements in each HMA area where both the main focus of proportionate housing development will be directed, along with other settlements where proportionate housing growth is appropriate.

Bishopswood is within the Ross on Wye HMA. The Ross on Wye HMA is to provide a minimum 1150 dwellings in the Plan period with an indicative housing growth target of 14%.

Walford parish have an adopted NDP that was made on 13 June 2023 which provides defined settlement boundaries for the villages.

NDP policy Walf 2 states: Housing growth within defined settlement boundaries will be supported at Walford and Coughton, Bishopswood and Howle Hill, predominantly through infilling and site allocations, where this reflects the character of the particular settlement.

The Bishopswood policy map can be seen below with the site identified with a red star:



As can be seen on the map the site is located within the settlement boundary for Bishopswood and therefore the principle of development is considered acceptable.

Herefordshire Council

However, the site is located in a landscape sensitive area and therefore the success of a scheme will be in the proposed design, materials and landscaping.

Officers have noted that the overall floorspace and footprints will be lower for the 8 dwellings than the approved 5 dwellings, however the additional units will reduce open gaps between the dwellings and increase the residential paraphernalia associated with dwellings which could impact upon the landscape. (see landscape officers comments below for more details)

The following NDP policies will be relevant for any future application and should be taken into account when preparing detailed designs:

NDP policy WALF4 - Conserving the Landscape and Scenic Beauty of the Parish

Measures to maintain and reinforce landscape character within Walford Parish, especially within the Wye Valley AONB, will be promoted wherever possible.

To ensure development contributes positively to the area's character and does not adversely affect it, proposals should:

a) Be accompanied by a landscape scheme, informed by an analysis of the site's setting and containing measures forming an integral part of the design for the development, retaining and enhancing as many natural features within or surrounding the site as possible.

b) Conserve and enhance the special landscape qualities, including the local distinctiveness, particularly within the Wye Valley Area of Outstanding Natural Beauty, including in accordance with its Management Plan, where sites fall within its area, or affect its setting.

c) Promote positively the landscape character of the Parish, in particular ensuring the features, including settlement pattern, contributing to their identification as 'Principal Settled Farmlands', 'Principal Wooded Hills', 'Wooded Hills and Farmlands', 'Riverside Meadows' and 'Forest Smallholdings and Dwellings' landscape types as appropriate, are conserved, restored or enhanced through measures consistent with their particular characterisation.

d) Protect and enhance the visual integrity of the River Wye and its banks.

e) Retain, wherever possible, enhance important landscape features such as orchards, hedgerows and water courses, and maintain and preferably extend tree cover using native species, where opportunities are available.

f) Trees considered to be of amenity value should be protected through the use of Tree Preservation Orders where appropriate.

g) Tree planting should be consistent with good arboricultural practice.

Policy WALF6: Enhancement of the Natural Environment

The conservation, recovery and enhancement of biodiversity habitats and geological features, including sites identified in the Priority Habitats Inventory and Herefordshire Biodiversity Action Plan, local wildlife sites, trees (especially veteran trees), woodlands, orchards, hedgerows, ponds, water courses and grasslands, in accordance with Core Strategy policy LD2 will be supported in order to maintain and expand wildlife13. Proposals resulting in a net gain of biodiversity will be supported.

To facilitate this, development should achieve at least the appropriate level of biodiversity net gain through measures that:

a) Ensure the integrity of the River Wye SAC and Coughton Wood and Marsh SSSI, maintaining or enhancing their conservation status.

b) Contribute towards connectivity in the wider ecological network within the Parish by enhancing the ecological corridors and stepping-stones identified by Herefordshire Council in its Ecological Network Map 2013 (and any subsequent successor).

c) Ensure, where possible, that the ecological network within the Parish contributes to that for the Wye Valley AONB.

d) Protect the biodiversity value of local wildlife and geological sites, ancient woodlands and other important habitats within the Parish.

e) Add to the green infrastructure14 network where possible, improving the ecological value of its constituent sites and features.

Proposals that promote the creation and/or active management of sites to maximise habitat diversity, including woodlands, orchards, streams and wetlands, will be supported, as will those that result in additional and new natural areas capable of becoming local wildlife sites.

Development proposals must, in particular, demonstrate that they will not have a significant adverse effect on the River Wye Special Area of Conservation and species of European importance. In the event that the integrity of the Lower River Wye catchment15 is found to be failing to meet its conservation status, planning permission will only be granted where it is shown that the proposal will not increase nutrient inputs into the SAC. This could include through the delivery of mitigation measures to make a proposal nutrient neutral. Reference should be made to Herefordshire Council's Phosphate calculator and associated guidance in making any assessment.

Policy WALF8: Wastewater Drainage

Within Coughton part of Walford and Coughton, should there be a temporary lack of capacity at Ross Lower Cleeve WwTWs or within the sewer generally, development upon sites may need to be delayed until such time as works are carried out to provide sufficient capacity. Developers may contribute towards remedial works in order to remove any capacity constraint and to advance their proposals more swiftly.

For developments within the Walford part of Walford and Coughton, Bishopswood, Howle Hill and elsewhere away from the public sewer, developers should show, through appropriate evidence, that wastewater drainage can be accommodated without causing pollution to the River Wye SAC, other properties and land. Developers should ensure any proposed scheme that meets the above requirement is fully implemented before development is brought into use. Developers should utilise or contribute to wet systems where this is practicable, including measures to support biodiversity

Policy WALF10: Sustainable Design

An integrated approach to achieve a high standard of sustainable design will be required to achieve the maximum possible reduction in the carbon footprint of any development. Development proposals, including alterations and extensions to buildings, should contain a co-ordinated package of design measures which could include, as appropriate:

a) Utilising sustainability measures associated with buildings that include their orientation to maximise solar gain, installation of photovoltaic cells, the provision of the highest possible energy and water conservation measures, storage for bicycles and for waste including provision for recycling, broadband infrastructure, and renewable energy infrastructure such as photovoltaic panels where these do not detract unacceptably from any historic features or the settings of historic assets.

b) Seeking on site measures that support energy conservation such as through tree planting and other forms of green infrastructure that provide shade, shelter and promote physical activity.

c) Integrating new homes fully into the existing neighbourhood and supporting a more pedestrian friendly environment through the use of permeable surfaces and convenient links to local facilities and public transport connections which are suitable for those pushing pushchairs, in a wheelchair, walking with aids or using mobility scooters.

d) Assisting offsite measures such as supporting infrastructure to promote sustainable travel and enabling a sustainable drainage system to serve the widest range of properties where opportunities exist.

e) Avoiding or fully mitigating the loss of woodlands, orchards, grassland and other features that absorb carbon.

f) In addition, providing opportunities for tree and woodland planting to offset the full extent of carbon used during manufacturing of building materials and construction works

g) Where there is good reason to believe that contamination of land may exist on any site, including through agricultural processes, ensuring an assessment is carried out to establish the extent and nature of the contamination, and effective measures taken to ensure potential occupiers, and the wider environment, are not put at unacceptable risk.

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h) Where external lighting is required and to avoid or reduce light spill to external areas generated from within buildings, development proposals should be supported by a lighting plan that demonstrates it will not have an adverse effect on residential and local amenity or the safety of road users through unnecessary glare or light trespass; protect the night sky from light pollution, especially on intrinsically dark landscapes and nature conservation; and should use reduced energy consumption infrastructure and renewable energy sources where possible.

i) Minimising construction traffic and reducing waste.

j) Where new innovative sustainable design or features are incorporated, they should fit sensitively within the street scene and incorporate locally distinctive features to maintain the area's cohesive character.

k) Locating noise sensitive development, including housing, in locations that are not subject to unacceptable levels of noise from highways and ensuring effective measures are taken to ensure that ambient noise levels both indoors and outdoors are acceptable.

Developments that seek to achieve the highest levels of sustainable design will, in particular, be encouraged, including those certified under the Code for Sustainable Homes scheme in relation to dwellings.

The following consultee comments were provided as part of the pre-application:

Tree Officer

I have not been to site to view this Pre app, but have been before to create the Tree Preservation Order and am familiar with it.

I have read the landscape comments and am in agreement that a BS5837 - Trees in relation to design, demolition and construction is required.

I am aware that previous applications submitted at tree report this would now be outdated and therefore a relatable one to the proposed layout will be required.



Landscape Officer

This is a desk based response, however I have visited the area for other nearby planning applications and have commented on previous pre-application requests for this site. Very little information has been provided with this application and it is a sensitive site. It seems that the principal of residential development on this site has been previously established through historic approved applications, however it is sensitive in landscape terms, being within the Wye Valley Area of Outstanding Natural Beauty and the Hazelhurst unregistered park and garden of local historic interest. The unique topography and adjacent TPO are also important characteristics. This means that the type and design of the proposed dwellings, their layout and how they sit in the retained and proposed landscape will be required in order to assess the suitability of the scheme. I recommend that further pre-application would be required once designs are prepared.

The application form and submitted drawing offer a comparison between the approved 5 dwelling scheme and assert that the new proposals will have a reduced footprint and floor area. This, however, does not in itself provide a landscape improvement. With an increased number of dwellings comes increased residential infrastructure and paraphernalia, such as cars, parking bays, sheds, fencing / boundary treatments, lighting, noise and movement. These all have the potential for increased negative landscape impacts. The increased number of dwellings reduces the gaps between built form and reduces the useable space available for gardens, hedgerows and retained / new planting. The overall perception of the site will be of a high density residential development that is not in keeping with the settlement pattern or landscape character, contrary to Core Strategy Policy LD1.

If the proposal is to be considered further, then it should be informed by:

Landscape appraisal

A Landscape and Visual Appraisal (LVA) is recommended to demonstrate that the applicant has undertaken a rigorous investigation of the site, *context*, impacts and mitigation methods to achieve an optimum design proposal for planning consideration. The LVA should address both effects on the landscape as a resource in its own right and effects on views and visual amenity. Refer to the Guidelines for Landscape and Visual Impact Assessment, 2013, Landscape Institute and Institute Environmental Management and Assessment. Consider appointing a Landscape Architect; Chartered Members of the Landscape Institute can be found at https://my.landscapeinstitute.org/directory.

Landscape led masterplan

Provide a scheme that takes into consideration context, solar gain orientation and pedestrian connectivity, with a strong emphasis on creating a green and healthy environment (amenity, biodiversity, recreation and leisure). Successful streets and housing are those associated with trees. The development should take into account climate resilience, aim to be carbon neutral and provide biodiversity net gain. Consider incorporation of food growing into existing and new developments, through the creation of roof gardens and / or growing spaces, increasing community food growing through allotment provision or edible landscapes. The landscape design should be fit for purpose and fit for place.

Tree and hedgerow survey

Provide a topographical survey, arboricultural method statement and relevant documentation as per BS5837:2012 'Trees in relation to design, demolition and construction – recommendations'. This should clearly identify all existing trees and hedgerows and then show those that are to be retained and protected and any that are to be removed. Retaining trees on site will help to promote viable habitats and enriched places to live. It will also help to identify requirements for proposed trees and hedgerows.

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For all sloping sites a topographical survey should be provided, together with existing and proposed levels. Site sections should demonstrate how new development will work with the existing landscape sensitively, so that the terrain can appear natural. Any cut and fill earthworks should be marked on the plan. Where possible avoid the use of retaining walls and utilise gentle slopes where vegetation will establish and contribute to green infrastructure (usually 1:3 or more). If retaining walls are used, consider a material that is fitting with the vernacular of the region and the new development.

Landscape scheme

Incorporate new landscape schemes and their management to ensure development integrates appropriately into its surroundings. This should include:

- Provide hard landscape plan (scale 1:200 or equivalent scale to communicate the information clearly), with existing and proposed levels. Indicate external paving, lighting, fencing, walls and other external elements. Provide a written specification of materials (type, sizes and colours).
- Provide a soft landscape plan (scale 1:200 or equivalent scale to communicate the information clearly), with trees and planting areas set out. Provide a written specification setting out species, size, quantity, density and cultivation details.

Landscape management and maintenance

Landscape management is the care of land to ensure that landscapes can fulfil needs and aspirations in an effective and sustainable manner for present and future communities of users. Identification of who is responsible for the long term landscape management is important, particularly for areas of public open space or communal use. A schedule of landscape maintenance for a period of 10 years shall be submitted to ensure the future establishment of the overall landscape scheme.

Drainage and water management

Provide a proposal that integrates water management, landscape amenity and useable open space, such as ponds, attenuation basins and swales (refer to Sustainable Drainage Systems (SuDS) Handbook <u>www.herefordshire.gov.uk</u> for guidance). Consideration could be given to water butts and rain gardens to capture roof water and hard surface runoff. Specify porous pavements to reduce road storm water runoff.

Material and colour design

Provide as part of the design and access statement, the external material and colour selection strategy. Utilise the local reference, Malvern Hills Areas of Outstanding Natural Beauty, Guidance on the Selection and Use of Colour.

www.malvernhillsaonb.org.uk/wp-content/uploads/2015/02/guidance on colour use screen-1.pdf

Lighting

Design of external lighting and lighting spill should take account of the relevant dark skies in and around Herefordshire, as well as the visual effect on countryside character, visual impacts and urban village settings. The design of any lighting infrastructure should be co-ordinated with the wider scheme in order to integrate with the new palette of materials.

Area of Outstanding Natural Beauty

The National Planning Policy Framework (NPPF) para 176 states "Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection. ... The scale and extent of development within all these designated areas should be limited, while development within their setting should be sensitively located and designed to avoid or minimise adverse impacts on designated areas."

 Within the Wye Valley development must take account of the Wye Valley Management Plan and associated guidance documents <u>https://www.wyevalleyaonb.org.uk/caring-for-wye-valleyaonb/management-plans/</u>. Particularly relevant are policies WV-D2 and WV-D3 on development design.

Historic Parks and Gardens

There are a large number of historic parks and gardens across that county that contribute to the richness and quality of the landscape. These creative landscape features also support large, varied and long-standing habitats for much flora and fauna.

• Un-registered Parks and Gardens are of local historic importance and have been surveyed jointly by Herefordshire Council and the Hereford and Worcester Gardens Trust. The historic structure, character, appearance, features or setting (including any designed visual envelope) should be given due consideration in any development proposals.

Herefordshire has a rich, beautiful and varied natural environment which cleans our air, channels our water, supports wildlife in all its many forms, lifts our spirits and keep us well (Herefordshire Council County Plan 2020 – 2024). The design of the landscape in any new development will be required to be of the highest quality to provide a healthy and vibrant place to live and contribute to the social, environmental and economic objectives of the local area. Relevant sections from the National Planning Policy Framework (NPPF) are:

- Chapter 12 Achieving well-designed places
- Chapter 14 Meeting the challenge of climate change, flooding and coast change
- Chapter 15 Conserving and enhancing the natural environment

Development proposals should be in accordance with Core Strategy Policies:

- SS6 Environmental quality and local distinctiveness
- SS7 Addressing climate change
- LD1 Landscape and Townscape
- LD2 Biodiversity and Geodiversity
- LD3 Green Infrastructure

Ecology Officer

The site is within the River Wye SAC catchment and this proposed development triggers the legal requirement for a Habitat Regulations Assessment process to be carried out by the LPA on any planning application submitted. The site is also within the HRA trigger buffer for the Wye Valley Woodlands SAC (Horseshoe bat species as an associated species) and Wye Woodlands and Forest of Dean Bat SAC (Horseshoe species). The final HRA 'appropriate assessment' completed by the LPA must be formally approved by Natural England PRIOR to any future planning consent being granted.

Sufficient and detailed information will be required to be submitted with any future outline or full applications to allow the authority to assess the proposal through its Duty of Care under NERC Act and Habitat Regulations. Natural England will also need to be a statutory consultee and will require sufficient information, like ourselves, to formally undertake a Screening Assessment for 'Likely Significant Effects' and then subsequently undertake a relevant Appropriate Assessment to determine and recommend relevant and appropriate Conditions to secure that the development(s) will have NO 'likely significant adverse effects' on the relevant SAC.

In support of a further application I would request:

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If Foul Water is proposed to be managed through connection to the local Mains Sewer network - confirmation that this practical and possible and that the local network has sufficient capacity must be provided in support of any further application.

Full details of how surface water run-off will be managed to ensure no increased discharge from site will occur and that there is no direct or unmanaged discharge in to any local watercourse. If discharge to local mains sewer is proposed confirmation this is acceptable to Welsh Water must be provided.

In addition:

An ecological assessment of the building should be supplied. The LPA has a duty of care to ensure all biodiversity and in particular protected species such as bats are fully considered within the planning process prior to any planning consent being granted. To support this at least one 'optimal period' bat surveys (Late May-August inclusive) should be carried out, if any evidence of use by bats (roosting) is found or presence of unassessed potential roosting features further optimal period surveys should be undertaken. The final report submitted should include detailed results and clear recommendations for all relevant ecological working methods and mitigation/compensation requirements for any bat usage, including foraging and commuting as well as any roosting. Any requirements for protected species licences should be detailed.

In line with NPPF Guidance, NERC Act and Core Strategy LD2 all developments should show how they are going to enhance the local biodiversity potential (net gain) - this is in addition to any mitigation or compensation required through a protected species licence. To ensure this a detailed biodiversity enhancement plan is requested. Enhancements should include significant consideration for a wide range of species, including as a minimum for, bats, birds and pollinating insects within the site boundary.

All external lighting and radiated light created must clearly demonstrate that it will not create a net increase in local night time illumination levels and no additional 'light glare' in local skies created. The latest guidance from the Institute of Lighting Professionals and the Bat Conservation Trust is a good starting source of relevant information.

Transport Officer

The submitted information contains sufficient detail to provide an assessment of the highways aspects of the development. The points below set out the observations and assessments of the highways elements of the proposal based on the submitted information:

The capacity of the highway network serving the site is close to its capacity due to the high vehicle flows, alignment and widths available. Therefore to make the proposal acceptable it will need to be demonstrated that these concerns are addressed and mitigated as part of a scheme. The impact on the network should not be underestimated, the routes to the site are rural and steep, therefore along with a Transport Statement a construction management plan will be required if permission is given to assess the buildability of the site.

The visibility splays are not shown. As a result these will need to be reviewed and fully set out on a drawing at a full application stage. This should include the rationale behind the calculation of the splays required. This will take into account the content of Herefordshire Council's Highways Design Guide for New Developments, the DfT's Manual for Streets and Manual for Streets 2. It is probable that suitable splays to support the access point for the proposal can be formed within the land ownership of the applicant, based on the information provided and the likely speeds on the highway network.
The access layout will need to be reviewed in conjunction with the missing visibility splays as there may need to be design alterations to accommodate the required splay. Therefore the deliverability of the access should be reviewed when the additional information is available to complete the design.

It is noted that an existing access is to be used, however should works be needed in the highway as the scheme develops permission may be required. The access construction is not set out and in the event that a full permission is sought, this specification should comply with the requirements of Herefordshire Council's Highways Specification for New Developments.

Vehicular accesses over 45m in length from the highway boundary to the face of a building should be referred to a Building Regulation Approved Inspector. In these circumstances, access and turning for emergency vehicles may be required, refer to Section 6.7 of Manual for Streets.

In terms of parking and turning provision for the proposals the following observations are made:

The parking provision is insufficient to meet the requirements of Herefordshire Council's Design Guide for New Developments. This should be reviewed prior to a full application being submitted.

The proposal does not include sufficient vehicle turning provision. This should be included as part of a full application to ensure vehicles do not reverse onto the highway.

It is unclear from the submission if cycle parking is to be included. This is a requirement for all new developments and as such a full application should set this provision out clearly.

The site is not located near to local amenities or bus stops and connection to these facilities should be considered for pedestrians or cyclists as appropriate.

The submitted information is insufficient to allow for highways to offer an indication of no objection at this stage.

All applicants are reminded that attaining planning consent does not constitute permission to work in the highway.

Land Drainage consultants

Our knowledge of the development proposals has been obtained from the following sources:

- Pre-planning application advice request;
- Location Plan (Ref: 137/A.L.000 Rev A);
- Existing Extant Proposal (Ref: 137/A.L.002 Rev A);
- Existing Extant Proposal Areas (Ref: 137/A.L.003 Rev A);
- Existing Topographical Survey (Ref: 137/A.L.001 Rev A);
- Proposed Footprint Comparison (Ref: 137/A.L.005 Rev A);
- Site Photos 1-4;
- Proposed Site Plan (Ref: 137/A.L.004A);
- LiDAR Plan (Ref: 15470_LiDAR_Plan);
- Email correspondence from Drainage Consultant 6.7.23.

References are made to supporting information provided under the previous planning permission 161689. Any relevant information intended to support the furture planning permission application must be re-submitted accordingly for additional review.

Overview of the Proposal

The Applicant proposes the construction of 8 new dwellings - a mixture of 3 and 4 bedroom properties. The site covers an area of approx. 1.52ha and is currently a mixture of greenfield, existing

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access/hardstanding, tennis courts and an existing property (Cats). The River Wye flows approx. 250m to the south of the site. The topography of the site slopes down from the north to the south by approx. 17m but it should be noted that the surrounding land area is steeply sloping.

Flood Risk

Fluvial Flood Risk

Review of the Environment Agency's Flood Map for Planning indicates that the site is located within the low probability Flood Zone 1.

Although the proposed development is located within Flood Zone 1, as it is more than 1ha, in accordance with Environment Agency standing advice, the planning application will need to be supported by a Flood Risk Assessment (FRA) undertaken in accordance with National Planning Policy Framework (NPPF) and its supporting Planning Practice Guidance.

Surface Water Flood Risk

Review of the EA's Risk of Flooding from Surface Water map indicates that the site is not at risk of surface water flooding.

Other Considerations and Sources of Flood Risk

The FRA prepared to support the planning application should include an assessment of risk associated with all sources of flooding, in accordance with the NPPF. This should include considerations of surface water, groundwater, sewers, reservoirs and any other manmade sources. The management of the additional surface water runoff generated by the proposed development should also be considered. The Applicant should also give consideration to any minor watercourses that could pose flood risk to the development as well as anecdotal evidence.

There may be a risk of surface water flooding from higher land. The Applicant would need to consider the likely flow routes in the vicinity of the proposed development site. It may be necessary to raise the threshold levels slightly to prevent ingress.

As topography within the area of the proposed development is steeply sloping, we would require the Applicant to demonstrate consideration of the management of overland flow and any necessary protection to the proposed dwellings and surface water drainage systems.

Review of the EA's Groundwater map indicates that the site is not located within a designated Source Protection Zone or Principal Aquifer.

Surface Water Drainage

We understand that a previous planning permission application was submitted for the same site (161689) whereby 5 dwellings were proposed. This application was supported by the submission of infiltration testing results; we note that the infiltration rates obtained ranged between $1x10^{-5}$ m/s and $1.3x10^{-5}$ m/s which are acceptable to support a surface water discharge to ground.

Email correspondence suggests that individual soakaways will be provided for each of the 8 proposed dwellings and will be sized to accommodate a 1 in 100yr + 45% CC event. These proposals appear acceptable in principle and appropriate for the proposed development. At planning permission stage, we will require a detailed surface water drainage strategy supported by sizing calculations clarifying the required soakaway volumes. The infiltration test report from August 2016 should also be included within the submissions for further review. A drainage layout drawing must be provided to confirm that the required offset distances can be accommodated for the proposed soakaways.

The Drainage Consultant has also proposed that the driveways and access road will be constructed of permeable materials. Again, this is acceptable in principle, but further construction details will be required at planning permission stage to ensure the provisions are adequate.

The below advice must be considered, and the associated information provided at Planning Permission stage to support the application.

The Applicant should provide a surface water drainage strategy showing how surface water from the proposed development will be managed. The strategy must demonstrate that there is no increased risk of flooding to the site or downstream of the site as a result of development between the 1 in 1 year event and up to the 1 in 100 year event and allowing for the potential effects of climate change. Note that in February 2016 the EA updated their advice on the potential effects of climate change and that a of allowances should be considered to understand the implications: range https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances.

All new drainage systems for new and redeveloped sites must, as far as practicable, meet the Non-Statutory Technical Standards for Sustainable Drainage Systems and will require approval from the Lead Local Flood Authority (Herefordshire Council).

In accordance with the NPPF, Non-Statutory Technical Standards for Sustainable Drainage Systems and Policy SD3 of the Core Strategy, the drainage strategy should incorporate the use of Sustainable Drainage (SUDS) where possible. The approach promotes the use of infiltration features in the first instance. If drainage cannot be achieved solely through infiltration due to site conditions or contamination risks, the preferred options are (in order of preference): (i) a controlled discharge to a local watercourse, or (ii) a controlled discharge into the public sewer network (depending on availability and capacity). The rate and volume of discharge should strive to provide betterment be restricted to the pre-development Greenfield values as far as practicable. For brownfield developments, a betterment of at least 20% is considered appropriate. Reference should be made to The SUDS Manual (CIRIA C753, 2015) for guidance on calculating runoff rates and volumes. The assessment of pre and post-development runoff rates should consider a range of storm durations to determine those which are critical for the site and receiving watercourse or sewer and demonstrate sufficient storage has been provided. Allowances for climate change would not typically be included in the calculation of existing discharge rates.

The Cranfield University Soilscapes Map identifies the soils within the proposed development area to be freely draining thus the use of infiltration techniques may be a viable option for managing surface water. On-site testing undertaken in accordance with BRE365 should be undertaken to determine whether the use of infiltration techniques are a viable option. Where site conditions and groundwater levels permit, the use of combined attenuation and infiltration features are promoted to provide treatment and reduce runoff during smaller rainfall events.

It should be noted that soakaways should be located a minimum of 5m from building foundations, that the base of soakaways and unlined storage/conveyance features should be a minimum of 1m above groundwater levels and must have a half drain time of no greater than 24 hours.

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For any proposed outfall to an adjacent watercourse, the Applicant must consider the risk of water backing up and/or not being able to discharge during periods of high river levels in the receiving watercourses.

The drainage system should be designed to ensure no flooding from the drainage system (which can include on-the-ground conveyance features) in all events up to the 1 in 30 year event. The Applicant must consider the management of surface water during extreme events that overwhelm the surface water drainage system (including temporary surcharging of gullies) and/or occur as a result of blockage. Surface water should either be managed within the site boundary or directed to an area of low vulnerability. Guidance for managing extreme events can be found within CIRIA C635: Designing for exceedance in urban drainage: Good practice.

Consideration should also be given to the control of potential pollution of ground or surface waters from wash down, vehicles and other potentially contaminating sources. Evidence of adequate separation and/or treatment of polluted water should be provided to ensure no risk of pollution is introduced to groundwater or watercourses both locally and downstream of the site, especially from proposed parking and vehicular areas. SUDS treatment of surface water is considered preferential for a development of this size.

The Applicant must confirm the proposed adoption and maintenance arrangements for the surface water drainage system. The Drainage Layout plan should reflect the ownership of the respective drainage components.

Foul Water Drainage

As stated above, we understand that there was a previous planning permission application for the site (161689). As clear from our previous consultation responses to 161689, there were significant issues regarding the foul water drainage proposals due to the spatial constraints of the site. Given that the proposed number of dwellings have now increased for the site from 5 to 8, this issue is likely to become more complicated.

We note that percolation testing was undertaken as part of application number 161689 and found acceptable Vp rates. However, the tests were conducted in a very spatially constrained area of the site and do not provide a full representation of the onsite soakage. The proposed site plan for this pre-application indicates the potential areas for foul drainage infrastructure; this is a different area to where the previous percolation tests were conducted. **Therefore, we will require additional localised testing conducted, in accordance with BS 6297, in the proposed foul drainage infrastructure location to confirm the local ground conditions can support a foul water discharge to ground. Given the steeply sloping topography of the site, the additional tests must be conducted at the correct depth with respect to the required grading of the site, due to the potential risk of surface and foul water springs. Before conducting the tests, we recommend that the Applicant considers the geometric aspects of the proposed installation, with close attention to details in the Building Regulations Part H (the pipes are typically installed with minimum 500mm cover, thus 600mm to invert).**

Section 1.42 of the Building Regulations identifies the need to install distribution pipes a minimum of 500mm below the surface. Conversely, BS 6297 Figure 4 identifies the minimum cover as 300mm (200mm + 100mm gravel).

On inclined sites, distribution pipe pipes should follow contour lines. Unless deep trial pits have demonstrated the presence of permeable soil.

Should viable onsite soakage be proven by the additional tests, we must be clear that drainage fields cannot be laid underneath any access road or driveway. The required drainage layout drawing must show this and confirm that the required offset distances can be accommodated, as detailed below. It must also demonstrate that the additional drainage field criteria relating to the gradient and pipe layout can be achieved.

Furthermore, we understand that a groundwater level assessment was not conducted as part of the previous ground investigations. As additional testing is required, we ask that this is undertaken at the same time.

A detailed foul water drainage strategy will be required at planning permission stage which clarifies the proposals informed by the additional test results (full test report required). Any associated sizing calculations must also be included. The below advice should be considered.

As there is no foul public sewer within 30m of the proposed development site, the Applicant should demonstrate that alternative proposals are compliant with the general Binding Rules and are in accordance with the Building Regulations Part H Drainage and Waste Disposal.

As there is not a foul public sewer in this area, the Applicant will be required to complete a Foul Drainage Assessment (FDA) form and submit this as part of any forthcoming planning application. The FDA form can be found on the GOV.UK website at this link: https://www.gov.uk/government/publications/foul-drainage-assessment-form-fda1

The Applicant should undertake percolation tests in accordance with BS6297 to determine whether percolation techniques are a viable option for managing treated effluent (see Section 1.32 of Building Regulations Part H Drainage and Waste Disposal).

If percolation testing results prove soakage is viable, the following must be adhered to for Drainage Fields:

- The drainage field should be located a minimum of 10m from any watercourse, 15m from any building (where serving multiple properties) or 7m where serving an individual property, 50m from an abstraction point of any groundwater supply and not in any Zone 1 groundwater protection zone. The drainage field should be sufficiently far from any other drainage field, to ensure that overall soakage capacity of the ground is not exceeded.
- The drainage field should be no less than 2m from adjoining land.
- Drainage fields should be constructed using perforated pipe, laid in trenches of uniform gradient which should not be steeper than 1:200. The distribution pipes should have a minimum 2m separation.
- Drainage fields should be set out in a continuous loop, i.e. the spreaders should be connected. If this feature is missed, it will gradually clog with debris and the field will become increasingly ineffective.

If drainage fields are to be used in the foul water drainage strategy, we recommend individual package treatment plants and individual corresponding drainage fields serve each property. If due to site constraints, such as available area, one package treatment plant and/or one drainage field will serve multiple properties, then we ask that the following is considered and detailed within the planning application:

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- 1. How maintenance and eventual replacement of the package treatment plant will be funded.
- 2. Please clarify which party will retrieve inorganic debris from the package treatment plant when this is discharged down the drains. The inorganic debris will need to be removed in a timely manner to ensure the continued operation of the plant.
- 3. Please clarify who will be responsible for communicating with new residents (e.g. new tenants) to advise them to dispose of inorganic debris using bins.
- 4. Which party will maintain the package treatment plant and which drains will be owned by respective property owners or a third party. If a private management company is proposed, then the land on which the package treatment plant is built and the plant itself will need to be owned by all of the property owners. This policy is consistent with our SuDS guidance and will ensure continuity if the management company went into administration.
- 5. In the event of electrical power failure, the Residual Current Device may isolate the package treatment plant. In this scenario pollution will occur. The RCD would need to be installed in a dry place, please confirm where. Please advise which party will be responsible for switching the package treatment plant on after an electrical power failure.
- 6. If a water company operated a remote pumping station, then they would install telemetry so that their maintenance team could respond to pump failure within 3 hours to mitigate the risk of pollution. Because there will be multiple users, the residents will not be immediately accountable and so will rely on any management company to resolve a problem. A method will need to be developed to ensure that failure of the package treatment plant will be communicated to those who maintain it.

If percolation testing results prove soakage is not viable, outfall to a watercourse or ditch with a nonseasonal constant flow may be permitted if the site **is not** within:

- 500m of a Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar site, Biological Site of Special Scientific Interest (SSSI), freshwater pearl mussel population, designated bathing water, or protected shellfish water.
- 200m of an aquatic local nature reserve.
- 50m of a chalk river or aquatic local wildlife site.

If the above is not true for the site, the Applicant should consider using a drainage mound. Please refer to Sections 1.27 to 1.44 of the Building Regulations, Part H Drainage and Waste Disposal, for further information about drainage mounds.

In accordance with Policy SD4 of the Core Strategy, the Applicant should provide a foul water drainage strategy showing how it will be managed. Foul water drainage must be separated from the surface water drainage. The Applicant should provide evidence that contaminated water will not get into the surface water drainage system, nearby watercourse and ponds.

Conclusion

In conclusion, the site is located within the defined settlement boundary for Bishopswood and therefore the principle of new development is acceptable and in accordance with NDP policy Walf2 and the Core Strategy Policy RA2.

However, the site has significant landscape and highway constraints and therefore without additional details on the designs, materials, landscaping, parking and turning areas Officers are unable to state at this time whether an application submitted for 8 dwellings on this site would be supported.

It is therefore advised that should you wish for certainty then a new pre-application should be submitted taking into account the comments detailed above with detailed design, layouts, landscaping and highways details. Please note that the design and siting of the dwellings should be landscape lead through a landscape appraisal.

If you wish to move to submit a full planning application, please take into consideration the comments above and submit the documents detailed below in the validation list:

Validation

Any forthcoming application would need to comply with validation requirements in order for it become valid. As such, it is recommended that the following is submitted should an application be made:

✓ Completed application form

Where possible please submit via the Planning Portal website. However, if you wish to download and submit a paper application, please submit two sets of all documents.

✓ Location plan

Based on an up-to-date map at an identifiable metric scale (1:1250 or 1:2500). The plan should identify sufficient roads, buildings, adjoining land etc. to ensure that location of the site is clear. The site should be edged clearly in red line and include all that is within the proposal; including any access from a highway, landscaping, parking, open areas around building etc. A blue line should be drawn around any other land owned or controlled by the applicant if close to or adjoining the site.

✓ Drawings (existing and proposed)

Applications should normally include existing and proposed plans at a standard metric scale (1:100 or 1:200 for householder applications and 1:500 otherwise). All site plans should be numbered and versioned if the drawing is subsequently amended. All site plans should accurately show:-

- > Direction of North and an indication of scale
- The footprint of all existing buildings on site with written dimensions and distances to the site boundaries or a scale bar appropriate to the building scale.
- > If using more than one scale on a drawing please clearly indicate so.
- > Building, roads and footpaths on adjoining land to the site including access
- > Any public Rights of Way
- > The position of all existing trees on and adjacent to the site
- > The extent and type of hard surfacing
- Boundary treatment including type and height of walls or fencing

Types of existing and proposed site plans include:-

- > Block plan of site (e.g. at 1:100 or 1:200) showing site boundaries
- Existing and proposed elevations (e.g. at 1:50 or 1:100)
- Existing and proposed floor plans (e.g. at 1:50 or 1:100)
- Existing and proposed site sections and finished floor and site levels (e.g. at 1:50 or 1:100)

Noting the comments of the relevant consultees as explained above, the following should also be submitted should any planning application be made;



- Landscape appraisal
- Flood risk assessment
- Topographical survey
- Landscape led masterplan
- Site sections
- Proposed hard and soft landscaping plan detailing any loss of trees/hedgerows and replacement specimens.
- > Tree and Hedgerow survey / arboricultural method statement
- Landscape management and maintenance plan
- Discharge and water management details
- Foul and Surface Water drainage Strategies
- Ecological assessment
- Bat survey
- External lighting details
- Biodiversity net gain details
- > Transport statement
- Visibility splays
- Cycle parking details
- Construction management plan
- Groundwater level assessment
- Percolation tests
- Climate change compliance checklist
- Biodiversity and ecology compliance checklist

This advice is given in the context of your request and the information provided in support and has regard to the Council's planning policy. Should you wish to submit a planning application I would recommend that this advice is taken into account. However this advice is offered without prejudice to any future decision the Council may make following the formal consideration of a planning application.

Yours sincerely

Gemma Webster

GEMMA WEBSTER SENIOR PLANNING OFFICER

Please note

Environmental Information Regulations

Please note that pre-application advice is subject to the Environmental Information Regulations, which means that members of the public can make requests to see the recorded information we hold on pre-application matters.

Although there are various exceptions within the legislation that might prevent release of information, all these have to be seen against the 'public interest' test. This means that the Council may refuse to disclose information only if in all the circumstances of the case the

public interest in maintaining the exception outweighs the public interest in releasing the information.

If there are any reasons why you consider that the information should not be made public in accordance with the exceptions set out in the Regulations, for example, where there are issues of commercial sensitivity, please outline them below. We will usually consult you further if a request is made involving information giving to you as pre-application advice, as the situation may have changed by the time a request is received. Herefordshire Council reserves the right to release the information where appropriate in accordance with the requirements of the legislation.

Appendix G MicroDrainage Soakaway Sizing Estimates



Waterco Ltd					Page 1							
Eden Court		15470										
Lon Parcwr Business Park 1 in 100 Year + 45% CC Event												
Denbighshire LL15 1NJ Soakaway 1												
Date 17/07/2023 Designed by RM												
File Soakawav 1	- 1 in 100 Y	Checked	bv AW		Urainage							
XP Solutions		Source C	ontrol 2	020.1.3								
				01001100								
Sum	Summary of Results for 100 year Return Period (+45%)											
Summary of Results for 100 year Result ferrou (1438)												
	Half Drai	.n Time :	881 minut	es.								
	Storm Max	Max	Max	Max Stat	us							
	Event Level D	epth Infi	ltration	Volume								
	(m)	(m)	(1/s)	(m ³)								
15	min Summer 9.249 C	.449	0.1	4.0	O K							
30	min Summer 9.403 C	.603	0.1	5.4	O K							
60	min Summer 9.572 C	.772	0.1	7.0	O K							
120	min Summer 9.718 C	.918	0.1	8.3 Flood	Risk							
180	min Summer 9.802 1	.002	0.1	9.0 Flood	Risk							
240	min Summer 9.857 1	.057	0.1	9.5 Flood	Risk							
360	min Summer 9.916 1	.116	0.1	10.1 Flood	Risk							
480	min Summer 9.939 1	.139	0.1	10.3 Flood	Risk							
600	min Summer 9.944 1	144	0.1	10.3 Flood	Risk							
720	min Summer 9.947 1	1/5	0.1	10.3 Flood	RISK							
1440	min Summer 9 925 1	125	0.1	10.3 Flood	RISK Rick							
2160	min Summer 9 886 1	086	0.1	9 8 Flood	Risk							
2880	min Summer 9.848 1	.048	0.1	9.5 Flood	Risk							
4320	min Summer 9.783 C	.983	0.1	8.9 Flood	Risk							
5760	min Summer 9.731 C	.931	0.1	8.4 Flood	Risk							
7200	min Summer 9.693 C	.893	0.1	8.1	ΟK							
8640	min Summer 9.664 C	.864	0.1	7.8	ОК							
	Storm	Rain	Flooded !	Time-Peak								
	Event	(mm/hr)	Volume	(mins)								
			(m³)									
	15 min Summe:	r 136.192	0.0	27								
	30 min Summe:	r 92.145	0.0	41								
	60 min Summe:	r 59.630	0.0	70								
	120 min Summe:	r 36.230	0.0	128								
	180 min Summe:	r 26.976	0.0	188								
	240 min Summe:	r 21.813	0.0	246								
	360 min Summe:	r 16.053	0.0	364								
	480 min Summe:	r 12.836	0.0	480								
	ouu min Summe:	r 10./5/	0.0	548 602								
	960 min Summe	r 7.294	0.0	00Z 700								
	1440 min Summe	r 5.260	0.0	988								
	2160 min Summe	r 3.767	0.0	1396								
	2880 min Summe:	r 2.987	0.0	1816								
	4320 min Summe:	r 2.183	0.0	2600								
	5760 min Summe:	r 1.770	0.0	3400								
	7200 min Summe:	r 1.523	0.0	4176								
	8640 min Summe:	r 1.359	0.0	4928								
	©198	32-2020 II	nnovyze									

Waterco Ltd				Page 2
Eden Court	15470			
Lon Parcwr Business Park	1 in 100	Year + 4	45% CC Event	
Denbighshire LL15 1NJ	Soakaway	1		Micco
Date 17/07/2023	Designed	- by RM		
File Soakaway $1 - 1$ in 100 Y	Checked 1			Drainage
VP Solutions	Source C	$\frac{1}{2}$	120 1 3	
	Source co	JILLIOI Z(520.1.5	
Summary of Results	s for 100 ve	ar Retur	n Period (+45%)	
	<u>5 101 100 yo</u>		<u>. 101104 (+100)</u>	
Storm Ma	x Max	Max	Max Status	
Event Lev	el Depth Infi	ltration	Volume	
(m	.) (m)	(l/s)	(m³)	
10080 min Summer 9 6	42 0 842	0 1	7.6 0.1	K
15 min Winter 9.2	49 0.449	0.1	4.0 0	K
30 min Winter 9.4	04 0.604	0.1	5.4 0	K
60 min Winter 9.5	73 0.773	0.1	7.0 01	K
120 min Winter 9.7	19 0.919	0.1	8.3 Flood Ris	k
180 min Winter 9.8	05 1.005	0.1	9.1 Flood Ris	k
240 min Winter 9.8	60 1.060	0.1	9.6 Flood Ris	k
360 min Winter 9.9	22 1.122	0.1	10.1 Flood Ris	k
480 min Winter 9.9	4/ 1.14/	0.1	10.3 Flood Ris	k
720 min Winter 9.9	54 1.154 51 1 151	0.1	10.4 Flood RIS	K Iz
960 min Winter 9 9	44 1 144	0.1	10.4 Flood Ris	k
1440 min Winter 9.9	12 1.112	0.1	10.0 Flood Ris	k
2160 min Winter 9.8	53 1.053	0.1	9.5 Flood Ris	k
2880 min Winter 9.7	97 0.997	0.1	9.0 Flood Ris	k
4320 min Winter 9.7	05 0.905	0.1	8.2 Flood Ris	k
5760 min Winter 9.6	35 0.835	0.1	7.5 01	K
7200 min Winter 9.5	82 0.782	0.1	7.1 01	K
8640 min Winter 9.5	42 0.742	0.1	6.7 01	K
Storm	Rain	Flooded	Time-Peak	
Event	(mm/hr)	Volume	(mins)	
		(m³)		
10080 min St	1mmor 1 212	0 0	5656	
15 min Wi	inter 136.192	0.0	26	
30 min Wi	inter 92.145	0.0	41	
60 min Wi	inter 59.630	0.0	70	
120 min Wi	inter 36.230	0.0	126	
180 min Wi	inter 26.976	0.0	184	
240 min Wi	inter 21.813	0.0	240	
360 min Wi	inter 16.053	0.0	354	
480 min Wi	inter 12.836	0.0	466	
600 min Wi 720 min Wi	10.75		5 / Z 66 /	
960 min Wi	inter 7 356	0.0	750	
1440 min Wi	inter 5.260	0.0	1056	
2160 min Wi	inter 3.767	0.0	1500	
2880 min Wi	inter 2.987	0.0	1936	
4320 min Wi	inter 2.183	0.0	2772	
5760 min Wi	inter 1.770	0.0	3576	
7200 min Wi	inter 1.523	0.0	4392	
8640 min Wi	inter 1.359	0.0	5112	
	1982-2020 Tr	000070		
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	поуде		

Eden Court: Lon Parcwr Business Park Date 17/07/2023 Date 17/07/2023 Pate 17/07/2023 Pate 17/07/2023 Summary of Results for 100 year Return Period (4453) Storm Max Max Max Max Status Event Level Depth Infiltration Volume (m) (m) (l/s) (m*) 10080 min Winter 9.509 0.709 0.1 6.4 0 K Storm Rain Flooded Time-Peak Event (mm/hr) Volume (mins) (m*) 10080 min Winter 1.243 0.0 5864	Waterco Ltd											Page 3
Lon Parowr Business Park l in 100 Year + 45% CC Event Soakaway 1 Designed by SM File Soakaway 1 - 1 in 100 Y YP Solutions Source Control 2020.1.3 Summary of Results for 100 year Return Period (+455). Storm Nax Max Max Max Status Event Level Depth Infiltration Volume (m) (m) (1/s) (m ²) 10080 min Winter 9.509 0.709 0.1 6.4 0 X Storm Rain Flooded Time-Peak Event (mm/hr) Volume (mins) (m ³) 10080 min Winter 1.243 0.0 5864	Eden Court					15470						
Denbighshire LL15 1NJ Soakaway 1 Date 17/07/2023 Designed by RM File Soakaway 1 - 1 in 100 Y XP Solutions Source Control 2020.1.3 Summary of Results for 100 year Return Period (+438). Storm Max Max Max Max Status Event Level Depth Infiltration Volume (m) (m) (1/s) (m²) 10080 min Winter 9.509 0.709 0.1 6.4 0 X Storm Rain Flooded Time-Peak Event (mm/hr) Volume (mins) (m²) 10080 min Winter 1.243 0.0 5864	Lon Parcwr B	usine	ss Par	k		1 in 1	00	Year +	45	% CC Ev	vent	
Designed by RM File Soakaway 1 - 1 in 100 Y PSolutions Summary of Results for 100 year Return Period (+455) Storm Max Max Max Max Status Event Level Depth Infiltration Volume (m) (n) (1/s) (m ²) 10080 min Winter 9.509 0.709 0.1 6.4 0 X Storm Rain Flooded Time-Peak Event (mm/hr) Volume (mins) (m ²) 10080 min Winter 1.243 0.0 5864	Denbighshire	LL1	5 1NJ			Soakawa	ay	1				Micco
File Soakaway 1 - 1 in 100 Y Checked by AW XP Solutions Summary of Results for 100 year Return Period (1455). Storm Max Max Max Max Status Event Level Depth Infiltration Volume (n) (n) (1/a) (n ²) 10080 min Winter 9.509 0.709 0.1 6.4 0 X Storm Rain Flooded Time-Peak Event (mm/hr) Volume (mins) (m ²) 10080 min Winter 1.243 0.0 5864 Period Status (1.243 0.0 5864)	Date 17/07/2	023				Design	ed	bv RM				
XP Solutions Source Control 2020.1.3 Summary of Results for 100 year Return Period (+45%). Storm Max Max Max Max Status Event Level Depth Infiltration Volume (m) (n) (1/s) (m ²) 10080 min Winter 9.509 0.709 0.1 6.4 0 K Storm Rain Flooded Time-Peak Event (mm/hr) Volume (mina) (m ²) 10090 min Winter 1.243 0.0 5864 Storm Status Status Event 0.0 5864	File Soakawa	v 1 -	1 in	100 Y.		Checke	d ł	ov AW				Drainage
Summary of Results for 100 year Return Period (+458). Storm Max Max Max Max Max Status Event Level Depth Infiltration Volume (m) (m) (l/s) 0.1 6.4 OK Storm Rain Flooded Time-Peak Event (mm/hr) Volume (mins) (m ²) 10080 min Winter 1.243 0.0 5864 Storm Status (max) 0.0 5864	XP Solutions					Source		ontrol 2	02	0.1.3		
Summary of Results for 100 year Return Period (+458). Storm Max Max Max Max Max Status Event Infiltration Volume (m) (1/s) (m ²) 10080 min Winter 9.509 0.709 0.1 6.4 0 K Storm Rain Flooded Time-Peak Event (mm/hr) Volume (mins) (m ²) 10080 min Winter 1.243 0.0 5864	AF SOLUCIONS SOULCE CONCLOT 2020.1.3											
Storm Max Max Max Max Max Status Event Level Depth Infiltration Volume (m) (m*) 10000 min Winter 9.509 0.709 0.1 6.4 0 K Storm Rain Flooded Time-Peak (ma) (mins) 20000 min Winter 1.243 0.0 5864		Summa	ry of H	Results	s fo	or 100	ve	ar Retur	n	Period	(+45%)	
Storm Max Max Max Max Max Status Event Level Depth Infiltration Volume (m) (n) (1/s) (n ⁻¹) 10080 min Winter 9.509 0.709 0.1 6.4 0 K Storm Rain Flooded Time-Peak Event (mm/hr) Volume (mins) (n ²) 10080 min Winter 1.243 0.0 5864 10080 min Winter 1.243 0.0 5864			-				-					
Event Level Depth Infiltration Volume (m) (m) (l/s) (m ³) 10080 min Winter 9.509 0.709 0.1 6.4 0 K Storm Rain Flooded Time-Peak Event (mm/hr) Volume (mins) (m ³) 10080 min Winter 1.243 0.0 5864 Storm Storm S			Storm	1	Max	Max		Max		Max	Status	
(m) (n) (1/s) (n ³) 10080 min Winter 9.509 0.709 0.1 6.4 ОК Storm Rain Flooded Time-Peak Event (mm/hr) Volume (mins) (m ³) 10080 min Winter 1.243 0.0 5864			Event	L	evel	Depth	In	filtrati	on	Volume		
10080 min Winter 9.509 0.709 0.1 6.4 ОК Storm Rain Flooded Time-Peak Event (mm/hr) Volume (mins) (m ³) 10080 min Winter 1.243 0.0 5864					(m)	(m)		(l/s)		(m³)		
Storn Rain Flooded Time-Peak Event (mm/hr) Volume (mins) (m ³) 10080 min Winter 1.243 0.0 5864		10080	min Wi	nter 9	509	0 709		0	1	64	ОК	
Storm (mm/hr) Volume (mins) (m ³) 10080 min Winter 1.243 0.0 5864		10000		Incer 9	. 50 5	0.705		0	• -	· · ·	0 10	
Storm Rain Flooded Time-Peak (mins) (m') 10080 min Winter 1.243 0.0 5864												
Storm Rain Flooded Time-Peak Event (mm/hr) Volume (mins) (m ³) 10080 min Winter 1.243 0.0 5864												
Event (mm/hr) Volume (mins) (m ³) 10080 min Winter 1.243 0.0 5864				Storm		Rair	ı	Flooded	Ti	me-Peak		
(m³) 10080 min Winter 1.243 0.0 5864				Event		(mm/h	r)	Volume		(mins)		
0.00 min Winter 1.243 0.0 5864								(m³)				
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©1982-2020 Innovvze			10000	11111 11	.ncei	L 1.2	чJ	0.0		5004		
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Waterco Ltd		Page 4
Eden Court	15470	
Lon Parcwr Business Park	1 in 100 Year + 45% CC Event	
Denbighshire LL15 1NJ	Soakaway 1	Mirro
Date 17/07/2023	Designed by RM	Dcainago
File Soakaway 1 - 1 in 100 Y	Checked by AW	Diamage
XP Solutions	Source Control 2020.1.3	
Ra	infall Details	
Rainfall Mode Return Period (years FEH Rainfall Versio	l FEH) 100 n 2013	
Site Locatio	n GB 358651 218813 SO 58651 18813	
Data Typ Summer Storm	e Point	
Winter Storm	s Yes	
Cv (Summer) 1.000	
Cv (Winter) 1.000	
Longest Storm (mins) 10080	
Climate Change	%	
Tin	ne Area Diagram	
Tota	l Area (ha) 0.012	
Time (mins) Area Tin From: To: (ha) Fro	me (mins) Area Time (mins) Area om: To: (ha) From: To: (ha)	
0 4 0.004	4 8 0.004 8 12 0.004	
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Waterco Ltd		Page 5
Eden Court	15470	
Lon Parcwr Business Park	1 in 100 Year + 45% CC Event	
Denbighshire LL15 1NJ	Soakaway 1	Mirro
Date 17/07/2023	Designed by RM	
File Soakaway 1 - 1 in 100 Y	Checked by AW	Diamage
XP Solutions	Source Control 2020.1.3	·

Model Details

Storage is Online Cover Level (m) 10.000

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr) 0.00000 Infiltration Coefficient Side (m/hr) 0.03960 Safety Factor 2.0 Porosity 0.95 Invert Level (m) 8.800 Trench Width (m) 1.0 Trench Length (m) 9.5 Slope (1:X) 10000.0 Cap Volume Depth (m) 0.000 Cap Infiltration Depth (m) 0.000







Waterco Ltd					Page 1
Eden Court		15470			
Lon Parcwr Busi					
Denbighshire L	Micco				
Date 17/07/2023					
File Soakaway 2	- 1 in 100 Y	Checked	by AW		Drainage
XP Solutions	1 111 100 1111	Source	$\frac{2}{2}$	020 1 3	
AI SOLUCIONS		bource c	Solicioi 2	020.1.5	
Sum	mary of Results f	- or 100 ve	ar Retur	n Period (+45%)	
built	<u>Indry of Rebuteb i</u>	<u>101 100 yc</u>	ar notar	<u>III ICIICA (+153)</u>	-
	Half Dra	in Time :	931 minut	ces.	
	Storm Max	Max	Max	Max Status	
	Event Level	Depth Infi	ltration	Volume	
	(m)	(m)	(1/s)	(m ³)	
15	min Summer 9.261	0.461	0.1	8.1 0	к
30	min Summer 9.421	0.621	0.1	10.9 0	K
60	min Summer 9.594	0.794	0.2	13.9 0	K
120	min Summer 9.745	0.945	0.2	16.6 Flood Ris	k
180	min Summer 9.833	1.033	0.2	18.1 Flood Ris	k
240	min Summer 9.890	1.090	0.2	19.1 Flood Ris	k
360	min Summer 9.954	1.154	0.2	20.3 Flood Ris	k
480	min Summer 9.979	1.179	0.3	20.7 Flood Ris	k
600	min Summer 9.986	1.186	0.3	20.8 Flood Ris	k
720	min Summer 9.989	1.189	0.3	20.9 Flood Ris	k
960	min Summer 9.987	1.187	0.3	20.8 Flood Ris	k
1440	min Summer 9.969	1.169	0.3	20.5 Flood Ris	k
2160	min Summer 9.932	1.132	0.2	19.9 Flood Ris	k
2880	min Summer 9.895	1.095	0.2	19.2 Flood Ris	k
4320	min Summer 9.830	1.030	0.2	18.1 Flood Ris	k
5760	min Summer 9.779	0.979	0.2	17.2 Flood Ris	k
7200	min Summer 9.741	0.941	0.2	16.5 Flood Ris	k
8640	min Summer 9.712	0.912	0.2	16.0 Flood Ris	k
	Storm	Rain	Flooded	Time-Peak	
	Event	(mm/hr)	Volume	(mins)	
			(m³)		
	15 min Summe	er 136.192	0.0	27	
	30 min Summe	er 92.145	0.0	41	
	60 min Summe	er 59.630	0.0	70	
	120 min Summe	er 36.230	0.0	128	
	180 min Summe	er 26.976	0.0	188	
	240 min Summe	er 21.813	0.0	246	
	360 min Summe	er 16.053	0.0	364	
	480 min Summe	er 12.836	0.0	482	
	600 min Summe	er 10.757	0.0	564	
	720 min Summe	er 9.294	0.0	614	
	960 min Summe	er 7.356	0.0	732	
	1440 min Summe	er 5.260	0.0	996	
	2160 min Summe	er 3.767	0.0	1408	
	2880 min Summe	er 2.987	0.0	1820	
	4320 min Summe	er 2.183	0.0	2632	
	5760 min Summe	er 1.770	0.0	3408	
	7200 min Summe	er 1.523	0.0	4184	
	8640 min Summe	er 1.359	0.0	4936	
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Waterco Ltd						Page 2						
Eden Court	-	15470										
Lon Parcwr Business Park	-	1 in 100	Year + 4	15% CC E	Ivent							
Denbighshire LL15 1NJ	2	Soakaway		Micro								
Date 17/07/2023	I	Designed	by RM									
File Soakaway 2 - 1 in 100	Y 0	Checked k	oy AW			Dialitada						
XP Solutions	5	Source Co	ontrol 20	020.1.3								
<u>Summary of Resu</u>	<u>lts fo</u>	<u>r 100 yea</u>	ar Retur	n Period	<u>d (+45%)</u>							
Storm	Max I	Max	Max 1+	Max	Status							
Event	(m) (m)	(m)	(1/s)	(m ³)								
	(111)	()	(1/3)	(
10080 min Summer 9	9.690 0	.890	0.2	15.6	O K							
15 min Winter 9	9.261 0	.461	0.1	8.1	ОК							
30 min Winter 9	9.421 0	.621	0.1	10.9	ОК							
60 min Winter 9	9.595 0	. / 95	0.2	14.0	U K Flood Bick							
180 min Winter	9.740 0	035	0.2	18 2 1	Flood Risk							
240 min Winter	9.894 1	.094	0.2	19.2	Flood Risk	-						
360 min Winter 9	9.959 1	.159	0.2	20.4	Flood Risk							
480 min Winter 9	9.987 1	.187	0.3	20.9 1	Flood Risk							
600 min Winter 9	9.996 1	.196	0.3	21.0 1	Flood Risk	:						
720 min Winter 9	9.995 1	.195	0.3	21.0 1	Flood Risk							
960 min Winter 9	9.987 1	.187	0.3	20.9 1	Flood Risk							
1440 min Winter 9	9.957 1	.157	0.2	20.3 1	Flood Risk							
2160 min Winter S	9.900 I	.100	0.2	19.3	Flood Risk							
4320 min Winter 9	9.044 I 9.753 O	953	0.2	16 7 1	Flood Risk							
5760 min Winter	9.682 0	.882	0.2	15.5	0 K							
7200 min Winter 9	9.629 0	.829	0.2	14.5	O K							
8640 min Winter 9	9.587 0	.787	0.2	13.8	0 K							
		_ ·										
Stol	cm	Rain (mm/hm)	Flooded	Time-Pea	ĸ							
Ever	10	(mm/nr)	(m ³)	(mins)								
			(111)									
10080 min	Summer	1.243	0.0	566	4							
15 min	Winter	136.192	0.0	2	6							
30 min	Winter	92.145	0.0	4	1							
60 min	Winter	59.630	0.0	7	0							
120 min	Winter	26.23U	0.0	10	6							
240 min	Winter	- 20.970	0.0	24	2							
360 min	Winter	16.053	0.0	35	6							
480 min	Winter	12.836	0.0	46	6							
600 min	Winter	10.757	0.0	57	4							
720 min	Winter	9.294	0.0	67	2							
960 min	Winter	7.356	0.0	75	6							
1440 min	Winter	5.260	0.0	106	2							
2160 min	Winter	3.767	0.0	151	ь 0							
2880 min 4220 min	Winter Winter	∠.98/ > 2.102	0.0	194 277	U 6							
4320 IIIIII 5760 min	Winter	1.770	0.0	277	4							
7200 min	Winter	1.523	0.0	439	2							
8640 min	Winter	1.359	0.0	518	4							
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Waterco Ltd									Page 3
Eden Court				15470					
Lon Parcwr B	usine	ss Par	k	1 in 1	00	Year + 4	45% CC E	vent	
Denbighshire	LL1	5 1NJ		Soakaw	ay	2			Micco
Date 17/07/2	023			Design	ed	bv RM			
File Soakawa	v 2 -	1 in	100 Y	Checke	d ł	ov AW			Drainage
XP Solutions	1 -			Source	Cc	ontrol 20	020.1.3		
				bource			520.1.5		
	Summa:	ry of I	Results f	or 100	vea	ar Retur	n Period	(+45%)	
-		-			-			<u> </u>	
		Storm	Max	Max		Max	Max	Status	
		Event	Leve	l Depth	In	filtratio	on Volume		
			(m)	(m)		(1/s)	(m³)		
	10080	min Wi	ntor 9 55	5 0 755		0	2 13 2	ΟK	
	10000			5 0.755		0.	.2 13.2	0 1	
			Storm	Rain	n	Flooded	Time-Peak		
			Event	(mm/h	r)	Volume	(mins)		
						(m³)			
		10080	min Winte	r 12	43	0 0	5953)	
		10000	MIII WIIICC		5	0.0	5552	-	
			<u></u>		-				
			©198	82-2020	⊥n	novyze			

Waterco Ltd		Page 4
Eden Court	15470	
Lon Parcwr Business Park	1 in 100 Year + 45% CC Event	
Denbighshire LL15 1NJ	Soakaway 2	Mirro
Date 17/07/2023	Designed by RM	Drainage
File Soakaway 2 - 1 in 100 Y	Checked by AW	Brainage
XP Solutions	Source Control 2020.1.3	
Ra	infall Details	
Rainfall Mode Return Period (years FEH Rainfall Versio	l FEH) 100 n 2013	
Site Locatio	n GB 358651 218813 SO 58651 18813	
Data Typ	e Point	
Summer Storm Winter Storm	s Ies s Yes	
Cv (Summer) 1.000	
Cv (Winter) 1.000	
Shortest Storm (mins) 15	
Climate Change) 10080 % +45	
<u>Tin</u>	ne Area Diagram	
Tota	l Area (ha) 0.024	
Time (mins) Area Tim From: To: (ha) Fro	me (mins) Area Time (mins) Area m: To: (ha) From: To: (ha)	
0 4 0.008	4 8 0.008 8 12 0.008	
©198	2-2020 Innovyze	

Waterco Ltd		Page 5					
Eden Court	15470						
Lon Parcwr Business Park	1 in 100 Year + 45% CC Event						
Denbighshire LL15 1NJ	Soakaway 2	Micro					
Date 17/07/2023	Designed by RM						
File Soakaway 2 - 1 in 100 Y	Checked by AW	Diamage					
XP Solutions	Source Control 2020.1.3						
<u>Model Details</u>							
Storage is Onl	line Cover Level (m) 10.000						

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr) 0.00000 Infiltration Coefficient Side (m/hr) 0.03960 Safety Factor 2.0 Porosity 0.95 Invert Level (m) 8.800 Trench Width (m) 1.0 Trench Length (m) 18.5 Slope (1:X) 10000.0 Cap Volume Depth (m) 0.000







Waterco Ltd					Page	1						
Eden Court		15470										
Lon Parcwr Business Pa	rk	1 in 100	Year +	45% CC Ever	nt 📔							
Denbighshire LL15 1NJ		Soakaway	3		Mic							
Date 17/07/2023		U										
File Soakaway 3 - 1 in	100 Y	Checked	bv AW		Urai	nage						
XP Solutions		Source C	ontrol 2	020.1.3								
AL SOLUCE CONCLOT 2020.1.3												
Summary of Results for 100 year Return Period (+45%)												
Summary of Resarce for the year result for the (+100)												
Storm	Max 1	Max	Max	Max St	atus							
Event	Level De	epth Infi	ltration	Volume								
	(m)	(m)	(1/S)	(m ³)								
15 min Sum	mer 9.254 0	.454	0.1	7.8	ОК							
30 min Sum	mer 9.411 0	.611	0.1	10.4	ОК							
60 min Sum	mer 9.582 0	.782	0.2	13.4	O K							
120 min Sum	mer 9.731 0	.931	0.2	15.9 Floo	d Risk							
180 min Sum	mer 9.817 1	.017	0.2	17.4 Floo	d Risk							
240 min Sum	mer 9.874 1	.074	0.2	18.3 Floo	d Risk							
360 min Sum	mer 9.936 1	.136	0.2	19.4 Floo	d Risk							
480 min Sum	umer 9.961 1	.161	0.2	19.8 Floo	d Risk							
600 min Sum	mer 9.968 1	.168	0.2	20.0 Floo	d Risk							
720 min Sum	mer 9.971 1	.171	0.2	20.0 Floo	d Risk							
960 min Sum	mer 9.969 1	.169	0.2	20.0 Floo	d Risk							
1440 min Sum	umer 9.951 1	.151	0.2	19.7 Floo	d Risk							
2160 min Sum	mer 9.914 1	.114	0.2	19.0 Floo	d Risk							
2880 min Sum	umer 9.878 1	.078	0.2	18.4 Floo	d Risk							
4320 min Sum	umer 9.814 1	.014	0.2	17.3 Floo	d Risk							
5760 min Sum	mer 9.763 0	.963	0.2	16.5 Floo	d Risk							
7200 min Sum	mer 9.726 0	.926	0.2	15.8 Floo	d Risk							
8640 min Sum	mer 9.698 0	.898	0.2	15.3	O K							
	Storm	Rain	Flooded	Time-Peak								
	Event	(mm/hr)	Volume	(mins)								
			(m³)									
1	5 min Summer	136.192	0.0	27								
3	0 min Summer	92.145	0.0	41								
6	0 min Summer	59.630	0.0	70								
12	0 min Summer	36.230	0.0	128								
18	0 min Summer	26.976	0.0	188								
24	0 min Summer	21.813	0.0	246								
36	0 min Summer	16.053	0.0	364								
48	0 min Summer	12.836	0.0	482								
60	0 min Summer	10.757	0.0	564								
72	0 min Summer	9.294	0.0	614								
96	0 min Summer	7.356	0.0	732								
144	0 min Summer	5.260	0.0	994								
216	0 min Summer	3.767	0.0	1408								
288	0 min Summer	2.987	0.0	1820								
432	0 min Summer	2.183	0.0	2632								
576	0 min Summer	1.770	0.0	3408								
720	0 min Summer	1.523	0.0	4184								
864	0 min Summer	1.359	0.0	4936								
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Waterco Ltd						Page 2
Eden Court	1	5470				
Lon Parcwr Business Park	1	in 100	Year + 4	45% CC	Event	
Denbighshire LL15 1NJ	S	oakaway	3			Micco
Date 17/07/2023	D	esigned	bv RM			
File Soakaway 3 - 1 in 100		hecked b	WA VC			Drainage
VP Solutions	G		$\frac{1}{2}$	120 1 3		
	5	ource ce		520.1.5		
Summary of Resul	ts for	100 ve	ar Rotur	n Peric	vd (+45%)	
<u>Summary or Resul</u>		<u> </u>	ar necur		<u>a (1408)</u>	
Storm	Max M	lax	Max	Max	Status	
Event L	evel De	pth Infi	ltration	Volume		
	(m) (- m)	(l/s)	(m³)		
10080 min Summer 9	.675 0.	875	0.2	15.0	O H	Κ
15 min Winter 9	.254 0.	454	0.1	7.8	O H	κ.
30 min Winter 9	.411 0.	611 702	0.1	10.4	0 4	<
60 min Winter 9	.583 0.	183	0.2	13.4	Elect Dial	-
120 Min Winter 9	• 132 U.	932	0.2	17.9	Flood Riss	<
240 min Winter 9	.020 1. 877 1	020	0.2	19.14	Flood Ris	<u> </u>
360 min Winter 9	0// 1. 0/1 1	141	0.2	19 5	Flood Ris	<u> </u>
480 min Winter 9	.969 1	169	0.2	20.0	Flood Risk	- <
600 min Winter 9	.978 1.	178	0.2	20.1	Flood Ris	- <
720 min Winter 9	.976 1.	176	0.2	20.1	Flood Ris	ς
960 min Winter 9	.969 1.	169	0.2	20.0	Flood Ris	< c
1440 min Winter 9	.940 1.	140	0.2	19.5	Flood Ris	ζ
2160 min Winter 9	.883 1.	083	0.2	18.5	Flood Ris	2
2880 min Winter 9	.828 1.	028	0.2	17.6	Flood Ris	< c
4320 min Winter 9	.738 0.	938	0.2	16.0	Flood Ris!	< c
5760 min Winter 9	.668 0.	868	0.2	14.8	O H	K
7200 min Winter 9	.616 0.	816	0.2	13.9	O H	K
8640 min Winter 9	.575 0.	775	0.2	13.2	O F	ζ.
Stor	m	Rain	Flooded	Time-Pe	ak	
Even	t.	(mm/hr)	Volume	(mins)		
	-	(,	(m ³)	(
10080 min	Summer	1.243	0.0	56	64	
15 min	Winter	136.192	0.0		26	
30 min	Winter	92.145	0.0		41	
60 min	Winter	59.630	0.0	-	70	
120 min	Winter	36.230	0.0	1.	26	
180 min	Winter	26.976	0.0	1	84 42	
240 min	Winter	21.813 16 050	0.0	2	4 <i>2</i> 56	
360 Min 400 min	Winter Winter	10.003 10 036	0.0	3.	50	
480 Min	Wintor	10 757	0.0	4	74	
720 min	Winter	9 294		5	[,] 1 72	
960 min	Winter	7 356	0.0	0 7	56	
1440 min	Winter	5.260	0.0	10	60	
2160 min	Winter	3.767	0.0	15	16	
2880 min	Winter	2.987	0.0	19	40	
4320 min	Winter	2.183	0.0	27	76	
5760 min	Winter	1.770	0.0	35	84	
7200 min	Winter	1.523	0.0	43	92	
8640 min	Winter	1.359	0.0	51	84	
	©1982·	-2020 In	novyze			

Waterco Ltd								Page 3
Eden Court 15470								
Lon Parcwr Business Park			1 in 10	0 Year +	- 45%	CC EN	vent	
Denbighshire LL15 1NJ			Soakaway 3					Micco
Date 17/07/2023	3		Designe	d by RM				
File Soakaway	- 3 - 1 in 10	0 Y	Checked	by AW				Urainage
XP Solutions			Source	Control	2020	.1.3		
Sun	mary of Res	sults fo	r 100 y	vear Reti	ırn F	Period	(+45%)	
	-		_					
	Storm	Max	Max	Max		Max	Status	
	Event	Level	Depth	Infiltrat	ion v	Volume		
		(m)	(m)	(l/s)		(m³)		
10	080 min Wint	er 9.542	0.742		0.2	12.7	ОК	
10		01 9.012	0.,12		0.2	±2•/	0 10	
	St	orm	Rain	Floode	d Tim	ne-Peak		
	Ev	ent	(mm/hr) Volume	e (1	mins)		
				(m³)				
	10080 m [.]	in Winter	1.24	3 0.0	0	5952		
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Waterco Ltd		Page 4
Eden Court	15470	
Lon Parcwr Business Park	1 in 100 Year + 45% CC Event	
Denbighshire LL15 1NJ	Soakaway 3	Micro
Date 17/07/2023	Designed by RM	Drainage
File Soakaway 3 - 1 in 100 Y	Checked by AW	Brainage
XP Solutions	Source Control 2020.1.3	
Ra	infall Details	
Rainfall Mode Return Period (years		
Site Locatio	n GB 358651 218813 SO 58651 18813	
Data Typ	e Point	
Summer Storm	s Yes	
Winter Storm Cv (Summer) 1.000	
Cv (Winter) 1.000	
Shortest Storm (mins) 15	
Longest Storm (mins) 10080 % ±45	
	o Irea Diagram	
Tota	l Area (ba) 0 023	
Time (mins) Area Tiu	me (mins) Area Time (mins) Area	
From: To: (ha) Fro	om: To: (ha) From: To: (ha)	
0 4 0.008	4 8 0.008 8 12 0.008	
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Waterco Ltd		Page 5			
Eden Court	15470	Micro Drainago			
Lon Parcwr Business Park	1 in 100 Year + 45% CC Event				
Denbighshire LL15 1NJ	Soakaway 3				
Date 17/07/2023	Designed by RM				
File Soakaway 3 - 1 in 100 Y	Checked by AW	Diamage			
XP Solutions	Source Control 2020.1.3				
Model Details					

Storage is Online Cover Level (m) 10.000

Trench Soakaway Structure

Infiltration Coefficient Base (m/hr) 0.00000 Infiltration Coefficient Side (m/hr) 0.03960 Safety Factor 2.0 Porosity 0.95 Invert Level (m) 8.800 Trench Width (m) 1.0 Trench Length (m) 18.0 Slope (1:X) 10000.0 Cap Volume Depth (m) 0.000







Appendix H Concept Surface Water Drainage Sketch





lular style CC event c-cellular 45% CC ellular style CC event	Notes: 1) This sk or approva limited to o 2) Unless this propo and within contractor 3) All dime above ord 4) This dra Site Plan' Donald Ar only and is	etch has no als. Its valid discussion a otherwise n sal are not o the remit o ensions in m nance datur awing is an (Drawing no chitecture'. s not intend	t been subj ity and use and informa toted the ris considered f an experie allimetres a m unless sh amendmen o. 137 / A.L. This drawin ed for detai	ect to fo must th tion pur ks asso to be ey enced a nown ot t of the .004 Re ig provid led desi	eref pos ociat ktra nd c evels herv 'Pro v A) des ign.	al checks fore be es only. ed with ordinary competent s in metres vise. posed b by 'Scott a concept	
		n					
	Sit	₽ e Boundary akaway 1 akaway 2	,				
	So	Soakaway 3					
	Pe	rmeable Pa	iving				
	CLIENT:						
	Dwell Ahead Ltd						
	N aterco						
		www.waterco.co.uk					
	SCHEME:	at 1 arr			اہ م	Dees	
	Land	at Leys	on Whee	vairo	ra,	, KOSS	
1				5			
$\sim \sim \sim$	PLOT TITLE:						
erland standard an far the	Conce	ept Surfac	e Water D	Drainag	je S	Sketch	
1				_			
1	PLOT STATUS:				DATE:		
				DI OT COM			
	RM	AW	MW	PLUT SCA	1:8	300	
1	PLOT NAME:		<u> </u>	Skotok		REVISION:	
1	154/0	_Svv_Concep	ג_Drainage_	_SKETCH		-	
Appendix I Maintenance Schedules





Operation and Maintenance Requirements for Soakaways

Maintenance Schedule	Required Action	Typical Frequency
	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside concrete manhole rings	Annually
Regular maintenance	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional maintenance	Remove sediment and debris from pre-treatment components and floor inspection tube or chamber and inside of concrete manhole rings.	As required, based on inspections
Domodial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs.	As required
Remedial actions	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation.	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

Ref. Table 13.1, CIRIA C753 'The SuDS Manual'

The maintenance requirements detailed above are to be undertaken by the site owner.

Name	:
Position	:
Date	:
Signed on behalf of the site owner	:



Operation and Maintenance Requirements for Permeable Paving

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional	Stabilise and move contributing and adjacent areas	As required
Occasional maintenance	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level or the paving	As required
actions	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Inspect for evidence of poor operation and / or weed growth – if required, take remedial action	Three-monthly, 48hr after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Ref. Table 20.15, CIRIA C753 'The SuDS Manual'

The maintenance requirements detailed above are to be undertaken by the site owner.

	-
Position	:
Data	· · · · · · · · · · · · · · · · · · ·
Date	•
Signed on behalf of the site owner	:

Appendix J Concept Foul Drainage Sketch





	Notes: 1) This ske or approva limited to of 2) Unless this propose and within contractor. 3) All dime above ord 4) This dra Site Plan' Donald Arr only and is	etch has no als. Its valid discussion a otherwise r sal are not a the remit o the remit o	t been subj ity and use and informa toted the ris considered f an experie nillimetres a m unless sh amendmen p. 137 / A.L. This drawin ed for detai	ect to fo must th tion pur ks asso to be exerced at nd all le nown oth t of the 004 Re g provid led desi	rma eref pos ciat ttra nd c vels nerv (Pro v A) des gn.	I checks ore be es only. ed with ordinary ompetent s in metres vise. posed by 'Scott a concept
	LEGEN Site	D e Boundary oposed Dra	, inage Field			
	 Proposed Foul Drain Proposed Biodisc Treatment Plant Proposed Foul Inspection Chamber 2m Buffer Between Drainage Field and Site Boundary 					
	CLIENT:					
	Dwell Ahead Ltd					
	www.waterco.co.uk					
 /\.	Land	at Leys	s Hill, W on Wye	Valfo	rd,	Ross
$\langle \hat{\mathbf{x}} \rangle$	PLOT TITLE:					
22 Yulun (201 647 (34	(Concept F	oul Draina	age Sk	etcł	ו
1	PLOT STATUS: DAT SKETCH 08			DATI 08	<u>.</u> -09-2023	
1	DRAWN: CHECKED: APPROVED: PLOT SCALE AT A3: RM AW MW 1:800				- <u>A3:</u> 300	
1	<u>PLOT NAME:</u>		<u> </u>			REVISION:
1	1547	0_FW_Concep	ot_Drainage_S	ketch		-

Appendix K Concept Designer's Risk Assessment





CONCEPT DESIGNER'S RISK ASSESSMENT

15470

Project:	Land at Leys Hill, Walford, Ross on Wye			Project No:
Client:	Dwell Ahead Ltd			
Report Reference:	15470-Drainage Strategy-03			
	-			
Prepared by:	Ryan Moore BSc (Hons)	Date:	25/07/2023	
Checked by:	Aled Williams BSc (Hons) MCIWEM C.WEM	Date:	27/07/2023	
Reviewed by:	Mike Wellington BEng (Hons) MSc CEng CEnv FICE FCIWEM C.WEM IMaPS MAPM	Date:	27/07/2023	

Requirement:

The Construction (Design and Management) Regulations 2015 (CDM 2015) place an obligation on the Designer to take all reasonable steps to provide, with the design, sufficient information about the design, construction or maintenance of the structure, to adequately assist the client, other designers and contractors to comply with their duties under CDM. The Designer has undertaken this assessment to identify any extra-ordinary risks, or those that would not be expected on this particular project by an experienced and competent Contractor. The aim is to avoid needless paperwork and bureaucracy and ensure the assessment is project specific, relevant and proportionate to the risk.

DRA Summary

Each of the following risk areas has been considered using the question below. Is a risk present which is considered to be extra-ordinary or unexpected in this instance?

If YES - A detailed risk assessment is required at design stage

If UNKNOWN - Insufficient information has been provided at concept design stage and the risks are unknown. Further consideration must be given at design stage(s) If NO - No further action is required.

Hazard Ref.	Risk Areas	YES, UNKNOWN or NO	Comments
1	Ground Conditions	Unknown	To be considered at detailed
2	Hazardous Environment	Unknown	To be considered at detailed
3	Existing Working Environment	Unknown	To be considered at detailed
4	Existing Services	Unknown	Existing septic tank on site. Service in
5	Proximity to Other Structure(s)	Unknown	Residential dwelling to
6	Near Waterbody / flood risk	No	
7	Proximity to Other Activities	Unknown	To be considered at detailed
8	Sequence of Construction	Unknown	To be considered at detailed
9	Access	Yes	Access from single track road w
10	Interfaces	Unknown	To be considered at detailed
11	Confined Space Working	Unknown	To be considered at detailed
12	Maintenance Considerations	Unknown	Communal drainage field
13	Working at Height	Unknown	To be considered at detailed
14	Steep Slopes	Yes	Site slopes from 83m AOD in the north
15	Demolition / Refurbishment / Repair	Unknown	To be considered at detailed
16	Welfare	Unknown	To be considered at detailed
17	Occupational Health	Unknown	To be considered at detailed
18	Environmental Issues	Unknown	To be considered at detailed
19	Other Significant Hazards not Identified Above	Unknown	To be considered at detailed
20	Residual Risk to Future Users	Unknown	To be considered at detailed

design stage.

design stage.

l design stage.

place serving former spa

the south

l design stage.

l design stage.

vith steep gradient

design stage.

l design stage.

d proposed

design stage.

to 65m AOD in the south.

design stage.

l design stage.

design stage.

l design stage.

l design stage.

design stage.

1 of 1