MEC Consulting Group

FLOOD RISK & DRAINAGE



Barlestone Road, Newbold Verdon, Leicestershire
Flood Risk Assessment
October 2024

Report Ref: 24832-FLD-0101 Rev D

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Flood Risk Assessment
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REPORT REF: 24832-FLD-0101 Rev D

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EXECUTIVE SUMMARY

Site Address	Barlestone Road, Newbold Verdon, Leicestershire. LE9 9PZ.
Site Description and Setting	The current site area is formed of greenspace and agricultural land. Further agricultural land borders to the north, east and west of the site. An equestrian centre sits on the northwest corner of the site. Barlestone Road and residential development borders the south of the site.
Proposed Development	Outline planning application (all matters reserved except vehicular access) for the erection of up to 240 residential dwellings (Use Class C3), retention of the existing access off Barlestone Road and the creation of a new access off Barlestone Road, land safeguarded for a cemetery (Use Class F2(c)) and a community facility (Use Classes E(e), E(f), F2(b) and F2(c)), public open space and associated infrastructure.
Flood Risk and Mitigation	The Flood Map for Planning shows the site lies within Flood Zone 1 (FZ1). This means that this area has a chance of flooding each year less than 0.1%. The Environment Agency Flood Risk from Surface Water Map, refer to Figure 3.2, indicates that the majority of the site is designated to be at very low risk from surface water flooding. The map shows a small area at low risk of surface water flooding towards the southeast of the site, likely caused by a localised low point on site. Soil Infiltration Rate Testing was completed by MEC in November 2023. During the tests, groundwater was discovered at depths of between 1.93m and 2.20m bgl along the northern boundary of the site. Given the depths, the northern section of the site will be considered at medium risk while the remainder of the site will be at low risk of groundwater flooding. All other risks from flooding sources is considered very low.
Surface Water Drainage Strategy	In accordance with the drainage hierarchy surface water will be stored, treated, and conveyed to a series of attenuation basins on site, which will discharge at a total rate of 17.9l/s. Given the levels on site, surface water flows will outfall to the unnamed watercourse north of the site and into the 150mm public surface water sewer along Sparkenhoe Road as agreed with Severn Trent Water. A total storage volume of 4,811.03m^3 is required within the proposed attenuation features to allow surface water to discharge at 17.9l/s and cater for all events up to and including the 1%AEP40CC plus urban creep. Attenuation basins 1 and 2 will discharge via gravity into the unnamed ditch to the north of the site while Attenuation basin 3 will discharge via gravity into an existing public surface water sewer along Sparkenhoe Road via a new proposed connection at an agreed rate. Additional drainage features including rain gardens and permeable paving will be used across the site and will provide extra storage on site and will act as a first treatment stage for any run-off and will ensure adequate surface water treatment is provided.
Foul Water Drainage Strategy	Sewer Records were obtained from Severn Trent Water. The records show a 225mm public foul water sewer along Barlestone Road to the south of the site. The disposal of foul water from the site will be into the 225mm foul water sewer along Barlestone Road via MH8001 subject to an agreement with Severn Trent Water. Given the levels on site, foul water will need to be pumped to allow for a connection into MH8001. The peak foul flow rate arising as a result of the development has been agreed with STW to not exceed 6.0l/s.
Conclusions	With the above measures in place, the development of the site will not create any flood risk issues to the wider area.
This summary should be read in conjunction with the full report and reflects an assessment of the site based on information received by MEC at the time of production.	

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I. MAINTENANCE AND MANAGEMENT

1.0 INTRODUCTION

1.1 MEC Consulting Group Ltd (MEC) has been commissioned by David Wilson Homes East Midlands (hereafter referred to as 'the Client') to undertake a Flood Risk Assessment for a proposed development on Barlestone Road, Newbold Verdon, Leicestershire (hereafter referred to as 'the Site'). A site location plan is provided in **Appendix A**. An indicative masterplan and parameter plan is contained within **Appendix B.**

1.2 The development description is as follows:

Outline planning application (all matters reserved except vehicular access) for the erection of up to 240 residential dwellings (Use Class C3), retention of the existing accesses off Barlestone Road and the creation of new accesses off Barlestone Road, land safeguarded for a cemetery and a health centre (Use Classes E(e)), public open space and associated infrastructure.

1.3 The proposed development will take place on existing open greenspace and the total site area covers circa 13.87ha. The grid reference for the site is E:444845, N:304268.

1.4 The assessment has been undertaken to ascertain the constraints of the development to the site and assess the impact of the design, concerning flood risk.

1.5 The Flood Risk Assessment has been carried out in accordance with the requirements of the documents below. See **Appendix C** for additional policies and references.

- National Planning Policy Framework (NPPF)
- National Planning Practice Guidance on Flood Risk & Coastal Change (PPG)
- Environment Agency Flood Risk Standing Advice

1.6 The Local Planning Authority for the site is Hinckley and Bosworth Borough Council (HBBC), whilst the Lead Local Flood Authority is Leicestershire County Council (LCC). The site falls within the Severn Trent Water (STW) Catchment.

1.7 The assessment has been prepared using our best engineering judgement however there are levels of uncertainty implicit in the historical data and methods of analysis. The report is based on the following information:

- British Geological Survey (BGS);
- The Flood Map for Planning and the Long-term Flood Risk Map from the Environment Agency and .gov.uk websites; and
- Leicestershire and Leicester City Strategic Flood Risk Assessment (August 2017)
- Topographical Survey by NJC Surveys (November 2022)
- Groundwater Survey by MEC (November 2023)

Disclaimer

1.8 MEC has completed this report for the benefit of the individuals referred to in paragraph 1.1 and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from MEC.

1.9 MEC accepts no responsibility or liability for:

- The consequence of this documentation being used for any purpose or project other than that for which it was commissioned;
- The issue of this document to any third party with whom approval for use has not been agreed.

2.0 SITE DESCRIPTION

Site Location and Features

2.1 The Ordnance Survey National Grid Reference (NGR) for the site is E:444794, N:304273. The site measures to circa 13.87ha in size. The site is located on Barlestone Road, Newbold Verdon. The current site area is formed of greenspace and agricultural land. Further agricultural land borders to the north, east and west of the site. An equestrian centre sits on the northwest corner of the site. Barlestone Road and residential development borders the south of the site.

Figure 2.1: Site Location Plan



Topographic Data

2.2 Full details of the topographical survey are included in **Appendix D.** The information indicates that the site slopes in different directions. The eastern section of the site mainly slopes southwest to northeast to a low point of 130.92m AOD, however, the southwest corner slopes down towards Barlestone Road to a low point of 132.26m AOD. The western half of the site slopes southeast to northwest towards the equestrian centre from 133.70m AOD to 131.26m AOD.

Flood Zone Maps & Flood Defence Data

2.3 Information relating to the current flood risk to the application site has been obtained from the Environment Agency and.gov.uk websites. There are no flood defences in the area.

Watercourses & Hydrology

2.4 The closest designated watercourse is the Rothley Brook which is located approximately 3.1km to the east of the site. There is a small unnamed watercourse which is approximately 300m north of the site, this connects into the Rothley Brook.

Historic Flooding

2.5 The EA historical map shows that there are no known flood incidences within the vicinity of the site.

Geological Data

2.6 The 1:50,000 British Geological Survey (BGS) viewer shows the area is underlain by the Edwalton Member consisting of Mudstone. The site area has an underlying superficial deposit of Glaciofluvial Deposits (Mid Pleistocene) which is composed of Sand and Gravel.

Sewers

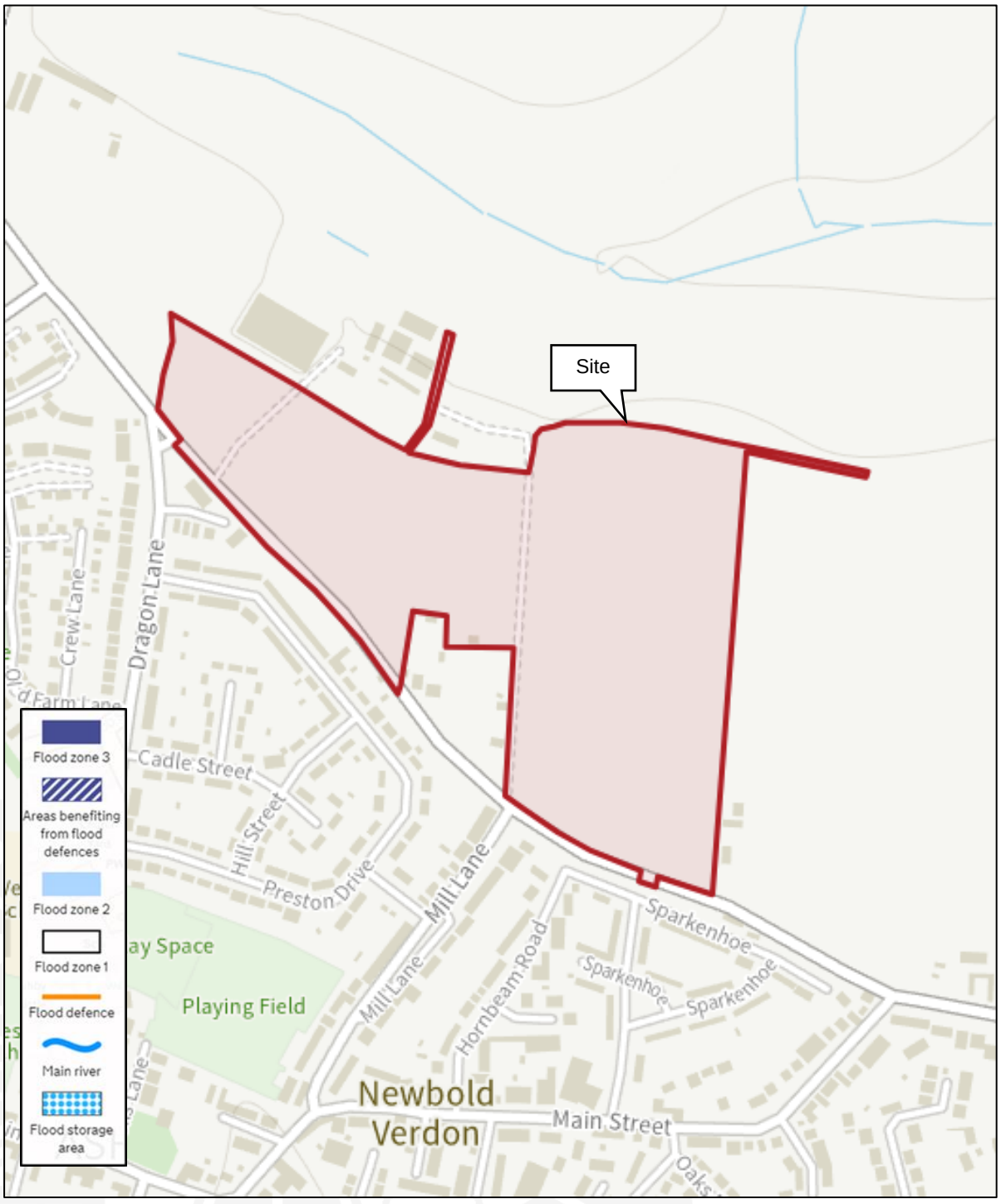
2.7 Sewer records have been obtained from Severn Trent Water (STW) see **Appendix E.** The sewer records show thereare no public sewers within the site. There is a 150mm Surface Water Sewer and 150mm Foul Water Sewer along Sparkenhoe Road. There are multiple 225mm Foul Water Sewers along Barlestone Road.

3.0 FLOOD RISK TO SITE

Flood Zone Allocation

3.1 The Flood Map for Planning is shown in Figure 3.1. The map shows the site is located within Flood Zone 1 (FZ1). FZ1 is defined as land assessed as having an annual probability of river flooding of less than 1%.

Figure 3.1: Environment Agency's Flood Map for Planning (Rivers and Sea).



Surface Water Flooding Risk Allocation

3.2 The Environment Agency Flood Risk from Surface Water Map, refer to Figure 3.2, indicates that the majority of the site is designated to be at very low risk from surface water flooding. The map shows a small area at low risk of surface water flooding towards the northeast of the site, likely caused by a localised low point on site. The areas at risk from surface water are likely to be collected by the proposed site-wide drainage infrastructure.

Figure 3.2: Environment Agency's Flood Risk from Surface Water Map



Groundwater Flood Risk

3.3 Groundwater Vulnerability Mapping indicates that the Glaciofluvial deposits are a Secondary A aquifer and the Edwalton Member is a Secondary B aquifer.

3.4 The site is not located within a Groundwater Source Protection Zone and groundwater abstractions are not recorded within 500m.

3.5 Soil Infiltration Rate Testing was completed by MEC in November 2023, see **Appendix F**. During the tests, groundwater was discovered at depths of between 1.93m and 2.20m bgl along the northern boundary of the site. The rest of the site is at a low risk to groundwater vulnerability.

Other Flooding Risk

3.6 The Environment Agency Mapping shows that the site is not at risk of reservoir flooding, as such, the risk of flooding from reservoirs is low.

3.7 According to the SFRA, there have been 5 recorded Sewer flood events in LE9 9, however, given the exact location of these floods is unknown the risk can be considered as low.

4.0 FLOOD RISK ASSESSMENT

Flood Risk Assessment Methodology & Objectives

4.1 It is recognised that developments that are designed without regard to flood risk may endanger lives, damage property, cause disruption to the wider community, damage the environment, be difficult to insure and require additional expense on remedial works. Current guidance on development and flood risk identifies several key aims for development to ensure that it is sustainable in flood risk terms.

4.2 These aims are as follows:

- The development should not be at significant risk of flooding and should not be susceptible to damage due to flooding;
- The development should not be exposed to flood risk such that the health, safety and welfare of the users of the development, or the population elsewhere, are threatened;
- Safe access/egress to and from the development should be possible during flood events;
- The development should not increase flood risk elsewhere;
- The development should not prevent safe maintenance of watercourses or maintenance and operation of flood defences;
- The development should not be associated with an onerous or difficult operation and maintenance regime to manage flood risk. The responsibility for any operation and maintenance required should be clearly defined;
- Future users of the development should be made aware of any flood risk issues relating to the development;
- The development should not lead to the degradation of the environment; and
- The development should meet all of the above criteria for its entire lifetime, including consideration of the potential effects of climate change.

4.3 This Flood Risk Assessment is undertaken with due consideration of these sustainability aims and has been prepared to inform the proposed scheme.

Project Scope

4.4 In order to achieve the aims outlined above, this Flood Risk Assessment has been undertaken in accordance with current best-practice guidance, including the PPG. A scoping study was initially undertaken to identify all potential sources of flooding at the site, which may warrant further consideration. Any potential flooding issues identified in the scoping study have subsequently been considered within this Flood Risk Assessment. The aim of the scoping study is to review all available information and provide a qualitative assessment of the flood risk to the site and the impact of the site on flood risk elsewhere. The report has been undertaken with due regard to the EA's National Standing Advice on Development and Flood Risk.

Scoping Study

4.5 All potential sources of flooding must be considered for any proposed development.

4.6 Using the EA Flood Zone mapping, topographical survey and Ordnance Survey maps, a summary of the potential sources of flooding and a review of the potential risk posed by each source on the development area of the application site is presented in Table 4.1.

Table 4.1: Potential Risks posed by Flooding Sources in accordance with the gov.uk Long-Term Flood Risk Map

Source	Risk			
	High	Medium	Low	Very low
Fluvial				✓
Tidal				✓
Surface Water				✓
Groundwater			✓	
Sewer			✓	
Artificial water bodies				✓

Flood Risk Mitigation

4.7 It is vital that the correct mitigation is put in place to minimise the flood risk to the development. In accordance with the NPPF, this includes preventing harm from occurring to the users of the site as well as ensuring the development itself is protected. The below outlines further building mitigation measures that are recommended.

Fluvial Flood Risk Mitigation

4.8 The proposed development falls entirely in Flood Zone 1. Given the site is in Flood Zone 1 and at very low risk of fluvial flooding, there would be no requirements to provide any further formal mitigation at this development site.

Surface Water Flood Risk Mitigation

4.9 The Environment Agency Flood Risk from Surface Water Map, indicates that the majority of the site is designated to be at very low risk from surface water flooding. The map shows a small area at low risk of surface water flooding towards the northeast of the site, likely caused by a localised low point. Detailed mapping shows that areas at risk from surface water flooding will likely be in the northeast corner.

4.10 The areas at risk from surface water are likely to be collected by the proposed site-wide drainage infrastructure. Permeable paving will be utilised to avoid any ponding of surface water above the ground. Given the above, surface water is likely to be collected by the proposed site-wide drainage infrastructure and conveyed to a proposed discharge point on site. Therefore, the risk of flooding will be managed at the development site post-development and the remaining risk will be very low.

Vulnerability Classification of Proposed Development

4.11 The National Planning Practice Guidance: Flood Zone and Flood Risk Tables provide information on the vulnerability classification of various developments. The proposed residential development end use of this site falls in the "more vulnerable" classification. A comparison of the 'more vulnerable' use with the development proposals within Flood Zone 1 areas shows development proposals are acceptable and in accordance with NPPF, as shown in Table 4.2.

Table 4.2: Flood risk vulnerability and flood zone 'compatibility' from Flood Risk and Coastal Change – Planning Practice Guidance

Flood Risk Vulnerability classification		Essential Infrastructure	Water compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test Required	✓	✓
	Zone 3a	Exception Test required	✓	x	Exception Test Required	✓
	Zone 3b 'Functional Floodplain'	Exception Test Required	✓	x	x	x

Key:

✓ Development is appropriate X Development should not be permitted

Sequential Test

4.12 According to National Planning Practice Guidance: Flood Zone and Flood Risk, the Sequential Test gives preference for locating new developments in low-risk areas from all sources of flooding. However, if there is no allocated land within the low-risk areas that meets the policy aims of the published Local Authority Local Plan or Local Development Framework then other sites in higher flood risk categories can be considered for that development.

4.13 The site lies within Flood Zone 1 and the majority of the site is within an area of very low surface risk.

4.14 In accordance with the PPG and given the conditions stated above it is deemed that the sequential test will not be required.

4.15 This meets the requirements of the PPG which states the aim of the sequential test is to

"… ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. This means avoiding, so far as possible, development in current and future medium and high flood risk areas considering all sources of flooding including areas at risk of surface water flooding".

Exception Test

4.16 The proposed development is in accordance with NPPF and the exception test is not required. This is in accordance with paragraphs 165 to 175 of the NPPF.

5.0 SURFACE WATER MANAGEMENT STRATEGY

5.1 It is essential that the proposed development does not increase flood risk to adjacent land or downstream of the site and protects the development from flooding itself. To ensure that the flood risk is minimised, the drainage design will incorporate the following flood mitigation measures:

- The proposed development will include a surface water drainage system that will intercept runoff generated within the development. This will minimise the risk of flooding to the new buildings and also reduce the incidence of overland flows.
- The surface water drainage system will convey flows to the attenuation features on site. The surface water flows generated within the development up to and including a 1%AEP40CC will be stored on-site and discharged at a controlled rate of 17.9l/s.

Surface Water Outfall

5.2 Surface water arising from developed sites should, as far as practical, be managed in a sustainable manner to mimic the surface water flows arising from the undeveloped site. When considering the surface water discharge the SuDS hierarchy needs to be adhered to. The SuDS hierarchy states that the options below must be adhered to in order of sustainability or evidenced otherwise before moving down to a less sustainable discharge method;

- Discharge at source (soakaway)
- Watercourse or waterbody
- Public Sewer

Discharge at Source

5.3 The BGS and supporting ground investigation reports by MEC illustrate the area is underlain by the Edwalton Member which consists of Mudstone. The site area has an underlying superficial deposit of Glaciofluvial Deposits (Mid Pleistocene) which is composed of Sand and Gravel.

5.4 Infiltration testing was undertaken on site by MEC at six locations in November 2023. Limited infiltration was recorded in four of the six test locations, likely due to the high fractions of cohesive material within the granular matrix. Soil infiltration rates in two of the locations were recorded between 5.02×10^{-6}m/s and 6.91×10^{-7}m/s. Due to the limited infiltration rates available and the presence of groundwater, soakaways would not be a viable drainage solution for the site and an alternative strategy was recommended.

Discharge to Watercourse

5.5 The closest designated watercourse is the Rothley Brook which is located approximately 3.1km to the east of the site. Any route to this watercourse would be across third party land and so considered unfeasible.

5.6 There is an unnamed watercourse approximately 300m north of the site which outfalls into the Rothley Brook. A connection to the unnamed watercourse will be made via two existing ditch networks both located along the northern boundary of the site. Due to the levels within the southern area of the site a gravity connection cannot be achieved to the watercourse without significant level raising, as such an alternative connection needs to be found.

Discharge to Sewers

5.7 The sewer records show there is a 150mm surface water sewer within Sparkenhoe Road, to the southeast of the site. The southern area will discharge into the existing surface water sewer by gravity via a new connection. STW have confirmed a connection feasible into the sewer subject to a discharge rate of 5.0l/s, please see correspondence within **Appendix E**.

Land Use

5.8 In order to calculate the drainage requirements an understanding of the land use on-site needs to be known. Table 5.1, below summarises the proposed land uses within the site. The site currently consists of an existing green open space. The current land use has been calculated using the existing site plan and the post-development land use has been measured from the proposed layout.

Table 5.1: Land Use Summary

Land Use Type	Existing Site Areas		Proposed Site Areas	
	ha	%	ha	%
Impermeable Areas	0	0	4.44	32
Green Landscape / Permeable areas	13.87	100	9.43	68
Total	**13.87**	**100**	**13.87**	**100**

Climate Change Allowances

5.9 The influence of climate change on rivers and watercourses is likely to increase the frequency of flood events and the overall volume of water that passes the site. When considering surface water runoff from the site, the increase in peak rainfall intensity varies over the lifetime of the development. Where residential developments with a lifetime beyond the 2070s are proposed the Flood Risk Assessments: Climate Change Allowances Guidance requires the use of the Upper-End Allowance for the 2070s epoch (2061 to 2125), the upper end gives an expected increase of 40%, refer to Table 5.2.

Table 5.2: Peak Rainfall intensity allowance in small and urban catchments from the Flood Risk Assessments: Climate Change Allowances Guidance

	Total potential change anticipated for the '2050s' (2022 to 2060)		Total potential change anticipated for the '2070s' (2061 to 2125)	
Annual Exceedance Probability	Central	Upper End	Central	Upper End
3.3 % AEP	20%	35%	25%	35%
1 % AEP	20%	40%	25%	40%

Urban Creep Allowances

5.10 Urban creep is the conversion of permeable surfaces to impermeable ones over time, e.g., extensions to existing buildings. It has been shown that, over the lifetime of development, urban creep can increase impermeable areas by as much as 10%. An allowance of 10% for increases in the impermeable area due to urban creep over the lifetime of the development will be included in the drainage calculations and the total calculated impermeable area will be 4.88ha based on a 10% increase to proposed values.

Contributing Drainage Area

5.11 When designing the proposed drainage strategy for a site, the incoming volume of water to the drainage system needs to be quantified. The contributing drainage area considers both the impermeable and permeable areas generated by the development. Permeable areas will likely enter the drainage system during higher return events as the ground will already be saturated.

5.12 With a total developable area of 7.40ha, and a total impermeable area (without urban creep) of 4.44ha, the total permeable area for the development is 2.96ha. The amount of direct surface water runoff generated within permeable areas has been estimated by applying the Standard Percentage Runoff (SPR) coefficient for the respective area. As such, a SPRHOST of 41.83% leads to an effective permeable area of 1.24ha.

5.13 In total, the contributing drainage area for the proposed site is **6.12ha**, which comprises of 4.88ha for the total impermeable area (with urban creep) and 1.24ha for the effective permeable area.

Discharge Rate

5.14 Existing runoff conditions have been calculated for the northern area of the site using FEH to calculate the Greenfield Discharge rate for the developable area of 5.81ha, the QBAR Greenfield rate has been calculated at 12.9l/s. The calculation of the Greenfield rate is included in **Appendix G.** An agreement was made with STW for surface water flows generated by the southern area of the site to discharge at a rate of 5.0l/s, see correspondence within **Appendix E.**

5.15 Given the above surface water flows will discharge the site at a total rate of 17.9l/s (12.9l/s at QBAR to the north and 5.0l/s at an agreed rate with STW to the south).

Drainage Strategy

5.16 The overall drainage strategy has been based on the land use table, discharge rates and the current site layout presented in **Appendix A.** In accordance with the National SuDS Standards, the strategy involves conveying surface water flows to multiple attenuation basins before discharging via gravity to the north into the two existing unnamed ditch networks at a QBAR of 12.9l/s and to the south via gravity into a public surface water sewer at an agreed rate of 5.0l/s subject to an investigation of levels.

Attenuation Basin 1

5.17 Surface water flows for a contributing area of 2.24ha will be conveyed to the proposed Attenuation Basin 1 on-site. A storage volume of 1,718.30m^3 is required within the proposed attenuation basin to allow sufficient water to discharge at 7.4l/s into the unnamed ditch to the north of the site and cater for all events up to and including the 1%AEP40CC. The attenuation basin has been designed to accommodate a 1:4 gradient for the internal slopes with a 1:4 gradient for the external batter slopes.

Attenuation Basin 2

5.18 Surface water flows for a contributing area of 2.57ha will be conveyed to the proposed Attenuation Basin 2 on-site. A storage volume of 2,121.11m^3 is required within the proposed attenuation basin to allow sufficient water to discharge at 5.5l/s into the unnamed ditch to the north of the site and cater for all events up to and including the 1%AEP40CC. The attenuation basin has been designed to accommodate a 1:4 gradient for the internal slopes with a 1:4 gradient for the external batter slopes.

Attenuation Basin 3

5.19 Surface water flows for a contributing area of 1.31ha will be conveyed to the proposed Attenuation Basin 3 on-site. A storage volume of 971.62m^3 is required within the proposed attenuation basin to allow sufficient water to discharge at 5.0l/s into the 150mm public surface water sewer on Sparkenhoe Road and cater for all events up to and including the 1%AEP40CC. Following correspondence with STW an agreement has been reached to discharge surface water from Attenuation Basin 3 into the 150mm public surface water sewer at a rate of 5.0l/s subject to an investigation into land ownership to the south of the site. See **Appendix E** for STW correspondence.

5.20 In total a storage volume of 4,811.03m^3 would be required within the attenuation basins to accommodate the 1%AEP40CC storm event. The results of this analysis are shown in Table 5.3. The calculations for the proposed design can be seen in **Appendix G**, and a drainage strategy based on the principles above is shown in drawing 24832_01_230_01f in **Appendix H**.

Table 5.3: Discharge Rates and Storage Requirements

	Contributing Area	Discharge Rate	Max Storage Requirements (1%AEP40CC)
Attenuation Basin 1	2.24ha	7.40l/s	1,718.30m^3
Attenuation Basin 2	2.57ha	5.50l/s	2,121.11m^3
Attenuation Basin 3	1.31ha	5.00l/s	971.62m^3
Total	**6.12ha**	**17.90l/s**	**4,811.03m^3**

5.21 Additional drainage features such as permeable paving and multiple swales will be used across the site and will provide extra storage on-site. Permeable paving will act as a first treatment stage for any run-off and will ensure adequate surface water treatment is provided. These features have been excluded from calculations at this stage.

5.22 Due to the presence of groundwater, all drainage features will be lined with an impermeable membrane to prevent any groundwater ingress.

Cemetery

5.23 Due to the limited impermeable areas generated by the cemetery no formal drainage strategy has been prepared at this time. It is recommended that all walkways are designed with gravel and that all parking comprise permeable paving. Surface water flows generated by these areas will infiltrate into the ground. An overflow pipe will be contained within permeable paving and will connect into the wider system prior to outfalling into the ditch network north of the site. Further design of this area can be considered at the detailed design stage once a more detailed layout for the space is available

Applicable SuDS Techniques

5.24 The National Standards for Sustainable Drainage Systems (Ref. 16) that deal with SuDS cover a whole range of sustainable approaches to surface water drainage management including:

- source control measures including rainwater recycling and drainage;
- filter strips and swales, which are vegetated features that hold and drain water downhill mimicking natural drainage patterns;
- filter drains and porous pavements to allow rainwater and run-off to infiltrate into permeable material below ground and provide storage if needed; and
- basins and ponds to hold excess water after rain and allow controlled discharge that avoids flooding.

5.25 Each of the five SuDS considerations listed above is discussed below in Table 5.4, with reference to their suitability for the proposed development.

Table 5.4: Suitability of SuDS techniques

	COMPONENT	SUITABILITY	REASON
Source Control	Rainwater Harvesting	Yes	Water butts could be used to store run-off from roofs before discharge into the drainage system. Any storage is not to be included in calculations.
	Green Roofs	No	This would not be appropriate given the scope and scale of the development.
	Bio-retention Systems/ Rain Gardens	Yes	Rain Gardens could be used as standalone SuDS across the site but offer limited attenuation capacity. Therefore, they have not been included within the drainage strategy at this stage.
Proprietary Systems	Proprietary bio-retention systems	No	More appropriate SuDS features can be accommodated within the development and are preferred.
Infiltration Devices	Permeable Paving	Yes	Permeable paving is suitable for the proposed development within parking spaces.
	Infiltration trenches/ Soakaways	No	Infiltration has been proven to be unfeasible at the proposed development.
Filtration	Open Swales, Filter Strips/ Drains	Yes	Three 3.5m swales will be used for conveying surface water flows to the attenuation basin.
Retention/ Detention	Detention Basin, Attenuation Pond/ Tanks	Yes	The proposed attenuation basins will provide surface water storage and treatment prior to discharge from the site.

Surface Water Quality

5.26 The SuDS Manual CIRIA document C753 (Ref. 10), indicates the minimum treatment indices appropriate for contributing pollution hazards for different land use classifications. To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index (for each contaminant) that equals or exceeds the pollution hazard index (see Table 5.5).

5.27 Surface water runoff from residential roofs will have a very low pollution hazard level, while the residential parking areas will have a low pollution hazard level and all other traffic will have a medium pollution hazard level. The exact pollution hazard levels are shown in Table 5.5.

Table 5.5: Pollution Hazard Indices (Extract from CIRIA 753 Table 26.2)

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very Low	0.2	0.2	0.05
Individual property driveways, residential car parks, and low-traffic roads.	Low	0.5	0.4	0.4
All other roads (not low trafficked)	Medium	0.7	0.6	0.7

5.28 To provide the correct level of treatment, an assessment needs to be made of the mitigation provided by each SuDS feature. This is shown in Table 5.6 below;

Table 5.6: SuDS Mitigation Indices (Extract from CIRIA 753 Table 26.3)

	Mitigation indices		
Type of SuDS component	**Total Suspended Solids**	**Metals**	**Hydrocarbons**
Permeable Paving	0.7	0.6	0.7
Attenuation Basin	0.5	0.5	0.6
Swale	0.5	0.6	0.6

5.29 For the very low to medium pollution hazard levels generated at the site, the proposed attenuation basin, permeable paving and swale would provide sufficient treatment in accordance with the Simple Index Method. Should further treatment be required appropriate devices will be selected to ensure the pollution to the receiving watercourse has no increase impact as a result of the development.

Exceedance and Flow Routing

5.30 The risk of overland flooding from adjacent land to dwellings is very low. The design of levels and features on the site will follow best practice by ensuring any overland flow on the site is routed safely away from dwellings and to areas of lowest risk on site. Any surcharging and subsequent flooding of sewers on or in the vicinity of the site will also be mitigated by the flood routing described above. As such the risk of flooding on site from exceedance events and flood flow routes is very low.

Maintenance and Management

5.31 An integrated approach to the maintenance and management of SuDS systems is a requirement of the NPPF and by the Flood & Water Management Act 2010. The aim of a maintenance and management plan is to ensure that there is a clear understanding of drainage responsibilities and that a maintenance regime is implemented for all new drainage systems for the lifetime of the development, so they can continue to function as required.

5.32 The surface water drainage network is to be offered for adoption. The attenuation basins have not been designed to an adoptable standard and therefore should remain within private ownership. However, this assumption can be visited at the detailed design stage, where an agreement can be sought with the sewerage undertaken to offer this component for adoption.

5.33 All private drainage systems, including the SuDS features, will be maintained by landowners or by an appointed management company.

5.34 A proposed maintenance schedule which breaks down the maintenance requirements of the various proposed assets is shown in **Appendix I**.

6.0 FOUL WATER STRATEGY

6.1 According to The Building Regulations (2010), foul water drainage from new developments should be discharged into the following in order of priority:

- A public sewer, or;
- A private sewer communicating with a public sewer, or;
- A septic tank which has an appropriate form of secondary treatment, or;
- A cesspool.

6.2 Sewer records were obtained from STW see **Appendix E**. The sewer records show there is a 225mm foul water sewer running along Barlestone Road approximately 5m to the south of the site.

6.3 STW has confirmed that the nearest connection achievable is the sewer at MH7101 or MH8001 within Barlestone Road. The disposal of foul water from the site will be via MH8001 into the 225mm foul water sewer along Barlestone Road. Given the levels on site, foul water will need to be pumped with a new gravity sewer provided prior to connecting into MH8001. STW would not expect pumped flows to exceed 6 l/s. STW has advised that sewer modelling will be required to understand the impact on the downstream network. The peak foul flow rate arising as a result of the development has been agreed with STW to not exceed 6.0l/s (**Appendix E)**.

6.4 The proposed foul water drainage can be seen on drawing 24832_01_230_01f in **Appendix H**.

7.0 CONCLUSION AND SUMMARY

7.1 MEC has been commissioned by David Wilson Homes East Midlands to undertake a Flood Risk Assessment for a proposed development on Barlestone Road, Newbold Verdon. This assessment has been undertaken to ascertain the constraints of the development to the site and to assess the impact of the design, with respect to flood risk.

- The whole of the site and area surrounding the vicinity are located within FZ1. The site is at a very low risk from surface water flooding as there are no major watercourses nearby. There is no concern of reservoir flooding.
- Soil Infiltration Rate Testing was completed by MEC in November 2023**.** During the tests groundwater was discovered at depths of between 1.93m and 2.20m bgl along the northern boundary of the site.
- All basins and swales to be lined to prevent groundwater ingress.
- Sequential and Essential Tests deemed not required.
- Existing runoff calculations have been calculated for the northern areas of the site using the FEH method for the developable area of 5.81ha, which produced a QBAR of 12.9l/s.
- An agreement was made with STW for the southern area of the site for a discharge rate of 5.0l/s.
- In total surface water flows from the site will discharge at a total rate of 17.9l/s.
- Surface water flows for a contributing area of 6.12ha will be conveyed to three attenuation basins across the site.
- A total storage volume of 4,811.03m^3 is required within the proposed attenuation features to allow surface water to discharge at 17.9l/s and cater for all events up to and including the 1%AEP40CC plus urban creep. Attenuation basins 1 and 2 will discharge via gravity into the unnamed ditch to the north of the site while Attenuation basin 3 will discharge via gravity into an existing public surface water sewer along Sparkenhoe Road subject to further investigations of land ownership.
- Additional drainage features including rain gardens and permeable paving will be used across the site and will provide extra storage on site and will act as a first treatment stage for any run-off and will ensure adequate surface water treatment is provided.
- Due to the limited impermeable areas generated by the proposed cemetery no formal drainage strategy has been designed at this time. It is recommended that all walkways are designed with gravel and all parking be designed with permeable paving. Surface water flows generated by these areas will infiltrate into the ground. An overflow pipe will be contained within permeable paving and will connect into the wider system prior to outfalling into the ditch network north of the site.
- The disposal of foul water from the site will be via MH8001 into the 225mm foul water sewer along Barlestone Road. Given the levels on site, foul water will need to be pumped with a new gravity sewer provided prior to connecting into MH8001. The peak foul flow rate arising as a result of the development has been agreed with STW to not exceed 6.0l/s.

7.2 With the above measures in place, the development of the site will not create any flood risk issues to the wider area.

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APPENDICES



APPENDIX A

MEC Consulting Group Ltd
The Old Chapel
Station Road
Hugglescote
Leicestershire
LE67 2GB

SITE LOCATION PLAN

Project:	**Barlestone Road, Newbold Verdon**
File Ref:	**24832**
O.S. Grid Ref:	**444791, 304283**
Postcode:	**LE9 9NE**



MEC Ordnance Survey Licence No. 100055865

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APPENDICES



APPENDIX B

Issue:



KEY

- SITE BOUNDARY
- INDICATIVE PUBLIC OPEN SPACE
- RETAINED EXISTING VEGETATION
- INDICATIVE PROPOSED TREES AND PLANTING
- INDICATIVE BUILT FORM
- CORRECTED VIEWPOINT 5 (DRAFT REGULATION 16 NEIGHBOURHOOD PLAN)
- INDICATIVE SWALES
- EXISTING BYWAY OPEN TO ALL TRAFFIC
- UNCLASSIFIED ADOPTED ROAD
- EXISTING FOOTPATH
- POTENTIAL PEDESTRIAN CYCLE CONNECTION
- RETAINED VEHICULAR ACCESS ROUTE TO EQUESTRIAN CENTRE/ PROPOSED ACCESS TO CEMETERY
- PROPOSED PEDESTRIAN ACCESS POINT
- RETAINED PROW ACCESS POINTS
- PRIMARY VEHICULAR ACCESS POINT
- EXISTING BARLESTONE ROAD CROSSING POINTS
- NEW BARLESTONE ROAD CROSSING POINTS
- INDICATIVE FOUL PUMPING STATION
- AGRICULTURAL ACCESS
- PRIVATE DRIVE ACCESS TO (EXISTING) WILLOWBROOK COTTAGE
- DRAINAGE OUTFALL

N 0 50 100 m

BARLESTONE ROAD, NEWBOLD VERDON - INDICATIVE MASTERPLAN

PEGASUS GROUP

| PEGASUSGROUP.CO.UK | TEAM/DRAWN BY: KB | APPROVED BY: ET | DATE: 27/08/2024 | SCALE: 1:2500@A2 | DRWG: P22-3085_DE_013_M_01 | CLIENT: DAVID WILSON HOMES |

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Issue:



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KEY

- SITE BOUNDARY
- PROPOSED OPEN SPACE including sustainable urban drainage basins
- PROPOSED DEVELOPMENT PARCLELS including roads/ footpaths/ infrastructure
- LOCATION OF PROPOSED LAND SET ASIDE FOR CEMETERY
- SAFEGUARDED COMMUNITY FACILITY LAND
- INDICATIVE AREA REQUIRED FOR INTERNAL ACCESS ROADS not within the residential land use
- INDICATIVE AREA REQUIRED FOR PROPOSED ACCESS ROADS not within the residential land use
- PRIMARY VEHICULAR ACCESS POINT
- LOCATION OF INDICATIVE PROPOSED BASINS
- LOCATION OF EXISTING WATER FEATURE
- AGRICULTURAL ACCESS
- PRIVATE DRIVE ACCESS TO (EXISTING) WILLOWBROOK COTTAGE
- PROPOSED INDICATIVE AREA OF PLAY
- PROPOSED ACCESS TO CEMETERY
- PROPOSED PEDESTRIAN/ CYCLE ACCESS
- RETAINED PROW ACCESS POINTS
- DRAINAGE OUTFALL

*All features and areas shown to a tolerance of 10m

N 0 50 100 m

BARLESTONE ROAD, NEWBOLD VERDON - PARAMETER PLAN

PEGASUS GROUP

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APPENDICES



APPENDIX C

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Policies and References

National Planning Policy Framework

The National Planning Policy Framework (Ref. 4) sets out the Government's objectives for the planning system and how there should be a 'Presumption in Favour of Sustainable Development and the planning system should facilitate and promote sustainable patterns of development, avoiding flood risk and accommodating the impacts of climate change.

The document seeks to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk. Reference should also be made to the Planning Practice Guidance (Ref. 17) which provides additional guidance on flood risk.

For the purposes of applying the National Planning Policy Framework, areas at risk from all sources of flooding are included. For fluvial (river) and sea flooding, this is principally land within Flood Zones 2 and 3. It can also include an area within Flood Zone 1 in which the Environment Agency has notified the local planning authority of having critical drainage problems.

Key elements from the document include

"Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk…"

"Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding."

"When determining any planning applications, local planning authorities should ensure flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific risk assessment. Development should only be allowed in areas at risk of flooding where in light of this assessment (and the sequential and exception tests) it can be demonstrated that:

a) *Within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;*

b) *The development is appropriately flood resistant and resilient*

c) *It incorporates sustainable drainage systems unless there is clear evidence that this would be inappropriate;*

d) *Any residual risk can be safely managed; and*

e) *Safe access and escape plan routes are included where appropriate, as part of an agreed emergency plan."*

Flood and Water Management Act 2010

The Flood and Water Management Act 2010 (Ref. 19) gained Royal Assent on the 8th April 2010. The Flood and Water Management Act is the government's newest legislation to help improve flood risk management and ensure the security of water supplies in England and Wales. The Act updates legislation to ensure better protection from flooding, manage water more sustainably, improve public services and secure water resources during periods of drought. The Flood and Water Management Act helps to reduce flood risk by:

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- Clarifying who is responsible for managing all sources of flood risk.
- Encourage more sustainable forms of drainage in new developments.
- Makes it easier to resolve misconnections to sewers.

The Flood and Water Management Act imparts significant new roles and responsibilities on local authorities. County or unitary authorities are now classed as lead local flood authorities (LLFAs) who have responsibilities for managing local flood risk. The responsibilities of a LLFA include:

- Prepare and maintain a strategy for local flood risk management in their areas, coordinating views and activity with other local bodies and communities through public consultation and scrutiny, and delivery planning.
- Maintain a register of assets – these are physical features that have a significant effect on flooding in their area.
- Investigate significant local flooding incidents and publish the results of such investigations.
- Issue consents for altering, removing or replacing certain structures or features on ordinary watercourses.
- Play a lead role in emergency planning and recovery after a flood event.

Planning Practice Guidance on Flood Risk & Coastal Change – March 2014, updated August 2021
The Government's new planning policy on sustainable drainage systems came into effect on 6 April 2015. It expects local planning policies and decisions on planning applications relating to major development (those of 10 dwellings or more; or equivalent non-residential or mixed development) to ensure that sustainable drainage systems for the management of run-off are put in place unless demonstrated to be inappropriate. Lead Local Flood Authorities (LLFAs) have also been made statutory consultees and new non-statutory guidance has been published under the changes.

The changes follow a joint Defra/DCLG consultation on delivering SuDS published in September 2014 in which the Government dropped all the key provisions of Schedule 3 of the Flood & Water Management Act 2010 and SuDS Approval Bodies (SABs) in favour of passing the oversight of SuDS from county councils (who are also LLFAs) to local planning authorities. According to the new planning policy, local planning authorities are expected, when considering planning applications:

- To consult the relevant lead local flood authority on the management of surface water,
- To satisfy themselves that the proposed minimum standards of operation are appropriate, and
- To ensure through the use of planning conditions or planning obligations that there are clear arrangements in place for ongoing maintenance over the lifetime of the development.

The policy also states that the sustainable drainage system should be designed to ensure that the maintenance and operation requirements are economically proportionate.

Sustainable Drainage Systems - Non-statutory technical standards for sustainable drainage systems – 2015
The non-statutory technical standards for the design, maintenance and operation of sustainable drainage systems to drain surface water have been published by Defra. The standards apply to systems that drain surface water from housing, non-residential or mixed use developments for the lifetime of the developments. The non-statutory technical standards are to be used in conjunction with the National Planning Policy Framework, and Planning Practice Guidance on Flood Risk & Coastal Change.

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The following documents have been referred to in this report:

1 The Building Regulations 2015, Approved Document H.
2 Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code") - October 2019, updated June 2022.
3 Planning Practice Guidance – November 2016, updated August 2022.
4 National Planning Policy Framework - March 2012, updated December 2023
5 Civil Engineering Specification for the Water Industry, 7th Edition.
6 Flood Risk and Coastal Change Guidance – March 2014, updated August 2022.
7 Environment Agency Flood Risk Standing Advice.
8 Environment Agency 'Flood Risk Assessments – Climate Change Allowances' - February 2016., updated May 2022.
9 The SuDS Manual – CIRIA C753.
10 Interim Code of Practice for Sustainable Drainage Systems – National SuDS Working Group, July 2004.
11 Cranfield University Soilscapes Map - http://www.landis.org.uk/soilscapes/.
12 British Geological Survey – Geology of Britain viewer, http://mapapps.bgs.ac.uk /geologyofbritain/home.html.
13 FEH WebService – Centre for Ecology and Hydrology, https://fehweb.ceh.ac.uk/GB/map.
14 Design and analysis of urban storm drainage. The Wallingford Procedure Vol.1.
15 Institute of Hydrology Report No. 124 – Flood Estimation for small catchments.
16 Sustainable Drainage Systems – Non-statutory technical standards for sustainable drainage systems – March 2015.
17 Water Industry Act 1991.
18 Flood and Water Management Act 2010.

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APPENDICES



APPENDIX D

Survey Notes

1: This Survey is related to Ordnance Survey Grid, OSGB36 (15).
The site grid has been established and transformed by a central OSGB36 (15) point and orientated accordingly. No scale factor has been applied.
Please refer to the Survey Control Schedule for site control.

2: All Levels are related to OS Datum, OSGB36 (15).

3: The information Shown on this drawing is surveyed to the accuracy of the base scale shown.

4: Man entry to sewers has not been undertaken. Depths and pipe sizes are measured / estimated from the ground. This should be checked with Local Authority records or on site prior to the commencement of any works.

5: Boundaries shown are physical features and may not represent legally conveyed ownership.

6: Some features may be omitted due to obstructions and features are shown at the time of survey.

7: Where adjacent buildings have been surveyed remotely all walls may not be shown due to obstructions along lines of sight.

8: This plan should only be used for its original purpose. NJC Surveys LTD accepts no responsibility for this plan if it is supplied to any party other than the original client.

Survey Key

Street Furniture Symbols & Abbreviations

AV	Air Valve	Pipe	Pipe
BB	Bellaths Beacon	PM	Parking Meter
BH	Borehole	PO	Post
BL	Bollard	RE	Bubbling Eye
BS	Bus Stop	RL	Ridge Level
DR	Drain	RP	Reflector Post
EP	Electric Pole	RS	Road Sign
EL	Eaves Level	SAP	Name Plate
EN	Earth Rod	SI	Sign
FB	Fence Bollard	SM	Sensor Relay
FL	Flood Light	ST	Stop Tap
FFL	Floor Level	STN	Survey Control
FS	Flag staff	SU	Stump
GP	Gate Post	SV	Stop Valve
GU	Gully	TC	Telecommunication
GV	Gas Valve	TCB	Tel. Control Box
IL	Invert Level	TL	Traffic Light
IC	Inspection Cover	TP	Telephone
LB	Letter Box	TS	Traffic Signal Pole
LB	Litter Bin	TV	Traffic Signal Cover
LP	Lamp Post	WD	Cable Television
MH	Square Manhole	WM	Wash Out
MH	Circular Manhole	WT	Water Meter
MH	Triangular Manhole	VP	Water Tap
MP	Marker Post		Vent Pipe
MP	Mile Post		
PB	Pillar Box		

Fence Types & Abbreviations

BAW	Post & Barbed Wire
CJB	Close Boarded
CBr	Crash Barrier
CrI	Corrugated Iron
CrL	Chain Link
ConcP	Concrete Panel
CrP	Chestnut Paling
Ele	Electric
HiM	Hit and Miss
Hrd	Hoarding
Ian	Interwoven
Mas	Masonry Railings
OIL	Overlap
Pal	Palisade
PVC	Post & Chain
PIK	Picket (Wooden)
PIR	Post & Rail
RW	Post & Wire
PM	Post & Wire Mesh
TiR	Trip Rail

Feature Lines

Hedge	Overhead Electric Line
Fence	Overhead Telecom Line
Gate	Ground Level
Stile	Individual Tree
Foliage/Tree Canopy	Individual Bush
Dropped Kerb Line	Structure
Kerb Line	Watercourse / Embankment etc
Verge/Edge of Track or change of surface	Sewer Lines
Unkerbed Channel Line	
Footpath	
Wall	
Retaining Wall	

SHEET LAYOUT

S3605/01
S3605/02
S3605/03

SURVEY CONTROL

STN	EASTINGS	NORTHINGS	LEVEL
NJC1	444454.599	304440.801	132.441
NJC2	444509.746	304374.086	133.557
NJC3	444574.881	304304.444	134.528
NJC4	444639.154	304243.445	133.850
NJC5	444704.344	304177.501	132.998
NJC6	444744.544	304101.591	132.998
NJC7	444814.347	304041.725	132.494
NJC7A	444778.615	303970.548	132.324
NJC8	444902.683	303868.661	132.443
NJC9	444953.752	303961.112	132.098
NJC9A	445003.752	303961.112	132.098
NJC10	444827.213	304187.270	133.100
NJC11	444653.146	304163.840	133.343
NJC12	444641.297	304222.529	132.942
NJC12A	445041.297	304367.860	132.448
NJC12B	445180.512	304340.223	131.610
NJC13	444785.015	304242.177	132.611
NJC14	444831.123	304265.251	132.469
NJC15	444733.946	304323.487	131.350
NJC16	444639.837	304341.492	132.936
NJC17	444617.379	304423.085	132.160
NJC18	444560.101	304476.596	131.908
NJC19	444662.335	304472.084	131.016
NJC20	444840.329	304391.145	130.947

REV	DATE	DESCRIPTION	BY	APP.

njc SURVEYS LTD

The Old Police Station, South Street, Ashby de la Zouch, Leicestershire, LE65 1BQ

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Site Engineering ● Monitoring Surveys ● Ground Modelling ● Volumetric Calculations

Client

DAVID WILSON HOMES
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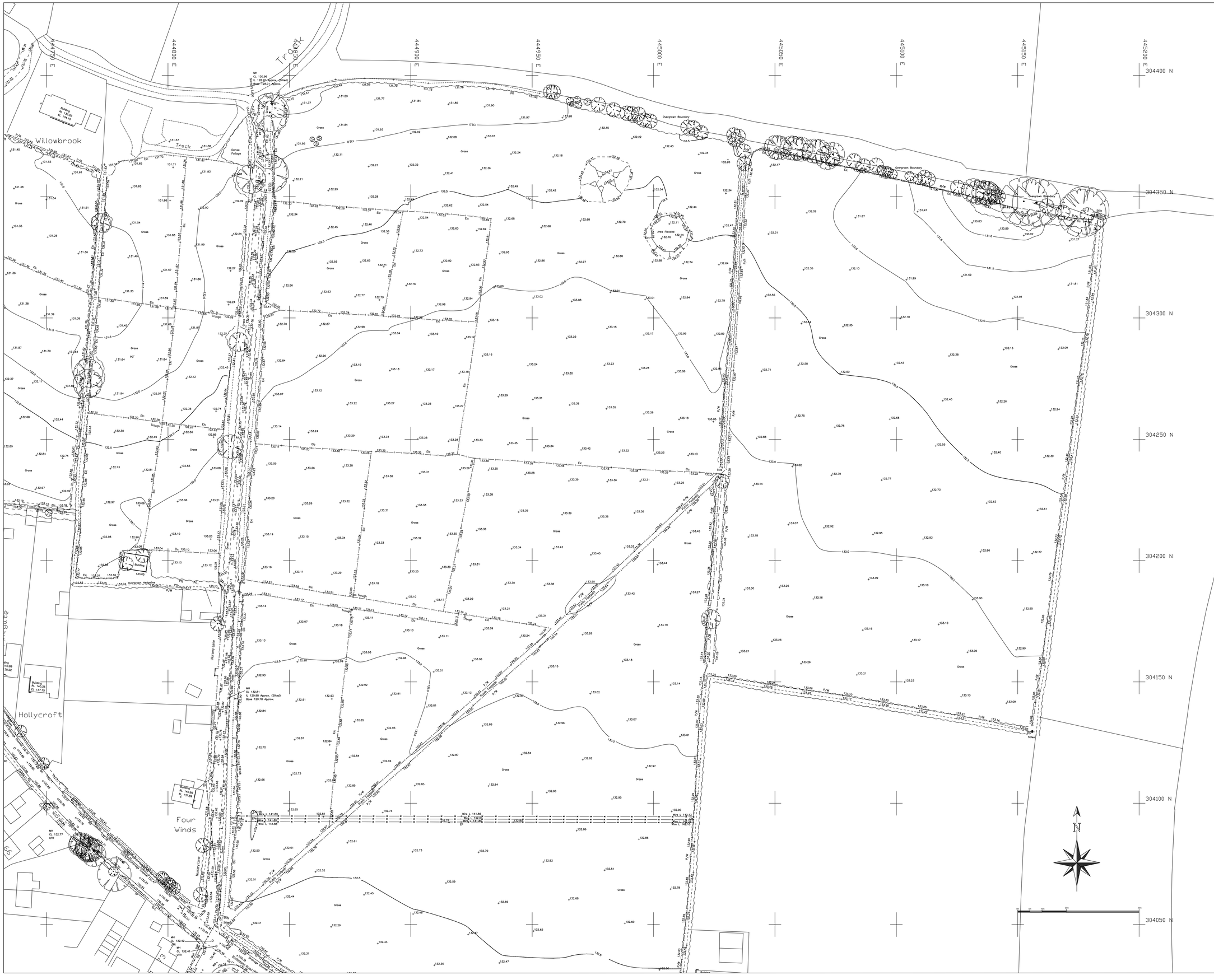
Project Title

Barlestone Road,
Newbold Verdon

Drawing Title

Topographical Survey

Drawn	Checked	Authorised
MM	LD	NJC
Date	Scale	Sheet size
29/11/2022	1/500	A0
Drg. No.		Revision
S3605/01		



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DR	Drain	RP	Road Sign		
EP	Electric Pole	RS	Name Plate		
EL	Eaves Level	SNP	Sign		
EH	Earth Rod	SI	Stay Stay		
FB	Fence Bollard	Stay	Stop Tap		
FL	Flood Light	ST	Survey Control		
FFL	Floor Level	STN	Slump		
FS	Flag staff	SLI	Stop Valve		
GP	Gate Post	SV	Telecommunication		
GU	Gully	TC	Tel. Control Box		
GV	Gas Valve	TCB	Traffic Light		
IL	Invert Level	TL	Traffic Pole		
IC	Inspection Cover	TP	Telephone Pole		
LB	Letter Box	TR	Traffic Sign Pole		
LB	Line Box	TS	Traffic Signal Cover		
LP	Lamp Post	TV	Cable Television		
MH	Square Manhole	WO	Wash Out		
MH	Circular Manhole	WM	Water Meter		
MH	Triangular Manhole	WT	Water Tap		
MP	Market Post	VP	Vent Pipe		
MP	Mile Post				
PB	Pillar Box				

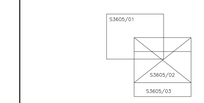
Fence Types & Abbreviations

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CL	Chain Link
ConcP	Concrete Panel
CP	Chestnut Paling
El.	Electric
HM	Hit and Miss
Hrd	Hoarding
Ian	Interwoven
Mas	Masonry Wall
OL	Overlap
Pal	Palisade
PC	Post & Chain
PK	Picket (Wooden)
PR	Post & Rail
PW	Post & Wire
PM	Post & Wire Mesh
TiR	Trip Rail

Feature Lines

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Unkerbed Channel Line	
Footpath	
Wall	
Retaining Wall	

SHEET LAYOUT



SURVEY CONTROL

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NJC5	444677.435	304201.601	133.254
NJC6	444744.344	304107.391	132.998
NJC7	444814.347	304041.725	132.494
NJC8	444902.683	303988.681	132.443
NJC9	444902.683	303988.681	132.443
NJC9A	444909.022	303966.986	131.982
NJC91	445003.752	303981.112	132.098
NJC10	444827.213	304187.270	133.100
NJC11	444827.213	304187.270	133.100
NJC12	445091.866	304222.529	132.942
NJC12A	445041.297	304367.860	132.448
NJC12B	445080.512	304340.223	131.610
NJC13	444781.123	304296.151	132.477
NJC14	444831.123	304296.151	132.469
NJC15	444733.946	304323.487	131.350
NJC16	444639.937	304341.492	132.936
NJC17	444650.101	304478.596	131.999
NJC18	444650.101	304478.596	131.999
NJC19	444662.335	304472.084	131.016
NJC20	444840.329	304361.145	130.947

REV	DATE	DESCRIPTION	BY	APP.

njc SURVEYS LTD

The Old Police Station, South Street, Ashby de la Zouch, Leicestershire, LE65 1BQ

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Topographical Surveys ● Measured Building Surveys ● Laser Scanning ● Utility Surveys
Site Engineering ● Monitoring Surveys ● Ground Modelling ● Volumetric Calculations

Client

DAVID WILSON HOMES
WHERE QUALITY LIVES

Project Title

Barlestone Road,
Newbold Verdon

Drawing Title

Topographical Survey

Drawn	Checked	Authorised
MM	LD	NJC
Date	Scale	Sheet size
29/11/2022	1/500	A0
Drg. No.		Revision
S3605/02		

Survey Notes

1: This Survey is related to Ordnance Survey Grid, OSGB36 (15).
The site grid has been established and transformed by a central OSGB36 (15) point and orientated accordingly. No scale factor has been applied.
Please refer to the Survey Control Schedule for site control.

2: All Levels are related to OS Datum, OSGB36 (15).

3: The information Shown on this drawing is surveyed to the accuracy of the base scale shown.

4: Main entry to sewers has not been undertaken. Depths and pipe sizes are measured / estimated from the ground. This should be checked with Local Authority records or on site prior to the commencement of any works.

5: Boundaries shown are physical features and may not represent legally conveyed ownership.

6: Some features may be omitted due to obstructions and features are shown at the time of survey.

7: Where adjacent buildings have been surveyed remotely all walls may not be shown due to obstructions along lines of sight.

8: This plan should only be used for its original purpose. NJC Surveys LTD accepts no responsibility for this plan if it is supplied to any party other than the original client.

Survey Key

Street Furniture Symbols & Abbreviations

AV	Air Valve	Pipe	Pipe
BB	Bellaths Beacon	PM	Parking Meter
BH	Borehole	PO	Post
BL	Bollard	RE	Bedding Eye
BS	Bus Stop	RL	Ridge Level
DR	Drain	RP	Reflector Post
EP	Electric Pole	RS	Road Sign
EL	Eaves Level	SNP	Name Plate
EN	Earth Rod	SI	Sign
FB	Fence Bollard	SY	Stop Delay
FL	Flood Light	ST	Stop Tap
FFL	Floor Level	STN	Survey Control
FS	Flag staff	SU	Stump
GP	Gate Post	SV	Stop Valve
GU	Gully	TC	Telecommunication
GV	Gas Valve	TCB	Tel. Control Box
IL	Invert Level	TL	Traffic Light
IC	Inspection Cover	TP	Telephone
LB	Letter Box	TS	Traffic Signal Cover
LB	Line Box	TV	Cable Television
LP	Lamp Post	WO	Wash Out
MH	Square Manhole	WM	Water Meter
MH	Circular Manhole	WT	Water Tap
MH	Triangular Manhole	VP	Vent Pipe
MP	Marker Post		
MP	Mile Post		
PB	Pillar Box		

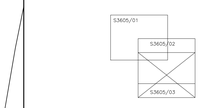
Fence Types & Abbreviations

BAW	Post & Barbed Wire
CAB	Close Boarded
CBr	Crash Barrier
CrI	Corrugated Iron
CrL	Chain Link
ConcP	Concrete Panel
CrP	Chestnut Paling
Elc	Electric
HiM	Hit and Miss
Hrd	Hoarding
Ian	Interwoven
Mas	Masonry Wall
OAL	Overhang
Pal	Palisade
PVC	Post & Chain
PIK	Picket (Wooden)
PrR	Post & Rail
RW	Post & Wire
PM	Post & Wire Mesh
TiR	Trip Rail

Feature Lines

Hedge	Overhead Electric Line
Fence	Overhead Telecom Line
Gate	Ground Level
Stile	Individual Tree
Foliage/Tree Canopy	Individual Bush
Dropped Kerb Line	Structure
Kerb Line	Watercourse / Embankment etc
Verge/Edge of Track or change of surface	Sewer Lines
Unkerbed Channel Line	
Footpath	
Wall	
Retaining Wall	

SHEET LAYOUT



SURVEY CONTROL

STN	EASTINGS	NORTHINGS	LEVEL
NJC1	444454.599	304440.801	132.441
NJC2	444509.746	304374.086	133.557
NJC3	444574.881	304304.444	134.528
NJC4	444639.154	304243.445	133.650
NJC5	444699.144	304167.500	133.000
NJC6	444744.344	304101.391	132.998
NJC7	444814.347	304041.725	132.494
NJC7A	444778.616	303970.548	132.324
NJC8	444902.683	303868.661	132.443
NJC9	444953.683	303907.661	132.099
NJC91	445003.752	303961.112	132.098
NJC10	444827.213	304187.270	133.100
NJC11	444853.146	304163.840	133.342
NJC12	444904.297	304163.840	133.342
NJC12A	445041.297	304367.860	132.448
NJC12B	445180.512	304340.223	131.610
NJC13	445180.512	304340.223	131.610
NJC14	444831.123	304265.251	132.469
NJC15	444733.946	304323.487	131.350
NJC16	444639.837	304341.492	132.936
NJC17	444617.379	304423.085	132.160
NJC18	444662.335	304472.084	131.016
NJC19	444662.335	304472.084	131.016
NJC20	444840.329	304391.145	130.947

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29/11/2022	1/500	A0
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S3605/03		

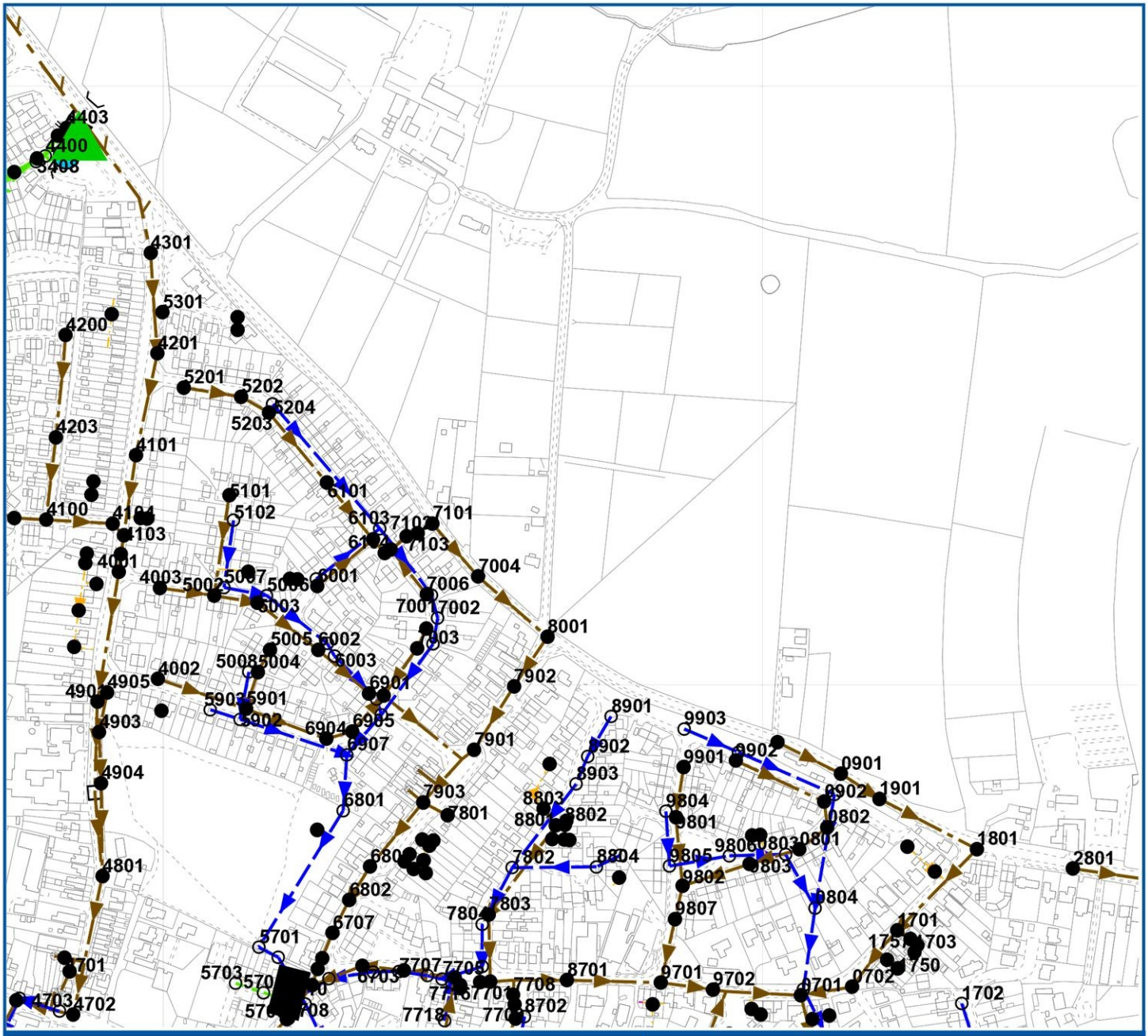
REV	DATE	DESCRIPTION	BY	APP.

MEC
Consulting Group

APPENDICES



APPENDIX E



LEGEND

Operational Site

Waste Water Pump
- Transferred Asset
- S24
- S104
- S102
- Null Private
- Null
- None
- Highway Drain
- Adopted Sewer

Storage
- Disposal Site
- Off-Line Waste Water Storage
- On-Line Waste Water Storage
- Wet Well

Waste Water Process Structure
- Sewage Treatment Point
- Sewage Treatment Structure
- Sludge Treatment Point
- Sludge Treatment Structure

Manhole
- Twin Manhole
- Foul Manhole
- Surface Water Manhole
- Combined Manhole
- Dual Manhole
- UnSurveyed Foul Manhole
- UnSurveyed Surface Water Manhole
- UnSurveyed Combined Manhole
- Unsurveyed Unknown Manhole

Gravity Sewer Pipe
- Foul Gravity Sewer
- Combined Gravity Sewer
- Surface Water Gravity Sewer
- S104 Surface Water Gravity Sewer
- S104 Combined Gravity Sewer
- S104 Foul Gravity Sewer
- Private Surface Water Gravity Sewer
- Private Combined Gravity Sewer
- Private Foul Gravity Sewer
- Surface Water Unsurveyed Pipe
- Combined Unsurveyed Pipe
- Foul Unsurveyed Pipe
- Transferred Surface Water Sewer
- Transferred Combined Sewer
- Transferred Foul Sewer
- Disposal Pipe
- Overflow Pipe
- Culverted Water Course
- Waste Internal Site Pipe
- Sewer Service Connection
- Gravity Sewer Others

Pressure Sewer Pipe
- Surface Water Pressure Sewer
- Combined Pressure Sewer
- Foul Pressure Sewer
- S104 Surface Water Pressure Sewer
- S104 Combined Pressure Sewer
- S104 Foul Pressure Sewer
- Private Surface Water Pressure Sewe
- Private Combined Pressure Sewer
- Private Foul Pressure Sewer
- Surface Water Vacuum Sewer
- Foul Vacuum Sewer
- Combined Vacuum Sewer
- S104 Surface Water Vacuum Sewer
- S104 Combined Vacuum Sewer
- S104 Foul Vacuum Sewer
- Private Surface Water Vaccum Sewer
- Private Combined Vacuum Sewer
- Private Foul Vacuum Sewer
- Surface Water Siphon
- Combined Siphon
- Foul Siphon
- Private Surface Water Siphon
- Private Combined Siphon
- Private Foul Siphon
- S104 Surface Water Siphon
- S104 Combined Siphon
- S104 Foul Siphon
- Surface Water Unsurveyed Pipe
- Combined Unsurveyed Pipe
- Foul Unsurveyed Pipe
- Disposal Pipe

Service Pipe
- Surface Water Lateral Drain
- Combined Lateral Drain
- Foul Lateral Drain
- S104 Surface Water Lateral Drain
- S104 Combined Lateral Drain
- S104 Foul Lateral Drain
- Private Surface Water Lateral Drain
- Private Combined Lateral Drain
- Private Foul Lateral Drain
- Transferred Surface Water Lateral Dra
- Transferred Combined Lateral Drain
- Transferred Foul Lateral Drain

Ancillary
- Balancing Lagoon
- Grease Trap
- Interceptor
- Screen

Chamber
- Flushing Chamber
- Scalaway
- Overflow

Fitting
- Blind Shaft
- Facility Connector
- Head Node
- Lamphole
- Sewerage Air Valve
- Sewerage Chemical Injection Point
- Sewerage Hatch Box
- Sewerage Pressure Washout
- Vent Column
- Waste Water Outfall

Control Valve
- Hydrobrake
- Penstock
- Sewerage Isolation Valve
- Sewerage Non Return Valve

Print500mLine

Severn Trent Water Limited
Asset Data Management
PO Box 5344
Coventry
CV3 9FT
Telephone: 0345 601 6616

SEWER RECORD

O/S Map Scale: 1:5,000

This map is centred upon:

Date of Issue: 25-10-23

X: 444841.44 **Y:** 304140.50

Disclaimer Statement:

1 Do not scale off this Map.

2 This plan and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this plan and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of SEVERN TRENT WATER assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems.

3 On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, Transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012. Private pumping stations, which form part of these sewers or lateral drains, will transfer to ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets. These assets may not be displayed on the map.

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Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK44046003	133.1499	131.3	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44036405	127.38	<UNK>	<UNK>	S	U	U	<UNK>	<UNK>	<UNK>	07/04/2020 00:00:00
SK44038503	130.3999	128.7	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44037801	132.38	130.94	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44036605	128.5899	127.19	<UNK>	S	VC	C	375	<UNK>	0	31/12/1899 00:00:00
SK44035902	132.7899	130.85	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44037506	130.3999	128.31	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44044101	<UNK>	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
SK44036710	129.973	128.695	128.61	S	<UNK>	<UNK>	0	0	128.47	28/11/2008 00:00:00
SK44045301	134.8099	132.83	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44046005	133.0399	132.19	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44037603	131.5299	129.48	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44047001	132.86	131.46	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44039601	131.47	130.51	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44038801	132.2599	130.51	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45030602	130.6699	129.15	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45033801	131.3399	129.93	<UNK>	F	CO	C	225	<UNK>	0	31/12/1899 00:00:00
SK45032601	130.27	128.29	<UNK>	F	CO	C	225	<UNK>	0	31/12/1899 00:00:00
SK44043407	<UNK>	<UNK>	<UNK>	F	U	<UNK>	1500	<UNK>	<UNK>	22/06/2021 00:00:00
SK44037503	129.86	127.68	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44037508	130.1999	128.84	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44046001	133.0599	131.66	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44038601	131.73	129.9	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44035702	130.6499	129	<UNK>	S	VC	C	300	<UNK>	0	31/12/1899 00:00:00
SK44046105	132.8099	131.36	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45031801	131.7299	129.89	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44038505	130.7899	129.19	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44045003	132.97	131.19	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44037702	131.0599	129.67	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44043200	134.68	133.185	132.98	F	VC	C	150	<UNK>	171.426	31/12/1899 00:00:00
SK44033602	129.1499	126.44	124.88	F	VC	C	225	<UNK>	68.74	31/12/1899 00:00:00
SK44036902	133.0899	131	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44044403	<UNK>	<UNK>	<UNK>	F	U	<UNK>	1500	<UNK>	<UNK>	22/06/2021 00:00:00
SK45033701	130.7899	128.53	<UNK>	F	CO	C	225	<UNK>	0	31/12/1899 00:00:00
SK44036601	130.32	129.07	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44045005	132.77	131.33	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44045006	133	131.61	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44037718	99.7939	98.41	98.05	S	PVC	C	225	<UNK>	91.25	31/12/1899 00:00:00
SK44039604	130.9199	129.68	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44035601	<UNK>	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44038803	132.2599	131.01	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK44046103	133.05	131.77	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44036903	133.0399	130.5	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44038805	132.07	131.16	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44035604	129.7299	128.15	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44038903	132.32	130.72	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45030901	132	130.07	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44043202	134.015	132.715	132.53	F	VC	C	150	<UNK>	132.51	31/12/1899 00:00:00
SK44035703	130.9819	129.34	128.85	S	<UNK>	<UNK>	0	0	49.92	28/11/2008 00:00:00
SK44035705	130.0299	128.52	128.355	F	<UNK>	<UNK>	0	0	72.12	28/11/2008 00:00:00
SK45032801	131.82	130.28	<UNK>	F	CO	C	225	<UNK>	0	31/12/1899 00:00:00
SK44037903	131.98	129.79	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44037703	131.36	130.04	<UNK>	S	VC	C	300	<UNK>	0	31/12/1899 00:00:00
SK44036700	<UNK>	37.361	<UNK>	F	VC	C	<UNK>	<UNK>	<UNK>	30/05/2016 00:00:00
SK44038603	131.2299	129.66	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44036706	130.08	128.75	<UNK>	S	VC	C	300	<UNK>	0	31/12/1899 00:00:00
SK44038501	130.51	129.27	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44038605	131.17	129.87	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44034502	128.1	126.01	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44035701	130.91	129.27	<UNK>	S	VC	C	300	<UNK>	0	31/12/1899 00:00:00
SK44036704	130.5299	129.09	<UNK>	S	VC	C	300	<UNK>	0	31/12/1899 00:00:00
SK44036906	132.91	130.54	<UNK>	S	VC	C	375	<UNK>	0	31/12/1899 00:00:00
SK45031901	131.7899	129.92	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44033404	<UNK>	<UNK>	<UNK>	F	VC	C	<UNK>	<UNK>	<UNK>	30/05/2016 00:00:00
SK44047002	132.7799	131.35	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44044201	134.22	132.05	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44039602	131.42	129.62	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44038901	132.3899	130.81	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44035903	132.83	131.16	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45030904	132.0399	130.36	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44033503	128.21	126.35	124.87	S	VC	C	150	<UNK>	32.92	31/12/1899 00:00:00
SK44037901	132.1399	130.17	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44039605	130.69	129.42	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45031757	<UNK>	<UNK>	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44039903	131.88	131.08	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44033701	130.63	127.69	126.91	F	VC	C	225	<UNK>	41.5	31/12/1899 00:00:00
SK45031603	130.5299	129.41	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44036712	130.1499	<UNK>	0	S	VC	C	300	0	0	31/12/1899 00:00:00
SK44036904	132.6999	130.77	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44044103	133.075	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
SK44044103	133.075	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	<UNK>	28/08/2016 00:00:00
SK44036500	127.288	<UNK>	<UNK>	S	CO	C	450	<UNK>	<UNK>	31/12/1899 00:00:00
SK44036500	127.288	126.001	<UNK>	S	PE	C	450	<UNK>	<UNK>	07/04/2020 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK44034901	132.48	130.87	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44039603	131.4299	130.36	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44044203	<UNK>	132.39	131.985	F	VC	C	150	<UNK>	171.166	31/12/1899 00:00:00
SK44039904	131.85	130.62	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44037711	131.89	130.72	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44037716	99.2699	98.02	<UNK>	S	PVC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44043102	133.515	132.345	132.255	F	VC	C	150	<UNK>	190.372	31/12/1899 00:00:00
SK44048001	132.3	130.34	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44039807	130.86	129.42	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44037504	129.85	127.81	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44046004	133.0399	131.49	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45031702	131.0599	129.87	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45031601	129.9799	128.59	<UNK>	S	CO	C	525	<UNK>	0	31/12/1899 00:00:00
SK44037710	131.7299	130.43	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44037804	131.82	130.18	<UNK>	S	VC	C	300	<UNK>	0	31/12/1899 00:00:00
SK44036603	129.24	127.83	<UNK>	S	VC	C	375	<UNK>	0	31/12/1899 00:00:00
SK44045008	132.6399	131.17	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK45030703	130.1999	129.12	<UNK>	S	CO	C	375	<UNK>	0	31/12/1899 00:00:00
SK44038804	132.07	130.95	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44043402	<UNK>	<UNK>	<UNK>	S	U	<UNK>	525	<UNK>	<UNK>	23/06/2021 00:00:00
SK44046104	132.9799	131.36	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44034400	<UNK>	<UNK>	<UNK>	F	VC	C	<UNK>	<UNK>	<UNK>	30/05/2016 00:00:00
SK44036602	129.7799	128.47	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44036705	130.22	128.64	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44037713	99.2829	97.79	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45030401	129.1199	127.1	<UNK>	F	CO	C	225	<UNK>	0	31/12/1899 00:00:00
SK44044301	<UNK>	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44038902	132.22	130.79	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44044102	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44043304	<UNK>	<UNK>	<UNK>	F	U	<UNK>	1500	<UNK>	<UNK>	22/06/2021 00:00:00
SK44037712	130.82	129.83	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44033702	130.63	128.88	128.81	S	VC	C	300	<UNK>	485.43	31/12/1899 00:00:00
SK45030603	130.58	128.26	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44037709	131.5	130.3	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44045201	134.2799	132.57	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44036703	130.52	128.83	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44043408	<UNK>	<UNK>	<UNK>	F	U	<UNK>	1500	<UNK>	<UNK>	22/06/2021 00:00:00
SK44033401	125.7799	123.98	122.86	S	VC	C	225	<UNK>	30.09	31/12/1899 00:00:00
SK44045102	133.44	132.12	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44039705	130.77	129.88	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44047006	132.69	131.69	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44039803	131.11	129.94	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK44037701	131.0399	129.72	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45031752	<UNK>	0	0	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44036503	127.7399	125.52	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44047007	132.7899	130.96	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44037502	129.63	127.47	<UNK>	S	VC	C	300	<UNK>	0	31/12/1899 00:00:00
SK44037706	130.74	129.2	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44044001	132.86	131.32	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44037604	131.4499	129.73	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44044003	133.21	131.63	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44039801	131.1399	129.85	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44037507	129.74	128.27	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44046102	132.94	131.44	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44044402	<UNK>	<UNK>	<UNK>	F	U	<UNK>	1500	<UNK>	<UNK>	22/06/2021 00:00:00
SK44034700	<UNK>	<UNK>	<UNK>	F	VC	C	<UNK>	<UNK>	<UNK>	30/05/2016 00:00:00
SK44039606	130.61	128.97	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44039802	131.0299	129.58	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44039805	131.0299	129.99	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44035401	128.83	127.87	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45030702	130.36	128.573	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44039607	130.57	129.29	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44037505	129.97	128.16	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44046002	132.97	130.87	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44039901	131.61	130.06	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44034501	127.97	125.94	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44043201	134.43	132.98	132.715	F	VC	C	150	<UNK>	118.287	31/12/1899 00:00:00
SK44034903	<UNK>	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44043305	<UNK>	<UNK>	<UNK>	F	U	<UNK>	1500	<UNK>	<UNK>	22/06/2021 00:00:00
SK44037902	132.1499	130.3	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44037802	132.5099	130.36	<UNK>	S	VC	C	300	<UNK>	0	31/12/1899 00:00:00
SK45031703	<UNK>	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	<UNK>	30/05/2016 00:00:00
SK44045002	133.1799	131.37	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44047103	132.8699	131.33	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45031602	130.27	129.17	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44047004	132.74	130.77	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44035502	129.4299	127.54	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44047005	132.69	131.22	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44039806	131.0599	129.71	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44037707	130.69	129.4	<UNK>	S	VC	C	300	<UNK>	0	31/12/1899 00:00:00
SK44039704	131	129.23	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44036402	<UNK>	<UNK>	<UNK>	S	CO	C	450	<UNK>	0	31/12/1899 00:00:00
SK44034503	129.0099	127.57	126.35	S	VC	C	150	<UNK>	41.52	31/12/1899 00:00:00
SK44035901	132.6399	131.1	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK44045004	132.69	131.19	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44033502	129.24	127.87	126.35	S	VC	C	150	<UNK>	31.64	31/12/1899 00:00:00
SK44044200	134.295	132.865	132.39	F	VC	C	150	<UNK>	180.332	31/12/1899 00:00:00
SK44038702	131.71	130.31	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44044401	<UNK>	<UNK>	<UNK>	S	U	<UNK>	225	<UNK>	<UNK>	23/06/2021 00:00:00
SK44044401	<UNK>	<UNK>	<UNK>	S	U	<UNK>	225	<UNK>	<UNK>	23/06/2021 00:00:00
SK44036505	127.538	125.847	124.142	S	PE	C	450	<UNK>	<UNK>	07/04/2020 00:00:00
SK44036505	127.538	125.847	124.142	S	PE	C	450	<UNK>	<UNK>	07/04/2020 00:00:00
SK44036714	129.7469	<UNK>	0	F	VC	C	225	0	0	31/12/1899 00:00:00
SK44044104	132.99	131.6	131.475	F	VC	C	150	<UNK>	109.054	31/12/1899 00:00:00
SK44036901	132.97	130.61	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45030903	131.85	130.16	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44039609	131.4499	129.42	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44034905	132.4799	131.02	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44038802	132.2799	130.73	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44039610	131.1999	130.26	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK45030601	130.0899	127.92	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44037717	99.8789	98.37	97.81	F	VC	C	150	<UNK>	94.23	31/12/1899 00:00:00
SK44037501	129.55	127.8	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44034601	130.75	128.9	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44039902	131.91	130.91	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44043401	<UNK>	<UNK>	<UNK>	S	U	<UNK>	525	<UNK>	<UNK>	23/06/2021 00:00:00
SK44034801	131.47	129.49	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44037708	131.2799	130.15	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44045203	133.7799	132.1	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44038504	130.36	128.43	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44036504	128.2299	126.6	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44036802	131.2	129.31	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK45031701	131.2899	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK45030701	130.15	128.43	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK45030902	131.8	130.45	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44036501	127.6399	<UNK>	<UNK>	S	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44037705	130.8699	129.62	<UNK>	S	VC	C	300	<UNK>	0	31/12/1899 00:00:00
SK44044100	133.605	131.985	131.6	F	VC	C	150	<UNK>	144.186	31/12/1899 00:00:00
SK44038602	131.11	129.57	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44035704	130.485	128.85	128.695	S	<UNK>	<UNK>	0	0	122.06	28/11/2008 00:00:00
SK44043301	<UNK>	<UNK>	<UNK>	S	U	<UNK>	525	<UNK>	<UNK>	23/06/2021 00:00:00
SK44043406	<UNK>	<UNK>	<UNK>	F	U	<UNK>	1500	<UNK>	<UNK>	22/06/2021 00:00:00
SK44043103	133.5	132.255	131.985	F	VC	C	150	<UNK>	98.086	31/12/1899 00:00:00
SK44047102	132.9299	131.22	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44036607	129.08	127.13	<UNK>	F	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44045204	133.83	132.49	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK44038604	131.26	129.96	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44034702	130.8099	128.21	127.69	F	VC	C	225	<UNK>	90.96	31/12/1899 00:00:00
SK45030804	<UNK>	<UNK>	<UNK>	S	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44043101	133.605	132.425	132.345	F	VC	C	150	<UNK>	187.261	31/12/1899 00:00:00
SK44036803	131.4	129.6	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44045101	133.5299	131.91	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44044400	<UNK>	<UNK>	<UNK>	S	U	<UNK>	525	<UNK>	<UNK>	23/06/2021 00:00:00
SK44044400	<UNK>	<UNK>	<UNK>	S	U	<UNK>	225	<UNK>	<UNK>	23/06/2021 00:00:00
SK45031604	130.6	129.67	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44033504	126.6399	124.87	<UNK>	S	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44036707	130.76	128.89	37.361	F	VC	C	<UNK>	<UNK>	<UNK>	30/05/2016 00:00:00
SK45030801	131.3099	130.12	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44033601	129.9199	126.91	126.44	F	VC	C	225	<UNK>	54.28	31/12/1899 00:00:00
SK44036604	129.16	127.57	<UNK>	S	VC	C	375	<UNK>	0	31/12/1899 00:00:00
SK44037602	<UNK>	<UNK>	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44043302	<UNK>	<UNK>	<UNK>	S	U	<UNK>	525	<UNK>	<UNK>	23/06/2021 00:00:00
SK44036702	130.06	128.5	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK45030802	131.49	130.33	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44036711	130.1499	128.61	128.575	S	<UNK>	<UNK>	0	0	123.14	28/11/2008 00:00:00
SK44038701	131.16	129.37	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44037803	131.83	130.26	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44036905	132.8899	130.7	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44034904	132.2	130.29	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SK44039804	131.21	130.32	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44036708	129.63	128.3	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44047101	132.8699	131.02	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44039702	130.58	128.95	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44043100	133.755	132.53	132.425	F	VC	C	150	<UNK>	178.525	31/12/1899 00:00:00
SK45030803	131.1699	129.64	<UNK>	S	VC	C	150	<UNK>	0	31/12/1899 00:00:00
SK44035603	130.19	128.15	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45030501	129.61	127.51	<UNK>	F	CO	C	225	<UNK>	0	31/12/1899 00:00:00
SK44034701	<UNK>	<UNK>	<UNK>	F	VC	C	<UNK>	<UNK>	<UNK>	30/05/2016 00:00:00
SK44034703	130.4799	129.42	<UNK>	S	VC	C	300	<UNK>	0	31/12/1899 00:00:00
SK44047003	132.85	130.84	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44044002	132.61	131.36	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44036709	129.77	128.15	<UNK>	S	CO	C	375	<UNK>	0	31/12/1899 00:00:00
SK44036801	132.6	130.05	<UNK>	S	CO	C	375	<UNK>	0	31/12/1899 00:00:00
SK44043303	<UNK>	<UNK>	<UNK>	F	U	<UNK>	1500	<UNK>	<UNK>	22/06/2021 00:00:00
SK44035501	128.91	127.33	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK45031750	<UNK>	<UNK>	<UNK>	F	VC	C	<UNK>	<UNK>	<UNK>	30/05/2016 00:00:00
SK44039701	130.63	129.12	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44038502	130.49	128.89	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK44045007	133.05	131.74	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44039703	130.7599	129.79	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44035602	130.3	128	<UNK>	F	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SK44033704	0	<UNK>	126.91	F	VC	C	225	<UNK>	<UNK>	31/12/1899 00:00:00
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Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
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WONDERFUL ON TAP

SEVERN TRENT

Severn Trent Water Ltd
Leicester Water Centre
Gorse Hill
Anstey
Leicester
LE7 7GU

www.stwater.co.uk

Email:
Network.Solutions@SevernTrent.co.uk
Belal Ali
Tel:
Our ref: 1067183

M-EC The Old Chapel
Station Road
Hugglescote
LE67 2GB

F.A.O: Emma Harris

16th December 2022

Dear Sir/Madam,

Proposed Development: (250 mixed residential dwellings) – Land off Barlestin Road, Newbold Verdon LE9 9PZ 444786 304316

I refer to your 'Development Enquiry Request' in respect of the above named site. Please find enclosed the sewer records that are included in the fee together with the Supplementary Guidance Notes (SGN) which refer to surface water disposal from development sites.

Protective Strip

No public sewers shown within site boundary.

Due to a change in legislation on 1 October 2011 there may be former private sewers on the site which have transferred to the responsibility of Severn Trent Water Ltd, which are not shown on the statutory sewer records, but are located in your client's land. These sewers would require protective strips of 3 metres either side of the sewer's centreline that we will not allow to be built over. If such sewers are identified to be present on the site, please contact us for further guidance.

Please note: there is no guarantee that you will be able to build over or close to any Severn Trent sewers, and where a diversion is required there is no guarantee that you will be able to undertake those works on a self-lay basis. Every approach to build near to or divert our assets has to be assessed on its own merit and the decision of what is or isn't permissible is taken based on the risk to the asset and the wider catchment it serves. It is vital therefore that you contact us at the earliest opportunity to discuss the implications

of our assets crossing your site. Failure to do so could significantly affect the costs and timescales of your project if it transpires diversionary works need to be carried out by Severn Trent.

Foul Water Drainage

Land contour suggests the site is likely to require a pump solution, no pump rates have been provided, however we would expect flows not to exceed 6 l/s. Suitable connection point for the development could be MH SK44047101 or MH SK44048001

Due to the downstream sewerage system having CSOs and a storage tank on it, plus there are known flooding areas that affect properties, sewer modelling will need to be undertaken to determine the impact this development's peak flow will have on the public foul network Modelling will also highlight if any upgrades to the network is required before the flows can be accommodated.

Please note in a change to our previous process, we no longer charge developers for the hydraulic modelling service. We will liaise with you over time with regards to the outcome of our investigations and any impact that may have on the Planning status, occupation, or phasing of the site. However, while we can provide a brief summary of our findings if you need us to, we will no longer provide the full external capacity assessment report.

From the application you have submitted and previous enquiries, I note the site has not been submitted for planning. Please inform us as and when planning has progressed as this will help determine how quick we carry out the modelling exercise. In the meantime, the site will be added to our modelling tracker and reviewed regularly until the site can be progressed for sewer modelling.

Surface Water Drainage

Under the terms of Section H of the Building Regulations 2000, the disposal of surface water by means of soakaways should be considered as the primary method. If these are found to be unsuitable, satisfactory evidence will need to be submitted. The evidence should be either percolation test results or by the submission of a statement from the SI consultant (extract or a supplementary letter).

Subject to the above, Severn Trent Water expects all surface water from the development to be drained in a sustainable way to the nearest watercourse or land drainage channel, subject to the

developer discussing all aspects of the developments surface water drainage with the Local Lead Flood Authority (LLFA). Any discharge rate to a watercourse or drainage ditch will be determined by the LLFA / EA.

Note, surface water shall not discharge to the public sewers in presence of available watercourse to the north of site boundary.

Connections

For any new connections (including the re-use of existing connections) to the public sewerage system, the developer will need to submit a Section 106 application form. Our Developer Services department are responsible for handling all new connections enquiries and applications. To contact them for an application form and associated guidance notes please call 0800 7076600 or download from www.stwater.co.uk.

Please quote the above reference in any future correspondence (including e-mails) with STW Limited. Please note that Developer Enquiry responses are only valid for 6 months from the date of this letter.

Yours sincerely



Belal Ali
Network Solutions
Developer Services

Ben Oyston

From: Network Solutions <Network.Solutions@severntrent.co.uk>
Sent: 22 March 2024 13:04
To: Emma Harris
Subject: RE: Developer Enquiry Response - Our Ref: 1067183 DEV(S)Barlestone Road, Newbold Verdon

ST Classification: UNMARKED

Hi Emma – Thanks for the clarity.

Yes, a gravity discharge would be preferable, especially if the site was potentially put up for adoptions.

The 150mm sewer has capacity to take 14 l/s max, your proposal at 7 l/s would potentially take up 50% capacity. Are you able to reduce flows further to 5 l/s ? I would be happy to accept this.

Alternatively, 7 l/s can discharge to the 225mm SWS (MH 8901) on Hornbeam Road.

I hope this is acceptable.

Regards

Belal

Belal Ali

Senior Evaluation Technician
Network Solutions
Developer Services

✉ Network.solutions@severntrent.co.uk

WONDERFUL ON TAP SEVERN TRENT

Did you know? You can now make full applications online for a variety of our Developer Service offerings including Development Enquiries. Take a look here for more details: https://www.stwater.co.uk/building-and-developing/regulations-and-forms/application-forms-and-guidance/

We have listened to our customers and local communties and Severn Trent have made a pledge to transform and protect the health of our Rivers, for more information please follow the link below: https://www.stwater.co.uk/get-river-positive/our-river-pledges/

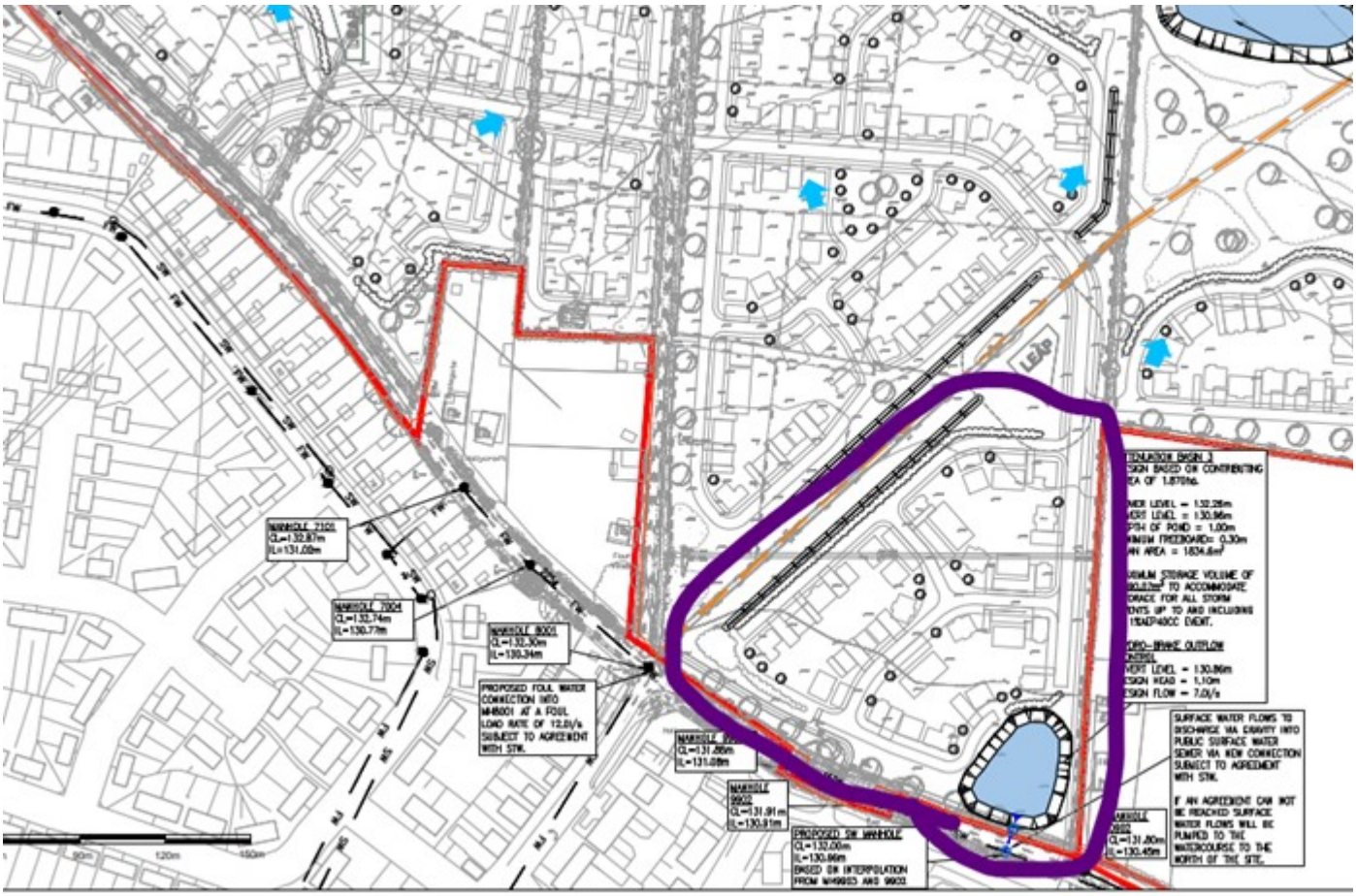
From: Emma Harris <emma.harris@m-ec.co.uk>
Sent: 15 March 2024 13:26
To: Network Solutions <Network.Solutions@severntrent.co.uk>
Subject: RE: Developer Enquiry Response - Our Ref: 1067183 DEV(S)Barlestone Road, Newbold Verdon

Caution: This is an external email originating outside Severn Trent. Think before you click on links or open attachments.

Hi Belal,

Thanks for your response, I am sorry I should have been much clearer:

We do not plan to discharge the whole site into the surface water sewers. We only plan to discharge an area of 1.870ha (see sketch below) into the 150mm SWS off Barlestone Road at MH9903 at a QBAR rate of 7.0l/s. The rest will go to a watercourse north of the site via gravity. If a connection cannot be made into the surface water sewer then surface water SW will need to be pumped to the north gravity outfall. We have looked how much level raising would be required to remove the pump and have a full gravity system. To allow for a full gravity system north the area highlight would need to be raised between 0.7m-1m which is not viable.



Kind Regards,

Emma Harris
Utilities Coordinator
emma.harris@m-ec.co.uk

T: 01530 264753
W: m-ec.co.uk

Birmingham | Brighton | Leicester

MEC Consulting Group

Please note our company name has changed to 'MEC Consulting Group Ltd'

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From: Network Solutions <Network.Solutions@severntrent.co.uk>
Sent: 15 March 2024 12:09
To: Emma Harris <emma.harris@m-ec.co.uk>
Subject: RE: Developer Enquiry Response - Our Ref: 1067183 DEV(S)Barlestone Road, Newbold Verdon

ST Classification: UNMARKED

Hi Emma,

Thanks for your email.

The 150mm SWS off Barlestone Road, MH9903 will not have sufficient capacity to take greenfield runoff from 16.2HA site. Flows anticipated to be around 81.0 l/s will cause flooding to the small network.

There is a 225mm SWS on Hornbeam Road can take around 42.0 l/s at full bore. However, taking into account existing catchment served this network won't have sufficient capacity.

Records show 375mm SWS, further along Main Street (MH SK44036709). This sewer could potentially take more flows, however we'd need to model the network to understand max allowable discharge rate and impact on wider network.

Please keep up unformed as and when SW drainage strategy has progressed so we can comment further.

Best Regards

Belal

Belal Ali

Senior Evaluation Technician
Network Solutions
Developer Services

✉ Network.solutions@severntrent.co.uk

WONDERFUL ON TAP SEVERN TRENT

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https://www.stwater.co.uk/get-river-positive/our-river-pledges/

From: Emma Harris <emma.harris@m-ec.co.uk>
Sent: 01 March 2024 14:41

To: Network Solutions <Network.Solutions@severntrent.co.uk>
Subject: RE: Developer Enquiry Response - Our Ref: 1067183 DEV(S)Barlestone Road, Newbold Verdon

Caution: This is an external email originating outside Severn Trent. Think before you click on links or open attachments.

Hi,

The watercourse located to the north of the site cannot be a gravity connection from the south of the site due to the topography. Therefore, we propose to discharge surface water via gravity into a new connection in the surface water sewer running along Barlestone Road.

Could you please confirm if this is acceptable?

Kind Regards,

Emma Harris
Utilities Coordinator
emma.harris@m-ec.co.uk

T: 01530 264753
W: m-ec.co.uk

Birmingham | Brighton | Leicester



Please note our company name has changed to 'MEC Consulting Group Ltd'

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From: Network Solutions <Network.Solutions@severntrent.co.uk>
Sent: 19 December 2022 11:54
To: Emma Harris <emma.harris@m-ec.co.uk>
Subject: Developer Enquiry Response - Our Ref: 1067183 DEV(S)Barlestone Road, Newbold Verdon

ST Classification: OFFICIAL PERSONAL

Dear Sir/Madam

Please find attached below our Developer Enquiry response letter, along with a sewer record extract and supplementary guidance notes with regard to the above site.

If you have any further queries with regard to our response, please do not hesitate to contact us on the number / email address mentioned below. Please refrain from sending responses to a certain individual directly. Our email address below will ensure that your response is logged and tracked for a response. When responding, please quote our reference number above in all return correspondence.

Kind regards,

Network Solutions

(reply to network.solutions@severntrent.co.uk)

WONDERFUL ON TAP SEVERN TRENT

Severn Trent Plc (registered number 2366619) and Severn Trent Water Limited (registered number 2366686) (together the "Companies") are both limited companies registered in England & Wales with their registered office at Severn Trent Centre, 2 St John's Street, Coventry, CV1 2LZ This email (which includes any files attached to it) is not contractually binding on its own, is intended solely for the named recipient and may contain CONFIDENTIAL, legally privileged or trade secret information protected by law. If you have received this message in error please delete it and notify us immediately by telephoning +44 2477715000. If you are not the intended recipient you must not use, disclose, distribute, reproduce, retransmit, retain or rely on any information contained in this email. Please note the Companies reserve the right to monitor email communicationsin accordance with applicable law and regulations. To the extent permitted by law, neither the Companies or any of their subsidiaries, nor any employee, director or officer thereof, accepts any liability whatsoever in relation to this email including liability arising from any external breach of security or confidentiality or for virus infection or for statements made by the sender as these are not necessarily made on behalf of the Companies. Reduce waste! Please consider the environment before printing this email

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Consulting Group

APPENDICES



APPENDIX F

The Old Chapel, Station Road, Hugglescote, Leicestershire LE67 2GB
Telephone 01530 264753
Email group@m-ec.co.uk
www.m-ec.co.uk

MEC Development Technical Consultants

Doc. Ref.	24832-CALC-0401
Sheet	1
Engineer	JM
Date	13/11/2023
Revision	-

SOIL INFILTRATION CALCULATIONS FRONT SHEET

SCHEME	Barlestone Road, Newbold Verdon, Leicestershire
CLIENT	David Wilson Homes East Midlands
ASPECTS OF SCHEME TO BE DESIGNED	Soil Infiltration Rate Testing
CODES OF PRACTICE, DESIGN SPECIFICATIONS & BRITISH STANDARDS	Soil Infiltration Rate testing and calculations completed in general accordance with BRE Digest 365 utilising the gravel fill method.
NOTES	Six soil infiltration rate test pits were excavated at the locations shown on the attached exploratory hole location plan. The test pits encountered predominantly glaciofluvial soils, typically comprising variably clayey and silty, gravelly, and cobbly SAND. Insufficient infiltration was recorded in four of the test locations due to the high percentage of clay and silt within the soils and groundwater in SA01(2.0m) and SA06(2.20m). Two tests were fully completed in SA04, with the lowest calculated infiltration rate of 5.02 x 10^{-6} m/s with a test duration over 7 hours. A single test was fully completed in SA03 and derived an infiltration rate of 6.91 x 10^{-7} m/s with a test duration of over 29 hours. Three additional deeper trial pits were excavated to assess ground conditions and the depth to groundwater. Glaciofluvial soils were confirmed to extend to depths of up to at least 2.80m. Groundwater ingress was noted in TP01 at 2.2m bgl. Given the high fines content within the soils encountered and the presence of shallow groundwater, soakaways will not provide a viable and consistent drainage solution for the site. Very limited infiltration may be available locally subject to confirmation by location specific testing.

INDEX

Pages	Calculations		Checked by	Approved By	Date
02	Exploratory Hole Location Plan				
03	SA01 – Test 1	Insufficient soakage to derive rate.			
04	SA02 – Test 1	Insufficient soakage to derive rate.			
05	SA03 – Test 1	**Calculated Rate: 6.91 x 10^{-7} m/s**			
06	SA04 – Test 1	Calculated Rate: 5.53x10^{-6} m/s	CW	DT	13/11/2023
07	SA04 – Test 2	**Calculated Rate: 5.02 x 10^{-6} m/s**			
08	SA05 – Test 1	Insufficient soakage to derive rate.			
09	SA06 – Test 1	Insufficient soakage to derive rate.			
10	Exploratory Hole Logs				

Value in bold represents lowest calculated result.



GENERAL NOTES

1. DO NOT SCALE THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALIST DESIGN DRAWINGS AND DETAILS.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
4. THIS DRAWING IS FOR STRATEGY PURPOSES ONLY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

KEY

- ▚ TRIAL PIT LOCATION
- ⧗ SOIL INFILTRATION TEST LOCATION
- 🟥 APPROXIMATE SITE BOUNDARY

REV:	AMENDMENTS:	DRN:	CHK:	APP:	DATE:
-	FIRST ISSUE	DW	CW	DT	31.10.23

PROJECT:
BARLESTONE ROAD
NEWBOLD VERDON
LEICESTERSHIRE

DRAWING TITLE:
EXPLORATORY HOLE
LOCATION PLAN

CLIENT:
DAVID WILSON HOMES
EAST MIDLANDS

DRAWING NUMBER:
24832_04_140_01

REVISION: –
SHEET SIZE: A1
SCALE: 1:1000

STATUS:
FOR INFORMATION / APPROVAL

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Consulting Development Engineers

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Printed:16.11.2023 File Location: T:\M-EC Job Book\24832\drawings\04 - geo-env\24832_04_140_01 Exploratory Hole Location Plan.dwg

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MEC Development Technical Consultants

Scheme	**Barlestone Road, Newbold Verdon, Leicestershire**	**Page No.**	3
Client	**David Wilson Homes East Midlands**	**Calcs by**	JM
Job ref.	**24832**	**Checked By**	DT
		Date	13/11/23

Soil Infiltration Test - Gravel Filled Method

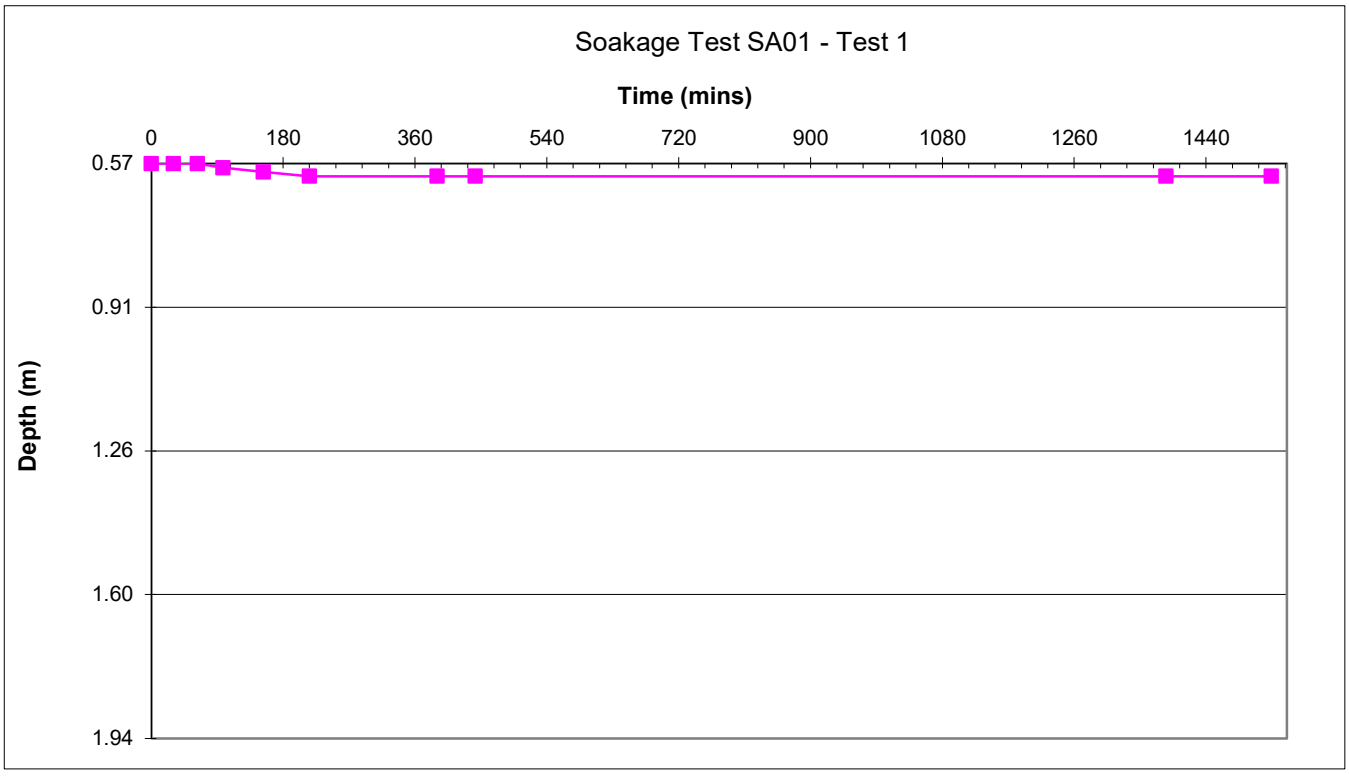
(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref.	**SA01**	**Test** 1
Length	**2.20** m	
Width	**0.60** m	
Depth	**1.94** m	
Ground water level	**2.00** m	
Ground conditions	**0.00-0.35m**	**Grass over brown clayey silty sandy TOPSOIL with gravel sized fragments of flint and quartzite.**
	0.35-2.10m	**Brown and orangish brown clayey silty gravelly slightly cobbly SAND. Gravel and cobbles comprise subangular fine to coarse quartzite, flint, and rare green sandstone (GLACIOFLUVIAL DEPOSITS).**

Time (mins)	Depth to water (m bgl)
0	0.57
30	0.57
63	0.57
98	0.58
153	0.59
216	0.60
390	0.60
442	0.60
1385	0.60
1529	0.60

Effective storage depth =	1.37	m
75% effective storage depth =	1.03	m
(ie depth below GL) =	0.91	m
25% effective storage depth =	0.34	m
(ie depth below GL) =	1.60	m
effective storage depth 75%-25% =	0.69	m
Time to fall to 75% effective depth =	-	mins
Time to fall to 25% effective depth =	-	mins
Void Ratio =	40%	
V (75%-25%) =	0.36	m^3
a (50%) =	5.16	m^2
t (75%-25%) =	-	mins

Insufficient soakage to derive infiltration rate.



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Scheme	**Barlestone Road, Newbold Verdon, Leicestershire**	**Page No.**	4
Client	**David Wilson Homes East Midlands**	**Calcs by**	JM
Job ref.	**24832**	**Checked By**	DT
		Date	13/11/23

Soil Infiltration Test - Gravel Filled Method

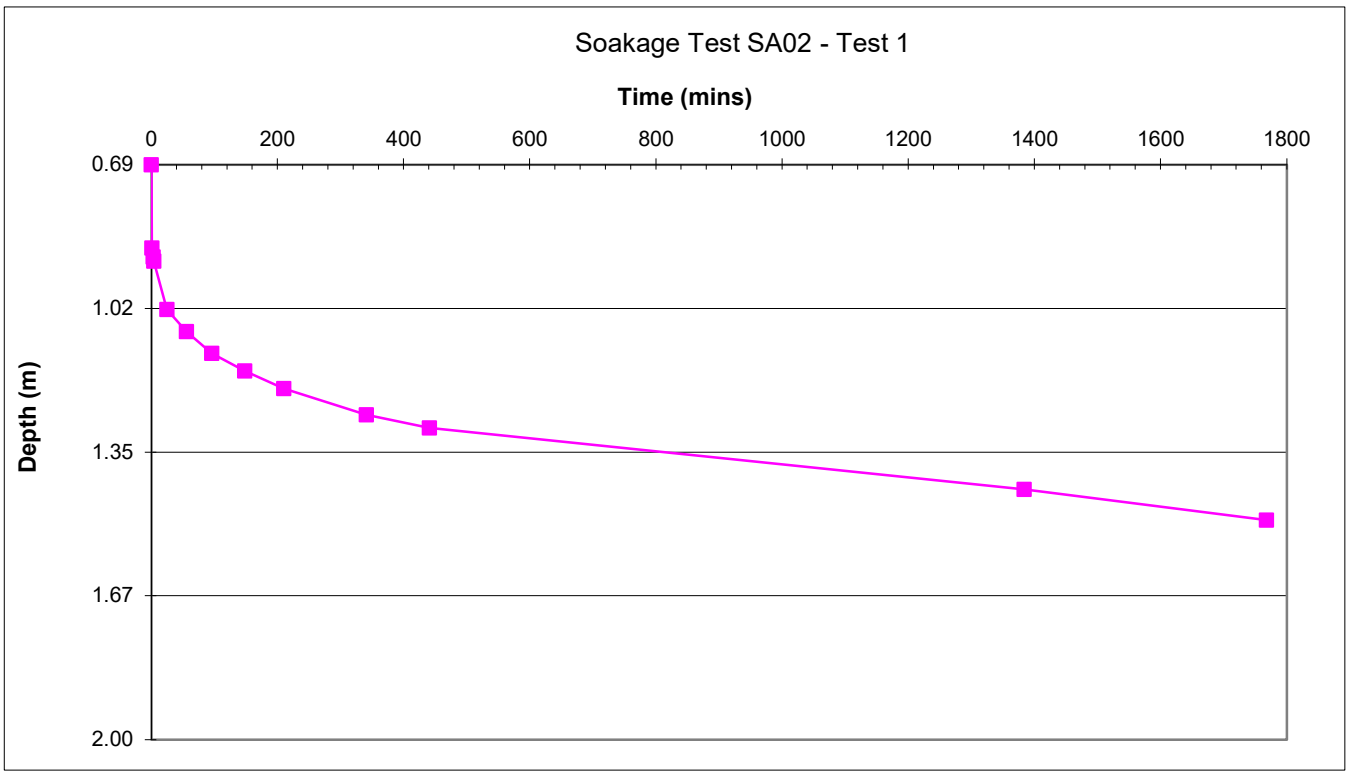
(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref. **SA02** **Test** 1
Length **2.20** m
Width **0.60** m
Depth **2.00** m
Ground water level **Not encountered**
Ground conditions **0.00-0.30m** **Grass over brown slightly clayey silty sandy TOPSOIL with gravel sized fragments of flint and quartzite.**
0.30-2.00m **Brown and orangish brown slightly clayey silty gravelly slightly cobbly SAND. Gravel and cobbles comprise subangular quartzite, flint, and rare green sandstone (GLACIOFLUVIAL DEPOSITS).**

Time (mins)	Depth to water (m bgl)
0	0.69
1	0.88
3	0.90
4	0.91
25	1.02
56	1.07
96	1.12
148	1.16
210	1.20
341	1.26
441	1.29
1384	1.43
1768	1.50

Effective storage depth =	1.31	m
75% effective storage depth =	0.98	m
(ie depth below GL) =	1.02	m
25% effective storage depth =	0.33	m
(ie depth below GL) =	1.67	m
effective storage depth 75%-25% =	0.66	m
Time to fall to 75% effective depth =	25	mins
Time to fall to 25% effective depth =	-	mins
Void Ratio =	40%	
V (75%-25%) =	0.35	m^3
a (50%) =	4.99	m^2
t (75%-25%) =	-	mins

Insufficient soakage to derive infiltration rate.



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Scheme	**Barlestone Road, Newbold Verdon, Leicestershire**	**Page No.**	5
Client	**David Wilson Homes East Midlands**	**Calcs by**	JM
Job ref.	**24832**	**Checked By**	DT
		Date	13/11/23

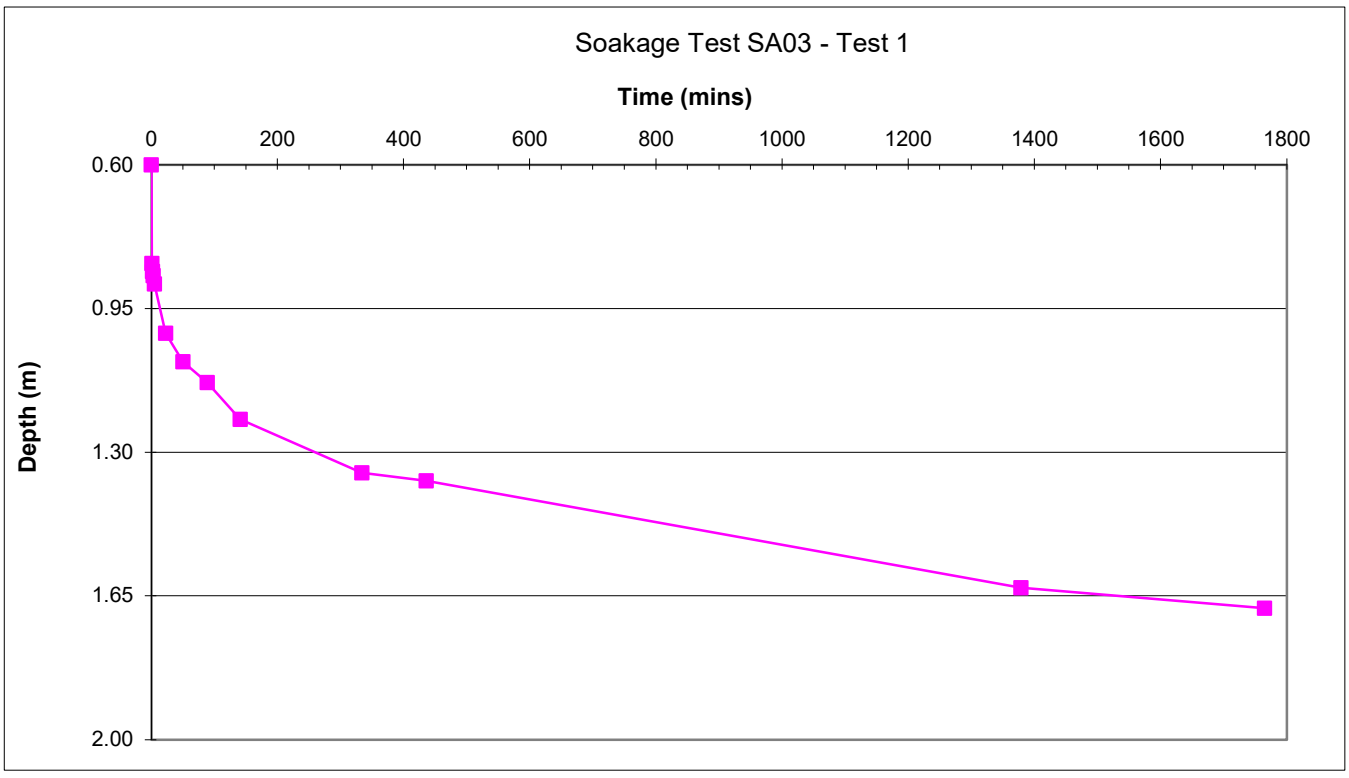
Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref. **SA03** **Test** 1
Length **2.00** m
Width **0.60** m
Depth **2.00** m
Ground water level **Not encountered**
Ground conditions **0.00-0.30m Grass over brown slightly clayey silty sandy TOPSOIL with gravel sized fragments of flint and quartzite.**
0.30-2.00m Brown and orangish brown slightly clayey silty gravelly slightly cobbly SAND. Gravel and cobbles comprise subangular quartzite and flint (GLACIOFLUVIAL DEPOSITS).

Time (mins)	Depth to water (m bgl)
0	0.60
1	0.84
2	0.86
3	0.87
5	0.89
23	1.01
50	1.08
89	1.13
141	1.22
334	1.35
436	1.37
1379	1.63
1765	1.68

Effective storage depth =	1.40	m
75% effective storage depth =	1.05	m
(ie depth below GL) =	0.95	m
25% effective storage depth =	0.35	m
(ie depth below GL) =	1.65	m
effective storage depth 75%-25% =	0.70	m
Time to fall to 75% effective depth =	25	mins
Time to fall to 25% effective depth =	1700	mins
Void Ratio =	40%	
V (75%-25%) =	0.34	m^3
a (50%) =	4.84	m^2
t (75%-25%) =	1675.00	mins
SOIL INFILTRATION RATE =	**6.91E-07**	**m/s**



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Scheme	**Barlestone Road, Newbold Verdon, Leicestershire**	**Page No.**	6
Client	**David Wilson Homes East Midlands**	**Calcs by**	JM
Job ref.	**24832**	**Checked By**	DT
		Date	13/11/23

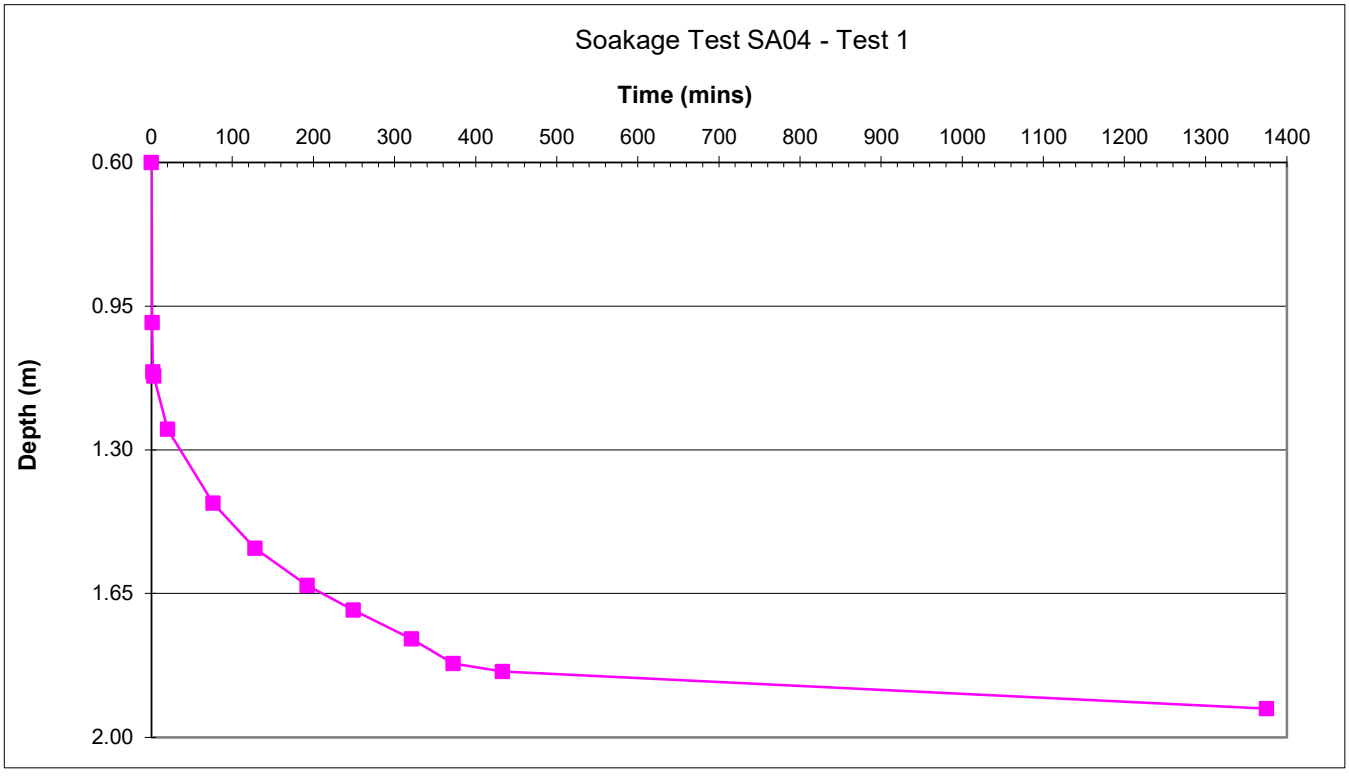
Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref. **SA04** **Test** 1
Length **2.00** m
Width **0.60** m
Depth **2.00** m
Ground water level **Not encountered**
Ground conditions **0.00-0.40m Grass over brown slightly clayey silty sandy TOPSOIL with gravel sized fragments of flint and quartzite.**
0.40-2.00m Brown and orangish brown slightly clayey silty gravelly slightly cobbly SAND. Gravel and cobbles comprise subangular quartzite, sandstone, and flint (GLACIOFLUVIAL DEPOSITS).

Time (mins)	Depth to water (m bgl)
0	0.60
1	0.99
2	1.11
3	1.12
20	1.25
76	1.43
128	1.54
192	1.63
249	1.69
321	1.76
372	1.82
433	1.84
1375	1.93

Effective storage depth =	1.40	m
75% effective storage depth =	1.05	m
(ie depth below GL) =	0.95	m
25% effective storage depth =	0.35	m
(ie depth below GL) =	1.65	m
effective storage depth 75%-25% =	0.70	m
Time to fall to 75% effective depth =	0.9	mins
Time to fall to 25% effective depth =	210	mins
Void Ratio =	40%	
V (75%-25%) =	0.34	m^3
a (50%) =	4.84	m^2
t (75%-25%) =	209.10	mins
SOIL INFILTRATION RATE =	**5.53E-06**	**m/s**



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Scheme	**Barlestone Road, Newbold Verdon, Leicestershire**	**Page No.**	7
Client	**David Wilson Homes East Midlands**	**Calcs by**	JM
Job ref.	**24832**	**Checked By**	DT
		Date	13/11/23

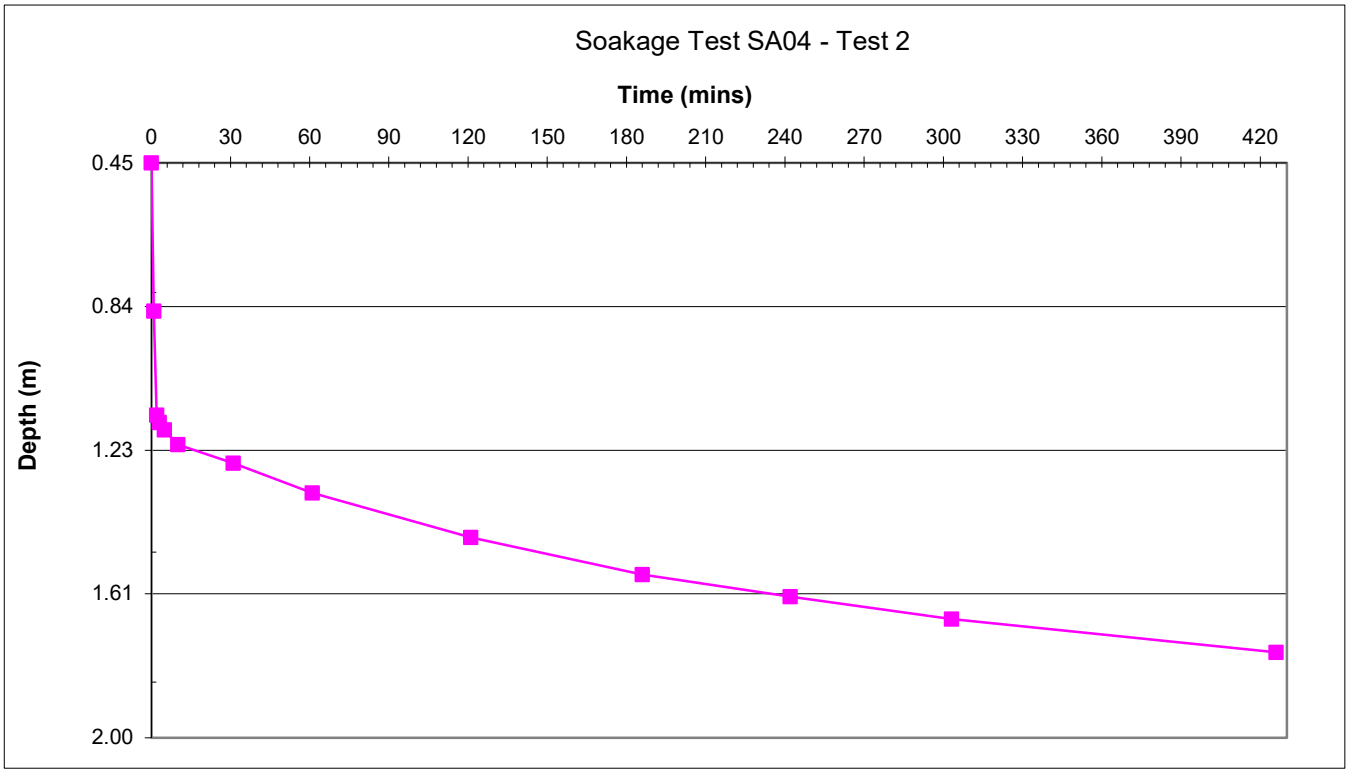
Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref. **SA04** **Test** 2
Length **2.00** m
Width **0.60** m
Depth **2.00** m
Ground water level **Not encountered**
Ground conditions **0.00-0.40m Grass over brown slightly clayey silty sandy TOPSOIL with gravel sized fragments of flint and quartzite.**
0.40-2.00m Brown and orangish brown slightly clayey silty gravelly slightly cobbly SAND. Gravel and cobbles comprise subangular quartzite, sandstone, and flint (GLACIOFLUVIAL DEPOSITS).

Time (mins)	Depth to water (m bgl)
0	0.45
1	0.85
2	1.13
3	1.15
5	1.17
10	1.21
31	1.26
61	1.34
121	1.46
186	1.56
242	1.62
303	1.68
426	1.77

Effective storage depth =	1.55	m
75% effective storage depth =	1.16	m
(ie depth below GL) =	0.84	m
25% effective storage depth =	0.39	m
(ie depth below GL) =	1.61	m
effective storage depth 75%-25% =	0.78	m
Time to fall to 75% effective depth =	1	mins
Time to fall to 25% effective depth =	237	mins
Void Ratio =	40%	
V (75%-25%) =	0.37	m^3
a (50%) =	5.23	m^2
t (75%-25%) =	236.00	mins
SOIL INFILTRATION RATE =	**5.02E-06**	**m/s**



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Client	**David Wilson Homes East Midlands**	**Calcs by**	JM
Job ref.	**24832**	**Checked By**	DT
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Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref. **SA05** **Test** 1
Length **2.00** m
Width **0.60** m
Depth **2.00** m
Ground water level **Not encountered**
Ground conditions

0.00-0.25m MADE GROUND: Grass over brown slightly clayey silty sandy topsoil with rare gravel sized fragments brick.

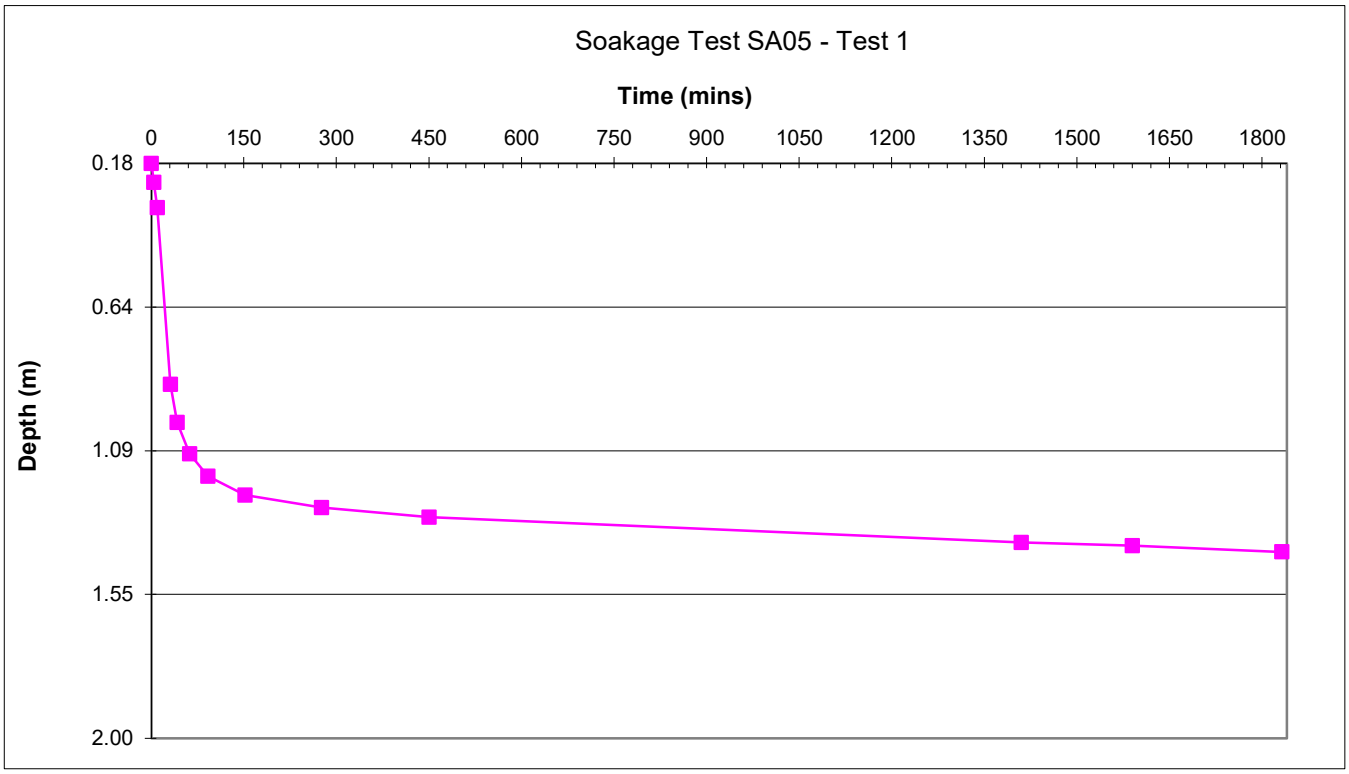
0.25-1.70m Brown sandy silty CLAY. (GLACIOFLUVIAL DEPOSITS)

1.70-2.00m Brown clayey slightly gravelly slightly cobbly SAND. Gravel and cobbles comprise subangular to subrounded quartzite, flint and rare green sandstone (GLACIOFLUVIAL DEPOSITS).

Time (mins)	Depth to water (m bgl)
0	0.18
4	0.24
10	0.32
31	0.88
42	1.00
62	1.10
92	1.17
152	1.23
276	1.27
450	1.30
1410	1.38
1590	1.39
1832	1.41

Effective storage depth =	1.82	m
75% effective storage depth =	1.37	m
(ie depth below GL) =	0.64	m
25% effective storage depth =	0.46	m
(ie depth below GL) =	1.55	m
effective storage depth 75%-25% =	0.91	m
Time to fall to 75% effective depth =	21.8	mins
Time to fall to 25% effective depth =	-	mins
Void Ratio =	40%	
V (75%-25%) =	0.44	m^3
a (50%) =	5.93	m^2
t (75%-25%) =	-	mins

Insufficient soakage to derive infiltration rate.



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Scheme	**Barlestone Road, Newbold Verdon, Leicestershire**	**Page No.**	9
Client	**David Wilson Homes East Midlands**	**Calcs by**	JM
Job ref.	**24832**	**Checked By**	DT
		Date	13/11/23

Soil Infiltration Test - Gravel Filled Method

(In general accordance with BRE Digest 365, 2016, Soakaway Design)

Soakaway pit ref. **SA06** **Test** 1

Length **2.10** m

Width **0.60** m

Depth **2.20** m

Ground water level **2.20 m**

Ground conditions

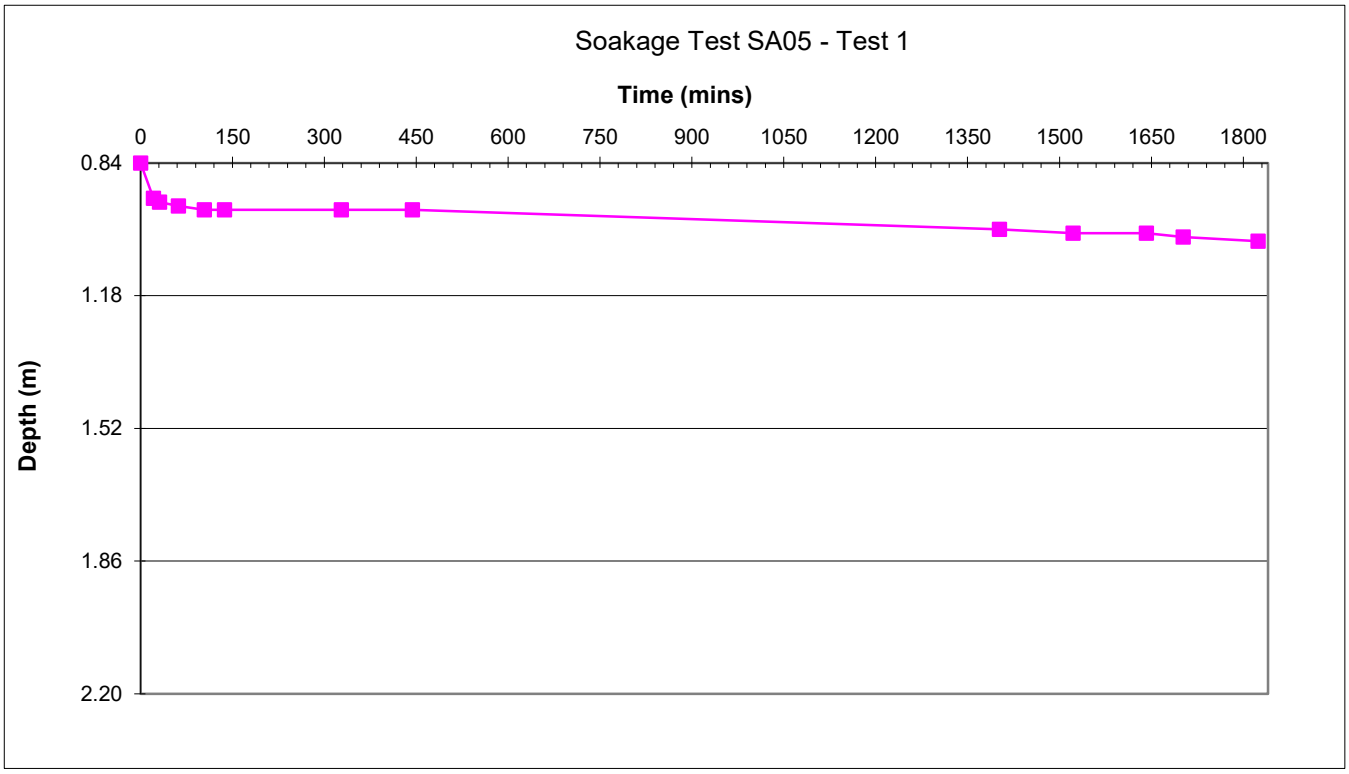
0.00-0.40m **Grass over brown slightly clayey silty sandy TOPSOIL with gravel sized fragments of flint and quartzite.**

0.40-2.20m **Brown locally orange clayey silty slightly gravelley slightly cobbly SAND. Gravel and cobbles comprise subangular to subrounded flint and quartzite (GLACIOFLUVIAL DEPOSITS).**

Time (mins)	Depth to water (m bgl)
0	0.84
21	0.93
31	0.94
62	0.95
104	0.96
137	0.96
328	0.96
444	0.96
1402	1.01
1522	1.02
1642	1.02
1702	1.03
1824	1.04

Effective storage depth =	1.36	m
75% effective storage depth =	1.02	m
(ie depth below GL) =	1.18	m
25% effective storage depth =	0.34	m
(ie depth below GL) =	1.86	m
effective storage depth 75%-25% =	0.68	m
Time to fall to 75% effective depth =	-	mins
Time to fall to 25% effective depth =	-	mins
Void Ratio =	40%	
V (75%-25%) =	0.34	m^3
a (50%) =	4.93	m^2
t (75%-25%) =	-	mins

Insufficient soakage to derive infiltration rate.



MEC Development Technical Consultants Mewies Engineering Consultants Ltd The Old Chapel, Station Road Hugglescote, Leicestershire LE67 2GB		Exploratory Hole ID:	**SA01** Sheet 1 of 1
Project: Barlestone Road, Newbold Verdon	Project No. 24832	Start Date: 08/11/2023	End Date: 08/11/2023	Plant Used: JCB 3CX
Location: Leicestershire, LE9 9NE	Logged By: CC	Easting and Northing Co-ordinates:		Elevation (m AOD):
Client: David Wilson Homes East Midlands	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Grass over brown clayey, silty, sandy TOPSOIL with gravel sized fragments of flint and quartzite.							
		0.35					
Brown and orangish brown, clayey, silty, gravelly, SAND with low cobble content. Gravel is subangular fine to coarse of quartzite, flint, and rare green sandstone. Cobbles are of sandstone. GLACIOFLUVIAL DEPOSITS							2.00 ▼
End of Trial Pit		2.10					

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater ingress at 2.0m bgl.
Visual or olfactory evidence of contamination was not observed.
Soakage testing was undertaken at this exploratory hole location.

Stability: STABLE

Dimensions:

Length: 2.20m
Width: 0.60m
Depth: 2.10m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

MEC Development Technical Consultants Mewies Engineering Consultants Ltd The Old Chapel, Station Road Hugglescote, Leicestershire LE67 2GB		Exploratory Hole ID:	**SA02** Sheet 1 of 1
Project: Barlestone Road, Newbold Verdon	Project No. 24832	Start Date: 08/11/2023	End Date: 08/11/2023	Plant Used: JCB 3CX
Location: Leicestershire, LE9 9NE	Logged By: CC	Easting and Northing Co-ordinates:		Elevation (m AOD):
Client: David Wilson Homes East Midlands	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Grass over brown slightly clayey, silty, sandy TOPSOIL with gravel sized fragments of flint and quartzite.							
		0.30					
Brown and orangish brown, slightly clayey, silty gravelly, SAND with low cobble content. Gravel is subangular fine to coarse of quartzite, flint, and rare green sandstone. Cobbles are of sandstone. GLACIOFLUVIAL DEPOSITS							
End of Trial Pit		2.00					

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.
Soakage testing was undertaken at this exploratory hole location.

Stability: STABLE

Dimensions:

Length: 2.20m
Width: 0.60m
Depth: 2.00m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

MEC Development Technical Consultants Mewies Engineering Consultants Ltd The Old Chapel, Station Road Hugglescote, Leicestershire LE67 2GB		Exploratory Hole ID:	**SA03** Sheet 1 of 1	
Project: Barlestone Road, Newbold Verdon	Project No. 24832	Start Date: 08/11/2023	End Date: 08/11/2023	Plant Used: JCB 3CX
Location: Leicestershire, LE9 9NE	Logged By: CC	Easting and Northing Co-ordinates:		Elevation (m AOD):
Client: David Wilson Homes East Midlands	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Grass over brown slightly clayey, silty, sandy TOPSOIL with gravel sized fragments of flint and quartzite.							
		0.30					
Brown and orangish brown, slightly clayey, silty, gravelly, SAND with low cobble content. Gravel is subangular fine to coarse of quartzite and flint. Cobbles are of sandstone. GLACIOFLUVIAL DEPOSITS							
End of Trial Pit		2.00					

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.
Soakage testing was undertaken at this exploratory hole location.

Stability: STABLE

Dimensions:

Length: 2.00m
Width: 0.60m
Depth: 2.00m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

MEC Development Technical Consultants Mewies Engineering Consultants Ltd The Old Chapel, Station Road Hugglescote, Leicestershire LE67 2GB		Exploratory Hole ID:	**SA04** Sheet 1 of 1	
Project: Barlestone Road, Newbold Verdon	Project No. 24832	Start Date: 08/11/2023	End Date: 08/11/2023	Plant Used: JCB 3CX
Location: Leicestershire, LE9 9NE	Logged By: CC	Easting and Northing Co-ordinates:		Elevation (m AOD):
Client: David Wilson Homes East Midlands	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Grass over brown slightly clayey, silty, sandy TOPSOIL with gravel sized fragments of flint and quartzite.							
		0.40					
Brown and orangish brown, slightly clayey, silty, gravelly, SAND with low cobble content. Gravel is subangular fine to coarse of quartzite, sandstone, and flint. Cobbles are of sandstone. GLACIOFLUVIAL DEPOSITS							
End of Trial Pit		2.00					

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.
Soakage testing was undertaken at this exploratory hole location.

Stability: STABLE

Dimensions:

Length: 2.00m
Width: 0.60m
Depth: 2.00m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

MEC Development Technical Consultants Mewies Engineering Consultants Ltd The Old Chapel, Station Road Hugglescote, Leicestershire LE67 2GB		Exploratory Hole ID:	**SA05** Sheet 1 of 1	
Project: Barlestone Road, Newbold Verdon	Project No. 24832	Start Date: 08/11/2023	End Date: 08/11/2023	Plant Used: JCB 3CX
Location: Leicestershire, LE9 9NE	Logged By: CC	Easting and Northing Co-ordinates:		Elevation (m AOD):
Client: David Wilson Homes East Midlands	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
MADE GROUND: Grass over brown slightly clayey silty sandy topsoil with rare gravel sized fragments brick.		0.25					
Brown sandy, silty, CLAY. GLACIOFLUVIAL DEPOSITS		1.70					
Brown, clayey, slightly gravelly, SAND with low cobble content. Gravels are subangular to subrounded, fine to coarse of quartzite, flint and rare green sandstone. Cobbles are of sandstone. GLACIOFLUVIAL DEPOSITS		2.00					
End of Trial Pit							

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.
Soakage testing was undertaken at this exploratory hole location.

Stability: STABLE

Dimensions:

Length: 2.00m
Width: 0.60m
Depth: 2.00m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

MEC Development Technical Consultants Mewies Engineering Consultants Ltd The Old Chapel, Station Road Hugglescote, Leicestershire LE67 2GB		Exploratory Hole ID:	**SA06** Sheet 1 of 1	
Project: Barlestone Road, Newbold Verdon	Project No. 24832	Start Date: 08/11/2023	End Date: 08/11/2023	Plant Used: JCB 3CX
Location: Leicestershire, LE9 9NE	Logged By: CC	Easting and Northing Co-ordinates:		Elevation (m AOD):
Client: David Wilson Homes East Midlands	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Grass over brown, slightly clayey, silty, sandy TOPSOIL with gravel sized fragments of flint and quartzite.							
		0.40					
Brown locally orange clayey, silty, slightly gravelly, SAND with low cobble content. Gravels are subangular to subrounded fine to coarse of flint and quartzite. Cobbles are of sandstone. GLACIOFLUVIAL DEPOSITS							
		2.20					2.20 ▼
End of Trial Pit							

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater ingress as slight seepage at 2.2m bgl.
Visual or olfactory evidence of contamination was not observed.
Soakage testing was undertaken at this exploratory hole location.

Stability: STABLE

Dimensions:

Length: 2.10m
Width: 0.60m
Depth: 2.20m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

MEC Development Technical Consultants
Mewies Engineering Consultants Ltd
The Old Chapel, Station Road
Hugglescote, Leicestershire
LE67 2GB

Exploratory Hole ID: **TP01**

Sheet 1 of 1

Project:	Barlestone Road, Newbold Verdon	Project No. 24832	Start Date: 08/11/2023	End Date: 08/11/2023	Plant Used: JCB 3CX
Location:	Leicestershire, LE9 9NE	Logged By: CC	Easting and Northing Co-ordinates:		Elevation (m AOD):
Client:	David Wilson Homes East Midlands	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Grass over brown, slightly clayey, silty, sandy TOPSOIL with gravel sized fragments of flint and quartzite.							
		0.35					
Brown and orangish brown, clayey, silty, gravelly, SAND with low cobble content. Gravel is subangular fine to coarse of quartzite, flint, and rare green sandstone. Cobbles are of sandstone. GLACIOFLUVIAL DEPOSITS							2.20 ▼
		2.40					
End of Trial Pit							

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater ingress at 2.2m bgl.
Visual or olfactory evidence of contamination was not observed.

Stability: STABLE

Dimensions:

Length: 2.00m
Width: 0.60m
Depth: 2.40m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

MEC Development Technical Consultants Mewies Engineering Consultants Ltd The Old Chapel, Station Road Hugglescote, Leicestershire LE67 2GB		Exploratory Hole ID:	**TP02** Sheet 1 of 1	
Project: Barlestone Road, Newbold Verdon	Project No. 24832	Start Date: 08/11/2023	End Date: 08/11/2023	Plant Used: JCB 3CX
Location: Leicestershire, LE9 9NE	Logged By: CC	Easting and Northing Co-ordinates:		Elevation (m AOD):
Client: David Wilson Homes East Midlands	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
Grass over brown, slightly clayey, silty, sandy TOPSOIL with gravel sized fragments of flint and quartzite.							
		0.25					
Brown and orangish brown, clayey, silty, gravelly, SAND with low cobble content. Gravel is subangular fine to coarse of quartzite, flint, and rare green sandstone. Cobbles are of sandstone. GLACIOFLUVIAL DEPOSITS							
End of Trial Pit		2.80					

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.

Stability: STABLE

Dimensions:

Length: 2.00m
Width: 0.60m
Depth: 2.80m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

MEC Development Technical Consultants Mewies Engineering Consultants Ltd The Old Chapel, Station Road Hugglescote, Leicestershire LE67 2GB		Exploratory Hole ID:	**TP03** Sheet 1 of 1	
Project: Barlestone Road, Newbold Verdon	Project No. 24832	Start Date: 08/11/2023	End Date: 08/11/2023	Plant Used: JCB 3CX
Location: Leicestershire, LE9 9NE	Logged By: CC	Easting and Northing Co-ordinates:		Elevation (m AOD):
Client: David Wilson Homes East Midlands	Approved By: DT			

Strata Description	Legend	Depth (m)	Level (m AOD)	Samples Type	Samples Depth	Tests	Groundwater (m)
MADE GROUND: Grass over brown, slightly clayey, silty, sandy topsoil with rare gravel sized fragments brick.							
		0.30					
Brown and orangish brown, clayey, silty, gravelly, SAND with low cobble content. Gravel is subangular fine to coarse of quartzite, flint, and rare green sandstone. Cobbles are of sandstone. GLACIOFLUVIAL DEPOSITS							
		2.80					
End of Trial Pit							

Remarks:

Exploratory hole location scanned with Cable Avoidance Tool and Signal Generator.
Descriptions based on visual inspection by a Geo-environmental engineer.
Groundwater was not encountered.
Visual or olfactory evidence of contamination was not observed.

Stability: STABLE

Dimensions:

Length: 2.00m
Width: 0.60m
Depth: 2.80m

Key:

B - Bulk Sample
D - Disturbed Sample
ES - Environmental Sample
W - Water Sample
PID - PID Reading
HSV - Hand Shear Vane Reading

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Consulting Group

APPENDICES



APPENDIX G

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MEC Consulting Group

Doc. Ref.	24832-CALC-0101
Sheet	1 of 8
Engineer	B. Oyston
Date	09 Oct 24
Revision	C

DESIGN CALCULATIONS FRONT SHEET

SCHEME	Barlestone Road, Newbold Verdon
CLIENT	David Wilson Homes East Midlands
ASPECTS OF SCHEME TO BE DESIGNED	• Greenfield Calculations • Surface Water Sewer Design • 1 in 2, 1 in 30 year +35% climate change and 1 in 100 year +40% climate change design simulations
CODES OF PRACTICE, DESIGN SPECIFICATIONS & BRITISH STANDARDS	• Design and analysis of urban storm drainage. Wallingford Procedure Vol. 1. • Sustainable Drainage Systems – Non-statutory technical standards for sustainable drainage systems – 2015. • The SuDS Manual – CIRIA C753.
NOTES	• In accordance with the National SuDS Standards, the strategy involves conveying surface water flows to a series of attenuation basins on-site, which will discharge into two unnamed ditch networks to the north of the site at a QBAR of 12.9l/s and a surface water sewer to the south at an agreed rate of 5.0l/s. • Existing greenfield runoff conditions have been calculated using the FEH Method within Flow Causeway for the northern developable area of the site of 5.81ha. The QBAR discharge rate for the northern developable area of 5.81ha is calculated at 12.9l/s. • Drainage design calculations were carried out within Flow Causeway.

INDEX

Pages	Calculations	Checked by	Date
2-8	QBAR calculations and surface water design details and simulation results for 1 in 2, 1 in 30 year + 35% climate and 1 in 100 year +40% climate change.	AB	09/10/2024

Design Settings

Rainfall Methodology	FEH-22	Maximum Time of Concentration (mins)	30.00	Preferred Cover Depth (m)	1.200
Return Period (years)	100	Maximum Rainfall (mm/hr)	200.0	Include Intermediate Ground	✓
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00	Enforce best practice design rules	✓
CV	0.750	Connection Type	Level Soffits		
Time of Entry (mins)	5.00	Minimum Backdrop Height (m)	0.200		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
Basin 1	2.240	5.00	131.400	1200	1.300
Flow Control 1			131.400	1200	1.400
Outfall 1			131.400	1200	3.400
Basin 2	2.567	5.00	132.000	1200	1.800
Flow Control 2			132.000	1200	1.900
Outfall 2			132.000	1200	4.000
Basin 3	1.315	5.00	132.260	1200	1.300
Flow Control 3			132.260	1200	1.400
Outfall 3			131.910	1200	1.110

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.01	Basin 1	Flow Control 1	10.000	0.600	130.100	130.000	0.100	100.0	300	5.11	160.5
1.02	Flow Control 1	Outfall 1	10.000	0.600	130.000	128.000	2.000	5.0	300	5.13	160.3
2.01	Basin 2	Flow Control 2	10.000	0.600	130.200	130.100	0.100	100.0	300	5.11	160.5
2.02	Flow Control 2	Outfall 2	10.000	0.600	130.100	128.000	2.100	4.8	300	5.13	160.3
3.00	Basin 3	Flow Control 3	10.000	0.600	130.960	130.860	0.100	100.0	150	5.17	159.9
3.01	Flow Control 3	Outfall 3	48.000	0.600	130.860	130.800	0.060	800.0	150	7.47	137.9

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.01	1.572	111.1	974.7	1.000	1.100	2.240	0.0
1.02	7.075	500.1	973.2	1.100	3.100	2.240	0.0
2.01	1.572	111.1	1117.0	1.500	1.600	2.567	0.0
2.02	7.250	512.5	1115.3	1.600	3.700	2.567	0.0
3.00	1.005	17.8	570.0	1.150	1.250	1.315	0.0
3.01	0.348	6.1	491.6	1.250	0.960	1.315	0.0

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.01	10.000	100.0	300	Circular	131.400	130.100	1.000	131.400	130.000	1.100
1.02	10.000	5.0	300	Circular	131.400	130.000	1.100	131.400	128.000	3.100
2.01	10.000	100.0	300	Circular	132.000	130.200	1.500	132.000	130.100	1.600
2.02	10.000	4.8	300	Circular	132.000	130.100	1.600	132.000	128.000	3.700
3.00	10.000	100.0	150	Circular	132.260	130.960	1.150	132.260	130.860	1.250
3.01	48.000	800.0	150	Circular	132.260	130.860	1.250	131.910	130.800	0.960

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.01	Basin 1	1200	Manhole	Adoptable	Flow Control 1	1200	Manhole	Adoptable
1.02	Flow Control 1	1200	Manhole	Adoptable	Outfall 1	1200	Manhole	Adoptable
2.01	Basin 2	1200	Manhole	Adoptable	Flow Control 2	1200	Manhole	Adoptable
2.02	Flow Control 2	1200	Manhole	Adoptable	Outfall 2	1200	Manhole	Adoptable
3.00	Basin 3	1200	Manhole	Adoptable	Flow Control 3	1200	Manhole	Adoptable
3.01	Flow Control 3	1200	Manhole	Adoptable	Outfall 3	1200	Manhole	Adoptable

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Basin 1	131.400	1.300	1200	0	1.01	130.100	300
Flow Control 1	131.400	1.400	1200	1	1.01	130.000	300
				0	1.02	130.000	300

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Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Outfall 1	131.400	3.400	1200	1	1.02	128.000	300
Basin 2	132.000	1.800	1200	0	2.01	130.200	300
Flow Control 2	132.000	1.900	1200	1	2.01	130.100	300
				0	2.02	130.100	300
Outfall 2	132.000	4.000	1200	1	2.02	128.000	300
Basin 3	132.260	1.300	1200	0	3.00	130.960	150
Flow Control 3	132.260	1.400	1200	1	3.00	130.860	150
				0	3.01	130.860	150
Outfall 3	131.910	1.110	1200	1	3.01	130.800	150

Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	x	2 year (l/s)	11.6	100 year 360 minute (m³)
Summer CV	0.750	Drain Down Time (mins)	240	30 year (l/s)	25.1	
Winter CV	0.840	Additional Storage (m³/ha)	0.0	100 year (l/s)	31.9	
Analysis Speed	Normal	Check Discharge Rate(s)	✓	Check Discharge Volume	✓	

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	40	0	0
30	35	0	0				

Pre-development Discharge Rate

Site Makeup	Greenfield	BFIHost	0.561	Growth Factor 100 year	2.48	Q 30 year (l/s)	25.1
Greenfield Method	FEH	Region	1	Betterment (%)	0	Q 100 year (l/s)	31.9
Positively Drained Area (ha)	5.810	QBar/QMed conversion factor	1.111	QMed	11.6		
SAAR (mm)	654	Growth Factor 2 year	0.90	QBar	12.9		
Host	1	Growth Factor 30 year	1.95	Q 2 year (l/s)	11.6		

Pre-development Discharge Volume

Site Makeup	Greenfield	Soil Index	1	Return Period (years)	100	Betterment (%)	0
Greenfield Method	FSR/FEH	SPR	0.10	Climate Change (%)	0	PR	
Positively Drained Area (ha)	5.810	CWI		Storm Duration (mins)	360	Runoff Volume (m³)	

Node Flow Control 1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	130.000	Product Number	CTL-SHE-0125-7400-1100-7400
Design Depth (m)	1.100	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	7.4	Min Node Diameter (mm)	1200

Node Flow Control 2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	130.100	Product Number	CTL-SHE-0102-5500-1600-5500
Design Depth (m)	1.600	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.5	Min Node Diameter (mm)	1200

Node Flow Control 3 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	130.860	Product Number	CTL-SHE-0104-5000-1100-5000
Design Depth (m)	1.100	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

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Node Basin 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	130.100
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1650.0	0.0	1.000	2276.2	0.0	1.300	2483.7	0.0

Node Basin 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	130.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	1100.0	0.0	1.500	1918.5	0.0	1.800	2109.4	0.0

Node Basin 3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	130.960
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	752.0	0.0	1.000	1191.1	0.0	1.300	1342.4	0.0

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.94%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
480 minute winter	Basin 1	456	130.330	0.230	52.2	396.0725	0.0000	OK
480 minute winter	Flow Control 1	456	130.329	0.329	21.0	0.3725	0.0000	SURCHARGED
15 minute summer	Outfall 1	1	128.000	0.000	7.2	0.0000	0.0000	OK
600 minute winter	Basin 2	585	130.618	0.418	45.9	508.4653	0.0000	SURCHARGED
600 minute winter	Flow Control 2	585	130.618	0.518	14.4	0.5859	0.0000	SURCHARGED
15 minute summer	Outfall 2	1	128.000	0.000	5.1	0.0000	0.0000	OK
360 minute winter	Basin 3	344	131.228	0.268	34.6	217.7423	0.0000	SURCHARGED
360 minute winter	Flow Control 3	344	131.218	0.358	5.0	0.4045	0.0000	SURCHARGED
15 minute summer	Outfall 3	1	130.800	0.000	4.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
480 minute winter	Basin 1	1.01	Flow Control 1	21.0	0.591	0.189	0.6417	
480 minute winter	Flow Control 1	Hydro-Brake®	Outfall 1	7.4				258.2
600 minute winter	Basin 2	2.01	Flow Control 2	14.4	0.416	0.130	0.7042	
600 minute winter	Flow Control 2	Hydro-Brake®	Outfall 2	5.3				227.8
360 minute winter	Basin 3	3.00	Flow Control 3	5.0	0.422	0.283	0.1760	
360 minute winter	Flow Control 3	Hydro-Brake®	Outfall 3	5.0				150.6

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Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.94%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	Basin 1	705	130.772	0.672	87.3	1250.9290	0.0000	SURCHARGED
720 minute winter	Flow Control 1	705	130.772	0.771	21.6	0.8725	0.0000	SURCHARGED
15 minute summer	Outfall 1	1	128.000	0.000	7.4	0.0000	0.0000	OK
1440 minute winter	Basin 2	1410	131.309	1.109	56.3	1556.8820	0.0000	SURCHARGED
1440 minute winter	Flow Control 2	1410	131.309	1.209	7.7	1.3671	0.0000	SURCHARGED
15 minute summer	Outfall 2	1	128.000	0.000	5.3	0.0000	0.0000	OK
720 minute winter	Basin 3	705	131.728	0.768	51.2	707.8440	0.0000	SURCHARGED
720 minute winter	Flow Control 3	705	131.720	0.860	5.0	0.9721	0.0000	SURCHARGED
15 minute summer	Outfall 3	1	130.800	0.000	5.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
720 minute winter	Basin 1	1.01	Flow Control 1	21.6	0.600	0.195	0.7042	
720 minute winter	Flow Control 1	Hydro-Brake®	Outfall 1	7.4				337.9
1440 minute winter	Basin 2	2.01	Flow Control 2	7.7	0.301	0.069	0.7042	
1440 minute winter	Flow Control 2	Hydro-Brake®	Outfall 2	5.3				449.7
720 minute winter	Basin 3	3.00	Flow Control 3	5.0	0.420	0.284	0.1760	
720 minute winter	Flow Control 3	Hydro-Brake®	Outfall 3	5.0				236.0

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.94%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	Basin 1	945	130.990	0.890	90.6	1718.3000	0.0000	SURCHARGED
960 minute winter	Flow Control 1	945	130.990	0.990	20.8	1.1193	0.0000	SURCHARGED
15 minute summer	Outfall 1	1	128.000	0.000	7.4	0.0000	0.0000	OK
1440 minute winter	Basin 2	1410	131.624	1.424	73.4	2121.1050	0.0000	SURCHARGED
1440 minute winter	Flow Control 2	1410	131.624	1.524	13.3	1.7231	0.0000	SURCHARGED
15 minute summer	Outfall 2	1	128.000	0.000	5.3	0.0000	0.0000	OK
720 minute winter	Basin 3	705	131.959	0.999	67.3	971.6204	0.0000	SURCHARGED
720 minute winter	Flow Control 3	705	131.949	1.089	5.0	1.2312	0.0000	SURCHARGED
15 minute summer	Outfall 3	1	130.800	0.000	5.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
960 minute winter	Basin 1	1.01	Flow Control 1	20.8	0.595	0.187	0.7042	
960 minute winter	Flow Control 1	Hydro-Brake®	Outfall 1	7.4				455.1
1440 minute winter	Basin 2	2.01	Flow Control 2	13.3	0.507	0.120	0.7042	
1440 minute winter	Flow Control 2	Hydro-Brake®	Outfall 2	5.4				480.3
720 minute winter	Basin 3	3.00	Flow Control 3	5.0	0.420	0.284	0.1760	
720 minute winter	Flow Control 3	Hydro-Brake®	Outfall 3	5.0				255.3

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APPENDICES



APPENDIX H

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CEMETERY TO CONTAIN ITS OWN SURFACE WATER DRAINAGE SYSTEM. ALL SURFACES WILL BE PERMEABLE AND WILL ALLOW SURFACE WATER FLOWS WILL INFILTRATE INTO THE GROUND. AN OVERFLOW PIPE WILL BE CONTAINED WITHIN SUDS FEATURES TO ALLOW OUTFALL INTO DITCH NETWORK NORTH OF SITE.

ATTENUATION BASIN 1
DESIGN BASED ON CONTRIBUTING AREA OF 2.24ha.

COVER LEVEL = 131.40m
INVERT LEVEL = 130.10m
DEPTH OF POND = 1.00m
MINIMUM FREEBOARD= 0.30m
PLAN AREA = 2,483.7m²

MAXIMUM STORAGE VOLUME OF 1,718.30m³ TO ACCOMMODATE STORAGE FOR ALL STORM EVENTS UP TO AND INCLUDING A 1%AEP40CC EVENT.

HYDRO-BRAKE OUTFLOW CONTROL
INVERT LEVEL = 130.00m
DESIGN HEAD = 1.10m
DESIGN FLOW = 7.4l/s

A DETAILED TOPOGRAPHICAL SURVEY IS REQUIRED TO CONFIRM LEVELS OF THE EXISTING DITCH NETWORK TO ALLOW FOR GRAVITY CONNECTION.

EXISTING DITCH CULVERTED TO ALLOW ACCESS INTO FIELD.

PROPOSED OUTFALL INTO EXISTING DITCH NETWORK

SURFACE WATER TO DISCHARGE VIA GRAVITY INTO AN EXISTING DITCH NETWORK NORTH OF THE SITE.

A DETAILED TOPOGRAPHICAL SURVEY IS REQUIRED TO CONFIRM LEVELS OF THE WATERCOURSE.

ATTENUATION BASIN 2
DESIGN BASED ON CONTRIBUTING AREA OF 2.57ha.

COVER LEVEL = 132.00m
INVERT LEVEL = 130.20m
DEPTH OF POND = 1.50m
MINIMUM FREEBOARD= 0.30m
PLAN AREA = 2,109.4m²

MAXIMUM STORAGE VOLUME OF 2,121.11m³ TO ACCOMMODATE STORAGE FOR ALL STORM EVENTS UP TO AND INCLUDING A 1%AEP40CC EVENT.

HYDRO-BRAKE OUTFLOW CONTROL
INVERT LEVEL = 130.10m
DESIGN HEAD = 1.60m
DESIGN FLOW = 5.9l/s

A DETAILED TOPOGRAPHICAL SURVEY IS REQUIRED TO CONFIRM LEVELS OF THE DITCH NETWORK AND IF A GRAVITY CONNECTION CAN BE ACHIEVED. IF A GRAVITY CONNECTION CANNOT BE ACHIEVED SURFACE WATER FLOWS WILL NEED TO BE PUMPED INTO THE DITCH.

IMPROVEMENT WORKS MAY BE REQUIRED TO THE EXISTING DITCH NETWORK TO ALLOW FOR A PROPOSED GRAVITY CONNECTION.

A SINGLE PUMPING STATION CAN ACCOMMODATE THE SITE BUT IT WILL REQUIRE A WET WELL OF APPROXIMATELY 6m DEEP. TO ALLOW GRAVITY FLOWS FOR THE WHOLE SITE.

PROPOSED FOUL WATER PUMPING STATION, WITH A 15M BUFFER ZONE TO HABITABLE DWELLINGS.

FOUL WATER WILL BE PUMPED VIA THE PROPOSED RISING MAIN BEFORE ENTERING A PROPOSED NEW GRAVITY SEWER AND THEN ENTER THE PUBLIC FOUL WATER SEWER VIA MH8001 ON BARLESTONE ROAD.

EXACT POSITIONS AND LAYOUT OF PUMPING STATION TO BE CONFIRMED AT DETAILED DESIGN STAGE. VEHICLE ACCESS AND ROAD CONNECTION WILL BE REQUIRED.

ATTENUATION BASIN 3
DESIGN BASED ON CONTRIBUTING AREA OF 1.31ha.

COVER LEVEL = 132.26m
INVERT LEVEL = 130.96m
DEPTH OF POND = 1.00m
MINIMUM FREEBOARD= 0.30m
PLAN AREA = 1,342.4m²

MAXIMUM STORAGE VOLUME OF 971.62m³ TO ACCOMMODATE STORAGE FOR ALL STORM EVENTS UP TO AND INCLUDING A 1%AEP40CC EVENT.

HYDRO-BRAKE OUTFLOW CONTROL
INVERT LEVEL = 130.86m
DESIGN HEAD = 1.10m
DESIGN FLOW = 5.0l/s

SURFACE WATER FLOWS TO DISCHARGE VIA GRAVITY INTO PUBLIC SURFACE WATER SEWER VIA NEW CONNECTION AS AGREED BY STW. A SECTION 98 SEWER REQUISITION WILL BE REQUIRED TO CROSS LAND BETWEEN TWO AREAS OF HIGHWAY.

IF A CONNECTION IS NOT VIABLE SURFACE WATER FLOWS WILL BE PUMPED TO THE WATERCOURSE TO THE NORTH OF THE SITE.

PROPOSED FOUL WATER CONNECTION INTO MH8001 AT A FOUL LOAD RATE NOT TO EXCEED 6.0l/s AS AGREED WITH STW.

MANHOLE 7101
CL=132.87m
IL=131.02m

MANHOLE 7004
CL=132.74m
IL=130.77m

MANHOLE 8001
CL=132.30m
IL=130.34m

MANHOLE 9903
CL=131.88m
IL=131.08m

MANHOLE 9902
CL=131.91m
IL=130.91m

MANHOLE 0902
CL=131.80m
IL=130.45m

LEAP

NOTES:

1. DO NOT SCALE THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SPECIALIST DESIGN DRAWINGS AND DETAILS.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE. ALL LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
4. THIS DRAWING IS FOR STRATEGY PURPOSES ONLY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.
5. DESIGN BASED ON EXISTING LEVELS AND SUBJECT TO CHANGE WITH EXTERNAL WORKS DESIGN / CONFIRMATION OF FFLS.
6. DRAINAGE STRATEGY IS SUBJECT TO AGREEMENT WITH RELEVANT THIRD PARTIES, INCLUDING ENVIRONMENT AGENCY, LOCAL PLANNING AUTHORITY, LEAD LOCAL FLOOD AUTHORITY AND WATER AUTHORITY.
7. PROPOSED CEMETERY AREA SURFACE WATER DRAINAGE SCHEME TO BE COMPILED ONCE FINAL DECISIONS HAVE BEEN CONFIRMED.

KEY

- SITE BOUNDARY
- PROPOSED SURFACE WATER SEWERS
- PROPOSED FOUL WATER NETWORK
- PROPOSED FOUL WATER RISING MAIN
- PROPOSED 5m SEWER EASEMENT
- PUBLIC SURFACE WATER SEWER
- PUBLIC FOUL WATER SEWER
- ROTHLEY BROOK
- EXISTING DITCH NETWORK
- EXISTING BYWAY
- EXISTING FOOTPATH
- POTENTIAL PEDESTRIAN CYCLE CONNECTION
- PROPOSED CEMETERY
- CONTRIBUTING AREAS
- PROPOSED ATTENUATION PONDS
- PROPOSED SWALES 3.5M WIDE, 0.5M DEEP
- PROPOSED FOUL WATER PUMPING STATION
- OVERLAND FLOW ROUTES
- WATERCOURSE FLOW ARROWS
- 120.5m 1m LIDAR DATA CONTOURS LINE

1:1000
30m 0m 30m 60m 90m 120m 150m

REV	AMENDMENTS:	DRN	CHK	APP	DATE
F	UPDATES BASED ON NEW MASTERPLAN	BO	RC	AB	09.10.24
E	UPDATES BASED ON NEW OUTFALL DITCH	BO	RC	AB	19.09.24
D	UPDATES BASED ON CLIENT COMMENTS	BO	RC	AB	06.08.24
C	UPDATES BASED ON MASTERPLAN	BO	RC	AB	23/07/24
B	UPDATES BASED ON DEVELOPER ENQUIRY	BO	RC	AB	25/03/24
A	UPDATES BASED ON CLIENT COMMENTS	BO	RC	AB	21/03/24
-	FIRST ISSUE	BO	RC	AB	29/02/24

PROJECT:
BARLESTONE ROAD
NEWBOLD VERDON

DRAWING TITLE:
OUTLINE DRAINAGE STRATEGY

CLIENT:
DAVID WILSON HOMES
EAST MIDLANDS

DRAWING NUMBER:
24832_01_230_01

REVISION: F | SHEET SIZE: A0 | SCALE: 1:1000

STATUS:
FOR INFORMATION / APPROVAL

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APPENDICES



APPENDIX I

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MAINTENANCE AND MANAGEMENT

A proposed maintenance plan is shown in the table below and breaks down the maintenance requirements of the various proposed assets in accordance with the CIRIA C753 SuDS Manual guidance.

Table 1.1: Proposed Maintenance Regime

Drainage Asset	Responsible Organisation	Maintenance Work	Frequency
Pipework / Manholes	Private Ownership / Management Company	Inspect pipework and clear blockages	Annually or after severe storms.
		Inspect manholes and clear blockages	
		Repair any defects in the network	
		Inspect flow control, ensure operating freely and pivoting bypass door and penstock valve operating correctly	
Headwalls	Private Ownership / Management Company	Inspect the structure and remove any debris/litter on the structure.	Annually or after severe storms
		Replace malfunctioning parts or structures	As required
Catchpits	Private Ownership / Management Company	Inspect structure and remove any debris/litter on structure	Annually or after severe storms
		Replace malfunctioning parts or structures	As required
Gullies	Private Ownership / Management Company	Inspect structure and remove any debris/litter on structure	Annually or after severe storms
		Replace malfunctioning parts or structures	As required
Foul Pumping Station	Private Ownership / Management Company	Inspect wet well, kiosk and valve chamber	Annually or after severe storms
		Inspect structure and remove any debris from the wet well	
		Replace malfunctioning parts or structures	As required
Flow Control Chamber	Private Ownership / Management Company	Inspect structure and remove excessive silt build-up	Monthly during construction and then annually or after severe storms
		Inspect pipework and manholes also clear blockages	Annually or after severe storms
		Inspect manholes and clear blockages	
		Inspect flow control, ensure operating freely and pivoting bypass door and penstock valve operating correctly	
		Replace malfunctioning parts or structures	
		Inspect for evidence of poor operation	6 monthly
		Inspect sediment accumulation rates and establish appropriate removal frequencies	
		Test control structure to ensure operating as per original design	5 yearly
Rainwater Harvesting	Private Ownership / Management Company	Inspection of the tank for debris and sediment build-up,	Annually (and following poor performance)

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		inlets/outlets/withdrawal devices, overflow areas, pumps and filters	
		Cleaning of the tank, inlets, outlets, gutters, withdrawal devices and roof drain filters of silts and other debris	
		Cleaning and/or replacement of any filters	3 monthly (or as required)
		Repair of overflow erosion damage or damage to the tank	As required
		Pump repairs	
Swales	Private Ownership / Management Company	Remove litter and debris	Monthly then as required
		Cut grass – to retain grass height within the specified design range	
		Manage other vegetation and remove nuisance plants	
		Inspect inlets, outlets and overflows for blockages and clear if required	
		Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	
		Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years then half-yearly
		Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half-yearly
		Reseed areas of poor vegetation growth, alter plant types to better suit conditions if required	As required or if bare soil is exposed over 10% more of the swale treatment area
		Repair erosion or other damage by re-turfing or reseeding	As required
		Relevel uneven surfaces and reinstate design levels	
		Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	
		Remove build-up of sediment on upstream gravel trench, flow spreader or at top of the filter strip	
		Remove and dispose of oil or petrol residues using safe standard practices	
Permeable Pavements	Private Ownership / Management Company	Brushing and vacuuming (standard cosmetic sweep over the whole surface)	Once a year after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging of manufacturer's recommendations.
		Stabilise and mow contributing and adjacent areas	As required
		Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than sweeping	

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		Remediate any landscaping which, through vegetation maintenance of soil slip, has been raised to within 50 mm of the level of the paving	
		Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users and replace lost jointing material	
		Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required
		Initial inspection	Monthly for 3 months after installation
		Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	3 monthly, 48 hours after large storms in first 6 months
		Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
		Monitor inspection chambers	
Attenuation/Detention Basins	Private Ownership / Management Company	Remove litter and debris	Monthly
		Cut grass – for spillways and access routes	
		Cut grass – meadow grass in and around the basin	
		Manage other vegetation and remove nuisance plants	
		Inspect inlets, outlets and overflows for blockages, and clean if required	
		Inspect banksides, structures for silt accumulation. Establish appropriate silt removal frequencies	
		Check any penstocks and other mechanical devices	Annually
		Tidy all dead growth before the start of the growing season	
		Remove the sediment from inlets, outlets and forebay	
		Manage wetland plants in outlet pool – where provided	
		Aerate pond when signs of eutrophication are detected	
		Realign rip-rap or repair other damage	
		Repair/rehabilitate inlets, outlets and overflows	

- CIVIL ENGINEERING
- TRANSPORT
- FLOOD RISK & DRAINAGE
- STRUCTURES
- GEO-ENVIRONMENTAL
- ACOUSTIC AIR
- UTILITIES
- GEOMATICS
- LIGHTING
- EXPERT WITNESS

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