Flood Risk Assessment (FRA)

Land East of Axminster

Persimmon Homes (South West) Ltd

Prepared by:

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SLR Ref.: 422.065211.00001

1 April 2025

Revision: 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
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Basis of Report

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Appendices

1.0 Introduction

Authorisation

1.1 SLR Consulting Ltd has been appointed by Persimmon Homes (South West) Ltd to prepare a Flood Risk Assessment (FRA) and drainage strategy to support a detailed planning application for a parcel of land east of Axminster.

Background

1.2 The site consists of open grassland which is approximately 4.7 hectares (ha) in size and is located at the eastern end of the town of Axminster, in Devon (see Figure 2-1).

1.3 According to the Environment Agency (EA) Flood Map for Planning, the site is entirely located in Flood Zone 1. This is defined as land having a less than 1 in 1,000 annual probability of river or sea flooding and is therefore considered to be a low risk from these sources.

1.4 Given the size of the site (i.e. greater than 1 ha), an FRA is required by the National Planning Policy Framework (NPPF) to support the planning application. This FRA has been developed in accordance with the guidelines set out in the NPPF and informed by regional and local planning policy.

1.5 The planning application was originally submitted in 2019. An FRA prepared by Vectos (now SLR Consulting Ltd) was prepared to support the planning application. This FRA supersedes that previously prepared for the planning application. However, where appropriate, the content is the same.

Development Proposal

1.6 The development proposal consists of the erection of 84 dwellings and associated roads, parking, drainage, landscaping and open space. The proposed Planning Layout is enclosed in Appendix A.

Aims and Objectives

1.7 The aim of this FRA is to demonstrate that the site can be developed safely for residential purposes, without exposing it to an unacceptable degree of flood risk and/or increasing the flood risk to third parties. The objectives of this FRA are to:

- Review the relevant planning policy documents to ensure that the development proposals are in accordance with this and other regional and local guidance.
- Undertake a desk-based review of the available flood risk information to assess past, current and future flood risk issues, taking into consideration the anticipated impacts of climate change.
- Identify flood mitigation requirements, if any, to ensure the development is safe from flooding, without impacting third parties.
- Assess whether the development will result in an increase of surface water runoff and how this can be mitigated through the incorporation of Sustainable Drainage Systems (SuDS) into the proposed development, which are informed through Lead Local Flood Authority (LLFA) guidance.
- Evaluate a conceptual foul water drainage solution.
- Summarise the above into an FRA report including a plan showing the proposed SuDS features associated with the surface water drainage strategy.

2.0 Site Description

Site Location and Description

2.1 The site is located on land at the at the eastern end of the town of Axminster, in Devon, and is centred at an approximate grid reference of SY307980. The site comprises two field which is currently used for agriculture. The total site area is approximately 4.7 ha. The red line boundary of the site is shown in Figure 2-1.

2.2 Lyme Road is located alongside the southwest boundary of the site; Sector Lane is located alongside the northeast boundary of the site. Existing residential development is located to the north and west of the site. The wider area is rural and mainly comprises agricultural fields. The centre of Axminster is approximately 1 km west of the site.

Figure 2-1: Site Location Plan

Site Topography

2.3 The topographical survey is enclosed in Appendix B. It shows that the site generally falls to the northeast, from a maximum of approximately 103 m AOD in the southwest corner. Lowest site levels are identified in the northeast corner at approximately 64 m AOD, alongside Sector Lane.

Geology and Hydrogeology

2.4 The 1 in 50,000 scale British Geological Survey (BGS) online mapping indicates that most of the site is underlain Charmouth Mudstone Formation, with an area of Blue Lias Formation -

Limestone and mudstone, interbedded, present in the east. Superficial deposits of Head (clay, silt, sand and gravel) are shown to occupy most of the site.

2.5 The Cranfield University Soilscapes website indicates that the site is largely located in an area with slowly permeable seasonally wet base-rich loamy and clayey soils, with impeded drainage.

2.6 A Ground Investigation was undertaken by Hamson Barron Smith in November 2018, with key extracts enclosed in Appendix C. This investigation included numerous intrusive test pits across the site and a wider area. It confirmed that infiltration to the ground on site is impeded, and soakaways would not be suitable. Groundwater seepages were noted in three boreholes, which was perched water in clay, rather than the water table. Groundwater seepages were recorded at depths ranging from 0.90 m to 1.00 m below ground level. Slightly shallower groundwater level (0.69 m below ground level) was identified at a subsequent groundwater monitoring visit. An area of soft ground was identified in the south corner of the site, which was consistent the area of groundwater seepages. OS mapping shows a drain in this area, which was presumably dug to help improve the drainage

Hydrology and Drainage

2.7 There are no major waterbodies on site. Mill Brook is located approximately 100 m to the east of the site boundary. As noted previously, there is a small drain adjacent to the south corner of the site. These streams and ditches are shown in Figure 2-1.

2.8 The site currently comprises farmland. Runoff from the existing site either infiltrates into the ground or follows the ground contours and flows towards Mill Brook.

2.9 Asset records obtained from South West Water and are enclosed in Appendix D. A 100 mm diameter surface water sewer follows the northwest boundary. There is also a 150 mm diameter foul sewer in Sector Lane and a 150 mm diameter combined sewer is in Lyme Road.

3.0 Planning Policy and Guidance

National Planning Policy Framework

3.1 The National Planning Policy Framework (NPPF) sets out the Government's national policies for flood risk management in a land use planning context within England and how these are expected to be applied. It states the requirement for a sequential, risk-based approach to the location of development – taking into account all sources of flood risk and the current and future impact of climate change – so as to avoid, where possible, flood risk to people and property.

3.2 The aim of the Sequential Test is to steer new development to areas with the lowest risk of flooding from any source. Development should not be allocated or permitted if there are reasonably available sites appropriate for the development in areas with a lower risk of flooding.

3.3 If it is not possible for development to be located in areas with a lower risk of flooding (taking into account wider sustainable development objectives), the Exception Test may have to be applied. The need for the Exception Test will depend on the potential vulnerability of the site and of the development proposed.

3.4 In accordance with Annex 3: Flood risk vulnerability classification of the Planning Practice Guidance (PPG), the proposed residential development is classified as More Vulnerable.

3.5 Table 3 of the PPG sets out the 'incompatibility' of the vulnerability classification with the identified flood zones. All of the site is located in Flood Zone 1, which is compatible with More Vulnerable development, and application of the Sequential and Exception Test is therefore not required.

East Devon Local Plan (Core Strategy) Development Plan Document

3.6 The East Devon Local Plan 2013-2031 was adopted in January 2016 and includes policies that are used for evaluating planning applications in East Devon.

3.7 The key policies regarding flood risk and surface water management are provided within EN18, EN21, and EN22 which are reiterated below:

EN18 - Maintenance of Water Quality and Quantity

The Council will require developers to take appropriate measures to ensure that development does not adversely affect the quality or quantity of either surface or groundwater. Development that would result in adverse impacts or potential for pollution will be restricted within Source Protection Zones.

EN21 - River and Coastal Flooding

A sequential approach will be taken to considering whether new developments excluding minor developments and changes of use (minor development includes non residential extensions with a footprint of less than 250 square metres, development that does not increase the size of the building or householder development unless it would create a separate dwelling) will be permitted in areas subject to river and coastal flooding.

Wherever possible developments should be sited in Flood Zone 1 as defined in the East Devon District Council Strategic Flood Risk Assessment[106]. Only if there is no reasonably available site in Flood Zone 1 will locating the development in Flood Zone 2 and then Flood Zone 3 be considered. The flood vulnerability of proposed development, as set out in Appendix D of the East Devon Strategic Flood Risk Assessment will be taken into account.

If, after following this sequential approach, acceptable sites cannot be found and the development is necessary for wider sustainable development reasons, development may be permitted if all of the following criteria are met.

1. It is demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk.
2. The proposed development is on previously developed land that is suitably located and available for development, unless no reasonable alternative sites are available.
3. A flood risk assessment demonstrates that the development will be safe, without increasing flood risk elsewhere and, where possible, will reduce flood risk overall.

This shall not apply to 'highly vulnerable' development in Flood Zone 3a or 'less vulnerable'; 'more vulnerable'; or 'highly vulnerable' development in Flood Zone 3b as defined in the East Devon Strategic Flood Risk Assessment.

EN22 - Surface Run-Off Implications of New Development

Planning permission for new development will require that:

1. The surface water run-off implications of the proposal have been fully considered and found to be acceptable, including implications for coastal erosion.
2. Appropriate remedial measures are included as an integral part of the development, and there are clear arrangements in place for ongoing maintenance over the lifetime of the development.
3. Where remedial measures are required away from the application site, the developer is in a position to secure the implementation of such measures.
4. A Drainage Impact Assessment will be required for all new development with potentially significant surface run off implications.
5. Surface water in all major commercial developments or schemes for 10 homes or more (or any revised threshold set by Government) should be managed by sustainable drainage systems, unless demonstrated to be inappropriate.

Devon County Council (LLFA) SuDS Guidance

3.8 The LLFA have produced a guidance document regarding the implementation of Sustainable Drainage Systems (SuDS) in Devon. The guide is primarily intended for use by developers

who are looking at general guidance on the principles of SuDS, and Devon County Council's specific requirements and standards.

Critical Drainage Area

3.9 The site is within a Critical Drainage Area (CDA), requiring more stringent surface water drainage design standards which all new developments must adhere to:

- The rates and volumes of surface water runoff must be safely managed on-site up to, and including, the 1 in 100-year (plus climate change) rainfall event;
- The rates and volumes of surface water runoff discharged off-site must mimic greenfield performance up to a maximum of the 1 in 10-year greenfield runoff rate and volume.

3.10 To satisfy these design standards, additional surface water attenuation storage areas will be required within the site in order to contribute to a reduction in downstream flood risk.

The SuDS Manual (CIRIA C753) 2015

3.11 The CIRIA SuDS Manual provides comprehensive guidance for the design and incorporation of SuDS. The manual sets out the process by which appropriate SuDS options may be selected for a site.

3.12 The guidance within the CIRIA SuDS Manual (2015) will be used for the planning, design, operation and maintenance of the proposed SuDS.

Policy Conclusions

3.13 The development proposals are consistent with the policies within the NPPF, Local Plan and supporting national, regional and local guidance documents. This is primarily because all buildings and SuDS will be in Flood Zone 1, and because surface water will be managed using SuDS. This is discussed in the following sections.

4.0 Assessment of Flood Risk

Historic Flooding

4.1 The EA Historic Flood Map dataset was consulted, which shows that no historic flood events have been recorded in the vicinity of the site. The East Devon District Council – Level 1 Strategic Flood Risk Assessment (SFRA) (2024) identifies historical flood events. Whilst various records are shown in Axminster, no incidents are recorded on site or in a location that could indicate a potential source of risk.

Risk from Fluvial and Coastal/Tidal Flooding

4.2 The EA Flood Map for Planning shows the risk of flooding from both rivers and the sea. It identifies that that site is in Flood Zone 1. Land in Flood Zone 1 is defined as land having a less than 1 in 1,000 annual probability of river or sea flooding. The Flood Map for Planning is shown in Figure 4-1.

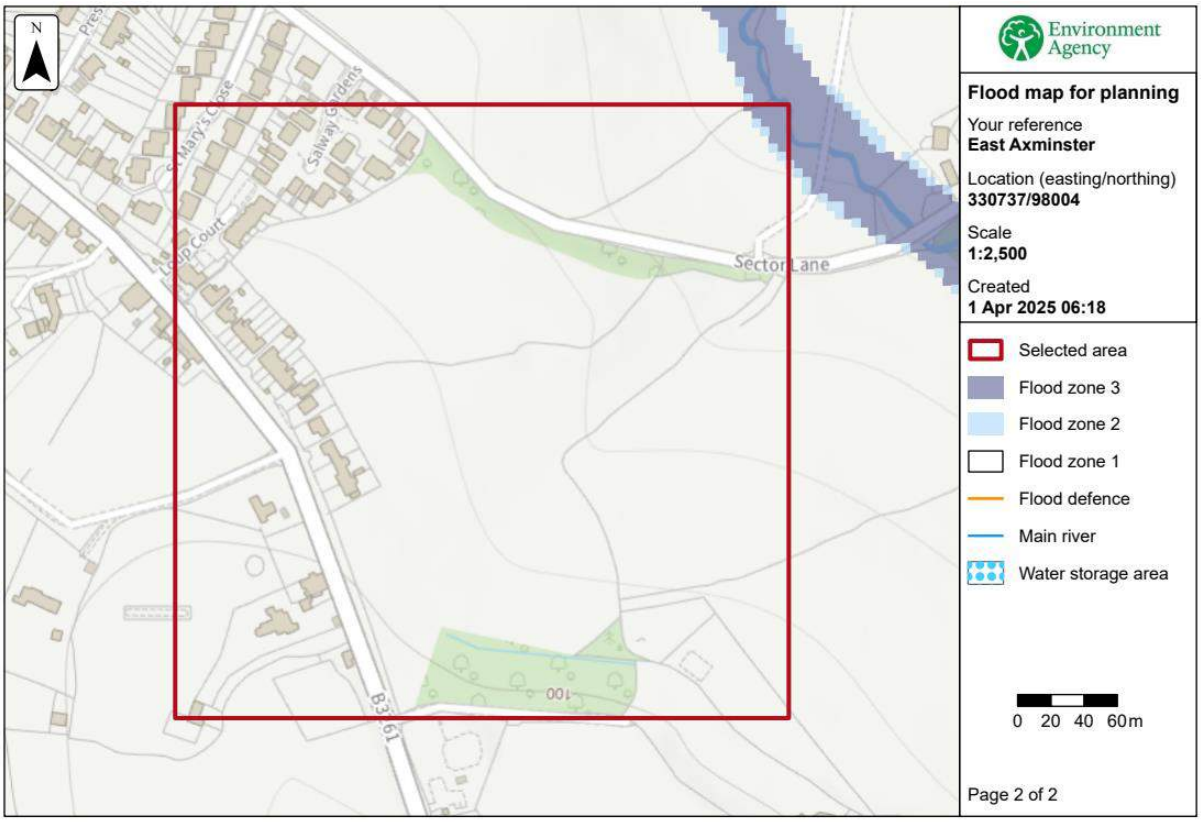

Figure 4-1: EA Flood Map for Planning

4.3 The site is inland and is elevated over 64 m AOD. It is therefore not susceptible to flooding from the sea. Given that all built development is located in Flood Zone 1, the risk of fluvial and tidal flooding is low.

Risk from Surface Water Flooding

4.4 Surface water flooding is a result of overland flow and ponding of water that can follow a rainfall event, from local catchment areas, hillsides and associated with minor ditches or

streams. The Risk of Flooding from Surface Water map is available online and is shown in Figure 4-2.

4.5 The EA's 'Risk of Flooding from Surface Water' map shows that the is at a very low risk of surface water flooding (defined as an area with less than 1 in 1,000 chance of flooding each year) across almost all of the site. Part of the southeast boundary is subject to surface water flooding, but this does not impact the proposed development. Flood risk from surface water is therefore considered to be low.

Figure 4-2: EA Flood Map for Surface Water

Risk from Groundwater Flooding

4.6 Groundwater flooding typically occurs in low-lying areas, close to hills which are underlain by permeable rocks. This typically happens after long periods of extensive and significant rainfall.

4.7 As noted in Chapter 2, the Ground Investigation undertaken by Hamson Barron Smith (Appendix C) found a small number of trial pits experienced shallow seepages. This was perched groundwater in the clay, as opposed to a water table. An area of soft ground was also identified in the south corner of the site, which was generally consistent with the area of seepages. It appears to have been historically managed through the construction of a small drain. This shallow perched groundwater is not considered to introduce a flood risk but may be a nuisance with respect to gardens etc during wet winter months.

4.8 The SFRA (2024) presents a groundwater flood risk map, which shows the areas with the shallowest groundwater levels generally follow the flow paths of the major watercourses in East Devon District, particularly along the River Otter valley and its tributary valleys, in areas

close to the River Clyst in the west of East Devon district and areas in the River Exe valley. The site is shown to be at a low risk of groundwater flooding.

Risk from Sewer Flooding

4.9 Drainage and infrastructure flooding occurs when sewerage systems are overwhelmed and result in flooding, which may occur alone or be combined with other flood sources (e.g. fluvial or surface water).

4.10 As described in Chapter 2, there limited sewers in the proximity of the site. Those that do exist are small diameter and represent a minor potential source of flood risk. Furthermore, the sewers are in a position that are unlikely to offer a preferential pathway onto the site, because of the topography. The risk of flooding from existing sewers is considered to be low.

Risk from Other Sources of Flooding

4.11 According to EA mapping, the site is not at flood risk from reservoirs. There are no impounded canals within the vicinity of the site that could pose a potential flood risk. Other sources of flood risk at the site are therefore negligible.

Flood Mitigation

4.12 Whilst the various potential sources of flood risk in the development parcels are not considered to represent a constraint, finished floor levels (FFL) of all dwellings should be elevated above the surrounding ground levels by at least 150 mm in accordance with building regulations. This will protect against the possibility of shallow ponding of water which is inevitable following heavy or prolonged rainfall.

4.13 The connectivity of the area of soft ground in the south corner of the site to the adjacent drain should be investigated and retained. This is likely to help minimise any nuisance caused to gardens during wet winter months.

5.0 Surface Water Management

Overview

5.1 It is well understood that one of the effects of development is typically to reduce the permeability of a site and consequently change its response to rainfall. Therefore, a drainage strategy is required to ensure that the surface water runoff regime is managed appropriately and that the proposed development does not increase flood risk on the site and/or to surrounding areas.

5.2 The NPPF states that flood risk to land and property must not be increased as a result of development. The NPPF also states that flood risk should not increase for events up to and including a 1 in 100-year return period, including an appropriate allowance for climate change. These requirements have formed the basis of the surface water drainage strategy, which is described in this section.

5.3 The proposed surface water management strategy has been derived based upon the principles of SuDS, in accordance with NPPF and the LLFA SuDS guide. It has subsequently been used to inform the Planning Layout (Appendix A).

Proposed Surface Water Discharge Receptor

5.4 The drainage hierarchy presented in the PPG states the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

- into the ground (infiltration),
- to a surface water body,
- to a surface water sewer, highway drain, or another drainage system,
- to a combined sewer.

5.5 Discharge options were investigated in the order of preference specified in the drainage hierarchy. As noted in Chapter 2, infiltration will not be possible due to the impermeable ground conditions.

5.6 A surface water body (Mill Brook) is present within an adjoining field. Persimmon Homes (South West) Ltd have a legal agreement with the landowner to layout an outfall pipe through the field and outfall into Mill Brook. The site naturally drains to Mil Brook, so this outfall will retain existing connectivity.

Existing Greenfield Runoff Rates

5.7 The FEH method was used to determine greenfield runoff rates. The parameters utilised are detailed in Table 5-1, which shows the calculation was undertaken for 1 ha. The calculated rates are presented in Table 5-2. The calculation summary sheets are enclosed in Appendix E.

Table 5-1: Calculation Parameters

Parameter	Value	Unit
Area	1	ha
SAAR	997	mm
Region	8	-
BFI HOST	0.398	-

Table 5-2: Greenfield Runoff Rates

Return Period	Peak Greenfield Discharge (l/s/ha)
QBAR	9.29
Q1	7.24
Q30	18.11
Q100	22.56

5.8 The QBAR rate has been adopted for the surface water drainage strategy, which will ensure that the long-term storage volume has been accommodated, so that the volume of surface water that is discharged from the site (as well as the rate that it is discharged at) has been managed. Restriction of runoff to the QBAR rate will exceed the requirements of the CDA.

Proposed Surface Water Drainage Strategy

5.9 The surface water management strategy proposed for the site has been derived based upon the principles of sustainable drainage as detailed in the CIRIA SuDS Manual (2015) and the LLFA SuDS guide.

5.10 SuDS will be utilised to manage surface water runoff from the entire site. It is proposed to collect runoff from the site via a network of swales (with underlying filter drains) and pipes, which will be discharged to two cascading attenuation basins. Surface water will be released slowly, at the QBAR rate, into Mill Brook. This is shown on the Drainage Plan, enclosed in Appendix F.

5.11 The concept of sustainable drainage is that environmental and social factors such as the quantity and quality of runoff and amenity value of surface water in the urban or developed environment are considered when making decisions about drainage. SuDS can be used to complement conventional piped urban drainage to recreate a more natural water cycle.

5.12 This process can be used in to reduce the existing problems associated with conventional piped systems, which can include the risk of flooding, the potential of pollution or poor water quality and damage to the natural environment.

Attenuation Volumes

5.13 The surface water drainage strategy has been based on providing attenuation up to and including the 1 in 100 year plus a 45% allowance climate change event, which is in accordance with the latest national planning policy.

5.14 A Causeway Flow network model has been constructed for the site, which represents the key conveyance and attenuation features. This has been informed using the values presented in Table 5-3.

5.15 The impermeable area has been calculated based on measurements extracted from the Planning Layout. In accordance with the SuDS Manual, an additional 10% allowance has been made to account for the potential of urban creep, which has been applied to all paved surfaces.

Table 5-3: Network Model Parameters

Parameter	Value	Units
Impermeable area	18,043	m^2
Urban creep	10	%
Future impermeable area	19,847	m^2
Basin freeboard	0.3	m
Climate change	45	%
Pond average side slope	1 in 3	-
Discharge rate	16.8	l/s

5.16 The network model has been used to define a surface water strategy that provides sufficient attenuation storage, which has all been provided in above ground features. The Drainage Plan is enclosed in Appendix F. The calculations are enclosed in Appendix E.

SuDS Proposals

5.17 In addition to their drainage function, SuDS can be designed to deliver significant community and environmental benefits. They provide an opportunity to create high value habitat and contribute an important biodiversity, aesthetic and recreational function for the site.

Swales

5.18 Swales are shallow (i.e. around 0.5 m deep) vegetated open channels designed to convey, treat and in certain circumstances attenuate surface water runoff. They enhance the natural landscape and provide aesthetic and biodiversity benefits. These can be 'wet' where water gathers above the surface, or 'dry' where water gathers in a gravel layer beneath.

5.19 It is proposed to incorporate a network of dry swales across the site for the conveyance of surface water (see Appendix F). It is recommended that the swales (and wider source control features) are unlined to allow runoff from small rainfall events to infiltrate and provide some localised interception.

Basins

5.20 At the detailed design stage, the basins could be designed to offer an area of permanent water storage, which can contribute additional biodiversity opportunity. The basins have average 1:3 side slope. At the detailed design stage, variation in slope will help to ensure that they appear as natural as possible.

Other SuDS Features

5.21 Other more local, or source control, SuDS features will be included to contribute to the management of surface water across the site. These can comprise rain gardens, tree pits or permeable paving, which also have amenity and biodiversity benefits. These opportunities will be investigated at the detailed design stage.

Conveyance of Exceedance Surface Water Flooding

5.22 The surface water drainage strategy must consider an exceedance scenario, i.e. for flows in excess of the 1 in 100 year plus climate change rainfall event. Exceedance flows must be managed in conveyance routes across a site that minimise the risk to people and property.

5.23 In an exceedance scenario, roads would be designed to convey any exceedance flows away from people and property using appropriate kerbing for channelling. Exceedance flow routes

will ultimately be directed towards the network of swales and attenuation ponds, and away from nearby properties. Refer to Appendix F for further details.

Water Quality

5.24 In accordance with the CIRIA SuDS Manual (2015), SuDS components must have a total pollution index that equals or exceeds the pollution hazard index for different land use classifications. The highest Pollution Hazard Index for the site is Low (individual property driveways and low traffic roads). Refer to Table 5-4 (as informed by Table 26.2 of the CIRIA SuDS Manual 2015)).

Table 5-4: Pollution Hazard Indices for the Site

Land Use	Pollution Hazard Indices for Different Land Use Classifications			
	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very Low	0.20	0.20	0.05
Individual property driveways, residential car parks, low traffic roads and non-residential car parking with infrequent change	Low	0.50	0.40	0.40
Total	-	0.70	0.60	0.45

5.25 It is considered that the proposed attenuation basins alone would provide sufficient water quality mitigation for the proposed site. Refer to Table 5-5 (as informed by Table 26.3 of the CIRIA SuDS Manual (2015)). However, the swales would provide additional water quality benefits, for those areas that drain through them.

Table 5-5: Pollution Mitigation Indices for Discharge to Surface Water

Type of SuDS	Pollution Mitigation Indices		
	TSS	Metals	Hydro-carbons
Detention basin	0.50	0.50	0.60
Detention basin[1]	0.25	0.25	0.30
Total	0.75	0.75	0.90

Operation and Maintenance

SuDS

5.26 It is anticipated that the proposed SuDS devices will remain private, and would be managed by a private maintenance company acting on behalf of the future property owners. Where privately maintained, the general maintenance requirements should be undertaken in

[1] As per the CIRIA SuDS Manual (2015), where the mitigation index of an individual component is insufficient, two components (or more) will be required. However, a factor of 0.5 is used to account for the secondary or tertiary components associated with the already reduced inflow concentrations

accordance with the recommendations outlined in the CIRIA SuDS Manual (2015), as replicated in Figure 5-1 and 5-2.

Other Assets

5.27 Various other smaller assets of the surface water drainage strategy consist of gutters, down water pipes, manholes, pipes and drainage channels. These assets should be checked annually and after large storm events, in order to remove debris and inspect the condition.

5.28 Jet washing may be required on occasion to remove any blockages within the pipe network. If the condition is found to be poor, replacement or repairs may be required.

Figure 5-1: Operation and Maintenance Requirements for Swales

TABLE 17.1 Operation and maintenance requirements for swales

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	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
Occasional maintenance	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% or more of the swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

Figure 5-2: Operation and Maintenance Requirements for Detention Basins

TABLE 22.1 Operation and maintenance requirements for detention basins

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

Summary

5.29 The surface water drainage strategy has been prepared to demonstrate that the proposed development of the site can meet national and local requirements for the management of surface water runoff. This will be achieved through the principles of SuDS but is subject to detailed design once planning permission has been approved.

5.30 The SuDS will offer wider benefits including biodiversity and recreational opportunities, as well as aesthetic improvements.

6.0 Foul Drainage

6.1 Developers may connect to the nearest public sewer on a size for size basis at their cost and, in this case, South West Water will provide capacity in the network to accommodate domestic type flows from granted development which is funded by infrastructure charging arrangements.

6.2 A connection to a 150 mm diameter public foul sewer in Sector Lane to the north of the site has been proposed. A pumping station is required to achieve the connection. The foul water drainage strategy is shown on the Drainage Layout enclosed in Appendix F.

7.0 Conclusions

7.1 This Flood Risk Assessment (FRA) and drainage strategy has been undertaken to accompany the detailed planning application for a proposed residential development for a parcel of land east of Axminster.

7.2 This report has been prepared by SLR on behalf of Persimmon Homes (South West) Ltd in accordance with the guidelines set out in the National Planning Policy Framework, regional and local guidance documents.

7.3 The site lies entirely within Flood Zone 1 (i.e. land having a less than 1 in 1,000 annual probability of river or sea flooding, with this considered to be low risk). No significant sources of flood risk have been identified in the proximity of the site.

7.4 An attenuation led surface water drainage strategy has been proposed to manage the surface water runoff from the site. Attenuation will be provided to limit runoff to a heavily restricted greenfield rate before discharging into a watercourse.

7.5 Foul water is to be disposed to a South West Water foul sewer to the north of the site, subject to a S106 agreement.

Appendix A Planning Layout

The scaling of this drawing cannot be assured

Revision		Date	Drn	Ckd
A	Minor amendments to align with site levels	21.01.25	HF	MRW
B	Layout amended to engineers latest road design	07.03.25	KR	MRW
C	Carriageway increased to 6m	26.03.25	KR	MRW
D	Plot 32 changed to Sherwood	11.04.25	BE	MRW
E	Plots 4-9 amended and substation added	30.05.25	KR	MRW
F	SO plots indicated, potential future connection arm removed	23.06.25	MRW	KR

Land East of Axminster

Drawing: PL-03 AC-02 Schedule of Accommodation — Revision F

Housetype	No's	Sq.ft	Sq.m	Storeys	Bedrooms	Total Sq.Ft
Open Market						
Addlebrough	18	779	72	2	2	14,022
Sherwood	11	968	90	2	3	10,648
Galloway	12	996	93	2	3	11,952
Chandale	5	1059	98	2	3	5,295
Barndale	9	1060	98	2	3	9,540
Rivington	3	1096	102	2	4	3,288
Cambridge	5	1377	128	2	4	6,885
Market Sub-total	63					61,630
Affordable Rent						
1B Mais	4	695	65	1	1	2,781
Wareham	7	859	80	2	2	6,013
Rendlesham	4	919	85	2	3	3,676
AR sub-total	15					12,470
Shared Ownership						
Wareham	2	859	80	2	2	1,718
Rendlesham	4	919	85	2	3	3,676
SO sub-total	6					5,394
Affordable sub-total	21	25.0%				17864
Total Dwellings	84				Total sq.ft	79,494
Gross Site Area			11.62 acres			4.70 ha
Net Site Area			5.37 acres			2.17 ha

KEY

- Application Boundary
- Affordable Rent Housing
- Shared Ownership Housing
- Fence 1.8 Closeboard
- Wall 1.8m Screen Brick
- Block Paving Marshalls Tegula 240 gauge Pennant Grey or similar approved
- External Recycling Bins Store
- 1.8m x 1.8m patio (600 sq. paving slabs)
- S/S Sub Station with 10m offset

N

Project
Land East of Lyme Road
Axminster

Drawing Title
Planning Layout

Date	Scale	Drawn by	Check by
15.01.25	1:500 @ A0	BE	MRW

Project No.	Drawing No	Revision
333101454	PL-03	F

Stantec
Stantec UK Limited
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stantec.com/uk

Appendix B Topographical Survey

ABBREVIATIONS

(A)	Approximate	Ea	Earth	IC	Inspection Cover	SL	Soffit Level
Ave	Average	EC	Electricity Cable Outlet	IL	Invert Level	SN	Sign
(AR)	Assumed Route	EIC	Electricity Inspection Chamber	KO	Kerb Outlet	SP	Soil Down Pipe
BB	Bottom Bank	EL	Eaves Level	LB	Letter Box	Sub	Substation
BBn	Belisha Beacon	EM	Electricity Meter	Ldr	Ladder	SV	Stop Valve
BD	Bollard	EP	Electricity Pole	LP	Lamp Post	SVMK	Stop Valve Marker
Bin	Litter Bin	ER	Earthing Rod	MH	Manhole	SVP	Soil Vent Pipe
Bldg	Building	ETL	Electricity Transmission Lines	MK	Marker	SWIC	Storm Water Inspection Chamber
BL	Bed Level	FB	Footbridge	Mon	Monument	SY	Stay
BTIC	BT Inspection Chamber	FD	French Drain	NB	Notice Board	Tac	Tactile Paving
Cab	Cabinet	FEsc	Fire Escape	o/h	Overhead	Tar	Tarmac
CE	Cable TV Entry Point	FH	Fire Hydrant	o/l	Outline of	TB	Top of Bank
CEK	Concrete Edging Kerb	FHMK	Fire Hydrant Marker	Pav	Paviors	TCB	Telephone Call Box
CI	Cable Into Ground	FL	Floor Level	PGM	Permanent Ground Marker	TL	Threshold Level
CL	Cover Level	Flb	Flower Bed	PI	Pipe Into Ground	TLt	Traffic Light
CM	Cable Marker	Flp	Flag Pole	PKN	Parker Kalon Nail	TP	Telegraph pole
Col	Column	Flt	Floodlight	PM	Parking Meter	TPS	Textured Paving Slabs
Conc	Concrete	FP	Footpath	(R)	Records	TS	Tree Stump
CP	Concrete Post	FWIC	Foul Water Inspection Chamber	RE	Rodding Eye	TTL	Telephone Transmission Line
CPS	Concrete Paving Slabs	Gbn	Gabions	RGL	Ridge Level	u/g	Underground
CT	Cable TV IC	GM	Gas Meter	RL	Roof Level	UTR	Unable To Raise
D	Duct	GMK	Gas Marker	RS	Road Sign	Veg	Vegetation
d	Depth	GP	Gate Post	RSJ	Reinforced Steel Joist	VP	Vent Pipe
DF	Drinking Fountain	Gr	Grass	Rub	Rubble	VT	Vent
Dil	Dilapidated	GT	Grease Trap	RWC	Rain Water Channel	WL	Water Level
DK	Drop Kerb	GV	Gas Valve	SA	Soakaway	WM	Water Meter
DM	Duct Marker	Gvl	Gravel	SB	Sign Board	WMK	Water Meter Marker
DP	Rainwater Down Pipe	GY	Gully	SD	Slot Drain	WO	Wash Out
		h	Height	SEK	Stone Edging Kerb	WP	Wooden Peg
		Hc	Hardcore	Shb	Shrub Bed	WT	Water Tap

Fences

AI	Angle Iron
CP	Concrete Post
MP	Metal Post
WP	Wooden Post
Bar	Barrier
BWF	Barbed Wire Fence
CB	Crash Barrier
CBF	Close Boarded Fence
ChP	Chestnut Paling
CIF	Corrugated Iron Fence
CLF	Chain Link Fence
EF	Electric Fence
IRF	Iron Railed Fence
IWF	InterWoven Fence
MHR	Metal Hand Rail
MPR	Metal Post & Rail Fence
Pa	Closed Panel
Pal	Pallisade
RF	Railed Fence
Sec	Security Fence
Tr	Trellis Fence
WMF	Wire Mesh Fence
WPR	Wooden Post & Rail Fence

Walls

BL	Block	RW	Retaining Wall
B	Brick	W	Wall
C	Concrete		
S	Stone		

LEVEL INFORMATION

Heights in Metres

Co-ordinate System: Best fit to previous Hydrock survey ref. C14487-D001A (shown in grey). GPS controlled (OSGB36-02)

SECTOR LANE CONTROL CO-ORDINATES

Station	Easting	Northing	Level
ST50	330598.334	98255.590	80.739
ST51	330628.622	98236.886	82.682
ST52	330645.483	98223.622	83.632
ST53	330667.307	98204.861	83.792
ST54	330688.273	98189.753	82.835
ST60	330705.003	98181.594	83.707
ST61	330737.336	98139.845	81.317
ST62	330788.834	98111.718	75.852
ST63	330920.095	98088.822	62.988
ST64	331005.432	98106.577	60.978

Rev.	Date	Amendments
A	20-08-18	Additional survey added south of Sector Lane

Drawing Number: PLS180141

Revision: A

Scale: 1:500

Survey Date: 02/08/2018

Sheet: 1:500

Drawn: JH

Checked: JH

CLIENT:
PERSIMMON HOMES
SOUTH WEST
MALLARD ROAD
SOWTON TRADING ESTATE
EXETER

TITLE:
AXMINSTER TOPOGRAPHICAL
SURVEY EXTENSION
SHEET 3 - LAND SOUTH OF SECTOR LANE

PRECISION LAND SURVEYS
3 Killams Close
Taunton
Somerset
TA1 3LD
Tel: 07769 268612
E-Mail: info@precisionlandsurveys.co.uk

Appendix C Ground Investigation Extracts

Hamson Barron Smith

HBS

Land East of Axminster
East Devon
Ground Investigation Report

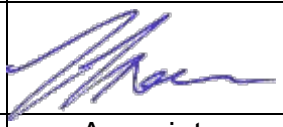
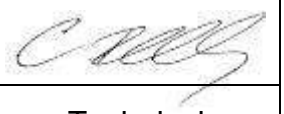
On behalf of Persimmon Homes South West

Report 23-20-19-1-6074/GIR1

November 2018

Report Issue Record

Project No.:	23-20-19-1-6074
Project Title:	Land East of Axminster
Site Location:	East Devon
Client:	Persimmon Homes South West
Report Title:	Ground Investigation Report
Issue Date:	20th November 2018
Report No.:	23-20-19-1-6074/GIR1
Revision:	-

Prepared by	Written	Reviewed	Approved
Name	**Alastair Hinchliffe**	**Tim Thornburn**	**Craig Roberts**
Signature			
Position	Graduate Geotechnical Engineer	Associate Geotechnical Engineer	Technical Director
Contact Details	01392 351212	01392 351208	07530 737462

Contents

Appendices

Executive Summary

SITE INFORMATION	
Client	Persimmon Homes South West.
Site	Land East of Axminster (Northern Site, Central Site and Southern Site).
Location	Axminster, East Devon. NGR SY306996 (entrance to Northern Site), SY308988 (entrance to Southern Site) and SY306978 (entrance to Southern Site).
Approximate area	Northern Site 7.9Ha Central Site 12.6Ha Southern Site 4.3Ha
Topography	The Northern Site generally slopes moderately to steeply downward toward the north / north-west with elevations ranging from approximately 61m OD in the south east to 36m OD in the north west Nearby electrical overhead posts were at a slanted angle suggesting mass movement of soils has been / is occurring. The Central Site generally slopes toward the north / north-east with a flatter lying plateau towards the west of the site with elevations ranging from approximately 85.00 – 53.00m AOD. Two raised mounds are present on site and were discovered to be a result of landfilling. The Southern Site generally slopes toward the north / north-east with elevations ranging from approximately 104.00 – 64.00m AOD. Evidence of creep / surface soil movement was uncovered in several of the trial pits in this part of the site.
Current land use	Undeveloped agricultural land.
Proposed development	Industrial in Northern Site, low rise residential in Southern Site, mixed residential, industrial, retail and education in Central Site.

SITE SETTING	
Geology	Superficial river terrace deposits over Blue Lias and Charmouth Mudstone Formations (limestone and mudstone).
Hydrogeology	Secondary A aquifer and unproductive strata. The site does not lie in a source protection zone.
Hydrology	Secondary water course runs along the northern boundary of the Northern Site, turning to a tertiary watercourse as it continues along the north eastern boundary of the Central Site. No surface water in vicinity of Southern Parcel.

History	The Northern Site has remained relatively unchanged overtime with the additions of small farm tracks and build-up of surrounding infrastructure including the Millwey Industrial Estate to the south. The Central Site has remained relatively unchanged overtime with the additions of farm buildings, tracks and ground workings (likely landfill pit) appearing on the 1959-1960 OS plan. The Southern Site has remained relatively unchanged overtime with the additions of small farm tracks and build-up of surrounding infrastructure.

INVESTIGATION	
Previous site investigations	'Ground Conditions Desk Study Report' by Hydrock Consultants Ltd (ref R/14487/001 – Issue 2) dated 20th January 2015.
This site Investigation	51 machine excavated trial pits. 23 windowless sampler and dynamic probe boreholes. 9 full scale soakaway tests in selected trial pits.
Monitoring	12 groundwater / gas monitoring well installations. One gas monitoring visit undertaken at issue of this report.
Ground conditions	Topsoil over firm and stiff clay over Central and Southern Sites, sand and gravel in Northern Site. Area of soft clay in southern corner of Southern Site. Made Ground of old landfills in Central Site. Groundwater levels recorded between 0.69m and 2.40m bgl during monitoring in October 2018.

GEOTECHNICAL	
Foundations	Shallow foundations suitable over majority of the three sites, with either piled foundations or earthworks and reinforced shallow foundations in area of soft soil in Southern Site and deep landfill in Central Site.
Shrinkable soils	Soils are shrinkable and of high volume change potential.
Buried concrete	DS1 & AC1. GEN1 for buried mass concrete.
Floor slabs	Suspended floors recommended on clay soils unless negligible risk of desiccation. Ground bearing floor slabs suitable in Northern Site.
Gas protection	No gas or radon protection measures required based on current monitoring. Further monitoring may be requested by LPA or Warranty Provider to confirm.
Slope stability	Gradients over majority of the sites are considered stable but careful assessment of changes of elevation or construction near existing slopes would still be needed. Evidence of soil movement was identified in the eastern part of the Southern Site. Careful assessment of proposed loadings / cuttings and changes to geometry and drainage would be required in this area.
Pavement	Design CBR generally 2.5%. Less than 1% in soft area in Southern Site. 5% in Northern Site.

Soakaways	Underlying geology proven unsuitable for soakaway drainage except in western part of Northern Site. Infiltration rates recorded of 2.1 and 2.3 x 10^{-5}m/s in this area.
Natural cavities	None expected.
Mining	None expected.

CONTAMINATION	
Human health	Heavy metals present in the localised landfill impacted area of the Central site poses a risk to future users. No significant risks identified in remainder of the sites.
Controlled waters	Waste within the landfill impacted area of the Central site has the potential to pose a risk to groundwater. Further works are required to quantify risks in this localised area. No other risks to controlled waters identified.
Water supply pipes	It is expected that standard pipework will be suitable for the majority of the site, with the exception of the landfilling areas in the Central site, here barrier pipe may be required, subject to confirmation with water supply company
Remediation	Subject to the findings of the groundwater risk assessment, remedial works to protecting future users from coming into direct contact with the materials in the landfill are required. We would envisage, at this stage, that a cover system, comprising placement of 600mm thick cover would be a viable solution.

1 Introduction

In September 2018 Hamson Barron Smith Ltd (HBS) was commissioned by Persimmon Homes South West (Persimmon) to undertake a ground investigation at Land East of Axminster, East Devon.

The site comprises three separate parcels / sites, herein referred to as 'Northern Site', 'Central Site' and 'Southern Site'. The location of the site is shown on Figure 1 and a site topographic survey is included in Appendix A.

A proposed masterplan for the area was provided by Persimmon 18-0241 Dated 9th February 2018 by Pegasus Design and is presented in Appendix B. This shows the Southern Site to be designated for residential development, the Northern Site to be a mix of employment and the Central Site to be residential, employment, retail and a school.

This report describes the work undertaken and presents the data obtained together with an evaluation of their significance in relation to the proposed works.

1.1 Project Requirements and Scope of Works

The objectives of the investigation were to:

- Establish the environmental setting, including sensitivity in relation to human health, surface water, groundwater and ecological receptors.
- Develop a ground model for the site.
- Quantitatively assess the potential nature and extent of contamination from those uses and the environmental risks and liabilities which may be posed to the identified receptors (human health and the environment).
- Assess any potential geotechnical risks.
- Provide geotechnical recommendations to assist in construction design.

To address these objectives Hamson Barron Smith proposed the following scope of works:

- An intrusive ground investigation consisting of dynamic probe and windowless sampler boreholes, trial pits, soakage testing, groundwater and gas monitoring and laboratory chemical and geotechnical testing.
- Reporting on findings of the ground investigation and presentation of results.
- Geotechnical recommendations in relation to the proposed development.
- Geo-environmental assessment and interpretation of the ground, ground gas and groundwater conditions.

1.2 Previous Investigations

A Preliminary 'Ground Conditions Desk Study Report' (Phase 1) for the site has been undertaken by Hydrock Consultants Ltd in January 2015 (report reference R/14487/001 – Issue 2).

2 Site Location

The three parcels are located approximately 1 – 1.5km to the east of Axminster, East Devon as shown on Figure 1.

Grid References: NGR SY306996 (entrance to Northern Site), SY308988 (entrance to Southern Site) and SY306978 (entrance to Southern Site).

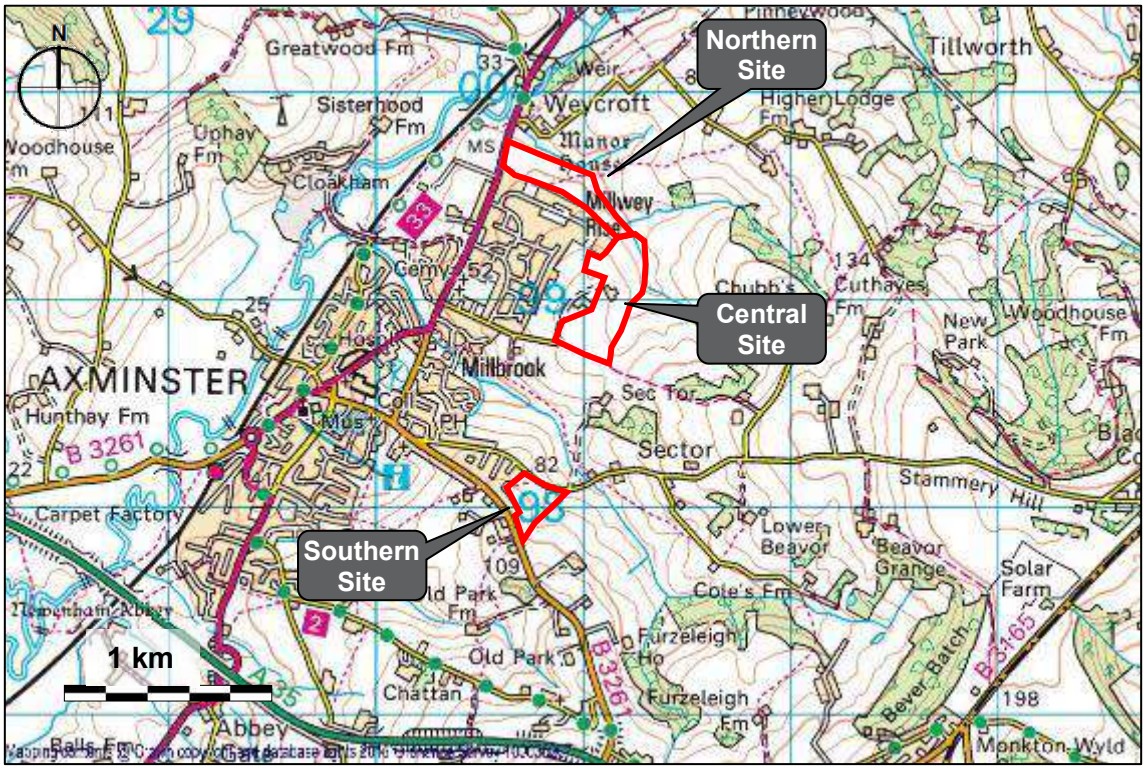


Figure 1 Site Location Plan

5 Ground Investigation

The intrusive investigation was proposed by Hamson Barron Smith. A number of minor geotechnical and environmental risks were flagged up prior to the ground investigation. The positions of the exploratory holes were intended to target specific features identified as potential areas of concern as well as to provide a reasonable coverage of the site for an assessment of general site ground conditions. Therefore, both targeted and random exploratory holes were proposed to include possible areas of infilling and superficial deposits / landslide deposits.

The intrusive works comprised the following:

- 51no. machine excavated trial pits.
- 9no. BRE soakaway tests.
- 23no. windowless sampler boreholes.
- Dynamic probe holes undertaken adjacent to each borehole (with exception to WS7 due to landfill content).
- Installation of 12 groundwater / ground gas monitoring wells.

In additional HBS was commissioned to undertake one round of ground gas monitoring

The procedures followed in this site investigation are based on BS 5930:1999 + Annex 2:2010 - Code of Practice for Site Investigations. The soils and rocks encountered have been described in accordance with BS5930:1999 + Annex 2:2010 and BS EN ISO 14688-1:2002 and BS EN ISO 14689-1:2003.

The approximate positions of the exploratory holes are shown on the Exploratory Hole Location Plans in Appendix C and the exploratory hole records are included in Appendix D.

5.1 Windowless Sampler Boreholes

Twenty three boreholes (WS1-WS23) were formed to depths of between 0.80m and 6.00m on various dates in September 2018 using windowless sampling techniques in

order to obtain samples for laboratory testing and to provide geotechnical information for foundation design.

Representative disturbed small (1kg) and environmental (identified on the borehole logs as D and ES) samples of the soils encountered were obtained at regular intervals.

Standard Penetration Tests (SPTs) were carried out at metre intervals using either a split spoon sampler or a solid 60° cone. The results of these tests are given as a Standard Penetration "N" value or as a blow count for a given penetration on the borehole logs.

Twelve of the boreholes were completed as groundwater / gas monitoring wells. The remaining boreholes were backfilled with arisings.

A detailed description of all strata and groundwater encountered, samples, in situ tests and other pertinent information observed are included on the borehole logs in Appendix D.

5.2 Dynamic Probing

Twenty two dynamic probes (DP1 to DP23 – no DP7 due to landfill) were undertaken adjacent to the corresponding windowless sampler boreholes using super-heavy dynamic probe equipment. The dynamic probe apparatus conforms to BS 1377 (1990) Part 9 and effectively drives a 90° (sacrificial) cone into the ground using a 63.5kg automatic trip hammer falling over 750mm. The number of blows required to achieve increments of 100mm penetration is recorded and plotted graphically on the records, which are presented in Appendix D.

5.3 Trial Pits

Fifty one trial pits (numbered TP01 to TP51) were excavated to depths varying between 0.85m and 3.90m below ground level (bgl) on various dates in August and September 2018 using a tracked excavator.

The profiles of strata or other features were recorded as excavation proceeded and measurements taken from ground level. Representative samples were taken, where appropriate, for laboratory analysis. In situ hand shear vane tests were also carried out

in suitable strata. Detailed descriptions of the strata encountered, groundwater observations and excavation stability notes, together with any other pertinent information observed, are included on the trial pit records, which are included in Appendix D.

5.4 Infiltration Testing

In order to determine the permeability of the ground to assess the suitability of soakaways for drainage at the site, infiltration testing was undertaken in nine trial pits (TP01, TP10, TP11, TP20, TP21, TP29, TP30, TP41 and TP42) in August and September 2018. Each pit was partially filled with water with the rate of dissipation was monitored to obtain a plot of water level over time.

The results of the infiltration testing are presented in Appendix E.

5.5 Installations

Gas / Groundwater monitoring wells were installed in twelve boreholes on completion, as detailed in Table 1. The wells were designed to allow monitoring of ground gases and shallow groundwater. The response zone comprised slotted pipe with a 10mm inert gravel surround. The strata above the response zone were sealed with bentonite. All remaining exploratory holes were backfilled with arisings and the ground surface reinstated. The ground gas / water monitoring results are included in Appendix H.

Table 1 Summary of Monitoring Installations

Site	Hole	Base (m bgl)	Dia. (mm)	Response Zone (m bgl)	Headworks
C	WS3	2.60	50	1.00 to 2.60	Gas valve, flush locked cover
C	WS7	4.00	50	1.00 to 4.00	Gas valve, flush locked cover
C	WS8	4.00	50	1.00 to 4.00	Gas valve, flush locked cover
C	WS9	2.00	50	1.00 to 2.00	Gas valve, flush locked cover
C	WS10	2.00	50	1.00 to 2.00	Gas valve, flush locked cover
C	WS12	2.30	50	1.00 to 2.30	Gas valve, flush locked cover
S	WS13	3.00	50	1.00 to 3.00	Gas valve, flush locked cover
S	WS17	4.00	50	1.00 to 4.00	Gas valve, flush locked cover
S	WS18	3.00	50	1.00 to 3.00	Gas valve, flush locked cover
N	WS20	5.00	50	1.00 to 5.00	Gas valve, flush locked cover
N	WS21	3.00	50	1.00 to 3.00	Gas valve, flush locked cover
N	WS23	2.80	50	1.00 to 2.80	Gas valve, flush locked cover

Generally the western half of the Northern Site recorded sands and gravels (river terrace deposits) overlying the clays / bedrock of the Blue Lias / Charmouth Mudstone Formations. The Central and Southern Sites recorded more cohesive superficial deposits including silts and clays but with some sands and gravels which correlated with the BGS record for Head Deposits within these areas.

The superficial deposits and weathered bedrock had in some areas similar proprieties. For the purpose of the report and as a general assumption HBS has classified soils that were not dark in colour or did not contain remnant rock structure to be superficial deposits. Depths varied from 0.15 to 4.70m bgl across the sites.

7.6 Blue Lias / Charmouth Mudstone Formation

The Made Ground and superficial deposits were underlain by the solid geology of the Blue Lias / Charmouth Mudstone Formation. This material varied from highly / completely weathered mudstones (clays) to limestone bedrock. Depths of material ranged from 0.55 to >6.00m bgl.

7.7 Groundwater

Groundwater was encountered in TP6, TP17, TP18 and TP39 at depths ranging from 0.60m to 1.40m bgl. Inflow rates were recorded as seepages.

Twelve installations were emplaced into a selection of boreholes for further ground water / gas monitoring. On a separate monitoring visit carried out on 19th October 2018 groundwater was recorded in several of the installations at depths of between 0.69 and 2.40m bgl as shown on the monitoring results in Appendix H.

7.8 Field Observations of Contamination

No visual or olfactory evidence of contamination was encountered within the natural soils. The Made Ground contained frequent miscellaneous waste including glass, wood, metal, clinker, masonry, bones etc.

7.9 Shrinkable Soils

Cohesive soils (clay and silt) may undergo volume change when subject to changes in moisture content. This can cause ground movement of soils where seasonal changes

WS17. The water levels may well represent perched water seeping into the installation rather than the water table itself.

The low permeability of the natural clay strata is likely to result in very low inflow rates and it is considered that groundwater control can be achieved by pumping.

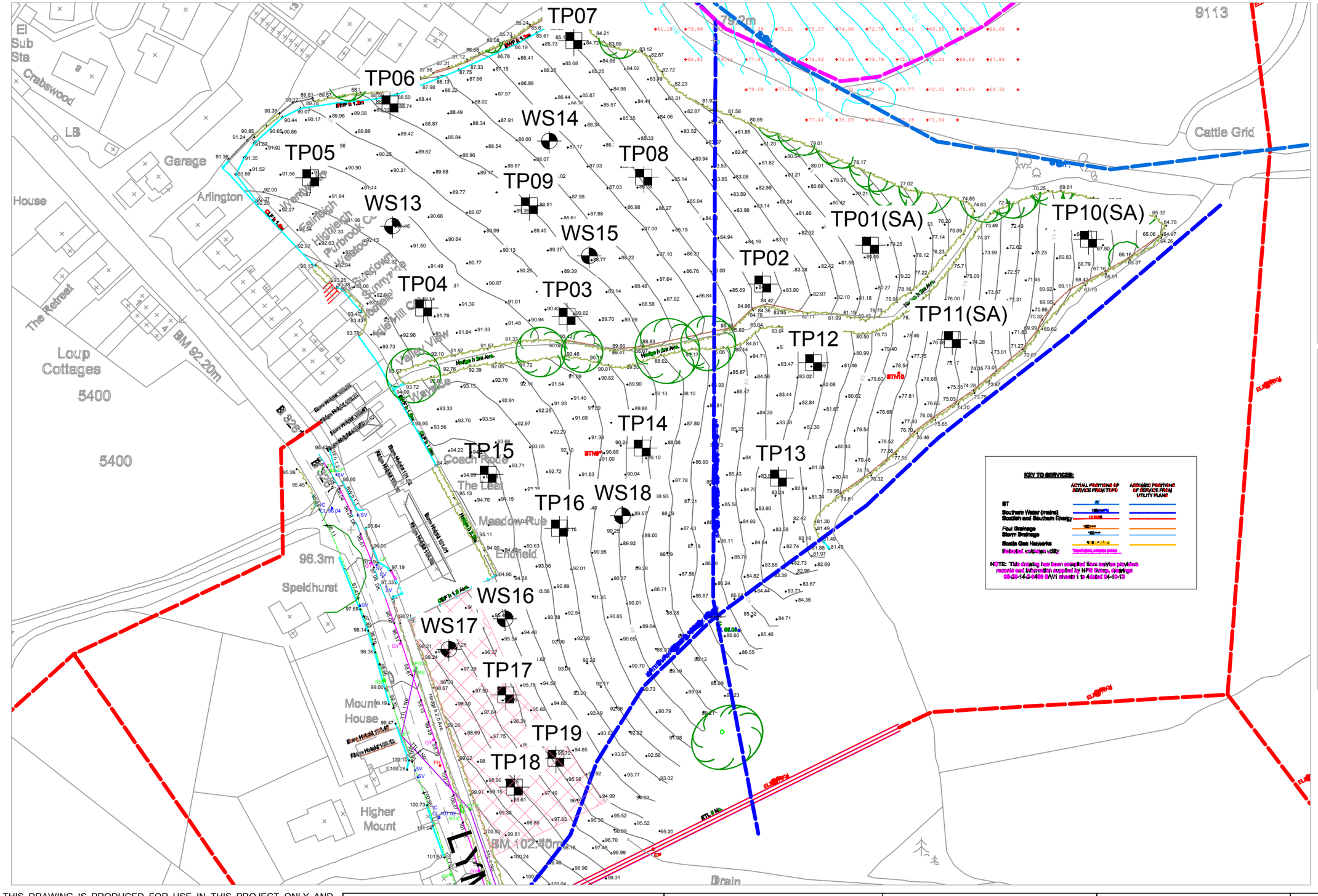
8.10 Soakaway Drainage

Infiltration testing was undertaken in accordance with BRE 365 (2016) in nine locations (TP01, TP10, TP11, TP20, TP21, TP29, TP30, TP41 and TP42).

Within the Northern Site one location (TP20) achieved two full cycles, giving infiltration rates of 2.1 x 10^{-5}m/s and 2.4 x 10^{-5}m/s.

Within the central and southern sites none of the pits drained sufficiently to allow the calculation of an infiltration rate. However, the very low dissipation of water would suggest infiltrations rates are likely to be less than 1x10^{-6}m/s and therefore efficient soakaway drainage is unlikely to be feasible.

The results of the infiltration testing are presented in Appendix E.



KEY

TP11	TRIAL PIT
TP01(SA)	TRIAL PIT WITH SOAKAGE TEST
WS1	WINDOWLESS SAMPLER / DYNAMIC PROBE BOREHOLE
	CONJECTURED AREA OF SOFT GROUND

NOTES

Drawing edited from Topographic Survey (Axminster Land Survey) DWG No. 14487-D001Sh1/2/7 Rev A) drawn by Hydrock Consultants Ltd dated 15/6/18.

Ground investigation was carried out over several dates ranging from August to September 2018.

Conjectured Area of Soft Ground extent based on exploratory hole data, topographical changes and aerial imagery.

ORIGINAL SHEET SIZE **A3**

REV	DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
P1	AH	SEP18				

FIRST ISSUE

CLIENT: PERSIMMON HOMES

PROJECT: LAND EAST OF AXMINSTER, DEVON

TITLE: EXPLORATORY HOLE LOCATION & FOUNDATION ZONE PLAN (SHEET 3 OF 3)

Hamson Barron Smith
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Venture House, 1 Capital Court, Sowton Industrial Estate, Exeter, Devon, EX2 7FW,
Tel: 01392 351000; **Email**: office@hamsonbarronsmith.com

SCALES	DISCIPLINE	PROJECT NUMBER
1:1250	GEO	19-1-6074

DRAWING NUMBER	REV CODE
HBS-DR-G-(00)-003	P 1

STATUS CODE	PURPOSE OF ISSUE	DRAWN
S2	PRELIMINARY	AH

File Path: F:\01 Projects\Engineering\2019\20-Exeter\23-20-19-1-6074 - East of Axminster\01_Project Documents\06_Drawings\Exp Hole Plans\23-20-19-1-6074 - East of Axminster Expl Hole Loc Plan.dwg, Saved: 14 November 2018 12:07:05, By: Hinchliffe, Alastair

Date Plotted: 14 November 2018 12:09:36

Appendix E

Infiltration Test Results

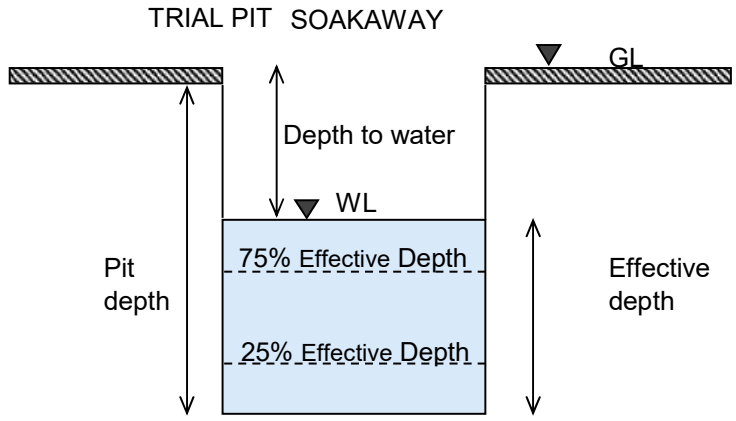
IN SITU TESTING - Soakaway Test

Hamson Barron Smith

Project: **Land East of Axminster, Devon**
Project No: **23-20-19-1-6074**
Client: **Persimmon Homes Severn Valley**

Test Location : **TP01-SA**
Test No : **1**
Date : **31/08/18**

ELAPSED TIME (minutes)	DEPTH to water below ground level (m)	HEAD (m)	HEAD (% effective depth)
0	1.30	0.45	100
15	1.30	0.45	100
45	1.30	0.45	100
75	1.30	0.45	100
120	1.30	0.45	100
165	1.30	0.45	100



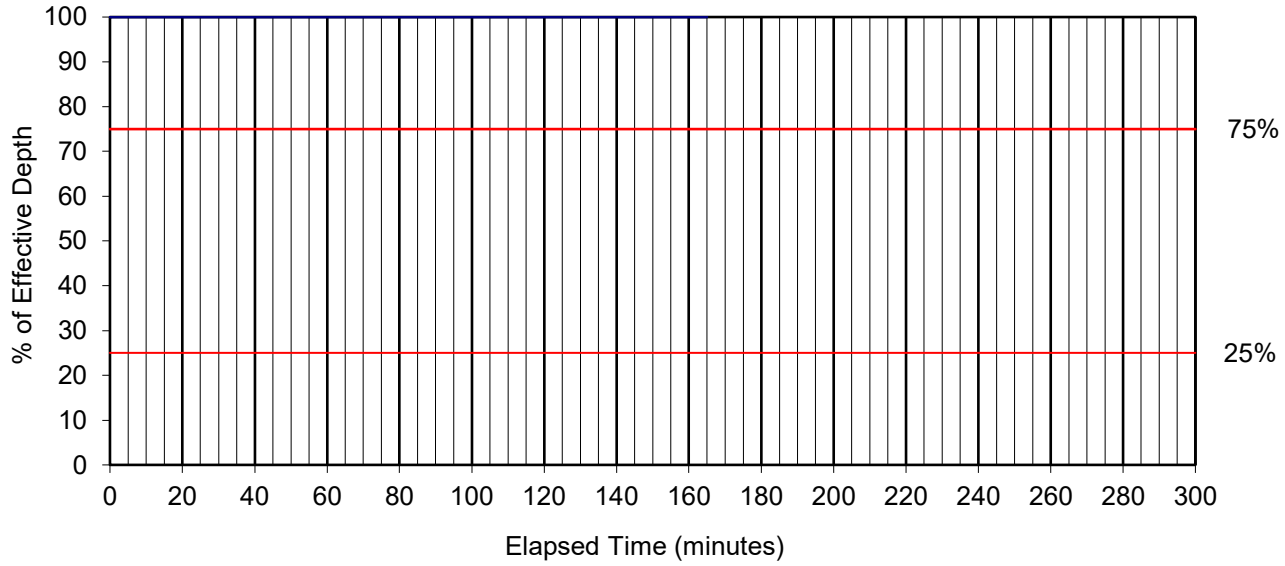
Trial Pit Length	=	3.10 m
Trial Pit Width	=	0.55 m
Trial Pit Depth	=	1.75 m
Effective depth (Head of Water)	=	0.45 m

	% of effective depth 75%	25%	
Depth	1.41	1.64	m bgl
Head	0.34	0.11	m
Time	-	-	minutes

V_{p75-25}	=	0.38	m^3
a_{p50}	=	3.35	m^2
t_{p75-25}	=	-	min

t_{p75}	=	-	minutes
t_{p25}	=	-	minutes

Soil Infiltration rate, *f* **=** **-** **m/sec**
- **mm/hr**



Remarks:

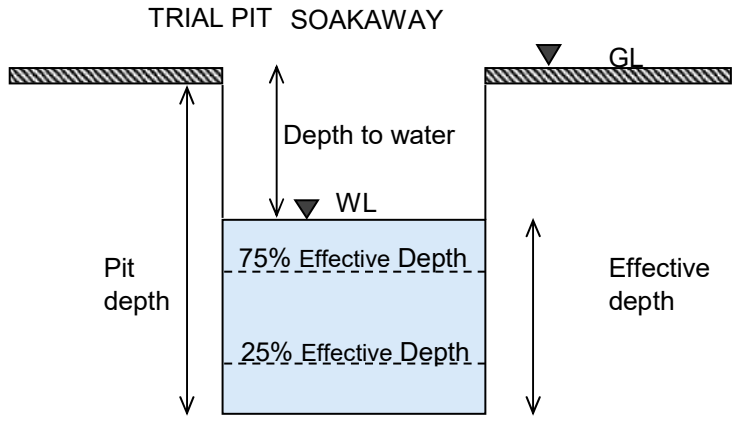
IN SITU TESTING - Soakaway Test

Hamson Barron Smith

Project: **Land East of Axminster, Devon**
Project No: **23-20-19-1-6074**
Client: **Persimmon Homes Severn Valley**

Test Location : **TP10-SA**
Test No : **1**
Date : **04/09/18**

ELAPSED TIME (minutes)	DEPTH to water below ground level (m)	HEAD (m)	HEAD (% effective depth)
0	0.78	1.22	100
29	0.78	1.22	100
60	0.78	1.22	100
88	0.78	1.22	100
119	0.78	1.22	100
153	0.78	1.22	100
177	0.78	1.22	100



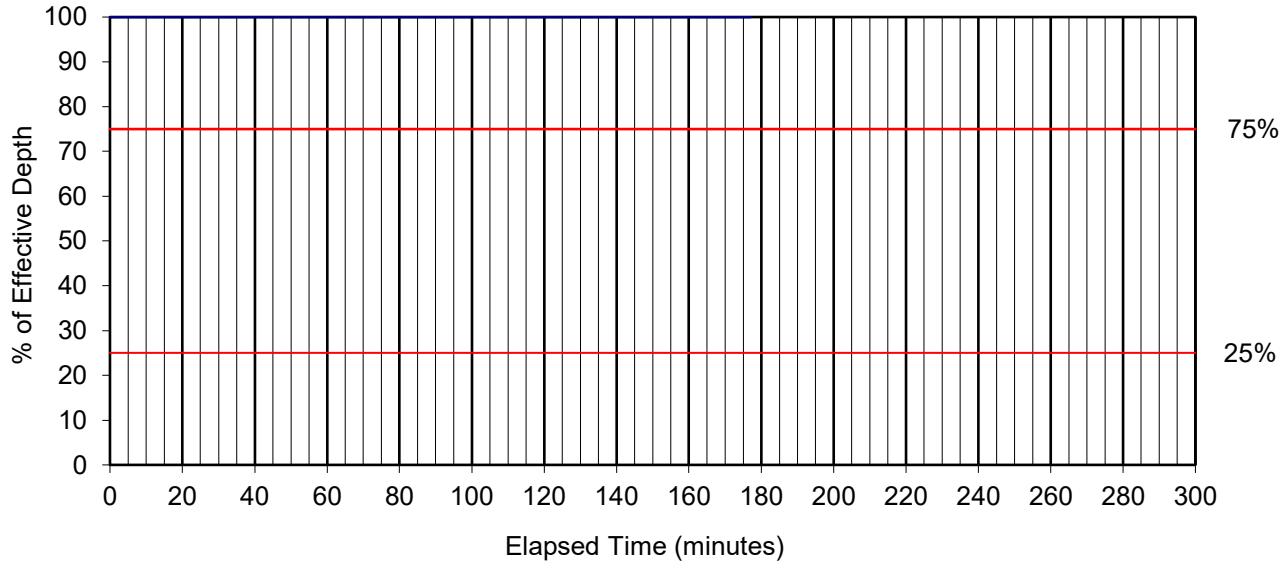
Trial Pit Length	=	1.70 m
Trial Pit Width	=	0.60 m
Trial Pit Depth	=	2.00 m
Effective depth (Head of Water)	=	1.22 m

	% of effective depth 75%	25%	
Depth	1.09	1.70	m bgl
Head	0.92	0.31	m
Time	-	-	minutes

V_{p75-25}	=	0.62	m^3
a_{p50}	=	3.83	m^2
t_{p75-25}	=	-	min

t_{p75}	=	-	minutes
t_{p25}	=	-	minutes

Soil Infiltration rate, *f* **=** **-** **m/sec**
- **mm/hr**



Remarks:

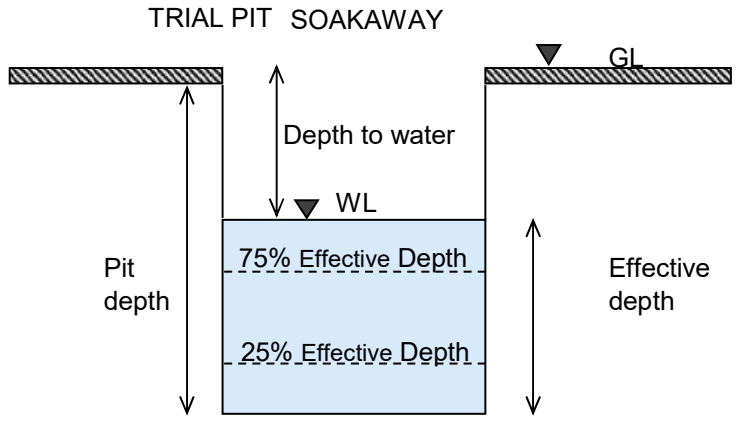
IN SITU TESTING - Soakaway Test

Hamson Barron Smith

Project: **Land East of Axminster, Devon**
Project No: **23-20-19-1-6074**
Client: **Persimmon Homes Severn Valley**

Test Location : **TP11-SA**
Test No : **1**
Date : **04/09/18**

ELAPSED TIME (minutes)	DEPTH to water below ground level (m)	HEAD (m)	HEAD (% effective depth)
0	0.87	1.23	100
29	0.87	1.23	100
60	0.87	1.23	100
87	0.87	1.23	100
119	0.87	1.23	100
153	0.87	1.23	100
177	0.87	1.23	100



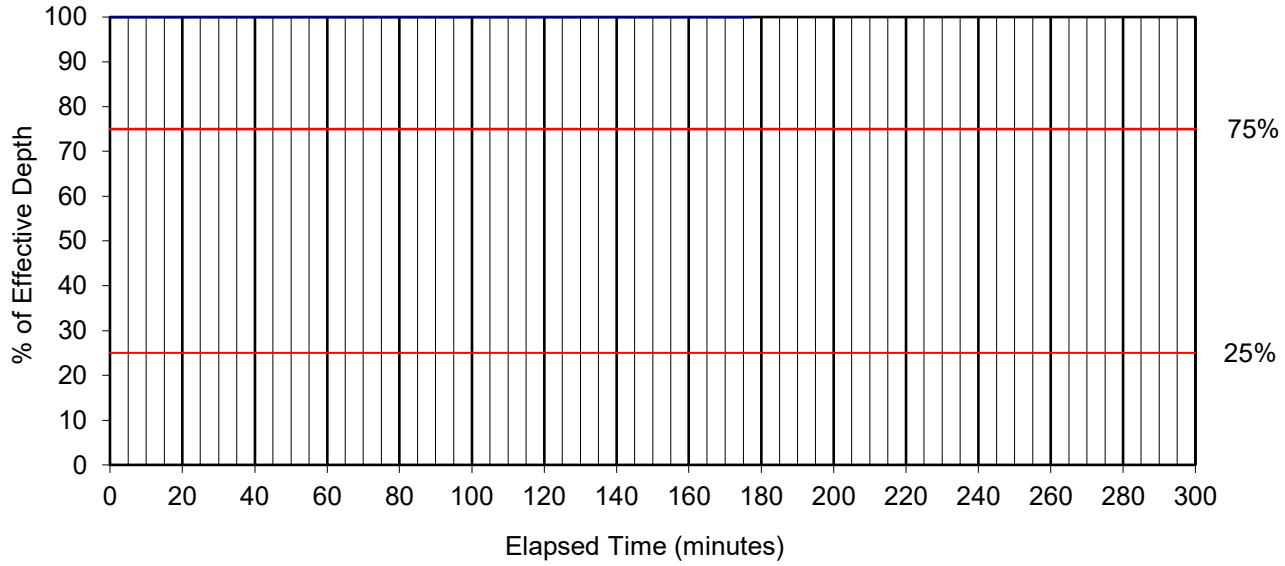
Trial Pit Length	=	1.70	m
Trial Pit Width	=	0.55	m
Trial Pit Depth	=	2.10	m
Effective depth (Head of Water)	=	1.23	m

	% of effective depth 75%	25%	
Depth	1.18	1.79	m bgl
Head	0.92	0.31	m
Time	-	-	minutes

V_{p75-25}	=	0.58	m^3
a_{p50}	=	3.70	m^2
t_{p75-25}	=	-	min

t_{p75}	=	-	minutes
t_{p25}	=	-	minutes

Soil Infiltration rate, *f* **=** **-** **m/sec**
- **mm/hr**



Remarks:

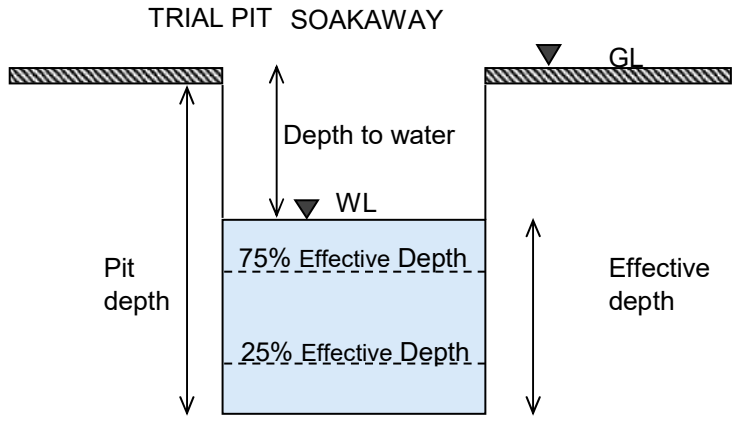
IN SITU TESTING - Soakaway Test

Hamson Barron Smith

Project: **Land East of Axminster, Devon**
Project No: **23-20-19-1-6074**
Client: **Persimmon Homes Severn Valley**

Test Location : **TP20-SA**
Test No : **1**
Date : **05/09/18**

ELAPSED TIME (minutes)	DEPTH to water below ground level (m)	HEAD (m)	HEAD (% effective depth)
0	0.85	1.45	100
4	1.00	1.30	90
6	1.05	1.25	86
8	1.09	1.21	83
10	1.13	1.17	81
12	1.15	1.15	79
14	1.18	1.12	77
16	1.20	1.10	76
18	1.23	1.07	74
23	1.29	1.01	70
28	1.34	0.96	66
38	1.44	0.86	59
48	1.50	0.80	55
58	1.59	0.71	49
68	1.65	0.65	45
78	1.70	0.60	41
88	1.74	0.56	39
98	1.80	0.50	34
108	1.84	0.46	32
118	1.87	0.43	30
138	1.94	0.36	25
143	1.96	0.35	24



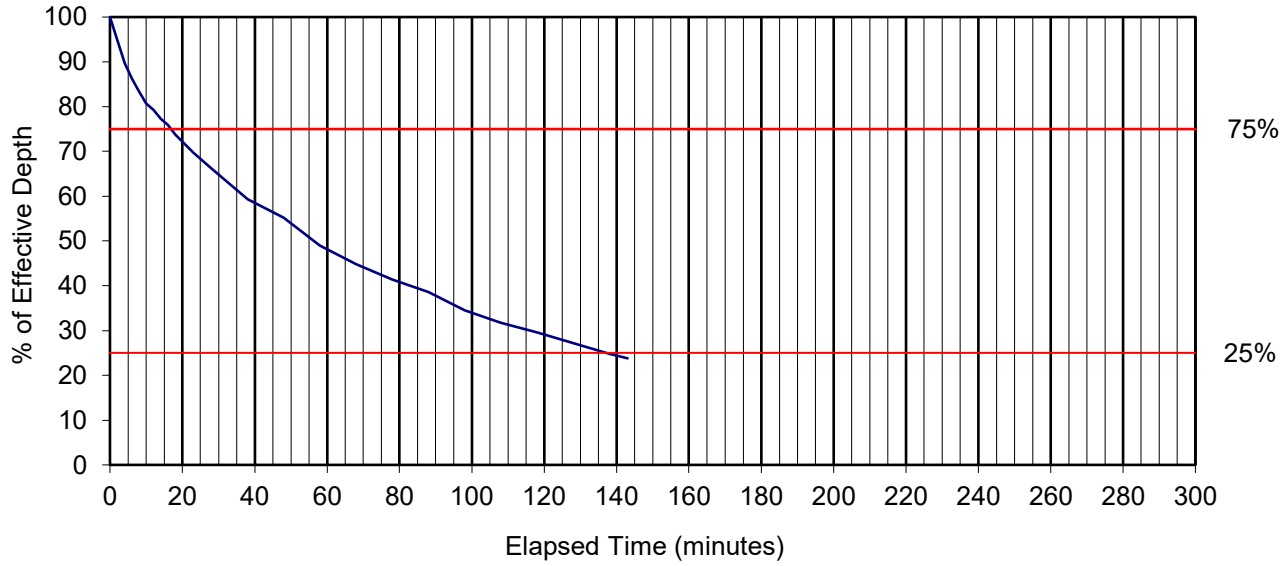
Trial Pit Length	=	1.60 m
Trial Pit Width	=	0.60 m
Trial Pit Depth	=	2.30 m
Effective depth (Head of Water)	=	1.45 m

	% of effective depth 75%	25%	
Depth	1.21	1.94	m bgl
Head	1.09	0.36	m
Time	17	138	minutes

V_{p75-25}	=	0.70	m^3
a_{p50}	=	4.15	m^2
t_{p75-25}	=	121	min

t_{p75}	=	17	minutes
t_{p25}	=	138	minutes

Soil Infiltration rate, *f* = **2.3E-05 m/sec**
83 mm/hr



Remarks:

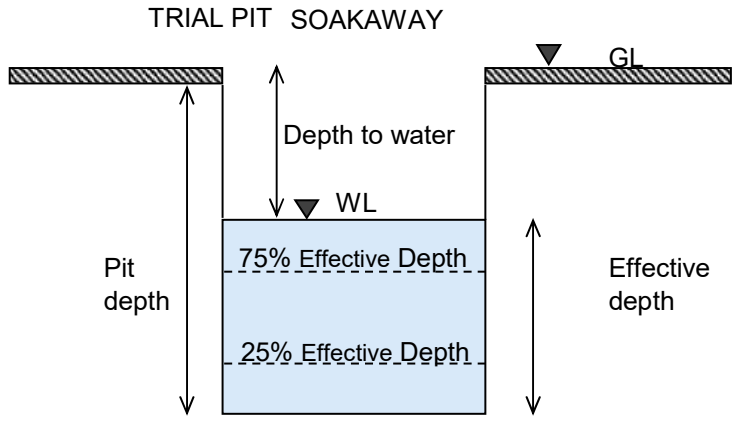
IN SITU TESTING - Soakaway Test

Hamson Barron Smith

Project: **Land East of Axminster, Devon**
Project No: **23-20-19-1-6074**
Client: **Persimmon Homes Severn Valley**

Test Location : **TP20-SA**
Test No : **2**
Date : **05/09/18**

ELAPSED TIME (minutes)	DEPTH to water below ground level (m)	HEAD (m)	HEAD (% effective depth)
0	1.01	1.29	100
1	1.03	1.27	98
2	1.05	1.26	97
3	1.06	1.25	97
4	1.07	1.23	95
5	1.08	1.22	95
10	1.12	1.18	91
19	1.21	1.09	84
29	1.30	1.00	78
31	1.33	0.97	75
44	1.41	0.89	69
59	1.50	0.80	62
74	1.58	0.72	56
89	1.65	0.65	50
107	1.74	0.56	43
117	1.79	0.52	40
151	1.93	0.37	29
164	1.99	0.31	24



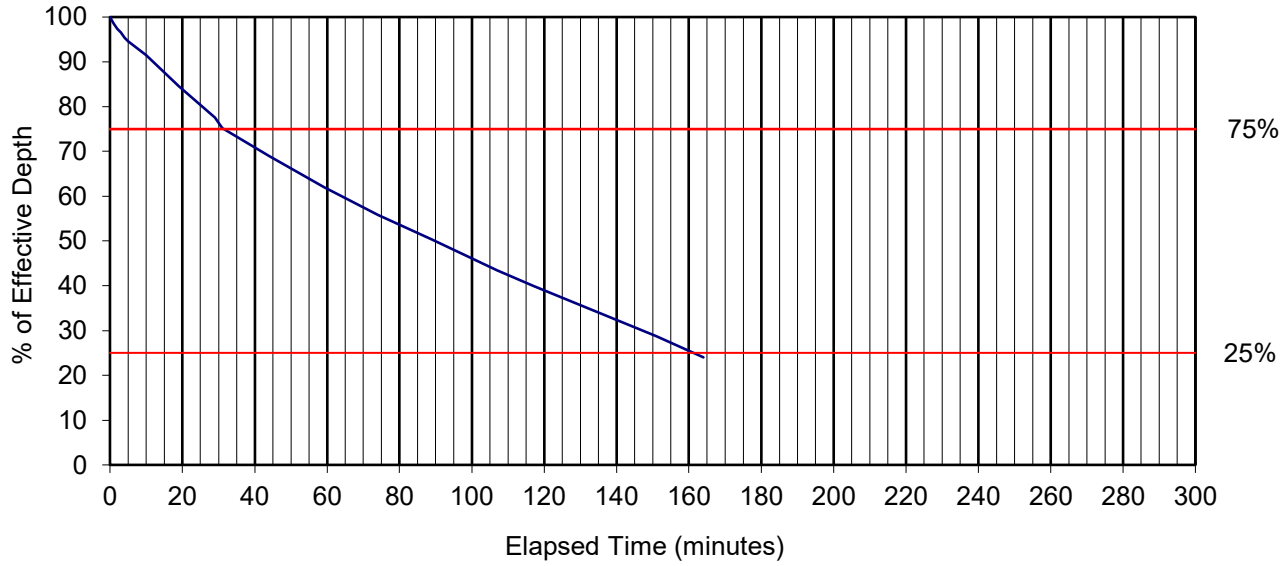
Trial Pit Length	=	1.60 m
Trial Pit Width	=	0.60 m
Trial Pit Depth	=	2.30 m
Effective depth (Head of Water)	=	1.29 m

	% of effective depth 75%	25%	
Depth	1.33	1.98	m bgl
Head	0.97	0.32	m
Time	31	161	minutes

V_{p75-25}	=	0.62	m^3
a_{p50}	=	3.80	m^2
t_{p75-25}	=	130	min

t_{p75}	=	31	minutes
t_{p25}	=	161	minutes

Soil Infiltration rate, *f* **=** **2.1E-05 m/sec**
75 mm/hr



Remarks:

IN SITU TESTING - Soakaway Test

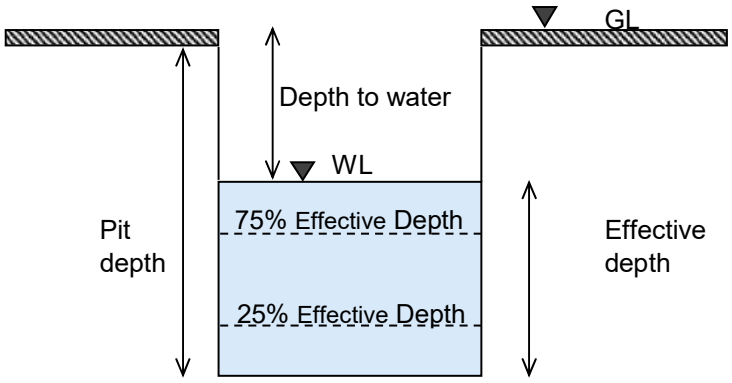
Hamson Barron Smith

Project: **Land East of Axminster, Devon**
Project No: **23-20-19-1-6074**
Client: **Persimmon Homes Severn Valley**

Test Location : **TP21-SA**
Test No : **1**
Date : **05/09/18**

ELAPSED TIME (minutes)	DEPTH to water below ground level (m)	HEAD (m)	HEAD (% effective depth)
0	0.51	1.29	100
1	0.52	1.29	100
2	0.54	1.27	98
3	0.54	1.27	98
4	0.54	1.27	98
5	0.54	1.26	98
10	0.55	1.25	97
30	0.60	1.21	93
50	0.60	1.21	93
90	0.61	1.19	92
130	0.62	1.19	92
170	0.62	1.19	92
250	0.65	1.15	89

TRIAL PIT SOAKAWAY



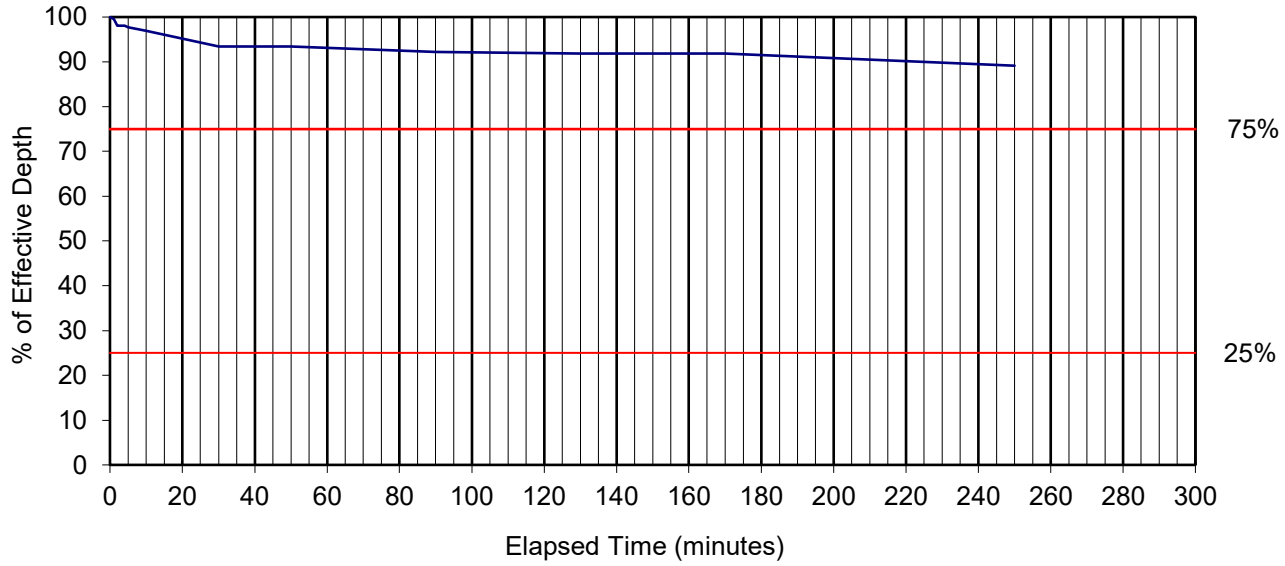
Trial Pit Length	=	1.40	m
Trial Pit Width	=	0.60	m
Trial Pit Depth	=	1.80	m
Effective depth (Head of Water)	=	1.29	m

	% of effective depth 75%	25%	
Depth	0.83	1.48	m bgl
Head	0.97	0.32	m
Time	-	-	minutes

V_{p75-25}	=	0.54	m^3
a_{p50}	=	3.42	m^2
t_{p75-25}	=	-	min

Soil Infiltration rate, *f* **=** **-** **m/sec**
- **mm/hr**

t_{p75}	=	-	minutes
t_{p25}	=	-	minutes



Remarks:

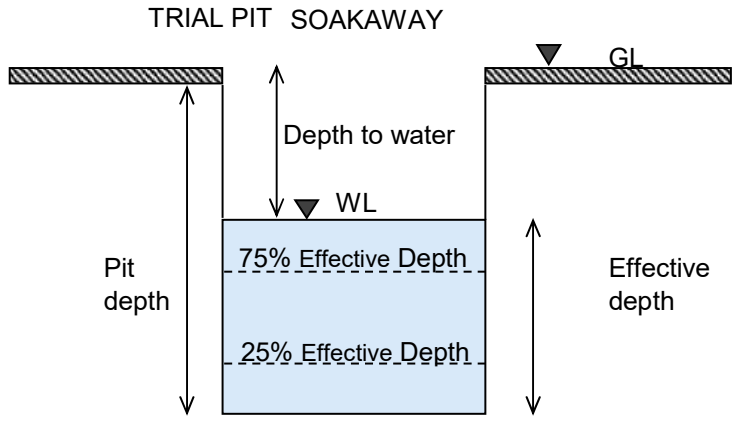
IN SITU TESTING - Soakaway Test

Hamson Barron Smith

Project: **Land East of Axminster, Devon**
Project No: **23-20-19-1-6074**
Client: **Persimmon Homes Severn Valley**

Test Location : **TP29-SA**
Test No : **1**
Date : **06/09/18**

ELAPSED TIME (minutes)	DEPTH to water below ground level (m)	HEAD (m)	HEAD (% effective depth)
0	0.66	0.94	100
26	0.70	0.90	96
57	0.71	0.89	95
93	0.71	0.89	95
124	0.71	0.89	95
162	0.73	0.87	93
195	0.74	0.86	91
225	0.74	0.86	91
265	0.74	0.86	91



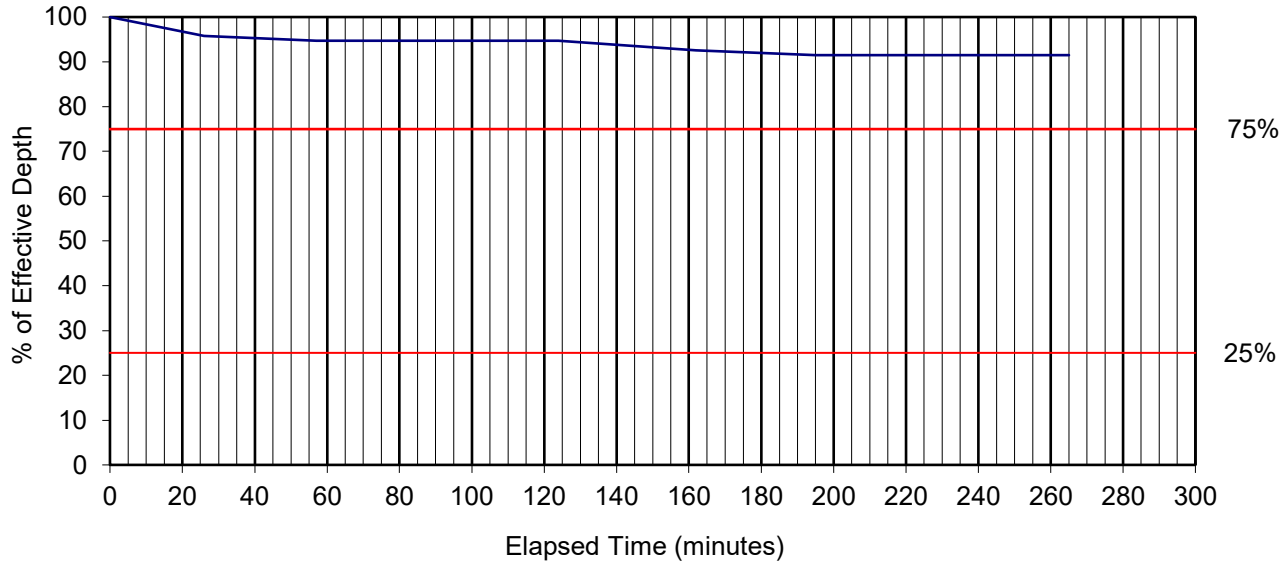
Trial Pit Length	=	1.70 m
Trial Pit Width	=	0.60 m
Trial Pit Depth	=	1.60 m
Effective depth (Head of Water)	=	0.94 m

	% of effective depth 75%	25%	
Depth	0.90	1.37	m bgl
Head	0.71	0.24	m
Time	-	-	minutes

V_{p75-25}	=	0.48	m^3
a_{p50}	=	3.18	m^2
t_{p75-25}	=	-	min

t_{p75}	=	-	minutes
t_{p25}	=	-	minutes

Soil Infiltration rate, *f* **=** **-** **m/sec**
- **mm/hr**



Remarks:

IN SITU TESTING - Soakaway Test

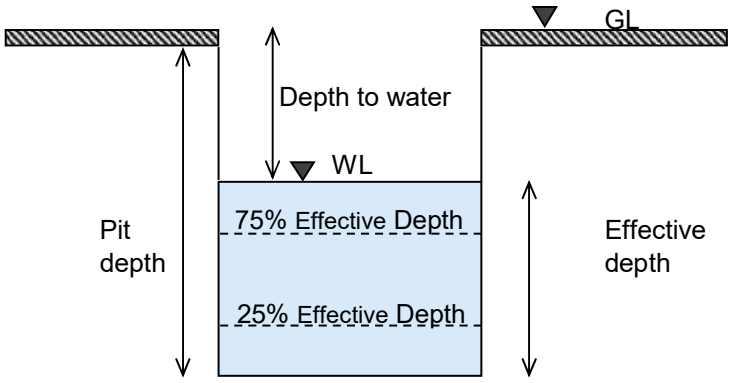
Hamson Barron Smith

Project: **Land East of Axminster, Devon**
Project No: **23-20-19-1-6074**
Client: **Persimmon Homes Severn Valley**

Test Location : **TP30-SA**
Test No : **1**
Date : **06/09/18**

ELAPSED TIME (minutes)	DEPTH to water below ground level (m)	HEAD (m)	HEAD (% effective depth)
0	0.30	0.90	100
25	0.41	0.79	88
44	0.43	0.77	86
85	0.46	0.75	83
111	0.46	0.74	82
148	0.47	0.74	82
188	0.47	0.73	81
216	0.48	0.73	81
255	0.48	0.72	80

TRIAL PIT SOAKAWAY



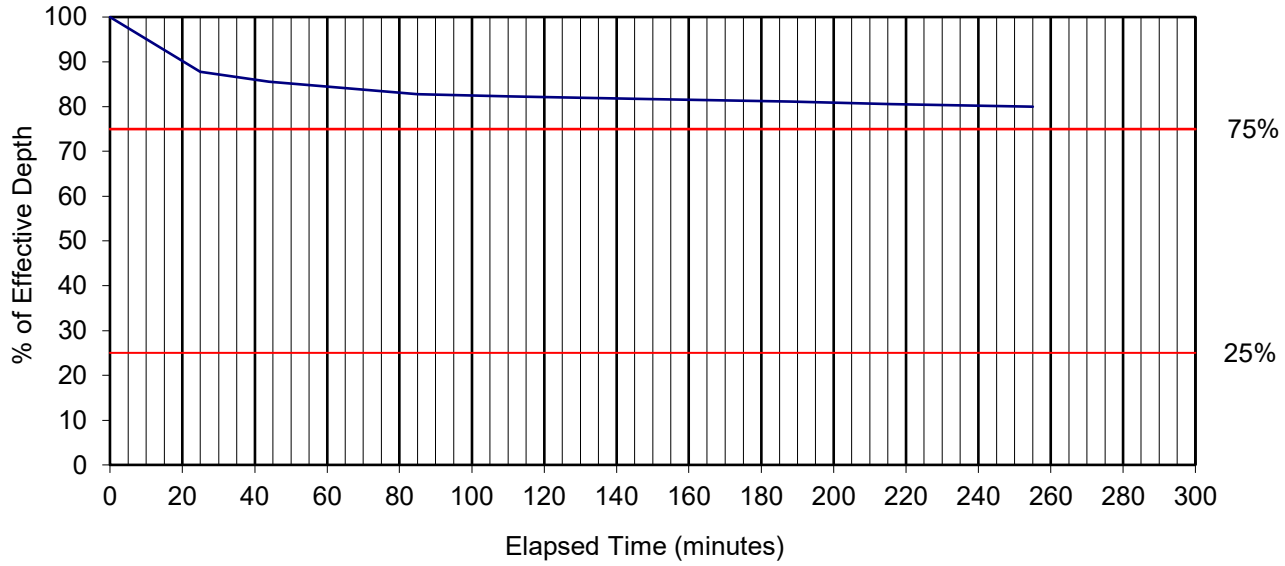
Trial Pit Length	=	1.55 m
Trial Pit Width	=	0.60 m
Trial Pit Depth	=	1.20 m
Effective depth (Head of Water)	=	0.90 m

	% of effective depth 75%	25%	
Depth	0.53	0.98	m bgl
Head	0.68	0.23	m
Time	-	-	minutes

V_{p75-25}	=	0.42	m^3
a_{p50}	=	2.87	m^2
t_{p75-25}	=	-	min

t_{p75}	=	-	minutes
t_{p25}	=	-	minutes

Soil Infiltration rate, *f* **=** **-** **m/sec**
- **mm/hr**



Remarks:

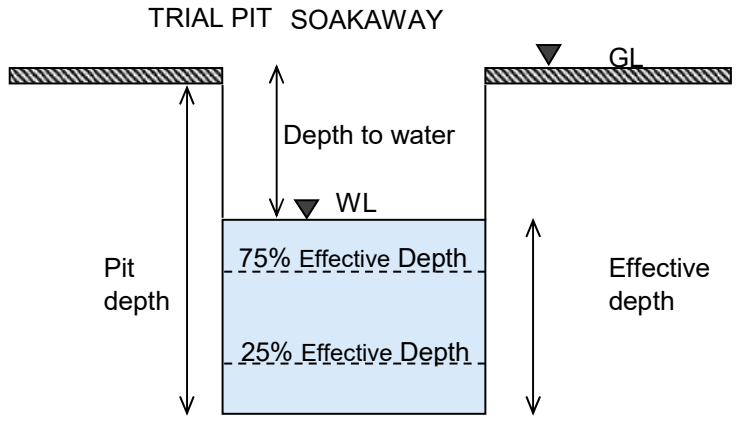
IN SITU TESTING - Soakaway Test

Hamson Barron Smith

Project: **Land East of Axminster, Devon**
Project No: **23-20-19-1-6074**
Client: **Persimmon Homes Severn Valley**

Test Location : **TP31-SA**
Test No : **1**
Date : **06/09/18**

ELAPSED TIME (minutes)	DEPTH to water below ground level (m)	HEAD (m)	HEAD (% effective depth)
0	0.81	1.39	100
3	0.81	1.39	100
36	0.81	1.39	100
67	0.81	1.39	100
90	0.81	1.39	100
131	0.82	1.38	99
170	0.82	1.38	99
197	0.82	1.38	99
238	0.82	1.38	99



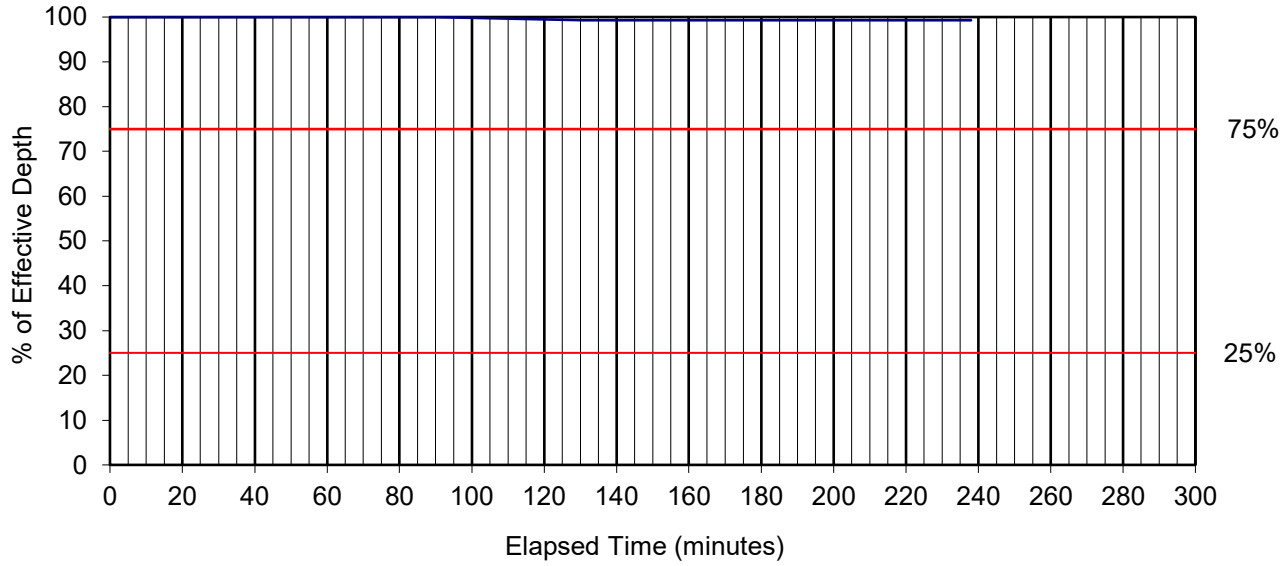
Trial Pit Length	=	1.30 m
Trial Pit Width	=	0.60 m
Trial Pit Depth	=	2.20 m
Effective depth (Head of Water)	=	1.39 m

	% of effective depth 75%	25%	
Depth	1.16	1.85	m bgl
Head	1.04	0.35	m
Time	-	-	minutes

V_{p75-25}	=	0.54	m^3
a_{p50}	=	3.42	m^2
t_{p75-25}	=	-	min

t_{p75}	=	-	minutes
t_{p25}	=	-	minutes

Soil Infiltration rate, *f* **=** **-** **m/sec**
- **mm/hr**



Remarks:

IN SITU TESTING - Soakaway Test

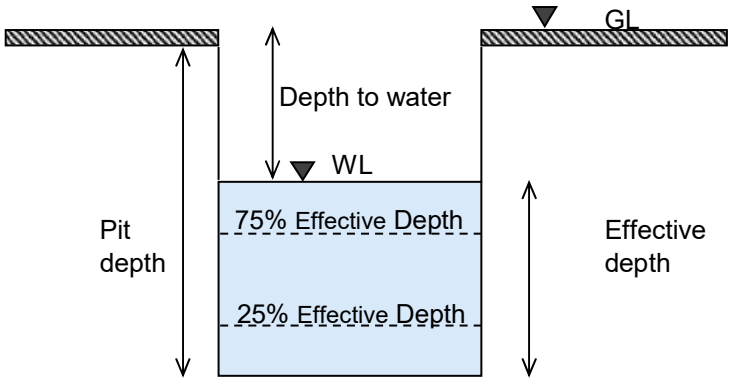
Hamson Barron Smith

Project: **Land East of Axminster, Devon**
Project No: **23-20-19-1-6074**
Client: **Persimmon Homes Severn Valley**

Test Location : **TP41-SA**
Test No : **1**
Date : **07/09/18**

ELAPSED TIME (minutes)	DEPTH to water below ground level (m)	HEAD (m)	HEAD (% effective depth)
0	0.77	1.33	100
5	0.79	1.31	98
37	0.79	1.31	98
67	0.79	1.31	98
97	0.79	1.31	98
127	0.79	1.31	98
157	0.79	1.31	98
190	0.79	1.31	98
218	0.79	1.31	98

TRIAL PIT SOAKAWAY



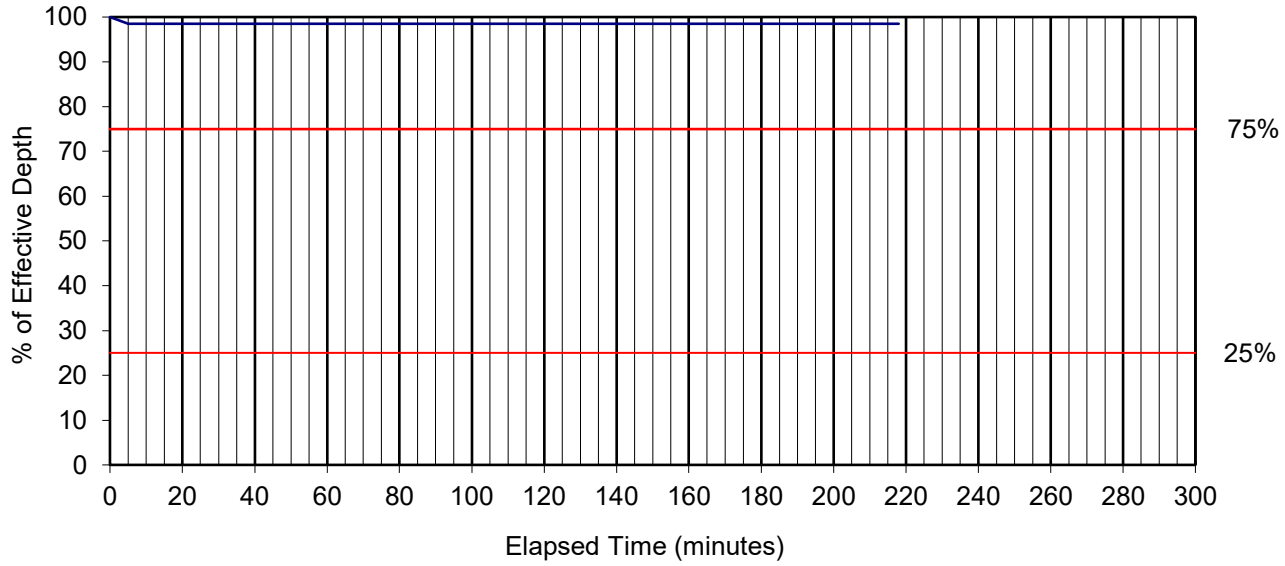
Trial Pit Length	=	1.20 m
Trial Pit Width	=	0.60 m
Trial Pit Depth	=	2.10 m
Effective depth (Head of Water)	=	1.33 m

	% of effective depth 75%	25%	
Depth	1.10	1.77	m bgl
Head	1.00	0.33	m
Time	-	-	minutes

V_{p75-25}	=	0.48	m^3
a_{p50}	=	3.11	m^2
t_{p75-25}	=	-	min

t_{p75}	=	-	minutes
t_{p25}	=	-	minutes

Soil Infiltration rate, *f* **=** **-** **m/sec**
- **mm/hr**



Remarks:

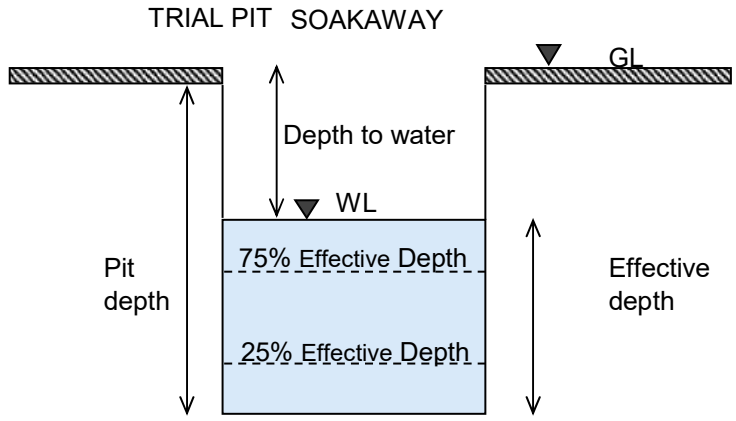
IN SITU TESTING - Soakaway Test

Hamson Barron Smith

Project: **Land East of Axminster, Devon**
Project No: **23-20-19-1-6074**
Client: **Persimmon Homes Severn Valley**

Test Location : **TP42-SA**
Test No : **1**
Date : **07/09/18**

ELAPSED TIME (minutes)	DEPTH to water below ground level (m)	HEAD (m)	HEAD (% effective depth)
0	0.30	1.31	100
2	0.31	1.29	99
5	0.34	1.26	97
25	0.40	1.20	92
53	0.42	1.18	90
84	0.43	1.17	90
114	0.44	1.17	89
146	0.45	1.16	89
174	0.45	1.15	88
206	0.45	1.15	88
233	0.45	1.15	88



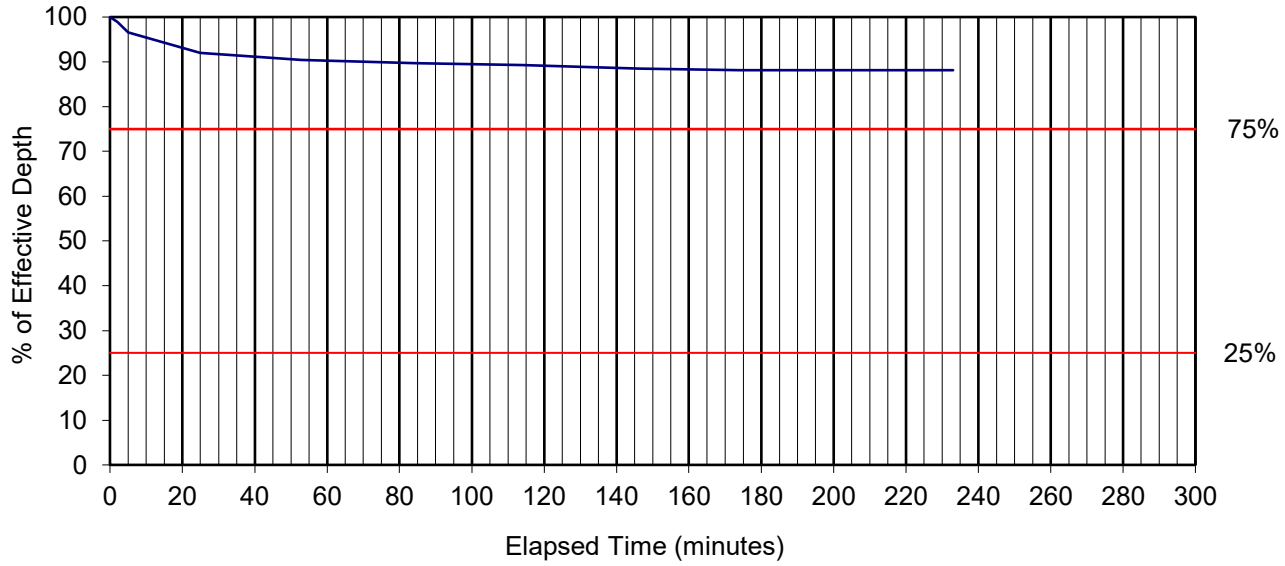
Trial Pit Length	=	1.35	m
Trial Pit Width	=	0.60	m
Trial Pit Depth	=	1.60	m
Effective depth (Head of Water)	=	1.31	m

	% of effective depth 75%	25%	
Depth	0.62	1.27	m bgl
Head	0.98	0.33	m
Time	-	-	minutes

V_{p75-25}	=	0.53	m^3
a_{p50}	=	3.35	m^2
t_{p75-25}	=	-	min

t_{p75}	=	-	minutes
t_{p25}	=	-	minutes

Soil Infiltration rate, *f* **=** **-** **m/sec**
- **mm/hr**



Remarks:

IN SITU TESTING - Soakaway Test

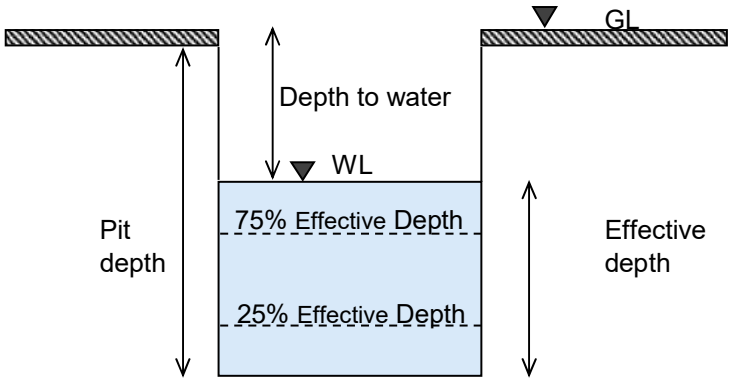
Hamson Barron Smith

Project: **Land East of Axminster, Devon**
Project No: **23-20-19-1-6074**
Client: **Persimmon Homes Severn Valley**

Test Location : **TP43-SA**
Test No : **1**
Date : **07/09/18**

ELAPSED TIME (minutes)	DEPTH to water below ground level (m)	HEAD (m)	HEAD (% effective depth)
0	0.43	0.57	100
1	0.47	0.53	93
2	0.49	0.52	90
3	0.50	0.50	88
4	0.51	0.49	86
6	0.53	0.47	82
8	0.55	0.45	79
10	0.56	0.44	77
12	0.57	0.43	75
14	0.58	0.43	75
24	0.59	0.41	72
44	0.61	0.39	68
70	0.63	0.38	66
101	0.63	0.37	65
130	0.63	0.37	65
159	0.63	0.37	65
190	0.64	0.36	63
221	0.64	0.36	63
251	0.64	0.36	63

TRIAL PIT SOAKAWAY



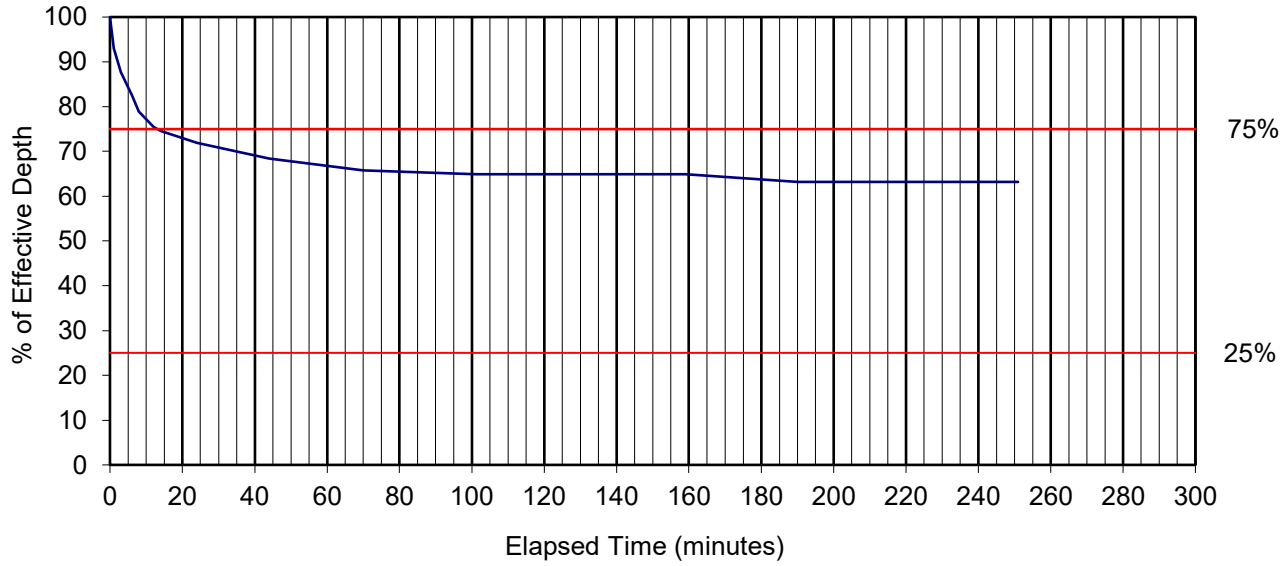
Trial Pit Length	=	1.25	m
Trial Pit Width	=	0.55	m
Trial Pit Depth	=	1.00	m
Effective depth (Head of Water)	=	0.57	m

	% of effective depth 75%	25%	
Depth	0.57	0.86	m bgl
Head	0.43	0.14	m
Time	-	-	minutes

V_{p75-25}	=	0.20	m^3
a_{p50}	=	1.71	m^2
t_{p75-25}	=	-	min

t_{p75}	=	-	minutes
t_{p25}	=	-	minutes

Soil Infiltration rate, *f* **=** **-** **m/sec**
- **mm/hr**



Remarks:

Summary of Gas / Water Monitoring Results

Project Name	East of Axminster	**Pr**
Client	Hamson Barron Smith	**Clie**

Borehole No.	CH4 (% vol. in air) Peak	CH4 (% vol. in air) Steady	CO2 (% vol. in air) Peak	CO2 (% vol. in air) Steady	O2 (% vol. in air) Peak	O2 (% vol. in air) Steady	Pressure (two days preceeding)	Pressure (mb)	Flow Peak (l/hr)	Flow Stead (l/hr)
WS03	0.2	0.2	0.9	0.9	18.6	18.6	1018/1026	1017	0	0
WS07	0.2	0.2	5.4	5.4	15.4	15.4	1018/1026	1018	0	0
WS08	0.1	0.1	1.4	1.4	17.5	17.5	1018/1026	1021	0	0
WS12	0.2	0.2	0.4	0.4	20.8	20.8	1018/1026	1021	0	0
WS13	0.2	0.2	0.8	0.8	19.6	19.6	1018/1026	1016	0	0
WS17	0.2	0.2	0.1	0.1	20.7	20.7	1018/1026	1016	0	0
WS18	0.2	0.2	4.1	4.1	17.4	17.4	1018/1026	1017	0	0
WS20	0.2	0.2	0.7	0.6	20.3	20.3	1018/1026	1022	0	0
WS21	0.2	0.2	0.2	0.1	20.6	20.6	1018/1026	1022	0	0
WS23	0.2	0.2	2	2	19.3	19.3	1018/1026	1022	0	0

When water level is recorded as "-", this signifies that no water was present
in air readings of CH4 - 0.2%

State of ground (dry, moist or wet)	Moist	**Precipitation (None, drizzle, moderate, or heavy)**	None	**Instrument and serial no**
Wind conditions (Calm, light, moderate, or strong)	Calm	**Certificate Number**	G504589_1/18288	**Date of Calibration**

Appendix D Sewer Maps

Date: 08/01/2025 11:31:47 User: Scale: 1:1250 at A3

98186
330966
N

Lyn
Hazelford
Meadowlea
Ivedon
The Firs
El Sub Sta
87.8m
Crabswood LB
Cowslip House
LOUP COURT
Loup House
Arlington
Wentworth
Fairleigh
Wildings
Purbrook Cottage
Ewellyn
Heygate
Sweetpea Cottage
Homeleigh
Idle Hill Cottage
Valley View
Wayside
The Retreat
Loup Cottages
B 3261
Coach Rode
The Leat
Meadow Rue
Endfield
96.3m
Speldhurst
Cattle Grid
Mount House
SALWAY SIDE
79.2m
CG

South West Water

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THE INFORMATION CONTAINED WITHIN THIS MAP SHOULD NOT BE USED FOR ANY PURPOSE OTHER THAN AS A GENERAL GUIDE TO THE LOCATION OF EXISTING SERVICES.
PLEASE REFER TO WATER AND SEWER LEGENDS FOR CONFIRMATION OF ASSET DETAILS.
THIS PLAN MUST NOT BE USED AS PART OF A CONVEYANCING DOCUMENT FOR PROPERTY PURCHASES.
The position & depth of apparatus and other information indicated on this map is provided as a general guide only and no assurance or warranty as to its correctness or accuracy is given or should be inferred.
Exact positions & depths should be obtained by excavation trial holes and the map must not be relied on in the event of excavation or other works undertaken or planned in the vicinity of the Company's apparatus
Please note that not all mains, service pipes and other apparatus of the Company in the area of the plan are shown.

South West Water

Map data

330467
97841

0 40 80 m

Date: 01/04/2025 08:49:55 User: Scale: 1:500 at A3

98271

330753

N

SECTOR LANE

ST MARY'S CLOSE

SALWAY GDNS

24

1

16

19

8

7

5

Sector Lane Farmhouse

83.5m

C / 150 / VC

C / 150 / VC / 32

100 mm DI

4 in CI

South West Water

South West Water

South West Water

79

0 20 m

330553

98133

South West Water

Map data

Water Colour Codes and Abbreviations

Examples of the abbreviation details above a Water Pipe (details will be in the same colour as the pipe itself):

A B
3 in CI

A: Size
B: Material Abbreviation

Distribution Main		Untreated Main	
Trunk Main		Private Pipe	
Communication Pipe		Abandoned Main	

Cast Iron CI	Spun Iron SI	Ductile Iron DI	Steel ST
Asbestos Cement AC	Plastic UPVC	High Density/ Medium Density Polyethylene HDPE MDPE	High Pressure Polyethylene HPPE

Water Features (shown in common colours)

Washout	Hydrant	Hatchbox	Washout Hydrant
Air Valve (Single)	Air Valve (Double)	Closed Valve Closing Direction: Anti-Clockwise	Closed Valve Closing Direction: Clockwise
Pump	Pumping Station Number of Pumps as indicated 2	Open Valve Opening Direction: Anti-Clockwise	Open Valve Opening Direction: Clockwise
Customer Meter C	EBCO M optional if meter fitted	Non-Return Valve /Reflux	Stoptap
Mains Meter M M=Normal DMA/WIS B=Boundary Meter; 1010 Optional Readout if location is different from the meter		Relief Valve	End Cap
		Inlet / Outlet	Pipe Reducer
Pressure Reducing Valve	Pressure Sustaining Valve	Abstraction Point AB	Bore Hole BH

Water Pipe Furniture

Anode A	Calgon / Aquarite C/A	Chlorination Point C	Flushing on a Sluice Valve F
Insert Flow Meter IFM	Excavation Location	Strainer	Ferrule

Sewerage Pipe Details

Examples of the abbreviation details above a Sewer Pipe (details will be in the same colour as the pipe itself):

A B C D

Cir / 225 / VC / 82

A: Shape
B: Diameter (replaced by width & length on non-circular pipes
C: Material
D: Gradient (1: number shown)

Public - Foul

Public - Surface

Public - Combined

Public - Treated

Private Sewer

Unverified

Highway

Abandoned Sewer A

Pumping Main

Elevated Sewer /EL

Syphon S

Shapes

Circular	Cir	Rectangular	Rec	Barrel	Brl	Trapezodial	Trpz
U Shaped	UShp	Horseshoe	Hsho				

Materials

Vitrified Clay	VC	Clay (Salt Glaze)	SG	Pre-cast Concrete	PCO	Concrete	CO
Asbestos Cement	AC	Brick	BR	Stone (Masonry)	MAC	Alkathene	AK
Steel	ST	Concrete Box	CB	Glass Reinforced Plastic	GRP	Plastic	PL
Polypropylene	PP	Unplasticised Polyvinylchloride	UPVC	Polyethylene	PE	Polyvinylchloride	PVC
Concrete Segments Bolted	CSB	Pitch Fibre	PF	Concrete Segments Unbolted	CSU	Medium Density Polyethylene	MDPE
Not Known	NK						

Sewerage Structures (shown in common colours)

Manhole Foul / Trade	Manhole Surface	Manhole Private	Manhole Combined
Soakaway SK	Washout WO	Catchpit CP	Hatchbox HB
Flushing FC	Lamphole LH	Tank Online TN	Tank Offline TO
Septic Tank S	Cesspit C	Header E	Drain LD
Reflux Valve RV	Sluice Valve	Air Valve AV	Venting Pole VP
Storm Overflow SO		Undefined Connection	Side Entry
Outfall OF		Backdrop	

Sewerage Installations

Pumping Station	Treatment Works WWTW

Details on Covers

Lockable k	Gas / Water Tight t	Bolted b

Location

Buried BL	Unable to Locate UL

Appendix E Surface Water Calculations

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Isobel Oates
Site name:	422.065211
Site location:	Land East of Axminster, East Devon

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	50.77798° N
Longitude:	2.98257° W
Reference:	626245132
Date:	Dec 10 2024 11:45

Runoff estimation approach

FEH Statistical

Site characteristics

Total site area (ha): 1

Methodology

Q_{MED} estimation method:	Calculate from BFI and SAAR
BFI and SPR method:	Specify BFI manually
HOST class:	N/A
BFI / BFIHOST:	0.398
Q_{MED} (l/s):	
Q_{BAR} / Q_{MED} factor:	1.08

Hydrological characteristics

	Default	Edited
SAAR (mm):	997	997
Hydrological region:	8	8
Growth curve factor 1 year:	0.78	0.78
Growth curve factor 30 years:	1.95	1.95
Growth curve factor 100 years:	2.43	2.43
Growth curve factor 200 years:	2.78	2.78

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):		9.29
1 in 1 year (l/s):		7.24
1 in 30 years (l/s):		18.11
1 in 100 year (l/s):		22.56
1 in 200 years (l/s):		25.81

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.074	5.00	99.000	1200	330668.601	97910.620	1.425
2	0.069	5.00	97.500	1200	330686.209	97919.967	1.500
3	0.053	5.00	95.750	1200	330695.750	97935.917	1.500
4	0.118	5.00	94.950	1200	330709.162	97931.245	1.475
5	0.050	5.00	92.400	1200	330736.180	97914.928	1.500
6	0.218	5.00	91.300	1350	330747.350	97922.192	1.575
7	0.062	5.00	86.500	1350	330760.394	97979.109	2.570
8	0.073	5.00	83.300	1350	330772.126	97990.797	1.475
9	0.000		82.750	1350	330777.036	98009.862	1.710
10	0.097	5.00	92.800	1200	330684.892	98006.679	1.425
11	0.085	5.00	91.600	1200	330710.348	98001.221	1.570
12	0.082	5.00	90.800	1200	330716.217	98022.754	1.500
13	0.150	5.00	89.200	1200	330738.114	98019.876	1.575
14	0.050	5.00	91.200	1200	330636.009	98080.396	1.425
15	0.281	5.00	90.600	1200	330646.380	98088.754	1.505
16	0.092	5.00	85.600	1350	330716.643	98116.198	1.500
17	0.029	5.00	86.100	1350	330752.507	98098.653	2.270
18	0.110	5.00	88.400	1200	330724.868	98055.109	1.425
19	0.090	5.00	86.350	1200	330741.702	98078.486	1.430
HW1	0.000		82.200	1350	330759.761	98095.578	1.570
HW2	0.000		81.000	1350	330783.317	98081.701	1.570
20	0.000		79.000	1350	330788.508	98078.460	1.570
HW3	0.000		79.330	1350	330796.533	98071.753	3.320
HW4	0.000		79.000	1500	330797.205	98062.733	2.990
HW5	0.000		79.330	1500	330804.273	98062.557	3.330
21	0.000		79.100	1500	330811.528	98056.200	4.600
HW6	0.000		73.330	1500	330839.149	98046.848	2.230
HW7	0.000		73.330	1500	330842.676	98045.243	2.330
22	0.000		73.100	1800	330851.726	98044.111	2.154
16A	0.062	5.00	85.700	1350	330740.788	98110.412	1.710
HW2A	0.000	5.00	85.900	1200	330758.616	98084.666	1.500
11A	0.140	5.00	93.200	1200	330700.375	97965.610	1.450

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)
1.000	1	2	19.935	0.600	97.575	96.000	1.575	12.7	225	5.09	50.0
1.001	2	3	18.586	0.600	96.000	94.250	1.750	10.6	225	5.17	50.0
1.002	3	4	14.202	0.600	94.250	93.550	0.700	20.3	225	5.25	49.8
1.003	4	5	31.563	0.600	93.475	90.900	2.575	12.3	300	5.36	49.4
1.004	5	6	13.324	0.600	90.900	89.800	1.100	12.1	300	5.41	49.2
1.005	6	7	58.393	0.600	89.725	84.000	5.725	10.2	375	5.58	48.7
1.006	7	8	16.560	0.600	83.930	81.900	2.030	8.2	375	5.63	48.5
1.007	8	9	19.687	0.600	81.825	81.110	0.715	27.5	450	5.71	48.2
1.008	9	HW4	56.587	0.600	81.040	76.010	5.030	11.2	450	5.87	47.7
1.009	HW4	HW5	7.070	0.600	76.010	76.000	0.010	707.0	525	6.01	47.2
1.010	HW5	21	9.646	0.600	76.000	74.500	1.500	6.4	525	6.49	45.8
1.011	21	HW6	29.161	0.600	74.500	71.100	3.400	8.6	300	6.58	45.5
1.012	HW6	HW7	3.875	0.600	71.100	71.000	0.100	38.8	600	6.59	45.4
1.013	HW7	22	9.121	0.600	71.000	70.946	0.054	168.9	600	6.67	45.2
2.000	10	11	26.035	0.600	91.375	90.100	1.275	20.4	225	5.15	50.0
2.001	11	12	22.318	0.600	90.030	89.300	0.730	30.6	300	5.35	49.5
2.002	12	13	22.085	0.600	89.300	87.630	1.670	13.2	300	5.44	49.2
2.003	13	9	40.190	0.600	87.625	81.180	6.445	6.2	300	5.54	48.8
3.000	14	15	13.320	0.600	89.775	89.170	0.605	22.0	225	5.08	50.0
3.001	15	16	75.433	0.600	89.095	84.100	4.995	15.1	300	5.39	49.3
3.002	16	16A	24.829	0.600	84.100	83.990	0.110	225.7	375	5.73	48.2
3.003	17	HW1	7.879	0.600	83.830	80.630	3.200	2.5	375	5.96	47.4
3.004	HW1	HW2	27.340	0.600	80.630	79.430	1.200	22.8	375	6.08	47.0
3.005	HW2	20	6.120	0.600	79.430	77.430	2.000	3.1	375	6.09	47.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	3.697	147.0	10.0	1.200	1.275	0.074	0.0	39	2.120
1.001	4.038	160.5	19.4	1.275	1.275	0.143	0.0	52	2.745
1.002	2.918	116.0	26.5	1.275	1.175	0.196	0.0	73	2.371
1.003	4.514	319.1	42.1	1.175	1.200	0.314	0.0	73	3.159
1.004	4.541	321.0	48.6	1.200	1.200	0.364	0.0	78	3.303
1.005	5.700	629.6	76.8	1.200	2.125	0.582	0.0	88	3.909
1.006	6.375	704.1	84.7	2.195	1.025	0.644	0.0	87	4.352
1.007	3.886	618.0	93.7	1.025	1.190	0.717	0.0	117	2.836
1.008	6.086	968.0	164.4	1.260	2.540	1.271	0.0	124	4.586
1.009	0.835	180.7	162.7	2.465	2.805	1.271	0.0	392	0.939
1.010	8.870	1920.2	246.3	2.805	4.075	1.985	0.0	126	6.197
1.011	5.399	381.6	244.8	4.300	1.930	1.985	0.0	175	5.716
1.012	3.919	1108.2	244.5	1.630	1.730	1.985	0.0	190	3.176
1.013	1.871	528.9	243.2	1.730	1.554	1.985	0.0	286	1.834
2.000	2.908	115.6	13.1	1.200	1.275	0.097	0.0	51	1.938
2.001	2.853	201.7	43.2	1.270	1.200	0.322	0.0	94	2.290
2.002	4.345	307.1	53.8	1.200	1.270	0.404	0.0	85	3.299
2.003	6.334	447.7	73.3	1.275	1.270	0.554	0.0	82	4.720
3.000	2.800	111.3	6.8	1.200	1.205	0.050	0.0	37	1.561
3.001	4.065	287.4	44.3	1.205	1.200	0.331	0.0	79	2.969
3.002	1.202	132.7	55.2	1.125	1.335	0.423	0.0	168	1.147
3.003	11.615	1282.9	91.7	1.895	1.195	0.714	0.0	67	6.842
3.004	3.809	420.7	91.0	1.195	1.195	0.714	0.0	118	3.062
3.005	10.418	1150.6	90.9	1.195	1.195	0.714	0.0	71	6.329

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)
3.006	20	HW3	10.459	0.600	77.430	76.010	1.420	7.4	375	6.12	46.9
3.007	HW3	HW5	12.020	0.600	76.010	76.000	0.010	1202.0	450	6.47	45.8
4.000	18	19	28.807	0.600	86.975	84.920	2.055	14.0	225	5.14	50.0
4.001	19	17	22.879	0.600	84.920	83.980	0.940	24.3	225	5.28	49.7
3.002A	16A	17	16.601	0.600	83.990	83.910	0.080	207.5	375	5.95	47.4
3.004A	HW2A	20	30.529	0.600	84.400	77.430	6.970	4.4	100	5.14	50.0
2.000A	11A	11	36.981	0.600	91.750	90.100	1.650	22.4	225	5.22	49.9

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
3.006	6.710	741.1	90.7	1.195	2.945	0.714	0.0	88	4.602
3.007	0.578	91.9	88.7	2.870	2.880	0.714	0.0	357	0.654
4.000	3.513	139.7	14.9	1.200	1.205	0.110	0.0	50	2.318
4.001	2.663	105.9	26.9	1.205	1.895	0.200	0.0	77	2.230
3.002A	1.254	138.5	62.3	1.335	1.815	0.485	0.0	176	1.222
3.004A	3.721	29.2	0.0	1.400	1.470	0.000	0.0	0	0.000
2.000A	2.775	110.3	18.9	1.225	1.275	0.140	0.0	63	2.089

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)
1.000	19.935	12.7	225	Circular	99.000	97.575	1.200	97.500	96.000	1.275
1.001	18.586	10.6	225	Circular	97.500	96.000	1.275	95.750	94.250	1.275
1.002	14.202	20.3	225	Circular	95.750	94.250	1.275	94.950	93.550	1.175
1.003	31.563	12.3	300	Circular	94.950	93.475	1.175	92.400	90.900	1.200
1.004	13.324	12.1	300	Circular	92.400	90.900	1.200	91.300	89.800	1.200
1.005	58.393	10.2	375	Circular	91.300	89.725	1.200	86.500	84.000	2.125
1.006	16.560	8.2	375	Circular	86.500	83.930	2.195	83.300	81.900	1.025
1.007	19.687	27.5	450	Circular	83.300	81.825	1.025	82.750	81.110	1.190
1.008	56.587	11.2	450	Circular	82.750	81.040	1.260	79.000	76.010	2.540
1.009	7.070	707.0	525	Circular	79.000	76.010	2.465	79.330	76.000	2.805
1.010	9.646	6.4	525	Circular	79.330	76.000	2.805	79.100	74.500	4.075
1.011	29.161	8.6	300	Circular	79.100	74.500	4.300	73.330	71.100	1.930
1.012	3.875	38.8	600	Circular	73.330	71.100	1.630	73.330	71.000	1.730

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1200	Manhole	Adoptable	2	1200	Manhole	Adoptable
1.001	2	1200	Manhole	Adoptable	3	1200	Manhole	Adoptable
1.002	3	1200	Manhole	Adoptable	4	1200	Manhole	Adoptable
1.003	4	1200	Manhole	Adoptable	5	1200	Manhole	Adoptable
1.004	5	1200	Manhole	Adoptable	6	1350	Manhole	Adoptable
1.005	6	1350	Manhole	Adoptable	7	1350	Manhole	Adoptable
1.006	7	1350	Manhole	Adoptable	8	1350	Manhole	Adoptable
1.007	8	1350	Manhole	Adoptable	9	1350	Manhole	Adoptable
1.008	9	1350	Manhole	Adoptable	HW4	1500	Manhole	Adoptable
1.009	HW4	1500	Manhole	Adoptable	HW5	1500	Manhole	Adoptable
1.010	HW5	1500	Manhole	Adoptable	21	1500	Manhole	Adoptable
1.011	21	1500	Manhole	Adoptable	HW6	1500	Manhole	Adoptable
1.012	HW6	1500	Manhole	Adoptable	HW7	1500	Manhole	Adoptable

Pipeline Schedule

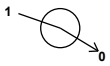
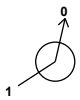
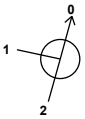
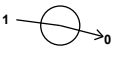
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.013	9.121	168.9	600	Circular	73.330	71.000	1.730	73.100	70.946	1.554
2.000	26.035	20.4	225	Circular	92.800	91.375	1.200	91.600	90.100	1.275
2.001	22.318	30.6	300	Circular	91.600	90.030	1.270	90.800	89.300	1.200
2.002	22.085	13.2	300	Circular	90.800	89.300	1.200	89.200	87.630	1.270
2.003	40.190	6.2	300	Circular	89.200	87.625	1.275	82.750	81.180	1.270
3.000	13.320	22.0	225	Circular	91.200	89.775	1.200	90.600	89.170	1.205
3.001	75.433	15.1	300	Circular	90.600	89.095	1.205	85.600	84.100	1.200
3.002	24.829	225.7	375	Circular	85.600	84.100	1.125	85.700	83.990	1.335
3.003	7.879	2.5	375	Circular	86.100	83.830	1.895	82.200	80.630	1.195
3.004	27.340	22.8	375	Circular	82.200	80.630	1.195	81.000	79.430	1.195
3.005	6.120	3.1	375	Circular	81.000	79.430	1.195	79.000	77.430	1.195
3.006	10.459	7.4	375	Circular	79.000	77.430	1.195	79.330	76.010	2.945
3.007	12.020	1202.0	450	Circular	79.330	76.010	2.870	79.330	76.000	2.880
4.000	28.807	14.0	225	Circular	88.400	86.975	1.200	86.350	84.920	1.205
4.001	22.879	24.3	225	Circular	86.350	84.920	1.205	86.100	83.980	1.895
3.002A	16.601	207.5	375	Circular	85.700	83.990	1.335	86.100	83.910	1.815
3.004A	30.529	4.4	100	Circular	85.900	84.400	1.400	79.000	77.430	1.470
2.000A	36.981	22.4	225	Circular	93.200	91.750	1.225	91.600	90.100	1.275

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.013	HW7	1500	Manhole	Adoptable	22	1800	Manhole	Adoptable
2.000	10	1200	Manhole	Adoptable	11	1200	Manhole	Adoptable
2.001	11	1200	Manhole	Adoptable	12	1200	Manhole	Adoptable
2.002	12	1200	Manhole	Adoptable	13	1200	Manhole	Adoptable
2.003	13	1200	Manhole	Adoptable	9	1350	Manhole	Adoptable
3.000	14	1200	Manhole	Adoptable	15	1200	Manhole	Adoptable
3.001	15	1200	Manhole	Adoptable	16	1350	Manhole	Adoptable
3.002	16	1350	Manhole	Adoptable	16A	1350	Manhole	Adoptable
3.003	17	1350	Manhole	Adoptable	HW1	1350	Manhole	Adoptable
3.004	HW1	1350	Manhole	Adoptable	HW2	1350	Manhole	Adoptable
3.005	HW2	1350	Manhole	Adoptable	20	1350	Manhole	Adoptable
3.006	20	1350	Manhole	Adoptable	HW3	1350	Manhole	Adoptable
3.007	HW3	1350	Manhole	Adoptable	HW5	1500	Manhole	Adoptable
4.000	18	1200	Manhole	Adoptable	19	1200	Manhole	Adoptable
4.001	19	1200	Manhole	Adoptable	17	1350	Manhole	Adoptable
3.002A	16A	1350	Manhole	Adoptable	17	1350	Manhole	Adoptable
3.004A	HW2A	1200	Manhole	Adoptable	20	1350	Manhole	Adoptable
2.000A	11A	1200	Manhole	Adoptable	11	1200	Manhole	Adoptable

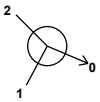
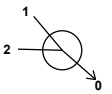
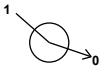
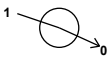
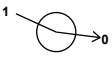
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	330668.601	97910.620	99.000	1.425	1200				
						0	1.000	97.575	225
2	330686.209	97919.967	97.500	1.500	1200		1	1.000	96.000	225
							0	1.001	96.000	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
3	330695.750	97935.917	95.750	1.500	1200	1	1.001	94.250	225
									
						0	1.002	94.250	225
4	330709.162	97931.245	94.950	1.475	1200	1	1.002	93.550	225
									
						0	1.003	93.475	300
5	330736.180	97914.928	92.400	1.500	1200	1	1.003	90.900	300
									
						0	1.004	90.900	300
6	330747.350	97922.192	91.300	1.575	1350	1	1.004	89.800	300
									
						0	1.005	89.725	375
7	330760.394	97979.109	86.500	2.570	1350	1	1.005	84.000	375
									
						0	1.006	83.930	375
8	330772.126	97990.797	83.300	1.475	1350	1	1.006	81.900	375
									
						0	1.007	81.825	450
9	330777.036	98009.862	82.750	1.710	1350	1	2.003	81.180	300
						2	1.007	81.110	450
									
						0	1.008	81.040	450
10	330684.892	98006.679	92.800	1.425	1200				
						0	2.000	91.375	225
11	330710.348	98001.221	91.600	1.570	1200	1	2.000	90.100	225
						2	2.000A	90.100	225
									
						0	2.001	90.030	300
12	330716.217	98022.754	90.800	1.500	1200	1	2.001	89.300	300
									
						0	2.002	89.300	300
13	330738.114	98019.876	89.200	1.575	1200	1	2.002	87.630	300
									
						0	2.003	87.625	300
14	330636.009	98080.396	91.200	1.425	1200				
						0	3.000	89.775	225
15	330646.380	98088.754	90.600	1.505	1200	1	3.000	89.170	225
									
						0	3.001	89.095	300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
16	330716.643	98116.198	85.600	1.500	1350	 1	3.001	84.100	300
						0	3.002	84.100	375
17	330752.507	98098.653	86.100	2.270	1350	 1	4.001	83.980	225
						2	3.002A	83.910	375
						0	3.003	83.830	375
18	330724.868	98055.109	88.400	1.425	1200				
						0	4.000	86.975	225
19	330741.702	98078.486	86.350	1.430	1200	 1	4.000	84.920	225
						0	4.001	84.920	225
HW1	330759.761	98095.578	82.200	1.570	1350	 1	3.003	80.630	375
						0	3.004	80.630	375
HW2	330783.317	98081.701	81.000	1.570	1350	 1	3.004	79.430	375
						0	3.005	79.430	375
20	330788.508	98078.460	79.000	1.570	1350	 1	3.004A	77.430	100
						2	3.005	77.430	375
						0	3.006	77.430	375
HW3	330796.533	98071.753	79.330	3.320	1350	 1	3.006	76.010	375
						0	3.007	76.010	450
HW4	330797.205	98062.733	79.000	2.990	1500	 1	1.008	76.010	450
						0	1.009	76.010	525
HW5	330804.273	98062.557	79.330	3.330	1500	 1	3.007	76.000	450
						2	1.009	76.000	525
						0	1.010	76.000	525
21	330811.528	98056.200	79.100	4.600	1500	 1	1.010	74.500	525
						0	1.011	74.500	300
HW6	330839.149	98046.848	73.330	2.230	1500	 1	1.011	71.100	300
						0	1.012	71.100	600
HW7	330842.676	98045.243	73.330	2.330	1500	 1	1.012	71.000	600
						0	1.013	71.000	600

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
22	330851.726	98044.111	73.100	2.154	1800	1	1.013	70.946	600
									
16A	330740.788	98110.412	85.700	1.710	1350	1	3.002	83.990	375
									
						0	3.002A	83.990	375
HW2A	330758.616	98084.666	85.900	1.500	1200				
						0	3.004A	84.400	100
11A	330700.375	97965.610	93.200	1.450	1200				
						0	2.000A	91.750	225

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	0.840	Additional Storage (m³/ha)	20.0		

Storm Durations

15	60	180	360	600	960	2160	4320
30	120	240	480	720	1440	2880	5760

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	45	0	0

Node 22 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	70.946	Product Number	CTL-SHE-0169-1680-2000-1680
Design Depth (m)	2.000	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	16.8	Min Node Diameter (mm)	1800

Node 21 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	74.500	Product Number	CTL-SHE-0176-2200-3100-2200
Design Depth (m)	3.100	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	22.0	Min Node Diameter (mm)	0

Node HW5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	76.000
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)
0.000	143.5	0.0	3.330	815.8	0.0

Node HW7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	71.000
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)
0.000	105.3	0.0	2.330	907.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.01%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	97.615	0.040	10.1	0.0862	0.0000	OK
15 minute winter	2	10	96.052	0.052	19.4	0.1076	0.0000	OK
15 minute winter	3	10	94.327	0.077	26.5	0.1417	0.0000	OK
15 minute winter	4	10	93.548	0.073	42.3	0.1997	0.0000	OK
15 minute winter	5	10	90.984	0.084	48.9	0.1517	0.0000	OK
15 minute winter	6	10	89.815	0.090	78.2	0.3767	0.0000	OK
15 minute winter	7	10	84.024	0.094	85.5	0.1793	0.0000	OK
15 minute winter	8	11	81.953	0.128	95.1	0.3088	0.0000	OK
15 minute winter	9	11	81.165	0.125	168.1	0.1793	0.0000	OK
15 minute winter	10	10	91.427	0.052	13.2	0.1297	0.0000	OK
15 minute winter	11	10	90.130	0.100	43.4	0.2209	0.0000	OK
15 minute winter	12	10	89.389	0.089	54.3	0.1975	0.0000	OK
15 minute winter	13	10	87.709	0.084	74.2	0.2554	0.0000	OK
15 minute winter	14	10	89.814	0.039	6.8	0.0707	0.0000	OK
15 minute winter	15	10	89.174	0.079	45.1	0.3855	0.0000	OK
15 minute winter	16	11	84.283	0.183	57.1	0.4862	0.0000	OK
15 minute winter	17	11	83.897	0.067	94.0	0.1125	0.0000	OK
15 minute winter	18	10	87.024	0.049	15.0	0.1322	0.0000	OK
15 minute winter	19	10	85.000	0.080	27.2	0.1914	0.0000	OK
15 minute winter	HW1	11	80.767	0.137	94.0	0.1956	0.0000	OK
15 minute winter	HW2	11	79.509	0.079	94.1	0.1128	0.0000	OK
15 minute winter	20	11	77.519	0.089	94.1	0.1275	0.0000	OK
240 minute winter	HW3	188	76.904	0.894	28.4	1.2796	0.0000	SURCHARGED
240 minute winter	HW4	188	76.904	0.894	50.7	1.5801	0.0000	SURCHARGED
240 minute winter	HW5	188	76.904	0.904	76.6	213.8561	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	10.0	1.718	0.068	0.1169	
15 minute winter	2	1.001	3	19.3	2.043	0.120	0.1769	
15 minute winter	3	1.002	4	26.2	2.276	0.226	0.1635	
15 minute winter	4	1.003	5	42.1	2.857	0.132	0.4651	
15 minute winter	5	1.004	6	48.4	3.145	0.151	0.2051	
15 minute winter	6	1.005	7	77.0	3.885	0.122	1.1589	
15 minute winter	7	1.006	8	85.1	4.183	0.121	0.3377	
15 minute winter	8	1.007	9	95.1	2.724	0.154	0.6874	
15 minute winter	9	1.008	HW4	168.7	2.371	0.174	4.9135	
15 minute winter	10	2.000	11	13.0	1.910	0.113	0.1775	
15 minute winter	11	2.001	12	43.1	2.275	0.214	0.4229	
15 minute winter	12	2.002	13	53.7	3.196	0.175	0.3713	
15 minute winter	13	2.003	9	73.5	4.655	0.164	0.6349	
15 minute winter	14	3.000	15	6.7	1.522	0.060	0.0588	
15 minute winter	15	3.001	16	44.5	1.539	0.155	2.2447	
15 minute winter	16	3.002	16A	56.1	1.016	0.422	1.3702	
15 minute winter	17	3.003	HW1	94.0	3.902	0.073	0.1950	
15 minute winter	18	4.000	19	14.9	1.576	0.106	0.2750	
15 minute winter	19	4.001	17	26.7	2.172	0.252	0.2811	
15 minute winter	HW1	3.004	HW2	94.1	3.601	0.224	0.7257	
15 minute winter	HW2	3.005	20	94.1	5.119	0.082	0.1126	
15 minute winter	20	3.006	HW3	94.0	1.967	0.127	0.6648	
240 minute winter	HW3	3.007	HW5	27.9	0.802	0.304	1.9045	
240 minute winter	HW4	1.009	HW5	48.7	1.165	0.270	1.5274	
240 minute winter	HW5	1.010	21	34.3	0.705	0.018	2.0839	

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.01%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	21	188	76.904	2.404	34.3	4.2474	0.0000	SURCHARGED
480 minute winter	HW6	608	71.400	0.300	29.8	0.5299	0.0000	OK
480 minute winter	HW7	608	71.400	0.400	28.1	70.4178	0.0000	OK
480 minute winter	22	608	71.400	0.454	25.4	1.1558	0.0000	OK
15 minute winter	16A	11	84.183	0.193	64.1	0.4157	0.0000	OK
15 minute summer	HW2A	1	84.400	0.000	0.0	0.0000	0.0000	OK
15 minute winter	11A	10	91.814	0.064	19.1	0.1957	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)
240 minute winter	21	Hydro-Brake®	HW6	20.3				
480 minute winter	HW6	1.012	HW7	28.1	1.365	0.025	0.6600	
480 minute winter	HW7	1.013	22	25.4	0.321	0.048	1.9545	
480 minute winter	22	Hydro-Brake®		16.6				567.4
15 minute winter	16A	3.002A	17	64.1	1.189	0.463	0.8948	
15 minute summer	HW2A	3.004A	20	0.0	0.000	0.000	0.1105	
15 minute winter	11A	2.000A	11	18.7	2.055	0.170	0.3372	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.01%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	97.639	0.064	26.2	0.1387	0.0000	OK
15 minute winter	2	10	96.086	0.086	50.5	0.1763	0.0000	OK
15 minute winter	3	10	94.389	0.139	69.0	0.2553	0.0000	OK
15 minute winter	4	10	93.597	0.122	110.1	0.3321	0.0000	OK
15 minute winter	5	10	91.049	0.149	127.3	0.2671	0.0000	OK
15 minute winter	6	10	89.875	0.150	203.5	0.6298	0.0000	OK
15 minute winter	7	10	84.091	0.161	223.2	0.3082	0.0000	OK
15 minute winter	8	10	82.050	0.225	248.6	0.5455	0.0000	OK
15 minute winter	9	11	81.248	0.208	437.9	0.2979	0.0000	OK
15 minute winter	10	10	91.458	0.083	34.3	0.2076	0.0000	OK
15 minute winter	11	10	90.206	0.176	113.4	0.3898	0.0000	OK
15 minute winter	12	10	89.455	0.155	140.9	0.3442	0.0000	OK
15 minute winter	13	10	87.768	0.143	192.7	0.4353	0.0000	OK
15 minute winter	14	10	89.838	0.063	17.7	0.1164	0.0000	OK
15 minute winter	15	10	89.226	0.131	117.0	0.6394	0.0000	OK
15 minute winter	16	11	84.568	0.468	148.5	1.2439	0.0000	SURCHARGED
15 minute winter	17	11	83.940	0.110	242.5	0.1851	0.0000	OK
15 minute winter	18	10	87.056	0.081	38.9	0.2155	0.0000	OK
15 minute winter	19	10	85.064	0.144	70.6	0.3435	0.0000	OK
15 minute winter	HW1	11	80.874	0.244	242.5	0.3494	0.0000	OK
15 minute winter	HW2	11	79.564	0.134	242.9	0.1921	0.0000	OK
240 minute winter	20	232	77.874	0.443	58.5	0.6346	0.0000	SURCHARGED
240 minute winter	HW3	232	77.873	1.863	58.5	2.6660	0.0000	SURCHARGED
240 minute winter	HW4	232	77.873	1.863	104.3	3.2923	0.0000	SURCHARGED
240 minute winter	HW5	232	77.873	1.873	159.1	626.2452	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	26.1	2.257	0.177	0.2312	
15 minute winter	2	1.001	3	50.2	2.532	0.313	0.3685	
15 minute winter	3	1.002	4	68.3	2.845	0.589	0.3409	
15 minute winter	4	1.003	5	109.6	3.564	0.344	0.9714	
15 minute winter	5	1.004	6	126.3	3.955	0.394	0.4257	
15 minute winter	6	1.005	7	201.3	5.035	0.320	2.3349	
15 minute winter	7	1.006	8	222.8	5.161	0.316	0.7157	
15 minute winter	8	1.007	9	246.5	3.418	0.399	1.4259	
15 minute winter	9	1.008	HW4	436.7	3.287	0.451	6.5112	
15 minute winter	10	2.000	11	34.1	2.240	0.295	0.4131	
15 minute winter	11	2.001	12	111.9	2.811	0.555	0.8884	
15 minute winter	12	2.002	13	139.6	4.046	0.455	0.7625	
15 minute winter	13	2.003	9	191.4	5.973	0.428	1.2882	
15 minute winter	14	3.000	15	17.6	1.985	0.158	0.1178	
15 minute winter	15	3.001	16	115.9	1.994	0.403	3.7753	
15 minute winter	16	3.002	16A	143.9	1.304	1.084	2.7386	
15 minute winter	17	3.003	HW1	242.5	4.745	0.189	0.4048	
15 minute winter	18	4.000	19	38.7	1.957	0.277	0.5693	
15 minute winter	19	4.001	17	69.5	2.725	0.656	0.5831	
15 minute winter	HW1	3.004	HW2	242.9	4.361	0.577	1.5225	
15 minute winter	HW2	3.005	20	243.3	6.004	0.211	0.2636	
240 minute winter	20	3.006	HW3	58.5	1.007	0.079	1.1536	
240 minute winter	HW3	3.007	HW5	57.6	0.774	0.627	1.9045	
240 minute winter	HW4	1.009	HW5	101.5	1.134	0.562	1.5274	
240 minute winter	HW5	1.010	21	31.5	0.556	0.016	2.0839	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.01%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	21	232	77.873	3.373	31.5	5.9593	0.0000	SURCHARGED
720 minute winter	HW6	960	71.811	0.711	33.3	1.2555	0.0000	SURCHARGED
720 minute winter	HW7	960	71.810	0.810	32.4	199.6061	0.0000	SURCHARGED
720 minute winter	22	960	71.810	0.864	16.9	2.1985	0.0000	OK
15 minute winter	16A	11	84.395	0.405	164.5	0.8738	0.0000	SURCHARGED
15 minute summer	HW2A	1	84.400	0.000	0.0	0.0000	0.0000	OK
15 minute winter	11A	10	91.859	0.109	49.6	0.3332	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)
240 minute winter	21	Hydro-Brake®	HW6	22.9				
720 minute winter	HW6	1.012	HW7	32.4	1.135	0.029	1.0915	
720 minute winter	HW7	1.013	22	16.9	0.304	0.032	2.5692	
720 minute winter	22	Hydro-Brake®		16.8				846.8
15 minute winter	16A	3.002A	17	164.8	1.534	1.190	1.6966	
15 minute summer	HW2A	3.004A	20	0.0	0.000	0.000	0.1194	
15 minute winter	11A	2.000A	11	49.2	2.633	0.446	0.6914	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.01%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	97.662	0.087	47.2	0.1889	0.0000	OK
15 minute winter	2	10	96.120	0.120	91.0	0.2471	0.0000	OK
15 minute winter	3	11	94.769	0.519	123.8	0.9534	0.0000	SURCHARGED
15 minute winter	4	10	93.644	0.169	190.9	0.4609	0.0000	OK
15 minute winter	5	11	91.124	0.224	221.7	0.4019	0.0000	OK
15 minute winter	6	11	89.935	0.210	357.6	0.8837	0.0000	OK
15 minute winter	7	10	84.154	0.224	392.6	0.4285	0.0000	OK
15 minute winter	8	11	82.165	0.340	438.0	0.8232	0.0000	OK
15 minute winter	9	11	81.381	0.341	775.9	0.4882	0.0000	OK
15 minute winter	10	10	91.491	0.116	61.9	0.2893	0.0000	OK
15 minute winter	11	11	90.496	0.466	204.2	1.0319	0.0000	SURCHARGED
15 minute winter	12	11	89.535	0.235	245.6	0.5222	0.0000	OK
15 minute winter	13	11	87.831	0.206	336.0	0.6269	0.0000	OK
15 minute winter	14	10	89.859	0.084	31.9	0.1531	0.0000	OK
15 minute winter	15	10	89.283	0.188	211.0	0.9157	0.0000	OK
15 minute winter	16	11	85.376	1.276	266.9	3.3908	0.0000	FLOOD RISK
15 minute winter	17	11	84.003	0.173	431.4	0.2912	0.0000	OK
15 minute winter	18	10	87.087	0.112	70.2	0.2993	0.0000	OK
15 minute winter	19	11	85.607	0.687	127.2	1.6425	0.0000	SURCHARGED
15 minute winter	HW1	11	81.613	0.983	431.2	1.4071	0.0000	SURCHARGED
15 minute winter	HW2	12	79.653	0.223	425.3	0.3193	0.0000	OK
360 minute winter	20	352	78.981	1.551	77.0	2.2190	0.0000	FLOOD RISK
360 minute winter	HW3	352	78.981	2.971	76.1	4.2510	0.0000	SURCHARGED
360 minute winter	HW4	352	78.980	2.970	137.4	5.2488	0.0000	FLOOD RISK
360 minute winter	HW5	352	78.980	2.980	210.3	1329.5810	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	1.000	2	47.0	2.630	0.320	0.3567	
15 minute winter	2	1.001	3	90.0	2.679	0.561	0.5706	
15 minute winter	3	1.002	4	120.0	3.019	1.035	0.5648	
15 minute winter	4	1.003	5	191.4	3.924	0.600	1.5318	
15 minute winter	5	1.004	6	222.3	4.392	0.693	0.6723	
15 minute winter	6	1.005	7	355.4	5.788	0.565	3.5859	
15 minute winter	7	1.006	8	393.1	5.211	0.558	1.2565	
15 minute winter	8	1.007	9	439.1	3.807	0.711	2.2620	
15 minute winter	9	1.008	HW4	776.5	5.058	0.802	8.1313	
15 minute winter	10	2.000	11	61.5	2.217	0.532	0.7865	
15 minute winter	11	2.001	12	196.4	2.967	0.974	1.4460	
15 minute winter	12	2.002	13	245.9	4.481	0.801	1.2088	
15 minute winter	13	2.003	9	336.8	6.707	0.752	2.0483	
15 minute winter	14	3.000	15	31.8	2.001	0.285	0.2224	
15 minute winter	15	3.001	16	208.2	3.219	0.724	4.4106	
15 minute winter	16	3.002	16A	258.3	2.342	1.946	2.7386	
15 minute winter	17	3.003	HW1	431.2	4.864	0.336	0.6295	
15 minute winter	18	4.000	19	69.8	2.085	0.500	0.8566	
15 minute winter	19	4.001	17	118.3	2.975	1.117	0.9093	
15 minute winter	HW1	3.004	HW2	425.3	4.511	1.011	2.4420	
15 minute winter	HW2	3.005	20	424.7	6.007	0.369	0.5466	
360 minute winter	20	3.006	HW3	76.1	1.051	0.103	1.1536	
360 minute winter	HW3	3.007	HW5	75.6	0.873	0.823	1.9045	
360 minute winter	HW4	1.009	HW5	134.7	1.308	0.746	1.5274	
360 minute winter	HW5	1.010	21	26.5	0.792	0.014	2.0839	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.01%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	21	352	78.980	4.480	26.5	7.9156	0.0000	FLOOD RISK
2160 minute winter	HW6	2400	72.673	1.573	24.2	2.7799	0.0000	SURCHARGED
2160 minute winter	HW7	2400	72.674	1.674	25.7	661.4418	0.0000	SURCHARGED
2160 minute winter	22	2400	72.674	1.728	16.9	4.3978	0.0000	OK
15 minute winter	16A	11	84.813	0.823	295.4	1.7755	0.0000	SURCHARGED
15 minute summer	HW2A	1	84.400	0.000	0.0	0.0000	0.0000	OK
15 minute winter	11A	10	91.902	0.152	89.3	0.4640	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)
360 minute winter	21	Hydro-Brake®	HW6	26.3				
2160 minute winter	HW6	1.012	HW7	25.7	0.835	0.023	1.0915	
2160 minute winter	HW7	1.013	22	16.9	0.310	0.032	2.5692	
2160 minute winter	22	Hydro-Brake®		16.8				1947.0
15 minute winter	16A	3.002A	17	295.7	2.681	2.135	1.8125	
15 minute summer	HW2A	3.004A	20	0.0	0.000	0.000	0.1194	
15 minute winter	11A	2.000A	11	88.5	2.615	0.802	1.2612	

Appendix F Drainage Layout

Key:

- Proposed adoptable surface water sewer and manhole
- Proposed adoptable surface water headwall
- Proposed swale
- Proposed shallow swale
- Easement
- Green verge/ Landscaping

AWAITING TECHNICAL APPROVAL

This drawing has NOT been technically approved by Local Authority and/or Water Authority. All works subject to change through technical review process with relevant approving authorities.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

PLEASE REFER TO THE HEALTH AND SAFETY FILE FOR A FULL LIST OF THE HAZARDS ASSOCIATED WITH THIS WORK. THE FOLLOWING ARE THE MOST SIGNIFICANT ITEMS TO BE AWARE OF.

CONSTRUCTION

1. OPERATIVES TO TAKE PRECAUTIONS WHEN WORKING ADJACENT TO OR WITHIN DEEP EXCAVATIONS. METHOD STATEMENT TO BE PRODUCED BY CONTRACTOR PRIOR TO WORKS COMMENCING.
2. ATTENTION IS DRAWN TO THE EXISTENCE OF BOTH EXISTING UNDERGROUND AND OVERHEAD UTILITIES.

ENVIRONMENTAL

1. EXISTING WATERCOURSES IN CLOSE PROXIMITY TO WORKS. A POLLUTION PREVENTION STRATEGY AND WORKING METHOD STATEMENTS TO BE PRODUCED BY THE CONTRACTOR PRIOR TO WORKS.
2. CONSIDERATION GIVEN TO NOISE LEVELS GIVEN PROXIMITY TO EXISTING PROPERTIES.
3. CONSIDERATION GIVEN TO GROUND CONDITIONS. CONTRACTOR TO REVIEW GEOTECHNICAL REPORT PRIOR TO UNDERTAKEN EXCAVATION WORKS.

WORK CAN ONLY BE CARRIED OUT BY SUITABLY TRAINED AND BRIEFED PERSONNEL.

Rev	Amendments	Date	By	Chk	Auth
P08	Drawing updated to latest layout	14.08.25	IO	JAK	JAK
P07	Drawing updated to latest layout	09.06.25	IO	JAK	JAK
P06	Drawing updated to latest layout	11.04.25	IO	JAK	JAK
P05	Impermeable area updated to new layout	27.03.25	IO	JAK	JAK
P04	Drainage updated to the latest levels	21.03.25	IO	JAK	JAK
P03	Drainage updated to the latest layout	12.03.25	IO	JAK	JAK
P02	Surface water drainage added	19.12.24	IO	JAK	JAK
P01	First issue	10.12.24	IO	JAK	JAK

SLR

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Drawing Status & Suitability Code: FOR INFORMATION S2

Client: PERSIMMON HOMES LTD

Project: LAND EAST OF AXMINSTER EAST DEVON

Drawing Title: DRAINAGE PLAN

Scale		SLR Project No.
1:500	@ A0	422.065211.00001

Designed	Drawn	Checked	Authorised
IO	IO	JAK	JAK
Date: 10.12.2024	Date: 10.12.2024	Date: 10.12.2024	Date: 10.12.2024

Drawing Number: 422.065211-SLR-XXX-XXX-DR-CH-500 Rev: P08

0 5 10 20 30
1:500 SCALE (m)

14/08/2025

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Key:

Overland flooding route

AWAITING TECHNICAL APPROVAL

This drawing has NOT been technically approved by Local Authority and/or Water Authority.
All works subject to change through technical review process with relevant approving authorities.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

PLEASE REFER TO THE HEALTH AND SAFETY FILE FOR A FULL LIST OF THE HAZARDS ASSOCIATED WITH THIS WORK - THE FOLLOWING ARE THE MOST SIGNIFICANT ITEMS TO BE AWARE OF.

CONSTRUCTION

1. OPERATIVES TO TAKE PRECAUTIONS WHEN WORKING ADJACENT TO OR WITHIN DEEP EXCAVATIONS. METHOD STATEMENT TO BE PRODUCED BY CONTRACTOR PRIOR TO WORKS COMMENCING.
2. ATTENTION IS DRAWN TO THE EXISTENCE OF BOTH EXISTING UNDERGROUND AND OVERHEAD UTILITIES.

ENVIRONMENTAL

1. EXISTING WATERCOURSES IN CLOSE PROXIMITY TO WORKS. A POLLUTION PREVENTION STRATEGY AND WORKING METHOD STATEMENTS TO BE PRODUCED BY THE CONTRACTOR FOR ALL WORKS.
2. CONSIDERATION GIVEN TO NOISE LEVELS GIVEN PROXIMITY TO EXISTING PROPERTIES.
3. CONSIDERATION GIVEN TO GROUND CONDITIONS. CONTRACTOR TO REVIEW GEOTECHNICAL REPORT PRIOR TO UNDERTAKEN EXCAVATION WORKS.

WORK CAN ONLY BE CARRIED OUT BY SUITABLY TRAINED AND BRIEFED PERSONNEL.

Rev.	Amendments	Date	By	Chk	Auth
P05	Updated to latest layout	14.08.25	IO	JAK	JAK
P04	Updated to latest layout	09.06.25	IO	JAK	JAK
P03	Updated to latest layout	11.04.25	IO	JAK	JAK
P02	Updated to latest layout	27.03.25	IO	JAK	JAK
P01	First issue	21.03.25	IO	JAK	JAK

SLR

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Drawing Status & Suitability Code: FOR INFORMATION S2

Client: PERSIMMON HOMES LTD

Project: LAND EAST OF AXMINSTER
EAST DEVON

Drawing Title: OVERLAND FLOODING ROUTE PLAN

Scale	SLR Project No.
1:500 @ A0	422.065211.00001

Designed	Drawn	Checked	Authorised
IO	IO	JAK	JAK
Date	Date	Date	Date
21.03.25	21.03.25	21.03.25	21.03.25

Drawing Number: 422.065211-SLR-XXX-XXX-DR-CH-500 Rev: P05

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1:500 SCALE (m)

14/08/2025

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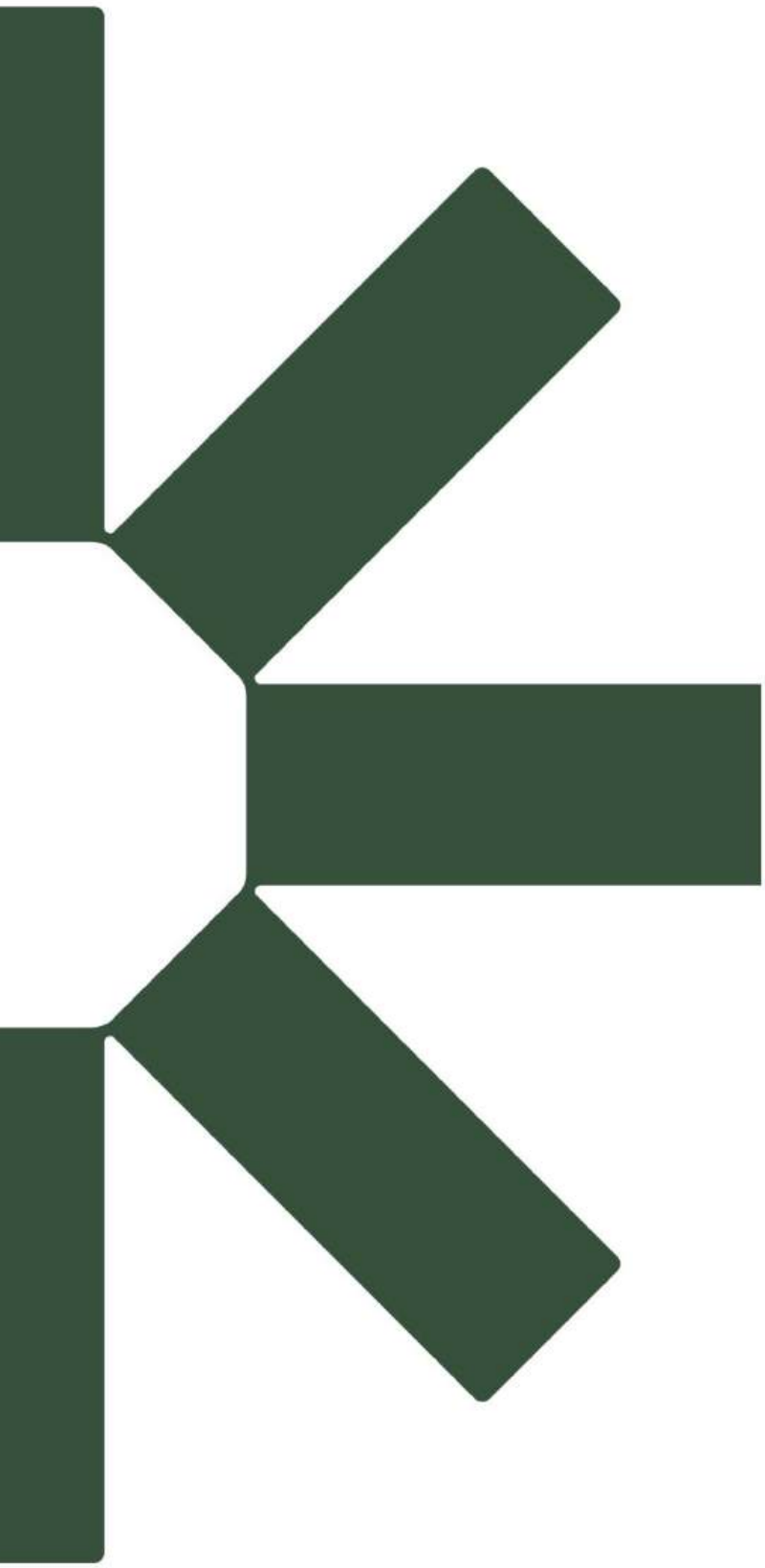

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