Land East of Mousdell Close
Ashington, West Sussex

Flood Risk Assessment and Drainage Strategy

For

Rocco Homes

motion

Document Control Sheet

Land East of Mousdell Close

Ashington, West Sussex

Rocco Homes

This document has been issued and amended as follows:

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Contents

Appendices

1.0 Introduction

1.1 This flood risk assessment (FRA) and drainage strategy has been produced by Motion on behalf of their client, Rocco Homes. It supports the planning application for 74 units on the land to the east of Mousdell Close, Ashington, RH20 3GS.

1.2 A layout of the proposed development can be seen in **Appendix A**.

1.3 The site location plan can be seen in **Appendix B**.

1.4 The 2.19 ha site is located within Flood Zone 1 according to the Environment Agency's (EA's) Flood Map for Planning (**Appendix C**).

1.5 With reference to the EA's Risk of Flooding from Surface Water (RoFSW) map in **Appendix D**, most of the site is in the very low surface water flood risk category (areas of between the 1 in 100-year return period and the 1 in 1,000-year return period and areas outside of the 1 in 1,000-year return period).

1.6 A drainage strategy is required to demonstrate how the development will manage and discharge surface water generated in all rainfall events up to and including the 1 in 100-year + 45% storm.

1.7 This FRA and drainage strategy has been produced to discuss the flood risks to the proposed development, from all sources. This FRA and drainage strategy will also define how the site will manage its surface water so that the development does not increase flood risk in the area or to neighbouring properties/land.

1.8 This drainage strategy follows the guidance set out in:

- National Planning Policy Framework (NPPF)
- Planning Practice Guidance (PPG) to the National Planning Policy Framework
- CIRIA SuDS Manual 2015 (C753)
- Environment Agency Rainfall Runoff Management for Developments
- Non-Statutory Technical Standards for SuDS (NSTS)

1.9 This FRA and drainage strategy report pertains only to the design of the drainage system for the built site. It does not provide details of how the site will be drained during the construction phase. This is considered to be temporary works and can only be prescribed and provided by the eventual appointed contractor.

1.10 Similarly, this report does not provide information on how the drainage infrastructure will be protected during the construction phase of the project. The provision of this information is, again, the responsibility of the appointed contractor.

2.0 Site Description

Table 2.1 – Site Description

Site Name	Land East of Mousdell Close
Location	Ashington, RH20 3GS
Grid Reference	TQ 12502 16380
Site Area	The red line boundary of the development is 21,900 m^2 (2.19 ha)
Development Type	Erection of 74no. dwellings with associated landscaping, open space, parking and creation of new vehicular access from Rectory Lane
Flood Zone	Flood Zone 1
Flood Risk Vulnerability Classification	More Vulnerable
Surface Water Flood Risk	Very Low
Local Water Authority	Southern Water
Local Planning Authority	Horsham District Council (HDC)
Lead Local Flood Authority	Horsham District Council (HDC)

Site Location and Description

2.1 The development is located in Ashington, on the land to the east of Mousdell Close and Penn Gardens. It is bordered by Rectory Lane to the north, residential properties on its eastern and western sides and trees on its southern side. The site location plan can be seen in **Appendix B**.

2.2 The existing site is currently an open field.

2.3 The proposed development is for the erection of 74 no. dwellings with associated landscaping, open space, parking and creation of new vehicular access from Rectory Lane. A copy of the proposed site plans can be seen in **Appendix A**.

Topography

2.4 A topographical survey has been undertaken for the site and can be seen in **Appendix E**.

2.5 Overall, the main site has a highpoint in the middle near to the northeast corner and then the site levels fall gently to the south and northwest. The site levels fall from around 30.50 metres above ordnance datum (m AOD) to a level of around 26.5m AOD in the northwest and 26.0m AOD in the south of the site.

2.6 The average gradients of the site, from the northeast in both directions, is approximately 1 in 30 (3.33%).

Geology

2.7 The 1:50,000 British Geological Survey (BGS) online Geoindex Mapping identifies that the solid geology underlying the site is of the Weald Clay Formation - Mudstone.

2.8 The BGS online 1:50,000 Geoindex mapping indicates that the superficial geology, along the southern edge of the site is listed as the Head – Clay, Silt, Sand and Gravel.

2.9 The Weald Clays are known to have poor infiltration properties therefore infiltration will not be the primary method of discharging surface water run-off from the site.

2.10 The nearest available BGS borehole log, reference TQ11NW1 (**Appendix F**), is located approximately 70 metres east of the site in Hodges Nursery. It provides details of the local geology down to 45.72 meters below ground level (mBGL). This borehole log shows that the local geology is made up of: Yellow Clay, Blue Clay with Brown Sand, Brown Marl, Shells and Fossils in between.

2.11 Rest-level of water was first encountered in the borehole at around 4.27 mBGL.

2.12 Defra's Magic Map online application has been referred to, which lists the soils in the area as 'slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils'.

Infiltration Potential

2.13 The desk-based geology information in the section above indicates that infiltration will not be feasible at the site due to the clay-based geology (Weald Clay).

2.14 Therefore, infiltration cannot be considered a viable means of surface water discharge for the development.

Hydrogeology

2.15 Groundwater Source Protection Zone (SPZ's) are defined around groundwater abstraction sources such as wells, boreholes and springs that are used for public drinking water supply.

2.16 SPZ's show the risk of contamination to groundwater from any activities that might cause pollution in the area. The closer the activity to the source of abstraction, the greater the risk. The maps show three main zones; inner – Zone 1; outer – Zone 2; and total catchment – Zone 3.

2.17 Defra's Magic Map was reviewed to see where the site is in relation to the Groundwater SPZ's and the site is not within any SPZ's.

2.18 The site's superficial geology (Head – Clay, Silt, Sand and Gravel) is listed as a Secondary (undifferentiated) Aquifer. The bedrock geology is listed as Unproductive Aquifer.

2.19 The Groundwater Vulnerability Map (England) classification is shown as 'Unproductive' for most of the site. The southern edge of the site is shown as 'Low'.

Existing Drainage Regime

2.20 Because the development site is greenfield, there is no formal drainage within the site boundary for surface water. Surface water on the existing site predominantly drains to the north-west and the south following the existing falls and gradients of the land to Rectory Lane and to the ditch running along the southern boundary of the site.

2.21 Records of the local drainage infrastructure were obtained from Southern Water, the sewerage undertaker for the area. These records (**Appendix G**) show that there is no public surface water sewer network in the vicinity of the site. There is a public foul sewer network in the local area, which includes a 150mm diameter foul water gravity network in Rectory Lane, Mousdell Close and Penn Garden. There is also a foul pumping station in Mousdell Close and the foul rising main in Rectory Lane.

2.22 There are two manhole nodes on the foul sewer in Rectory Lane; node 4401 and node 5401. Manhole no. 5401 is located near the proposed access, manhole no. 4401 is located further down Rectory Lane, towards Penns gardens.

2.23 The invert level of node 4401 is 25.15 mBGL and the invert level of node 5401 is 27.93 mBGL. Due to the site topography and the proposed site layout, the foul water drainage will be collected by gravity

network within the site and pumped to the existing foul water network on Rectory lane via a new demarcation chamber.

Hydrology

2.24 The nearest surface water body is about 50 metres south of the site. The Lancing Brook is around 340 metres to the north of the site.

2.25 The nearest significant watercourse and designated main river is the River Chilt, which is 3.3 kilometres to the west of the site.

2.26 Surface water within the existing site predominantly drains to the north-west and the south following the existing falls and gradients of the land to Rectory Lane and to the ditch running along the southern boundary of the site. The existing ditch that runs along the southern boundary is connected, and communicates with, the network of mapped watercourses to the south and east of the site. The watercourses are culverted below Rectory Lane and are a tributary of the Lancing Brook located to the north of Rectory Lane.

2.27 Any surface water run-off from the site to Rectory Lane drain to, and is collected by, the existing surface water (highway) drainage system.

2.28 The network of drainage ditches on the site boundaries means that the site is connected to the local hydraulic network and that there is confirmed ongoing connectivity.

3.0 Legislative and Policy Framework

3.1 LLFA's have a responsibility under the FWMA to develop, maintain, apply and monitor the application of a strategy for local flood risk in their area. Local flood risk is defined as flood risk arising from local sources, such as surface water run-off, groundwater and ordinary watercourses (i.e. non-main rivers). The EA plays a role in managing, maintaining and regulating activity around the watercourses designated as Main Rivers.

The Environment Agency Flood Map for Planning

3.2 The updated Environment Agency's Flood Map for Planning was released on 25th March 2025. This updated and new National Flood Risk Assessment (NaFRA) uses both existing detailed local information and improved national data, includes the potential impact of climate change on flood risk, based on UK Climate Projections (UKCP18) and shows potential flood depths. This allows the Flood Map for Planning to provide much higher resolution maps that make it easier to see where there is risk.

3.3 The EA's Flood Map for Planning gives an indicative prediction of areas at risk of fluvial and tidal flooding. The mapping is an amalgamation of modelled flood outlines and historical flood event outlines.

3.4 The Flood Map is split into 'Flood Zones', which demarcate the extent of flooding from rivers or the sea for different return periods. The Flood Map for Planning shows the extent of the natural floodplain if there were no defences or other man-made structures in place.

3.5 Table 3.1, below, lists the flood zone categories and explains the flood risk probabilities they represent.

Table 3.1 – Flood Zone Categories

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding (shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of tidal flooding (land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of tidal flooding (land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their SFRAs areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map, but may be distinguished in Product 4 information, for example). Following the 2022 update to the NPPF, Flood Zone 3b is considered to be anywhere within the 1 in 30-year flood event outline.

The National Planning Policy Framework

3.6 The NPPF sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. The Planning Practice Guidance (PPG) to the NPPF provides further information on the policies set out in the NPPF. It encourages development to take place in areas of lower flood risk wherever possible and stresses the importance of preventing increases in flood risk off-site to the wider catchment area. This includes ensuring that flood risk is taken into account at all stages of the planning process, avoiding inappropriate development in areas at risk of flooding and directing development away from those areas where risks are the highest.

3.7 A site-specific FRA is required for proposals of 1ha or greater in Flood Zone 1, all proposals for development in Flood Zones 2 and 3, or in an area within Flood Zone 1 that has critical drainage problems (as notified to the local planning authority by the EA).

3.8 The FRA should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.

3.9 Within each Flood Zone, a key factor in determining planning applications for development is the flood risk vulnerability of a development. The PPG to the NPPF categorises different development types according to their vulnerability to flooding. These categories are:

- Essential infrastructure;
- Highly vulnerable development;
- More vulnerable;
- Less vulnerable development; and;
- Water-compatible development.

3.10 The proposed new residential dwellings are considered to be 'more vulnerable' by the NPPF.

3.11 Within the different Flood Zones each of the above development categories are considered appropriate or not permissible. The PPG to the NPPF lists theses as:

Flood Zone 1:

- All the development categories listed above are appropriate.

Flood Zone 2:

- Water-compatible, less vulnerable development, more vulnerable development and essential infrastructure is appropriate in this zone.

Flood Zone 3a:

- Water-compatible and less vulnerable development is appropriate in this zone. Highly vulnerable development should not be permitted in this zone.

Flood Zone 3b:

- Only water-compatible development and essential infrastructure that has to be there should be permitted in this zone.

3.12 The above information sets out the basis by which developments must assessed in terms of flood risk. Later in this report, the development will be reviewed against the Flood Zone in which it is located, and an assessment will be made of the appropriateness of the development, as per the advice within the PPG to the NPPF.

4.0 Current Flood Risk

4.1 Flooding can arise from a variety or combination of sources. These may be natural, or artificial and may be affected by climate change. These are discussed, below, in the following two sections and are summarised in Table 6.1, which is in Chapter 6.

Tidal Flooding

4.2 The site is not in proximity of a tidally influenced river, thus the development cannot be considered at risk of tidal flooding.

Fluvial Flooding

4.3 The Environment Agency's Flood Map for Planning (**Appendix C**) states that the site is located within Flood Zone 1, which means it is outside the 1 in 1,000-year flood event outline (Flood Zone 2).

Flood Risk and Appropriateness of the Proposed Development

4.4 According to the classifications in the NPPF the site is considered to be 'more vulnerable'.

4.5 Table 3 of the PPG to the NPPF (see below) states that 'more vulnerable' development is appropriate in Flood Zone 1, thus the proposed development is appropriate in this location. This is supported by the fact that the site is bordered by residential properties.

Table 3 of the NPPF – Flood Risk Vulnerability and Flood Zone Compatibility

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	✗	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Surface Water Flooding

4.6 Surface water, or pluvial flooding, results from rainfall-generated overland flow, where rainwater has not yet reached a watercourse or sewer and where the local drainage systems become overwhelmed. Pluvial flooding often occurs during short, very intense storms, but can also occur during longer periods of rainfall when the ground is already saturated, or where land has low permeability due to development.

4.7 In these conditions surface water can build up where the topography allows it to converge or pond. Where it gathers it will travel down prevailing gradients. Pluvial flooding then occurs at locations where

significant surface water flow paths converge, at localised low points and/or due to overland obstructions. In urban areas pluvial flooding often occurs where the built environment channels overland flow routes (down roads that are bounded by kerbs, for example) or where there are obstacles to the natural overland flow routes. Boundary walls and buildings are often the main causes and, hence, the likelihood of pluvial flooding to impact property and built-up areas.

4.8 Pluvial flooding is exacerbated in many cases by the mistreatment or failure of the below ground infrastructure (including partial or full blockages of gullies and/or within the combined sewers and the accumulation of fats, oils and greases within the sewer networks).

4.9 The EA's Risk of Flooding from Surface Water (RoFSW) map was updated and refined in January 2025. The map uses improvements in data, technology and modelling and includes information and input from LLFAs, where this is available. This New National Model (NNM) for surface water represents a significant improvement over previous national-scale models and, generally speaking, has shown a reduction in overall surface water flood risk (when compared with the previous RoFSW mapping) with more targeted risk areas that tie in better with local land features and overall topography.

4.10 The EA's RoFSW maps for the site (**Appendix D**) shows that the site is at very low surface water flood risk (less than the 1 in 1,000-year return period).

4.11 There is an area along the southern edge of the site that is at high risk of surface water flooding (areas greater than the 1 in 30-year return period), the surface water flood risk is associated with the existing ditch that runs on the southern boundary of the site and is a discrete and linear area of flood risk that is within the confines and the boundary of the channel (ditch). This is not in an area of the proposed development and just runs along the boundary line of the site.

4.12 Therefore, it is concluded that the site is not at risk of surface water flooding.

Groundwater Flooding

4.13 There are no flood risk maps for groundwater, as stated by the Environment Agency in their 2011 guidance note 'flooding from groundwater'. Mapping products currently available only show areas where the geological and hydrological conditions may combine to cause groundwater flooding, but they should not be considered as groundwater flood risk maps. They only show susceptibility to groundwater flooding.

4.14 There are several mapping products that depict areas that may be susceptible to groundwater flooding, but they are not comparable in detail to the risk maps developed for fluvial, tidal and surface water, such as those used by practitioners and risk management authorities to support planning decisions. The mapping does not show the likelihood of groundwater flooding occurring and can only be considered as a hazard, but not a risk-based dataset.

4.15 As such, the mapping products can be viewed as indicative at best and should only be used as a prompt to review site-based information to determine whether groundwater is a risk factor that should be considered. Indeed, the Environment Agency state that:

"The susceptibility data should not be used on its own to make planning decisions at any scale and, in particular, should not be used to inform planning decisions at the site scale. The susceptibility data cannot be used on its own to indicate risk of groundwater flooding."

4.16 This FRA will review the groundwater flooding susceptibility mapping available, which has been supplied in the Envirocheck Landmark Flood Studies Report (FSR) and can be seen in **Appendix H**.

BGS Geological Indicators of Flooding

4.17 The BGS Geological Indicators of Flooding map shows that the site is not in an area with indicators of groundwater flooding.

BGS Groundwater Flooding Susceptibility

4.18 The BGS Groundwater Flooding Susceptibility map shows that most of the site is not in an area where there is potential for groundwater flooding to occur. There is a small area in the south of the site that has potential for groundwater flooding to occur at surface.

Geosmart Information Groundwater Flood Map

4.19 The Geosmart Information Groundwater Flood Map places the site in an area of 'negligible' risk.

Groundwater Flood Risk Summary

4.20 The site is not in an area with any indicators of groundwater flooding but has a small area with potential for groundwater flooding to occur at surface. Due to this and being in an area of 'negligible' risk, it can be seen that the development site is at very low to low groundwater flood risk.

Flooding from Infrastructure Failure

4.21 Sewer flooding can occur when the capacity of the infrastructure is exceeded by excessive flows, or because of a reduction in capacity due to collapse, siltation, blockage, or if the downstream system becomes surcharged. This can lead to the sewers flooding onto the surrounding ground via manholes and gullies, which can generate overland flows.

4.22 Typically, sewer systems are constructed to accommodate rainstorms with a 30-year return period or less, depending on their age. Consequently, rainstorm events greater than 1 in 30-years would be expected to result in surcharging of some parts of the sewer system. In fact, due to most gullies being poorly maintained and often partially blocked with silt, leaves and other debris, their capacity is often estimated to be closer to the 1 in 10-year storm.

4.23 All Water Companies have a statutory obligation to maintain a register of properties/areas which have reported records of flooding from the public sewerage system, and this is shown on the 'DG5 Flood Register'. This includes records of flooding from foul sewers, combined sewers and surface water sewers that are deemed to be public and maintained by the Water Company.

4.24 The DG5 Flood Register only records sewer flooding incidents per postcode area and over a 10-year period, thus is not detailed in its resolution but it can provide an indicator of areas that have persistent sewer flooding problems.

4.25 Southern Water provided an extract from their DG5 Flood Register for Appendix A Figure 5A Sewer Flooding Incidents (2014-2024) in the Horsham District Council Level 1 Strategic Flood Risk Assessment6 (SFRA). Appendix A Figure 5A identifies that the RH20 postcode experienced between 41 and 120 sewer flooding incidents between 2014-2024. This is a large number over a postcode that covers a wide area, this is can be concluded that the site is at low risk of sewer flooding.

Flooding from Artificial sources

4.26 The EA provides a map showing the maximum potential flood extent should all reservoirs with a capacity of greater than 25,000 cubic metres fail and release the water they hold.

4.27 The map shows that the site would not experience flooding in this scenario.

4.28 There are no other artificial sources of flooding (such as canals) in the vicinity of the site that could cause flooding.

Historic Flooding

4.29 The Envirocheck Landmark FSR includes a map showing recorded flood outlines, which can be seen in **Appendix I**.

4.30 This map shows that the site has no record of flooding in the past. Thus the Historic Flood Map supports this report's conclusion that the site is at low risk of flooding and that the proposed development is appropriate in this location.

5.0 Future Flood Risk & Climate Change

5.1 The NPPF and the supporting Technical Guidance document sets out how flood risk should be considered over the lifetime of a development. This requires an increase in flood risk due to climate change to be taken into account. Both peak river flows and rainfall intensity should be assessed.

Peak River Flows

5.2 Because the site is shown to be in Flood Zone 1, increases in future peak river flows do not need to be considered.

Peak Rainfall Intensity and Climate Change

5.3 With climate change it is becoming more common to see rainfall events of higher intensity, particularly in the southeast of England. Increases rainfall intensity affects river levels and drainage systems, with the result being an increase in surface water flooding and sewerage surcharges.

5.4 The site lies within the 'Adur and Ouse Management Catchment' and the peak rainfall climate change allowances for this catchment are as follows in Table 5.2, below:

Table 5.2 – Climate Change Predictions for the Adur and Ouse Management Catchment

1 in 30-year Rainfall Event	**Central Allowance**	**Upper End Allowance**
2050's epoch	20%	35%
2070's epoch	20%	40%
1 in 100-year Rainfall Event	**Central Allowance**	**Upper End Allowance**
2050's epoch	20%	45%
2070's epoch	25%	45%

5.5 The NPPF states that for developments with a lifetime of up to 2100, the 'Upper End' climate change allowances should be used and both the 1 in 30-year and 1 in 100-year rainfall events considered. For the proposed development, this means that the anticipated peak rainfall increases due to climate change is 40% for the 1 in 30-year and 45% for the 1 in 100-year rainfall events.

5.6 The site is currently in an area of very low surface water flood risk and, as such, even with the climate change increase predictions outlined above, it is very unlikely that surface water flood risk will increase on the site to the extent that the development would become inappropriate.

6.0 Summary of Flood Risk

6.1 Historic, current and future flood risk, from all sources, has been reviewed in the context of the proposed development at Land East of Mousdell Close. A summary of these flood risks is summarised in Table 6.1, below. The allocation of overall flood risk shows the residual flood risk once the site-specific conditions have been taken into account.

Table 6.1 - Summary of Residual Flood Risk From All Sources

Flood Source	Risk Level				Comment
	High	Medium	Low	Very Low	
Fluvial				X	The site is within Flood Zone 1 on EA Flood Map.
Tidal				X	In Tidal FZ1.
Groundwater			X	X	In an area with inland indicators of groundwater flooding and the potential for groundwater flooding to occur at the surface, but at 'negligible' risk.
Surface Water				X	Site at very low risk of surface water flooding.
Canals				X	No canals in the local area.
Reservoirs				X	No reservoirs in the local area.
Infrastructure Failure			X		RH20 postcode experienced between 41 and 120 sewer flooding incidents between 2014-2024.
Increase due to Climate Change				X	Increased peak rainfall intensities are not expected to affect any infrastructure or properties.

7.0 Proposed Surface Water Drainage Strategy

Sustainable Drainage Overview

7.1 Current planning policy and EA guidance requires developments to employ SuDS (Sustainable Drainage Systems) techniques wherever feasible. Careful design of SuDS features can ensure that a development's surface water drainage closely reflects the natural hydrology of the pre-developed site.

7.2 SuDS will attenuate and treat surface water run-off quantities at the source (source control) in line with NPPF and EA policies.

7.3 The key benefits of SuDS are as follows:

- Improving water quality over a conventional piped system by removing pollutants from diffuse pollutant sources (e.g., roads);
- Improving amenity through the provision of open green space;
- Improving biodiversity through increased areas for wildlife habitat; and
- Enabling a natural drainage regime that recharges groundwater (where possible).

7.4 SuDS provide a flexible approach to drainage, with a wide range of components from soakaways to large-scale basins or ponds. The individual techniques should be used where possible in a management train that mimics the natural pre-developed pattern of drainage.

Site Areas and Greenfield Runoff Rate

7.5 The site areas to undergo development are to be assessed as follows in Table 7.1:

Table 7.1 – Site Areas

Breakdown of Site Areas	Proposed (ha)
Total Area	2.190
Total Impermeable Areas	0.971
Total Permeable Areas	1.219

7.6 The greenfield runoff rates have been calculated using the QMED value, which is the index flood in the Flood Estimation Handbook (FEH) and is based on the 2022 dataset. QMED has been calculated for rural and urban values in InfoDrainage using the catchment descriptors methodology, which includes the following input variables:

- Site Location
- SAAR – Standard Average Annual Rainfall 1961 – 1990 (mm)
- SPR Host - Standard percentage runoff derived from HOST soils data
- URBEXT - The extent of urban and suburban cover
- BFIHOST - Baseflow index derived from Hydrology of Soil Types (HOST) soils data
- FARL - Index of flood attenuation due to reservoirs and lakes
- Catchment Area – Hectares

7.7 The QMED calculation sheet for the impermeable area is included in the InfoDrainage modelling report, which is discussed and presented later in the discussion of the drainage strategy. This is summarised in Table 7.2 below

Table 7.2 – QMED Runoff Rate

QMED Rural (l/s)	QMED Urban (l/s)
11.4	11.6

7.8 The calculated QMED Rural value is 11.4 l/s over the 0.971 ha impermeable area of the proposed development.

Urban Creep

7.9 An appropriate allowance should be made for urban creep throughout the lifetime of the development as per 'BS 8582:2013 Code of Practice for Surface Water Management for Developed Sites'.

7.10 WSCC have produced their own guidance on the percentage of urban creep that should be applied. They state that the consideration of urban creep should be assessed on a site-by-site basis but is limited to residential development only. The allowances set out in Table 5.2 of WSCC LLFA Policy for the Management of Surface Water must be applied to the impermeable area within the property curtilage according to the proposed development density. Table 5.2 is shown below.

Table 7.3: Table 5.2 of WSCC LLFA Policy for the Management of Surface Water

Residential development density (Dwellings per hectare)	Change allowance (% of impermeable area)
≤25	10
30	8
35	6
45	4
≥50	2
Flats & Apartments	0

7.11 In the hydraulic design of the site, urban creep results in a total impermeable area increase of 400m^2 within residential curtilages.

7.12 The results of the hydraulic modelling, inclusive of urban creep, will be discussed later in this report. At this stage, it should be noted that the proposed drainage strategy can attenuate all surface water arising in the 1 in 100-year + 45% critical rainfall event, inclusive of a 10% uplift due to urban creep, without flooding.

Drainage Strategy Overview

7.13 As discussed in Sections 2 of this report, The desk-based geology information in the section above indicates that infiltration will not be feasible at the site due to the clay-based geology (Weald Clay). Therefore, infiltration cannot be considered a viable means of surface water discharge for the development.

7.14 The drainage strategy for the site has been developed on the premise that infiltration of surface water is not possible.

7.15 Therefore, the drainage strategy for the development will look to discharge surface water to an existing ordinary watercourse at a controlled rate via a vortex flow control.

7.16 The proposed site layout of the drainage strategy can be seen in **Appendix K** of this report. This outlines the proposed drainage strategy for the development. The design criteria achieved by the proposed drainage strategy, and how it has been developed in accordance with the sequential check of the drainage hierarchy, is discussed below.

Design Criteria

7.17 The drainage strategy has been designed in accordance with the design criteria outlined in West Sussex County Council's LLFA Policy for the Management of Surface Water. This ensures that the current drainage strategy accords with local policy requirements (as well as those of the NPPF). In brief, this includes:

- Using FEH 2022 Annual Maximum Catchment data rather than FSR data.
- 10 % Urban Creep allowance has been applied for property curtilage.
- Using a runoff coefficient (CV) value of 1.0 in all hydraulic modelling in summer and winter storms.
- The full suite of rainfall events has been used.

7.18 The proposed drainage strategy for the development and how it has been designed has been outlined. With reference to how the proposed drainage strategy has been considered within each tier of the drainage hierarchy, this is discussed below.

The Drainage Hierarchy

7.19 The NPPF states that opportunities to reduce overall flood risk should be sought and achieved through sustainable development and careful drainage design. This can be achieved through the layout and form of development, including green infrastructure and the appropriate application of sustainable drainage systems (SuDS). SuDS are designed to control surface water runoff close to where it falls and mimic natural drainage as closely as possible. They provide opportunities to:

- Reduce the causes and impacts of flooding;
- Remove pollutants from urban run-off at source;
- Combine water management with green space with benefits for amenity, recreation and biodiversity.

7.20 To deliver SuDS benefits and ensure that a development reduces overall flood risk, there is an established hierarchy of surface water drainage methods that should be considered. The most preferable and sustainable are at the top and the least preferable and least sustainable at the bottom.

7.21 The drainage hierarchy is a sequential check that intends to ensure that all practical and reasonable measures are taken to manage surface water as high up the hierarchy (with '1' being the highest) as possible, and that the amount of surface water managed at the bottom of the hierarchy is minimised. The Planning Practice Guidance to the National Planning Policy Framework (NPPF) states that *"Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable".*

7.22 The drainage hierarchy presented in the NPPF presents only four tiers of drainage options. This has been expanded on and adopted by others and now can be viewed as the following:

1. Store rainwater for later use
2. Use infiltration techniques, such as porous surfaces in non-clay areas
3. Attenuate rainwater in ponds or open water features for gradual release
4. Attenuate rainwater by storing in tanks or sealed water features for gradual release
5. Discharge rainwater direct to a watercourse

6. Discharge rainwater to a surface water sewer/drain
7. Discharge rainwater to the combined sewer
8. Discharge rainwater to the foul sewer

7.23 The first two tiers of the drainage hierarchy ensure that surface water is retained within the site boundary and does not increase flood risk to others. This is always the most preferable method of surface water management.

7.24 The next six tiers of the hierarchy provide regional control, but with decreasing levels of pollution removal and reduced potential for amenity and habitat creation.

7.25 Within the lower six tiers of the drainage hierarchy, there must be some form of flow restriction, so that off-site surface water discharge resembles greenfield runoff rates, as much as is reasonably practicable. This requires on-site storage facilities, which may include ponds, swales, subsurface storage tanks and System C (non-infiltration) permeable paviours with flow control devices. Again, methods that provide the most potential for amenity and pollution removal should be favoured.

7.26 With regards to the proposed development and its drainage strategy, the tiers of the drainage hierarchy that have been achieved are summarised in Table 7.4, below:

Table 7.4 - Compliance with the Drainage Hierarchy

Tier	Discharge Method	Achievement of Tier	Notes
1	Store rainwater for later use	✓	Water butts specified
2	Use infiltration techniques	✗	Not viable: clay soils.
3	Attenuate rainwater in ponds or open water features	✓	SuDS basin proposed
4	Attenuate rainwater by storing in tanks or sealed water features	✓	System C 'tanked' permeable paviours used in selected areas
5	Discharge rainwater direct to a watercourse	✓	All surface water to be discharged to watercourses on the site boundaries
6	Discharge rainwater to a surface water sewer/drain	✗	This is not required for the drainage strategy
7	Discharge rainwater to the combined sewer	✗	N/A
8	Discharge rainwater to the foul sewer	✗	N/A

Tier 1 – Store rainwater for later use

7.27 Water re-use systems can rarely manage 100% of the surface water discharged from a development. This requires the surface water yield from the building and hardstanding areas to balance perfectly with the demand from the proposed development; too much demand will result in a lack of water supply; too little demand will cause the storage systems to become overwhelmed and could result in flooding when the next rainfall event happens. Consequently, even if there are opportunities and a need for rainwater recycling systems, further solutions for attenuating and discharging surface water will almost always be required.

7.28 There is likely to be a moderate rainwater yield from the roof areas of the development that could be used for non-potable water uses. The proposed development includes landscaping that may benefit from having a supply of recycled rainwater for the watering of gardens, beds, etc.

7.29 The opportunity for water re-use and recycling on site has been explored and this report recommends the use of water butts to be used on each plot. These will reduce the reliance on potable water supplies during activities such as gardening. They can also provide small amounts of storage for surface water. The typical types and storage volumes of water butts are in Table 7.5, below:

7.30 Water butts can also provide small amounts of storage for surface water and can often assist in achieving zero discharge for rainfall depths up to 5mm, which covers 50% of annual rainfall events (according to the EA's Rainfall Runoff Management for Developments report – SC030219).

Table 7.5 – Types and Storage Volumes of water butts

Typical Water Butt Options	Dimensions (m)	Storage Volume Provided
Type 1 (wall-mounted - small)	1.22 x 0.46 x 0.23	100 litres (0.10m^3)
Type 2 (standard house water butt)	0.9 x 0.68 diameter	210 litres (0.21m^3)
Type 3 (large house water butt)	1.26 x 1.24 x 0.8	510 litres (0.50m^3)
Type 4 (column tank – very large)	2.23 x 1.28 diameter	2000 litres (2.00m^3)

7.31 This report recommends that 'Type 2' standard water butt is installed on each of the proposed dwellings. This approximately equates to up to 210 litres (0.21m3) of surface water attenuation and recycled water on site.

7.32 The surface water storage available in the water butts has not been included in any hydraulic calculations as it can't be guaranteed that they will be empty at the start of a rainfall event.

Tier 3 - Attenuate rainwater in ponds or open water features for gradual release

7.33 Ponds and open water features are SuDS features that offer surface water attenuation, pollution mitigation and amenity and biodiversity benefits and an attenuation basin is proposed on this site.

7.34 The attenuation basin will cover areas of 500m2; have side slopes of 1 in 3; have depths of 0.9m; and have an attenuation storage volume of 315 m3. Surface water runoff will be restricted by a HydroBrake Flow Control Chamber that will control discharge to 11.0 l/s for the 100 year + 45% climate change critical rainfall event.

Tier 4 - Attenuate rainwater by storing in tanks or sealed water features for gradual release

7.35 Several pervious pavement area (around 2129m2) has been included in the InfoDrainage Hydraulic Model, which can be seen in **Appendix L** based on a 130mm thick pervious surface layer / laying course and 450-600mm thick Type 3 subbase with 30% voids ratio. This proportion of pervious pavement area alone will provide around 422m3 of attenuation storage.

7.36 A cellular storage tank has been proposed for this development with a dimension of 39m x 11m x1.2m that provides 490 m3 attenuation storage. The discharge rate will be restricted to 2 l/s by a HydroBrake Flow Control Chamber.

Tier 5 - Discharge rainwater direct to a watercourse

7.37 The site will discharge into an existing ditch which drains into the system of mapped watercourses and drain to the Lancing brook watercourse north of Rectory Lane. The discharge rate is restricted by a HydroBrake Flow Control Chamber to less than the greenfield run of rate for the site of 11 l/s.

InfoDrainage Hydraulic Modelling

7.38 The drainage strategy has been designed using InfoDrainage's hydraulic modelling software.

7.39 The results of the InfoDrainage hydraulic modelling for the development can be seen in **Appendix L**.

7.40 Impermeable areas of the development such as roofs, roads, driveways and footpaths have been modelled using a percentage of impervious area factor (PIMP) of 100%.

7.41 The results of the hydraulic modelling show that the surface water drainage strategy as outlined above can attenuate and discharge the surface water generated in the 1 in 100-year + 45% critical rainfall event, inclusive of a 10% uplift due to urban creep, with minimal (less than 0.5 m^3) flooding at PP1, PP3 and PP4.

7.42 This manages flood risk on and off-site and reduces overall local flood risk.

8.0 Proposed Foul Water Drainage Strategy

8.1 The Southern Water Wastewater Plan in **Appendix G** shows an existing network of adopted foul sewers near to the site. A capacity check has been submitted to Southern Water, to confirmed if there is adequate capacity in the foul sewer network to accommodate a foul flow of 0.67 l/s from the development.

8.2 The gravity foul flow rate from the proposed development has been based on the following assumptions using the Southern Water Developer Services Foul Flow Excel Calculation:

- 125 litres per head per day
- Occupancy of 2.4 persons per dwelling
- Infiltration of groundwater is minimised to the low rate of 10% of base flow
- A Peaking Factor of 2.5

8.3 Using the Southern Water Developer Services Foul Flow Excel Calculation in **Appendix M**, the gravity foul flow rate from the proposed development for 74 dwellings is estimated be 0.67 l/s, therefore the capacity check that has been issued to Southern Water will confirm if there is sewer capacity for the proposed development.

8.4 Due to the site topography and the proposed site layout, the foul water drainage will be collected by gravity network system within the site and pumped to the existing foul water network on Rectory Lane via a new demarcation chamber as shown on the drainage strategy drawing in **Appendix K**.

8.5 A package pumping station has been proposed at the low point of the site and the foul drainage system, near to the site's southern boundary.

9.0 Surface Water Runoff Quality

9.1 The NPPF states that developments should not have a detrimental impact on the environment, including the water environment. The technical guidance to the NPPF provides further advice on the benefits of ensuring runoff quality is to an appropriate standard.

9.2 The CIRIA SuDS Manual provides guidance on the treatment of surface water runoff. With regards to the proposed development, Table 4.3 of the CIRIA SuDS Manual rates the pollution hazard from roof water runoff as 'very low'. The only requirement for roof water runoff is the removal of gross solids and sediments, which would be achieved using catchpits and silt traps throughout the drainage network and upstream of where permeable surfacing is used.

9.3 With regards to the access roads, parking areas and driveways, Table 4.3 of the CIRIA SuDS Manual rates the pollution hazard from residential car parking and low traffic roads as 'low'. To mitigate a 'low' pollution hazard, the CIRIA SuDS Manual recommends using a simple index approach in line with Section 26.7.1. This is discussed, below.

9.4 Table 26.2 of the CIRIA SuDS Manual provides pollution hazard indices for different land use classifications. The land use classification that requires consideration for low traffic roads and parking areas is in Table 9.1 below.

Table 9.1: Excerpt from Table 26.2 of CIRIA SuDS Manual

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Individual property driveways, residential car parks, low traffic roads (e.g. cul-de-sacs, home zones and general access roads) with less than 300 traffic movements per day.	Low	0.5	0.4	0.4

9.5 To deliver adequate pollution treatment and mitigation, the CIRIA SuDS Manual recommends using a SuDS component that has a total pollution mitigation index (for each contaminant type) that equals or exceeds the pollution hazard index (for each contaminant type).

9.6 Table 26.3 of the CIRIA SuDS Manual provides indicative SuDS mitigation indices for each SuDS type when discharging to surface waters. Table 9.2, below, which is an excerpt from Table 26.3, shows the mitigation index for permeable paviours, which are used in selected locations across the development.

Table 9.2: Pollution Mitigation Indices for Permeable Pavements

Type of pollution removal component	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Permeable Pavements	0.7	0.6	0.7

9.7 The mitigation indices for permeable pavements exceed those of the highest pollution hazard index figures from Table 9.1.

9.8 The site will also include SuDS basins and some surface water will enter to the SuDS basins without passing through permeable paviours and this will be the only mitigation component of the drainage strategy. Therefore, the pollution mitigation potential of SuDS basins also needs to be assessed.

9.9 The mitigation index for SuDS Basins, a prescribed in Table 26.3 of the CIRIA SuDS Manual is as follows in Table 9.3.

Table 9.3: Pollution Mitigation Indices for SuDS Basin

Type of pollution removal component	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
SuDS Basin	0.5	0.5	0.6

9.10 Again, the individual mitigation indices for SuDS basin exceed the development's pollution hazard indices in Table 9.1, thus no further pollution mitigation measures are needed.

9.11 Some parts of the development's drainage strategy will allow surface water to pass through both the permeable paviours and the SuDS basin, and therefore two mitigation components will be used. Where two mitigation components are used in series, the SuDS manual states that:

Total SuDS mitigation index = mitigation index (component one) + 0.5 mitigation index (component two)

9.12 The SuDS basins when following the permeable paviours will provide the below mitigation indices as in Table 9.4:

Table 9.4: Pollution Mitigation Indices for Secondary SuDS Feature

Type of pollution removal component	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
SuDS Basin	0.25 (0.5 ÷ 2)	0.25 (0.5 ÷ 2)	0.30 (0.6 ÷ 2)

9.13 And the total mitigation indices for the site will be as per Table 9.5, below, which shows the mitigation indices for secondary SuDS features (SuDS Basins) added to the mitigation indices for the primary SuDS features (permeable paviours):

Table 9.5: Total Pollution Mitigation Offered by Permeable Paviours and SuDS Basin:

Contaminant Type	Pollution Hazard Index	Pollution Mitigation Index	Difference
Total Suspended Solids	0.5	**0.95** (0.7 + 0.25)	+ 0.45
Metals	0.4	**0.85** (0.6 + 0.25)	+ 0.45
Hydrocarbons	0.4	**1.00** (0.7 + 0.30)	+ 0.60

9.14 The above evidence shows how the permeable surfaces provide sufficient pollution mitigation on their own, as does the SuDS Basin, but with the SuDS basin following the permeable paviours, they provide further pollution mitigation and ensure all pollution hazards are completely mitigated.

10.0 Residual Risk

10.1 Whilst the drainage strategy for the site has been designed to current standards, there would remain a small residual risk of flooding due to blockage or failure of on-site infrastructure. Therefore, appropriate and regular maintenance of the drainage infrastructure should be undertaken by the site management company or their agents (and the residents, where applicable).

10.2 To assist with this process, a Drainage Management and Maintenance Plan has been prepared, which sets out the principles for the long-term management and maintenance of the proposed surface water drainage system on the development. The Drainage Management and Maintenance Plan can be seen in **Appendix N**.

10.3 The purpose of this document is to ensure that those responsible for site maintenance have a robust inspection and maintenance plan going forwards. This will help ensure the optimum operation of the surface water drainage system and that it will be regularly maintained for the lifetime of the development. This will contribute to reducing the risk of surface water flooding both on- and off-site.

11.0 Summary and Conclusions

11.1 This FRA and Drainage Strategy has been produced by Motion on behalf of Rocco Homes. It supports the planning application for 74 units on the land to the east of Mousdell Close, Ashington, West Sussex RH20 3GS.

11.2 On the basis that the FRA indicates the site lies within Flood Zone 1 - i.e. land assessed as having less than a 0.1 per cent (1 in 1000) chance of river flooding occurring each year as defined in Government Guidance on Flood risk and coastal change, and the flood risk assessment indicates a low risk of flooding from all sources both now and in the future, sequential and exception tests are not required for the proposed development.

11.3 The drainage strategy has been designed in accordance with the design criteria outlined in West Sussex County Council's LLFA Policy for the Management of Surface Water. This ensures that the current drainage strategy accords with local policy requirements (as well as those of the NPPF). In brief, this includes:

- Using FEH Annual Maximum Catchment data rather than FSR data. It should be noted that FEH 2022 has been used, although in certain cases InfoDrainage does not acknowledge this dataset and assumes that it is 2013 and labels it as such.
- 10 % Urban Creep allowance has been applied for property curtilage. Using a runoff coefficient (CV) value of 1.0 in all hydraulic modelling (for both summer and winter storms, both of which have been assessed in the model).
- The full suite of rainfall events has been used.

11.4 As detailed in Section 2 infiltration techniques are not viable on site, however surface water run-off from the existing site drains by a network of ditches, ordinary watercourses and culverts to Lancing Brook north of Rectory Lane. The drainage strategy for the development proposes to maintain the current means of draining the site to this system of watercourses to ensure that the natural drainage system is maintained.

11.5 The surface water drainage strategy for the development will look to use Type C no infiltration pervious pavements, a geocellular attenuation tank and an attenuation basin for the storage of surface water runoff. A HydroBrake Flow Control Chamber will control surface water discharge from the site to the existing site's greenfield run-off rate of 11.0 l/s for the 100 year + 45% climate change critical rainfall event.

11.6 The results of the hydraulic modelling show that the surface water drainage strategy as outlined above can attenuate and discharge the surface water generated in the 1 in 100-year + 45% critical rainfall event, inclusive of a 10% uplift due to urban creep, with minimal flooding (less than 0.5 m^3). This manages flood risk on and off site and reduces overall local flood risk.

11.7 Additionally, the Interpave document Guide to the Design, Construction and Maintenance of Concrete Block Permeable Pavements edition 6 states 'permeable pavements reduce the volume of rainfall that flows out from them significantly and the time it takes for the water to flow out is much longer than for conventional drainage systems. Studies reported in CIRIA report C 582 (CIRIA, 2001) have shown that some 11% to 45% of rainfall flows out from the pavement during a rainfall event. Subsequently over the 2 to 4 days after an event, more water flows out to give a total outfall of between 55% and 100%'. On this basis, it is concluded that the long-term storage volumes provided by the widespread extent of Pervious Pavements proposed as part of the development are likely to be more than what is indicated in the hydraulic calculations.

11.8 Using the Southern Water Developer Services Foul Flow Calculation, the gravity foul flow rate from the proposed development for 74 dwellings is estimated be 0.67 l/s. Foul waste from the site will drain to the existing foul sewer located in Rectory Lane via a onsite pumping station. A capacity check has been

lodged with Southern Water to confirm sufficient capacity in the foul sewer network to accommodate the proposed development.

11.9 The proposed surface water drainage strategy can mitigate all pollution hazards created on site using SuDS features and no further pollution mitigation is needed.

11.10 Residual risk has been addressed through the development of a drainage management and maintenance plan that provides a framework through which the site's drainage system should be managed in perpetuity.

11.11 In conclusion, the site is at low risk of flooding and the proposed drainage strategy can discharge the critical rainfall event with minimal flooding (less than 0.5 m^3). As such, the proposed development is in accordance with local and national planning policy and the NPPF, and flood risk and surface water management should not form an impediment to the progress of this planning application.

Appendix A

Proposed Site Layout

CDM 2015 Health & Safety Information

This information relates only to 'Significant Hazards' identified on this drawing and is to be read in conjunction with the Designer's Hazard Register.

Accommodation Schedule

Affordable Dwellings **(26no. - 35.1%)**

Affordable Rent

4no.	1-Bedroom Flats	Up to 2.5 Storeys	Blocks A and B	540sqft
4no.	1-Bedroom Flats - M4(3)	Up to 2.5 Storeys	Blocks A and B	660sqft
8no.	2-Bedroom Flats	Up to 2.5 Storeys	Blocks A and B	660sqft
1no.	3-Bedroom Townhouses	2.5 Storeys	Semi / Terraced	1145sqft
1no.	3-Bedroom Townhouses	2.5 Storeys	Semi / Terraced	1271sqft

Shared Ownership

1no.	1-Bedroom Flats	2 Storeys	Block C	540sqft
1no.	1-Bedroom Flats	2 Storeys	Block C	592sqft
2no.	2-Bedroom Houses	2 Storeys	Semi-Detached	855sqft
2no.	3-Bedroom Houses	2 Storeys	Semi-Detached	1003sqft
2no.	3-Bedroom Townhouses	2.5 Storeys	Semi / Terraced	1145sqft

Open Market Dwellings **(48no. - 64.9%)**

2no.	1-Bedroom Flats	2 Storeys	Block D/E	540sqft
2no.	1-Bedroom Flats	2 Storeys	Block D/E	592sqft
8no.	2-Bedroom Houses	2 Storeys	Semi-Detached	855sqft
13no.	3-Bedroom Houses	2 Storeys	Semi- Detached	1003sqft
8no.	3-Bedroom Houses	2.5 Storeys	Semi-Detached	1145sqft
5no.	4-Bedroom Houses	2 Storeys	Detached	1240sqft
1no.	4-Bedroom Houses	2 Storeys	Detached	1261sqft
2no.	3-Bedroom Houses	2.5 Storeys	Semi-Detached	1271sqft
1no.	4-Bedroom Houses	2 Storeys	Detached	1285sqft
2no.	4-Bedroom Houses	2.5 Storeys	Semi-Detached	1340sqft
2no.	4-Bedroom Houses	2 Storeys	Detached	1425sqft
2no.	4-Bedroom Houses	2 Storeys	Detached	1933sqft

Total; 74 Dwellings [2.19 Ha approx. to Overall Ownership Line - 33.78 Dw/Ha]

Car Parking Generally;
1 space per 1-Bedroom Flat
1.5 spaces per 2-Bedroom Flat
2-3 spaces per 2 and 3-Bedroom House (incl. open car barns)
3 spaces per 4-Bedroom House (incl. garages)
23 visitor spaces (1 per 3.26 dwellings)

Rev	Date	Revision Details	Dr	Ch
A	25.07.25	Updated Site Layout	CV	KE

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ECE Architecture
www.ecearchitecture.com

Client's Name
Rocco Homes

Job Title
Land East of Penn Gardens,
Ashington, West Sussex

Drawing Title
Proposed Site Layout

Scale
1:500 @ A1 / 1:1000 @ A3
metres 10 20 30 40 50

Drawn	Checked	Date
CV	KE	16.07.25

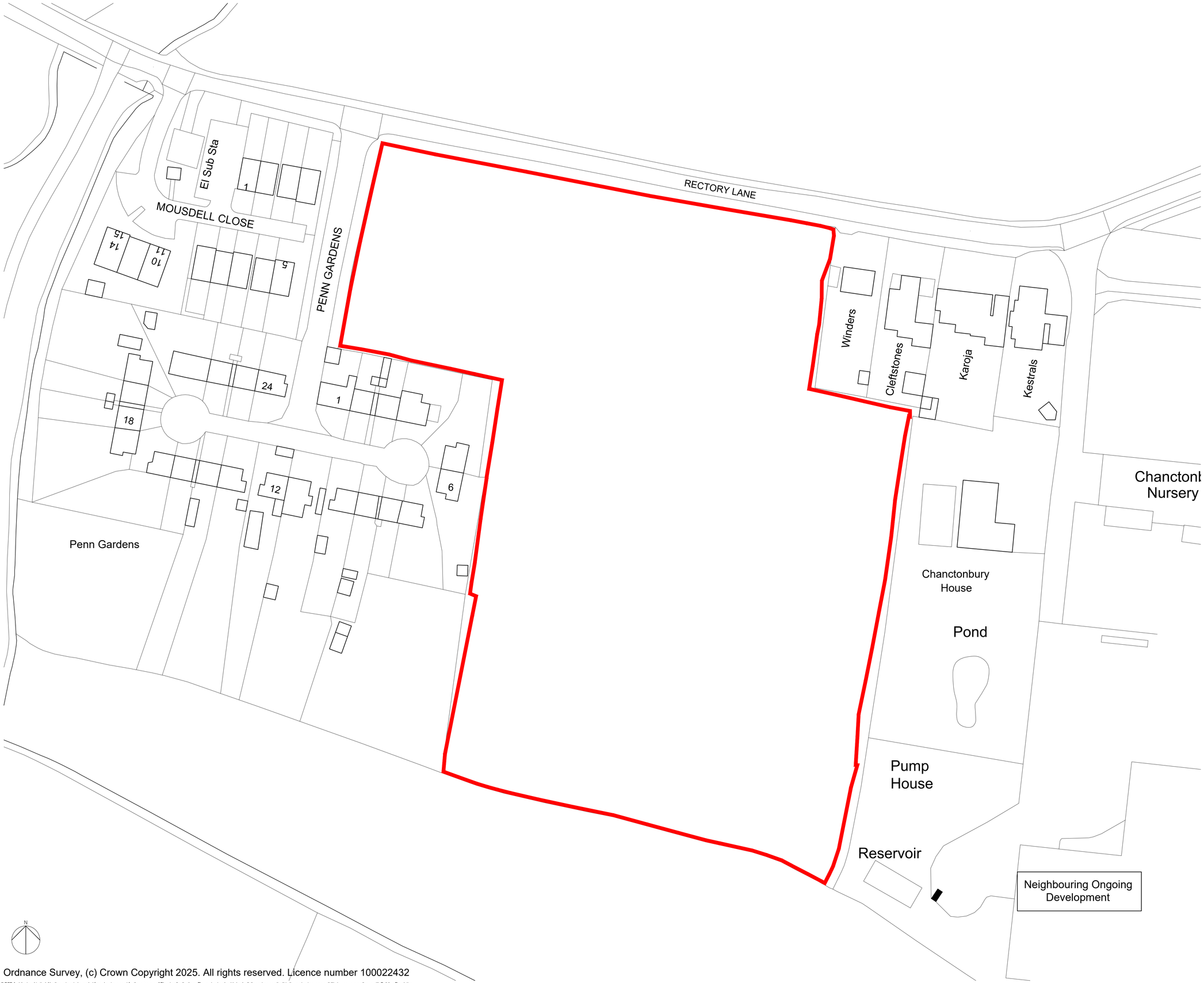
Job No	Drawing No	Rev
7578	PL01	A

Status
APPROVAL

CAD Plot date: 25/07/2025 - 14:22:22 7578-site.dwg

Appendix B

Site Location Plan



CDM 2015 Health & Safety Information

This information relates only to 'Significant Hazards' identified on this drawing and is to be read in conjunction with the Designer's Hazard Register.

Rev	Date	Revision Details	Dr	Ch

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www.ecearchitecture.com

Client's Name
Rocco Homes

Job Title
Land East of Penn Gardens,
Ashington, West Sussex

Drawing Title
Location Plan

Scale
1:500 @ A1 / 1:1000 @ A3

metres 10 20 30 40 50

Drawn	Checked	Date
CV	KE	14.07.25

Job No	Drawing No	Rev
7578	PL10	

Status
INFORMATION

CAD Plot date: 14/07/2025 - 16:59:15 7578-site.dwg

Appendix C

EA Flood Map for Planning

Flood map for planning

Your reference	Location (easting/northing)	Created
Unspecified	**512499/116351**	**24 April 2025 13:46**

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following**:

- bigger than 1 hectare (ha)
- in an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Environment Agency

Flood map for planning

Your reference
Unspecified

Location (easting/northing)
512499/116351

Scale
1:2,500

Created
24 Apr 2025 13:47

- Selected area
- Flood zone 3
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Water storage area

0 20 40 60 m

Appendix D

EA Risk of Flooding from Surface Water (RoFSW) Map

Surface Water Flood Risk

Get a boundary report

Edit

Delete

Datasets

- ○ Flood zones 2 and 3
- ○ River and sea with defences
- ○ River and sea without defences
- ◉ Surface water
- ○ None

Annual likelihood of flooding

- ◉ 1 in 30
- ○ 1 in 100
- ○ 1 in 1000

Get a boundary report

Edit

Delete

Datasets

- ◯ Flood zones 2 and 3
- ◯ River and sea with defences
- ◯ River and sea without defences
- ◉ Surface water
- ◯ None

Annual likelihood of flooding

- ◯ 1 in 30
- ◉ 1 in 100
- ◯ 1 in 1000

Get a boundary report

Edit

Delete

Datasets

- ◯ Flood zones 2 and 3
- ◯ River and sea with defences
- ◯ River and sea without defences
- ◉ Surface water
- ◯ None

Annual likelihood of flooding

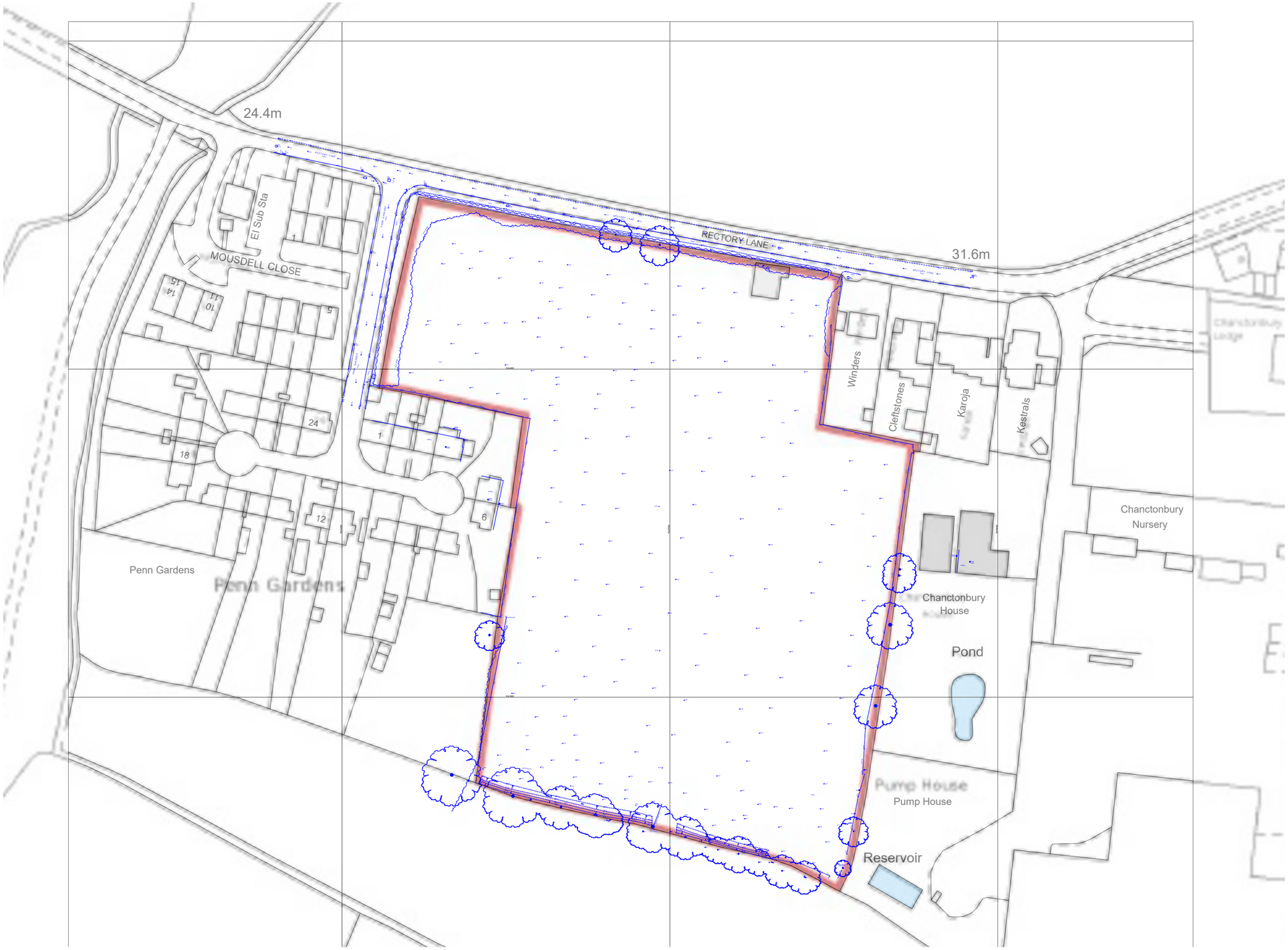
- ◯ 1 in 30
- ◯ 1 in 100
- ◉ 1 in 1000

Appendix E

Topographic Survey

CDM 2015 Health & Safety Information:

This information relates only to 'Significant Hazards' identified on this drawing and is to be read in conjunction with the Designer's Hazard Register.



OS layers in Black
Topo Survey Layers in Blue

N

Client's Name
Rocco Homes

Job Title
Land east of Mousedell Close, Ashington

Drawing Title
Land Registry Underlay

Scale
1:250 @ A3
metres 2 4 6 8 10

Drawn	Checked	Date
KE	AK	13.03.25

Job No	Drawing No	Rev
7578	L-01	A

Status
INFORMATION

Rev	Date	Revision Details	Dr	Ch
A	08.04.25	Survey information updated	KB	AK

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ECE Architecture
www.ecearchitecture.com

CAD Plot date: 8/04/2025 - 09:35:47 7578-site v2.dwg

Appendix F

BGS Borehole Log

TQ 11 NW | 1
1265.1640

318/7 Hodges Nursery, Rectory Lane, Ashington

Surface +102. Lining tubes: 150 × 4½ in from surface (perforated 10% to 17, 30% to 38 and 55 to 70%). Water struck at +92, +66 and +47. R.W.L. +88. P.W.L. -6. Suction -6. Yield 120 g.p.h. (test). *Dando, Feb. 1936.*
Yield 150 g.p.h. *May 1940;* 120 g.p.h. *June 1947.*

WC	...	...	150	150
	Yellow clay		5	5
	Yellow clay & brown sand		9 6	14 6
	Blue sandy marl		23 6	38
	Hard blue clay		10	48
	Brown marl		3	51
WC	Brown clay & fossils		4	55
	Blue clay		32	87
	Hard shale		6	93
	Blue clay		9	102
	Bed of shells		2	104
	Rock with fossils		6	110
	Blue shale		40	150

LONDON, S.W.1.

TQ 1266 1640

TQ11/33

318/7 Hodges Nursery, Rectory Lane, Ashington

Surface +102. Lining tubes: 150 × 4½ in from surface (perforated 10½ to 17, 30½ to 38 and 55 to 70½). Water struck at +92, +66 and +47. R.W.L. +88. P.W.L. -6. Suction -6. Yield 120 g.p.h. (test). *Dando, Feb. 1936.*
Yield 150 g.p.h. *May 1940;* 120 g.p.h. *June 1947.*

WC	...	...	150		150	
	Yellow clay		5		5	
	Yellow clay & brown sand		9	6	14	6
	Blue sandy marl		23	6	38	
	Hard blue clay		10		48	
WC	Brown marl		3		51	
	Brown clay & fossils		4		55	
	Blue clay		32		87	
	Hard shale		6		93	
	Blue clay		9		102	
	Bed of shells		2		104	
	Rock with fossils		6		110	
	Blue shale		40		150	

RECORD of WELL or BORING

TQ11/33

Survey No. 1" N.S. 318
1" O.S.

at (house or farm) Nursery, Rectory Lane,

Town, Village, &c. Ashington, County Sussex. Six-inch map xxxvii.S.W.

Exact site (unless a tracing from a map is supplied, give distance and direction from parish church, cross-roads, or other object shown on maps). In Rectory Lane. 3/8 mile N.N.W. of Church.

Popular Edition of one-inch map. Sheet 317 Square

Surface level of ground 102 ft. above Ordnance Datum. Well or Bore commenced at 0 ft. below surface level of ground.

Sunk - ft., diameter - ft. Bored 150 ft.; diameter of boring: at top $4\frac{1}{2}$ in., at bottom $4\frac{1}{2}$ in.

Details of lining tubes (internal diameters preferred) $4\frac{1}{2}$ int.dia. Tubes from surface to 150' perforations 10' 10" to 16' 11" 30' 9" to 38' 1" 55' 0" to 70' 10"

Water struck at depths of (feet) 10' 0" 36' 0" and 55' 0"

Rest-level of water below/above top of well or bore 14 ft. Pumping level 108 ft. Time of recovery hours.

Suction at 108 ft. depth. Yield: (i) on test 120 galls. per hr., (ii) normal 100 galls. per hr.

Quality (attach copy of analysis if available)

Made by Duke and Ockenden Ltd., for Messrs. G. & E. Hodges Date of boring Feb. 1936.

Information from

(For Survey use only). GEOLOGICAL CLASSIFICATION.	NATURE OF STRATA. (and any additional remarks)	THICKNESS. Feet.	THICKNESS. Inches.	DEPTH. Feet.	DEPTH. Inches.
	Yellow clay	5	0	5	0
	Yellow Clay and Brown Sand	9	6	14	6
	Blue Sandy Marl	23	6	38	0
	Hard Blue Clay	10	0	48	0
	Brown Marl	3	0	51	0
	Brown Clay and fossils	4	0	55	0
Weald Clay	Blue Clay	32	0	87	0
	Hard Shale	6	0	93	0
	Blue Clay	9	0	102	0
	Bed of shells	2	0	104	0
	Rock with fossils	6	0	110	0
	Blue shale	40	0	150	0

HG 29/7/86

Yield 150 gph.

Visited S. Buchan 6.5.40.

Well visited and sited on Sussex 37 SW/E.
Yield 120 g.p.h. R. 2.6.47

DATA Bank

Geological Survey and Museum, South Kensington, London, S.W.7.

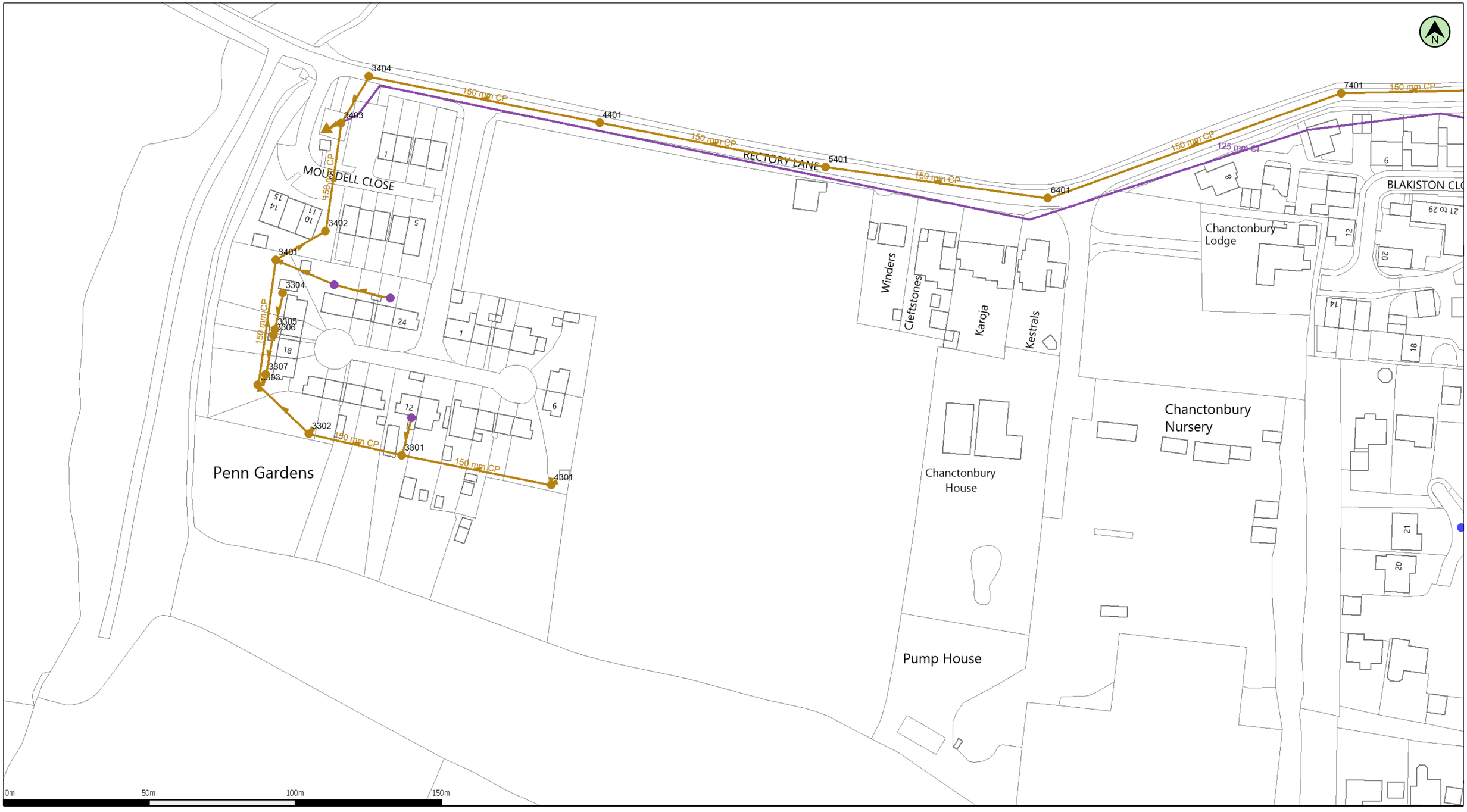
For Survey use only.

Date received.	G.S.M.	M. of H. notified.	Site marked on 1" map.

(66237B) Wt 28270/58 2,500 2/35 H, J, R & L, Ld Gp 616

Appendix G

Southern Water Asset Location Plan



(c) Crown copyright and database rights 2025 Ordnance Survey AC0000808122 | Date: 16/06/25 | Scale: 1:1250 | Map Centre: 512505,116355 | Data updated: 20/05/25 | Our Ref: 1798321 - 1 | Wastewater Plan A3 Powered by digdat

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2025 Ordnance Survey AC0000808122 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

Foul Gravity Sewer
Combined Gravity Sewer
Culverted Water Course or Treated Effluent
Surface Water Gravity Sewer
Rising Main, Vacuum or Syphon
Combined Outfall
Surface Water Outfall
Foul Outfall
Surface Water Inlet
Combined Pumping Station
Surface Water Pumping Station
Foul Pumping Station
WWTW Water Treatment Works
Section 104 Area
Building Over Agreement Area
Foul Manhole
Combined Manhole
Surface Water Manhole
Side Entry Manhole, Demarcation Chamber, Dummy Manhole or Surface Water Soakaway

pallen@motion.co.uk

1ecmou/2504072

from Southern Water

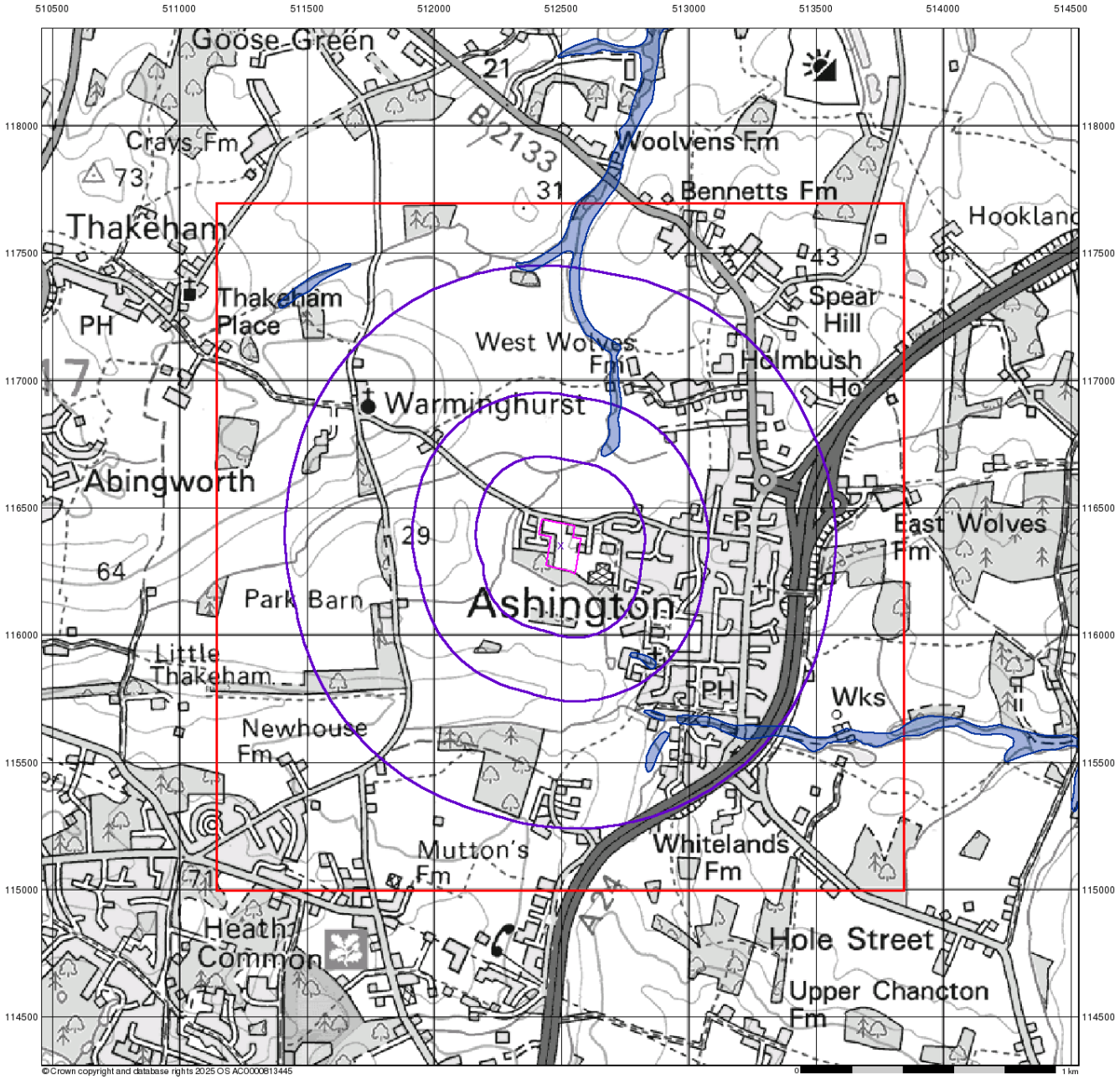
Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
3301	F	20.39	18.65	
3302	F	27.06	26.03	
3303	F	25.81	24.79	
3304	F	0.00	0.00	
3305	F	0.00	0.00	
3306	F	0.00	0.00	
3307	F	0.00	0.00	
3401	F	26.20	24.27	
3402	F	0.00	0.00	
3403	F	25.21	22.72	
3404	F	24.76	23.29	
4301	F	15.90	14.62	
4401	F	26.59	25.15	
5401	F	29.46	27.93	
6401	F	31.68	28.26	
7401	F	31.40	28.79	
7351	S	31.89	29.37	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix H

Groundwater Flooding Susceptibility Mapping



motion

BGS Flood Data (1:50,000)

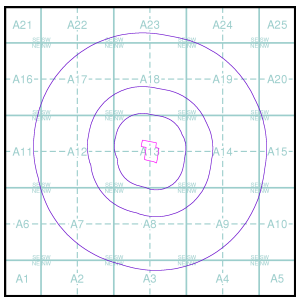
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

BGS Geological Indicators of Flooding

- Coastal
- Inland
- Bodies of Water

BGS Flood Data Map - Slice A



Order Details

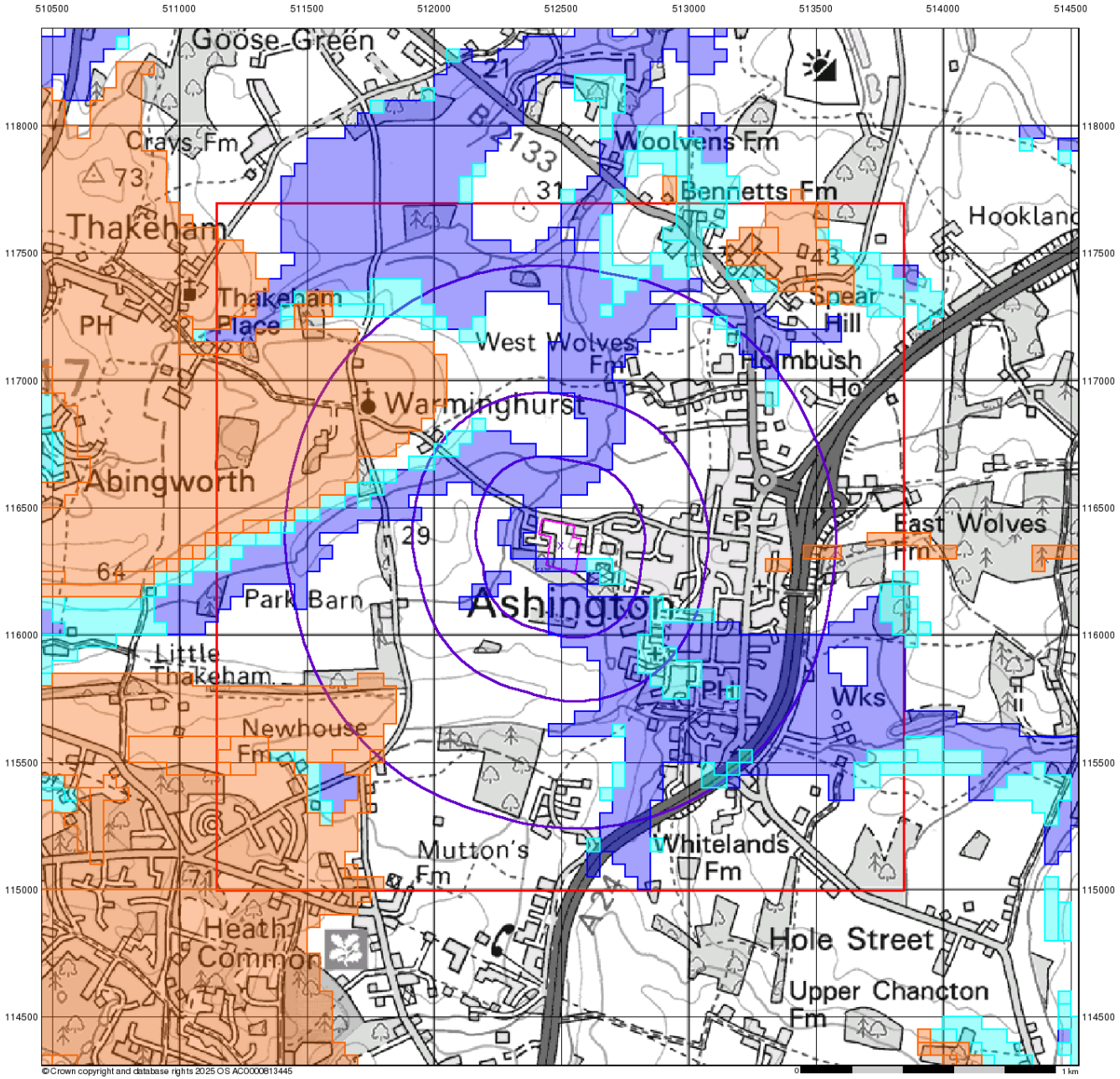
Order Number:	380777533_1_1
Customer Ref:	1ecmou/2504072 - LJ
National Grid Reference:	512490, 116350
Slice:	A
Site Area (Ha):	2.23
Search Buffer (m):	1000

Site Details

4, Mousdell Close, Ashington, PULBOROUGH, RH20 3GS

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



motion

BGS Flood Data (1:50,000)

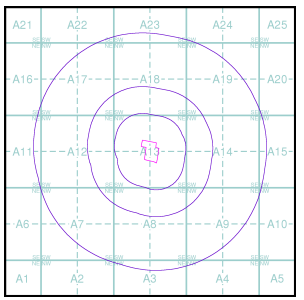
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

BGS Groundwater Flooding Susceptibility

- Potential for Groundwater Flooding to Occur at Surface
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Limited Potential for Groundwater Flooding to Occur

BGS Flood Data Map - Slice A



Order Details

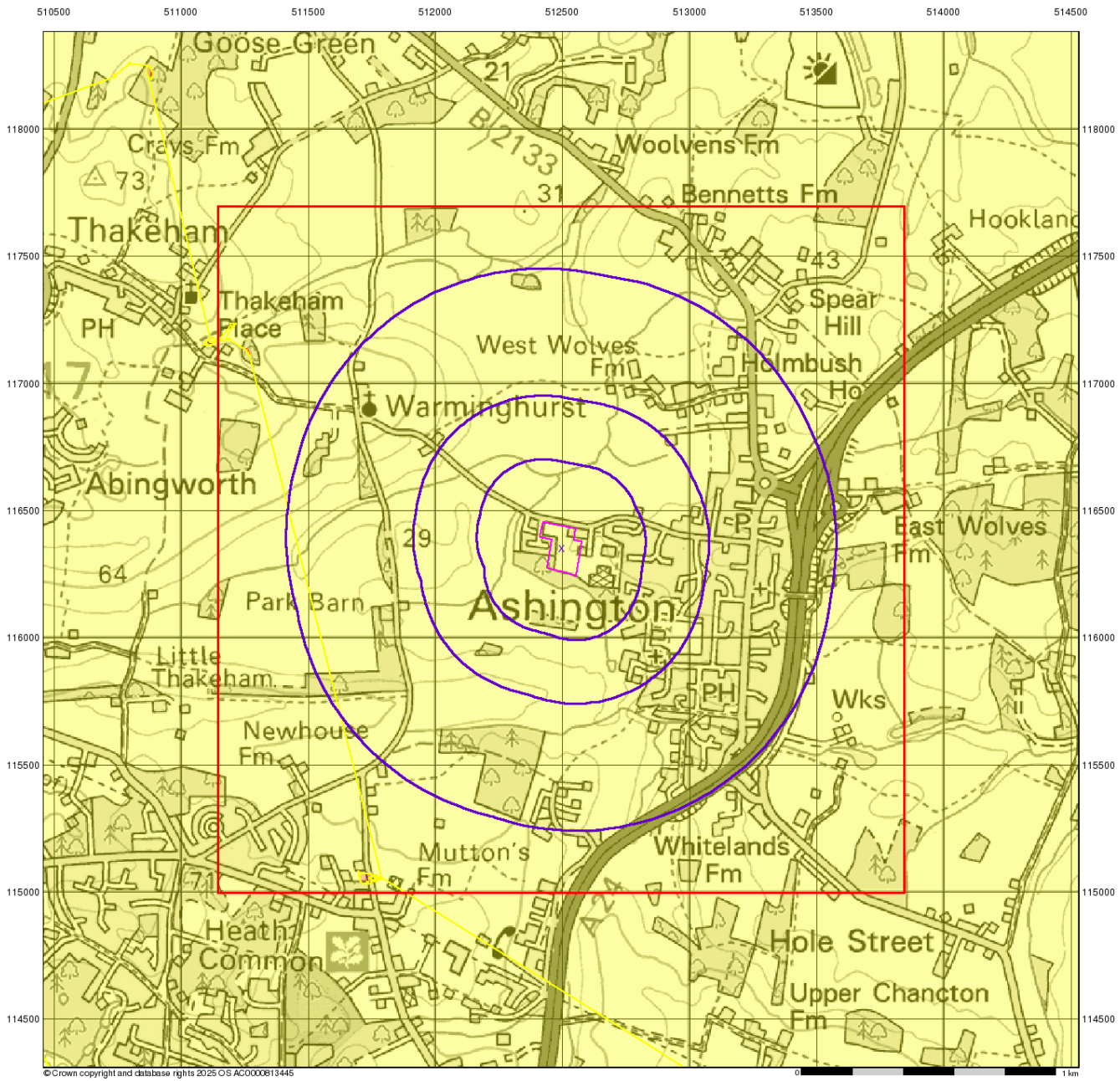
Order Number:	380777533_1_1
Customer Ref:	1ecmou/2504072 - LJ
National Grid Reference:	512490, 116350
Slice:	A
Site Area (Ha):	2.23
Search Buffer (m):	1000

Site Details

4, Mousdell Close, Ashington, PULBOROUGH, RH20 3GS

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



motion

GeoSmart Information Groundwater Flood Map (1:50,000)

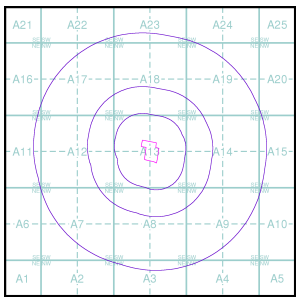
General

Specified Site
Specified Buffer(s)
Bearing Reference Point
Slice

GeoSmart Information Groundwater Flooding Risk

High Risk
Moderate Risk
Low Risk
Negligible Risk

GeoSmart Information Groundwater Flood Map - Slice A



Order Details

Order Number:	380777533_1_1
Customer Ref:	1ecmou/2504072 - LJ
National Grid Reference:	512490, 116350
Slice:	A
Site Area (Ha):	2.23
Search Buffer (m):	1000

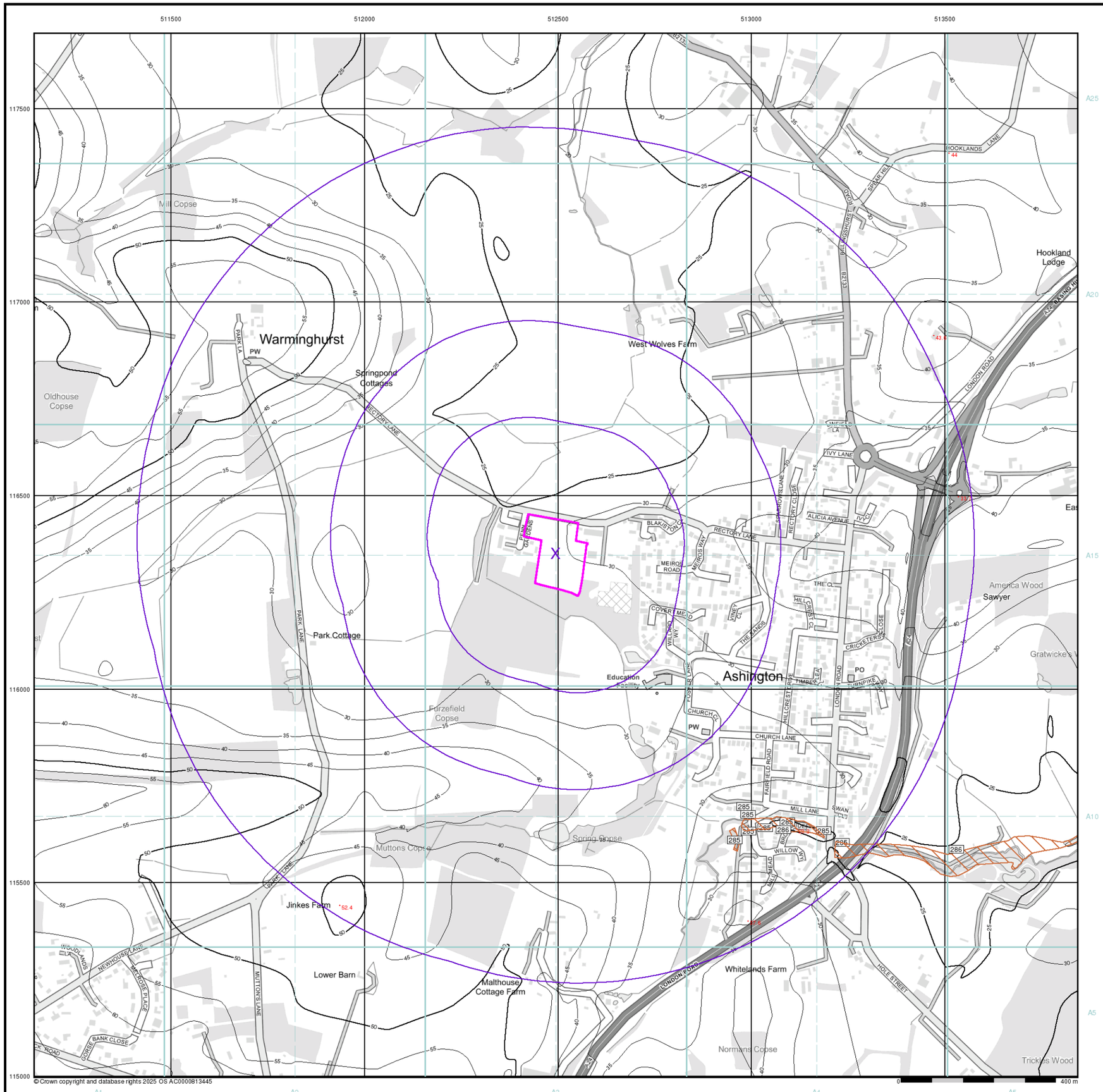
Site Details

4, Mousdell Close, Ashington, PULBOROUGH, RH20 3GS

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Appendix I

EA/NRW Historic Flood Map



motion

EA/NRW Historic Flood Map (1:10,000)

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID

Historic Flood Events Data

- Channel Capacity Exceeded (no raised defences)
- Channel Capacity Exceeded /Surface Water
- Groundwater/High Water Table
- Local Drainage/Surface Water
- Mechanical Failure
- Obstruction/Blockage - Bridge
- Obstruction/Blockage - Channel
- Historical Flood Liabilities
- Obstruction/Blockage - Culvert
- Obstruction/Blockage - Debris Screen
- Operational Failure/ Breach of Defence
- Other
- Overtopping of Defences
- Surface Water
- Unknown

Contours (height in metres)

Standard Contour 105 100 95

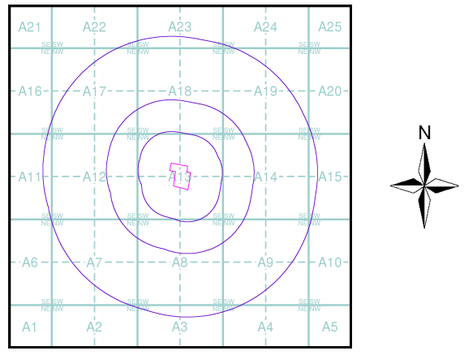
Master Contour

Spot Height *167.8

MLW Mean Low Water

MHW Mean High Water

EA/NRW Historic Flood Map - Slice A



Order Details

Order Number:	380777533_1_1
Customer Ref:	1ecmou/2504072 - LJ
National Grid Reference:	512490, 116350
Slice:	A
Site Area (Ha):	2.23
Search Buffer (m):	1000

Site Details

4, Mousdell Close, Ashington, PULBOROUGH, RH20 3GS

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Appendix J

FEH QMED Calculations

FEH

Details

Site Location	GB 512400 116500 TQ 12400 16500
Rainfall Version	2022
Data Type	Catchment

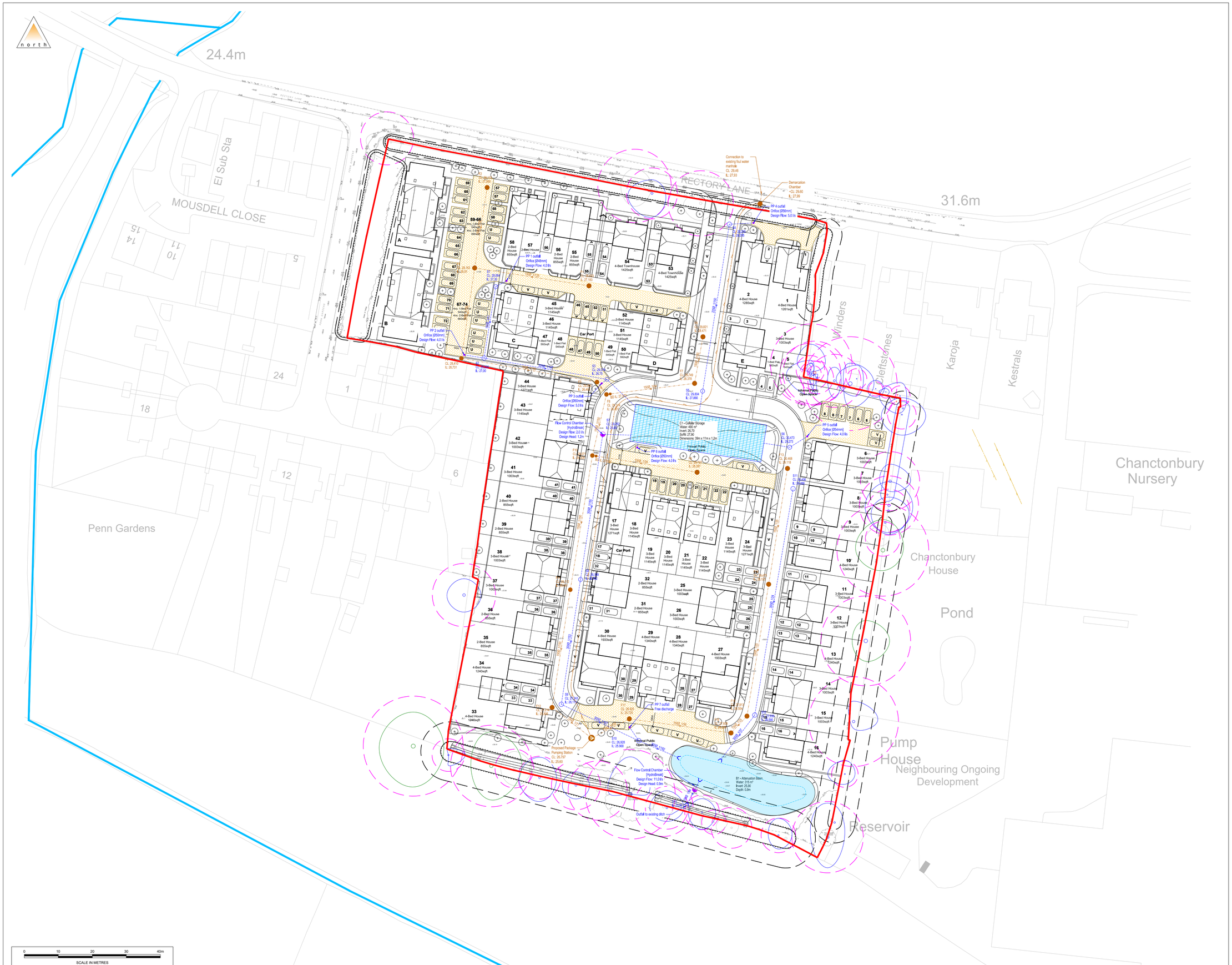
Area (ha)	0.971
SAAR (mm)	841.0
SPRHOST (%)	42.51
URBEXT 1990	0.0196
BFIHOST	0.371
FARL	1.000

Results

QMED Rural (L/s)	11.4
QMED Urban (L/s)	11.6

Appendix K

Proposed Drainage Strategy



Notes

1. All levels and dimensions are to be checked on site before any work commences. All dimensions are in metres unless stated otherwise.
2. This drawing has been based upon survey information supplied by ECE Architecture and Motion cannot guarantee the accuracy of the data provided.
3. Any discrepancies should be reported to the engineer immediately, so that clarification can be sought prior to the commencement of works.
4. This drawing should be read in conjunction with all other relevant engineering details, drawings and specification.
5. 350mm minimum cover is to be provided for private pipes laid in soft/paved areas, with 900mm minimum cover to be provided for private pipes laid beneath roads / driveways unless not practicable. Where unachievable, shallow pipe drains may require protection using concrete surround or paving slabs bridging the trench, subject to the NHBC Inspector's requirements.
6. Manholes situated within areas accessible to motor vehicles are to be fitted with suitable strength covers and frames.

Legend

- Site Boundary
- Existing Watercourse
- Pervious Pavement [450mm-600mm no infiltration Type 3 open graded sub-base with 30% void ratio]
- Surface Water Attenuation Basin
- Surface Water Gravity Pipe
- Surface Water Manhole
- Surface Water Flow Control Chamber
- Porous Pavement Outfall with Orifice Plate
- Proposed Headwall
- Foul Water Gravity Pipe
- Foul Water Rising Main
- Surface Water Manhole
- Foul Water Pumping Station

Rev.	Description	Drn	Chk	App	Date
P03	Outfall pipe realigned to minimize RPA impact	CC	PA	JM	04/08/2025
P02	Updated following layout changes	CC	PA	JM	31/07/2025
P01	First Issue	CC	PA	JM	11/07/2025

Drawing Status:

FOR PLANNING
NOT FOR CONSTRUCTION

motion
Guildford - Reading - London
www.motion.co.uk

Client:
Rocco Homes

Project:
Land East of Mousdell Close
Ashington

Title:
Drainage Strategy

Scale: 1:500 (@ A1)

Drawing: 2504072-0501
Revision: P03

C:\Users\cczako\Motion\SaffSite - 1ecmou 2504072\Drawings\2504072-0501 [Drainage Strategy].dwg

Appendix L

InfoDrainage Modelling Results

Project:	Date:		
Land East of Mousdell Close Ashington	09/07/2025		
	Designed by: CC	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: Surface Network 1	Company Address: Motion		

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
S2	Manhole	512451.707	116388.768	28.205	1.205	27.000	Circular	1.350
S3	Manhole	512487.844	116382.515	29.374	2.624	26.750	Circular	1.200
S9	Manhole	512474.421	116286.978	27.243	1.124	26.119	Circular	1.350
S10	Manhole	512497.214	116276.286	26.928	0.960	25.968	Circular	1.350
S13	Manhole	512508.618	116257.675	26.200	0.400	25.800	Circular	1.350
S4	Manhole	512524.031	116429.277	29.255	1.050	28.205	Circular	1.350
S5	Manhole	512515.985	116379.045	29.804	1.938	27.866	Circular	1.200
S11	Manhole	512542.590	116350.374	30.406	1.050	29.356	Circular	1.350
S12	Manhole	512531.315	116283.822	27.930	1.350	26.580	Circular	1.350
S7	Manhole	512486.623	116366.376	29.052	2.402	26.650	Circular	1.200
S8	Manhole	512480.061	116323.676	28.199	1.837	26.362	Circular	1.200
S6	Manhole	512541.599	116362.538	30.473	1.200	29.273	Circular	1.200
S1	Manhole	512455.131	116409.771	28.064	0.764	27.300	Circular	1.200

Name	Lock
S2	None
S3	None
S9	None
S10	None
S13	None
S4	None
S5	None
S11	None
S12	None
S7	None
S8	None
S6	None
S1	None

Project:	Date:		
Land East of Mousdell Close Ashington	09/07/2025		
	Designed by: CC	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Surface Network 1	Company Address: Motion		

B1 - Basin **Type : Pond**

Dimensions

Exceedance Level (m)	26.800
Depth (m)	0.900
Base Level (m)	25.900
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	4.433
Total Volume (m³)	315.128

Depth (m)	Area (m²)	Volume (m³)
0.000	226.95	0.000
0.900	490.00	315.128

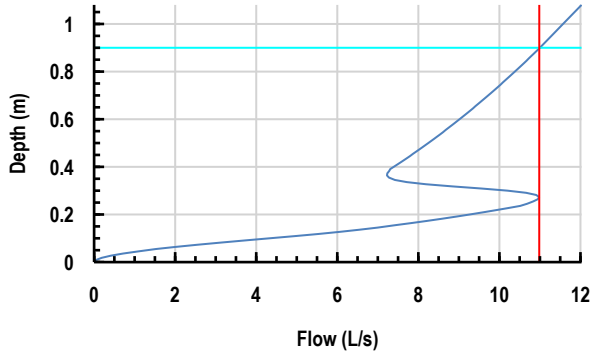
Outlets

Outlet

Outgoing Connection	B1-S13
Outlet Type	Hydro-Brake®

Invert Level (m)	25.900
Design Depth (m)	0.900
Design Flow (L/s)	11.0
Objective	Minimise Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☐

Unit Reference	CHE-0146-1100-0900-1100



Advanced

Perimeter	Circular
Length (m)	36.876
Friction Scheme	Manning's n
n	0.03

PP6 **Type : Porous Paving**

Dimensions

Exceedance Level (m)	29.100
Depth (m)	0.730
Base Level (m)	28.370
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	4.0
Porosity (%)	30
Length (m)	49.097
Long. Slope (1:X)	100.00
Width (m)	7.665
Total Volume (m³)	67.738

Outlets

Outlet

Outgoing Connection	PP6-C1
Outlet Type	Orifice

Diameter (m)	0.050
Coefficient of Discharge	0.600
Invert Level (m)	28.370

Advanced

Conductivity (m/hr)	500.0

PP7 **Type : Porous Paving**

Dimensions

Exceedance Level (m)	26.970
Depth (m)	0.730
Base Level (m)	26.240
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	4.0
Porosity (%)	30
Length (m)	45.105
Long. Slope (1:X)	80.00
Width (m)	5.592
Total Volume (m³)	45.402

Outlets

Outlet

Outgoing Connection	PP7-S10
Outlet Type	Free Discharge

Advanced

Conductivity (m/hr)	500.0

PP5

Type : Porous Paving

Dimensions

Exceedance Level (m)	30.555
Depth (m)	0.580
Base Level (m)	29.975
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	4.0
Porosity (%)	30
Length (m)	21.792
Long. Slope (1:X)	200.00
Width (m)	8.358
Total Volume (m^3)	24.590

Outlets

Outlet

Outgoing Connection	PP5-S6
Outlet Type	Orifice

Diameter (m)	0.054
Coefficient of Discharge	0.600
Invert Level (m)	29.975

Advanced

Conductivity (m/hr)	500.0

PP2

Type : Porous Paving

Dimensions

Exceedance Level (m)	28.130
Depth (m)	1.030
Base Level (m)	27.100
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	4.0
Porosity (%)	30
Length (m)	53.295
Long. Slope (1:X)	500.00
Width (m)	13.210
Total Volume (m^3)	190.089

Outlets

Outlet

Outgoing Connection	PP2-S2
Outlet Type	Orifice

Diameter (m)	0.050
Coefficient of Discharge	0.600
Invert Level (m)	27.100

Advanced

Conductivity (m/hr)	500.0

PP1

Type : Porous Paving

Dimensions

Exceedance Level (m)	28.200
Depth (m)	0.730
Base Level (m)	27.470
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	4.0
Porosity (%)	30
Length (m)	54.757
Long. Slope (1:X)	67.00
Width (m)	6.387
Total Volume (m³)	62.950

Outlets

Outlet

Outgoing Connection	PP1-S1
Outlet Type	Orifice

Diameter (m)	0.048
Coefficient of Discharge	0.600
Invert Level (m)	27.470

Advanced

Conductivity (m/hr)	500.0

PP3

Type : Porous Paving

Dimensions

Exceedance Level (m)	29.000
Depth (m)	0.580
Base Level (m)	28.420
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	4.0
Porosity (%)	30
Length (m)	19.230
Long. Slope (1:X)	50.00
Width (m)	7.540
Total Volume (m³)	19.575

Outlets

Outlet

Outgoing Connection	PP3-S3
Outlet Type	Orifice

Diameter (m)	0.060
Coefficient of Discharge	0.600
Invert Level (m)	28.420

Advanced

Conductivity (m/hr)	500.0

PP4

Type : Porous Paving

Dimensions

Exceedance Level (m)	30.000
Depth (m)	0.730
Base Level (m)	29.270
Paving Layer Depth (mm)	130
Membrane Percolation (m/hr)	4.0
Porosity (%)	30
Length (m)	20.877
Long. Slope (1:X)	50.00
Width (m)	4.019
Total Volume (m^3)	15.104

Outlets

Outlet

Outgoing Connection	PP4-S4
Outlet Type	Orifice

Diameter (m)	0.056
Coefficient of Discharge	0.600
Invert Level (m)	29.270

Advanced

Conductivity (m/hr)	500.0

Project:	Date:		
Land East of Mousdell Close Ashington	09/07/2025		
	Designed by: CC	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Surface Network 1	Company Address: Motion		

C1 - Cellular Storage

Type : Cellular Storage

Dimensions

Exceedance Level (m)	29.500
Depth (m)	1.200
Base Level (m)	26.700
Number of Crates Long	39
Number of Crates Wide	22
Number of Crates High	3
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	490.660

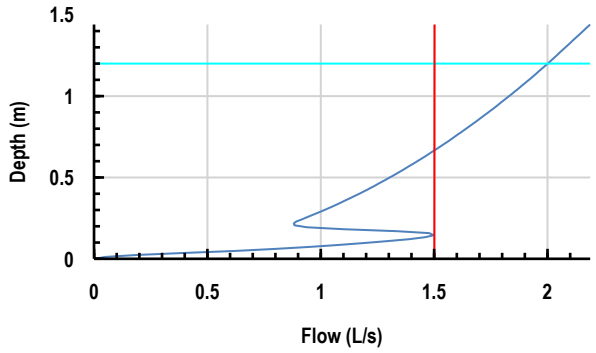
Outlets

Outlet

Outgoing Connection	C1-S7
Outlet Type	Hydro-Brake®

Invert Level (m)	26.700
Design Depth (m)	1.200
Design Flow (L/s)	2.0
Objective	Minimise Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☐

Unit Reference	CHE-0062-2000-1200-2000



Project:	Date:		
Land East of Mousdell Close Ashington	09/07/2025		
	Designed by:	Checked by:	Approved By:
	CC		
Report Details:	Company Address:		
Type: Inflow Summary Storm Phase: Surface Network 1	Motion		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
23.60m - 1.003	S7		Time of Concentration	0.002	100	0	100	0.002
26.22m - 2.000	PP4		Time of Concentration	0.003	100	0	100	0.003
26.94m - 2.000	PP4		Time of Concentration	0.003	100	0	100	0.003
34.03m - 2.000	S6		Time of Concentration	0.003	100	0	100	0.003
35.49m - 2.000	S4		Time of Concentration	0.004	100	0	100	0.004
40.81m - 2.000	S5		Time of Concentration	0.004	100	0	100	0.004
40.82m - 1.003	S8		Time of Concentration	0.004	100	0	100	0.004
47.00m - 3.000	S11		Time of Concentration	0.005	100	0	100	0.005
47.99m - 3.000	S11		Time of Concentration	0.005	100	0	100	0.005
50.57m - 1.003	S8		Time of Concentration	0.005	100	0	100	0.005
60.90m - 2.000	PP1		Time of Concentration	0.006	100	0	100	0.006
61.04m - 1.000	PP1		Time of Concentration	0.006	100	0	100	0.006
68.36m - 2.000	PP4		Time of Concentration	0.007	100	0	100	0.007
68.91m - 1.003	S8		Time of Concentration	0.007	100	10	110	0.008
68.91m - 1.004	S9		Time of Concentration	0.007	100	10	110	0.008
68.91m - 3.000	S11		Time of Concentration	0.007	100	10	110	0.008
68.91m - 3.000	S11		Time of Concentration	0.007	100	10	110	0.008
68.91m - 3.001	S12		Time of Concentration	0.007	100	10	110	0.008
74.76m - 3.000	S11		Time of Concentration	0.007	100	0	100	0.007
76.75m - 1.003	S8		Time of Concentration	0.008	100	0	100	0.008
77.56m - 1.003	S7		Time of Concentration	0.008	100	0	100	0.008
77.92m - 1.003	S7		Time of Concentration	0.008	100	0	100	0.008
81.95m - 1.003	PP6		Time of Concentration	0.008	100	0	100	0.008
82.32m - 3.001	S12		Time of Concentration	0.008	100	0	100	0.008
82.34m - 3.000	PP6		Time of Concentration	0.008	100	0	100	0.008
83.70m - 3.000	S11		Time of Concentration	0.008	100	0	100	0.008
84.41m - 2.000	S4		Time of Concentration	0.008	100	10	110	0.009
84.41m - 2.000	PP1		Time of Concentration	0.008	100	10	110	0.009
94.19m - 3.000	S11		Time of Concentration	0.009	100	0	100	0.009
94.24m - 3.000	S11		Time of Concentration	0.009	100	0	100	0.009
95.08m - 2.000	PP4		Time of Concentration	0.010	100	10	110	0.010
95.08m - 2.000	PP4		Time of Concentration	0.010	100	10	110	0.010
96.33m - 2.001	S5		Time of Concentration	0.010	100	0	100	0.010
96.73m - 3.000	PP6		Time of Concentration	0.010	100	10	110	0.011
96.74m - 1.000	PP1		Time of Concentration	0.010	100	10	110	0.011

96.74m - 1.000	PP2		Time of Concentration	0.010	100	10	110	0.011
96.74m - 1.003	S8		Time of Concentration	0.010	100	10	110	0.011
96.74m - 1.003	S8		Time of Concentration	0.010	100	10	110	0.011
96.74m - 1.003	S7		Time of Concentration	0.010	100	10	110	0.011
96.75m - 1.003	PP6		Time of Concentration	0.010	100	10	110	0.011
97.73m - 3.000	S6		Time of Concentration	0.010	100	0	100	0.010
97.83m - 1.000	PP2		Time of Concentration	0.010	100	0	100	0.010
98.87m - 1.003	PP6		Time of Concentration	0.010	100	10	110	0.011
98.87m - 3.000	PP6		Time of Concentration	0.010	100	10	110	0.011
98.93m - 1.002	PP3		Time of Concentration	0.010	100	10	110	0.011
101.31m - 1.000	PP3		Time of Concentration	0.010	100	0	100	0.010
106.61m - 1.004	S9		Time of Concentration	0.011	100	10	110	0.012
106.61m - 3.001	S12		Time of Concentration	0.011	100	10	110	0.012
107.35m - 1.002	S7		Time of Concentration	0.011	100	0	100	0.011
107.98m - 1.000	PP2		Time of Concentration	0.011	100	0	100	0.011
110.56m - 1.003	S7		Time of Concentration	0.011	100	0	100	0.011
111.29m - 3.000	S11		Time of Concentration	0.011	100	0	100	0.011
111.55m - 1.003	S8		Time of Concentration	0.011	100	10	110	0.012
111.55m - 1.003	S7		Time of Concentration	0.011	100	10	110	0.012
111.55m - 1.005	S9		Time of Concentration	0.011	100	10	110	0.012
111.55m - 3.000	S11		Time of Concentration	0.011	100	10	110	0.012
111.55m - 3.000	S11		Time of Concentration	0.011	100	10	110	0.012
111.55m - 3.000	S11		Time of Concentration	0.011	100	10	110	0.012
111.55m - 3.000	S11		Time of Concentration	0.011	100	10	110	0.012
111.55m - 3.000	PP5		Time of Concentration	0.011	100	10	110	0.012
121.78m - 2.000	S5		Time of Concentration	0.012	100	10	110	0.013
122.41m - 1.004	PP7		Time of Concentration	0.012	100	0	100	0.012
122.92m - 1.005	PP7		Time of Concentration	0.012	100	0	100	0.012
126.50m - 1.003	S7		Time of Concentration	0.013	100	0	100	0.013
126.57m - 3.000	S11		Time of Concentration	0.013	100	0	100	0.013
127.19m - 2.001	PP6		Time of Concentration	0.013	100	0	100	0.013
128.24m - 3.000	PP6		Time of Concentration	0.013	100	0	100	0.013
136.42m - 1.003	S7		Time of Concentration	0.014	100	0	100	0.014
138.67m - 1.004	S9		Time of Concentration	0.014	100	0	100	0.014
144.94m - 1.000	PP1		Time of Concentration	0.014	100	0	100	0.014
147.72m - 1.003	S8		Time of Concentration	0.015	100	0	100	0.015
149.47m - 1.005	PP7		Time of Concentration	0.015	100	0	100	0.015

151.96m - 1.000	PP2		Time of Concentration	0.015	100	0	100	0.015
152.64m - 1.000	PP1		Time of Concentration	0.015	100	0	100	0.015
153.74m - 1.000	PP2		Time of Concentration	0.015	100	0	100	0.015
160.90m - 1.000	S2		Time of Concentration	0.016	100	10	110	0.018
160.90m - 2.000	S5		Time of Concentration	0.016	100	10	110	0.018
161.30m - 1.000	PP2		Time of Concentration	0.016	100	0	100	0.016
165.53m - 1.000	PP2		Time of Concentration	0.017	100	0	100	0.017
173.55m - 1.002	PP3		Time of Concentration	0.017	100	0	100	0.017
187.65m - 2.001	PP5		Time of Concentration	0.019	100	0	100	0.019
191.17m - 3.000	S11		Time of Concentration	0.019	100	0	100	0.019
207.64m - 1.000	PP1		Time of Concentration	0.021	100	0	100	0.021
218.55m - 1.005	PP7		Time of Concentration	0.022	100	0	100	0.022
227.72m - 2.000	S4		Time of Concentration	0.023	100	0	100	0.023
254.90m - 1.000	PP2		Time of Concentration	0.025	100	10	110	0.028
254.90m - 1.000 2	PP2		Time of Concentration	0.025	100	10	110	0.028
292.23m - 2.001	S5		Time of Concentration	0.029	100	0	100	0.029
TOTAL		0.0		0.971				1.008

Project:	Date:		
Land East of Mousdell Close Ashington	09/07/2025		
	Designed by: CC	Checked by:	Approved By:
Report Title: Rainfall Analysis Criteria	Company Address: Motion		

Runoff Type	**Dynamic**
Output Interval (mins)	**5**
Time Step	**Default**
Urban Creep	**Use Catchment Values**
Junction Flood Risk Margin (mm)	**0**
Perform No Discharge Analysis	☐

Rainfall

FEH22

Type: FEH

Site Location	**GB 512400 116500 TQ 12400 16500**
Rainfall Version	**2022**
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	40.000
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

FEH

Details

Site Location	GB 512400 116500 TQ 12400 16500
Rainfall Version	2022
Data Type	Catchment

Area (ha)	0.971
SAAR (mm)	841.0
SPRHOST (%)	42.51
URBEXT 1990	0.0196
BFIHOST	0.371
FARL	1.000

Results

QMED Rural (L/s)	11.4
QMED Urban (L/s)	11.6

Project:	Date:		
Land East of Mousdell Close Ashington	09/07/2025		
	Designed by: CC	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Surface Network 1	Company Address: Motion		

FEH22: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S2	**FEH22: 2 years: +0 %: 1440 mins: Summer**	**28.205**	**27.000**	**27.096**	**0.096**	**2.3**	**0.137**	**0.000**	**2.3**	**106.937**	**OK**
S3	**FEH22: 2 years: +0 %: 1440 mins: Summer**	**29.374**	**26.750**	**27.096**	**0.346**	**2.9**	**0.391**	**0.000**	**2.8**	**123.586**	**Surcharged**
S9	**FEH22: 2 years: +0 %: 15 mins: Summer**	**27.243**	**26.119**	**26.275**	**0.155**	**42.8**	**0.222**	**0.000**	**39.5**	**20.521**	**OK**
S10	**FEH22: 2 years: +0 %: 360 mins: Summer**	**26.928**	**25.968**	**26.189**	**0.221**	**14.5**	**0.316**	**0.000**	**14.1**	**123.668**	**OK**
S13	**FEH22: 2 years: +0 %: 360 mins: Summer**	**26.200**	**25.800**	**25.876**	**0.076**	**9.5**	**0.000**	**0.000**	**9.5**	**165.070**	**OK**
S4	**FEH22: 2 years: +0 %: 15 mins: Summer**	**29.255**	**28.205**	**28.274**	**0.069**	**9.0**	**0.099**	**0.000**	**8.1**	**4.574**	**OK**
S5	**FEH22: 2 years: +0 %: 15 mins: Summer**	**29.804**	**27.866**	**27.930**	**0.064**	**25.0**	**0.072**	**0.000**	**24.4**	**11.900**	**OK**
S11	**FEH22: 2 years: +0 %: 15 mins: Summer**	**30.406**	**29.356**	**29.434**	**0.077**	**34.5**	**0.111**	**0.000**	**33.3**	**14.958**	**OK**
S12	**FEH22: 2 years: +0 %: 15 mins: Summer**	**27.930**	**26.580**	**26.671**	**0.092**	**39.6**	**0.131**	**0.000**	**37.9**	**17.691**	**OK**
S7	**FEH22: 2 years: +0 %: 15 mins: Summer**	**29.052**	**26.650**	**26.742**	**0.092**	**20.3**	**0.105**	**0.000**	**18.8**	**9.022**	**OK**
S8	**FEH22: 2 years: +0 %: 15 mins: Summer**	**28.199**	**26.362**	**26.492**	**0.130**	**35.4**	**0.148**	**0.000**	**32.5**	**16.070**	**OK**
S6	**FEH22: 2 years: +0 %: 15 mins: Summer**	**30.473**	**29.273**	**29.293**	**0.020**	**3.3**	**0.022**	**0.000**	**3.2**	**1.863**	**OK**
S1	**FEH22: 2 years: +0 %: 240 mins: Summer**	**28.064**	**27.300**	**27.325**	**0.025**	**1.3**	**0.029**	**0.000**	**1.3**	**19.988**	**OK**

Project:	Date:		
Land East of Mousdell Close Ashington	09/07/2025		
	Designed by: CC	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Surface Network 1	Company Address: Motion		

FEH22: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S2	**FEH22: 30 years: +40 %: 1440 mins: Winter**	**28.205**	**27.000**	**27.655**	**0.655**	**4.1**	**0.937**	**0.000**	**4.0**	**203.320**	**Surcharged**
S3	**FEH22: 30 years: +40 %: 1440 mins: Winter**	**29.374**	**26.750**	**27.654**	**0.904**	**5.2**	**1.023**	**0.000**	**5.1**	**243.904**	**Surcharged**
S9	**FEH22: 30 years: +40 %: 240 mins: Winter**	**27.243**	**26.119**	**26.632**	**0.512**	**30.0**	**0.733**	**0.000**	**29.1**	**193.873**	**Surcharged**
S10	**FEH22: 30 years: +40 %: 240 mins: Winter**	**26.928**	**25.968**	**26.631**	**0.663**	**30.2**	**0.948**	**0.000**	**29.9**	**228.381**	**Surcharged**
S13	**FEH22: 30 years: +40 %: 480 mins: Winter**	**26.200**	**25.800**	**25.883**	**0.083**	**11.0**	**0.000**	**0.000**	**11.0**	**428.991**	**OK**
S4	**FEH22: 30 years: +40 %: 15 mins: Summer**	**29.255**	**28.205**	**28.340**	**0.135**	**27.8**	**0.193**	**0.000**	**26.0**	**14.642**	**OK**
S5	**FEH22: 30 years: +40 %: 15 mins: Summer**	**29.804**	**27.866**	**27.984**	**0.118**	**79.1**	**0.133**	**0.000**	**77.8**	**37.671**	**OK**
S11	**FEH22: 30 years: +40 %: 15 mins: Summer**	**30.406**	**29.356**	**29.501**	**0.145**	**108.5**	**0.207**	**0.000**	**106.0**	**47.142**	**OK**
S12	**FEH22: 30 years: +40 %: 15 mins: Summer**	**27.930**	**26.580**	**26.760**	**0.180**	**125.7**	**0.257**	**0.000**	**121.2**	**55.706**	**OK**
S7	**FEH22: 30 years: +40 %: 15 mins: Summer**	**29.052**	**26.650**	**26.973**	**0.323**	**63.8**	**0.365**	**0.000**	**39.4**	**29.100**	**Surcharged**
S8	**FEH22: 30 years: +40 %: 15 mins: Summer**	**28.199**	**26.362**	**26.883**	**0.521**	**91.5**	**0.589**	**0.000**	**84.0**	**50.714**	**Surcharged**
S6	**FEH22: 30 years: +40 %: 15 mins: Summer**	**30.473**	**29.273**	**29.306**	**0.033**	**10.8**	**0.037**	**0.000**	**10.7**	**6.217**	**OK**
S1	**FEH22: 30 years: +40 %: 1440 mins: Winter**	**28.064**	**27.300**	**27.655**	**0.355**	**2.0**	**0.401**	**0.000**	**2.0**	**91.495**	**Surcharged**

Project:	Date:		
Land East of Mousdell Close Ashington	09/07/2025		
	Designed by: CC	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Surface Network 1	Company Address: Motion		

FEH22: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S2	**FEH22: 100 years: +45 %: 1440 mins: Winter**	**28.205**	**27.000**	**27.893**	**0.893**	**4.5**	**1.278**	**0.000**	**4.5**	**229.284**	**Surcharged**
S3	**FEH22: 100 years: +45 %: 1440 mins: Winter**	**29.374**	**26.750**	**27.893**	**1.143**	**6.0**	**1.293**	**0.000**	**6.0**	**281.413**	**Surcharged**
S9	**FEH22: 100 years: +45 %: 15 mins: Summer**	**27.243**	**26.119**	**27.048**	**0.929**	**159.9**	**1.330**	**0.000**	**151.8**	**81.926**	**Surcharged**
S10	**FEH22: 100 years: +45 %: 360 mins: Winter**	**26.928**	**25.968**	**26.797**	**0.829**	**28.0**	**1.186**	**0.000**	**27.8**	**337.743**	**Surcharged**
S13	**FEH22: 100 years: +45 %: 1440 mins: Winter**	**26.200**	**25.800**	**25.883**	**0.083**	**11.0**	**0.000**	**0.000**	**11.0**	**883.343**	**OK**
S4	**FEH22: 100 years: +45 %: 15 mins: Summer**	**29.255**	**28.205**	**28.367**	**0.162**	**36.1**	**0.232**	**0.000**	**33.8**	**18.955**	**OK**
S5	**FEH22: 100 years: +45 %: 15 mins: Summer**	**29.804**	**27.866**	**28.005**	**0.139**	**103.3**	**0.157**	**0.000**	**101.6**	**49.087**	**OK**
S11	**FEH22: 100 years: +45 %: 15 mins: Summer**	**30.406**	**29.356**	**29.527**	**0.170**	**142.0**	**0.244**	**0.000**	**138.8**	**61.661**	**OK**
S12	**FEH22: 100 years: +45 %: 15 mins: Summer**	**27.930**	**26.580**	**26.801**	**0.221**	**164.6**	**0.316**	**0.000**	**157.9**	**72.785**	**OK**
S7	**FEH22: 100 years: +45 %: 15 mins: Summer**	**29.052**	**26.650**	**27.674**	**1.024**	**83.4**	**1.159**	**0.000**	**59.3**	**38.454**	**Surcharged**
S8	**FEH22: 100 years: +45 %: 15 mins: Summer**	**28.199**	**26.362**	**27.526**	**1.164**	**127.6**	**1.316**	**0.000**	**117.3**	**65.895**	**Surcharged**
S6	**FEH22: 100 years: +45 %: 15 mins: Summer**	**30.473**	**29.273**	**29.311**	**0.037**	**14.0**	**0.042**	**0.000**	**13.9**	**8.023**	**OK**
S1	**FEH22: 100 years: +45 %: 1440 mins: Winter**	**28.064**	**27.300**	**27.893**	**0.593**	**2.5**	**0.671**	**0.000**	**2.4**	**111.581**	**Surcharged**

Project:	Date:		
Land East of Mousdell Close Ashington	09/07/2025		
	Designed by: CC	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Surface Network 1	Company Address: Motion		

FEH22: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
B1 - Basin	**FEH22: 2 years: +0 %: 360 mins: Summer**	**26.188**	**26.188**	**0.288**	**0.288**	**24.9**	**75.642**	**0.000**	**0.000**	**9.5**	**165.105**	**95**	**75.997**
C1 - Cellular Storage	**FEH22: 2 years: +0 %: 1440 mins: Summer**	**27.096**	**27.096**	**0.396**	**0.396**	**7.2**	**161.300**	**0.000**	**0.000**	**1.5**	**148.218**	**923**	**67.126**
PP6	**FEH22: 2 years: +0 %: 360 mins: Summer**	**28.992**	**28.451**	**0.131**	**0.081**	**5.1**	**17.449**	**0.000**	**0.000**	**1.2**	**24.373**	**164**	**74.241**
PP7	**FEH22: 2 years: +0 %: 360 mins: Summer**	**26.926**	**26.255**	**0.122**	**0.015**	**3.7**	**10.865**	**0.000**	**0.000**	**1.2**	**19.455**	**99**	**76.069**
PP5	**FEH22: 2 years: +0 %: 360 mins: Summer**	**30.194**	**30.018**	**0.110**	**0.044**	**1.9**	**5.333**	**0.000**	**0.000**	**0.7**	**9.523**	**98**	**78.312**
PP2	**FEH22: 2 years: +0 %: 960 mins: Summer**	**27.418**	**27.173**	**0.212**	**0.073**	**4.4**	**37.790**	**0.000**	**0.000**	**1.1**	**49.825**	**364**	**80.120**
PP1	**FEH22: 2 years: +0 %: 360 mins: Summer**	**28.402**	**27.564**	**0.114**	**0.094**	**5.0**	**16.523**	**0.000**	**0.000**	**1.3**	**26.184**	**145**	**73.752**
PP3	**FEH22: 2 years: +0 %: 120 mins: Summer**	**28.901**	**28.497**	**0.096**	**0.077**	**4.2**	**4.531**	**0.000**	**0.000**	**1.6**	**8.478**	**34**	**76.853**
PP4	**FEH22: 2 years: +0 %: 120 mins: Summer**	**29.828**	**29.345**	**0.141**	**0.075**	**3.6**	**3.835**	**0.000**	**0.000**	**1.4**	**7.287**	**33**	**74.607**

Status
OK
OK
OK
OK
OK
OK
OK
OK
OK

Project:	Date:		
Land East of Mousdell Close Ashington	09/07/2025		
	Designed by: CC	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Surface Network 1	Company Address: Motion		

FEH22: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
B1 - Basin	**FEH22: 30 years: +40 %: 240 mins: Winter**	**26.630**	**26.630**	**0.730**	**0.730**	**54.7**	**236.755**	**0.000**	**0.000**	**10.9**	**215.646**	**205**	**24.870**
C1 - Cellular Storage	**FEH22: 30 years: +40 %: 1440 mins: Winter**	**27.654**	**27.654**	**0.954**	**0.954**	**12.6**	**388.955**	**0.000**	**0.000**	**1.8**	**239.431**	**2185**	**20.728**
PP6	**FEH22: 30 years: +40 %: 240 mins: Summer**	**29.240**	**28.699**	**0.379**	**0.329**	**17.5**	**46.357**	**0.000**	**0.000**	**2.9**	**50.379**	**172**	**31.565**
PP7	**FEH22: 30 years: +40 %: 240 mins: Summer**	**27.177**	**26.630**	**0.373**	**0.390**	**12.9**	**31.891**	**0.000**	**0.000**	**2.4**	**36.686**	**242**	**29.759**
PP5	**FEH22: 30 years: +40 %: 240 mins: Summer**	**30.368**	**30.119**	**0.284**	**0.144**	**6.4**	**13.277**	**0.000**	**0.000**	**2.1**	**21.808**	**73**	**46.005**
PP2	**FEH22: 30 years: +40 %: 1440 mins: Winter**	**27.684**	**27.656**	**0.477**	**0.556**	**4.9**	**109.615**	**0.000**	**0.000**	**1.9**	**94.115**	**521**	**42.335**
PP1	**FEH22: 30 years: +40 %: 240 mins: Summer**	**28.636**	**27.860**	**0.348**	**0.390**	**17.0**	**44.793**	**0.000**	**0.000**	**2.9**	**52.561**	**168**	**28.843**
PP3	**FEH22: 30 years: +40 %: 120 mins: Summer**	**29.102**	**28.716**	**0.297**	**0.296**	**12.0**	**13.803**	**0.000**	**0.000**	**3.9**	**24.174**	**46**	**29.487**
PP4	**FEH22: 30 years: +40 %: 120 mins: Summer**	**30.134**	**29.622**	**0.446**	**0.352**	**10.3**	**11.285**	**0.000**	**0.000**	**3.7**	**20.768**	**38**	**25.284**

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Project:	Date:		
Land East of Mousdell Close Ashington	09/07/2025		
	Designed by: CC	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Surface Network 1	Company Address: Motion		

FEH22: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
B1 - Basin	**FEH22: 100 years: +45 %: 360 mins: Winter**	**26.796**	**26.796**	**0.896**	**0.896**	**50.9**	**313.037**	**0.000**	**0.000**	**10.9**	**359.374**	**287**	**0.664**
C1 - Cellular Storage	**FEH22: 100 years: +45 %: 1440 mins: Winter**	**27.893**	**27.893**	**1.193**	**1.193**	**15.5**	**486.116**	**0.000**	**0.000**	**2.0**	**269.780**	**2449**	**0.926**
PP6	**FEH22: 100 years: +45 %: 240 mins: Summer**	**29.356**	**28.837**	**0.495**	**0.467**	**22.4**	**60.137**	**0.000**	**0.000**	**3.5**	**63.954**	**188**	**11.222**
PP7	**FEH22: 100 years: +45 %: 240 mins: Summer**	**27.294**	**26.792**	**0.490**	**0.552**	**16.1**	**41.622**	**0.000**	**0.000**	**2.8**	**42.599**	**262**	**8.325**
PP5	**FEH22: 100 years: +45 %: 120 mins: Summer**	**30.438**	**30.197**	**0.354**	**0.222**	**12.5**	**17.186**	**0.000**	**0.000**	**2.7**	**19.977**	**85**	**30.109**
PP2	**FEH22: 100 years: +45 %: 1440 mins: Winter**	**27.900**	**27.893**	**0.693**	**0.793**	**6.3**	**157.169**	**0.000**	**0.000**	**1.9**	**95.081**	**730**	**17.318**
PP1	**FEH22: 100 years: +45 %: 240 mins: Summer**	**28.745**	**28.027**	**0.458**	**0.557**	**21.7**	**58.222**	**0.435**	**0.000**	**3.5**	**63.279**	**184**	**7.510**
PP3	**FEH22: 100 years: +45 %: 120 mins: Summer**	**29.194**	**28.833**	**0.390**	**0.413**	**15.5**	**18.292**	**0.124**	**0.000**	**4.7**	**31.139**	**51**	**6.556**
PP4	**FEH22: 100 years: +45 %: 120 mins: Summer**	**30.256**	**29.820**	**0.568**	**0.550**	**13.3**	**14.865**	**0.400**	**0.000**	**4.7**	**26.842**	**41**	**1.577**

Status
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Appendix M

Southern Water Developer Services Foul Flow Excel Calculation

Development Size (Number of Units)	N	74	
Site Area (Ha)	A	2.19	
Development Density per 4ha	D	135.16	
Per Capita Flow -Litres/ head / day	G	125	
Infiltration – Percentage	I	10	
Occupancy – Persons/Dwelling	O	2.4	
Dry Weather Flow multiplier		**SD**	**PF**
(PF - Peaking Factor)		30 - 240	2.5
(SD –Storm Duration– minutes)		240 - 480	2
		>480	1.4
Allowance for misconnected surface water			
Population – Number of people	P	177.6	
Misconnected surface water allowance m^2/property	M	2.1	

Assume storm duration of 360 minutes, thus a default value of '2'

Refer to Row 4 and compare to the integers in Columns B20 to B24 and enter the correcponding value from Columns C20 to C24

Design Flow (litres/day) **57,875.40**
Design Flow (litres/sec) **0.67**

Development Density (Properties / 4Ha)	Misconnected surface water allowance m2/property
<=100	2.10
120	1.60
140	1.10
180	0.60
>=200	0.30

Appendix N

Drainage Management and Maintenance Plan

Land East of Mousdell Close
Ashington, West Sussex

Sustainable Drainage Management and Maintenance Plan

For

Rocco Homes

motion

Document Control Sheet

Land East of Mousdell Close

Ashington, West Sussex

Rocco Homes

This document has been issued and amended as follows:

Date	Issue	Prepared by	Approved by
11/07/2025	Draft	Laura Jagiela	Jason Morgans

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Contents

1.0 Introduction

1.1 This document sets out the principles for the long-term management and maintenance of the proposed sustainable drainage system on the proposed development.

1.2 The purpose of this document is to ensure that the site management company or their agents have a robust inspection and maintenance plan going forwards. This ensures the optimum operation of the sustainable surface water drainage system and that it will be continually maintained for the lifetime of the development. This will contribute to reducing the risk of surface water flooding both on- and off-site.

1.3 All those responsible for maintenance should follow relevant health and safety legislation for all activities listed within this report (including lone working, if relevant). Method statements and risk assessments should always be undertaken and made available, if requested.

1.4 This document has been produced by Motion on behalf of their clients Rocco Homes. This document describes the typical management and maintenance tasks that are known at the design stage (maintenance frequencies and typical tasks, for example). These have been drawn from industry guidance such as CIRIA C753 - The SuDS Manual – and manufacturer's own guidance.

1.5 Maintenance is considered as a construction activity under the CDM Regulations 2015. Under the CDM Regulations, it is a requirement that a competent person be appointed to carry out a required role. CDM defines a competent person as an individual with sufficient knowledge of the specific tasks to be undertaken, as well as sufficient experience and ability to carry out their duties in relation to the task in a way that secures health and safety on site.

1.6 In recognition of the requirements of the CDM Regulations 2015, this sustainable drainage management and maintenance plan expects that the maintenance work will be carried out by a competent person who must have prior knowledge of the drainage components and SuDS systems on site.

1.7 There are limitations on what this document can prescribe at this time. At this stage this document cannot name the specific individuals who will carry out the maintenance and what equipment is to be used. Related to this, this document is unable to provide method statements for exactly how maintenance practices will be carried out. These can only be determined at the time of the maintenance being carried out and the exact maintenance need. Therefore, this is to be the responsibility of the site management company and/or the individuals carrying out the work. We urge those who are carrying out the maintenance to record this information and make it available to the Local Planning Authority (LPA), if required to do so. This drainage management and maintenance plan needs to be a living document that is owned and maintained by the adopting site management company.

2.0 Maintenance Categories

2.1 There are three categories of maintenance activities referred to in this report. These are:

Regular maintenance (including inspections and monitoring)

- Regular maintenance consists of basic tasks done on a frequent and predictable schedule, including inspections, vegetation management, and litter, silt and debris removal.

Occasional maintenance

- Occasional maintenance comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example).

Remedial maintenance

- Remedial maintenance comprises of intermittent tasks that may be required to rectify faults associated with the system. The likelihood of faults can be minimised by correct installation, regular inspection and timely maintenance. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events and, as such, timings are difficult to predict.
- This document should be read in conjunction with the design drawings of the sustainable drainage system, so that the location and type of each feature can be recognised and understood.

3.0 The Sustainable Surface Water Drainage System

3.1 The proposed sustainable surface water drainage system is made up of a number of components. These include:

- Geocellular attenuation storage
- Attenuation Basin
- Permeable paving
- Catchpit manholes/silt traps
- Manholes
- Pipes
- Water Butts

3.2 All components should be installed in accordance with the manufacturer's instructions and to the levels/arrangement as defined on the designer's drawings. Not doing so will invalidate any warranty provided by the manufacturer.

3.3 All maintenance and cleaning must be carried out in accordance with manufacturer's recommendations and by competent and suitably qualified staff, as defined in the CDM regulations 2015.

4.0 General Maintenance Principles

4.1 All surface water drainage systems, whether piped gravity systems or Sustainable Drainage Systems (SuDS), require regular maintenance to keep them working at optimum efficiency and capacity. The maintenance of the sustainable surface water drainage system on the development should be carried out alongside other regular maintenance tasks on site.

4.2 Timely and adequate maintenance will increase the lifespan of all the drainage components. Inadequate maintenance will do the reverse. Therefore, the projected lifespan and anticipated replacement date of each drainage component cannot be forecast at the time of this document being produced.

4.3 The site management company and/or their agents are responsible for the maintenance of the sustainable surface water drainage system.

4.4 Construction activities can create and discharge significant quantities of sediment that will quickly clog the sustainable surface water drainage system. Therefore, construction-stage sediment removal is required immediately post-construction. This may require several cleans of the system during the first year after installation. The construction site manager should assess this and carry out cleaning as necessary.

4.5 Catchpit manholes/silt traps will be specified upstream of the attenuation storage and permeable paving. They will remove gross solids and the majority of silts. It is important that any debris build-up in the catchpit manholes/silt traps is removed at regular intervals. This will reduce the risk of the permeable paving becoming silted up. It will maintain its design capacity and function.

4.6 Cleaning should also take place after large storms when there have been increased surface water flows and visible entrainment and deposition of debris.

4.7 An increased frequency of inspection and maintenance should be programmed into the autumn and winter months in acknowledgement that:

- Leaf fall from deciduous trees in autumn will result in an increased amount of leaf litter and an elevated blockage risk of drainage infrastructure.
- Increased rainfall during winter months will result in greater quantities of water moving through the drainage system and a greater input of silt and other debris.

4.8 Table 4.1, below, gives an overview of typical maintenance tasks and the frequency with which they need to be undertaken. Section 5 – Inspection and Maintenance Frequency of Components – will assign typical maintenance frequencies and tasks to the specific components used within the sustainable surface water drainage system used on the development.

Table 4.1: Typical maintenance tasks and frequencies

Activity	Indicative Frequency	Typical Tasks
Routine/regular maintenance	Monthly to annually	▸ Litter picking ▸ Silt removal ▸ Inspection of all inlets, outlets and control structures ▸ Weed removal and invasive plant control
Occasional maintenance	Annually up to 25 years	▸ Silt control around components ▸ Vegetation management around components ▸ Sweeping of pavement areas to remove surface silt ▸ Silt removal from catchpits, cellular storage structures
Remedial maintenance	As required	▸ Inlet/outlet repairs ▸ Erosion repairs ▸ Reinstatement of edgings ▸ Reinstatement following pollution ▸ Removal of silt build-up and leaf litter after storms ▸ Repair of vandalism ▸ Replacement of any blocked filter ▸ membranes/materials

5.0 Inspection and Maintenance Frequency of Components

5.1 Table 5.1 below lists each of the components used within the site's sustainable surface water drainage system. It suggests an indicative maintenance frequency for each component and ascribes typical maintenance tasks to them.

5.2 This list is not exhaustive, nor is it prescriptive. As mentioned in Section 3, additional, unscheduled maintenance may be required following adverse weather conditions or after autumn leaf falls. Additional maintenance tasks may be required to adequately clean and maintain individual components.

5.3 The list of components should be cross-referenced with the designer's drawings so that the location of each component can be identified.

5.4 It is the responsibility of the site management company and/or their agents to ensure that all necessary maintenance activities are carried out in a timely manner and that the design performance of each drainage component is preserved.

5.5 If there is any uncertainty regarding the correct and safe methods of cleaning, or what equipment should be used, the manufacturer should be consulted.

Table 5.1: Maintenance Frequency and Task for Drainage Components

Activity	Indicative Frequency	Anticipated Tasks
Pipes	As required	▸ Identify any pipes that may not be operating properly and employ a competent, qualified contractor to inspect using CCTV. ▸ If the pipe is blocked with silt or debris, the pipe should be jetted clean from an upstream access point. All silt and debris should be captured and removed at a downstream access point. ▸ Inspect once clean. ▸ If any other defects are encountered (cracks, displaced joints, root ingress), appropriate solutions should be discussed with a competent and qualified contractor. These services are usually provided by the same companies that offer CCTV surveys and pipe jetting services.
Manholes	Annually	▸ Inspect/identify any damage or areas that are not operating correctly ▸ Remove silt, litter, leaves and other detritus. ▸ Inspect once clean.
Catchpit Manholes/Silt Traps	Twice a year, before and after autumn/winter	▸ Inspect/identify any damage or areas that are not operating correctly ▸ Remove silt, litter, leaves and other detritus. ▸ Inspect once clean.
Attenuation Basins	Monthly in Summer, as required in Winter	▸ Responsibility should be with landscape contractors. ▸ Maintenance tasks are not that different from standard public open space. ▸ Adequate access needs to be provided to the area.

		▸ Regular mowing should take place across maintenance access routes, amenity areas, across embankments and the main storage area. Remaining areas can remain as 'meadow'. Mowed grass lengths of 75 – 100mm are appropriate. ▸ Grass clippings should be disposed of off-site. ▸ Any dead growth should be cleared before the start of the growing season. ▸ Any permanently wet areas with emergent aquatic vegetation should be managed as ponds or wetlands. ▸ Remove any sediment build-up as required. ▸ Check any inlets and outlets for blockages and clear as required. ▸ Check any flow control devices, if present.
Geocellular Crates	Every three months for the first year, then annually thereafter	▸ Contact manufacturer for instruction on approved and safe inspection and maintenance practices ▸ Inspect/identify any areas that are not operating correctly ▸ Remove debris from catchment surface ▸ Remove sediment from pre-treatment structures ▸ Check for silt build-up and flush and remove as required (in accordance with manufacturer's instructions). ▸ Inspect once clean. ▸ See Table 21.3 of CIRIA C753 for more information. ▸ Most geocellular units have a 60 year creep limited life expectancy, so they should be planned for replacement by 2081 (approx.).
Water Butts	Annually in Autumn to Winter	▸ Remove falling leaves and seeds from guttering or those that have found their way into the water butt. ▸ Water may stagnate slightly. If so, use a water butt cleaning disc into the tank. ▸ In autumn and winter, drain water off every 10 days (or less) to make sure that water butts don't overflow and that water is kept moving. This will stop larvae and flies from using the water butt. ▸ Use safe products such as vinegar to clean the outside of the tank and the inside of the lid and be careful not to contaminate water with chemicals. ▸ At least once a year, completely empty the water butt and scrub it out with warm soapy water and then rinse thoroughly. This is best done at a time when the water butt is already nearly empty (end of summer) or when it can readily refill (winter).

Permeable paving	Once a year after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations.	▸ Agitate surface by means of mechanical sweeping or vacuuming to ensure no vegetation or moss is allowed to establish and grow in the joints. ▸ Mechanical sweeping of paviours and refilling of joints with the correct aggregate need only be carried out at intervals of 5 years or so ▸ Remove weeds from the surface through the application of glyphosate-based weed killers ▸ Stabilise and mow contributing and adjacent areas. ▸ Inspect once clean. ▸ See Table 20.15 of CIRIA C753 for more information. ▸ Permeable paving has a nominal 25 year lifespan, if correctly and regularly maintained. ▸ When subjected to low level oil drips permeable paviours can continue to biodegrade hydrocarbons indefinitely. ▸ Major oil spills have the potential to contaminate the surface and the underlying crushed stone. In the event of a major oil spill, the area of block paviours and crushed stone that is affected should be removed, cleaned and reinstalled.

5.6 Upon completion of maintenance activities, a record should be kept of the work carried out. This should be retained and an annual maintenance report should be compiled, which should include the following:

- Observations resulting from inspections
- Maintenance and operation activities undertaken during the year
- Recommendations for inspections and maintenance programmes for the following year

5.7 On the last page of this document is a table with suggested information should be recorded and included with the maintenance plan. As mentioned in the introduction to this document, this should be a living document and regularly updated, as required.

5.8 The Local Planning Authority (Horsham District Council) may request to check and sign off any maintenance activities. Therefore, it is the recommendation that the LPA is contacted prior to any scheduled routine maintenance. The table mentioned above and on the next page, as well as the annual maintenance report, should be offered to the LPA for their records and approval.

Date	Component requiring maintenance	Issues prompting maintenance	Scheduled maintenance (Y/N)	Maintenance carried out	Additional works required (Y/N). If yes, please detail	Next scheduled date of inspection and maintenance