

Flood Risk Assessment

**Broadacre Southwater
(Phase 5)**
Horsham

for

Berkeley Homes (Southern) Ltd
12345

June 2024

Flood Risk Assessment
Broadacre Southwater (Phase 5)
for
Berkeley Homes (Southern) Ltd

Revision	Date of issue	Comments	Prepared By	Checked By
1.0	21.06.2024	Initial Issue	AM	DB
2.0	26.06.2024	Minor amendments	AM	DB
3.0	27.06.2024	SUDS risk assessment added	AM	DB
4.0	28.06.2024	Client's comments added	AM	DB

Should you have any queries relating to this document please contact:

David Brooke
PPCP Limited T/A Patrick Parsons
Satelliet House
2 Nexus Park
Lysons Avenue
Ash Vale
GU12 5QE

T: +44 (0) 1276 700 400

E: david.brooke@patrickparsons.co.uk



Executive Summary

Description	
Patrick Parsons has been instructed by Berkeley Homes (Southern) Ltd, to produce a Flood Risk Assessment under National Planning Policy Framework (NPPF) to support the Planning Application for the site at Broadacre Southwater (Phase 5) , Horsham.	
Flood Risk Assessment	
Coastal:	Zone 1
Fluvial:	Zone 1
Pluvial:	Low
Groundwater:	Low
Other sources:	Low
Flood Resilience Measures	
Set all plot levels to a minimum level above estimated 1 in 100-year storm event (+40% climate change) level.	
Conclusions	
The site is within Flood Zone 1 and has a very low risk of flooding from rivers and surface water flooding. There will be potential for surface water flooding on the route of the existing ditch on the eastern side at the site during an extreme storm. However, the hazard level across the developed portion of the site is very low. Therefore, the development does not pose a flood risk to occupants.	



Contents

1.0	Introduction.....	1
2.0	Location of site and context	2
3.0	Site Description.....	3
4.0	Proposed Development.....	4
5.0	Flooding Information.....	6
6.0	Flood Risk Classification.....	7
7.0	Climate Change Allowance	9
8.0	Flood Risk Assessment.....	10
9.0	Summary and Conclusions	13

Appendices

Appendix A	Location Plan
Appendix B	Topographical Survey
Appendix C	Borhole Data
Appendix D	Magic Map Geology Information
Appendix E	Site Plan
Appendix F	Drainage Strategy Layout
Appendix G	Causeway Flow Calculation
Appendix H	Environment Agency Flood Map (For Planning)
Appendix J	Horsham District Council Strategic Flood Risk Assessment
Appendix K	Environment Agency Surface Water Flood Map
Appendix L	Hazard Technical Note

1.0 Introduction

- 1.1.1 This report has been prepared in support of amendments associated to application DC/19/2464 and Phase 5 of the development known as Broadacres, Southwater.
- 1.1.2 The proposed changes solely relate to the unbuilt Phase 5 with the aim to deliver an alternative housing mix, amend the number of homes (an increase of 14 compared to the resolved to be approved plans) and an improved design. The proposed amendments remain in accordance with the approved outline application parameter plans.
- 1.1.3 The revised the development relates to the erection of 94 dwellings with associated access, parking and landscaping at Land West of Worthing Road (Phase 5), Southwater. As detailed in the covering letter.
- 1.1.4 Patrick Parsons has been instructed by Berkeley Homes (Southern) Ltd, to produce a Flood Risk Assessment to support the above.
- 1.1.5 This report aims to demonstrate that the site is not at risk of any form of flooding.
- 1.1.6 This report follows the same principles of the previously submitted FRA which did not create any concerns from the LPA or LLFA officers.
- 1.1.7 The general limitations of this assessment are that:
- Several data sources have been used in compiling this report. Whilst Patrick Parsons believe them to be trustworthy; it is unable to guarantee the accuracy of the information that has been provided by others.
 - This report is based on information available at the time of preparation. There is potential for further information to become available, which may create a need to modify conclusions drawn in this report.

2.0 Location of site and context

- 2.1.1 The site is located west of Southwater in Broadacres. A location plan is enclosed in **Appendix A**. Broadacres relates to a high-quality residential development built by Berkeley Homes.
- 2.1.2 Outline planning permission was granted for up to 594 dwellings at Southwater in 2015 under application reference DC/14/0590. The proposals were considered to be EIA development and the application was supported by an Environmental Statement. Reserved matters approval has subsequently been granted for phases 1, 2, 3 and 4, totalling 514 units and community facilities. Phases 1, 2 and 3 have now been completed, with the final Phase 4 and 5 remaining.
- 2.1.3 In 2018 Berkeley gained reserved matters approval for 213 homes including 61 affordable homes in Phases 3.2 and 4 of the Southwater development (Ref: DC/18/1246).
- 2.1.4 The Phase 3.2 and Phase 4 reserved matters application has now been implemented in part with Phase 3.2 completed and largely occupied to relate to 56 of the 213 homes (including 6 affordable homes). No work other than an internal access road to base course have been completed within Phase 4. Berkeley have submitted a separate application to amend the design of Phase 4 under a S.73 application.
- 2.1.5 Phase 5, to which this report relates, was submitted as a full standalone planning application in December 2019 (within the context of the parameters of the outline permission) and received resolution to grant at committee in September 2020 (DC/19/2464). Due to issues related to water neutrality a decision notice has not been issued and the planning application remains undetermined. This submission therefore seeks to update the existing planning application.

3.0 Site Description

3.1 Existing Site

- 3.1.1 The site represents a former agricultural hoarded development parcel laid to grass. An internal access road to base course, site compound has been completed within Phase 5, together with ecological mitigation and reptile translocation areas associated to previous development phases located to the east of the site. A topographic survey can be found in **Appendix B**.
- 3.1.2 The site features steep terrain, with elevations ranging from 61.60m AOD on the north side to 53.0m AOD on the south side.

3.2 Existing Geology

- 3.2.1 The geology of the site has been ascertained by reference to the 1:50,000 British Geological Survey website. The data provided on the website indicates the bedrock geology for the site.
- 3.2.2 The strata of the site (bedrock geology) comprise Weald Clay Formation - Mudstone, described as follows:

"The lower boundary is generally poorly defined and gradational in complete successions, from the siltstones and silty fine-grained sandstones of the underlying Tunbridge Wells Sand Formation up into the mudstones of the Weald Clay Formation. Locally, the basal beds of the Weald Clay are weakly sideritised. Elsewhere, the boundary is erosive and unconformable, with the Weald Clay resting on beds down to the Grinstead Clay Member (e.g. southwestern part of the Maidstone Geological Sheet around Pearsons Green [TQ 694 433])."

3.3 Geological Assessment

- 3.3.1 Boreholes in the local area indicate the area is predominantly clay, as included at **Appendix C**.
- 3.3.2 Based on the desk study information on the geology of the site and the restricted space, infiltration is not suitable for the development. The requirement for a positive surface water discharge has been considered in this report.

3.4 Hydrogeology Setting

- 3.4.1 The Environment Agency (EA) mapping service, as provided by Magic Map, indicates the aquifer designation for the bedrock and superficial drift geology and the groundwater vulnerability in the area. The mapping, as included at **Appendix D**, provide the following information for the site:

Geology Map	Site Description
Aquifer Designation (Bedrock)	Secondary A
Aquifer Designation (Superficial Drift)	-
Groundwater Vulnerability	Unproductive
Groundwater Source Protection Zone	None

3.5 Hydrology

- 3.5.1 There are no strategic watercourses in the local area. A local ditch is located on the west boundary of the site.

4.0 Proposed Development

- 4.1.1 The proposed site layout is shown in **Appendix E**. The proposed development for the erection of 94 dwellings with associated access, parking and landscaping works.
- 4.1.2 The proposed site levels will generally mimic the existing site topography with localised changes to improve the levels of the site where appropriate, enable the construction of site infrastructure and allow for the creation of modest bunding to create interest in the landscape design and minimise movements of heavy goods vehicles associated to cart-away.

4.2 Surface Water Drainage Proposal

- 4.2.1 The proposed drainage plan is attached in **Appendix F**.
- 4.2.2 The proposals follow the same strategy as proposed and accepted in principle by the LLFA. The only exception is that we have used FEH rainfall data in our design and utilized two hydro-braes to restrict flow into the local ditch network.
- 4.2.3 As can be seen in the design proposals, we have designed a conventional drainage system with a restricted outfall into the local ditch system. The agreed discharge rate is 55 l/s, equivalent to the greenfield run off rate.
- 4.2.4 Two ponds have been designed to accommodate a 1 in 100 year plus 40% climate change storm event. Also, a minimum of 300mm freeboard has been allocated for. For biodiversity / ecological benefits the pond will be excavated a further metre down to maintain a wetted area all year round. The pond will be carefully landscaped to provide further water treatment.
- 4.2.5 The scheme has been modelled and the supporting causeway flow calculations are attached in **Appendix G**. From the results there will be no flooding in the critical storm events.
- 4.2.6 Throughout the scheme additional SUDS measuring will be introduced. This will include porous surface for some parking spaces. Where practicable rainwater pipes will either discharge directly onto porous surfacing or via diffuser into clean stone beneath the porous surfacing. In addition, where practicable, private driveways will drain to minor swales located on the low side of any driveway or conveyed to intermediary swales in open spaces.

4.3 Flood Protection

- 4.3.1 It is impossible to completely guard against flooding since an extreme event is always possible; however, the risk can be minimised by employing flood resilient construction techniques to the proposed building as listed below, it should be noted that these should not be needed for this development:
- The use of concrete floor with waterproof membrane
 - Waterproof walls up to a height providing 300mm freeboard to the assumed flood level and sealed service ducts
 - Location of electrical and other plant above the floor

- High electrical sockets and Ensuring security of supplies.

4.3.2 It is recommended that the developer considers all the mitigation measures and above techniques when discussing and agreeing the precise detail of the development with the Local Authority.

4.4 SUDS Risk Assessment

4.4.1 In the design of the surface water attenuation pond at the site, a comprehensive Sustainable Urban Drainage System (SUDS) risk assessment was conducted to ensure operational efficacy and safety. Key considerations include below.

4.4.2 Drainage Capability: The pond is designed to manage peak runoff effectively, thereby mitigating downstream flood risks.

4.4.3 Water Quality Management: Incorporation of sediment forebays and vegetated swales facilitates natural filtration, enhancing water quality.

4.4.4 Structural Stability: The pond banks feature a 1/3 slope to prevent erosion and structural compromise, complemented by a 300mm freeboard to safeguard against overflow.

4.4.5 Safety Measures: A secure perimeter fence will restrict access to the pond area, and emergency life rings will be strategically placed for safety.

4.4.6 Biodiversity Enhancement: The pond design supports local flora and fauna, creating a habitat conducive to biodiversity while minimizing ecological disruption.

4.4.7 Maintenance Regimen: Regular drainage system inspections and upkeep protocols are established to ensure ongoing functionality and risk management.

4.4.8 This thorough risk assessment underscores compliance with regulatory standards and affirms the pond's role as a sustainable solution for surface water management at the site.

5.0 Flooding Information

- 5.1.1 As set out in the National Planning Policy Framework (NPPF), inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere. For these purposes:
- “areas at risk of flooding” means land within Flood Zones 2 and 3; or land within Flood Zone 1 which has critical drainage problems, and which has been notified to the local planning authority by the Environment Agency;
 - “flood risk” means risk from all sources of flooding - including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources.
- 5.1.2 Flooding information for Planning from the Environment Agency (EA) has indicated the site is located within Flood Zone 1, as found in the map at **Appendix H**.
- 5.1.3 As part of the data capture, data and mapping from the Horsham Strategic Flood Risk Assessment (SFRA) was sought, as found in the map at **Appendix J**

6.0 Flood Risk Classification

- 6.1.1 The data on the EA's website in their updated mapping, shows the site has a "low" risk of flooding.
- 6.1.2 The EA confirmed that the proposed development site is located in Flood Zone 1 for Planning.
- 6.1.3 According to Table 2 of National Planning Policy Framework (NPPF), the development, being residential, is classed as 'more vulnerable'.
- 6.1.4 According to NPPF Table 3 'Flood Risk Vulnerability and Flood Zone Compatibility', the development should be permitted, with an exception test.

Table 3: Flood risk vulnerability and flood zone 'compatibility'

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	✗	✗	✗

Key: ✓ Development is appropriate.
 ✗ Development should not be permitted.

6.2 Sequential Test

- 6.2.1 Local Planning Authorities (LPA) are encouraged to take a risk-based approach to proposals for development in or affecting flood risk areas through the application of the Sequential Test and the objectives of this test are to steer new development away from high-risk areas towards those at lower risk of flooding.
- 6.2.2 However, in some areas where developable land is in short supply, there can be an overriding need to build in areas that are at risk of flooding. In such circumstances, the application of the Sequential Test is used to ensure that the lower risk sites are developed before the higher risk ones.
- 6.2.3 NPPF (PPG25) states that the Sequential Test should be applied at all stages of the planning process and the starting point is generally the Environment Agency's flood zone maps.
- 6.2.4 These maps and the associated information are intended for guidance and cannot provide details for individual properties. They do not consider other considerations such as existing flood defences, alternative flooding mechanisms and detailed site-based surveys. They do, however, provide high level information on the type and likelihood of flood risk in any area of the country.
- 6.2.5 The site is within Flood Zone 1 and so would not ordinarily require not require a sequential test assessment. In addition, the site represents an allocated development site within Horsham adopted Local Plan and site with a committee resolution for approval, based on an officer recommendation.
- 6.2.6 The only section of medium and high-risk surface water flooding is within the southeast corner of Phase 5. This area will largely remain landscaped areas, with planting, open space, recreation, and pond attenuation proposed only. Residential development is limited in these locations (Refer to **Appendix E** - Site Layout and **Appendix K** - Surface Water Mapping). It should be noted that the risk of surface water flooding will reduce in this area as overland flows will be intercepted by the development proposals. The surface water flooding adjacent to the site does not require a sequential test assessment.

6.3 Exception Test

- 6.3.1 The Exception Test is an additional test to be applied by decision-makers following application of the Sequential Test. The Exception Test has two elements as shown below, both of which must be satisfied for development in a flood risk area to be considered acceptable.
- 6.3.2 The Exception Test is only appropriate for use when there are large areas in Flood Zones 2 and 3, where the Sequential Test alone cannot deliver acceptable sites, but where some continuing development is needed for wider sustainable development reasons, considering the need to avoid social or economic blight and the need for essential civil infrastructure to remain operational during floods.
- 6.3.3 For the Exception Test to be passed:

- a. It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a SFRA; and,
- b. A site-specific FRA must demonstrate that the development will be safe for its lifetime, without increasing flood risk elsewhere and, where possible, reducing flood risk overall.

6.3.4 An exception test is not required, in accordance with NPPF Table 3, as the development is appropriate.

7.0 Climate Change Allowance

7.1.1 Climate change allowances, as set out by the Government guidance, are predictions of anticipated change for peak river flow, peak rainfall intensity, sea level rise and offshore wind speed / extreme wave height.

7.1.2 To increase resilience to flooding and coastal change, allowances for climate change are considered in any flood risk assessment.

7.1.3 The allowances are based on percentiles from UKCP18 climate change prediction data. A percentile is a measure used in statistics. They describe the proportion of possible scenarios that fall below an allowance level. The:

- Central allowance is based on the 50th percentile
- Higher central allowance is based on the 70th percentile
- Extreme allowance is based on the 95th percentile

7.1.4 To manage river flooding in on the site, any flood assessment should use the:

- Central allowance as your design allowance
- Higher central allowance to test the impacts of higher scenarios of climate change and any extra mitigation
- Extreme allowance to test your option under more extreme climate change and exceedance events
- 2080s epoch allowances for changes beyond the 2080s epoch and up to 2115

7.2 Climate Change Allowances

7.2.1 The Environment Agency have prepared a River Catchment map (**Climate change allowances for peak river flow in England (data.gov.uk)**) that identifies the percentage allowances required for a specific postcode.

Baseline	Central	Higher	Upper
2020s	16%	23%	40%
2050s	18%	28%	57%
2080s	37%	55%	107%

8.0 Flood Risk Assessment

8.1 Fluvial Flooding Risk

- 8.1.1 The EA flooding information indicates that the site lies within Flood Zone 1 and is therefore, at a low (0.1% annual probability) risk of flooding from fluvial sources.

8.2 Historic Flood Data

- 8.2.1 The Environment Agency have no information indicating that the site was flooded historically from fluvial sources.

8.3 Surface Water Flooding

- 8.3.1 Overland flow / surface water flooding typically arise because of intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems. It can run quickly off land and result in localised flooding.
- 8.3.2 The Environment Agency has produced illustrative mapping (Flood Map for Surface Water) relating to flooding risks from surface water. They are classified as Flood Hazard Maps for the purpose of the Flood Risk Regulations 2009. These maps are the next generation on from the previous "Area Susceptible to Surface Water Flooding" maps, which are contained within the SFRA.
- 8.3.3 The EA maps show high resolution image and indicative flow paths for pluvial events. The maps are based on coarse level data and indicate ridges, valleys and flat spots where water would collect. Typically, the flow paths follow valleys, rivers and watercourses.
- 8.3.4 The surface water maps, and the associated information are intended for guidance only and cannot provide details for individual properties. They do, however, provide high level information and indicate areas in which surface water flooding issues should be investigated further. The risk categories are classified as follows:
- Very low probability of flooding – This zone is assessed as having less than a 1 in 1000 annual probability of surface water flooding.
 - Low probability of flooding – This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of surface water flooding.
 - Medium probability of flooding - This zone comprises land assessed as having between a 1 in 30 and 1 in 100 annual probability of surface water flooding.
 - High probability of flooding – This zone is assessed as having greater than a 1 in 30 annual probability of surface water flooding.
- 8.3.5 A review of the EA mapping, as included at **Appendix K**, indicates there is some risk of surface water flooding to the site. However, this is at the edge of the site where no properties are proposed. The extent of any potential surface water flooding will reduce due to the development proposals as overland surface water run-off from the fields will be captured

before it enters the water course. This same surface water will find its way back to the existing ditch system.

- 8.3.6 The route of the existing surface flooding will not be impacted by the changes to the topography of the land and plots have been positioned away from it to allow it to naturally disperse along its natural route.
- 8.3.7 An assessment of the "medium" risk scenario (up to 1 in 100-year event), indicates that there would be some flood water on the site. The water appears to be highly localised and shallow.
- 8.3.8 The worst-case hazard rating (up to 1 in 100-year event) for the site can be refined and calculated using the formulae in the guidance document in **Appendix L**. The hazard can be obtained from the maximum possible water depth of 300mm and assumed velocity of 0.25 m/s (although it is expected to be much lower).
- 8.3.9 The flood Hazard Rating (HR) is based primarily on consideration to the direct risks of people exposed to floodwaters and is expressed below.

$$HR = d (v + n) + DF$$

$$HR = 0.300 \times (0.25 + 0.5) + 0.5$$

$$HR = 0.725$$

d = Depth of water (m)

v = Velocity of water (m/s)

n = constant taken as 0.5

DF = debris factor

(=0,1,2 depending on probability that debris will lead to a significantly greater hazard)

- 8.3.10 The guidance document provides details of the potential risk to occupants of the site as per the table below:

Thresholds for Flood Hazard Rating $H = d \times (v + 0.5) + DF$		Degree of Flood Hazard	Description
FD2321	FD2320		
<0.75	<0.75	Low	Caution - "Flood zone with shallow flowing water or deep standing water"
0.75 - 1.25	0.75 - 1.25	Moderate	Dangerous for some (i.e. children) - "Danger: Flood zone with deep or fast flowing water"
1.25 - 2.5	1.25 - 2.0	Significant	Dangerous for most people - "Danger: flood zone with deep fast flowing water"
>2.5	>2.0	Extreme	Dangerous for all - "Extreme danger: flood zone with deep fast flowing water"

- 8.3.11 The worst possible flood hazard from surface water based on this calculation is "Low". This indicates that there is a hazard level of "Caution", from potential shallow water, which should not prevent any occupants from escaping.

- 8.3.12 The proposed drainage strategy should carefully consider these localised low points and sources of surface water flooding. Mitigation measures should be included as appropriate to remove any risk to occupants.

8.4 Groundwater

- 8.4.1 Groundwater flooding is caused by the emergence of water originating from sub-surface permeable strata. A ground water flood event results from a rise in ground water level, sufficient for the water table to intersect the ground surface and inundate low lying land. Groundwater floods may emerge from either a single point or diffuse locations.
- 8.4.2 The underlying strata throughout the area and investigations into the SFRA geology data suggest that there is a low risk of groundwater emergence which is likely to relate to the geology of the area.
- 8.4.3 The Environment Agency have information indicating that groundwater flooding in the site is unlikely in this area.

8.5 Flooding from Sewers

- 8.5.1 Flooding from sewers can occur because of different reasons; if sewers are blocked during the heavy rainfalls, or if a sewer cannot provide adequate capacity, then flooding can cause a large amount of damage.
- 8.5.2 The Horsham SFRA has no records indicating the site has been flooded by sewers historically.

8.6 Flooding from Reservoirs

- 8.6.1 Reservoir flooding is extremely unlikely to happen. There has been no loss of life in the UK from reservoir flooding since 1925. All large reservoirs must be inspected and supervised by reservoir panel engineers. As the enforcement authority for the Reservoirs Act 1975 in England, the Environment Agency ensures that reservoirs are inspected regularly, and essential safety work is carried out.
- 8.6.2 However, in the unlikely event that a reservoir dam failed, a large volume of water would escape at once and flooding could happen with little or no warning. If the site is within a risk area, plans should be made for safe evacuation and escape. Residents may need to evacuate immediately, know the safest route to safety, and be ready to follow the advice of emergency services.
- 8.6.3 Data from the EA's website indicates that the site is at no risk from reservoir flooding.

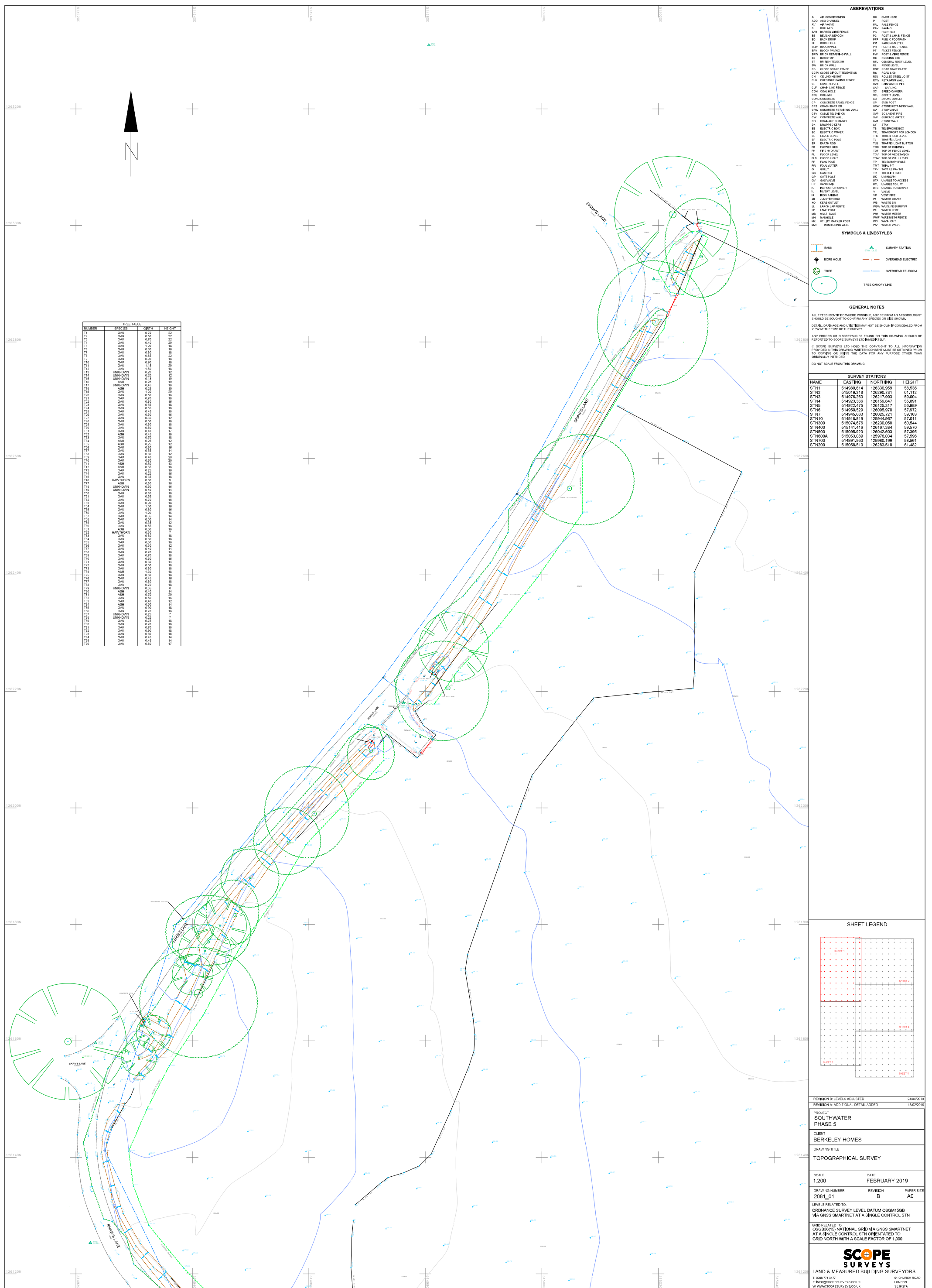
9.0 Summary and Conclusions

- 9.1.1 Patrick Parsons has been instructed by Berkeley Homes (Southern) Ltd, to produce a Flood Risk Assessment under National Planning Policy Framework (NPPF) to support the Planning Application.
- 9.1.2 The Environment Agency mapping indicates that the site is within Flood Zone 1 and has a very low risk of flooding from rivers, the sea and surface water flooding.
- 9.1.3 There will be potentially surface water flooding to the west of the site out of the developable area. The route of the potential surfacing water flooding will not be impacted by the development proposal. This was accepted in principle in the previous application for the site.
- 9.1.4 All other sources of flooding for the site have been investigated and shown to be of minimal or no risk.
- 9.1.5 The proposed development is appropriate and sustainable in the terms as set out in NPPF.

Appendix A Location Plan

Appendix B

Topographical Survey



TREE TABLE			
LINE NUMBER	SPECIES	GIRTH	HEIGHT
T1	GAK	0.70	22
T2	GAK	0.40	22
T3	GAK	0.40	22
T4	GAK	1.20	18
T5	GAK	0.60	16
T6	GAK	0.80	18
T7	GAK	0.80	18
T8	GAK	0.55	22
T9	GAK	0.60	18
T10	GAK	0.80	18
T11	GAK	1.50	18
T12	UNFURN	1.20	12
T13	UNFURN	0.30	12
T14	UNFURN	0.30	12
T15	ASH	0.28	10
T16	ASH	0.45	10
T17	ASH	0.28	10
T18	GAK	1.30	20
T19	UNFURN	0.30	20
T20	GAK	0.60	16
T21	GAK	0.70	18
T22	GAK	0.55	18
T23	GAK	0.55	18
T24	GAK	0.55	18
T25	GAK	0.45	18
T26	GAK	0.50	18
T27	GAK	0.50	18
T28	GAK	0.50	18
T29	GAK	0.50	18
T30	GAK	0.50	18
T31	GAK	0.50	18
T32	ASH	0.45	18
T33	GAK	0.70	17
T34	ASH	0.25	12
T35	ASH	0.25	12
T36	ASH	0.25	12
T37	GAK	0.60	14
T38	GAK	0.55	14
T39	GAK	0.60	20
T40	GAK	0.50	18
T41	ASH	0.50	13
T42	ASH	0.35	13
T43	GAK	0.25	16
T44	GAK	0.25	16
T45	GAK	0.50	16
T46	HAYTHORN	0.60	9
T47	GAK	0.60	9
T48	UNFURN	0.50	16
T49	UNFURN	0.40	14
T50	GAK	0.65	18
T51	GAK	0.55	18
T52	GAK	0.70	15
T53	GAK	0.60	18
T54	GAK	0.60	18
T55	GAK	0.60	18
T56	GAK	0.50	18
T57	GAK	0.35	14
T58	GAK	0.50	14
T59	GAK	0.55	18
T60	ASH	0.60	18
T61	HAYTHORN	0.30	7
T62	GAK	0.30	7
T63	GAK	0.60	18
T64	GAK	0.60	18
T65	GAK	0.60	18
T66	GAK	0.70	16
T67	GAK	0.70	16
T68	GAK	0.70	16
T69	GAK	0.70	16
T70	GAK	0.70	16
T71	GAK	0.60	18
T72	ASH	1.30	20
T73	ASH	0.30	14
T74	ASH	0.45	14
T75	GAK	0.60	18
T76	GAK	0.60	18
T77	GAK	0.60	18
T78	UNFURN	0.40	14
T79	UNFURN	0.40	14
T80	ASH	0.40	14
T81	ASH	0.40	14
T82	GAK	0.70	18
T83	GAK	0.40	12
T84	ASH	0.50	14
T85	GAK	0.70	18
T86	UNFURN	0.35	7
T87	UNFURN	0.35	7
T88	GAK	0.70	18
T89	GAK	0.70	18
T90	GAK	0.70	18
T91	GAK	0.70	18
T92	GAK	0.60	18
T93	GAK	0.60	18
T94	GAK	0.45	14
T95	GAK	0.45	14
T96	GAK	0.45	14
T97	GAK	0.60	17

[illegible]

SYMBOLS & LINSTYLES



GENERAL NOTES

ALL TREES IDENTIFIED WHERE POSSIBLE. ADVICE FROM AN ARBOROLOGIST SHOULD BE SOUGHT TO CONFIRM ANY SPECIES OR SIZE SHOWN.

DETAIL, DRAINAGE AND UTILITIES MAY NOT BE SHOWN IF CONCEALED FROM VIEW AT THE TIME OF THE SURVEY.

ANY ERRORS OR DISCREPANCIES FOUND ON THIS DRAWING SHOULD BE
REPORTED TO SCOPE SURVEYS LTD IMMEDIATELY.

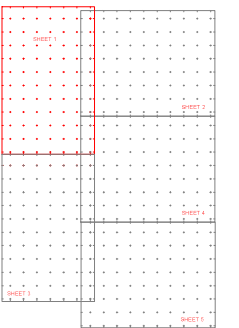
© SCOPE SURVEYS LTD HOLD THE COPYRIGHT TO ALL INFORMATION PROVIDED IN THIS DRAWING. WRITTEN CONSENT MUST BE OBTAINED PRIOR TO COPYING OR USING THE DATA FOR ANY PURPOSE OTHER THAN ORIGINALLY INTENDED.

DO NOT SCALE FROM THIS DRAWING.

DO NOT SCALE FROM THIS DRAWING.

SURVEY STATIONS			
NAME	EASTING	NORTHING	HEIGHT
STN1	154980.814	126330.959	58.336
STN2	154992.218	126329.81	61.112
STN3	154976.263	126127.993	59.004
STN4	154923.366	126159.647	55.891
STN5	154922.475	126125.317	56.889
STN6	154950.529	126095.978	57.972
STN7	154484.663	126025.721	59.163
STN8	154948.919	126025.721	57.811
STN300	155074.676	126032.058	60.543
STN400	155141.416	126167.384	59.570
STN500	155095.923	126162.603	57.395
STN600A	155053.089	125976.634	57.596
STN700	154918.860	125980.199	58.561
STN800	154918.860	125980.199	58.561

SHEET LEGEND



REVISION B: LEVELS ADJUSTED	24/04/2019
REVISION A: ADDITIONAL DETAIL ADDED	18/02/2019

PROJECT
SOUTHWATER
PHASE 5

CLIENT
BERKELEY HOMES

DRAWING TITLE

TOPOGRAPHICAL SURVEY

SCALE 1:200 DATE FEBRUARY 2019

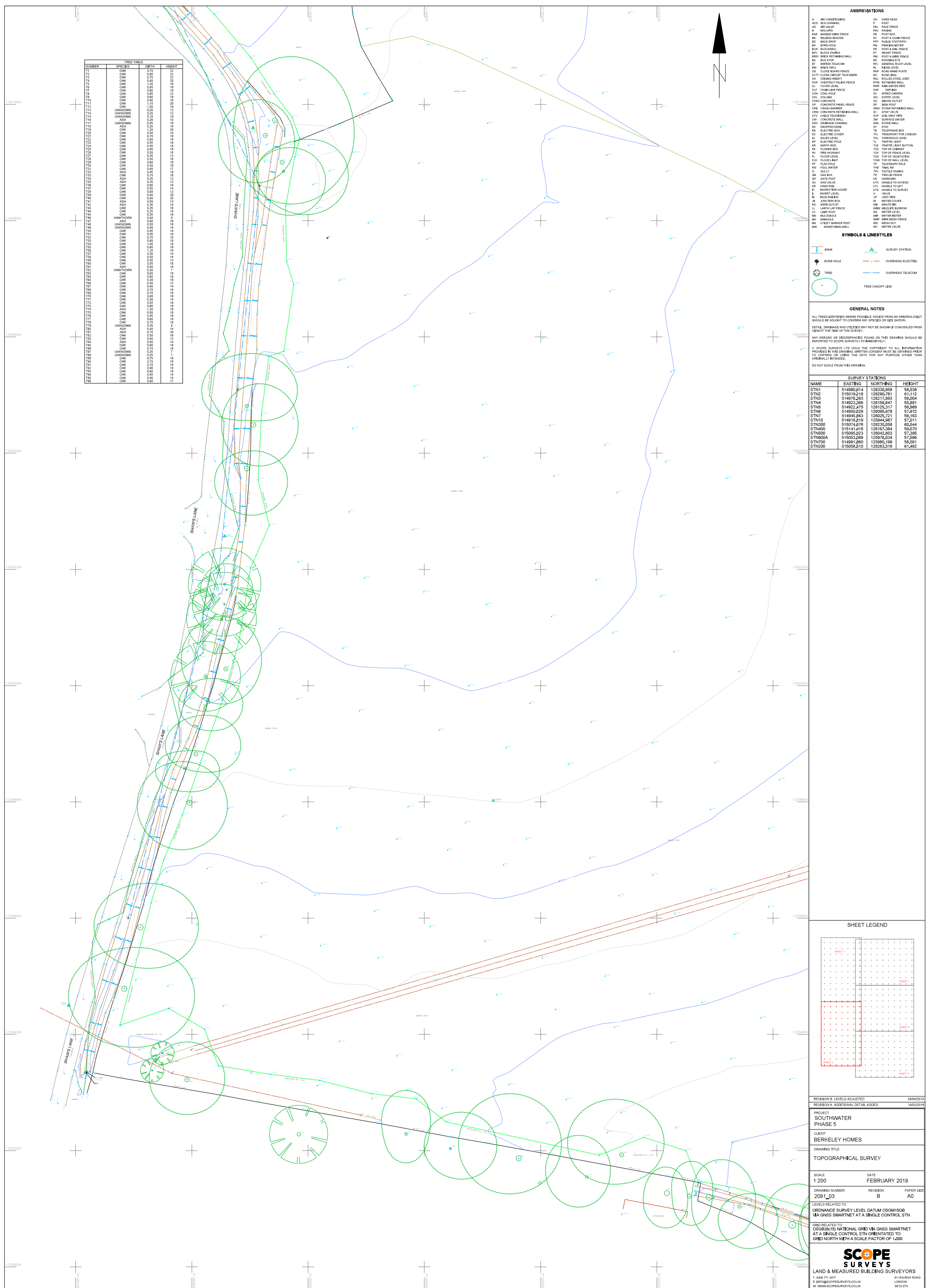
DRAWING NUMBER	REVISION	PAPER SIZE
2081_01	B	A0
LEVELS RELATED TO:		
ORDNANCE SURVEY LEVEL DATUM OSGM15GB		
VIA GNSS SMARTNET AT A SINGLE CONTROL STN		

GRID RELATED TO:
OSGB36(15) NATIONAL GRID VIA GNSS SMARTNET
AT A SINGLE CONTROL STN ORIENTED TO
GRID NORTH WITH A SCALE FACTOR OF 1.000

SCOPE
SURVEYS
LAND & MEASURED BUILDING SURVEYORS

T: 0208 771 3477
E: INFO@SCOPEMURVEYS.CO.UK
W: WWW.SCOPEMURVEYS.CO.UK

91 CHURCH ROAD
LONDON
SE18 2TA

[illegible]

SYMBOLS & LIFESTYLES

	BANK		SURVEY STATION
	BORE HOLE		OVERHEAD ELECTRIC
	TREE		OVERHEAD TELECOM
	TREE CANOPY LINE		

GENERAL NOTES

ALL TREES IDENTIFIED WHERE POSSIBLE. ADVICE FROM AN ARBORICULTURIST SHOULD BE SOUGHT TO CONFIRM ANY SPECIES OR SIZE SHOWN.

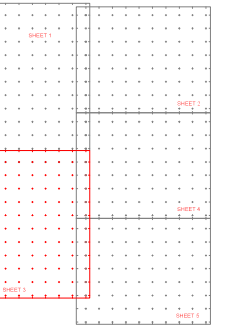
DETAILS, DRAINAGE AND UTILITIES MAY NOT BE SHOWN IF CONCEALED FROM VIEW AT THE TIME OF THE SURVEY.

© SCOPE SURVEYS LTD HOLD THE COPYRIGHT TO ALL INFORMATION PROVIDED IN THIS DRAWING. WRITTEN CONSENT MUST BE OBTAINED PRIOR TO COPYING OR USING THE DATA FOR ANY PURPOSE OTHER THAN ORIGINALLY INTENDED.

DO NOT SCALE FROM THIS DRAWING.

SURVEY STATIONS			
NAME	EASTING	NORTHING	HEIGHT
STN1	514980.814	126330.959	58.536
STN2	515019.218	126290.781	61.112
STN3	514976.263	126217.993	59.004
STN4	514923.366	126156.647	55.891
STN5	514922.475	126126.317	56.989
STN6	514950.539	126202.778	57.272
STN7	514945.663	126025.721	59.163
STN10	514918.919	125944.967	57.011
STN300	515074.676	126230.058	60.544
STN400	515141.416	126167.384	59.570
STN500	515053.899	126103.034	58.590
STN600A	515053.899	125976.034	57.596
STN700	514991.860	125980.199	58.561
STN200	515058.510	126238.518	61.482

SHEET LEGEND



REVISION B: LEVELS ADJUSTED	24/04/2019
REVISION A: ADDITIONAL DETAIL ADDED	18/02/2019

PROJECT
SOUTHWATER
PHASE 5

CLIENT
BERKELEY HOMES

DRAWING TITLE

TOPOGRAPHICAL SURVEY

FOR CORRELATION SURVEY

SCALE 1:200 DATE FEBRUARY 2019

DRAWING NUMBER	REVISION	PAPER SIZE
2081_03	B	A0

LEVELS RELATED TO:
ORDNANCE SURVEY LEVEL DATUM OSGM15GB

GRID RELATED TO:

AT A SINGLE CONTROL STN ORIENTED TO
GRID NORTH WITH A SCALE FACTOR OF 1.000

SCOPE
SURVEYS

LAND & MEASURED BUILDING SURVEYORS
T: 0208 771 3477
E: INFO@SCOPESURVEYS.CO.UK
91 CHURCH ROAD
LONDON

W: WWW.SCOPESSURVEYS.CO.UK SE19 2TA

[illegible]

SYMBOLS & LINSTYLES



GENERAL NOTES

ALL TREES IDENTIFIED WHERE POSSIBLE. ADVICE FROM AN ARBOROLOGIST SHOULD BE SOUGHT TO CONFIRM ANY SPECIES OR SIZE SHOWN.

DETAIL, DRAINAGE AND UTILITIES MAY NOT BE SHOWN IF CONCEALED FROM VIEW AT THE TIME OF THE SURVEY.

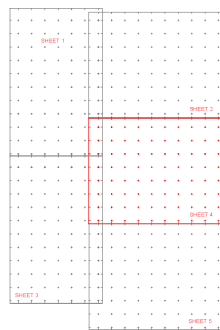
ANY ERRORS OR DISCREPANCIES FOUND ON THIS DRAWING SHOULD BE REPORTED TO SCOPE SURVEYS LTD IMMEDIATELY.

© SCOPE SURVEYS LTD HOLD THE COPYRIGHT TO ALL INFORMATION PROVIDED IN THIS DRAWING. WRITTEN CONSENT MUST BE OBTAINED PRIOR TO COPYING OR USING THE DATA FOR ANY PURPOSE OTHER THAN ORIGINALLY INTENDED.

DO NOT SCALE FROM THIS DRAWING.

SURVEY STATIONS			
NAME	EASTING	NORTHING	HEIGHT
STN1	154980.14	126330.959	58.536
STN2	155019.218	126090.781	61.112
STN3	154976.263	12617.993	59.004
STN4	154923.366	126159.647	55.891
STN5	154922.475	126125.317	56.989
STN6	154850.529	126095.978	57.872
STN7	154946.863	126127.21	57.995
STN10	154918.819	126294.067	57.011
STN300	155074.676	126230.058	60.544
STN400	155141.416	126167.234	59.570
STN500	155095.923	126160.283	57.395
STN600	155095.923	126160.283	57.395
STN700	154991.865	125980.199	58.561
STN200	155058.10	126283.518	61.482

SHEET LEGEND



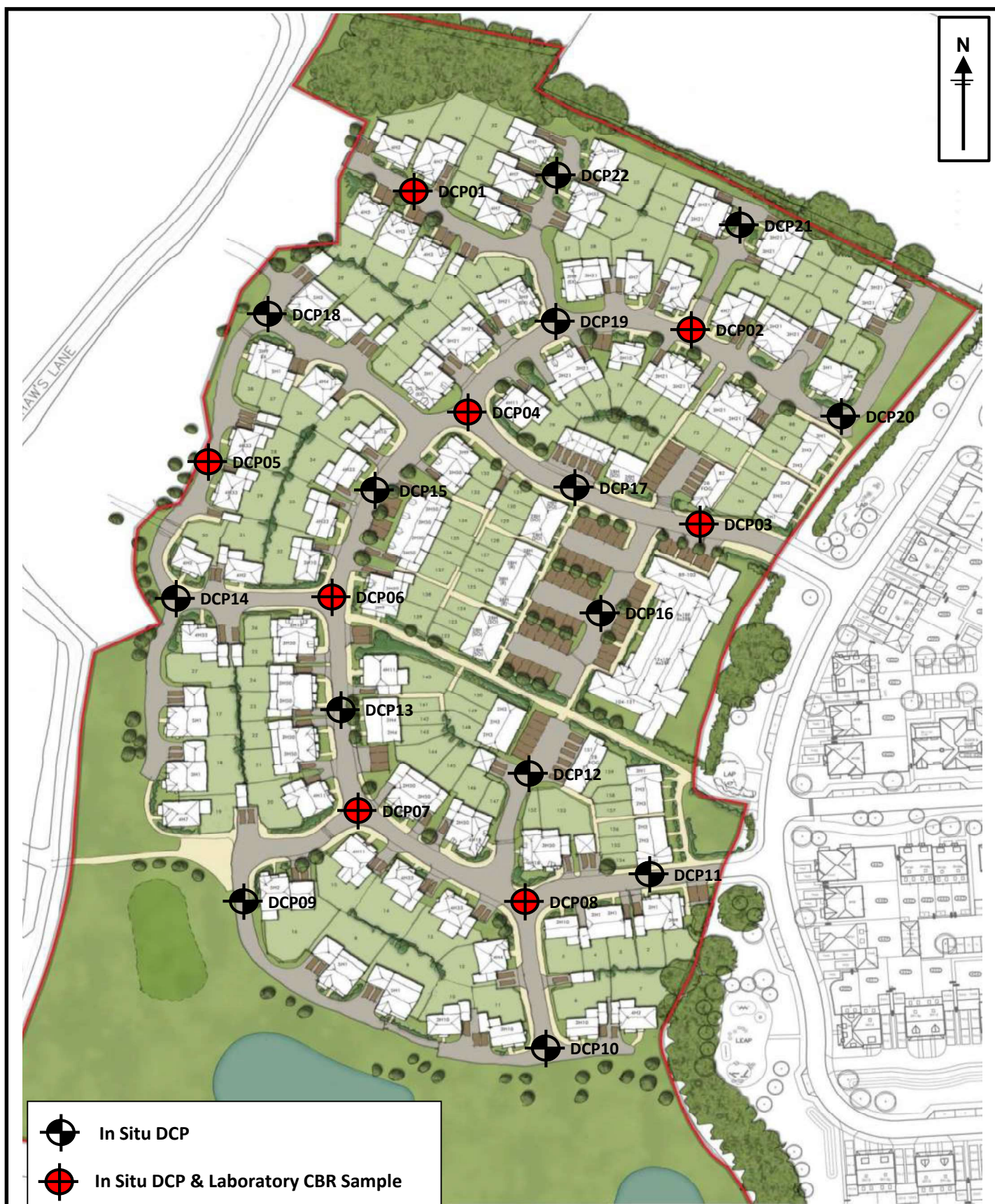
NUMBER	TREE TABLE		DEPTH	HEIGHT
	SPECIES	DATE		
T2	DAK	0.89	22	
T5	DAK	0.79	22	
T6	DAK	0.80	22	
T7	DAK	0.80	22	
T8	DAK	0.80	22	
T9	DAK	0.80	22	
T10	DAK	0.80	22	
T11	DAK	1.15	20	
T12	DAK	1.52	19	
T13	UNKNOWN	0.20	12	
T14	UNKNOWN	0.20	12	
T15	DAK	0.80	22	
T16	ASH	0.28	10	
T17	UNKNOWN	0.20	12	
T18	ASH	0.28	10	
T19	DAK	0.80	22	
T20	DAK	1.20	20	
T21	DAK	0.80	22	
T22	DAK	0.80	22	
T23	DAK	0.55	18	
T24	DAK	0.70	18	
T25	DAK	0.55	18	
T26	DAK	0.45	16	
T27	DAK	0.80	22	
T28	DAK	0.55	18	
T29	DAK	0.80	22	
T30	DAK	0.80	22	
T31	DAK	0.80	22	
T32	DAK	0.80	22	
T33	DAK	0.45	16	
T34	DAK	0.80	22	
T35	ASH	0.25	12	
T36	ASH	0.25	12	
T37	DAK	0.80	22	
T38	DAK	0.80	22	
T39	DAK	0.55	18	
T40	DAK	0.80	22	
T41	DAK	0.80	22	
T42	DAK	0.80	22	
T43	DAK	0.55	18	
T44	DAK	0.80	22	
T45	DAK	0.55	18	
T46	DAK	0.80	22	
T47	HAWTHORN	0.35	19	
T48	ASH	0.60	16	
T49	ASH	0.60	16	
T50	UNKNOWN	0.20	12	
T51	DAK	0.80	22	
T52	DAK	0.55	18	
T53	DAK	0.70	15	
T54	DAK	0.80	22	
T55	DAK	0.80	22	
T56	DAK	1.20	18	
T57	DAK	0.55	18	
T58	DAK	0.35	14	
T59	DAK	0.35	12	
T60	DAK	0.35	12	
T61	ASH	0.50	19	
T62	DAK	0.80	22	
T63	DAK	0.60	19	
T64	DAK	0.35	14	
T65	DAK	0.30	12	
T66	DAK	0.30	12	
T67	DAK	0.30	12	
T68	DAK	0.70	16	
T69	DAK	0.70	16	
T70	DAK	0.60	19	
T71	DAK	0.30	14	
T72	DAK	0.50	18	
T73	DAK	0.80	22	
T74	DAK	0.50	15	
T75	DAK	0.50	15	
T76	DAK	0.80	22	
T77	DAK	0.80	22	
T78	DAK	0.70	19	
T79	UNKNOWN	0.35	8	
T80	DAK	0.40	14	
T81	ASH	0.70	20	
T82	DAK	0.80	22	
T83	DAK	0.80	22	
T84	ASH	0.60	14	
T85	DAK	0.80	22	
T86	DAK	0.70	19	
T87	DAK	0.25	17	
T88	UNKNOWN	0.25	7	
T89	DAK	0.70	18	
T90	DAK	0.70	18	
T91	DAK	0.70	18	
T92	DAK	0.60	19	
T93	DAK	0.60	19	
T94	DAK	0.60	19	
T95	DAK	0.45	14	
T96	DAK	0.80	17	

SCOPE
SURVEYS
LAND & MEASURED BUILDING SURVEYORS

T: 0208 771 3477
E: info@scopesurveys.co.uk
W: www.scopesurveys.co.uk

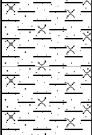
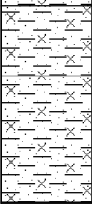
91 CHURCH ROAD
LONDON
SE19 2TA

Appendix C Borhole Data



Project:	Southwater Phase V	Title:	CBR Location Plan		
Address:	Southwater Phase V	Date:	Jan-19	Revision:	v1
		Drawn:	JK	 Geo-Environmental	
Grid Ref:		Scale:	Not to Scale	Ref:	GE17902
Client:	Berkeley Homes (Southern) Limited	Figure:	4		

 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. BH01 Sheet 1 of 3	
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 515102E - 126243N		Hole Type CP	
Location: Southwater				Level:		Scale 1:50	
Client: Berkeley Homes Southern Limited				Dates: 16/01/2019		Logged By PL	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10		 Brown sandy silty clay with frequent rootlets TOPSOIL		
		0.50 - 1.00	B				 Firm to stiff brown sandy silty CLAY WEALD CLAY	1	
		1.00 - 1.50	U	Ublow=60	1.20		 Stiff, high strength brown and bluish grey mottled sandy silty CLAY with occasional siltstone lenses and inclusions WEALD CLAY	2	
		1.50 1.50 - 2.00	D B		2.50		 Stiff to very stiff, high to extremely high strength silty CLAY/extremely weak MUDSTONE WEALD CLAY	3	
		2.00	S	N=28 (4,4/6,7,7,8)				4	
		2.45 2.50 - 3.00	D B					5	
		3.00	S	N=81 (11,11/17,19,20,25)				6	
		3.45	D					7	
		4.00	S	N=70 (8,7/14,17,19,20)				8	
		4.45	D					9	
		5.00 - 5.50	U	Ublow=100	5.30		 Stiff to very stiff, high strength grey sandy silty CLAY/extremely weak MUDSTONE WEALD CLAY	10	
		5.50	D						
		6.00	D						
		6.50	S	N=55 (5,4/10,12,14,19)					
		6.95	D						
		7.50	D						
		8.00 - 8.50	U	Ublow=100					
		8.50	D						
		9.00	D						
		9.50	S	N=66 (10,9/12,15,18,21)					
		9.95	D						
Continued on Next Sheet									

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to		
150	3.00						

 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. BH01 Sheet 2 of 3			
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 515102E - 126243N		Hole Type CP			
Location: Southwater				Level:		Scale 1:50			
Client: Berkeley Homes Southern Limited				Dates: 16/01/2019		Logged By PL			
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.50	D		11.00			Very stiff, extremely high strength grey sandy silty CLAY/extremely weak MUDSTONE WEALD CLAY	
		11.00	S	N=69 (10,10/13,15,19,22)					11
		11.45	D						
		12.00	D						12
		12.50	S	N=86 (11,10/19,20,22,25)					
		12.95	D						13
		13.50	D						
		14.00	S	N=94 (12,11/20,22,25,27)					14
		14.45	D						
		15.00	D						15
		15.50	S	N=101 (12,12/21,23,27,30)					
		15.95	D						16
		16.50	D						
		17.00	S	N=106 (12,12/22,25,28,31)					17
		17.45	D						
		18.00	D						18
		18.50	S	N=110 (16,15/20,25,30,35)					
		18.95	D						19
		19.50	D						
		20.00	S	86 (16,16/86 for 100mm)					20
Continued on Next Sheet									
Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks			
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to				
150	3.00								
									



www.gesl.net

Borehole Log

Borehole No.

BH01

Sheet 3 of 3

Project Name: Southwater Phase V

Project No.
GE17902

Co-ords: 515102E - 126243N

Hole Type
CP

Location: Southwater

Level:

Scale
1:50

Client: Berkeley Homes Southern Limited

Dates: 16/01/2019

Logged By
PL

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		20.45	D		20.50			End of Borehole at 20.00m	
									21
									22
									23
									24
									25
									26
									27
									28
									29
									30
Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks			
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to				
150	3.00								
									

 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. BH02 Sheet 1 of 3	
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 515121E - 126023N		Hole Type CP	
Location: Southwater				Level:		Scale 1:50	
Client: Berkeley Homes Southern Limited				Dates: 17/01/2019		Logged By PL	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10		 Brown sandy silty clay with frequent rootlets TOPSOIL		
		0.50 - 1.00	B				 Stiff brown silty CLAY WEALD CLAY		
		1.00 - 1.50	U	Ublow=100	0.80		 Stiff to very stiff, high strength brown and grey mottled sandy silty CLAY with frequent siltstone inclusions and lenses WEALD CLAY	1	
		1.50 - 2.00	D B						
		2.00	S	N=28 (5,4/7,6,8,7)				2	
		2.45 - 2.50	D B						
		3.00 - 3.50	U	Ublow=120			 Stiff to very stiff, high strength brownish grey shaley CLAY/extremely weak MUDSTONE WEALD CLAY	3	
		3.50	D		3.20				
		4.00	S	N=29 (4,3/6,8,7,8)	3.70		 Stiff, high strength grey slightly sandy, shaley, silty CLAY/extremely weak MUDSTONE WEALD CLAY	4	
		4.45	D						
		5.00	S	N=33 (4,4/7,9,8,9)				5	
		5.45	D						
		6.00	D					6	
		6.50	S	N=67 (9,9/12,15,19,21)	6.50		 Very stiff, extremely high strength grey slightly sandy, shaley, silty CLAY/extremely weak MUDSTONE WEALD CLAY	7	
		6.95	D						
		7.50	D						
		8.00	S	N=90 (11,10/19,20,24,27)				8	
		8.45	D						
		9.00	D					9	
		9.50	S	N=101 (13,12/21,23,27,30)					
		9.95	D					10	
Continued on Next Sheet									

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to		
150	3.00						

 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. BH02 Sheet 2 of 3			
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 515121E - 126023N		Hole Type CP			
Location: Southwater				Level:		Scale 1:50			
Client: Berkeley Homes Southern Limited				Dates: 17/01/2019		Logged By PL			
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.50	D						
		11.00	S	N=101 (13,12/21,23,27,30)					11
		11.45	D						
		12.00	D						12
		12.50	S	N=106 (13,13/22,25,28,31)					
		12.95	D						13
		13.50	D						
		14.00	S	N=94 (15,15/18,19,25,32)					14
		14.45	D						
		15.00	D						15
		15.50	S	N=110 (16,16/20,25,30,35)					
		15.95	D						16
		16.50	D						
		17.00	S	90 (17,17/90 for 100mm)					17
		17.45	D						
		18.00	D						18
		18.50	S	91 (18,18/91 for 100mm)					
		18.95	D						19
		19.50	D						
		20.00	S	95 (19,19/95 for 100mm)					20
Continued on Next Sheet									
Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks			
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to				
150	3.00								



www.gesl.net

Borehole Log

Borehole No.

BH02

Sheet 3 of 3

Project Name: Southwater Phase V

Project No.
GE17902

Co-ords: 515121E - 126023N

Hole Type
CP

Location: Southwater

Level:

Scale
1:50

Client: Berkeley Homes Southern Limited

Dates: 17/01/2019

Logged By
PL

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		20.45	D		20.50			End of Borehole at 20.00m	
									21
									22
									23
									24
									25
									26
									27
									28
									29
									30
Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks			
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to				
150	3.00								
									



www.gesl.net

Borehole Log

WS01

Sheet 1 of 1

Project Name: Southwater Phase V

Project No.
GE17902

Co-ords: 515049E - 126269N

Hole Type	WLS
1	0.0000
2	0.0000
3	0.0000
4	0.0000
5	0.0000
6	0.0000
7	0.0000
8	0.0000
9	0.0000
10	0.0000
11	0.0000
12	0.0000
13	0.0000
14	0.0000
15	0.0000
16	0.0000
17	0.0000
18	0.0000
19	0.0000
20	0.0000
21	0.0000
22	0.0000
23	0.0000
24	0.0000
25	0.0000
26	0.0000
27	0.0000
28	0.0000
29	0.0000
30	0.0000
31	0.0000
32	0.0000
33	0.0000
34	0.0000
35	0.0000
36	0.0000
37	0.0000
38	0.0000
39	0.0000
40	0.0000
41	0.0000
42	0.0000
43	0.0000
44	0.0000
45	0.0000
46	0.0000
47	0.0000
48	0.0000
49	0.0000
50	0.0000
51	0.0000
52	0.0000
53	0.0000
54	0.0000
55	0.0000
56	0.0000
57	0.0000
58	0.0000
59	0.0000
60	0.0000
61	0.0000
62	0.0000
63	0.0000
64	0.0000
65	0.0000
66	0.0000
67	0.0000
68	0.0000
69	0.0000
70	0.0000
71	0.0000
72	0.0000
73	0.0000
74	0.0000
75	0.0000
76	0.0000
77	0.0000
78	0.0000
79	0.0000
80	0.0000
81	0.0000
82	0.0000
83	0.0000
84	0.0000
85	0.0000
86	0.0000
87	0.0000
88	0.0000
89	0.0000
90	0.0000
91	0.0000
92	0.0000
93	0.0000
94	0.0000
95	0.0000
96	0.0000
97	0.0000
98	0.0000
99	0.0000
100	0.0000

Location: Southwater

Level:

Scale
1:25

Client: Berkeley Homes Southern Limited

Dates: 10/01/2019

Logged By
LD

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.07 - 0.20	ES		0.26		Brown slightly sandy silty clay with abundant fine roots (<1mm in dia.) and occasional ferruginous stained partings.	1	
		0.20 - 0.50	ES				TOPSOIL		
		0.40	PP	1.5kg/cm2	1.10		Stiff to very stiff orangish brown greenish grey mottled slightly fine sandy silty CLAY with occasional ferruginous stained partings.		
		0.50 - 0.75	D						
		0.50	PP	2.0kg/cm2					
		0.60	PP	2.0kg/cm2					
		0.75 - 1.00	D						
		0.80	PP	1.5kg/cm2					
		1.00	PP	2.0kg/cm2	4.00		Orange brown grey mottled weakly cemented MUDSTONE with ferruginous stained partings.	2	
		1.20	PP	2.0kg/cm2					
		1.50	D						
		1.50	PP	2.5kg/cm2					
		2.00	D						
		2.00	PP	3.0kg/cm2					
		2.20	PP	3.0kg/cm2					
		2.40	PP	3.0kg/cm2					
		2.50	D						
		2.80	PP	3.5kg/cm2					
		3.00	D						
		3.00	PP	4.0kg/cm2					
3.20	PP	4.0kg/cm2							
3.40	PP								
3.50	D								
3.60	PP	3.5kg/cm2							
3.80	PP	4.0kg/cm2							
4.00	D	4.0kg/cm2	4.00		End of Borehole at 4.00m	4			
4.00	PP								
		4.50	D						
		5.00	D					5	

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	

 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. WS02 Sheet 1 of 1			
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 515147E - 126217N		Hole Type WLS			
Location: Southwater				Level:		Scale 1:25			
Client: Berkeley Homes Southern Limited				Dates: 10/01/2019		Logged By LD			
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15	ES	2.0kg/cm2	0.30		 Brown slightly sandy silty clay with abundant fine roots (<1mm in dia.) and occasional ferruginous stained partings. TOPSOIL		
		0.20	PP						
		0.25	D						
		0.40	PP	3.0kg/cm2		 Stiff to very stiff orangish brown greenish grey mottled slightly fine sandy silty CLAY with occasional ferruginous stained partings, and occasional rootlets to 1.00m bgl WEALD CLAY			
		0.50	D						
		0.60	PP						
		0.75	D	2.5kg/cm2					
		0.80	PP						
		1.00	D						
		1.00	PP	2.5kg/cm2					
		1.25	D						
		1.40	PP						
		1.50	D	3.5kg/cm2	1.50				
		1.75	D						
		1.80	PP						
2.00	D	4.0kg/cm2							
2.20	PP								
2.50	D								
3.00	D	4.0kg/cm2							
3.50	D								
3.50	D								
End of Borehole at 3.50m									
Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks			
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to				





www.gesl.net

Borehole Log

WS03

Sheet 1 of 1

Project Name: Southwater Phase V

Project No.
GE17902

Co-ords: 515194E - 126191N

Hole Type	WLS
1	0.0000
2	0.0000
3	0.0000
4	0.0000
5	0.0000
6	0.0000
7	0.0000
8	0.0000
9	0.0000
10	0.0000
11	0.0000
12	0.0000
13	0.0000
14	0.0000
15	0.0000
16	0.0000
17	0.0000
18	0.0000
19	0.0000
20	0.0000
21	0.0000
22	0.0000
23	0.0000
24	0.0000
25	0.0000
26	0.0000
27	0.0000
28	0.0000
29	0.0000
30	0.0000
31	0.0000
32	0.0000
33	0.0000
34	0.0000
35	0.0000
36	0.0000
37	0.0000
38	0.0000
39	0.0000
40	0.0000
41	0.0000
42	0.0000
43	0.0000
44	0.0000
45	0.0000
46	0.0000
47	0.0000
48	0.0000
49	0.0000
50	0.0000
51	0.0000
52	0.0000
53	0.0000
54	0.0000
55	0.0000
56	0.0000
57	0.0000
58	0.0000
59	0.0000
60	0.0000
61	0.0000
62	0.0000
63	0.0000
64	0.0000
65	0.0000
66	0.0000
67	0.0000
68	0.0000
69	0.0000
70	0.0000
71	0.0000
72	0.0000
73	0.0000
74	0.0000
75	0.0000
76	0.0000
77	0.0000
78	0.0000
79	0.0000
80	0.0000
81	0.0000
82	0.0000
83	0.0000
84	0.0000
85	0.0000
86	0.0000
87	0.0000
88	0.0000
89	0.0000
90	0.0000
91	0.0000
92	0.0000
93	0.0000
94	0.0000
95	0.0000
96	0.0000
97	0.0000
98	0.0000
99	0.0000
100	0.0000

Location: Southwater

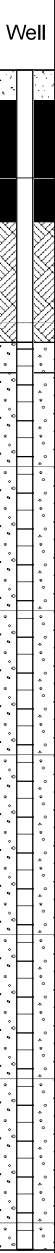
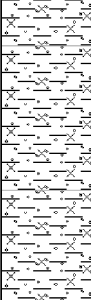
Level:

Scale
1:25

Client: Berkeley Homes Southern Limited

Dates: 10/01/2019

Logged By
LD

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.10 - 0.20	ES		0.20			Brown slightly sandy silty clay with abundant fine roots (<1mm in dia.) and occasional ferruginous stained partings. TOPSOIL	1		
		0.20	PP	1.5kg/cm2							
		0.40	PP	2.5kg/cm2							
		0.50	D								
		0.60	PP	2.5kg/cm2							
		0.75	D								
		0.80	PP	2.0kg/cm2	1.20		Stiff to very stiff orangish brown greenish grey mottled slightly fine sandy silty CLAY with occasional ferruginous stained partings. WEALD CLAY				
								<i>...occasional decaying rootlets at 0.75m bgl</i>			
		1.00	D								
		1.00	PP	2.5kg/cm2							
		1.25	D								
		1.40	PP	2.8kg/cm2							
		1.50	D								
		1.75	D								
		1.80	PP	3.7kg/cm2							
		2.00	D								
		2.40	PP	3.2kg/cm2							
		2.50	D								
2.80	PP	3.5kg/cm2	3.90		End of Borehole at 3.90m						
3.00	D										
3.00	PP	4.0kg/cm2									
3.50	D										
3.90	D										

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	

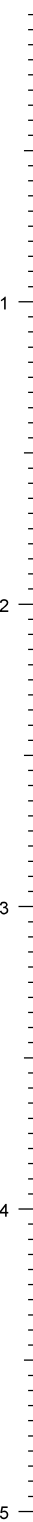
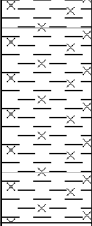
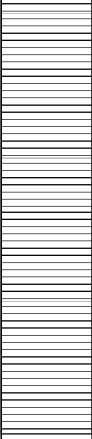


 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. WS04 Sheet 1 of 1	
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 515164E - 126149N		Hole Type WLS	
Location: Southwater				Level:		Scale 1:25	
Client: Berkeley Homes Southern Limited				Dates: 10/01/2019		Logged By LD	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.15	ES		0.15		Brown slightly sandy silty clay with abundant fine roots (<1mm in dia.) and occasional ferruginous stained partings. TOPSOIL		
		0.25	D						
		0.30	PP	2.3kg/cm2					
		0.40	PP	2.0kg/cm2					
		0.50	D						
		0.50	PP	2.5kg/cm2					
		0.60	PP	2.0kg/cm2					
		0.70	PP	2.0kg/cm2					
		0.75	D						
		0.80	PP	2.3kg/cm2					
		0.90	PP	2.5kg/cm2					
		1.00	D		1.00				
		1.00	PP	2.7kg/cm2					
		1.10	PP	3.0kg/cm2					
		1.20	PP	3.5kg/cm2					
		1.25	D						
		1.50	B						
		1.50	D						
		1.50	PP	3.0kg/cm2					
		1.75	D						
		1.80	PP	3.4kg/cm2					
		2.00	D						
		2.00	PP	3.2kg/cm2					
		2.50	D						
		2.50	PP	3.0kg/cm2					
		3.00	D						
		3.00	PP	3.0kg/cm2					
		3.40	D		3.40				
End of Borehole at 3.40m									

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	



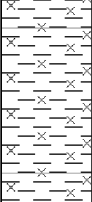
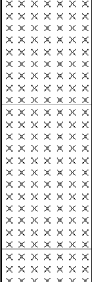
 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net				Borehole Log				Borehole No. WS05 Sheet 1 of 1	
Project Name: Southwater Phase V				Project No. GE17902		Co-ords: 515119E - 126171N		Hole Type WLS	
Location: Southwater				Level:		Scale 1:25			
Client: Berkeley Homes Southern Limited				Dates: 10/01/2019		Logged By LD			
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
	 	0.05 - 0.15	ES		0.20		 Brown slightly sandy silty clay with abundant fine roots (<1mm in dia.) and occasional ferruginous stained partings. TOPSOIL		
		0.30	PP	2.0kg/cm2					
		0.40	PP	2.2kg/cm2					
		0.50	D		1.00		 Stiff to very stiff orangish brown greenish grey mottled slightly silty CLAY with occasional ferruginous stained partings. WEALD CLAY		
		0.50	PP	2.2kg/cm2					
		0.60	PP	2.5kg/cm2					
		0.70	PP	2.3kg/cm2					
		0.75	D						
		0.80	PP	3.0kg/cm2					
		0.90	PP	3.5kg/cm2	1.00		 Stiff to very stiff reddish brown becoming pale yellow weakly cemented MUDSTONE with partings of very stiff clay. WEALD CLAY		
		1.00	D						
		1.00	PP	4.0kg/cm2					
		1.25	D		2.70				
		1.50	D						
		1.50	PP	2.0kg/cm2					
		1.75	D						
		2.00	D						
		2.00	PP	2.8kg/cm2					
2.25	D								
2.50	D								
2.50	PP	4.0kg/cm2	2.70						
2.70	D								
2.70	PP	4.5kg/cm2	End of Borehole at 2.70m						
Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks			
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to				
		1.90	1.50						

 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. WS06 Sheet 1 of 1	
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 515067E - 126191N		Hole Type WLS	
Location: Southwater				Level:		Scale 1:25	
Client: Berkeley Homes Southern Limited				Dates: 10/01/2019		Logged By LD	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15	ES		0.25		Brown slightly sandy silty clay with abundant fine roots (<1mm in dia.) and occasional ferruginous stained partings. TOPSOIL	1	
		0.25	D						
		0.30	PP	3.0kg/cm2					
		0.40	PP	2.0kg/cm2					
		0.50	D						
		0.50	PP	1.8kg/cm2					
		0.60	PP	1.8kg/cm2					
		0.70	PP	1.8kg/cm2					
		0.75	D						
		0.80	PP	2.0kg/cm2					
		0.90	PP	2.0kg/cm2					
		1.00	D						
		1.00	PP	1.6kg/cm2					
		1.20	PP	2.0kg/cm2					
		1.25	D						
		1.50	D		1.40		Stiff to very stiff reddish brown becoming pale yellow weakly cemented MUDSTONE with partings of very stiff clay. WEALD CLAY	2	
		1.60	PP	2.5kg/cm2					
		1.75	D						
		1.80	PP	3.5kg/cm2					
		2.00	D						
		2.00	PP	4.0kg/cm2					
		2.50	D						
		2.50	PP	3.0kg/cm2					
		3.00	D						
		3.00	PP	3.0kg/cm2					
		3.30	D		3.30		End of Borehole at 3.30m	3	
								4	
								5	

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to		

 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. WS07 Sheet 1 of 1	
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 515020E - 126208N		Hole Type WLS	
Location: Southwater				Level:		Scale 1:25	
Client: Berkeley Homes Southern Limited				Dates: 11/01/2019		Logged By LD	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.20	ES		0.20		 Brown slightly sandy silty Clay with abundant fine roots (<1mm in dia.) and occasional ferruginous stained partings. TOPSOIL		
		0.30	PP	1.5kg/cm2			 Stiff to very stiff orangish brown greenish grey mottled slightly silty CLAY with occasional ferruginous stained partings. WEALD CLAY		
		0.40	PP	1.5kg/cm2					
		0.50	D						
		0.50	PP	1.0kg/cm2					
		0.60	PP	1.0kg/cm2					
		0.70	PP	1.5kg/cm2					
		0.75	D						
		0.80	PP	2.0kg/cm2					
		0.90	PP	2.5kg/cm2					
		1.00	D		0.95		 Stiff to very stiff light grey brown weakly cemented MUDSTONE with partings of very stiff clay. WEALD CLAY	1	
		1.25	D						
		1.50	D						
		1.50	PP	4.0kg/cm2					
		1.80	PP	4.2kg/cm2					
		2.00	D		1.90		 Stiff to very stiff reddish brown becoming pale yellow weakly cemented MUDSTONE with partings of very stiff clay. WEALD CLAY	2	
		2.50	D						
		3.00	D						
		3.50	D						
		4.00	D		4.00				
		End of Borehole at 4.00m						4	
								5	

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to		



www.gesl.net

Borehole Log

WS08

Sheet 1 of 1

Project No.	GE17902
-------------	---------

Hole Type	WLS
1	0.0000
2	0.0000
3	0.0000
4	0.0000
5	0.0000
6	0.0000
7	0.0000
8	0.0000
9	0.0000
10	0.0000
11	0.0000
12	0.0000
13	0.0000
14	0.0000
15	0.0000
16	0.0000
17	0.0000
18	0.0000
19	0.0000
20	0.0000
21	0.0000
22	0.0000
23	0.0000
24	0.0000
25	0.0000
26	0.0000
27	0.0000
28	0.0000
29	0.0000
30	0.0000
31	0.0000
32	0.0000
33	0.0000
34	0.0000
35	0.0000
36	0.0000
37	0.0000
38	0.0000
39	0.0000
40	0.0000
41	0.0000
42	0.0000
43	0.0000
44	0.0000
45	0.0000
46	0.0000
47	0.0000
48	0.0000
49	0.0000
50	0.0000
51	0.0000
52	0.0000
53	0.0000
54	0.0000
55	0.0000
56	0.0000
57	0.0000
58	0.0000
59	0.0000
60	0.0000
61	0.0000
62	0.0000
63	0.0000
64	0.0000
65	0.0000
66	0.0000
67	0.0000
68	0.0000
69	0.0000
70	0.0000
71	0.0000
72	0.0000
73	0.0000
74	0.0000
75	0.0000
76	0.0000
77	0.0000
78	0.0000
79	0.0000
80	0.0000
81	0.0000
82	0.0000
83	0.0000
84	0.0000
85	0.0000
86	0.0000
87	0.0000
88	0.0000
89	0.0000
90	0.0000
91	0.0000
92	0.0000
93	0.0000
94	0.0000
95	0.0000
96	0.0000
97	0.0000
98	0.0000
99	0.0000
100	0.0000

Level:

Scale
1:25

Dates: 11/01/2019

Logged By
LD

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15	ES		0.20			Brown slightly sandy silty clay with abundant fine roots (<1mm in dia.). TOPSOIL	1



www.gesl.net

Borehole Log

WS09

Sheet 1 of 1

Project Name: Southwater Phase V

Project No.
GE17902

Co-ords: 515060E - 126111N

Hole Type
WLS

Location: Southwater

Level:

Scale
1:25

Client: Berkeley Homes Southern Limited

Dates: 11/01/2019

Logged By
LD

[illegible]



www.gesl.net

Borehole Log

Borehole No.

WS10

Sheet 1 of 1

Project Name: Southwater Phase V

Project No.
GE17902

Co-ords: 515125E - 126079N

Hole Type	WLS
-----------	-----

Location: Southwater

Level:

Scale
1:25

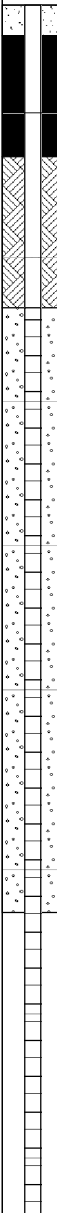
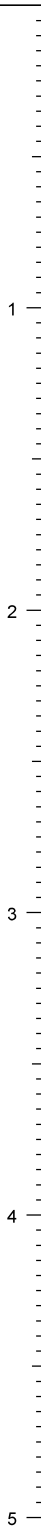
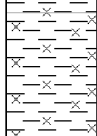
Client: Berkeley Homes Southern Limited

Dates: 11/01/2019

Logged By
LD

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.15	ES	1.0kg/cm2	0.25		Brown slightly sandy silty clay with abundant fine roots (<1mm in dia.) and occasional ferruginous stained partings.	
		0.20	PP				TOPSOIL	
		0.30	D				Stiff to very stiff orangish brown greenish grey mottled slightly silty CLAY with occasional ferruginous stained partings.	
		0.30	PP	2.0kg/cm2				
		0.40	PP	2.0kg/cm2				
		0.50	D					
		0.50	PP	2.0kg/cm2				
		0.60	PP	1.5kg/cm2				
		0.70	PP	1.0kg/cm2				
		0.75	D					
		0.80	PP	1.5kg/cm2				
		0.90	PP	1.4kg/cm2				
		1.00	D					
		1.00	PP	1.5kg/cm2				
		1.20	PP	1.2kg/cm2				
		1.25	D					
		1.40	PP	2.0kg/cm2				
		1.50	D					
		1.60	PP	3.0kg/cm2				
		1.75	D					
		1.80	PP	3.2kg/cm2				
		1.90	PP	1.5kg/cm2				
		2.00	D					
		1.90	1.90		Stiff to very stiff reddish brown becoming pale yellow weakly cemented MUDSTONE with partings of very stiff clay.			
					WEALD CLAY			
		2.50	D		Stiff to very stiff reddish brown becoming pale yellow weakly cemented MUDSTONE with partings of very stiff clay.			
3.00	D							
3.50	D							
3.60	3.60	End of Borehole at 3.60m						
Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks		
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to			

 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. WS11 Sheet 1 of 1	
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 514977E - 126081N		Hole Type WLS	
Location: Southwater				Level:		Scale 1:25	
Client: Berkeley Homes Southern Limited				Dates: 11/01/2019		Logged By LD	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.10 - 0.25	ES		0.30		Brown slightly sandy silty Clay with abundant fine roots (<1mm in dia.) and occasional ferruginous stained partings. TOPSOIL			
		0.40	PP	1.5kg/cm2			0.80			Stiff to very stiff orangish brown greenish grey mottled slightly shaley silty CLAY with occasional ferruginous stained partings. WEALD CLAY
		0.50	D							
		0.50	PP	1.5kg/cm2						
		0.60	PP	1.0kg/cm2						
		0.70	PP	1.2kg/cm2						
		0.75	D							
		0.80	PP	1.0kg/cm2						
		0.90	PP	2.5kg/cm2						
		1.00	D		1.60		Stiff to very stiff orangish brown greenish grey mottled weakly cemented MUDSTONE with partings of very stiff clay and occasional ferruginous stained partings. WEALD CLAY			
		1.00	PP	2.7kg/cm2						
		1.20	PP	4.0kg/cm2						
		1.25	D							
		1.40	PP	4.0kg/cm2						
		1.50	D							
		1.60	PP	4.6kg/cm2						
		1.75	D							
		2.00	D		4.00		Stiff to very stiff reddish brown becoming pale yellow weakly cemented MUDSTONE with partings of very stiff clay. WEALD CLAY			
	2.50	D								
	3.00	D								
	3.50	D								
	4.00	D								
End of Borehole at 4.00m										

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to		

 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. WS12 Sheet 1 of 1	
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 515052E - 126055N		Hole Type WLS	
Location: Southwater				Level:		Scale 1:25	
Client: Berkeley Homes Southern Limited				Dates: 11/01/2019		Logged By LD	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.05 - 0.20	ES				Brown slightly sandy silty clay with abundant fine roots (<1mm in dia.) and occasional ferruginous stained partings. TOPSOIL Stiff to very stiff orangish brown greenish grey mottled shaley silty CLAY with occasional ferruginous stained partings, and rare rootlets WEALD CLAY Reddish-brown greenish orange brown friable/fissured weak MUDSTONE. WEALD CLAY Stiff to very stiff reddish brown becoming pale yellow weakly cemented MUDSTONE with partings of very stiff clay. WEALD CLAY		
		0.28 - 0.48	D		0.28				
		0.30	PP	1.5kg/cm2					
		0.35	D						
		0.40	PP	2.0kg/cm2	0.48				
		0.50	D						
		0.50	PP	2.0kg/cm2	0.63				
		0.60	PP	0.6kg/cm2					
		0.70	PP	1.0kg/cm2					
		0.75	D						
		0.90	PP	1.5kg/cm2					
		1.00	D						
		1.25	D						
		1.50	D						
		1.75	D						
		2.00	D						
		2.50	D						
		3.00	D						
		3.50	D						
					4.00				
End of Borehole at 4.00m									

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	



 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. WS13 Sheet 1 of 1	
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 514984E - 126019N		Hole Type WLS	
Location: Southwater				Level:		Scale 1:25	
Client: Berkeley Homes Southern Limited				Dates: 14/01/2019		Logged By KOD	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.30		Dark brown silty clay with abundant rootlets (<1mm) and rare gravel. Gravel is fine sub angular siltstone. TOPSOIL		
		0.50	D		0.70		Stiff orange brown and grey mottled silty CLAY with grey siltstone inclusions of fine gravel size. WEALD CLAY		
		0.50	PP	2.3kg/cm2					
		0.90	PP	2.5kg/cm2	1.20		Stiff to very stiff orange brown and grey mottled silty CLAY with orange stained and slightly fissured tabular siltstone inclusions. WEALD CLAY	1	
		1.00	D						
		1.10	PP	3.0kg/cm2					
		1.50	D		1.90		Slightly fissured reddish brown and orange brown tabular MUDSTONE with black ferruginous staining and occasional stiff grey silty clay partings. WEALD CLAY		
		2.00	D				Fissured reddish brown/orange brown and grey tabular MUDSTONE with black ferruginous staining and rare stiff grey silty clay partings. WEALD CLAY	2	
		2.50	D				...rare rootlets at 2.00m bgl		
		3.00	D					3	
		3.50	D						
		4.00	D		4.00		End of Borehole at 4.00m	4	
								5	

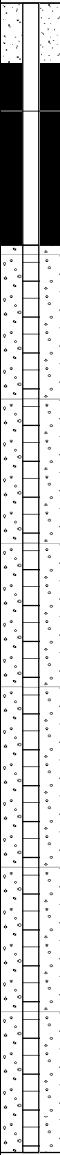
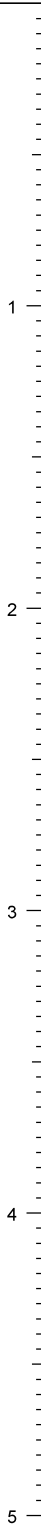
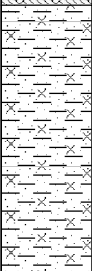
Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to		

 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. WS14 Sheet 1 of 1	
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 515056E - 125996N		Hole Type WLS	
Location: Southwater				Level:		Scale 1:25	
Client: Berkeley Homes Southern Limited				Dates: 14/01/2019		Logged By KOD	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES				Dark brown silty clay with abundant rootlets and some black ferruginous fragments TOPSOIL		
		0.35	PP		0.30		Orange brown silty CLAY with abundant reddish black ferruginous stained siltstone inclusions. WEALD CLAY Stiff orange brown and grey mottled silty CLAY with some siltstone inclusions WEALD CLAY		
		0.50	D		0.40				
		0.60	PP	2.0kg/cm2					
		1.00	D				Orange brown with some blue grey MUDSTONE with some black ferruginous staining. WEALD CLAY		
		1.00	PP	4.3kg/cm2	1.10				
		1.50	D						
					1.80		Orange brown, reddish brown and grey brown fissured MUDSTONE with occasional firm blue grey clay partings. WEALD CLAY		
		2.00	D						
		2.50	D						
		3.00	D						
		3.50	D						
		4.00	D		4.00				
								End of Borehole at 4.00m	

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to		

 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. WS15 Sheet 1 of 1	
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 515114E - 125959N		Hole Type WLS	
Location: Southwater				Level:		Scale 1:25	
Client: Berkeley Homes Southern Limited				Dates: 14/01/2019		Logged By KOD	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15	ES	2.7kg/cm2	0.30		Dark brown silty clay with abundant rootlets and some black ferruginous fragments. TOPSOIL		
	0.40	PP							
	0.50	ES							
	0.60	D	3.4kg/cm2	1.20		Stiff to very stiff orange brown and grey mottled sandy silty CLAY with reddish black tabular siltstone inclusions, and occasional rootlets to 1.00m bgl WEALD CLAY			
	0.90	PP							
	1.00	D							
	1.50	D	2.10		Brown, reddish orange brown and grey mottled fissured MUDSTONE with reddish brown to black iron staining. WEALD CLAY				
	2.00	D							
	2.50	D							
	3.00	D	3.70		Orange brown to dark grey fissured MUDSTONE with reddish brown ferruginous staining. WEALD CLAY				
3.50	D								
3.80 - 4.00	D								
				3.80			Grey fissured MUDSTONE with reddish orange ferruginous stained partings. WEALD CLAY End of Borehole at 3.80m		

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to	



 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. WS16 Sheet 1 of 1	
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 515025E - 125962N		Hole Type WLS	
Location: Southwater				Level:		Scale 1:25	
Client: Berkeley Homes Southern Limited				Dates: 14/01/2019		Logged By KOD	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.30		Dark brown silty slightly gravelly clay with abundant rootlets and black ferruginous fragments. Gravel is fine sub angular siltstone. TOPSOIL		
		0.50 0.50	D PP	2.2kg/cm2	0.70		Stiff orange brown and grey mottled shaley sandy silty CLAY with fissured tabular ferruginous stained siltstone intrusions of fine to coarse gravel size. WEALD CLAY		
		1.00 1.00	D PP	1.8kg/cm2	1.00		Stiff orange brown and grey mottled silty CLAY with black ferruginous fragments and rare tabular siltstone inclusions of fine gravel size. WEALD CLAY	1	
		1.50 1.50	D PP	2.5kg/cm2	1.60		Stiff orange brown and grey mottled silty CLAY with tabular siltstone inclusions of fine gravel size and some soft blue grey clay partings. WEALD CLAY		
		2.00	D				Reddish brown to grey brown fissured MUDSTONE with some reddish black and orange ferruginous staining. WEALD CLAY	2	
		2.50	D						
		3.00	D					3	
		3.50	D						
		4.00	D		4.00		End of Borehole at 4.00m	4	
								5	

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to		

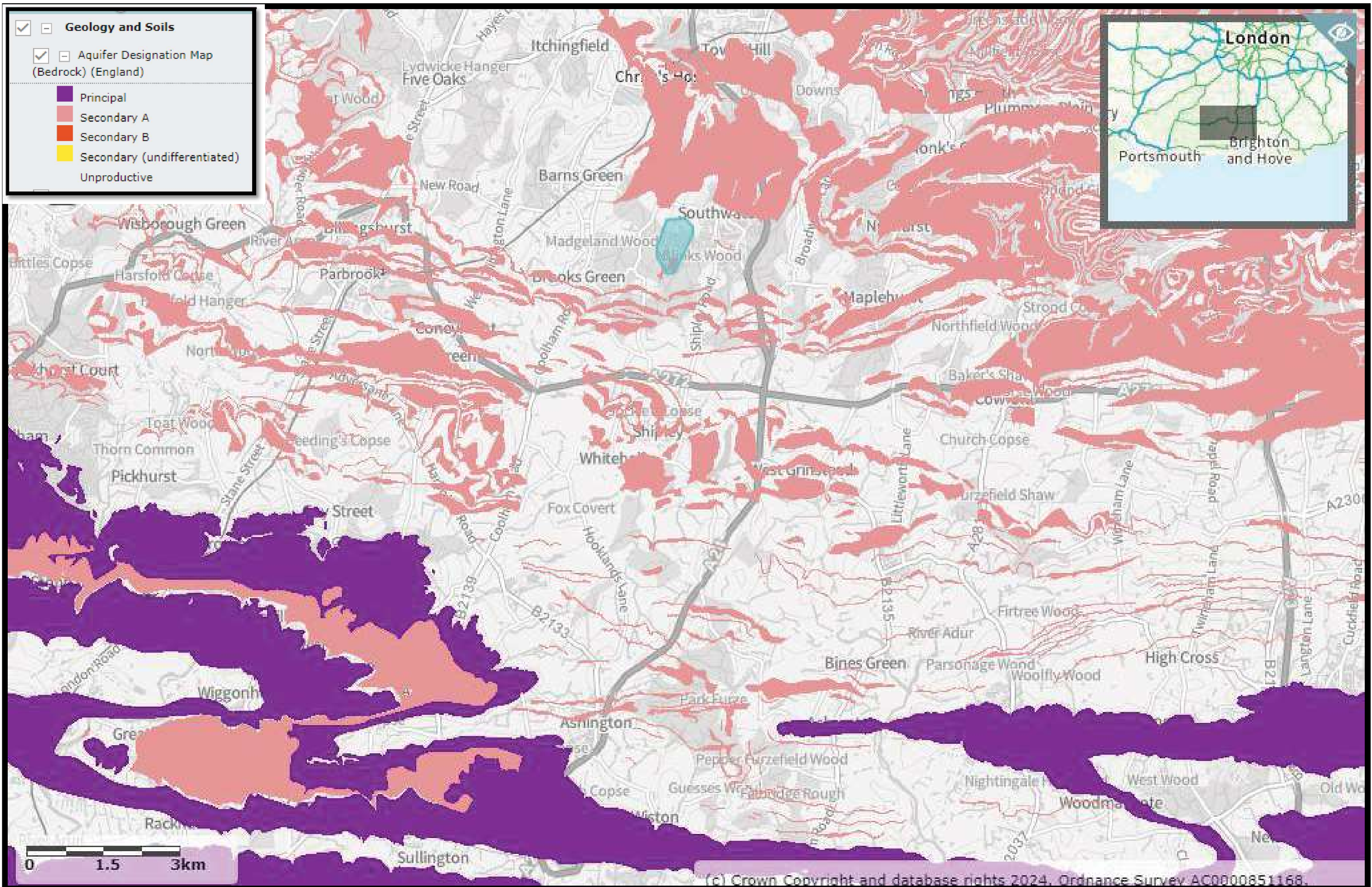
 Unit 7, Danworth Farm Hurstpierpoint BN6 9GL www.gesl.net		Borehole Log				Borehole No. WS17 Sheet 1 of 1	
Project Name: Southwater Phase V		Project No. GE17902		Co-ords: 515116E - 125917N		Hole Type WLS	
Location: Southwater				Level:		Scale 1:25	
Client: Berkeley Homes Southern Limited				Dates: 14/01/2019		Logged By KOD	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.30		Dark brown silty clay with abundant rootlets and black ferruginous fragments. TOPSOIL		
		0.50	D				Stiff orange brown and grey mottled shaley silty CLAY with abundant black ferruginous fragments. WEALD CLAY		
		0.50	PP	2.0kg/cm2					
		0.70	PP	1.9kg/cm2	0.70		Orange brown and reddish brown fissured MUDSTONE with some firm blue grey clay partings. WEALD CLAY	1	
		1.00	D				Orange brown and grey brown mottled fissured MUDSTONE with reddish brown to black and orange ferruginous staining. WEALD CLAY		
		1.40	D		1.30				
		2.00	D				Orange brown, grey and reddish brown fissured ferruginous stained MUDSTONE. WEALD CLAY	2	
		2.50	D		2.70				
		3.00	D				End of Borehole at 4.00m	3	
		3.50	D						
		4.00	D		4.00			4	
								5	

Casing		Water Strikes (mbgl)		Chiselling (mbgl)		Remarks	
Diameter	Depth (m)	Depth Strike	Rose to	Depth from	Depth to		

Appendix D

Magic Map Geology Information



☒ ☐ Aquifer Designation Map
(Superficial Drift) (England)

Principal

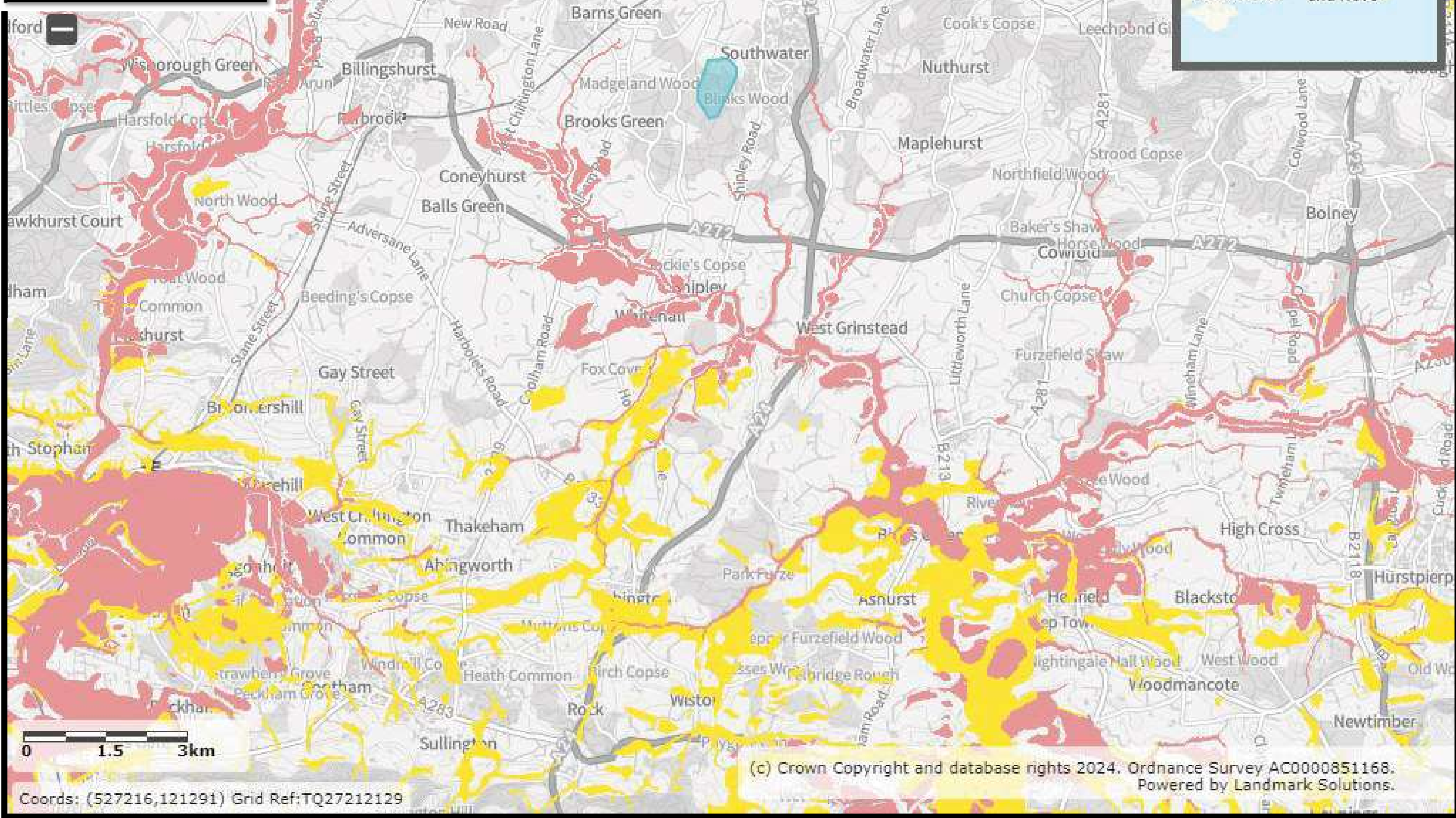
Secondary A

Secondary B

Secondary (undifferentiated)

Unknown (lakes+landslip)

Unproductive



☒ ☐ Groundwater Vulnerability Map (England)

Local Information

Soluble Rock Risk

High

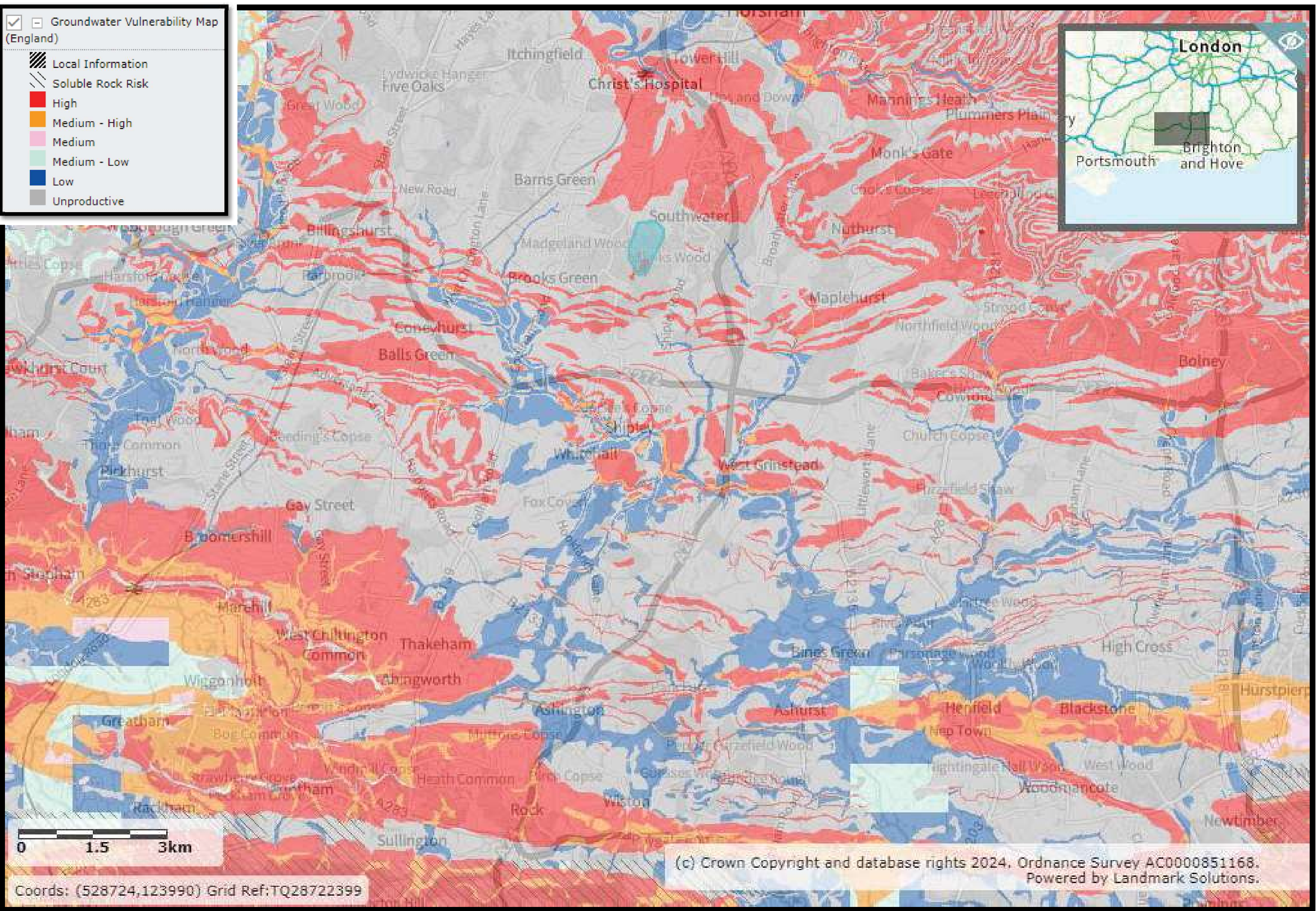
Medium - High

Medium

Medium - Low

Low

Unproductive



(c) Crown Copyright and database rights 2024. Ordnance Survey AC0000851168.
 Powered by Landmark Solutions.

Coords: (528724,123990) Grid Ref:TQ28722399

☒ ☐ Source Protection Zones merged (England)

Zone I - Inner Protection Zone

Zone I - Subsurface Activity

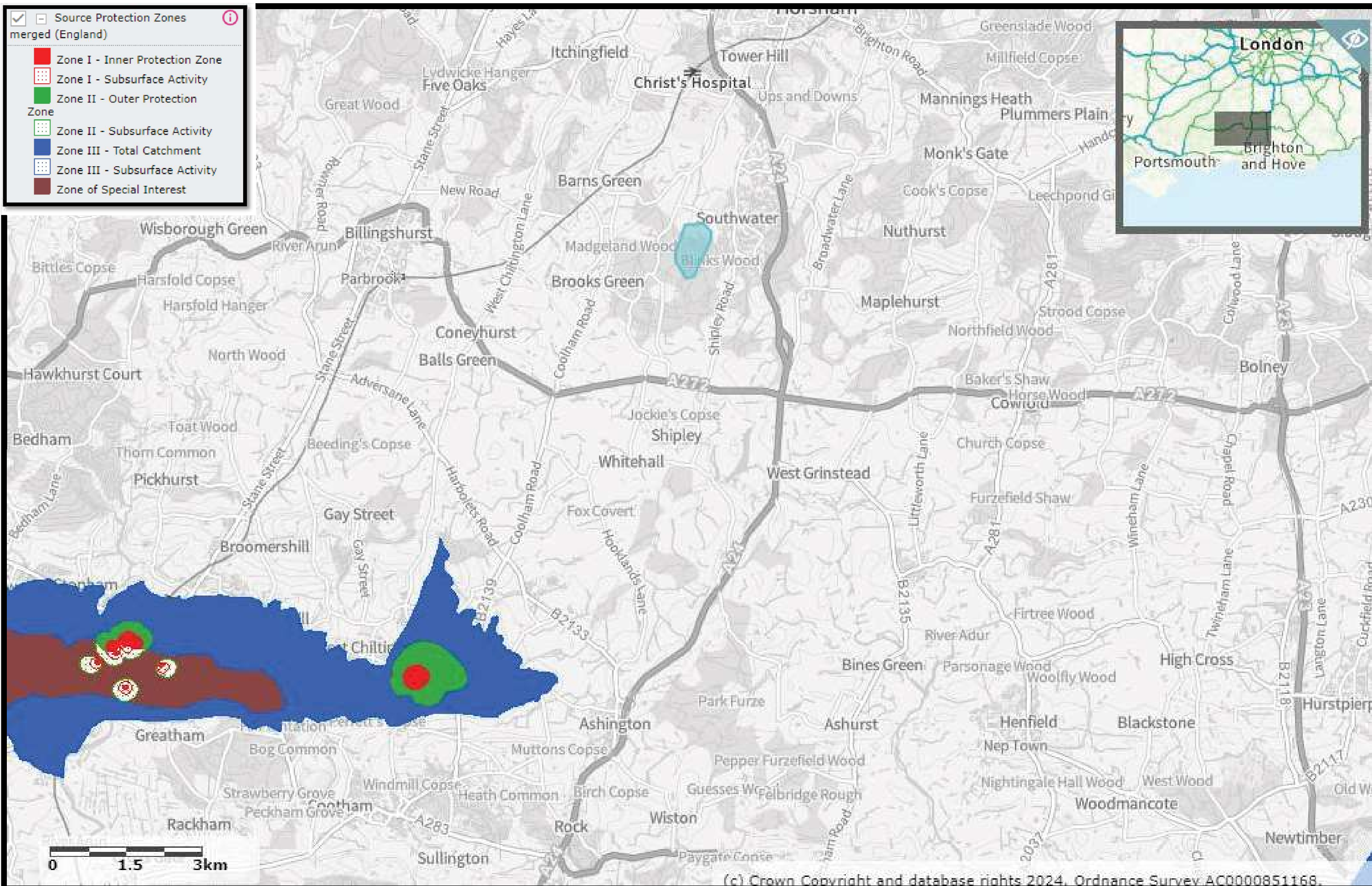
Zone II - Outer Protection Zone

Zone II - Subsurface Activity

Zone III - Total Catchment

Zone III - Subsurface Activity

Zone of Special Interest



Appendix E

Site Plan

9229

PROW

9688

Woodland House

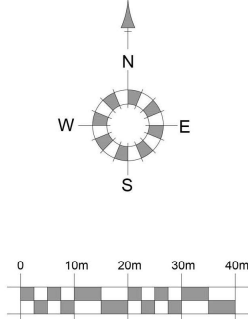
Pond

SHAW'S LANE

SHAW'S LANE

Southwater House

Holy Inno Church
The Vicarage



- D 28/06/24 Layout updated with new mix for planning.
C 13/07/20 Position of Plots 3 & 7 slightly re-adjusted & access road between these plots revised to allow more tree planting. Additional footpaths added in front of Plots 25 & 68 linking to the PROW.
B 05/06/20 Parkinghouse types adjusted on Plot 8, 15-16, 34-35, 43-44, 53-55 & 71.
A 14/05/20 House type on Plot 62 revised.

DEVELOPER
PHASE 5
SOUTHWATER
WEST SUSSEX

DRAWING TITLE
SITE LAYOUT

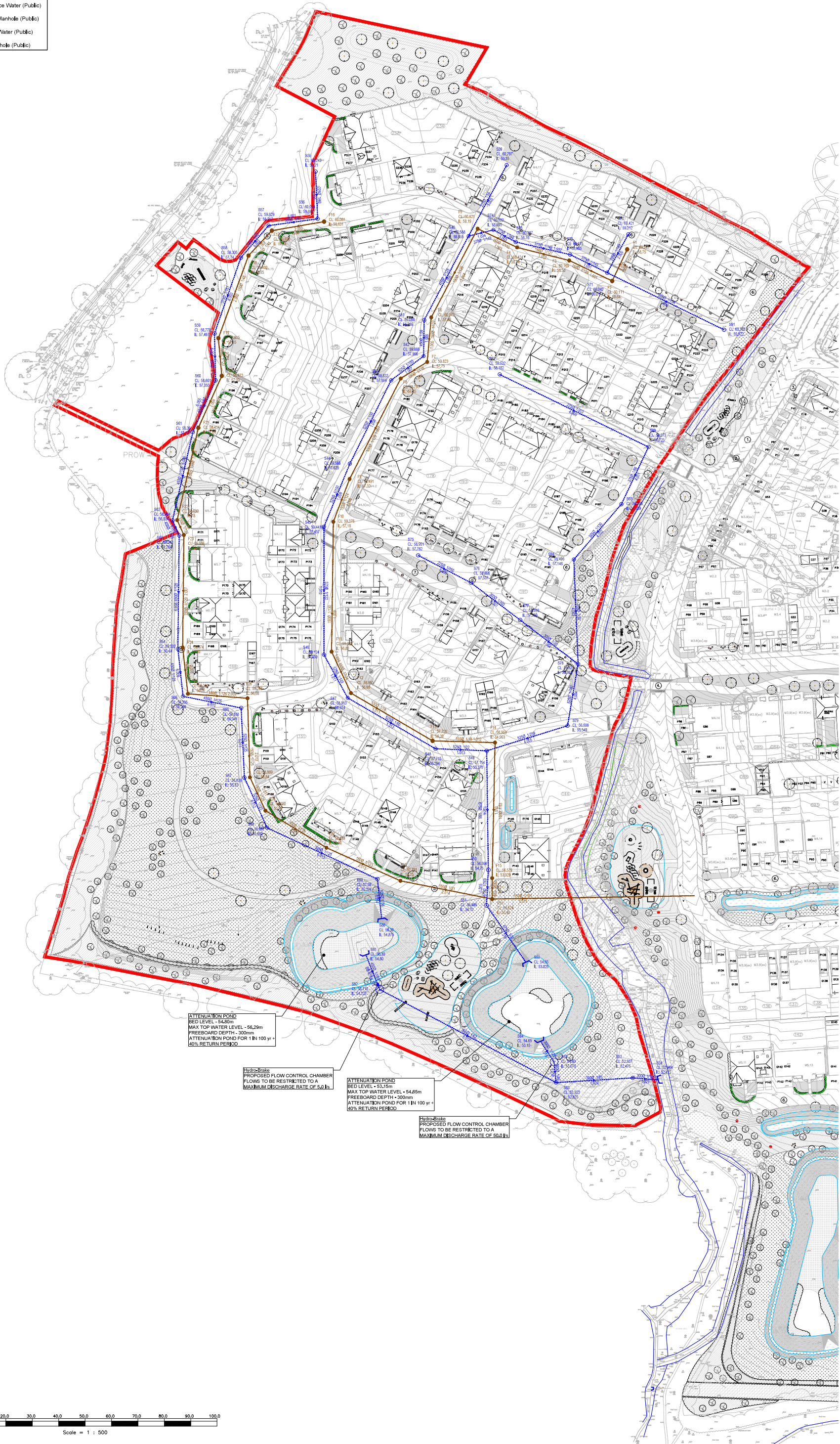
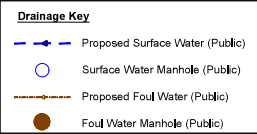
Berkeley
Designed for life
Berkeley Homes (Southern) Limited
Berkeley House, Bay Tree Avenue
Leatherhead
Surrey, KT22 7JL
Tel: (01372) 370400

DRAWN: _____ CHECKED: _____
DATE: MAY 2020 SCALE: 1:500@A0

REF: S835/SL/001 REV: D

Appendix F

Drainage Strategy Layout

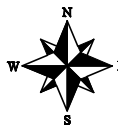


GENERAL NOTES

- 1.1. THIS DRAWING IS COPYRIGHT AND SHOULD NOT BE REPRODUCED IN WHOLE OR PART WITHOUT THE WRITTEN CONSENT OF PRICE GROUP LTD.
- 1.2. ALL DIMENSIONS TO BE CHECKED ON SITE AND COORDINATE WITH RELEVANT ARCHITECT'S DRAWINGS. ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER PRIOR TO CONSTRUCTION.
- 1.3. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
- 1.4. ALL LEVELS IN METRES.
- 1.5. NOTES HEREON SHALL NOT BE MODIFIED WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER.
- 1.6. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS DRAWINGS & SPECIFICATIONS.

Drainage Construction Notes

1. All materials and workmanship related to private sewers shall be in accordance with Part 1 of the Building Regulations and BS EN752 and best practice.
2. All materials and workmanship related to adoptable sewers shall be in accordance with the Design and Construction Guidance 2020 as published by the Water Services Association and any subsequent revisions shown by the water authority.
3. All sustainable drainage systems to be designed and maintained in accordance with CWSA C750 The SuDS Manual and best practice guidance.
4. All patios and external surfaces to drain away from building thresholds unless explicitly noted on the plan.
5. All downpipes with pathways falling towards them to be fitted with threshold drains, to be connected to nearest SW inspection chamber or pipe.
6. All parking area to be porous paving.
7. Where practicable rainwater pipe to discharge onto parking area or into ditch.
8. Land drainage to be provided in gardens where the gradient falls towards a property.



P3	MINOR AMENDMENTS
AM	26/06/24 DB 26/06/24 DB 26/06/24
P2	DISCHARGE RATE AT HYDRO-BRAKS UPDATED
AM	24/06/24 DB 24/06/24 DB 24/06/24
P1	INITIAL ISSUE
AM	19/06/24 DB 19/06/24 DB 19/06/24
REV.	REVISION NOTIFICATION
DRW BY	DATE
CHK BY	DATE
APP BY	DATE



Smallfield House, 2 Tennis Park
Lyons Avenue, Ash Vale
Guilford
GU11 3GE
United Kingdom
T: +44 (0)1276 700 400
E: info@patrickparsons.co.uk
W: www.patrickparsons.co.uk

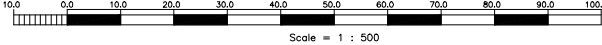
Client
Berkeley Homes (Southern) Ltd

Project
Southwater, Phase 4 & 5

Drawing
Strategy Surface Water Layout Overview - Phase 5

Drawn	Date
JH	JUNE 2024
Patrick Parsons Project No.	Scale @ A3
12345	1:500

Revision	Revision
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100



Appendix G

Causeway Flow Calculation

**Design Settings**

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	5	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	1.000
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	x
Maximum Time of Concentration (mins)	999.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S91	0.062	5.00	60.185	1350	515182.412	126177.357	0.663
S70	0.062	5.00	60.421	1350	515146.126	126213.485	1.209
S71	0.062	5.00	60.042	1350	515138.153	126198.964	1.032
S72	0.062	5.00	60.115	1350	515124.058	126205.845	1.210
S73	0.062	5.00	60.397	1350	515103.477	126210.627	1.637
S74	0.062	5.00	60.522	1200	515094.995	126215.200	1.827
S39		5.00	60.797	1350	515100.058	126239.734	1.447
S40	0.062	5.00	60.588	1200	515085.597	126212.832	2.033
S41	0.062	5.00	60.088	1350	515068.787	126181.000	1.819
S42	0.062	5.00	59.888	1200	515068.586	126167.374	1.922
S43	0.062	5.00	59.833	1350	515056.283	126158.244	1.969
S44	0.062	5.00	59.588	1350	515040.668	126126.645	1.959
S45	0.112	5.00	59.441	1350	515030.819	126102.737	1.984
S46	0.062	5.00	59.124	1350	515030.819	126054.264	2.065
S47	0.062	5.00	58.913	1200	515039.822	126037.910	1.979
S48	0.162	5.00	57.715	1350	515073.082	126018.645	1.421
S92	0.062	5.00	59.532	1350	515097.377	126160.445	1.350
S89	0.162	5.00	59.073	1350	515153.786	126132.929	1.350
S93	0.062	5.00	58.709	1350	515143.510	126111.282	1.350
S94	0.062	5.00	58.496	1350	515125.497	126090.322	1.350
S75	0.064	5.00	58.951	1350	515066.505	126091.911	1.189
S76	0.062	5.00	58.696	1350	515086.535	126081.527	1.159
S77	0.062	5.00	58.316	1350	515105.161	126067.392	1.013
S78			56.831	1350	515127.123	126050.720	1.150
S79	0.062	5.00	56.699	1350	515123.112	126027.358	1.150
S49	0.062	5.00	57.114	1350	515092.494	126017.862	1.839
S50	0.114	5.00	56.596	1500	515093.089	125972.716	1.846
S51	0.062	5.00	56.486	1500	515092.431	125959.297	1.786
S52			54.650		515107.284	125937.864	1.400
S84		5.00	54.650		515112.881	125907.813	1.500
S85			54.600	3000	515118.000	125900.000	1.525
S55	0.062	5.00	60.243	1350	515027.642	126237.296	1.033
S56	0.062	5.00	60.024	1350	515028.441	126219.392	1.337
S57	0.062	5.00	59.629	1350	515009.823	126216.806	1.412
S58	0.062	5.00	59.305	1350	514999.321	126204.642	1.565
S59	0.062	5.00	58.778	1350	514989.350	126175.891	1.281
S60	0.062	5.00	58.601	1350	514989.789	126158.208	1.246
S61	0.062	5.00	58.360	1350	514981.151	126138.610	1.251
S62	0.062	5.00	58.994	1350	514973.457	126105.138	2.160
S63			59.042	1350	514975.978	126099.415	2.258
S64	0.062	5.00	59.332	1350	514975.491	126056.412	2.892
S65	0.062	5.00	59.335	1350	514977.441	126038.486	3.039

**Nodes**

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S66	0.112	5.00	59.188	1350	514999.453	126034.089	3.147
S67	0.062	5.00	58.818	1350	515000.685	126007.708	2.988
S68	0.062	5.00	58.667	1350	515009.311	125988.660	3.004
S69	0.062	5.00	57.990	1350	515051.089	125969.275	2.696
S80			56.300		515052.664	125954.401	1.425
S81		5.00	56.300		515046.679	125940.622	1.500
S82			56.119	3000	515051.914	125927.470	1.994
S83			53.923	1350	515118.751	125892.163	1.098
S53			52.937	1350	515147.813	125893.947	0.462
S54			52.964		515157.470	125893.200	0.549

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S91	S71	49.251	0.600	59.522	59.154	0.368	133.8	225	5.73	50.0
2.000	S70	S71	16.566	0.600	59.212	59.101	0.111	149.2	225	5.26	50.0
1.001	S71	S72	15.685	0.600	59.010	58.905	0.105	149.4	375	5.90	50.0
1.002	S72	S73	21.129	0.600	58.905	58.760	0.145	145.7	375	6.14	50.0
1.003	S73	S74	9.637	0.600	58.760	58.695	0.065	148.3	375	6.25	50.0
1.004	S74	S40	9.692	0.600	58.695	58.630	0.065	149.1	375	6.36	50.0
3.000	S39	S40	30.543	0.600	59.350	58.780	0.570	53.6	225	5.28	50.0
1.005	S40	S41	35.998	0.600	58.555	58.269	0.286	125.9	450	6.69	50.0
1.006	S41	S42	13.627	0.600	58.269	58.037	0.232	58.7	450	6.77	50.0
1.007	S42	S43	15.321	0.600	57.966	57.864	0.102	150.2	525	6.91	50.0
1.008	S43	S44	35.247	0.600	57.864	57.629	0.235	150.0	525	7.23	50.0
1.009	S44	S45	25.858	0.600	57.629	57.457	0.172	150.3	525	7.47	50.0
1.010	S45	S46	48.473	0.600	57.457	57.059	0.398	121.8	525	7.87	50.0
1.011	S46	S47	18.668	0.600	57.059	56.934	0.125	149.3	525	8.04	50.0
1.012	S47	S48	38.436	0.600	56.934	56.294	0.640	60.1	525	8.26	50.0
1.013	S48	S49	19.428	0.600	56.294	55.425	0.869	22.4	525	8.33	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	1.128	44.9	8.4	0.438	0.663	0.062	0.0
2.000	1.068	42.5	8.4	0.984	0.716	0.062	0.0
1.001	1.480	163.4	25.2	0.657	0.835	0.186	0.0
1.002	1.499	165.5	33.6	0.835	1.262	0.248	0.0
1.003	1.486	164.1	42.0	1.262	1.452	0.310	0.0
1.004	1.481	163.6	50.4	1.452	1.583	0.372	0.0
3.000	1.790	71.2	0.0	1.222	1.583	0.000	0.0
1.005	1.810	287.9	58.8	1.583	1.369	0.434	0.0
1.006	2.656	422.5	67.2	1.369	1.401	0.496	0.0
1.007	1.825	395.1	75.6	1.397	1.444	0.558	0.0
1.008	1.826	395.4	84.0	1.444	1.434	0.620	0.0
1.009	1.824	394.9	92.4	1.434	1.459	0.682	0.0
1.010	2.028	439.0	107.6	1.459	1.540	0.794	0.0
1.011	1.830	396.2	116.0	1.540	1.454	0.856	0.0
1.012	2.894	626.4	124.4	1.454	0.896	0.918	0.0
1.013	4.751	1028.5	146.4	0.896	1.164	1.080	0.0

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
4.000	S92	S89	62.762	0.600	58.182	57.873	0.309	203.1	225	6.15	50.0
4.001	S89	S93	23.962	0.600	57.723	57.359	0.364	65.8	375	6.32	50.0
4.002	S93	S94	27.637	0.600	57.359	57.146	0.213	129.8	375	6.61	50.0
4.003	S94	S78	39.646	0.600	57.146	55.831	1.315	30.1	375	6.81	50.0
5.000	S75	S76	22.562	0.600	57.762	57.612	0.150	150.4	225	5.35	50.0
5.001	S76	S77	23.383	0.600	57.537	57.303	0.234	99.9	300	5.60	50.0
5.002	S77	S78	27.754	0.600	57.303	55.906	1.397	19.9	300	5.73	50.0
4.004	S78	S79	23.743	0.600	55.681	55.549	0.132	179.9	525	7.05	50.0
4.005	S79	S49	32.056	0.600	55.549	55.425	0.124	258.5	525	7.44	50.0
1.014	S49	S50	45.150	0.600	55.275	54.750	0.525	86.0	675	8.60	50.0
1.015	S50	S51	13.435	0.600	54.750	54.700	0.050	268.7	675	8.74	50.0
1.016	S51	S52	26.077	0.600	54.700	53.825	0.875	29.8	675	8.83	50.0
1.018	S84	S85	9.393	0.600	53.150	53.075	0.075	125.2	300	5.11	50.0
1.019	S85	S83	8.061	0.600	53.075	52.825	0.250	32.2	300	5.16	50.0
6.000	S55	S56	17.922	0.600	59.210	58.762	0.448	40.0	225	5.14	50.0
6.001	S56	S57	18.797	0.600	58.687	58.217	0.470	40.0	300	5.27	50.0
6.002	S57	S58	16.071	0.600	58.217	57.815	0.402	40.0	300	5.38	50.0
6.003	S58	S59	30.430	0.600	57.740	57.572	0.168	181.1	375	5.75	50.0
6.004	S59	S60	17.689	0.600	57.497	57.355	0.142	124.6	450	5.92	50.0
6.005	S60	S61	21.417	0.600	57.355	57.109	0.246	87.1	450	6.08	50.0
6.006	S61	S62	34.345	0.600	57.109	56.834	0.275	124.9	450	6.40	50.0
6.007	S62	S63	6.254	0.600	56.834	56.784	0.050	125.1	450	6.45	50.0
6.008	S63	S64	43.006	0.600	56.784	56.440	0.344	125.0	450	6.85	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
4.000	0.913	36.3	8.4	1.125	0.975	0.062	0.0
4.001	2.236	246.9	30.4	0.975	0.975	0.224	0.0
4.002	1.589	175.5	38.8	0.975	0.975	0.286	0.0
4.003	3.310	365.6	47.2	0.975	0.625	0.348	0.0
5.000	1.064	42.3	8.7	0.964	0.859	0.064	0.0
5.001	1.573	111.2	17.1	0.859	0.713	0.126	0.0
5.002	3.543	250.4	25.5	0.713	0.625	0.188	0.0
4.004	1.667	360.8	72.6	0.625	0.625	0.536	0.0
4.005	1.388	300.5	81.0	0.625	1.164	0.598	0.0
1.014	2.827	1011.6	235.8	1.164	1.171	1.740	0.0
1.015	1.594	570.3	251.3	1.171	1.111	1.854	0.0
1.016	4.811	1721.7	259.7	1.111	0.150	1.916	0.0
1.018	1.403	99.2	0.0	1.200	1.225	0.000	0.0
1.019	2.778	196.4	0.0	1.225	0.798	0.000	0.0
6.000	2.074	82.5	8.4	0.808	1.037	0.062	0.0
6.001	2.493	176.2	16.8	1.037	1.112	0.124	0.0
6.002	2.494	176.3	25.2	1.112	1.190	0.186	0.0
6.003	1.343	148.3	33.6	1.190	0.831	0.248	0.0
6.004	1.820	289.4	42.0	0.831	0.796	0.310	0.0
6.005	2.179	346.6	50.4	0.796	0.801	0.372	0.0
6.006	1.818	289.1	58.8	0.801	1.710	0.434	0.0
6.007	1.816	288.9	67.2	1.710	1.808	0.496	0.0
6.008	1.817	288.9	67.2	1.808	2.442	0.496	0.0

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
6.009	S64	S65	18.032	0.600	56.440	56.296	0.144	125.2	450	7.01	50.0
6.010	S65	S66	22.446	0.600	56.296	56.116	0.180	124.7	450	7.22	50.0
6.011	S66	S67	26.410	0.600	56.041	55.830	0.211	125.2	525	7.44	50.0
6.012	S67	S68	20.910	0.600	55.830	55.663	0.167	125.2	525	7.61	50.0
6.013	S68	S69	46.057	0.600	55.663	55.294	0.369	124.8	525	8.00	50.0
6.014	S69	S80	14.957	0.600	55.294	54.875	0.419	35.7	525	8.06	50.0
6.016	S81	S82	14.155	0.600	54.800	54.725	0.075	188.7	450	5.16	50.0
6.017	S82	S83	75.589	0.600	54.125	52.825	1.300	58.1	300	5.77	50.0
1.020	S83	S53	29.117	0.600	52.825	52.475	0.350	83.2	300	6.05	50.0
1.021	S53	S54	9.685	0.600	52.475	52.415	0.060	161.4	300	6.18	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
6.009	1.815	288.7	75.6	2.442	2.589	0.558	0.0
6.010	1.819	289.3	84.0	2.589	2.622	0.620	0.0
6.011	2.000	433.1	99.2	2.622	2.463	0.732	0.0
6.012	2.000	433.0	107.6	2.463	2.479	0.794	0.0
6.013	2.003	433.7	116.0	2.479	2.171	0.856	0.0
6.014	3.757	813.3	124.4	2.171	0.900	0.918	0.0
6.016	1.476	234.8	0.0	1.050	0.944	0.000	0.0
6.017	2.065	146.0	0.0	1.694	0.798	0.000	0.0
1.020	1.725	121.9	0.0	0.798	0.162	0.000	0.0
1.021	1.235	87.3	0.0	0.162	0.249	0.000	0.0

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	49.251	133.8	225	Circular	60.185	59.522	0.438	60.042	59.154	0.663
2.000	16.566	149.2	225	Circular	60.421	59.212	0.984	60.042	59.101	0.716
1.001	15.685	149.4	375	Circular	60.042	59.010	0.657	60.115	58.905	0.835
1.002	21.129	145.7	375	Circular	60.115	58.905	0.835	60.397	58.760	1.262
1.003	9.637	148.3	375	Circular	60.397	58.760	1.262	60.522	58.695	1.452
1.004	9.692	149.1	375	Circular	60.522	58.695	1.452	60.588	58.630	1.583
3.000	30.543	53.6	225	Circular	60.797	59.350	1.222	60.588	58.780	1.583
1.005	35.998	125.9	450	Circular	60.588	58.555	1.583	60.088	58.269	1.369
1.006	13.627	58.7	450	Circular	60.088	58.269	1.369	59.888	58.037	1.401

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S91	1350	Manhole	Adoptable	S71	1350	Manhole	Adoptable
2.000	S70	1350	Manhole	Adoptable	S71	1350	Manhole	Adoptable
1.001	S71	1350	Manhole	Adoptable	S72	1350	Manhole	Adoptable
1.002	S72	1350	Manhole	Adoptable	S73	1350	Manhole	Adoptable
1.003	S73	1350	Manhole	Adoptable	S74	1200	Manhole	Adoptable
1.004	S74	1200	Manhole	Adoptable	S40	1200	Manhole	Adoptable
3.000	S39	1350	Manhole	Adoptable	S40	1200	Manhole	Adoptable
1.005	S40	1200	Manhole	Adoptable	S41	1350	Manhole	Adoptable
1.006	S41	1350	Manhole	Adoptable	S42	1200	Manhole	Adoptable

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.007	15.321	150.2	525	Circular	59.888	57.966	1.397	59.833	57.864	1.444
1.008	35.247	150.0	525	Circular	59.833	57.864	1.444	59.588	57.629	1.434
1.009	25.858	150.3	525	Circular	59.588	57.629	1.434	59.441	57.457	1.459
1.010	48.473	121.8	525	Circular	59.441	57.457	1.459	59.124	57.059	1.540
1.011	18.668	149.3	525	Circular	59.124	57.059	1.540	58.913	56.934	1.454
1.012	38.436	60.1	525	Circular	58.913	56.934	1.454	57.715	56.294	0.896
1.013	19.428	22.4	525	Circular	57.715	56.294	0.896	57.114	55.425	1.164
4.000	62.762	203.1	225	Circular	59.532	58.182	1.125	59.073	57.873	0.975
4.001	23.962	65.8	375	Circular	59.073	57.723	0.975	58.709	57.359	0.975
4.002	27.637	129.8	375	Circular	58.709	57.359	0.975	58.496	57.146	0.975
4.003	39.646	30.1	375	Circular	58.496	57.146	0.975	56.831	55.831	0.625
5.000	22.562	150.4	225	Circular	58.951	57.762	0.964	58.696	57.612	0.859
5.001	23.383	99.9	300	Circular	58.696	57.537	0.859	58.316	57.303	0.713
5.002	27.754	19.9	300	Circular	58.316	57.303	0.713	56.831	55.906	0.625
4.004	23.743	179.9	525	Circular	56.831	55.681	0.625	56.699	55.549	0.625
4.005	32.056	258.5	525	Circular	56.699	55.549	0.625	57.114	55.425	1.164
1.014	45.150	86.0	675	Circular	57.114	55.275	1.164	56.596	54.750	1.171
1.015	13.435	268.7	675	Circular	56.596	54.750	1.171	56.486	54.700	1.111
1.016	26.077	29.8	675	Circular	56.486	54.700	1.111	54.650	53.825	0.150

1.018	9.393	125.2	300	Circular	54.650	53.150	1.200	54.600	53.075	1.225
1.019	8.061	32.2	300	Circular	54.600	53.075	1.225	53.923	52.825	0.798
6.000	17.922	40.0	225	Circular	60.243	59.210	0.808	60.024	58.762	1.037
6.001	18.797	40.0	300	Circular	60.024	58.687	1.037	59.629	58.217	1.112
6.002	16.071	40.0	300	Circular	59.629	58.217	1.112	59.305	57.815	1.190

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.007	S42	1200	Manhole	Adoptable	S43	1350	Manhole	Adoptable
1.008	S43	1350	Manhole	Adoptable	S44	1350	Manhole	Adoptable
1.009	S44	1350	Manhole	Adoptable	S45	1350	Manhole	Adoptable
1.010	S45	1350	Manhole	Adoptable	S46	1350	Manhole	Adoptable
1.011	S46	1350	Manhole	Adoptable	S47	1200	Manhole	Adoptable
1.012	S47	1200	Manhole	Adoptable	S48	1350	Manhole	Adoptable
1.013	S48	1350	Manhole	Adoptable	S49	1350	Manhole	Adoptable
4.000	S92	1350	Manhole	Adoptable	S89	1350	Manhole	Adoptable
4.001	S89	1350	Manhole	Adoptable	S93	1350	Manhole	Adoptable
4.002	S93	1350	Manhole	Adoptable	S94	1350	Manhole	Adoptable
4.003	S94	1350	Manhole	Adoptable	S78	1350	Manhole	Adoptable
5.000	S75	1350	Manhole	Adoptable	S76	1350	Manhole	Adoptable
5.001	S76	1350	Manhole	Adoptable	S77	1350	Manhole	Adoptable
5.002	S77	1350	Manhole	Adoptable	S78	1350	Manhole	Adoptable
4.004	S78	1350	Manhole	Adoptable	S79	1350	Manhole	Adoptable
4.005	S79	1350	Manhole	Adoptable	S49	1350	Manhole	Adoptable
1.014	S49	1350	Manhole	Adoptable	S50	1500	Manhole	Adoptable
1.015	S50	1500	Manhole	Adoptable	S51	1500	Manhole	Adoptable
1.016	S51	1500	Manhole	Adoptable	S52		Junction	
1.018	S84		Junction		S85	3000	Manhole	Adoptable
1.019	S85	3000	Manhole	Adoptable	S83	1350	Manhole	Adoptable
6.000	S55	1350	Manhole	Adoptable	S56	1350	Manhole	Adoptable
6.001	S56	1350	Manhole	Adoptable	S57	1350	Manhole	Adoptable
6.002	S57	1350	Manhole	Adoptable	S58	1350	Manhole	Adoptable

Pipeline Schedule

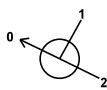
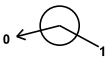
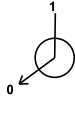
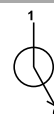
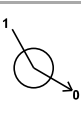
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
6.003	30.430	181.1	375	Circular	59.305	57.740	1.190	58.778	57.572	0.831
6.004	17.689	124.6	450	Circular	58.778	57.497	0.831	58.601	57.355	0.796
6.005	21.417	87.1	450	Circular	58.601	57.355	0.796	58.360	57.109	0.801
6.006	34.345	124.9	450	Circular	58.360	57.109	0.801	58.994	56.834	1.710
6.007	6.254	125.1	450	Circular	58.994	56.834	1.710	59.042	56.784	1.808
6.008	43.006	125.0	450	Circular	59.042	56.784	1.808	59.332	56.440	2.442
6.009	18.032	125.2	450	Circular	59.332	56.440	2.442	59.335	56.296	2.589
6.010	22.446	124.7	450	Circular	59.335	56.296	2.589	59.188	56.116	2.622
6.011	26.410	125.2	525	Circular	59.188	56.041	2.622	58.818	55.830	2.463
6.012	20.910	125.2	525	Circular	58.818	55.830	2.463	58.667	55.663	2.479
6.013	46.057	124.8	525	Circular	58.667	55.663	2.479	57.990	55.294	2.171
6.014	14.957	35.7	525	Circular	57.990	55.294	2.171	56.300	54.875	0.900
6.016	14.155	188.7	450	Circular	56.300	54.800	1.050	56.119	54.725	0.944
6.017	75.589	58.1	300	Circular	56.119	54.125	1.694	53.923	52.825	0.798
1.020	29.117	83.2	300	Circular	53.923	52.825	0.798	52.937	52.475	0.162
1.021	9.685	161.4	300	Circular	52.937	52.475	0.162	52.964	52.415	0.249

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
6.003	S58	1350	Manhole	Adoptable	S59	1350	Manhole	Adoptable
6.004	S59	1350	Manhole	Adoptable	S60	1350	Manhole	Adoptable
6.005	S60	1350	Manhole	Adoptable	S61	1350	Manhole	Adoptable
6.006	S61	1350	Manhole	Adoptable	S62	1350	Manhole	Adoptable
6.007	S62	1350	Manhole	Adoptable	S63	1350	Manhole	Adoptable
6.008	S63	1350	Manhole	Adoptable	S64	1350	Manhole	Adoptable
6.009	S64	1350	Manhole	Adoptable	S65	1350	Manhole	Adoptable
6.010	S65	1350	Manhole	Adoptable	S66	1350	Manhole	Adoptable
6.011	S66	1350	Manhole	Adoptable	S67	1350	Manhole	Adoptable
6.012	S67	1350	Manhole	Adoptable	S68	1350	Manhole	Adoptable
6.013	S68	1350	Manhole	Adoptable	S69	1350	Manhole	Adoptable
6.014	S69	1350	Manhole	Adoptable	S80		Junction	
6.016	S81		Junction		S82	3000	Manhole	Adoptable
6.017	S82	3000	Manhole	Adoptable	S83	1350	Manhole	Adoptable
1.020	S83	1350	Manhole	Adoptable	S53	1350	Manhole	Adoptable
1.021	S53	1350	Manhole	Adoptable	S54		Junction	

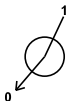
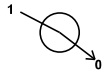
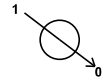
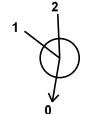
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S91	515182.412	126177.357	60.185	0.663	1350				
						0	1.000	59.522	225
S70	515146.126	126213.485	60.421	1.209	1350				
						0	2.000	59.212	225

**Manhole Schedule**

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S71	515138.153	126198.964	60.042	1.032	1350		1	2.000	59.101	225
							2	1.000	59.154	225
							0	1.001	59.010	375
S72	515124.058	126205.845	60.115	1.210	1350		1	1.001	58.905	375
							0	1.002	58.905	375
S73	515103.477	126210.627	60.397	1.637	1350		1	1.002	58.760	375
							0	1.003	58.760	375
S74	515094.995	126215.200	60.522	1.827	1200		1	1.003	58.695	375
							0	1.004	58.695	375
S39	515100.058	126239.734	60.797	1.447	1350					
S40	515085.597	126212.832	60.588	2.033	1200		1	3.000	59.350	225
							2	1.004	58.630	375
							0	1.005	58.555	450
S41	515068.787	126181.000	60.088	1.819	1350		1	1.005	58.269	450
							0	1.006	58.269	450
S42	515068.586	126167.374	59.888	1.922	1200		1	1.006	58.037	450
							0	1.007	57.966	525
S43	515056.283	126158.244	59.833	1.969	1350		1	1.007	57.864	525
							0	1.008	57.864	525
S44	515040.668	126126.645	59.588	1.959	1350		1	1.008	57.629	525
							0	1.009	57.629	525
S45	515030.819	126102.737	59.441	1.984	1350		1	1.009	57.457	525
							0	1.010	57.457	525
S46	515030.819	126054.264	59.124	2.065	1350		1	1.010	57.059	525
							0	1.011	57.059	525
S47	515039.822	126037.910	58.913	1.979	1200		1	1.011	56.934	525
							0	1.012	56.934	525

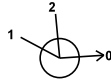
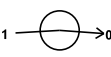
**Manhole Schedule**

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S48	515073.082	126018.645	57.715	1.421	1350		1	1.012	56.294	525
							0	1.013	56.294	525
S92	515097.377	126160.445	59.532	1.350	1350		0	4.000	58.182	225
S89	515153.786	126132.929	59.073	1.350	1350		1	4.000	57.873	225
							0	4.001	57.723	375
S93	515143.510	126111.282	58.709	1.350	1350		1	4.001	57.359	375
							0	4.002	57.359	375
S94	515125.497	126090.322	58.496	1.350	1350		1	4.002	57.146	375
							0	4.003	57.146	375
S75	515066.505	126091.911	58.951	1.189	1350		0	5.000	57.762	225
S76	515086.535	126081.527	58.696	1.159	1350		1	5.000	57.612	225
							0	5.001	57.537	300
S77	515105.161	126067.392	58.316	1.013	1350		1	5.001	57.303	300
							0	5.002	57.303	300
S78	515127.123	126050.720	56.831	1.150	1350		1	5.002	55.906	300
							2	4.003	55.831	375
							0	4.004	55.681	525
S79	515123.112	126027.358	56.699	1.150	1350		1	4.004	55.549	525
							0	4.005	55.549	525
S49	515092.494	126017.862	57.114	1.839	1350		1	4.005	55.425	525
							2	1.013	55.425	525
							0	1.014	55.275	675
S50	515093.089	125972.716	56.596	1.846	1500		1	1.014	54.750	675
							0	1.015	54.750	675
S51	515092.431	125959.297	56.486	1.786	1500		1	1.015	54.700	675
							0	1.016	54.700	675

**Manhole Schedule**

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S52	515107.284	125937.864	54.650	1.400		1			

**Manhole Schedule**

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections		Link	IL (m)	Dia (mm)
S65	514977.441	126038.486	59.335	3.039	1350		1	6.009	56.296	450
							0	6.010	56.296	450
S66	514999.453	126034.089	59.188	3.147	1350		1	6.010	56.116	450
							0	6.011	56.041	525
S67	515000.685	126007.708	58.818	2.988	1350		1	6.011	55.830	525
							0	6.012	55.830	525
S68	515009.311	125988.660	58.667	3.004	1350		1	6.012	55.663	525
							0	6.013	55.663	525
S69	515051.089	125969.275	57.990	2.696	1350		1	6.013	55.294	525
							0	6.014	55.294	525
S80	515052.664	125954.401	56.300	1.425			1	6.014	54.875	525
S81	515046.679	125940.622	56.300	1.500						
							0	6.016	54.800	450
S82	515051.914	125927.470	56.119	1.994	3000		1	6.016	54.725	450
							0	6.017	54.125	300
S83	515118.751	125892.163	53.923	1.098	1350		1	6.017	52.825	300
							2	1.019	52.825	300
							0	1.020	52.825	300
S53	515147.813	125893.947	52.937	0.462	1350		1	1.020	52.475	300
							0	1.021	52.475	300
S54	515157.470	125893.200	52.964	0.549			1	1.021	52.415	300

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0
Summer CV	0.750	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	10080	Check Discharge Volume	x

Storm Durations

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



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

Node S82 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	54.125	Product Number	CTL-SHE-0092-5000-2000-5000
Design Depth (m)	2.000	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node S85 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	53.075	Product Number	CTL-SHE-0281-5000-2000-5000
Design Depth (m)	2.000	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	50.0	Min Node Diameter (mm)	2100

Node S81 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	50.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	54.800	Main Channel Slope (1:X)	500.0
Safety Factor	1.0	Time to half empty (mins)	495	Main Channel n	0.600

**Inlets
S80**

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	393.9	0.0	0.400	570.1	0.0	0.800	772.1	0.0	1.200	999.3	0.0
0.100	435.0	0.0	0.500	618.2	0.0	0.900	826.6	0.0	1.300	1060.0	0.0
0.200	478.4	0.0	0.600	668.0	0.0	1.000	882.6	0.0	1.400	1122.3	0.0
0.300	523.5	0.0	0.700	719.3	0.0	1.100	940.1	0.0	1.490	1180.9	0.0

Node S84 Flow through Pond Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Main Channel Length (m)	50.000
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	53.150	Main Channel Slope (1:X)	500.0
Safety Factor	1.0	Time to half empty (mins)	114	Main Channel n	0.600

**Inlets
S52**

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	585.7	0.0	0.400	745.2	0.0	0.800	921.5	0.0	1.200	1113.9	0.0
0.100	623.5	0.0	0.500	787.7	0.0	0.900	968.1	0.0	1.300	1164.6	0.0
0.200	663.0	0.0	0.600	831.3	0.0	1.000	1015.7	0.0	1.400	1216.2	0.0
0.300	703.6	0.0	0.700	875.9	0.0	1.100	1064.3	0.0	1.500	1268.8	0.0

**Results for 2 year Critical Storm Duration. Lowest mass balance: 99.82%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S91	11	59.590	0.068	9.1	0.0973	0.0000	OK
15 minute winter	S70	10	59.285	0.073	9.1	0.1041	0.0000	OK
15 minute winter	S71	10	59.120	0.110	26.5	0.1570	0.0000	OK
15 minute winter	S72	11	59.029	0.124	35.3	0.1774	0.0000	OK
15 minute winter	S73	11	58.915	0.155	43.9	0.2223	0.0000	OK
15 minute winter	S74	11	58.857	0.162	52.8	0.1837	0.0000	OK
15 minute summer	S39	1	59.350	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S40	11	58.702	0.147	61.6	0.1660	0.0000	OK
15 minute winter	S41	11	58.406	0.137	70.4	0.1955	0.0000	OK
15 minute winter	S42	11	58.143	0.177	79.0	0.1999	0.0000	OK
15 minute winter	S43	11	58.040	0.176	87.6	0.2513	0.0000	OK
15 minute winter	S44	11	57.817	0.188	96.0	0.2687	0.0000	OK
15 minute winter	S45	11	57.640	0.183	110.5	0.2623	0.0000	OK
15 minute winter	S46	12	57.269	0.210	117.4	0.3008	0.0000	OK
15 minute winter	S47	12	57.102	0.168	125.4	0.1904	0.0000	OK
15 minute winter	S48	12	56.438	0.144	144.7	0.2066	0.0000	OK
15 minute winter	S92	11	58.257	0.075	9.1	0.1069	0.0000	OK
15 minute winter	S89	10	57.813	0.090	31.7	0.1284	0.0000	OK
15 minute winter	S93	10	57.487	0.128	40.5	0.1838	0.0000	OK
15 minute winter	S94	11	57.241	0.095	48.8	0.1356	0.0000	OK
15 minute winter	S75	10	57.835	0.073	9.4	0.1049	0.0000	OK
15 minute winter	S76	10	57.623	0.086	18.3	0.1235	0.0000	OK
15 minute winter	S77	10	57.371	0.068	27.2	0.0971	0.0000	OK
15 minute winter	S78	11	55.859	0.178	76.0	0.2546	0.0000	OK
15 minute winter	S79	11	55.748	0.199	85.0	0.2848	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S91	1.000	S71	8.8	0.878	0.196	0.4920	
15 minute winter	S70	2.000	S71	8.9	0.830	0.210	0.1781	
15 minute winter	S71	1.001	S72	26.3	0.903	0.161	0.4581	
15 minute winter	S72	1.002	S73	35.3	0.946	0.213	0.7906	
15 minute winter	S73	1.003	S74	44.2	0.997	0.270	0.4278	
15 minute winter	S74	1.004	S40	53.0	1.251	0.324	0.4112	
15 minute summer	S39	3.000	S40	0.0	0.000	0.000	0.0000	
15 minute winter	S40	1.005	S41	61.8	1.448	0.215	1.5378	
15 minute winter	S41	1.006	S42	70.4	1.869	0.167	0.5140	
15 minute winter	S42	1.007	S43	79.0	1.244	0.200	0.9731	
15 minute winter	S43	1.008	S44	87.4	1.319	0.221	2.3355	
15 minute winter	S44	1.009	S45	95.0	1.407	0.241	1.7628	
15 minute winter	S45	1.010	S46	109.6	1.494	0.250	3.5604	
15 minute winter	S46	1.011	S47	118.3	1.689	0.299	1.3100	
15 minute winter	S47	1.012	S48	126.1	2.343	0.201	2.0718	
15 minute winter	S48	1.013	S49	145.6	3.229	0.142	0.8765	
15 minute winter	S92	4.000	S89	8.5	0.750	0.235	0.7145	
15 minute winter	S89	4.001	S93	31.4	1.180	0.127	0.6411	
15 minute winter	S93	4.002	S94	40.2	1.465	0.229	0.7618	
15 minute winter	S94	4.003	S78	49.2	2.303	0.135	0.8470	
15 minute winter	S75	5.000	S76	9.2	0.842	0.217	0.2464	
15 minute winter	S76	5.001	S77	18.1	1.265	0.162	0.3352	
15 minute winter	S77	5.002	S78	26.8	2.299	0.107	0.3235	
15 minute winter	S78	4.004	S79	76.4	1.097	0.212	1.6543	
15 minute winter	S79	4.005	S49	84.3	1.181	0.281	2.2975	

**Results for 2 year Critical Storm Duration. Lowest mass balance: 99.82%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S49	12	55.504	0.229	235.2	0.3271	0.0000	OK
15 minute winter	S50	12	55.054	0.304	250.3	0.5380	0.0000	OK
15 minute winter	S51	12	54.882	0.182	258.7	0.3216	0.0000	OK
30 minute winter	S52	25	53.556	0.306	207.3	0.0000	0.0000	OK
120 minute winter	S84	90	53.447	0.297	94.7	0.0000	0.0000	OK
120 minute winter	S85	90	53.425	0.350	47.5	2.4721	0.0000	SURCHARGED
15 minute winter	S55	10	59.262	0.052	9.1	0.0739	0.0000	OK
15 minute winter	S56	10	58.751	0.064	18.1	0.0920	0.0000	OK
15 minute winter	S57	10	58.300	0.083	27.1	0.1192	0.0000	OK
15 minute winter	S58	11	57.869	0.129	35.8	0.1846	0.0000	OK
15 minute winter	S59	11	57.624	0.127	44.3	0.1810	0.0000	OK
15 minute winter	S60	11	57.480	0.125	53.1	0.1783	0.0000	OK
15 minute winter	S61	11	57.255	0.146	62.0	0.2093	0.0000	OK
15 minute winter	S62	11	57.010	0.176	71.0	0.2525	0.0000	OK
15 minute winter	S63	11	56.939	0.155	70.8	0.2220	0.0000	OK
15 minute winter	S64	11	56.616	0.176	79.1	0.2521	0.0000	OK
15 minute winter	S65	12	56.476	0.180	86.3	0.2581	0.0000	OK
15 minute winter	S66	11	56.225	0.184	99.8	0.2627	0.0000	OK
15 minute winter	S67	12	56.025	0.195	107.4	0.2791	0.0000	OK
15 minute winter	S68	12	55.859	0.196	115.7	0.2802	0.0000	OK
15 minute winter	S69	12	55.438	0.144	123.8	0.2063	0.0000	OK
360 minute winter	S80	344	55.156	0.281	24.6	0.0000	0.0000	OK
360 minute winter	S81	344	55.156	0.356	26.1	0.0000	0.0000	OK
360 minute winter	S82	344	55.159	1.034	13.5	7.3127	0.0000	SURCHARGED
120 minute winter	S83	92	52.965	0.140	50.9	0.2000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S49	1.014	S50	237.3	1.813	0.235	5.9244	
15 minute winter	S50	1.015	S51	251.6	2.174	0.441	1.5691	
15 minute winter	S51	1.016	S52	259.4	3.470	0.151	1.9505	
30 minute winter	S52	Flow through pond	S84	112.8	0.043	0.084	140.5953	
120 minute winter	S84	1.018	S85	47.5	0.760	0.479	0.6610	
120 minute winter	S85	Hydro-Brake®	S83	47.4				
15 minute winter	S55	6.000	S56	9.0	1.342	0.109	0.1200	
15 minute winter	S56	6.001	S57	18.0	1.338	0.102	0.2536	
15 minute winter	S57	6.002	S58	26.7	1.749	0.152	0.2456	
15 minute winter	S58	6.003	S59	35.7	1.097	0.240	0.9897	
15 minute winter	S59	6.004	S60	44.5	1.233	0.154	0.6385	
15 minute winter	S60	6.005	S61	53.4	1.332	0.154	0.8604	
15 minute winter	S61	6.006	S62	62.4	1.222	0.216	1.7560	
15 minute winter	S62	6.007	S63	70.8	1.337	0.245	0.3315	
15 minute winter	S63	6.008	S64	70.5	1.333	0.244	2.2769	
15 minute winter	S64	6.009	S65	78.1	1.343	0.270	1.0498	
15 minute winter	S65	6.010	S66	86.5	1.542	0.299	1.2599	
15 minute winter	S66	6.011	S67	100.3	1.434	0.232	1.8466	
15 minute winter	S67	6.012	S68	108.6	1.484	0.251	1.5297	
15 minute winter	S68	6.013	S69	116.7	1.930	0.269	2.7960	
15 minute winter	S69	6.014	S80	124.6	2.989	0.153	0.8851	
360 minute winter	S80	Flow through pond	S81	20.9	0.019	0.020	140.9628	
360 minute winter	S81	6.016	S82	13.5	0.706	0.057	2.0607	
360 minute winter	S82	Hydro-Brake®	S83	4.1				
120 minute winter	S83	1.020	S53	51.0	1.375	0.418	1.0783	



Results for 2 year Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	S53	90	52.648	0.173	51.0	0.2469	0.0000	OK
120 minute winter	S54	90	52.577	0.162	50.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	S53	1.021	S54	50.9	1.260	0.584	0.3915	440.5

**Results for 30 year Critical Storm Duration. Lowest mass balance: 99.82%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S91	10	59.638	0.116	23.8	0.1664	0.0000	OK
15 minute winter	S70	10	59.339	0.127	23.8	0.1820	0.0000	OK
15 minute winter	S71	10	59.209	0.199	69.8	0.2846	0.0000	OK
15 minute winter	S72	11	59.138	0.233	92.9	0.3329	0.0000	OK
15 minute winter	S73	11	59.067	0.307	114.8	0.4390	0.0000	OK
15 minute winter	S74	11	58.999	0.304	137.8	0.3436	0.0000	OK
15 minute summer	S39	1	59.350	0.000	0.0	0.0000	0.0000	OK
15 minute winter	S40	11	58.813	0.258	160.8	0.2918	0.0000	OK
15 minute winter	S41	11	58.517	0.248	184.0	0.3547	0.0000	OK
15 minute winter	S42	11	58.293	0.327	206.7	0.3700	0.0000	OK
15 minute winter	S43	11	58.185	0.321	229.4	0.4598	0.0000	OK
15 minute winter	S44	11	57.977	0.348	251.8	0.4985	0.0000	OK
15 minute winter	S45	11	57.798	0.341	291.2	0.4883	0.0000	OK
15 minute winter	S46	11	57.439	0.380	311.6	0.5433	0.0000	OK
15 minute winter	S47	11	57.231	0.297	330.5	0.3354	0.0000	OK
15 minute winter	S48	11	56.543	0.249	386.4	0.3569	0.0000	OK
15 minute winter	S92	11	58.313	0.131	23.8	0.1879	0.0000	OK
15 minute winter	S89	10	57.882	0.159	83.8	0.2274	0.0000	OK
15 minute winter	S93	10	57.583	0.224	106.9	0.3203	0.0000	OK
15 minute winter	S94	10	57.302	0.156	128.8	0.2237	0.0000	OK
15 minute winter	S75	10	57.890	0.128	24.6	0.1834	0.0000	OK
15 minute winter	S76	10	57.684	0.147	47.8	0.2103	0.0000	OK
15 minute winter	S77	10	57.417	0.114	71.2	0.1633	0.0000	OK
15 minute winter	S78	11	56.013	0.332	198.5	0.4745	0.0000	OK
15 minute winter	S79	11	55.911	0.362	223.2	0.5175	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S91	1.000	S71	23.1	1.133	0.514	1.0021	
15 minute winter	S70	2.000	S71	23.4	1.059	0.551	0.3661	
15 minute winter	S71	1.001	S72	69.2	1.060	0.423	1.0233	
15 minute winter	S72	1.002	S73	92.3	1.091	0.557	1.7784	
15 minute winter	S73	1.003	S74	115.4	1.201	0.704	0.9261	
15 minute winter	S74	1.004	S40	138.4	1.562	0.846	0.8564	
15 minute summer	S39	3.000	S40	0.0	0.000	0.000	0.0379	
15 minute winter	S40	1.005	S41	161.6	1.762	0.561	3.3019	
15 minute winter	S41	1.006	S42	184.4	2.089	0.436	1.2444	
15 minute winter	S42	1.007	S43	207.0	1.479	0.524	2.1442	
15 minute winter	S43	1.008	S44	229.4	1.580	0.580	5.1205	
15 minute winter	S44	1.009	S45	250.8	1.685	0.635	3.8866	
15 minute winter	S45	1.010	S46	289.2	1.841	0.659	7.6530	
15 minute winter	S46	1.011	S47	309.1	2.117	0.780	2.7344	
15 minute winter	S47	1.012	S48	330.5	2.936	0.528	4.3578	
15 minute winter	S48	1.013	S49	384.3	3.788	0.374	2.1825	
15 minute winter	S92	4.000	S89	22.8	0.973	0.627	1.4682	
15 minute winter	S89	4.001	S93	83.1	1.471	0.336	1.3539	
15 minute winter	S93	4.002	S94	105.3	1.900	0.600	1.5482	
15 minute winter	S94	4.003	S78	128.9	2.816	0.353	1.8988	
15 minute winter	S75	5.000	S76	24.1	1.074	0.569	0.5069	
15 minute winter	S76	5.001	S77	47.4	1.615	0.427	0.6884	
15 minute winter	S77	5.002	S78	70.3	2.971	0.281	0.6572	
15 minute winter	S78	4.004	S79	200.8	1.329	0.557	3.5890	
15 minute winter	S79	4.005	S49	223.6	1.509	0.744	4.7470	

**Results for 30 year Critical Storm Duration. Lowest mass balance: 99.82%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S49	11	55.718	0.443	630.3	0.6333	0.0000	OK
15 minute winter	S50	11	55.279	0.529	667.6	0.9346	0.0000	OK
15 minute winter	S51	11	55.015	0.315	684.7	0.5567	0.0000	OK
120 minute winter	S52	100	53.847	0.597	237.6	0.0000	0.0000	OK
120 minute winter	S84	100	53.845	0.695	182.6	0.0000	0.0000	SURCHARGED
120 minute winter	S85	100	53.819	0.744	51.9	5.2622	0.0000	SURCHARGED
15 minute winter	S55	10	59.297	0.087	23.8	0.1241	0.0000	OK
15 minute winter	S56	10	58.795	0.108	47.3	0.1552	0.0000	OK
15 minute winter	S57	10	58.360	0.143	70.9	0.2047	0.0000	OK
15 minute winter	S58	10	57.968	0.228	94.1	0.3267	0.0000	OK
15 minute winter	S59	10	57.721	0.224	115.8	0.3209	0.0000	OK
15 minute winter	S60	11	57.580	0.225	138.8	0.3216	0.0000	OK
15 minute winter	S61	11	57.375	0.266	162.2	0.3812	0.0000	OK
15 minute winter	S62	11	57.160	0.326	185.8	0.4668	0.0000	OK
15 minute winter	S63	11	57.069	0.285	186.1	0.4084	0.0000	OK
15 minute winter	S64	11	56.782	0.342	208.7	0.4898	0.0000	OK
15 minute winter	S65	11	56.633	0.337	229.0	0.4824	0.0000	OK
15 minute winter	S66	11	56.390	0.349	266.9	0.4995	0.0000	OK
15 minute winter	S67	11	56.196	0.366	288.0	0.5242	0.0000	OK
15 minute winter	S68	11	56.011	0.348	307.5	0.4984	0.0000	OK
15 minute winter	S69	12	55.554	0.260	326.6	0.3718	0.0000	OK
360 minute winter	S80	360	55.488	0.613	76.3	0.0000	0.0000	OK
360 minute winter	S81	360	55.488	0.688	47.1	0.0000	0.0000	SURCHARGED
360 minute winter	S82	360	55.488	1.363	17.3	9.6362	0.0000	SURCHARGED
240 minute winter	S83	228	52.970	0.145	54.1	0.2076	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S49	1.014	S50	626.4	2.297	0.619	12.3718	
15 minute winter	S50	1.015	S51	663.5	2.843	1.163	3.1123	
15 minute winter	S51	1.016	S52	686.7	4.457	0.399	4.0192	
120 minute winter	S52	Flow through pond	S84	182.6	0.041	0.137	462.5868	
120 minute winter	S84	1.018	S85	51.9	0.766	0.523	0.6614	
120 minute winter	S85	Hydro-Brake®	S83	49.9				
15 minute winter	S55	6.000	S56	23.5	1.737	0.285	0.2430	
15 minute winter	S56	6.001	S57	47.1	1.682	0.267	0.5272	
15 minute winter	S57	6.002	S58	70.3	2.052	0.399	0.5571	
15 minute winter	S58	6.003	S59	93.0	1.392	0.627	2.0330	
15 minute winter	S59	6.004	S60	116.2	1.474	0.401	1.3945	
15 minute winter	S60	6.005	S61	139.8	1.580	0.403	1.8934	
15 minute winter	S61	6.006	S62	163.4	1.477	0.565	3.7913	
15 minute winter	S62	6.007	S63	186.1	1.623	0.644	0.7163	
15 minute winter	S63	6.008	S64	186.3	1.578	0.645	5.0610	
15 minute winter	S64	6.009	S65	206.6	1.612	0.716	2.3150	
15 minute winter	S65	6.010	S66	226.4	1.923	0.783	2.6535	
15 minute winter	S66	6.011	S67	265.6	1.707	0.613	4.1376	
15 minute winter	S67	6.012	S68	285.1	1.838	0.659	3.2720	
15 minute winter	S68	6.013	S69	308.0	2.385	0.710	5.9349	
15 minute winter	S69	6.014	S80	326.7	3.525	0.402	2.1330	
360 minute winter	S80	Flow through pond	S81	47.1	0.018	0.045	342.3591	
360 minute winter	S81	6.016	S82	17.3	0.687	0.074	2.2428	
360 minute winter	S82	Hydro-Brake®	S83	4.2				
240 minute winter	S83	1.020	S53	54.1	1.392	0.444	1.1303	



Results for 30 year Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	S53	228	52.654	0.179	54.1	0.2564	0.0000	OK
240 minute winter	S54	228	52.584	0.169	54.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	S53	1.021	S54	54.1	1.278	0.620	0.4099	1211.8

**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.82%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S91	12	60.164	0.642	42.0	0.9184	0.0000	FLOOD RISK
15 minute winter	S70	12	60.007	0.795	42.0	1.1381	0.0000	SURCHARGED
15 minute winter	S71	12	59.906	0.896	111.1	1.2821	0.0000	FLOOD RISK
15 minute winter	S72	12	59.837	0.932	149.4	1.3333	0.0000	FLOOD RISK
15 minute winter	S73	12	59.686	0.926	189.2	1.3255	0.0000	SURCHARGED
15 minute winter	S74	12	59.544	0.849	229.7	0.9600	0.0000	SURCHARGED
15 minute winter	S39	12	59.360	0.010	0.2	0.0142	0.0000	OK
15 minute winter	S40	12	59.340	0.785	270.8	0.8875	0.0000	SURCHARGED
15 minute winter	S41	12	59.058	0.789	305.1	1.1298	0.0000	SURCHARGED
15 minute winter	S42	11	58.880	0.914	316.9	1.0333	0.0000	SURCHARGED
15 minute winter	S43	11	58.765	0.901	351.8	1.2886	0.0000	SURCHARGED
15 minute winter	S44	11	58.516	0.887	387.4	1.2687	0.0000	SURCHARGED
15 minute winter	S45	11	58.263	0.806	457.0	1.1528	0.0000	SURCHARGED
15 minute winter	S46	11	57.721	0.662	492.8	0.9477	0.0000	SURCHARGED
15 minute winter	S47	12	57.379	0.445	530.2	0.5037	0.0000	OK
15 minute winter	S48	12	56.875	0.581	627.4	0.8315	0.0000	SURCHARGED
15 minute winter	S92	11	58.401	0.219	42.0	0.3132	0.0000	OK
15 minute winter	S89	10	57.959	0.236	147.0	0.3380	0.0000	OK
15 minute winter	S93	11	57.707	0.348	188.2	0.4983	0.0000	OK
15 minute winter	S94	11	57.416	0.270	226.1	0.3864	0.0000	OK
15 minute winter	S75	10	57.964	0.202	43.4	0.2889	0.0000	OK
15 minute winter	S76	10	57.748	0.211	84.1	0.3025	0.0000	OK
15 minute winter	S77	11	57.477	0.174	125.4	0.2495	0.0000	OK
15 minute winter	S78	11	56.800	1.119	341.5	1.6017	0.0000	FLOOD RISK
15 minute winter	S79	11	56.616	1.067	373.7	1.5271	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S91	1.000	S71	38.5	1.154	0.859	1.9588	
15 minute winter	S70	2.000	S71	38.8	1.083	0.914	0.6588	
15 minute winter	S71	1.001	S72	107.4	1.066	0.657	1.7300	
15 minute winter	S72	1.002	S73	147.2	1.335	0.889	2.3305	
15 minute winter	S73	1.003	S74	187.7	1.702	1.144	1.0629	
15 minute winter	S74	1.004	S40	228.8	2.076	1.399	1.0690	
15 minute winter	S39	3.000	S40	-0.2	0.106	-0.003	0.6164	
15 minute winter	S40	1.005	S41	263.1	1.824	0.914	5.7036	
15 minute winter	S41	1.006	S42	284.1	2.124	0.672	2.1591	
15 minute winter	S42	1.007	S43	319.0	1.519	0.808	3.3098	
15 minute winter	S43	1.008	S44	354.6	1.641	0.897	7.6145	
15 minute winter	S44	1.009	S45	389.9	1.805	0.987	5.5862	
15 minute winter	S45	1.010	S46	453.2	2.098	1.032	10.4718	
15 minute winter	S46	1.011	S47	490.6	2.303	1.238	3.8394	
15 minute winter	S47	1.012	S48	530.5	3.145	0.847	7.9050	
15 minute winter	S48	1.013	S49	620.2	3.914	0.603	4.1971	
15 minute winter	S92	4.000	S89	38.8	1.089	1.067	2.2178	
15 minute winter	S89	4.001	S93	146.3	1.604	0.592	2.1398	
15 minute winter	S93	4.002	S94	184.1	2.080	1.049	2.6495	
15 minute winter	S94	4.003	S78	221.1	2.771	0.605	3.8705	
15 minute winter	S75	5.000	S76	42.1	1.202	0.996	0.7912	
15 minute winter	S76	5.001	S77	83.5	1.863	0.751	1.1031	
15 minute winter	S77	5.002	S78	120.5	2.941	0.481	1.5664	
15 minute winter	S78	4.004	S79	334.1	1.547	0.926	5.1293	
15 minute winter	S79	4.005	S49	373.8	1.730	1.244	6.9251	

**Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.82%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S49	12	56.346	1.071	1021.6	1.5325	0.0000	SURCHARGED
15 minute winter	S50	11	55.617	0.867	1084.2	1.5316	0.0000	SURCHARGED
15 minute winter	S51	11	55.136	0.436	1125.3	0.7702	0.0000	OK
120 minute winter	S52	122	54.349	1.099	419.1	0.0000	0.0000	OK
120 minute winter	S84	122	54.349	1.199	250.7	0.0000	0.0000	SURCHARGED
120 minute winter	S85	122	54.328	1.253	53.2	8.8608	0.0000	FLOOD RISK
15 minute winter	S55	10	59.332	0.122	42.0	0.1746	0.0000	OK
15 minute winter	S56	12	58.940	0.253	83.6	0.3615	0.0000	OK
15 minute winter	S57	12	58.862	0.645	125.2	0.9224	0.0000	SURCHARGED
15 minute winter	S58	12	58.667	0.927	165.3	1.3259	0.0000	SURCHARGED
15 minute winter	S59	12	58.483	0.986	182.0	1.4103	0.0000	FLOOD RISK
15 minute winter	S60	12	58.402	1.047	217.6	1.4987	0.0000	FLOOD RISK
15 minute winter	S61	12	58.272	1.163	250.1	1.6636	0.0000	FLOOD RISK
15 minute winter	S62	12	58.019	1.185	277.8	1.6962	0.0000	SURCHARGED
15 minute winter	S63	12	57.896	1.112	275.2	1.5918	0.0000	SURCHARGED
15 minute winter	S64	12	57.495	1.055	310.0	1.5095	0.0000	SURCHARGED
15 minute winter	S65	12	57.225	0.929	345.0	1.3287	0.0000	SURCHARGED
15 minute winter	S66	11	56.844	0.803	407.3	1.1492	0.0000	SURCHARGED
15 minute winter	S67	11	56.568	0.738	444.1	1.0557	0.0000	SURCHARGED
15 minute winter	S68	11	56.284	0.621	481.3	0.8886	0.0000	SURCHARGED
720 minute winter	S69	705	55.900	0.606	120.0	0.8669	0.0000	SURCHARGED
720 minute winter	S80	705	55.897	1.022	50.7	0.0000	0.0000	OK
720 minute winter	S81	705	55.897	1.097	31.4	0.0000	0.0000	SURCHARGED
720 minute winter	S82	705	55.897	1.772	11.4	12.5231	0.0000	FLOOD RISK
600 minute winter	S83	615	52.971	0.146	54.6	0.2090	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S49	1.014	S50	1023.5	2.868	1.012	16.1176	
15 minute winter	S50	1.015	S51	1085.9	3.292	1.904	4.0348	
15 minute winter	S51	1.016	S52	1124.0	4.964	0.653	5.9222	
120 minute winter	S52	Flow through pond	S84	250.7	0.042	0.188	949.2792	
120 minute winter	S84	1.018	S85	53.2	0.765	0.537	0.6614	
120 minute winter	S85	Hydro-Brake®	S83	49.9				
15 minute winter	S55	6.000	S56	41.6	1.991	0.504	0.4519	
15 minute winter	S56	6.001	S57	83.2	1.806	0.472	1.2569	
15 minute winter	S57	6.002	S58	123.3	2.083	0.700	1.1317	
15 minute winter	S58	6.003	S59	142.4	1.487	0.960	3.3563	
15 minute winter	S59	6.004	S60	178.0	1.527	0.615	2.8027	
15 minute winter	S60	6.005	S61	210.5	1.640	0.607	3.3934	
15 minute winter	S61	6.006	S62	240.4	1.532	0.832	5.4417	
15 minute winter	S62	6.007	S63	275.2	1.737	0.953	0.9909	
15 minute winter	S63	6.008	S64	277.2	1.750	0.960	6.8140	
15 minute winter	S64	6.009	S65	312.2	1.971	1.082	2.8571	
15 minute winter	S65	6.010	S66	347.2	2.192	1.200	3.5564	
15 minute winter	S66	6.011	S67	408.6	1.892	0.944	5.7054	
15 minute winter	S67	6.012	S68	443.1	2.051	1.023	4.5172	
15 minute winter	S68	6.013	S69	479.7	2.472	1.106	8.8758	
720 minute winter	S69	6.014	S80	-68.6	0.807	-0.084	3.2312	
720 minute winter	S80	Flow through pond	S81	31.4	0.015	0.030	667.6055	
720 minute winter	S81	6.016	S82	11.4	0.693	0.049	2.2428	
720 minute winter	S82	Hydro-Brake®	S83	4.7				
600 minute winter	S83	1.020	S53	54.6	1.395	0.448	1.1398	



Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.82%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
600 minute winter	S53	615	52.655	0.180	54.6	0.2582	0.0000	OK
600 minute winter	S54	615	52.585	0.170	54.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
600 minute winter	S53	1.021	S54	54.6	1.281	0.626	0.4132	2558.6

Appendix H

Environment Agency Flood Map (For Planning)

Flood map for planning

Your reference
Phase 5 South

Location (easting/northing)
515090/126090

Created
17 Jun 2024 21:47

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)

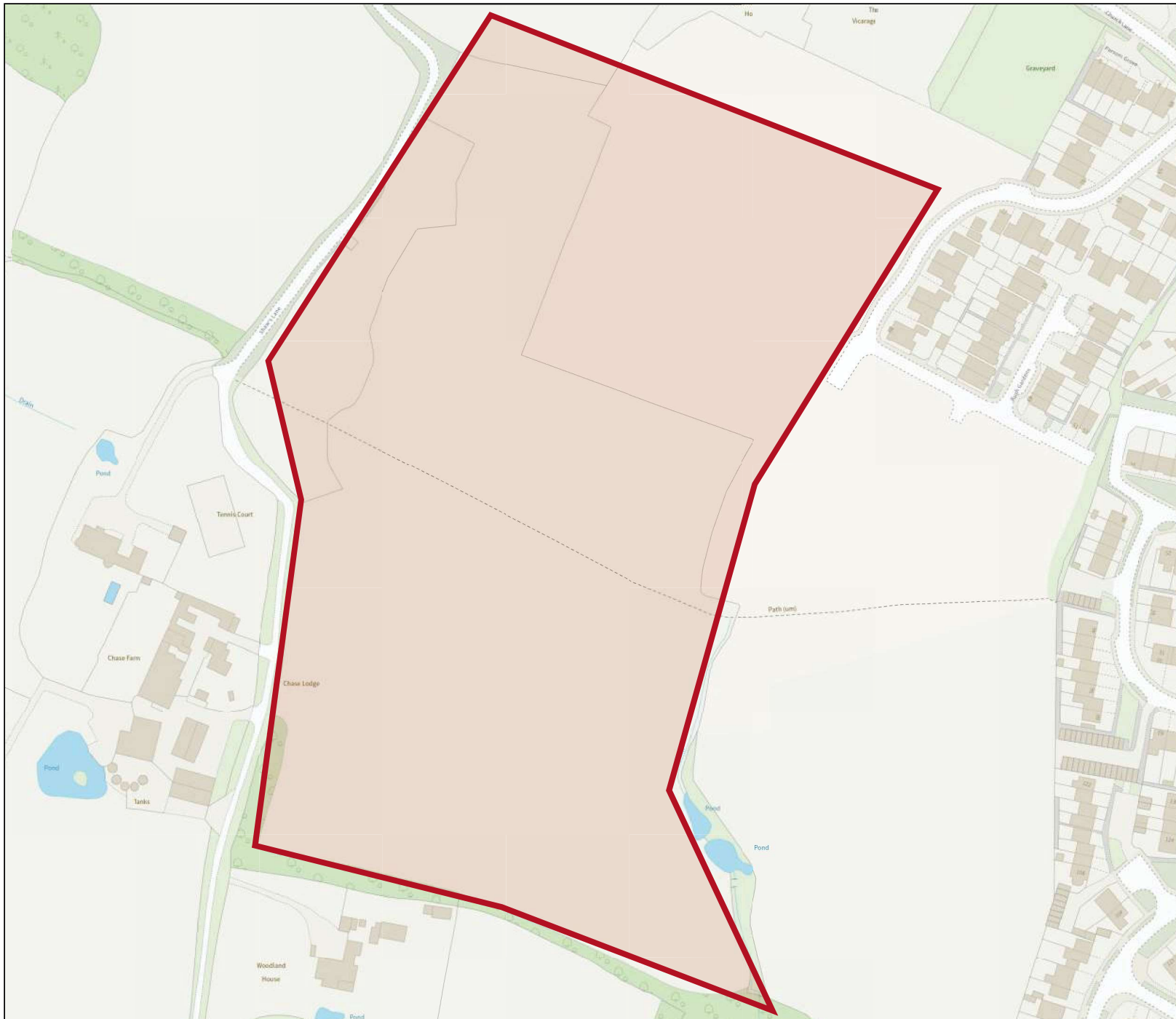
Notes

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.

Flood risk data is covered by the Open Government Licence **which** sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference
Phase 5 South

Location (easting/northing)
515090/126090

Scale
1:2500

Created
17 Jun 2024 21:47

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

0 20 40 60m

Appendix J
Horsham District Council Strategic Flood Risk Assessment

Horsham District Council LDF: Level 1 SFRA



**Horsham
District
Council**

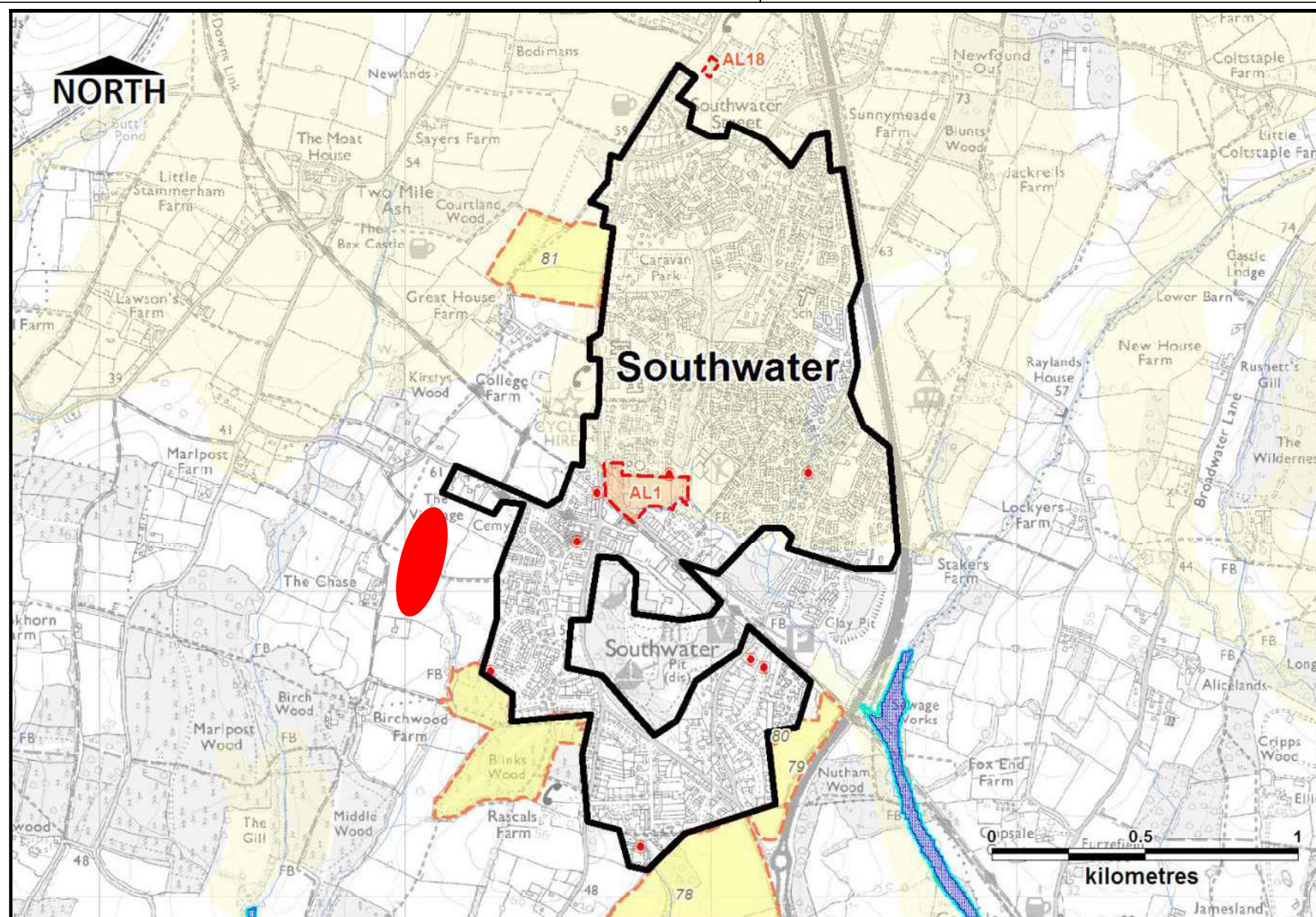


Settlement Sustainability Hierarchy:

Category 1

Southwater

Preliminary Core Strategy Assessment



Flood Zone	1
Potential Housing Allocation	The Adopted Core Strategy classifies Southwater as a Category 1 Settlement, one which is "capable of sustaining some expansion, infilling and redevelopment") and could therefore be allocation for some of the proposed 2740 further homes which are to be provided by 2018. Preliminary assessment shows that any new allocations for housing development at Billingshurst will not fall within Flood Zone 2 or 3 regions.
Potential Employment Allocation	The Adopted Core Strategy states that there is "no provision before 2018 for any further large scale development at Southwater but recognition that this position may need to be reviewed in the light of the approval of the South East Plan and any requirements stemming from the final regional/sub regional strategy to accommodate additional development in the District". Preliminary assessment shows that any new allocations for employment development at Southwater will not fall within Flood Zone 2 or 3 regions.
Main River	None
Flood Record Information data	An extensive flooding incident was recorded in 1981 in the area of Southwater Street. As a result extensive watercourse improvements and large land drainage culverts were carried out. Minor flooding events have been recorded at Cripplegate Lane, New Road, Worthing Road, Boars Head Pub, King Edwards Close, Two Mile Ash Road and Downslink.

Settlement Level Coarse Assessment

	Size of settlement	Area in Zone 3		Area in Zone 2	Likely new development in Zones 2 and 3
		FZ3b FFP	FZ3a 100yr		
Area (ha)	180.10	0.00	0.00	0.00	0.00
% of Area		0.00	0.00	0.00	0.00

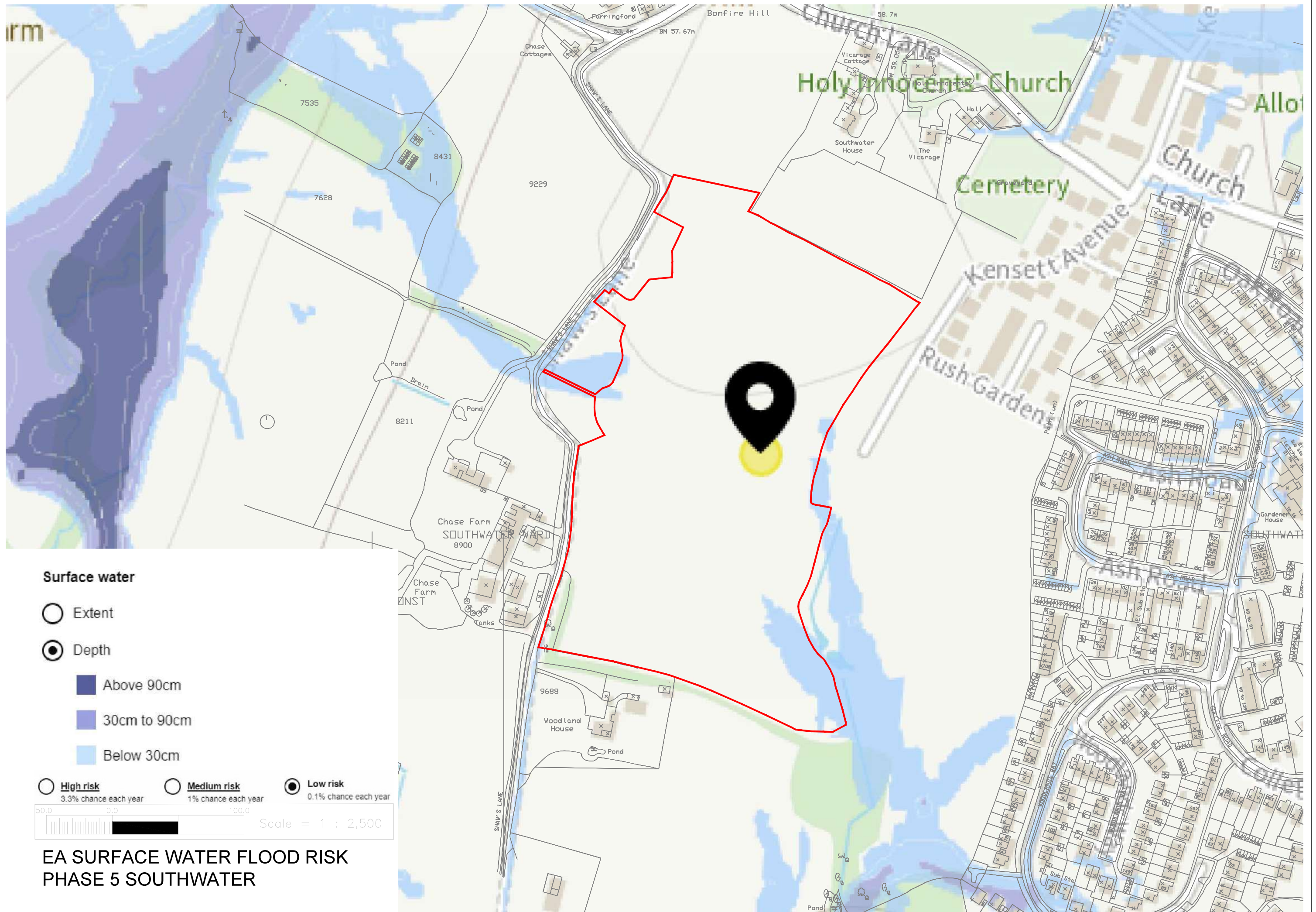
Some features of this map are based on digital spatial data licensed from the Centre for Ecology and Hydrology, © NERC. Includes mapping data based on Ordnance Survey 1:50,000 maps with permission of HMSO © Crown copyright and/or database right 2006. License 100017572.

This map is based upon Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings.
Horsham District Council Sub-Contractor License: DH0R 002

Some features of this map are based on information provided by the Environment Agency. Copyright © Environment Agency, 2007

Appendix K

Environment Agency Surface Water Flood Map



Appendix L

Hazard Technical Note

SUPPLEMENTARY NOTE ON FLOOD HAZARD RATINGS AND THRESHOLDS
FOR DEVELOPMENT PLANNING AND CONTROL PURPOSE
– Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1.

Suresh Surendran and Geoff Gibbs (Environment Agency),
Steven Wade and Helen Udale-Clarke (HR Wallingford)
May 2008

Introduction

This document is a supplementary note to reconcile information provided in the ‘Flood Risks to People Methodology’ (FD2321/TR1¹) and the ‘Framework and Guidance for Assessing and Managing Flood Risk for New Development’ (FD2320/TR2²) reports about the Flood Hazard Rating. It has been produced because both PPS25 in England and TAN15 in Wales require that people should be appropriately safe around new development. The document emphasises that for FRAs and FCAs at all levels to inform development allocations and proposals the simplified approach of FD2320 with regard to flood hazard rating should be used rather than the approach in FD2321. Although the final version of FD2321/TR1 post-dates FD2320/TR2, the work presented actually pre-dates the guidance in FD2320/TR2. This supplementary guidance is issued for those involved in development planning and control and to clarify the detail or difference of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1.

FD2321/TR1 was a research project based on the detailed literature review and analysis of empirical evidence related to flood hazard, derived mainly from theoretical assumptions and some basic laboratory experiments. Factors that affected flood hazard and vulnerability were combined in a form of multi-criteria analysis that was used to identify the hot-spots and broadly estimate the probability of people seriously harmed and fatalities during the event of a flood. The multi-criteria method was calibrated to actual events, validated using data from seven flood events and shown to work well. The FD2321 (Risk to people) methodology illustrates the fundamental concepts and demonstrate how the approach could be used for different applications - it did not set a policy for flood hazard thresholds.

(Nevertheless there are a number of assumptions used in the FD2321 methodology, particularly with respect to the impact of debris and people’s behaviour during flood events. There is a requirement for further research to collate more evidence on flood hazard, particularly the impacts of debris, and vulnerability in order to refine assumptions made in the flood hazard calculations, flood hazard thresholds and risks to people guidance. The study recommend more laboratory and field based tests on the impact of physical water quality aspect such as debris, mudflow; chemical and biological water quality that cause seriously harm or fatalities to people.)

¹ Defra and Agency (2006) *The Flood Risks to People Methodology*, Flood Risks to People Phase 2, FD2321 Technical Report 1, HR Wallingford et al. did the report for Defra/EA Flood and Coastal Defence R&D Programme, March 2006.

(http://sciencesearch.defra.gov.uk/Document.aspx?Document=FD2321_3436_TRP.pdf)

² Defra and Agency (2005) *Framework and Guidance for Assessing and Managing Flood Risk for New Development*, Flood Risk Assessment Guidance for New Development, FD2320 Technical Report 2, HR Wallingford et al. did the report for Defra/EA Flood and Coastal Defence R&D Programme, October 2005. (http://sciencesearch.defra.gov.uk/Document.aspx?Document=FD2320_3364_TRP.pdf)

FD2320/TR2 (FRA guidance for new development) provides guidance that is a specific interpretation of the methodology developed under FD2321, within the context of development planning and control. Based on FD2320 consultation workshops, the project board (key users and experts) advised the project team to provide a simple methodology. Due to uncertainties and limitations related to estimating risks to people, FD2320 adopted a precautionary approach, particularly with respect to the selection of debris factors and flood hazard thresholds

Risk to People (Ninj)

$$\mathbf{Ninj} = \mathbf{Nz} \times \mathbf{Flood\ Hazard\ Rating} \times \mathbf{Area\ Vulnerability} \times \mathbf{People\ Vulnerability}$$

where,

Ninj (Risk to People) = number of injuries within a particular hazard ‘zone’;

Nz = number of people within the hazard zone (at ground/basement level);

Flood Hazard Rating = HR = function of flood depth/velocity (within the hazard zone being considered) and debris factor;

Area Vulnerability = function of effectiveness of flood warning, speed of onset of flooding and nature of area (including types of buildings); and

People Vulnerability = function of presence of people who are very old and/or infirm/disabled/long-term sick

Flood Hazard Rating (HR) and thresholds

The revised ‘hazard rating’ expression based primarily, on consideration to the direct risks of people exposed to floodwaters.

$$\mathbf{HR} = \mathbf{d} \times (\mathbf{v} + \mathbf{n}) + \mathbf{DF}$$

where, HR = (flood) hazard rating;

d = depth of flooding (m);

v = velocity of floodwaters (m/sec); and

DF = debris factor (0, 0.5, 1 depending on probability that debris will lead to a hazard)

n = a constant of 0.5

This final revised Flood Hazard Rating formula from the Flood Risks to People project is presented on page 10 (section 3.5) of FD2321/TR1. The formula is identical in both FD2320 and FD2321 reports.

Based on Table 3.2 of FD2321, the Figure 3.2 of FD2321 illustrates the “Hazard to People Classifications” as a function of depth, velocity and debris factor. Such categorisation and the look-up table with flood hazard threshold could be useful for a range of application as an initial indication of Risks to People.

In this case (Figure 3.2 of FD2321) the calculation takes a debris factor as zero

$$(\mathbf{HR} = \mathbf{d} \times (\mathbf{v} + \mathbf{0.5}) + \mathbf{0}).$$

However FD2321 strongly recommends the use of the debris factor and the formulas described in the Guidance Document for further calculation. The Table 3.1 of FD2321/TR1 (Table 1 of this note) suggests appropriate debris factors for different depths, velocities and the dominant land use.

Table 1: Guidance on debris factors for different flood depths, velocities and dominant land uses. (Source FD2321 Table 3.1):

Depths (d)	Pasture/Arable	Woodland	Urban
0 to 0.25 m	0	0	0
0.25 to 0.75 m	0	0.5	1
d>0.75 m and/or v>2	0.5	1	1

The way that Flood Hazard Rating and thresholds have been presented in Table 13.1 in FD2320/TR2 compared to Figure 3.2 of FD2321/TR1

A concern was raised in the FD2320 consultation workshops and by the FD2320 Project Board during discussions on FD2321, that the methodology was complex and the results presented in the Figure 3.2 of FD2321 were not reflecting the potential risk to people (as this table was of hazard rating for different depths and velocity without debris). There was a need for further work to include debris, area vulnerability and people vulnerability aspects. They requested a simpler single table to represent the risk to people.

For example Figure 3.2 of FD2321 did not reflect the fact that there is a risk from drowning even at low depths and velocities. In reality FD2321/TR1 recognises this but only in the subsequent “people vulnerability” calculation (risk to children, old, sick and disable). For still water up to 1.25m depth, the Figure 3.2 of FD2321/TR1 assumes that there is low hazard, if there are no debris or vulnerable group. However to avoid further calculation, but include the vulnerability aspect the Table 13.1 of FD2320 for still water with the depths between 0.25–1.25m were reclassified as “danger to some”, which was felt to be more appropriate for development planning and control, where users may make use of flood hazard without completing the more complex full calculations including people and area vulnerability.

Similarly Figure 3.2 of FD2321/TR1 shows that at the depth of 0.25m, if there is no debris then up to the flow velocity of 2.0 m/sec there would be low hazard. However FD2321/TR1 suggests the usage of an appropriate debris factor dependent on depth, velocity and the dominant land use. To make the process simpler (whatever the land use), FD2320/TR2 includes a default debris factor. In the Table 13.1 of FD2320/TR2 a debris factor of 0.5 has been applied for depths less than and equal to 0.25m and a debris factor of 1.0 has been used for depths greater than 0.25m. Therefore, in the Table 13.1 of FD2320/TR2 at the depth of 0.25m, up to the flow velocity of 0.30 m/sec is treated as low hazard.

Table 3.2 of FD2321/TR1 (Table 2 of this note) provides thresholds for classifying the hazard to people. In the FD2321/TR1 report the threshold between “danger for most” and “danger for all” is 2.5 and it was used as an initial indication of Risk to People (further calculation is recommended using the formulas). However as there is no further analysis in FD2320 but the Project Board decided that the threshold between “danger for most” and “danger for all” should be more precautionary and a Flood Hazard Rating of 2.0 is selected as a key threshold. i.e. In FD2321 the threshold for “danger for all” is 2.5 and it lowered to 2.0 in FD2320. Therefore, the Flood Hazard Rating between 2.0 to 2.5 in FD2320 is not classified as it is in FD2321.

Table 2: Hazard to People (Source Table 3.2 in FD2321/TR1)

Thresholds for Flood Hazard Rating $H = d \times (v + 0.5) + DF$		Degree of Flood Hazard	Description
FD2321	FD2320		
<0.75	<0.75	Low	Caution - "Flood zone with shallow flowing water or deep standing water"
0.75 - 1.25	0.75 - 1.25	Moderate	Dangerous for some (i.e. children) - "Danger: Flood zone with deep or fast flowing water"
1.25 - 2.5	1.25 - 2.0	Significant	Dangerous for most people - "Danger: flood zone with deep fast flowing water"
>2.5	>2.0	Extreme	Dangerous for all - "Extreme danger: flood zone with deep fast flowing water"

The final difference between Table 13.1 in FD2320/TR2 and Figure 3.2 of FD2321/TR1 is the use of smaller increments of depth, so that lower depths are presented more fully in FD2320/TR2. This was felt to be more helpful for identifying what might be judged as acceptable depending on site specific circumstances.

Conclusions

Table 13.1 of FD2320 and Figure 3.2 of FD2321 look very similar but there are significant differences (see Table 3 of this paper). Either Table/Figure can be used as the basis for assessing the risks to people associated with different flood depths velocities and debris factors.

Table 3: comparison of Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1

	In Table 13.1 of FD2320/TR2	In Figure 3.2 of FD2321/TR1
The depths above 0.25m	Danger for some, most or all	For still water, up to 1.25m the hazard is low (In addition to hazard rating further calculation to include vulnerability aspect is recommended)
Debris factor	Debris factor of 0.5 has been applied for depths $\leq 0.25m$ and a debris factor of 1.0 has been used for depths $\geq 0.25m$.	In this case a Debris factor of zero applied (in addition to this further calculation is recommended using debris factor and the formulas)
HR Thresholds for "Dangerous for all" hazard classification	>2.0 (precautionary due to uncertainties and to avoid further calculation as FD2321)	>2.5
Increments of depth	Small increments at lower depths	Every 0.25 m

Table 13.1 of FD2320/TR2 is a simple method applies the precautionary principle and uses suitable assumptions (so that there is no need for further calculations) for application in the development planning and control context (see Table 4 of this paper - an extended version of table 13.1).

This table is recommended for development planning and control use.

Table 4 – Hazard to People Classification using Hazard Rating ($HR = d \times (v + 0.5) + DF$) for (Source Table 13.1 of FD2320/TR2 - Extended version)

HR	Depth of flooding - d (m)												
	DF = 0.5				DF = 1								
Velocity v (m/s)	0.05	0.10	0.20	0.25	0.30	0.40	0.50	0.60	0.80	1.00	1.50	2.00	2.50
0.0	0.03 + 0.5 = 0.53	0.05 + 0.5 = 0.55	0.10 + 0.5 = 0.60	0.13 + 0.5 = 0.63	0.15 + 1.0 = 1.15	0.20 + 1.0 = 1.20	0.25 + 1.0 = 1.25	0.30 + 1.0 = 1.30	0.40 + 1.0 = 1.40	0.50 + 1.0 = 1.50	0.75 + 1.0 = 1.75	1.00 + 1.0 = 2.00	1.25 + 1.0 = 2.25
0.1	0.03 + 0.5 = 0.53	0.06 + 0.5 = 0.56	0.12 + 0.5 = 0.62	0.15 + 0.5 = 0.65	0.18 + 1.0 = 1.18	0.24 + 1.0 = 1.24	0.30 + 1.0 = 1.30	0.36 + 1.0 = 1.36	0.48 + 1.0 = 1.48	0.60 + 1.0 = 1.60	0.90 + 1.0 = 1.90	1.20 + 1.0 = 2.20	1.50 + 1.0 = 2.55
0.3	0.04 + 0.5 = 0.54	0.08 + 0.5 = 0.58	0.15 + 0.5 = 0.65	0.19 + 0.5 = 0.69	0.23 + 1.0 = 1.23	0.30 + 1.0 = 1.30	0.38 + 1.0 = 1.38	0.45 + 1.0 = 1.45	0.60 + 1.0 = 1.60	0.75 + 1.0 = 1.75	1.13 + 1.0 = 2.13	1.50 + 1.0 = 2.50	1.88 + 1.0 = 2.88
0.5	0.05 + 0.5 = 0.55	0.10 + 0.5 = 0.60	0.20 + 0.5 = 0.70	0.25 + 0.5 = 0.75	0.30 + 1.0 = 1.30	0.40 + 1.0 = 1.40	0.50 + 1.0 = 1.50	0.60 + 1.0 = 1.60	0.80 + 1.0 = 1.80	1.00 + 1.0 = 2.00	1.30 + 1.0 = 2.50	2.00 + 1.0 = 3.00	2.50 + 1.0 = 3.50
1.0	0.08 + 0.5 = 0.58	0.15 + 0.5 = 0.65	0.30 + 0.5 = 0.80	0.38 + 0.5 = 0.88	0.45 + 1.0 = 1.45	0.60 + 1.0 = 1.60	0.75 + 1.0 = 1.75	0.90 + 1.0 = 1.90	1.20 + 1.0 = 2.20	1.50 + 1.0 = 2.50	2.25 + 1.0 = 3.25	3.00 + 1.0 = 4.00	3.75 + 1.0 = 4.75
1.5	0.10 + 0.5 = 0.60	0.20 + 0.5 = 0.70	0.40 + 0.5 = 0.90	0.50 + 0.5 = 1.00	0.60 + 1.0 = 1.60	0.80 + 1.0 = 1.80	1.00 + 1.0 = 2.00	1.20 + 1.0 = 2.20	1.60 + 1.0 = 2.60	2.00 + 1.0 = 3.00	3.00 + 1.0 = 4.00	4.00 + 1.0 = 5.00	5.00 + 1.0 = 6.00
2.0	0.13 + 0.5 = 0.63	0.25 + 0.5 = 0.75	0.50 + 0.5 = 1.00	0.63 + 0.5 = 1.13	0.75 + 1.0 = 1.75	1.00 + 1.0 = 2.00	1.25 + 1.0 = 2.25	1.50 + 1.0 = 2.50	2.00 + 1.0 = 3.00	3.50	4.75	6.00	7.25
2.5	0.15 + 0.5 = 0.65	0.30 + 0.5 = 0.80	0.60 + 0.5 = 1.10	0.75 + 0.5 = 1.25	0.90 + 1.0 = 1.90	1.20 + 1.0 = 2.20	1.50 + 1.0 = 2.50	1.80 + 1.0 = 2.80	3.40	4.00	5.50	7.00	8.50
3.0	0.18 + 0.5 = 0.68	0.35 + 0.5 = 0.85	0.70 + 0.5 = 1.20	0.88 + 0.5 = 1.38	1.05 + 1.0 = 2.05	1.40 + 1.0 = 2.40	1.75 + 1.0 = 2.75	3.10	3.80	4.50	6.25	8.00	9.75
3.5	0.20 + 0.5 = 0.70	0.40 + 0.5 = 0.90	0.80 + 0.5 = 1.30	1.00 + 0.5 = 1.50	1.20 + 1.0 = 2.20	1.60 + 1.0 = 2.60	3.00	3.40	4.20	5.00	7.00	9.00	11.00
4.0	0.23 + 0.5 = 0.73	0.45 + 0.5 = 0.95	0.90 + 0.5 = 1.40	1.13 + 0.5 = 1.63	1.35 + 1.0 = 2.35	1.80 + 1.0 = 2.80	3.25	3.70	4.60	5.50	7.75	10.00	12.25
4.5	0.25 + 0.5 = 0.75	0.50 + 0.5 = 1.00	1.00 + 0.5 = 1.50	1.25 + 0.5 = 1.75	1.50 + 1.0 = 2.50	2.00 + 1.0 = 3.00	3.50	4.00	5.00	6.00	8.50	11.00	13.50
5.0	0.28 + 0.5 = 0.78	0.60 + 0.5 = 1.10	1.10 + 0.5 = 1.60	1.38 + 0.5 = 1.88	1.65 + 1.0 = 2.65	3.20	3.75	4.30	5.40	6.50	9.25	12.00	14.75
Flood Hazard Rating (HR)		Colour Code		Hazard to People Classification									
Less than 0.75				Very low hazard - Caution									
0.75 to 1.25				Danger for some – includes children, the elderly and the infirm									
1.25 to 2.0				Danger for most – includes the general public									
More than 2.0				Danger for all – includes the emergency services									

UK Locations

Ash Vale
Birmingham
London
Wakefield

