



Flood Risk Assessment

Land Opposite 26 Lodge Lane, Keymer BN6 8NA

Client

Mrs Wakeham

Ref: 13895

Date: December 2025

Consulting Engineers

GTA Civils & Transport Limited

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192-198 London Road

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Issue	Issue date	Compiled	Checked
Preliminary Issue	27 November 2025	JP	FVV / MR
First Issue	15 December 2025	JP	FVV / MR

1 Introduction

- 1.1 This report has been prepared for Mrs Wakeham in relation to the application for Full Planning Permission for land opposite 26 Lodge Lane, Keymer BN6 8NA. No responsibility is accepted to any third party for all or part of this study in connection with this or any other development.
- 1.2 GTA Civils & Transport Limited was appointed by the client to provide a Flood Risk Assessment (FRA) to support a Planning Application for demolition of a domestic garage and building a detached outbuilding for use as an office/workroom and utility space.
- 1.3 This report will take the form of a formal Flood Risk Assessment in accordance with the 2025 National Planning Policy Framework (NPPF) and the current Planning Practice Guidance (PPG).

2 Existing Site and Current Flood Risk

- 2.1 The application site lies within Keymer village, which is administered by Mid Sussex District Council. The application site comprises a single garage flanked by 2-storey dwellings. Site location maps and an aerial view are shown in **Appendix A**.
- 2.2 Topography: a topographic survey is shown in **Appendix C**. The site is relatively flat and level with external levels ranging between - approximately – 51.09m AOD and 50.77m AOD. (There is a SE – NW slope, albeit at a very shallow gradient over the wider context, looking at lidar mapping online.)
- 2.3 Hydrology: The site lies within the catchment area of the Herrings Stream, a tributary of the River Adur. There are various unnamed ditches to the NW of the site that flow north and northwest to the Herrings Stream. The nearest watercourse shown on the OS maps is approximately 100m to the west; this is culverted in many sections.
- 2.4 Geology: the BGS online mapping shows this area is underlain by Gault Formation (mudstone); there are no drift deposits recorded in this area.
- 2.5 Soil soakage testing was undertaken on site at one location on 20/10/25. The pit was filled 3 times and the emptying was timed – refer to the results page and graphs in **Appendix D**. The first test was the slowest, which would indicate that the pressure from this opened fissures in the soil, even if only slightly. The lowest calculated soakage rate (test 1) is 2.45×10^{-6} m/s.
- 2.6 Surface Water drainage from the garage is assumed to drain via gravity to a house soakaway.
- 2.7 Fluvial flooding: the Environment Agency's Rivers and Seas Flood Map in **Appendix B** shows the site falling within in Flood Zone 3 (FZ3) – High Risk. Fluvial sites in FZ3 are susceptible to an annual exceedance probability (AEP) from rivers and watercourses of more than 1 in 100 years (>1% AEP).
- 2.8 Tidal flooding: This inland site lies many kilometres from the nearest tidally influenced river.
- 2.9 The EA's modelled data-pack (in **Appendix B**) shows the modelled fluvial outputs for this site. The flood levels and depths are displayed at 5 nodes around the site, with #3 near to the centre and #1 and #2 to the NW and NE respectively (#4 and #5 covering the SW and SE corner).
- 2.10 Only the undefended scenario has been modelled because this area does not benefit from defences. The 3 levels of climate change (35%, 45% and 105%) used in this model are out of date; these are now determined on a river catchment basis. The site lies in the Adur and Ouse Management Catchment. The correct level of climate change to be used for a site in FZ3 for development whose design life extends

beyond the 2080s is 37%. As there is very little variation in flood level between no CC and 105% CC it is safe to equate the 35% flood levels with 37% CC. These range between 50.96m and 50.81m AOD at nodes #2 and #4 respectively. The key nodes are #3 and #5 as the centre of the proposed unit falls approximately halfway between these. The interpolated flood level is $(50.95 + 50.93 \div 2 =)$ **50.94m AOD**.

- 2.11 Surface water flooding: this *can* occur when excess rainwater does not infiltrate into the ground, or is not intercepted by urban drainage systems, and instead flows across the surface. The EA's surface water flood maps in **Appendix B** show the current day and 2040-2060 scenarios. It is clear from the flood patterns on these maps that this source of flood risk has less impact than the fluvial risk, with shallower flood levels/depths.
- 2.12 Artificial sources: flooding from reservoirs, canals and docks. The EA's reservoir flooding map in **Appendix B** shows the site is not liable to flood from this source. There are no docks or canals close to the site.
- 2.13 The EA's Historical Flood Map in **Appendix B** confirms that this area is removed from the nearest flooding.
- 2.14 Groundwater Flooding: such flooding may occur when groundwater rises up from the underlying aquifer to flood subsurface infrastructure or to emerge at the ground surface. The EA's Groundwater Vulnerability Zones (GWVZ) and Groundwater Source Protection Zones (GWPZ) maps are shown in **Appendix B**. The site is removed from the nearest SPZ and the Groundwater Vulnerability Zones map shows the site overlies an unproductive zone. The risk of flooding from this source is Low.
- 2.15 In summary the flood risk profile of this site is High: the critical predicated maximum fluvial flood depth (in the 100yrs + 37% CC storm) is 0.06m (at #2: 50.96m – 50.90m); the maximum surface water flood depth (estimated from the EA's various SW flood maps) is 0.25m.

3 Proposed Development & Flood Risk Mitigation

- 3.1 The proposed Planning Application is to demolish the garage and build an outbuilding for use as an office/workroom and utility space. See Appendix D for the proposed site layout drawing.
- 3.2 Garages, offices and ancillary space are all classed as **Less Vulnerable** in Appendix C of the NPPF. There is no increase in vulnerability, therefore. The proposed increase in building footprint constitutes the only increase in flood risk between pre- and post-development scenarios.
- 3.3 The Sequential Test: the proposed development, according to Table 3 of the NPPF's Appendix C, is allowed, subject to passing the Sequential Test. This procedure lies outside the scope of this report. This report's main role is to demonstrate that the development a) will be **safe** over its predicted lifetime and b) will not increase flood risks elsewhere.
- 3.4 For compliance with the NPPF, habitable accommodation in *new* developments must be set 0.3m above the critical flood level. The building's floor level will be set at 0.3m above the critical fluvial flood level of 50.94, ie **51.24m AOD**.
- 3.5 Proposed Flood Resistance: A demountable flood barrier (with a minimum height of 0.45m to extend above 51.24m AOD) shall be fitted in front of each external door.
- 3.6 Floodplain volume: to offset the loss of surface water floodplain, there will be a floodable void set under the ground floor, which shall be suspended and flood resilient, eg beam and block or similar. There is no land within this site in FZ1 to lower, thereby leaving only a floodable void as the only way to balance the displaced flood volume.
- 3.7 The soffit of the void shall be set at or above the predicted flood level of 51.10m AOD. There will be a minimum of 20% (1m in 5m) openings over the external perimeter (walls) to minimise impedance of the floodplain. All openings shall be fitted with mesh or louvres to stop vermin and birds from entering this space. The base of the void space shall be of oversite concrete, which shall be trowelled smooth with a 1 in 60 slope down to a drain that connects to the house's surface water drainage.
- 3.8 Safe Access to Dry Land: Occupants will be able to reside safely above the flood level. As this is ancillary to the main unit occupants would make their way to the main house, if unduly inclement weather set in. (If minded to do so, occupants can make their way safely to dry land - as the route east and then either north or south along Lodge Lane is in FZ1.)
- 3.9 As set out in Section 2.5 above, the lowest of the 3 tests' soil soakage rate is 2.45×10^{-6} m/s. The total contributing area is 82m², which include the roof, gravel parking area and porous paved area next to the

unit. 10% allowance for urban creep has been added to the roof area.

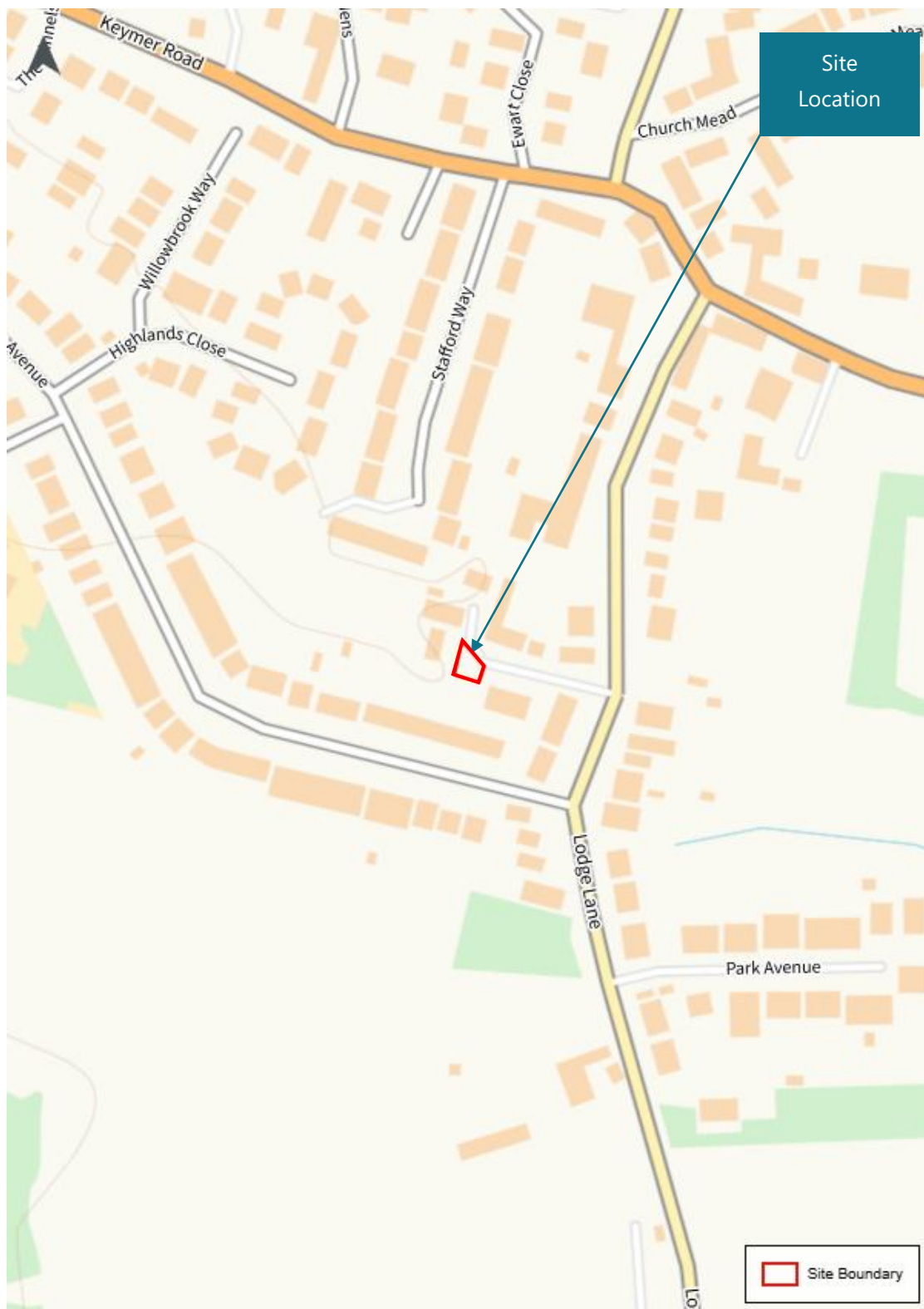
- 3.10 A Flow drainage calculation is shown in Appendix E. This shows that the storage volume needed is 8.9m³ in the critical '100 years plus 45% CC' storm event. FEH22 hydrological data and Cv values of 1.0 have been used. The soil's soakage rate has been rounded downwards to 2 x 10⁻⁶m/s – as a conservative measure, given that the slowest test was the first, which is unusual.
- 3.11 The design of the porous paved areas will be finalised during the next stage: it is likely that a cellular soakaway shall be placed underneath the sub-base.
- 3.12 Treatment: The discharge from the roofs will be of low hazard so no treatment is needed. The discharge from the pavings shall be through the sub-base layers. The mitigation indices of porous pavings are equal or greater than the pollution indices for a residential development – according to CIRIA C753, the SuDS Manual.
- 3.13 Conclusion

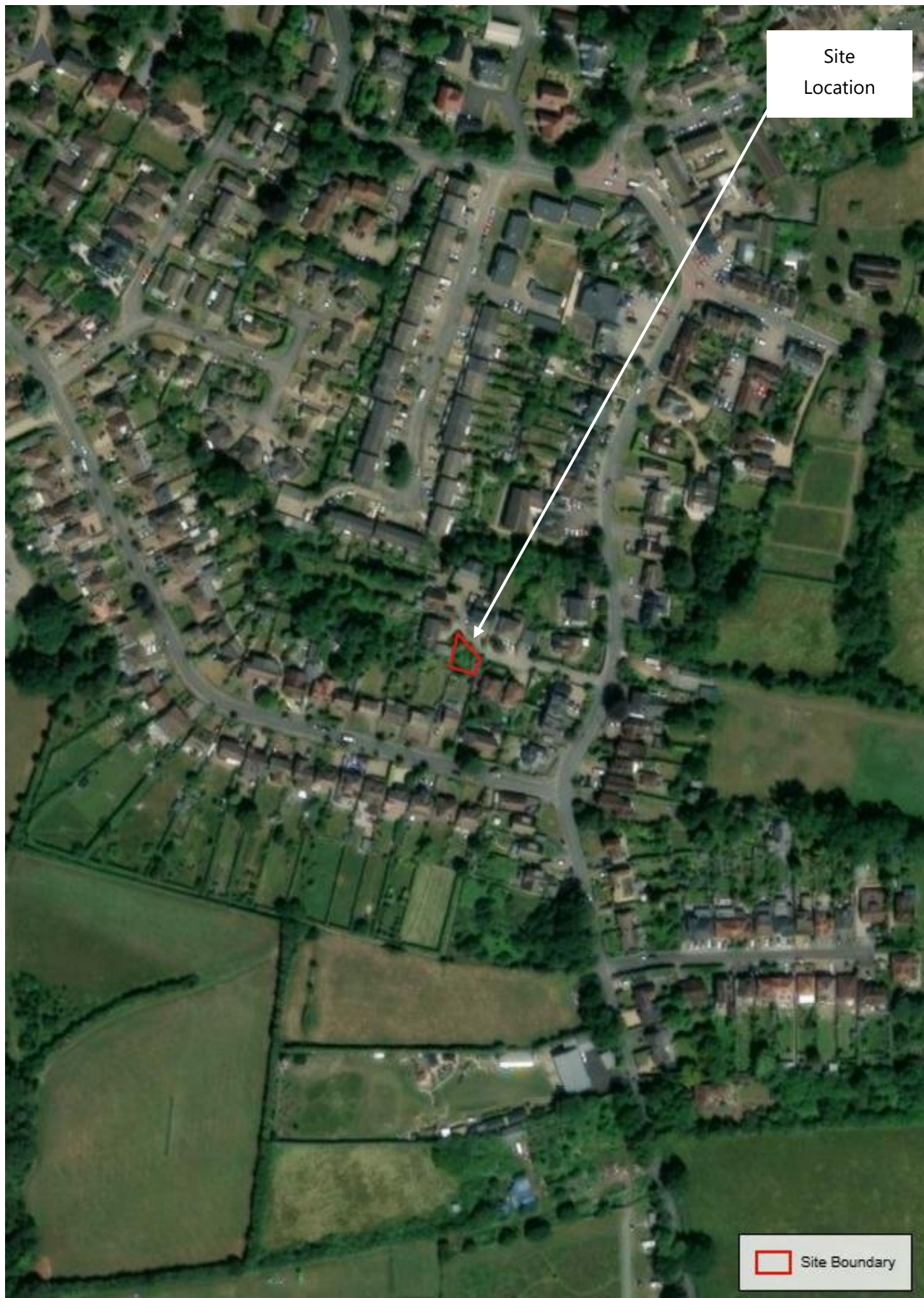
This development will not increase the flood risk, either on this site or to neighbouring properties, and so complies fully with the 2025 NPPF and current PPG.

- End of Report -

Appendix A

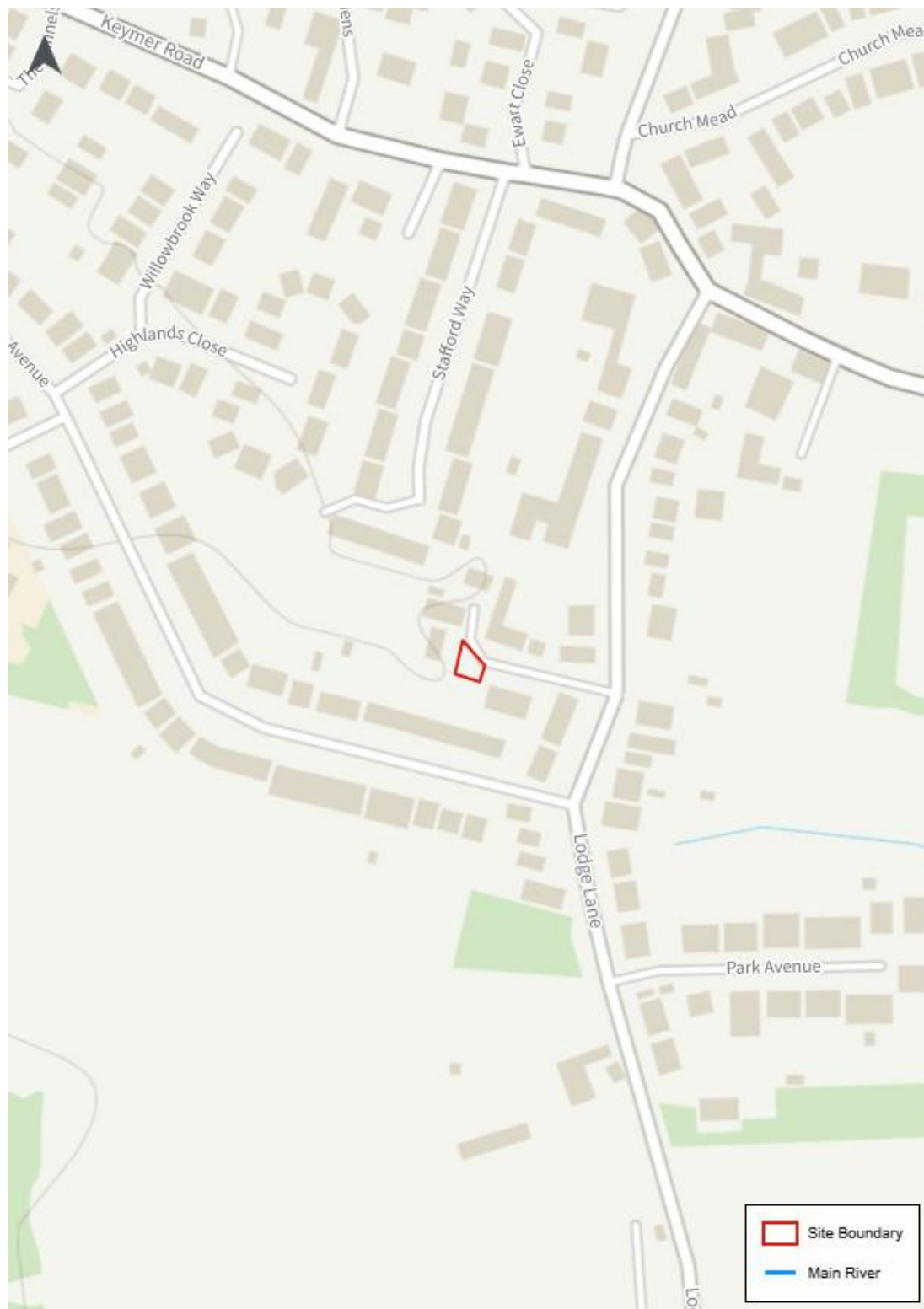
Site Location Map & Aerial Photo



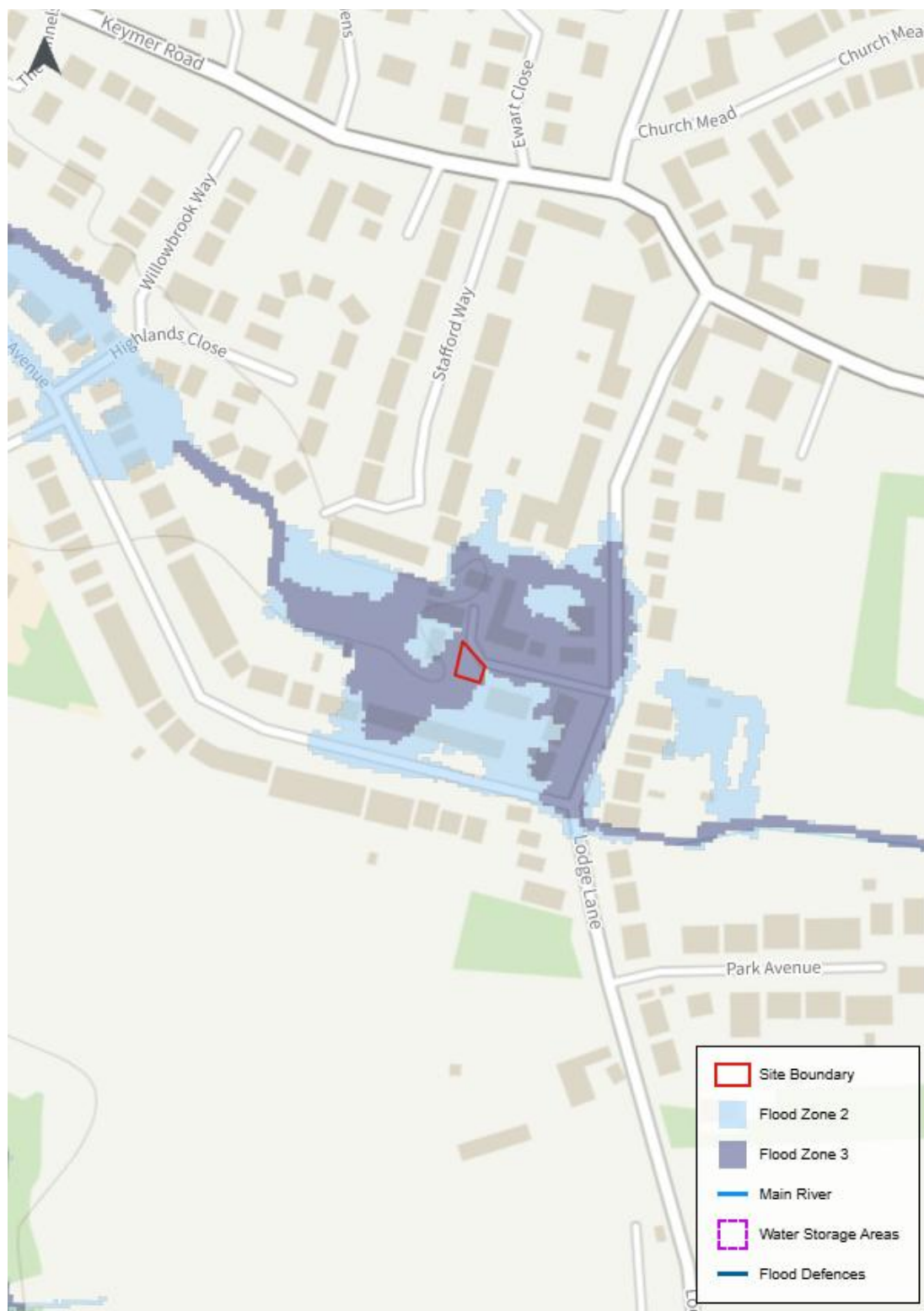


Appendix B

Environment Agency Flood Data

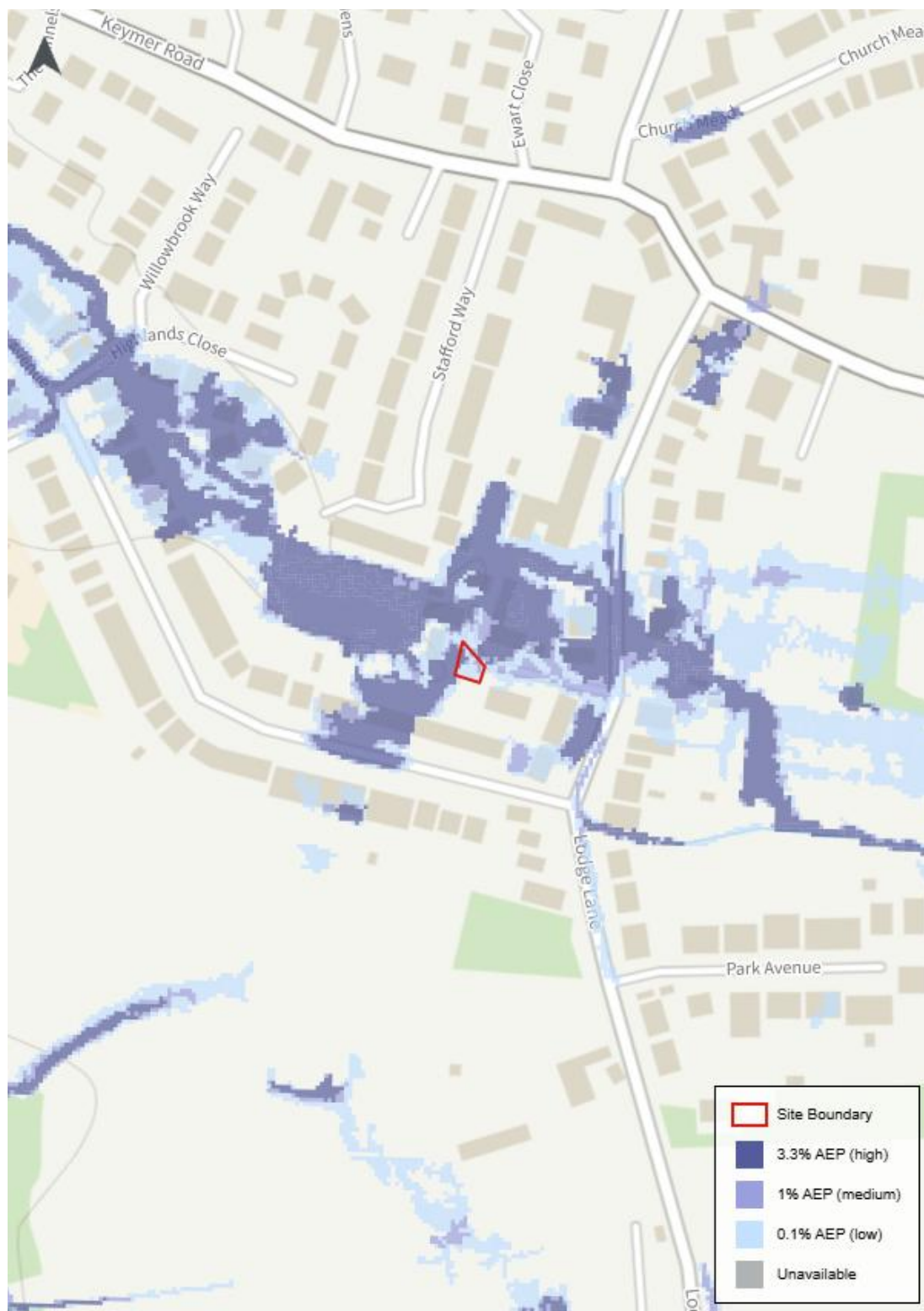


Environment Agency Main Rivers Map

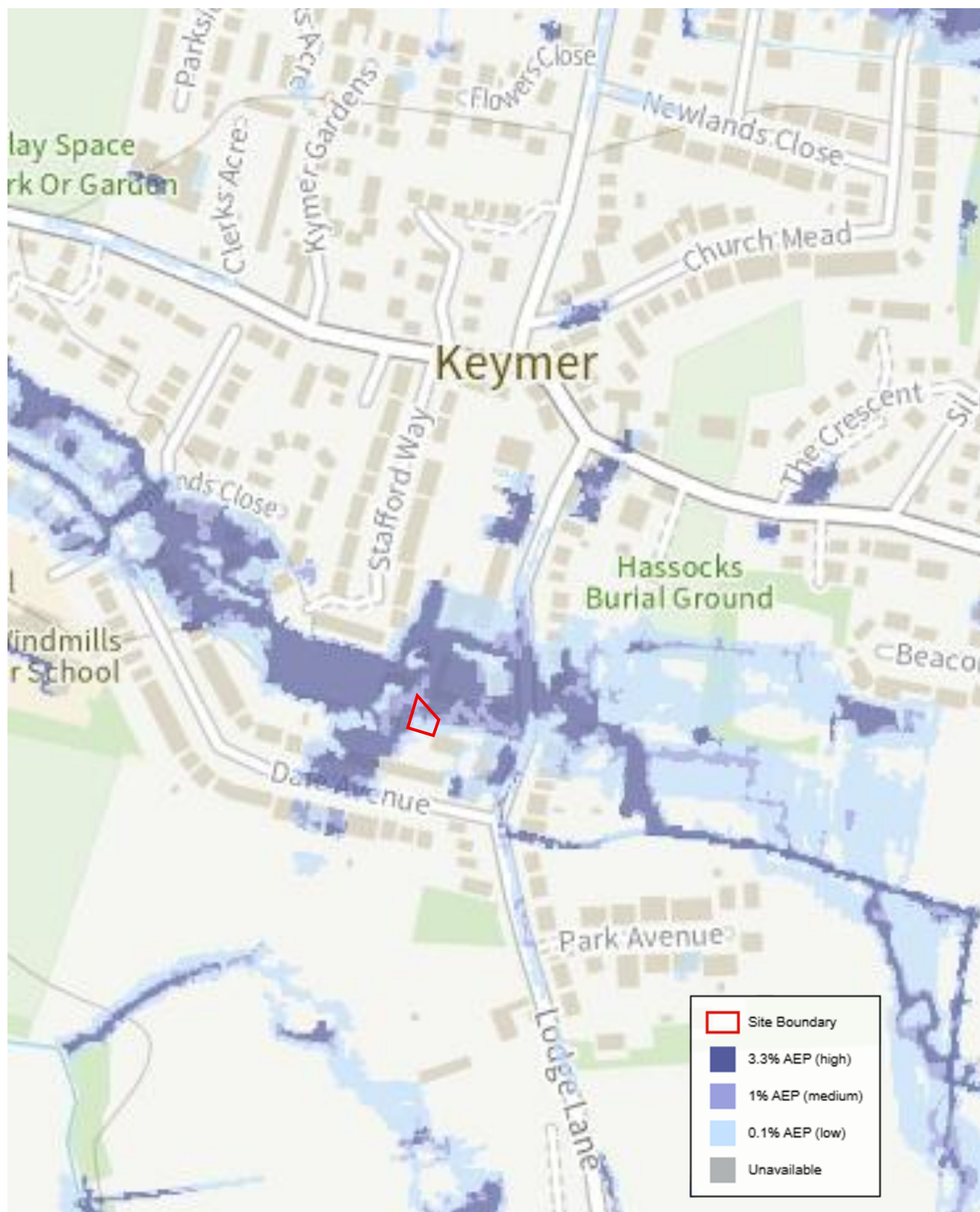


Environment Agency Flood Map for Planning

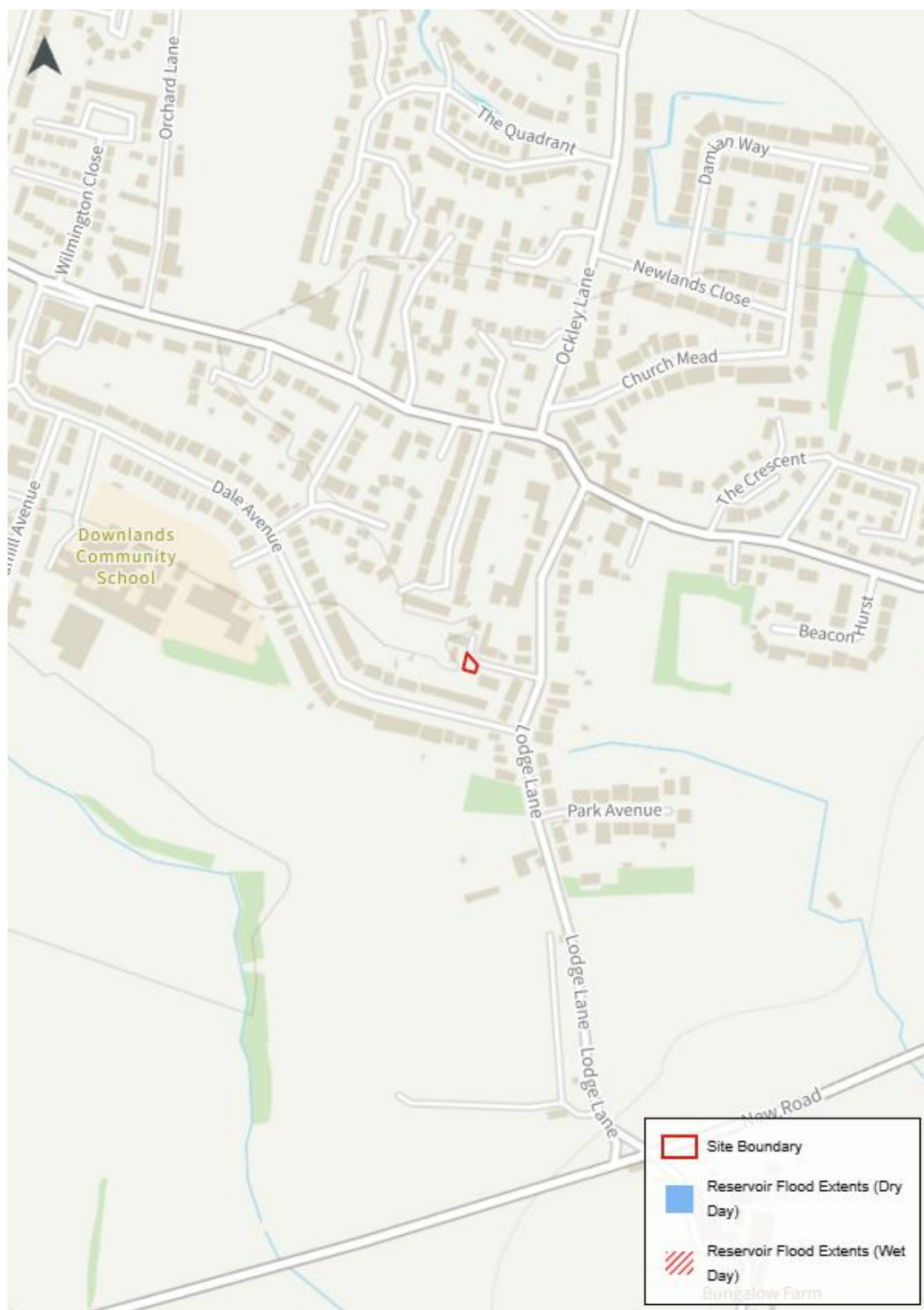
The site lies in Flood Zone 3



EA Surface Water Flood Extents Map (Yearly Chance of Flooding)

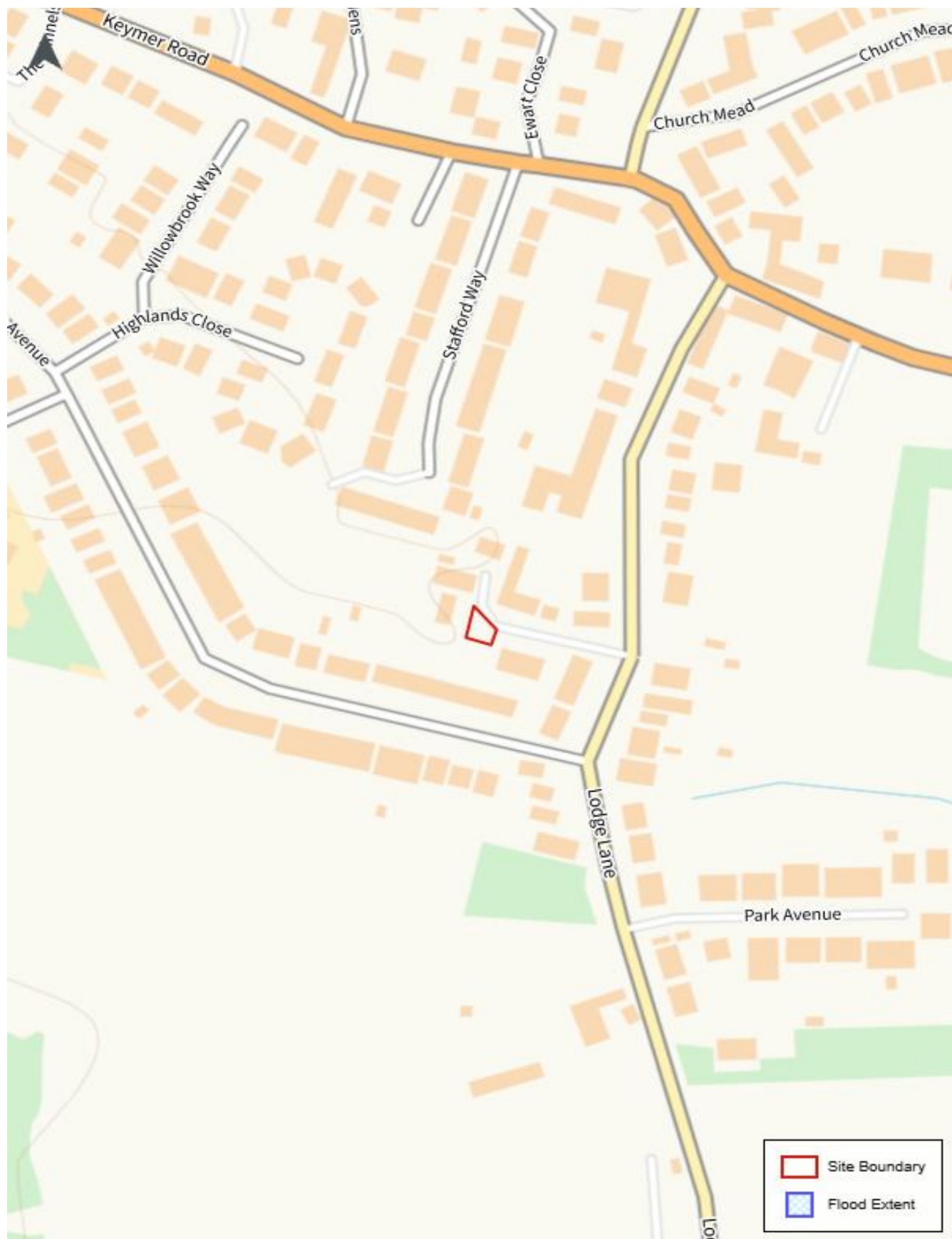


EA Surface Water Flood Extents Map (Yearly Chance of Flooding Between 2040 and 2060)



Environment Agency Flood Risk from Reservoirs

The site is clear from the risk of flooding from this source



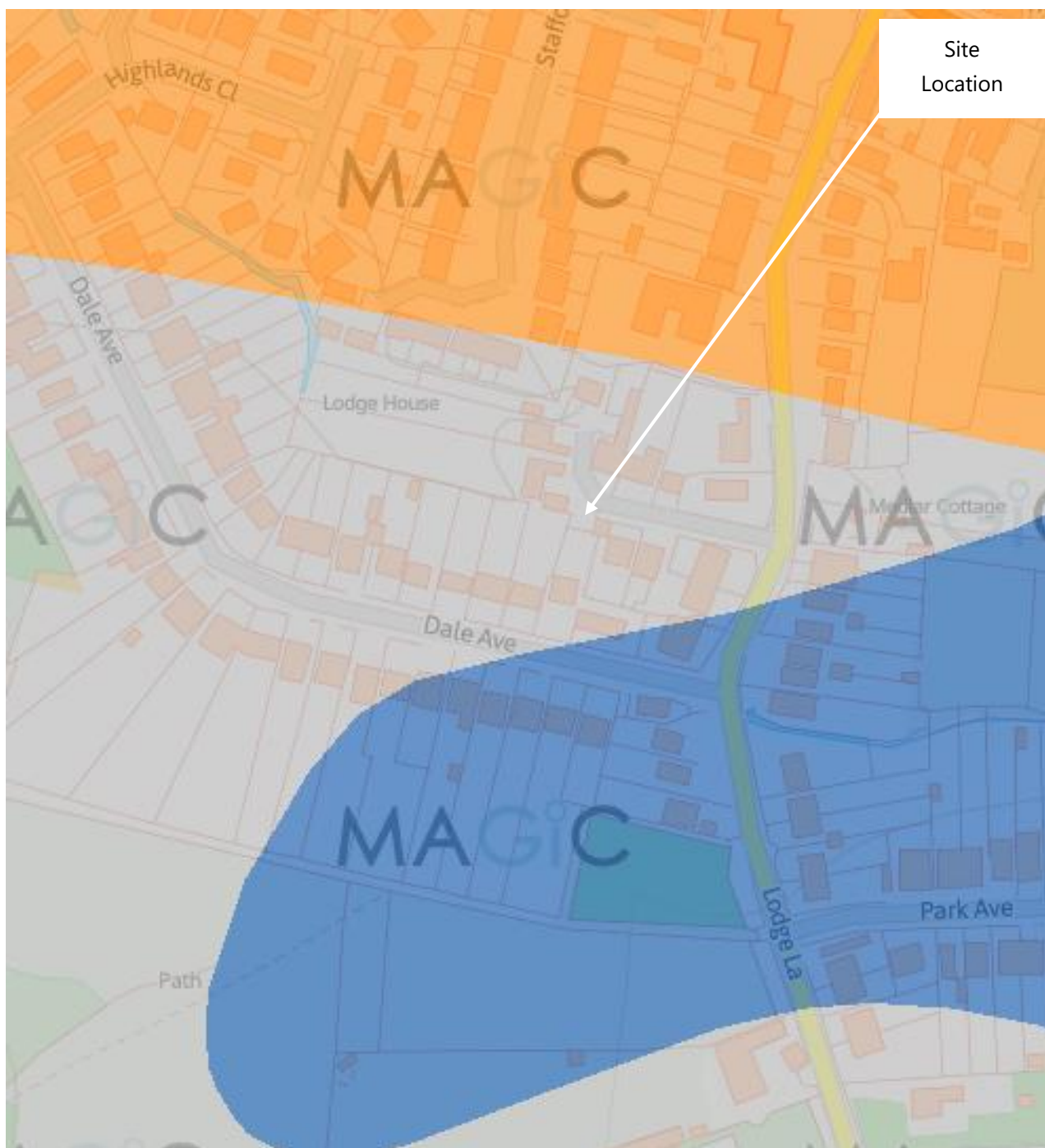
DEFRA Historical Flooding Map

Neither this site nor anywhere in the vicinity has been affected by flooding in the past



Environment Agency Groundwater Source Protection Zones Map

The site is removed from the nearest such zone

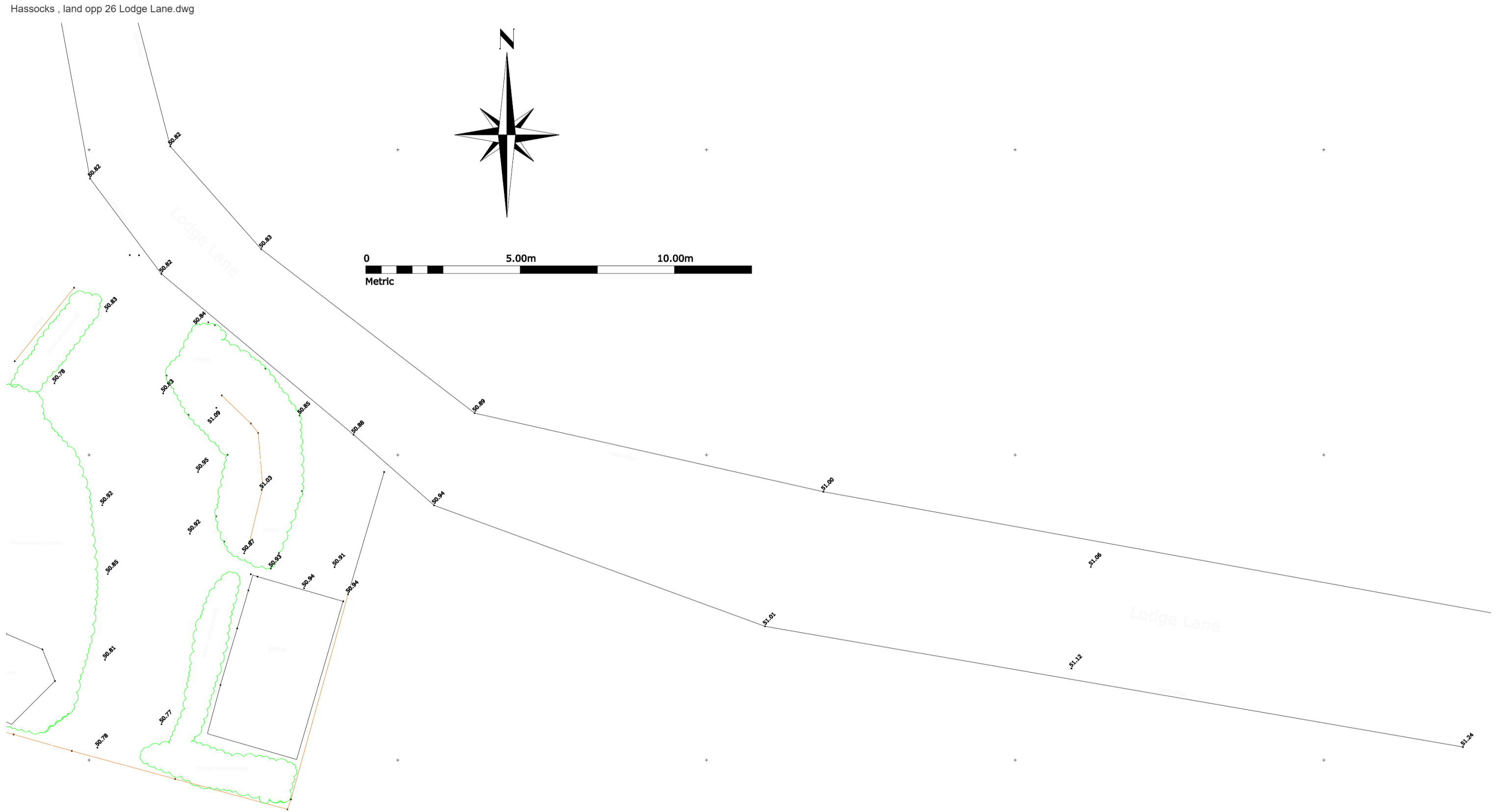


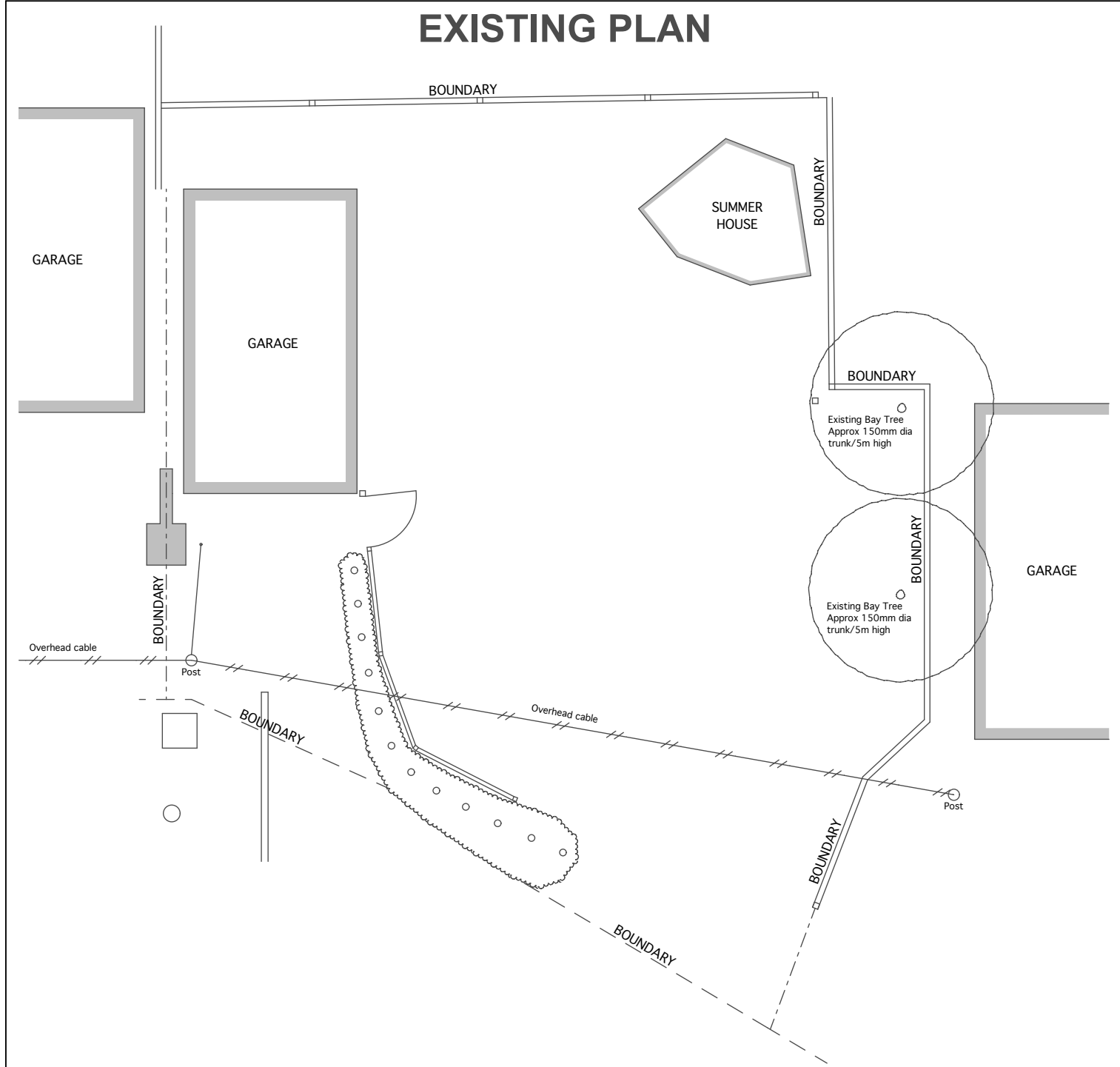
Environment Agency Online Groundwater Vulnerability Zones Map

The application site overlies an 'Unproductive' Groundwater Vulnerability Zone

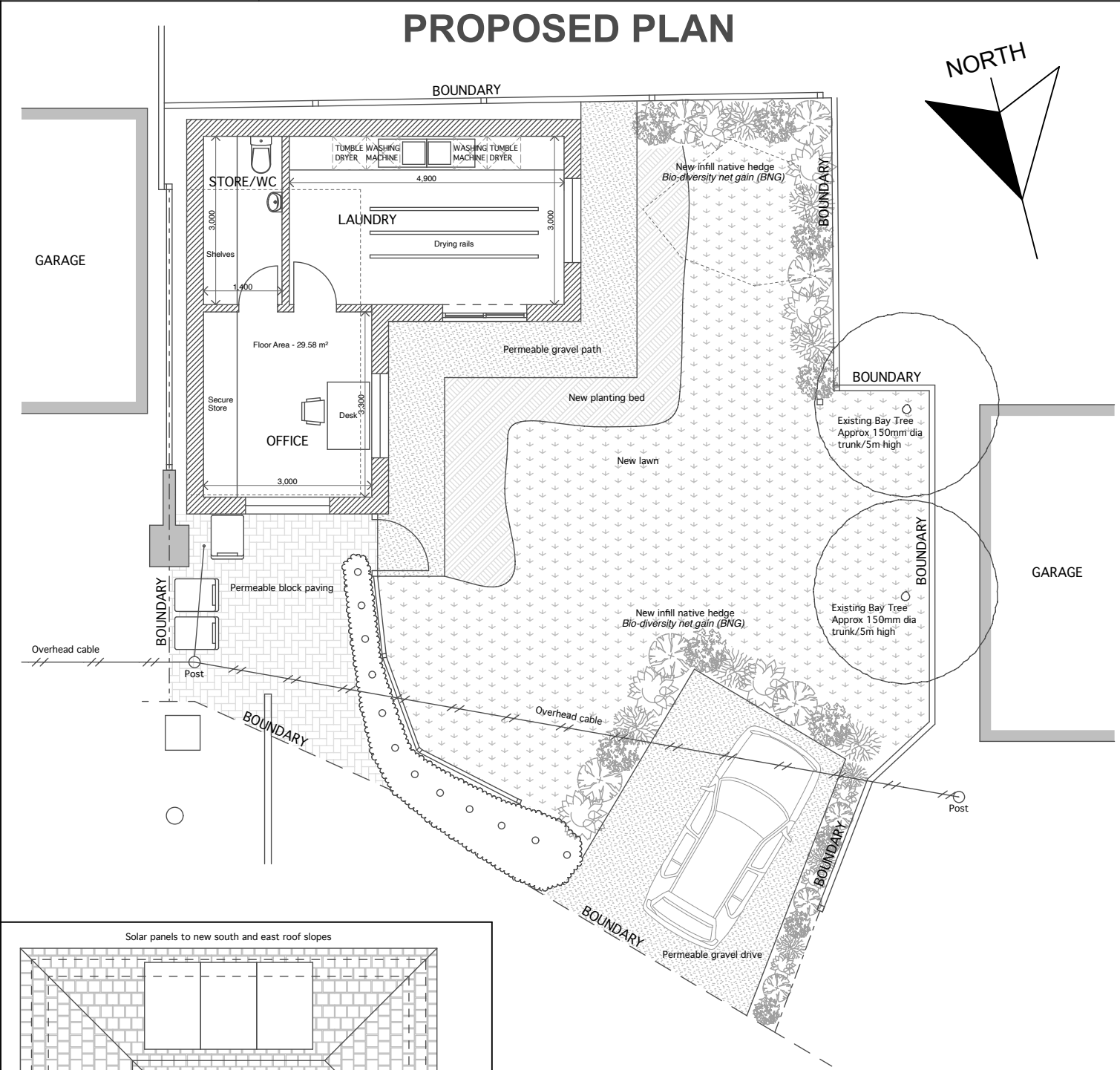
Appendix C

Topographic Survey & Architect's Scheme Drawings

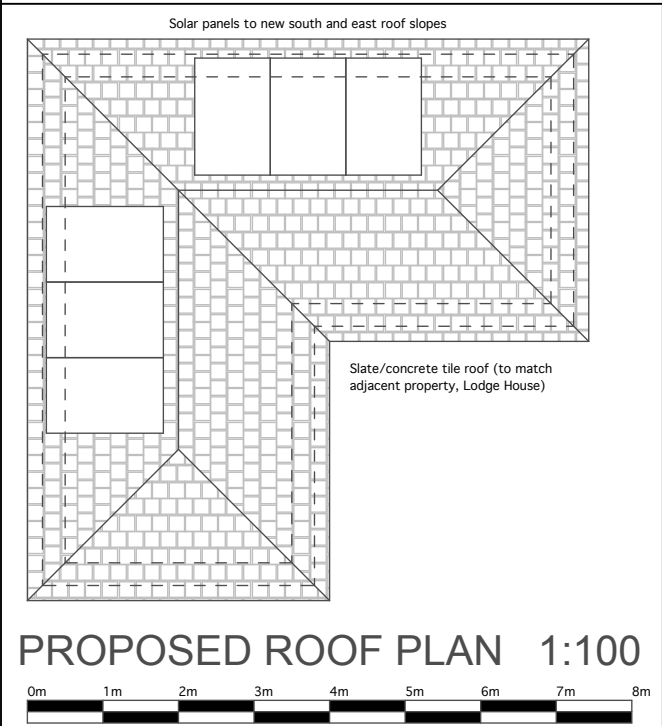




EXISTING GROUND FLOOR PLAN 1:100

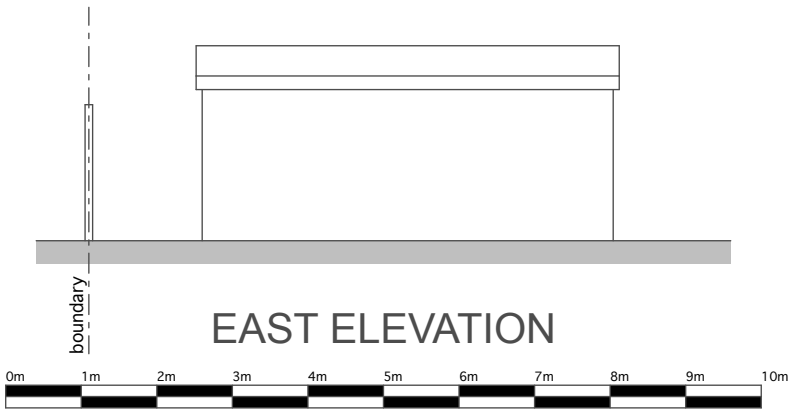
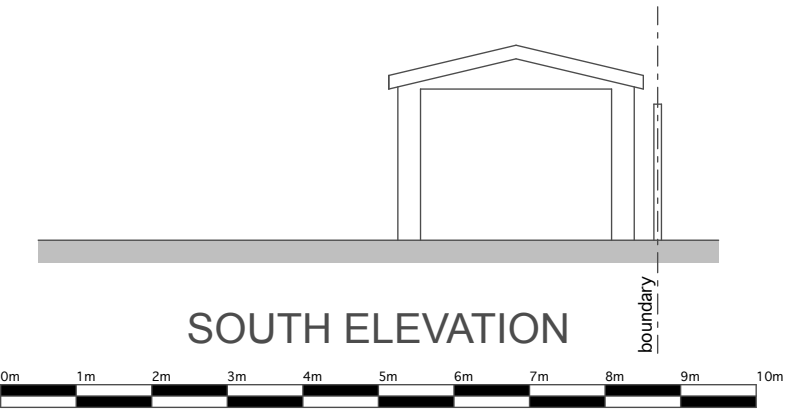
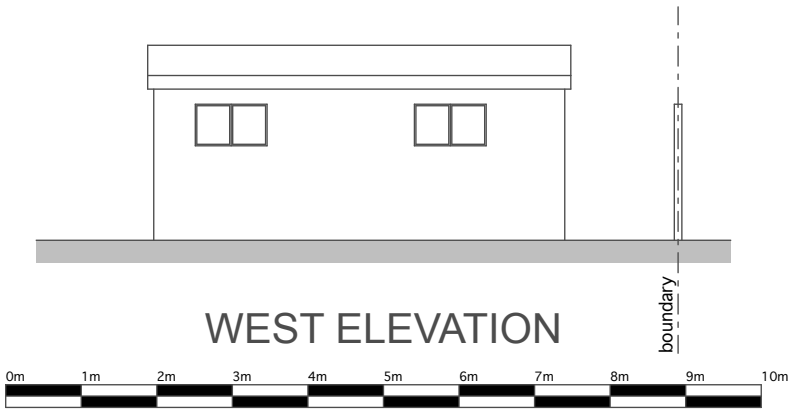
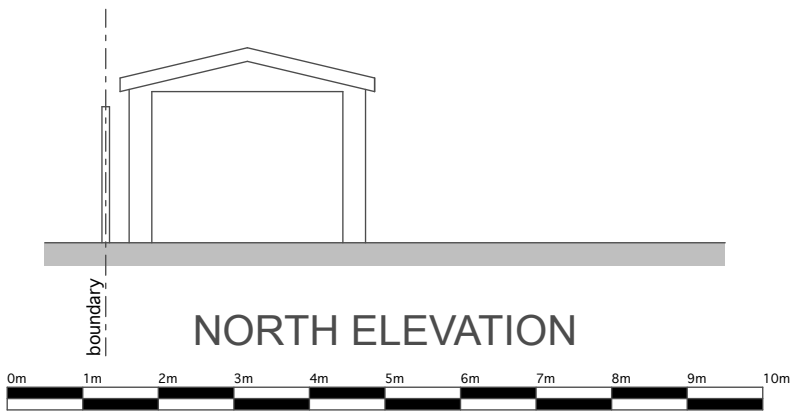


PROPOSED GROUND FLOOR PLAN 1:100

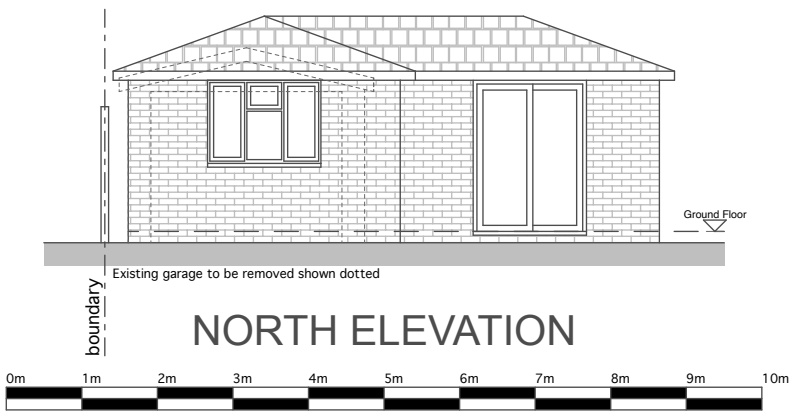


PROPOSED ROOF PLAN 1:100

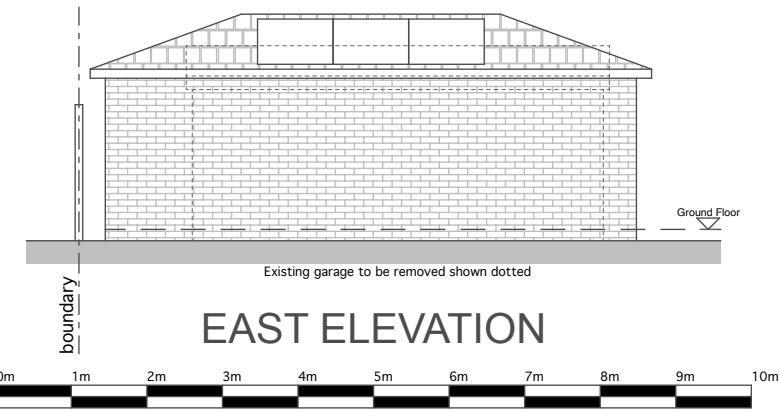
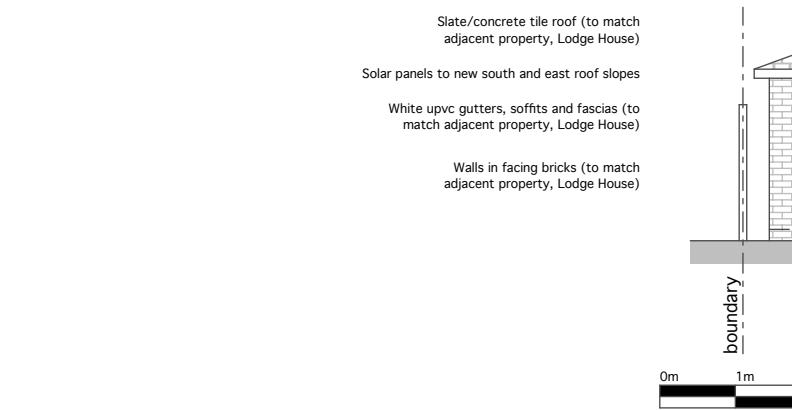
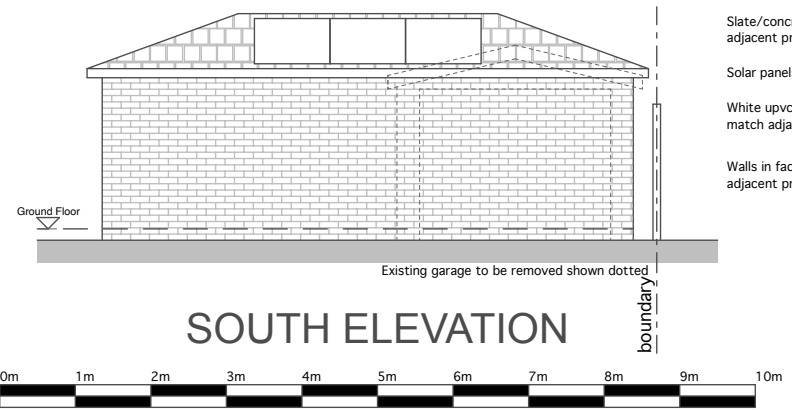
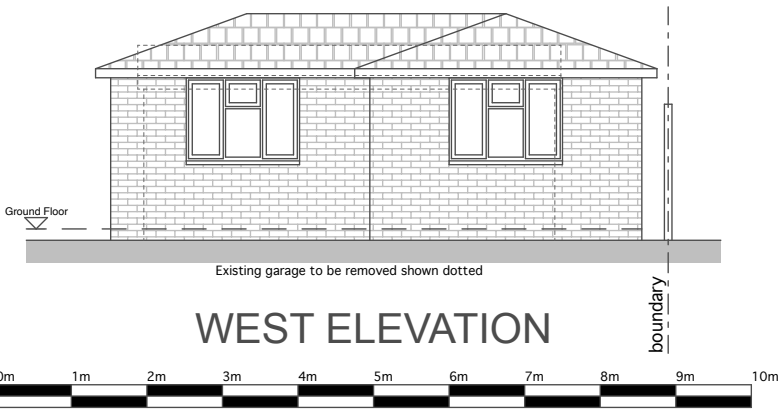
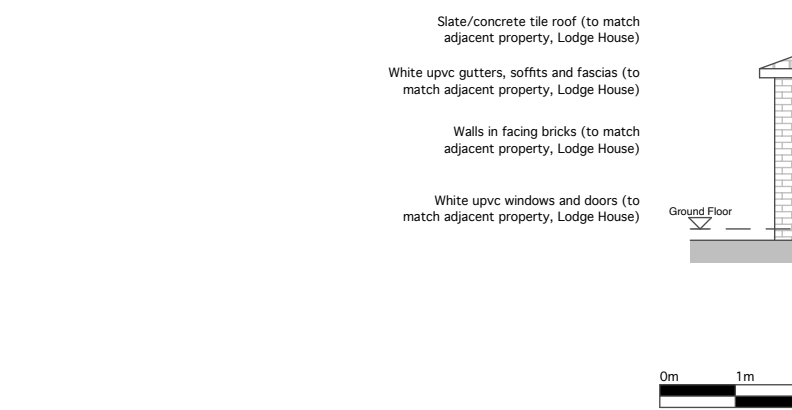
EXISTING ELEVATIONS



PROPOSED ELEVATIONS

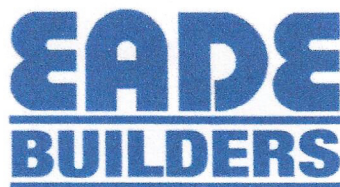


- Slate/concrete tile roof (to match adjacent property, Lodge House)
- White upvc gutters, soffits and fascias (to match adjacent property, Lodge House)
- Walls in facing bricks (to match adjacent property, Lodge House)
- White upvc windows and doors (to match adjacent property, Lodge House)



Appendix D

BRE 365 Soil Soakage Test Results & Graphs



Mr & Mrs J & B Wakeham
Swallow field House
Keymer Road,
Keymer Hassocks,
Sussex
BN6 8QU

Est. 1975

Page 1 of 3

7 Nov 25

**Results of Infiltration Test at 26 Lodge Lane Keymer
Carried out week Commencing 20 Oct 2025**

Dear Mr & Mrs Wakeham

20 10 25 Excavation of test hole 1550deep x 1500long x 600wide
Last 18hrs of torrential rain with test hole exposed but no water in base the following morning.

First Test 21 10 25 Started test with following results Start depth 1550mm

Time	Elapsed Min	Water dip	Depth mm
10.42	0.0		1550
10.43	1.0		1540
10.44	2.0		1520
10.45	3.0		1510
10.46	4.0		1500
10.47	5.0		1485
10.49	7.0		1465
10.51	9.0		1445
10.54	12.0		1425
11.01	19.0		1400
11.20	38.0		1315
11.50	68.0		1250
12.20	98.0		1195
13.05	143.0		1140
13.35	173.0		1110
14.35	233.0		1070
16.00	318.0		1000
Next Morning			
09.00	1338.0		342

Second Test 22 10 2025

Time	Elapsed Min	Water dip	Depth
09.08	0.0		1550
09.10	2.0		1530
09.12	4.0		1515
09.14	6.0		1490
09.16	8.0		1475
09.20	12.0		1460

cont Page 2

NEW BUILDINGS ALTERATIONS HOUSEHOLD EXTENSIONS

Oak Cottage Spring Lane Clayton Hassocks Sussex BN6 9PN
Mobile: 07860 556939 Email: eadebuilders@hotmail.com
Proprietor: L.G.Eade. VAT No. 191 0597 56

cont Page 2

7 Nov 25

Second Test 22. 10. 2025

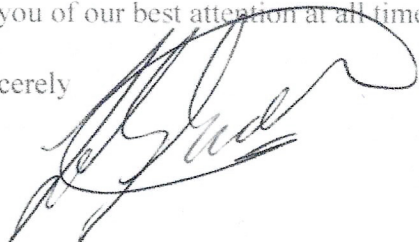
Time	Elapsed Min	Water dip	Depth mm
09.25	17.0		1430
09.30	22.0		1405
09.35	27.0		1385
09.40	32.0		1370
09.50	42.0		1335
10.00	52.0		1300
10.10	62.0		1275
10.20	72.0		1255
10.30	82.0		1230
11.00	112.0		1180
11.15	127.0		1155
12.00	172.0		1085
12.45	217.0		1040
13.30	262.0		995

Third Test 22 10 2025

Time	Elapsed Min	Water dip	Depth mm
13.35	0.0		1550
13.36	1.0		1540
13.37	2.0		1530
13.38	3.0		1520
13.40	5.0		1515
13.42	7.0		1510
13.44	9.0		1500
13 46	11.0		1495
13 48	13.0		1485
13 50	15.0		1480
13.55	20.0		1460
14.00	25.0		1440
14.05	30.0		1420
14.15	40.0		1390
14.25	50.0		1365
14.35	60.0		1280
15.15	100.0		1255
16.25	170.0		1135
17.43	248.0		1040

Heavey Rain over night on 23rd and pit in the morning at 08 55hrs water depth 460mm
24th @10.30hrs pit dry after heavy overnight rain then back filled
Assuring you of our best attention at all times.

Yours sincerely
L G Eade



Results of Infiltration Test at 26 Lodge Lane Keymer: 20/10/25 - 22/10/25

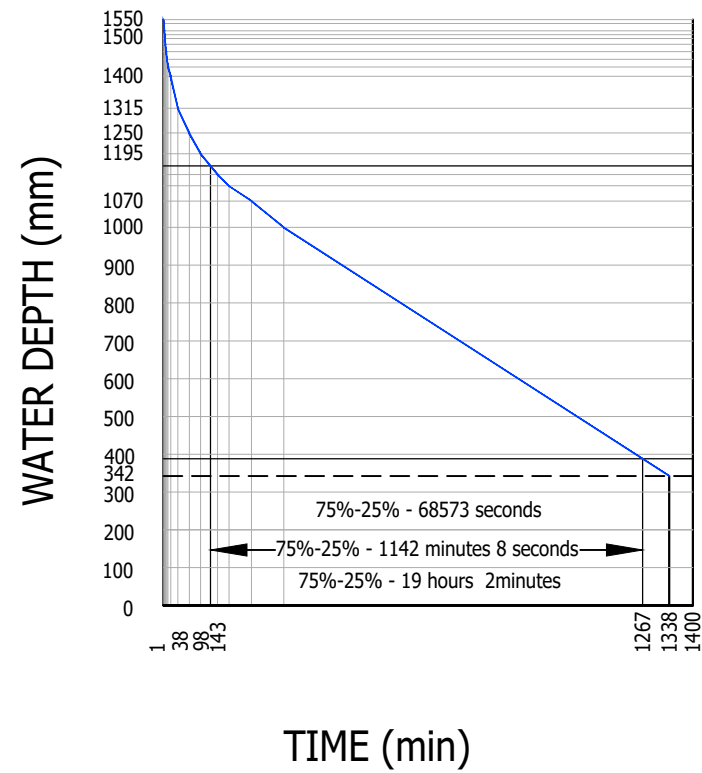
Test hole: 1550 x 1500 x 600; capacity 1600lts

Excavated material mix of topsoil, flint, sand, chalk and clay.

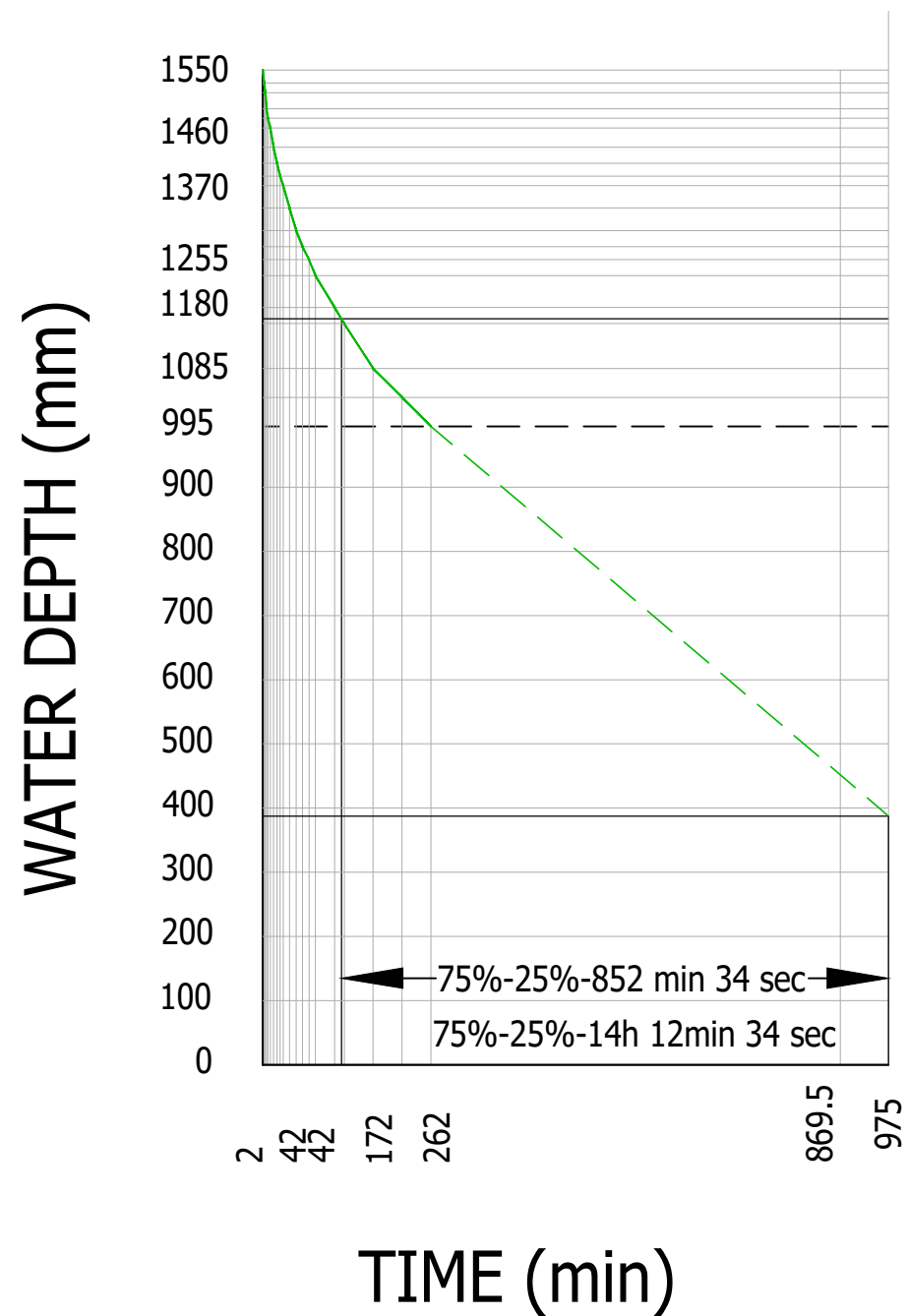
Test carried out during week of high rainfall.



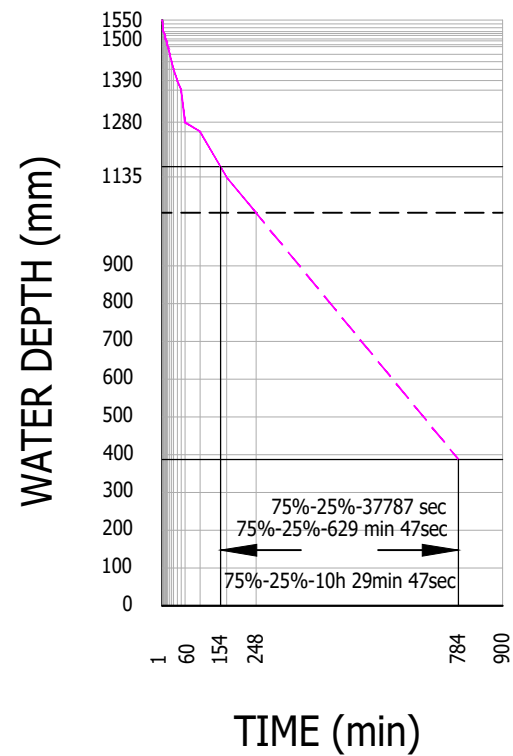




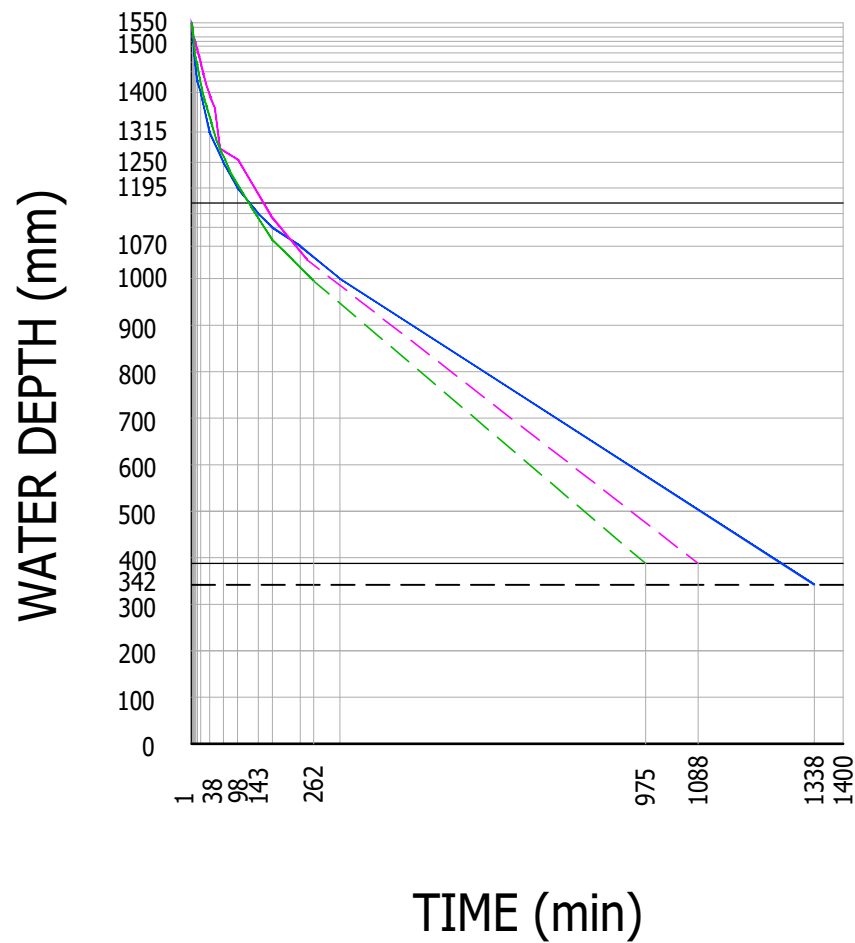
26 LODGE LANE, HASSOCKS - SOAKAWAY TEST 1 RESULTS GRAPH



26 LODGE LANE, HASSOCKS - SOAKAWAY TEST 2 RESULTS GRAPH



26 LODGE LANE, HASSOCKS - SOAKAWAY TEST 3 RESULTS GRAPH



- TEST 1 RESULTS GRAPH
- TEST 2 RESULTS GRAPH
- TEST 3 RESULTS GRAPH

26 LODGE LANE, HASSOCKS - SOAKAWAY TEST COMBINED RESULTS GRAPH



Job: 13895 - 26 Lodge Lane

Infiltration Calculator

$$f = \frac{V_{p75-25}}{ap_{50} \times tp_{75-25}}$$

V_{p75-25} = Effective storage volume between 75% and 25% effective depth

ap_{50} = Internal surface area of the trial pit up to 50% effective depth and including the base area

tp_{75-25} = The time for the water level to fall from 75% to 25% effective depth

f = Infiltration rate

Trial pit width	=	0.6
Trial pit depth	=	1.55
Trial pit length	=	1.5

ap_{50} = 4.155 m/squared

tp_{75-25} = 68528 seconds

V_{p75-25} = 0.6975 m/cubed

F = 2.45E-06

Appendix E

Drainage Calculation Sheets

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	45	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Depth (m)
Storage	0.009	5.00	51.000	1.300

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	Storage	Outfall	1.200	0.600	51.000	50.800	0.200	6.0	100	5.55	50.0

Name	US Depth (m)
1.000	-0.100

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	4320	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	20.0		

Storm Durations

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

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

Node Storage Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00720	Invert Level (m)	49.700	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00720	Time to half empty (mins)	1820	Depth (m)	
Safety Factor	2.0	Width (m)	3.600	Inf Depth (m)	
Porosity	0.30	Length (m)	10.000		

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	Storage	1410	50.683	0.983	0.6	10.6939	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)
1440 minute summer	Storage	Infiltration	0.1



Civil Engineering - Transport Planning - Flood Risk

GTA Civils & Transport, Maple House, 192-198 London Road, Burgess Hill, West Sussex, RH15 9RD

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