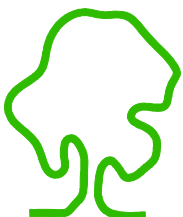


LAND AT NEW BARN FARM - OFFICE

CAPEL ROAD, RUSPER, HORSHAM, WEST SUSSEX, RH12 4PZ

Flood Risk and Drainage Assessment

May 2026



eas ltd

Environmental Assessment Services Ltd

REPORT DATA SHEET

Requirement	Data
Report Reference	891a/LDVArchitecture/NewBarnFarmOffice/FRA&D
Date	May 2026
Client	Steve Lamb
Report type	Flood Risk Assessment and Drainage Strategy
Purpose	Planning
Revisions	-
Prepared by	Xanthe Lyford BSc (Hons) Signed 
Approved by	Eur Ing Malcolm McKemey BSc (Hons), CEng, Cenv, MICE, MCIWEM, MIEnvSc Signed 

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SUSSEX, RH12 4PZ

Flood Risk Assessment and Drainage Strategy

May 2026

CONTENTS

1. BACKGROUND, EXISTING SITE & PROPOSED DEVELOPMENT
2. GEOLOGY & HYDROGEOLOGICAL CONSIDERATIONS
3. FLOOD RISK ASSESSMENT
4. ALTERNATIVE SOURCES OF FLOODING
5. HISTORY OF FLOODING
6. PLANNING WITH RESPECT TO FLOODING
7. RISK TO PROPERTY
8. RISK TO USERS OF THE PROPOSED DEVELOPMENT
9. LIKELY IMPACT ON FLOOD RISK ELSEWHERE
10. EXISTING SITE DRAINAGE
11. SURFACE WATER DRAINAGE OPTIONS
12. PROPOSED FOUL DRAINAGE
13. DRAINAGE DESIGN SUMMARY
14. OPERATION AND MAINTENANCE OF THE SYSTEM
15. SUMMARY OF CONCLUSIONS

APPENDIX A: FIGURES AND DRAWINGS

- Figure 1: Site Location
- Figure 2: Site as Existing
- Figure 3: Proposed Development
- Figure 4: Suggested Drainage Arrangement

APPENDIX B:	ENVIRONMENT AGENCY FLOOD MAPS FOR PLANNING
APPENDIX C:	H R WALLINGFORD GREENFIELD FLOW RATES
APPENDIX D:	OUTPUT FROM DRAINAGE DESIGN SOFTWARE
APPENDIX E:	PHOTOGRAPHS
APPENDIX F:	SOUTHERN WATER SEWER PLAN LETTER
APPENDIX G:	ENVIRONMENT AGENCY PRODUCT 4 INFORMATION

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Flood Risk Assessment and Drainage Strategy

May 2026

1. BACKGROUND, EXISTING SITE & PROPOSED DEVELOPMENT

- 1.1 The site is currently used as the office for a stud farm, comprising a portacabin style building to the west of the entrance from the public highway, Capel Road, surrounded by hardstanding for parking with a shipping container adjacent and to the east. The site area (redline boundary) is approximately 0.06 ha. The Ordnance Survey map reference for the centre of the site is TQ 18487 37514. The site elevation for the centre of the site is approximately +103 m OD. See Appendix A Figure 1 for the site location plan and Figure 2 for the existing site layout.
- 1.2 It is proposed to redevelop the site, after the demolition of the existing building and removal of the shipping container, into a new larger office building on the approximate footprint of the existing office. See Figure 3 in Appendix A for the proposed development.

2. GEOLOGY & HYDROGEOLOGICAL CONSIDERATIONS

- 2.1 According to the British Geological Survey website the site lies on Weald Clay Formation-Limestone. Mostly clay with a band of limestone running through.
- 2.2 The Department for Environment, Food and Rural Affairs (Defra) online mapping (MAGIC) shows the northern boundary of the site to be lying on a Secondary A bedrock aquifer and unproductive superficial drift. DEFRA classify the soil type as “*slightly acid but base-rich loamy and clayey soils*”. The site lies on an area of ‘high’ groundwater vulnerability, the site does not lie in a groundwater source protection zone (SPZ).

3. FLOOD RISK ASSESSMENT

3.1 Outline Flood Risk

- 3.2 According to the Environment Agency’s Flood Maps for Planning, the site lies in Flood Zone 1 (low risk of flooding from fluvial sources where defences are not considered / <0.1%% AEP of flooding in any given year). The site is not shown to be at risk of surface water flooding in the 1 in 30-year, 1 in 100-year or 1 in 1000-year scenarios. Groundwater and reservoir flooding at the site is

considered unlikely at this location. See Appendix B for the flood maps for the site.

3.3 Defences

- 3.1 Flood defences can help reduce the chance of flooding but cannot completely prevent it. They can fail, or water could spill over the top if it is deep enough. There is one record of a main watercourse onsite: Boldings Brook in the upper operational catchment of the River Arun. However, this is at a significantly lower elevation than the area to be developed and the site is not considered to be at risk of flooding from fluvial sources.

4 ALTERNATIVE SOURCES OF FLOODING

An assessment of alternative sources of flooding potentially affecting the site has been made from a review of the EA online flood mapping and from the Horsham District Council Level 1 Strategic Flood Risk Assessment (SFRA 2010). The SFRA addresses alternative sources of flooding including fluvial flooding, surface water flooding, groundwater flooding and flooding from sewers and reservoirs.

4.1 Surface Water Flooding

- 4.1.1 Surface water runoff (or 'pluvial' flooding) is most likely to be caused by intense downpours e.g. thunderstorms and is exacerbated by blocked culverts and areas of nonpermeable surfacing.
- 4.1.2 The EA flood maps for planning show that the site is not at risk of surface water flooding in the 1 in 30-year, 1 in 100-year or 1 in 1000-year scenarios. The EA's long-term flood prediction indicates that the risk of surface water flooding at the site is 'very low' risk (<0.1 % risk per year) and is expected to remain 'very low' in the 2040-2060 prediction. See Appendix B for the long-term surface water flood risk map for the site.

4.2 Sewer Flooding

- 4.2.1 There is no foul sewer provision at the site and none in the immediate vicinity. Although there have been records of sewer flooding within the Ruser area, there are no records of sewer flooding at the site itself. See Appendix F for the Southern Water Sewer letter for a previous application on the wider site.

4.3 Groundwater Flooding

- 4.3.1 Groundwater flooding occurs when the water table rises above the surface of the ground, normally as a result of persistent rainfall over a prolonged period. Increased levels of development in an area can increase the risk of groundwater flooding. The flood maps for planning classifies the site as unlikely to be at risk from groundwater flooding. There are no records of the site being impacted by groundwater flooding.

5 HISTORY OF FLOODING

- 5.1 According to the SFRA (2010), there are several recorded incidents of flooding within the Horsham District area. Most notably in the winter of 1993-1994, and Autumn 2000. No records of historic flood events directly affecting the site, or its immediate surroundings, have been found.
- 5.2 The design flood level is usually derived from the Environment Agency Product 4 for the site. The Environment Agency's flood risk data (Product 4) was ordered from the EA on 26 February 2026. The EA stated that there was no modelled data available for the site and its immediate surroundings. See Appendix G for the EA's Product 4 letter.

6 PLANNING STATUS WITH RESPECT TO FLOODING

- 6.1 The site is shown on the current Environment Agency (EA) flood risk mapping as being within Flood Zone 1 (<0.1 % probability of flooding in any year). The site is not at risk of flooding from surface water. See Appendix B for the Environment Agency Flood maps for planning.
- 6.2 The Sequential Test is intended to steer more vulnerable development to land in a lower Flood Zone, in this case the site lies in Flood Zone 1 and is not at risk of surface water flooding. There is no requirement for a Sequential Test and the Exception Test will not be required.
- 6.3 The existing building and shipping container, lie on permeable hardstanding (road plantings). Part of this is to remain to the east of the proposed office building and the section of land to the west is to be a garden area, laid to lawn with a line of new trees outside the western redline boundary of the site. The retention of the permeable surfacing and the creation of a lawned garden area (SuDS measures) will help to minimise any impact from the increase in size of the building by reducing the runoff from the site and infiltrating and attenuating the surface water. These sustainable drainage measures will reduce the flood risk from surface water elsewhere.

7 RISK TO PROPERTY

- 7.1 The site to be developed lies in Flood Zone 1 (low risk of flooding from fluvial waters where defences are not considered) and is not at risk of flooding from surface water. The proposed office building is not considered to be at risk from flooding.
- 7.2 The areas of hardstanding on the site at present are permeable road plantings, some of this is to remain and an area or lawned garden is to be included in the proposed design. These SuDS measures will reduce surface water runoff and make the developed site more sustainable.

8 RISK TO USERS OF THE PROPOSED DEVELOPMENT

- 8.1 The site lies in Flood Zone 1 (low risk of fluvial flooding where defences are not considered) and is at not at risk of surface water flooding. The proposed development will slightly increase the amount of hardstanding at the site. The inclusion of a garden and retention of a portion of the permeable hardstanding in the parking areas has helped to reduce the impact of this. The site lies in an area with a long history of residential and agricultural development. It can be considered that the future users of the site will not be at risk of flooding.

9 LIKELY IMPACT ON FLOOD RISK ELSEWHERE

- 9.1 The site, as existing, is partly impermeable surfacing (the roofs of the office and the shipping container) and partly permeable (road planings). The proposed development will increase the impermeable surface area and therefore increase the surface water runoff leaving the site by the increase in the size of the roof of the new office building (approximately 120 m²). The inclusion of a garden area to the east and permeable surfacing to the west of the office building will minimise the impact of the increase in runoff from the site in line with SuDS recommendation.

10 EXISTING SITE DRAINAGE

- 10.1 The site was visited on the 5th and 12th of March and the 7th April 2026.
- 10.2 The wider site currently drains its surface water to attenuation storage discharging via a 2 l/s flow control device into the watercourse to the south of the site, Highams Gill. There is no public foul sewer at the site or in Capel Road and the existing foul sewage system from the wider site is managed by a package sewage treatment plant with the treated effluent flowing into the abovementioned watercourse. See Appendix E for photographs of the watercourse to the south and Appendix F for the Southern Water sewer letter for a previous application at the wider site.

11 SURFACE WATER DRAINAGE OPTIONS

- 11.1 There is a general requirement that new drainage systems should be sustainable (SuDS) and that flow leaving the site should not exceed the Greenfield flow rate, including both surface water and sewage effluent.
- 11.2 The area of impermeable surface will be increased by the proposed redevelopment by the increased roof area of the proposed building.
- 11.3 The proposed development will have an impermeable surface area of approximately 173 m² comprising the roof of the proposed office building. The inclusion of permeable hardstanding to the east and a garden to the west in the design will reduce the surface area to be drained and therefore the surface water runoff from the developed site, making the development more sustainable.

- 11.4 The Greenfield runoff rate for the site has been calculated using the UK SuDS tools. The results are shown in See Appendix C and summarised in Table 11.1 below:

TABLE 11.1
GREENFIELD RUNOFF RATES

Return period	Flow rates (l/s)
Qbar	0.3
1 in 1 year	0.3
1 in 2 year	0.3
1 in 10 year	0.6
1 in 30 year	0.8
1 in 100 year	1.1
1 in 200 year	1.3

- 11.5 The current non-statutory guidance indicates that the maximum discharge permitted to leave the site from the drained area post development should not exceed the 1 in 1 year return period flow rate (0.3 l/s), or as near as practicable. To reduce the impact on the local watercourses the flow is proposed to be reduced to 2 l/s. Flow controlled vortex valves or orifices exist that can control the flow to as low as 2 l/s to reduce the flow to a suitable rate so as not to overload the surface water sewer system. See Appendix C for the HR Greenfield Flow Rate tool data.
- 11.6 According to the SuDS manual, UK runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:
- *priority 1: collected for non-potable use*
 - *priority 2: infiltrated to ground*
 - *priority 3: discharged to an above ground surface water body*
 - *priority 4: discharged to a surface water sewer, or another piped surface water drainage system*
 - *priority 5: discharged to a combined sewer*
- (priority 1 is the highest priority and priority 5 is the lowest.)*
- 11.7 Rainwater harvesting in the form of water butts for garden watering should be included on the drainpipe downpipes from the office building - *collection for the non-potable use*. This will reduce the runoff from the roof. The inclusion of permeable hardstanding in the area to the east and the creation of a garden area to the west will allow some of the surface water to *infiltrate to the ground*, making the development more sustainable.
- 11.8 Discharge to soakaway requires suitably permeable ground. The soil at the site is Weald Clay Formation (variable-poor permeability), and unsuitable for

soakaway drainage, as evidenced by the use of attenuation storage for the surface water drainage from the existing buildings on the wider site.

- 11.9 The alternative to drainage to soakaway is drainage to attenuation storage where excess surface water is stored on site, either in a pond, gully, swale or underground attenuation storage unit. The surface water is allowed to discharge at a maximum of the Greenfield 1 in 1-year flow rate (or as near as practicable) via a flow-control vortex valve or orifice plate into a nearby watercourse. In this case Highams Gill to the south of the site (*above ground surface water body*).
- 11.10 It is proposed to drain the surface water from the developed site to underground attenuation storage crates discharging via a flow-controlled device (limiting the flow to 2 l/s) to the existing watercourse that lies to the south of the site, Highams Gill, as with the existing scenario across the wider site. This is the preferred method of disposal of surface water from the developed site in line with the SuDS hierarchy. The use of water butts on the drainpipe down pipes for use in watering the garden will further reduce the runoff from the site.
- 11.11 A suitable area to locate a sealed, underground attenuation crate for the building would be the garden area to the west of the site. The attenuation store will overspill into the watercourse to the south, Highams Gill. The attenuation crate would need to accept any surface water runoff from the roof of the proposed office buildings discharging at a rate of 2 l/s via a flow control orifice.
- 11.12 A suitable sized sealed underground attenuation crate would be 4.5 m x 4 m x 0.4 m deep as calculated by the MasterDrain drainage network model. The surface water runoff from the roofs of the buildings will be drained into this before discharging via a flow-controlled device, limiting the flow to 2 l/s into the watercourse to the south of the site. The proposed drainage layout is shown in Figure 4 and output from the drainage design model can be seen in Appendix D.

11.13 Design Storm

The surface water drainage system has been designed for the 30-year return period event plus a 35% allowance for climate change and tested for surcharge for the 1 in 100-year return period event (1% Annual Exceedance Probability) plus a 45% allowance for climate change. See Appendix A, Figure 4 for the proposed drainage design and Appendix D for pipe and chamber layout and sizing of the drainage field from the MasterDrain model.

11.14 Drainage Design Model

The attenuation crate is to be a sealed unit (wrapped in non-permeable membrane) and as such will not need to adhere to the 'not less than 5 m from the edge of the nearest building and 2.5 m from the nearest boundary' rule. The chosen location is in the garden area to the west of the site. See Figure 4 in Appendix A for the suggested drainage arrangement.

The attenuation crate consists of modular, high-strength plastic structures designed for underground stormwater management. They form a robust,

lightweight, interlocking grid that creates a large, high-void ratio (over 95%) underground reservoir. These crates temporarily store rainwater, releasing it slowly into a watercourse (in this case Highams Gill to the south of the site). The crates are wrapped in a non-permeable membrane to create a sealed unit. The attenuation crate has been sized at 4.5 m x 4 m x 0.4 m deep.

The drainage arrangement has been designed using the MasterDrain network drainage model.

11.17 Hydrological Data

Hydrological data for the site as used in the MasterDrain model is given in Appendix D.

11.18 Extreme Event

An extreme event, which overwhelmed the drainage system, would likely result in water flowing south across the surface of the ground with the topography of the land towards the existing watercourse, Highams Gill.

12 PROPOSED FOUL DRAINAGE

- 12.1 In the absence of a mains sewer in the immediate vicinity of the site, the existing dwellings on the wider site drain their foul water to a package sewage treatment plant, with the treated effluent draining to the watercourse to the south, Highams Gill. It is proposed to treat the foul water from the proposed office building onsite via the same method. See Appendix F for the Southern Water Sewer Letter from a previous application at the site and Figure 4 in Appendix A for the suggested drainage layout.

13. DRAINAGE DESIGN SUMMARY

- 13.1 The surface water chamber sizes, invert levels and pipe sizes from the MasterDrain model are summarised in Table 13.1 below:

TABLE 13.1
SURFACE WATER CHAMBERS

No.	Dia (mm)	Cover level (mAOD)	Invert level (mAOD)	Pipe dia (mm)
SW1	600	103.68	103.18	100
Attenuation Crate	-	103.14	102.64	100
SW2 (2 l/s Flow)	600	103.68	102.24	100

- 13.2 The foul sewage chamber sizes, invert levels and pipe sizes are given in Table 13.2 below:

TABLE 13.2
FOUL SEWAGE CHAMBERS

No.	Dia (mm)	Cover level (mAOD)	Invert level (mAOD)	Pipe dia out (mm)
FW1	600	103.68	103.18	100
FW2	600	103.43	99.60	100
Sewage Treatment Plant	-	97.84	97.34	100

14 OPERATION AND MAINTENANCE OF THE SYSTEM

- 14.1 The drainage system will generally require minimal operational input once construction has been completed. However, it will require some regular maintenance.

- 14.2 Items requiring maintenance will include:

- Chambers (including any flow control devices) will require regular removal of any debris likely to obstruct and checking for any structural damage to the chamber or cover. Cleaning requires removing sediment, silt, and obstructions, using high-pressure water jets or manual clearing. Ensure covers are secure and airtight to prevent odour, rodent, or water ingress. Maintenance should be carried out annually at the time of year after most leaf fall has occurred.
- Any gullies, pipes and channels will need regular removal of accumulated debris and silt. Annual cleaning (or 3-6 months for high-debris areas) to remove leaves, sediment, and litter, to prevent blockages, odours, and flooding. Preventative measures like silt traps or drain guards will aid maintenance.
- The attenuation crate will need annual inspections and cleaning of inlet and outlet pipes to remove accumulated silt, debris and pollutants, prevent clogging and to check for and repair any structural issues.
- The sewage treatment plant will require regular annual inspection and maintenance by a specialist company.

15. SUMMARY OF CONCLUSIONS

- 15.1 The site is currently used as the office for a stud farm, comprising a portacabin style building to the west of the entrance from the public highway, Capel Road, surrounded by hardstanding for parking with a shipping container adjacent and to the east. The site area (redline boundary) is approximately 0.06 ha.

- 15.2 It is proposed to redevelop the site, after the demolition of the existing building and removal of the shipping container, into a new larger office building on the approximate footprint of the existing office. See Figure 3 in Appendix A for the proposed development.
- 15.3 According to the British Geological Survey website the site lies on Weald Clay Formation - Limestone. The north of the site lies on a Secondary A bedrock aquifer with undifferentiated superficial drift. The site does not lie in a groundwater SPZ.
- 15.4 According to the Environment Agency's Flood Maps for Planning, the site lies in Flood Zone 1 (Low risk of flooding from fluvial sources where defences are not considered / <0.1% AEP of flooding in any given year). The site is not shown to be at risk of surface water flooding. Groundwater and reservoir flooding at the site is considered unlikely at this location. See Appendix B for the flood maps for the site.
- 15.5 The proposed development includes permeable surfacing the area to the east of the building and a garden area laid to lawn to the west as well as water butts on the drainpipe downpipes. These measures will help keep the impact of the development on flood risk elsewhere to a minimum, making the development more sustainable in line with the SuDS hierarchy.
- 15.6 The preferred method for the disposal of surface water is drainage to a sealed underground attenuation storage crate, draining via a flow-controlled device limiting the flow to 2 l/s and draining into the existing watercourse that lies to the south of the site, Highams Gill. The attenuation crate is to be located in the grassed garden area to the west of the building. A suitable sized attenuation crate for the residences would be 4.5 m x 4 m x 0.4 m deep. This will discharge into the watercourse to the south of the site as with the existing scenario for the wider site. This is the preferred method for the disposal of surface water in line with the SuDS hierarchy.
- 15.7 An extreme event overtopping the system would likely follow the topography of the land and flow south towards Highams Gill as with the existing scenario.
- 15.8 As there is no mains sewage system in close proximity to the site, the foul water from the existing dwellings on the wider site is currently drained into a sewage treatment plant with the treated effluent discharging into the watercourse to the south of the site, Highams Gill. It is proposed to treat the foul water from the new proposed building onsite via the same method. See Figure 4 in Appendix A for the drainage design and Appendix D for the MasterDrain drainage design calculation data.



APPENDIX A:

- Figure 1: Site Location
- Figure 2: Site as Existing
- Figure 3: Proposed Development
- Figure 4: Suggested Drainage Arrangement



1 Location Plan
1 : 1250

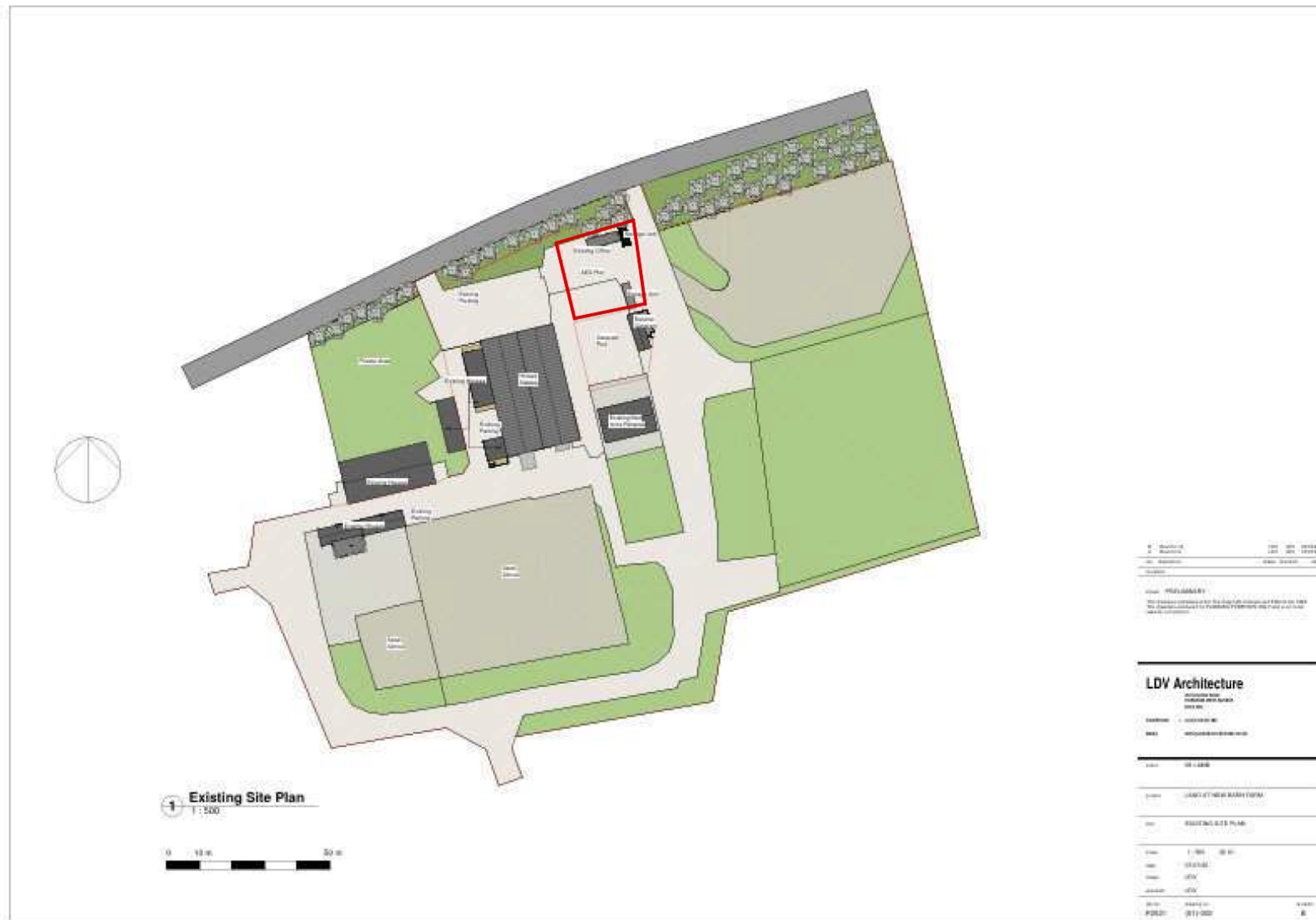


New Barn Farm
Capel Road, Horsham, West Sussex, RH12 4PZ

Scale as shown

Figure 1: Location

May 2026



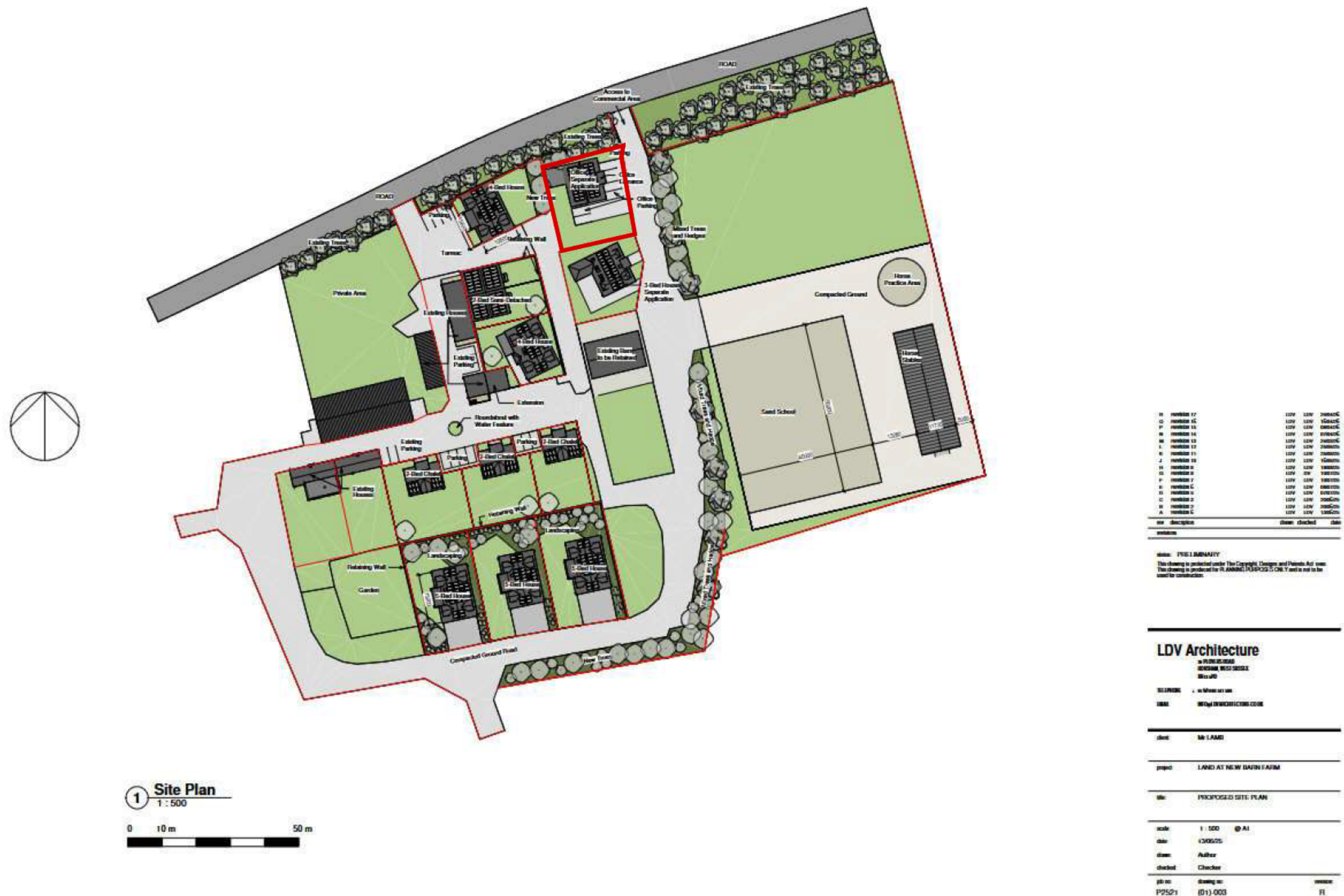
STEVE LAMB

Scale as shown

New Barn Farm, Capel Road, Horsham, West Sussex, RH12 4PZ

Figure 2: Existing Site

May 2026



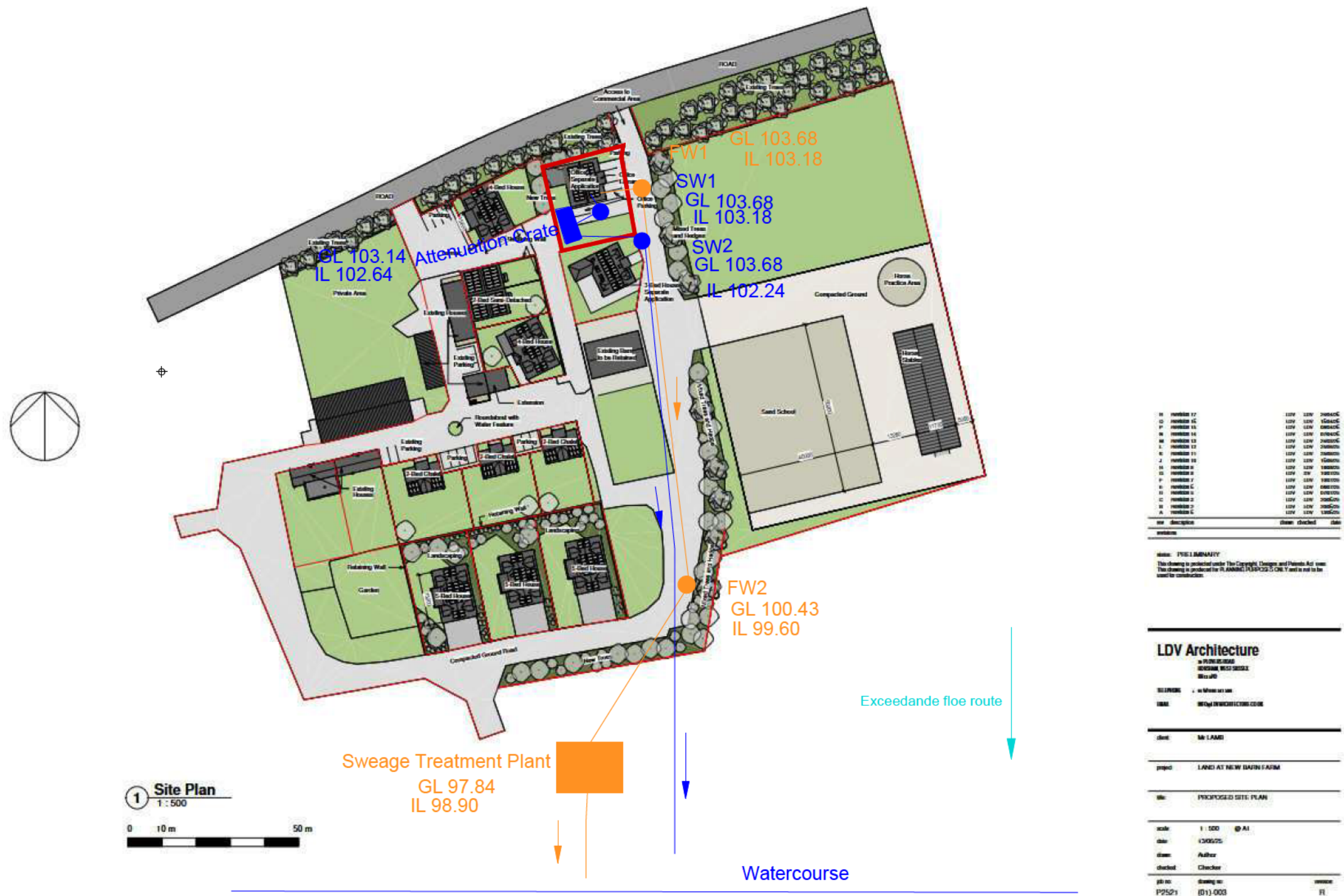
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Scale as shown

New Barn Farm, Capel Road, Horsham, West Sussex, RH12 4PZ

Figure 3: Proposed Development

May 2026



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Scale as shown

New Barn Farm, Capel Road, Horsham, West Sussex, RH12 4PZ

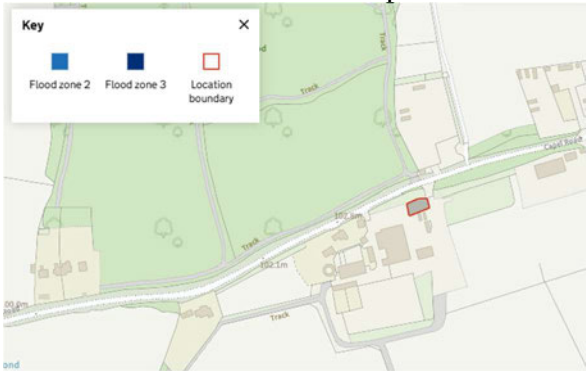
Figure 4: Drainage Design

May 2026

APPENDIX B:

ENVIRONMENT AGENCY FLOOD MAPS FOR PLANNING

Flood Zone Map



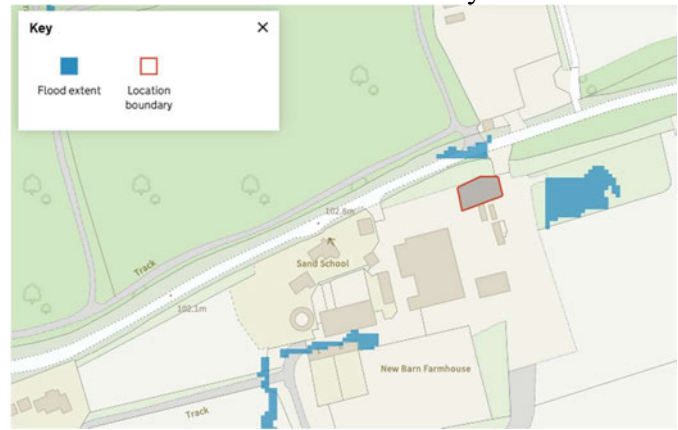
Surface water 1 in 30 years



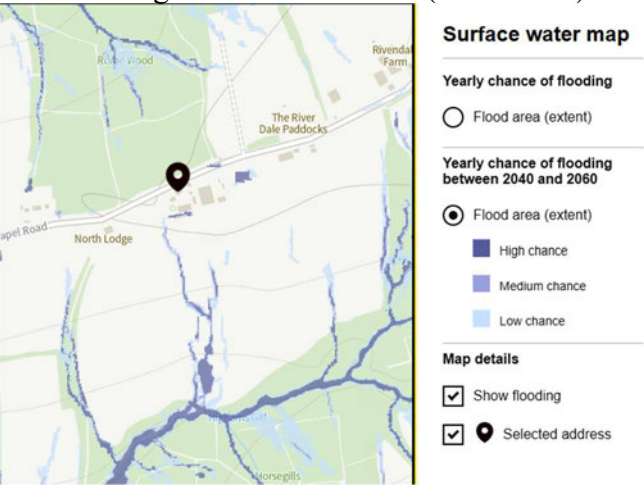
Surface water 1 in 100 years



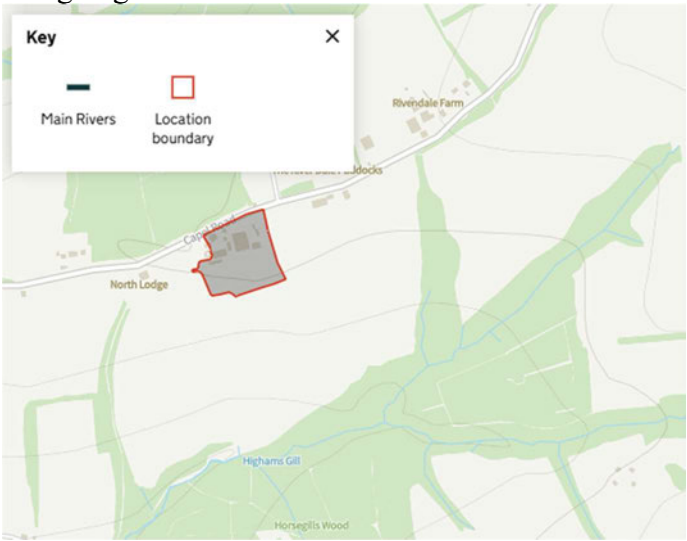
Surface water 1 in 1000 years



Long-term surface water (2040-2060)



Map showing Highams Gill watercourse to the south of the wider site



APPENDIX C:
HR WALLINGFORD GREENFIELD FLOW RATES

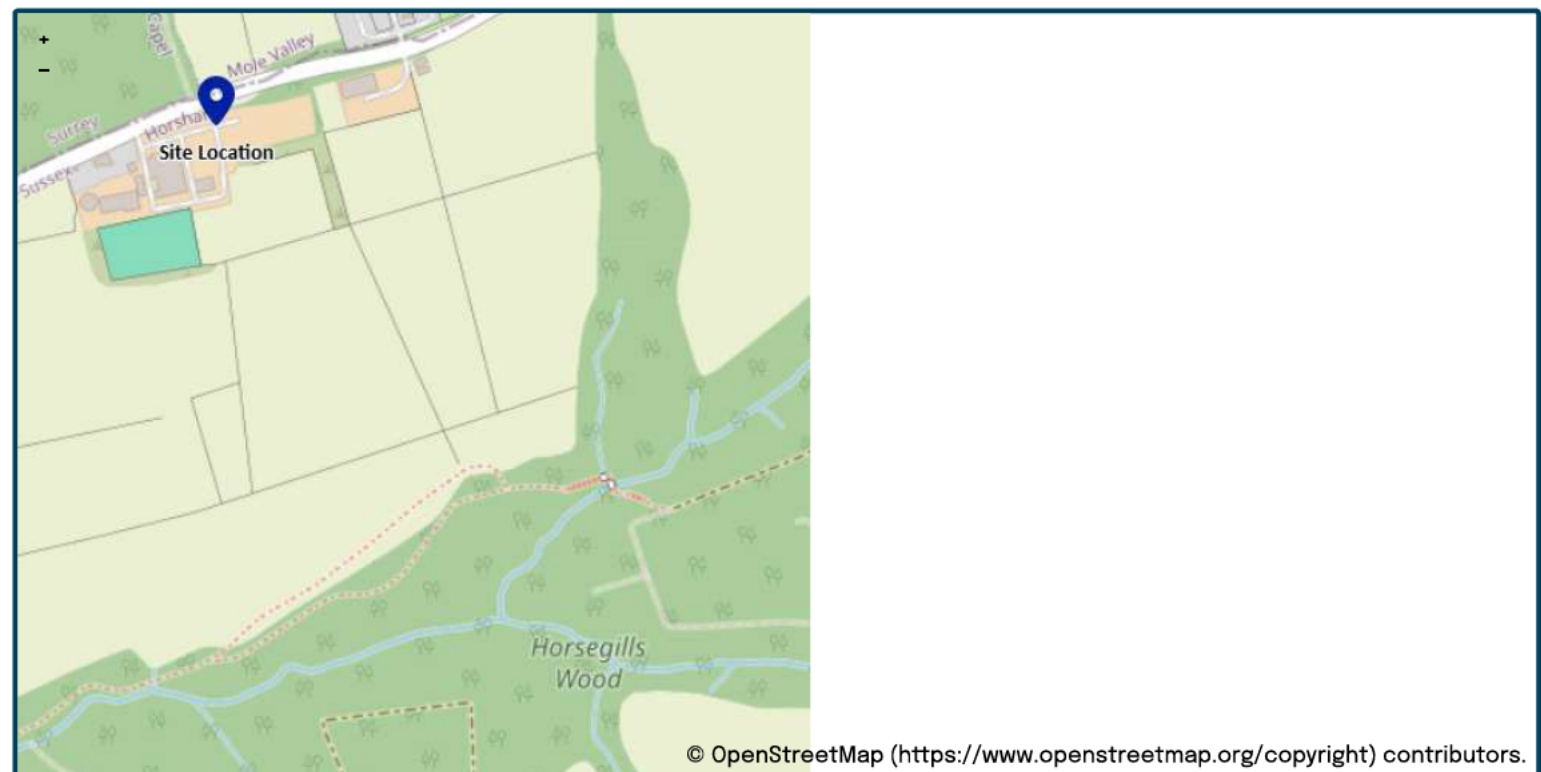
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015).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

Project details

Date	15/05/2026
Calculated by	EAS LTD
Reference	891a
Model version	2.2.3

Location

Site name	New Barn Farm
Site location	Rusper



Site easting (British National Grid)	519295
Site northing (British National Grid)	137604

Site details

Total site area (ha)	0.06	ha
----------------------	-----------------------------------	----

Greenfield runoff

Method

Method	IH124		
IH124			
	<u>My value</u>	☐	<u>Map value</u>
SAAR (mm)	805	mm	805
How should SPR be derived?	WRAP soil type		
WRAP soil type	4	☐	4
SPR	0.47		
QBar (IH124) (l/s)	0.3		l/s

Growth curve factors

	<u>My value</u>	☐	<u>Map value</u>
Hydrological region	6		6
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

Method	IH124	
Flow rate 1 year (l/s)	0.3	l/s
Flow rate 2 year (l/s)	0.3	l/s
Flow rate 10 years (l/s)	0.6	l/s
Flow rate 30 years (l/s)	0.8	l/s
Flow rate 100 years (l/s)	1.1	l/s
Flow rate 200 years (l/s)	1.3	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

APPENDIX D:

OUTPUT FROM DRAINAGE DESIGN SOFTWARE AND
DRAINAGE FIELD INFILTRATION CALCULATIONS



MasterDrain
SW

**Environmental Assessment
Services Ltd**
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Job No. 891a		
Sheet no. 1		
Date 15/05/26		
By XL	Checked	Reviewed

Project	NEW BARN FARM OFFICE
Title	Surcharge calcs (Sized at 30 yrs storm) for NEW BARN FARM OFFICE.SW CCF = 45%

Using in-line restrictors
Return period = 100 yrs
Climate change factor = 45

PEAK hydrograph values printed
Storm duration = 15 mins
No offline storage

Mean rain intens. 313.00 mm/hr
Storm profile = Summer
Using FEH data

Peak rain intens. 1226.96 mm/hr
Sample period = 7.5 secs.

Entry No.	SECT. No.	MANHOLE REF	PIPE CAPACITY l/s	RATE FLOW l/s	PIPE SIZE mm	CHAMBER DIAM/LxW mm	INVERT LEVEL m	WATER LEVEL m	GRND LEVEL m	SURCHARGE fract.	Depth	EXCESS FLOW l/s	FLOODED VOL m³	DRAINED AREA (m²) :x FACTOR	STATUS	
1	I	1.01	SW1	14.4	24.3	100	600	103.18	103.54	103.86	1.69	0.36	9.96	0.000	164	Surch.
2	I	1.02	STORAGE#	8.1	2.0	100	1200	102.64	102.67	103.14	0.25	0.03	0.00	0.000	164	OK
3	I	1.03	SW2	43.3	2.0	100	600	102.24	102.25	103.68	0.05	0.01	0.00	0.000	164	OK



MasterDrain
SW

Environmental Assessment Services Ltd

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Job No. 891a		
Sheet no. 2		
Date 15/05/26		
By XL	Checked	Reviewed

Project	NEW BARN FARM OFFICE
Title	Surcharge calcs (Sized at 30 yrs storm) for NEW BARN FARM OFFICE.SW CCF = 45%

Notes

Printout headings

- | | | |
|---|---|--|
| 1) Entry no - position in file | 2) Section no - pipe identifier | 3) Manhole ref - Manhole identifier |
| 4) Pipe cap - full bore capacity of that pipe | 5) Rate of flow - calculated flow rate (l/s) ± = flow restrictor. | 6) Pipe diam - outlet pipe diameter (mm) |
| 7) Chamber diam - chamber diam. at base of MH | 8) Invert level - invert level of manhole | 9) Water level - calculated peak water level. |
| 10) Grnd level - ground / cover level | 11) Surch. fract - calc.flow/pipe capacity | 12) Surch. depth - surcharge level above soffit |
| 13) Overflow - surcharged flow rate (l/s) | 14) Flooded vol - volume of water above cover | 15) Upstrm Vol - upstream pipe vol to previous manhole(s) |
| 16) Status - OK - outlet not surcharged | 17) Status - Surcharged - outlet surcharged | 18) Status - Warning - water level within 299mm of cover level |
| 19) Status - Flooded - cover over-topped | 20) § against diameter indicates throttle pipe used. | |

Title box

Hydrograph data

- | | | |
|---|--------------------------------------|--|
| 1) Ret. period - that used to calculate profile | 2) Duration - length of storm (mins) | 3) Profile - either Winter (75%) or Summer (50%) |
|---|--------------------------------------|--|

Flow restrictors

Manhole reference - ATTENUATION STORAGE

Restrictor flowrate - 2 l/s



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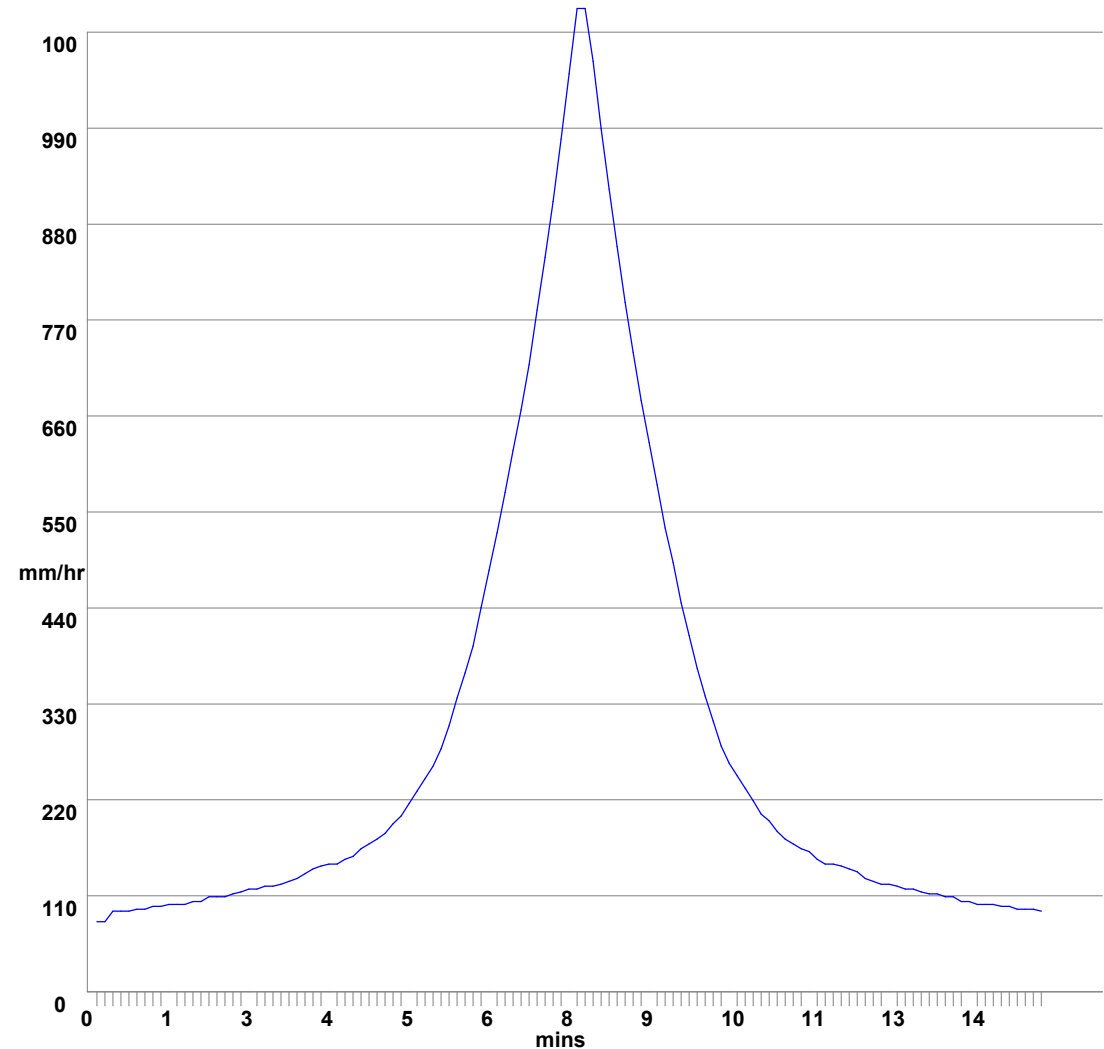
Job No. 891a		
Sheet no. 3		
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By XL	Checked	Reviewed

Project NEW BARN FARM OFFICE
Title Surcharge calcs (Sized at 30 yrs storm) for NEW BARN FARM OFFICE.SW CCF = 45%

Time mins	Rain mm/hr	Time mins	Rain mm/hr	Time mins	Rain mm/hr
0:08	73.14	5:08	208.96	10:08	224.64
0:15	73.14	5:15	222.03	10:15	211.58
0:22	83.59	5:22	235.09	10:22	198.52
0:30	83.59	5:30	253.37	10:30	185.46
0:38	83.59	5:38	276.88	10:38	177.62
0:45	86.20	5:45	305.61	10:45	167.17
0:52	86.20	5:52	331.73	10:52	159.34
1:00	88.81	6:00	360.46	11:00	154.11
1:08	88.81	6:08	399.65	11:08	148.89
1:15	91.42	6:15	438.83	11:15	146.28
1:22	91.42	6:22	478.01	11:22	138.44
1:30	91.42	6:30	519.80	11:30	133.22
1:38	94.03	6:38	564.21	11:38	133.22
1:45	94.03	6:45	606.00	11:45	130.60
1:52	99.26	6:52	653.02	11:52	127.99
2:00	99.26	7:00	710.48	12:00	125.38
2:08	99.26	7:08	765.33	12:08	117.54
2:15	101.87	7:15	822.80	12:15	114.93
2:22	104.48	7:22	888.10	12:22	112.32
2:30	107.09	7:30	956.01	12:30	112.32
2:38	107.09	7:38	1023.93	12:38	109.71
2:45	109.71	7:45	1023.93	12:45	107.09
2:52	109.71	7:52	969.07	12:52	107.09
3:00	112.32	8:00	898.55	13:00	104.48
3:08	114.93	8:08	835.86	13:08	101.87
3:15	117.54	8:15	775.78	13:15	101.87
3:22	122.77	8:22	718.32	13:22	99.26
3:30	127.99	8:30	666.08	13:30	99.26
3:38	130.60	8:38	616.45	13:38	94.03
3:45	133.22	8:45	572.04	13:45	94.03
3:52	133.22	8:52	527.64	13:52	91.42
4:00	138.44	9:00	483.23	14:00	91.42
4:08	141.05	9:08	446.66	14:08	91.42
4:15	148.89	9:15	404.87	14:15	88.81
4:22	154.11	9:22	370.91	14:22	88.81
4:30	159.34	9:30	336.96	14:30	86.20
4:38	164.56	9:38	308.22	14:38	86.20
4:45	175.01	9:45	282.10	14:45	86.20
4:52	182.84	9:52	255.98	14:52	83.59
5:00	195.90	10:00	237.70	15:00	83.59

Hydrograph profile derived from data in the Flood Studies Report

Return period= 100 yrs Duration= 15 mins Profile - summer





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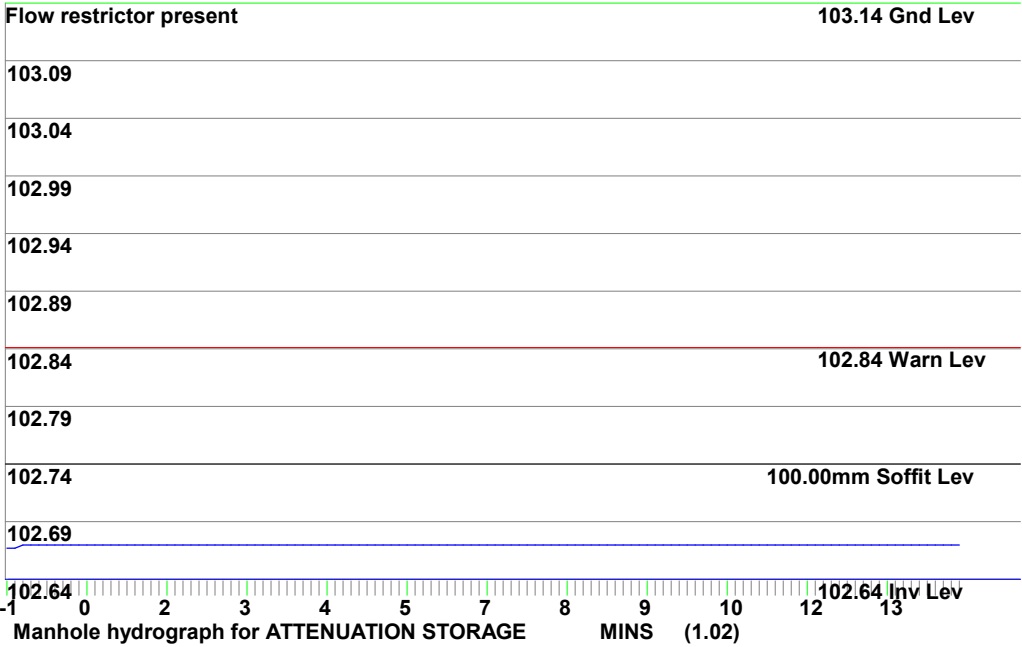
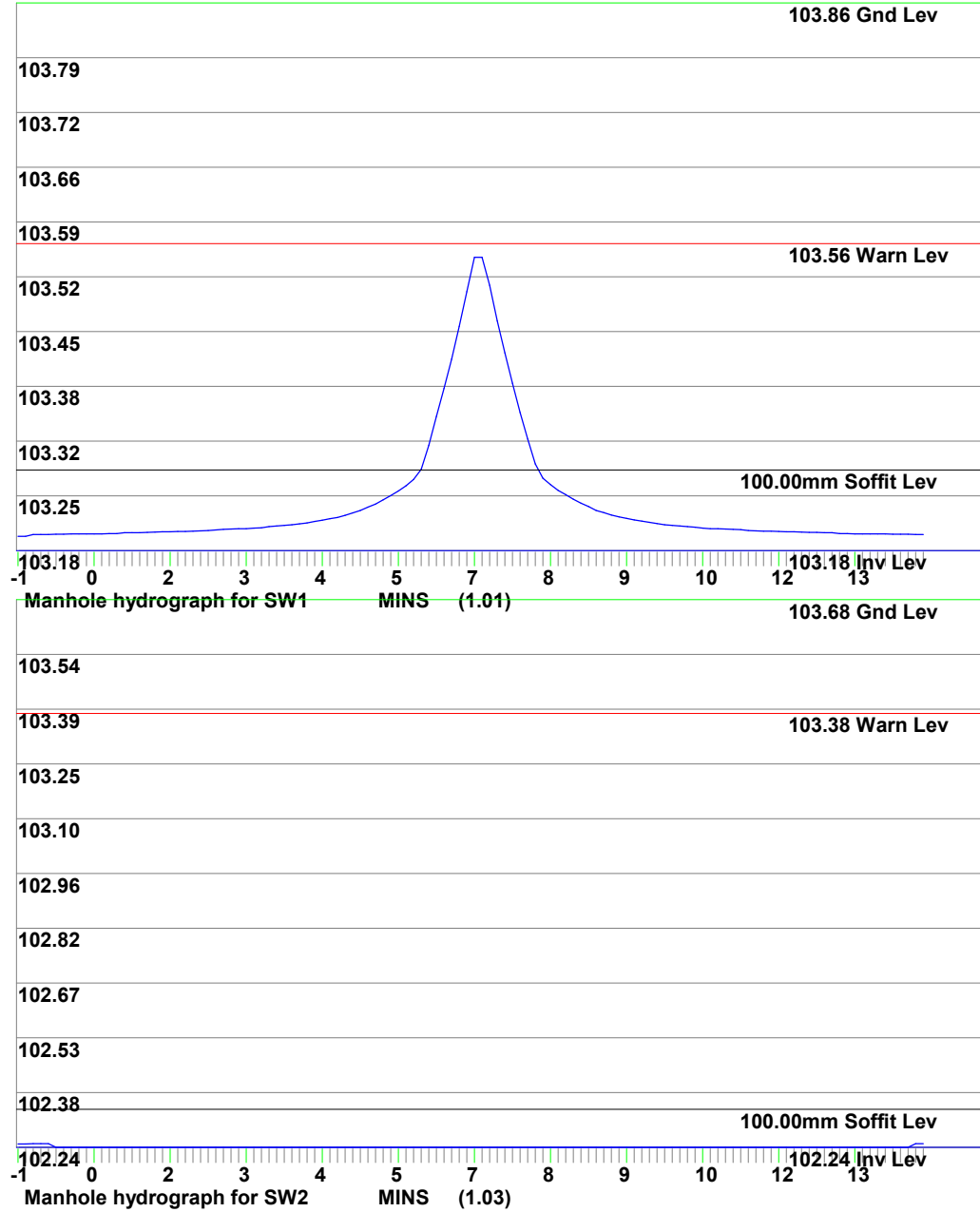
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Project NEW BARN FARM OFFICE	
Title Surcharge calcs (Sized at 30 yrs storm) for NEW BARN FARM OFFICE.SW CCF = 45%	





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Project NEW BARN FARM OFFICE				By XL	Checked	Reviewed
Title Surcharge calcs (Sized at 30 yrs storm) for NEW BARN FARM OFFICE.SW CCF = 45%						



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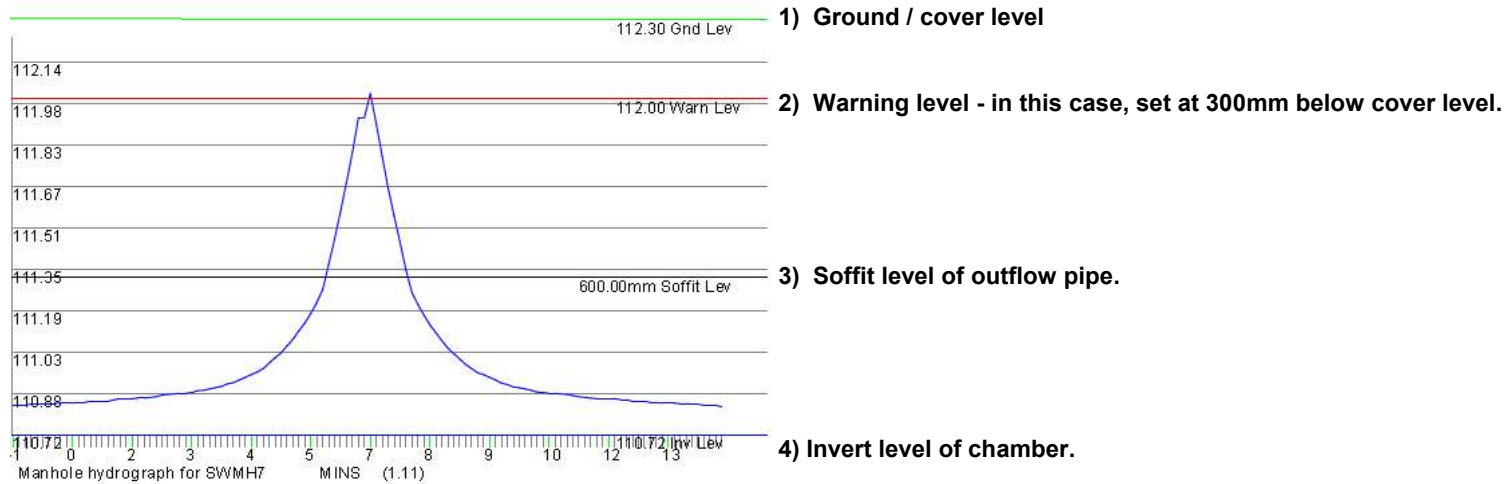
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Job No. 891a		
Sheet no. 6		
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Project
NEW BARN FARM OFFICE

Title
Surcharge calcs (Sized at 30 yrs storm) for NEW BARN FARM OFFICE.SW CCF = 45%



Notes

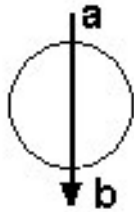
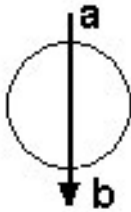
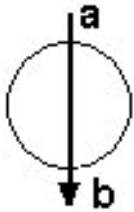
- Lower section of the graph shows the water depth filling the channel. Channel is assumed to be a full pipe diameter in depth.
- Upper section of the graph shows the water depth filling the chamber. Chamber has a greater width/diameter than the channel, so increases in depth are proportionally less.
- The top of the graph clips the warning level and would be marked thus on the printout.
- In many cases the invert of the offline storage is required to enter at the channel soffit level, meaning that the pipe will still surcharge but flooding risk reduced.
- The diagram above is a general one and is not part of the current calculation.

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		Date 15/05/26 14:45
Project New Barn Farm - Office	By XL	Checked
Title Manhole printout for NEW BARN FARM OFFICE.SW		Reviewed

	Manhole ref.	X ref	Y ref	Form	Cham diam. or length	Rect. width	Chamb. height	Shaft height	MH Volume	Exit Diam	Exit Crown	Exit Invert	Chamb const	Slab level	Cover Level	Dwnstr MH
	SW1	127.11	43.13	circ	600	N/A	0.68		0.19	100	103.305	103.180	N/A	103.130	103.860	N STORAGE
ION STORAGE		117.61	42.25	circ	1200	N/A	0.50		0.57	100	102.765	102.640	N/A	102.590	103.140	SW2
	SW2	139.44	37.68	circ	600	N/A	1.44		0.41	100	102.365	102.240	N/A	102.190	103.680	TERCOURSE

All manholes to be as per 'Sewers for Adoption'

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Title Manhole printout for NEW BARN FARM OFFICE.SW					



MH = SW1	MH = ATTENUATION	MH = SW1
a= head	a= 100	a= 100
b = 100	b = 100	b = 100

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		Sheet no. 3		
		Date 15/05/26 14:45		
Project	New Barn Farm - Office	By XL	Checked	Reviewed
Title				
Manhole printout for NEW BARN FARM OFFICE.SW				

These explanatory notes should be read in conjunction with the Manhole printout

- 1) Manhole ref - the reference for the manhole in question
- 2) Form - either circular or rectangular
- 3) Chamber diam or length - diameter of chamber if circular, or length if rectangular - in metres
- 4) Rectangular width - if form is rectangular, this gives the width of the chamber
- 5) Chamber height - height of chamber from invert
- 6) Shaft height - height of access shaft if applicable, from top of chamber to ground level
- 7) Manhole volume - cubic capacity of manhole chamber
- 8) Exit diameter - diameter of pipe leaving this manhole
- 9) Exit crown - crown level of pipe leaving this manhole
- 10) Exit invert - invert level of pipe leaving this manhole
- 11) Chamb const - manhole construction :-
 - N/A - not specified
 - Conc - concrete rings
 - Poly - polypropylene rings surrounded by selected fill
 - Poly/conc - polypropylene rings surrounded by concrete
 - Brick - brick built with waterproof render
 - In situ - concrete cast in situ
- 12) Slab level - surface level of base slab (if no sump, this is placed at 50mm below exit invert to allow levels manipulation).
- 13) Manhole diameters of 9999 have exceeded the sizes available in SfA
- 14) Manhole diameters may have to be modified due to the number of branches



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Sheet no. 1
Date 15/05/26
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Project **New Barn Farm Office**

Title **Hydrograph storage analysis (Winter profile) for Rusper**

Data:-

Location = Rusper Grid reference = TQ2037
M5-60 (mm) = 19.7 r = 0.34
Soil index = 0.45 SAAR (mm/yr) = 805
Return period = 100 WRAP = 4
UCWI = 0.0 Climate change = +45%

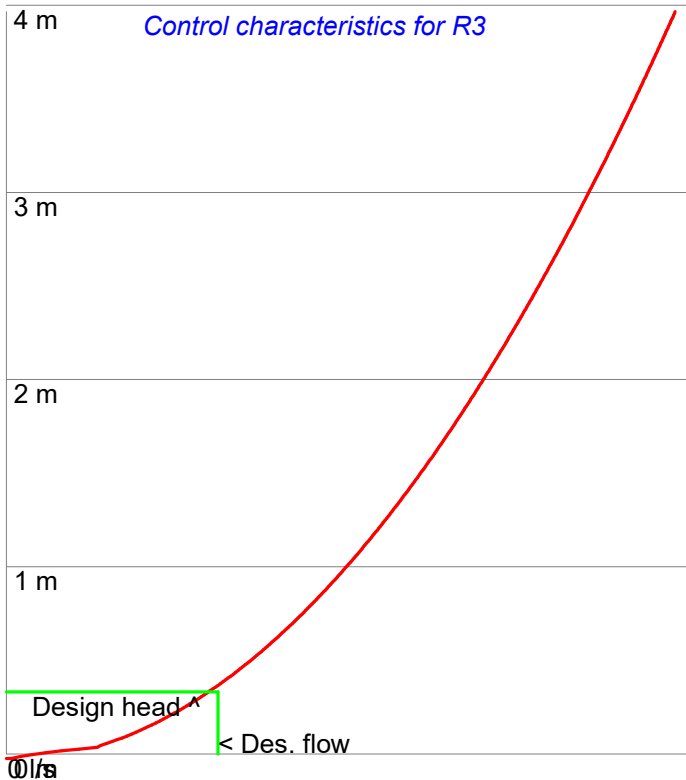
Clayey, or loamy over clayey soils with an impermeable layer at shallow depth.

Percentage runoff = 95.0% (manual setting)

Imperv. area = 173 m² Pervious area = 0 m²
Total area = 173 m² Equiv area = 164 m² (Tot. area x % runoff).
Total runoff = 9.5 m³ Discharge rate = 2.000 l/s

Design Head = 0.4m Peak flow = 1.95 l/s
Control device = R3 Orifice diam = 49.7 mm
Max. calc. depth = 0.39 m Available depth = 0.0 m³
Mean discharge = 1.51 l/s

Available system storage = 0.00 m³ under a system plane at the design head level.
Offline storage = 0.0 m³
Total storage = 6.5 m³ Peak input flow = 6.60 l/s



Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
0.01	0.05	2.01	4.48
0.05	0.52	2.05	4.53
0.10	1.00	2.10	4.58
0.15	1.22	2.15	4.64
0.20	1.41	2.20	4.69
0.25	1.58	2.25	4.74
0.30	1.73	2.30	4.80
0.35	1.87	2.35	4.85
0.40	2.00	2.40	4.90
0.45	2.12	2.45	4.95
0.50	2.24	2.50	5.00
0.55	2.35	2.55	5.05
0.60	2.45	2.60	5.10
0.65	2.55	2.65	5.15
0.70	2.65	2.70	5.20
0.75	2.74	2.75	5.24
0.80	2.83	2.80	5.29
0.85	2.92	2.85	5.34
0.90	3.00	2.90	5.39
0.95	3.08	2.95	5.43
1.00	3.16	3.00	5.48
1.05	3.24	3.05	5.52
1.10	3.32	3.10	5.57
1.15	3.39	3.15	5.61
1.20	3.46	3.20	5.66
1.25	3.54	3.25	5.70
1.30	3.61	3.30	5.74
1.35	3.67	3.35	5.79
1.40	3.74	3.40	5.83
1.45	3.81	3.45	5.87
1.50	3.87	3.50	5.92
1.55	3.94	3.55	5.96
1.60	4.00	3.60	6.00
1.65	4.06	3.65	6.04
1.70	4.12	3.70	6.08
1.75	4.18	3.75	6.12
1.80	4.24	3.80	6.16
1.85	4.30	3.85	6.20
1.90	4.36	3.90	6.24
1.95	4.42	3.95	6.28
2.00	4.47	4.00	6.32

Calculation data provided by Crown Water Ltd, SL5 7NT



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Project
New Barn Farm Office

Title
Hydrograph storage analysis (Winter profile) for Rusper

Storage curves for a 1 hours storm.

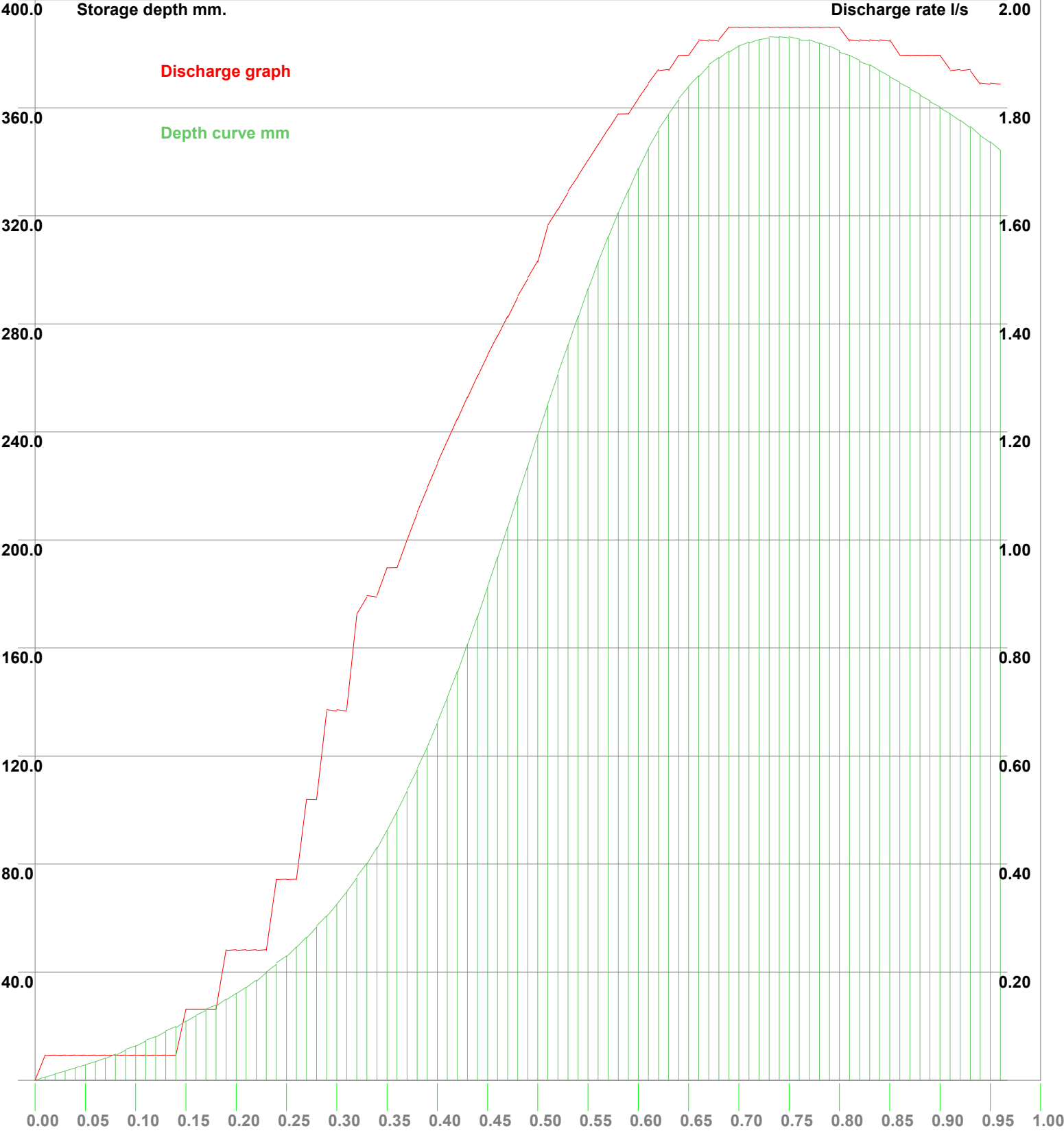
Storage depth mm.

Discharge rate l/s

2.00

Discharge graph

Depth curve mm





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Project New Barn Farm Office		By XL	Checked	Reviewed	
Title Hydrograph storage analysis (Winter profile) for Rusper					

Incremental rainfall figures.

Storm Mins	Storage Depth mm	Control Flow l/s	Storm Mins	Storage Depth mm	Control Flow l/s
0.6	1.2	0.05	30.6	250.2	1.58
1.2	2.2	0.05	31.2	261.2	1.61
1.8	3.4	0.05	31.8	272.2	1.64
2.4	4.5	0.05	32.4	282.8	1.67
3.0	5.7	0.05	33.0	293.1	1.70
3.6	6.9	0.05	33.6	302.9	1.73
4.2	8.2	0.05	34.2	312.3	1.76
4.8	9.6	0.05	34.8	321.2	1.79
5.4	11.1	0.05	35.4	329.7	1.79
6.0	12.7	0.05	36.0	337.6	1.82
6.6	14.4	0.05	36.6	344.9	1.84
7.2	16.2	0.05	37.2	351.6	1.87
7.8	18.0	0.05	37.8	357.5	1.87
8.4	19.9	0.05	38.4	363.0	1.90
9.0	21.9	0.13	39.0	367.8	1.90
9.6	23.8	0.13	39.6	371.9	1.92
10.2	25.8	0.13	40.2	375.6	1.92
10.8	27.9	0.13	40.8	378.6	1.92
11.4	30.0	0.24	41.4	381.0	1.95
12.0	32.1	0.24	42.0	382.9	1.95
12.6	34.5	0.24	42.6	384.3	1.95
13.2	37.0	0.24	43.2	385.3	1.95
13.8	39.8	0.24	43.8	385.9	1.95
14.4	42.9	0.37	44.4	386.1	1.95
15.0	45.9	0.37	45.0	385.9	1.95
15.6	49.3	0.37	45.6	385.4	1.95
16.2	53.0	0.52	46.2	384.7	1.95
16.8	56.7	0.52	46.8	383.8	1.95
17.4	60.9	0.68	47.4	382.5	1.95
18.0	65.1	0.68	48.0	381.1	1.95
18.6	69.7	0.68	48.6	379.4	1.92
19.2	74.9	0.86	49.2	377.6	1.92
19.8	80.3	0.89	49.8	375.7	1.92
20.4	86.2	0.89	50.4	373.7	1.92
21.0	92.6	0.95	51.0	371.7	1.92
21.6	99.5	0.95	51.6	369.5	1.90
22.2	107.0	1.00	52.2	367.3	1.90
22.8	114.9	1.05	52.8	365.0	1.90
23.4	123.3	1.10	53.4	362.7	1.90
24.0	132.2	1.14	54.0	360.3	1.90
24.6	141.6	1.18	54.6	357.8	1.87
25.2	151.4	1.22	55.2	355.2	1.87
25.8	161.5	1.26	55.8	352.6	1.87
26.4	171.9	1.30	56.4	349.9	1.84
27.0	182.6	1.34	57.0	347.1	1.84
27.6	193.6	1.38	57.6	344.3	1.84
28.2	204.8	1.41	58.2	341.5	1.84
28.8	216.2	1.45	58.8	338.6	1.82
29.4	227.6	1.48	59.4	335.7	1.82
30.0	238.9	1.52	60.0	332.9	1.82

Using the Get Max button causes the program to step through a series of storm durations until a maximum volume is obtained.

Each duration is sampled 600 times and the results recorded. The storm durations (hrs) are:-

0.25, 0.5, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 18, 20, 24, 30, 36, 42, 48, 54, 60, 66, 72, 84, 96, 120, 150, 175, 200, 250, 300, 375, 500, 750, 1000, 1250, 1500, 1570, 2000, 2500, 3000, 3500, 4000

It should be noted that the six hour storm frequently requested rarely demonstrates the worst case for storage.



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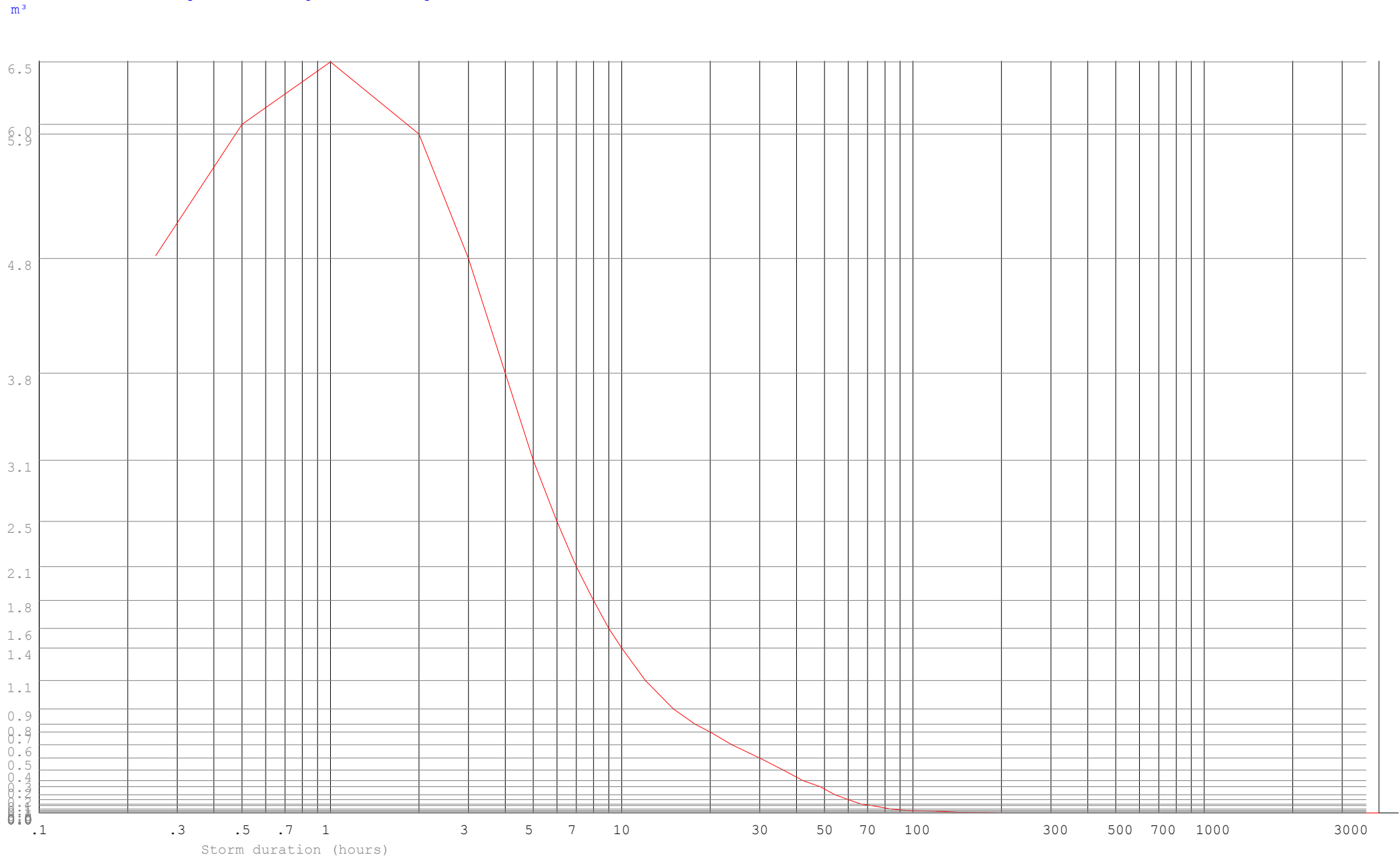
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Project
New Barn Farm Office

Title
Hydrograph storage analysis (Winter profile) for Rusper

Sequential storage volume at specific storm durations.





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Foul 11.5

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Sheet no. 0		
Date 15/05/26		
By XL	Checked	Reviewed

Project New Barn Farm Office	
Title Manhole printout for NEW BARN FARM OFFICE. FL.FL	

Manhole ref.	Form	Cham diam. or length	Rect. width	Chamb. height	Shaft height	MH Volume	Ent. Diam	Ent. Crown	Ent. Invert	Exit Diam	Exit Crown	Exit Invert	Chamb const	Cover Level	Dwnstr MH
FW1	circ	600	N/A	0.50		0.14	Head	----	----	100	103.305	103.180	N/A	103.680	FW2
FW2	circ	600	N/A	0.83		0.23	100	0.000	0.000	100	99.725	99.600	N/A	100.430	ENT PLANT
TMENT PLANT	circ	1200	N/A	0.50		0.57	100	0.000	0.000	0	97.365	97.340	N/A	97.840	TERCOURSE

All manholes to be as per 'Sewers for Adoption'

Levels calculated for level inverts



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Foul 11.5

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Project	New Barn Farm Office
Title	Manhole printout for NEW BARN FARM OFFICE. FL.FL

These explanatory notes should be read in conjunction with the Manhole printout

- 1) Manhole ref - the reference for the manhole in question
- 2) Form - either circular or rectangular
- 3) Chamber diam or length - diameter of chamber if circular, or length if rectangular - in metres
- 4) Rectangular width - if form is rectangular, this gives the width of the chamber
- 5) Chamber height - height of chamber from invert
- 6) Shaft height - height of access shaft if applicable, from top of chamber to ground level
- 7) Manhole volume - cubic capacity of manhole chamber
- 8) Exit diameter - diameter of pipe leaving this manhole
- 9) Exit crown - crown level of pipe leaving this manhole
- 10) Exit invert - invert level of pipe leaving this manhole
- 11) Manhole diameters of 9999 have exceeded the sizes available in Sfa
- 12) Manhole diameters may have to be modified due to the number of branches

APPENDIX E: PHOTOGRAPHS

Entrance to Capel Road showing shipping container and office



Site Office



Existing manhole leading from sewage treatment plant



Highams Gill watercourse to the south (flowing west)



APPENDIX F

SOUTHERN WATER SEWER PLANS LETTER



Directorate of Planning
Horsham District Council
Parkside
Chart Way
Horsham
West Sussex
RH12 1RL

Developer Services
Southern Water
Sparrowgrove House
Sparrowgrove
Otterbourne
Hampshire
SO21 2SW

Tel: 0330 303 0119

Email: southernwaterplanning@atkinsglobal.com

Your Ref

DC/17/2835

Our Ref

PLAN-021583

Date

09/02/2018

Dear Sirs,

Proposal: Conversion of commercial equestrian buildings into 10 dwellings together with a corner shop, partial demolition of main equestrian building to create courtyard and replacement of all concrete hardstanding with permeable surfacing and landscaping.

Site: Sports Horses International Ltd, Stud Farm, New Barn Farmhouse, Capel Road, Rusper, Horsham West Sussex RH12 4PZ.

DC/17/2835

Thank you for your letter of 22/01/2018.

There is no public foul sewer in the vicinity of the site. The applicant is advised to examine alternative means of foul sewage disposal.

The Environment Agency should be consulted directly regarding the use of a private wastewater treatment works or septic tank drainage which disposes of effluent to sub-soil irrigation. The owner of the premises will need to empty and maintain the works or septic tank to ensure its long term effectiveness.

The Council's Building Control officers or technical staff should be asked to comment on the adequacy of soakaways to dispose of surface water from the proposed development.

Due to changes in legislation that came in to force on 1st October 2011 regarding the future ownership of sewers it is possible that a sewer now deemed to be public could be crossing the above property. Therefore, should any sewer be found during construction

Southern Water Sparrowgrove House Otterbourne Winchester Hampshire SO21 2SW www.southernwater.co.uk

Southern Water Services Ltd Registered Office: Southern House Yeoman Road Worthing BN13 3NX Registered in England No.2306670

[illegible]

Requested By:

APPENDIX G

ENVIRONMENT AGENCY PRODUCT 4 INFORMATION

Our reference: EIR2026/10168

Thank you for your request of 27th February 2026 to use Environment Agency Product 4 data for the site at 519225,137531 (easting and northing coordinates).

Response to your request

The Environment Agency's records indicate that the above site is located in Flood Zone 1 (land assessed as having less than 0.1% (1 in 1,000) chance of flooding in any given year from **rivers or the sea**). Therefore, the likelihood of flooding from rivers and sea in this area is estimated as 'very low'.

Proximity to Flood Zones 2 or 3

The above site is approximately 490m away from Flood Zone 3. We are therefore unable to provide data from our detailed fluvial or tidal models which is relevant to your site.

More information on Flood Zones can be found on the GOV.UK website:

<http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/flood-zone-and-flood-risk-tables/table-1-flood-zones/>

Surface water flooding

Our mapping indicates that this site **is** at risk of surface water flooding.

For information on flooding from all other sources, such as surface water, please contact the Lead Local Flood Authority, which in this case is West Sussex County Council. A link to their information available online is shown below:

<https://www.westsussex.gov.uk/fire-emergencies-and-crime/dealing-with-extreme-weather/dealing-with-flooding/flood-risk-management/local-flood-risk-management-strategy/>

Please note that the above is a link to an external website which the Environment Agency does not control or maintain. Therefore, the link may not be the most up-to-date at the date of this letter. If the link does not work, and you are unable to find the information about surface water flooding on the relevant website, please contact the authority named above directly.

Where you can find further information

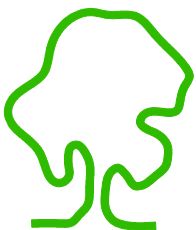
- Detailed long-term flood information and maps can be found on the GOV.UK website:
<https://flood-warning-information.service.gov.uk/long-term-flood-risk/>
- Flood maps for planning can be found on the GOV.UK website:
<https://flood-map-for-planning.service.gov.uk/>
- Please be aware that in February 2016 the Environment Agency updated its guidance on climate change allowances. The standard allowance of adding 20% to peak flows – as per previous guidance in the National Planning Policy Framework, may not be applicable for the purposes of informing development proposals. It is possible that our current modelling has under estimated flood risk when taking climate change into consideration. This does not however have an effect on Flood Zones 2 or 3. For further information please visit:
<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>
- Further details about the Environment Agency information supplied can be found on the GOV.UK website:
<https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather>
- If you have requested this information to help inform a development proposal, then you should note the information on GOV.UK on the use of Environment Agency information for Flood Risk Assessments:
<https://www.gov.uk/planning-applications-assessing-flood-risk>
<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

If you have any queries or would like to discuss the content of this letter further please call us on 03708 506 506, or reply to the email sent to you with this letter attached.

Please get in touch if you have any further queries or contact us within two (2) months if you would like us to review the information we have sent.

For information on what you can expect from us and our full service commitment to you, please click on this link:

<https://www.gov.uk/government/publications/environment-agency-customer-service-commitment--2/environment-agency-customer-service-commitment>



eas ltd

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