Project Name	: Land Adjacent to 21 Greencourt Drive, Bersted
Job No	: 24-277
Note Title	: Drainage Strategy Technical Note
Author	: NM
Checked	: GG
Approved	: GG
Date	: March 2025

1.0 INTRODUCTION

1.1 Background

1.1.1 Odyssey has been commissioned by UK Signature Homes to undertake a surface water and foul drainage strategy, to support a planning application for a proposed development at Land Adjacent to 21 Greencourt Drive, Bersted.

1.1.2 The proposal comprises a residential development of two dwellings, including the creation of new vehicular access, landscape planting, surface water attenuation and associated infrastructure. The Arun District Council (ADC) planning application number is BE/70/24/PL.

1.1.3 This technical note sets out details of the proposed drainage strategy in response to the ADC Drainage Engineer comments. The ADC comments are presented in **Appendix A**.

2.0 EXISTING SITE CONDITIONS

2.1 Location

2.1.1 The 0.08 hectare (ha) site is located approximately 1.5 kilometres (km) to the north-west of Bognor Regis railway station. The site is bounded by the rear accesses to gardens of dwellings along Nor'Bren Avenue in the north, the gardens of adjacent properties to the east and west, and Greencourt Drive to the south.

2.2 Topography

2.2.1 Based on available Light Detection and Ranging (LiDAR) data, level on site range from 7.8 metres Above Ordnance Datum (m AOD) to 8.2m AOD.

2.3 Geology and Hydrology

2.3.1 British Geological Survey (BGS) online mapping (accessed March 2025) indicates the bedrock geology of the site comprises Lambeth Group (clay, silt and sand). The mapping shows there are superficial River Terrace deposits (sand, silt and clay) present on the site. BGS mapping is presented in **Appendix B**.

2.3.2 Environment Agency (EA) online mapping indicates the nearest Main River is the Aldingbourne Rife, located approximately 1.5km to the north of the site.

2.3.3 BGS hydrogeology mapping (accessed March 2025) shows the site lies within the Lambeth Group, described as *"low productivity aquifer"* and summarised as a *"variable sequence of clays, shell beds, fine sands, silts and pebble beds giving low yields. Sometimes in hydraulic continuity with underlying Chalk aquifer"*.

2.3.4 Groundwater mapping published by the EA indicates the site is not located within a Source Protection Zone.

2.3.5 Groundwater monitoring was undertaken on site between November 2024 and March 2025. The depth of groundwater encountered ranged between 1.40m below ground level (bgl) and 2.50m bgl. The groundwater records are provided in **Appendix C**.

2.3.6 Percolation testing was carried out on site to determine an indicative soakage rate. The Vp rates calculated ranged from 49 seconds to 58 seconds. The percolation testing calculations are presented in **Appendix C**.

2.4 Existing Drainage

2.4.1 Southern Water sewer records indicate the presence of a foul water sewer crossing the site. The sewer records are presented in **Appendix D**. A survey would be required to identify any existing private drainage infrastructure on site. There are no existing public surface water sewers within the site boundary, and the nearest is located approximately 100m to the south-east at the junction of Greencourt Drive, South Way, and Collyer Avenue.

2.4.2 As the developable area for this site is less than 50ha, the Institute of Hydrology (IoH) Report 124 Flood Estimation for Smaller Catchments (1994) method is suitable (50ha is used in the formula and the flow rate is linearly interpolated based on the ratio of the development area). This methodology is approved in the Construction Industry Research and Information Association (CIRIA) C753 The SuDS Manual; the parameters used are presented in **Table 2.1**.

Table 2.1: SuDS Parameters

Parameter	Value	Unit
SAAR	718	Millimetres (mm)
Soil Index	0.400	-
Region	7	-
Urban	0.000	-

2.4.3 **Table 2.2** summarises the greenfield discharge rates for the total proposed impermeable area of the site (0.051). Supporting calculations are included in **Appendix E**.

Table 2.2: Greenfield Surface Water Discharge Rates

Return Period	Existing Greenfield Discharge Rates from Site (litres per second (l/s)	Existing Greenfield Discharge Rates per Hectare (l/s/ha)
QBAR	0.2	3.5
Q1	0.2	3.0
Q30	0.4	7.9
Q100	0.6	11.2

3.0 PROPOSED DEVELOPMENT

3.1.1 The development proposals comprise the construction of two dwellings to the rear of 21 Greencourt Drive with associated infrastructure and works including highway access.

3.1.2 The proposed site layout is presented in **Appendix F**.

4.0 SURFACE WATER DRAINAGE STRATEGY

4.1 Surface Water Drainage Strategy Requirements

4.1.1 Any surface water drainage strategy must demonstrate that the proposed development would be drained in a sustainable manner, commensurate with local and national policy. The National Planning Policy Framework (NPPF) requires that flood risk is not increased elsewhere as a result of new development.

4.2 Proposed Surface Water Drainage Strategy

4.2.1 The proposed surface water drainage strategy is shown in **Drawing 24-277-004**.

4.2.2 The ADC drainage hierarchy states that the most-preferred method of surface water discharge is "*discharge into the ground (infiltration)*". The groundwater monitoring results indicate the highest level encountered was 1.40m bgl, and a 1m unsaturated zone would be required between the base of an infiltration device and the peak groundwater level. The attenuation storage would therefore need to be kept at a maximum depth of 0.40m in order to achieve the 1m unsaturated zone, and the area required to achieve sufficient storage at this shallow depth would not be feasible within the site layout.

4.2.3 Furthermore, a 5m infiltration buffer between an infiltration device and any building. There would be insufficient space to achieve the necessary attenuation on site once a 5m buffer has been applied to both the existing dwellings located to the east and the west of the site, as well as the proposed dwellings. As such, infiltration is deemed to be an unviable option for surface water disposal.

4.2.4 The next most-preferred method of surface water discharge is "*controlled discharge to a surface water body*". There are no water bodies within the vicinity of the site, and therefore this option is not viable.

4.2.5 The next most-preferred method of surface water discharge is "*controlled discharge to a surface water sewer*". It is proposed to connect flows to the Southern Water surface water sewer located to the south-east of the site.

4.2.6 It is proposed that surface water from roads and clean roofs would be conveyed to permeable paving within the shared surfacing serving the two dwellings. Flows would connect to the public sewer at a controlled rate. Owing to the very low QBAR greenfield runoff rate, it is proposed to discharge flows at 2l/s in order to reduce the maintenance burden associated with lower flows.

4.2.7 The permeable paving has been designed to accommodate a 1 in 100-year storm plus 45% to account for climate change in line with the latest guidelines. The calculations have been undertaken in Causeway Flow and incorporate FEH 2022 rainfall data. Cv values have been set to 1.0 as per ADC requirements, and no additional allowance has been included to account for urban creep owing to the restricted nature of the site. The Causeway Flow calculations are presented in **Appendix E**.

4.3 Water Quality

4.3.1 The 'pollution hazard indices for different land use classifications' table has been extracted from CIRIA C753 The SuDS Manual, and applied to the development proposals, as shown in **Table 4.1**. The site is classed as having a low pollution hazard level.

Table 4.1: Pollution Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-carbons
Residential Roofs	Very low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements /day	Low	0.5	0.4	0.4

4.3.2 The proposed permeable paving would provide treatment for the surface water runoff from the site. The SuDS mitigation indices have been calculated in **Table 4.2** in accordance with the guidance contained in The SuDS Manual.

Table 4.2: SuDS Mitigation Indices

Type of SuDS Component	Mitigation Indices		
	TSS	Metals	Hydrocarbons
Permeable Pavement	0.7	0.6	0.7

4.3.3 The total mitigation indices from **Tables 4.2** exceed the corresponding pollution hazard indices for the site from **Table 4.1**, therefore the pollution hazard from the site would be sufficiently mitigated.

5.0 FOUL DRAINAGE STRATEGY

5.1 Proposed Foul Water Drainage Strategy

5.1.1 Proposed foul flows would discharge to the existing Southern Water public foul sewer which crosses the site.

6.0 SUMMARY AND CONCLUSIONS

6.1.1 Odyssey has been commissioned by UK Signature Homes to undertake a surface water and foul drainage strategy in response to consultation comments from ADC, in support of a planning application for a proposed development at Land adjacent to 21 Greencourt Drive, Bersted.

6.1.2 It is proposed that surface water generated by the development would be attenuated onsite using lined permeable paving, and discharged at a restricted rate to the nearby Southern Water surface water sewer. It is proposed that foul flows would be discharged to the Southern Water foul sewer which crosses the site.

6.1.3 This Technical Note demonstrates the design principles for the proposed development regarding surface water and foul drainage are commensurate with national and local policy and meet ADC requirements.

DRAWINGS

S1 PERMEABLE PAVING
PLAN AREA: 73.522m²
COVER LEVEL: 8.0m
INVERT LEVEL: 7.138m
562mm EFFECTIVE DEPTH

S2 PERMEABLE PAVING
PLAN AREA: 46.90m²
COVER LEVEL: 8.0m
INVERT LEVEL: 7.134m
566mm EFFECTIVE DEPTH

S3 PERMEABLE PAVING
PLAN AREA: 41.32m²
COVER LEVEL: 8.0m
INVERT LEVEL: 7.130m
570mm EFFECTIVE DEPTH

S4 VORTEX FLOW CONTROL
FLOW RATE: 2 l/s
COVER LEVEL: 8.20
INVERT LEVEL: 6.675

S1.003 150Ø 1:100

S5
CL 8.10
IL 6.585

S1.004 150Ø @ 1:100

GREENCOURT DRIVE

225Ø

EX 2351
CL 7.70
IL 5.61

1
2
11
5
26
28
18
9
30

NOTES

1. DO NOT SCALE FROM THIS DRAWING.
2. THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS ISSUED BY THE ARCHITECT.
3. SITE LAYOUT HAS BEEN PROVIDED BY WILDERN ARCHITECTURE LTD. DATED MARCH 2023. DRAWING REF. W22-020-102-A
4. PROPOSED SuDS FEATURES ARE INDICATIVE ONLY AND SUBJECT TO EVOLVE IN LINE WITH THE DESIGN DEVELOPMENT.

LEGEND:

- SITE BOUNDARY
- EXISTING FOUL WATER SEWER AND MANHOLE
- EXISTING SURFACE WATER SEWER AND MANHOLE
- PROPSOED SURFACE WATER SEWER AND MANHOLE
- PROPOSED FOUL WATER SEWER AND MANHOLE
- PROPOSED EXCEEDANCE FLOW ROUTE
- PROPOSED NON-INFILTRATING PERMEABLE PAVING
- PROPOSED PERMEABLE PAVING DIFFUSER

Rev.	Amendments	Drn	Chk	App.	Date

ODYSSEY
Tuscany House
White Hart Lane
Basingstoke
Hampshire RG21 4AF
Telephone: 01256 331144
Fax: 01256 331134
E: info@odysseyconsult.co.uk
W: www.odysseyconsult.co.uk

Job Title
LAND ADJACENT TO 21 GREENCOURT DRIVE, BERSTED

Drawing Title
PRELIMINARY DRAINAGE STRATEGY

Client
UK SIGNATURE HOMES

Scale	Date	Designed
1:200 @A1	OCT 24	HM
Drawn	Checked	Approved
HM	NM	GG
Job No	Drawing No	Rev
24-277	24-277-004	-

P:\24-277 - Land adjacent to 21 Greencourt Drive, Bersted\Tech\Acad\Drawings\24-277-004 Preliminary Drainage Strategy.dwg

APPENDIX A

Arun District Council Drainage Consultation Comments

Engineers Comments Regarding Surface Water Drainage

Application Reference:	BE/70/24/PL	**Reviewer Reference:**	ADC/SB
Planning Officer:	Hannah Kersley	**Date of Review:**	10/10/2024
Site Name:	Land adjacent to 21 Greencourt Drive Bersted PO21 5EU		
Application Description:	2 No 2-bed detached bungalows with associated car parking and bin and bike storage. This application is in CIL Zone 4 and is CIL Liable as new dwellings.		
Assessment Number:	1 of 1		

Policy and Guidance Information

Arun District Council Surface Water Drainage Guidance - https://www.arun.gov.uk/surfacewater

Land Drainage Consent – https://www.westsussex.gov.uk/fire-emergencies-and-crime/dealing-with-extreme-weather/flooding/flood-risk-management/ordinary-watercourse-land-drainage-consent/
and
https://www.arun.gov.uk/land-drainage-consent/

Arun District Council surface water pre-commencement conditions -
https://www.arun.gov.uk/planning-pre-commencement-conditions

The SuDs Manual [C753] by CIRIA

Sustainable drainage systems: non-statutory technical standards'
https://assets.publishing.service.gov.uk/media/5a815646ed915d74e6231b43/sustainable-drainage-technical-standards.pdf

Response	**Objection**

Critical Items for Surface Water Drainage Design Conditions

The failure to adequately address the following items will result in an objection to a surface water drainage design.

If any of these items are inadequately addressed by the submission, then their correction may result in a redesign of the surface water drainage scheme. A redesign is likely to have site wide implications such as the potential for storage structures to increase in volume or plan area.

Critical Item	Reason	Status
Winter groundwater monitoring data.	Adequate winter groundwater monitoring data must be supplied to evidence that infiltration designs have sufficient freeboard from the base of structures and the peak groundwater level. The same data is necessary to ensure that the potential for buoyancy has been adequately considered in attenuation designs.	**Not supplied**

Winter infiltration testing data.	Adequate winter infiltration testing must be supplied to justify the proposed discharge method and design infiltration rates. Infiltration tests must be completed strictly in accordance with BRE DG 365, CIRIA R156 or a similar approved method. Testing depths must account for peak groundwater levels and correspond with the location and depth of proposed infiltration features. Designs must be based upon the slowest infiltration rate evidenced closest to a proposed infiltration feature. Average design rates will not be accepted. The results of incomplete tests should not be extrapolated to obtain design values for infiltration rates.	**Not supplied**
The hierarchy for sustainable drainage.	The proposed discharge method must accord with the SuDS hierarchy as given below. Evidence must be supplied to justify the proposed discharge method. 1. Rainwater reuse where possible. 2. Complete discharge into the ground (infiltration). 3. Hybrid infiltration and restricted discharge to an appropriate water body or surface water sewer. 4. Restricted discharge to an appropriate water body. 5. Restricted discharge to a surface water sewer. 6. Restricted discharge to a combined sewer. A water body may be defined as a river, watercourse, ditch, culverted watercourse, reservoir, wetland or the sea. **Engineers cannot support any proposed connection of surface water to the foul sewer.**	**Not supplied**
Calculations	Calculations for pre-development run off rates must be based upon the positively drained area only. Proposed discharge rates must not increase flood risk on site or elsewhere. Discharge	**Not supplied**

	rates must be restricted to QBAR or 2 l/s/ha, depending on whichever is higher.	
	Designs must be based on the most recently available rainfall data at the time of conditions being applied. **FSR rainfall data will not be accepted.** FEH rainfall data is based upon more recent records and continues to be updated.	**Not supplied**
	Designs must use the correct climate change allowances at the time of determination of the outline or full planning application. CV values for all events must be set to 1. This includes summer, winter, design, and simulation events. The correct allowance for urban creep must be applied. Additional storage must be set to zero unless it can be evidenced where this is provided. Infiltration half-drain times must be less than 24 hours. Infiltration design rates must be applied to the sides of soakaways, or to the base of infiltration blankets. Design rates must not be applied to both the base and sides of infiltration structures. A surcharged outfall must be modelled.	**Not supplied**
Natural catchments design.	The submission must define the natural drainage characteristics within, and hydraulically linked to, the site and demonstrate that the drainage proposals will integrate with and not compromise the function of the natural and existing drainage systems. The condition, performance (including capacity where appropriate) and ownership of any existing site surface water drainage infrastructure must be accurately reported. Appropriate easements to watercourses and other services must be shown on all plans. Where there are areas of flood risk from any source on the site, it must be shown how a sustainable surface water drainage design can	**Not supplied**

	be accommodated on the site without conflicting with those areas of flood risk. Designs must replicate the natural drainage catchments of the site. All surface water drainage designs must therefore drain via gravity to corresponding points of discharge. **The use of pumps for surface water drainage is not sustainable and will not be supported**. .	
Plans	Plan areas, depths and levels of drainage infrastructure must accurately correspond with the supporting calculations.	**Not supplied**
Water quality benefits.	An assessment of water quality is necessary to evidence that the proposed design provides adequate treatment of surface water.	**Not supplied**
Trees and planting	There should be no conflict between surface water drainage infrastructure and existing or proposed trees or planting. The design must consider the potential growth of proposed trees and adequate mitigation must be provided to protect drainage infrastructure where conflict **cannot** be avoided.	**Not supplied**

Additional comments to the planning officer

The NPPF states that when determining any planning application, local planning authorities should ensure that flood risk is not increased elsewhere (paragraph 173 and 180e). The PPG guides local planning authorities to refer to 'Sustainable drainage systems: non-statutory technical standards' and detailed industry guidance like The SuDS Manual [C753] by CIRIA to guide decisions about the design, maintenance, and operation of sustainable drainage systems for non-major development.

This consultation has been primarily informed by The SuDS Manual.

Insufficient information regarding surface water drainage has been submitted to evidence that flood risk will not be increased as due to the proposed development.

The only information relating to surface water drainage is in the application form, where it is indicated that the site will drain surface water via soakaway. We are supportive of this strategy, however no evidence has been submitted to show that infiltration is viable on the site. Ground conditions and infiltration potential are variable in Bersted. Infiltration can be possible, but in parts, groundwater can be high or infiltration rates so low as to make infiltration unviable.

If infiltration is not viable, then there are limited alternative sustainable means of draining the site, summarised as follows:

1. Infiltration – not investigated.
2. To a watercourse – none available.
3. To a surface water sewer – none available in immediate vicinity – closest mapped surface water sewer is on South Way, it is unclear if a gravity connection can be achieved.
4. To a highway drainage system – As this is a private network, permission cannot be assumed. Generally, applications to connect surface water to highway drainage are strongly resisted.
5. To a combined sewer – none available.

Surface water must not be discharged into the foul sewer. The foul sewer is not a recognised disposal location in the SuDS Manual, Approved Document H, or the NPPG **[Flood risk and coastal change para 056]**. It is important to recognise that the foul and combined sewer networks are defined by the public sewer records held by Southern Water Services Ltd.

If infiltration is not possible and it is not possible to achieve a gravity connection (with permission) to the highway drainage network or surface water sewer, then there are no alternative sustainable disposal locations for surface water.

In the absence of any surface water drainage design information, we cannot assess if flood risk will be increased by the proposed development. Therefore, this application does not accord with the NPPF as set out above.

Overcoming our objection

As this is not a holding objection or a request for further information, I am not listing requested conditions. If you are minded to approve this application, please reconsult me for a list of suggested conditions to ensure that the development is adequately drained and does not increase flood risk elsewhere.

The imposition of conditions at this stage rather than overcoming my objection could result in a circumstance where the condition cannot be discharged. In the event of attaching a condition that cannot be discharged, permission may be invalid.

If the planning officer is minded to allow the applicant additional time to submit further documents to support this application, then the following evidence may overcome our objection. Please do not submit further documents without prior discussion with the planning officer as to whether it will be possible for these to be assessed or influence their determination.

1. Provide evidence of a sustainable surface water disposal location. Including but not limited to:

- Winter groundwater monitoring and winter infiltration testing,
  If infiltration is not viable then present evidence of this in addition to:

- Permission in principle to connect surface water from the site to an alternative disposal location. Please note, evidence of permission to connect surface water to the Southern Water public foul sewer will not be acceptable.

2. Evidence that a sustainable surface water drainage design can be accommodated within the proposed site layout. This will require a drainage statement, supporting calculations and a preliminary drainage layout (including connection levels) as a minimum.

A reduced site-specific version of our full surface water drainage design checklist is provided below. This has been edited to remove elements that are not applicable to this site, either due to the scale of the proposal or the method of disposal. The checklist is provided to assist the applicant and designer in preparing a revised design to meet our requirements. It is applicable to Land Adjacent to 21 Greenfield Court only.

The full unedited surface water design checklist is available on our website at https://www.arun.gov.uk/surfacewater/. **If the design is amended following receipt of our consultation the designer may need to refer to the full checklist to ensure that the revised design meets our requirements.**

Land Adjacent to 21 Greenfield Court Designer Checklist

Ground Investigation Results

Comment: To be provided prior to determination.

Groundwater monitoring

☐ Plan showing location of monitoring points provided.
☐ Depths of holes detailed.
☐ Dates of observations and depth to groundwater recorded.
☐ Evidence of the strata within borehole or monitoring pits provided.

Requested to aid speed of assessment

☐ Plan showing the peak groundwater levels at each monitoring point in mAOD.
☐ Peak groundwater levels recorded in metres below ground level and mAOD.

Infiltration testing

☐ Completed strictly in accordance with BRE DG 365, CIRIA R156 or a similar approved method.
☐ Plan showing location of trial pits provided.
☐ Pit dimensions provided.
☐ Depths of testing provided.
☐ Dates, times and readings of each test recorded.
☐ Calculations for the infiltration rate for each test provided.
☐ Evidence of the strata within trial pits provided.
☐ Test locations, and depths correspond with the expected location and depths of proposed infiltration features.

Requested to aid speed of assessment

☐ Depths of testing provided in m below ground level and mAOD.

Other

As appropriate, dependent upon specific site conditions

☐ Appropriate geotechnical advice is sought where infiltration may have negative effects due to the ground conditions on the site – please see our guidance linked above for information.

Surface Water Drainage Statement

Comment: To be provided prior to determination.

Disposal method (Select as appropriate)
☐ Rainwater reuse is proposed where possible.
☐ Infiltration is proposed and maximised wherever possible.
☐ Hybrid infiltration and restricted discharge to an appropriate water body or surface water sewer is proposed where a full infiltration design is not possible.
☐ ~~Restricted discharge to a water body is proposed where a full infiltration design is not possible.~~
☐ Restricted discharge to a surface water sewer is proposed where a full infiltration design is not possible and there are no nearby water bodies.
☐ Restricted discharge to a public or private highway drainage network is proposed where a full infiltration design is not possible and there are no nearby water bodies or surface water sewers.
☐ ~~Restricted discharge to a public combined sewer is proposed where a full infiltration design is not possible and there are no water bodies, surface water sewers, highway, or private drainage systems nearby.~~

Disposal method justification
☐ Infiltration has been adequately investigated, in winter, at appropriate and varying depths where appropriate, above peak recorded winter groundwater levels at the given location.
☐ Surface water sewer network is investigated (location, mapping, network, flow direction, ownership/responsibility, depth, capacity, and condition).
☐ Public and private downstream highway drainage networks are investigated (location, mapping, network, flow direction, ownership/responsibility, depth, capacity, and condition).
☐ Any relevant permissions or legal agreements from asset or landowners that are needed are identified and evidence of consents provided.

Requested to aid speed of assessment
☐ Any previous relevant correspondence or pre-application advice from the Local Planning Authority [LPA] or the Lead Local Flood Authority [LLFA] regarding the surface water drainage design is included with the statement.

Existing Site
Essential
☐ It is clear what the natural drainage characteristics of the site and hydraulically linked areas are.
☐ Natural flow paths are identified on a plan (where applicable).
☐ Existing site drainage features are investigated – condition, performance, and ownership.
☐ Any appropriate easements to infrastructure are investigated.
☐ Existing and future flood risk from any source is detailed.

It is suggested that the above is achieved with the following, which may be combined where appropriate:
☐ An existing topographical plan.
☐ Flood maps (fluvial, tidal, pluvial, groundwater, sewer, and reservoir) are supplied (or Flood Risk Assessment referred to).
☐ Confirmation and surveys of any existing drainage infrastructure on the site.
☐ Full details of any known flooding on the site.

Proposed Design
Essential
☐ Statement confirming the proposed design criteria including fixed design calculation inputs for the SuDS system. Examples include:
- Climate change allowances,

- Urban creep allowance,
- CV values,
- Rainfall data,
- MADD factor or additional storage.

☐ Natural catchments are followed.
☐ The design is gravity based with no use of pumps.
☐ Where there is existing drainage infrastructure on the site it is clearly explained or illustrated what is being retained, upgraded, or removed.
☐ Details of necessary off-site works and consents are provided.
☐ If the surface water drainage is designed to flood in the 1% Annual Exceedance Probability [AEP] + Climate Change Allowance [CCA] event, then the flood volume is contained safely on site without flooding any part of a building or utility plant susceptible to water or affecting safe access or egress.

☐ The design provides and evidences interception drainage and is able to capture and retain on site the first 5mm of the majority of all rainfall events.
☐ Water quality and treatment is adequately assessed – with an assessment appropriate for the scale and proposed use of the site.
☐ Adequate freeboard is provided between the top water level of any open storage features and the top of the bank.
☐ There are no clashes with other infrastructure.
☐ Self-cleansing velocities are achieved where pipes are proposed.

☐ 1m freeboard is provided between peak groundwater levels and the base of any infiltration feature.

☐ The proposed discharge rate is explained and justified (for attenuation designs).
☐ Where discharge is proposed to a public surface water or combined sewer, a capacity check confirming that the sewer can receive the proposed flows is submitted.
☐ Adequate freeboard is provided between peak groundwater levels and the base of any attenuation feature (refer below if this is not possible).
☐ Where there is a risk that the base of an attenuation feature may penetrate peak groundwater levels, additional mitigation measures to prevent groundwater ingress are incorporated into the design and construction method statement.
☐ Where there is a risk that the base of an attenuation feature may penetrate peak groundwater levels the effects of buoyancy have been considered in the design.

☐ Amenity benefits are provided by the drainage system (assessed by others).
☐ Biodiversity benefits are provided by the drainage system (assessed by others).
☐ Landscaping has been designed to ensure ease of maintenance of drainage assets.
☐ The justification and criteria for tree root avoidance and mitigation measures is clear, referencing adopting body standards where applicable.

<u>Preferred</u>
☐ Ground raising is avoided where possible.
☐ The drainage system is considered by and contributes to the biodiversity net gain statement (assessed by others).

Impermeable Area/Catchment Plan

Comment: May be combined with the drainage layout. To be provided prior to determination.

Essential

☐ An impermeable area plan is provided showing all positively drained areas including open surface water storage plan areas.

Preferred

☐ Impermeable areas are shown in m^2 on the impermeable areas plan(s).

☐ Demarcated impermeable areas correspond with the distribution of those areas in the supporting calculations.

Surface Water Drainage Calculations

Comment: To be provided prior to determination.

General

☐ The most recently applicable, or previously agreed FEH rainfall data is used.

☐ CV values for all events are set to 1. This includes summer, winter, design, and simulation events.

☐ The correct climate change allowances, appropriate for the full lifetime of the development, have been applied to all calculations.

☐ A 10% allowance for urban creep is applied to all residential roof areas.

☐ 100% Annual Exceedance Probability [AEP] + Climate Change Allowance [CCA] (1 in 1 year) event calculations provided.

☐ 10% AEP + CCA (1 in 10 year) event calculations provided showing that the incoming pipe to any infiltration feature is above this level.

☐ 3.33% AEP + CCA (1 in 30 year) event calculations provided showing that the full surface water volume is contained within the designed system without flooding.

☐ 1% AEP + CCA (1 in 100 year) event calculations provided showing that the full surface water volume is contained safely on site, without flooding any part of a building or utility plant susceptible to water or affecting safe access or egress.

Infiltration

☐ Half drain times do not exceed 24 hours for the 10% AEP + CCA and 1% AEP + CCA events.

☐ If half drain times exceed 24 hours for the 1% AEP + CCA event, then advice and agreement from the LPA has been sought and submitted.

☐ The most precautionary design infiltration rate is used.

☐ Design infiltration rates are applied to the sides of soakaways only.

☐ Design infiltration rates are applied to the base of permeable paving, infiltration blankets or basins only.

☐ Where the design infiltration rate is applied to the base an appropriate factor of safety is applied.

Attenuation and Restricted Discharge

☐ Greenfield run off rates are based upon the positively drained area of the site only.

☐ Discharge rates are restricted to QBAR or 2 l/s/ha, depending on whichever is higher, for all storms up to the 1% AEP + CCA event.

☐ Half drain times and available capacity in the drainage system for subsequent storms are considered.

☐ A surcharged outfall to a watercourse or sewer has been modelled. The surcharge level is the 1% AEP + CCA flood event for the receiving watercourse, or to the top of the bank if appropriate hydraulic modelling is not available.

Requested to aid assessment

☐ FEH22 point descriptors for the site are provided.

Drainage Plans and Specifications

Comment: Preliminary drainage layout may be provided prior to determination with full details and specifications agreed vis condition if necessary. The preliminary layout must include levels at connection to a disposal location if applicable.

Essential

Plans are provided showing:

☐ The proposed design within the proposed site layout.

☐ Existing and proposed site sections and levels.

☐ Exceedance flow management routes.

☐ Details of connections to sewers or private drainage networks.

These plans must be of sufficient detail that a reviewer can be confident that the design can be constructed without flood risk being increased on site or elsewhere.

Specifications are required for all materials used in the design. We suggest that this is best achieved and illustrated with site specific construction detail drawings. The combination of construction details, with plans and sections, ensure that the proposed standard of construction will facilitate adoption and maintenance by an appropriate body and have structural integrity.

The following checklist is designed to demonstrate the level of detail required:

Easements

☐ Any appropriate easements as stipulated by any public or private utility provider shown on all plans.

☐ Infiltration features (aside from permeable paving that does not take any extra impermeable catchment such as a roof) are shown at least 5m from buildings or structures.

☐ Maintenance easements are shown from the top of the bank from all open SuDS features on all plans.

☐ Existing trees and their root protection zones are shown on any drainage layout.

☐ Proposed trees and appropriate easements are shown on any drainage layout.

Detail

☐ It can be clearly determined what a pipe's diameter, pipe materials, gradients, flow directions and invert levels are from the plans.

☐ It can be clearly determined what an inspection chamber or manhole's cover level, invert level, cover loading grade and sump depth (where applicable) are from the plans.

☐ All infiltration or attenuation features (including permeable paving) are clearly labelled with their dimensions, invert/base levels and cover levels.

☐ Control structures are labelled with discharge rates, hydraulic head, invert and cover levels and ideally model number.

☐ Measures to protect drainage from tree root damage are clearly shown on any drainage layout.

☐ If the 1% AEP + CCA event floods, then the extent and depth of the flooding is shown on a site plan. This plan includes proposed external ground levels and finished floor levels of buildings.

☐ Potential flow routes off site are shown. The plan also includes proposed external ground levels, finished floor levels of buildings and designed slopes on all impermeable surfaces such as highways or car parks.

☐ Cross sections and long sections of all open features are provided.

☐ Construction detail drawings are site specific.
☐ Construction detail drawings are provided for all components including but not limited to:

- ☐ Infiltration structures
- ☐ Attenuation structures
- ☐ Manholes/inspection chambers
- ☐ Catchpits/silt traps
- ☐ Flow control devices
- ☐ Permeable paving
- ☐ Channel drains
- ☐ Gullies
- ☐ Pipe bed and surround
- ☐ Pipe to pipe connections
- ☐ Filter strips or drains
- ☐ Swales
- ☐ Bio-retention systems
- ☐ Ponds and wetlands
- ☐ Tree pits and measures to protect drainage from root incursion
- ☐ Water treatment features
- ☐ Green roofs
- ☐ Measures to protect drainage from tree roots.
- ☐ Water butts or alternative methods of water reuse – also to be shown on plans.

<u>The following items are requested to aid assessment or confidence in construction:</u>

☐ Where features have a non-uniform plan area, a plan showing the coordinates of the perimeter is provided.
☐ All drainage infrastructure is labelled to correspond with the supporting calculations.

Other
☐ Open feature planting specification is provided (to be assessed by others).

This checklist is designed to aid an applicant with their submission. The list is not exhaustive, and our engineers may request additional information to enable them to review a proposal to their satisfaction.

The checklist may also request information that an applicant does not feel is relevant to their submission. In this case the applicant can provide an explanation as to why they have omitted certain information in their drainage statement. However, the appraising engineer reserves the right to request this information if they believe it is necessary for their review.

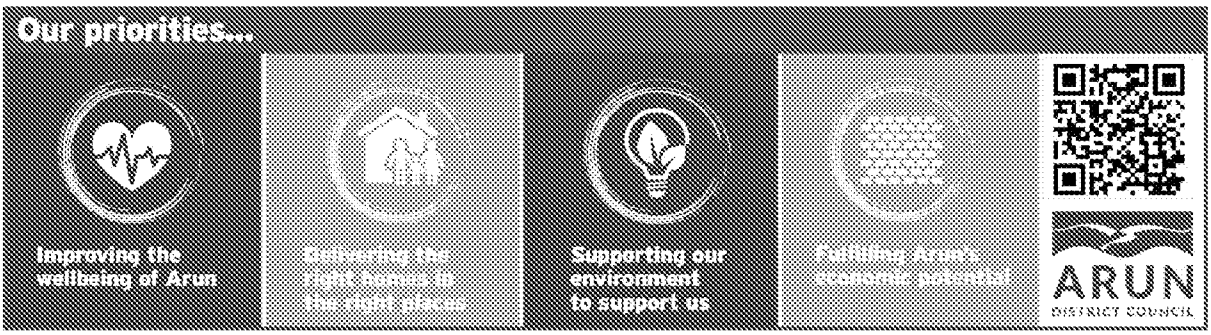
[redacted]

Drainage Engineers response

[redacted]

Arun District Council, Civic Centre, Maltravers Rd
Littlehampton, West Sussex, BN17 5LF
www.arun.gov.uk

To register to receive notifications of planning applications in your area please go to https://www1.arun.gov.uk/planning-application-finder



From: Sarah Burrow <Sarah.Burrow@arun.gov.uk>
Sent: 10 October 2024 11:57
To: Planning.Responses <Planning.Responses@arun.gov.uk>
Cc: Hannah Kersley <Hannah.Kersley@arun.gov.uk>; Paul Cann <Paul.Cann@arun.gov.uk>
Subject: RE: Planning Consultation on: BE/70/24/PL

Hi Hannah,

Find my consultation – an objection – attached. Apologies for the delay in response.

I haven't noted in the body of the consultation that a mapped public foul sewer crosses the site access. Please consult Southern Water regarding this proposal and in particular, any easements that may required to the sewer.

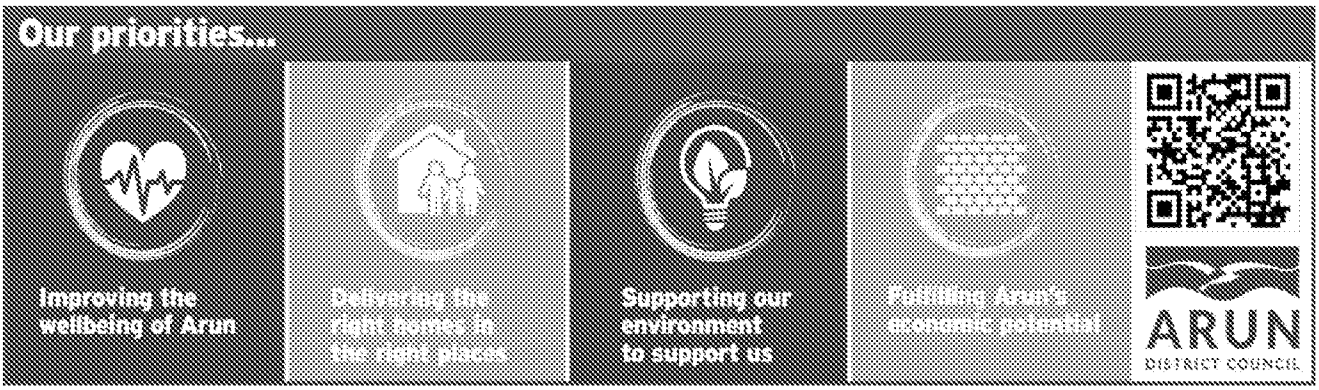
Kind regards

Sarah Burrow
Flood Risk and Drainage Engineer, Coastal Engineers and Flood Prevention

T: 01903 737815
E: sarah.burrow@arun.gov.uk
[redacted]

Usual working pattern:
Monday – Flexible between 8am and 6pm
Tuesday and Wednesday – 9:15am to 2:45pm
Thursday – 9am to 6pm
Friday – Flexible between 8am and 6pm

Arun District Council, Civic Centre, Maltravers Rd
Littlehampton, West Sussex, BN17 5LF
www.arun.gov.uk



From: Planning.Responses <Planning.Responses@arun.gov.uk>
Sent: 02 September 2024 10:34
To: Land Drainage <Land.Drainage@arun.gov.uk>
Subject: Planning Consultation on: BE/70/24/PL

To: **Engineers (Drainage)**

NOTIFICATION FROM ARUN DISTRICT COUNCIL

Town & Country Planning Act 1990 (as amended)
Town and Country Planning (Development Management Procedure) (England) Order 2015

Planning Permission

Application No:	**BE/70/24/PL**
Registered:	30th August 2024
Site Address:	Land adjacent to 21 Greencourt Drive Bersted PO21 5EU
Grid Reference:	492190 100365
Description of Works:	2 No 2-bed detached bungalows with associated car parking and bin and bike storage. This application is in CIL Zone 4 and is CIL Liable as new dwellings.

The Council have received the above application.

Click here to view the application details

This application has been identified as CIL Liable. Therefore please be aware that, in accordance with Appendix 2 of the Arun CIL Charging Schedule, your consultation response should only include requests for Section 106 for onsite mitigation, Pagham Harbour Management Contributions (if applicable} or Affordable Housing. "Off" Site mitigation measures directly related to this development should be dealt with by condition if possible to ensure the scaling back of Section 106 if possible. CIL contributions will be used for "off" site infrastructure mitigation schemes. Therefore if this proposal triggers the need for "off" site mitigation, please ensure that you engage in the CIL Infrastructure List Consultation process upon receipt of a consultation letter.

Should you have any comments to make, these should be sent by replying to this email by 3rd October 2024 . You can also monitor the progress of this application through the Council web site:

https://www.arun.gov.uk/planning-application-search

The application will be determined having regard to the development plan policies (if any are relevant) and other material considerations. The development plan can be accessed via the website https://www.arun.gov.uk/development-plan as can information on what comments we can consider https://www.arun.gov.uk/planning-application-comments

Please be aware that any comments you may make will be available on our website so please do not insert personal details or signatures on your reply.

Should the application go to appeal the Planning Inspectorate will publish any comments made to the Council on their website:https://acp.planninginspectorate.gov.uk/ but they will protect personal details.

In the absence of a reply within the period stated, I shall assume that you have no observations to make.

Yours sincerely

Hannah Kersley

Planning Officer- Arun District Council

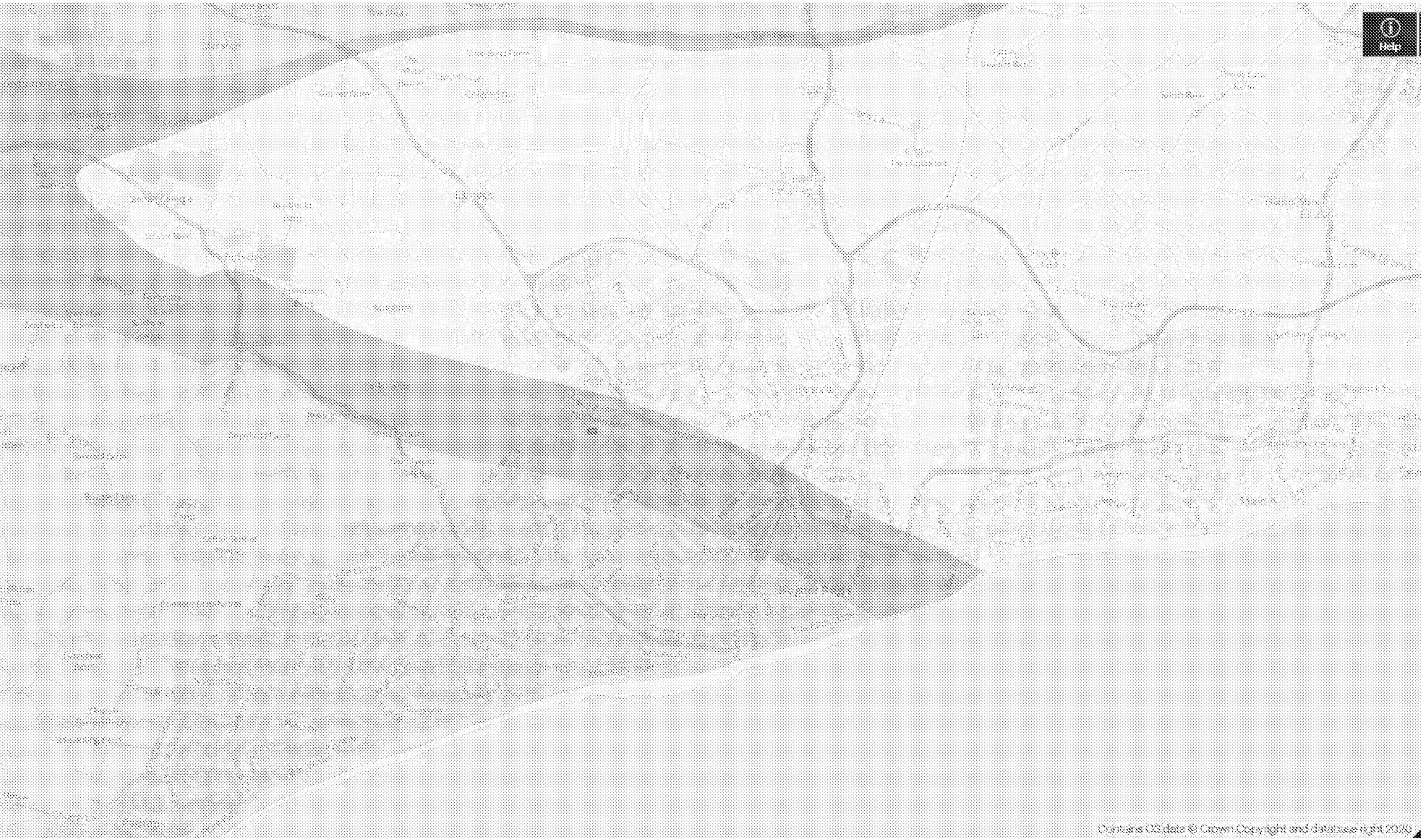
Telephone: 01903 737856

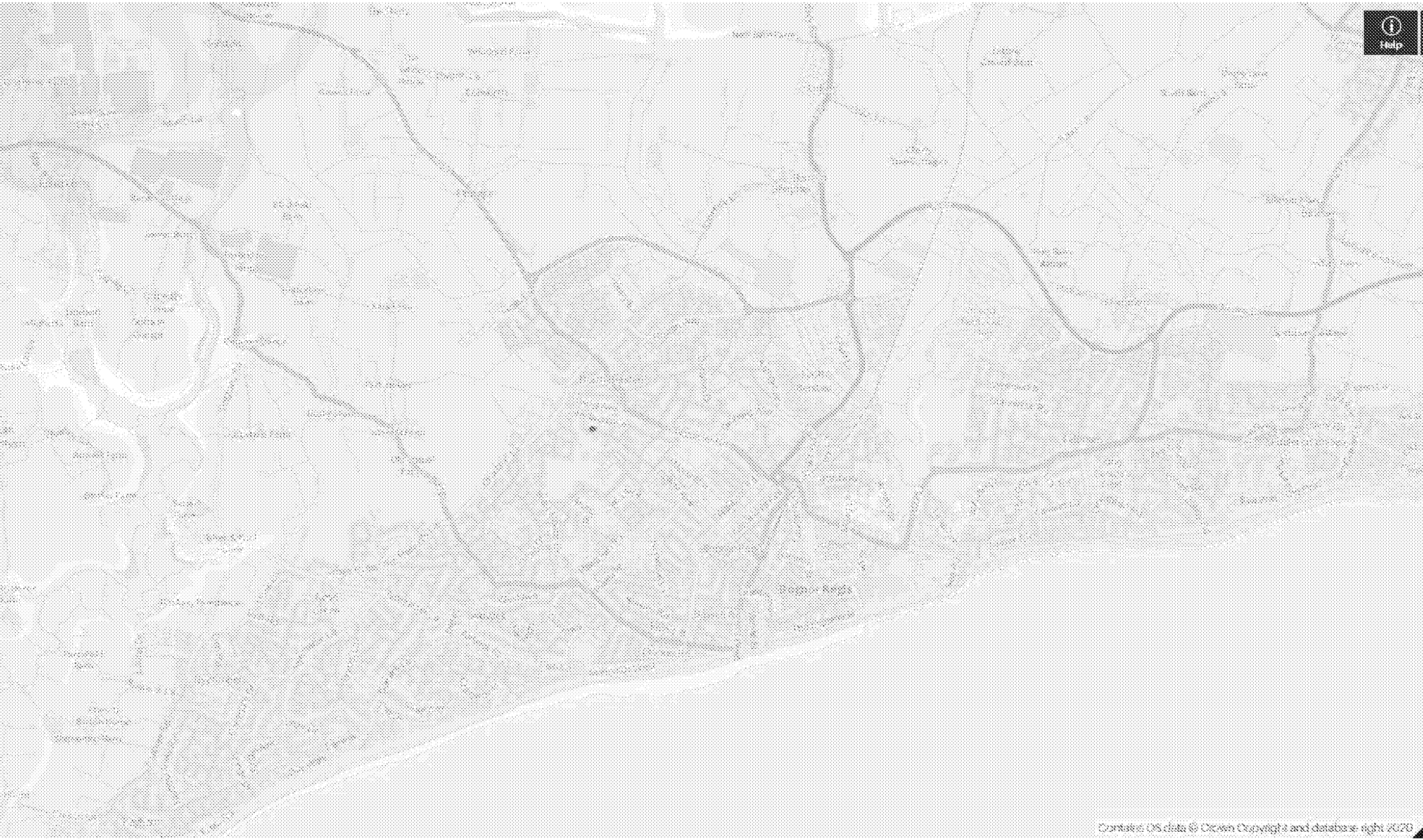
Email: hannah.kersley@arun.gov.uk

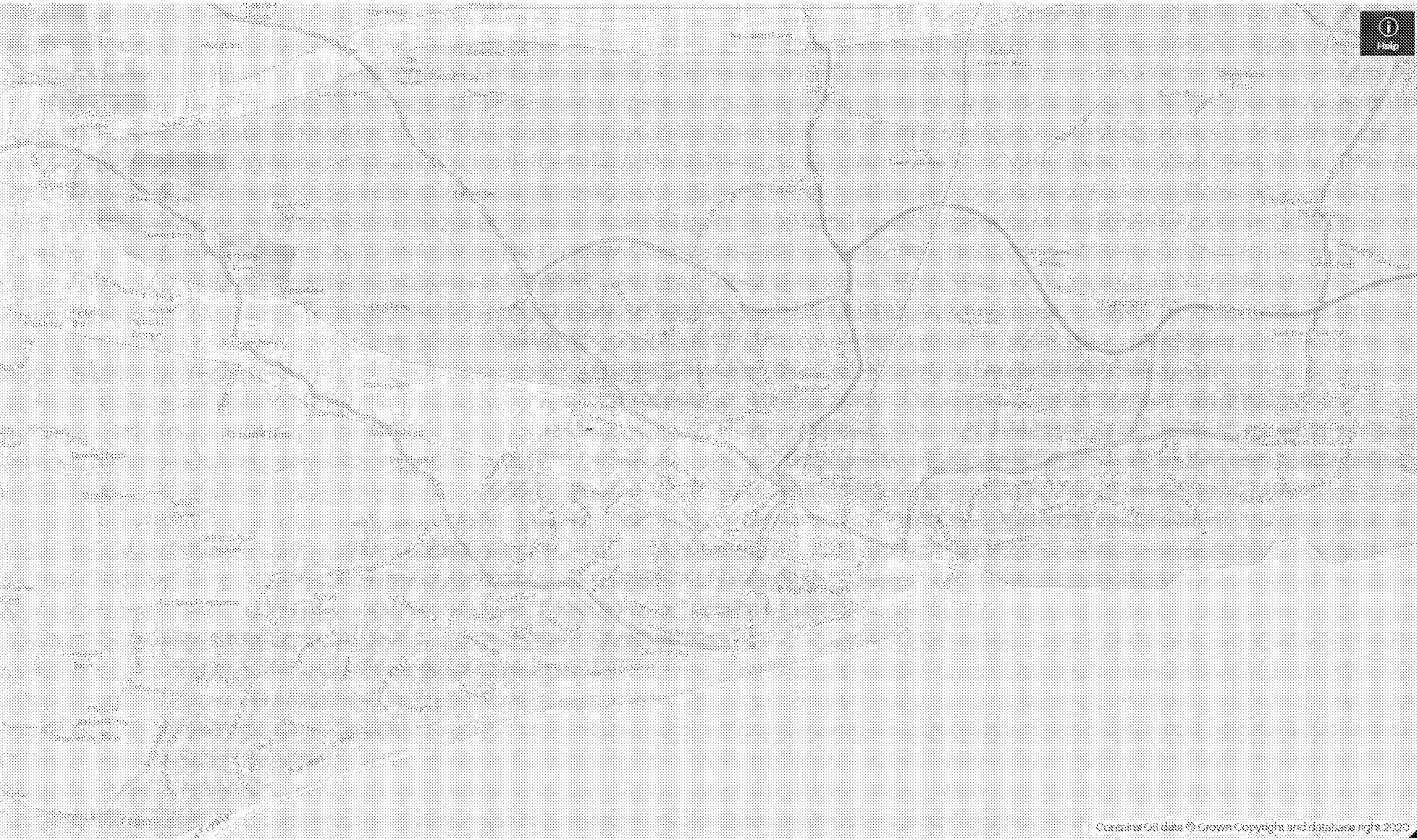
PLCONSULT (ODB) 2020

APPENDIX B

British Geological Survey Mapping


Help
Contains OS data © Crown Copyright and database right 2020


1 Map
Contains OS data © Crown Copyright and database right 2020


Help
Contains OS data © Crown Copyright and database right 2020

APPENDIX C

Site Investigation Results

Depth of Standing Groundwater			
Trial Hole	**Date**	**Depth of Groundwater (m bgl)**	**Depth of Standpipe (m bgl)**
WS1	25/11/2024	1.40	3.25
	05/12/2024	1.50	3.20
	07/01/2024	1.40	3.30
	12/02/2025	2.50	3.00
	03/03/2025	2.40	3.30
WS2	25/11/2024	1.87	3.25
	05/12/2024	2.00	3.20
	07/01/2024	1.80	3.20
	12/02/2025	2.50	3.15
	03/03/2025	2.41	3.10

PERCOLATION TESTS AND CALCULATIONS

For the proposed installation of a new soak away system

Calculations

Result of 1st Percolation Test

(a) Depth of water (mm) **250** (b) Time taken to soak away (secs) **14,400**

Percolation Value (V_p) = (b) ÷ (a) **57.6** (secs)

Result of 2nd Percolation Test

(a) Depth of water (mm) **250** (b) Time taken to soak away (secs) **12,600**

Percolation Value (V_p) = (b) ÷ (a) **50.4** (secs)

Result of 3rd Percolation Test

(a) Depth of water (mm) **250** (b) Time taken to soak away (secs) **12,240**

Percolation Value (V_p) = (b) ÷ (a) **48.96** (secs)

Calculations (continued)

Average V_p Value of test 1, 2 & 3 **52.32** (secs) (This is known as the Percolation Value)

Number of persons (P) to be served by the new system **6**

(Allow a realistic figure here, e.g for a 3 bedroom house, 4 to 5 persons)

Area of drainage trench (A_t) required = P x V_p x 0.25 (or 0.2)

Substituting the values given above: A_t = **6** x **52,32** x **.25**

= **78.48** square metres

Width (W) of new drainage trench = **.6** **metres**

Length (L) of new drainage trench = **A_t ÷ W**

= **78.48** ÷ **.6** metres

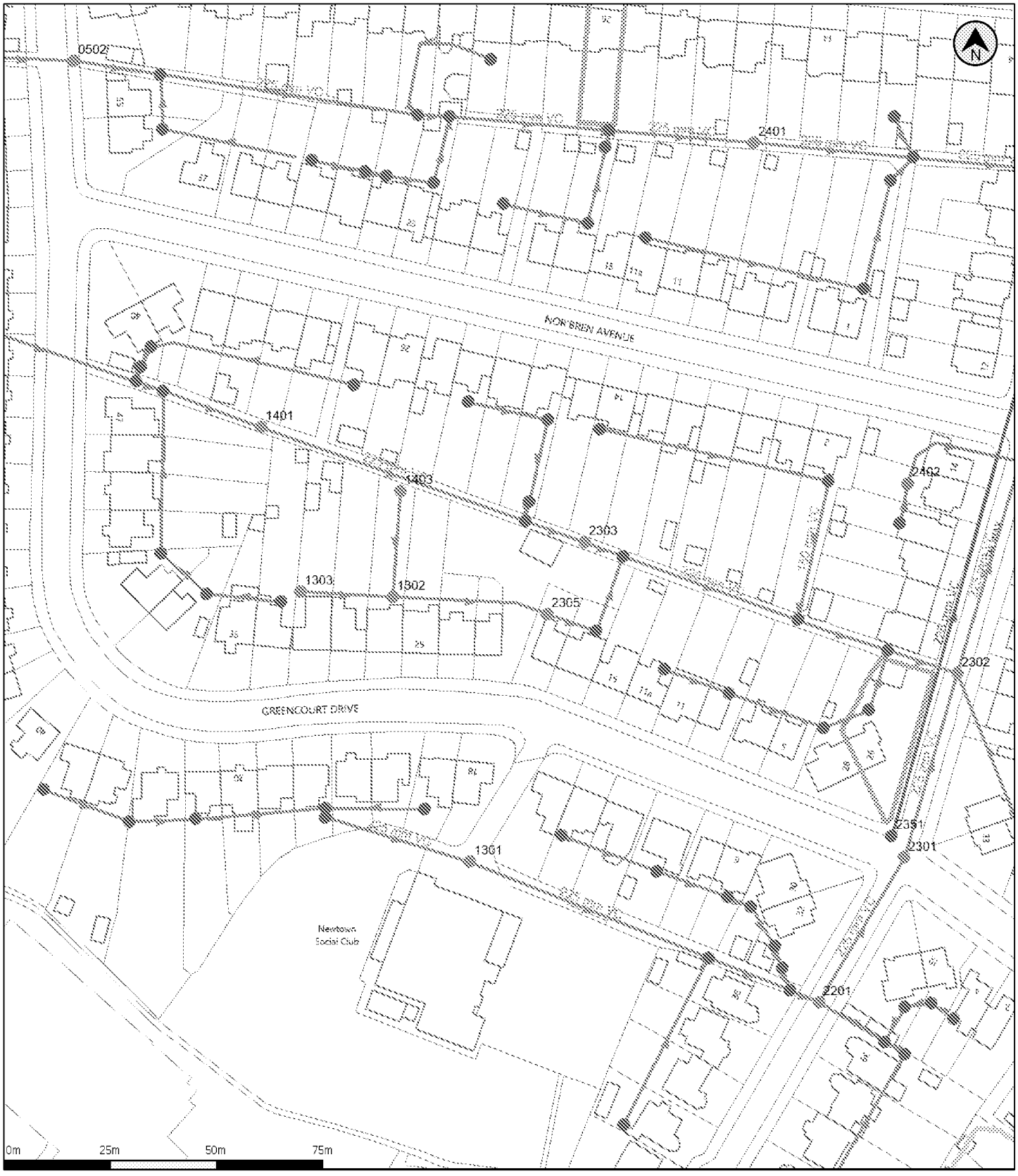
= **130.8** **metres**

Notes

Test was carried out on February 28th.
Test hole filled overnight.
The 27th had prolonged heavy rain in the morning.
The 28th was dry and fair.
Hole size was 1m x .6 x .8 and filled to a depth of 250mm with water.
First test conducted at 7am.
Second test conducted at 1230pm.
Third test conducted at 8am on the next day.

APPENDIX D

Southern Water Sewer Records



(c) Crown copyright and database rights 2024 Ordnance Survey AC0000808122	Scale: 1:1250	Date: 17/10/24	Wastewater Plan A4
Data updated: 24/09/24	Map Centre: 492193,100379	Our Ref: 1597664 - 1	Powered by digdat

Foul Gravity Sewer | Combined Gravity Sewer | Culverted Water Course or Ordinary Watercourse | Surface Water Gravity Sewer

Combined Outfall | Surface Water Outfall | Foul Outfall | Surface Water Inlet

Combined Pumping Station | Surface Water Pumping Station | Foul Pumping Station | Water Treatment Works | Sewage Treatment Works | Building Over Agreement Area

Foul Manhole | Combined Manhole | Surface Water Manhole | Hole with Manhole, Inspection Chamber, Summit Manhole or Surface Water Soakaway

cneedham@odysseyconsult.co.uk

24-277

Water for Life

Southern Water

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2024 Ordnance Survey AC0000808122 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

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

ARUN DISTRICT COUNCIL BE/44/25/PL

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
2402	C	0.00	0.00	
0502	F	6.51	0.00	
1301	F	8.39	5.35	
1302	F	0.00	0.00	
1303	F	0.00	0.00	
1401	F	7.24	0.00	
1403	F	0.00	0.00	
2201	F	7.91	4.98	
2301	F	7.68	0.00	
2302	F	7.07	0.00	
2303	F	0.00	0.00	
2305	F	0.00	0.00	
2401	F	6.44	0.00	
2351	S	7.70	5.61	

APPENDIX E

Drainage Strategy Supporting Calculations

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.400
Area (ha)	1.000	Urban	0.000
SAAR (mm)	718	Region Number	Region 7

Results l/s

QBAR Rural	3.5
QBAR Urban	3.5
Q100 years	11.2
Q1 year	3.0
Q30 years	7.9
Q100 years	11.2

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	4.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

	Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Notes
✓	S1 Permeable Paving	0.035	4.00	8.000	Manhole	Adoptable	1200	492193.633	100379.083	0.862	
✓	S2 Permeable Paving	0.008	4.00	8.000	Junction			492194.228	100372.068	0.866	
✓	S3 (Permeable Paving)	0.008	4.00	8.000	Junction			492194.602	100366.263	0.870	Auto-design is off
✓	S4			8.200	Manhole	Adoptable	1200	492193.609	100358.396	1.525	
✓	S5			8.100	Junction			492198.382	100350.530	1.515	

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type	T of C (mins)	Rain (mm/hr)
? 1.002	S3 (Permeable Paving)	S4	2.500	0.600	Colebrook-White	7.130	6.675	0.455	5.5	150	Circular	4.18	50.0
? 1.003	S4	S5	9.201	0.600	Colebrook-White	6.675	6.585	0.090	102.2	150	Circular	4.31	50.0
? 1.000	S1 Permeable Paving	S2 Permeable Paving	2.000	0.600	Colebrook-White	7.138	7.134	0.004	500.0	150	Circular	4.03	50.0
? 1.001	S2 Permeable Paving	S3 (Permeable Paving)	2.000	0.600	Colebrook-White	7.134	7.130	0.004	500.0	150	Circular	4.15	50.0

Name	US Node	DS Node	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Minimum Depth (m)	Maximum Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
? 1.002	S3 (Permeable Paving)	S4	0.428	76.5	9.2	0.720	1.375	0.720	1.375	0.051	0.0	35	2.927
? 1.003	S4	S5	0.095	17.6	9.2	1.375	1.365	1.365	1.375	0.051	0.0	77	1.005
? 1.000	S1 Permeable Paving	S2 Permeable Paving	0.443	7.8	6.3	0.712	0.716	0.712	0.716	0.035	0.0	102	0.492
? 1.001	S2 Permeable Paving	S3 (Permeable Paving)	0.443	7.8	7.8	0.716	0.720	0.716	0.720	0.043	0.0	122	0.504

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)
1.002	2.500	5.5	150	Circular	8.000	7.130	0.720	8.200	6.675	1.375
1.003	9.201	102.2	150	Circular	8.200	6.675	1.375	8.100	6.585	1.365
1.000	2.000	500.0	150	Circular	8.000	7.138	0.712	8.000	7.134	0.716
1.001	2.000	500.0	150	Circular	8.000	7.134	0.716	8.000	7.130	0.720

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.002	S3 (Permeable Paving)		Junction		S4	1200	Manhole	Adoptable
1.003	S4	1200	Manhole	Adoptable	S5		Junction	
1.000	S1 Permeable Paving	1200	Manhole	Adoptable	S2 Permeable Paving		Junction	
1.001	S2 Permeable Paving		Junction		S3 (Permeable Paving)		Junction	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
S1 Permeable Paving	492193.633	100379.083	8.000	0.862	1200	Manhole	Adoptable	0	1.000	7.138	150	Circular
S2 Permeable Paving	492194.228	100372.068	8.000	0.866		Junction		1	1.000	7.134	150	Circular
								0	1.001	7.134	150	Circular
S3 (Permeable Paving)	492194.602	100366.263	8.000	0.870		Junction		1	1.001	7.130	150	Circular
								0	1.002	7.130	150	Circular

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
S4	492193.609	100358.396	8.200	1.525	1200	Manhole	Adoptable	1	1.002	6.675	150	Circular
								0	1.000	6.675	150	Circular
S5	492198.382	100350.530	8.100	1.515		Junction		1	1.000	6.585	150	Circular

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0
Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	1.000	Drain Down Time (mins)	240	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 %)
100	45	0	0

Node S3 (Permeable Paving) Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	7.130	Product Number	CTL-SHE-0072-2000-0700-2000
Design Depth (m)	0.700	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.0	Min Node Diameter (mm)	1200

Node S3 (Permeable Paving) Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	7.130	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	132	Depth (m)	
Safety Factor	3.0	Width (m)	6.428	Inf Depth (m)	
Porosity	0.30	Length (m)	6.428		

Node S1 Permeable Paving Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	7.138	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	130	Depth (m)	
Safety Factor	2.0	Width (m)	8.642	Inf Depth (m)	
Porosity	0.30	Length (m)	8.642		

Node S2 Permeable Paving Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	7.134	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	132	Depth (m)	
Safety Factor	2.0	Width (m)	6.848	Inf Depth (m)	
Porosity	0.30	Length (m)	6.848		

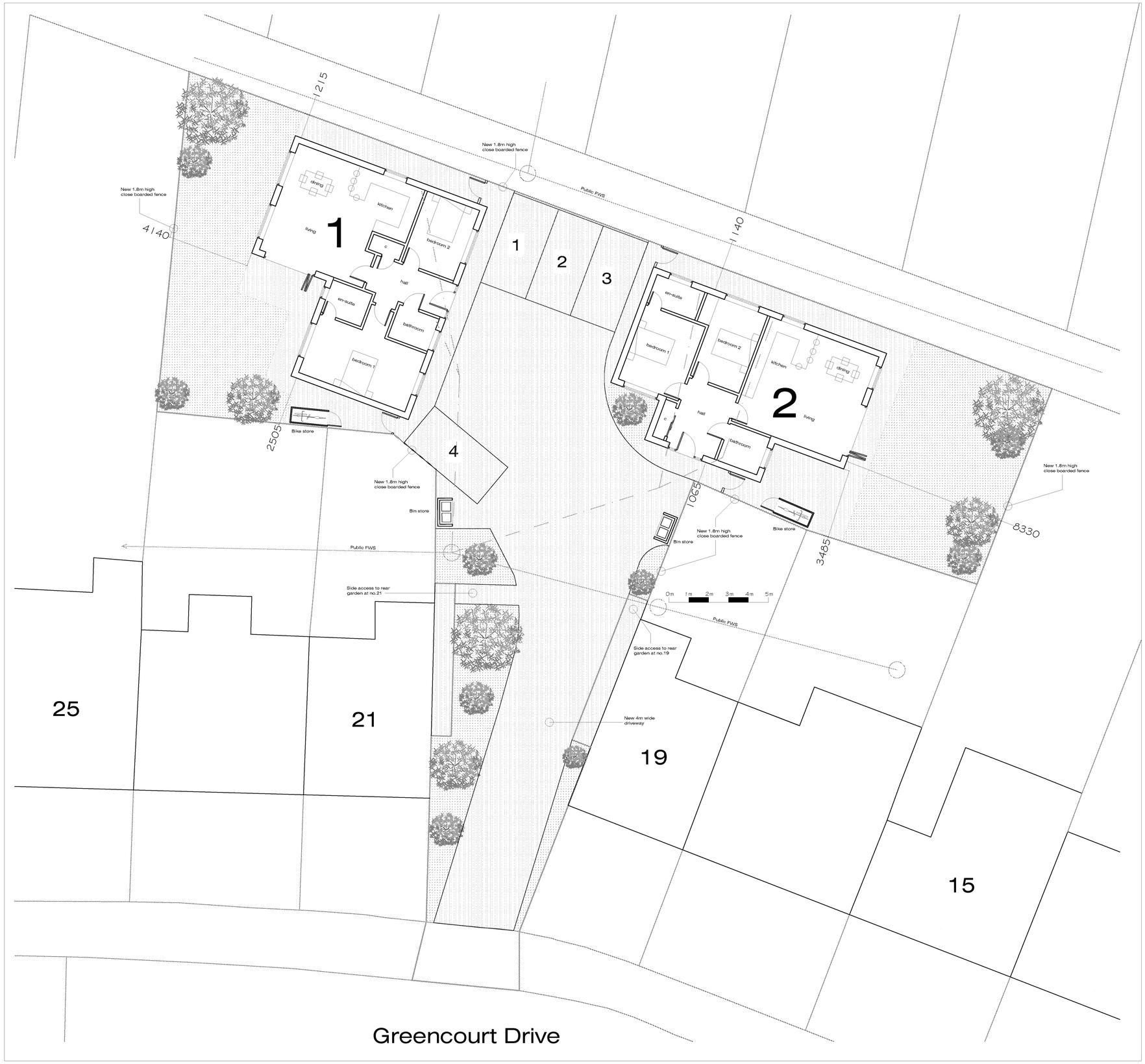
Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.92%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	S1 Permeable Paving	116	7.697	0.559	9.1	12.8352	0.0000	SURCHARGED
120 minute winter	S2 Permeable Paving	116	7.697	0.563	5.9	7.8246	0.0000	SURCHARGED
120 minute winter	S3 (Permeable Paving)	116	7.697	0.567	4.8	6.9480	0.0000	SURCHARGED
15 minute summer	S4	83	6.710	0.035	2.0	0.0393	0.0000	OK
15 minute winter	S5	83	6.619	0.034	2.0	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	S1 Permeable Paving	1.000	S2 Permeable Paving	3.8	0.361	0.484	0.0352	
120 minute winter	S2 Permeable Paving	1.001	S3 (Permeable Paving)	2.7	0.286	0.342	0.0352	
120 minute winter	S3 (Permeable Paving)	Hydro-Brake®	S4	2.0				
15 minute summer	S4	1.003	S5	2.0	0.657	0.114	0.0280	18.7

APPENDIX F

Proposed Site Layout



Site Plan - As Proposed 1:100

Rev.		By	Date
A	Red line amended - Re-issued for Planning Application	NJ	25-09-24
-	Issued for Planning Application	NJ	30-07-24

Wildern Architecture Ltd
The Hawthorns, 105 Dibles Road,
Warsash, Southampton, SO31 9JL
07920 260758

Project

Land adjacent to 21 Greencourt Drive, Bersted, PO21 5EU

Client

Sherfield Homes Ltd

Title

Site Plan - As Proposed

Date March 23 Drawn By NJ

Job No.	Drawing No.	Scale	Revision
W22-020	102	1:100@A1	A