

SuDS and Drainage Report

1 Littleworth Lane, Partridge Green, West Sussex RH13 8JF

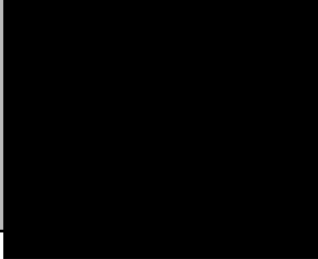
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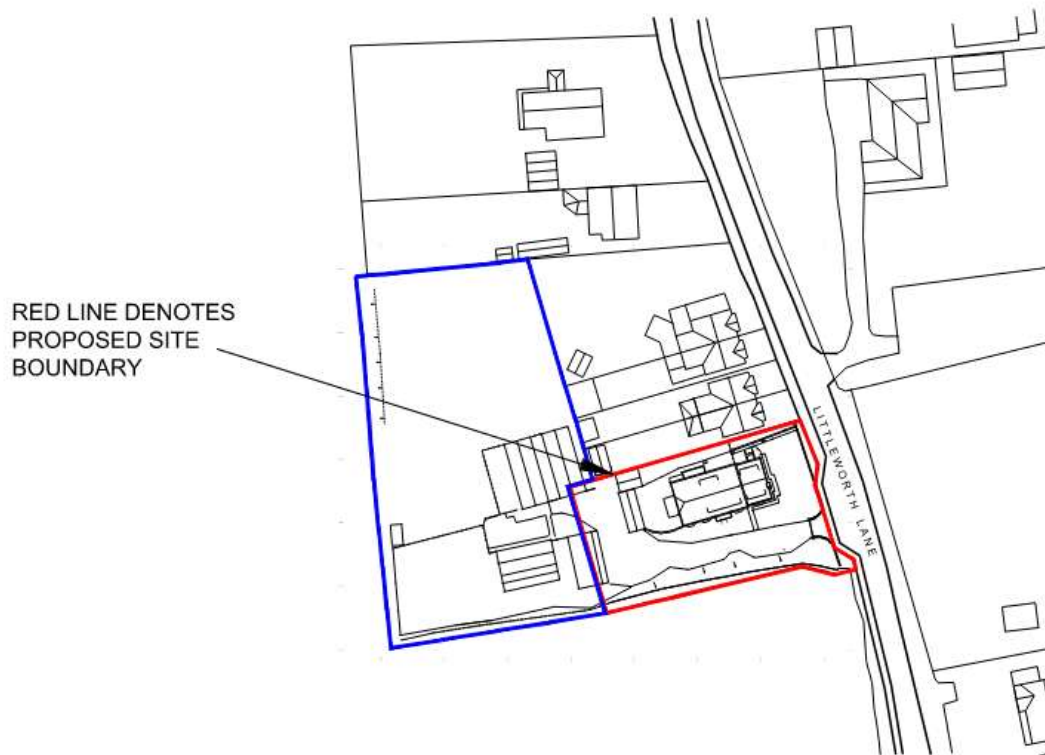
1 Introduction

- 1.1.1 CGS Civils Ltd has been appointed to undertake a drainage strategy report for a proposed development at I Littleworth Lane in Partridge Green.
- 1.1.2 The proposed development will consist of the demolition of an existing bungalow and 2 No. outbuildings, and erection of 2 No. dwellings with car ports and parking to rear.
- 1.1.3 The proposed development is located as OS Grid Reference TQ 19195 19964, what3words airbrush.puddings.together and has the post code RH13 8JF.
- 1.1.4 The purpose of this drainage strategy is to demonstrate how the development area can be satisfactorily drained without increasing flood risk on site and elsewhere, and to clear comments included in Horsham DC Drainage response from 03/07/2026, with the planning reference: DC/26/0741. The comments have asked for the following:
- An assessment into the potential for disposing of surface water by means of Sustainable Drainage System (SuDS).
 - Pre and post development permeable and impermeable areas.
 - Details of a management and maintenance plan for the drainage scheme
 - The appropriate Design Storm to be used in the preparation of the drainage design is to be the critical 1 in 100 year return period storm event, plus an allowance of 45% for the predicted effects of climate change and a further 10% for Urban Creep.
 - Supporting foul calculations
- 1.1.5 This document has been prepared with reference to:
- National Planning Policy Framework (NPPF)
 - DEFRA: Sustainable Drainage Systems: Non-Statutory technical standards for sustainable drainage systems
 - DEFRA: National Standards for Sustainable Drainage Systems (SuDS)
 - The SuDS Manual (C753)
 - Building Regulations Document H
 - West Sussex County Council Local Flood Risk Management Strategy

2 The Site

- 2.1.1 The site is currently a parcel of residential land which is comprised of a single bungalow with a number of outbuildings the encompasses 1199m² of area located off Littleworth Lane in Partridge Green. The site is constrained by protected trees that are present along the southern boundary and a single protected tree within the centre of the site.
- 2.1.2 The proposed development will consist of the demolition of the existing bungalow and 2 no. outbuildings, followed by the construction of 2 No. dwellings with car ports and parking to the rear. The existing access into site is to be retained with the access road being redeveloped to suit the proposed scheme. The development will result in a total of 481m² of impermeable areas; of which, 214m² will be constructed from a 'no-dig' permeable surface.
- 2.1.3 The development and use of SuDS features are restricted by the root protection areas that border the site.

Fig I. Site Location



3 Executive Summary:

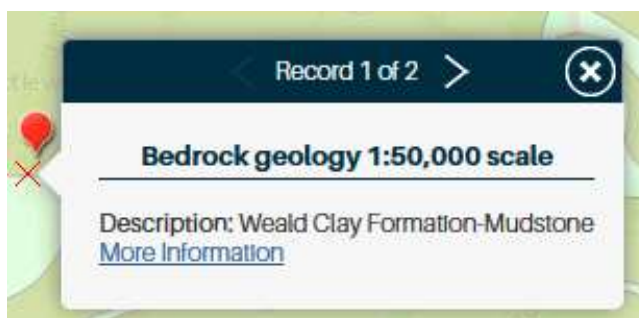
- 3.1.1 The proposed development will consist of the demolition of existing bungalow and 2 No. outbuildings, and erection of 2 No. dwellings with car ports and parking to rear.
- 3.1.2 The underlying geology is noted to be comprised of Clay. Infiltration testing to BRE365 was carried out on site at 2 separate depths. The excavation of the trial pits confirmed the sub-strata to be comprised of clay whilst the infiltration testing recorded an infiltration rate of $2.13 \times 10^{-6} \text{m/s}$ and $2.40 \times 10^{-6} \text{m/s}$ at 0.6mbgl and 0.9mbgl respectively.
- 3.1.3 Despite the favourable infiltration rates, the use of infiltration features was ruled out following a full winters groundwater monitoring. During the monitoring period, a peak groundwater level of 0.6mbgl was recorded which rules out infiltration under the National Standards for SuDS.
- 3.1.4 Surface water runoff will therefore be discharged into a nearby drainage ditch which is located on the opposite side of Littleworth Lane. Runoff from the roof areas are to be captured into a positive drainage network prior to discharging into the nearby drainage ditch at a restricted rate of 0.5l/s. The hard paved access road is to be constructed from a 'no-dig' permeable construction which will allow runoff to infiltrate to ground. The use of this 'no-dig' surface will protect the tree roots whilst providing betterment over the existing hard paved access road by increasing hydration and oxygenation.
- 3.1.5 Foul water is to discharge into the existing foul water sewer within Littleworth Lane. The proposed connection is subject to Southern Water approval under a Section 106 application.

4 Site Geology

4.1 British Geological Survey information

- 4.1.1 Data from the British Geological Survey shows an expected bedrock geology of Weald Clay Formation. There are no recorded superficial deposits.
- 4.1.2 The BGS holds records of historical boreholes in the vicinity of the site which may give some insight into the underlying geology.
- Borehole TQ11NE1/AB (Located approx. 850m Southwest of the site) – Clay

Fig 2. British Geological Survey



4.2 Geological Assessment

- 4.2.1 At the time of writing, a full ground investigation has not been carried out on site. However, CGS Civils Ltd have undertaken infiltration testing to BRE365 within 2 No. trial pits on site which give an insight into the strata whilst confirming the viability of infiltration.
- 4.2.2 On 29th March 2024, BRE365 testing was carried out on site at two depths. Test SAT1 was undertaken at 0.9mbgl, which corresponds to the depth of a conventional soakaway. Test SAT2 was undertaken at 0.5mbgl, which corresponds to the depth of the access road formation levels.
- 4.2.3 The tests confirmed that the use of infiltration features is viable on site, albeit at a slow rate, with SAT1 recording a worst-case infiltration rate of $2.13 \times 10^{-6} \text{m/s}$ and SAT2 recording a rate of $2.40 \times 10^{-6} \text{m/s}$.
- 4.2.4 In addition to infiltration testing, winter groundwater monitoring was carried out between 17th December 2024 and 21st March 2025. During this monitoring period, a peak groundwater level of 0.6mbgl was recorded which rules out the use of infiltration on site under the National Standards for SuDS (NSfS).

Fig 3. Infiltration Test Photographs



5 Existing Drainage

- 5.1.1 A CCTV drainage survey was carried out on site by Eyes On Drainage Ltd, which confirmed that surface water runoff from the bungalow and 2 No. outbuildings discharge into the existing foul water network that discharges into a public foul water sewer within Littleworth Lane. A number of rainwater downpipes are noted to discharge directly onto ground.
- 5.1.2 During the CCTV survey, a pipe from a neighbouring property was noted to discharge into the existing foul water network. This existing connection will need to be retained and the foul water is to be diverted around the proposed development to ensure the neighbouring foul water network functions as intended and that the connection is retained.
- 5.1.3 Southern Water sewer records confirm the presence of a public foul water sewer within Littleworth Lane which runs from north to south.

Fig 4. Sewer Records



- 5.1.4 During site investigations, a drainage ditch was noted to be present on the adjacent side of Littleworth Lane. The ditch was confirmed to flow from North to South. During a site walkover, it was noted that the drainage ditch requires clearance works in order to restore true bed level and to restore flow routes. A topographical survey of this ditch was conducted, and it was clear that the silt and debris build up within the ditch affects the flow route and it is proposed that clearance/regrading works are to be carried out in order to restore the full capacity of the ditch network. These works will be subject to Ordinary Watercourse Consent approval with West Sussex County Council.
- 5.1.5 The ditch is understood to connect into a wider watercourse network to the south.

Fig 5. Ditch Network





6 Proposed Drainage Strategy

6.1 SuDS Hierarchy

- 6.1.1 All options for the destination of run-off generated on site have been assessed in the following sequence, in line with the SuDS hierarchy as set out in Building Regulations Part H document and DEFRA's Draft National Standards for SuDS.

Table 1. SuDS Hierarchy

Discharge Destination	Justification
Rainwater Harvesting	Yes – Rainwater harvesting has been included as part of the design.
Interception Features	Bioretention planters and rainwater harvesting tanks are to be utilised as interception features. The no-dig permeable paving will also act as an interception feature.
Infiltration to ground	Not viable due to recorded groundwater levels. The proposed access road is to be constructed from a 'No-dig' permeable surface which will allow for infiltration of runoff to ground.
To Watercourse	Surface water runoff to discharge into existing drainage ditch on adjacent site of Littleworth Lane. Discharge rate to be restricted to 0.5l/s.
To Surface Water Sewer	None nearby
To Other Sewer	Discharge to foul water sewer not permitted.

6.2 Proposed Hydraulic Calculation Specifications:

Table 2. Hydraulic Calculations

Hydraulic Calculations Settings:	
Rainfall Methodology	FEH-22
Volumetric Run-off Coefficient Cv	1
CV Winter and Summer	1.0
Additional Storage (m ³ / ha)	0.0
Maximum Rainfall (mm/hr)	999
Urban Creep	10%
Storm Period and Climate Change Allowances (CCA)	1
	2
	10
	30 + 45%
	100 + 45%

Table 3. Flow Control Settings

Flow Control Settings:	
Design head (m)	0.775
Discharge rate (l/s)	0.5
Discharge Coefficient	0.650
Orifice Diameter (m)	0.015

Table 4. Storage Settings

Storage Settings:	
Attenuation Tank	Base Coefficient (m/hr): 0.00000
	Side Coefficient (m/hr): 0.00000
	Factor of Safety: 2
	Porosity: 95%
	Time to Half Empty (mins): -

6.3 Surface Water Drainage

- 6.3.1 A series of infiltration tests were performed that yielded a slow, but passable infiltration rate of $2.13 \times 10^{-6} \text{m/s}$, however, despite having a workable infiltration rate, the use of infiltration is deemed not viable as a peak groundwater level of 0.6mbgl was recorded. This rules out the use of infiltration features under the National Standards for SuDS (NSfS) as a clear 1m unsaturated zone cannot be maintained between the underside of the infiltration structure and peak recorded groundwater level.
- 6.3.2 It is therefore proposed that surface water runoff from site is to be discharged into the existing drainage ditch located on the adjacent side of Littleworth Lane. Surface water runoff from roof areas is to be collected into a positive drainage network prior to discharging into the ditch at a restricted rate of 0.5l/s. The network will make use of a geocellular attenuation tank in order to cater for the 1 in 100-year storm +45% CCA +10% urban creep.
- 6.3.3 The discharge rate is to be restricted to 0.5l/s which is the general accepted minimum practical rate. National Standards for SuDS (NSfS) states that the discharge rate is to be restricted to greenfield runoff rate or 3l/s/ha, whichever is greater. However, due to the size of the site, the discharge rate of 0.5l/s has been adopted as this is generally recognised as the lowest practical discharge that can be achieved whilst maintaining satisfactory hydraulic performance.
- 6.3.4 The proposed access road will be constructed using a 'no-dig' permeable system that facilitates infiltration to ground. This represents a clear improvement over the existing impermeable tarmac surface, which currently discharges surface water runoff directly onto the public highway. This existing arrangement contributes to increased loading on the receiving drainage network and may exacerbate localised surface water flooding.
- 6.3.5 The proposed permeable construction will instead enable rainfall to be temporarily stored within the sub-base and released in a controlled manner, providing a more sustainable drainage solution. Although groundwater levels were recorded at approximately 0.6m below ground level, which would ordinarily constrain infiltration in accordance with NSfS, the proposal is considered acceptable on a betterment basis.
- 6.3.6 The system will still allow for partial infiltration and moisture retention within the underlying soils, which will help support surrounding ground conditions and provide incidental benefit to adjacent vegetation and tree roots. Crucially, the proposal will significantly reduce both the rate and volume of surface water runoff leaving the site when compared to the existing impermeable arrangement.
- 6.3.7 The dwellings are to be fitted with rainwater harvesting tanks which will allow for the re-use of rainwater within the gardens and external areas of each property. The plots are also to have bio-retention planters installed which will provide interception, water quality and bio-diversity benefits.
- 6.3.8 Greenfield runoff and Hydraulic calculations have been carried out which can be found in Appendix C. Note that urban creep has been applied to dwelling roof areas only, which is reflected within the impermeable areas plan in Appendix B.

Table 3. Greenfield Runoff Calculations

Storm return period without CCA	Greenfield runoff rate (l/s)	Proposed Discharge Rate (l/s)	Difference (l/s)
Q_{BAR}	0.4	0.5	+ 0.1
1	0.4	0.5	+ 0.1
2	0.4	0.5	+ 0.1
30	0.8	0.5	- 0.3
100	1.0	0.5	- 0.5

7 Compliance with National SuDS Standards and Principles

7.1.1 The current national SuDS standards comprise 7 standards supported by 11 design principles. The tables below summarise how the proposed drainage strategy for I Littleworth Lane responds to these requirements.

Standard	Requirement	Project response
1	Runoff destinations	Rainwater harvesting has been included. Infiltration has been ruled out for roof area discharge due to recorded groundwater levels. Runoff to be discharged into ditch adjacent site.
2	Management of everyday rainfall	Rainfall is managed close to source by rainwater harvesting, bio retention and permeable paving, reducing routine runoff from the site.
3	Management of extreme rainfall and flooding	Roof drainage is directed towards drainage ditch on adjacent side of Littleworth Lane. Storage provided in attenuation tank feature sized for the 1 in 100-year +45% climate change storm with 10% urban creep. Any exceedance routes are directed safely away from habitable areas and towards the road.
4	Water quality	Runoff from roofs and parking areas is treated through the SuDS management train. Permeable paving and bioretention planters provide pollutant mitigation in accordance with the simple index approach.
5	Amenity	The drainage strategy uses source control and permeable surfacing integrated within the site layout rather than relying solely on conventional buried drainage. Given the restrictive nature of the site, open SuDS are not considered appropriate. However, the inclusion of SuDS planters will provide amenity benefits.
6	Biodiversity	Given the small nature of the site, it will not be appropriate to utilise open SuDS however, the use of SuDS planters will provide biodiversity benefits.
7	Construction, operation, maintenance and structural integrity	The proposed SuDS components are conventional, buildable and maintainable. Long-term maintenance is addressed within the maintenance schedule and the design respects monitored groundwater levels.

Compliance Table A. Summary of compliance with the 7 national SuDS standards

The proposed drainage design also follows the 11 underpinning principles of the national standards as summarised below.

Principle	Summary	Project response
1	Natural approach to managing water	Surface water is managed on site at source as much as possible using infiltration in the form of permeable paving and rainwater harvesting.
2	Management train close to source	Varying SuDS features are used together, with re-use and permeable surfacing operating and discharging to source.
3	SuDS approach	The strategy manages runoff quantity, water quality and long-term maintenance in an integrated manner.
4	Early and integrated design	Drainage has been considered alongside site levels, layout, root protection areas, groundwater conditions and the proposed access road arrangement.
5	Site layout informed by drainage	The access road and drainage networks have been assessed separately. Drainage serving these features have been designed to reflect different levels and infiltration rates.
6	Follow natural drainage routes	The layout allows runoff to be managed in accordance with site topography and infiltration opportunities.
7	Take account of local policy and flood evidence	The design is based on BRE 365 testing, BGS data and current national and local SuDS standards. Winter ground water monitoring was conducted.
8	Early engagement with the authority	The report format and supporting evidence are intended to support planning application.
9	Demonstrate compliance from concept stage	Compliance with the national standards is addressed within this planning-stage drainage strategy rather than deferred entirely to later stages.
10	Show how the standards are met in site design	The report sets out the hierarchy, testing, hydraulic basis, water quality approach in one coordinated document.
11	Consider phasing where relevant	The development is small and not expected to be phased; however, the strategy is capable of being delivered in a single coordinated phase.

Compliance Table B. Summary of compliance with the 11 SuDS design principles

7.2 Water Quality

- 7.2.1 A key requirement of any SuDS system is that it protects the receiving water body from the risk of pollution.
- 7.2.2 Frequent and short duration rainfall events are those that are most loaded with potential contaminants (silts, fines, heavy metals, and various organic and inorganic contaminants) Therefore the first 5-10mm of rainfall should be adequately treated with SuDS.
- 7.2.3 The SuDS Manual (CIRIA C753) describes risks posed to the receiving environment by any proposed drainage discharge.
- 7.2.4 The Manual describes risks posed by the surface water runoff to the receiving environment as a function of:
- The pollution hazard at a particular site (i.e., the pollution source)
 - The effectiveness of SuDS treatment components in reducing levels of pollutants to environmentally acceptable levels
 - The sensitivity of the receiving environment
- 7.2.5 The recommended approaches for water quality risk management are given in the SuDS Manual Table 26.1.

Table 26.1, (SuDS Manual Section E) from SuDS manual. Approaches to Water Quality Risk Management

Design method	Hazard Characterisation	Risk Reduction	
		For Surface Water	For Groundwater
Simple Index Approach	Simple pollution hazard indices based on land use (Table 26.2)	Simple SuDS hazard mitigation indices (Table 26.3)	Simple SuDS hazard mitigation indices (Table 26.4)
Risk Screening	Factors characterising traffic density and extent of infiltration likely to occur (Table 26.5)	N/A	Factors characterising unsaturated soil depth and type, and predominant flow type through the soils (Table 26.5)
Detailed Risk Assessment	Site specific information used to define likely pollutants and their significance	More detailed, component specific performance information used to demonstrate that the proposed SuDS components reduce the hazard to acceptable levels	
Process-based treatment modelling	Time series rainfall used with generic pollution characteristics to determine statistical distributions of likely concentrations and loadings in the runoff	Models that represent the treatment processes in the proposed SuDS components give estimates of reductions in even mean discharge concentrations and total annual load reductions delivered by the system	

- 7.2.6 In accordance with the guidelines above, the Simple Index Approach will be used to determine the water quality requirements for this developments.

7.2.7 Table 26.2 (SuDS Manual Section E) provides hazard classifications that are to be applied to various land uses. The land uses relevant to this development are:

Land Use	Pollution Hazard Level	Total Suspended solids (TSS)	Metals	Hydro-Carbons
Residential roofs	Very Low	0.2	0.2	0.05
Other roofs (Typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (e.g., cul-de-sacs, homezones and general access roads) and non-residential car parking with infrequent change (e.g., schools, offices) i.e., < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g., hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g., haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways	High	0.8	0.8	0.9

7.2.8 To deliver adequate treatment, the selected SuDS components must have a total pollution mitigation index that exceeds the pollution hazard index for each containment type.

Total SuDS mitigation index $\geq$ pollution hazard index

Table 26.2 from SuDS manual. Pollution Hazard Indices for Different Land Use Classifications

Table 26.2 Pollution hazard indices for different land use classifications				
Land Use	Pollution Hazard Level	Total Suspended solids (TSS)	Metals	Hydro-Carbons
Residential roofs	Very Low	0.2	0.2	0.05
Other roofs (Typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (e.g., cul-de-sacs, homezones and general access roads) and non-residential car parking with infrequent change (e.g., schools, offices) i.e., < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g., hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g., haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways	High	0.8	0.8	0.9

7.2.9 The relevant land uses for this development are highlighted.

7.2.10 Table 26.4 (SuDS Manual Section E) provides indicative SuDS mitigation indices for proposed discharges to groundwater.

Table 26.4 Indicative SuDS mitigation indices for discharges to groundwater			
Characteristics of the material overlying the proposed infiltration surface, through which the runoff percolates	TSS	Metals	Hydrocarbons
A layer of dense vegetation underlain by a soil with good containment attenuation potential of at least 300mm in depth	0.6	0.5	0.6
A soil with good contaminant attenuation potential of at least 300mm in depth	0.4	0.3	0.3
Infiltration trench (where a suitable depth of filtration material is included that provides treatment, i.e., graded gravel with sufficient smaller particles but not single size coarse aggregate such as 20mm gravel) underlain by a soil with good contaminant attenuation potential of at least 300mm in depth.	0.4	0.4	0.4
Constructed permeable pavement (where a suitable filtration later is included that provides treatment, and including a geotextile at the base separating the foundation from the subgrade) underlain by a soil with good contaminant attenuation potential of at least 300mm in depth	0.7	0.6	0.7
Bioretention underlain by a soil with good contaminant attenuation potential of at least 300mm in depth	0.8	0.8	0.8
Proprietary treatment systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for inflow concentrations relevant to the contributing drainage area		

Table 26.3 Indicative SuDS mitigation indices for discharges to surface waters			
Type of SuDS Components	Mitigation Indices		
	TSS	Metals	Hydrocarbons
Filter Strip	0.4	0.4	0.5
Filter Drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention System	0.8	0.8	0.8
Permeable Pavement	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5
Wetland	0.8	0.8	0.8
Proprietary treatment systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for inflow concentrations relevant to the contributing drainage area		

Table 4: SuDS mitigation index

Table 4 Mitigation Indices						
Runoff Source	Destination of Runoff	Mitigation Index Source	Type of SuDS Component	Hazard Index (Table 26.2)		
				Total Suspended Solids (TSS)	Metals	Hydrocarbons
Individual driveways, residential car parks and low traffic roads	Ground water	Table 26.4 (for ground waters)	Permeable Paving	0.5	0.4	0.4
				Mitigation Indices (Table 26.4)		
				0.7	0.6	0.7
Residential Roofs	Surface water	Table 26.3 (for surface waters)	Bioretention system	Hazard Index (Table 26.2)		
				Total Suspended Solids (TSS)	Metals	Hydrocarbons
				0.2	0.2	0.05
				Mitigation Indices (Table 26.3)		
				0.8	0.8	0.8

7.2.11 This analysis has demonstrated that the SuDS components proposed for this development will adequately mitigate any pollution risks identified during the assessment.

7.3 Foul water drainage

- 7.3.1 The foul water will discharge into the local foul water sewer via a new direct connection into the existing sewer within Littleworth Lane.
- 7.3.2 Based upon a total population of 10 with a discharge rate of 150 l/p/day, the maximum discharge rate of the foul water from site will be 0.017 l/s. It is assumed that sufficient capacity exists in the public foul sewerage system, though this will be subject to confirmation by the water authority.

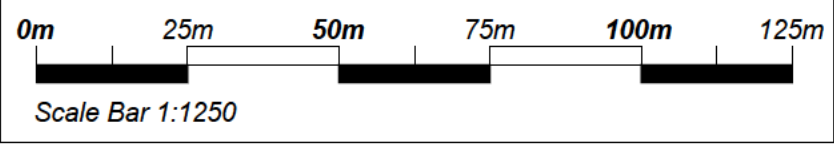
8 Summary and Conclusions

- 8.1.1 CGS Civils has been instructed to produce a Drainage statement under National Planning Policy Framework (NPPF) to support the Planning Application for the construction of 2 No. dwellings.
- 8.1.2 The Surface Water will discharge to the existing drainage ditch located on the opposite side of Littleworth Lane. The discharge rate is to be restricted to 0.5l/s and the network will make use of a geocellular attenuation tank in order to cater for the 1 in 100-year +45% storm +10% urban creep. The access road is to be constructed from a 'no-dig' construction, which will freely discharge to ground via infiltration.
- 8.1.3 The Foul water will discharge into the existing foul sewer located within Littleworth Lane. The proposed discharge is subject to Southern Water approval under a Section 106 application.
- 8.1.4 This report demonstrates that the foul and surface water drainage measures proposed for this development are suitable and will adequately mitigate the risks identified.
- 8.1.5 A separate, site-specific Maintenance and Management Document has been prepared and is also appended to this report for ease of reference.

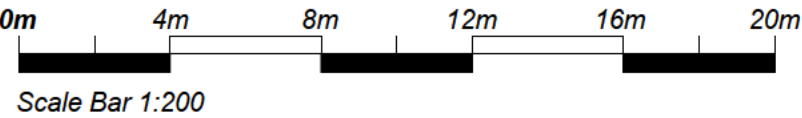
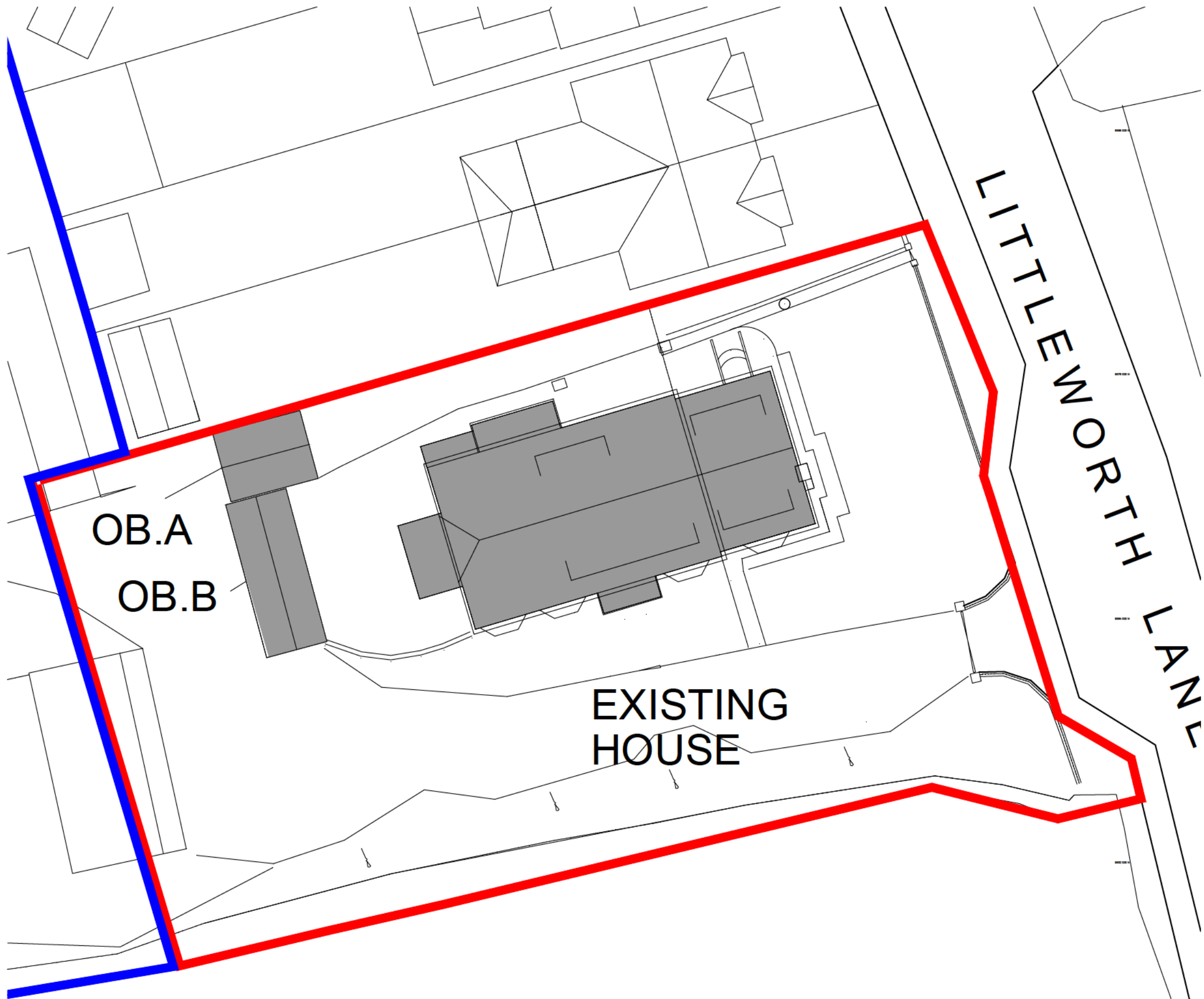
9 Appendices

9.1 Appendix A – Site Plan

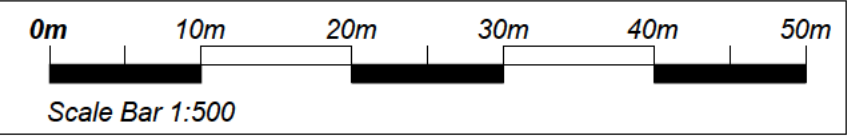
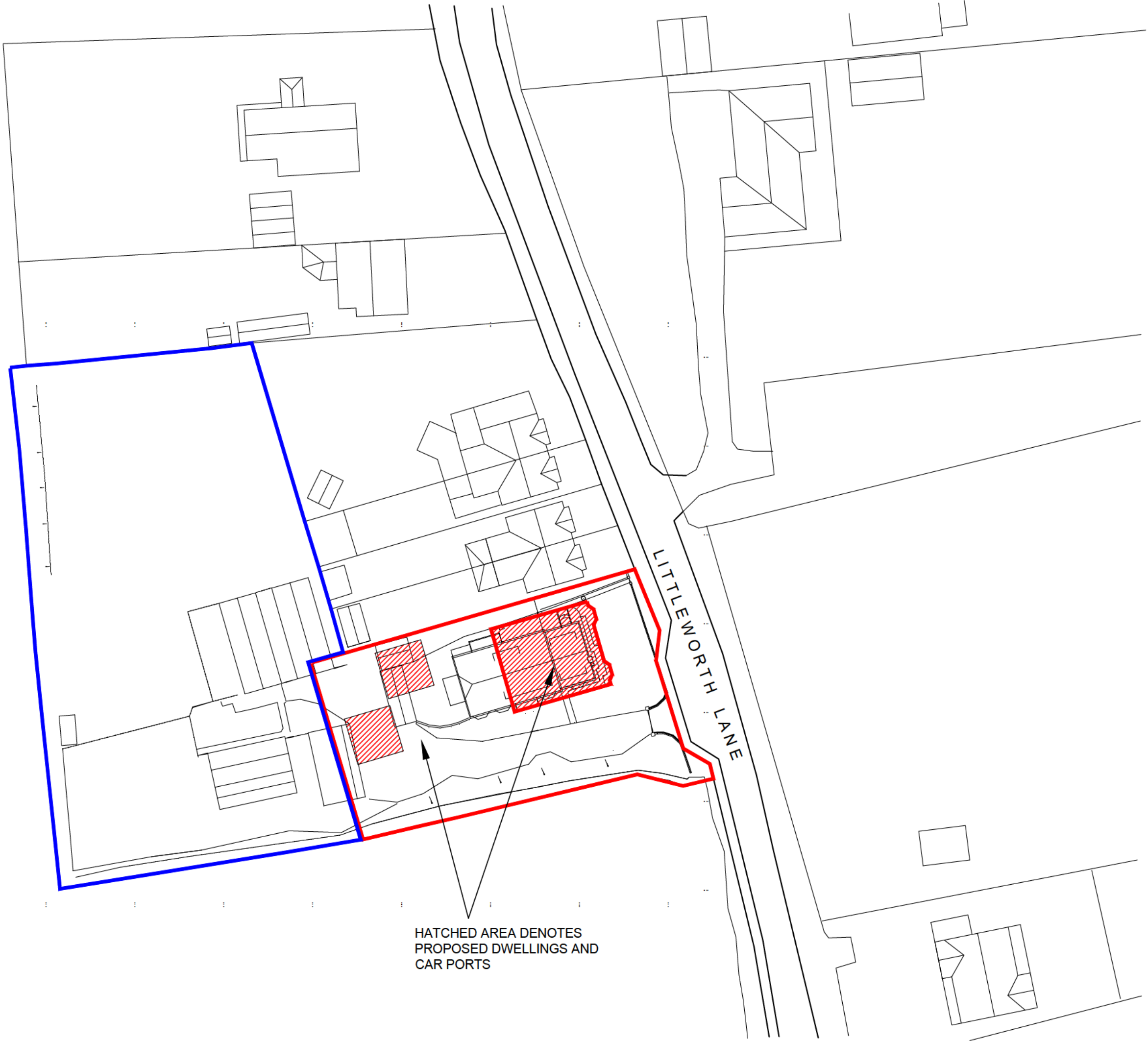
RED LINE DENOTES
PROPOSED SITE
BOUNDARY



SITE LOCATION PLAN (1:1250)



SITE PLAN SHOWING EXISTING BUILDINGS
TO BE DEMOLISHED - SCALE (1:200)



SITE BLOCK PLAN (1:500)

This drawing is to be read in conjunction with all other relevant drawings and specifications.
Do not scale from this drawing. Use figured dimensions only. All levels and dimensions to be checked on site. All dimensional discrepancies are to be brought to the immediate attention of DMA BUILDING DESIGNS.
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Notes

P1	ISSUED FOR PLANNING APPROVAL	27.03.2026
REV	DESCRIPTION	DATE

DMA
BUILDING DESIGNS

UNIT 4B, RUDGWICK BRICKWORKS, LYNNWICK ST
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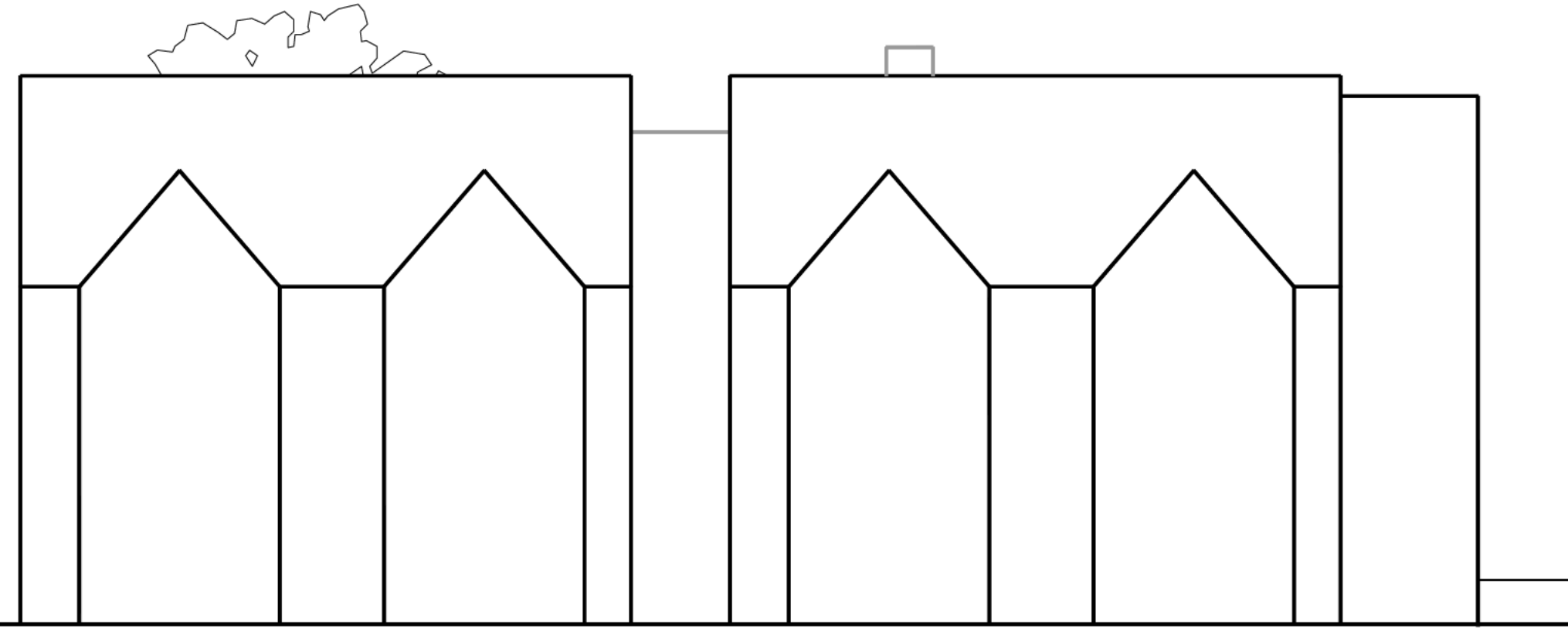
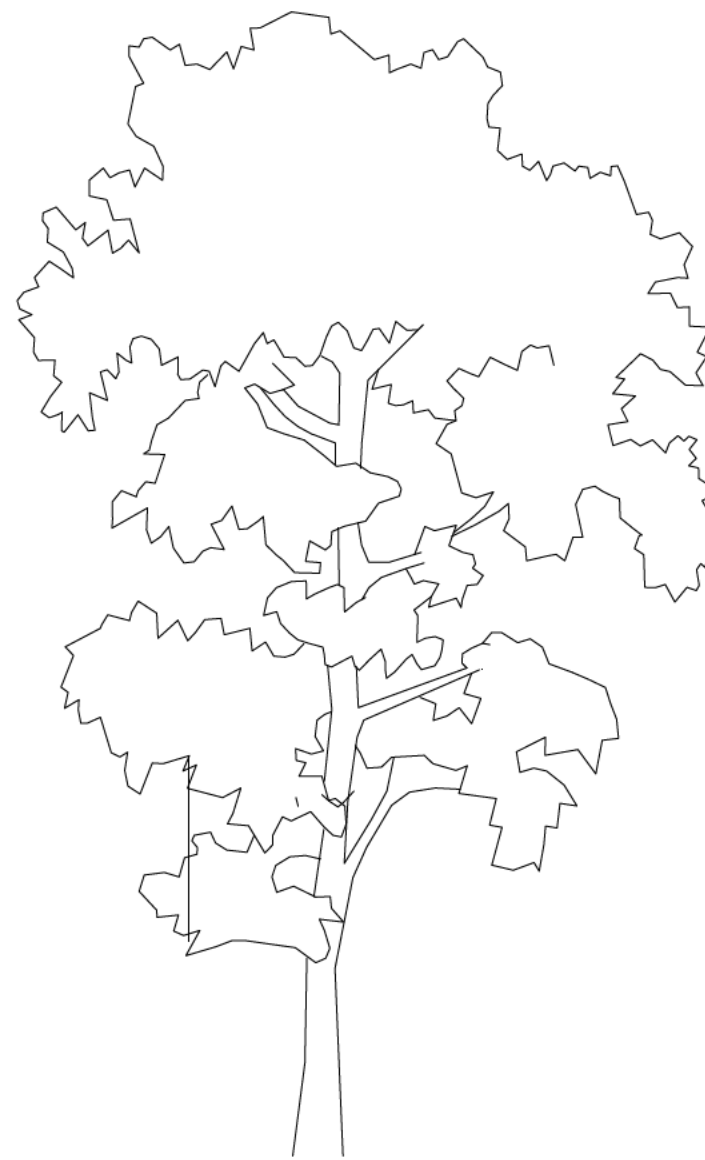
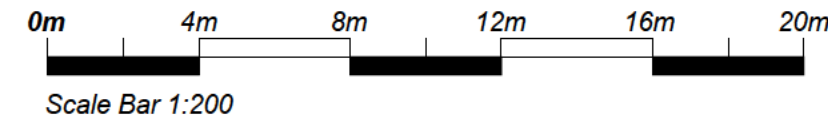
CLIENT
VBMC Building Development Ltd.

PROJECT
DEMOLITION OF EXISTING HOUSE AND ERECTION OF TWO
SEMI-DETACHED HOUSES AND CAR PORTS.

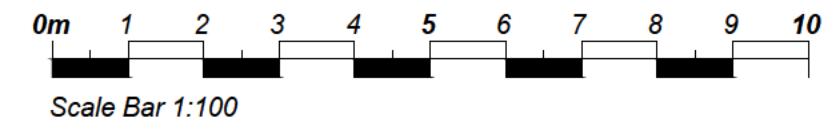
DRAWING
LOCATION, BLOCK AND SITE PLAN
1 LITTLEWORTH LANE, PARTRIDGE GREEN,
WEST SUSSEX, RH13 8JF

STATUS PLANNING	SCALE @ A1 1:200, 1:500, 1:1250	DATE JANUARY 2026	ORG No VBMC001/P2 - 02	REVISION P1
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Proposed area - 0.119 Hectare



PROPOSED STREET SCENE SHOWING NEW
UNITS AND NEIGHBOURING HOUSES
SCALE 1:100

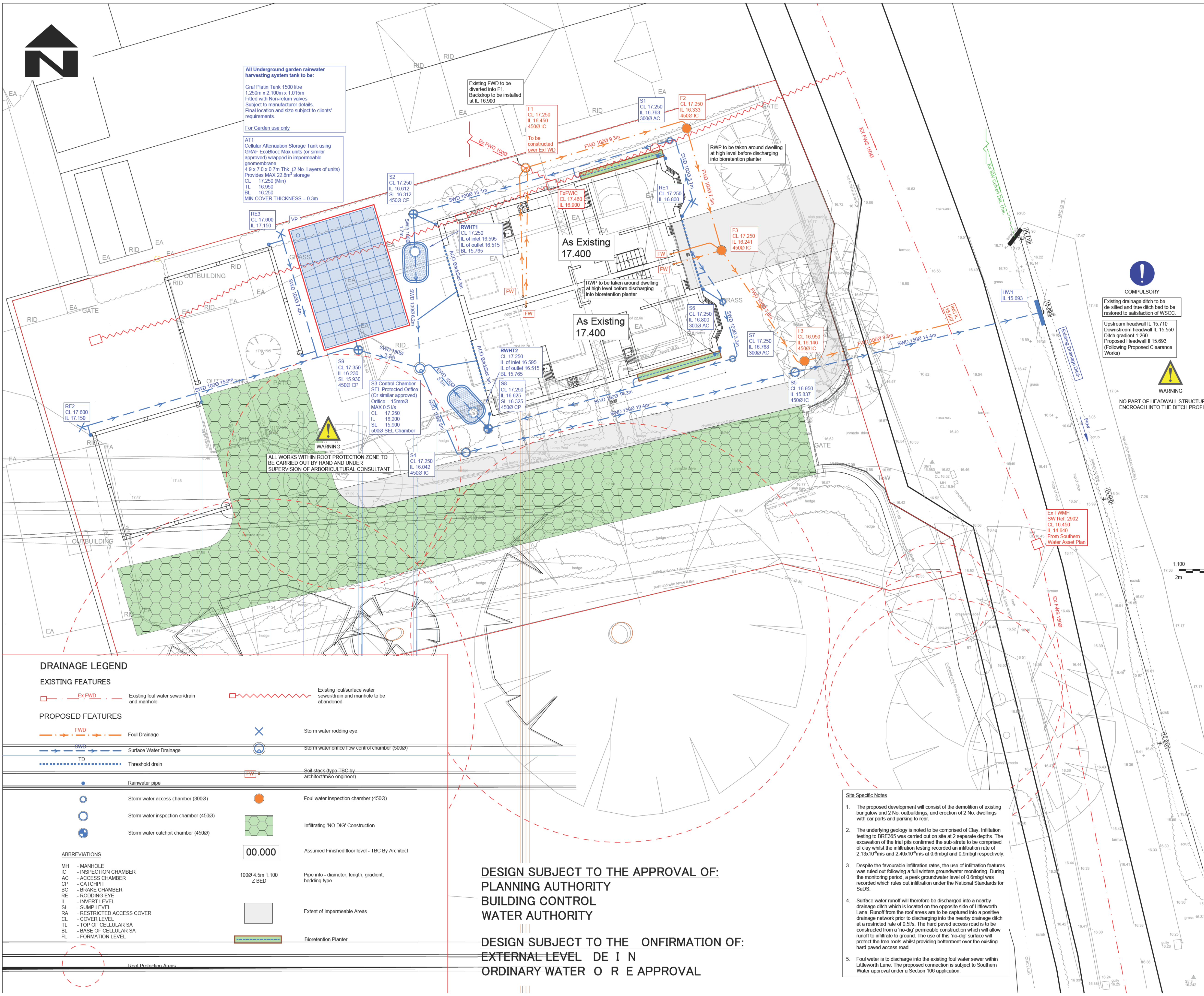


This drawing is to be read in conjunction with all other relevant drawings and specifications.
Do not scale from this drawing. Use figured dimensions only. All levels and dimensions to be checked on site. All dimensional discrepancies are to be brought to the immediate attention of DMA BUILDING DESIGNS.
Responsibility cannot be accepted for alteration and/or deviation from this design without prior knowledge of DMA BUILDING DESIGNS.
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Prior to any works commencing on site, DMA BUILDING DESIGNS is to be contacted regarding the current status, revision or regulatory approval of this drawing.

Notes

P1	ISSUED FOR PLANNING APPROVAL	27.03.2026
REV	DESCRIPTION	DATE
DMA BUILDING DESIGNS UNIT 4B, RUDGWICK BRICKWORKS, LYNNWICK ST RUDGWICK, HORSHAM, WEST SUSSEX, RH12 3DH. TEL No 01403 822220 Mobile 07730 523447 Email - admin@dmabuildingdesigns.co.uk		
CLIENT VBMC Building Development Ltd.		
PROJECT DEMOLITION OF EXISTING HOUSE AND ERECTION OF TWO SEMI-DETACHED HOUSES AND CAR PORTS.		
DRAWING PROPOSED SITE PLAN AND STREET SCENE. 1 LITTLEWORTH LANE, PARTRIDGE GREEN, WEST SUSSEX, RH13 8JF		
STATUS PLANNING		
SCALE @ A1 1:100,1:200	DATE JANUARY 2026	ORG No VBMC001/P2 - 03
		REVISION P1

9.2 **Appendix B – Drainage Layout**



STANDARD DRAINAGE NOTES

- DO NOT SCALE FROM THIS DRAWING. REFER TO FIGURED DIMENSIONS ONLY. THE CONTRACTOR SHOULD CHECK ALL DIMENSIONS ON SITE.
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- COVER LEVELS SHOWN ARE APPROXIMATE. COVERS AND FRAMES SHALL BE SET TO FINISHED GROUND LEVELS AND FALLS.
- ALL UN-REFERENCED PIPES ARE TO BE 100mm DIA.
- ALL PIPES TO BE ADOPTED, OR CONNECTING TO ADOPTED SEWERS, TO BE VITRIFIED CLAY TO BS EN 205 AND BS85 (SWS ONLY), OR CONCRETE PIPES TO BE EN 1916 AND BS5911 PART 1.
- ROAD GULLY OUTLET PIPES ARE TO BE 150mm DIA. WITH CONCRETE SURROUND AND FLEXIBLE JOINTS. ALL GULLIES SHALL BE FITTED WITH GRADE D400 GRATINGS AND FRAMES TO BS EN124, UNLESS OTHERWISE STATED.
- ALL ADOPTABLE SEWERS SHALL BE CONSTRUCTED TO THE STANDARDS AND SPECIFICATION Laid Down In 'SEWERS FOR ADOPTION' 6th EDITION, WITH A VIEW TO ADOPTION UPON COMPLETION OF WORKS.
- ALL PRIVATE DRAINAGE TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS APPROVED DOCUMENT PART-H, AND TO THE SATISFACTION OF THE BUILDING CONTROL INSPECTOR.
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 - 'B125' IN ALL DRIVEWAYS
 - 'C250' IN PRIVATE PARKING AREAS
 - 'D400' IN CARRIAGEWAY/ACCESS ROAD

COMPULSORY

Existing drainage ditch to be de-silted and true ditch bed to be restored to satisfaction of WSCC.

Upstream headwall IL 15.710
Downstream headwall IL 15.550
Ditch gradient 1:200
Proposed Headwall IL 15.693
(Following Proposed Clearance Works)

WARNING

NO PART OF HEADWALL STRUCTURE IS TO ENCR OACH INTO THE DITCH PROFILE

1:100

2m 0 2m 4m 6m 8m 10m

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C = CONSTRUCTION	These are the only drawings that shall be used for construction purposes
R = RECORD	Record of actual completed work

P.	05.08.26	PRELIMINARY ISSUE	LH	CS	CS
REV	DATE	DESCRIPTION	BY	CHK	APP

o lig ivil E ge er

CLIENT	VBMC BUILDING DEVELOPMENT LTD
ARCHITECT	DMA BUILDING DESIGNS
JOB TITLE	1 LITTLEWORTH LANE PARTRIDGE GREEN
DRAWING TITLE	DRAINAGE STRATEGY

DRAWN	LH	ENGINEER	C SLADE	CHECKED	CS	APPROVED	CS
DATE	JULY 2026		SCALE @ A1		1:100		
JOB No.	C3111	STATUS	PL	DRAWING No.	101	REV.	1

FOR PLANNING ONLY

Site Specific Notes

- The proposed development will consist of the demolition of existing bungalow and 2 No. outbuildings, and erection of 2 No. dwellings with car ports and parking to rear.
- The underlying geology is noted to be comprised of Clay. Infiltration testing to BRE365 was carried out on site at 2 separate depths. The excavation of the trial pits confirmed the sub-strata to be comprised of clay whilst the infiltration testing recorded an infiltration rate of 2.13x10⁻⁴m/s and 2.40x10⁻⁴m/s at 0.6mbgl and 0.9mbgl respectively.
- Despite the favourable infiltration rates, the use of infiltration features was ruled out following a full winters groundwater monitoring. During the monitoring period, a peak groundwater level of 0.6mbgl was recorded which rules out infiltration under the National Standards for SUDS.
- Surface water runoff will therefore be discharged into a nearby drainage ditch which is located on the opposite side of Littleworth Lane. Runoff from the roof areas are to be captured into a positive drainage network prior to discharging into the nearby drainage ditch at a restricted rate of 0.5l/s. The hard paved access road is to be constructed from a 'no-dig' permeable construction which will allow runoff to infiltrate to ground. The use of this 'no-dig' surface will protect the tree roots whilst providing betterment over the existing hard paved access road.
- Foul water is to discharge into the existing foul water sewer within Littleworth Lane. The proposed connection is subject to Southern Water approval under a Section 106 application.

DESIGN SUBJECT TO THE APPROVAL OF:

PLANNING AUTHORITY

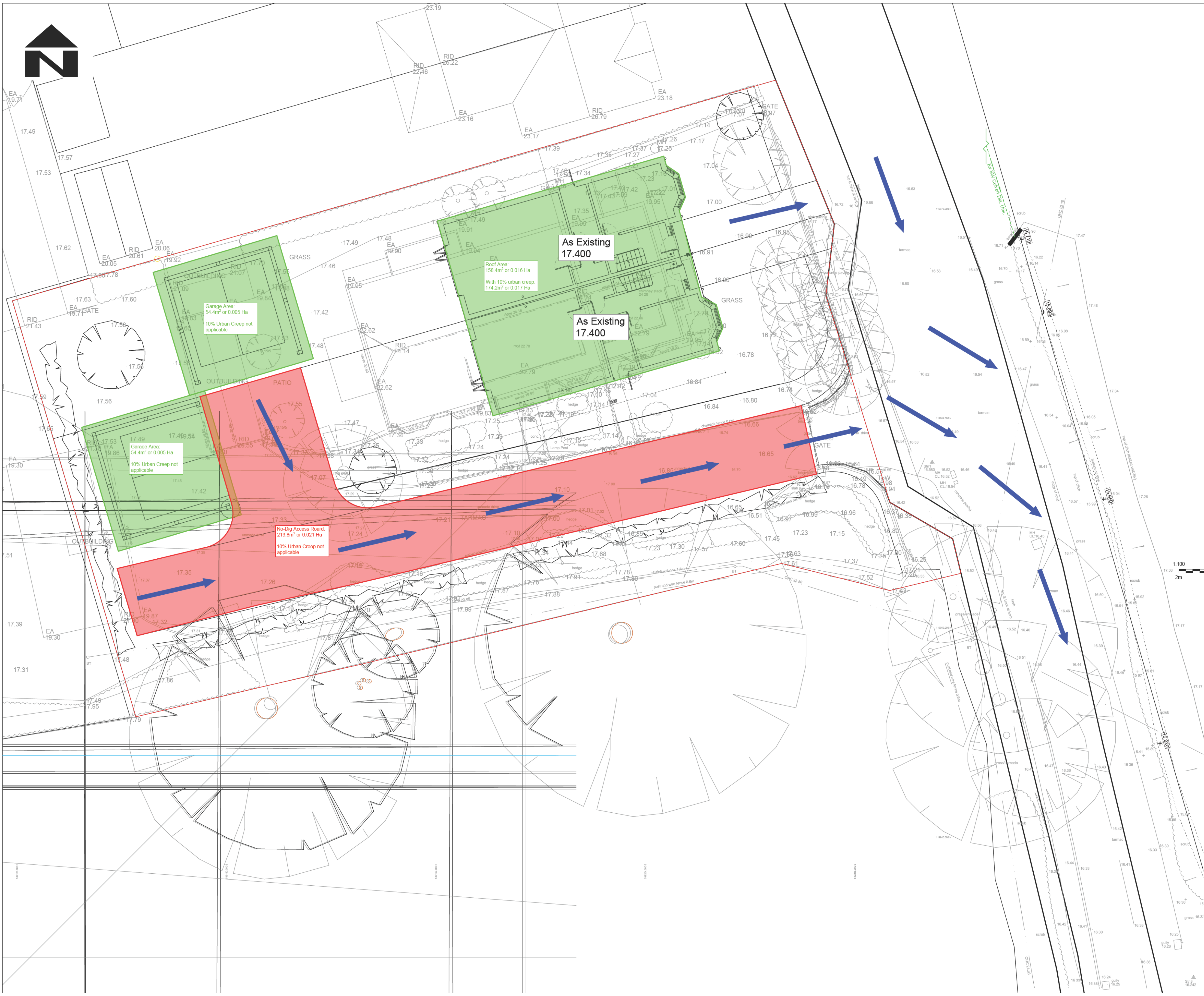
BUILDING CONTROL

WATER AUTHORITY

DESIGN SUBJECT TO THE ONFIRMATION OF:

EXTERNAL LEVEL DE I N

ORDINARY WATER O R E APPROVAL



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P.	05.08.26	PRELIMINARY ISSUE	LH	CS	CS
REV	DATE	DESCRIPTION	BY	CHK	APP



CLIENT
VBMC BUILDING DEVELOPMENT LTD

ARCHITECT
DMA BUILDING DESIGNS

JOB TITLE
1 LITTLEWORTH LANE
PARTRIDGE GREEN

DRAWING TITLE
PROPOSED IMPERMEABLE AREAS
& OVERLAND FLOW ROUTE PLAN

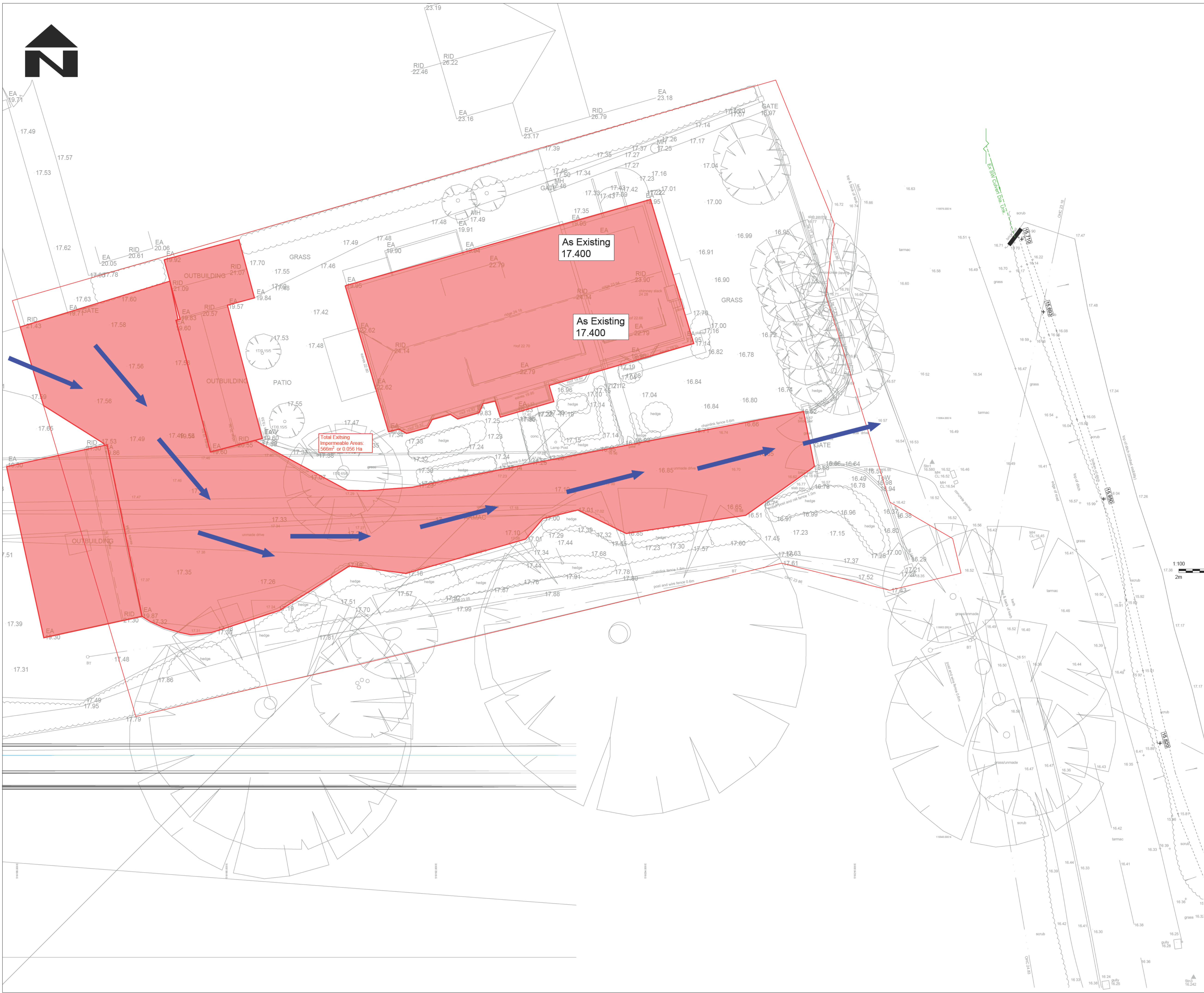
DRAWN	LH	ENGINEER	C SLADE	CHECKED	CS	APPROVED	CS
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DATE
JULY 2026

SCALE @ A1
1:100

JOB No.	C3111	STATUS	PL	DRAWING No.	101	REV.	1
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FOR PLANNING ONLY

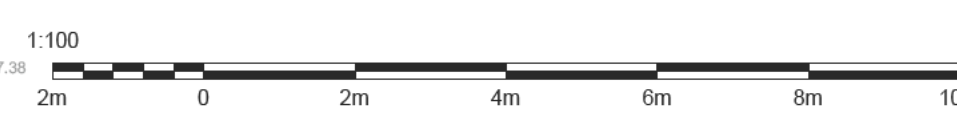


Total Existing
Impermeable Areas:
566m² or 0.056 Ha

As Existing
17.400

As Existing
17.400

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g ivil o lig ivil E g eer					
CLIENT VBMC BUILDING DEVELOPMENT LTD					
ARCHITECT DMA BUILDING DESIGNS					
JOB TITLE 1 LITTLEWORTH LANE PARTRIDGE GREEN					
DRAWING TITLE EXISTING IMPERMEABLE AREAS & OVERLAND FLOW ROUTE PLAN					
DRAWN	LH	ENGINEER	C SLADE	CHECKED	CS
DATE	JULY 2026	SCALE	@ A1	1:100	
JOB No.	C3111	STATUS	PL	DRAWING No.	101
				REV.	1

FOR PLANNING ONLY

9.3 **Appendix C – Surface Water Calculations**

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	0.350
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	999.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
S9	0.010	5.00	17.350	450	519187.746	119968.075	1.120	16.230
S3	0.017		17.250	450	519191.048	119966.076	1.050	16.200

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	S9	S3	3.860	0.600	16.230	16.200	0.030	128.7	100	5.10	54.8

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.676	5.3	2.0	1.020	0.950	0.010	0.0	43	0.629

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	3.860	128.7	100	Circular	17.350	16.230	1.020	17.250	16.200	0.950

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S9	450	Manhole	Adoptable	S3	450	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S9	519187.746	119968.075	17.350	1.120	450		0	1.000	16.230	100
S3	519191.048	119966.076	17.250	1.050	450		1	1.000	16.200	100

Simulation Settings

Rainfall Methodology	FEH-22	Drain Down Time (mins)	240	10 year (l/s)	0.0
Rainfall Events	Singular	Additional Storage (m³/ha)	0.0	30 year (l/s)	0.0
Summer CV	1.000	Starting Level (m)		100 year (l/s)	0.0
Winter CV	1.000	Check Discharge Rate(s)	✓	Check Discharge Volume	x
Analysis Speed	Normal	1 year (l/s)	0.0		
Skip Steady State	x	2 year (l/s)	0.0		

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 %)
1	0	0	0
2	0	0	0
10	0	0	0
30	45	0	0
100	45	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)		Betterment (%)	0
SAAR (mm)		QBar	
Soil Index	1	Q 1 year (l/s)	
SPR	0.10	Q 2 year (l/s)	
Region	1	Q 10 year (l/s)	
Growth Factor 1 year	0.85	Q 30 year (l/s)	
Growth Factor 2 year	0.90	Q 100 year (l/s)	
Growth Factor 10 year	1.45		

Node S3 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.775	Discharge Coefficient	0.650
Replaces Downstream Link	x	Design Flow (l/s)	0.5		
Invert Level (m)	16.200	Diameter (m)	0.015		

Node S9 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	16.350
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	34.3	34.3	0.700	34.3	48.8	0.701	0.0	48.8

9.4 **Appendix D – Borehole Logs**

3

BOREHOLE No. 2b,

SHEET No 1

TR 11 NE/1
186 193

SITE: PARTRIDGE GREEN SUBSTATION

DATUM FOR LEVELS :- GROUND LEVEL.

GROUND LEVEL - TOP OF RAIL

POSITION - SEE SITE PLAN: No. 9/P5/3

DATE :- 7-11/7/60

RESEARCH SECTION,
SOUTH SIDE OFFICES,
WATERLOO. EXT. 2786.

BRITISH RAILWAYS, SOUTHERN REGION,
CHIEF CIVIL ENGINEER'S DEPARTMENT,
WATERLOO STATION, S.E.1.

STRATA	THICKNESS	DEPTH (M)	KEY	WATER LEVELS	SAMPLES	REMARKS
TOPSOIL	0-9'	0-9'				
FIRM BROWN MARGLE CLAY WITH SPICES OF CHALK AND ROOTLETS	1-0'	1-9'				
FIRM BROWN-GREY MOTTLED CLAY WITH ROOTLETS	1-3"	3-0"				
FIRM TO STIFF BROWN-GREY MOTTLED SILTY CLAY	3-6	6-6				
STIFF BROWN-GREY LAMINATED FISSURED SILTY CLAY	6-2"	12-8"				
STIFF BLUE-GREY CLAYEY GRAY		14-2"				
END OF CORE		(4-32)				

BGS

BGS

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RESEARCH SECTION,
SOUTH SIDE OFFICES,
WATERLOO. EXT. 2786.

BRITISH RAILWAYS, SOUTHERN REGION,
CHIEF CIVIL ENGINEER'S DEPARTMENT,
WATERLOO STATION, S.E.1.

BOREHOLE No. 1a.

SHEET No.

TQ NE/1
186 193

SITE: PARTRIDGE GREEN SUBSTATION

DATUM FOR LEVELS :- GROUND LEVEL

GROUND LEVEL :- TOP OF RAIL

POSITION - SEE SITE PLAN: No. 9/P5/3

DATE :- 4-6/7/60

STRATA	THICKNESS	DEPTH (M)	KEY	WATER LEVELS	SAMPLES	REMARKS
TOPSOIL	1'-2"	1'-2"				
FIRM TO STIFF LIGHT BROWN-GREY CLAY, WITH SMALL POCKETS OF YELLOW SILT AND ROOTLETS	1'-4"	2'-6"				
FIRM REDDISH BROWN CLAY, WITH SMALL POCKETS OF YELLOW SILT	1'-0"	3'-6"				
SOFT TO FIRM LIGHT BROWN SILTY CLAY, WITH SOME GREY CLAY	1'-10"	5'-4"				
SOFT TO FIRM GREY-BROWN CLAY	0'-10"	6'-2"				
FIRM BROWN FISSURED CLAY WITH GREY SONTENDED FISSURES: FACES	3'-3"	9'-5"				
STIFF BROWN FISSURED SILTY CLAY	3'-1"	12'-6"				
STIFF BLUE-GRAY SILTY CLAY						
END OF BORE						

9.5 **Appendix E – Soakage Test Results and Groundwater monitoring**

Project:	Littleworth Lane, Partridge Green, RH13 8JF	GW1
Project No:	C3111	
Client:	VBMC BUILDING DEVELOPMENT LTD	

Ref: C3111

VBMC Building Development Ltd

10th January 2025**Re: Littleworth Lane, Partridge– Soakaway Testing – Infiltration Test Result Summary**

The following investigation was carried out at the above location in accordance with our quotation.

1. Site Works

The aim of this investigation is to provide soakaway test data in accordance with the guidance outlined in BRE Document 365 (Soakaway Design). Two holes were conducted at a location corresponding to the proposed locations for potential infiltration devices.

The accompanying drawing shows the locations of the test pits. The BRE365 pits were excavated to a depth of 0.9m and 0.5m consistent with the anticipated depth of the proposed soakaway and permeable paving subbase.

The testing commenced on 29th March 2024 with three tests being undertaken in each hole in accordance with BRE 365.

2. BRE 365 Soakaway Test Findings

The SAT1 test, was conducted on subsoils identified as clay soils and yielded a BRE 365 design infiltration rate of 2.13×10^{-6} m/s. This was the slowest rate of among the three tests performed.

The SAT2 (shallow) test, was conducted on subsoils identified as stiff clay soils and yielded a BRE 365 design infiltration rate of 2.40×10^{-6} m/s. This was the slowest rate of among the three tests performed.

3. BRE 365 Soakaway Test Results

Test Pit No	Infiltration Rate (1-3 Tests)			Depth of Test	Soil Type
SAT1	2.24×10^{-6} m/s	2.19×10^{-6} m/s	2.13×10^{-6} m/s	0.9m	Clay
SAT2	3.16×10^{-6} m/s	2.68×10^{-6} m/s	2.40×10^{-6} m/s	0.5m	Clay

Appendix A – Soakaway Tests Location Plan



Appendix B – Site Photographs





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Appendix C – Soakaway Test Results

SAT1

Job: Littleworth Lane, Partridge - SAT 1 Test 1

Infiltration Calculator

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

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

a_{p50} = Internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} = The time for the water level to fall from 75% to 25% effective depth

f = Infiltration rate

Trial pit width	=	0.3
Trial pit depth	=	0.9
Trial pit length	=	1

a_{p50} = 1.47 m/squared

t_{p75-25} = 41000 seconds

V_{p75-25} = 0.135 m/cubed

F = 2.24E-06

Job: Littleworth Lane, Partridge - SAT 1 Test 2

Infiltration Calculator

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

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

a_{p50} = Internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} = The time for the water level to fall from 75% to 25% effective depth

f = Infiltration rate

Trial pit width	=	0.3
Trial pit depth	=	0.9
Trial pit length	=	1

a_{p50} = 1.47 m/squared

t_{p75-25} = 42000 seconds

V_{p75-25} = 0.135 m/cubed

F = 2.19E-06

Job: Littleworth Lane, Partridge - SAT 1 Test 3

Infiltration Calculator

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

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

a_{p50} = Internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} = The time for the water level to fall from 75% to 25% effective depth

f = Infiltration rate

Trial pit width	=	0.3
Trial pit depth	=	0.9
Trial pit length	=	1

a_{p50} = 1.47 m/squared

t_{p75-25} = 43200 seconds

V_{p75-25} = 0.135 m/cubed

F = 2.13E-06



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SAT2 (shallow)

Job: Littleworth Lane, Partridge - SAT 2 Test 1

Infiltration Calculator

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

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

a_{p50} = Internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} = The time for the water level to fall from 75% to 25% effective depth

f = Infiltration rate

Trial pit width	=	0.3
Trial pit depth	=	0.5
Trial pit length	=	1

a_{p50} = 0.95 m/squared

t_{p75-25} = 25000 seconds

V_{p75-25} = 0.075 m/cubed

F = 3.16E-06

Job: Littleworth Lane, Partridge - SAT 2 Test 2

Infiltration Calculator

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

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

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

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

f = Infiltration rate

Trial pit width	=	0.3
Trial pit depth	=	0.5
Trial pit length	=	1

ap_{50} = 0.95 m/squared

tp_{75-25} = 29500 seconds

V_{p75-25} = 0.075 m/cubed

F = 2.68E-06

Job: Littleworth Lane, Partridge - SAT 2 Test 3

Infiltration Calculator

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

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

a_{p50} = Internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} = The time for the water level to fall from 75% to 25% effective depth

f = Infiltration rate

Trial pit width	=	0.3
Trial pit depth	=	0.5
Trial pit length	=	1

a_{p50} = 0.95 m/squared

t_{p75-25} = 32950 seconds

V_{p75-25} = 0.075 m/cubed

F =

2.4E-06
