

SuDS and Drainage Report

Clock House Farm, Stonehouse Lane, Cowfold, West Sussex RH13 8DL

Rev: **2**

Ref: **C3948**



Date	Revision	Author	Approved
09.03.2026	1	LH	CS
30.06.2026	2	LH	CS

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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 Clock House Farm in Cowfold, West Sussex.
- 1.1.2 The proposed development will consist of the demolition of 7 No. agricultural buildings, the conversion of a stable block to form 5 No. residential units and the construction of a new commercial building and Sussex barn. The proposed development is located as OS Grid Reference TQ 19689 22221 and has the post code RH13 8DL.
- 1.1.3 The purpose of this drainage scheme is to demonstrate how the proposed development can be satisfactorily drained without increasing flood risk onsite and where appropriate, providing betterment over the existing site to reduce flood risk in the region.
- 1.1.4 At time of writing, planning permission for the site has not been granted, however, the following report has been completed in anticipation of any further drainage related planning conditions and as such, the report will include the following:
- The results of an assessment into the potential for disposing of surface water by means of Sustainable Drainage System (SuDS).
 - Details of a management and maintenance plan for the drainage scheme
 - The appropriate design standard for the surface water drainage scheme must be the 1 in 100-year return period with a 45% allowance for climate change + 10% urban creep.

Fig 1. Site Location



2 Executive Summary:

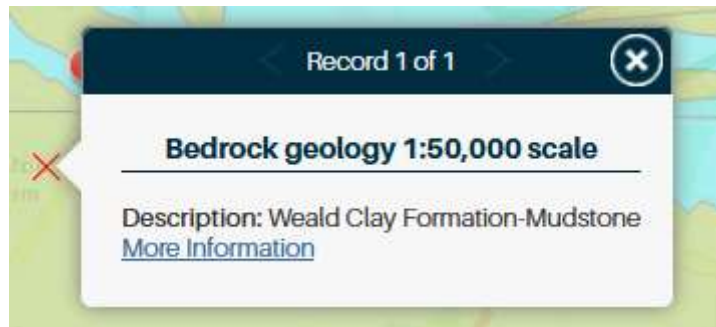
- 2.1.1 The proposed development will consist of the demolition of 7 No. agricultural buildings, the conversion of a stable block to form 5 No. residential units and the construction of a new commercial building and Sussex barn.
- 2.1.2 The underlying geology is noted to be clay with groundwater being recorded at depths ranging from 0.6 – 0.9mbgl. Infiltration testing was conducted on site at varying depths which all failed to drain more than 20mm over a 24 hour period. It is therefore confirmed that infiltration is not viable.
- 2.1.3 The surface water runoff is to be captured into a positive drainage network prior to discharging into an existing watercourse at site Q_{BAR} which is 5.4l/s. The proposed drainage network will make use of a geocellular attenuation tank in addition to an above ground attenuation swale in order to cater for the 1 in 100-year +45% storm + 10% urban creep.
- 2.1.4 The foul water is to be treated on site via a package treatment plant prior to discharging into the watercourse alongside the surface water runoff.

3 Site Geology

3.1 British Geological Survey information

- 3.1.1 The British Geological Survey confirms the bedrock geology to be made up of Weald Clay Formation. At the time of writing the British Geological Survey website does not have any recorded information of the Superficial deposits on site.

Fig 2. British Geological Survey



3.2 Geological Assessment

- 3.2.1 3 No. groundwater monitoring wells were drilled by E3S Consulting Ltd on behalf of CGS Civils Ltd. During drilling of the wells, the underlying geology was recorded to be comprised of Clay. It was noted that the monitoring wells were dry upon completion, however, subsequent visits recorded groundwater at depths between 0.6mbgl and 0.9mbgl.
- 3.2.2 In addition to the installation of monitoring wells, 4 No. infiltration tests to BRE365 were conducted on site at varying locations and depths. The water level within all 4 of the trial pits dropped only 10-20mm over a 24-hour period and was then abandoned.
- 3.2.3 Due to the failure of the infiltration testing, it is confirmed that infiltration is not a viable means of surface water discharge and an alternative means of surface water discharge should be sought.

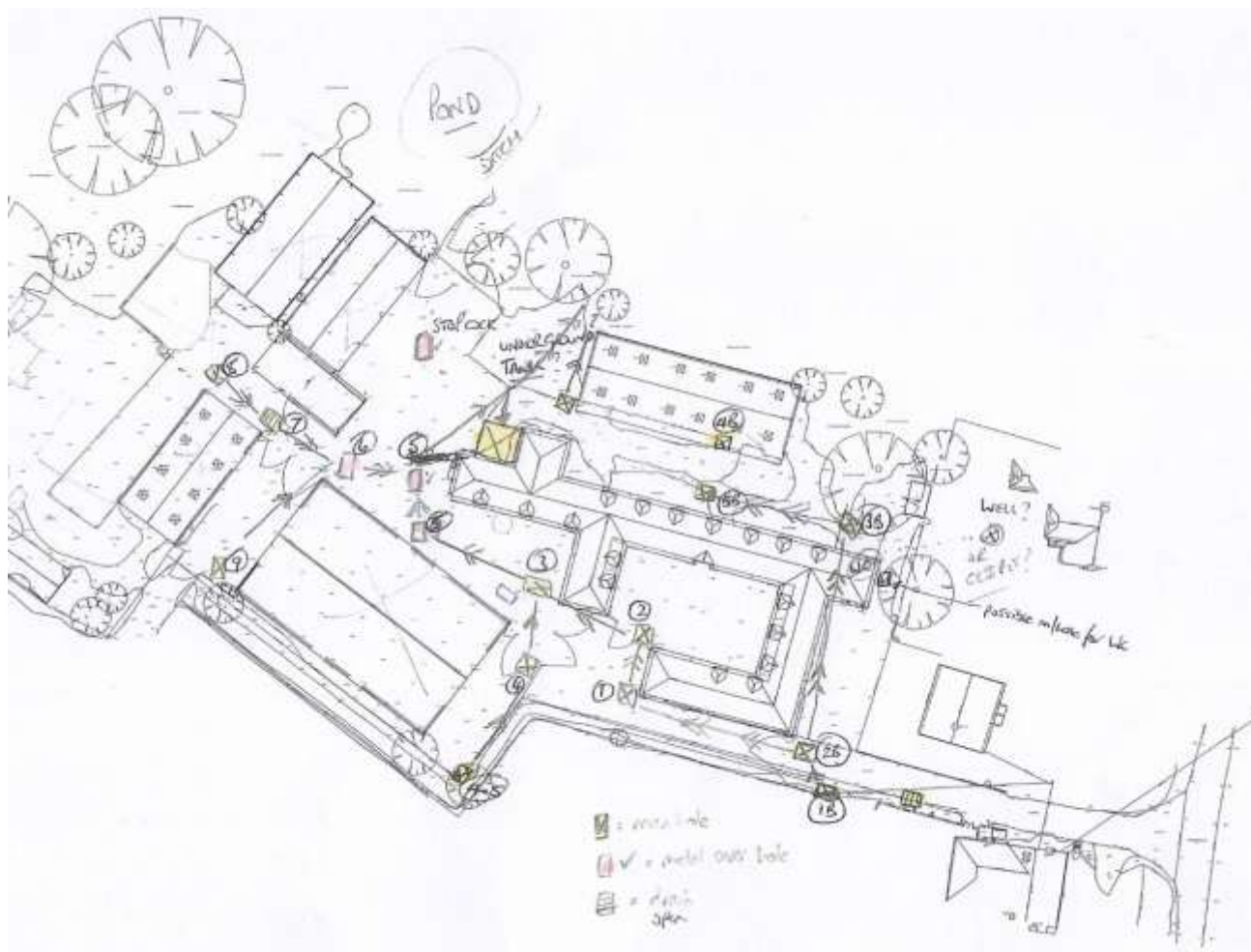
Fig 3. Soakaway test photographs



4 Existing Drainage

- 4.1.1 In order to determine how the existing site discharges surface water runoff and to confirm if any part of the existing drainage can be re-used, a CCTV Drainage survey was undertaken by the client. During the survey it was noted that most of the surface water runoff discharge towards the north, however, a final connection point was not confirmed but it is believed to discharge into the existing ditch network.
- 4.1.2 As the final discharge located has not been confirmed, it is proposed that the majority of the existing drainage network is to be abandoned and a new, robust SuDS oriented system is to be installed.

Fig 4. Snippet of CCTV Report



The map shows the Stonehouse Farm area in Kent. A red line outlines the Clockhouse Farm area, which includes the Clockhouse Farm, Little Patches, and Dairy Cottage. A blue line outlines the Little Patches area. The map also shows a pond, a stream, and a road labeled 'STONEHOUSE LANE'. Other labels include 'Northstone Cottages', 'Clockhouse Farmhouse', and 'Issues'.

5 Proposed Drainage Strategy

5.1 SuDS Hierarchy

- 5.1.1 All options for the destination of run-off generated on site have been assessed 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	
Rainwater Harvesting	Rainwater harvesting is not currently included within the overall strategy of the site. However, this is to be included at detailed design stage once the location of rainwater pipes has been confirmed.
Discharge to Ground	Discharge to ground deemed not viable due to failed soakaway test.
Discharge to Watercourse	Yes – Surface water drainage to be discharged into existing watercourse network to the northwest. Discharge rate restricted to Q_{BAR} which is 5.4l/s.
Discharge to Surface Water Sewer	N/A due to above
Discharge to Other Sewer	N/A due to above

5.2 Proposed Hydraulic Calculation Specifications:

Table 2. SuDS Hierarchy

Hydraulic Calculations Settings:	
Rainfall Methodology	FEH-22
Volumetric Run-off Coefficient C_v	1
CV Winter and Summer	1
Additional Storage (m^3 / ha)	0.0
Maximum Rainfall (mm/hr)	75
Flow Control	1.067m Head @ 5.4 l/s discharge
Attenuation Tank Design	Base Coefficient (m/hr): 0.00000
	Side Coefficient (m/hr): 0.00000
	Factor of Safety: 2
	Porosity: 95%
	Time to Half Empty (mins): -
Swale Design	Base Coefficient (m/hr): 0.00000
	Side Coefficient (m/hr): 0.00000
	Factor of Safety: 2
	Porosity: 100%
	Side Slope: 1:3

5.3 Surface Water Drainage

- 5.3.1 Due to the failure of onsite infiltration testing, it is deemed that infiltration is not a viable option for surface water discharge. Groundwater was also recorded at depths between 0.6 and 0.9mbgl which further confirms that infiltration is not suitable for storm water disposal. Therefore, it is proposed that surface water runoff from the site is to be discharged into an existing watercourse that is located north of the site within the client's ownership.
- 5.3.2 The surface water runoff is to be captured into a positive drainage network prior to discharging into the watercourse at site Q_{BAR} which is 5.4l/s. The proposed drainage network will make use of a geocellular attenuation tank in addition to an above ground attenuation swale in order to cater for the 1 in 100-year +45% storm + 10% urban creep.
- 5.3.3 Each domestic plot will also have a bio-retention planter where possible to provide interception, water quality and bio-diversity benefits. Once rainwater down pipe positions have been confirmed, each dwelling will have a rainwater harvesting tank to allow for reuse of rainwater within the property.
- 5.3.4 The hard paved areas of the site are to be comprised of a concrete which will be utilised as the access road to the dwelling and also to allow for access to the farm buildings.
- 5.3.5 Greenfield Runoff and Hydraulic calculations have been carried out which can be found at Appendix C. It should be noted that a 10% urban creep has been applied to the roof areas only. This has been included within the hydraulic calculations as additional area which is highlighted within the impermeable areas plan in **Appendix B**.

Table 3. Greenfield Runoff Calculations

Greenfield Runoff Calculations			
Storm period	Greenfield runoff rate (l/s)	Proposed Discharge Rate (l/s)	Difference (l/s)
Q_{BAR}	5.4	5.4	+ 0.0
1	4.6	5.4	+ 0.8
2	4.7	5.4	+ 0.7
30	12.4	5.4	- 7.0
100	17.2	5.4	- 11.8

5.4 Water Quality

- 5.4.1 A key requirement of any SuDS system is that it protects the receiving water body from the risk of pollution.
- 5.4.2 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.
- 5.4.3 The new SuDS Manual (Ciria C753, November 2015) introduces slightly different approach compared to the previous version for the water quality management of surface water. 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
- 5.4.4 The recommended approaches for water quality risk management are given in the SuDS Manual Table 26.1.

Table 26.1 from SuDS manual. Approaches to Water Quality Risk Management

Table 26.1 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	

- 5.4.5 As per Table 26.1 Simple Index approach will be used as a design method for this site.
- 5.4.6 Table 26.2 will provide hazard classification of different land uses. The land uses for the surface water drainage for this site are.
- Residential Roofs
 - Other roofs
 - Commercial Yards
- 5.4.7 To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index for each contaminant type that equals or exceeds the pollution hazard index for each contaminant type. Therefore, the following must be achieved for the surface running off the site.

Total SuDS mitigation index $\geq$ pollution hazard index

- 5.4.8 Pollution Hazard Indices are given for different land uses in Table 26.2 of the SuDS manual;

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

5.4.9 From Table 26.2 the following information is tabulated in Table 1

Table 3: Pollution hazard index and destination of runoff for the proposed site

Table 3: Pollution Hazard Index and Destination of runoff for the proposed Site						
Land Use	Destination of Runoff	Pollution Hazard Level	Total Solids	Suspended	Metals	Hydrocarbons
Residential Roof	Surface Water	Very Low		0.2	0.2	0.05
Other Roofs	Surface water	Low		0.3	0.2 up to 0.8	0.05
Commercial Yard	Surface Water	Medium		0.7	0.6	0.7

5.4.10 The SuDS mitigation index will be obtained from Table 26.4 (for groundwater) of the SuDS manual.

Table 26.4 from SuDS manual. Indicative SuDS Mitigation Indices for discharges to ground waters.

5.4.11 SuDS mitigation index are tabulated in Table 5 as followed.

Table 26.4 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	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roof	Surface Water	Table 26.3 (for surface waters)	Bioretention System	0.8	0.8	0.8
Other Roof	Surface Water	Table 26.3 (for surface waters)	Swale	0.5	0.6	0.6
Commercial yard	Surface Water	Table 26.3 (for surface waters)	Swale	0.5	0.6	0.6

5.4.12 The above analysis demonstrates that the SuDS devices within the design will mitigate any pollution present within the surface water system.

5.5 Foul water drainage

- 5.5.1 The foul water is to be treated on site via a package treatment plant prior to discharging into the watercourse alongside the surface water runoff.
- 5.5.2 Once the nature of the commercial units has been confirmed, any discharge from the commercial units that may pollute the watercourse or the downstream receiving body should be discharged separately.
- 5.5.3 The proposed treatment plant is to be designed based upon the following occupancies based upon British Flows and Loads and HCA Employment Density Guide. This will be fully calculated at detailed design stage once the Class Use of the commercial units has been confirmed.

6 Summary and Conclusions

- 6.1.1 CGS Civils has been instructed to produce a Drainage statement under National Planning Policy Framework (NPPF) to support the Planning Application for the demolition of 7 No. agricultural buildings, the conversion of a stable block to form 5 No. residential units and the construction of a new commercial building and Sussex barn.
- 6.1.2 The Surface Water will discharge to into an adjacent watercourse at a restricted rate of 5.4l/s. The network will make use of a geocellular attenuation tank and planted swale in order to cater for the 1 in 100-year +45% storm +10% urban creep. Bioretention planters are to be used where possible to provide water quality, biodiversity and amenity benefits.
- 6.1.3 The Foul water is to be treated on site via a package treatment plant prior to discharging into the watercourse alongside the surface water runoff.
- 6.1.4 The report has demonstrated that the proposed drainage measures ensure that suitable means of surface water and foul drainage can be achieved for the proposed development.

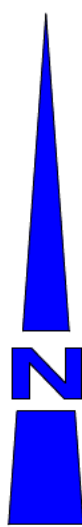
7 Appendices

7.1 Appendix A – Site Plan

IF YOU NEED ANY FURTHER INFORMATION OR INDEPENDENT ADVICE ON UNDERTAKING YOUR CDM REGULATIONS DUTIES, PLEASE CONTACT: THE ASSOCIATION FOR PROJECT SAFETY, 5 NEW MART PLACE, EDINBURGH EH14 1RW TEL: 08456 121 290 EMAIL: info@aps.org.uk YOU CAN VISIT THE HSE AND APS WEBSITES FOR MUCH MORE INFORMATION AT: www.hse.gov.uk/and www.aps.org.uk RESPECTIVELY.

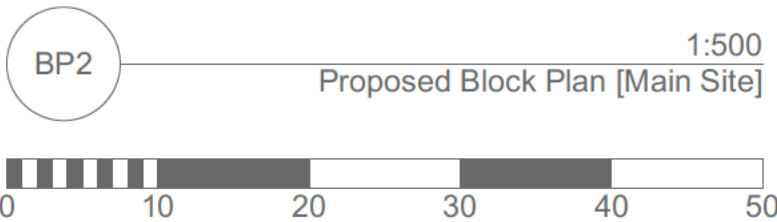
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IT SHOULD BE ASSUMED THAT ALL WORKS ARE TO BE CARRIED OUT BY A COMPETENT CONTRACTOR AND, WHERE APPLICABLE, TO AN APPROVED METHOD STATEMENT.



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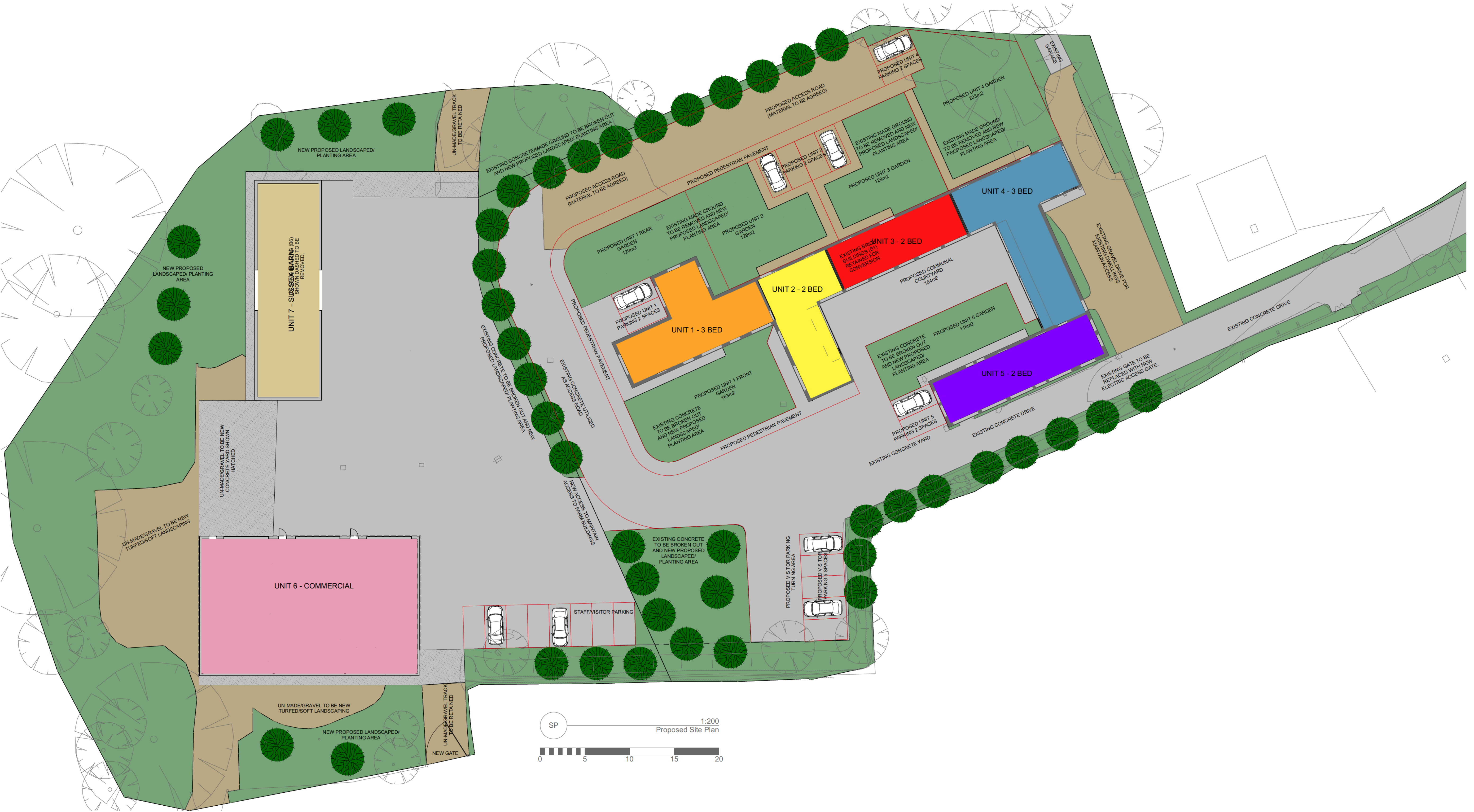
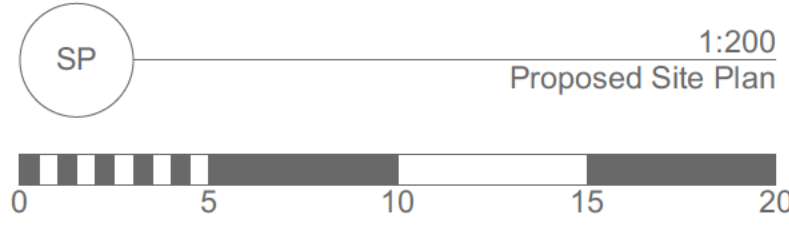
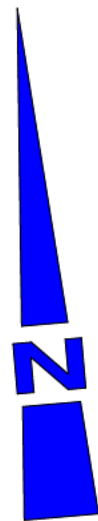
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UNIT GROUND FLOOR AREAS SCHEDULE

UNIT		GROSS INTERNAL AREA
UNIT 1	3 BED	107.47
UNIT 2	2 BED	87.87
UNIT 3	2 BED	73.25
UNIT 4	3 BED	133.97
UNIT 5	2 BED	91.40
UNIT 6	COMMERCIAL	362.33
UNIT 7	SUSSEX BARN	163.66



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PROJECT:

STABLES CONVERSION
CLOCKHOUSE FARM, BURNTHOUSE
LANE, COWFOLD, WEST SUSSEX, RH13
8DL

DRAWING TITLE:

Proposed Site Plan

DRAWN:

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DATE:

JUNE 25

JOB NO:

2684/25

DRAWING NO:

SP-01

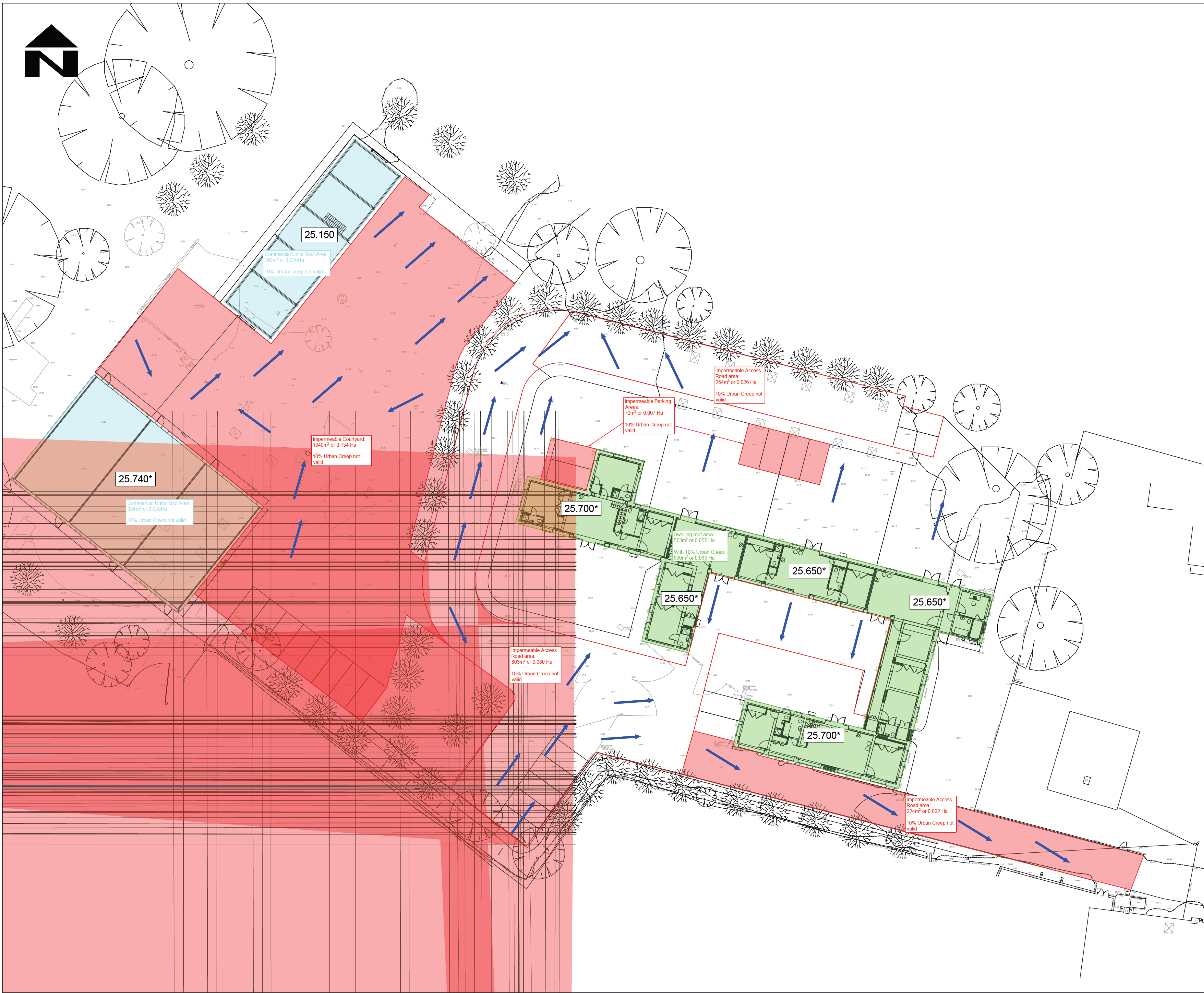
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7.2 **Appendix B – Drainage Layout**



Prefix to drawing numbers shall signify the following:-

PL = PLANNING	Shall not be used for contract or construction purposes
P = PRELIMINARY	Shall not be used for contract or construction purposes
T = TENDER	Shall not be used for construction purposes
C = CONSTRUCTION	These are the only drawings that shall be used for construction purposes
R = RECORD	Record of actual completed work

1	18.03.26	PRELIMINARY ISSUE	LH	CS	CS
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CLIENT THE CAMELIA BOTNAR FOUNDATION					
ARCHITECT PHILIPS SURVEYORS					
JOB TITLE CLOCK HOUSE FARM HORSHAM					
DRAWING TITLE IMPERMEABLE AREAS & OVERLAND FLOW ROUTE PLAN					
DRAWN	LH	ENGINEER	C SLADE	CHECKED	CS
DATE	MARCH 2026	SCALE @ A1	1:200	APPROVED	CS
JOB No.	C3948	STATUS	P	DRAWING No.	401
REV.					1

FOR PLANNING ONLY

7.3 **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)	75.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)	Invert Level (m)
S1	0.023	5.00	25.580	600	519740.169	122189.552	0.880	24.700
S2	0.009	5.00	25.580	600	519740.990	122195.284	0.916	24.664
S3	0.009	5.00	25.500	600	519745.987	122216.735	1.057	24.443
S4	0.028	5.00	25.470	600	519705.535	122231.462	1.218	24.252
S5	0.046	5.00	25.500	600	519692.223	122234.519	1.393	24.107
AT1	0.000	5.00	25.000	600	519677.514	122246.068	1.300	23.700
S7	0.052		25.000	1200	519684.398	122255.292	1.350	23.650
S8	0.029	5.00	25.550	600	519720.806	122202.888	0.600	24.950
S9	0.029	5.00	25.520	600	519703.585	122209.063	0.795	24.725
S10	0.028	5.00	25.500	600	519689.143	122222.324	1.000	24.500
S11	0.031	5.00	25.700	600	519653.930	122214.082	0.600	25.100
S12	0.031	5.00	25.500	600	519663.726	122226.366	0.700	24.800
S13	0.022	5.00	25.000	600	519662.536	122241.545	0.861	24.139
S16	0.049	5.00	25.000	600	519653.158	122248.383	0.720	24.280

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)
1.006	S1	S2	5.790	0.600	24.700	24.664	0.036	160.8	150	5.12	53.5
1.000	S2	S3	22.025	0.600	24.664	24.518	0.146	150.9	150	5.57	51.7
1.002	S3	S4	43.049	0.600	24.443	24.252	0.191	225.4	225	6.40	48.6
1.003	S4	S5	13.658	0.600	24.252	24.182	0.070	195.1	225	6.64	47.8
1.004	S5	AT1	18.701	0.600	24.107	23.700	0.407	45.9	300	6.78	47.3
1.005	AT1	S7	11.510	0.600	23.700	23.650	0.050	230.2	300	6.96	46.7
2.000	S11	S12	15.712	0.600	25.100	24.800	0.300	52.4	225	5.14	53.4

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)
1.006	0.790	14.0	4.4	0.730	0.766	0.023	0.0	58	0.703
1.000	0.816	14.4	6.0	0.766	0.832	0.032	0.0	67	0.777
1.002	0.867	34.5	7.2	0.832	0.993	0.041	0.0	70	0.689
1.003	0.932	37.1	11.9	0.993	1.093	0.069	0.0	87	0.832
1.004	2.325	164.4	34.4	1.093	1.000	0.201	0.0	93	1.853
1.005	1.032	72.9	56.3	1.000	1.050	0.334	0.0	198	1.135
2.000	1.811	72.0	6.0	0.375	0.475	0.031	0.0	44	1.104

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)
2.001	S12	S13	15.226	0.600	24.800	24.139	0.661	23.0	225	5.24	53.0
2.002	S13	AT1	15.646	0.600	24.139	23.700	0.439	35.6	225	5.36	52.6
3.000	S16	S13	11.606	0.600	24.280	24.139	0.141	82.3	225	5.13	53.5
4.000	S8	S9	18.295	0.600	24.950	24.800	0.150	122.0	150	5.34	52.7
4.001	S9	S10	19.607	0.600	24.725	24.500	0.225	87.1	225	5.57	51.7
4.002	S10	S5	12.578	0.600	24.500	24.182	0.318	39.6	225	5.67	51.3

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)
2.001	2.737	108.8	11.9	0.475	0.636	0.062	0.0	50	1.805
2.002	2.198	87.4	25.3	0.636	1.075	0.133	0.0	83	1.914
3.000	1.442	57.3	9.5	0.495	0.636	0.049	0.0	62	1.076
4.000	0.908	16.1	5.5	0.450	0.570	0.029	0.0	61	0.825
4.001	1.401	55.7	10.8	0.570	0.775	0.058	0.0	67	1.093
4.002	2.086	82.9	15.9	0.775	1.093	0.086	0.0	66	1.617

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)
1.006	5.790	160.8	150	Circular	25.580	24.700	0.730	25.580	24.664	0.766
1.000	22.025	150.9	150	Circular	25.580	24.664	0.766	25.500	24.518	0.832
1.002	43.049	225.4	225	Circular	25.500	24.443	0.832	25.470	24.252	0.993
1.003	13.658	195.1	225	Circular	25.470	24.252	0.993	25.500	24.182	1.093
1.004	18.701	45.9	300	Circular	25.500	24.107	1.093	25.000	23.700	1.000
1.005	11.510	230.2	300	Circular	25.000	23.700	1.000	25.000	23.650	1.050
2.000	15.712	52.4	225	Circular	25.700	25.100	0.375	25.500	24.800	0.475
2.001	15.226	23.0	225	Circular	25.500	24.800	0.475	25.000	24.139	0.636
2.002	15.646	35.6	225	Circular	25.000	24.139	0.636	25.000	23.700	1.075
3.000	11.606	82.3	225	Circular	25.000	24.280	0.495	25.000	24.139	0.636

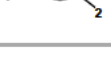
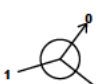
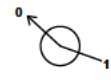
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.006	S1	600	Manhole	Adoptable	S2	600	Manhole	Adoptable
1.000	S2	600	Manhole	Adoptable	S3	600	Manhole	Adoptable
1.002	S3	600	Manhole	Adoptable	S4	600	Manhole	Adoptable
1.003	S4	600	Manhole	Adoptable	S5	600	Manhole	Adoptable
1.004	S5	600	Manhole	Adoptable	AT1	600	Manhole	Adoptable
1.005	AT1	600	Manhole	Adoptable	S7	1200	Manhole	Adoptable
2.000	S11	600	Manhole	Adoptable	S12	600	Manhole	Adoptable
2.001	S12	600	Manhole	Adoptable	S13	600	Manhole	Adoptable
2.002	S13	600	Manhole	Adoptable	AT1	600	Manhole	Adoptable
3.000	S16	600	Manhole	Adoptable	S13	600	Manhole	Adoptable

Pipeline Schedule

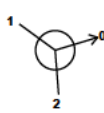
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
4.000	18.295	122.0	150	Circular	25.550	24.950	0.450	25.520	24.800	0.570
4.001	19.607	87.1	225	Circular	25.520	24.725	0.570	25.500	24.500	0.775
4.002	12.578	39.6	225	Circular	25.500	24.500	0.775	25.500	24.182	1.093

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
4.000	S8	600	Manhole	Adoptable	S9	600	Manhole	Adoptable
4.001	S9	600	Manhole	Adoptable	S10	600	Manhole	Adoptable
4.002	S10	600	Manhole	Adoptable	S5	600	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S1	519740.169	122189.552	25.580	0.880	600		0	1.006	24.700	150
S2	519740.990	122195.284	25.580	0.916	600		1	1.006	24.664	150
							0	1.000	24.664	150
S3	519745.987	122216.735	25.500	1.057	600		1	1.000	24.518	150
							0	1.002	24.443	225
S4	519705.535	122231.462	25.470	1.218	600		1	1.002	24.252	225
							0	1.003	24.252	225
S5	519692.223	122234.519	25.500	1.393	600		1	4.002	24.182	225
							2	1.003	24.182	225
							0	1.004	24.107	300
AT1	519677.514	122246.068	25.000	1.300	600		1	2.002	23.700	225
							2	1.004	23.700	300
							0	1.005	23.700	300
S7	519684.398	122255.292	25.000	1.350	1200		1	1.005	23.650	300
S8	519720.806	122202.888	25.550	0.600	600		0	4.000	24.950	150
S9	519703.585	122209.063	25.520	0.795	600		1	4.000	24.800	150
							0	4.001	24.725	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S10	519689.143	122222.324	25.500	1.000	600	 1	4.001	24.500	225
						0	4.002	24.500	225
S11	519653.930	122214.082	25.700	0.600	600	 0			
						0	2.000	25.100	225
S12	519663.726	122226.366	25.500	0.700	600	 1	2.000	24.800	225
						0	2.001	24.800	225
S13	519662.536	122241.545	25.000	0.861	600	 1 2 0	1 2	3.000 2.001	24.139 24.139
						0	2.002	24.139	225
S16	519653.158	122248.383	25.000	0.720	600	 0			
						0	3.000	24.280	225

Simulation Settings

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

Node S7 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	23.650	Product Number	CTL-SHE-0104-5400-1350-5400
Design Depth (m)	1.350	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.4	Min Node Diameter (mm)	1200

Node S16 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	24.300
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	248

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	179.5	179.5	0.700	293.1	299.2

Node AT1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	23.700
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	180.0	180.0	0.800	180.0	218.0	0.801	0.0	218.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	10	24.748	0.048	2.7	0.0135	0.0000	OK
15 minute summer	S2	11	24.717	0.053	3.8	0.0149	0.0000	OK
15 minute summer	S3	11	24.499	0.056	4.7	0.0158	0.0000	OK
15 minute summer	S4	11	24.325	0.073	7.8	0.0205	0.0000	OK
15 minute summer	S5	10	24.194	0.087	22.8	0.0246	0.0000	OK
240 minute summer	AT1	160	23.884	0.184	14.7	31.5196	0.0000	OK
240 minute summer	S7	160	23.884	0.234	5.2	0.2644	0.0000	OK
15 minute summer	S8	10	24.998	0.048	3.4	0.0135	0.0000	OK
15 minute summer	S9	10	24.779	0.054	6.7	0.0152	0.0000	OK
15 minute summer	S10	10	24.555	0.055	10.0	0.0155	0.0000	OK
15 minute summer	S11	10	25.134	0.034	3.7	0.0097	0.0000	OK
15 minute summer	S12	10	24.839	0.039	7.4	0.0112	0.0000	OK
15 minute summer	S13	10	24.200	0.061	11.2	0.0172	0.0000	OK
120 minute summer	S16	72	24.307	0.027	3.2	1.4449	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.006	S2	2.7	0.524	0.192	0.0298	67.5
15 minute summer	S2	1.000	S3	3.7	0.680	0.257	0.1201	
15 minute summer	S3	1.002	S4	4.7	0.508	0.137	0.4029	
15 minute summer	S4	1.003	S5	7.7	0.722	0.208	0.1459	
15 minute summer	S5	1.004	AT1	23.0	2.185	0.140	0.2271	
240 minute summer	AT1	1.005	S7	4.8	0.269	0.065	0.5997	
240 minute summer	S7	Hydro-Brake®		5.1				
15 minute summer	S8	4.000	S9	3.4	0.712	0.209	0.0864	
15 minute summer	S9	4.001	S10	6.7	0.914	0.121	0.1444	
15 minute summer	S10	4.002	S5	9.9	1.373	0.119	0.0908	
15 minute summer	S11	2.000	S12	3.7	0.864	0.051	0.0666	
15 minute summer	S12	2.001	S13	7.3	1.135	0.067	0.1013	
15 minute summer	S13	2.002	AT1	11.4	1.960	0.130	0.1280	
120 minute summer	S16	3.000	S13	1.8	0.588	0.032	0.0445	

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	10	24.761	0.061	4.1	0.0172	0.0000	OK
15 minute summer	S2	11	24.730	0.066	5.7	0.0187	0.0000	OK
15 minute summer	S3	11	24.512	0.069	7.1	0.0194	0.0000	OK
15 minute summer	S4	11	24.344	0.092	11.9	0.0260	0.0000	OK
15 minute summer	S5	10	24.213	0.106	34.8	0.0300	0.0000	OK
240 minute summer	AT1	168	23.970	0.270	19.7	46.2725	0.0000	OK
240 minute summer	S7	168	23.970	0.320	5.4	0.3618	0.0000	OK
15 minute summer	S8	10	25.010	0.060	5.2	0.0170	0.0000	OK
15 minute summer	S9	10	24.792	0.067	10.3	0.0190	0.0000	OK
15 minute summer	S10	10	24.569	0.069	15.2	0.0195	0.0000	OK
15 minute summer	S11	10	25.142	0.042	5.6	0.0120	0.0000	OK
15 minute summer	S12	10	24.848	0.048	11.1	0.0137	0.0000	OK
15 minute summer	S13	9	24.211	0.072	16.7	0.0204	0.0000	OK
30 minute summer	S16	23	24.313	0.033	7.9	2.4752	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.006	S2	4.1	0.573	0.291	0.0410	91.6
15 minute summer	S2	1.000	S3	5.6	0.757	0.386	0.1619	
15 minute summer	S3	1.002	S4	7.1	0.561	0.206	0.5477	
15 minute summer	S4	1.003	S5	11.8	0.809	0.319	0.1997	
15 minute summer	S5	1.004	AT1	35.1	2.335	0.213	0.3479	
240 minute summer	AT1	1.005	S7	5.2	0.265	0.071	0.7898	
240 minute summer	S7	Hydro-Brake®		5.4				
15 minute summer	S8	4.000	S9	5.1	0.796	0.319	0.1178	
15 minute summer	S9	4.001	S10	10.3	1.017	0.184	0.1979	
15 minute summer	S10	4.002	S5	15.1	1.538	0.182	0.1238	
15 minute summer	S11	2.000	S12	5.6	0.975	0.077	0.0896	
15 minute summer	S12	2.001	S13	11.1	1.324	0.102	0.1309	
15 minute summer	S13	2.002	AT1	16.9	2.030	0.194	0.2169	
30 minute summer	S16	3.000	S13	2.7	0.706	0.047	0.0709	

Results for 10 year Critical Storm Duration. Lowest mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	10	24.796	0.096	8.1	0.0270	0.0000	OK
15 minute summer	S2	10	24.766	0.102	11.2	0.0290	0.0000	OK
15 minute summer	S3	11	24.542	0.099	14.1	0.0281	0.0000	OK
15 minute summer	S4	11	24.392	0.140	23.5	0.0396	0.0000	OK
15 minute summer	S5	10	24.256	0.149	68.4	0.0421	0.0000	OK
180 minute winter	AT1	172	24.242	0.542	27.4	92.9035	0.0000	SURCHARGED
180 minute winter	S7	172	24.242	0.592	5.6	0.6696	0.0000	OK
15 minute summer	S8	10	25.040	0.090	10.2	0.0255	0.0000	OK
15 minute summer	S9	10	24.823	0.098	20.2	0.0276	0.0000	OK
15 minute summer	S10	10	24.601	0.101	29.9	0.0286	0.0000	OK
15 minute summer	S11	10	25.160	0.060	10.9	0.0170	0.0000	OK
15 minute summer	S12	10	24.868	0.068	21.7	0.0192	0.0000	OK
180 minute winter	S13	172	24.243	0.104	10.2	0.0293	0.0000	OK
30 minute summer	S16	22	24.328	0.048	15.6	5.2793	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.006	S2	8.0	0.656	0.575	0.0713	120.5
15 minute summer	S2	1.000	S3	11.0	0.886	0.764	0.2738	
15 minute summer	S3	1.002	S4	14.1	0.660	0.410	0.9210	
15 minute summer	S4	1.003	S5	23.5	0.957	0.635	0.3358	
15 minute summer	S5	1.004	AT1	68.7	2.481	0.418	0.7253	
180 minute winter	AT1	1.005	S7	5.4	0.217	0.074	0.8105	
180 minute winter	S7	Hydro-Brake®		5.4				
15 minute summer	S8	4.000	S9	10.0	0.937	0.625	0.1960	
15 minute summer	S9	4.001	S10	20.1	1.190	0.361	0.3310	
15 minute summer	S10	4.002	S5	29.6	1.820	0.357	0.2050	
15 minute summer	S11	2.000	S12	10.8	1.170	0.150	0.1456	
15 minute summer	S12	2.001	S13	21.6	1.627	0.199	0.2047	
180 minute winter	S13	2.002	AT1	10.2	1.278	0.117	0.4505	
30 minute summer	S16	3.000	S13	5.8	0.849	0.101	0.1177	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.92%

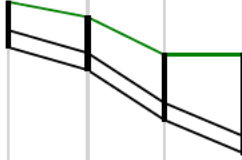
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	10	24.820	0.120	10.5	0.0341	0.0000	OK
15 minute summer	S2	11	24.794	0.130	14.4	0.0367	0.0000	OK
15 minute summer	S3	11	24.558	0.115	18.1	0.0325	0.0000	OK
15 minute summer	S4	11	24.419	0.167	30.4	0.0473	0.0000	OK
180 minute winter	S5	176	24.369	0.262	21.6	0.0741	0.0000	OK
180 minute winter	AT1	176	24.369	0.669	34.6	114.5759	0.0000	SURCHARGED
180 minute winter	S7	176	24.369	0.719	5.6	0.8128	0.0000	OK
15 minute summer	S8	10	25.059	0.109	13.3	0.0309	0.0000	OK
15 minute summer	S9	10	24.840	0.115	26.4	0.0325	0.0000	OK
15 minute summer	S10	10	24.619	0.119	39.0	0.0337	0.0000	OK
15 minute summer	S11	10	25.169	0.069	14.2	0.0196	0.0000	OK
15 minute summer	S12	10	24.878	0.078	28.3	0.0220	0.0000	OK
180 minute winter	S13	176	24.369	0.230	13.1	0.0651	0.0000	SURCHARGED
180 minute winter	S16	176	24.369	0.089	6.7	12.9422	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.006	S2	10.3	0.681	0.742	0.0905	120.1
15 minute summer	S2	1.000	S3	14.2	0.939	0.986	0.3318	
15 minute summer	S3	1.002	S4	18.2	0.695	0.528	1.1191	
15 minute summer	S4	1.003	S5	30.4	1.032	0.821	0.4021	
180 minute winter	S5	1.004	AT1	21.6	1.355	0.131	1.2686	
180 minute winter	AT1	1.005	S7	5.4	0.200	0.074	0.8105	
180 minute winter	S7	Hydro-Brake®		5.4				
15 minute summer	S8	4.000	S9	13.1	0.988	0.816	0.2429	
15 minute summer	S9	4.001	S10	26.2	1.259	0.471	0.4087	
15 minute summer	S10	4.002	S5	38.7	1.935	0.467	0.2517	
15 minute summer	S11	2.000	S12	14.1	1.254	0.196	0.1769	
15 minute summer	S12	2.001	S13	28.2	1.730	0.259	0.2487	
180 minute winter	S13	2.002	AT1	13.0	1.378	0.149	0.6223	
180 minute winter	S16	3.000	S13	-4.6	0.679	-0.081	0.3158	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.57%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	12	25.343	0.643	19.2	0.1820	0.0000	FLOOD RISK
15 minute summer	S2	12	25.274	0.610	24.8	0.1726	0.0000	SURCHARGED
120 minute summer	S3	72	25.037	0.594	15.5	0.1680	0.0000	SURCHARGED
120 minute summer	S4	72	25.022	0.770	25.5	0.2178	0.0000	SURCHARGED
120 minute summer	S5	72	25.006	0.899	73.8	0.2544	0.0000	SURCHARGED
120 minute summer	AT1	72	24.966	1.266	110.5	137.2438	0.0000	FLOOD RISK
120 minute summer	S7	72	24.967	1.317	25.3	1.4890	0.0000	OK
15 minute summer	S8	11	25.314	0.364	24.2	0.1029	0.0000	FLOOD RISK
120 minute summer	S9	72	25.044	0.319	22.0	0.0902	0.0000	SURCHARGED
120 minute summer	S10	72	25.029	0.529	32.6	0.1496	0.0000	SURCHARGED
15 minute summer	S11	10	25.198	0.098	25.9	0.0276	0.0000	OK
15 minute summer	S12	10	24.909	0.109	51.6	0.0308	0.0000	OK
360 minute winter	S13	352	24.894	0.755	27.2	0.2138	0.0000	FLOOD RISK
360 minute winter	S16	352	24.895	0.615	31.9	135.6725	0.0000	FLOOD RISK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	S1	1.006	S2	17.3	0.986	1.243	0.1019	100.1
15 minute summer	S2	1.000	S3	22.8	1.298	1.585	0.3877	
120 minute summer	S3	1.002	S4	14.9	0.650	0.433	1.7121	
120 minute summer	S4	1.003	S5	23.8	0.938	0.642	0.5432	
120 minute summer	S5	1.004	AT1	73.3	1.725	0.446	1.3169	
120 minute summer	AT1	1.005	S7	-14.2	-0.201	-0.194	0.8105	
120 minute summer	S7	Hydro-Brake®		5.4				
15 minute summer	S8	4.000	S9	23.3	1.323	1.450	0.3221	
120 minute summer	S9	4.001	S10	22.0	1.286	0.395	0.7798	
120 minute summer	S10	4.002	S5	33.3	1.741	0.402	0.5002	
15 minute summer	S11	2.000	S12	25.8	1.450	0.358	0.2792	
15 minute summer	S12	2.001	S13	51.6	1.877	0.474	0.4314	
360 minute winter	S13	2.002	AT1	-19.0	1.359	-0.217	0.6223	
360 minute winter	S16	3.000	S13	-27.1	-0.680	-0.472	0.4616	

Node Name	S1	S2	S3	S4	S5	AT1	S7
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 19.000							
	Link Name	1.0	1.000	1.002	1.003	1.004	1.005
	Section Type	15	150mm	225mm	225mm	300mm	300mm
	Slope (1:X)	16	150.9	225.4	195.1	45.9	230.2
	Cover Level (m)	25.580	25.580	25.500	25.470	25.500	25.000
	Invert Level (m)	24.560	24.664	24.518	24.252	24.107	23.700
	Length (m)	5.7	22.025	43.049	13.658	18.701	11.51

Node Name	S8	S9	S10	S5
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 19.000				
Link Name	4.000	4.001	4.002	
Section Type	150mm	225mm	225m	
Slope (1:X)	122.0	87.1	39.6	
Cover Level (m)	25.550	25.520	25.500	25.500
Invert Level (m)	24.950	24.800	24.725	24.500
	24.800	24.725	24.500	24.182
Length (m)	18.295	19.607	12.57	

Node Name	S11	S12	S13	AT1
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 19.000				
	2.000	2.001	2.002	
	225mm	225mm	225mm	
	52.4	23.0	35.6	
	25.700	25.500	25.000	25.000
	25.100	24.800	24.139	23.700
	15.712	15.226	15.646	

Node Name	S16	S13
A4 drawing Hor Scale 1500 Ver Scale 100 Datum (m) 19.000		
Link Name	3.000	
Section Type	225m	
Slope (1:X)	82.3	
Cover Level (m)	25.000	25.000
Invert Level (m)	24.280 24.139	
Length (m)	11.60	

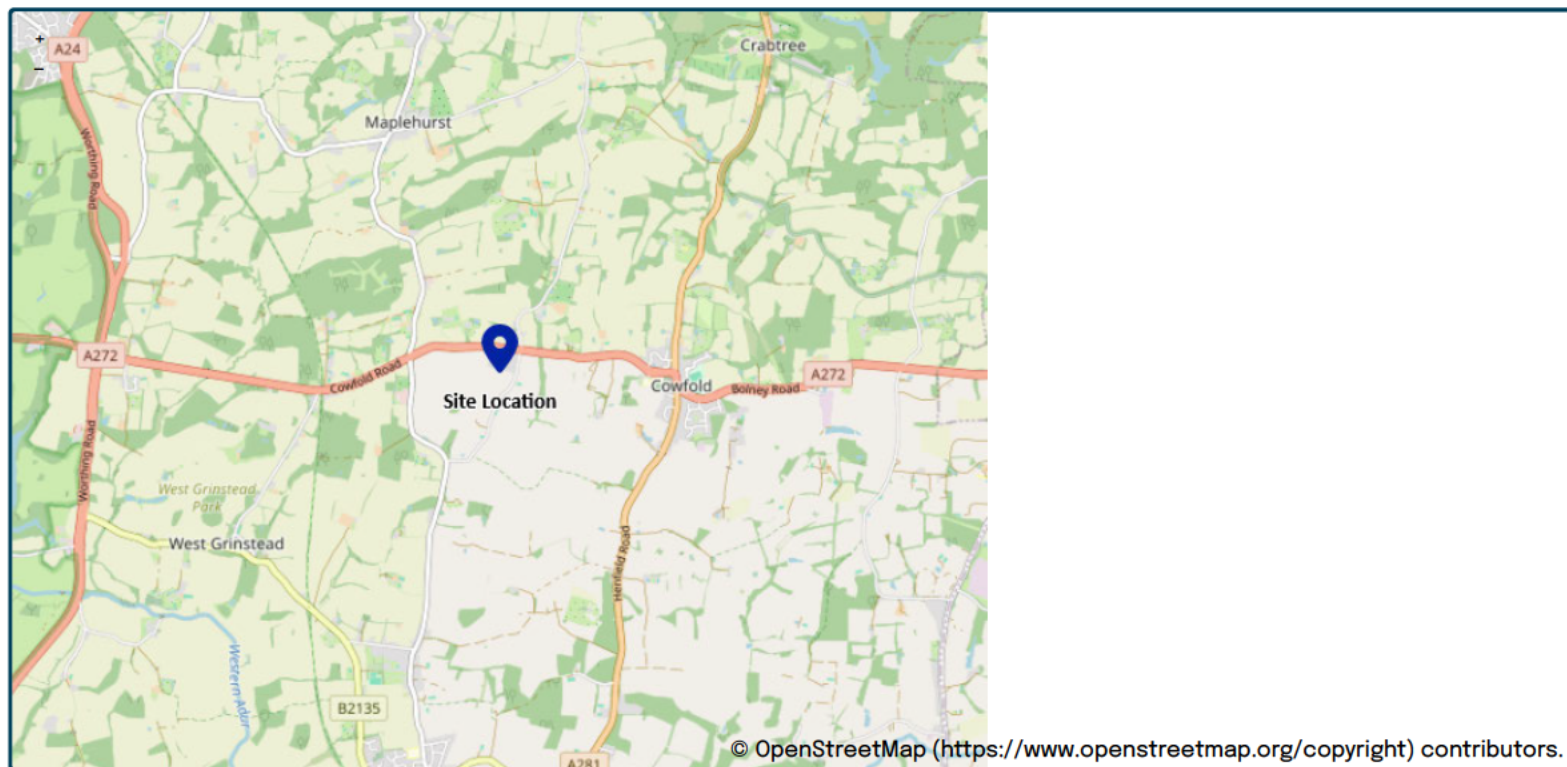
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015).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

Project details

Date	05/03/2026
Calculated by	
Reference	
Model version	2.2.3

Location

Site name	Clock house Farm
Site location	Horsham



Site easting (British National Grid)	519876
Site northing (British National Grid)	122450

Site details

Total site area (ha)	0.6481	ha
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OK, I AGREE

MORE INFO

Greenfield runoff

Method

Method

FEH statistical (2025)

FEH statistical (2025)

	My value		Map value
SAAR9120 (mm)	815		mm
BFIHOST19scaled	0.252		
QMed-QBar conversion	1.136	☐	1.136
QMed (l/s)	4.7	l/s	
QBar (FEH statistical 2025) (l/s)	5.4	l/s	

Growth curve factors

	My value		Map value
Hydrological region	7	☐	7
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

Method	FEH statistical (2025)
Flow rate 1 year (l/s)	4.6 l/s
Flow rate 2 year (l/s)	4.7 l/s
Flow rate 10 years (l/s)	8.7 l/s
Flow rate 30 years (l/s)	12.4 l/s
Flow rate 100 years (l/s)	17.2 l/s
Flow rate 200 years (l/s)	20.2 l/s

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

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is on a "no warranty, as is" basis. It is the responsibility of the user to ensure that the data entered into the tool is accurate and that the results are used in accordance with the terms and conditions of use, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). No results from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

OK, I AGREE

MORE INFO

7.4 **Appendix D – Groundwater well install and soakaway test report**

3 February 2026

Our ref: NN3006R01

Chris Slade
chris@cgscivils.co.uk

Attention: Mr Slade

Dear Sir,

DRAINAGE GROUND INVESTIGATION - GROUND WATER MONITORING INSTALLATIONS AND INFILTRATION TESTING, CLOCK HOUSE FARM, HORSHAM

This letter presents a summary of ground water well installation and infiltration testing undertaken by E3S Consulting Ltd (E3S) on behalf of CGS Civils Ltd (The Client) in relation to a proposed residential development at the above site.

Fieldwork was undertaken in December 2025 (groundwater monitoring well installation) and January 2026 (BRE365 testing). The site works consisted of the advancement of 3 No. groundwater well installations (BH01, BH02 and BH03) advanced to a depth of 4.00m below ground level (mbgl). A total of 4 No. trial pits were also excavated across the site for infiltration testing in line with BRE365 methodology (TP01, TP02 TP03 and TP04). An exploratory hole location plan is included as **Figure 1** of this report. Photographs of the trial pits are presented as **Figure 2** of this report.

The exploratory hole locations were set out based on site access and discussions with the client. The exploratory holes were logged by a Geo-Environmental Consultant from E3S. The logs are presented within **Appendix A** of this letter.

The boreholes were advanced using an Archway competitor tracked windowless sampling rig. Groundwater well installations were installed to 4.00mbgl within each borehole, holes were diamond cored from surface where concrete cover was present. The trial pits were excavated utilising a 3-tonne tracked excavator (with breaker attachment for advancement through concrete cover). The trial pits were filled with water from a 4x4 mounted bowser with rapid discharge valve and monitored over a 24 hour period. None of the trail pits emptied over the 24 hour period with only a small measurable drop in water levels recorded. A summary of the exploratory holes and testing results is presented within Table 1 below;

Table 1 - Exploratory Hole and Testing/ Installation Summary

Exploratory Hole ID	Termination depth (mbgl)	Testing Summary/ Installation Information
BH01	4.00mbgl	Groundwater well, 1m plain pipe with bentonite, 3m slotted pipe with gravel, dry on completion.
BH02	4.00mbgl	Groundwater well, 1m plain pipe with bentonite, 3m slotted pipe with gravel, dry on completion.
BH03	4.00mbgl	Groundwater well, 1m plain pipe with bentonite, 3m slotted pipe with gravel, dry on completion.
TP01	0.60mbgl	Water filled to 0.30mbgl, dropped 20mm over 24 hours. Testing abandoned.
TP02	1.50mbgl	Water filled to 0.44mbgl, dropped 10mm over 24 hours. Testing abandoned.
TP03	0.60mbgl	Water filled to 0.23mbgl, dropped 10mm over 24 hours. Testing abandoned.
TP04	1.50mbgl	Water filled to 0.47mbgl, dropped 30mm over 24 hours. Testing abandoned.

Whilst the monitoring wells were dry on completion, further monitoring is being undertaken by the client and will be reported separately. It is important to highlight that groundwater levels can fluctuate for a number of reasons including seasonal variations.

We trust that the site works undertaken, and summary letter meet your current requirements. Should you have any immediate comments of queries please do not hesitate to contact the undersigned.

Kind Regards,

For and on behalf of E3S Consulting Ltd,

Chris Barron BSc (Hons) MEnvSc CGeol FGS

Attachments;

Figure 1 – Site & Investigation Location Plan (1 page)

Figure 2 – Trial Pit photographs (1 page)

Appendix A – Exploratory Hole Logs (7 Pages)

TP01



TP02



TP03



TP04



Drawn	CB		Client: CGS CIVILS LTD		
Approved	CB		Project: DRAINAGE GROUND INVESTIGATION, CLOCK HOUSE FARM, HORSHAM		
Date	03/02/2026		Title: TRIAL PIT PHOTOGRAPHS		
Scale	NTS		Project no:	NN3006	Figure no: FIGURE 2
Original	A3		Rev: 1		

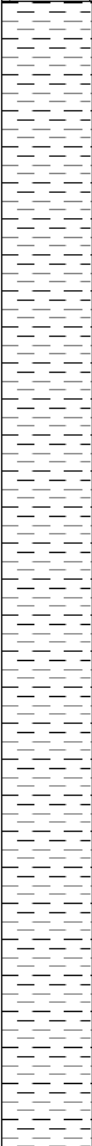
APPENDIX A

Exploratory Hole Log



BOREHOLE LOG

Project Name: DRAINAGE GROUND INVESTIGATION		Client: CGS CIVILS LTD		Date: 16/12/2025	
Location: CLOCK HOUSE FARM, HORSHAM		Contractor:			
Project No. : NN3006		Crew Name: JO/CB		Drilling Equipment: Archway Competitor	
Borehole Number BH01	Hole Type WLS	Level	Logged By CB	Scale 1:25	Page Number Sheet 1 of 1

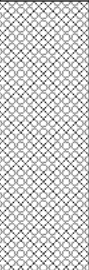
Well Ⓜ	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20			CONCRETE.	
								Light brown mottled blue grey slightly silty CLAY.	
					4.00			End of Borehole at 4.000m	

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks Dry on completion	
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BOREHOLE LOG

Project Name: DRAINAGE GROUND INVESTIGATION		Client: CGS CIVILS LTD		Date: 16/12/2025	
Location: CLOCK HOUSE FARM, HORSHAM		Contractor:			
Project No. : NN3006		Crew Name: JO/CB		Drilling Equipment: Archway Competitor	
Borehole Number BH02	Hole Type WLS	Level	Logged By CB	Scale 1:25	Page Number Sheet 1 of 1

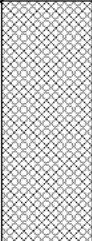
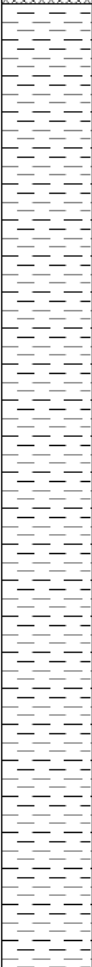
Well Ⓢ	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.90			MADE GROUND Grey brown clay with fragments of brick concrete and road plainings.	
								Light brown mottled blue grey slightly silty CLAY.	1
									2
									3
					4.00			End of Borehole at 4.000m	4
									5

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks Dry on completion										
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BOREHOLE LOG

Project Name: DRAINAGE GROUND INVESTIGATION		Client: CGS CIVILS LTD		Date: 16/12/2025	
Location: CLOCK HOUSE FARM, HORSHAM		Contractor:			
Project No. : NN3006		Crew Name: JO/CB		Drilling Equipment: Archway Competitor	
Borehole Number BH03	Hole Type WLS	Level	Logged By CB	Scale 1:25	Page Number Sheet 1 of 1

Well Ⓜ	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.80			MADE GROUND grey to red brown clay with fragments of concrete and brick.	
								Light brown mottled blue grey slightly silty CLAY.	1
									2
									3
					4.00			End of Borehole at 4.000m	4
									5

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks Dry on completion										
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TRIAL PIT LOG

Project Name: DRAINAGE GROUND INVESTIGATION		Client: CGS CIVILS LTD		Date: 28/01/2026	
Location: CLOCK HOUSE FARM, HORSHAM		Contractor:			
Project No. : NN3006		Crew Name: JO		Equipment: 3tn Tracked Excavator	
Location Number TP01	Location Type TP	Level	Logged By CB	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10			CONCRETE.	
					0.25			MADE GROUND Grey to red brown clay with fragments of brick and concrete.	
								Light brown mottled blue grey slightly silty CLAY.	
					0.60			End of Borehole at 0.600m	
									1
									2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

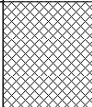
Remarks





TRIAL PIT LOG

Project Name: DRAINAGE GROUND INVESTIGATION		Client: CGS CIVILS LTD		Date: 28/01/2026	
Location: CLOCK HOUSE FARM, HORSHAM		Contractor:			
Project No. : NN3006		Crew Name: JO		Equipment: 3tn Tracked Excavator	
Location Number TP02	Location Type TP	Level	Logged By CB	Scale 1:25	Page Number Sheet 1 of 1

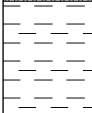
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.35			MADE GROUND Grey to red brown clay with fragments of brick and concrete.	
								Light brown mottled blue grey slightly silty CLAY.	1
					1.50			End of Borehole at 1.500m	2
									3
									4
									5

Dimensions		Trench Support and Comment				Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks		Date	Rate	Remarks

Remarks	
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TRIAL PIT LOG

Project Name: DRAINAGE GROUND INVESTIGATION		Client: CGS CIVILS LTD		Date: 28/01/2026	
Location: CLOCK HOUSE FARM, HORSHAM		Contractor:			
Project No. : NN3006		Crew Name: JO		Equipment: 3tn Tracked Excavator	
Location Number TP03	Location Type TP	Level	Logged By CB	Scale 1:25	Page Number Sheet 1 of 1

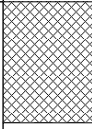
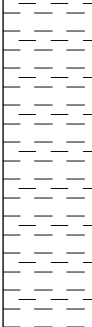
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20			MADE GROUND dark grey brown clay with concrete fragments.	
								Light brown mottled blue grey slightly silty CLAY.	
					0.60			End of Borehole at 0.600m	
									1
									2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks	
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TRIAL PIT LOG

Project Name: DRAINAGE GROUND INVESTIGATION		Client: CGS CIVILS LTD		Date: 28/01/2026	
Location: CLOCK HOUSE FARM, HORSHAM		Contractor:			
Project No. : NN3006		Crew Name: JO		Equipment: 3tn Tracked Excavator	
Location Number TP04	Location Type TP	Level	Logged By CB	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.40			MADE GROUND dark grey brown clay with concrete fragments.	
								Light brown mottled blue grey slightly silty CLAY.	1
					1.50			End of Borehole at 1.500m	2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks