

Foul and Surface Water Drainage Report

Bridgers Farm, Hurstpierpoint

Planning Ref: DM/22/3064

For

John Langran

Rev - P

Reference **C3270**

Date **25th September 2024**

Revision	Date of Issue	Comments	Prepared By	Checked By
P	25/09/2024	Initial Issue	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 Bridgers Farm, Hurstpierpoint.
- 1.1.2 The purpose of this drainage strategy is to demonstrate how the development area can be satisfactorily drained without increasing flood risk onsite and elsewhere in order to clear Condition 4. The condition has been in place on the Decision Notice from **14th June 2024**, with the planning reference: **DM/24/0319**. The condition requires the following to be included:
- 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.
- 1.1.3 The proposed development will consist of the change of use of existing buildings and the construction of new replacement buildings to form flexible commercial use. The proposed development is located as OS Grid Reference TQ 27377 18429 and has the post code BN6 9HA.

Fig 1. Site Location



2 Executive Summary:

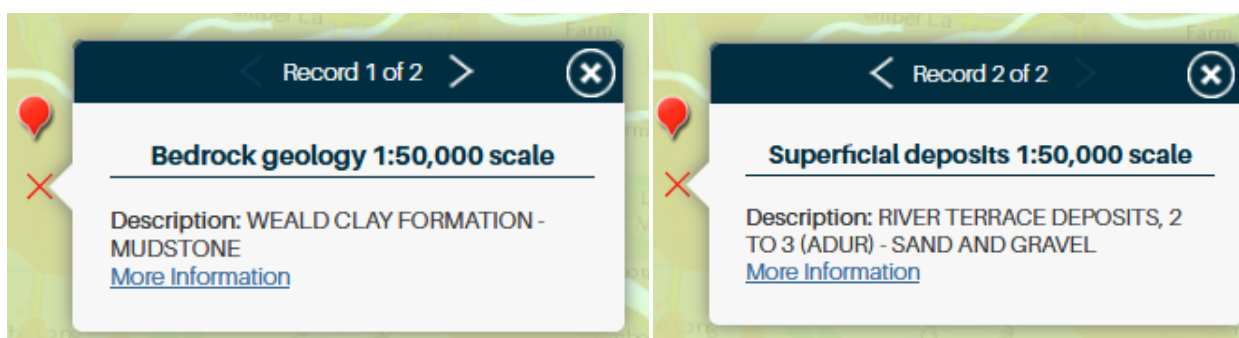
- 2.1.1 The Surface Water will discharge to an existing culverted watercourse at a restricted rate of 2.0l/s. All hard paved areas are to discharge freely to ground via infiltration. The proposed discharge is subject to Ordinary Watercourse Consent with Mid Sussex District Council.
- 2.1.2 The Foul water is to be treated on site via a new package treatment plant. All treated effluent runoff is to be discharged into the existing culverted 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. The BGS website confirms the superficial deposits on site to be made up of River Terrace Deposits, which are comprised of Sand and Gravel.

Fig 2. British Geological Survey



3.2 Geological Assessment

- 3.2.1 On-site ground investigations have not been carried out, however, based upon the British Geological survey information, it is indicated that the use of conventional soakaways is not viable.
- 3.2.2 The LandIS website provides soil information, and it is confirmed that the drainage characteristics of the soils on site is 'Impeded'. Therefore, it is confirmed that the use of conventional soakaways is not viable, however, the use of permeable paving is. Shallow onsite infiltration tests should be carried out to confirm the infiltration rate of soils at a shallow level.

Fig 3. LandIS

Soilscape 18:

Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils

Texture:

Loamy and clayey

Coverage:

England: 19.9%, Wales: 2.4%, England & Wales: 17.5%

Drainage:

Impeded drainage



4 Existing Drainage

- 4.1.1 It is not currently known how the existing site discharges surface water runoff. However, there are reports of an existing culverted watercourse that runs parallel to the site. It is presumed that runoff discharges to this watercourse.

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	
Discharge to Ground	No – Desktop Study indicates that the use of infiltration is not viable.
Discharge to Watercourse	Yes – Reports of existing culverted watercourse. Presence to be confirmed. Should existing culvert not be present there is an existing watercourse on the opposite side of Langton Lane. Discharge to be restricted to 2.0l/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 Cv	0.75
CV Winter and Summer	1
Additional Storage (m ³ / ha)	0.0
Flow Control	1.226m Head @ 2l/s discharge
Attenuation Tank Design	Base Coefficient (m/hr): 0.00000
	Side Coefficient (m/hr): 0.00000
	Factor of Safety: 2
	Porosity: 95%

5.3 Surface Water Drainage

- 5.3.1 Based upon the information gathered from the British Geological Survey website, it is deemed that discharge to ground via infiltration using conventional soakaways is not viable. It is therefore proposed that all surface water runoff is to be discharged to the existing culverted watercourse at a restricted rate of 2.0l/s. Greenfield runoff calculations were carried out and confirmed that the site's Q_{BAR} is 1.18l/s. It is proposed that the discharge rate is restricted to a minimum practical rate of 2.0l/s. This discharge rate does provide betterment within the 1:30, 1:100 and 1:200-year storm periods (Appendix D)

Storm Period	Greenfield Runoff (l/s)	Proposed Discharge Rate (l/s)	Difference (l/s)
Q_{BAR}	1.18	2	+ 0.82
1 in 1	1	2	+ 1
1 in 30	2.71	2	- 0.71
1 in 100	3.75	2	- 1.75
1 in 200	4.4	2	- 2.4

- 5.3.2 It is proposed that all runoff from hard paved areas are to freely drain to ground through the use of permeable paving. Any exceedance will be captured by the proposed drainage network.
- 5.3.3 The existing culverted watercourse is to be investigated in order to confirm the depth/location to ensure a connection is viable. An existing watercourse is noted to be on the opposing side of Langton Lane which can be utilised for a connection if the culvert is deemed to not be suitable.
- 5.3.4 Hydraulic calculations have been carried out which can be found at Appendix C.

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
 - Individual Property driveways and residential car parks
 - Low traffic roads
- 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 Suspended Solids	Metals	Hydrocarbons
Residential Roof	Ground Water	Very Low	0.2	0.2	0.05
Individual driveways, residential car parks and low traffic roads	Ground water	Low	0.5	0.4	0.4

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 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 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
Individual driveways, residential car parks and low traffic roads	Ground water	Table 26.4 (for ground waters)	Permeable Paving	0.7	0.6	0.7

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

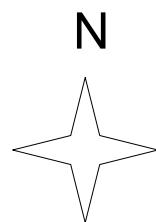
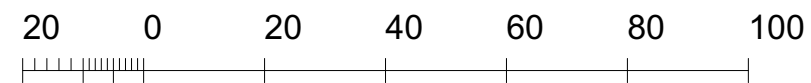
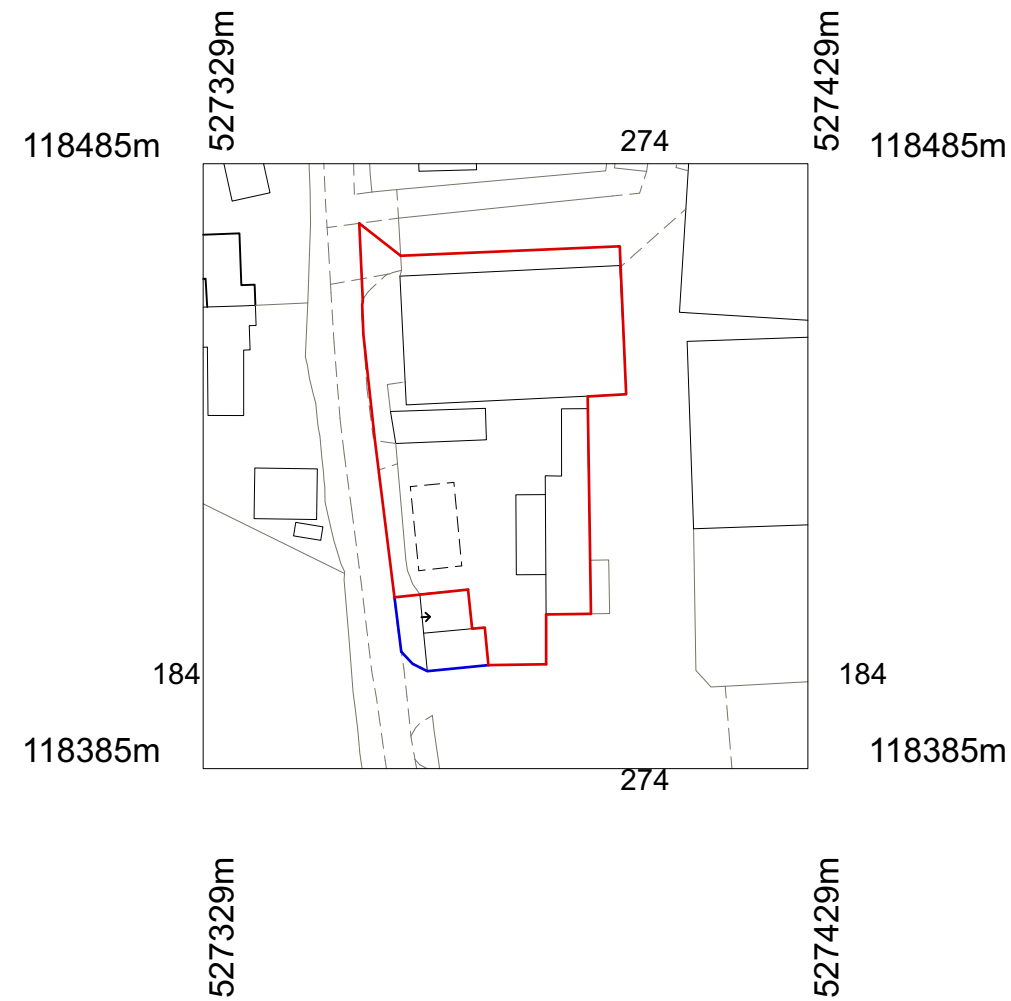
- 5.5.1 The foul water on site is to be treated via a new package treatment plant. All treated effluent runoff is to then be discharged into the culverted watercourse alongside the surface water runoff.
- 5.5.2 The proposed discharge will be less than 5m³ a day, and therefore, Environment Agency approval is not required.

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 change of use of existing commercial buildings and the construction of new replacement buildings to form flexible commercial use.
- 6.1.2 The Surface Water will discharge to an existing culverted watercourse at a restricted rate of 2.0l/s. All hard paved areas are to discharge freely to ground via infiltration. The proposed discharge is subject to Ordinary Watercourse Consent with Mid Sussex District Council.
- 6.1.3 The Foul water is to be treated on site via a new package treatment plant. All treated effluent runoff is to be discharged into the existing culverted 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



Licence No. OI 1421331
Scale 1:1250

		Paul Maggs MCIAT Hazelwood, Harbolets Road, West Chilmington RH20 2LG Tel: 01798 813298 paul@pbproperties.co.uk www.pbproperties.co.uk	Client: Harris Site Address: Bridgers Farm Langton Lane Hurstpierpoint BN6 9HA	Project Name: Agricultural Barn Conversion to Office/Storage Use Date: 11/09/2020	Scales: 1:1250 Plan No. D 0920/503/01 A Drawings produced using Vectorworks CAD. Only written dimensions to be respected. Copyright protected to PB Properties
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FOUL RUNS

KLARGESTER

LANGTON
LANE

CONNECTION
TO EXISTING
DRAINAGE

NOTE: DESIGN INTENT ONLY. NOT TO BE USED AS CONSTRUCTION DRAWINGS. ALL DIMENSIONS TO BE CHECKED ON SITE PRIOR TO CONSTRUCTION.

FOUL DRAINAGE
RUNS

PIPE DIAMETERS: 110mm

NOTE: FOUL EFFLUENT TO BE TREATED BY KLARGESTER, ONCE TREATED CLEAN WATER IS FIT TO GO INTO MAIN DRAINAGE. KLARGESTER SYSTEM WILL BE COMPLETELY EMPTIED BY LORRY TANKER ANNUALLY. DRAINAGE RATES TO COMPLY WITH DRAINAGE AND WASTE DISPOSAL: APPROVED DOCUMENT H. Building regulation in England for surface water drainage and disposal. 100mm Drainage pipes to have a minimum fall of 1:80 allowing for the maximum discharge capacity of approximately 7 litres of water per second. Gradients on impervious surfaces should be designed to permit the water to drain quickly from the surface. A gradient of at least 1 in 60 is. The gradient across any paths should not exceed 1 in 40. SITE LOCATED OUTSIDE OF ANY FLOOD RISK ZONES

Klargester tank outside diameter is 2.7m. The Capacity is a 12 full time staff unit capable of handling approximately 1,100 litres per day.

PRELIMINARY ISSUE

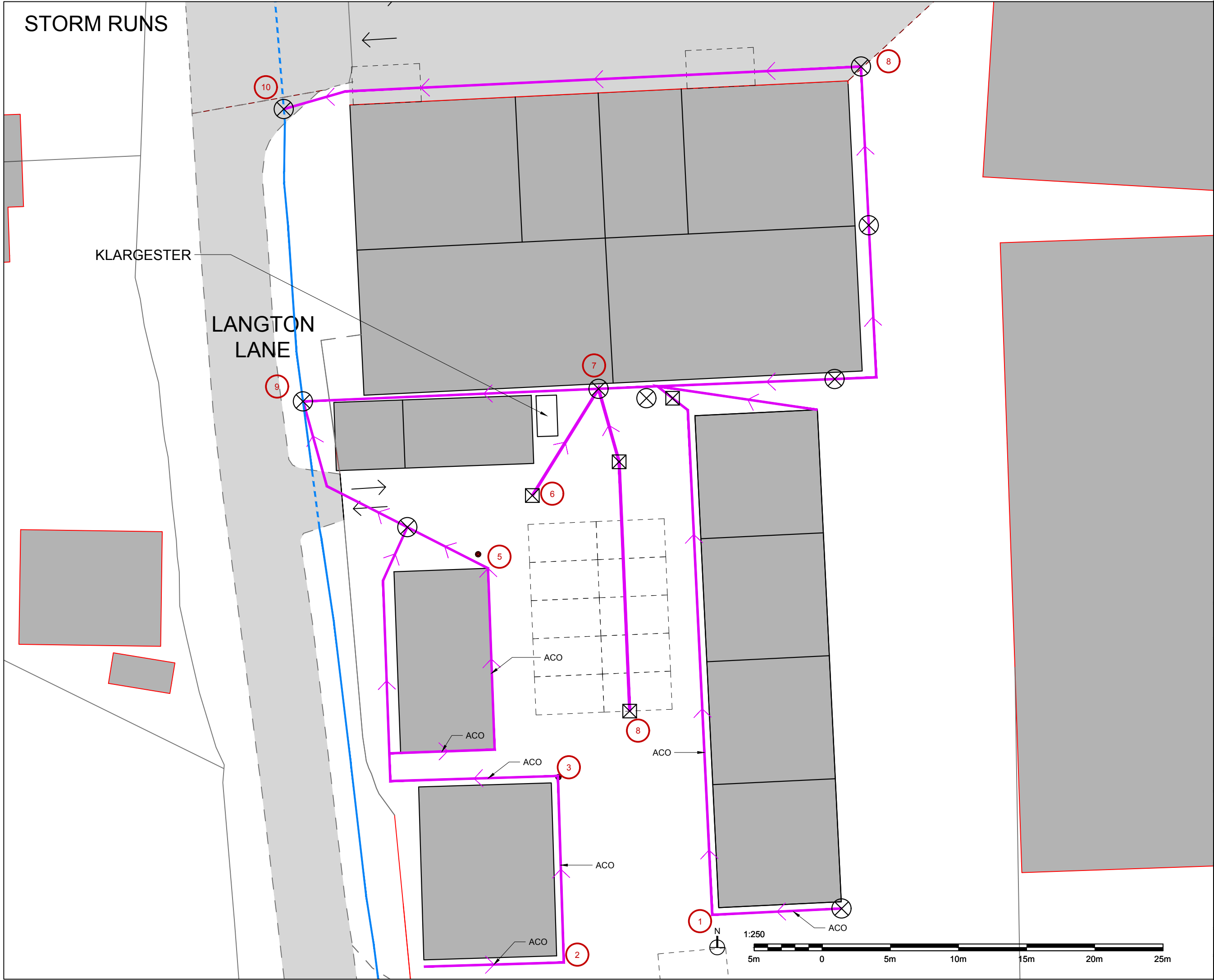
REVISIONS

DATE (DD / MM / YY)	REVISION	DESCRIPTION / COMMENT
25/03/22	/	PRELIMINARY ISSUE
01/02/24	A	PRELIMINARY ISSUE
29/04/24	B	INFORMATION ISSUE
29/05/24	C	INFORMATION ISSUE
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006
BRIDGERS FARM
FOUL RUNS
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STORM RUNS



NOTE: DESIGN INTENT ONLY. NOT TO BE USED AS CONSTRUCTION DRAWINGS. ALL DIMENSIONS TO BE CHECKED ON SITE PRIOR TO CONSTRUCTION.

- ACO DRAINS
- EXISTING STORM DRAIN
- SURFACE WATER DRAINAGE RUNS
- PIPE DIAMETERS: 110mm
- STORM GULLY
- INSPECTION CHAMBER

NOTE: DRAINAGE RATES TO COMPLY WITH DRAINAGE AND WASTE DISPOSAL: APPROVED DOCUMENT H. Building regulation in England for surface water drainage and disposal.
100mm Drainage pipes to have a minimum fall of 1:80 allowing for the maximum discharge capacity of approximately 7 litres of water per second.
Gradients on impervious surfaces should to be designed to permit the water to drain quickly from the surface. A gradient of at least 1 in 60 is. The gradient across any paths should not exceed 1 in 40.
SITE LOCATED OUTSIDE OF ANY FLOOD RISK ZONES

- Invert levels:
- 1. Second highest reading at 1235mm
 - 2. Highest point on the site at 1135mm
 - 3. Aco inlet 1250mm
 - 4. Gully 1435mm
 - 5. Aco inlet 1520mm
 - 6. Gully 1640mm
 - 7. Aco inlet 1680mm
 - 8. Aco inlet 1840mm
 - 9. Intersection with storm run 1785mm
 - 10. Intersection with storm run 1920mm
- 785mm fall from the top of site to lowest intersection with the existing storm run.
- Measurements taken at surface level to give falls. Inverts to Acos are -100mm and gullies / intersections -500mm.

INFORMATION ISSUE

REVISIONS		
DATE (DD/MM/YY)	REVISION	DESCRIPTION / COMMENT
01/02/24	/	PRELIMINARY ISSUE
29/04/24	A	INFORMATION ISSUE
29/05/24	B	INFORMATION ISSUE
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006
BRIDGERS FARM

SURFACE WATER DRAINAGE PLAN
STORM RUNS

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7.2 **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.
 - ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
 - THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECT AND ENGINEERING DETAILS, DRAWINGS AND SPECIFICATIONS.
 - ANY DISCREPANCIES SHOULD BE REPORTED TO THE ARCHITECT AND/OR ENGINEER IMMEDIATELY, SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO THE COMMENCEMENT OF WORK.
 - BEFORE COMMENCING CONSTRUCTION THE CONTRACTOR MUST CHECK THE INVERT LEVELS OF EXISTING SEWERS TO WHICH CONNECTIONS ARE MADE. IN ADDITION THE CONTRACTOR MUST LOCATE AND DETERMINE INVERT LEVELS OF THE EXISTING SPURS TO WHICH CONNECTIONS ARE PROPOSED. ANY DISCREPANCIES ARE TO BE NOTIFIED TO THE ENGINEER IMMEDIATELY, PRIOR TO CONSTRUCTION.
 - ALL DRAINAGE WORKS SHOULD COMMENCE AT THE PROPOSED DOWNSTREAM CONNECTION POINT. THE WORKS CONTINUING UPSTREAM FOLLOWING CONFIRMATION OF THE TIE-IN INVERT LEVELS TO THE ENGINEER. CONNECTIONS TO MANHOLES OR LARGER SIZED PIPES ETC. SHOULD BE SOFFIT TO SOFFIT UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER. IF THIS IS NOT POSSIBLE INFORM THE ENGINEER IMMEDIATELY.
 - 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 295 AND BS65 (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 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.
 - THE CONTRACTOR IS TO KEEP A RECORD OF ANY VARIATIONS MADE ON SITE, INCLUDING THE RELOCATION OF SEWERS OR DRAINS, SO THAT AN AS CONSTRUCTED DRAWING CAN BE PREPARED UPON COMPLETION OF THE PROJECT.
 - STUB CONNECTIONS TO ADOPTABLE MANHOLES SHALL BE MADE FROM VITRIFIED CLAY AND CONSIST OF TWO ROCKER PIPES LAID AT THE SAME GRADIENT AS THE UP OR DOWNSTREAM PIPE.
 - IF ANY SUB SOIL DRAINAGE SYSTEMS ARE UNCOVERED DURING THE WORKS CONTACT THE ENGINEER FOR INSTRUCTIONS. SUB SOIL DRAINS ARE TO BE DIVERTED AROUND NEW WORKS AND CONNECTED INTO THE SURFACE WATER.
 - NO PRIVATE AREAS ARE TO DRAIN ONTO ADOPTABLE AREAS AND VICE VERSA.
 - ALL EXISTING MANHOLE COVERS, GULLIES, ETC. ARE TO BE RAISED/LOWERED TO SUIT NEW LEVELS.
 - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM THE LOCATION AND DEPTH OF ALL EXISTING SERVICES AND UTILITIES THAT MAY BE PRESENT
 - UPON COMPLETION BUT PRIOR TO HANDOVER, CONTRACTOR TO CARRY OUT FULL CCTV SURVEY OF DRAINAGE SYSTEM WHICH IS TO BE REVIEWED BY ENGINEER TO ENSURE SATISFACTORY INSTALLATION
 - MANHOLE AND CHAMBER COVER GRADES:

- 'A15' IN ALL LANDSCAPED AREAS AND ON FOOTPATHS
- 'B125' IN ALL DRIVEWAYS
- 'C250' IN PRIVATE PARKING AREAS
- 'D400' IN CARRIAGEWAY/ACCESS ROAD

DRAINAGE LEGEND

EXISTING FEATURES

- Ex SWD Existing culverted watercourse

PROPOSED FEATURES

- Pipe crossing (thickening denotes pipe above)
- Foul Drainage
- Surface Water Drainage
- ACO Channel drain
- Rainwater pipe
- Storm water inspection chamber
- Storm water catchpit
- Soil stack (type TBC by architect/m&e engineer)
- Foul water inspection chamber (4500)
- Pipe info - diameter, length, gradient, bedding type
- Proposed surface level

ABBREVIATIONS

- MH - MANHOLE
- IC - INSPECTION CHAMBER
- AC - ACCESS CHAMBER
- CP - CATCHPIT
- BC - BRAKE CHAMBER
- RE - RODDING EYE
- IL - INVERT LEVEL
- SL - SUMP LEVEL
- RA - RESTRICTED ACCESS COVER
- CL - COVER LEVEL
- TL - TOP OF CELLULAR SA
- BL - BASE OF CELLULAR SA
- FL - FORMATION LEVEL

Prefixed 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

P-	25.09.24	PRELIMINARY ISSUE	LH	CS	CS
REV	DATE	DESCRIPTION	BY	CHK	APP

Consulting Civil Engineers							
CLIENT	JOHN LANGRAN						
ARCHITECT	-						
JOB TITLE	BRIDGERS FARM, HURSTPIERPOINT BN6 9HA						
DRAWING TITLE	DRAINAGE LAYOUT						
DRAWN	LH	ENGINEER	TZ	CHECKED	CS	APPROVED	CS
DATE	SEPTEMBER 2024		SCALE @ A1	1:100			
JOB NO.	C3270	STATUS	P	DRAWING No.	101	REV.	P-

PRELIMINARY

Site Specific Notes

- The proposed scheme consists of the change of use of existing buildings and the construction of replacement buildings for form flexible commercial use.
- The British Geological survey confirms the bedrock geology to be made up of Weald Clay Formation and the superficial deposits to be made up of River Terrace Deposits.
- The SoilScape information from the LandIS website confirms the soils to have impeded drainage.
- It is proposed that all surface water runoff from roof areas are to be discharged into an existing culverted watercourse at a restricted rate of 2.0l/s. Hard paved areas are to be constructed from a permeable pavement to allow them to freely discharge to ground via infiltration.
- The foul water is to be treated on site. All treated effluent is to then be discharged into the existing watercourse alongside the surface water.
- Ordinary Watercourse Consent is required from WSCC in order to discharge surface and foul water runoff.
- Further investigations are required to confirm the precense and depth of the existing culvert. Should a connection not be viable, then the existing watercourse located on the opposite side of Langton Lane is to be utilised.

DESIGN SUBJECT TO THE APPROVAL OF:
PLANNING AUTHORITY
BUILDING CONTROL

DESIGN SUBJECT TO THE CONFIRMATION OF:
EXTERNAL LEVELS DESIGN
ORDINARY WATERCOURSE APPROVAL
LOCATION AND DEPTH OF EXISTING UTILITIES
RWP + SVP POSITIONS ASSUMED - TBC

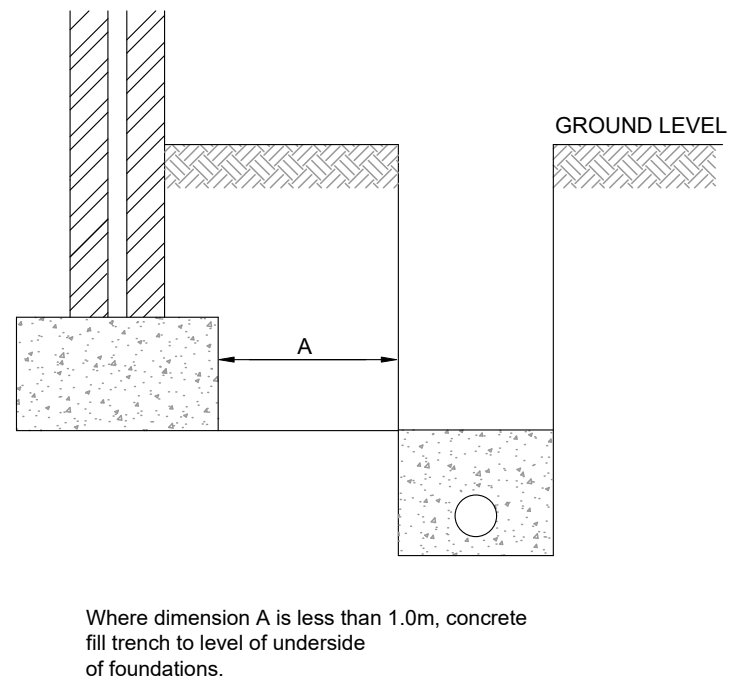


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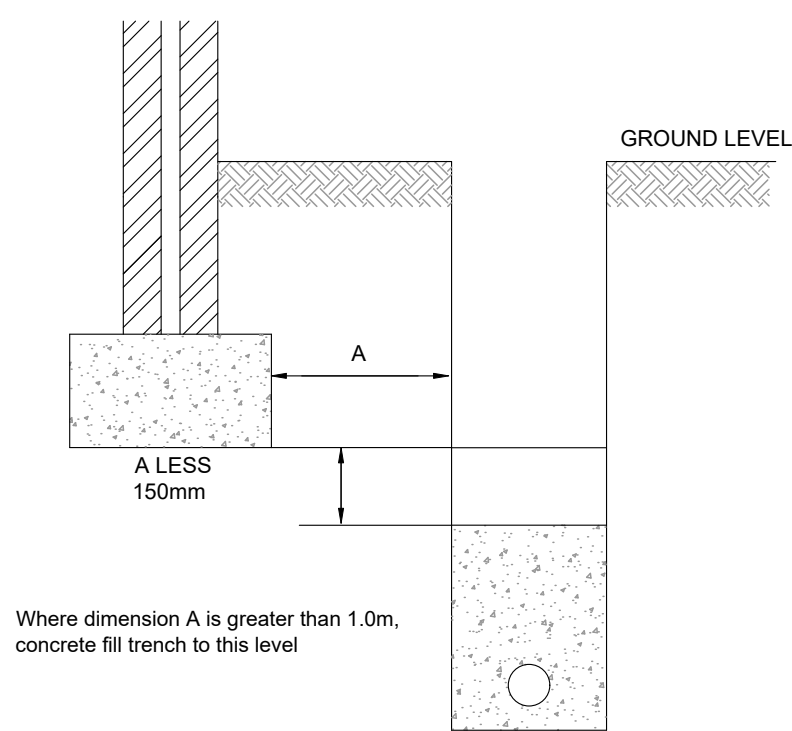
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CLIENT JOHN LANGRAN					
ARCHITECT -					
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PRELIMINARY



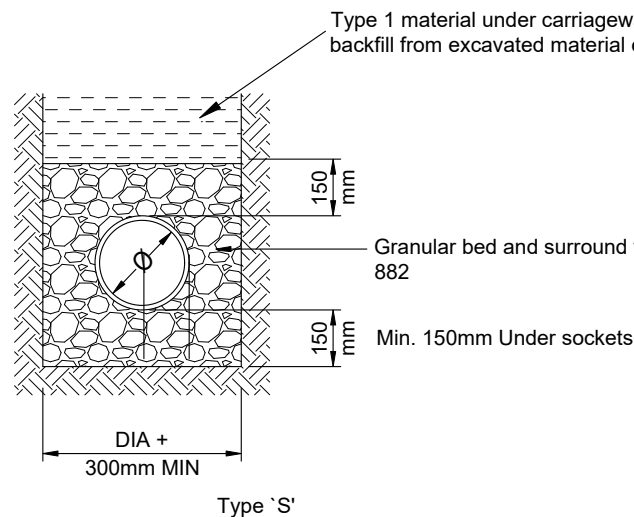
Where dimension A is less than 1.0m, concrete fill trench to level of underside of foundations.

Pipes near buildings



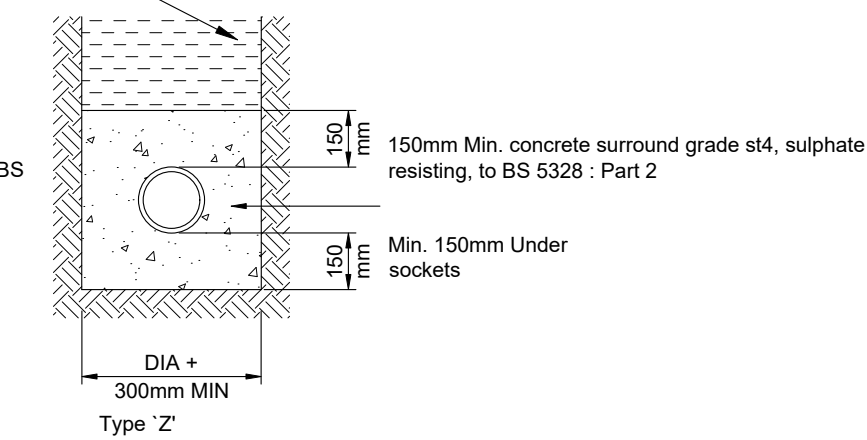
Where dimension A is greater than 1.0m, concrete fill trench to this level

Pipes near buildings

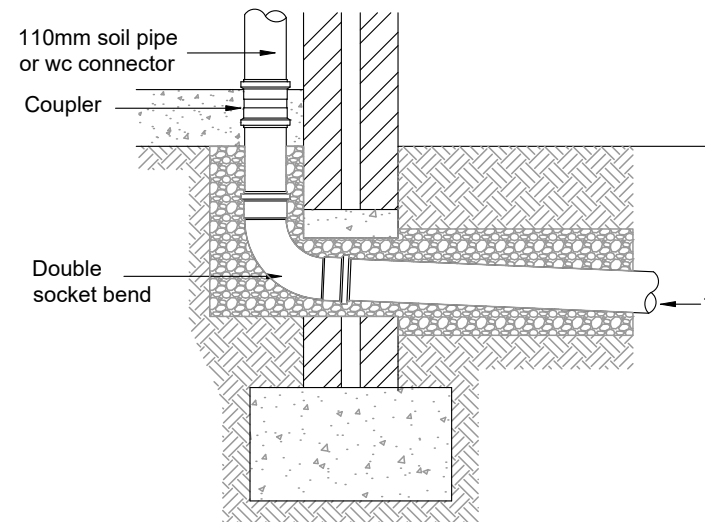


Drainage with more than 600mm cover - Landscaped 900mm cover - Roads (Unless bedding type is stated on the drainage plans or specification)

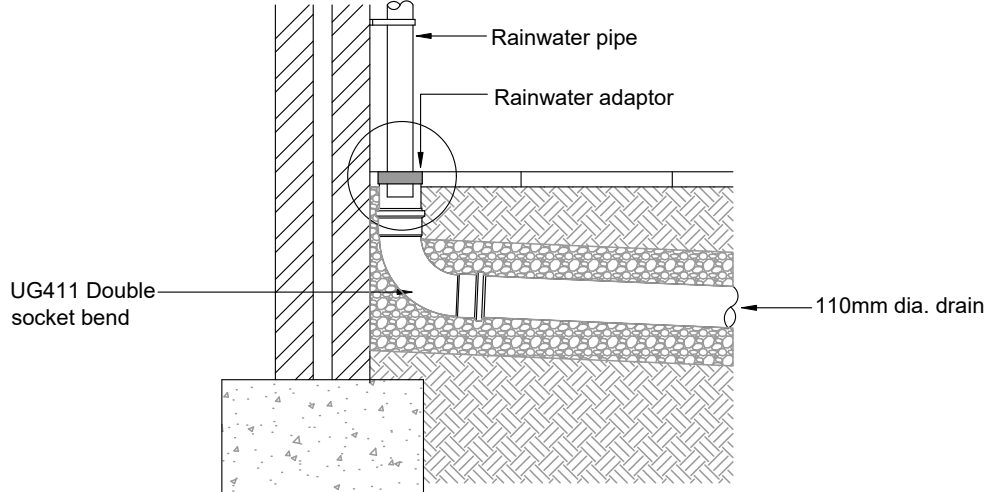
Pipe bedding details in private Areas



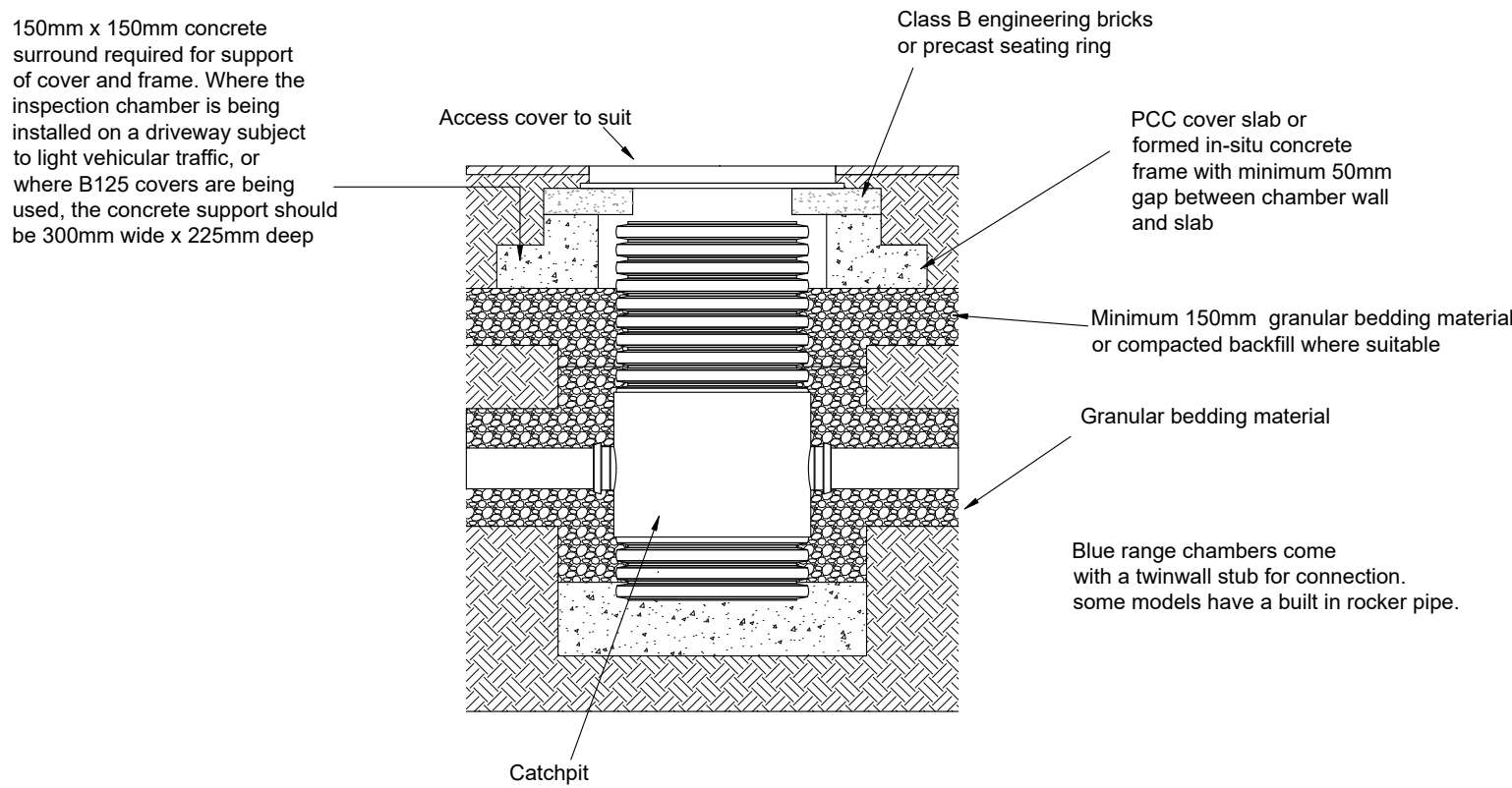
Drainage with less than 600mm cover - Landscaped 900mm cover - Roads (Unless bedding type is stated on the drainage plans or specification)



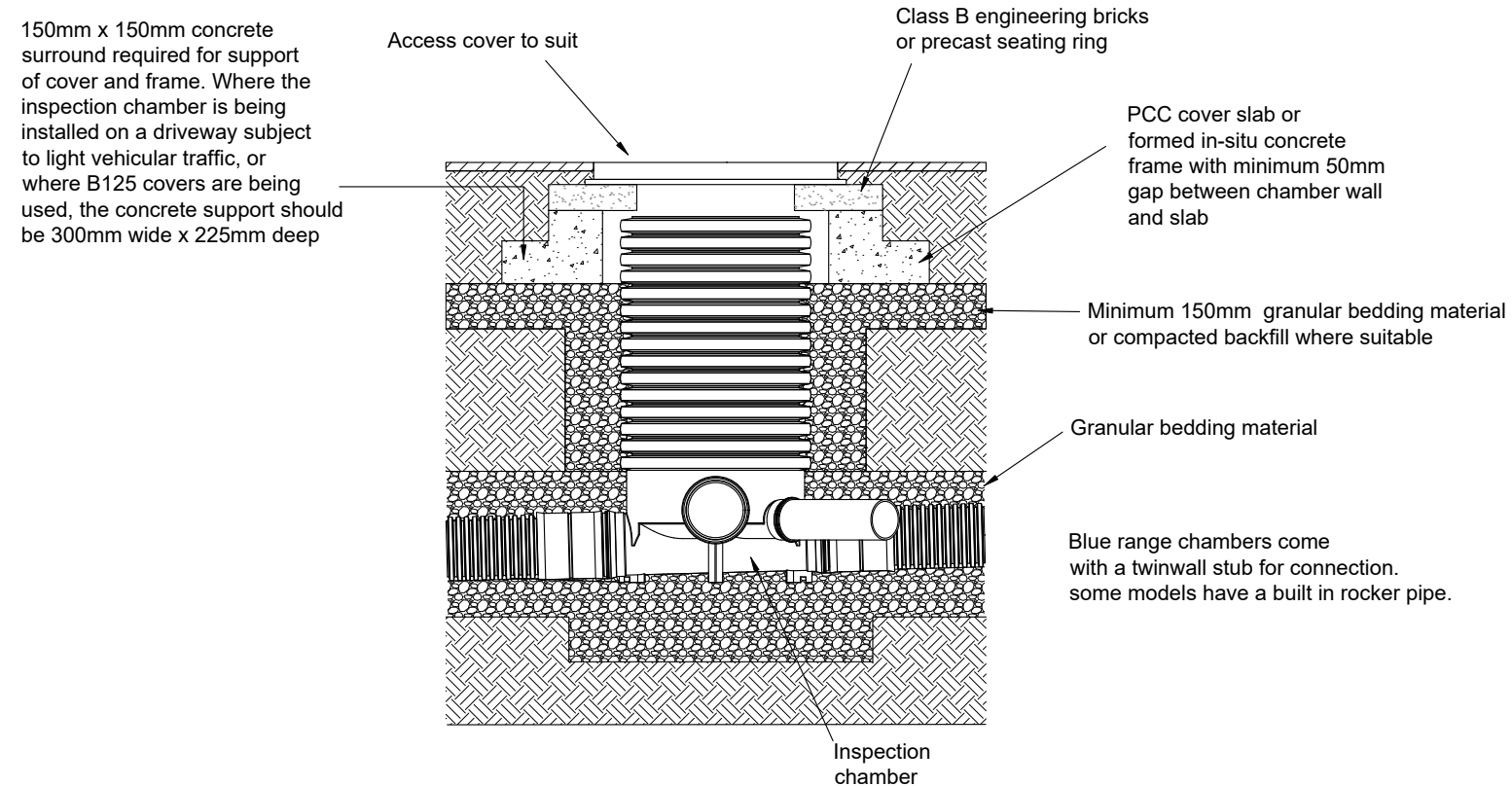
Soil pipe / wc connection



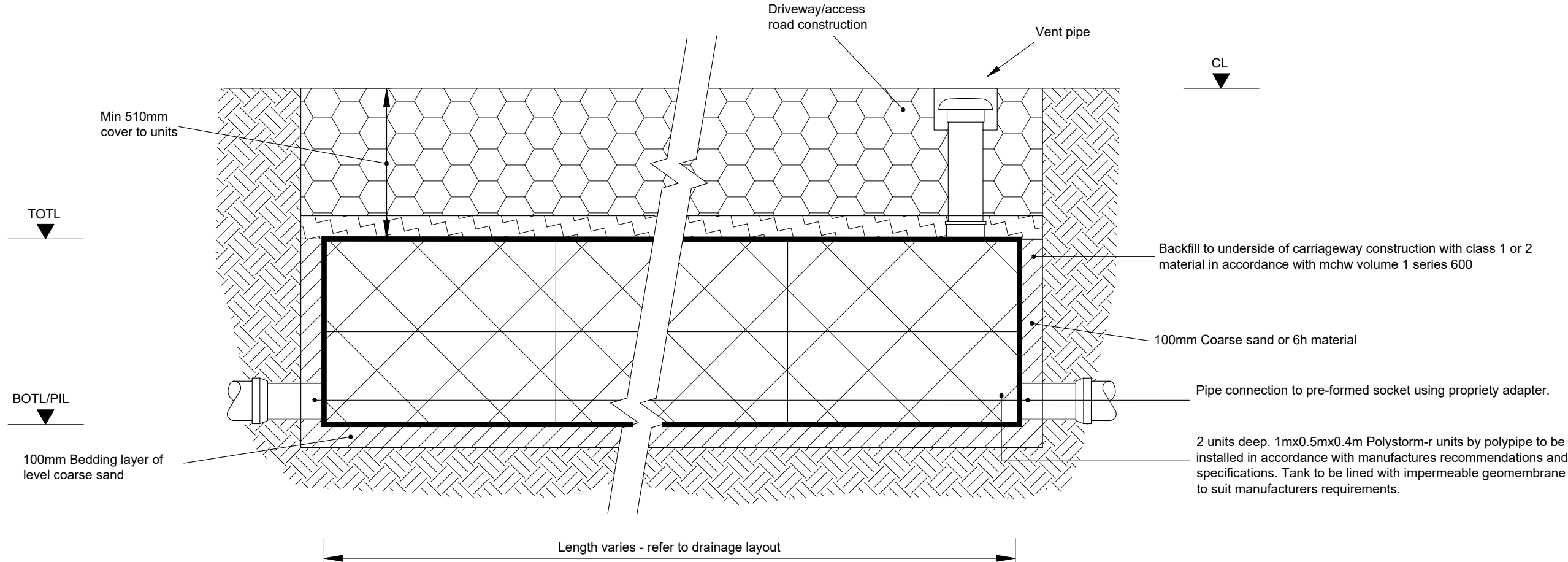
Rainwater pipe connection



450mmØ/600mmØ Turtle Enviro Silt Trap Detail

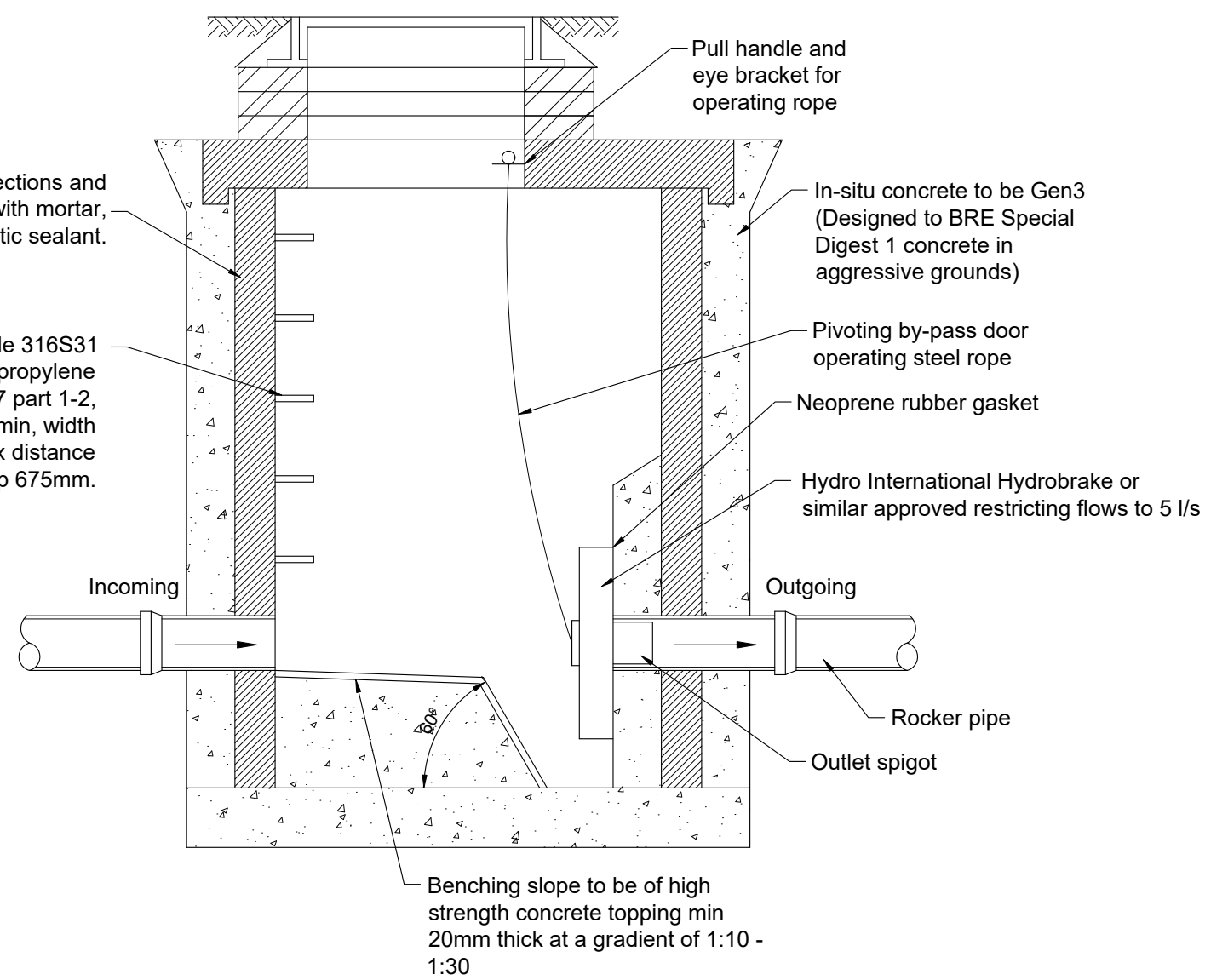


450mmØ/600mmØ Turtle Enviro Inspection Chamber



Attenuation tank using polystorm-r geomodular units trafficked areas

All storage tank drainage works shall be carried out in accordance with the specifications, method statements and recommendations of polypipe



Typical Hydrobrake Manhole detail
Chamber is to be constructed to flow control manufacturers specific requirements

Prefixed 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		

P-	25.09.24	PRELIMINARY ISSUE	LH	CS	CS
REV	DATE	DESCRIPTION	BY	CHK	APP
					
CLIENT JOHN LANGRAN					
ARCHITECT -					
JOB TITLE BRIDGERS FARM, HURSTPIERPOINT BN6 9HA					
DRAWING TITLE CONSTRUCTION DETAILS					
DRAWN	LH	ENGINEER	TZ	CHECKED	CS
DATE	SEPTEMBER 2024	SCALE @ A1	1:20	APPROVED	CS
JOB No.	C3270	STATUS	P	DRAWING No.	301
REV.	P-				

PRELIMINARY

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	0.750	Preferred Cover Depth (m)	0.500
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.004	5.00	10.000	Manhole	Adoptable	600	886.150	265.820	0.750
S2	0.019	5.00	10.000	Manhole	Adoptable	600	883.956	301.646	0.988
S3	0.015	5.00	10.000	Manhole	Adoptable	600	874.383	301.183	1.052
S4	0.015	5.00	10.000	Manhole	Adoptable	600	866.443	300.489	1.178
S5	0.004	5.00	10.000	Manhole	Adoptable	600	860.590	290.866	1.320
S6	0.003	5.00	10.000	Manhole	Adoptable	600	848.623	290.936	1.371
S7	0.013		9.900	Manhole	Adoptable	1050	847.797	301.612	1.316
S8	0.004	5.00	10.000	Manhole	Adoptable	600	876.118	265.335	0.750
S9	0.003	5.00	10.000	Manhole	Adoptable	600	854.072	261.391	0.994
S10	0.006	5.00	10.000	Manhole	Adoptable	600	854.145	274.602	1.080
S11			10.000	Manhole	Adoptable	600	861.155	275.345	1.125
S12	0.003	5.00	10.000	Manhole	Adoptable	600	866.070	261.751	1.018
S13	0.003	5.00	10.000	Manhole	Adoptable	600	865.079	274.165	1.098

Links (Input)

Name	US Node	DS Node	Length (m)	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
1.000	S1	S2	35.893	9.250	9.012	0.238	150.8	150
1.001	S2	S3	9.584	9.012	8.948	0.064	149.8	150
1.002	S3	S4	7.970	8.948	8.897	0.051	156.3	150
1.003	S4	S5	11.263	8.822	8.680	0.142	79.3	225
1.004	S5	S6	11.967	8.680	8.629	0.051	234.7	225
1.005	S6	S7	10.708	8.629	8.584	0.045	238.0	225
2.000	S8	S3	35.890	9.250	8.948	0.302	118.8	150
3.000	S9	S10	13.211	9.006	8.920	0.086	153.6	150
3.001	S10	S11	7.049	8.920	8.875	0.045	156.7	150
3.002	S11	S5	15.531	8.875	8.773	0.102	152.3	150
4.000	S12	S13	12.453	8.982	8.902	0.080	155.7	150
4.001	S13	S11	4.098	8.902	8.875	0.027	151.8	150

Simulation Settings

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

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	------

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
10	0	0	0
30	0	0	0
100	45	0	0

Node S7 Online Orifice Control

Flap Valve	x	Design Depth (m)	1.226	Discharge Coefficient	0.650
Replaces Downstream Link	✓	Design Flow (l/s)	2.0		
Invert Level (m)	8.584	Diameter (m)	0.028		

Node S5 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	8.700
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	70.0	0.0	0.800	70.0	0.0	0.801	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 96.47%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	11	9.272	0.022	0.7	0.0063	0.0000	OK
15 minute summer	S2	11	9.066	0.054	4.2	0.0153	0.0000	OK
15 minute summer	S3	11	9.030	0.082	7.4	0.0232	0.0000	OK
15 minute summer	S4	11	8.889	0.067	9.9	0.0188	0.0000	OK
360 minute winter	S5	256	8.871	0.191	2.4	11.4578	0.0000	OK
360 minute winter	S6	256	8.871	0.242	0.8	0.0685	0.0000	SURCHARGED
360 minute winter	S7	256	8.871	0.287	0.9	0.2485	0.0000	OK
15 minute summer	S8	11	9.271	0.021	0.7	0.0060	0.0000	OK
15 minute summer	S9	11	9.025	0.019	0.5	0.0054	0.0000	OK
15 minute summer	S10	10	8.954	0.034	1.6	0.0096	0.0000	OK
15 minute summer	S11	11	8.919	0.044	2.5	0.0123	0.0000	OK
15 minute summer	S12	11	9.001	0.019	0.5	0.0054	0.0000	OK
15 minute summer	S13	11	8.929	0.027	1.0	0.0076	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	1.000	S2	0.7	0.200	0.048	0.1317	24.6
15 minute summer	S2	1.001	S3	4.1	0.534	0.280	0.0744	
15 minute summer	S3	1.002	S4	7.3	0.778	0.516	0.0748	
15 minute summer	S4	1.003	S5	9.9	1.265	0.170	0.1118	
360 minute winter	S5	1.004	S6	0.8	0.272	0.025	0.4530	
360 minute winter	S6	1.005	S7	0.9	0.112	0.026	0.4259	
360 minute winter	S7	Orifice		0.9				
15 minute summer	S8	2.000	S3	0.7	0.133	0.043	0.2033	
15 minute summer	S9	3.000	S10	0.5	0.241	0.035	0.0283	
15 minute summer	S10	3.001	S11	1.5	0.442	0.110	0.0253	
15 minute summer	S11	3.002	S5	2.5	0.606	0.176	0.0648	
15 minute summer	S12	4.000	S13	0.5	0.294	0.035	0.0213	
15 minute summer	S13	4.001	S11	1.0	0.325	0.069	0.0130	

Results for 10 year Critical Storm Duration. Lowest mass balance: 96.47%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	11	9.281	0.031	1.4	0.0089	0.0000	OK
15 minute summer	S2	11	9.103	0.091	8.3	0.0258	0.0000	OK
15 minute summer	S3	11	9.084	0.136	14.5	0.0386	0.0000	OK
240 minute winter	S4	220	9.029	0.207	4.2	0.0585	0.0000	OK
240 minute winter	S5	220	9.029	0.349	5.4	21.9968	0.0000	SURCHARGED
240 minute winter	S6	220	9.029	0.400	1.1	0.1131	0.0000	SURCHARGED
240 minute winter	S7	220	9.029	0.445	1.2	0.3851	0.0000	OK
15 minute summer	S8	11	9.280	0.030	1.4	0.0084	0.0000	OK
15 minute summer	S9	10	9.034	0.028	1.1	0.0078	0.0000	OK
240 minute winter	S10	220	9.029	0.109	0.6	0.0308	0.0000	OK
240 minute winter	S11	216	9.029	0.154	1.0	0.0435	0.0000	SURCHARGED
240 minute winter	S12	220	9.029	0.047	0.2	0.0132	0.0000	OK
240 minute winter	S13	216	9.029	0.127	0.4	0.0359	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	1.000	S2	1.4	0.211	0.097	0.2486	26.8
15 minute summer	S2	1.001	S3	7.9	0.586	0.545	0.1341	
15 minute summer	S3	1.002	S4	14.3	0.919	1.008	0.1226	
240 minute winter	S4	1.003	S5	4.1	0.444	0.071	0.4392	
240 minute winter	S5	1.004	S6	1.1	0.311	0.033	0.4759	
240 minute winter	S6	1.005	S7	1.1	0.121	0.034	0.4259	
240 minute winter	S7	Orifice		1.2				
15 minute summer	S8	2.000	S3	1.4	0.148	0.086	0.3456	
15 minute summer	S9	3.000	S10	1.1	0.289	0.074	0.0495	
240 minute winter	S10	3.001	S11	0.6	0.333	0.042	0.1103	
240 minute winter	S11	3.002	S5	1.0	0.451	0.070	0.2734	
240 minute winter	S12	4.000	S13	0.2	0.223	0.014	0.1279	
240 minute winter	S13	4.001	S11	0.4	0.259	0.028	0.0686	

Results for 30 year Critical Storm Duration. Lowest mass balance: 96.47%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	S1	11	9.286	0.036	1.9	0.0102	0.0000	OK
15 minute summer	S2	11	9.169	0.157	10.8	0.0444	0.0000	SURCHARGED
180 minute winter	S3	176	9.135	0.187	4.6	0.0530	0.0000	SURCHARGED
180 minute winter	S4	176	9.135	0.313	6.3	0.0886	0.0000	SURCHARGED
180 minute winter	S5	176	9.135	0.455	8.1	29.1016	0.0000	SURCHARGED
180 minute winter	S6	176	9.135	0.506	1.3	0.1432	0.0000	SURCHARGED
180 minute winter	S7	176	9.135	0.551	1.4	0.4772	0.0000	OK
15 minute summer	S8	11	9.284	0.034	1.9	0.0096	0.0000	OK
180 minute winter	S9	176	9.135	0.129	0.3	0.0365	0.0000	OK
180 minute winter	S10	176	9.135	0.215	1.0	0.0608	0.0000	SURCHARGED
180 minute winter	S11	176	9.135	0.260	1.5	0.0736	0.0000	SURCHARGED
180 minute winter	S12	176	9.135	0.153	0.3	0.0433	0.0000	SURCHARGED
180 minute winter	S13	176	9.135	0.233	0.6	0.0659	0.0000	SURCHARGED

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	1.000	S2	1.8	0.217	0.127	0.3742	26.7
15 minute summer	S2	1.001	S3	9.7	0.591	0.670	0.1687	
180 minute winter	S3	1.002	S4	4.6	0.695	0.325	0.1403	
180 minute winter	S4	1.003	S5	6.1	0.550	0.104	0.4479	
180 minute winter	S5	1.004	S6	1.3	0.341	0.037	0.4759	
180 minute winter	S6	1.005	S7	1.3	0.150	0.038	0.4259	
180 minute winter	S7	Orifice		1.3				
15 minute summer	S8	2.000	S3	1.8	0.155	0.113	0.3694	
180 minute winter	S9	3.000	S10	0.3	0.216	0.021	0.2227	
180 minute winter	S10	3.001	S11	1.0	0.375	0.070	0.1241	
180 minute winter	S11	3.002	S5	1.5	0.461	0.105	0.2734	
180 minute winter	S12	4.000	S13	0.3	0.252	0.021	0.2192	
180 minute winter	S13	4.001	S11	0.6	0.285	0.042	0.0721	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 96.47%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	S1	344	9.780	0.530	0.5	0.1501	0.0000	FLOOD RISK
360 minute winter	S2	344	9.780	0.768	2.8	0.2175	0.0000	FLOOD RISK
360 minute winter	S3	344	9.780	0.832	4.8	0.2356	0.0000	FLOOD RISK
360 minute winter	S4	344	9.780	0.958	6.3	0.2712	0.0000	FLOOD RISK
360 minute winter	S5	344	9.780	1.100	8.4	53.5778	0.0000	FLOOD RISK
360 minute winter	S6	344	9.780	1.151	1.7	0.3257	0.0000	FLOOD RISK
360 minute winter	S7	344	9.780	1.196	2.0	1.0355	0.0000	OK
360 minute winter	S8	344	9.780	0.530	0.5	0.1501	0.0000	FLOOD RISK
360 minute winter	S9	344	9.780	0.774	0.4	0.2191	0.0000	FLOOD RISK
360 minute winter	S10	344	9.780	0.860	1.0	0.2434	0.0000	FLOOD RISK
360 minute winter	S11	344	9.780	0.905	1.4	0.2562	0.0000	FLOOD RISK
360 minute winter	S12	344	9.780	0.798	0.4	0.2259	0.0000	FLOOD RISK
360 minute winter	S13	344	9.780	0.878	0.7	0.2485	0.0000	FLOOD RISK

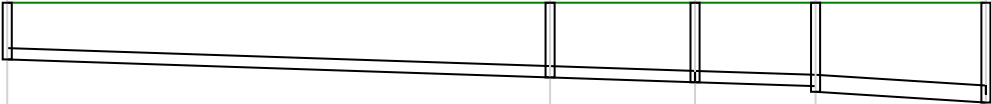
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	S1	1.000	S2	0.5	0.175	0.035	0.6319	49.9
360 minute winter	S2	1.001	S3	2.5	0.451	0.173	0.1687	
360 minute winter	S3	1.002	S4	4.5	0.634	0.319	0.1403	
360 minute winter	S4	1.003	S5	6.2	0.507	0.106	0.4479	
360 minute winter	S5	1.004	S6	1.7	0.312	0.050	0.4759	
360 minute winter	S6	1.005	S7	1.7	0.130	0.051	0.4259	
360 minute winter	S7	Orifice		1.9				
360 minute winter	S8	2.000	S3	0.5	0.125	0.031	0.6318	
360 minute winter	S9	3.000	S10	0.3	0.198	0.020	0.2326	
360 minute winter	S10	3.001	S11	0.9	0.332	0.061	0.1241	
360 minute winter	S11	3.002	S5	1.3	0.380	0.089	0.2734	
360 minute winter	S12	4.000	S13	0.3	0.223	0.021	0.2192	
360 minute winter	S13	4.001	S11	0.5	0.258	0.038	0.0721	



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File: C3270 Flow.pfd
Network: Storm Network 1
Luke Honeywill
30/09/2024

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Bridgers Farm
Hurstpierpoint

Node Name	S1	S2	S3	S4	S5
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) -1.000					
	Link Name	1.000	1.001	1.002	1.003
	Section Type	150mm	150mm	150mm	225mm
	Slope (1:X)	150.8	149.8	156.3	79.3
	Cover Level (m)	10.000	10.000	10.000	10.000
	Invert Level (m)	9.250	9.012	8.948	8.897
			9.012	8.948	8.822
				8.897	8.680
	Length (m)	35.893	9.584	7.970	11.263



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Bridgers Farm
Hurstpierpoint

Node Name	S5	S6	S7
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) -1.000			
	1.004	1.005	
	225mm	225mm	
	234.7	238.0	
	10.000	10.000	9.900
	8.680	8.629	8.584
	11.967	10.708	



Node Name	S8		S3
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) -1.000			
	Link Name		2.000
	Section Type		150mm
	Slope (1:X)		118.8
	Cover Level (m)	10.000	10.000
Invert Level (m)	9.250		8.948
Length (m)	35.890		



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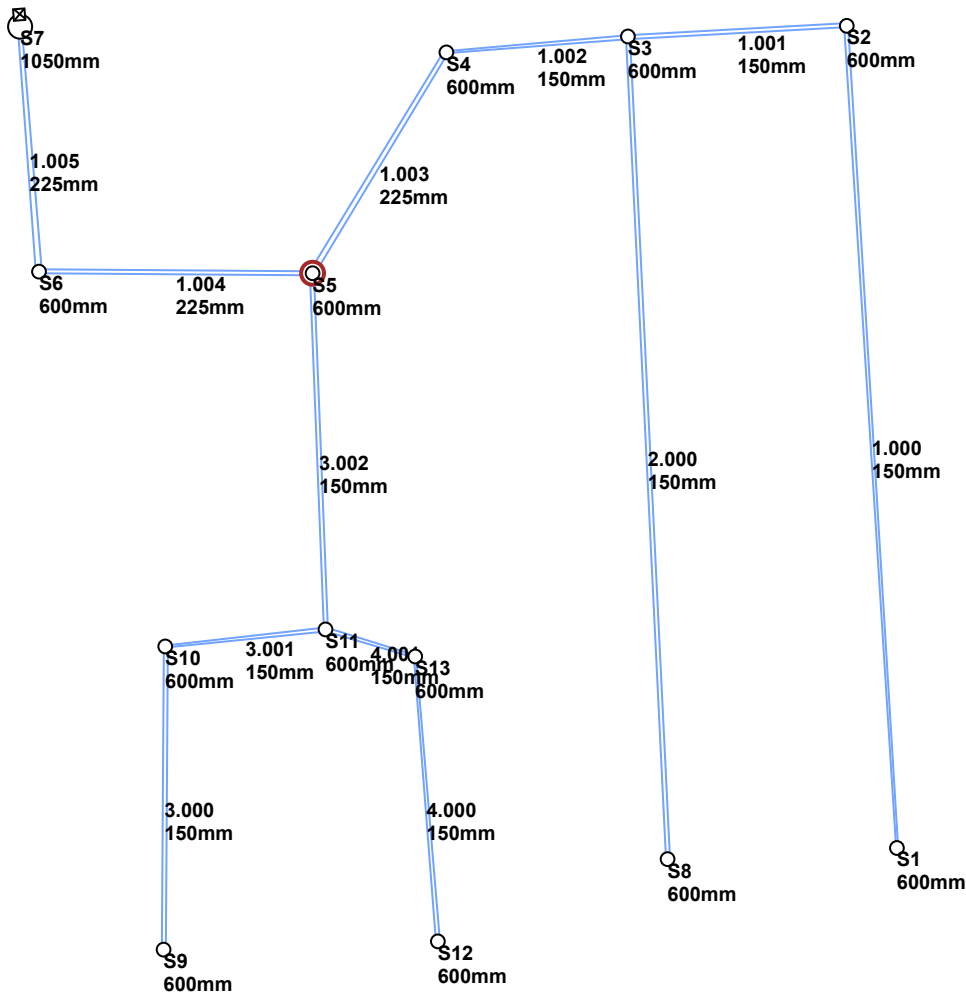
File: C3270 Flow.pfd
Network: Storm Network 1
Luke Honeywill
30/09/2024

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Bridgers Farm
Hurstpierpoint

Node Name	S9	S10	S11	S5
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) -1.000				
	3.000	3.001	3.002	
	150mm	150mm	150mm	
	153.6	156.7	152.3	
	10.000	10.000	10.000	10.000
	9.006	8.920	8.875	8.773
	13.211	7.049	15.531	



Node Name	S12	S13	S11
A4 drawing Hor Scale 500 Ver Scale 100 Datum (m) -1.000			
	4.000	4.001	
	150mm	150mm	
	155.7	151.8	
	10.000	10.000	10.000
	8.982	8.902 8.902 8.875	
	12.453	4.098	



7.4 **Appendix D – Greenfield Runoff Calculations**

Calculated by:	Luke Honeywill
Site name:	Bridgers Farm
Site location:	Hurstpierpoint

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.

Site Details

Latitude:	50.95124° N
Longitude:	0.18775° W
Reference:	3173014667
Date:	Sep 24 2024 13:41

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	0.2
-----------------------	-----

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

	Default	Edited
SAAR (mm):	829	829
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	1.18	1.18
1 in 1 year (l/s):	1	1
1 in 30 years (l/s):	2.71	2.71
1 in 100 year (l/s):	3.75	3.75
1 in 200 years (l/s):	4.4	4.4

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of 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, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

7.5 **Appendix E – Maintenance Schedule**

Maintenance Schedule

Bridgers Farm, Hurstpierpoint

Planning Ref: DM/22/3064

For

John Langran

Rev - P

Reference **C3270**

Date **25th September 2024**

Revision	Date of Issue	Comments	Prepared By	Checked By
P	25/09/2024	Initial Issue	LH	CS

Contents

1 **MAINTENANCE..... 3**

1 Maintenance

1.1 Introduction

- 1.1.1 During construction, the Contractor will be responsible for maintaining the drainage and SuDS (Sustainable Drainage Systems). The client will take on the responsibility of these duties as laid out in this report.
- 1.1.2 The maintenance schedule for the proposed development will be split down into two separate categories; SuDS features and regular private drainage.

1.2 SuDS at Bridgers Farm, Hurstpierpoint

- 1.2.1 As listed above, in section 5.1.2, the SuDS features used on site will be **Attenuation Tank and Permeable Paving**
- 1.2.2 The SuDS features have been designed for easy maintenance and comprise:
- Regular Day-to-Day care – litter collection, regular gardening to control vegetation growth and checking inlets where water enters the SuDS features
 - Occasional tasks – checking the SuDS features and removing any silt that builds up in the SuDS feature
 - Remedial work – repairing damage where necessary

1.3 SuDS Drainage Maintenance Specification

1.3.1 Attenuation Tank

In order to maintain the functioning of the attenuation tanks, the following maintenance requirements should be adhered to:

Table 21.3 Operation and maintenance requirements for attenuation storage tanks		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae, or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from per-treatment structures and/or internal forebays	Annually, or as required
Remedial Actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents, and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

1.3.2 Permeable Paving

In order to maintain the functioning of the permeable paving, the following maintenance requirements should be adhered to:

Table 21.3 Operation and maintenance requirements for permeable paving		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required take remedial action	Three-monthly, 48h after large storms in first six months
	Inspect silt accumulation rate and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

1.4 General Drainage Maintenance Specification

1.4.1 Inlet Structures and Inspection Chambers

- Inlet structures such as rainwater downpipes, road gullies and channel drains should be free from obstruction at all times to all free flow through the SuDS
- Inspection Chambers and Rodding Eyes are used on bends or where pipes come together. They allow access and cleaning to the system if necessary.

Inlet Structures and Inspection Chambers	
Regular Maintenance	Frequency
Inlet Structures Inspect rainwater downpipes, channel drains and road gullies, removing obstructions and silt as necessary. Check that there is no physical damage. Strim vegetation 1m min surround to structures and keep area free from silt and debris	Monthly
Inspections Chambers and below ground control chambers. Remove cover and inspect, ensuring that the water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in Autumn	Annually
Occasional Maintenance Check topsoil levels are 20mm above edges of chambers to avoid mower damage.	As necessary
Remedial Work Repair physical damage if necessary	As required

1.4.2 Below ground drainage pipes

- Below ground drainage pipes convey water to the SuDS system. They should always be free from obstruction to allow free flow.

Below Ground Drainage Pipes	
Regular Maintenance	Frequency
Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months then annually
Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
Remove sediment from pre-treatment inlet structures and inspection chambers.	Annually or as required
Maintain vegetation to designed limits within the vicinity of below ground drainage pipes and tanks.	Monthly or as required
Remedial Work	
Repair physical damage if necessary	As required
Monitoring	
Inspect all inlets, outlets and vents to ensure that they are in good conditions and operating as designed.	Annually
Survey inside of pipe runs for sediment build up and remove if necessary.	Every 5 years or as required