



DRAINAGE STATEMENT

RYEFIELDS FARMHOUSE, OAK TREE LANE

Residential Development

2026-C160-DS02

July 2026

Prepared on Behalf of Chichester Carpentry & Building Ltd

DOCUMENT CONTROL

Project Name:	Ryefields Farmhouse, Oak Tree Lane
Development Type:	Residential Development
Report Type:	Drainage Statement
Client Name:	Chichester Carpentry & Building Ltd
Document Reference:	2026-C160-DS02
Prepared by:	Dan Lytton

REVISIONS:

Issue	Date	Status	Issued by
01	14/05/2026	Original Issue	DJL
02	08/07/2026	Revised Issue	DJL

DRAWINGS

2026-C160-001	Geotechnical Investigation Plan
2026-C160-002	Engineering GA - Levels & Drainage Design
2026-C160-003	Proposed Catchment
2026-C160-004	Interception Assessment
2026-C160-005	Construction Details
2026-C160-006	Manhole Schedule & Impermeable Areas Schedule

APPENDICES

Appendix A	Greenfield Runoff Calculation
Appendix B	Geotechnical Investigation Extracts
Appendix C	Southern Water Sewer Records
Appendix D	Planning Stage Drainage Design
Appendix E	Southern Water S106 Approval
Appendix F	Evidence of Deed of Easement
Appendix G	Hydraulic Modelling Calculations
Appendix H	Sudsstore Controflow Universal Flow Control Detail
Appendix I	GreenBlue SuDS Pod Detail
Appendix J	Maintenance Schedule



FLOOD AND DRAINAGE STATEMENT

Harbourstone Design Limited is instructed by Chichester Carpentry & Building Ltd to prepare a Drainage Statement to support a Discharge of Condition Application for a Residential Development at Ryefields Farmhouse, Oak Tree Lane. This report is for the benefit of the Client only.

The below sets out information about the drainage design for the benefit of the application.

Existing Site Information	
Location:	Land at Ryefields Farmhouse, Oak Tree Lane, Woodgate PO20 3GU
Area:	0.20 Ha.
Existing Topography:	Fairly flat, with fall southeasterly. Site levels vary from 9.9m to 9.4m AOD.
Existing Site Use:	Greenfield
Proposed Development Type:	4 no. residential dwellings
Existing Site Greenfield Rate:	0.4 l/s (Appendix A)

Existing Geology	
Geology:	Topsoil: SILT, Silt/Clay, Made Ground Superficial Deposits: River Terrace Deposits – CLAY, Silt/Clay, Sand (below 1.4mbgl) Bedrock: London Clay Formation – CLAY, silt and sand
Hydrogeology:	Superficial Drift Aquifer: 'Secondary A' Bedrock Aquifer: 'Unproductive Strata' - Potential for some/limited shallow infiltration, above bedrock only. Groundwater Vulnerability: Medium-Low - Low vulnerability to groundwater from pollutants
Groundwater Depth:	Peak winter groundwater levels at 0.09mbgl, January 2021.
Soakage Results:	1 no. soakage test was undertaken at 2 no. trial pits on site. Results were 3.26×10^{-7} and 1.87×10^{-7} m/s.
Infiltration Viability:	Infiltration is not viable, primarily due to very shallow groundwater levels. (Drawing 001, Appendix B)



Existing Drainage	
Nearest Watercourse:	None
Nearest Surface Water Sewer:	None
Nearest Foul Sewer:	225mm dia. foul sewer south of site, in neighbouring land. Nearest manhole 9102, recorded depth 1.26mbgl. (Appendix C)
Existing Site Drainage:	Overland runoff / infiltration
Highway Drainage:	Over-the-edge runoff / infiltration
Other Drainage Conditions:	Adjacent land has approved drainage strategy, with surface water to be attenuated and discharged to watercourse at approved rate. The infrastructure is under construction and expected to be completed by 2027, whereby a connection can be made.

Prior Design	
Planning Reference:	AL/31/22/PL
Relevant Planning Condition(s):	Condition 5: <i>"Development shall not commence, other than works of site survey and investigation, until full details of the proposed surface water drainage scheme have been submitted to and approved in writing by the Local Planning Authority..."</i> <i>"Where the design of the surface water drainage scheme relies on an adjacent development, a Deed of Easement detailing agreement of taking such drainage shall also be provided as part of the required details..."</i>
Planning Drainage Design:	KNC2107-602-02 Rev E, Kazys Narbutas Consulting, March 2022 (Appendix D)
Proposed Strategy:	Foul water discharge to public foul sewer. Surface water discharge to Third-Party surface water drainage infrastructure, to be further attenuated prior to discharge to watercourse.
Sewerage Authority Approval:	Legal Agreement obtained through S106 Connection Approval (Appendix E)
Third Party Land Approval:	Evidence of Deed of Easement (Appendix F)



Surface Water Drainage Solution	
Proposed Catchment Area:	0.099 Ha
Proposed Catchment Greenfield Rate (Pro-Rata):	Qbar: 0.2 l/s
Drainage Hierarchy:	• Use of living roof, rainwater harvesting, and tanked permeable pavement to ensure that all runoff is subject to interception drainage at source. • Infiltration not viable. • Discharge to watercourse, via Third-party infrastructure as agreed.
Calculations:	Discharge at up to 0.6l/s. No Flooding in Design Storm Event (Appendix G)
Viable SuDS:	Living roof, rainwater harvesting, tanked permeable pavement
Surface Water Storage:	53.6m ³ permeable pavement (30% voids)
Surface Water Discharge:	Restricted discharge via Controflow Universal Flow Control Chamber (Appendix H): • Protected orifice • PS3: 18mm diameter (0.6 l/s design rate, 0.75m design head) • Proposed discharge rate less represents 3 x greenfield rate for catchment area
Design Standards:	1 in 100 year storm, 45% climate change, 10% urban creep
Further Comments:	Utilisation of living roof and GreenBlue SuDSPod prior to discharge from all RWP's will further slow runoff compared to modelling results. Features will reduce first-flush flows and provide evapotranspiration for first 5mm of rainfall, as well as irrigation of surface level planting. GreenBlue SuDSPod also utilise integral attenuation and flow control to reduce storm flow rates, as seen in Appendix I .
Surface Water Treatment: (Pollution Hazard Indices / Pollution Treatment Indices)	Residential Parking: Low, TSS = 0.5, M = 0.4, H = 0.4 Residential Roofs: Very low, TSS = 0.2, M = 0.2, H = 0.05 Permeable Pavement: TSS = 0.7, M = 0.6, H = 0.7 Bioretention system: TSS = 0.8, M = 0.8, H = 0.8



Mitigation against flood risk:	Proposed finished floor levels are raised above surrounding and existing ground levels , to ensure residual risk of internal flooding from shallow groundwater mitigated against for lifetime of development.
Temporary Strategy (until Third-Party surface water drainage infrastructure operational):	Foul and Surface water discharge to public foul sewer. KNC2107-602-02 Rev D, Kazys Narbutas Consulting, November 2021 (Appendix D) Surface water discharge restricted to 1.0 l/s per S106 Approval. Connection through Third-Party land.

Foul Drainage Solution	
Drainage Hierarchy:	Public foul sewer south of site.
Foul Proposals:	Private foul run from proposed residential development to public sewer, by gravity
Discharge:	Discharge to public foul sewer with direct connection to existing public foul manhole.
Further Comments:	Expected peak foul discharge 0.19 l/s (in accordance with Water UK Design & Construction Guidance). Legal Agreement for connection and strategy with Southern Water under S106 obtained (Appendix E)

Further Design Notes	
Drainage Plans (inc. areas, full drainage details, specification, details, water quality):	Detailed drainage plan provided, and accompanying construction details and flow control specification. Water quality treatment is covered on the previous page.
Biodiversity & Amenity Benefits:	The proposals for Living Roof and Raised Planters (rainwater harvesting) with compatible planting offer attractive features that provides ecological and amenity benefits.
Arboricultural Constraints:	None – no RPZs. Design to be reviewed by arboricultural consultant, minor tree removal, mitigation and/or protection to be made as required.
Hydraulic Modelling:	Modelling shows some surcharged nodes in 1yr & 10yr + 40%CC (climate change) events. This is due to the nature of the proposed design attenuating runoff via a flat system utilising permeable pavement.



	Use of Living Roof and Raised Planters (rainwater harvesting) will reduce first flush flows and mitigate surcharging in minor storm events. Modelling results show no flooding up to the design event.
Maintenance Responsibilities:	Maintenance plan details responsibilities (Appendix J) & complies with Arun drainage maintenance checklist (https://www.arun.gov.uk/designer-checklists/)

Arun Checklist Adherence	
Ground Investigation Results:	Groundwater monitoring provided: • Full groundwater monitoring data • Plan showing location (Drawing 001) • Depths of holes, dates of observations, depths to groundwater • Evidence of strata encountered • Peak groundwater levels and depths in mbgl and mAOD • Data demonstrates infiltration is not viable (shallow groundwater) Infiltration Testing provided: • Infiltration testing results provided • Data demonstrates infiltration is not viable (failed tests)
Statement:	As provided here, explaining proposals, adherence, hierarchy followed, reasoning and relevant approvals.
1. Runoff Destination:	
Existing Site:	Existing site information: • No existing surface water assets • No flood risk from rivers, sea or surface water. • No flood risk from existing surface water infrastructure • Shallow groundwater, area susceptible to groundwater emergence. Mitigated with raised FFLs, shallow SuDS, raised planters for rainwater harvesting
Proposed Hierarchy:	1. Rainwater reuse YES 2. Infiltration into the ground NOT VIABLE 3. Hybrid infiltration and restricted discharge to an appropriate water body or surface water sewer is proposed NOT VIABLE



	4. Restricted discharge to a water body YES 5. Restricted discharge to a surface water sewer or another piped surface water drainage system 6. Restricted discharge to a public combined sewer
Evidence to justify proposed discharge method:	Approved strategy at planning.
Details of consent/off-site works provided:	Evidence of Deed of Easement Provided
Other Design Items:	All pipework designed to Building Regulations Ground raising avoided where possible (base of permeable pavement and foundations roughly level with existing ground levels)
2. Interception Drainage	
Assessment:	Drawing 004 shows all runoff receives interception drainage.
3. Extreme rainfall and flooding	
Proposed Rate:	3xGFR for catchment area only.
Design Criteria:	FEH22 rainfall point data for site location 45% climate change for 1% AEP storm event 10% urban creep on all individual catchment areas CV of 1.0 No flooding in design event No existing flood risk or flood storage on-site
4. Water Quality:	As covered above, adequate treatment for pollutants
5/6. Amenity & Biodiversity:	As covered above, provided by planters and living roof
7. Construction, operation, maintenance:	Detailed in Maintenance Plan (Appendix J) Controflow has integral blockage protection (Appendix H)
Modelling	As detailed above. Half drain times for critical 3.33% + AEP event below



	PP4 assigned to Manhole D4 (30Yr+40% 360Min Winter) Depth (m) 0.65 0.580m Cover Depth 0.52 0.450m Storage Depth 0.400m (339min) 0.225m (790min) 0.00 0 230 460 690 920 Time (mins)
Plans:	Provided as required: • Contributing area plan • Proposed design • Calculations • SuDS details • Pipe details • Control feature details • Construction details



DRAWINGS

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2026-C160-006	Manhole Schedule & Impermeable Areas Schedule

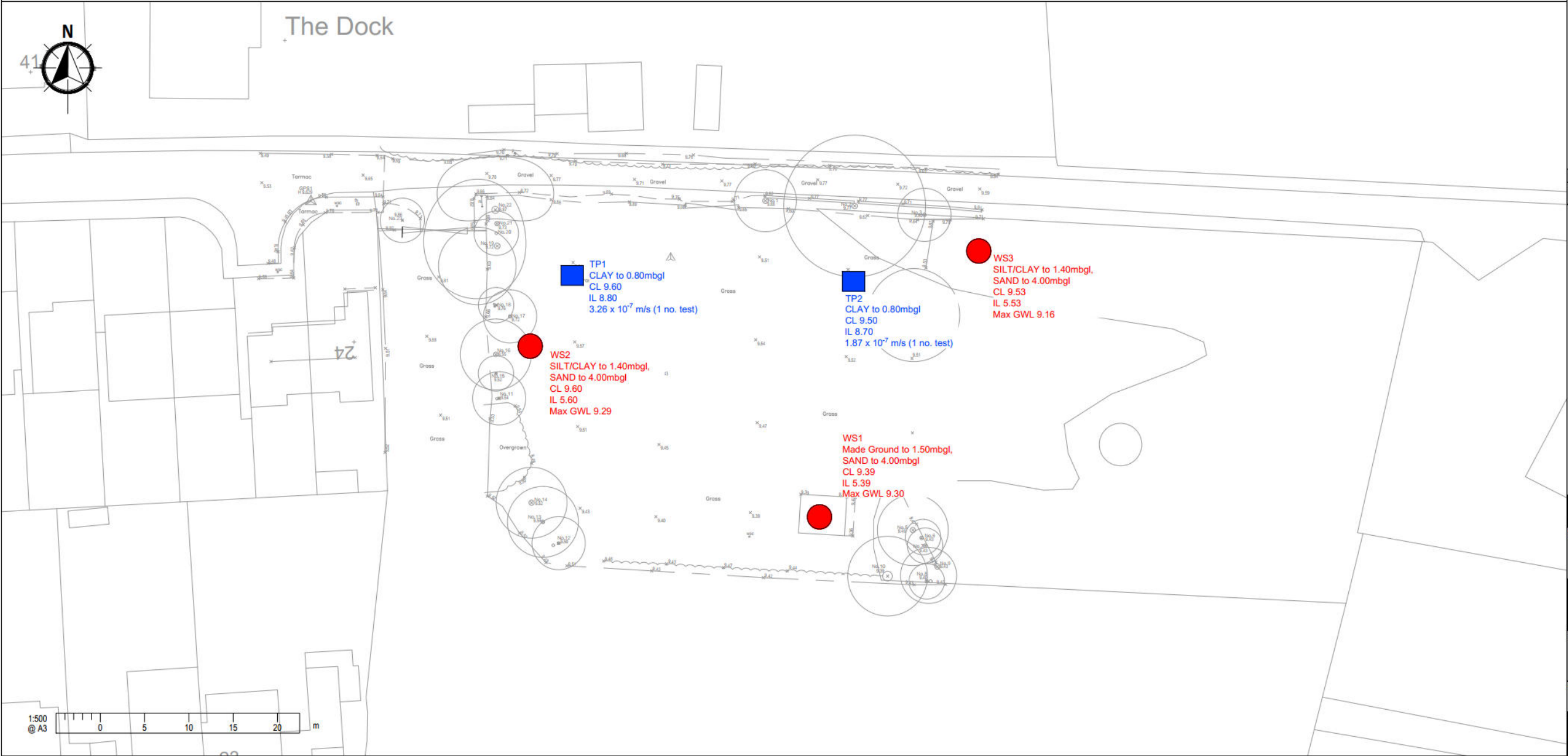
Infiltration Test Results – Recorded Infiltration Rates m/s

	Test 1	Test 2	Test 3
TP1 @ 0.80m bgl within Undifferentiated River Terrace Deposits	3.26 x10 ⁻⁷ m/s	-	-
TP2 @ 0.80m bgl within Undifferentiated River Terrace Deposits	1.87 x10 ⁻⁷ m/s	-	-

Date	05/01/2021	05/02/2021	17/02/2021	05/03/2021	15/03/2021	27/11/2021	10/12/2021	06/01/2022	16/01/2022
	GWT	GWT	GWT	GWT	GWT	GWT	GWT	GWT	GWT
	(m bgl)	(m bgl)	(m bgl)	(m bgl)	(m bgl)	m bgl)	(m bgl)	(m bgl)	(m bgl)
Trial Hole									
WS1	0.09	0.74	0.98	1.40	1.50	1.40	1.80	1.00	0.90
WS2	0.31	1.00	1.30	1.40	1.50	1.60	1.80	0.82	0.90
WS3	0.37	0.90	1.20	1.40	1.55	1.60	1.80	1.00	0.85

Trial Hole	Cover Level	mAOD	mAOD	mAOD	mAOD	mAOD	mAOD	mAOD	mAOD	mAOD
WS1	9.39	9.30	8.65	8.41	7.99	7.89	7.99	7.59	8.39	8.49
WS2	9.60	9.29	8.60	8.30	8.20	8.10	8.00	7.80	8.78	8.70
WS3	9.53	9.16	8.63	8.33	8.13	7.98	7.93	7.73	8.53	8.68

1. This drawing is to be read in conjunction with any other information, drawings and specification issued by Principle Designer, Architect and the Harboustone Design package for this project. Any discrepancies found are to be reported immediately to the Engineer.
2. Harboustone Design accepts no responsibility for inaccuracies in data provided by third parties such as topographic surveys or Ordnance Survey mapping.
3. Drawing to be scaled for planning purposes only, with drawing not for construction purposes. All dimensions are in millimeters unless noted otherwise and all levels are in metres from the topographic survey datum.
4. Any information given regarding existing underground services is given in good faith after consultation with the relevant authority, however accuracy is not certain. The main contractor is responsible for checking all information on site prior to work commencing and taking due care whilst undertaking the works.
5. All dimensions to be checked on site. All details and dimensions relating to sub-contractors work must be checked and agreed between the sub-contractor or supplier and the general contractor.
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-	Original Issue	-
Rev.	Amendments	Date



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Civil Engineering Consultants - harboustonedesign.co.uk
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Drawing Status
DISCHARGE OF CONDITIONS

Client
Chichester Carpentry & Building Ltd

Project
Ryefields Farmhouse, Oak Tree Lane

Drawing Title
Geotechnical Investigation Plan

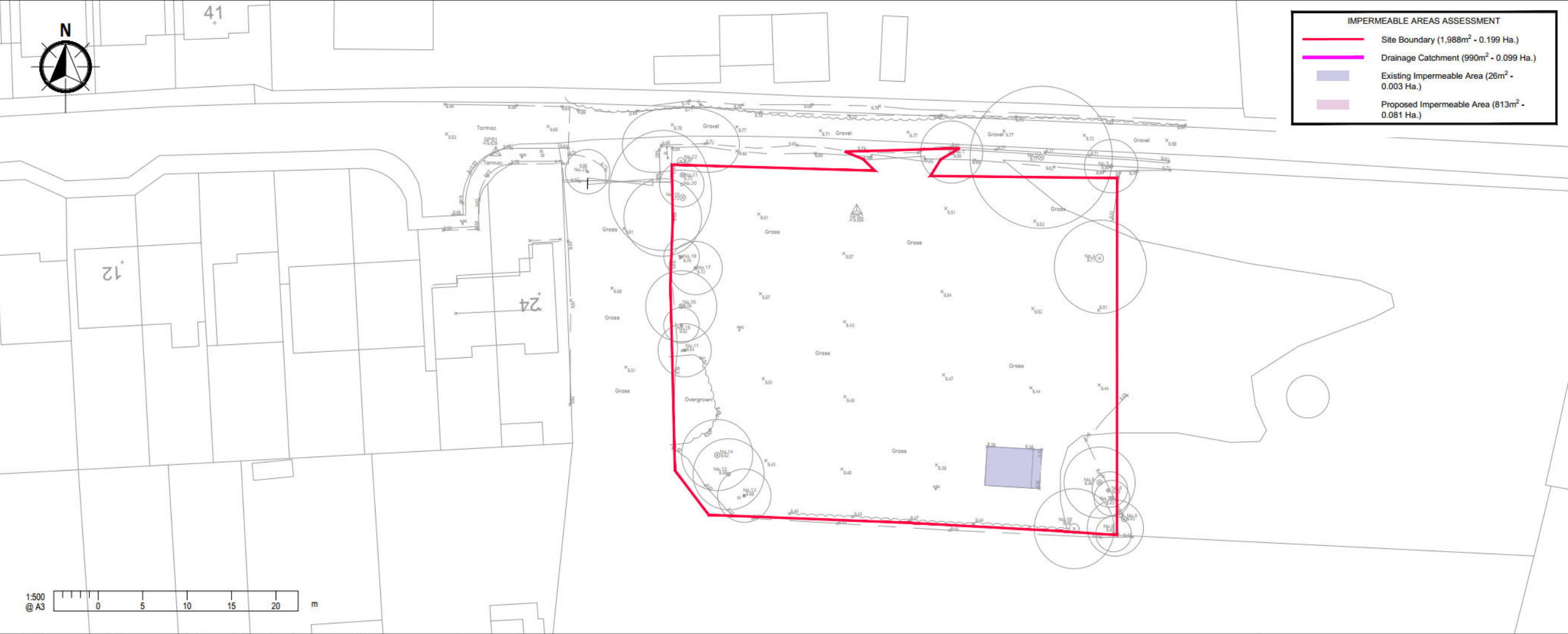
Scale	Date	Drawn by	Checked by
1:500	May '26	DL	CT

Drawing No.	Rev.
2026-C160-001	-



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2026-C160-002	A
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IMPERMEABLE AREAS ASSESSMENT

- Site Boundary (1,988m² - 0.199 Ha.)
- Drainage Catchment (990m² - 0.099 Ha.)
- Existing Impermeable Area (26m² - 0.003 Ha.)
- Proposed Impermeable Area (813m² - 0.081 Ha.)

- A3**
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Drawing Status
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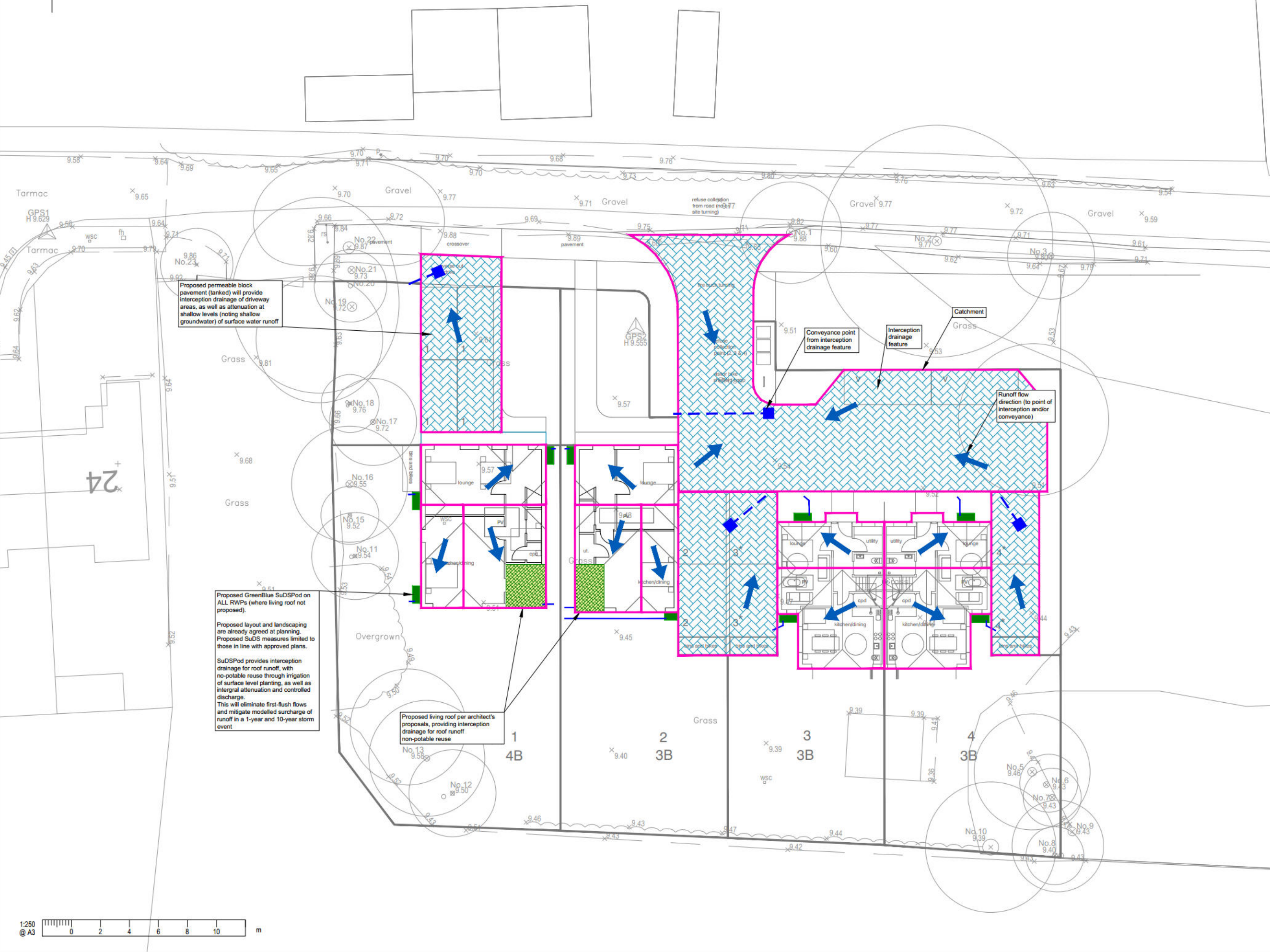
Client
Chichester Carpentry & Building Ltd

Project
Ryefields Farmhouse, Oak Tree Lane

Drawing Title
Catchment Assessment

Scale	Date	Drawn by	Checked by
1:500	May '26	DL	CT

Drawing No.	Rev.
2026-C160-003	-



- A3**
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Rev.	Original Issue	Amendments	Date
-	-	-	-



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Drawing Status
DISCHARGE OF CONDITION

Client
Chichester Carpentry & Building Ltd

Project
Ryefields Farmhouse, Oak Tree Lane

Drawing Title
Interception Assessment

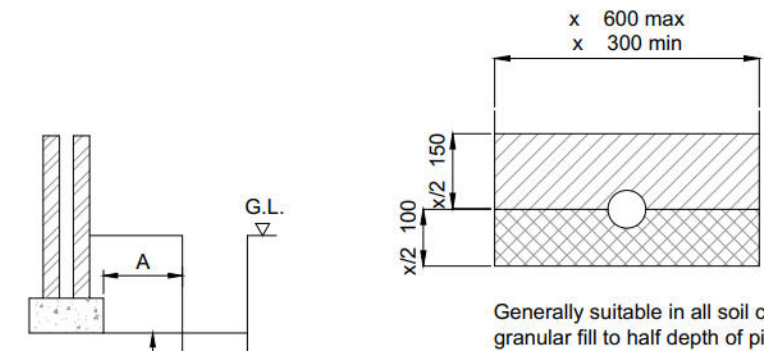
Scale 1:250	Date May '26	Drawn by DL	Checked by CT
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Drawing No. 2026-C160-004	Rev. -
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Minimum Dimensions for Access Fittings and Inspection Chambers						
Type	Min Internal Sizes				Cover Sizes	
	Depth to invert (m)	Size of largest pipe (DN)	Length x Width (mm)	Circular (mm)	Length x Width (mm)	Circular (mm)
Rodding Eye			As Drain but Minimum 100mm ^a			
Access Fitting						
Small	0.6 or less		150x100	150	150x100 ^a	Same size as access fitting
Large	except where situated in a chamber		225x100	225	225x100 ^a	
Inspection Chamber						
Shallow	0.6 or less			190 ^b		190 ^a
	1.2 or less		450x450	450	450x450	430 ^a
Deep	1.2 - 3.0		450x450	450	Max 300x300 ^c	Access restricted ^c to Max 350

Notes:

- the clear opening may be reduced by 20mm in order to provide proper support for the cover and frame
- Drains up to 150mm
- A larger clear opening cover may be used in conjunction with a restricted access, the size is restricted for health a safety reasons to deter entry.



PIPE BEDDING DETAIL UNDER DRIVES AND GARDENS
Min depth of cover 0.35m under private gardens and 0.5m under private drives

LEGEND:

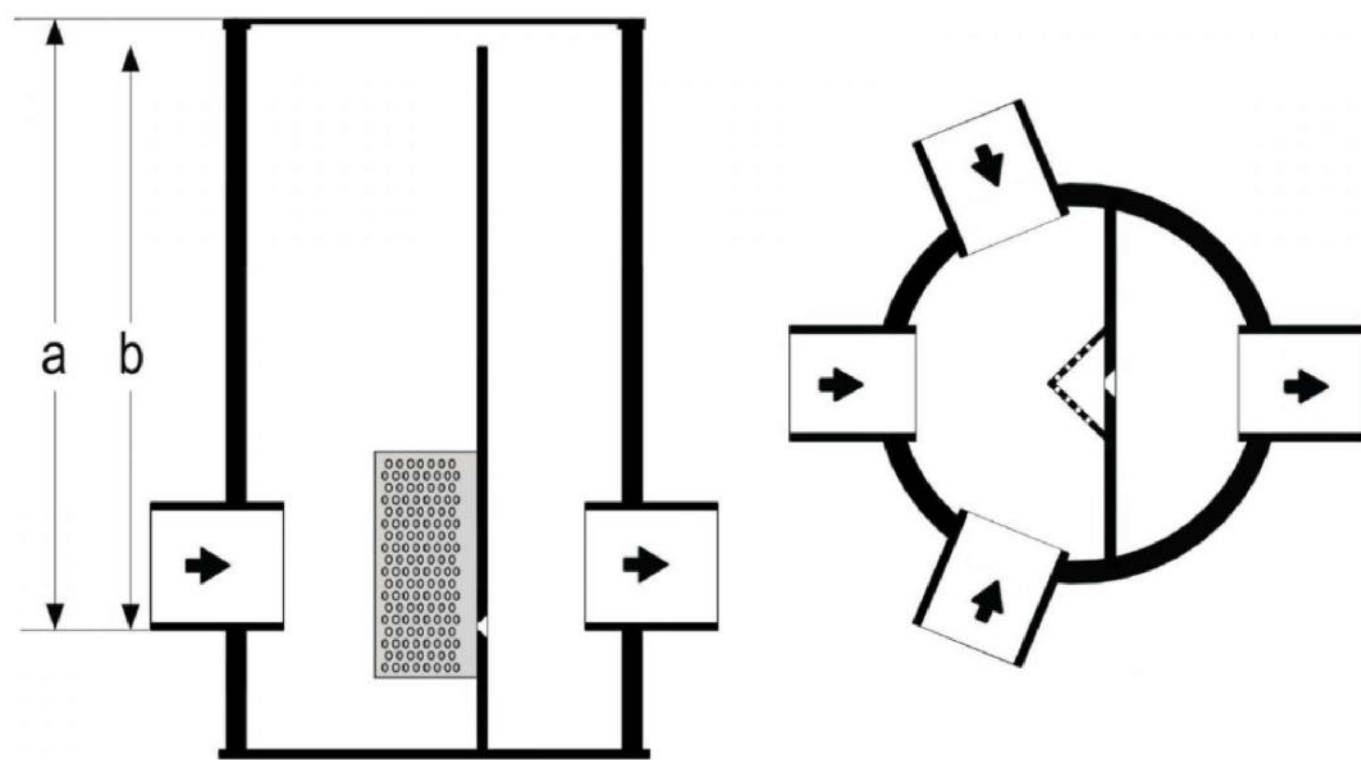
- Selected fill: free from stones larger than 40mm, lumps of clay over 100mm, timber frozen material and vegetable matter.
- Granular material: should conform to BS 882:1983 table 4 or BS8301:1985 Appendix D. Compaction fraction 0.3 for class N 0.2 for class F and B.

'x' - Denotes external pipe diameter.

FLOW CONTROL CHAMBER PS3

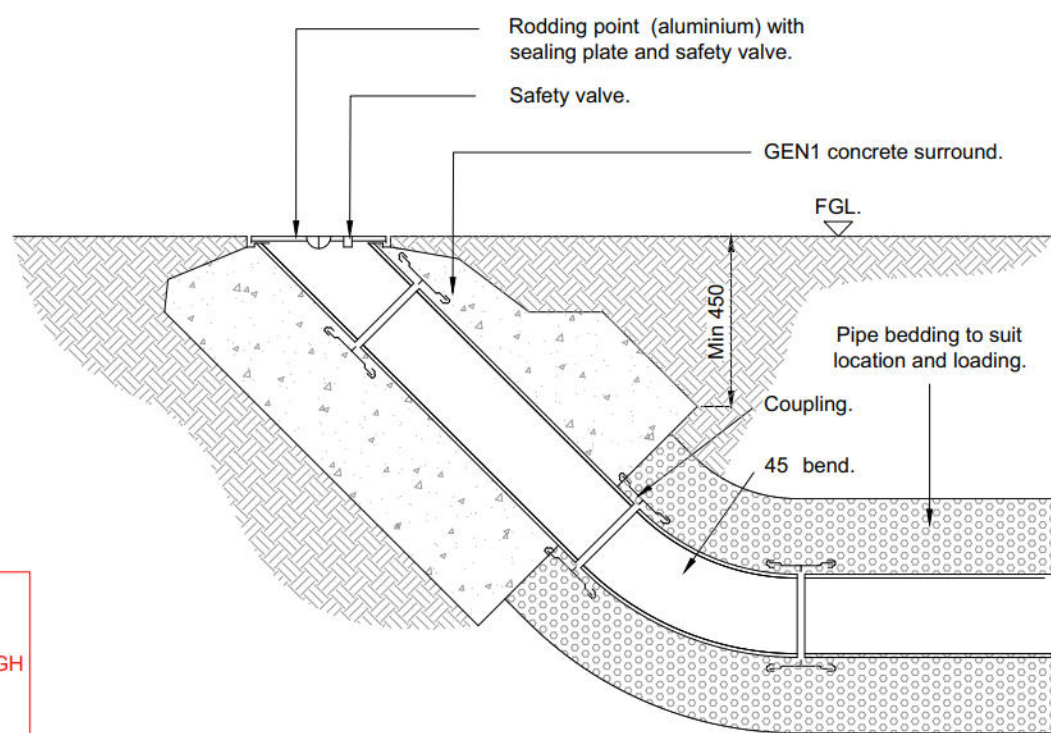
SCHEDULE

COVER LEVEL: 9.777
INVERT LEVEL: 8.450
DESIGN FLOW RATE: 1.0 l/s, DESIGN HEAD: 1.10 m
ORIFICE DIAMETER: 21mm
CALCULATED FLOW RATE (1 AEP STORM): 0.949 l/s
FLOW CONTROL UNIT: SUDSTORE
CONTROFLOW UNIVERSAL
UNIT REFERENCE: SUDS02005
MANHOLE DIMENSIONS: 500 mm

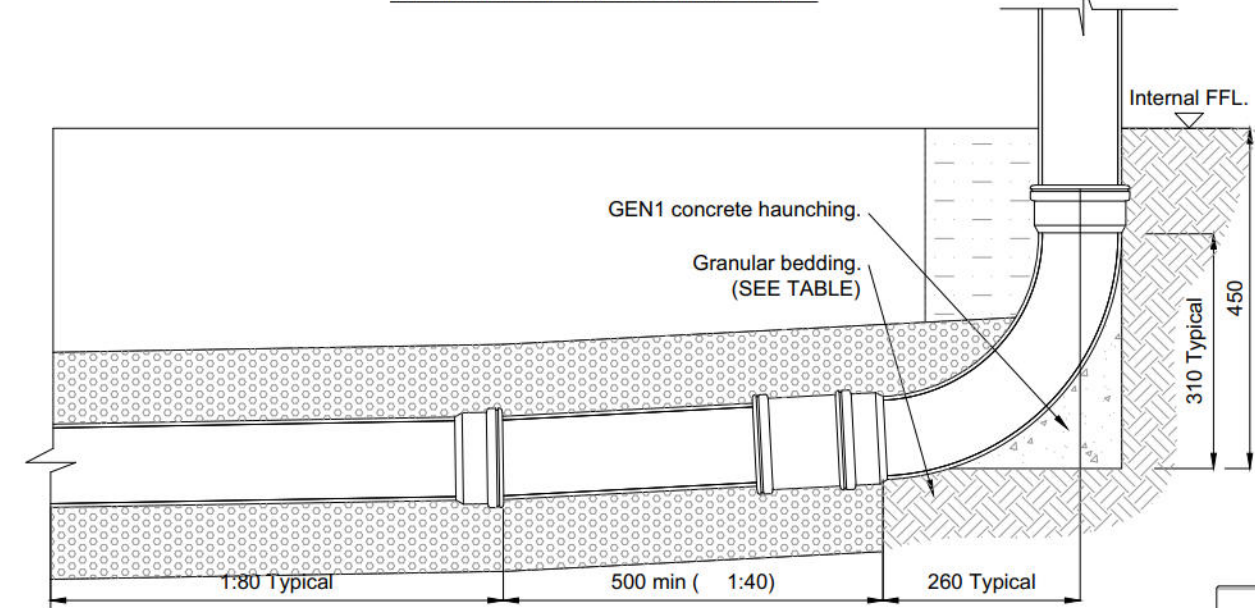


CONTROFLOW UNIVERSAL EXAMPLE SECTION

FURTHER DETAIL SHOWN IN APPENDICES

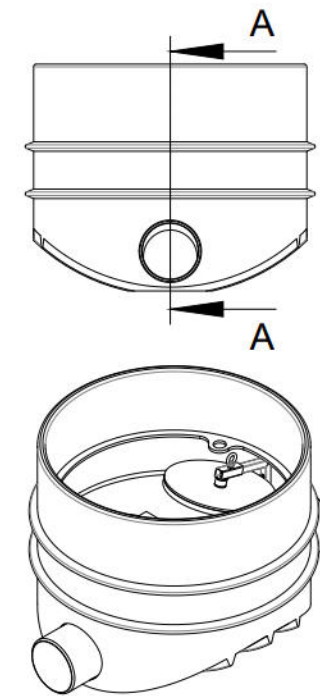


DETAIL OF RODDING EYE



DETAIL OF FOUL REST BEND

(Scale 1:20)



WABACK WB110-600 NON RETURN CHAMBER 100mm INCOMING AND OUTGOING PIPE DIAMETER, MINIMUM INVERT DEPTH 650mm BELOW GROUND LEVEL

DRAINAGE NOTES:

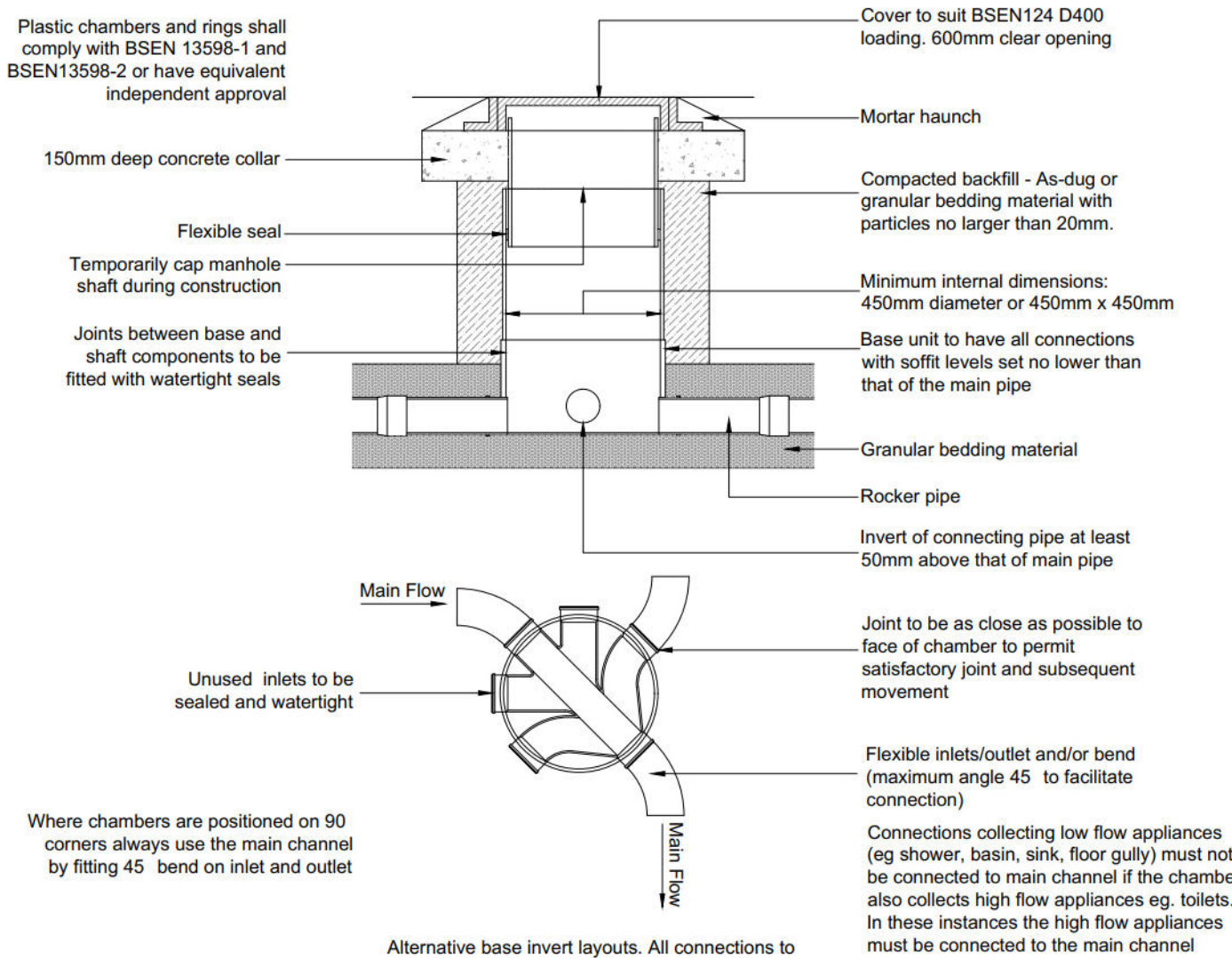
- All drainage works to be constructed in strict accordance with specification of the Local Authority, Building Regulations, Design and Construction Guidance (published by Water UK) BS EN 752.
- Any existing drainage found crossing the site is to be investigated, and if found to be 'live', it should be diverted in consultation with Harbournstone Design.
- For location and setting out of building drainage points refer to architects drawings.
- All pipe runs near buildings to comply with the Building Regulations 2015 part H11. Where a pipe is within 1m of a foundation the trench shall be filled with class GEN3 concrete to the lowest level of the foundation. Where the trench is further than 1m from the foundation, the trench shall be filled with class GEN3 concrete to a level below the lowest level for the foundation equal to the distance from the foundation less 150mm. In both cases the pipe shall be bedded and surrounded in 150mm thick class GEN3 concrete.
- Where pipes, external to the structures, have a depth to soffit from ground level of less than 450mm they shall have a class GEN3 concrete encasement (150mm thick).
- Where a pipe, under a carriageway, has a depth of cover of less than 1.2m the pipe shall be laid in a concrete bed and surround.
- Where a pipe, under a vehicular area other than a carriageway has a depth of cover if less than 0.5m the pipe shall be protected with a concrete slab set above it.
- In any circumstances where pipes are bedded and surrounded in concrete flexible joints should be provided, compressible boards (fireboard or polystyrene) shall be provided at a maximum of 8m centres (coinciding with pipe joints), the boards shall be pre-cut to pipe diameter and to a height and width equal to the concrete cross section, a board thickness of 10mm for pipes up to 450mm nominal diameter and 30mm for pipes over 450mm nominal diameter.
- All private building drainage shall be constructed in strict accordance with BS EN 752. Foul drainage beneath the floor slab shall be laid, shall be laid no flatter than 1:40. Unless otherwise specified below ground building drainage external to the building shall be 100mm diameter and shall be laid at a minimum gradient of (1 in 1 in 40) 1 in 80 for foul drains and 1 in 80 for surface water drains.
- All building drains shall be laid in conjunction with 'non adoptive bedding details' (class o or n or b) unless otherwise specified.
- All pipes, bends and junction for private building drainage shall be UPVC conforming to BS4660, BS EN 13588 and BS EN 1401 as appropriate and shall be laid in accordance with the manufacturer's specification.
- All pipes, bends and junction materials for adoptable drainage shall be vitrified clay, extra strength or super strength to BS EN 205, with flexible joints and kilnmark certified.
- All back inlet gullies to be roddable or connected to inspection chambers.
- All gully connections other than at manholes to be 'Y' junctions.
- All road gully connections to be 150mm diameter.
- All stub stacks to be fitted with air admittance valves where branch drain exceeds 12m except at the head of the run. Soil vent pipes located at the head of a run to terminate to fresh air.
- No low point shall be without a method of drainage.
- All connections to be soffit to soffit unless otherwise noted.
- All concrete and concrete products to be in accordance with BRE 363 for sulphates.
- The locations of all building drainage points shall be cross referenced against the architects drawings during setting out and any discrepancies reported immediately.
- Before connections are made to existing public sewers an application under S106 must be made to relevant sewerage undertaker.
- The precise depth and location and size of existing pipes, watercourses or manholes where connections or diversion are proposed must be confirmed and reported to the engineer before works commence on site.
- Any existing drains to be abandoned to be decommissioned in accordance with the Building Regulations by either grubbing, infilling or sealing.
- Should groundwater be encountered on site during construction Harbournstone Design shall be informed to determine if additional measures are required. This includes design against flotation.
- The drainage system shall be fully cleansed on completion of the project using methods that ensure pollution off site does not occur.
- Any existing land drains severed during construction shall be reinstated.

GENERAL

- The main contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of existing buildings at all times.
- The main contractor is responsible for dealing with all occurrences of ground water during the construction period.
- The contractor must comply with all current legislation relating to health safety.
- All products specified shall be installed in strict accordance with the manufacturers recommendations and instructions. If there are discrepancies between that information and the details on any Harbournstone Design drawings, the manufacturers instructions must be used.
- All concrete and cement mortar to be in accordance with BS8500, BS EN 206 and BS EN 998.
- The contractor is responsible for managing surface water run off during construction.

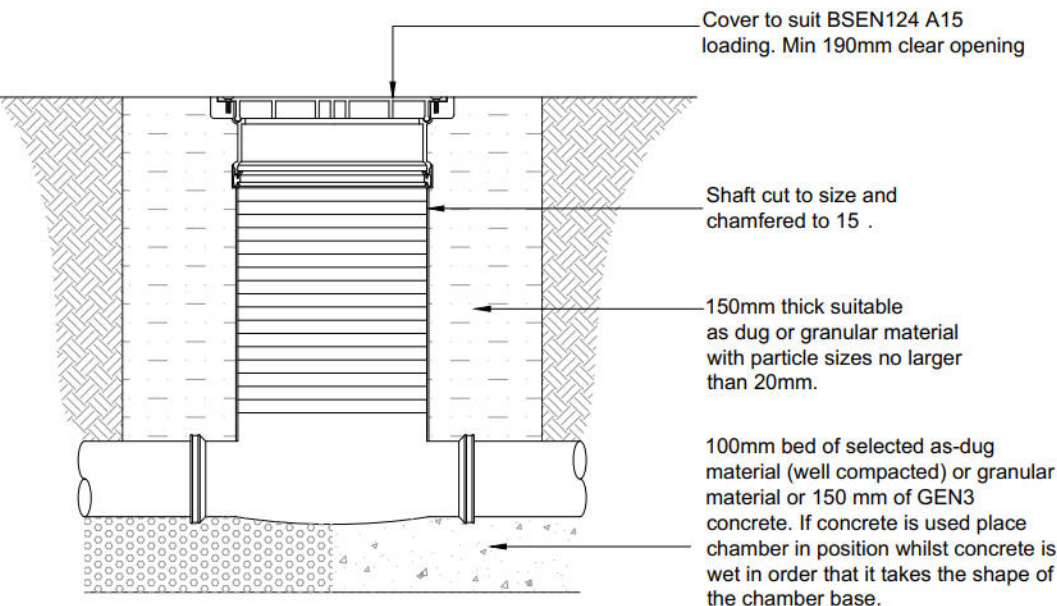
BUILDING REGULATIONS MINIMUM DIMENSIONS FOR CHAMBERS

(Not to Scale)
This table complies with the Building Regulations 2015
Section 'H' - Drainage Waste Disposal.



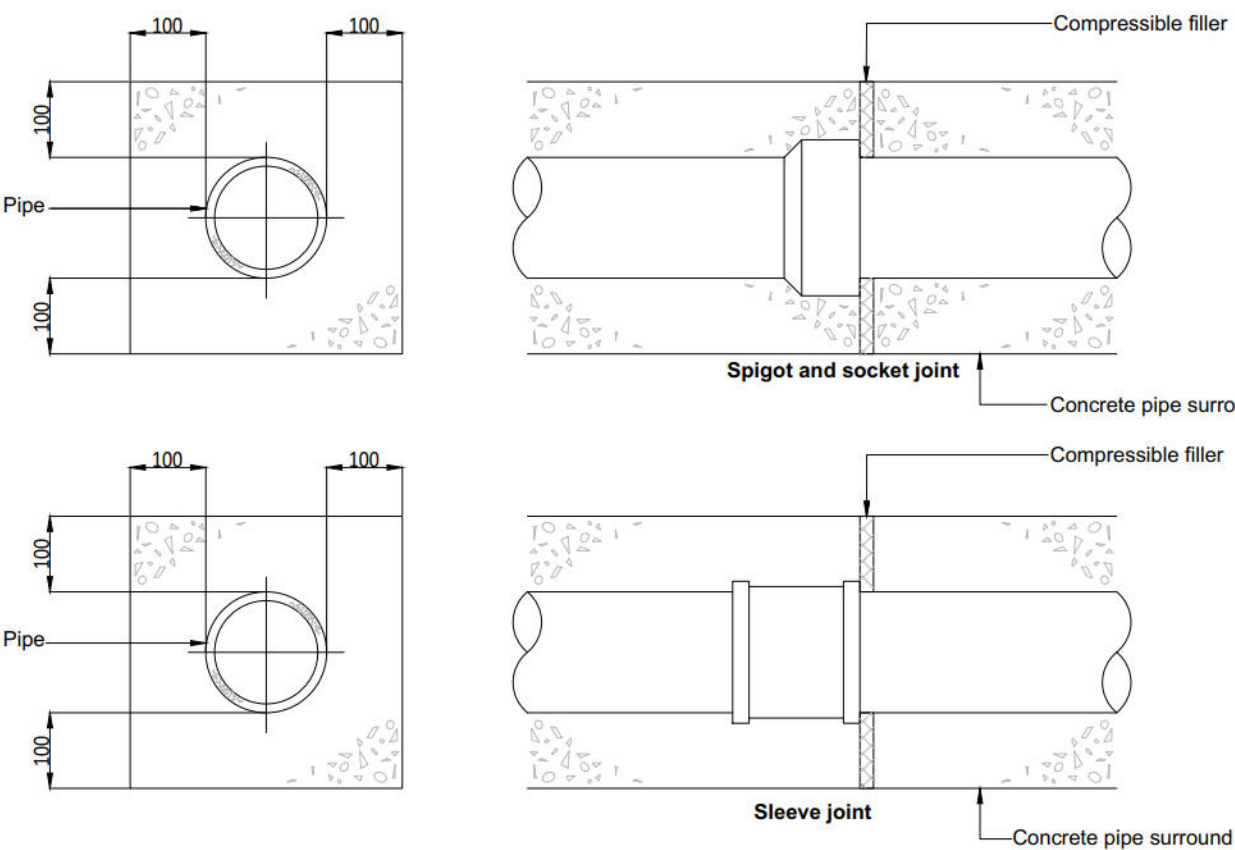
TYPICAL ACCESS CHAMBER DETAIL - 450 (FOOTPATHS AND PRIVATE DRIVES)

1.2m MAXIMUM DEPTH TO FROM COVER TO PIPE INVERT (OR ACCESS RESTRICTED TO MAX 300 X 300 / 350). LOCATED IN AREAS SUBJECT TO LIGHT VEHICLES AND FOOTPATHS



TYPICAL SHALLOW ACCESS CHAMBER DETAIL - 250

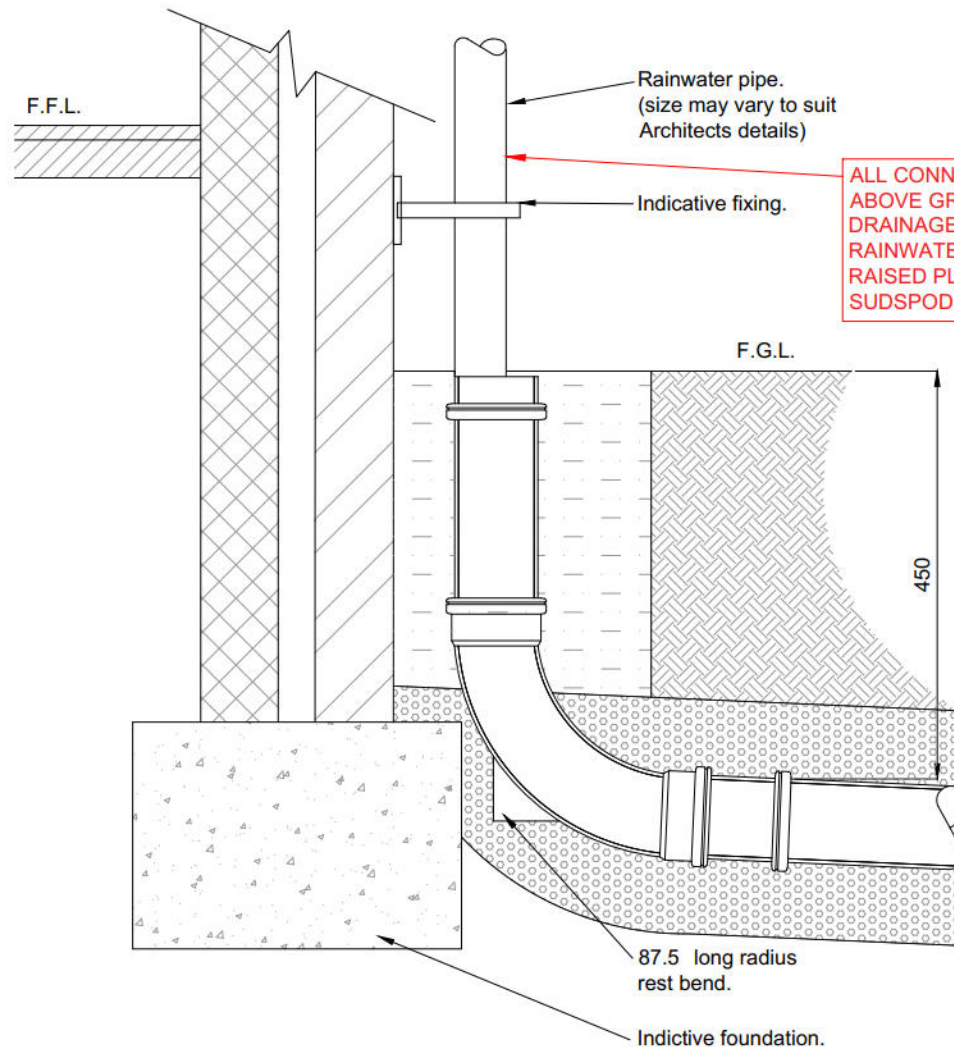
0.6m MAXIMUM DEPTH TO FROM COVER TO PIPE INVERT.



JOINTS FOR ENCASED PIPES

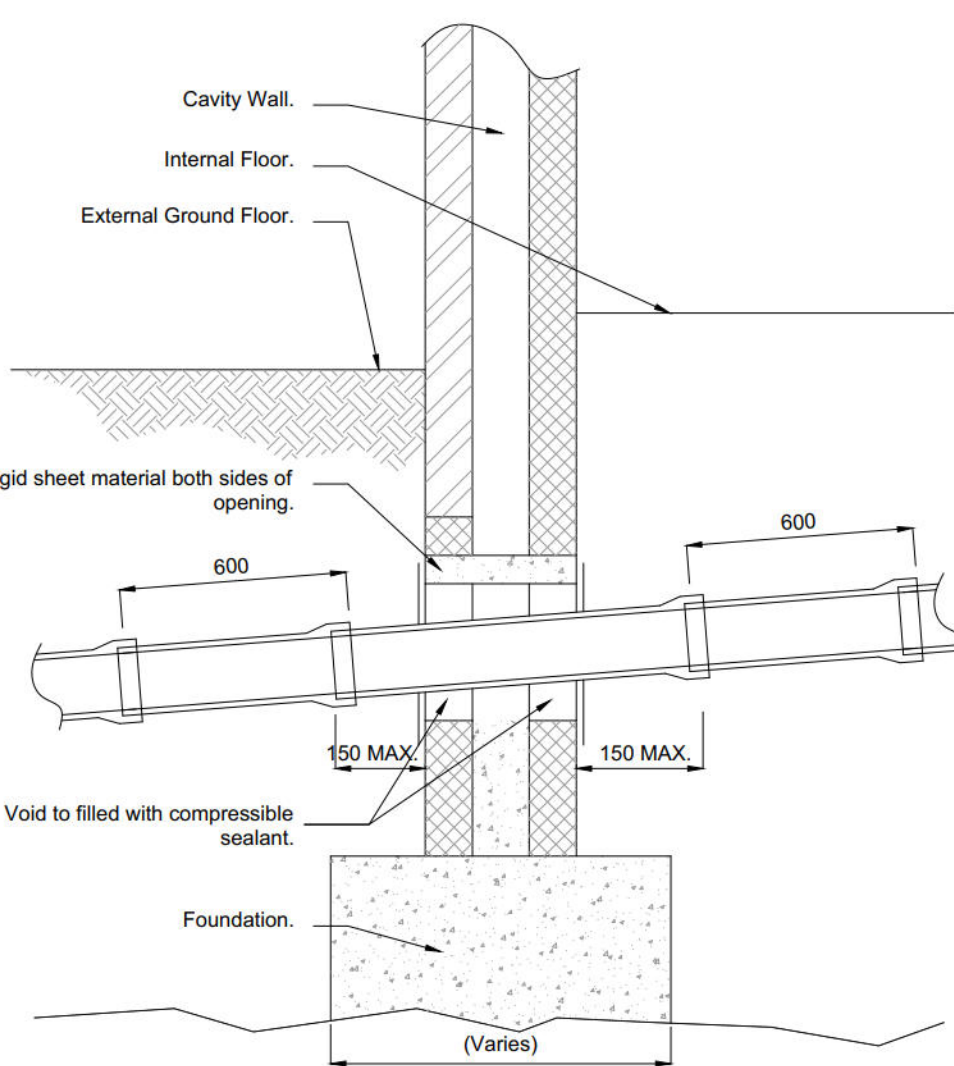
DETAIL OF PIPE RUNS NEAR BUILDINGS

(Not to Scale)



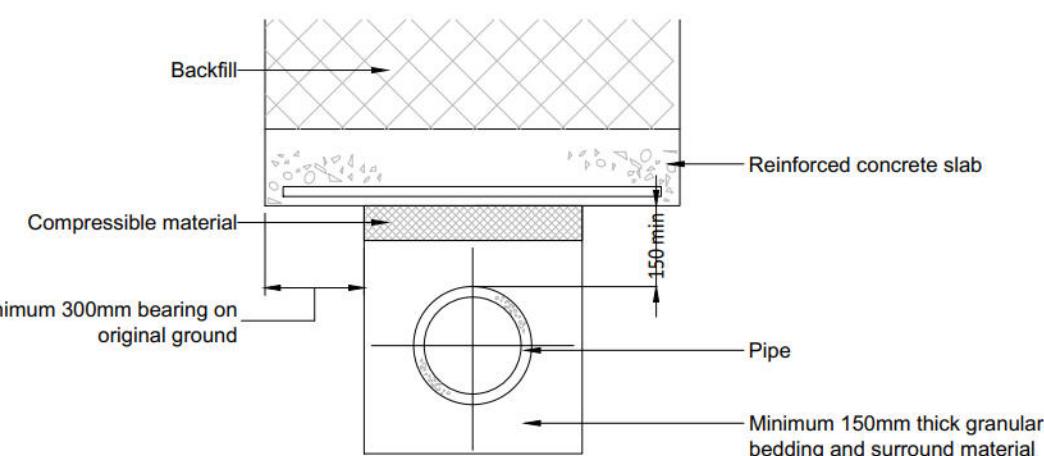
DETAIL OF RAINWATER PIPE

(Scale 1:20)



TYPICAL SECTION PIPE PASSING THROUGH WALL PIPE THROUGH LITTELLED OPENING

(Scale 1:20)



PROTECTION OF PIPES AT SHALLOW DEPTH

ARRANGEMENT OF PIPE JUNCTION WITHIN MANHOLE 9201

Nominal diameter (mm)	Maximum effective length (m)
150 - 600	0.6
601 - 750	1.00
over 750	1.25

All pipes entering the bottom of the manhole to have soffits level.

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RESIDUAL HAZARDS

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- Working in vicinity of Waterbodies with variable surface water flows debris. Contractor to provide method statement and ensure operatives have appropriate safeguarding equipment.

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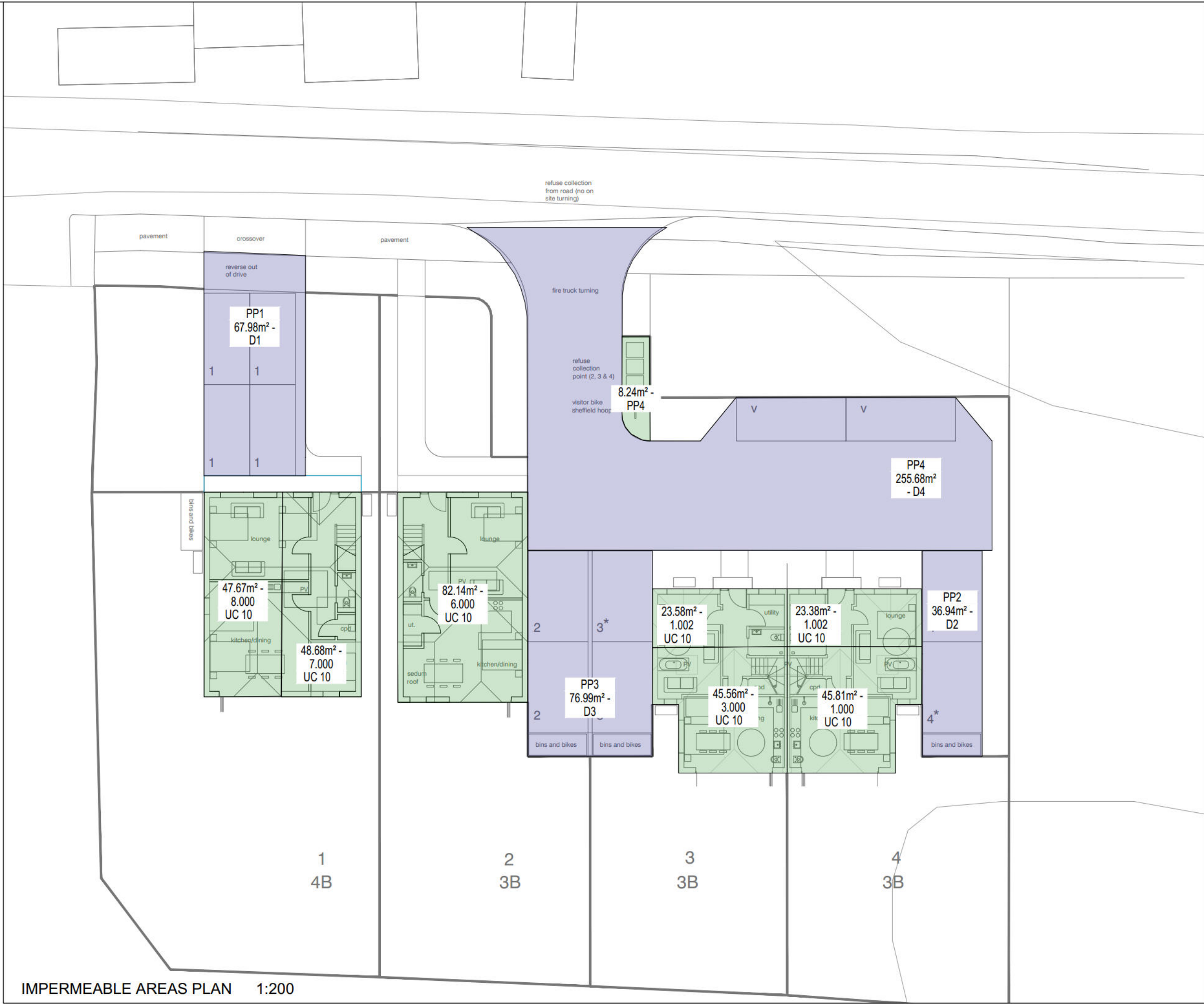
Drawing Status: **DISCHARGE OF CONDITION**
Client: Chichester Carpentry & Building Ltd

Project: Ryefields Farmhouse, Oak Tree Lane

Drawing Title: Construction Details

Scale	Date	Drawn By	Checked By
As Shown	May '26	DJL	CT
Drawing No.	2026-C160-005		
Revising No.	-		

	COVER	I	A	9.30m		COVER	I	A	9.05m
	9.798m	N	B			9.949m	N	B	9.05m
	SIZE	V	C			DIAMETER	V	C	9.05m
	710mm x710mm	R	D			450mm	R	D	
	Type E	T	E			450 Inspection	T	E	
	COVER	I	A	9.35m		COVER	I	A	9.34m
	9.920m	N	B			9.89m	N	B	
	SIZE	V	C			DIAMETER	V	C	
	710mm x710mm	R	D			180mm	R	D	
	Type E	T	E			Type E	T	E	
	COVER	I	A	9.25m		COVER	I	A	9.34m
	9.817m	N	B			9.89m	N	B	
	SIZE	V	C			DIAMETER	V	C	
	710mm x710mm	R	D			180mm	R	D	
	Type E	T	E			Type E	T	E	
	COVER	I	A	9.08m		COVER	I	A	9.34m
	9.676m	N	B			9.89m	N	B	9.34m
	SIZE	V	C			DIAMETER	V	C	
	710mm x710mm	R	D			180mm	R	D	
	Type E	T	E			Type E	T	E	
	COVER	I	A	8.404m		COVER	I	A	9.35m
	9.27m	N	B			9.904m	N	B	9.35m
	DIAMETER	V	C			DIAMETER	V	C	
	180mm	R	D			250mm	R	D	
	Type E	T	E			250 Inspection	T	E	
	COVER	I	A	8.46m		COVER	I	A	9.25m
	9.40m	N	B	8.46m		9.815m	N	B	9.25m
	DIAMETER	V	C			DIAMETER	V	C	
	1200mm	R	D			450mm	R	D	
	Type B	T	E			450 Inspection	T	E	
	COVER	I	A	8.835m		COVER	I	A	8.26m
	9.732m	N	B	8.835m		9.807m	N	B	8.26m
	DIAMETER	V	C			DIAMETER	V	C	
	450mm	R	D			450mm	R	D	
	450 Inspection	T	E			450 Inspection	T	E	
	COVER	I	A	8.91m		COVER	I	A	8.13m
	9.804m	N	B	8.96m		9.810m	N	B	8.13m
	DIAMETER	V	C	8.91m		DIAMETER	V	C	
	600mm	R	D	8.96m		450mm	R	D	
	Type E	T	E			450 Inspection	T	E	
	COVER	I	A	8.98m		COVER	I	A	7.745m
	10.018m	N	B	9.03m		9.698m	N	B	7.745m
	DIAMETER	V	C	9.03m		DIAMETER	V	C	
	450mm	R	D	9.03m		450mm	R	D	
	450 Inspection	T	E	8.98m		450 Inspection	T	E	
	COVER	I	A	9.035m		COVER	I	A	7.025m
	9.805m	N	B	9.035m		9.38m	N	B	7.025m
	DIAMETER	V	C	9.035m		DIAMETER	V	C	
	450mm	R	D			1200mm	R	D	
	450 Inspection	T	E			Type B	T	E	
	COVER	I	A	9.095m		COVER	I	A	8.48m
	9.788m	N	B	9.145m		9.775m	N	B	
	DIAMETER	V	C	9.095m		DIAMETER	V	C	
	450mm	R	D	9.145m		450mm	R	D	
	450 Inspection	T	E			450 Inspection	T	E	
	COVER	I	A	9.115m		COVER	I	A	9.00m
	9.812m	N	B	9.115m		10.004m	N	B	
	DIAMETER	V	C	9.165m		DIAMETER	V	C	
	450mm	R	D			450mm	R	D	
	450 Inspection	T	E			450 Inspection	T	E	
	COVER	I	A	9.21m		COVER	I	A	9.00m
	9.915m	N	B	9.26m		9.968m	N	B	
	DIAMETER	V	C	9.26m		DIAMETER	V	C	
	450mm	R	D	9.26m		450mm	R	D	
	450 Inspection	T	E			450 Inspection	T	E	
	COVER	I	A	9.10m		COVER	I	A	8.875m
	9.816m	N	B	9.10m		9.893m	N	B	
	DIAMETER	V	C			DIAMETER	V	C	
	450mm	R	D			450mm	R	D	
	450 Inspection	T	E			450 Inspection	T	E	



PHASE: 0								
MH No.	MANHOLE DIMENSION (mm)	MANHOLE TYPE	COVER TYPE	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH TO SOFFIT (m)	EASTING (m)	NORTHING (m)
9102	1200	Type A		9.280	5.720	3.410	493959.862	104193.930

MH No.	MANHOLE DIMENSION (mm)	MANHOLE TYPE	COVER TYPE	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH TO SOFFIT (m)	EASTING (m)	NORTHING (m)
D1	710x710	Type E	B125	9.798	9.300	0.398	493985.867	104267.131
D2	710x710	Type E	B125	9.920	9.350	0.470	494025.958	104249.717
D3	710x710	Type E	B125	9.817	9.250	0.467	494006.018	104249.173
D4	710x710	Type E	D400	9.676	9.080	0.446	494008.658	104257.378
PS1	1200	Type B		9.400	8.460	0.790	493968.944	104201.402
PS2	450	450 Inspection		9.732	8.835	0.747	493972.584	104257.264
PS3	600	Type E		9.804	8.910	0.744	493983.756	104257.293
PS4	450	450 Inspection		10.018	8.980	0.888	493993.973	104257.318
PS5	450	450 Inspection	D400	9.805	9.035	0.620	494002.101	104257.339
PS6	450	450 Inspection	B125	9.788	9.095	0.543	494008.451	104251.187
PS7	450	450 Inspection	B125	9.812	9.115	0.547	494011.106	104251.654
PS8	450	450 Inspection	B125	9.915	9.210	0.555	494024.713	104251.599
PS9	450	450 Inspection		9.816	9.100	0.616	493983.854	104266.299
PS10	450	450 Inspection		9.949	9.050	0.799	493994.597	104255.470
PS11	180	Type E		9.890	9.340	0.450	493994.670	104243.224
PS12	180	Type E		9.890	9.340	0.450	493994.055	104243.400
PS13	180	Type E		9.890	9.340	0.450	493983.803	104251.768
PS14	250	250 Inspection	B125	9.904	9.350	0.454	494024.695	104243.230
PS16	450	450 Inspection	B125	9.815	9.250	0.465	494008.452	104243.540
PS0 out	180	Type E		9.270	8.404	0.716	493968.802	104192.979
PF2	450	450 Inspection		9.807	8.260	1.447	494010.619	104250.997
PF3	450	450 Inspection	B125	9.810	8.130	1.580	494002.085	104256.406
PF4	450	450 Inspection		9.698	7.745	1.853	493971.581	104256.408
PF5	1200	Type B		9.380	7.025	2.255	493967.951	104200.000
PF7	450	450 Inspection		9.775	8.480	1.195	494028.176	104250.953
PF8	450	450 Inspection		10.004	9.000	0.904	493998.719	104255.639
PF9	450	450 Inspection		9.968	9.000	0.868	493988.222	104255.608
PF10	450	450 Inspection		9.893	8.875	0.918	494018.147	104250.302

Manhole No.	Pipe No.	Adoptable IMP	Adoptable UC	Private IMP	Private UC	Total IMP UC
RWP2	0.000	0.000	0.000	0.000	0.000	0.000
RWP1	0.000	0.000	0.000	0.000	0.000	0.000
RWHT6	1.000	0.000	0.000	45.806	4.581	50.386
PS14	1.001	0.000	0.000	0.000	0.000	0.000
PS8	1.002	0.000	0.000	0.000	0.000	0.000
PS7	1.003	0.000	0.000	0.000	0.000	0.000
PS6	1.004	0.000	0.000	0.000	0.000	0.000
PS5	1.005	0.000	0.000	0.000	0.000	0.000
PS4	1.006	0.000	0.000	0.000	0.000	0.000
PS3	1.007	0.000	0.000	0.000	0.000	0.000
PS2	1.008	0.000	0.000	0.000	0.000	0.000
PS1	1.009	0.000	0.000	0.000	0.000	0.000
RWHT7	2.000	0.000	0.000	23.381	2.338	25.719
D2	3.000	0.000	0.000	36.939	0.000	36.939
RWHT5	4.000	0.000	0.000	23.580	2.358	25.938
RWHT4	5.000	0.000	0.000	45.558	4.556	50.114
PS16	5.001	0.000	0.000	0.000	0.000	0.000
D3	6.000	0.000	0.000	76.992	0.000	76.992
D4	7.000	0.000	0.000	263.921	0.000	263.921
PS11	8.000	0.000	0.000	40.599	4.060	44.659
PS10	8.001	0.000	0.000	0.000	0.000	0.000
RWHT3	9.000	0.000	0.000	41.481	4.148	45.629
PS12	10.000	0.000	0.000	30.158	3.016	33.174
RWHT2	11.000	0.000	0.000	18.612	1.861	20.474
D1	12.000	0.000	0.000	67.976	0.000	67.976
PS9	12.001	0.000	0.000	0.000	0.000	0.000
RWHT1	13.000	0.000	0.000	47.666	4.767	52.433
PS13	13.001	0.000	0.000	0.000	0.000	0.000
Totals:		0.000	0.000	762.671	31.684	794.355

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A	Revised Issue	8/7/26
-	Original Issue	-
Rev.	Amendments	Date



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Drawing Status	DISCHARGE OF CONDITION
Client	Chichester Carpentry & Building Ltd

Project	Ryefields Farmhouse, Oak Tree Lane
---------	------------------------------------

Drawing Title	Manhole & Impermeable Areas Schedules
---------------	---------------------------------------

Scale	Date	Drawn By	Checked By
As Shown	May '26	DJL	CT

Drawing No.	Rev.
2026-C106-006	A



APPENDICES



Appendix A

Greenfield Runoff Calculation

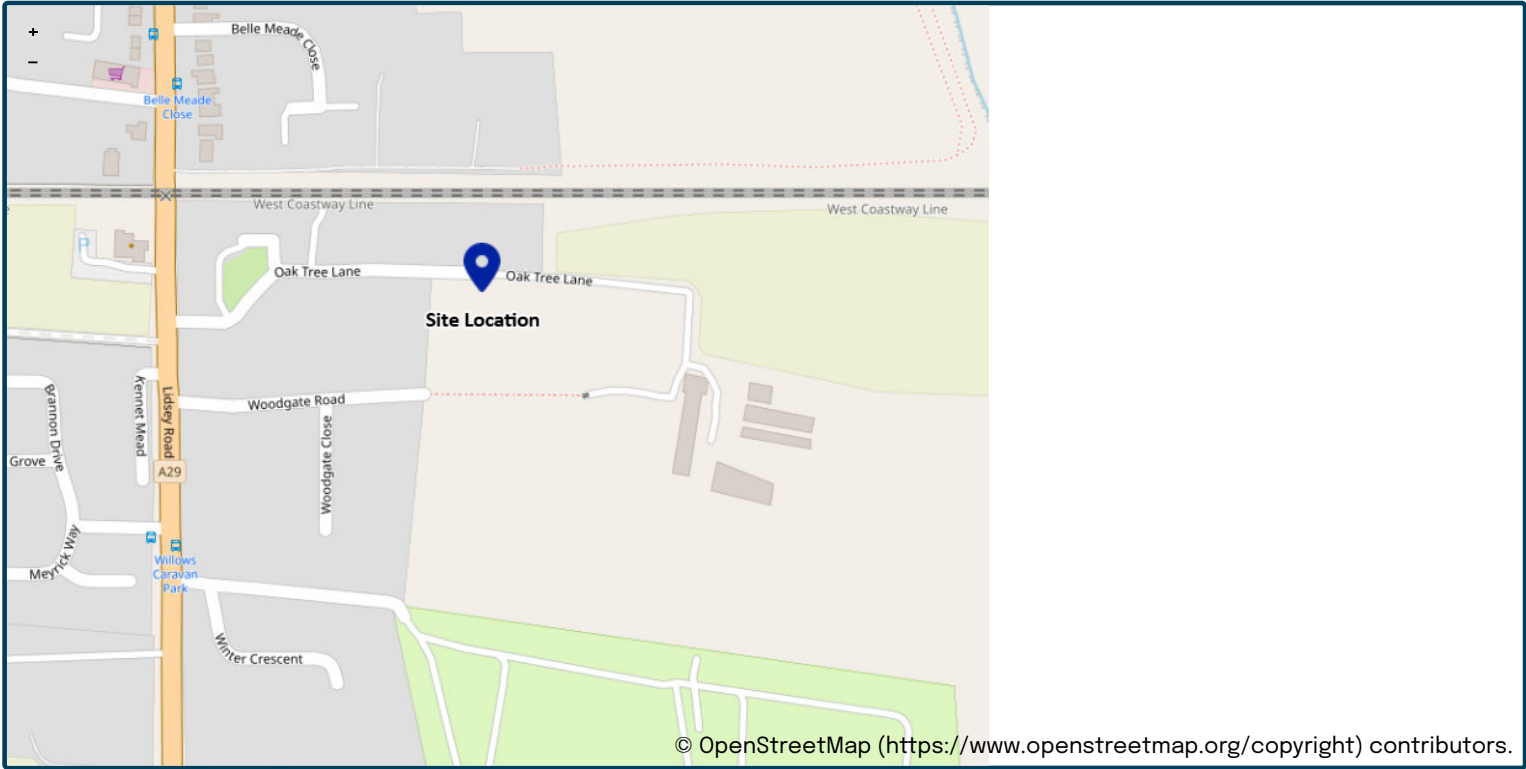
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	13/05/2026
Calculated by	DL
Reference	C160
Model version	2.2.3

Location

Site name	Ryefields
Site location	Woodgate



Site easting (British National Grid)	494000
Site northing (British National Grid)	104246

Site details

Total site area (ha)	0.21	ha
----------------------	-----------------------------------	----

Greenfield runoff

Method

Method	FEH statistical (2025)
--------	-----------------------------------

FEH statistical (2025)

	<u>My value</u>	<u>Map value</u>
SAAR9120 (mm)	794	mm
BFIHOST19scaled	0.68	
QMed-QBar conversion	1.136	1.136
QMed (l/s)	0.4	l/s
QBar (FEH statistical 2025) (l/s)	0.4	l/s

Growth curve factors

	<u>My value</u>	<u>Map value</u>
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)	0.4	l/s
Flow rate 2 year (l/s)	0.4	l/s
Flow rate 10 years (l/s)	0.7	l/s
Flow rate 30 years (l/s)	1.0	l/s
Flow rate 100 years (l/s)	1.3	l/s
Flow rate 200 years (l/s)	1.6	l/s

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

Disclaimer

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



Appendix B Geotechnical Investigation Extracts

Soakage Testing Letter Report

CLIENT	Domusea
SITE ADDRESS	Ryelands Farmhouse, 4 Oak Tree Lane, Woodgate, Chichester, West Sussex PO20 3GU
REPORT REFERENCE	GWPR4660
ENGINEER	Roger Foord, Ground and Water Limited
INVESTIGATION LOCATIONS AND SCOPE OF WORKS	Site works were undertaken in on the 3 rd March 2022. Two trial pits (TP1 and TP2) were machine excavated to a depth of 0.80m bgl. Infiltration tests in accordance with the principles of BRE365 were undertaken in each of the trial pits. A trial hole location plan can be seen in Figure 1.

GROUND CONDITIONS ENCOUNTERED

Summary of Strata Encountered			
Strata	Depth Strata Encountered (m bgl)	Base of Strata (m bgl)	Thickness (m)
TOPSOIL: Brown gravelly sandy SILT. The sand was fine grained and the gravel was fine to medium, sub-angular flint.	GL	0.20m	0.20m
UNDIFFERENTIATED RIVER TERRACE DEPOSITS: Orangish brown sandy CLAY. The sand was fine to medium grained.	0.20m	>0.80m	>0.60m

GROUNDWATER

Groundwater was not encountered.

ROOTS

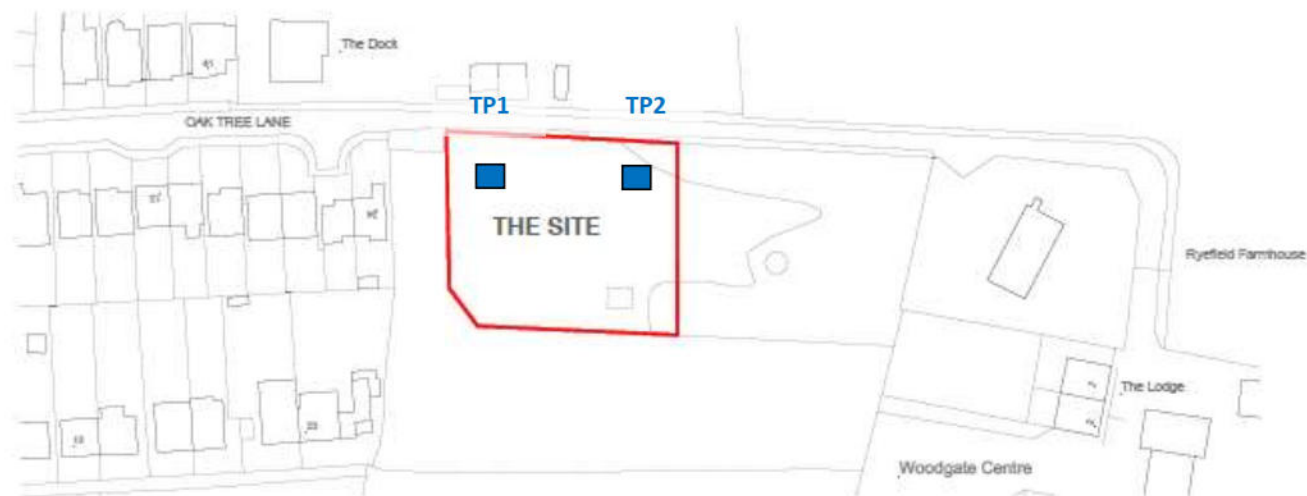
Roots were noted to a depth of 0.70m bgl in TP1 and 0.60m bgl in TP2.

Soakaway tests, in accordance with the principles of BRE365 were undertaken in the base of the trial pits at a depth of 0.80m bgl. TP1 and TP2 were all bottomed out within the soils of the Undifferentiated River Terrace Deposits generally comprising an orange brown sandy clay. The sand was fine to medium grained. The infiltration rates recorded within the trial pits can be seen tabulated below.

INFILTRATION TESTING

Infiltration Test Results – Recorded Infiltration Rates m/s			
	Test 1	Test 2	Test 3
TP1 @ 0.80m bgl within Undifferentiated River Terrace Deposits	3.26 x10 ⁻⁷ m/s	-	-
TP2 @ 0.80m bgl within Undifferentiated River Terrace Deposits	1.87 x10 ⁻⁷ m/s	-	-

Based upon the results of the infiltration tests, it was considered unlikely that the soils of the Undifferentiated River Terrace Deposits encountered at shallow depth would provide a suitable medium for soakaway installation.



LOCATION PLAN
SCALE 1:1250 @ a3



0m 10m 20m 50m 100m

— APPROXIMATE SITE BOUNDARY

NOTE: NOT TO SCALE

Project:

Ryelands Farmhouse, 4 Oak Tree Lane, Woodgate, Chichester, West Sussex PO20 3GU

Client:

Domesua

Date:

March 2022

Trial Hole Location Plan

Ref:

GWPR4660

Figure 1





Date: 03/03/2022

Contractor:

Equipment:

Page Number
Sheet 1 of 1

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

Roots noted to 0.70m bgl. Groundwater not encountered.





Trial Pit Log

Project Name: 4, Oak Tree Lane,		Client: Domusea		Date: 03/03/2022	
Location: Woodgate, Chichester, PO20 3GU		Contractor:			
Project No. : GWPR4660		Crew Name:		Equipment:	
Location Number TP2	Location Type TP	Level	Logged By	Scale 1:25	Page Number Sheet 1 of 1

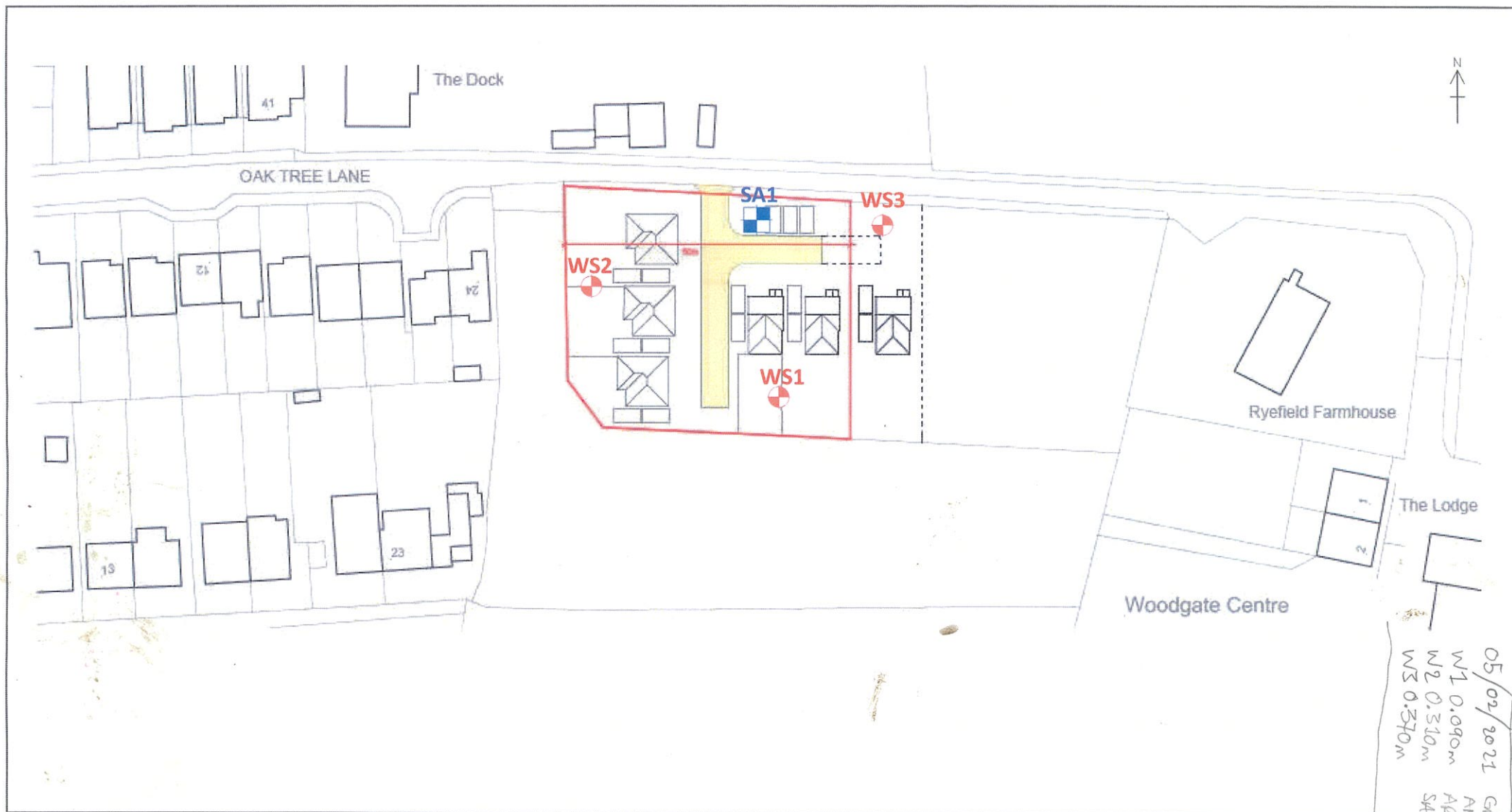
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20			Brown gravelly sandy SILT. The sand was fine grained and the gravel was fine to medium, sub-angular gravel. (TOPSOIL).	
					0.80			Orangish brown sandy CLAY. The sand was fine to medium grained. (UNDIFFERENTIATED RIVER TERRACE DEPOSITS).	
								End of Borehole at 0.800m	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

Roots noted to 0.60m bgl. Groundwater not encountered.





05/02/2021
 W1 0.090m
 W2 0.310m
 W3 0.370m

GROUND
 AND SURROUNDINGS
 AREA FULLED/
 SATURATED.

Notes:

1. Do not scale from this drawing.
2. All dimensions must be checked on site prior to commencement of work.
3. Where applicable this drawing is to be read in conjunction with other consultants drawings.
4. This drawing is the copyright of Impact Geotechnical Ltd.

Drawing Title:

Hole Location Plan

Site Name:

Land to the west of
 Ryefield Farm House

Project Reference:

P21.109A

Revision: 0

Drawn by: RM

Scale: Not to Scale



IMPACT
 GEOTECHNICAL

Percussion Drilling Log

Project Name: Ryefield Farm House	Client: Domusea	Date: 26/01/2021
Location: Eastergate, West Sussex	Contractor: Impact GEotechnical Ltd	
Project No. : P21.109B	Crew Name: SG	Drilling Equipment: Archway Dart
Borehole Number WS1	Hole Type WLS	Level
		Logged By RM
		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			Orange brown mottled pale grey sandy SILT/CLAY. Sand is fine (RIVER TERRACE DEPOSITS).	
		1.00	SPT	N=14 (2,2/3,3,4,4)				MADE GROUND: Grass over brown sandy Silt/Clay. Sand is fine. Rare subangular to subrounded fine to medium sized gravel of flint (TOPSOIL).	1
					1.50				
		2.00	SPT	N=17 (2,2/4,4,4,5)				Orange brown occasionally mottled light grey fine to medium SAND (RIVER TERRACE DEPOSITS).	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

Groundwater encountered at 1.40mbgl and noted to rise to ~1.30mbgl. 35mm diameter groundwater standpipe installed at 4.00mbgl with 1.00m plain pipe and 3.00m slotted pipe.

Percussion Drilling Log

Project Name: Ryefield Farm House		Client: Domusea		Date: 26/01/2021	
Location: Eastergate, West Sussex		Contractor: Impact GEotechnical Ltd			
Project No. : P21.109B		Crew Name: SG		Drilling Equipment: Archway Dart	
Borehole Number WS2	Hole Type WLS	Level	Logged By RM	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					
					0.15			MADE GROUND: Grass over brown sandy Silt/ Clay. Sand is fine. Rare subangular to subrounded fine to medium sized gravel of flint (TOPSOIL). Orange brown mottled pale grey sandy SILT/CLAY. Sand is fine (RIVER TERRACE DEPOSITS).	1
		1.00	SPT	N=14 (2,2/3,3,4,4)		1.40		Orange brown occasionally mottled light grey fine to medium SAND (RIVER TERRACE DEPOSITS).	2
		2.00	SPT	N=17 (2,2/4,4,4,5)					3
					4.00			End of Borehole at 4.00m	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

Groundwater encountered at 1.40mbgl and noted to rise to ~1.20mbgl. 35mm diameter groundwater standpipe installed at 4.00mbgl with 1.00m plain pipe and 3.00m slotted pipe.

Percussion Drilling Log

Project Name: Ryefield Farm House	Client: Domusea	Date: 26/01/2021
Location: Eastergate, West Sussex	Contractor: Impact GEotechnical Ltd	
Project No. : P21.109B	Crew Name: RM	Drilling Equipment: Archway Dart
Borehole Number WS3	Hole Type WLS	Level
		Logged By RM
		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: Grass over brown sandy Silt/Clay. Sand is fine. Rare subangular to subrounded fine to medium sized gravel of flint (TOPSOIL). Orange brown mottled pale grey sandy SILT/CLAY. Sand is fine (RIVER TERRACE DEPOSITS).	1
		1.00	SPT	N=14 (1,2/3,3,4,4)		1.40		Orange brown occasionally mottled light grey fine to medium SAND (RIVER TERRACE DEPOSITS).	2
		2.00	SPT	N=17 (2,3/3,4,5,5)					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

Groundwater encountered at 1.40mbgl and noted to rise to ~1.20mbgl. 35mm diameter groundwater standpipe installed at 3.80mbgl with 0.80m plain pipe and 3.00m slotted pipe.



Appendix C Southern Water Sewer Records



(c) Crown copyright and database rights 2026 Ordnance Survey AC0000808122 Date: 14/05/26 Scale: 1:1250 Map Centre: 493963,104249 Data updated: 17/04/26 Our Ref: 2121238 - 1 Wastewater Plan A3
Powered by digdat

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2026 Ordnance Survey AC0000808122. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

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

dan@harbourstonedesign.co.uk	
C160	





Appendix D Planning Stage Drainage Design



Legend:

- HB1 Manhole with Hydro Brake limiting discharge to 1.0lit/sec
- Existing Southern Water manhole with backdrop connection- Subject to S106 Agreement
- Domestic surface water gravity sewer
- Domestic foul water gravity sewer
- Domestic combined gravity sewer
- Type 3 manhole - 450Ø
- Type 4 inspection chamber - 280Ø
- ST Silt trap inspection chamber - 450Ø
- Surface water attenuation storage for 1 in 100yr storm + 45%CC +10% UC
- FFL: 11.60
- Garden levels
- Flood Flow Route

Foul Water Drainage Strategy:

- The nearest public sewer to achieve a gravity connection is situated 40 metres south of the site in third party land at manhole Ref9102 for which the land owner has given consent to lay a connection through to connect into this manhole.
- Southern Water have confirmed that there is capacity at manhole Ref9202 to cater for the foul water flow from the proposed development of 0.05lit/sec.
- Manhole Ref9102 is downstream of manhole Ref9202 and will allow a gravity connection from the site rather than a pumped discharge if the connection was made at manhole Ref9202 situated north of the site in Oak Tree Lane.
- Connection to manhole Ref9102 will be subject to a S106 agreement with Southern Water

Surface Water Drainage Strategy:

- In order to provide an acceptable surface water drainage strategy for the proposed development the SuDS hierarchy for sustainable drainage has been followed. Winter monitoring has shown that the recorded groundwater levels preclude the use of domestic soakaways as the means of surface water disposal with the highest recorded level being 0.09m below ground level so it will only be possible to utilise a shallow infiltration system for the permeable block paved drives and access. The nearest watercourse is 0.25km east of the site and any access to it will be over third party land to which the developer has no rights. The new Water UK 'Design & Construction Guidance for Foul and Surface Water Sewers' precludes the requisitioning of a surface water outfall to a watercourse so this solution is not achievable. Southern Water asset plans show that there is a public sewer south of the site in third party land for which the land owner has given consent to lay a connection through to connect into manhole Ref9102. Southern Water confirmed in July 2021 that there is adequate capacity in this sewer network to discharge a surface water flow of 1.0lit/sec. Although Southern Water stated that the results were only valid for a 12 months period there has been no material change to the network that would preclude their acceptance of such a small discharge. It should be noted that in line with SuDS it is proposed to install water butts for each property which will help further reduce the flow into the network. Connection will be into manhole Ref9102, which is downstream of manhole Ref9202, this will be subject to a S106 Agreement with Southern Water.
- Utilising the allowable discharge of 1.0 lit/sec and catering for the 1 in 100 year storm event with an additional 45% allowance for climate change and incorporating a further 10% allowance on the impermeable area for 'urban creep' the volume of attenuation required calculated by the MicroDrainage suite is 22.1m³.
- It is proposed that this volume will be stored in a cellular 'Aquacell' tank at the southern end of the site prior to discharging through a 'Hydro Brake' vortex flow control into the sewer network.
- All surface water drainage features and pollution control measures will be maintained by the site specific management company set up for any site maintenance requirements and which will be funded by an annual payment from residents.
- Prior to discharging into manhole Ref9102 the surface water and foul discharge from the site will be combined into a single outlet which will be subject to a S106 connection Agreement with Southern Water.

D	28.11.24	Drainage layout amended	KN
C	15.10.24	Drainage layout amended & rainwater butts added	KN
B	06.09.24	Issue size amended	KN
A	02.09.24	Initial issue	KN
Rev.	Date	Details	Initials

Drawing Status

PRELIMINARY FOR PLANNING

Project

RYEFIELD FARMHOUSE, WOODGATE BARNHAM

Client



KAZYS NARBUTAS CONSULTING
Civil Engineering Consultant
Unit 24b, Romsey Industrial Estate, Greatbridge Road, Romsey, Hants. SO51 0HE
Telephone: 01794 223146 Email: kazys.n@knc.email

Drawing Title

Engineering Details
Drainage Strategy

Drawn	Checked	Scales	Paper Size	Date
KN		1:500	A2	09.24
Job No.	Drawing No.	Revision		
KNC2107	602-02	D		



EXTRACT FROM PYE HOMES DRAINAGE PROPOSALS

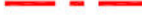
- In order to provide an acceptable surface water drainage strategy for the proposed development the SUDS hierarchy for sustainable drainage has been followed, with the following has been allowed for:

 - 1. The use of soakaways as the means of surface water disposal with the highest recorded level required is 0.9m below ground level.
 - 2. The nearest watercourse is 0.228km east of the site and any access to it will be on a clearly land to which the developer has no rights. The new Water U/L Design & Construction Guidance for Foul and Surface Water Sewers' precludes the requiring of a surface water outfall to a watercourse so this solution is not an option.
 - 3. Southern Water asset plans show that there are no public surface water sewers in the vicinity that would provide a discharge solution.
 - 4. Southern Water asset plans show that there are no public surface water drains in the vicinity that would provide a discharge solution.

It is proposed that the following measures will be implemented:

 - 1. All surface water from the site will be collected by a drainage network from the site of 2.0 litres/sec can drain into the drainage network serving their adjacent development.
 - 2. Utilising the allowable discharge of 2.0 litres/sec and catering for the 1 in 100 year storm event with an additional 40% allowance for climate change and incorporating a further 10% allowance on the impermeable area for 'urban crease' the volume of attenuation required calculated by the MicroDrainage site is 61.5m³.
 - 3. It is proposed that this volume will be stored in a cellular 'Aquifer' bank at the southern end of the site prior to discharging into a 'Hydro Brak' vortex flow control tank into the Dye-Homes network.
 - 4. All surface water drainage features and pollution control measures will be maintained in accordance with the requirements of the drainage system and any site maintenance requirements and which will be funded by an annual payment from residents.

1. The nearest public foul sewer is situated 55 metres west of the site in Oak Tree Lane. Due to the level differences between the site and the nearest manhole Ref 9202 it is not possible to provide a gravity discharge from the site to the public sewer.
2. Agreement has been reached with Pye Homes that the foul water discharge from the development can discharge into the foul sewer system serving their adjacent development.

	Manhole with Hydro Brake limiting discharge
	Domestic surface water gravity sewer
	Domestic foul water gravity sewer
	Type 3 manhole - 450Ø
	Type 4 inspection chamber - 280Ø
	Slit trap inspection chamber - 450Ø
	Surface water attenuation storage
FFL: 11.60	Proposed Finished Floor Level
	Garden levels
	Flood Flow Route

E	22.03.22	Layout revised	KI
D	23.11.21	Drainage levels added	KI
C	10.11.21	Parking amended	KI
B	08.11.21	Foul & surface water drainage systems amended to gravity discharges	KI
A	12.05.21	Initial issue	KI
Rev.	Date	Details	Initial

Drawing Status
PRELIMINARY FOR PLANNING

Project
RYEFIELD FARMHOUSE
WOODGATE



Drawing Title
Engineering Details
Drainage Strategy

Drawn KN	Checked	Scales 1:500	Paper Size A1	Date 05.21
Job No. KNC2107		Drawing No. 602-01		Revision E

SAFETY, HEALTH & ENVIRONMENTAL
INFORMATION
CDM Regulations 2015

In addition to the hazards/risks normally associated with the type of work detailed in this drawing note should be made of the following:

- Working in vicinity of live highway
- Services to be located prior to any excavation work being undertaken
- Working on live foul sewers
- Deep excavations

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement. Contractor is not relieved of any of his obligations under all applicable health and safety regulations.



Appendix E

Southern Water S106 Approval



Mrs Mandy Lake
Unit 24b
Romsey Industrial Estate
Greatbridge Road
Romsey
Hampshire
SO51 0HR

Your ref
17050

Our ref
DSA000037049

Date
09 January 2025

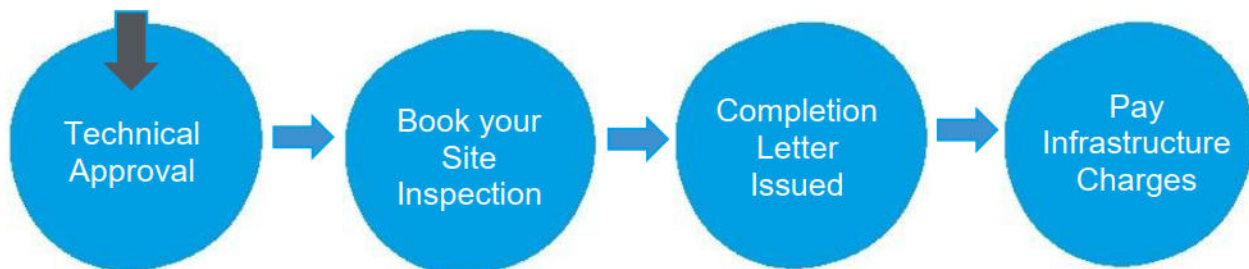
Contact
Tel: 07460 644246

Dear Mrs Lake,

Application to Connect to the Public Sewerage System - Section 106.

Location: Ryefields Farmhouse, Oak Tree Lane, Woodgate, Aldingbourne, West Sussex, PO20 3GU.

You are here



What happens next?

1. This is your technical approval.
2. Construction of the wastewater connection begins. Once completed, ensure you book a site inspection, so we know the connection is in line with your application.
3. Once the site inspection has confirmed the work is satisfactory, a completion letter will be issued. See the Essential Sewer Connection Information document to find out why this letter is important.
4. Your infrastructure charge invoice will be issued (if applicable*).

How to book your site inspection

To progress, select the '**Accept**' option on the Get Connected customer dashboard. Or, if you have further questions, please select the 'Query' option. If you do not wish to progress with the application, then please select the 'Withdraw' option.

Now you have received our approval, you will need to arrange with your contractor to carry out your works on site to connect into our sewer. Once the connection has been made it is a mandatory requirement for the point of connection to be inspected by one of our Assistant Adoption Managers.

To arrange this inspection, please select '**Ready for Inspection**' on your Get Connected customer dashboard. Once this has been selected, please contact **Mick Vince** our Assistant Adoption Manager for this area on [REDACTED] and request an inspection giving at least two full working days' notice.

Once we are happy that your connection to the public sewer complies with our requirements and have passed our inspection, we will send you a completion letter within 7 working days. It's important to ensure your connection is inspected to prevent any risk of disconnection at a later date.

Technical Approval

We are pleased to advise that your Section 106 application to connect to the public **foul** sewer, as shown on your drawing **602-02**, Revision **D**, dated **28/11/24**, is approved by Southern Water for **both the site's foul and surface water discharges**. Our approval means we are satisfied with your connection method. Inspection of the wastewater connection is required to complete your Section 106 application.

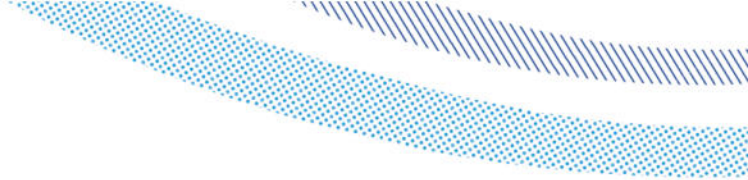
Please note, that the peak flow rate for the site's surface water discharge must not exceed the agreed flow rate of 1.0L/S.

Connections to existing/new Southern Water assets (i.e., manholes) and the arrangement of Southern Water assets (i.e., pipe junctions within manholes) should always be in accordance with the new Design and Construction Guidance manual ("the Code") and Southern Water's guidance documentation. [water.org.uk/sewerage-sector-guidance-approved-documents/](https://www.water.org.uk/sewerage-sector-guidance-approved-documents/)

This Section 106 approval does not confirm that public sewer network capacity is available at your location for the proposed development. The availability of capacity may be assessed through the Pre-Planning Enquiry process.

Please note that your connection should not proceed if:

- There are unapproved changes to your submitted plan or to the intended connection point. Any unapproved changes may lead to us disconnecting your connection under Section 109 of the Water Industry Act 1991.
- The relevant Planning Authority has set out conditions relating to the site's drainage and those conditions have not yet been discharged.
- You have not consulted our Health and Safety Advisory that can be viewed at the following link southernwater.co.uk/developing-building/health-and-safety

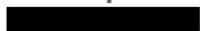
- 
- You have not obtained the necessary Building Regulations Approvals or, if relevant, obtained a Highway Authority Road Opening License.
 - Landowner consent has not been obtained where your connection is to be made through another Party's land.

Please contact the Developer Services Team via the Get Connected customer dashboard / on 0330 303 0119 should you require any further advice.

Yours sincerely,



Dale Hughes
Technical Coordinator - Wastewater
Developer Services





Essential Sewer Connection Information

1. Site Inspection Checklist
2. What happens if the sewer connection is not inspected?
3. Adoption of a sewer
4. Infrastructure charges
5. Enforcement Policy

1. Site Inspection Checklist

We have prepared a site inspection checklist so that inspection of your sewer connection can be passed first time southernwater.co.uk/media/3028/ds-site-inspection-checklist.pdf

2. What happens if the sewer connection is not inspected and a completion letter is not issued?

Incidences where construction of the sewer connection has been completed but a site inspection has not been requested then the sewer connection application is not completed. You will need to request for a site inspection to finalise the application. If the sewer connection has not been built as per the designs submitted then we will ask you to rectify.

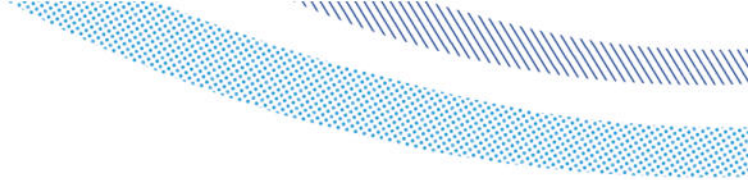
3. Adoption of a sewer

When a new development is planned, the developer can construct the sewers using approved materials and to a standard, which makes them suitable for adoption by Southern Water when construction is complete.

An adoption agreement can be entered into under Section 104 of the Water Industry Act 1991, prior to the sewers being built. This is the most desirable arrangement and if all new developments were covered by such adoption agreements, there would be few, if any, new private sewers on housing estates. However, there are many kilometres of existing private sewers that were built without an adoption agreement in place.

Section 102 of the Water Industry Act 1991 provides for the adoption of such sewers to be considered. It is important to draw a distinction between sewers, drains, and lateral drains:

- Sewers are pipes carrying sewage from more than one property
- Drains are pipes carrying sewage from only one property to the curtilage of the building or premises
- Lateral drains are those pipes which extend from the curtilage of a single building to the point of connection with an existing public or private sewer



To start the process of having the private sewer adopted, please visit our website and fill in the S102 Adoption Form.

4. Infrastructure charges

New developments increase the load on our networks and may require investment in upstream network reinforcement. This investment is funded through the Infrastructure Charge where the cost of network reinforcement is levied per property at the time of final connection.

* In addition to the sewer connection application charge, a charge for sewerage infrastructure is levied on each dwelling connecting onto the sewerage system. Non domestic properties will be individually assessed according to the number of appliances/fittings producing wastewater. Infrastructure charges are applicable even if the connection is made via a private sewer providing that the private sewer ultimately discharges into the public system.

There are three scenarios:

1. Water and wastewater connections are made within Southern Waters supply area. Infrastructure charges will be included in you water connection quote.
2. Water connections are made within another water company's supply zone and Wastewater is within the Southern Water supply area. Infrastructure charges will be invoiced following connection of the meters as advised by each water company.
3. You already have a water connection and require a wastewater connection in the Southern Water supply area. Infrastructure charges will be invoiced directly following completion of the wastewater connection.

For information and our current Connection Charges please refer to section 2 of the Southern Water Charging Arrangements [Connection charging arrangements \(southernwater.co.uk\)](https://www.southernwater.co.uk/connection-charging-arrangements)

5. Enforcement Policy

It is an offence to not comply with the requirements of a S106 Water Industry Act 1991, which are detailed in the body of the letter. This can result in prosecution and a fine and/or removal of the illegal connection.



Appendix F

Evidence of Deed of Easement

From: [Edward Rees](#)
To: [Edward Rees](#)
Subject: Ryefields.
Date: 03 October 2024 12:18:01
Attachments: [image038778.png](#)
[image429206.png](#)
[image244617.png](#)
[image969620.png](#)
[image045315.png](#)

Your reference: DSA000037049

To whom it may concern,

We write in relation to an application to connect to the public sewerage system – Section 106. This application concerns land at Ryefields Farmhouse, Oak Tree Lane, Woodgate, Aldingbourne, West Sussex, PO20 3GU (Dominant Land) and relates to a connection into a public sewer that adjoins a neighbouring parcel of land to the south known as Woodgate Centre, Oak Tree Lane, Woodgate, Chichester PO20 3GU (Servient Land). Please take this email as confirmation that the Dominant Land benefits from a legal agreement with the owner of the Servient Land which will provide the Dominant Land with legal easements so that surface and foul water can be drained from the Dominant Land over the adjoining Servient Land.

Yours faithfully
Moore Barlow LLP

Ben Loosemore
Partner



For and on behalf of Moore Barlow LLP

Gateway House, Tollgate, Chandler's Ford, Eastleigh SO53 3TG



Private wealth | Family | Employment | Property | Corporate | Commercial | Schools | Charities | Disputes | Serious injury

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Appendix G Hydraulic Modelling Calculations

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Size (mm)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
RWHT6	0.005	180	Type E	9.900	9.400	0.400	494023.640	104243.212
PS14	0.000	250	250 Inspection	9.904	9.350	0.454	494024.695	104243.230
RWHT7	0.003	180	Type E	9.900	9.400	0.400	494022.744	104250.221
D2	0.004	710x710	Type E	9.920	9.350	0.470	494025.958	104249.717
PS8	0.000	450	450 Inspection	9.915	9.210	0.555	494024.713	104251.599
RWHT5	0.003	180	Type E	9.800	9.300	0.400	494011.110	104250.300
PS7	0.000	450	450 Inspection	9.812	9.115	0.547	494011.106	104251.654
RWHT4	0.005	180	Type E	9.800	9.300	0.400	494009.593	104243.194
PS16	0.000	450	450 Inspection	9.815	9.250	0.465	494008.452	104243.540
D3	0.008	710x710	Type E	9.817	9.250	0.467	494006.018	104249.173
PS6	0.000	450	450 Inspection	9.788	9.095	0.543	494008.451	104251.187
D4	0.026	710x710	Type E	9.676	9.080	0.446	494008.658	104257.378
PS5	0.000	450	450 Inspection	9.805	9.035	0.620	494002.101	104257.339
PS11	0.004	180	Type E	9.890	9.340	0.450	493994.670	104243.224
RWHT3	0.005	180	Type E	9.900	9.400	0.400	493994.991	104254.934
PS10	0.000	450	450 Inspection	9.949	9.050	0.799	493994.597	104255.470
PS12	0.003	180	Type E	9.890	9.340	0.450	493994.055	104243.400
RWHT2	0.002	180	Type E	9.900	9.400	0.400	493993.617	104254.956
PS4	0.000	450	450 Inspection	10.018	8.980	0.888	493993.973	104257.318
D1	0.007	710x710	Type E	9.798	9.300	0.398	493985.867	104267.131
PS9	0.000	450	450 Inspection	9.816	9.100	0.616	493983.854	104266.299
RWHT1	0.005	180	Type E	9.895	9.395	0.400	493984.359	104251.654
PS13	0.000	180	Type E	9.890	9.340	0.450	493983.803	104251.768
PS3	0.000	600	Type E	9.804	8.910	0.744	493983.756	104257.293
PS2	0.000	450	450 Inspection	9.732	8.835	0.747	493972.584	104257.264
PS1	0.000	1200	Type B	9.400	8.460	0.790	493968.944	104201.402
PS0_out	0.000	180	Type E	9.270	8.404	0.716	493968.802	104192.979

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	RWHT6	9.400	PS14	9.350	Circ	100	1.055	21	0.600	0.400	0.454
1.001	PS14	9.350	PS8	9.260	Circ	100	8.369	93	0.600	0.454	0.555
2.000	RWHT7	9.400	PS8	9.260	Circ	100	2.403	17	0.600	0.400	0.555
3.000	D2	9.350	PS8	9.260	Circ	100	2.257	25	0.600	0.470	0.555
1.002	PS8	9.210	PS7	9.115	Circ	150	13.606	143	0.600	0.555	0.547
4.000	RWHT5	9.300	PS7	9.165	Circ	100	1.354	10	0.600	0.400	0.547
1.003	PS7	9.115	PS6	9.095	Circ	150	2.696	135	0.600	0.547	0.543
5.000	RWHT4	9.300	PS16	9.250	Circ	100	1.192	24	0.600	0.400	0.465
5.001	PS16	9.250	PS6	9.145	Circ	100	7.647	73	0.600	0.465	0.543
6.000	D3	9.250	PS6	9.145	Circ	100	3.158	30	0.600	0.467	0.543
1.004	PS6	9.095	PS5	9.035	Circ	150	8.842	147	0.600	0.543	0.620
7.000	D4	9.080	PS5	9.035	Circ	150	6.557	146	0.600	0.446	0.620
1.005	PS5	9.035	PS4	8.980	Circ	150	8.128	148	0.600	0.620	0.888
8.000	PS11	9.340	PS10	9.050	Circ	100	12.246	42	0.600	0.450	0.799
9.000	RWHT3	9.400	PS10	9.050	Circ	100	0.665	2	0.600	0.400	0.799
8.001	PS10	9.050	PS4	9.030	Circ	100	1.951	98	0.600	0.799	0.888
10.000	PS12	9.340	PS4	9.030	Circ	100	13.918	45	0.600	0.450	0.888
11.000	RWHT2	9.400	PS4	9.030	Circ	100	2.389	6	0.600	0.400	0.888
1.006	PS4	8.980	PS3	8.910	Circ	150	10.216	146	0.600	0.888	0.744
12.000	D1	9.300	PS9	9.100	Circ	100	2.179	11	0.600	0.398	0.616
12.001	PS9	9.100	PS3	8.960	Circ	100	9.006	64	0.600	0.616	0.744
13.000	RWHT1	9.395	PS13	9.340	Circ	100	0.568	10	0.600	0.400	0.450

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
13.001	PS13	9.340	PS3	8.960	Circ	100	5.525	15	0.600	0.450	0.744
1.007	PS3	8.910	PS2	8.835	Circ	150	11.172	149	0.600	0.744	0.747
1.008	PS2	8.835	PS1	8.460	Circ	150	55.981	149	0.600	0.747	0.790
1.009	PS1	8.460	PS0_out	8.404	Circ	150	8.424	150	0.600	0.790	0.716

Permeable Paving Schedule

Permeable Paving	Assigned Manhole	Effective Storage Volume (m3)	CL (m)	IL (m)	Storage Infil Rate (m/hr)	Safety Factor	Easting (m)	Northing (m)
PP2	D2	3.879	9.920	9.440	0.00000000	2.00	494025.708	104248.862
PP3	D3	8.084	9.817	9.337	0.00000000	2.00	494005.846	104244.091
PP4	D4	34.517	9.676	9.096	0.00000000	2.00	494023.722	104256.127
PP1	D1	7.138	9.798	9.318	0.00000000	2.00	493987.462	104264.424

Outfall Details

Outfall Manhole PS0_out : Free Discharge

Flow Control Details

Controls within Manhole RWHT6

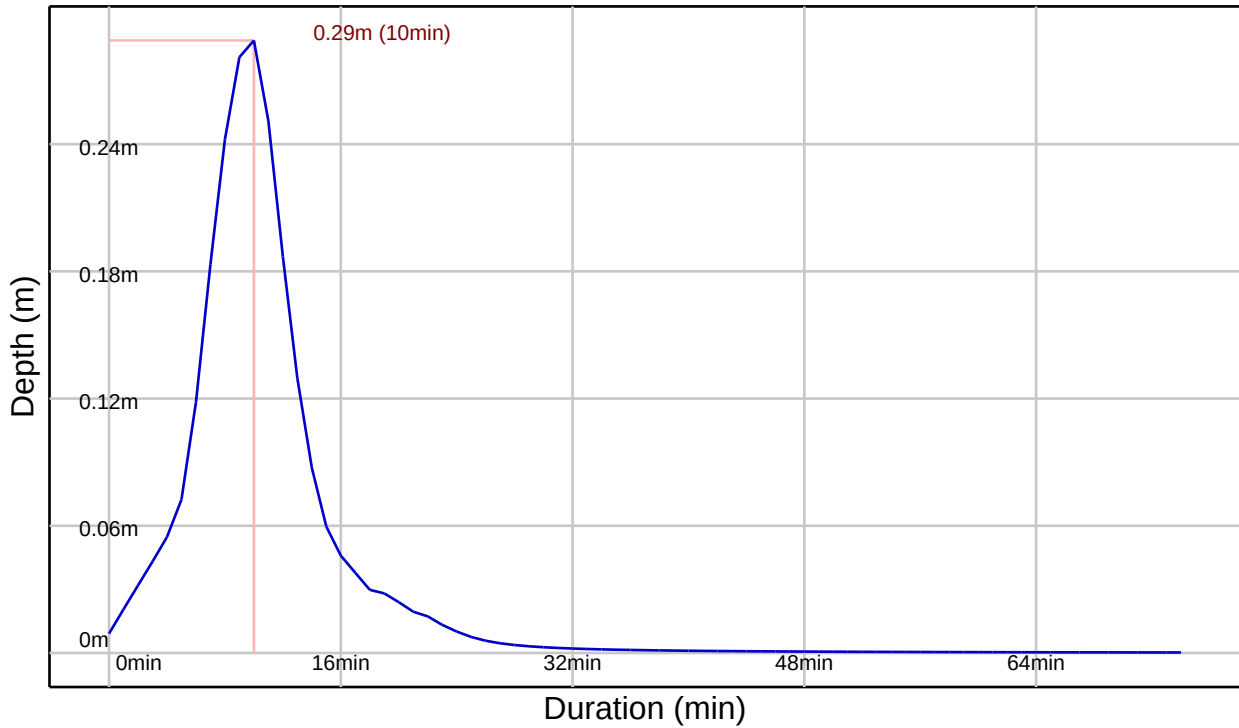
Orifice Control

Invert Offset (m)	Orifice Diameter (m)	Discharge Coeff
0.000	0.060	0.600

Tank Structure at Manhole RWHT6

Tank Invert (m)	Tank Height (m)	Porosity Ratio (%)	Area (m2)	Effective Area (m2) Area x Porosity Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
9.400	0.500	100.00	0.600	0.600	0.300	0.00000000	0.00000000	2.00

Tank 6 at RWHT6 (100Yr+45% 15Min Summer)



Controls within Manhole RWHT7

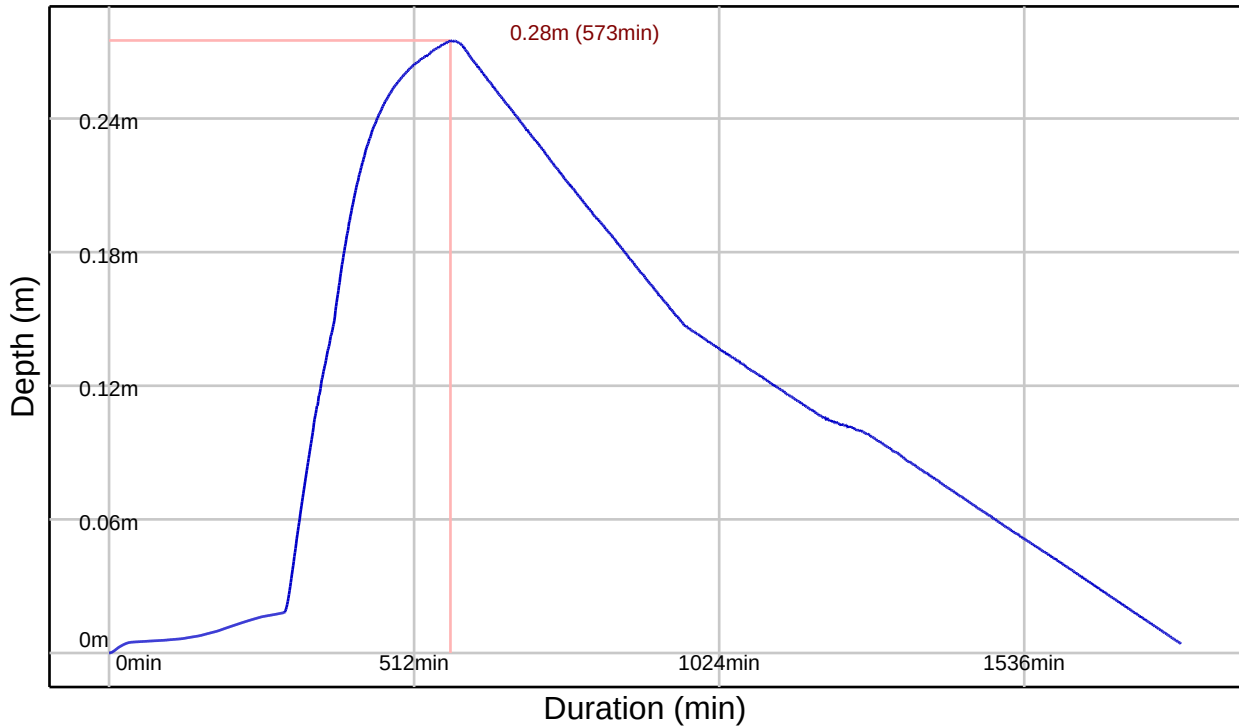
Orifice Control

Invert Offset (m)	Orifice Diameter (m)	Discharge Coeff
0.000	0.060	0.600

Tank Structure at Manhole RWHT7

Tank Invert (m)	Tank Height (m)	Porosity Ratio (%)	Area (m2)	Effective Area (m2) Area x Porosity Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
9.400	0.500	100.00	0.600	0.600	0.300	0.00000000	0.00000000	2.00

Tank 7 at RWHT7 (100Yr+45% 600Min Winter)



Controls within Manhole RWHT5

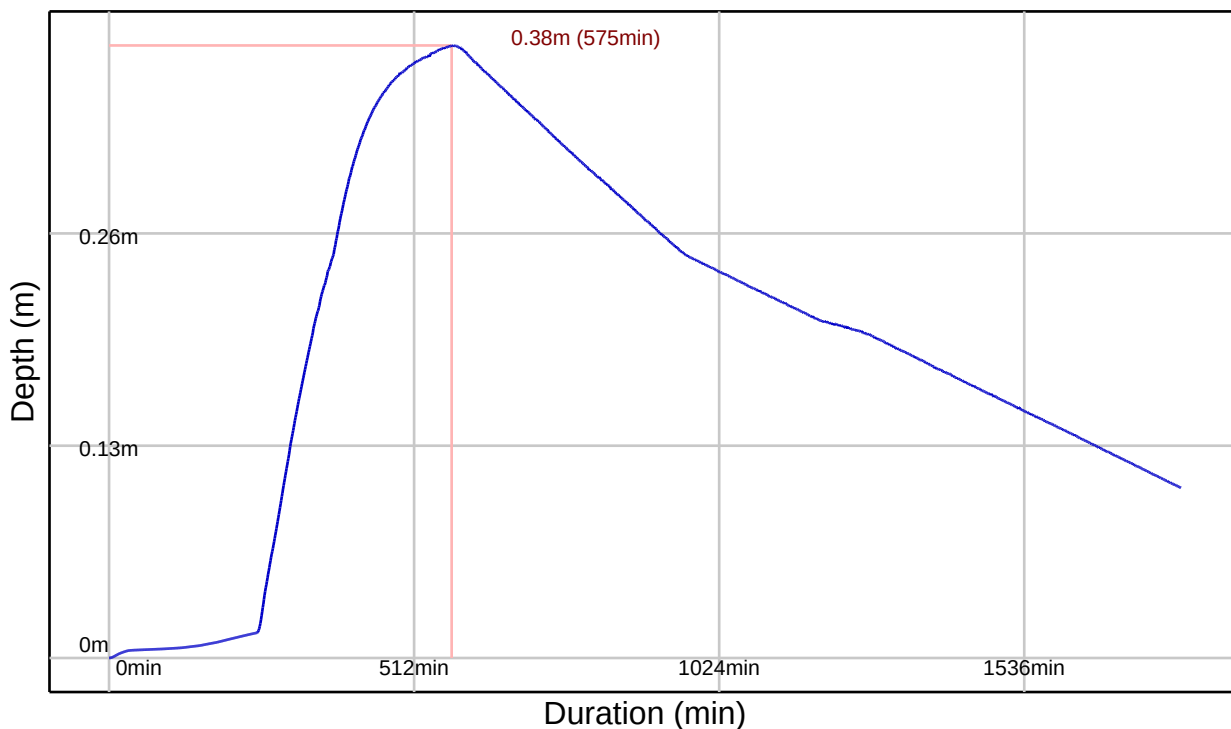
Orifice Control

Invert Offset (m)	Orifice Diameter (m)	Discharge Coeff
0.000	0.060	0.600

Tank Structure at Manhole RWHT5

Tank Invert (m)	Tank Height (m)	Porosity Ratio (%)	Area (m2)	Effective Area (m2) Area x Porosity Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
9.300	0.500	100.00	0.600	0.600	0.300	0.00000000	0.00000000	2.00

Tank 5 at RWHT5 (100Yr+45% 600Min Winter)



Controls within Manhole RWHT4

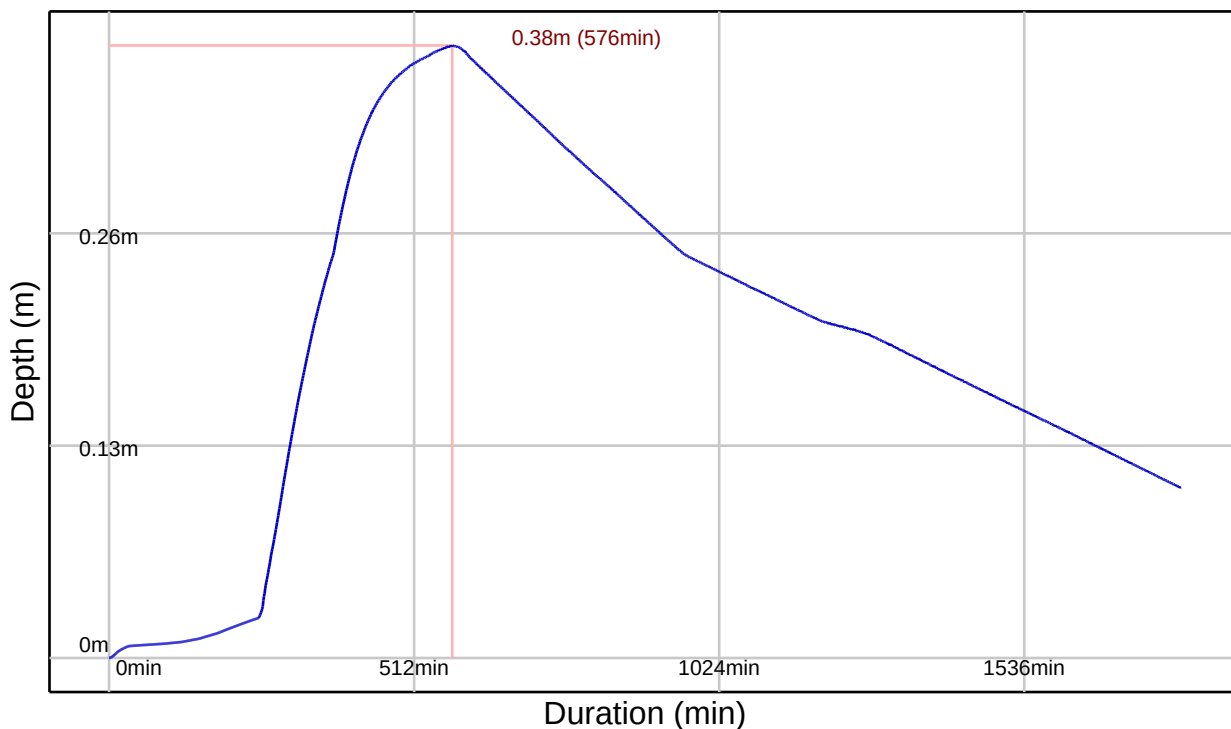
Orifice Control

Invert Offset (m)	Orifice Diameter (m)	Discharge Coeff
0.000	0.060	0.600

Tank Structure at Manhole RWHT4

Tank Invert (m)	Tank Height (m)	Porosity Ratio (%)	Area (m2)	Effective Area (m2) Area x Porosity Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
9.300	0.500	100.00	0.600	0.600	0.300	0.00000000	0.00000000	2.00

Tank 4 at RWHT4 (100Yr+45% 600Min Winter)



Controls within Manhole RWHT3

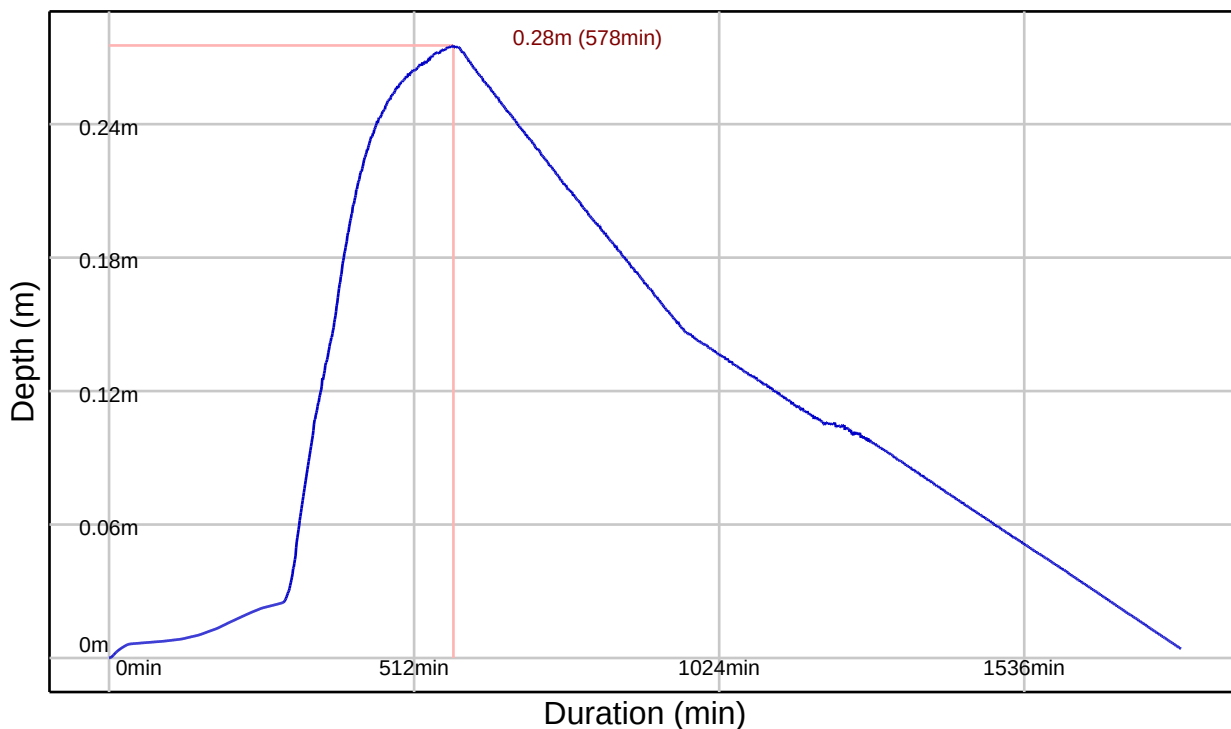
Orifice Control

Invert Offset (m)	Orifice Diameter (m)	Discharge Coeff
0.000	0.060	0.600

Tank Structure at Manhole RWHT3

Tank Invert (m)	Tank Height (m)	Porosity Ratio (%)	Area (m2)	Effective Area (m2) Area x Porosity Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
9.400	0.500	100.00	0.600	0.600	0.300	0.00000000	0.00000000	2.00

Tank 3 at RWHT3 (100Yr+45% 600Min Winter)



Controls within Manhole RWHT2

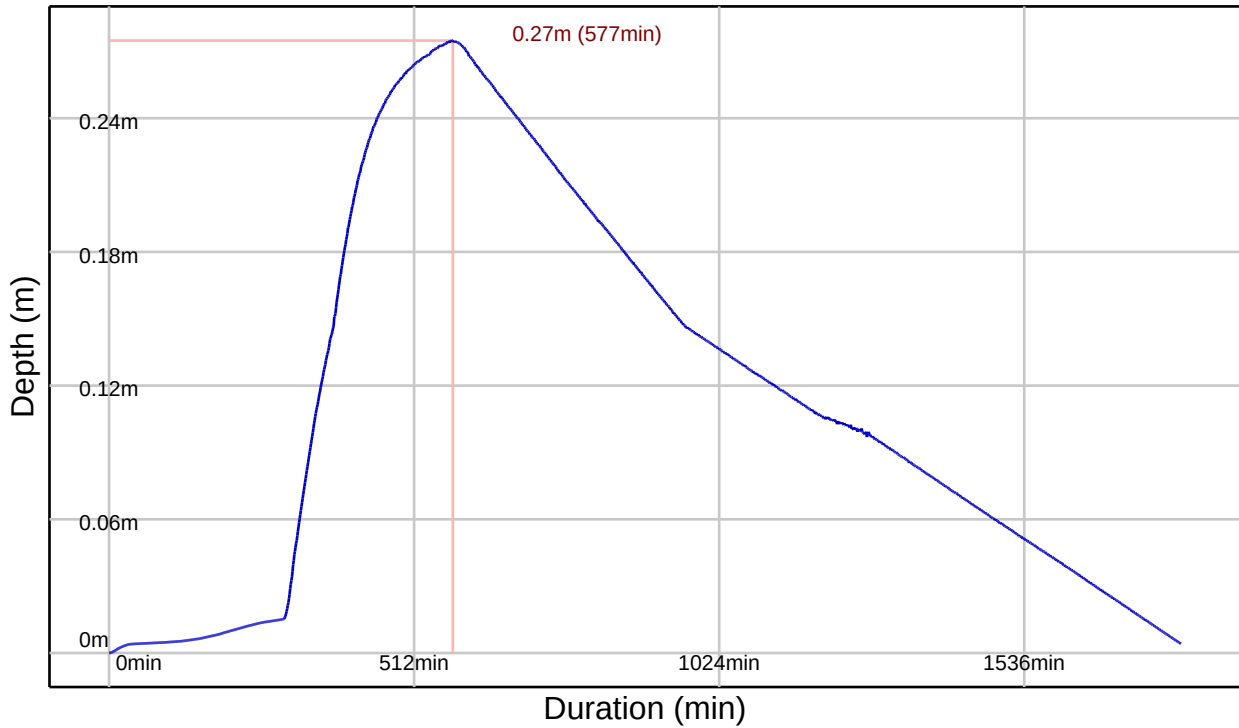
Orifice Control

Invert Offset (m)	Orifice Diameter (m)	Discharge Coeff
0.000	0.060	0.600

Tank Structure at Manhole RWHT2

Tank Invert (m)	Tank Height (m)	Porosity Ratio (%)	Area (m2)	Effective Area (m2) Area x Porosity Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
9.400	0.500	100.00	0.600	0.600	0.300	0.00000000	0.00000000	2.00

Tank 2 at RWHT2 (100Yr+45% 600Min Winter)



Controls within Manhole RWHT1

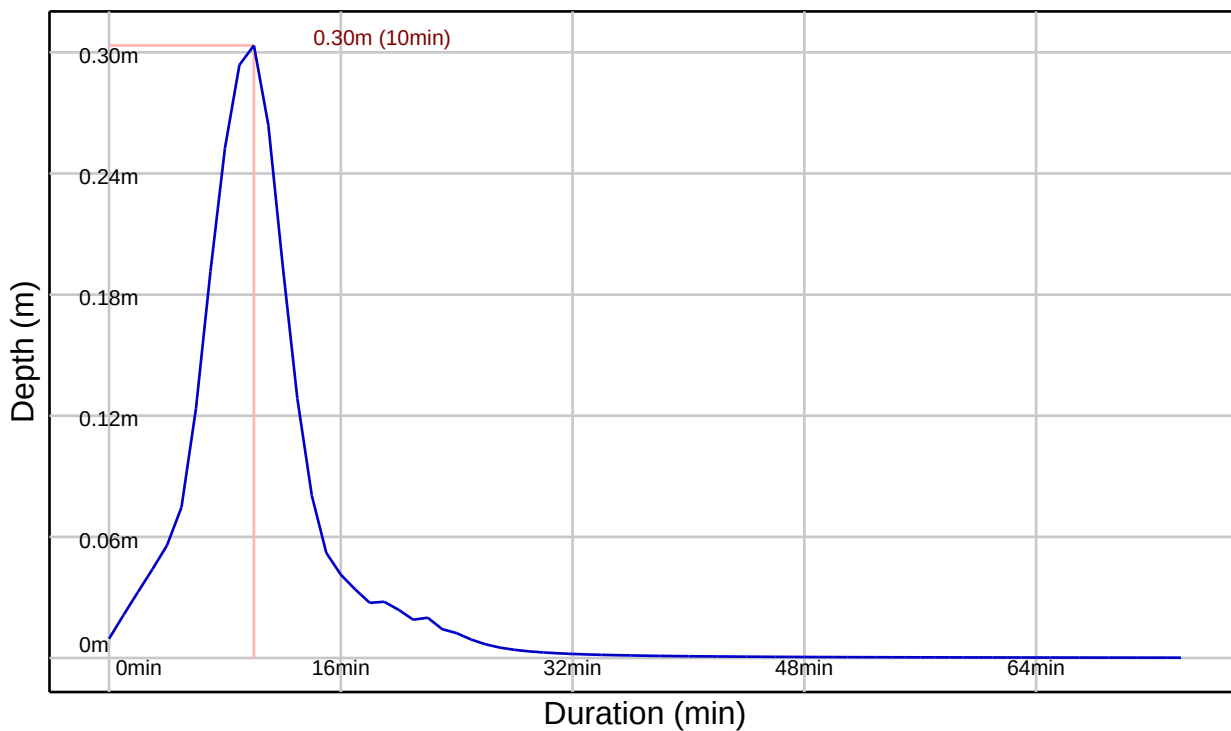
Orifice Control

Invert Offset (m)	Orifice Diameter (m)	Discharge Coeff
0.000	0.060	0.600

Tank Structure at Manhole RWHT1

Tank Invert (m)	Tank Height (m)	Porosity Ratio (%)	Area (m2)	Effective Area (m2) Area x Porosity Ratio	Max Storage (m3) Effective Area x Height	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
9.395	0.500	100.00	0.600	0.600	0.300	0.00000000	0.00000000	2.00

Tank 1 at RWHT1 (100Yr+45% 15Min Summer)



Controls within Manhole PS3

Orifice Control

Invert Offset (m)	Orifice Diameter (m)	Discharge Coeff
0.000	0.018	0.600

Simulation Settings

FEH2022 (point): Filename=FEH_Point_Descriptors_493987_104248_v5_1_0.xml

Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Periods (yrs) + Climate Change: (1, +0%), (10, +40%), (30, +40%), (100, +45%)

Manhole Flood Risk Freeboard: 0.150m

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
1Yr 15Min Winter	15.600	0.00	1.64	30Yr+40% 15Min Summer	113.152	0.00	3.64
1Yr 15Min Summer	15.600	0.00	1.60	30Yr+40% 15Min Winter	113.152	0.00	3.58
1Yr 30Min Winter	10.400	0.00	1.37	30Yr+40% 30Min Summer	75.408	0.00	4.64
1Yr 30Min Summer	10.400	0.00	1.37	30Yr+40% 30Min Winter	75.408	0.00	4.66
1Yr 60Min Winter	6.643	0.00	0.88	30Yr+40% 60Min Summer	48.093	0.00	4.86
1Yr 60Min Summer	6.643	0.00	0.88	30Yr+40% 60Min Winter	48.093	0.00	4.89
1Yr 120Min Summer	5.313	0.00	0.48	30Yr+40% 120Min Summer	29.302	0.00	4.77
1Yr 120Min Winter	5.313	0.00	0.48	30Yr+40% 120Min Winter	29.302	0.00	4.77
1Yr 180Min Summer	4.471	0.00	0.26	30Yr+40% 180Min Summer	21.664	0.00	4.30
1Yr 180Min Winter	4.471	0.00	0.26	30Yr+40% 180Min Winter	21.664	0.00	4.29
1Yr 240Min Summer	3.707	0.00	0.18	30Yr+40% 240Min Summer	17.405	0.00	3.66
1Yr 240Min Winter	3.707	0.00	0.18	30Yr+40% 240Min Winter	17.405	0.00	3.53
1Yr 360Min Summer	2.898	0.00	0.00	30Yr+40% 360Min Summer	12.632	0.00	1.44
1Yr 360Min Winter	2.898	0.00	0.00	30Yr+40% 360Min Winter	12.632	0.00	1.47
1Yr 480Min Summer	2.407	0.00	0.00	30Yr+40% 480Min Summer	10.015	0.00	0.38
1Yr 480Min Winter	2.407	0.00	0.00	30Yr+40% 480Min Winter	10.015	0.00	0.83
1Yr 600Min Summer	2.045	0.00	0.00	30Yr+40% 600Min Summer	8.343	0.00	-0.55
1Yr 600Min Winter	2.045	0.00	0.00	30Yr+40% 600Min Winter	8.343	0.00	-0.23
1Yr 720Min Winter	1.778	0.00	0.00	30Yr+40% 720Min Summer	7.172	0.00	-0.78
1Yr 720Min Summer	1.778	0.00	0.00	30Yr+40% 720Min Winter	7.172	0.00	-0.66
1Yr 960Min Summer	1.443	0.00	0.00	30Yr+40% 960Min Summer	5.647	0.00	-2.38
1Yr 960Min Winter	1.443	0.00	0.00	30Yr+40% 960Min Winter	5.647	0.00	-1.70
1Yr 1440Min Summer	1.083	0.00	0.00	30Yr+40% 1440Min Summer	4.039	0.00	-0.05
1Yr 1440Min Winter	1.083	0.00	0.00	30Yr+40% 1440Min Winter	4.039	0.00	-0.04
10Yr+40% 15Min Summer	87.997	0.00	2.93	100Yr+45% 15Min Summer	147.195	0.00	4.54
10Yr+40% 15Min Winter	87.997	0.00	2.90	100Yr+45% 15Min Winter	147.195	0.00	4.50
10Yr+40% 30Min Summer	57.561	0.00	3.59	100Yr+45% 30Min Summer	98.984	0.00	5.50
10Yr+40% 30Min Winter	57.561	0.00	3.62	100Yr+45% 30Min Winter	98.984	0.00	5.52
10Yr+40% 60Min Summer	36.582	0.00	3.98	100Yr+45% 60Min Summer	63.544	0.00	6.04
10Yr+40% 60Min Winter	36.582	0.00	4.01	100Yr+45% 60Min Winter	63.544	0.00	6.04
10Yr+40% 120Min Winter	22.971	0.00	3.77	100Yr+45% 120Min Summer	38.005	0.00	5.65
10Yr+40% 120Min Summer	22.971	0.00	3.76	100Yr+45% 120Min Winter	38.005	0.00	5.49
10Yr+40% 180Min Summer	17.247	0.00	3.33	100Yr+45% 180Min Summer	27.852	0.00	5.34
10Yr+40% 180Min Winter	17.247	0.00	3.33	100Yr+45% 180Min Winter	27.852	0.00	5.25
10Yr+40% 240Min Summer	13.876	0.00	2.79	100Yr+45% 240Min Summer	22.385	0.00	4.58
10Yr+40% 240Min Winter	13.876	0.00	2.82	100Yr+45% 240Min Winter	22.385	0.00	4.35
10Yr+40% 360Min Summer	10.144	0.00	1.83	100Yr+45% 360Min Summer	16.261	0.00	2.83
10Yr+40% 360Min Winter	10.144	0.00	1.76	100Yr+45% 360Min Winter	16.261	0.00	3.02
10Yr+40% 480Min Summer	8.084	0.00	1.07	100Yr+45% 480Min Summer	12.907	0.00	2.08
10Yr+40% 480Min Winter	8.084	0.00	1.00	100Yr+45% 480Min Winter	12.907	0.00	2.13
10Yr+40% 600Min Winter	6.745	0.00	0.55	100Yr+45% 600Min Summer	10.771	0.00	1.03
10Yr+40% 600Min Summer	6.745	0.00	0.61	100Yr+45% 600Min Winter	10.771	0.00	1.01
10Yr+40% 720Min Summer	5.800	0.00	0.34	100Yr+45% 720Min Summer	9.274	0.00	0.73
10Yr+40% 720Min Winter	5.800	0.00	0.25	100Yr+45% 720Min Winter	9.274	0.00	0.34
10Yr+40% 960Min Summer	4.577	0.00	0.20	100Yr+45% 960Min Summer	7.309	0.00	-0.79
10Yr+40% 960Min Winter	4.577	0.00	0.13	100Yr+45% 960Min Winter	7.309	0.00	-0.52
10Yr+40% 1440Min Summer	3.293	0.00	0.18	100Yr+45% 1440Min Winter	5.220	0.00	-1.17
10Yr+40% 1440Min Winter	3.293	0.00	0.19	100Yr+45% 1440Min Summer	5.220	0.00	-1.36

Simulation Results

Return Period (yrs) + Climate Change (%):

1yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
RWHT6	15 min Summer	9	9.431	0.031	0.445		OK
PS14	15 min Summer	10	9.368	0.018	0.427		OK
RWHT7	15 min Summer	9	9.420	0.020	0.227		OK
D2	180 min Summer	102	9.356	0.006	0.115		OK
PS8	15 min Summer	10	9.231	0.021	0.644		OK
RWHT5	15 min Summer	9	9.320	0.020	0.229		OK
PS7	600 min Summer	417	9.173	0.058	0.061		OK
RWHT4	15 min Summer	9	9.331	0.031	0.443		OK
PS16	15 min Summer	10	9.267	0.017	0.425		OK
D3	240 min Summer	138	9.259	0.009	0.183		OK
PS6	600 min Summer	420	9.173	0.078	0.122		OK
D4	600 min Summer	420	9.173	0.093	0.101		OK
PS5	600 min Summer	421	9.173	0.138	0.226		OK
PS11	15 min Summer	8	9.354	0.014	0.412		OK
RWHT3	15 min Summer	9	9.428	0.028	0.403		OK
PS10	600 min Summer	420	9.173	0.123	0.035		Surcharged
PS12	15 min Summer	8	9.352	0.012	0.306		OK
RWHT2	15 min Summer	9	9.416	0.016	0.181		OK
PS4	600 min Summer	421	9.173	0.193	0.279		Surcharged
D1	180 min Summer	106	9.306	0.006	0.170		OK
PS9	600 min Summer	421	9.173	0.073	0.037		OK
RWHT1	15 min Summer	9	9.427	0.032	0.463		OK
PS13	15 min Summer	10	9.351	0.011	0.444		OK
PS3	600 min Summer	421	9.173	0.263	0.336		Surcharged
PS2	600 min Summer	422	8.851	0.016	0.336		OK
PS1	600 min Summer	423	8.476	0.016	0.336		OK
PS0_out	600 min Summer	423	8.419	0.015	0.336		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	15 min Summer	10	RWHT6	PS14	0.015	0.604	0.430	0.032	OK
1.001	15 min Summer	10	PS14	PS8	0.018	0.464	0.431	0.069	OK
2.000	15 min Summer	10	RWHT7	PS8	0.008	0.698	0.212	0.014	OK
3.000	180 min Summer	102	D2	PS8	0.006	0.536	0.115	0.010	OK
1.002	600 min Summer	412	PS8	PS7	0.032	0.296	0.243	0.016	OK
4.000	15 min Summer	10	RWHT5	PS7	0.007	0.874	0.216	0.011	OK
1.003	600 min Summer	420	PS7	PS6	0.068	0.250	0.291	0.019	OK
5.000	15 min Summer	10	RWHT4	PS16	0.014	0.630	0.428	0.034	OK
5.001	15 min Summer	10	PS16	PS6	0.016	0.508	0.429	0.061	OK
6.000	600 min Summer	409	D3	PS6	0.016	0.525	0.147	0.013	OK
1.004	600 min Summer	420	PS6	PS5	0.108	0.285	0.527	0.036	OK
7.000	600 min Summer	663	D4	PS5	0.115	0.238	0.276	0.019	OK
1.005	600 min Summer	421	PS5	PS4	0.144	0.215	0.309	0.021	OK
8.000	360 min Summer	206	PS11	PS10	0.053	0.244	0.140	0.015	OK
9.000	360 min Summer	206	RWHT3	PS10	0.051	0.358	0.142	0.003	OK
8.001	240 min Summer	152	PS10	PS4	0.100	0.339	0.318	0.052	Surcharged
10.000	120 min Summer	61	PS12	PS4	0.055	0.326	0.182	0.020	OK
11.000	30 min Summer	20	RWHT2	PS4	0.052	0.760	0.155	0.006	OK
1.006	30 min Summer	20	PS4	PS3	0.150	0.303	0.999	0.068	Surcharged
12.000	600 min Summer	411	D1	PS9	0.038	0.397	0.132	0.007	OK
12.001	600 min Summer	421	PS9	PS3	0.086	0.021	0.123	0.016	OK
13.000	15 min Summer	9	RWHT1	PS13	0.011	0.975	0.452	0.024	OK
13.001	15 min Summer	10	PS13	PS3	0.056	0.639	0.449	0.028	OK
1.007	600 min Summer	421	PS3	PS2	0.016	0.345	0.336	0.023	OK
1.008	600 min Summer	423	PS2	PS1	0.016	0.345	0.336	0.023	OK
1.009	600 min Summer	423	PS1	PS0_out	0.015	0.351	0.336	0.023	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
PP2	180 min Summer	102	9.448	0.008	0.114			OK
PP3	240 min Summer	137	9.349	0.012	0.185			OK
PP4	600 min Summer	420	9.173	0.076	0.102			OK
PP1	180 min Summer	106	9.329	0.011	0.171			OK

Return Period (yrs) + Climate Change (%):

10yr+40%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
RWHT6	15 min Summer	9	9.533	0.133	2.512		Surcharged
PS14	480 min Winter	455	9.446	0.096	0.032		OK
RWHT7	15 min Summer	8	9.460	0.060	1.340		OK
D2	480 min Winter	462	9.446	0.096	0.018		OK
PS8	480 min Winter	455	9.446	0.236	0.043		Surcharged
RWHT5	480 min Winter	464	9.446	0.146	0.012		Surcharged
PS7	480 min Winter	462	9.447	0.332	0.118		Surcharged
RWHT4	480 min Winter	456	9.446	0.146	0.033		Surcharged
PS16	480 min Winter	456	9.446	0.196	0.020		Surcharged
D3	480 min Winter	457	9.446	0.196	0.037		Surcharged
PS6	480 min Winter	456	9.447	0.352	0.037		Surcharged
D4	480 min Winter	459	9.446	0.366	0.180		Surcharged
PS5	480 min Winter	462	9.446	0.411	0.362		Surcharged
PS11	480 min Winter	456	9.446	0.106	0.030		Surcharged
RWHT3	15 min Summer	9	9.516	0.116	2.275		Surcharged
PS10	480 min Winter	452	9.446	0.396	0.029		Surcharged
PS12	480 min Winter	463	9.447	0.107	0.018		Surcharged
RWHT2	15 min Summer	9	9.453	0.053	1.020		OK
PS4	480 min Winter	464	9.446	0.466	0.311		Surcharged
D1	480 min Winter	458	9.446	0.146	0.056		Surcharged
PS9	480 min Winter	449	9.446	0.346	0.064		Surcharged
RWHT1	15 min Summer	9	9.535	0.140	2.614		Surcharged
PS13	480 min Winter	466	9.446	0.106	0.059		Surcharged
PS3	480 min Winter	462	9.446	0.536	0.473		Surcharged
PS2	480 min Winter	460	8.854	0.019	0.487		OK
PS1	480 min Winter	462	8.479	0.019	0.487		OK
PS0_out	480 min Winter	462	8.422	0.018	0.487		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	480 min Winter	455	RWHT6	PS14	0.071	0.535	0.855	0.065	OK
1.001	480 min Winter	455	PS14	PS8	0.098	0.402	0.470	0.075	OK
2.000	480 min Winter	458	RWHT7	PS8	0.073	0.606	0.144	0.010	OK
3.000	480 min Winter	462	D2	PS8	0.098	0.618	0.448	0.037	OK
1.002	30 min Summer	19	PS8	PS7	0.150	0.416	3.271	0.221	Surcharged
4.000	120 min Summer	118	RWHT5	PS7	0.100	0.881	0.632	0.033	Surcharged
1.003	30 min Summer	18	PS7	PS6	0.150	0.404	3.427	0.225	Surcharged
5.000	120 min Summer	118	RWHT4	PS16	0.100	0.790	2.661	0.214	Surcharged
5.001	15 min Winter	12	PS16	PS6	0.100	0.705	2.039	0.288	Surcharged
6.000	15 min Winter	16	D3	PS6	0.100	0.220	1.662	0.150	Surcharged
1.004	30 min Summer	20	PS6	PS5	0.150	0.494	4.883	0.335	Surcharged
7.000	960 min Winter	2009	D4	PS5	0.150	0.238	0.551	0.038	Surcharged
1.005	30 min Summer	13	PS5	PS4	0.150	0.198	1.089	0.075	Surcharged
8.000	480 min Winter	380	PS11	PS10	0.100	0.210	0.428	0.046	Surcharged
9.000	480 min Winter	458	RWHT3	PS10	0.073	0.445	2.325	0.052	OK
8.001	30 min Summer	17	PS10	PS4	0.100	0.524	3.372	0.553	Surcharged
10.000	480 min Summer	405	PS12	PS4	0.100	0.262	0.292	0.032	Surcharged
11.000	480 min Winter	458	RWHT2	PS4	0.073	0.247	1.140	0.047	OK
1.006	15 min Winter	6	PS4	PS3	0.150	0.459	1.759	0.120	Surcharged
12.000	240 min Summer	158	D1	PS9	0.100	0.394	2.155	0.117	Surcharged
12.001	15 min Winter	16	PS9	PS3	0.100	0.192	1.511	0.200	Surcharged
13.000	480 min Winter	454	RWHT1	PS13	0.076	0.864	1.769	0.093	OK
13.001	480 min Summer	406	PS13	PS3	0.100	0.437	0.728	0.046	Surcharged
1.007	480 min Winter	461	PS3	PS2	0.019	0.385	0.487	0.034	OK
1.008	480 min Winter	461	PS2	PS1	0.019	0.385	0.487	0.034	OK
1.009	480 min Winter	462	PS1	PS0_out	0.018	0.391	0.487	0.034	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
PP2	30 min Summer	23	9.473	0.033	0.917			OK
PP3	480 min Winter	461	9.446	0.109	0.045			OK
PP4	480 min Winter	459	9.446	0.350	0.178			OK
PP1	480 min Winter	459	9.446	0.128	0.046			OK

Return Period (yrs) + Climate Change (%):

30yr+40%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
RWHT6	15 min Summer	9	9.591	0.191	3.230		Surcharged
PS14	600 min Winter	574	9.516	0.166	0.028		Surcharged
RWHT7	600 min Winter	570	9.516	0.116	0.018		Surcharged
D2	600 min Winter	573	9.517	0.167	0.001		Surcharged
PS8	480 min Winter	457	9.516	0.306	0.093		Surcharged
RWHT5	480 min Winter	469	9.517	0.217	0.010		Surcharged
PS7	480 min Winter	452	9.517	0.402	0.038		Surcharged
RWHT4	600 min Winter	570	9.516	0.216	0.035		Surcharged
PS16	480 min Winter	469	9.516	0.266	0.041		Surcharged
D3	480 min Winter	452	9.516	0.266	0.026		Surcharged
PS6	600 min Winter	586	9.516	0.421	0.016		Surcharged
D4	600 min Winter	569	9.516	0.436	0.004		Surcharged
PS5	600 min Winter	566	9.517	0.482	0.358		Surcharged
PS11	600 min Winter	578	9.517	0.177	0.023		Surcharged
RWHT3	15 min Summer	9	9.563	0.163	2.925		Surcharged
PS10	480 min Summer	470	9.518	0.468	0.029		Surcharged
PS12	480 min Summer	474	9.517	0.177	0.030		Surcharged
RWHT2	480 min Winter	461	9.516	0.116	0.032		Surcharged
PS4	600 min Winter	566	9.517	0.537	0.365		Surcharged
D1	600 min Winter	573	9.516	0.216	0.001		Surcharged
PS9	480 min Winter	460	9.516	0.416	0.065		Surcharged
RWHT1	15 min Summer	9	9.594	0.199	3.361		Surcharged
PS13	600 min Winter	575	9.516	0.176	0.031		Surcharged
PS3	600 min Winter	573	9.516	0.606	0.461		Surcharged
PS2	600 min Winter	576	8.854	0.019	0.518		OK
PS1	600 min Winter	577	8.479	0.019	0.518		OK
PS0_out	600 min Winter	577	8.423	0.019	0.518		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	720 min Winter	524	RWHT6	PS14	0.100	0.515	1.789	0.135	Surcharged
1.001	180 min Summer	123	PS14	PS8	0.100	0.554	1.203	0.192	Surcharged
2.000	960 min Winter	705	RWHT7	PS8	0.100	0.528	0.319	0.022	Surcharged
3.000	180 min Summer	123	D2	PS8	0.100	0.760	2.293	0.189	Surcharged
1.002	30 min Summer	19	PS8	PS7	0.150	0.405	3.850	0.261	Surcharged
4.000	30 min Winter	20	RWHT5	PS7	0.100	1.103	1.085	0.056	Surcharged
1.003	30 min Summer	20	PS7	PS6	0.150	0.407	4.413	0.290	Surcharged
5.000	60 min Summer	34	RWHT4	PS16	0.100	0.870	3.348	0.269	Surcharged
5.001	15 min Winter	10	PS16	PS6	0.100	0.734	2.139	0.302	Surcharged
6.000	15 min Winter	18	D3	PS6	0.100	0.261	2.049	0.185	Surcharged
1.004	15 min Winter	14	PS6	PS5	0.150	0.614	5.500	0.378	Surcharged
7.000	60 min Summer	67	D4	PS5	0.150	0.023	0.408	0.028	Surcharged
1.005	30 min Summer	12	PS5	PS4	0.150	0.193	0.981	0.067	Surcharged
8.000	180 min Summer	113	PS11	PS10	0.100	0.401	0.998	0.107	Surcharged
9.000	360 min Winter	287	RWHT3	PS10	0.100	0.505	2.884	0.065	Surcharged
8.001	15 min Winter	9	PS10	PS4	0.100	0.685	4.372	0.716	Surcharged
10.000	180 min Summer	115	PS12	PS4	0.100	0.347	0.741	0.082	Surcharged
11.000	960 min Summer	712	RWHT2	PS4	0.100	0.163	0.869	0.036	Surcharged
1.006	15 min Winter	6	PS4	PS3	0.150	0.516	1.867	0.128	Surcharged
12.000	120 min Winter	71	D1	PS9	0.100	0.431	2.285	0.124	Surcharged
12.001	15 min Winter	19	PS9	PS3	0.100	0.255	2.000	0.265	Surcharged
13.000	240 min Winter	219	RWHT1	PS13	0.100	1.058	2.705	0.142	Surcharged
13.001	180 min Summer	112	PS13	PS3	0.100	0.576	1.138	0.071	Surcharged
1.007	480 min Winter	463	PS3	PS2	0.019	0.392	0.518	0.036	OK
1.008	600 min Winter	577	PS2	PS1	0.019	0.392	0.518	0.036	OK
1.009	600 min Winter	577	PS1	PS0_out	0.019	0.398	0.518	0.036	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
PP2	600 min Winter	574	9.516	0.076	0.024			OK
PP3	600 min Winter	570	9.516	0.179	0.054			OK
PP4	600 min Winter	573	9.516	0.420	0.179			OK
PP1	480 min Winter	464	9.516	0.198	0.053			OK

Return Period (yrs) + Climate Change (%):

100yr+45%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
RWHT6	15 min Summer	10	9.689	0.289	3.490		Surcharged
PS14	600 min Winter	579	9.675	0.325	0.025		Surcharged
RWHT7	600 min Winter	573	9.675	0.275	0.021		Surcharged
D2	600 min Winter	580	9.675	0.325	0.046		Surcharged
PS8	600 min Winter	576	9.675	0.465	0.092		Surcharged
RWHT5	600 min Winter	575	9.675	0.375	0.042		Surcharged
PS7	600 min Winter	586	9.675	0.560	0.212		Flood Risk
RWHT4	600 min Winter	576	9.675	0.375	0.037		Surcharged
PS16	600 min Winter	574	9.675	0.425	0.028		Flood Risk
D3	600 min Winter	579	9.675	0.425	0.057		Flood Risk
PS6	600 min Winter	578	9.675	0.580	0.038		Flood Risk
D4	600 min Winter	577	9.675	0.595	0.005		Flood Risk
PS5	600 min Winter	572	9.676	0.641	0.434		Flood Risk
PS11	600 min Winter	583	9.675	0.335	0.023		Surcharged
RWHT3	600 min Winter	578	9.675	0.275	0.054		Surcharged
PS10	600 min Winter	575	9.676	0.626	0.021		Surcharged
PS12	600 min Winter	582	9.675	0.335	0.018		Surcharged
RWHT2	600 min Winter	573	9.675	0.275	0.017		Surcharged
PS4	600 min Winter	576	9.675	0.695	0.675		Surcharged
D1	600 min Winter	575	9.675	0.375	0.011		Flood Risk
PS9	600 min Winter	582	9.675	0.575	0.127		Flood Risk
RWHT1	15 min Summer	10	9.698	0.303	3.631		Surcharged
PS13	600 min Winter	578	9.675	0.335	0.020		Surcharged
PS3	600 min Winter	578	9.675	0.765	0.507		Flood Risk
PS2	600 min Winter	579	8.855	0.020	0.583		OK
PS1	600 min Winter	579	8.480	0.020	0.584		OK
PS0_out	600 min Winter	579	8.424	0.020	0.584		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	120 min Summer	76	RWHT6	PS14	0.100	0.827	3.562	0.269	Surcharged
1.001	15 min Winter	11	PS14	PS8	0.100	0.759	3.122	0.499	Surcharged
2.000	60 min Winter	50	RWHT7	PS8	0.100	0.973	1.362	0.093	Surcharged
3.000	120 min Winter	69	D2	PS8	0.100	0.800	2.223	0.183	Surcharged
1.002	15 min Winter	13	PS8	PS7	0.150	0.521	4.348	0.294	Surcharged
4.000	15 min Winter	10	RWHT5	PS7	0.100	1.292	1.626	0.084	Surcharged
1.003	30 min Summer	19	PS7	PS6	0.150	0.428	5.200	0.341	Surcharged
5.000	60 min Summer	31	RWHT4	PS16	0.100	0.874	3.297	0.265	Surcharged
5.001	30 min Summer	18	PS16	PS6	0.100	0.593	2.612	0.369	Surcharged
6.000	15 min Winter	19	D3	PS6	0.100	0.331	2.596	0.234	Surcharged
1.004	15 min Winter	15	PS6	PS5	0.150	0.568	5.840	0.401	Surcharged
7.000	240 min Winter	171	D4	PS5	0.150	0.119	2.107	0.144	Surcharged
1.005	600 min Summer	360	PS5	PS4	0.150	0.214	1.288	0.089	Surcharged
8.000	15 min Winter	10	PS11	PS10	0.100	0.616	3.319	0.356	Surcharged
9.000	360 min Summer	204	RWHT3	PS10	0.100	0.546	3.206	0.072	Surcharged
8.001	30 min Summer	17	PS10	PS4	0.100	0.679	5.337	0.874	Surcharged
10.000	15 min Winter	11	PS12	PS4	0.100	0.656	2.478	0.274	Surcharged
11.000	960 min Winter	542	RWHT2	PS4	0.100	0.198	0.949	0.039	Surcharged
1.006	15 min Winter	5	PS4	PS3	0.150	0.511	1.839	0.126	Surcharged
12.000	240 min Summer	120	D1	PS9	0.100	0.378	2.036	0.110	Surcharged
12.001	15 min Winter	19	PS9	PS3	0.100	0.254	1.997	0.265	Surcharged
13.000	60 min Winter	47	RWHT1	PS13	0.100	1.381	4.173	0.220	Surcharged
13.001	15 min Winter	11	PS13	PS3	0.100	0.674	3.034	0.190	Surcharged
1.007	600 min Winter	578	PS3	PS2	0.020	0.406	0.584	0.040	OK
1.008	600 min Winter	579	PS2	PS1	0.020	0.407	0.584	0.040	OK
1.009	600 min Winter	579	PS1	PS0_out	0.020	0.412	0.584	0.040	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
PP2	600 min Winter	580	9.675	0.235	0.030			OK
PP3	600 min Winter	579	9.675	0.338	0.224			OK
PP4	600 min Winter	575	9.676	0.580	0.215			Flood Risk
PP1	600 min Winter	582	9.675	0.357	0.070			Surcharged



Appendix H

Sudsstore Controflow Universal Flow Control Detail

Description

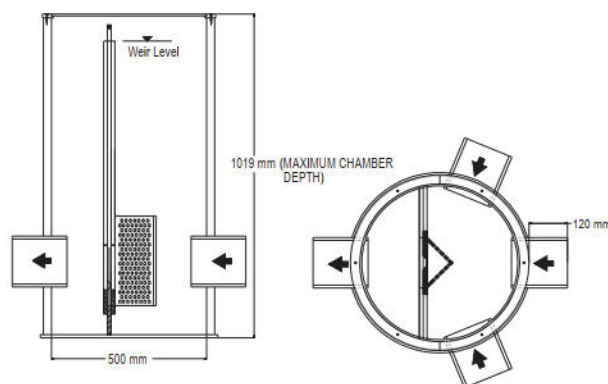
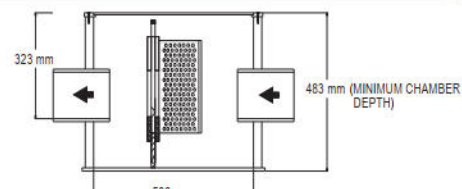
A flexible universal flow control chamber, with level inverts, suitable for any SuDS technique. The slide-out centre plate acts as an overflow weir and contains a circular orifice (to specified diameter), protected by an upstream filter guard. The slide-out centre plate can be temporarily removed to gain access to rod the connections, during regular maintenance services. The Controflow 500 Series Universal Level Invert is available with either 160mm or 110mm diameter connection stubs which offer a flexible layout and is available in depths ranging from 483mm to 925mm. An optional foul air trap is available when connected to the combined sewer. Chambers are supplied with a temporary protective site cover (permanent cover and frame available upon request).



Packaging Details

Element	Value	Unit
Packaging unit dimension	773 x 773 x 1032 (LxWxD)	mm
Packaging unit weight	TBC	kg
Number of units per pallet	8	nr
Pallet dimensions	1200 x 1200 x 150 (LxWxD)	mm
Pallet weight	TBC	kg

*packaging dimensions based on maximum chamber depth



Specification

Element	Value	Unit
Maximum depth of chamber	1019	mm
Minimum depth of chamber	483	mm
Overall width	753	mm
Spigot O.D. ø	160 or 110	mm
Orifice type	Fixed plate	
Unit weight	TBC	kg
Material	HDPE	

Information Check List

(required prior to order being processed)

Element	Value	Unit
Cover level		m (A.O.D)
Pipe invert level		m (A.O.D)
Weir Level		m (A.O.D)
Orifice diameter		mm
Depth of cover and frame to be used		mm
Spigot Diameter		mm
Number of inlet spigots		nr.

A.O.D - Above Ordinance Datum



Appendix I

GreenBlue SuDSPod Detail



NEW FEATURE

New cladding style

SuDSPod now comes with vertical cladding, available in a range of stained and painted finishes.

NEW FEATURE

Water storage for reuse

SuDSPod's unique patented internal chamber is now capable of storing water for reuse.



Enhances biodiversity



Filters the water



All water attenuated in 98% of storms



Pressure on the network significantly reduced



Customisable flow control

NEW FEATURE

In built levelling system

SuDSPod's comes with an in built levelling system that allows for fast installation and adaptability to suit all sites.

How SuDSPod works

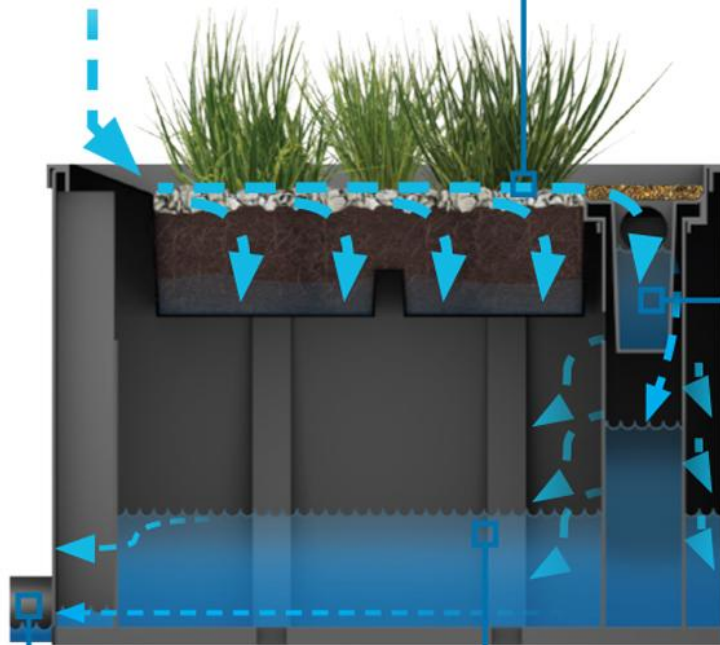
Water inflows from the downpipe.

Water percolates across soil and stone mulch layer, trapping silt and debris on the surface.

Water discharges slowly into drain.

Patented internal flow control system provides optimal attenuation performance.

Any residual silt and debris caught by silt trap.





Appendix J

Maintenance Schedule



MANAGEMENT & MAINTENANCE SCHEDULE

RYEFIELDS FARMHOUSE, OAK TREE LANE

Residential Development

2026-C160-MMS02

July 2026

Prepared on Behalf of Chichester Carpentry & Building Ltd



1 MAINTENANCE

1.1 General Maintenance & Responsibilities

- 1.1.1 In accordance with National Standards for SuDS (Standard 7), a Maintenance Plan, within an Operation and Maintenance Manual, is required to ensure that the proposed drainage system can be maintained safely. Chapter 32 of the SuDS Manual details good practice for operation and maintenance activities, and the below sets out the basis of measures to be incorporated in a detailed management plan as part of the detailed drainage design.
- 1.1.2 Maintenance of shared drainage features are the responsibility of Chichester Carpentry & Building Ltd, or their appointed management company. Chichester Carpentry & Building Ltd will be responsible for funding maintenance, either through self-funding or agreement with residents on ongoing property maintenance, for the lifetime of the development. They are responsible for costing long term maintenance budgets into their overall delivery of the development, but the engineer estimates that overall maintenance cost for this combined sustainable drainage system is £800/yr (approx. £200 per household).
- 1.1.3 Maintenance access to shared drainage features will be across shared land only, that will remain in the ownership of Chichester Carpentry & Building Ltd. Maintenance access is therefore expected to pose no significant issues, with visitor parking on-site available for maintenance workers.
- 1.1.4 Maintenance of private features serving only one residential dwelling are the responsibility of the resident. Maintenance of box planters and living roof by an external contractor is expected to cost another £800/yr (approx. £200 per household).
- 1.1.5 A maintenance regime should include tasks to be taken at regular intervals to keep the system in good working order (see SuDS Manual Table 32.1). This should be done in accordance with the proposed document to ensure continued effective operation and to prevent flooding.
- 1.1.6 General measures should include:

Drainage System feature	Proposed maintenance / remedial works	Required frequency of works
Catch pits, gully sumps and drains, flap valves	Inspection and additional cleansing as required.	Every 6 months
	Desilting	Year 1, Year 3, then every 5 years
Pipework	Jetting to clear blockages	As required

- 1.1.7 Chapters 11-23 of the CIRIA SuDS Manual set out specific maintenance for differing SuDS features, and this is detailed below for the proposed SuDS features.



1.2 Permeable Pavements & Diffuser Units

- 1.2.1 Tanked permeable pavement operates by letting rainwater filter through porous blocks into an underlying, gravel-filled sub-base wrapped in an impermeable geomembrane liner to form a watertight underground tank. Its purpose is to physically trap pollutants and attenuate stormwater before discharging it at a controlled rate. The primary performance risks include sediment or debris clogging the surface pores, and sub-base structural collapse from heavy vehicle overloading. If the tanked system malfunctions, it loses its drainage capacity, causing surface water ponding.
- 1.2.2 As part of the permeable paving system, diffuser units are used to discharge surface water run-off from roof areas into the sub-base, as well as conveying runoff to the outfall from the permeable paving. These diffuser units are small heavy-duty cellular units which allow more efficient discharge of surface water into the sub-base base of the permeable paved areas.
- 1.2.3 The areas of permeable paving will require additional maintenance measures to ensure they operate as designed. Failure in carrying out this maintenance could increase the risk of flooding, as if the surface material becomes clogged it will provide a slower surface infiltration rate. The additional measures are as follows:

Drainage System feature	Proposed maintenance / remedial works	Required frequency of works
Permeable Pavement	Surface sweeping to reduce silt and debris accumulation.	Every 8 to 12 weeks
	Replace broken slabs/blocks	As required
	Removal / management of weed growth	At least once a year
	Silt removal from permeable surfaces, possibly involving raking out of joints, redressing, removal and remedial works.	As required / to be specified by manufacturer
Diffuser units	Inspection and additional cleansing as required.	Annual
	Desilting.	Year 1, Year 3, then every 5 years

1.3 Orifice Chamber

- 1.3.1 Orifice chambers operate by forcing stormwater a metal barrier with a precisely sized, fixed opening. Their purpose is to restrict water discharge at a controlled rate. The primary performance risk is the narrow opening getting clogged by leaves and sediment. If the chamber blocks completely, upstream storage will overwhelm.
- 1.3.2 The orifice chamber includes a guard against blockages, and a weir overflow. A plate is situated in the front of the unit which can be slid out for clearance via the chamber cover. The chamber also provides access of rodding of the upstream pipework.
- 1.3.3 The flow control chamber will require the following maintenance:



- The sump within the flow control chamber should be monitored for build-up of silts and should be emptied as a minimum on the same regime as specified for catchpits previously within this document.
- The guard located on the centre of the unit will require inspection for blockages, to ensure it is operating as intended.

Drainage System feature	Proposed maintenance / remedial works	Required frequency of works
Flow Control Chambers	Clean out chamber/sump	Monthly for first 3 months then twice annually
	Inspect flow control unit and remove debris	

1.4 Non-Return Valve

1.4.1 Drainage non-return valves use a one-way flap that opens for outgoing wastewater but seals shut under reverse pressure to prevent sewage from backing up into a building during heavy rain or sewer overloads. The primary performance risks include the flap getting jammed open by grease or debris, or the mechanical seals wearing out over time. If the valve fails, this can lead to flooding on-site.

1.4.2 The non-return chamber will require the following maintenance:

- The chamber should be monitored for build-up of silts and should be emptied as a minimum on the same regime as specified for catchpits previously within this document.
- The component will require inspection, greasing and opening annually, to ensure it is operating as intended.

Drainage System feature	Proposed maintenance / remedial works	Required frequency of works
Non-Return Valve	Inspection, clearance, and maintenance of components	As required, minimum annually

1.5 Rainwater Harvesting (Box Planters)

1.5.1 Rainwater harvesting box-planters capture gutter runoff into a planter soil bed, filtering it into a lower reservoir that self-waters plants via capillary action to reduce mains water use and slow down stormwater. The main performance risks include soil or leaf debris clogging the internal overflow pipes and roots invading the storage tank. If the system fails, it can waterlog the soil, killing the plants, or overflow unpredictably against the building, causing structural damp and foundation erosion.

Drainage System feature	Proposed maintenance / remedial works	Required frequency of works
Attenuation Tank	Inspection for and cleaning of debris, sediment build up, blockages of inlet/outlet devices or overflow areas	Annually (and if performing poorly)
Filtration System:	Cleaning and/or replacement of any filters	Three monthly (or as required)



Planting surface	Repair of overflow erosion damage	As required
	Planting, weed clearance, soil replacement	As required

1.6 Living Roof

- 1.6.1 Living roofs operate as multi-layered, engineered ecosystems that manage stormwater and filter rain through vegetation and specialized soil. While they offer significant biodiversity benefits, performance risks like plant failure and clogged drainage can lead to malfunctions. If the system fails, it can cause interior leaks or structural rot.

Drainage System feature	Proposed maintenance / remedial works	Required frequency of works
Entire system	Inspection to ensure proper operation, integrity of waterproofing and structural stability, including underside of roof	Annually and after severe storms
Soil substrate	Inspect for evidence of erosion channels	Annually and after severe storms
	Stabilise any erosion channels with extra soil and control	As required
Drain inlets	Inspect to ensure no blockages	Annually and after severe storms
	Repair any cracks, blockages or settlement	As required
Surface	Remove weeds, debris and litter to prevent clogging or poor growth	Six monthly or as required
	Replace dead plants at establishment (i.e. year one)	Responsibility of manufacturer
	Replace dead plants post-establishment	Annually in autumn
	Prune, mow, trim as required	Six monthly or as required

1.7 Remedial Maintenance

- 1.7.1 As well as the frequencies set out in the above tables, inspections should be undertaken after significant storm events to establish any remedial maintenance may be required, as there may be damage to the drainage system that could cause adverse impacts in a future storm event if not identified.

1.8 Accidental Spillages

- 1.8.1 In the event of a serious spillage, either by volume or of unknown or toxic compounds, the spillage should be isolated with the use of soil, turf or fabric with outlet pipes from chambers downstream of the spillage blocked with a bung/bungs.



- 1.8.2 Minor spillages of fuels and oils from motor vehicles will be dealt with by the permachannel, filter gully & catchpits collecting the hydrocarbons.
- 1.8.3 In the event of a spillage, the responsibility lies with the private resident to clear up any spillage before it enters the drainage network. The primary method of dealing with any spillage of hydrocarbons should be using sand (or equivalent) to soak up the leak and mitigate pollution migration. Any contaminated waste shall be disposed of by a licensed contractor, & SmartSponge replacement (inserted within filter gully) should be made in accordance with the manufacturer's instructions.
- 1.8.4 The Environment Agency should then be contacted immediately on their incident hotline; 0800 807060.

1.9 Construction & Operation (Maintenance) Considerations

- 1.9.1 In addition to the regular, occasional and remedial maintenance measures set out above, the following considerations are to be taken:
- i. The Construction Management Plan needs to include management of surface water runoff during construction to prevent pollution. In addition, it is recommended that construction phasing ensures SuDs are completed prior to the construction of buildings and hardstanding areas where possible to provide treatment during construction. These features will need a complete inspection upon completion with necessary remedial maintenance taken.
 - a. It is recommended that permeable pavement is constructed at commencement of construction to provide treatment and attenuation during construction.
 - b. Full maintenance and remediation of system is required at completion
 - c. If contractor is to undertake a different construction phasing methodology, the Construction & Environmental Management Plan (CEMP) will need to detail adequate control and treatment of surface water runoff during the construction phase.
 - ii. Maintenance of private (individual) living roofs and box planters will require green waste and organic sediments arising from the maintenance activities to be disposed of in a Council green waste bin or an alternative legal manner (e.g. compost bin, recycling centre).
 - iii. Chichester Carpentry & Building Ltd, or their appointed management company, are responsible for responsible disposal of any other waste from maintenance activities, however nothing significant is expected during regular maintenance activities.
 - iv. Key Safety Risks for consideration by those undertaking activities:
 - a. Living Roof: Falls from heights, slipping on wet surfaces, and roof structural overload.
 - b. Permeable Pavement: Physical strain from heavy cleaning machinery and slip hazards from surface ponding.
 - c. Box Planters: Heavy lifting injuries, skin irritation from chemical fertilizers, and pest breeding in stagnant water.
 - d. Piped Drainage: Toxic gas buildup in confined spaces, exposure to harmful bacteria, and trench collapse during digging.



1.10 Inspections

1.10.1 The following stipulations are to be adhered to:

- i. A pre-handover inspection of all shared and private drainage features is required.
- ii. Chichester Carpentry & Building Ltd, or their appointed management company, must utilise a checklist based on the principles of this document to facilitate consistent inspection of the condition of the system, in accordance with the manner and frequency of works set out in this document.
- iii. Chichester Carpentry & Building Ltd, or their appointed management company, must provide contact details of who to contact if the surface water drainage system is not functioning correctly.

1.10.2 Contact details for Chichester Carpentry & Building Ltd are as follows: *Unit 72, Enterprise Centre, Terminus Rd, Chichester PO19 8FY, 01243 537601*, <https://chichestercarpentry.co.uk/>

1.10.3 Method Statement: Drainage Maintenance Safety

1.10.4 Pre-Work Planning

- i. Risk assessment: Inspect all areas for immediate hazards like unstable ground or high winds before starting.
- ii. PPE required: Wear safety boots, heavy-duty gloves, safety glasses, and a hi-vis vest.
- iii. Utility check: Locate and mark underground utility lines before any digging.

1.10.5 Living Roof Maintenance

- i. Fall protection: Use installed guardrails or wear a certified safety harness attached to a secure anchor point.
- ii. Access safety: Use secured, stable ladders or structural stairs; never carry heavy tools up a ladder by hand.
- iii. Weight limits: Distribute tools and materials evenly to avoid overloading the roof structure.

1.10.6 Permeable Pavement Care

- i. Ergonomics: Use mechanical sweepers or proper lifting techniques to prevent muscle strain.
- ii. Spill response: Keep a spill kit nearby to clean oil or chemical leaks immediately, preventing pavement contamination.

1.10.7 Box Planter Management

- i. Safe lifting: Use team lifting or wheelbarrows for heavy soil and pots.
- ii. Hygiene: Wear gloves when handling soil or fertilizer, and wash hands immediately afterward to avoid bacteria.

1.10.8 Piped Drainage & Confined Spaces

- i. No entry: Never enter a manhole, deep trench, or tank without specialist confined-space training and gas detectors.



- ii. Biohazard control: Wear fluid-resistant gloves and a mask when handling pipes to protect against wastewater bacteria.
- iii. Trench shoring: Support trench walls with shoring equipment if digging deeper than 1.2 metres.

1.11 Evaluation and Modification

- 1.11.1 Any future changes to the proposed development will need assessment by the designer to determine impacts on and/or changes required to the proposed drainage system. Advice can then be provided as to how alterations or works carried out may affect the surface water drainage system.
- 1.11.2 Periodic evaluation of the maintenance regime is to be undertaken by Chichester Carpentry & Building Ltd, or their appointed management company, 1 year after completion and subsequently every 5 years.

