LANMOR Consulting

Civil Engineers & Transport Planners

Woodfalls Stud

Drainage Strategy

August 2024

231718/DS/AG/RS/01

Rev A

LANMOR Consulting

Civil Engineers & Transport Planners

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1 INTRODUCTION

1.1 General

1.1.1 Lanmor Consulting Ltd has been appointed to provide a Drainage Strategy for the proposed development at Woodfalls Stud, Loxwood Road, Rudgwick, RH12 3DR.

1.1.2 Figure 1.1 below shows the location of the site.

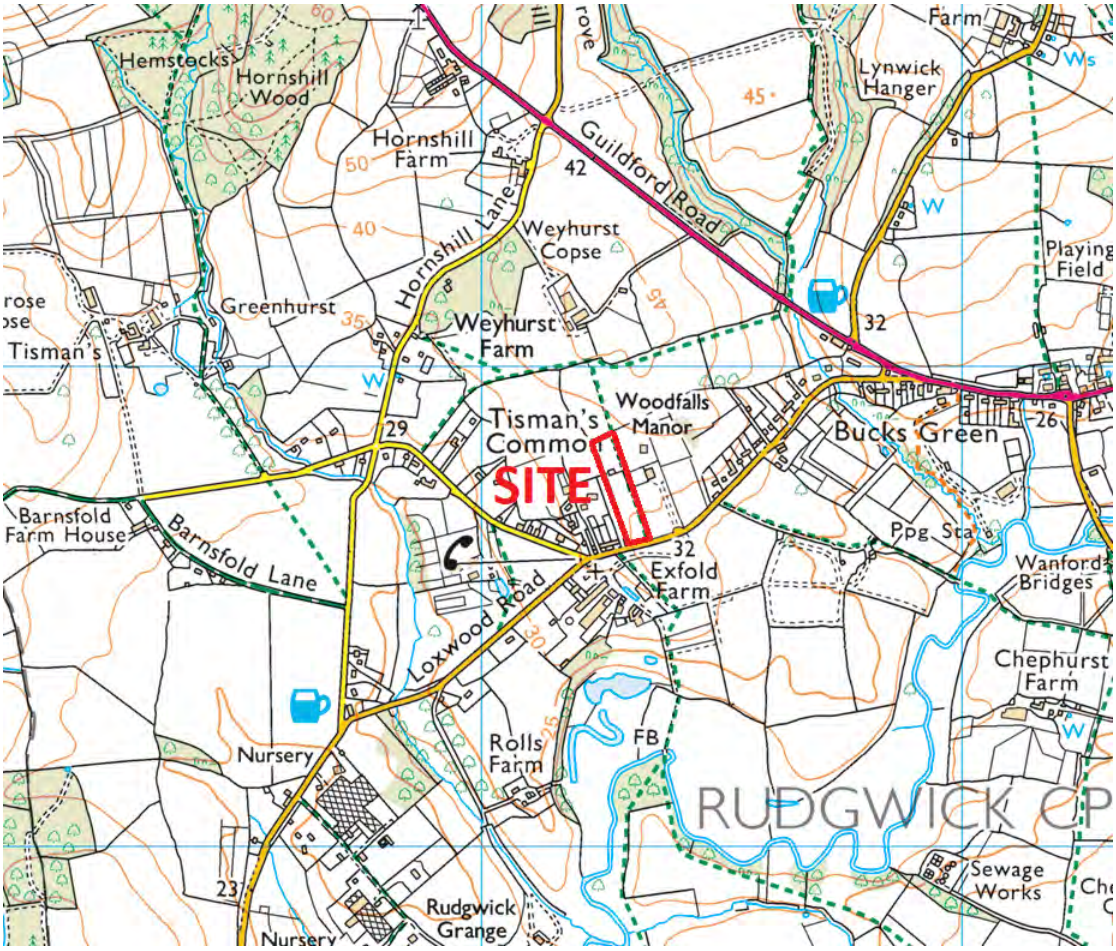


Figure 1.1 – Site Location Map

1.2 Scope

1.2.1 This report will consider the proposed drainage strategy regime for the above site. It will assess the site's current discharge, its Greenfield runoff rate, suitable methods of discharging the runoff from the development and will set out the drainage strategy for the development, including proposed discharge rates and any requirements for attenuation.

1.2.2 The information and details within this drainage strategy report will be refined, modified and updated as the detailed design is progressed. The scope of this report is outlined below:

- Review available data relating to existing on-site drainage and other drainage networks in the vicinity of the site.
- Review the site's ground conditions for suitability of Sustainable Drainage Systems (SuDS).
- Consider the use of SuDS as an option for the disposal of surface water runoff from the proposed development.
- Undertake drainage assessments of the proposed buildings to establish the discharge rates and attenuation requirements to deal with any increased surface water runoff.

2 BASELINE CONDITIONS AND PROPOSED DEVELOPMENT

2.1 Existing Site

2.1.1 The site is located on the outskirts of Rudgwick, West Sussex and is used by the applicant as an equine school for the rearing and training of horses for use in equestrian sport. In terms of topography, the site is currently occupied by a sand school, horse walker, stables, lunge pen and office, with a long access driveway leading from Loxwood Road into the concrete stable yard. A topographical survey of the existing site has been included in Appendix A.

2.2 Regional Geology

2.2.1 The British Geological Survey (BGS) indicates that the site is underlain by Weald Clay Formation – Mudstone. The sedimentary bedrock formed between 133.9 and 126.3 million years ago during the Cretaceous period. No information was available with regards the superficial geology of the site.

2.3 Proposed Development

2.3.1 The proposed development seeks the construction of a single storey, 2-bedroom dwelling on the site, in addition to the replacement of the old tack room and site office with a combined office, lab and tack room block. The proposed site plan for the development has been included in Appendix A as drawings 23/2194-3.

3 ONSITE DRAINAGE

3.1 Existing Drainage

3.1.1 As part of the investigation into the existing drainage regime for the site, Southern Water sewer records were obtained. These show that there is a 150mm foul sewer along Loxwood Road.

3.1.2 A CCTV survey by Insewer Surveys on the 2nd of November 2023 established that the site has an existing foul network which serves the buildings on site, and this outfalls to the sewer in Loxwood Road. The survey also established that the existing drainage channel in the stable yard discharges to the onsite foul network and into the sewer in Loxwood Road.

3.2 Proposed Foul Drainage

3.2.1 A section of the existing foul network will be abandoned, and new foul drainage connections will be constructed to cater for the dwelling. These will connect into the existing foul pipe through a new manhole, and foul water will then outfall to the Southern Water sewer in Loxwood Road to the south of the site. An indicative layout for the foul drainage strategy for the site has been included in Appendix C as drawing 231718/DS/01.

3.3 Proposed Surface Water Drainage

3.3.1 The Sustainable Drainage Systems (SuDS) Hierarchy was consulted in order to establish the most sustainable and practicable method of discharging runoff from the site. Since the proposed dwelling and the office building will have pitched roofs, blue / green roof attenuation will not be a viable method of drainage for the site and so has been discounted.

3.3.2 Rainwater harvesting was also considered as a means of reusing surface water runoff within the building. However, the facilities within the building will have a very limited demand so this has been discounted. Also, for it to provide effective storage it needs to be completely empty at the time of the next storm. As there is no guarantee it will be empty for this eventuality, rainwater harvesting should be excluded from any attenuation storage.

3.3.3 Next on the Sustainable Drainage Hierarchy is the use of ground infiltration techniques such as soakaways and infiltration basins. As stated above, the British Geological Survey (BGS) indicates that the location of the site is underlain by Weald Clay Formation and so it is likely that soakaways would be unsuitable for the site due to the low permeability of clay. Any soakaways designed for the site would not achieve a half drain time of less than 24 hours and therefore would not comply with Building Regulations. For these reasons the use of soakaways has been discounted. It would be possible to use permeable paving for the site; however, this will not discharge to ground and would instead have a gravel and permavoid sub-base to attenuate the flows.

3.3.4 Discharge to a nearby watercourse is the next option on the Sustainable Drainage Hierarchy, however as the proposed development is not situated near any suitable watercourse, discharging via this method would not be a viable option and so has been discounted.

3.3.5 Next on the hierarchy is discharging to a surface water sewer and attenuating the flows. There is no surface water sewer within the immediate vicinity of the site and nor is there a combined sewer. Discharging to either a surface water or a combined sewer has therefore been discounted.

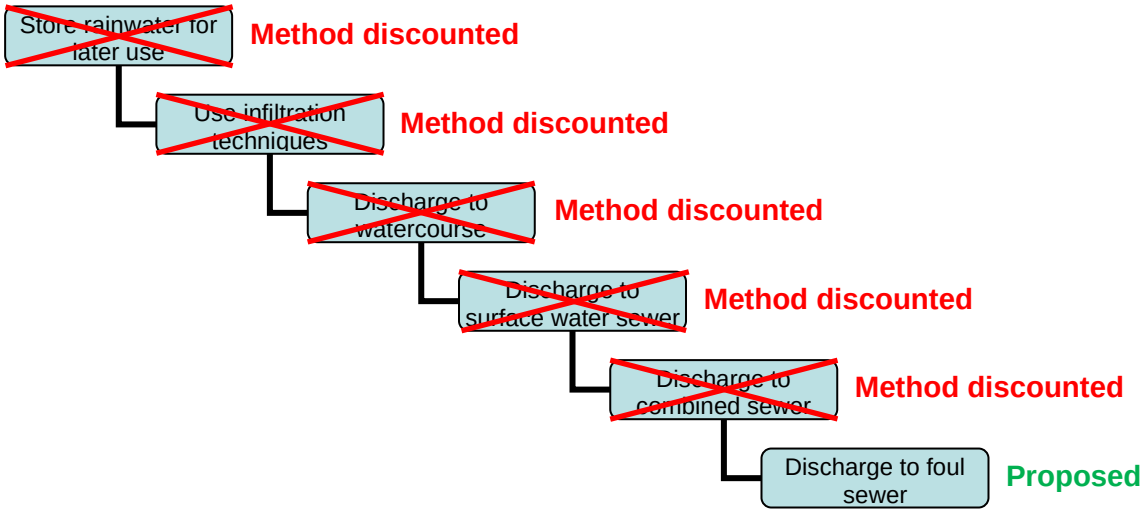


Figure 3.1 – SuDS Hierarchy

3.3.6 The last option is to discharge surface water runoff to a foul sewer and attenuate the flows. The asset records obtained from Southern Water indicate that there is a foul sewer which runs along Loxwood Road. The CCTV survey also shows that runoff from the stable yard currently outfalls to this sewer via the drainage channel and so it is proposed to establish a new connection for the new dwelling and office building which will comprise a 100mm diameter pipe connecting the paving to the existing surface water network, before flowing out to the foul network at IC4. The flows from the paving into the sewer will be controlled by a 22mm orifice plate.

3.3.7 The proposed surface water strategy utilises a permeable paving structure to attenuate runoff from the roofs and will also capture rainfall that falls directly onto it. Therefore, the total drained area for the system is the dwelling roof (74m^2) plus the equestrian building roof (72m^2) plus the permeable paving (83m^2) giving a total drained area of 230m^2 (0.023ha).

3.3.8 Calculations have been undertaken to determine the existing Greenfield and Brownfield rates for the application site. The existing building to be removed has a roof area of 57m^2 (0.006ha) which has been used for the Brownfield runoff calculations. The Brownfield discharge rates were compared against the total proposed discharge rates to determine the effects of the proposed drainage regime on the peak discharge rate of surface water runoff from the property. The rates and calculations are tabulated below in Table 3.1. The full calculations are included in Appendix D.

Return Period	Greenfield Rate (l/s)		Brownfield Rate (l/s)	Water Depth in sub-base (m)	Proposed Flow Rate (l/s)	% Reduction	Storage Required (m^3)
	Site	Developable Area					
Q_{BAR}	4.7	0.2	-	-	-	-	
1 in 1	4.0	0.2	0.5	0.051	0.2	56%	1.8
1 in 30	10.8	0.5	1.2	0.100	0.3	75%	5.5
1 in 100	15.1	0.7	1.6	0.128	0.3	81%	7.7
1 in 100 +45% CC	-	-	2.3	0.198	0.4	82%	12.0

Table 3.1 – Existing and Proposed Flow Rates

3.3.9 For this development the alternative approach has been used, with discharge rates limited to a range of Greenfield rates. This is shown in Table 3.1 above, with the proposed discharge rates less than or equal to the Greenfield rates for the developable area for all storm events. In all cases the runoff has been restricted to less than the 1 in 30 year Greenfield rates (0.5 l/s). When compared with the Brownfield rates there is a greater than 50% betterment of existing runoff rates for all events.

3.3.10 The proposed discharge rates have been achieved through the use of a 22mm diameter orifice plate in the control chamber. To restrict the discharge rates to the 1 in 1 year Greenfield rate would require a much smaller opening, which would significantly increase the risk of blockages and flooding on site, and in the surrounding area.

3.3.11 The discharge rate from the site to the foul sewer will be restricted through the use of an orifice plate which will be located in a flow control chamber to control the outflow from the sub-base of the permeable paving. Southern Water have been consulted as part of the planning application and have confirmed that "*The Drainage Strategy document indicates surface water flows no greater than existing levels being connected into the public system proving betterment which would be satisfactory to Southern Water*." A copy of their consultation response letter is provided in Appendix E.

3.3.12 Permeable paving will be used on the forecourt in front of the new dwelling and office building. The sub-base of the permeable paving will be lined to prevent pollution to, or ingress of, groundwater into the system. It will be 300mm thick and will comprised of 150mm of permavoid crates overlaid by 150mm of gravel. Calculations have been undertaken using MicroDrainage to show that the paving would have a half drain time of 274 minutes for the 1 in 100-year plus 45% CC event which is under 24 hours as required by Building Regulations. Reductions in the flow rate for the proposed development compared with the Brownfield Rate range from 56% for the 1 in 1-year event to 82% for the 1 in 100-year +45% CC event.

3.3.13 An indicative layout for the proposed surface water drainage strategy has been included in Appendix C as drawing 231718/DS/01, and the full calculations for the permeable paving are included in Appendix D.

3.4 Exceedance Flows

3.4.1 The site slopes from north to south and so any exceedance flows from the paving will flow into the existing drainage channel in the stable yard, and out towards the sewer. The proposed development will not alter the ground levels across the site and therefore will not alter the exceedance flow routes. An exceedance flow route drawing is included in Appendix C.

4 SURFACE WATER/SUDS MAINTENANCE

4.1 SuDS Maintenance

4.1.1 Regularly inspecting the surface water drainage network for blockages and clearing unwanted debris / silt from the system should improve the performance of the surface water network and decrease the need for future repairs.

4.1.2 The level and frequency of maintenance required on site is dependent on the type of facility. The type of maintenance will fall into one of three categories "regular maintenance", "occasional maintenance" and "remedial maintenance".

4.1.3 Regular maintenance of the drainage and SuDS features will include, inspections, removal of litter / debris and sweeping of the surfaces. Occasional maintenance will include removal of sediment etc. and remedial maintenance may include structural repairs if required.

4.1.4 The drainage and SuDS elements after an initial inspection following construction should be inspected on a monthly basis for the first 12 months and after large storms, thereafter the following maintenance regime should be applied and adjusted if the 12-month monitoring process has identified any issues.

4.1.5 The freeholder will be responsible for the drainage and SuDS elements within their property. The appropriate health and safety equipment must be used when accessing manholes. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained.

Pipes and Manholes

4.1.6 For drainage pipes and manholes, the following maintenance is recommended.

Manhole / Pipe Maintenance Schedule		
	Required Action	**Typical Frequency**
Regular maintenance	Inspect for evidence of poor operation via water level in chambers. If required, take remedial action.	3-monthly, 48 hours after large storms.
	Check and remove large vegetation growth near pipe runs.	Monthly or as required
	Remove sediment from structures.	Annually or as required
Remedial Actions	Rod through poorly performing runs as initial remediation.	As required
	If continued poor performance jet and CCTV survey poorly performing runs.	As required
Monitoring	Inspect/check all inlets, outlets, to ensure that they are in good condition and operating as designed.	Annually
	Survey inside of pipe manholes for sediment build-up and remove if necessary	Every 5 years or as required

Table 4.1 – Manhole, Catchpit and Pipes Maintenance Schedule

Permeable Paving

4.1.7 For permeable paving areas, the following maintenance is recommended.

Permeable Paving Maintenance Schedule		
	Required Action	**Typical Frequency**
Regular maintenance	Remove debris and leaves etc.	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surfaces from adjacent impermeable areas as this area is most likely to collect the most sediment.
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting etc	As required
	Rehabilitation of surface and upper substructure	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action.	Three-monthly, 48 hours after large storms in the first six months
	Inspect silt accumulation rates and establish appropriate frequencies for rehabilitation	Annually
	Monitor inspection chambers	Annually

Table 4.2 – Permeable Paving Maintenance Schedule

4.2 SuDS Treatment

4.2.1 As part of the CIRIA SuDS Manual C753, Section 26 provides guidance regarding methods for managing pollution risks from surface water runoff.

4.2.2 Part of the assessment is to determine which land use classification the proposed development falls under, Table 26.1 of the CIRIA Report C753 sets the approaches to water quality risk management. For this site the Simple Index Approach will be used.

4.2.3 Table 26.2 in C753 reproduced as Table 4.3, shows the potential hazard associated with different land uses the hazard indices. The development will consist of a residential property, and so it is concluded that the site should be classed within the sections shown in Table 4.3 below.

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

Table 4.3 – CIRIA SuDS Manual C753 (Land use classifications)

4.2.4 The roofs of the buildings are considered to have a “very low” pollution hazard, generating 0.2 total suspended solids, 0.2 metals and 0.05 hydrocarbons.

4.2.5 The paving area is considered to have a “low” pollution hazard, generating 0.5 total suspended solids, 0.4 metals and 0.4 hydrocarbons.

4.2.6 The proposed development will incorporate permeable paving for storage and an orifice plate for restriction of runoff from the site. Suitable treatment measures offered by SuDS features are set out in the CIRIA report.

4.2.7 Table 26.3 of C753 reproduced below as Table 4.4 sets out the mitigation indices provided by SuDS features for discharge to surface waters.

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters

	Mitigation indices[1]		
Type of SuDS component	**TSS**	**Metals**	**Hydrocarbons**
Filter strip	0.4	0.4	0.5
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond[4]	0.7[3]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary treatment systems[5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Table 4.4 – CIRIA SuDS Manual C753 (Mitigation Indices to Surface Water)

4.2.8 The permeable paving will provide mitigation of 0.7 for total suspended solids, 0.6 for metals and 0.7 for hydrocarbons. These are all greater than the pollution hazard indices identified in Table 4.3 above.

5 SUMMARY AND CONCLUSION

5.1.1 The site is located on the outskirts of Rudgwick, West Sussex and is used by the applicant as an equine school for the rearing and training of horses for use in equestrian sport. The proposed development will involve the construction of a single storey, 2-bedroom dwelling on the site, in addition to the replacement of the old tack room and site office with a combined office, lab and tack room block.

5.1.2 Foul drainage from the proposed development will be discharged to the Southern Water sewer running along Loxwood Road. Part of the existing foul network will be abandoned as it lies beneath the proposed dwelling, and a new connection into the existing foul system will be established via a new manhole. This will outfall to the foul sewer in Loxwood Road.

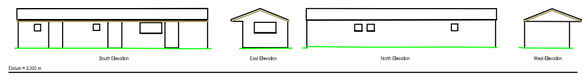
5.1.3 Surface water runoff from the new dwelling and office block will drain via the permeable paving and will outfall to the foul sewer at IC4 through the existing onsite surface water drainage network. The flows from the paving will then be discharged into the sewer at a restricted rate via a 22mm orifice plate. The CCTV survey by Insewer Surveys has shown that the drainage channel in the stable yard already drains into the foul sewer. The proposed flow rate for the 1 in 100-year plus 45% CC event will be set at 0.4 l/s which is a 82% reduction on the existing Brownfield Rate. In conclusion, a SuDS assessment has been completed for the proposed development and has found that discharging to the foul sewer is the most sustainable method of drainage available to this development.

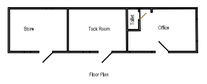
5.1.4 For the reasons outlined within this report we see no reason to refuse planning permission on the grounds of there being insufficient capacity to discharge runoff from the development.

APPENDIX A

Topographical Survey

Post & Wire Fence
Gate
Grass
Gate
Field
Close Board Fence
Track
Track
Sand School
Close Board Fence
Close Board Fence
Gate
Gate
Decking
Silage
Horse Walker
Controls For Horse Walker
Power Pole
Post & Wire Fence
Field
Building One
Roof 7.29
Ridge 8.22
Roof 7.35
Shed
Overhead Power Line
Wall
Channel
Concrete
Concrete
Concrete
Roof 7.80
Ridge 8.10
Stables
Floor Level 5.10
Roof 7.80
Roof 7.75
Stables
Roof 7.50
Path
Power Pole
A1
529.713
543.407
5.000
Gate
Grass
Gate
Gate
Post & Wire Fence
Post & Wire Fence
Lunge Pen
Field
Hedge
Stone Drive
Field
Gate
Gate
Hedge
Stone Drive
Loxwood Road





Floor Plans And Elevations Of Building One

A C E SURVEYS

Topographical Survey

Woodfalls Stud
Loxwood Road
Rudgwick
RH12 3DR

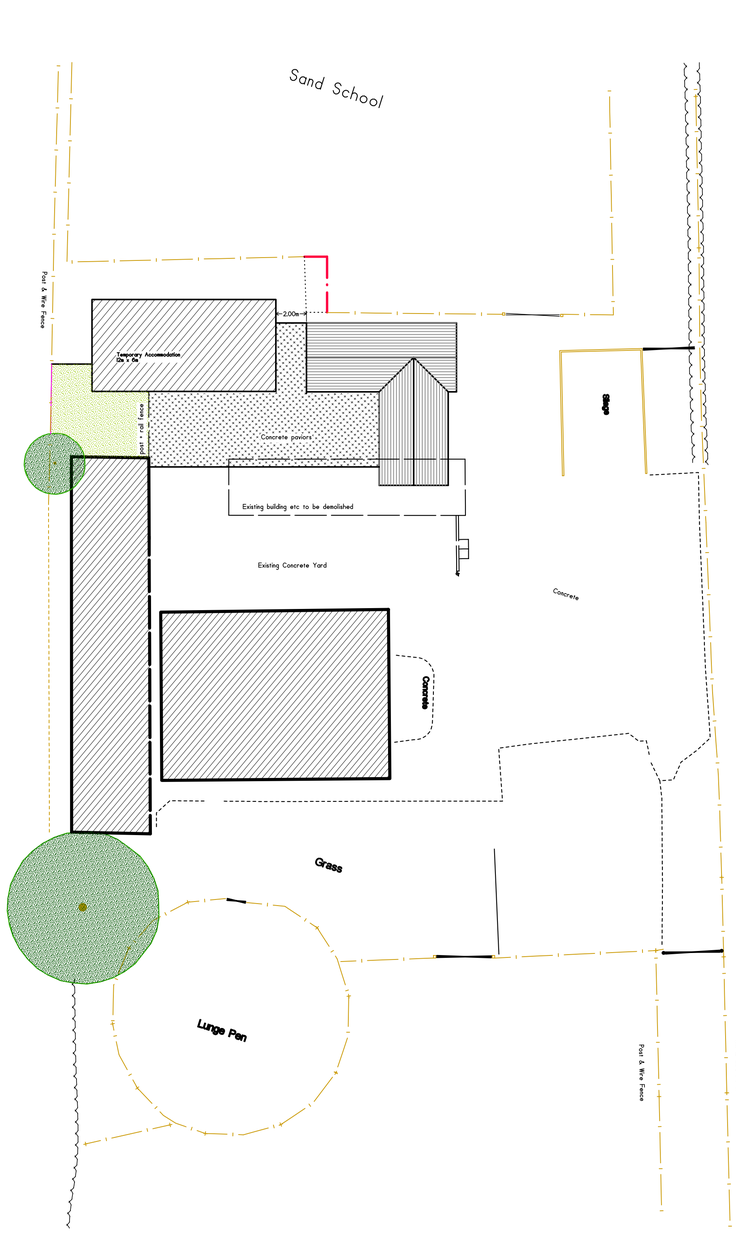
Scale 1:250
Date 29-08-23

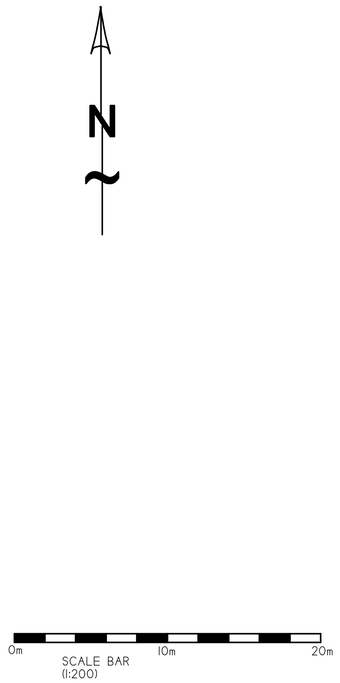
All Levels Relate To Station A1
With Arbitrary Level Of 5.000 m

Key
IC = Inspection Chamber

Scale Bar
20.000m
20.000m

23/2194-3 – Proposed Site Plan





A1
1:200

REV	DATE	DESCRIPTION
A	July 24	House replaced with temporary accommodation unit

CLIENT:
N. Wyatt Esq.

Proposed rural dwelling and ancillary equestrian building

Woodfalls Stud
Loxwood Road
Rudgwick
RH12 3DR

DRAWING TITLE:
Proposed Site Plan

DSEQUINE
www.dsequine.com
07831 758231

REVISION		
A	SCALE	As shown
	DATE	September 23
	DRAWN BY	
	CHECKED BY	

DRAWING No.
23/2194-3

D:\OneDrive\Documents\General\Cadd\GXD drawings\David Spragg\2194 Woodfalls Stud\2194-3A.gxd -- 07/05/2024 -- 03:48 PM -- Scale 1 : 200.00

APPENDIX B

Southern Water Sewer Records



(c) Crown copyright and database rights 2023 Ordnance Survey 100031673

Scale: 1:1250 | Date: 11/10/23 | Wastewater Plan A3

Data updated: 21/08/23

Map Centre: 507297,132741 | Our Ref: 1294077 - 1 | Powered by digdat

Foul Gravity Sewer
Combined Gravity Sewer
Culverted Water Course or Treated Effluent
Surface Water Gravity Sewer
Rising Main, Vacuum or Syphon
Combined Outfall
Surface Water Outfall
Foul Outfall
Surface Water Inlet
Combined Pumping Station
Surface Water Pumping Station
Foul Pumping Station
WWTW Water Treatment Works
Section 104 Area
Building Over Agreement Area
Foul Manhole
Combined Manhole
Surface Water Manhole
Side Entry Manhole, Decarcation Chamber, Dummy Manhole or Surface Water Soakaway

alex.grinsted@lanmor.co.uk

Woodfalls Stud

WATER for LIFE from Southern Water

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2023 Ordnance Survey 100031673 .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.

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
1501	F	33.50	32.07	
1601	F	33.23	31.72	
1602	F	35.43	34.02	
1603	F	34.73	33.15	
1604	F	34.27	31.65	
1605	F	33.96	31.43	
2501	F	35.00	33.60	
2601	F	36.25	34.67	
2602	F	37.16	36.16	
2701	F	0.00	0.00	
3601	F	33.89	31.84	
4601	F	31.69	30.21	
4602	F	31.59	30.12	
4603	F	31.87	30.30	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

CCTV Survey

Sewer Inspection,

Cleaning and Repair

Project ref:TV231105

02nd Nov 2023

CCTV Survey Report

CLIENT: MR NICK WYATT

SITE: Woodfalls Stud

Loxwood Road

Tismans Common

RH12 3DR

www.insewer.co.uk

Tel : 01634 861 768

Insewer Surveys
16a Revenge Road, Chatham
Tel. 01634 861 768

Project Information

Project Name	Project Number	Project Date
TV231105		02/11/2023

Client

Contact: Mr Nick Wyatt
Street: 32 Pondfield Road
Town or City: Rudgwick
County: West Sussex
Post Code: RH12 3EW

Site

Description:
Department: Woodfalls Stud
Street: Loxwood Road
Town or City: Tismans Common
County: West Sussex
Post Code: RH12 3DR

Contractor

Company: Insewer Surveys
Contact: Liam Sellar
Street: 16a Revenge Road
Town or City: Chatham
County: Kent
Post Code: ME5 8UD
Phone: 01634 861 768
Fax: 01634 201376
Mobile: 07802 660 752

Insewer Surveys
16a Revenge Road, Chatham
Tel. 01634 861 768

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TV231105		02/11/2023

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Section Item 13: IC6 > RUN X (IC6Y) 21
Section Item 14: 3601-A > 3601 (3601-AX) 23
Section Item 15: IC7-B > IC7 (IC7-BX) 25
Section Item 16: IC7 > GULLY 2 (IC7X) 27

Insewer Surveys
16a Revenge Road, Chatham
Tel. 01634 861 768

Scoring Summary

Project Name	Project Number	Project Date
TV231105		02/11/2023

Structural Defects

Section	PLR	Grade	Description
All inspected pipes are in an acceptable structural condition (< grade 3).			

Service / Operational Condition

Grade 3: Best practice suggests consideration should be given to maintenance activities in the medium term.

Grade 4: Best practice suggests consideration should be given to maintenance activity to avoid potential blockages.

Grade 5: Best practice suggests that this pipe is at a high risk of backing up or causing flooding.

Section	PLR	Grade	Description
2	IC2X	3	Settled deposits, hard or compacted, 5% cross-sectional area loss, finish
3	IC1X	3	Settled deposits, hard or compacted, 10% cross-sectional area loss
4	OUTFALL 1X	3	Settled deposits, hard or compacted, 10% cross-sectional area loss
7	IC4-BX	5	Settled deposits, hard or compacted, 80% cross-sectional area loss
11	IC6.1X	3	Attached deposits, grease from 09 o'clock to 03 o'clock, 10% cross-sectional area loss
12	IC6X	2	Deformed sewer or drain, 5%, finish
15	IC7-BX	4	Settled deposits, hard or compacted, 40% cross-sectional area loss, finish

Abandoned Surveys

Section	PLR	Description
7	IC4-BX	Survey abandoned
12	IC6X	Survey abandoned
13	IC6Y	Survey abandoned
14	3601-AX	Survey abandoned
15	IC7-BX	Survey abandoned

Information

These scoring summaries are based on the SRM grading from the WRc.

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Cleaning and Repair

Site Photos

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IC1



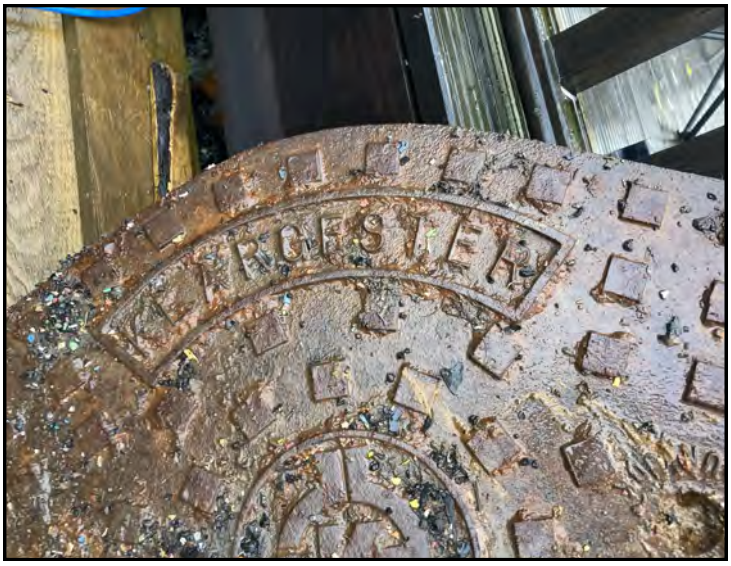
LOCATION OF IC1



IC2 - ASSUMED KLARGESTER



LOCATION OF IC2



IC2 - ASSUMED KLARGESTER AS SHOWN ON COVER

IC3. UNABLE TO LOCATE / LIFT



LOCATION OF IC3



IC4 - CATCHPIT



LOCATION OF IC4



IC5 - PUMP CHAMBER



LOCATION OF IC5



IC6 - MASS ROOTS IN CHAMBER



LOCATION OF IC6



IC7 - CATCHPIT.
UNABLE TO FULLY CCTV



LOCATION OF IC7



3601 - NOTE GREEN DYE FROM IC6



LOCATION OF 3601



GULLY 1 + SVP. (GULLY 1 TRAPPED)
UNABLE TO CCTV - OUTFALLS TO IC2



LOCATION OF GULLY 1 + SVP



GULLY 2



LOCATION OF GULLY 2



ACO 1



LOCATION OF ACO 1



OUTFALL 1



LOCATION OF OUTFALL 1



RWP 1 - ASSUMED ONTO GROUND



LOCATION OF RWP 1



RWP 2 - ONTO GROUND



LOCATION OF RWP 2



RWP 3 - ONTO GROUND



LOCATION OF RWP 3



RWP 4 - ONTO GROUND



LOCATION OF RWP 4



RWP 5 - INTO GROUND



LOCATION OF RWP 5

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Post & Wire Fence
Gate
Grass
Field
Gate
Close Board Fence
Track
Close Board Fence
Track
Sand School
Close Board Fence
Post & Wire Fence
Gate
Gate
Horse Walker 100ø PVC
Controls For Horse Walker
Decking
Steps
Overhead Power Lines
Roof 7.29
Ridge 8.22
Building One
Roof 7.80
Shed
Concrete
Concrete
Chicane
Chicane
Concrete
Roof 7.50
Stables
Ridge 8.10
Stables
Floor Level 5.10
Roof 7.80
Path
Power Pole
Gate
Grass
Gate
Post & Wire Fence
Lunge Pen
100 ø PVC Route Indicative
Field
Hedge
Hedge
Field
Stone Drive
Gate
Gate
Stone Drive
Loxwood Road

IC1
0.88m
DEPTH TO GROUND LEVEL - COVER SEIZED IN FRAME.
A - 100 ø PVC LAND DRAIN.

IC2
UNIDENTIFIED CHAMBER. WATER FILLED. COVER IDENTIFIES CHAMBER AS A KLARGESTER - UNPROVEN.

SUP1 + COMBINED CULV 1 CONNECTED TO IC2 - UNABLE TO LOCATE.

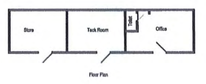
IC3
CATCHPIT
VSC
UNABLE TO LOCATE / LIFT.

IC4
CATCHPIT
BOTTOM - 1.16m
X - 0.80m
A - 100 ø PVC (ASSUMED UC ø PVC)
B - 100 ø PVC SURVEY ABANDONED
C - 100 ø PVC AGG

IC5
PUMP CHAMBER
D - 100 ø PVC

IC6
1.22m
MASS ROOTS IN CHAMBER.
B - 100 ø VC (ASSUMED VC - LINED)
VPS 7 REAM MH
IC6.1
UNABLE TO LOCATE / LIFT
X - 160 ø PE(?) SURVEY ABANDONED CONNECTIVITY PROVEN TO SE01-A BY DYE TEST.





Floor Plans And Elevations Of Building One

Disclaimer
Detail shown on this plan is for reference only.
The positions of the pipes and their route and location are believed to be correct.
InSewer Surveys accept no responsibility in the event of inaccuracy.
Before mechanical plant is used the actual position and route of the drainage system should be verified on site.

A C E SURVEYS
Topographical Survey

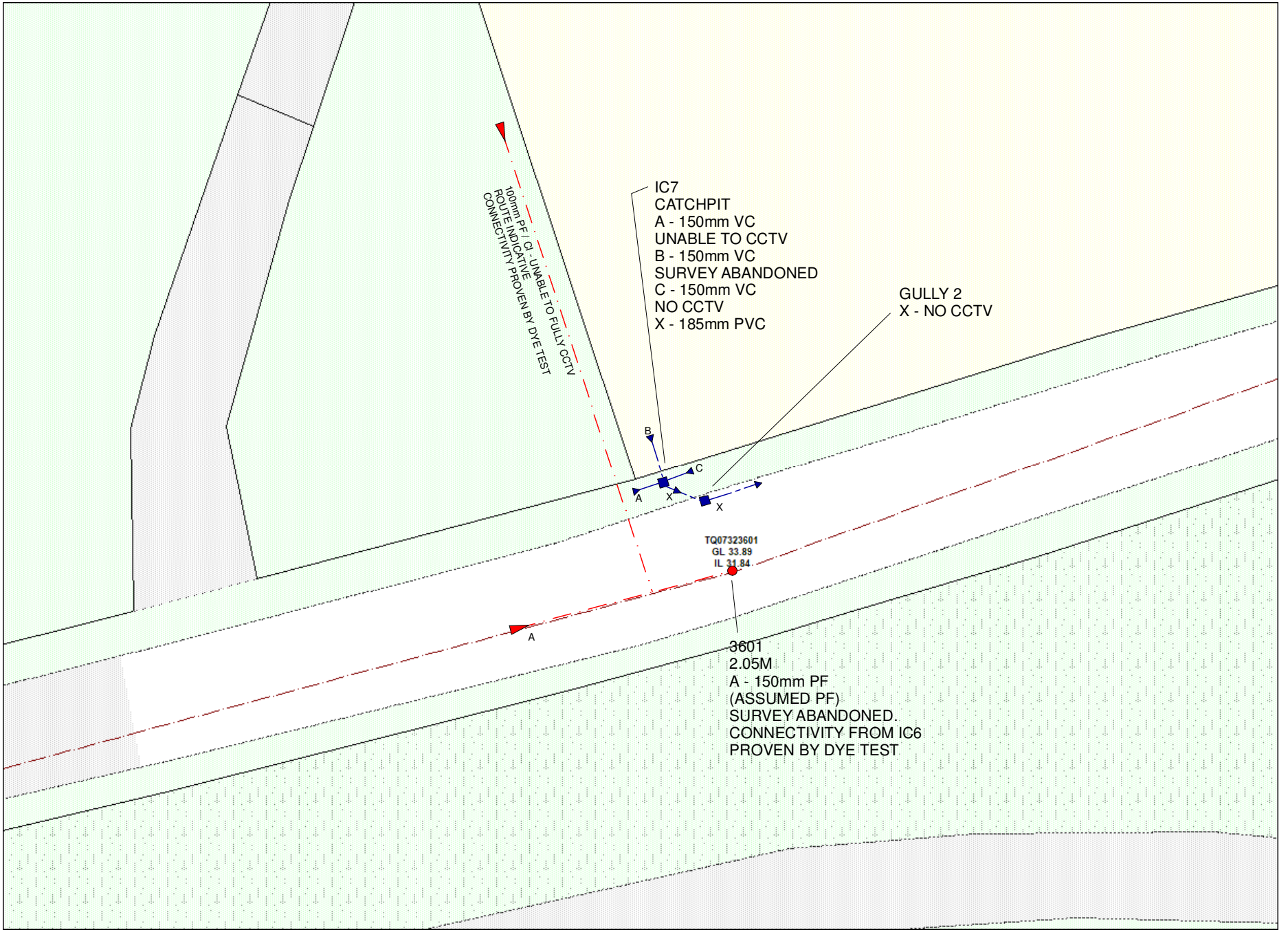
Woodfalls Stud
Loxwood Road
Rudgwick
RH12 3DR

Scale 1:250
Date 29-08-23

All Levels Relate To Station A1 With Arbitrary Level Of 5.000 m

Key
IC = Inspection Chamber

Scale Bar
20.000m
20.000m



General Notes

- foul water manhole with flow direction
- soil pipe
- foul gully
- surface water mh with flow direction
- rwp
- rainwater gully
- svp — soil & vent pipe
- sp — soil pipe
- wc — toilet
- fg — foul gully
- rg — rainwater gully
- rwp — rainwater pipe
- re — rodding eye
- ed — electronic depth
- Points traced electronically

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16a Revenge Road
Chatham
Kent
ME5 8UD
Tel: 01634 861 768
Tel: 01634 201 376
www.insewer.co.uk

Project Name and Address

Woodfalls Stud
Loxwood Road
Tismans Common
RH12 3DR

Drainage Survey

Disclaimer

Detail shown on this plan is for reference only.
The positions of the pipes have been traced electronically and their route and location are believed to be correct.
InSewer Surveys accept no responsibilty in the event of inaccuracy.
Before mechanical plant is used the actual position and route of the drainage system should be verified on site.

Project: *TV231105*

Date: 02/11/2023

Scale: *Not to scale*



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Scale: 1:1250 | Date: 11/10/23 | Wastewater Plan A3

Data updated: 21/08/23

Map Centre: 507297,132741 | Our Ref: 1294077 - 1 | Powered by digdat

Foul Gravity Sewer
Combined Gravity Sewer
Culverted Water Course or Treated Effluent
Surface Water Gravity Sewer
Rising Main, Vacuum or Syphon
Combined Outfall
Surface Water Outfall
Foul Outfall
Surface Water Inlet
Combined Pumping Station
Surface Water Pumping Station
Foul Pumping Station
WWTW Water Treatment Works
Section 104 Area
Building Over Agreement Area
Foul Manhole
Combined Manhole
Surface Water Manhole
Side Entry Manhole, Decarcation Chamber, Dummy Manhole or Surface Water Soakaway

alex.grinsted@lanmor.co.uk

Woodfalls Stud

WATER for LIFE from Southern Water

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2023 Ordnance Survey 100031673 .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.

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Section Inspection - 02/11/2023 - IC1-AX

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
1	1	02/11/23	8:34	TV231105	Rain	No	IC1-AX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

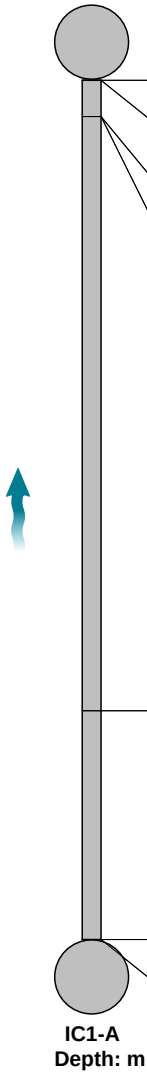
Town or Village:	Tismans Common	**Inspection Direction:**	Upstream	**Upstream Node:**	IC1-A
Road:	Woodfalls Stud	**Inspected Length:**	7.06 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	7.06 m	**Downstream Node:**	IC1
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	0.880 m

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	100 mm
Flow Control:	-	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations: -

Scale: 1:62

Depth: 0.88 m
IC1



IC1-A
Depth: m

Position [m]	Code	Observation	Grade
0.00	IC	Start node, inspection chamber, reference: IC1	
0.00	WL	Water level, 5% of the vertical dimension	
0.30	CUW	Loss of vision, camera under water	
0.30	REM	General remark: Land drain	
5.18	WL	Water level, 20% of the vertical dimension	
7.06	WL	Water level, 5% of the vertical dimension	
7.06	OFF	Finish node, outfall, reference: IC1-A: At head of run / capped end	



OFF - 7.06

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Tel. 01634 861 768

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
1	Upstream	IC1-AX	TV231105	



1, 00:01:10, 7.06 m
Finish node, outfall, reference: IC1-A, At head of run / capped end

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Section Inspection - 02/11/2023 - IC2X

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
2	1	02/11/23	8:38	TV231105	Rain	No	IC2X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

Town or Village:	Tismans Common	**Inspection Direction:**	Upstream	**Upstream Node:**	IC2
Road:	Woodfalls Stud	**Inspected Length:**	17.21 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	17.21 m	**Downstream Node:**	IC1
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	0.880 m

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	100 mm
Flow Control:	-	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations: -

Scale: 1:150

Depth: 0.88 m
IC1

Position [m]		Code	Observation	Grade
0.00		IC	Start node, inspection chamber, reference: IC1	
0.00		WL	Water level, 5% of the vertical dimension	
5.49		JN	Junction at 03 o'clock, 100mm dia	
14.42	S01	DEC	Settled deposits, hard or compacted, 5% cross-sectional area loss, start	
17.21	F01	DEC	Settled deposits, hard or compacted, 5% cross-sectional area loss, finish	3
17.21		OCF	Finish node, other special chamber, reference: IC2: Assumed klargester	

IC2
Depth: m



DEC - 14.42

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	2.0	0.3	6.0	3.0

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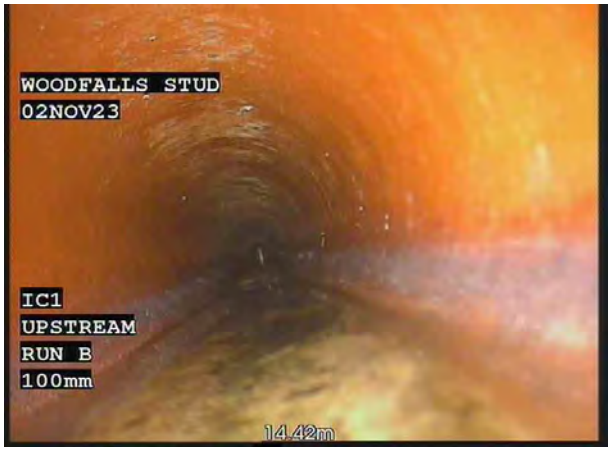
Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
2	Upstream	IC2X	TV231105	



1, 00:01:28, 14.42 m
Settled deposits, hard or compacted, 5% cross-sectional area loss, start

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Section Inspection - 02/11/2023 - IC1X

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
3	1	02/11/23	8:46	TV231105	Rain	No	IC1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

Town or Village:	Tismans Common	**Inspection Direction:**	Downstream	**Upstream Node:**	IC1
Road:	Woodfalls Stud	**Inspected Length:**	29.43 m	**Upstream Pipe Depth:**	0.880 m
Location:		**Total Length:**	29.43 m	**Downstream Node:**	IC3
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	100 mm
Flow Control:	-	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

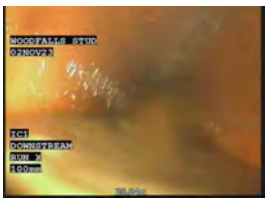
Comments:
Recommendations: -

Scale: 1:255

Depth: 0.88 m
IC1

Position [m]	Code	Observation	Grade
0.00	IC	Start node, inspection chamber, reference: IC1	
0.00	WL	Water level, 5% of the vertical dimension	
1.54	WL	Water level, 10% of the vertical dimension	
4.03	WL	Water level, 5% of the vertical dimension	
10.55	WL	Water level, 10% of the vertical dimension	
12.33	WL	Water level, 5% of the vertical dimension	
13.94	JN	Junction at 09 o'clock, 100mm dia	
15.18	WL	Water level, 10% of the vertical dimension	
25.54	DEC	Settled deposits, hard or compacted, 10% cross-sectional area loss	3
26.44	JN	Junction at 09 o'clock, 100mm dia	
27.53	WL	Water level, 20% of the vertical dimension	
29.25	WL	Water level, 10% of the vertical dimension	
29.43	CPF	Finish node, catchpit, reference: IC3: Unable to locate / lift	

IC3
Depth: m



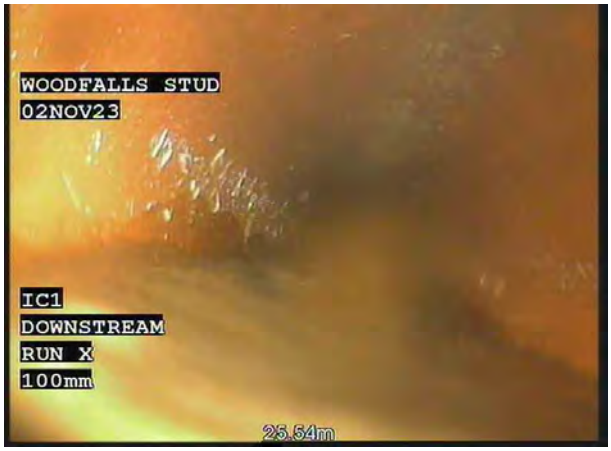
DEC - 25.54



CPF - 29.43

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	2.0	0.1	2.0	3.0

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
3	Downstream	IC1X	TV231105	



1, 00:02:38, 25.54 m
Settled deposits, hard or compacted, 10% cross-sectional area loss



2, 00:03:37, 29.43 m
Finish node, catchpit, reference: IC3, Unable to locate / lift

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Section Inspection - 02/11/2023 - OUTFALL 1X

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
4	1	02/11/23	9:23	TV231105	Rain	No	OUTFALL 1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

Town or Village:	Tismans Common	**Inspection Direction:**	Downstream	**Upstream Node:**	OUTFALL 1
Road:	Woodfalls Stud	**Inspected Length:**	5.23 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	5.23 m	**Downstream Node:**	RUN X
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	100 mm
Flow Control:	-	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations: -

Scale: 1:50

Position [m]	Code	Observation	Grade
Depth: m OUTFALL 1			
0.00	OF	Start node, outfall, reference: OUTFALL 1	
0.00	WL	Water level, 5% of the vertical dimension	
0.30	LD	Line deviates down	
1.90	DEC	Settled deposits, hard or compacted, 10% cross-sectional area loss	3
2.24	LD	Line deviates down	
5.23	BRF	Finish node, major connection without manhole, reference: RUN X: At saddle connection	
RUN X Depth: m			



DEC - 1.90

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	2.0	0.4	2.0	3.0

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
4	Downstream	OUTFALL 1X	TV231105	



1, 00:00:37, 1.90 m
Settled deposits, hard or compacted, 10% cross-sectional area loss

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Section Inspection - 02/11/2023 - ACO 1X

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
5	1	02/11/23	9:28	TV231105	Rain	No	ACO 1X

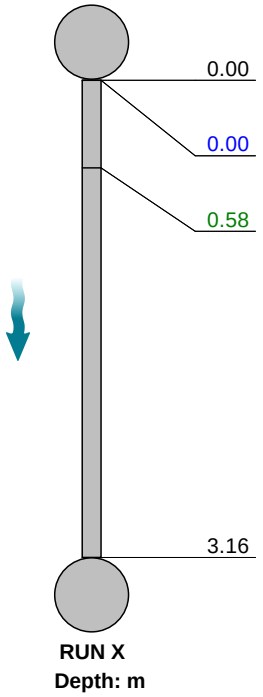
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

Town or Village:	Tismans Common	**Inspection Direction:**	Downstream	**Upstream Node:**	ACO 1
Road:	Woodfalls Stud	**Inspected Length:**	3.16 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	3.16 m	**Downstream Node:**	RUN X
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	100 mm
Flow Control:	-	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations: -

Scale: 1:50



Position [m]	Code	Observation	Grade
0.00	OF	Start node, outfall, reference: ACO 1	
0.00	WL	Water level, 5% of the vertical dimension	
0.58	LR	Line deviates right	
3.16	BRF	Finish node, major connection without manhole, reference: RUN X: At saddle connection	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 02/11/2023 - IC4-AX

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
6	1	02/11/23	9:57	TV231105	Rain	No	IC4-AX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

Town or Village:	Tismans Common	**Inspection Direction:**	Upstream	**Upstream Node:**	IC4-A
Road:	Woodfalls Stud	**Inspected Length:**	12.97 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	12.97 m	**Downstream Node:**	IC4
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	100 mm
Flow Control:	-	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations: -

Scale: 1:113

Position [m]	Code	Observation	Grade
		Depth: m	
		IC4	
0.00	CP	Start node, catchpit, reference: IC4	
0.00	WL	Water level, 5% of the vertical dimension	
9.43	WL	Water level, 10% of the vertical dimension	
11.30	WL	Water level, 5% of the vertical dimension	
12.97	SC	Pipe size changes, new size(s), 40mm high: Estimated	
12.97	OFF	Finish node, outfall, reference: IC4-A: Pumped outfall from IC5	
		IC4-A	
		Depth: m	



OFF - 12.97

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Tel. 01634 861 768

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
6	Upstream	IC4-AX	TV231105	



1, 00:01:46, 12.97 m
Finish node, outfall, reference: IC4-A, Pumped outfall from IC5

Insewer Surveys
16a Revenge Road, Chatham
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Section Inspection - 02/11/2023 - IC4-BX

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
7	1	02/11/23	10:11	TV231105	Rain	No	IC4-BX

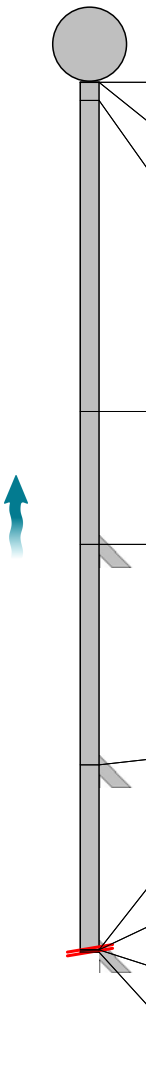
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

Town or Village:	Tismans Common	**Inspection Direction:**	Upstream	**Upstream Node:**	IC4-B
Road:	Woodfalls Stud	**Inspected Length:**	14.41 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	14.41 m	**Downstream Node:**	IC4
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

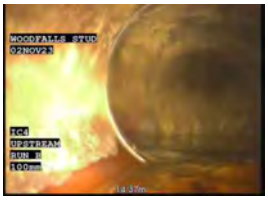
Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	100 mm
Flow Control:	-	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations: -

Scale: 1:125



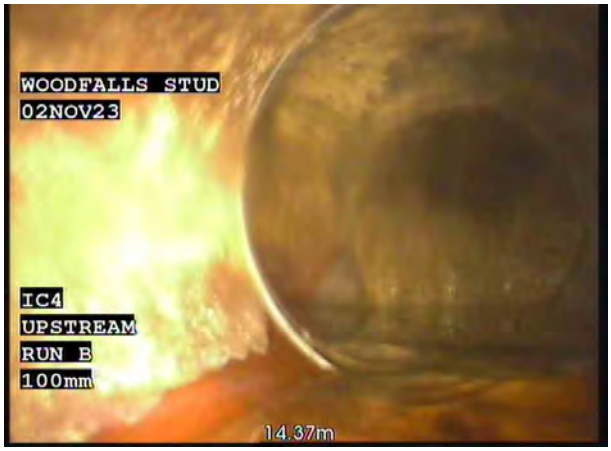
Position [m]	Code	Observation	Grade
0.00	CP	Start node, catchpit, reference: IC4	
0.00	WL	Water level, 5% of the vertical dimension	
0.30	CUW	Loss of vision, camera under water	
5.45	WL	Water level, 10% of the vertical dimension	
7.65	JN	Junction at 09 o'clock, 100mm dia	
11.30	JN	Junction at 09 o'clock, 100mm dia	
14.37	LR	Line deviates right	
14.37	JN	Junction at 09 o'clock, 100mm dia	
14.37	DEC	Settled deposits, hard or compacted, 80% cross-sectional area loss	5
14.41	SA	Survey abandoned: Unable to continue	



DEC - 14.37

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	10.0	0.7	10.0	5.0

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
7	Upstream	IC4-BX	TV231105	



1, 00:01:57, 14.37 m
Settled deposits, hard or compacted, 80% cross-sectional area loss

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Section Inspection - 02/11/2023 - IC4-CX

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
8	1	02/11/23	10:16	TV231105	Rain	No	IC4-CX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

Town or Village:	Tismans Common	**Inspection Direction:**	Upstream	**Upstream Node:**	IC4-C
Road:	Woodfalls Stud	**Inspected Length:**	8.26 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	8.26 m	**Downstream Node:**	IC4
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	100 mm
Flow Control:	-	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations: -

Scale: 1:72

Position [m]	Code	Observation	Grade
		Depth: m	
		IC4	
0.00	CP	Start node, catchpit, reference: IC4	
0.00	WL	Water level, 5% of the vertical dimension	
1.23	LL	Line deviates left	
5.74	WL	Water level, 10% of the vertical dimension	
6.57	LL	Line deviates left	
7.71	WL	Water level, 5% of the vertical dimension	
7.73	LL	Line deviates left	
8.26	OFF	Finish node, outfall, reference: IC4-C: At aco	
		IC4-C	
		Depth: m	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 02/11/2023 - IC4X

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
9	1	02/11/23	10:19	TV231105	Rain	No	IC4X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

Town or Village:	Tismans Common	**Inspection Direction:**	Downstream	**Upstream Node:**	IC4
Road:	Woodfalls Stud	**Inspected Length:**	41.53 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	41.53 m	**Downstream Node:**	IC6
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	1.220 m

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	100 mm
Flow Control:	-	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations: -

Scale: 1:360

Position [m]	Code	Observation	Grade
		Depth: m	
		IC4	
0.00	CP	Start node, catchpit, reference: IC4	
0.00	WL	Water level, 5% of the vertical dimension	
0.30	LL	Line deviates left	
0.73	WL	Water level, 10% of the vertical dimension: Standing water - irregular gradient or backfall	
3.82	WL	Water level, 5% of the vertical dimension	
6.59	WL	Water level, 10% of the vertical dimension: Standing water - irregular gradient or backfall	
30.22	WL	Water level, 5% of the vertical dimension	
35.62	LL	Line deviates left: Slight	
41.53	MHF	Finish node, manhole, reference: IC6	
		IC6	
		Depth: 1.22 m	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 02/11/2023 - IC3X

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
10	1	02/11/23	10:37	TV231105	Rain	No	IC3X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

Town or Village:	Tismans Common	**Inspection Direction:**	Upstream	**Upstream Node:**	IC3
Road:	Woodfalls Stud	**Inspected Length:**	5.02 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	5.02 m	**Downstream Node:**	IC5
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	100 mm
Flow Control:	-	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations: -

Scale: 1:50

Position [m]	Code	Observation	Grade
		Depth: m	
		IC5	
0.00	OC	Start node, other special chamber, reference: IC5: Pump chamber	
0.00	WL	Water level, 5% of the vertical dimension	
0.30	CUW	Loss of vision, camera under water	
4.54	LR	Line deviates right	
5.02	CPF	Finish node, catchpit, reference: IC3: Unable to locate / lift	
		IC3	
		Depth: m	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Section Inspection - 02/11/2023 - IC6.1X

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
11	1	02/11/23	10:55	TV231105	Rain	No	IC6.1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

Town or Village:	Tismans Common	**Inspection Direction:**	Upstream	**Upstream Node:**	IC6.1
Road:	Woodfalls Stud	**Inspected Length:**	7.60 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	7.60 m	**Downstream Node:**	IC6
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	1.220 m

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	100 mm
Flow Control:	-	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	Cured in place lining
Inspection Purpose:	Routine inspection	**Lining Material:**	Epoxy

Comments:
Recommendations: -

Scale: 1:66

Depth: 1.22 m
IC6

Position [m]	Code	Observation	Grade
0.00	MH	Start node, manhole, reference: IC6	
0.00	WL	Water level, 5% of the vertical dimension	
0.30	WL	Water level, 20% of the vertical dimension	
0.64	DEG	Attached deposits, grease from 09 o'clock to 03 o'clock, 10% cross-sectional area loss	3
7.60	MHF	Finish node, manhole, reference: IC6.1: Unable to locate / lift - no access	



DEG - 0.64



MHF - 7.60

IC6.1
Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	4.0	0.5	4.0	3.0

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
11	Upstream	IC6.1X	TV231105	



1, 00:00:17, 0.64 m
Attached deposits, grease from 09 o'clock to 03 o'clock, 10% cross-sectional area loss



2, 00:01:09, 7.60 m
Finish node, manhole, reference: IC6.1, Unable to locate / lift - no access

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Section Inspection - 02/11/2023 - IC6X

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
12	1	02/11/23	10:58	TV231105	Rain	No	IC6X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

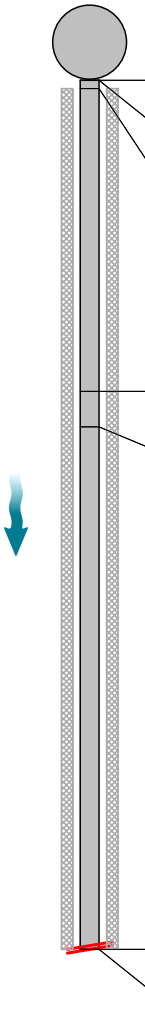
Town or Village:	Tismans Common	**Inspection Direction:**	Downstream	**Upstream Node:**	IC6
Road:	Woodfalls Stud	**Inspected Length:**	29.60 m	**Upstream Pipe Depth:**	1.220 m
Location:		**Total Length:**	29.60 m	**Downstream Node:**	RUN X
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	100 mm
Flow Control:	-	**Material:**	Pitch fibre
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

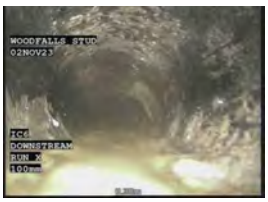
Comments:
Recommendations: -

Scale: 1:257 **Position [m]** **Code** **Observation** **Grade**

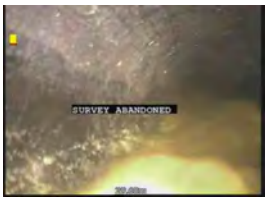
Depth: 1.22 m
IC6



Position [m]		Code	Observation	Grade
0.00		MH	Start node, manhole, reference: IC6	
0.00		WL	Water level, 5% of the vertical dimension	
0.30	S01	D	Deformed sewer or drain, 5%, start	
10.60		WL	Water level, 20% of the vertical dimension	
11.82		WL	Water level, 5% of the vertical dimension	
29.60	F01	D	Deformed sewer or drain, 5%, finish	1 / 2
29.60		SA	Survey abandoned: Unable to continue	



D - 0.30



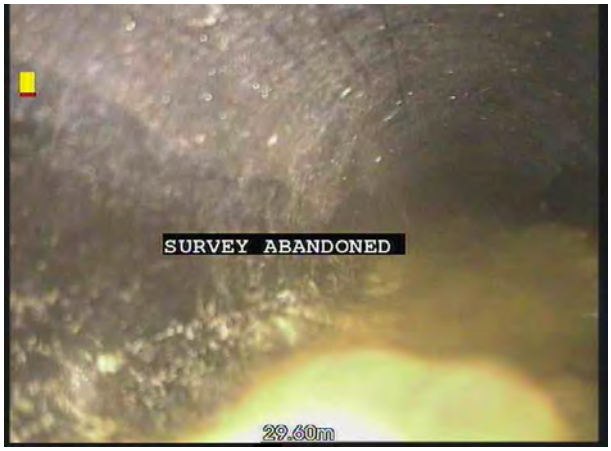
SA - 29.60

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
1	0.0	0.0	0.0	1.0	1	1.0	1.0	30.0	3.0

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
12	Downstream	IC6X	TV231105	



1, 00:00:04, 0.30 m
Deformed sewer or drain, 5%, start



2, 00:02:28, 29.60 m
Survey abandoned, Unable to continue

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Section Inspection - 02/11/2023 - IC6Y

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
13	1	02/11/23	11:03	TV231105	Rain	No	IC6Y

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

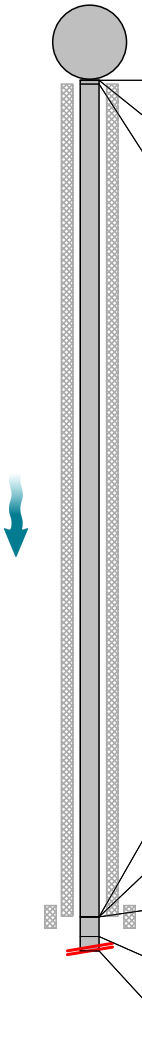
Town or Village:	Tismans Common	**Inspection Direction:**	Downstream	**Upstream Node:**	IC6
Road:	Woodfalls Stud	**Inspected Length:**	62.39 m	**Upstream Pipe Depth:**	1.220 m
Location:		**Total Length:**	62.39 m	**Downstream Node:**	RUN X
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	100 mm
Flow Control:	-	**Material:**	Pitch fibre
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations: -

Scale: 1:541

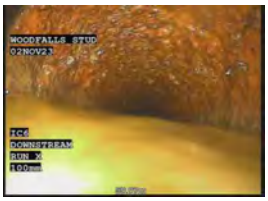
Depth: 1.22 m
IC6



Position [m]		Code	Observation	Grade
0.00		MH	Start node, manhole, reference: IC6	
0.00		WL	Water level, 5% of the vertical dimension	
0.30	S01	D	Deformed sewer or drain, 5%, start	
59.97		MCCI	Pipe material changes to cast iron at this point	
59.97	F01	D	Deformed sewer or drain, 5%, finish	1 / 2
59.97	S02	DEE	Attached deposits, encrustation from 12 o'clock to 12 o'clock, 5% cross-sectional area loss, start	3
61.36		CUW	Loss of vision, camera under water	
62.39		SA	Survey abandoned: Unable to continue	



D - 0.30



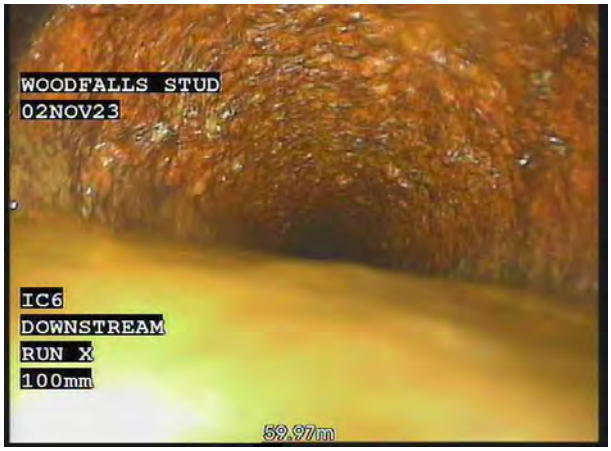
DEE - 59.97

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
1	0.0	0.0	0.0	1.0	2	1.0	1.0	62.0	2.0

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
13	Downstream	IC6Y	TV231105	



1, 00:00:07, 0.30 m
Deformed sewer or drain, 5%, start



2, 00:04:17, 59.97 m
Attached deposits, encrustation from 12 o'clock to 12 o'clock, 5% cross-sectional area loss, start

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Section Inspection - 02/11/2023 - 3601-AX

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
14	1	02/11/23	11:42	TV231105	Rain	No	3601-AX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

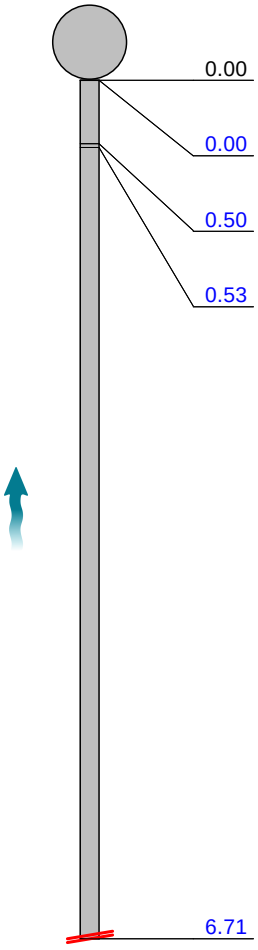
Town or Village:	Tismans Common	**Inspection Direction:**	Upstream	**Upstream Node:**	3601-A
Road:	Woodfalls Stud	**Inspected Length:**	6.71 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	6.71 m	**Downstream Node:**	3601
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	2.050 m

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	150 mm
Flow Control:	-	**Material:**	Pitch fibre
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

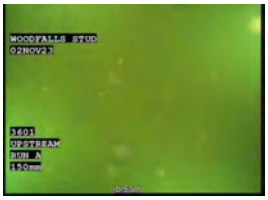
Comments:
Recommendations: -

Scale: 1:59 **Position [m]** **Code** **Observation** **Grade**

Depth: 2.05 m
3601



Position [m]	Code	Observation
0.00	MH	Start node, manhole, reference: 3601
0.00	WL	Water level, 5% of the vertical dimension
0.50	CUW	Loss of vision, camera under water
0.53	REM	General remark: Connectivity from IC6 proven by dye test
6.71	SA	Survey abandoned: Unable to pass unknown obstruction



REM - 0.53



SA - 6.71

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

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Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
14	Upstream	3601-AX	TV231105	



1, 00:00:11, 0.53 m
General remark, Connectivity from IC6 proven by dye test



2, 00:00:58, 6.71 m
Survey abandoned, Unable to pass unknown obstruction

Insewer Surveys
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Section Inspection - 02/11/2023 - IC7-BX

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
15	1	02/11/23	12:00	TV231105	Rain	No	IC7-BX

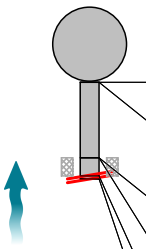
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

Town or Village:	Tismans Common	**Inspection Direction:**	Upstream	**Upstream Node:**	IC7-B
Road:	Woodfalls Stud	**Inspected Length:**	0.64 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	0.64 m	**Downstream Node:**	IC7
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

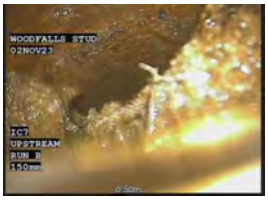
Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	150 mm
Flow Control:	-	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations: -

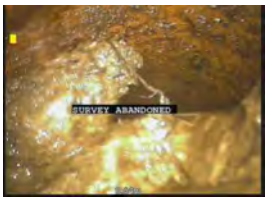
Scale: 1:50



Position [m]		Code	Observation	Grade
0.00		CP	Start node, catchpit, reference: IC7	
0.00		WL	Water level, 5% of the vertical dimension	
0.50		WL	Water level, 10% of the vertical dimension	
0.50	S01	DEC	Settled deposits, hard or compacted, 40% cross-sectional area loss, start	
0.62	F01	DEC	Settled deposits, hard or compacted, 40% cross-sectional area loss, finish	4
0.64		SA	Survey abandoned: Unable to continue	



DEC - 0.50



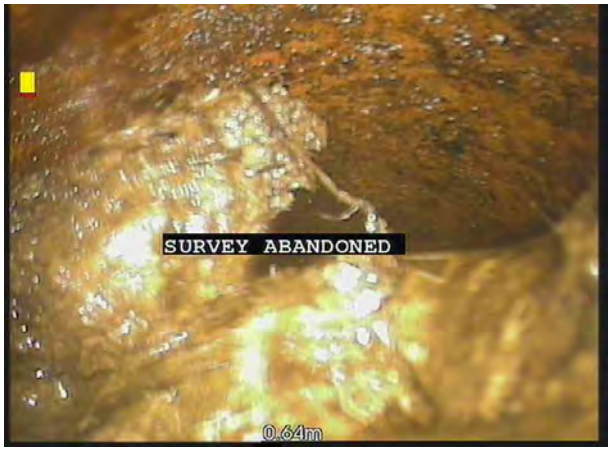
SA - 0.64

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	5.0	7.6	5.0	5.0

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
15	Upstream	IC7-BX	TV231105	



1, 00:00:09, 0.50 m
Settled deposits, hard or compacted, 40% cross-sectional area loss, start



2, 00:00:45, 0.64 m
Survey abandoned, Unable to continue

Insewer Surveys
16a Revenge Road, Chatham
Tel. 01634 861 768

Section Inspection - 02/11/2023 - IC7X

WEB PROJECT CLICK TO OPEN THIS SECTION

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
16	1	02/11/23	12:02	TV231105	Rain	No	IC7X

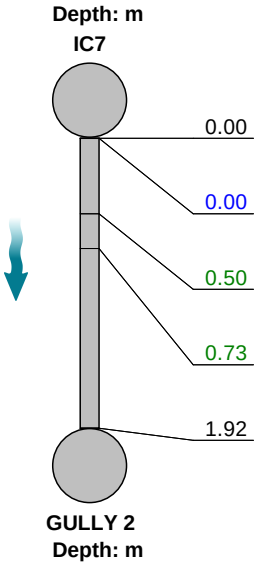
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
InSewer MO	-	Not Specified	Not Specified	-	-

Town or Village:	Tismans Common	**Inspection Direction:**	Downstream	**Upstream Node:**	IC7
Road:	Woodfalls Stud	**Inspected Length:**	1.92 m	**Upstream Pipe Depth:**	
Location:		**Total Length:**	1.92 m	**Downstream Node:**	GULLY 2
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	185 mm
Flow Control:	-	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations: -

Scale: 1:50



Position [m]	Code	Observation	Grade
0.00	CP	Start node, catchpit, reference: IC7	
0.00	WL	Water level, 5% of the vertical dimension	
0.50	LL	Line deviates left	
0.73	LL	Line deviates left	
1.92	GYF	Finish node, gully, reference: GULLY 2	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

HYDRO GROUP OF COMPANIES

Sewer Inspection,

Cleaning and Repair

Recommendations

www.insewer.co.uk

Tel : 01634 861 768

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safecontractor APPROVED
A member of the BRITISH SAFETY COUNCIL
CSCS CONSTRUCTION SKILLS CERTIFICATION SCHEME constructionskills
CRB/DBS Checks Disclosure & Barring Service
CRB
WJA

Section number	Upstream manhole	Flow direction	Downstream manhole	Recommendations / Notes
1	IC1-A	Upstream	IC1	
2	IC2	Upstream	IC1	
3	IC1	Downstream	IC3	IC3 to be located and lifted
4	OUTFALL 1	Downstream	RUN X	
5	ACO 1	Downstream	RUN X	
6	IC4-A	Upstream	IC4	
7	IC4-B	Upstream	IC4	Clean by van pack jetting unit and resurvey
8	IC4-C	Upstream	IC4	
9	IC4	Downstream	IC6	10% standing water - irregular gradient or backfall
10	IC3	Upstream	IC5	
11	IC6.1	Upstream	IC6	Assumed Off-site connection
12	IC6	Downstream	RUN X	
13	IC6	Downstream	RUN X	Consider cleaning by specialist high pressure descaling and resurvey
14	3601-A	Upstream	3601	Public Sewer
15	IC7-B	Upstream	IC7	Clean by specialist high pressure descaling and resurvey
16	IC7	Downstream	GULLY 2	



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Chatham, Kent ME5 8UD
Company Reg No: 1304128
VAT No. 573 7537 09

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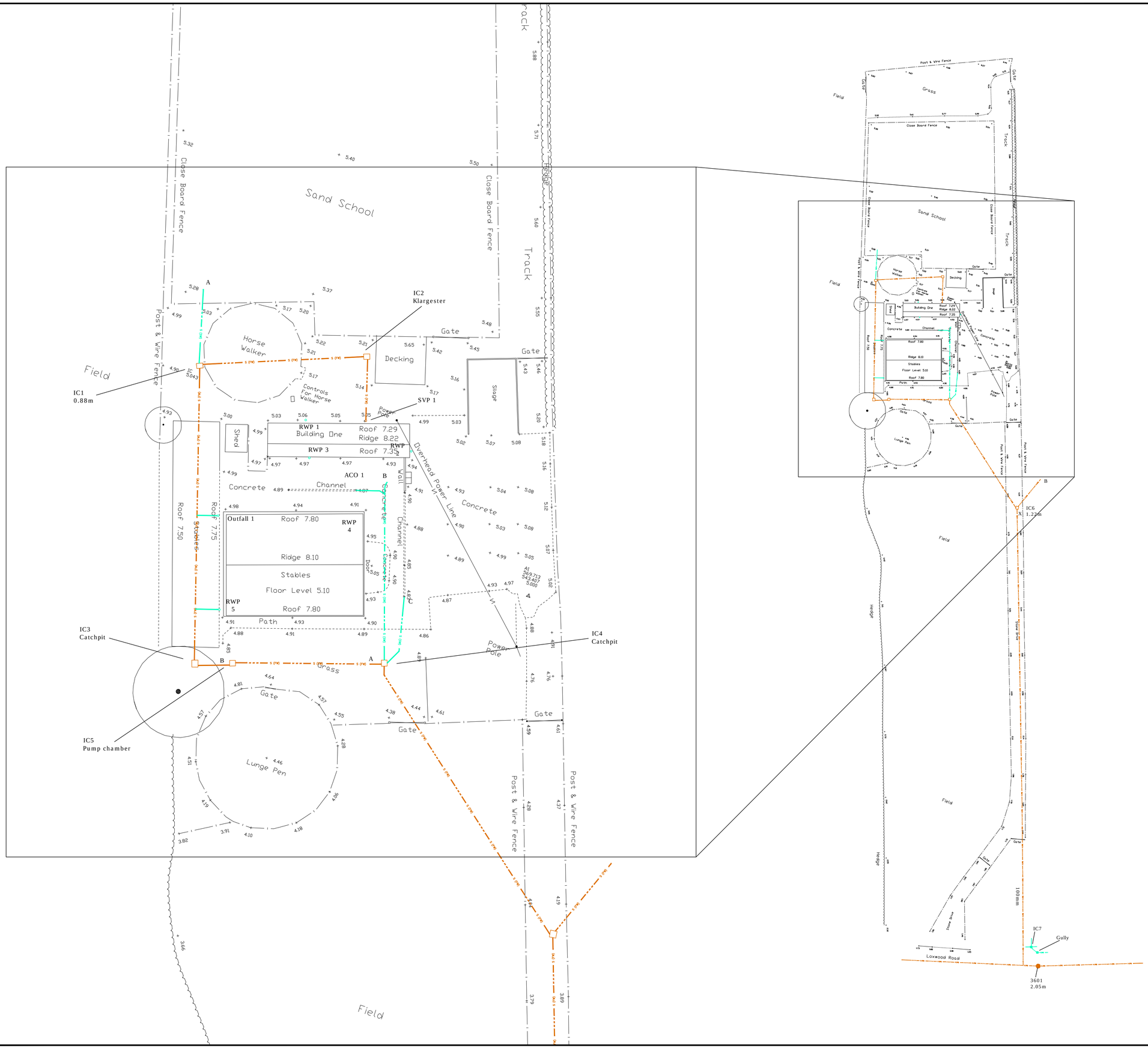
APPENDIX C

231718/DS/02 – Existing Drainage Layout

DWG No. 231718-DS-02



NOTES

Rev	Amendment	Drawn	Checked	Approved	Date

LANMOR Consulting
Civil Engineers & Transport Planning
Thorogood House, 34 Tolworth Close, Surbiton, Surrey, KT6 7EW
Telephone: 0208 339 7899 Fax: 0208 339 7898
e-mail: info@lanmor.co.uk
www.lanmor.co.uk

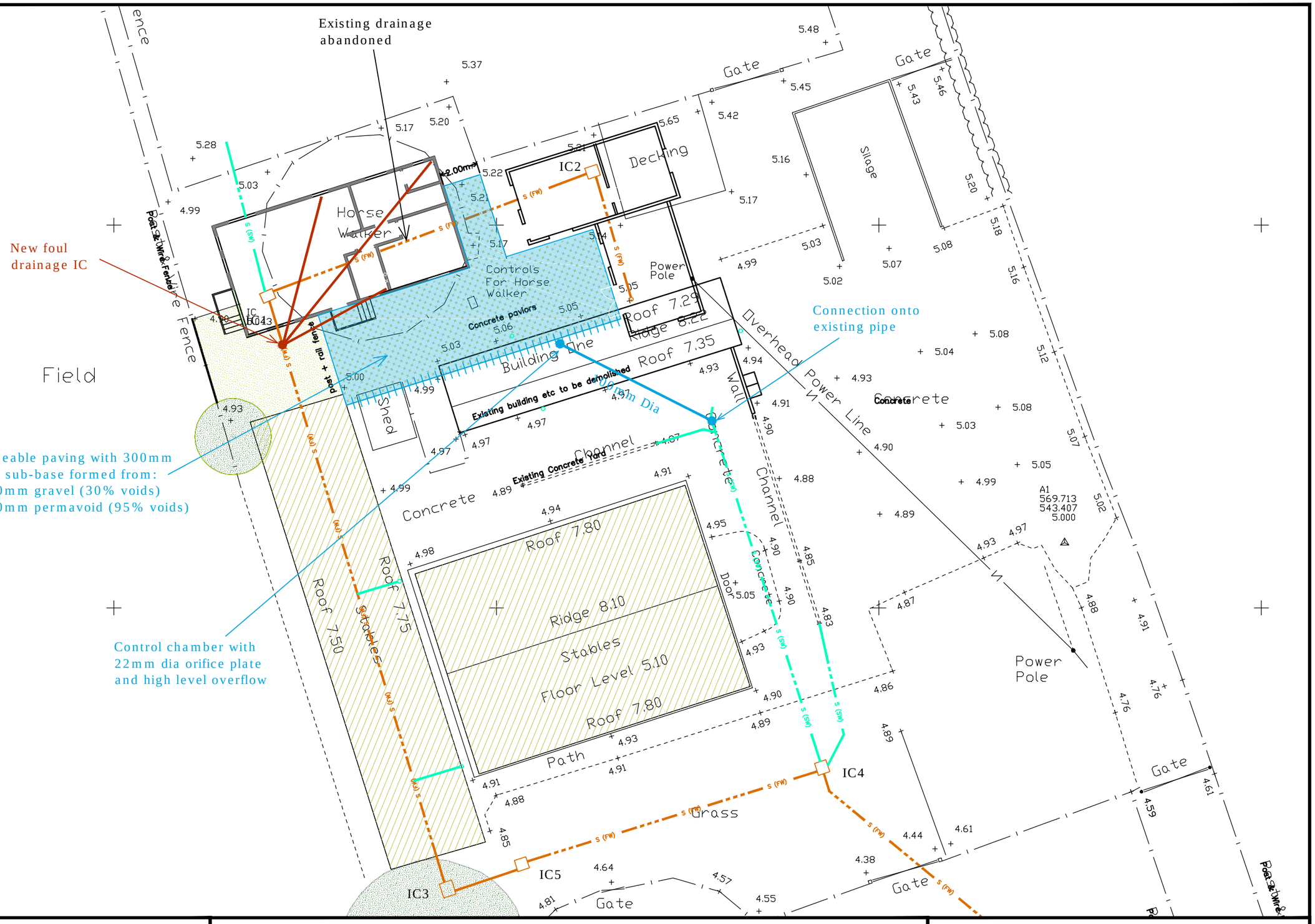
Mr Nick Wyatt

Woodfalls Stud
Loxwood Road

Existing Drainage Layout

DRAWN	RS	CHECKED	KBL	APPROVED	KBL
DATE	Apr-24	DATE	Apr-24	DATE	Apr-24
SCALE	1:200 / 1:500	PRJ No.	231718	SIZE	REV
DWG No.	231718-DS-02			A1	A

231718/DS/01 – Proposed Drainage Strategy



Mr Nick Wyatt

Woodfalls Stud
Loxwood Road

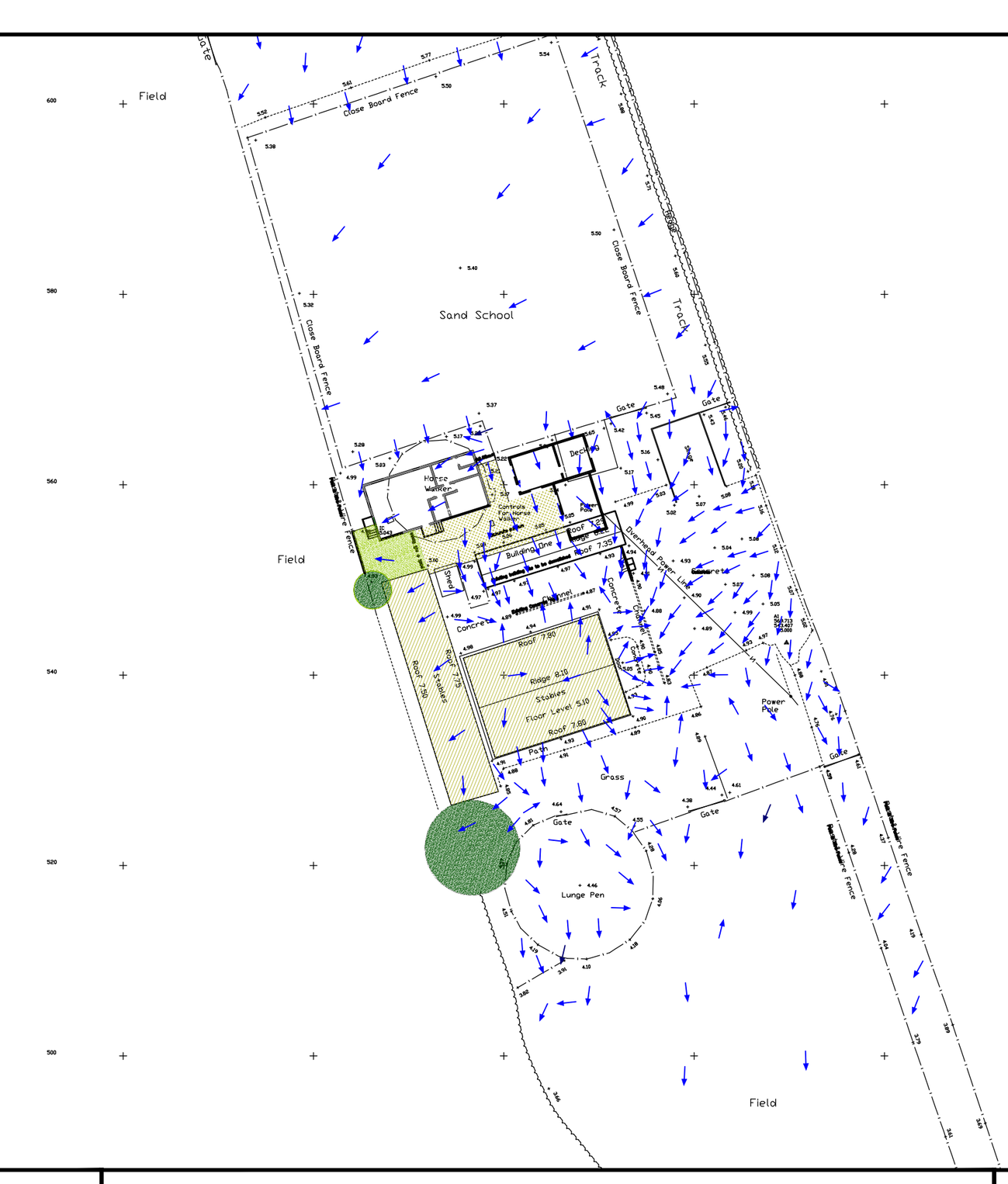
Drainage Strategy

SCALE	DRAWN BY	PRJ No.	DWG No.
1:200	RS	231718	231718/DS/01 Rev A

LANMOR Consulting
Civil Engineers & Transport Planning

Thorogood House, 34 Tolworth Close, Surbiton, Surrey, KT6 7EW
Telephone: 0208 339 7899 Fax: 0208 339 7898
E-mail: info@lanmor.co.uk
www.lanmor.co.uk

231718/DS/04 – Overland Flow Routes



N. Wyatt E

Proposed te
ancillary equ

Woodfalls S
Loxwood Ro
Rudgwick
RH12 3DR

Proposed

A1 A

Mr Nick Wyatt

Woodfalls Stud
Loxwood Road

Overland Flow Routes

SCALE	DRAWN BY	PRJ No.	DWG No.
1:500	RS	231718	231718/DS/04 Rev A

LANMOR Consulting
Civil Engineers & Transport Planning
Thorogood House, 34 Tolworth Close, Surbiton, Surrey, KT6 7EW
Telephone: 0208 339 7899 Fax: 0208 339 7898
E-mail: info@lanmor.co.uk
www.lanmor.co.uk

APPENDIX D

MicroDrainage Calculations

ICP SUDS Mean Annual Flood

Input

Return Period (years) 100 SAAR (mm) 800 Urban 0.000
Area (ha) 0.924 Soil 0.450 Region Number Region 6

Results l/s

QBAR Rural 4.7
QBAR Urban 4.7

Q100 years 15.1

Q1 year 4.0
Q30 years 10.8
Q100 years 15.1

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ICP SUDS Mean Annual Flood

Input

Return Period (years) 100 SAAR (mm) 800 Urban 0.000
Area (ha) 0.042 Soil 0.450 Region Number Region 6

Results l/s

QBAR Rural 0.2
QBAR Urban 0.2

Q100 years 0.7

Q1 year 0.2
Q30 years 0.5
Q100 years 0.7

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Summary of Results for 1 year Return Period

Half Drain Time : 88 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.024	0.024	0.0	0.1	0.1	0.4	O K
30 min Summer	0.032	0.032	0.0	0.1	0.1	0.7	O K
60 min Summer	0.039	0.039	0.0	0.2	0.2	1.1	O K
120 min Summer	0.043	0.043	0.0	0.2	0.2	1.3	O K
180 min Summer	0.046	0.046	0.0	0.2	0.2	1.5	O K
240 min Summer	0.047	0.047	0.0	0.2	0.2	1.6	O K
360 min Summer	0.048	0.048	0.0	0.2	0.2	1.6	O K
480 min Summer	0.048	0.048	0.0	0.2	0.2	1.6	O K
600 min Summer	0.047	0.047	0.0	0.2	0.2	1.6	O K
720 min Summer	0.047	0.047	0.0	0.2	0.2	1.5	O K
960 min Summer	0.045	0.045	0.0	0.2	0.2	1.4	O K
1440 min Summer	0.041	0.041	0.0	0.2	0.2	1.2	O K
2160 min Summer	0.035	0.035	0.0	0.2	0.2	0.9	O K
2880 min Summer	0.031	0.031	0.0	0.1	0.1	0.7	O K
4320 min Summer	0.027	0.027	0.0	0.1	0.1	0.5	O K
5760 min Summer	0.024	0.024	0.0	0.1	0.1	0.4	O K
7200 min Summer	0.022	0.022	0.0	0.1	0.1	0.3	O K
8640 min Summer	0.020	0.020	0.0	0.1	0.1	0.3	O K
10080 min Summer	0.019	0.019	0.0	0.1	0.1	0.3	O K
15 min Winter	0.028	0.028	0.0	0.1	0.1	0.6	O K
30 min Winter	0.036	0.036	0.0	0.2	0.2	0.9	O K
60 min Winter	0.043	0.043	0.0	0.2	0.2	1.3	O K
120 min Winter	0.048	0.048	0.0	0.2	0.2	1.6	O K
180 min Winter	0.050	0.050	0.0	0.2	0.2	1.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	29.648	0.0	0.4	18
30 min Summer	19.726	0.0	0.9	32
60 min Summer	12.800	0.0	1.4	60
120 min Summer	8.156	0.0	1.9	96
180 min Summer	6.242	0.0	2.3	128
240 min Summer	5.155	0.0	2.6	164
360 min Summer	3.898	0.0	3.1	232
480 min Summer	3.196	0.0	3.4	300
600 min Summer	2.740	0.0	3.7	366
720 min Summer	2.417	0.0	3.9	432
960 min Summer	1.983	0.0	4.3	558
1440 min Summer	1.501	0.0	4.9	796
2160 min Summer	1.134	0.0	5.5	1152
2880 min Summer	0.930	0.0	5.9	1500
4320 min Summer	0.704	0.0	6.4	2244
5760 min Summer	0.578	0.0	6.8	2936
7200 min Summer	0.495	0.0	7.0	3672
8640 min Summer	0.436	0.0	7.0	4408
10080 min Summer	0.391	0.0	7.0	5112
15 min Winter	29.648	0.0	0.6	18
30 min Winter	19.726	0.0	1.1	32
60 min Winter	12.800	0.0	1.6	60
120 min Winter	8.156	0.0	2.3	100
180 min Winter	6.242	0.0	2.7	138

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Summary of Results for 1 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
240 min Winter	0.051	0.051	0.0	0.2	0.2	1.8	O K
360 min Winter	0.051	0.051	0.0	0.2	0.2	1.8	O K
480 min Winter	0.049	0.049	0.0	0.2	0.2	1.7	O K
600 min Winter	0.048	0.048	0.0	0.2	0.2	1.6	O K
720 min Winter	0.046	0.046	0.0	0.2	0.2	1.5	O K
960 min Winter	0.043	0.043	0.0	0.2	0.2	1.3	O K
1440 min Winter	0.037	0.037	0.0	0.2	0.2	1.0	O K
2160 min Winter	0.030	0.030	0.0	0.1	0.1	0.7	O K
2880 min Winter	0.027	0.027	0.0	0.1	0.1	0.5	O K
4320 min Winter	0.023	0.023	0.0	0.1	0.1	0.4	O K
5760 min Winter	0.020	0.020	0.0	0.1	0.1	0.3	O K
7200 min Winter	0.018	0.018	0.0	0.1	0.1	0.2	O K
8640 min Winter	0.017	0.017	0.0	0.1	0.1	0.2	O K
10080 min Winter	0.015	0.015	0.0	0.0	0.0	0.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	5.155	0.0	3.1	176
360 min Winter	3.898	0.0	3.6	250
480 min Winter	3.196	0.0	4.0	322
600 min Winter	2.740	0.0	4.3	390
720 min Winter	2.417	0.0	4.5	456
960 min Winter	1.983	0.0	5.0	586
1440 min Winter	1.501	0.0	5.6	824
2160 min Winter	1.134	0.0	6.3	1168
2880 min Winter	0.930	0.0	6.8	1528
4320 min Winter	0.704	0.0	7.5	2232
5760 min Winter	0.578	0.0	8.0	2992
7200 min Winter	0.495	0.0	8.2	3624
8640 min Winter	0.436	0.0	8.4	4408
10080 min Winter	0.391	0.0	8.5	5128

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.023

Time (mins) From:	To:	Area (ha)
0	4	0.023

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Model Details

Storage is Online Cover Level (m) 0.500

Complex Structure

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.9
Max Percolation (l/s)	20.4	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.95	Evaporation (mm/day)	3
Invert Level (m)	0.000	Cap Volume Depth (m)	0.150

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	2.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.5
Max Percolation (l/s)	2.5	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.95	Evaporation (mm/day)	3
Invert Level (m)	0.050	Cap Volume Depth (m)	0.150

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.9
Max Percolation (l/s)	20.4	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.150	Cap Volume Depth (m)	0.150

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	2.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.5
Max Percolation (l/s)	2.5	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.200	Cap Volume Depth (m)	0.150

Orifice Outflow Control

Diameter (m) 0.022 Discharge Coefficient 0.600 Invert Level (m) 0.000

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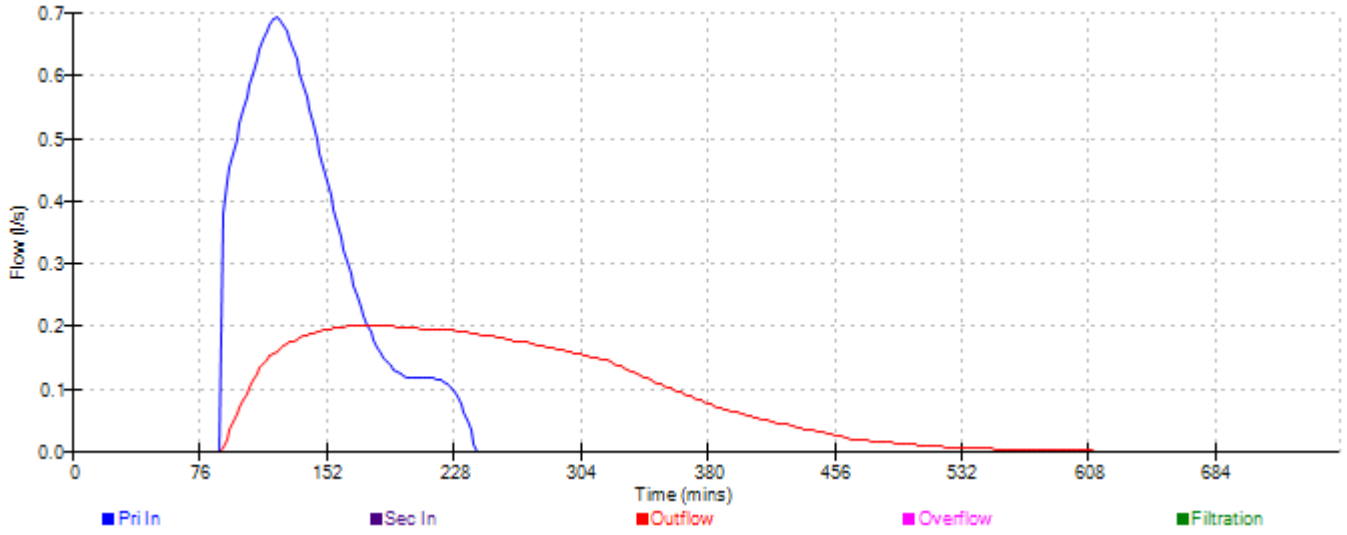
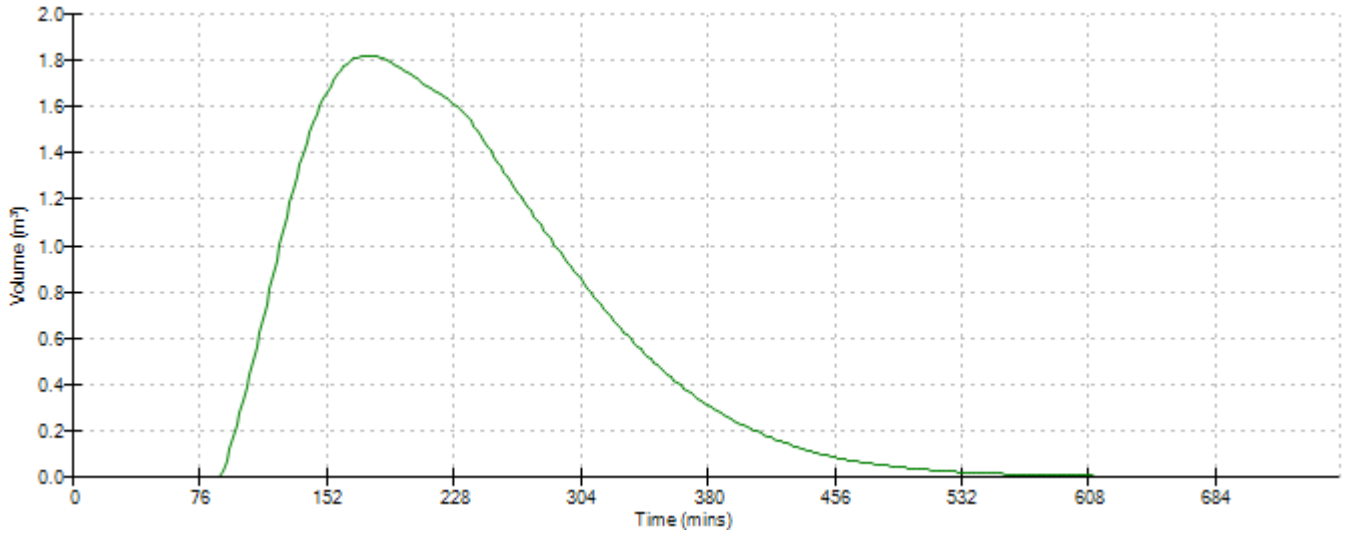
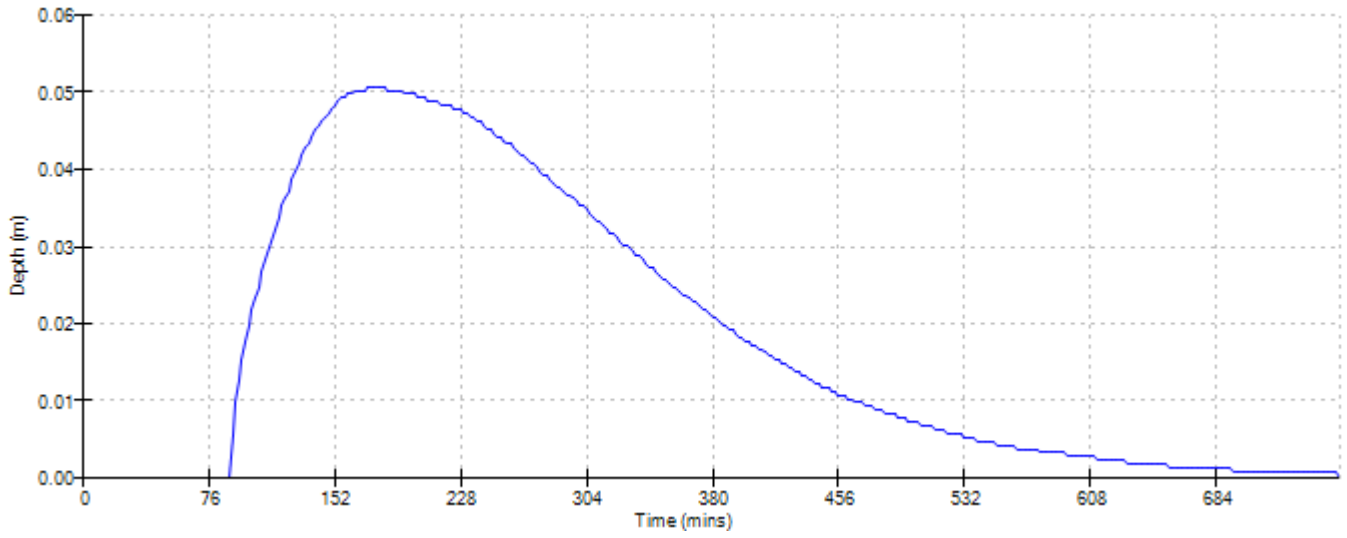
Event: 240 min Winter







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Summary of Results for 30 year Return Period

Half Drain Time : 177 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.056	0.056	0.0	0.2	0.2	2.2	O K
30 min Summer	0.068	0.068	0.0	0.2	0.2	3.1	O K
60 min Summer	0.080	0.080	0.0	0.3	0.3	3.9	O K
120 min Summer	0.088	0.088	0.0	0.3	0.3	4.6	O K
180 min Summer	0.090	0.090	0.0	0.3	0.3	4.7	O K
240 min Summer	0.091	0.091	0.0	0.3	0.3	4.8	O K
360 min Summer	0.092	0.092	0.0	0.3	0.3	4.9	O K
480 min Summer	0.091	0.091	0.0	0.3	0.3	4.8	O K
600 min Summer	0.089	0.089	0.0	0.3	0.3	4.7	O K
720 min Summer	0.088	0.088	0.0	0.3	0.3	4.5	O K
960 min Summer	0.083	0.083	0.0	0.3	0.3	4.2	O K
1440 min Summer	0.075	0.075	0.0	0.3	0.3	3.6	O K
2160 min Summer	0.065	0.065	0.0	0.2	0.2	2.8	O K
2880 min Summer	0.057	0.057	0.0	0.2	0.2	2.2	O K
4320 min Summer	0.045	0.045	0.0	0.2	0.2	1.5	O K
5760 min Summer	0.038	0.038	0.0	0.2	0.2	1.0	O K
7200 min Summer	0.033	0.033	0.0	0.1	0.1	0.8	O K
8640 min Summer	0.030	0.030	0.0	0.1	0.1	0.6	O K
10080 min Summer	0.027	0.027	0.0	0.1	0.1	0.5	O K
15 min Winter	0.061	0.061	0.0	0.2	0.2	2.6	O K
30 min Winter	0.075	0.075	0.0	0.3	0.3	3.6	O K
60 min Winter	0.088	0.088	0.0	0.3	0.3	4.5	O K
120 min Winter	0.097	0.097	0.0	0.3	0.3	5.3	O K
180 min Winter	0.100	0.100	0.0	0.3	0.3	5.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	72.682	0.0	2.3	18
30 min Summer	48.363	0.0	3.3	33
60 min Summer	30.811	0.0	4.5	62
120 min Summer	19.036	0.0	5.7	120
180 min Summer	14.191	0.0	6.5	152
240 min Summer	11.467	0.0	7.0	182
360 min Summer	8.493	0.0	7.8	248
480 min Summer	6.855	0.0	8.5	318
600 min Summer	5.801	0.0	9.0	386
720 min Summer	5.059	0.0	9.4	456
960 min Summer	4.074	0.0	10.1	588
1440 min Summer	2.998	0.0	11.1	850
2160 min Summer	2.203	0.0	12.1	1228
2880 min Summer	1.769	0.0	12.8	1588
4320 min Summer	1.297	0.0	13.8	2292
5760 min Summer	1.040	0.0	14.4	3000
7200 min Summer	0.876	0.0	14.8	3680
8640 min Summer	0.762	0.0	15.1	4408
10080 min Summer	0.677	0.0	15.3	5144
15 min Winter	72.682	0.0	2.7	18
30 min Winter	48.363	0.0	3.8	32
60 min Winter	30.811	0.0	5.1	60
120 min Winter	19.036	0.0	6.5	116
180 min Winter	14.191	0.0	7.3	170

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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
240 min Winter	0.100	0.100	0.0	0.3	0.3	5.5	O K
360 min Winter	0.100	0.100	0.0	0.3	0.3	5.5	O K
480 min Winter	0.098	0.098	0.0	0.3	0.3	5.4	O K
600 min Winter	0.095	0.095	0.0	0.3	0.3	5.1	O K
720 min Winter	0.092	0.092	0.0	0.3	0.3	4.9	O K
960 min Winter	0.086	0.086	0.0	0.3	0.3	4.4	O K
1440 min Winter	0.074	0.074	0.0	0.3	0.3	3.5	O K
2160 min Winter	0.059	0.059	0.0	0.2	0.2	2.4	O K
2880 min Winter	0.049	0.049	0.0	0.2	0.2	1.7	O K
4320 min Winter	0.036	0.036	0.0	0.2	0.2	0.9	O K
5760 min Winter	0.030	0.030	0.0	0.1	0.1	0.6	O K
7200 min Winter	0.026	0.026	0.0	0.1	0.1	0.5	O K
8640 min Winter	0.024	0.024	0.0	0.1	0.1	0.4	O K
10080 min Winter	0.022	0.022	0.0	0.1	0.1	0.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	11.467	0.0	8.0	192
360 min Winter	8.493	0.0	8.9	268
480 min Winter	6.855	0.0	9.6	344
600 min Winter	5.801	0.0	10.2	418
720 min Winter	5.059	0.0	10.7	492
960 min Winter	4.074	0.0	11.4	632
1440 min Winter	2.998	0.0	12.6	896
2160 min Winter	2.203	0.0	13.8	1276
2880 min Winter	1.769	0.0	14.6	1640
4320 min Winter	1.297	0.0	15.8	2296
5760 min Winter	1.040	0.0	16.5	2944
7200 min Winter	0.876	0.0	17.1	3680
8640 min Winter	0.762	0.0	17.5	4464
10080 min Winter	0.677	0.0	17.8	5008

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.023

Time (mins) From:	To:	Area (ha)
0	4	0.023

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Model Details

Storage is Online Cover Level (m) 0.500

Complex Structure

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.9
Max Percolation (l/s)	20.4	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.95	Evaporation (mm/day)	3
Invert Level (m)	0.000	Cap Volume Depth (m)	0.150

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	2.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.5
Max Percolation (l/s)	2.5	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.95	Evaporation (mm/day)	3
Invert Level (m)	0.050	Cap Volume Depth (m)	0.150

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.9
Max Percolation (l/s)	20.4	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.150	Cap Volume Depth (m)	0.150

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	2.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.5
Max Percolation (l/s)	2.5	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.200	Cap Volume Depth (m)	0.150

Orifice Outflow Control

Diameter (m) 0.022 Discharge Coefficient 0.600 Invert Level (m) 0.000

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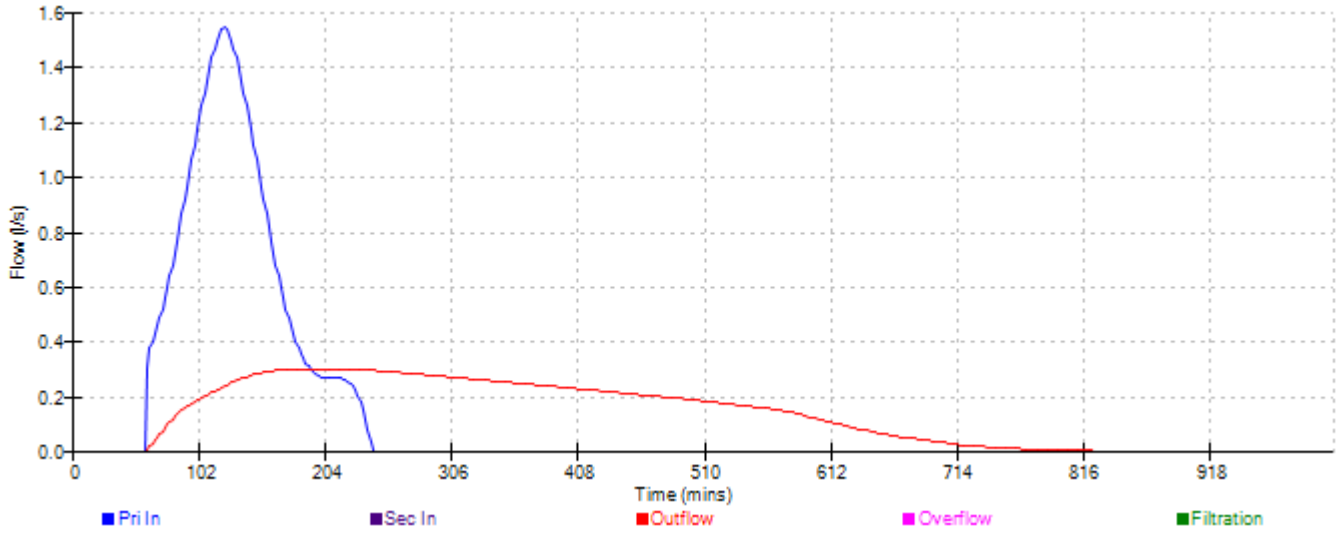
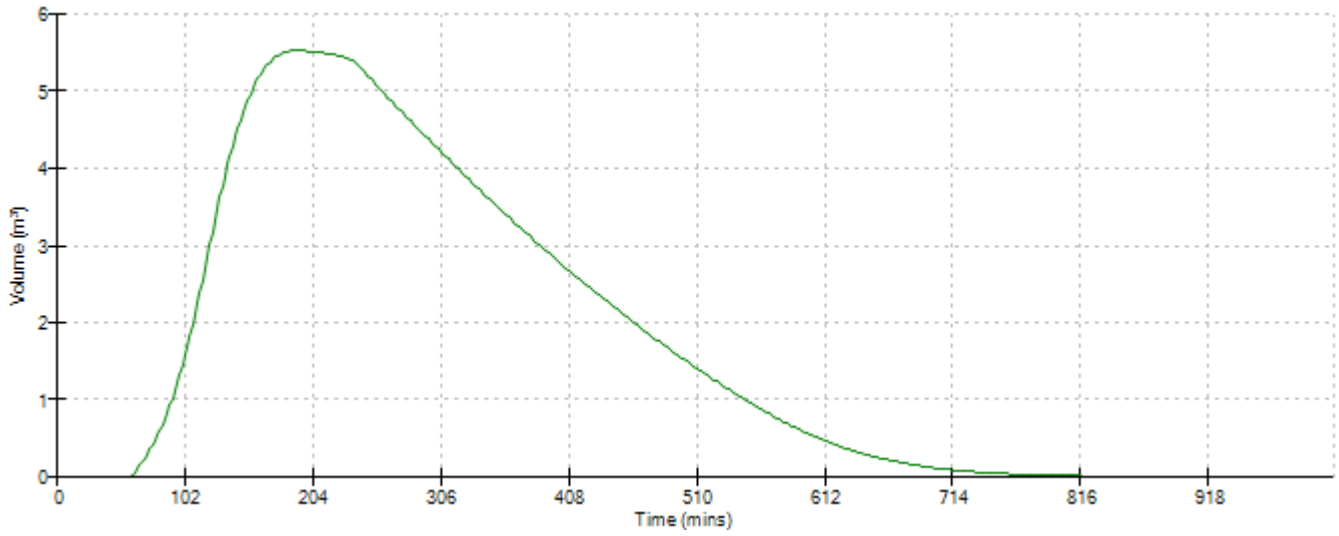
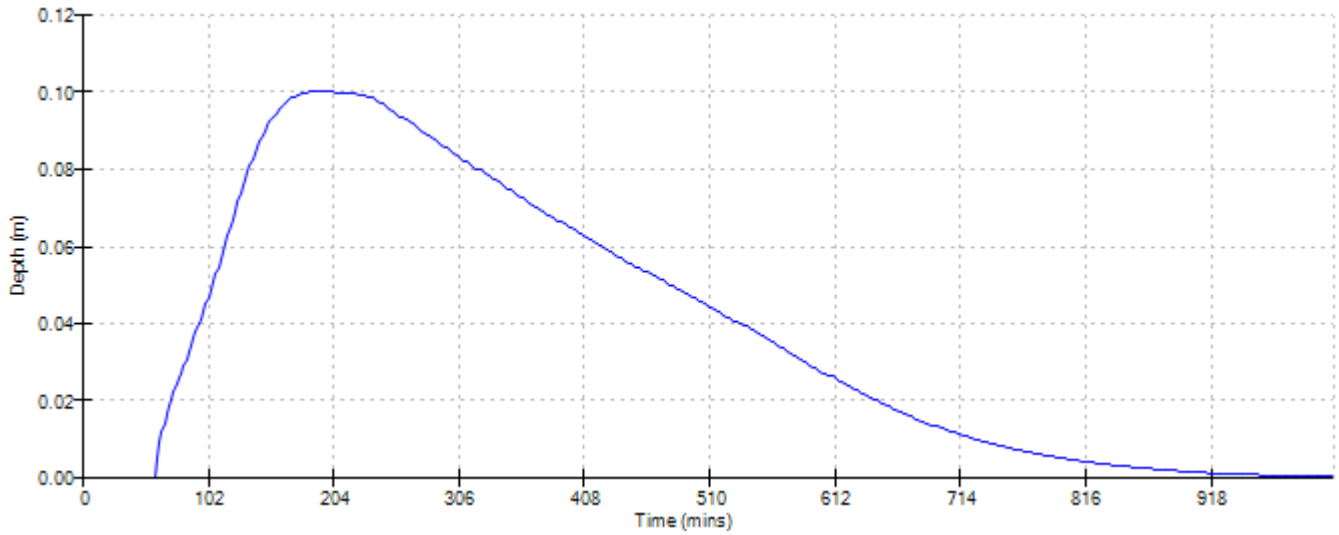
Event: 240 min Winter







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Summary of Results for 100 year Return Period

Half Drain Time : 216 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.068	0.068	0.0	0.2	0.2	3.1	O K
30 min Summer	0.085	0.085	0.0	0.3	0.3	4.3	O K
60 min Summer	0.100	0.100	0.0	0.3	0.3	5.5	O K
120 min Summer	0.111	0.111	0.0	0.3	0.3	6.4	O K
180 min Summer	0.114	0.114	0.0	0.3	0.3	6.6	O K
240 min Summer	0.115	0.115	0.0	0.3	0.3	6.7	O K
360 min Summer	0.115	0.115	0.0	0.3	0.3	6.7	O K
480 min Summer	0.114	0.114	0.0	0.3	0.3	6.6	O K
600 min Summer	0.112	0.112	0.0	0.3	0.3	6.5	O K
720 min Summer	0.110	0.110	0.0	0.3	0.3	6.3	O K
960 min Summer	0.105	0.105	0.0	0.3	0.3	5.9	O K
1440 min Summer	0.094	0.094	0.0	0.3	0.3	5.1	O K
2160 min Summer	0.081	0.081	0.0	0.3	0.3	4.1	O K
2880 min Summer	0.071	0.071	0.0	0.2	0.2	3.3	O K
4320 min Summer	0.056	0.056	0.0	0.2	0.2	2.2	O K
5760 min Summer	0.046	0.046	0.0	0.2	0.2	1.5	O K
7200 min Summer	0.040	0.040	0.0	0.2	0.2	1.1	O K
8640 min Summer	0.035	0.035	0.0	0.2	0.2	0.9	O K
10080 min Summer	0.031	0.031	0.0	0.1	0.1	0.7	O K
15 min Winter	0.075	0.075	0.0	0.3	0.3	3.6	O K
30 min Winter	0.093	0.093	0.0	0.3	0.3	5.0	O K
60 min Winter	0.110	0.110	0.0	0.3	0.3	6.3	O K
120 min Winter	0.124	0.124	0.0	0.3	0.3	7.4	O K
180 min Winter	0.128	0.128	0.0	0.3	0.3	7.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	94.179	0.0	3.2	18
30 min Summer	63.261	0.0	4.6	33
60 min Summer	40.510	0.0	6.1	62
120 min Summer	25.003	0.0	7.8	120
180 min Summer	18.552	0.0	8.7	164
240 min Summer	14.912	0.0	9.4	192
360 min Summer	10.975	0.0	10.4	256
480 min Summer	8.815	0.0	11.2	326
600 min Summer	7.430	0.0	11.8	394
720 min Summer	6.458	0.0	12.3	462
960 min Summer	5.172	0.0	13.1	598
1440 min Summer	3.774	0.0	14.3	866
2160 min Summer	2.748	0.0	15.5	1252
2880 min Summer	2.192	0.0	16.3	1616
4320 min Summer	1.590	0.0	17.4	2336
5760 min Summer	1.265	0.0	18.1	3048
7200 min Summer	1.060	0.0	18.6	3744
8640 min Summer	0.917	0.0	19.0	4416
10080 min Summer	0.812	0.0	19.2	5144
15 min Winter	94.179	0.0	3.7	18
30 min Winter	63.261	0.0	5.3	32
60 min Winter	40.510	0.0	7.0	62
120 min Winter	25.003	0.0	8.8	118
180 min Winter	18.552	0.0	9.9	172

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Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
240 min Winter	0.128	0.128	0.0	0.3	0.3	7.7	O K
360 min Winter	0.127	0.127	0.0	0.3	0.3	7.7	O K
480 min Winter	0.125	0.125	0.0	0.3	0.3	7.5	O K
600 min Winter	0.122	0.122	0.0	0.3	0.3	7.2	O K
720 min Winter	0.118	0.118	0.0	0.3	0.3	6.9	O K
960 min Winter	0.110	0.110	0.0	0.3	0.3	6.3	O K
1440 min Winter	0.095	0.095	0.0	0.3	0.3	5.1	O K
2160 min Winter	0.077	0.077	0.0	0.3	0.3	3.7	O K
2880 min Winter	0.064	0.064	0.0	0.2	0.2	2.7	O K
4320 min Winter	0.046	0.046	0.0	0.2	0.2	1.5	O K
5760 min Winter	0.036	0.036	0.0	0.2	0.2	0.9	O K
7200 min Winter	0.030	0.030	0.0	0.1	0.1	0.6	O K
8640 min Winter	0.027	0.027	0.0	0.1	0.1	0.5	O K
10080 min Winter	0.025	0.025	0.0	0.1	0.1	0.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	14.912	0.0	10.6	218
360 min Winter	10.975	0.0	11.8	274
480 min Winter	8.815	0.0	12.6	352
600 min Winter	7.430	0.0	13.3	428
720 min Winter	6.458	0.0	13.9	500
960 min Winter	5.172	0.0	14.8	644
1440 min Winter	3.774	0.0	16.2	922
2160 min Winter	2.748	0.0	17.6	1300
2880 min Winter	2.192	0.0	18.5	1672
4320 min Winter	1.590	0.0	19.8	2376
5760 min Winter	1.265	0.0	20.7	3056
7200 min Winter	1.060	0.0	21.3	3680
8640 min Winter	0.917	0.0	21.8	4408
10080 min Winter	0.812	0.0	22.1	5088

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.023

Time (mins) From:	To:	Area (ha)
0	4	0.023

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Model Details

Storage is Online Cover Level (m) 0.500

Complex Structure

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.9
Max Percolation (l/s)	20.4	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.95	Evaporation (mm/day)	3
Invert Level (m)	0.000	Cap Volume Depth (m)	0.150

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	2.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.5
Max Percolation (l/s)	2.5	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.95	Evaporation (mm/day)	3
Invert Level (m)	0.050	Cap Volume Depth (m)	0.150

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.9
Max Percolation (l/s)	20.4	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.150	Cap Volume Depth (m)	0.150

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	2.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.5
Max Percolation (l/s)	2.5	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.200	Cap Volume Depth (m)	0.150

Orifice Outflow Control

Diameter (m) 0.022 Discharge Coefficient 0.600 Invert Level (m) 0.000

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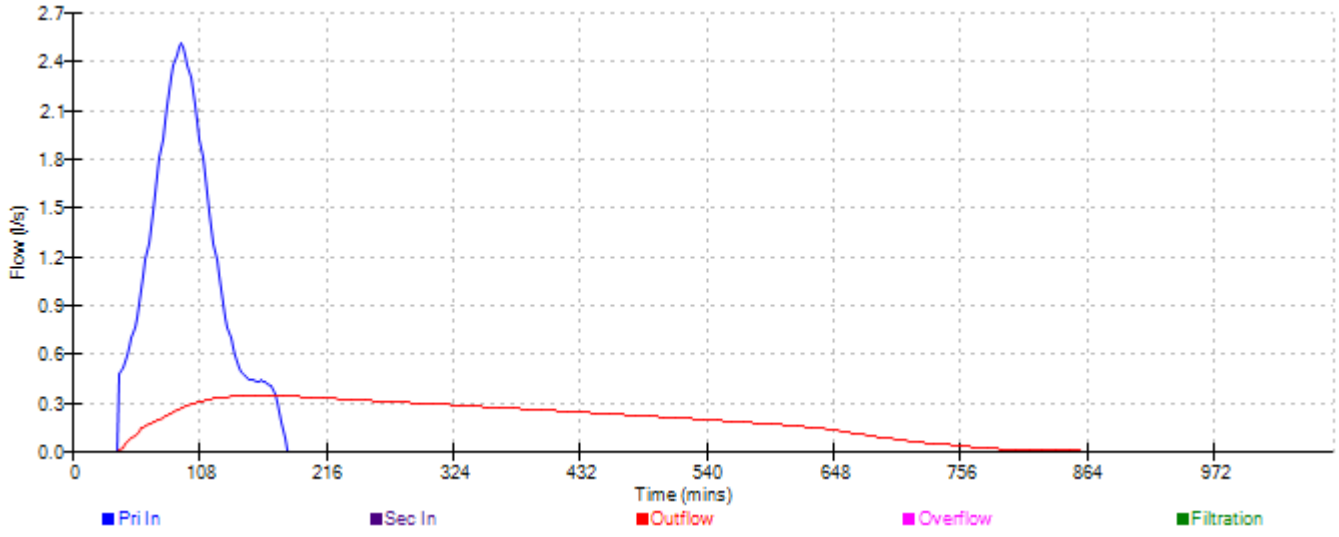
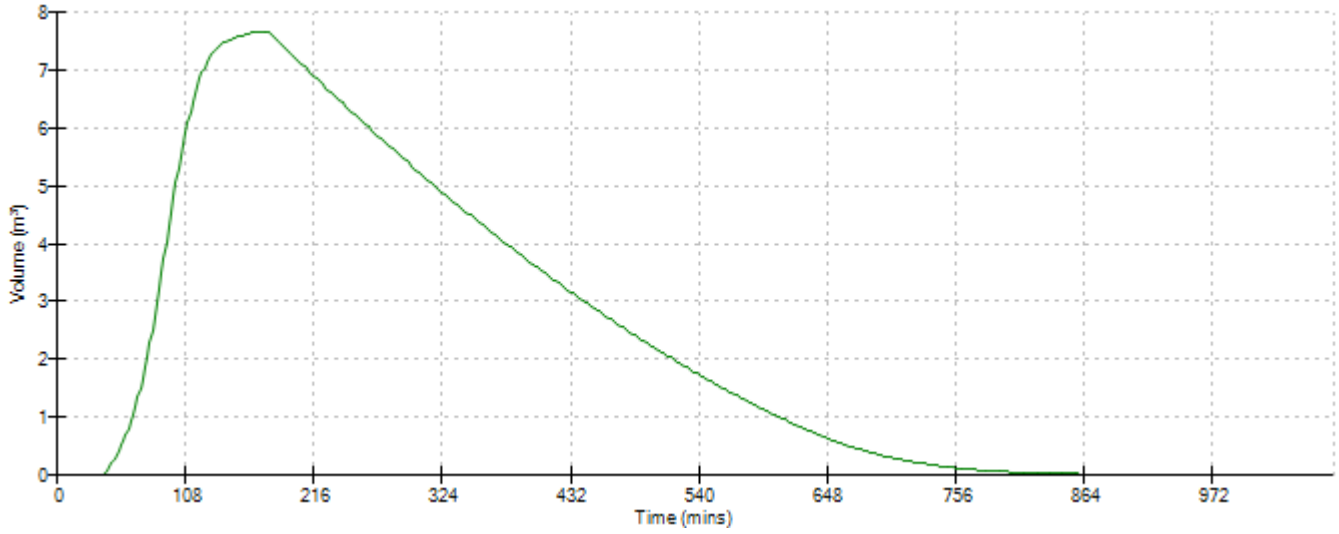
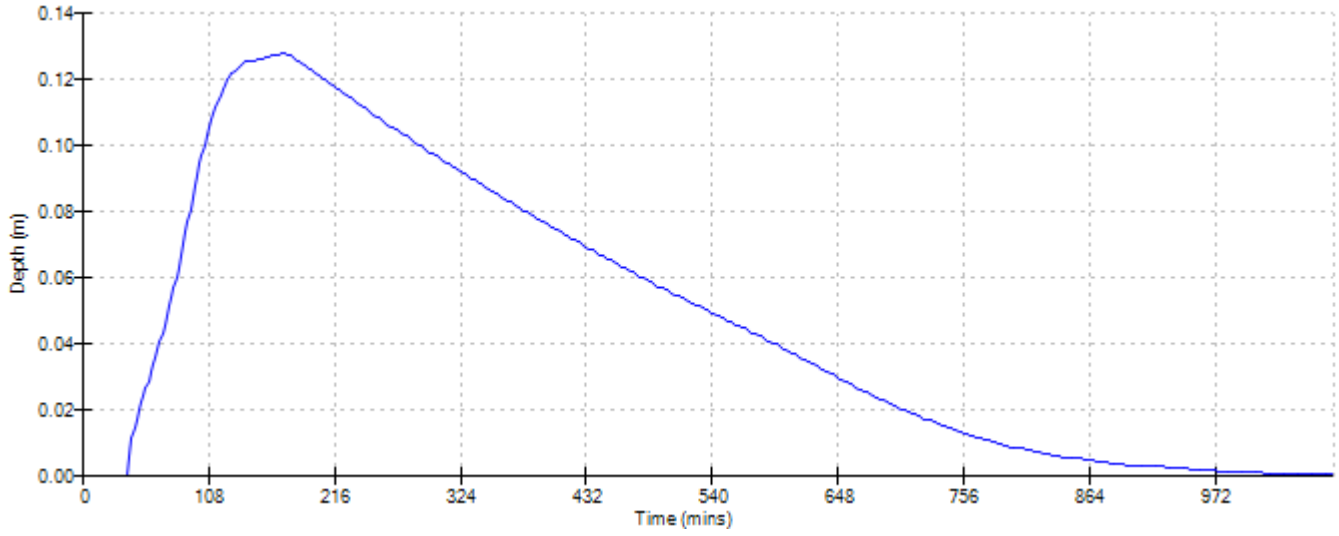
Event: 180 min Winter







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Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 274 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	0.092	0.092	0.0	0.3	0.3	4.9	O K
30 min Summer	0.115	0.115	0.0	0.3	0.3	6.7	O K
60 min Summer	0.138	0.138	0.0	0.4	0.4	8.5	O K
120 min Summer	0.157	0.157	0.0	0.4	0.4	9.9	O K
180 min Summer	0.163	0.163	0.0	0.4	0.4	10.4	O K
240 min Summer	0.165	0.165	0.0	0.4	0.4	10.5	O K
360 min Summer	0.166	0.166	0.0	0.4	0.4	10.6	O K
480 min Summer	0.165	0.165	0.0	0.4	0.4	10.5	O K
600 min Summer	0.163	0.163	0.0	0.4	0.4	10.3	O K
720 min Summer	0.160	0.160	0.0	0.4	0.4	10.1	O K
960 min Summer	0.153	0.153	0.0	0.4	0.4	9.6	O K
1440 min Summer	0.140	0.140	0.0	0.4	0.4	8.6	O K
2160 min Summer	0.122	0.122	0.0	0.3	0.3	7.3	O K
2880 min Summer	0.108	0.108	0.0	0.3	0.3	6.1	O K
4320 min Summer	0.087	0.087	0.0	0.3	0.3	4.5	O K
5760 min Summer	0.072	0.072	0.0	0.2	0.2	3.4	O K
7200 min Summer	0.061	0.061	0.0	0.2	0.2	2.6	O K
8640 min Summer	0.053	0.053	0.0	0.2	0.2	2.0	O K
10080 min Summer	0.047	0.047	0.0	0.2	0.2	1.6	O K
15 min Winter	0.101	0.101	0.0	0.3	0.3	5.6	O K
30 min Winter	0.127	0.127	0.0	0.3	0.3	7.6	O K
60 min Winter	0.153	0.153	0.0	0.4	0.4	9.7	O K
120 min Winter	0.180	0.180	0.0	0.4	0.4	11.3	O K
180 min Winter	0.194	0.194	0.0	0.4	0.4	11.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	136.560	0.0	5.1	18
30 min Summer	91.729	0.0	7.1	33
60 min Summer	58.739	0.0	9.3	62
120 min Summer	36.254	0.0	11.6	122
180 min Summer	26.900	0.0	13.0	180
240 min Summer	21.623	0.0	14.0	210
360 min Summer	15.914	0.0	15.5	272
480 min Summer	12.782	0.0	16.6	338
600 min Summer	10.774	0.0	17.6	408
720 min Summer	9.365	0.0	18.3	476
960 min Summer	7.499	0.0	19.5	616
1440 min Summer	5.473	0.0	21.3	882
2160 min Summer	3.985	0.0	23.2	1276
2880 min Summer	3.178	0.0	24.5	1648
4320 min Summer	2.306	0.0	26.3	2380
5760 min Summer	1.834	0.0	27.6	3112
7200 min Summer	1.536	0.0	28.5	3824
8640 min Summer	1.330	0.0	29.2	4504
10080 min Summer	1.178	0.0	29.8	5240
15 min Winter	136.560	0.0	5.8	18
30 min Winter	91.729	0.0	8.0	33
60 min Winter	58.739	0.0	10.5	62
120 min Winter	36.254	0.0	13.1	118
180 min Winter	26.900	0.0	14.7	174

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Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
240 min Winter	0.198	0.198	0.0	0.4	0.4	12.0	O K
360 min Winter	0.197	0.197	0.0	0.4	0.4	12.0	O K
480 min Winter	0.193	0.193	0.0	0.4	0.4	11.9	O K
600 min Winter	0.187	0.187	0.0	0.4	0.4	11.7	O K
720 min Winter	0.180	0.180	0.0	0.4	0.4	11.3	O K
960 min Winter	0.166	0.166	0.0	0.4	0.4	10.6	O K
1440 min Winter	0.145	0.145	0.0	0.4	0.4	9.1	O K
2160 min Winter	0.121	0.121	0.0	0.3	0.3	7.1	O K
2880 min Winter	0.102	0.102	0.0	0.3	0.3	5.6	O K
4320 min Winter	0.075	0.075	0.0	0.3	0.3	3.6	O K
5760 min Winter	0.058	0.058	0.0	0.2	0.2	2.3	O K
7200 min Winter	0.047	0.047	0.0	0.2	0.2	1.6	O K
8640 min Winter	0.039	0.039	0.0	0.2	0.2	1.1	O K
10080 min Winter	0.034	0.034	0.0	0.2	0.2	0.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
240 min Winter	21.623	0.0	15.8	228
360 min Winter	15.914	0.0	17.5	284
480 min Winter	12.782	0.0	18.8	362
600 min Winter	10.774	0.0	19.8	438
720 min Winter	9.365	0.0	20.6	514
960 min Winter	7.499	0.0	22.0	664
1440 min Winter	5.473	0.0	24.1	950
2160 min Winter	3.985	0.0	26.2	1344
2880 min Winter	3.178	0.0	27.7	1732
4320 min Winter	2.306	0.0	29.8	2464
5760 min Winter	1.834	0.0	31.2	3176
7200 min Winter	1.536	0.0	32.3	3888
8640 min Winter	1.330	0.0	33.2	4504
10080 min Winter	1.178	0.0	34.0	5240

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.000	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time Area Diagram

Total Area (ha) 0.023

Time (mins) From:	To:	Area (ha)
0	4	0.023

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Model Details

Storage is Online Cover Level (m) 0.500

Complex Structure

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.9
Max Percolation (l/s)	20.4	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.95	Evaporation (mm/day)	3
Invert Level (m)	0.000	Cap Volume Depth (m)	0.150

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	2.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.5
Max Percolation (l/s)	2.5	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.95	Evaporation (mm/day)	3
Invert Level (m)	0.050	Cap Volume Depth (m)	0.150

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	15.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.9
Max Percolation (l/s)	20.4	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.150	Cap Volume Depth (m)	0.150

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	2.0
Membrane Percolation (mm/hr)	1000	Length (m)	4.5
Max Percolation (l/s)	2.5	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	0.200	Cap Volume Depth (m)	0.150

Orifice Outflow Control

Diameter (m) 0.022 Discharge Coefficient 0.600 Invert Level (m) 0.000

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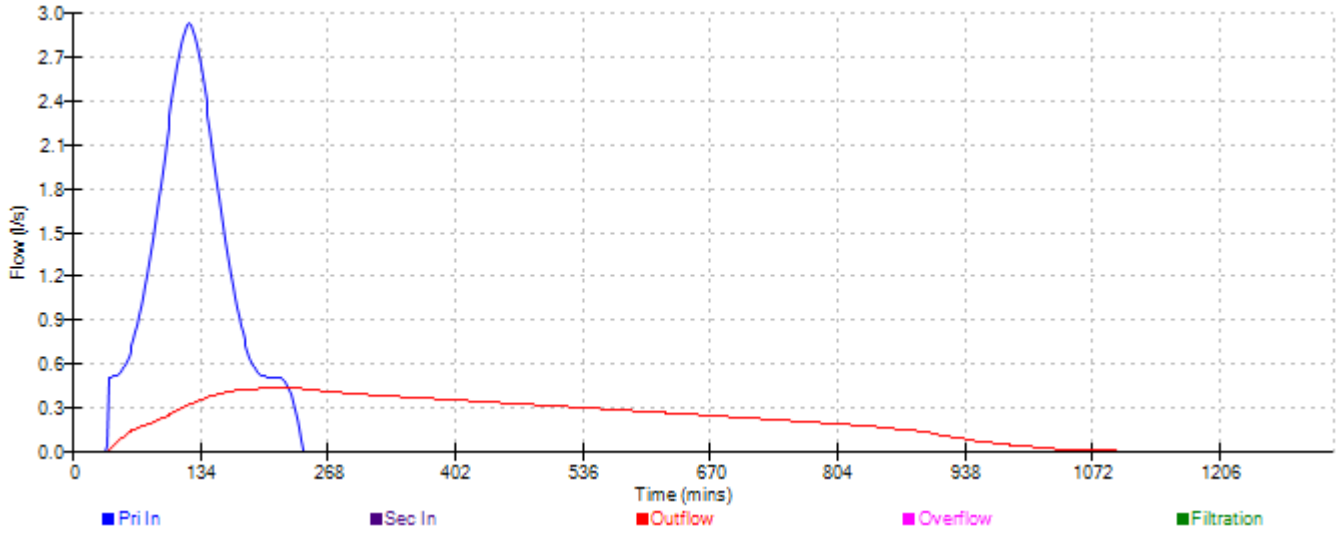
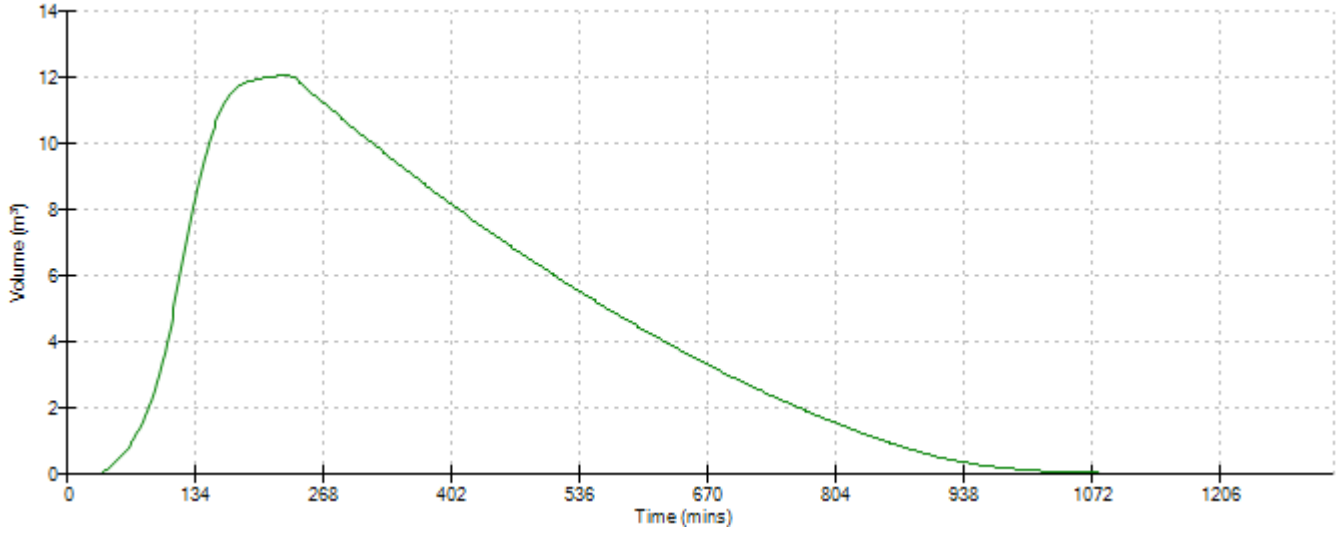
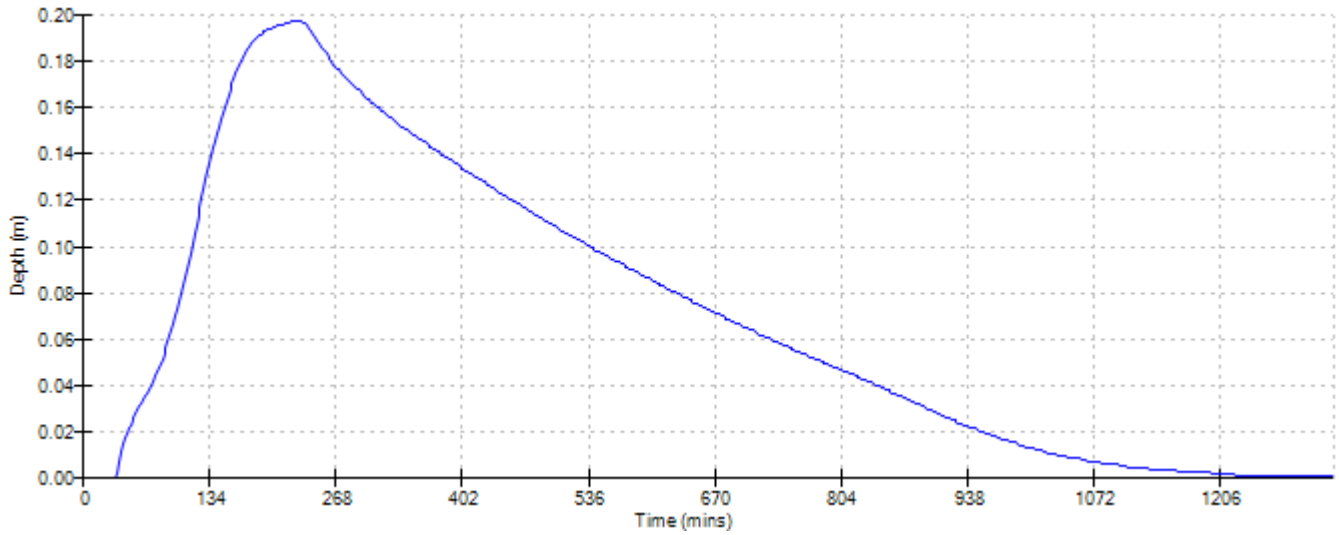
Event: 240 min Winter







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APPENDIX E

Southern Water Consultation Response

from Southern Water

Directorate of Planning
Horsham District Council
Parkside
Chart Way
Horsham
West Sussex
RH12 1RL

Your ref
DC/24/0103

Our ref
DSA000031145

Date
16 February 2024

Contact
Tel 0330 303 0119

Dear Sir/Madam,

Proposal: Erection of a 3-bedroom dwellinghouse and a single storey equestrian building.
Site: DC/24/0103: - Woodfalls Stud, Loxwood Road, Rudgwick, Horsham, RH12 3DR.

Thank you for your letter dated 26 January 2024.

Following the review of the submitted documents, we have the below comments for the Planning consultation.

Foul and Surface Water Drainage

Southern Water requires a formal application for a connection to the public sewer to be made by the applicant or developer.

To make an application visit Southern Water's Get Connected service: developerservices.southernwater.co.uk and please read our New Connections Charging Arrangements documents which are available on our website via the following link: southernwater.co.uk/developing-building/connection-charging-arrangements

The Drainage Strategy document indicates surface water flows no greater than existing levels being connected into the public system proving betterment which would be satisfactory to Southern Water.

It is possible that a sewer now deemed to be public could be crossing the development site. Therefore, should any sewer be found during construction works, an investigation of the sewer will be required to ascertain its ownership before any further works commence on site.

Southern Water Services Ltd, Registered Office: Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX Registered in England No. 2366670

For further advice, please contact Southern Water, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX (Tel: 0330 303 0119).

Website: southernwater.co.uk or by email at: SouthernWaterPlanning@southernwater.co.uk

Yours faithfully,

Future Growth Planning Team
Developer Services

southernwater.co.uk/developing-building/planning-your-development

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Controllable Valve
Damboards | Penstock | Valve

Flow Control
Anti Flood Device | Pumped Anti Flood Device | Reflux Valve

Inlet-Outfall
Inlet | Outfall

Manhole
BIF Bifurcation | Cascade | CP Catchpit | Head Of Public Sewer | IC Interceptor Chamber | Manhole | S Soakaway | WO Washout

Outfall Headworks
Outfall Headworks

Overflow Chamber
CSO Combined Sewer Overflow | EMO Emergency Overflow

Pipe Bridge
Pipe Bridge

Pumping Station
Micro Pumping Station | Pumping Station

Sewer Level Monitor
Sewer Level Monitor

Storage
Storm Tank | Tidal Storage Tank

Treatment Works
Treatment Works

Weir
Weir

Wastewater Site
Wastewater Site

Wastewater Pipe
Culverted Water Course
Drain
Outfall
Overflow
Rising Main
Sewer
Syphon
Tank Sewer
Trunk Sewer
Vacuum Main
Decommissioned Pipe

Wastewater Use
Foul
Combined
Sludge
Treated Effluent
Surface Water
Private

Developer Services
Build Over Agreement | Section 104

Wastewater Area
Catchment
Sub-Catchment

Map Title: SW Print

Printed By: Vijeyta.Sudarshan

Date Printed: 14/02/2024

Map Scale: 2500

The positions of pipes 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

WATER for LIFE from Southern Water