ArcEngineers
Consulting Civil & Structural Engineering



DRAINAGE STRATEGY REPORT

PROJECT	No. 25 ROSEDALE CARE HOME
PROJECT NUMBER	25 021
CLIENT	ROSEDALE CARE LIMITED
REPORT DATE	NOVEMBER 2026

The Institution of Structural Engineers

3 CADMAN COURT
MORLEY
LEEDS
LS27 0RX
T: 0113 253 3904
W:www.arc-engineers.co.uk

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1.0 INTRODUCTION

ARC Engineers have been commissioned by Rosedale Care Ltd to produce a Sustainable Drainage Strategy Report for the proposed development at No. 25 Rosedale Care Home, Kings Road, Horsham, RH13 5PP as shown in Fig.1 to support a planning submission. The proposed development comprises the construction of a new Care Home along with proposed associated external hardstanding areas.



Fig. 1 SITE LOCATION PLAN © Streetmap

Planning Practice guidance Paragraph 55 states that "*SuDS are designed to control surface water runoff close to where it falls*", referred to as Source Control a sustainable drainage system provides opportunities to:

1. Control the quantity of runoff.
2. Manage the quality of runoff to prevent pollution.
3. Create amenity space for people.
4. Promote biodiversity to create better places for nature.

These are known as the Four Pillars of SuDS and this report will demonstrate how they are to be incorporated into the proposals for this development.

2.0 FLOOD ZONE CLASSIFICATION

The site has been identified as being within Flood Zone 1 which means there is a low risk of flooding from rivers and the sea. This is as shown in Fig2. The total area of the development site is 1200m^2 (0.12Ha) and in such circumstances, the standing advice is that a Flood Risk Assessment is not required, and this report does not purport to assess flood risk.

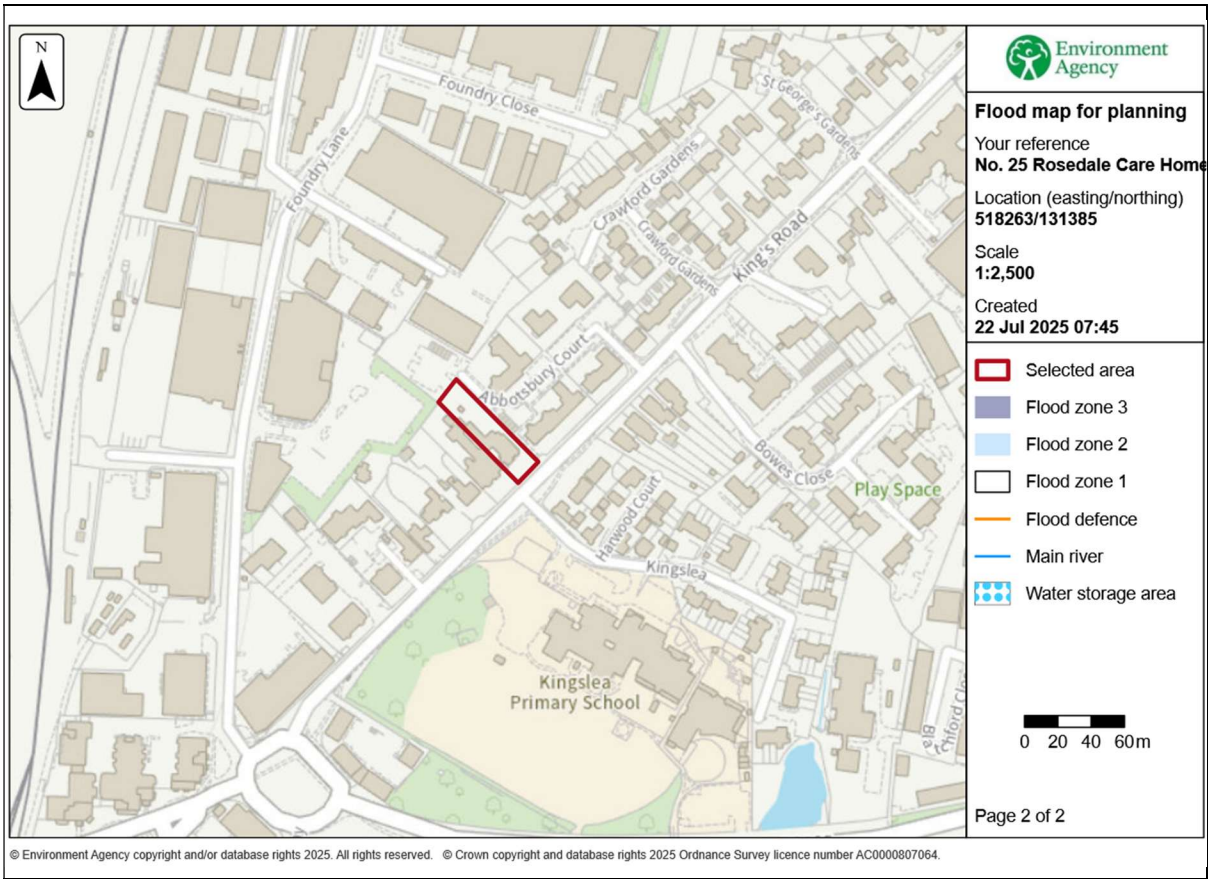

Fig. 2 FLOOD ZONE © Flood map for planning

2.1 SOURCES OF FLOODING

The Government website www.gov.uk/check-long-term-flood-risk has been consulted and the following advice has been confirmed.

Surface Water Flooding	**Very Low Risk of Flooding -** Very low risk means that this area has a chance of flooding of less than 0.1% each year.
Rivers and the Sea	**Very low risk of flooding -** Very low risk means that this area has a chance of flooding of less than 0.1% each year.
Ground Water	Flooding from groundwater is **unlikely** in this area.
Reservoirs	Flooding from reservoirs is **unlikely** in this area.

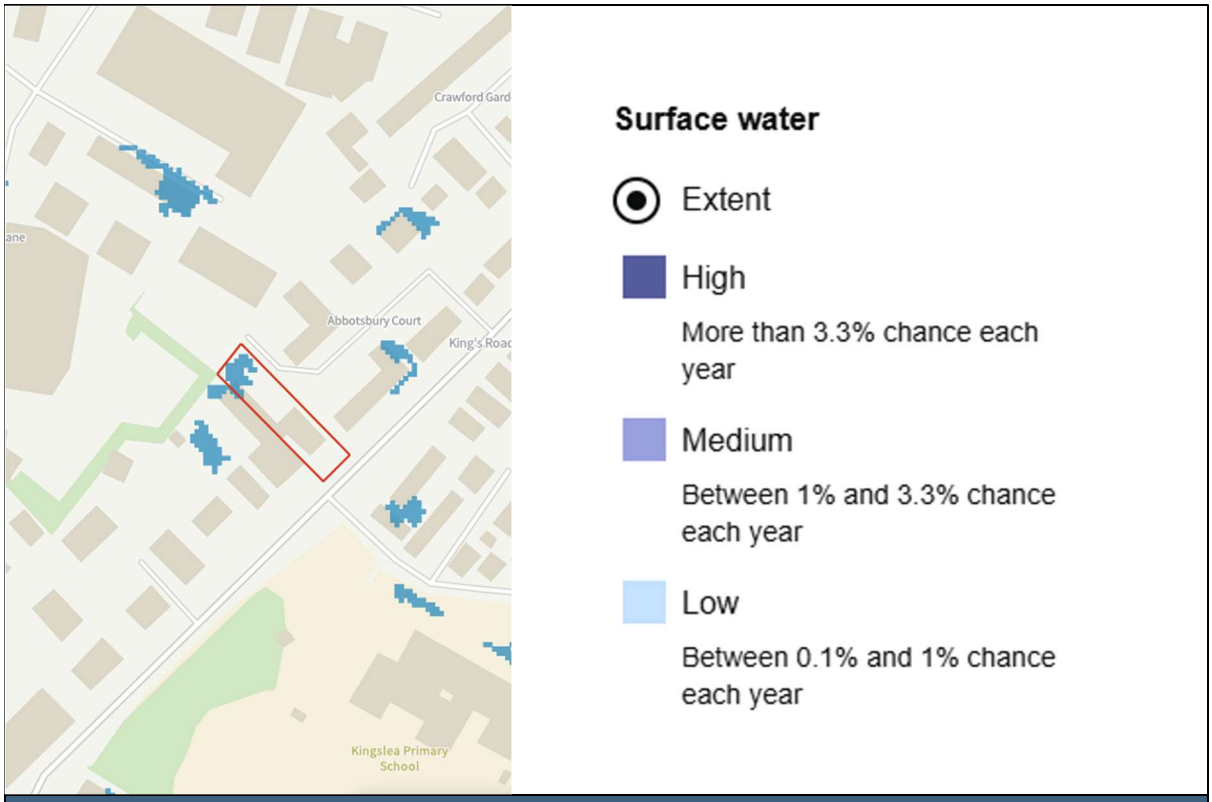

Fig. 3 SURFACE WATER FLOODING © Flood map for planning

Figure 3 shows no risk of surface water flooding within the site boundary although located directly north of the existing care home is an area noted as having a low risk of flooding for a 1 in 1000 year event, which is in excess of the 1 in 100 year design requirements.

It is considered that the potential surface water flooding shown on the map is attributable to the existing topography and a low spots within the site. Due to the proposals for the new building footprint and the SuDS elements, this risk will be mitigated on completion of the development. All low areas will be removed during construction and any remaining surface flows will be collected by the proposal surface water network with restricted outflow and attenuation.

3.0 GEOLOGY AND HYDROLOGY

3.1 GEOLOGY

A review of the online data from British Geological Society has been undertaken which shows that there is no superficial ground condition recorded. Bedrock geology is identified as the Upper Tunbridge Wells Sand – Sandstone and mudstone. This is shown in Fig 4.

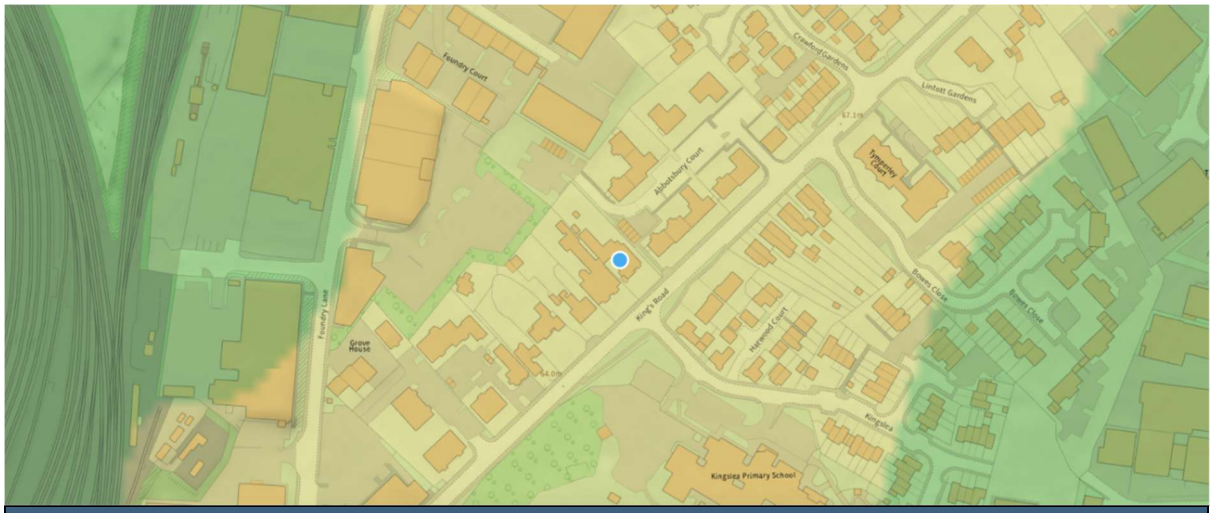

Fig. 4 BEDROCK GEOLOGY © BGS GEOLOGY VIEWERS

3.2 HYDROLOGY

The sandstones and mudstones of the Upper Tunbridge Wells Sand are classified by the Environment Agency (EA) as an 'Secondary Aquifer – A' defined as 'permeable layers that can support local water supplies and may form an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers. The mudstones of the Upper Tunbridge Wells Sand to the west are classified by the EA as an 'Unproductive Strata' defined as 'rock layers or drift deposits with low permeability that has negligible significance for water supply or river base flow.'

The site is not located in a Source Protection Zone (SPZ).

3.3 INFILTRATION RESULTS

Infiltration testing has been carried out in accordance with BRE 365. The BRE 365 results shown that infiltration is not sufficient in this site. Refer to Appendix A for Soakaway Test Report.

4.0 EXISTING DRAINAGE

The Existing Drainage within the site boundary has been depicted in the Drainage General Arrangement drawing included in appendix G, and Existing Site Areas in Appendix D. Based on Topographical Survey and the CCTV survey, included in Appendix B, there is an existing combined water pipeline within the site boundary. The existing combined water pipe seems to be located at 1.2m deep. Levels and location of this combined water system needs to be confirmed onsite prior any drainage work commencement.

The site is considered brownfield as the existing building is positively drained, and the existing drainage has been surveyed. The existing impermeable areas have been calculated and are indicated in Appendix D.

The total existing positively drained area is 813.8m^2 (0.081ha), including the building roofs and the hardstanding areas.

A plan showing the above is included in Appendix D along with calculations to show the existing unattenuated discharge flow rates.

1 in 1 year	0.57 l/s
1 in 2 years	0.60 l/s
1 in 30 years	1.60 l/s
1 in 100 years	2.20 l/s

A greenfield run off rate has been calculated using the HR Wallingford calculation method. The results can be seen in Appendix D. The QBar rate was calculated at 0.68 l/s.

5.0 PROPOSED FOUL DRAINAGE

The new network on site will be designed in accordance with Part H1 and H2 of the current Building Regulations 2010 (2015 Edition) and BS EN 752:2008 Drain and sewer systems outside of buildings. It is proposed to make a new foul water connection to the existing combined water pipeline located within the site boundary.

The proposed foul water drainage system will be connected to the existing foul drainage in Kings Road. Please refer to Appendix G "Proposed Drainage Layout". Please also refer to the correspondence with Southern Water in Appendix I.

The following calculation is presented to show the peak, Dry Weather Flow (DWF) contributions for the given operational parameters;

Flow rate of 350l/p/d

Maximum occupancy rate 40 residents plus 20 staff/visitors.

The performance of the FW sewer system is assessed using a constant 6 x DWF flat profile to represent the maximum diurnal variations in flow.

Maximum Occupancy	= 60 people
DWF Rate (24 hours)	= 350 l/p/d x 60 / 86,400 = 0.24 l/s
Peak Flow Rate	**= 0.24 x 6 = 1.44 l/s**

6.0 PROPOSED SURFACE WATER DRAINAGE

West Sussex Council is the Lead Local Flood Authority (LLFA) for Horsham and their standing advice website page "**Sustainable Drainage Systems (SuDS)"** (3rd July 2025) has been consulted in the preparation of this report which aims to address West Sussex Councils SuDS Policies listed within that document.

The proposed surface water drainage will be connected to the existing surface water drainage within Kings Road. Please refer to Appendix G "Proposed Drainage Layout". Please also refer to the correspondence with Southern Water in Appendix I.

6.1 DRAINAGE HIERARCHY - DISCHARGE OF SURFACE WATER

Part H of the Building Regulations requires that surface water should be discharged from new development in accordance with the following hierarchy;

- By infiltration to the ground via soakaway or other infiltration device.
- To surface water body / watercourse
- To a public sewer.

Infiltration disposal:

As already mentioned, infiltration will not be viable for this site.

Watercourse:

Review of OS information and satellite confirms there are no watercourse in the vicinity of the site.

Connection to existing System:

It is proposed all runoff from the proposed impermeable area is attenuated and controlled to 0.5 l/s for all storm events up to and including the critical 100 years plus 40% climate change event.

0.5 l/s discharge has been chosen to simultaneously control flows as close as reasonably practical to greenfield runoff rates whilst also providing safeguard against blockage risk.

It is proposed the full external hardstanding area will utilise tanked permeable paving construction which will accommodate voided Type 3 sub-base material allowing for treatment of runoff.

The proposed surface water drainage will convey surface water to a tanked geo-cellular storage tank located underneath the private permeable pavement, before releasing flows at 0.5 l/s via a hydro-brake flow control to existing manhole located within the site boundary.

6.2 FLOOD RISK MANAGEMENT

The proposed drainage scheme has been developed to protect people and property on the development site from flooding and to avoid creating any additional flood risk outside of the development. An exceedance plan to demonstrate this is provided in Appendix E. An Impermeable areas plan is also included in Appendix F.

STANDARD 3 – MANAGEMENT OF EXTREME RAINFALL AND FLOODING

The development is shown to be in Flood Zone 1 and is not considered to be at risk of flooding. Levels on site are to be designed to ensure that surface water run-off is captured and contained within the SuDS features on site before being attenuated and discharged to a ditch / ordinary water course via a Hydro brake to limit the discharge to the Greenfield Run-off Rate

The drainage system has been designed to the following, based on information provided on West Sussex County Councils website

Sustainable drainage systems - West Sussex County Council

The drainage system has been designed to the following criteria.

• Cv Value	1.0 Summer & Winter
• MADD Factor	0
• Rainfall data	FEH
• Climate Change Allowance	40%
• Urban Creep	0% (No permitted development rights)

- a) For the 50% AEP storm event = pipe full / no surcharge (with exceptions).
- b) For the 3.33% AEP storm event = no surface flooding.
- c) For the 1% AEP event + Climate Change (CC) = no property flooding and any flooding retained within the extent of the application site.

6.3 NATURAL FLOWS, DRAINAGE FLOW PATH AND REDUCE FLOOD RISK

It is understood that the LLFA's policy is, where possible, for development on brownfield land to reduce flood risk by restricting the surface water discharge to the existing runoff rate with a betterment of 50% during all events up to and including the 1 in 100 year rainfall event with climate change.

An alternative approach would be for discharge rates to be limited to a range of greenfield rates, based on the 1 in 1, 1 in 30 and 1 in 100 year storm events. However, the use of this method to restrict discharge rates requires the inclusion of long term storage, sized to take account of the increased post development volumes, discharging at no greater than 2l/s/ha. While discharging at no greater than 2 l/s/ha is acceptable, it is still the LLFA's preference that the former approach is used wherever

possible. In this instance, the discharge rate is 0.5 l/s following greenfield rates, which is much lower than 2 l/s.

Our proposal seeks to direct all surface water to the appropriate sewer at an attenuated flow which will reduce flood risk. One attenuation tank has been included in the design to retain the flow up to the 1 in 100 year storm event plus climate change. The proposed attenuation tank is 99m^2 x 0.8m deep, with Cover Level approx. 65.175 and Invert level 61.840. Tank volume 75.24m^3.

The proposed discharge rates for the site have been included within the drainage calculations in Appendix F and are as follows:

- 1 year storm
- 30 years storm + 35% cc
- 100 years storm + 45% cc

6.3 SUDS FEATURES

National Planning Policy Framework (the NPPF) states that SuDS should be incorporated in all new developments unless evidence of unsuitability is provided. Table 1 shows the SuDS components that have been considered for incorporation within this project along with comments regarding their inclusion or rejection.

Table 1 – SuDS Components

SuDS Component	Suitable for site?	Comments	Included
Rainwater harvesting system	×	Not to be used for operational restrictions regarding risk to heath of residents	No
Rain garden	✓	To be used to serve Impermeable roof area	Yes
Soakaway	×	Ground conditions are not suitable	No
Pervious pavement/ pavement reservoir	✓	To be used as storage and treatment for water quality for hard landscaping	Yes
Filter strip	×	Unsuitable due to size of development	No
Infiltration trench	×	Ground conditions are not suitable	No
Swale	×	Unsuitable due to site layout & ground conditions	No
Bioretention	×	Unsuitable due to site layout & ground conditions	No
Geocellular System	✓	To be used as storage and treatment for water	Yes
Infiltration basin	×	Unsuitable due to site layout & ground conditions	No
Detention basin	×	Unsuitable due to site layout & ground conditions	No
Pond	×	Open water not compatible with care use	No
Stormwater wetlands	×	Unsuitable due to size of development	No
Proprietary device	✓	Suitable but other options preferable	No

6.4 WATER QUALITY

An assessment as to the suitability of these provisions has been made using the simple index approach outlined within Chapter 26 of CIRIA C753 The SUDS Manual. This requires that the pollution mitigation indices (see fig. 5b) are equal to, or higher than, the pollution hazard indices (see fig. 5a).

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

Fig. 5a Pollution Hazard Indices © CIRIA C753 THE SUDS MANUAL

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.		

Fig. 5b SuDS mitigation indices © CIRIA C753 THE SUDS MANUAL

Consideration is given to the following three situations set out in tables 2a, 2b & 2c for land use in conjunction with the proposed SuDS components to demonstrate that water quality has been adequately addressed.

Tb 2a External Works Non residential parking <300 traffic movements per day		Total SS	Metals	Hydrocarbons
Hazard Index	External works	0.5	0.5	0.4
Mitigation Index	Permeable Pavement	0.7	0.6	0.7
		Pass	Pass	Pass

Tb 2c External Works + Roof		Total SS	Metals	Hydrocarbons
Hazard Index	Roof	0.2	0.2	0.05
	External works	0.5	0.5	0.4
	Total	**0.7**	**0.7**	**0.45**
Mitigation Index	Filter Drain	0.4	0.4	0.4
	Permeable Pavement	0.7	0.6	0.7
	Total Mitigation	1.1	1.0	1.1
		Pass	Pass	Pass

Based on the above, the proposed SUDS features are therefore considered to provide appropriate mitigation against potential sources of pollution generated by the development.

7.0 MAINTENANCE

Maintenance of the foul and surface water drainage systems serving the development will be the responsibility of the Rosedale Care Home operator. (See Appendix J)

8.0 CONCLUSIONS AND RECOMMENDATIONS

ARC Engineers have been commissioned to undertake a Drainage Strategy for a proposed Rosedale Care Home at the site No 25 Kings Road, Horsham RH13 5PP. The details below are a summary of the preceding pages.

FOUL WATER DRAINAGE

The proposed foul water drainage network is to discharge through a new foul water connection into the combined water system in Kings Road.

SURFACE WATER DRAINAGE

The use of infiltration to dispose of surface water is not possible due to the infiltration results. Due to this, and no watercourse being within vicinity of the development in which to make a connection, it is proposed a controlled connection to the surface water sewer in Kings Road.

It is proposed all runoff from the proposed impermeable area is attenuated and controlled to 0.5 l/s for all storm events up to and including the critical 100 years plus 40% climate change event.

It is proposed the full external hardstanding area will utilise tanked permeable paving construction which will accommodate voided Type 3 sub-base material allowing for treatment of runoff.

The proposed surface water drainage will convey surface water to a tanked geo-cellular storage tank located underneath the private permeable pavement, before releasing flows at 0.5 l/s via a hydro-brake flow control to the surface water sewer in Kings Road.

CONTROL THE QUANTITY OF RUNOFF

At present the surface water from the site discharges in unattenuated manner. The proposed development seeks to control the surface water within the site and discharge into the existing manhole located within the site boundary. This solution will help reduce the volume and speed of water leaving the site, thereby reducing flood risk.

MANAGE THE QUALITY OF RUNOFF TO PREVENT POLLUTION

The proposals for surface water management include an appropriate number of SuDS components that provide sufficient treatment for pollutants as set out in simple index approach outlined within Chapter 26 of The SuDS Manual.

AMENITY SPACE FOR PEOPLE FOR BIODIVERSITY FEATURES FOR NATURE

The following SuDS features have been incorporated into the landscape to provide both amenity space for the future residents of the care home and also to promote Biodiversity environments to create better places for nature; rain gardens and permeable pavement.

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APPENDIX A

INFILTRATION RESULTS

The Institution of Structural Engineers

3 CADMAN COURT
MORLEY
LEEDS
LS27 0RX
T: 0113 253 3904
W:www.arc-engineers.co.uk

Site
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Engineers

SOLMEK

Solmek Ltd.
12 Yarm Road
Stockton on Tees
TS18 3NA
www.solmek.com

Tel: 01642 607083
Fax: 01642 612355
E-mail:
south@solmek.com

FAO: Jim Emmerson
Arc Engineers

Contract Ref: SOU25-031

26th August 2025

Dear Jim Emmerson,

PERMEABILITY TESTING AT ROSEDALE CARE HOME, HORSHAM

SCOPE & INSTRUCTION

The works described in this letter report were carried out by Solmek, to the instructions of Arc Engineering, on a plot of land at Rosedale Care Home, 25 Kings Rd, Horsham RH13 5PP within the front yard of currently operating care home.

An infiltration testing investigation was requested. The fieldwork and testing were generally carried out according to the recommendations of BS5930: 2015 "Code of Practice for Ground Investigations" and all stratum descriptions are as recommended in that publication. The information provided in this report is based on the investigation fieldwork and is subject to the comments and approval of the various regulatory authorities.

There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report. Solmek reserve the right to alter conclusions and recommendations should further information be available or provided. Any schematic representation or opinion of the possible configuration of ground conditions between exploratory holes is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

FIELDWORK

The fieldwork was carried out by Solmek on 11th July 2025. The extent of the investigation was:

- 1no machine excavated trial pits (TP01) to a maximum depth of 1.20m below ground level (bgl).
  - The trial pit locations were specified by the client.
- Infiltration testing within the trial pit

The trial pit was backfilled with clean arisings upon completion.

Descriptions of the strata encountered in the trial pits together with details of sampling and groundwater are presented in Appendix B of this report. A plan showing the location of the trial pits can be found in Appendix A (Figure 2).

GROUND CONDITIONS

Made Ground

Made ground was encountered to depth of 0.60mbgl and consisted of paving bricks from surface to 0.08mbgl followed by clayey very gravelly fine to coarse sand. The gravel mainly comprised quartz, brick, chert and flint.

Natural Deposits

Proven to underlie the made ground deposits, natural ground generally comprised stiff grey mottled yellow silt.

Groundwater

No groundwater was encountered during the intrusive works.

It should be noted the rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including season, rainfall, dewatering and pumping activities.

RESULTS

Infiltration testing was undertaken within the trial pit, with three flushes completed within the pit. The testing was generally carried out in accordance with BRE Digest 365: Soakaway Design.

Within each of the three flushes, the water has failed to soakaway.

Soakaway drainage, if incorporated, should be designed in accordance with BRE *Special Digest 365 – Soakaway Design*.

We would like to take this opportunity to thank you for using Solmek.

Yours sincerely



Maksims Malahovs
Geotechnical Engineer

For and on behalf of Solmek Ltd

Solmek Ltd
12-16 Yarm Road
Stockton on Tees
TS18 3NA
Tel: 01642 607083
Email: info@solmek.com

Trial Pit Log

TrialPit No
TP01
Sheet 1 of 1

Project Name:	Rosedale Care Home, Horsham	Project No. SOU25-031	Co-ords: 518289E - 131369N Level:
Date	11/07/2025		
Plant Used:	JCB 3CX	Dimensions (m): Depth 1.20	2.00 × 0.80
Scale	1:26		
Client:	Arc Engineers		
Logged	MM		

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.08			Paving bricks
							MADE GROUND: dark brown, clayey very gravelly fine to coarse SAND. Gravel is fine to coarse, angular to sub-rounded of quartz, brick, chert and flint.
				0.60			Stiff, grey mottled yellow SILT
				1.20			End of Pit at 1.200m

Remarks: No groundwater encountered.

Stability: Unstable within made ground. Stable within natural silt.

♣Solmek conditions of offer, notes on limitations & basis for contract (ref: version1/2025)

These conditions accompany our tender and supercede any previous conditions issued. Solmek will prepare a report solely for the use of the Client (the party invoiced) and its agent(s). No reliance should be placed on the contents of this report, in whole or in part by 3rd parties. The report, its content and format and associated data are copyright, and the property of Solmek. Photocopying of part or all of the contents, transfer or reproduction of any kind is forbidden without written permission from Solmek. A charge may be levied against such approval, the same to be made at the discretion of Solmek.

Solmek cannot be held liable and do not warrant, or otherwise guarantee the validity of information provided by third parties and subsequently used in our reports. Solmek are not responsible for the action negligent of otherwise of subcontractors or third parties.

Site investigation is a process of sampling. The scope and size of an investigation may be considered proportional to levels of confidence regarding the ground and groundwater conditions. The exploratory holes undertaken investigate only a small volume of the ground in relation to the overall size of the site, and can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions as encountered within each of the exploratory holes. There may be different ground conditions elsewhere on the site which have not been identified by this investigation and which therefore have not been taken into account in this report. Reports are generally subject to the comments of the local authority and Environment Agency. The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that mobile contamination, ground gas levels and groundwater levels may vary owing to seasonal, tidal and/or weather related effects. Solmek cannot be held liable for any unrecorded or unforeseen obstructions between exploratory boreholes and trial pits. This includes instances where previous structures on the site (buried man made structures) or the presence of boulder clay (cobbles and/or boulder obstructions) have been anticipated. All types of piling operations should make allowance for obstructions within the construction budget to accommodate this. Unrecorded ancient mining may occur anywhere where seams that have been worked and influence the rock and soil above. Dissolution cavities can occur where gypsum or chalk is present. Rotary drilling is the recommended technique to prove the integrity of the rock.

Where the scope of the investigation is limited via access to information, time constraints, equipment limitations, testing, interpretation or by the client or his agents budgetary constraints, elements not set out in the proposal and excluded from the report are deemed to be omitted from the scope of the investigation.

Desk studies are generally prepared in accordance with RICS guidelines. Environmental site investigations are generally undertaken as 'exploratory investigations' in accordance with the definitions provided in paragraph 5.4 of BS 10175:2011 in order to confirm the conceptual assumptions. You are advised to familiarize yourself with the typical scope of such an investigation. No pumping of water will be undertaken unless a licence or facilities/equipment have been arranged by others.

Where the type, number or/and depth of exploratory hole is specified by others, Solmek cannot and will not be responsible for any subsequent shortfall or inadequacy in data, and any consequent shortfall in interpretation of environmental and geotechnical aspects which may be required at a later date in order to facilitate the design of permanent or temporary works.

All information acquired by Solmek in the course of investigation is the property of Solmek, and, only also becomes the joint property of the Client only on the complete settlement of all invoices relating to the project. Solmek reserve the right to use the information in commercial tendering and marketing, unless the Client expressly wishes otherwise in writing. The quoted rates do not include VAT, and payment terms are 30 days from dispatch of invoice from our offices. Quotes are subject to a site visit.

We have allowed for 1 mobilisation and normal working hours unless otherwise stated. The scope of the investigation may be reviewed following the desk study and/or fieldwork. The presence or otherwise of Japanese Knotweed or other invasive plants can be difficult to identify especially during winter months. If Japanese Knotweed or other invasive species are suspect, it should be confirmed by an ecologist. We have not allowed for acquiring services information, and cannot be responsible for damage to underground services or pipes not shown to us or not clearly shown on plans. Costs incurred will be passed on to you, and in commissioning Solmek you understand and accept that you/your agent have a contractual relationship with Solmek & you accept this. Our rates assume unobstructed, reasonably level and firm access to the exploratory positions and adequate clear working areas and headroom. We have priced on the basis that you or your client have the necessary permissions, wayleaves and approvals to access land. All boreholes and pits are backfilled with arisings except where gas monitoring pipes are installed with stopcock covers. Solmek are not responsible for any uneven surfaces as a result of siteworks and rutting and backfilled excavations may require re-levelling and/or making good by others after fieldwork is complete, and Solmek has not allowed for this. No price has been provided or requested for a return visit to remove pipework and covers. Hourly rates apply to consultancy only and do not include expenses unless otherwise shown. If warranties are required, legal costs incurred will be passed on to you assuming Solmek agree to complete such warranties, modified or otherwise and you understand and agree to pay all costs.

We reserve the right to pursue full payment of the invoice prior to release of any information including reports. We advise you/your client that we may elect to pursue our statutory rights under late payment legislation, and will apply 8% to the base rate for unreasonably late payments. Solmek are exempt from the CIS Scheme. Solmek offer to undertake work only in strict accordance with conditions covered by our current insurances, which are available for inspection. Solmek are not responsible for acts, negligent or otherwise of subcontractors and as a matter of policy cannot indemnify any other parties. Professional indemnity Insurance is limited to ten times the invoice net total except where stated otherwise by Solmek. Solmek give notice that consequential loss as a direct or indirect result of Solmek's activities or omission of the same are excluded.

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APPENDIX B

CCTV SURVEY

The Institution of Structural Engineers

3 CADMAN COURT
MORLEY
LEEDS
LS27 0RX
T: 0113 253 3904
W:www.arc-engineers.co.uk

First Local Services

24/7 DRAINAGE EXPERTS

WinCan - CCTV Report

Unit 4A, GP Centre, Yeoman Road,
Ringwood, BH24 3FF
Tel: 0800 6696492
Email: ross@firstlocalservices.co.uk

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First Local Services

24/7 DRAINAGE EXPERTS

Your CCTV Report - Explained..

Our CCTV Reports

If you've never had a survey carried out before, it's understandable you may have some questions for us regarding your CCTV Report. We'll try and explain that for you and give an understanding of what the findings mean for you and your property.

Our trained technicians have now attended the property and carried out a CCTV survey of the required drainage, including photos of the drainage features and an indicative drainage layout. Each of the sections within the report relates to a specific pipe run surveyed, and this will correspond with the drainage layout. A summary of these runs can be found on the Table of Contents and any specific notes will be added to the Project Summary (if required).

Our report sections and drainage layout drawing will provide you with all the information required for the pipes surveyed.. including what pipe connects where and the use, length and condition of that pipework. A key will be provided on our layout to assist with those findings.

Our Findings

Following the internal CCTV inspection of the pipework, a summary of our findings is shown in the Scoring Summary at the front of the report. This will give key information regarding any defects or deposits identified on the survey. Each defect is given a industry standard grading of 1-5, with 5 being the most severe as per the below Scoring Guide. Defects scored between 3-5 will usually require urgent attention. Itemised scoring of the defects is provided within the report for that section, on the right of the page and under the "Grade" section.

Internal condition grade	Defect descriptions
1	**Acceptable structural condition** No structural defects Service defects
2	**Potential for further deterioration – minor risk of collapse** Circumferential cracks, Moderate joint defects, Surface damage – minor
3	**Collapse unlikely in near future, but deterioration likely** Fractures with minor deformation, Longitudinal / multiple cracks, more severe joint defects, Surface damage – medium
4	**Collapse likely in foreseeable future** Broken or fractured with medium deformation, Multiple fractures, Serious level loss, Serious joint defects, Surface damage –large
5	**Already collapsed or collapse imminent** Collapse, Broken or Fractured with major deformation, Extensive areas of fabric missing

Our Recommendations

Pipe cleansing or repair work required? We can take care of that for you. Our skilled engineers can remedy any issues encountered, whether that be HPW Jetting, Patching & Lining works or excavation / installation.

If we have found defects or deposits within the CCTV Report, these will be detailed in our Recommendations, which can be found in Appendix A of this report. Each of the noted defects / deposits will be itemised along with our recommended remedial actions and costings.

We hope that answers any questions or queries you may have, but if not please give one of our team a call, we'll be more than happy to answer any questions you may have.

Thank you for choosing First Local Services.

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24/7 DRAINAGE EXPERTS

First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

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33397_CCTV		24/07/2025

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Tel. 0800 6696492
chris@firstlocalservices.co.uk

Project Information

Project Name	Project Number	Project Date
33397_CCTV		24/07/2025

Client

Company: ARC Engineers Ltd
Contact: Mani Ghomi
Department: Technical Director
Street: 3 Cadman Court
Town or City: Morley, Leeds
County: West Yorkshire
Post Code: LS27 0RX
Phone: 0113 253 3904
Email: mani.ghomi@arc-engineers.co.uk

Site

Company: Rosedale & Kings Court Care Home
Street: 23 Kings Road
Town or City: Horsham
County: West Sussex
Post Code: RH13 5PP

Contractor

Company: First Local Services Ltd
Contact: Chris Smith
Department: Report & Survey Technician
Street: Unit 4A, GP Centre, Yeoman Road
Town or City: Ringwood
County: Hampshire
Post Code: BH24 3FF
Phone: 0800 6696492
Mobile: 07955405513
Email: chris@firstlocalservices.co.uk

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Scoring Summary

Project Name	Project Number	Project Date
33397_CCTV		24/07/2025

Structural Defects

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

Grade 4: Best practice suggests consideration should be given to repairs to avoid a potential collapse.

Grade 5: Best practice suggests that this pipe is at risk of collapse at any time. Urgent consideration should be given to repairs to avoid total failure.

Section	PLR	Grade	Description
9	MH10X	3	Fracture, longitudinal at joint at 1 o'clock, finish
17	Line AX	3	Fracture, longitudinal at 3 o'clock, finish

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	IC1X	3	Attached deposits, fouling from 5 o'clock to 7 o'clock, 10% cross-sectional area loss, finish
5	MH3X	3	Joint displaced, medium, finish
6	Line AX	4	Attached deposits, fouling from 2 o'clock to 10 o'clock, 80% cross-sectiona area loss
9	MH10X	3	Multiple defects
10	MH11X	5	Multiple defects
14	MH9X	5	Roots, mass, 20% cross-sectional area loss, finish
16	MH13X	3	Settled deposits, fine at joint, 10% cross-sectional area loss, finish
18	MH14X	3	Multiple defects

Abandoned Surveys

Section	PLR	Description
6	Line AX	Survey abandoned
10	MH11X	Survey abandoned
13	MH9X	Survey abandoned
14	MH9X	Survey abandoned

Information

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

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24/7 DRAINAGE EXPERTS

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Section Inspection - 24/07/2025 - Line AX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
1	1	24/07/25	10:46	Not Specified	No Rain Or Snow	Not Specified	LINE AX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Upstream	**Upstream Node:**	LINE A
Road:	23 Kings Road	**Inspected Length:**	10.00 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	10.00 m	**Downstream Node:**	IC1
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:87



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	IC	Start node, inspection chamber, reference: IC1	00:00:00		
0.00	WL	Water level, 5% of the vertical dimension	00:00:03		
9.40	LU	Line deviates up	00:00:20		
10.00	OCF	Finish node, other special chamber, reference: Line A: SVP	00:00:21		

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 - 24/07/2025 - IC1X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
2	1	24/07/25	10:45	Not Specified	No Rain Or Snow	Not Specified	IC1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Upstream	**Upstream Node:**	IC1
Road:	23 Kings Road	**Inspected Length:**	6.20 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	6.20 m	**Downstream Node:**	MH1
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	0.800 m

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:54



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: MH1	00:00:00		
0.00		WL	Water level, 5% of the vertical dimension	00:00:00		
2.00	S01	DEF	Attached deposits, fouling from 5 o'clock to 7 o'clock, 10% cross-sectional area loss, start: Live foul waste	00:00:33	1_MH1_IC 1.jpg	
4.30	F01	DEF	Attached deposits, fouling from 5 o'clock to 7 o'clock, 10% cross-sectional area loss, finish: Live foul waste	00:00:45		3
6.20		ICF	Finish node, inspection chamber, reference: IC1	00:01:01		

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	1.0	6.0	3.0

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Section Pictures - 24/07/2025 - IC1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
2	Upstream	IC1X		



1_MH1_IC1.jpg, 00:00:33, 2.00 m
Attached deposits, fouling from 5 o'clock to 7 o'clock, 10% cross-sectional area loss, start, Live foul waste

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Section Inspection - 24/07/2025 - MH1X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
3	1	24/07/25	10:46	Not Specified	No Rain Or Snow	Not Specified	MH1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	MH1
Road:	23 Kings Road	**Inspected Length:**	4.00 m	**Upstream Pipe Depth:**	0.800 m
Location:	Property or buildings	**Total Length:**	4.00 m	**Downstream Node:**	MH2
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: 0.80 m						
MH1						
	0.00	MH	Start node, manhole, reference: MH1	00:00:00		
	0.00	WL	Water level, 0% of the vertical dimension	00:00:12		
	4.00	MHF	Finish node, manhole, reference: MH2	00:00:27		
MH2						
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 - 24/07/2025 - MH2X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
4	1	24/07/25	10:47	Not Specified	No Rain Or Snow	Not Specified	MH2X

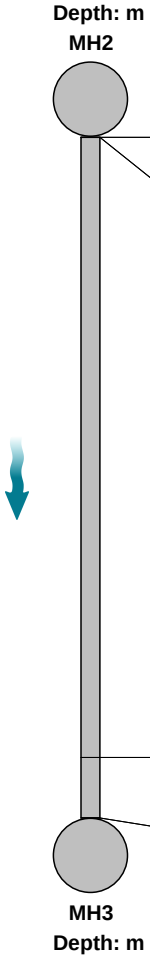
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	MH2
Road:	23 Kings Road	**Inspected Length:**	4.50 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	4.50 m	**Downstream Node:**	MH3
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH2	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension	00:00:22		
4.10	LR	Line deviates right: Slight	00:00:36		
4.50	MHF	Finish node, manhole, reference: MH3	00:00:37		

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	0	0.0	0.0	0.0	1.0

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Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - MH3X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
5	1	24/07/25	10:47	Not Specified	No Rain Or Snow	Not Specified	MH3X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	MH3
Road:	23 Kings Road	**Inspected Length:**	27.50 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	27.50 m	**Downstream Node:**	MH4
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:204



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: .	00:00:00		
0.00		WL	Water level, 5% of the vertical dimension	00:00:07		
0.70		JN	Junction at 3 o'clock, 150mm dia	00:00:11		
1.90		JN	Junction at 2 o'clock, 100mm dia	00:00:16		
2.80	S01	JDM	Joint displaced, medium, start	00:00:19	2_MH3_MH4.jpg	
4.50		GP	General photograph taken at this point	00:00:26	3_MH3_MH4.jpg	
7.70		GP	General photograph taken at this point	00:00:33	4_MH3_MH4.jpg	
9.50		JN	Junction at 2 o'clock, 100mm dia	00:00:40		
13.30		GP	General photograph taken at this point	00:00:49	5_MH3_MH4.jpg	
13.90	S02	CUZ	Loss of vision, other, start: Soap suds	00:00:53		
15.00		LR	Line deviates right: Slight	00:01:02		
15.00	F02	CUZ	Loss of vision, other, finish: Soap suds	00:01:02		
15.90		GP	General photograph taken at this point	00:01:08	6_MH3_MH4.jpg	
19.40		GP	General photograph taken at this point	00:01:23	7_MH3_MH4.jpg	
20.90		JN	Junction at 12 o'clock, 100mm dia	00:01:28		

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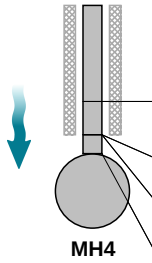
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - MH3X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
5	1	24/07/25	10:47	Not Specified	No Rain Or Snow	Not Specified	MH3X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified



Depth: m

Scale: 1:204	Position [m]		Code	Observation	MPEG	Photo	Grade
	26.10		WL	Water level, 10% of the vertical dimension	00:01:44		
	27.00		WL	Water level, 5% of the vertical dimension	00:01:47		
	27.00	F01	JDM	Joint displaced, medium, finish	00:01:51		1 / 3
	27.50		MHF	Finish node, manhole, reference: MH4	00:01:51		

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	1.0	0.9	25.0	1.0	1	2.0	1.8	50.0	3.0

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Section Pictures - 24/07/2025 - MH3X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
5	Downstream	MH3X		



2_MH3_MH4.jpg, 00:00:19, 2.80 m
Joint displaced, medium, start



3_MH3_MH4.jpg, 00:00:26, 4.50 m
General photograph taken at this point



4_MH3_MH4.jpg, 00:00:33, 7.70 m
General photograph taken at this point



5_MH3_MH4.jpg, 00:00:49, 13.30 m
General photograph taken at this point

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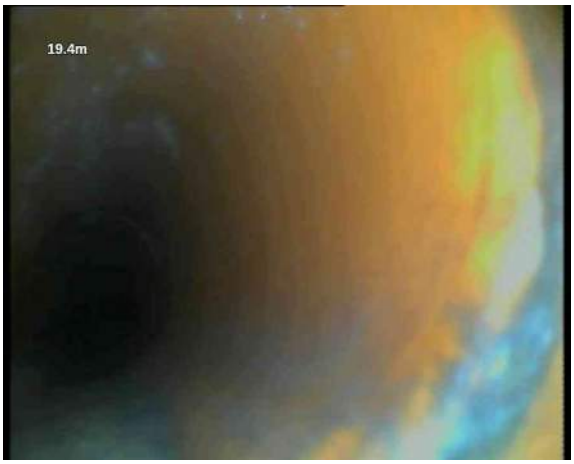
Section Pictures - 24/07/2025 - MH3X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
5	Downstream	MH3X		



6_MH3_MH4.jpg, 00:01:08, 15.90 m
General photograph taken at this point



7_MH3_MH4.jpg, 00:01:23, 19.40 m
General photograph taken at this point

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Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - Line AX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
6	1	24/07/25	10:48	Not Specified	No Rain Or Snow	Not Specified	LINE AX

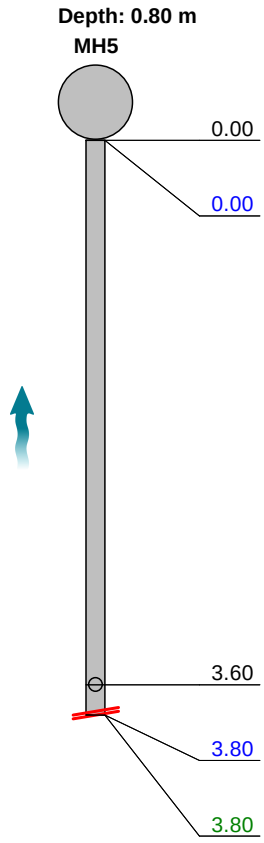
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Upstream	**Upstream Node:**	LINE A
Road:	23 Kings Road	**Inspected Length:**	3.80 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	3.80 m	**Downstream Node:**	MH5
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	0.800 m

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH5	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension	00:00:01		
3.60	JN	Junction at 12 o'clock, 100mm dia	00:00:21		
3.80	SA	Survey abandoned: Unable to pass - HPWJ required	00:00:21		
3.80	DEF	Attached deposits, fouling from 2 o'clock to 10 o'clock, 80% cross-sectional area loss: Wet wipes snagged	00:00:21	8_MH5_Line A.jpg	4

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	1.3	5.0	4.0

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Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Pictures - 24/07/2025 - Line AX

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
6	Upstream	LINE AX		



8_MH5_Line A.jpg, 00:00:21, 3.80 m
Attached deposits, fouling from 2 o'clock to 10 o'clock, 80% cross-sectional area loss, Wet wipes snagged

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chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - MH5X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
7	1	24/07/25	10:52	Not Specified	No Rain Or Snow	Not Specified	MH5X

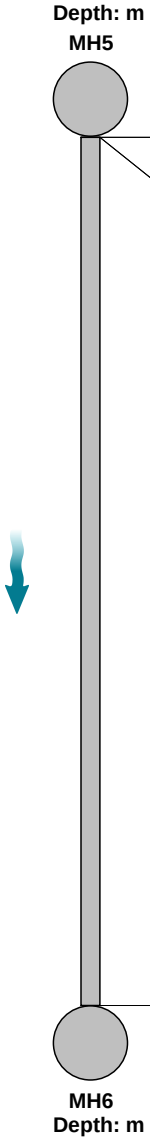
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	MH5
Road:	23 Kings Road	**Inspected Length:**	6.20 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	6.20 m	**Downstream Node:**	MH6
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:54



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH5	00:00:00		
0.00	WL	Water level, 5% of the vertical dimension	00:00:02		
6.20	MHF	Finish node, manhole, reference: MH6	00:00:22		

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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24/7 DRAINAGE EXPERTS

First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - MH6X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
8	1	24/07/25	10:56	Not Specified	No Rain Or Snow	Not Specified	MH6X

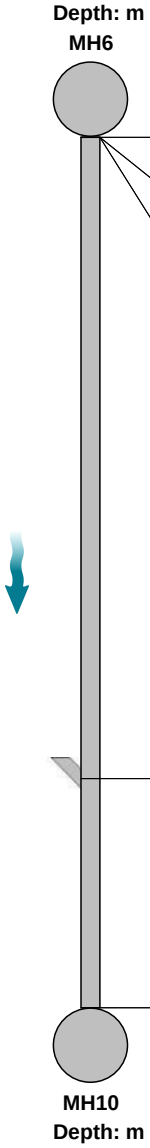
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	MH6
Road:	23 Kings Road	**Inspected Length:**	15.20 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	15.20 m	**Downstream Node:**	MH10
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:132



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH6	00:00:00		
0.00	WL	Water level, 5% of the vertical dimension	00:00:00		
0.01	RFJ	Roots, fine at joint	00:00:00	9_MH6_MH10.jpg	2
11.20	JN	Junction at 2 o'clock, 100mm dia	00:00:45		
15.20	MHF	Finish node, manhole, reference: MH10	00:00:54		

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	1.0	0.1	1.0	2.0

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First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Pictures - 24/07/2025 - MH6X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
8	Downstream	MH6X		



9_MH6_MH10.jpg, 00:00:00, 0.01 m
Roots, fine at joint

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First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - MH10X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
9	1	24/07/25	10:56	Not Specified	No Rain Or Snow	Not Specified	MH10X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	MH10
Road:	23 Kings Road	**Inspected Length:**	12.90 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	12.90 m	**Downstream Node:**	MH11
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:112



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: MH10	00:00:00		
0.00		WL	Water level, 5% of the vertical dimension	00:00:00		
0.00	S01	DEGJ	Attached deposits, grease at joint from 5 o'clock to 7 o'clock, 5% cross-sectional area loss, start	00:00:07	10_MH10_MH11.jpg	
3.00		JDM	Joint displaced, medium	00:00:22	11_MH10_MH11.jpg	1 / 3
5.90		RFJ	Roots, fine at joint	00:00:29		2
5.90	S02	FLJ	Fracture, longitudinal at joint at 1 o'clock, start	00:00:29	12_MH10_MH11.jpg	
7.10	F02	FLJ	Fracture, longitudinal at joint at 1 o'clock, finish	00:00:32		3 / 2
12.90	F01	DEGJ	Attached deposits, grease at joint from 5 o'clock to 7 o'clock, 5% cross-sectional area loss, finish	00:00:42		3
12.90		MHF	Finish node, manhole, reference: MH11	00:00:42		

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**
2	40.0	6.3	81.0	3.0	4	4.0	4.4	57.0	4.0

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First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Pictures - 24/07/2025 - MH10X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
9	Downstream	MH10X		



10_MH10_MH11.jpg, 00:00:07, 0.00 m
Attached deposits, grease at joint from 5 o'clock to 7 o'clock, 5% cross-sectional area loss, start



11_MH10_MH11.jpg, 00:00:22, 3.00 m
Joint displaced, medium



12_MH10_MH11.jpg, 00:00:29, 5.90 m
Fracture, longitudinal at joint at 1 o'clock, start

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First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - MH11X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
10	1	24/07/25	10:58	Not Specified	No Rain Or Snow	Not Specified	MH11X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	MH11
Road:	23 Kings Road	**Inspected Length:**	18.00 m	**Upstream Pipe Depth:**	2.000 m
Location:	Property or buildings	**Total Length:**	18.00 m	**Downstream Node:**	LINE X
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:156



Depth: 2.00 m
MH11

Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: MH11	00:00:00		
0.00		WL	Water level, 5% of the vertical dimension	00:00:01		
0.50	S01	JDM	Joint displaced, medium, start	00:00:18	13_MH11_Line X.jpg	
0.70		LR	Line deviates right: Medium	00:00:19		
1.10		WL	Water level, 30% of the vertical dimension	00:00:20		
1.50		RMJ	Roots, mass at joint, 65% cross-sectional area loss	00:00:20	14_MH11_Line X.jpg	5
1.50		DEGJ	Attached deposits, grease at joint from 2 o'clock to 10 o'clock, 65% cross-sectional area loss	00:00:20	15_MH11_Line X.jpg	5
1.90		WL	Water level, 10% of the vertical dimension	00:00:23		
4.50		WL	Water level, 30% of the vertical dimension	00:00:29		
4.50	F01	JDM	Joint displaced, medium, finish	00:00:29		1 / 3
4.50	S02	CUW	Loss of vision, camera under water, start	00:00:32		
18.00	F02	CUW	Loss of vision, camera under water, finish	00:01:18		
18.00		SA	Survey abandoned: Due to water level	00:01:18		

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	1.0	0.2	4.0	1.0	3	30.0	2.1	38.0	5.0

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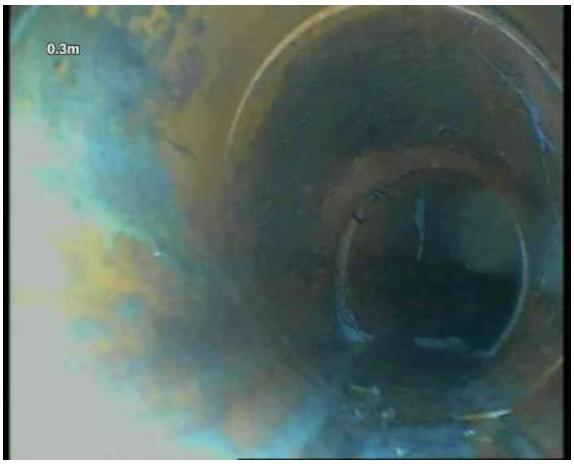
24/7 DRAINAGE EXPERTS

First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Pictures - 24/07/2025 - MH11X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
10	Downstream	MH11X		



13_MH11_Line X.jpg, 00:00:18, 0.50 m
Joint displaced, medium, start



14_MH11_Line X.jpg, 00:00:20, 1.50 m
Roots, mass at joint, 65% cross-sectional area loss



15_MH11_Line X.jpg, 00:00:20, 1.50 m
Attached deposits, grease at joint from 2 o'clock to 10 o'clock, 65% cross-sectional area loss

First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - MH7X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
11	1	24/07/25	10:52	Not Specified	No Rain Or Snow	Not Specified	MH7X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Upstream	**Upstream Node:**	MH7
Road:	23 Kings Road	**Inspected Length:**	6.70 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	6.70 m	**Downstream Node:**	MH8
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	0.800 m

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:59



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH8	00:00:00		
0.00	WL	Water level, 5% of the vertical dimension	00:00:02		
6.10	OJM	Open joint, medium	00:00:18	16_MH8_MH7.jpg	1
6.70	MHF	Finish node, manhole, reference: MH7	00:00:22		

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	1.0	0.1	1.0	1.0	0	0.0	0.0	0.0	1.0

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24/7 DRAINAGE EXPERTS

First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Pictures - 24/07/2025 - MH7X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
11	Upstream	MH7X		



16_MH8_MH7.jpg, 00:00:18, 6.10 m
Open joint, medium

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Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - MH8X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
12	1	24/07/25	10:55	Not Specified	No Rain Or Snow	Not Specified	MH8X

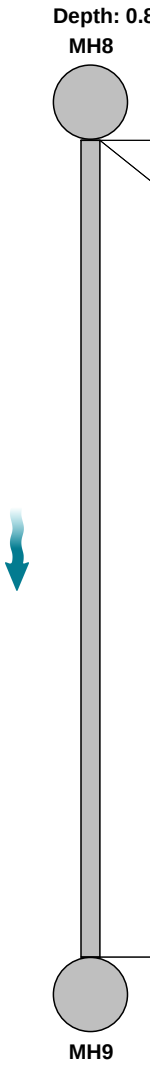
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	MH8
Road:	23 Kings Road	**Inspected Length:**	5.40 m	**Upstream Pipe Depth:**	0.800 m
Location:	Property or buildings	**Total Length:**	5.40 m	**Downstream Node:**	MH9
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH8	00:00:00		
0.00	WL	Water level, 5% of the vertical dimension	00:00:02		
5.40	MHF	Finish node, manhole, reference: MH9	00:00:26		

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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First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - MH9X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
13	1	24/07/25	10:57	Not Specified	No Rain Or Snow	Not Specified	MH9X

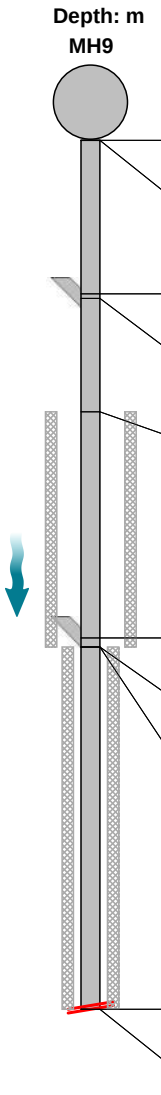
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	MH9
Road:	23 Kings Road	**Inspected Length:**	19.20 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	19.20 m	**Downstream Node:**	MH12
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:167



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: MH9	00:00:00		
0.00		WL	Water level, 5% of the vertical dimension	00:00:01		
3.40		JDM	Joint displaced, medium	00:00:26	17_MH9_MH12.jpg	1 / 3
3.50		JN	Junction at 2 o'clock, 100mm dia	00:00:27		
6.00	S01	DESJ	Settled deposits, fine at joint, 5% cross-sectional area loss, start	00:00:36	18_MH9_MH12.jpg	
11.00		JN	Junction at 3 o'clock, 150mm dia	00:00:44		
11.20	F01	DESJ	Settled deposits, fine at joint, 5% cross-sectional area loss, finish	00:00:45		3
11.20	S02	DESJ	Settled deposits, fine at joint, 20% cross-sectional area loss, start	00:00:45	19_MH9_MH12.jpg	
19.20	F02	DESJ	Settled deposits, fine at joint, 20% cross-sectional area loss, finish	00:01:11		4
19.20		SA	Survey abandoned: Unable to pass - overlap required	00:01:11		

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	1.0	0.1	1.0	1.0	3	5.0	2.8	54.0	4.0

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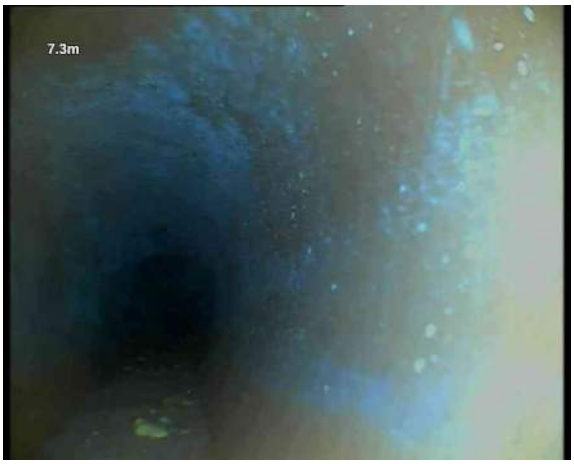
First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Pictures - 24/07/2025 - MH9X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
13	Downstream	MH9X		



17_MH9_MH12.jpg, 00:00:26, 3.40 m
Joint displaced, medium



18_MH9_MH12.jpg, 00:00:36, 6.00 m
Settled deposits, fine at joint, 5% cross-sectional area loss, start



19_MH9_MH12.jpg, 00:00:45, 11.20 m
Settled deposits, fine at joint, 20% cross-sectional area loss, start

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First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - MH9X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
14	1	24/07/25	10:57	Not Specified	No Rain Or Snow	Not Specified	MH9X

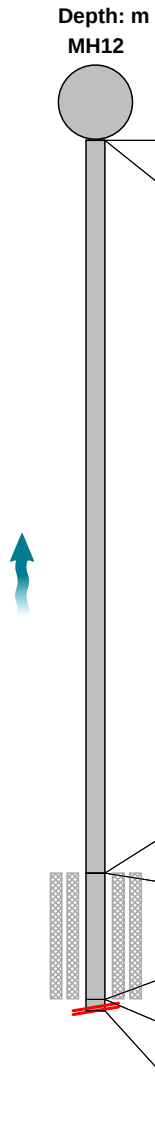
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Upstream	**Upstream Node:**	MH9
Road:	23 Kings Road	**Inspected Length:**	7.60 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	7.60 m	**Downstream Node:**	MH12
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:66



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: MH12	00:00:00		
0.00		WL	Water level, 5% of the vertical dimension	00:00:01		
6.40	S01	RM	Roots, mass, 20% cross-sectional area loss, start	00:00:20	20_MH12_MH9.jpg	
6.40	S02	DESJ	Settled deposits, fine at joint, 20% cross-sectional area loss, start	00:00:20	21_MH12_MH9.jpg	
7.50	F02	DESJ	Settled deposits, fine at joint, 20% cross-sectional area loss, finish	00:00:38		4
7.50	F01	RM	Roots, mass, 20% cross-sectional area loss, finish	00:00:38		5
7.60		SA	Survey abandoned: Due to mass roots & silt - overlap complete	00:00:38		

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	2	15.0	3.9	30.0	5.0

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24/7 DRAINAGE EXPERTS

First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Pictures - 24/07/2025 - MH9X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
14	Upstream	MH9X		



20_MH12_MH9.jpg, 00:00:20, 6.40 m
Roots, mass, 20% cross-sectional area loss, start



21_MH12_MH9.jpg, 00:00:20, 6.40 m
Settled deposits, fine at joint, 20% cross-sectional area loss, start

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First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - MH12X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
15	1	24/07/25	10:58	Not Specified	No Rain Or Snow	Not Specified	MH12X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	MH12
Road:	23 Kings Road	**Inspected Length:**	5.60 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	5.60 m	**Downstream Node:**	MH13
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50



Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m MH12					
0.00	MH	Start node, manhole, reference: MH12	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension	00:00:07		
5.60	MHF	Finish node, manhole, reference: MH13	00:00:26		
MH13 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

First Local Services
24/7 DRAINAGE EXPERTS

First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - MH13X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
16	1	24/07/25	10:58	Not Specified	No Rain Or Snow	Not Specified	MH13X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	MH13
Road:	23 Kings Road	**Inspected Length:**	3.10 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	3.10 m	**Downstream Node:**	CP1
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: MH13	00:00:00		
0.00		WL	Water level, 0% of the vertical dimension	00:00:01		
1.60	S01	DESJ	Settled deposits, fine at joint, 10% cross-sectional area loss, start	00:00:12	22_MH13_CP1.jpg	
3.00	F01	DESJ	Settled deposits, fine at joint, 10% cross-sectional area loss, finish	00:00:15		3
3.10		CPF	Finish node, catchpit, reference: CP1	00:00:15		

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	1.3	4.0	3.0

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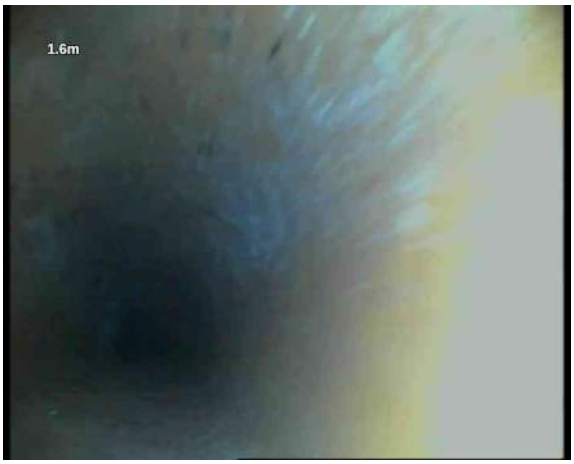
24/7 DRAINAGE EXPERTS

First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Pictures - 24/07/2025 - MH13X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
16	Downstream	MH13X		



22_MH13_CP1.jpg, 00:00:12, 1.60 m
Settled deposits, fine at joint, 10% cross-sectional area loss, start

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Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - Line AX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
17	1	24/07/25	10:59	Not Specified	No Rain Or Snow	Not Specified	LINE AX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Upstream	**Upstream Node:**	LINE A
Road:	23 Kings Road	**Inspected Length:**	12.00 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	12.00 m	**Downstream Node:**	MH14
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	1.000 m

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:104



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: MH14	00:00:00		
0.00		WL	Water level, 5% of the vertical dimension	00:00:03		
0.00	S01	DEGJ	Attached deposits, grease at joint from 4 o'clock to 8 o'clock, 5% cross-sectional area loss, start	00:00:03	23_MH14_Line A.jpg	
0.00		OJM	Open joint, medium	00:00:15	24_MH14_Line A.jpg	1
0.70		JN	Junction at 2 o'clock, 100mm dia	00:00:14		
2.00	S02	FL	Fracture, longitudinal at 3 o'clock, start: wanders	00:00:18	25_MH14_Line A.jpg	
6.60		WL	Water level, 10% of the vertical dimension	00:00:28		
6.60	F02	FL	Fracture, longitudinal at 3 o'clock, finish: wanders	00:00:28		3 / 2
7.70		JN	Junction at 3 o'clock, 100mm dia	00:00:31		
8.10	S03	CUW	Loss of vision, camera under water, start	00:00:32		
9.80	F03	CUW	Loss of vision, camera under water, finish	00:00:39		
11.00	F01	DEGJ	Attached deposits, grease at joint from 4 o'clock to 8 o'clock, 5% cross-sectional area loss, finish	00:00:46		3
11.20		LR	Line deviates right	00:00:44		
12.00		OCF	Finish node, other special chamber, reference: Line A: SVP	00:00:47		

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**
2	40.0	16.8	201.0	3.0	2	4.0	4.1	49.0	4.0

First Local Services
24/7 DRAINAGE EXPERTS

First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Pictures - 24/07/2025 - Line AX

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
17	Upstream	LINE AX		



23_MH14_Line A.jpg, 00:00:03, 0.00 m
Attached deposits, grease at joint from 4 o'clock to 8 o'clock, 5% cross-sectional area loss, start



24_MH14_Line A.jpg, 00:00:15, 0.00 m
Open joint, medium



25_MH14_Line A.jpg, 00:00:18, 2.00 m
Fracture, longitudinal at 3 o'clock, start, wanders

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First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Inspection - 24/07/2025 - MH14X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
18	1	24/07/25	10:59	Not Specified	No Rain Or Snow	Not Specified	MH14X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Blake	Not Specified	Not Specified	Not Specified	Not Specified	Not Specified

Town or Village:	Horsham	**Inspection Direction:**	Downstream	**Upstream Node:**	MH14
Road:	23 Kings Road	**Inspected Length:**	8.80 m	**Upstream Pipe Depth:**	1.000 m
Location:	Property or buildings	**Total Length:**	8.80 m	**Downstream Node:**	MH15
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Foul	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	150 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Sample condition survey	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:77



Position [m]		Code	Observation	MPEG	Photo	Grade
Depth: 1.00 m						
MH14						
0.00		MH	Start node, manhole, reference: MH14	00:00:00		
0.00		WL	Water level, 10% of the vertical dimension	00:00:02		
0.50	S01	DEGJ	Attached deposits, grease at joint from 4 o'clock to 8 o'clock, 10% cross-sectional area loss, start	00:00:11	26_MH14_ MH15.jpg	
5.90		JDM	Joint displaced, medium	00:00:27	27_MH14_ MH15.jpg	1 / 3
8.70	F01	DEGJ	Attached deposits, grease at joint from 4 o'clock to 8 o'clock, 10% cross-sectional area loss, finish	00:00:38		3
8.80		MHF	Finish node, manhole, reference: MH15	00:00:38		
MH15						
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**
1	1.0	0.1	1.0	1.0	2	4.0	4.3	38.0	4.0

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24/7 DRAINAGE EXPERTS

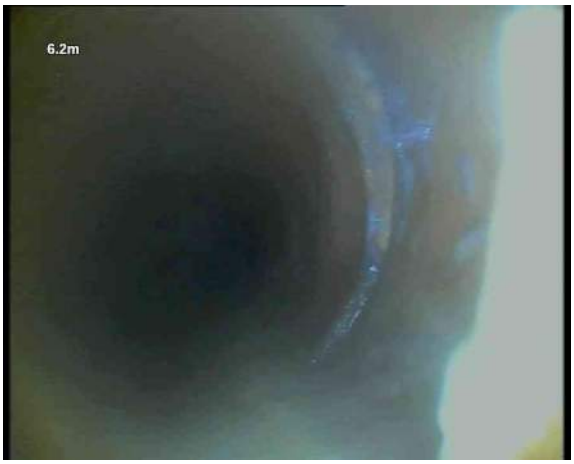
First Local Services Ltd
Unit 4A, GP Centre, Yeoman Road, Ringwood
Tel. 0800 6696492
chris@firstlocalservices.co.uk

Section Pictures - 24/07/2025 - MH14X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
18	Downstream	MH14X		



26_MH14_MH15.jpg, 00:00:11, 0.50 m
Attached deposits, grease at joint from 4 o'clock to 8 o'clock, 10% cross-sectional area loss, start



27_MH14_MH15.jpg, 00:00:27, 5.90 m
Joint displaced, medium

First Local Services
24/7 DRAINAGE EXPERTS

Appendix A – Remedial Quotation

33397_CCTV

First Local Services
Unit 4, GP Centre, Yeomans Road, Ringwood, BH24 3FF
Tel: 0800 6696492
ross@firstlocalservices.co.uk

Project Works Report

Project Name	Project Number	Project Date
Rosedale & Kings Court Care Home, Horsham, RH13 5PP	33397	11/07/2025

Our engineers attended the above property / site to carry out a CCTV Inspection to determine the condition of the pipework and our remedial quotation is priced in accordance with the full schedule of works being undertaken.

Our condition report has identified the following defects within the pipework, and these are summarised as follows:

Section 2. MH1 – IC1	**Depth = 0.80m (100mm)**
Defects:	Foul waste noted from 2.0m to 4.3m.
Recommendation:	HPW Jetting required to remove deposits.
Cost to repair – HPWJ / Fixer 10 / Root-cutting:	**£1,650.00 + VAT (Combined Day Rate)**
Section 5. MH3 – MH4	**Depth = Unknown (150mm)**
Defects:	Displaced joints were identified throughout the pipe. We encountered soap suds and a temporary loss of vision from 13.9m to 15.0m.
Recommendation:	HPW Jetting required to remove soap suds, check pipe and install 150mm CIPP Flexi Liner from 2.8m to 27.5m to cover the above noted displacements. Liner to be installed from MH4 and lateral cutting required to re-open junctions at 9.5m & 20.9m.
Cost to repair – HPWJ / Fixer 10 / Root-cutting:	**Included Above**
Cost to repair – Patching / Lining:	**£4,550.00 + VAT**
Cost to repair – Lateral Cutting:	**£750.00 + VAT**
Section 6. MH5 – Line A	**Depth = 0.80m (150mm)**
Defects:	Foul waste noted at 3.8m, resulting in abandonment of survey.
Recommendation:	HPW Jetting required to remove deposits and allow for completion of the survey.
Cost to repair – HPWJ & Fixer 10:	**Included Above**
Section 8. MH6 – MH10	**Depth = Unknown (150mm)**
Defects:	Fine roots were noted at 0.1m.
Recommendation:	Root-cutting / Fixer 10 (Milling Machine) required to remove roots & manually from chamber and install 150mm CIPP Liner (5m) downstream from MH6 to prevent further root intrusion.
Cost to repair – HPWJ / Fixer 10 / Root-cutting:	**Included Above**
Cost to repair – Patching / Lining:	**£850.00 + VAT**
Section 9. MH10 – MH11	**Depth = 2.00m (150mm)**
Defects:	Grease deposits noted throughout the pipe with fine root intrusion evident at 5.9m. We have identified a displaced joint at 3.0m and a fracture from 5.9m to 7.1m.
Recommendation:	Root-cutting & Fixer 10 (Milling Machine) to remove deposits and roots before installing a 150mm CIPP Liner from MH to MH (12.9m) to cover the above noted defects and prevent further root intrusion.
Cost to repair – HPWJ / Fixer 10 / Root-cutting:	**Included Above**
Cost to repair – Patching / Lining:	**£2,150.00 + VAT**

Section 10. MH11 – Line X	**Depth = 2.00m (150mm)**
Defects:	Displaced joints identified from 0.5m to 4.5m, with grease deposits, root intrusion and high water levels encountered, resulting in abandonment of the survey at 18.0m.
Recommendation:	Root-cutting & Fixer 10 (Milling Machine) to remove deposits and roots before installing a 150mm CIPP Liner (5m) downstream to the boundary. Please note the pipe is underwater from 4.5m to 18.0m, suggesting the pipe is blocked in the main sewer (off boundary). Clearance of this pipe would be the responsibility of the local water authority.
Cost to repair – HPWJ / Fixer 10 / Root-cutting:	**Included Above**
Cost to repair – Patching / Lining:	**£850.00 + VAT**
Section 11. MH8 – MH7	**Depth = 0.80m (150mm)**
Defects:	Open joint identified at 6.1m.
Recommendation:	Install 150mm CIPP Liner to cover the defective joint.
Cost to repair – Patching / Lining:	**£1,150.00 + VAT**
Section 13. MH9 – MH12	**Depth = Unknown (150mm)**
Defects:	A displaced joint was identified at 3.4m with heavy silt deposits noted from 6.0m to 19.2m, resulting in abandonment of the survey (overlapped on Section 14).
Recommendation:	Please see below section (overlapped).
Cost to repair:	**See Below (Overlapped)**
Section 14. MH12 – MH9	**Depth = Unknown (150mm)**
Defects:	Mass root intrusion and silt deposits were identified from 6.4m to 7.5m, resulting in abandonment of the survey.
Recommendation:	Root-cutting & Fixer 10 (Milling Machine) to remove deposits and roots before re-surveying to determine best method of repair.
Cost to repair – HPWJ / Fixer 10 / Root-cutting:	**Included Above**
Section 16. MH13 – CP1	**Depth = Unknown (150mm)**
Defects:	Silt deposits identified from 1.6m to 3.0m.
Recommendation:	HPW Jetting required to remove deposits.
Cost to repair – HPWJ / Fixer 10 / Root-cutting:	**Included Above**
Section 17. MH14 – Line A	**Depth = 1.00m (100mm)**
Defects:	Grease deposits and high water levels noted throughout with an open joint identified at 0.0m and a fracture visible from 2.0m to 6.6m.
Recommendation:	HPWJ & Fixer 10 (Milling Machine) to remove deposits and before re-surveying to determine best method of repair.
Cost to repair – HPWJ / Fixer 10 / Root-cutting:	**Included Above**
Section 18. MH14 – MH15	**Depth = 1.00m (150mm)**
Defects:	Grease deposits identified from 0.5m to 8.7m with a displaced joint noted at 5.9m.
Recommendation:	HPW Jetting & Fixer 10 (Milling Machine) to remove deposits and install a 150mm CIPP Liner to cover the displacement.
Cost to repair – HPWJ / Fixer 10 / Root-cutting:	**Included Above**
Cost to repair – Patching / Lining:	**£1,250.00 + VAT**
	Total Cost: £13,200.00 + VAT

First Local Services
24/7 DRAINAGE EXPERTS

Appendix B – Annotated Site Plan

33397_CCTV

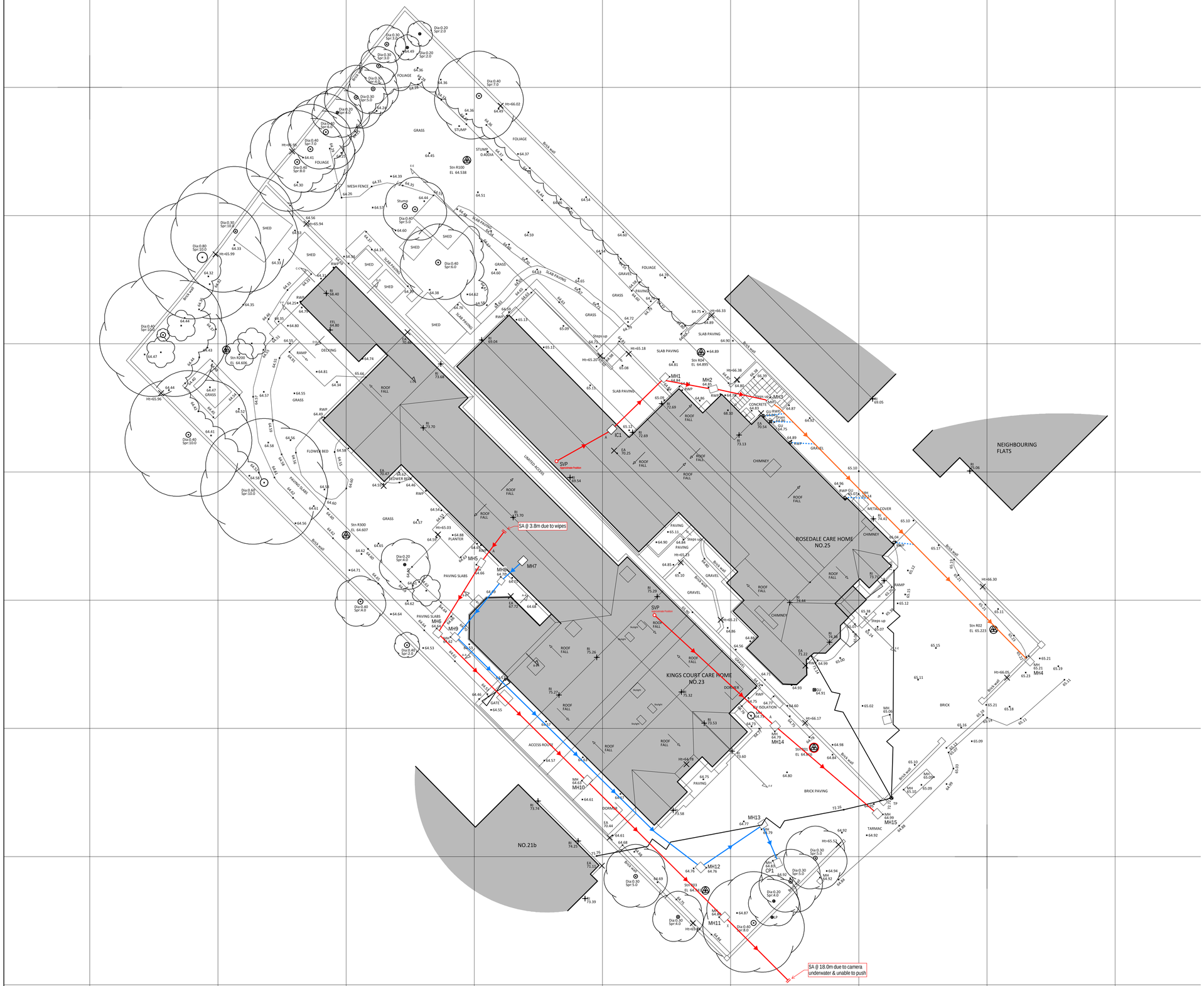
ArcEngineers
Consulting Civil & Structural Engineering

APPENDIX C

TOPOGRAPHICAL SURVEY

The Institution of Structural Engineers

3 CADMAN COURT
MORLEY
LEEDS
LS27 0RX
T: 0113 253 3904
W:www.arc-engineers.co.uk



TOPOGRAPHICAL SURVEY

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LEGEND

BANKING (Top / Bottom)
BUSHES & HEDGES
MARSH
TREES — 3T / 0.2 / 6 (No of Trunks / Dia of Base / Height of Tree)
NOTE:- SPREADS AND HEIGHTS ARE INDICATIVE ONLY
GATES (Single / Double)
RETAINING WALL (RTW)
SLOPING MASONRY
FENCE
WALL (Width drawn to scale)
BUILDING - SURVEYED
BUILDING - SURVEYED BASIC DATA ONLY
OPEN SIDED BUILDING
GLASS ROOFED
CONTOURS
OVERHEAD WIRES

ABBREVIATIONS (WHERE APPLICABLE)

AIR VALVE	AV	MANHOLE	MH
BED LEVEL	BL	MARKER	MKR
BELISHA BEACON	BB	NOTICE BOARD	NB
BOLLARD	B	NAME PLATE	NP
BRITISH TELECOM BOX	BTB	OVERHEAD WIRES	OHW
BRITISH TELECOM MANHOLE	BTMH	PARKING METER	PM
BRICKWORK	BKWK	RIDGE LEVEL	RID
BUS STOP	BS	ROAD SIGN	RS
CABLE TV	CATV	RETAINING WALL BOTTOM	RWB
COVER LEVEL	CL	RETAINING WALL TOP	RWT
CABLE MARKER	CM	STOP VALVE	SV
CONCRETE POST	CP	STOP COCK	SC
DOWN PIPE	DP	SOFFIT LEVEL	SOF
DROP KERB	DK	SPOT LEVEL	SL
EAVES LEVEL	EA	STRUCTURAL SLAB LEVEL	SSL
ELECTRICITY CABLE PIT	ELCP	STATION	STN
ELECTRICITY CONTROL BOX	ECB	TREE STUMP	ST
ELECTRICITY POLE	EP	TELEGRAPH POLE	TP
EARTH ROD	ER	TELEPHONE CALL BOX	TCB
FIRE HYDRANT	FH	TOP OF KERB	TK
FLOWER BED	FB	THRESHOLD LEVEL	TL
FOOTPATH	FP	TRAFFIC LIGHT	TL
FLOOR LEVEL	FL	TOP OF WALL	TW
FLAG STAFF	FS	UNDERGROUND	UG
GAS VALVE	GV	UNABLE TO LIFT	UTL
GATE STOP	GS	UNABLE TO SURVEY	UTS
GULLY	G	VENT PIPE	VP
GULLY OUTLET	GO	WATER LEVEL	WL
INSPECTION COVER	IC	WATER METER	WM
INVERT LEVEL	IL	WASH OUT	WO
LAMP POST	LP	WASTE PIPE	WP
LETTER BOX	LB	WATER VALVE	WV

BUILDING

ACCESS HATCH	AH	WINDOW CILL LEVEL	WCL
ARCH HEAD HEIGHT	AHH	WINDOW HEAD LEVEL	WHL
ARCH HEAD LEVEL	AHL	SKYLIGHT	SL
ARCH SPRINGER HEIGHT	ASH	SOIL AND VENT PIPE	SVP
ARCH SPRINGER LEVEL	ASL	THRESHOLD LEVEL	THL
BEAM	BE	WASH BASIN	WB
BEAM HEIGHT	BH	WATER TANK	WT
BEAM HEAD LEVEL	BHL		
BEAM SOFFIT LEVEL	BSL		
COLUMN	Col		
CILL TO HEAD	C-H		
CEILING LEVEL	CL		
DOOR HEAD	DH		
DOOR HEAD LEVEL	DHL		
FIRE ALARM	FA		
FLOOR TO CILL	F-C		
FALSE CEILING	FC		
FLOOR TO CEILING HEIGHT	2.34		
FINISHED FLOOR LEVEL	FFL		
HOSE REEL	HR		
ROOF LEVEL	RL		
RADIATOR	Rad		
RAIN WATER PIPE	RWP		

FENCES

BARBED WIRE FENCE	BWF
CORRUGATED IRON FENCE	CIF
CLOSE BOARD FENCE	CBF
CHAIN LINK FENCE	CLF
CHESTNUT PALING FENCE	CPF
FENCE POST	FPO
INTERWOVEN FENCE	IWF
IRON RAILING FENCE	IRF
LARCH LAP FENCE	LLF
MISCELLANEOUS FENCING	Misc.F
PALISADE FENCE	PF
POST AND CHAIN FENCE	PCF
POST AND RAIL FENCE	PRF
POST AND WIRE	PWF
TUBULAR STEEL RAIL	TSRF
WIRE MESH FENCE	WMF

(Concrete Post/Steel Post/Timber Post)(C/P/S/P/TP)

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NOTES

1. The Survey Grid is on Ordnance Survey Level & Grid.
2. Fences shown are not necessarily legal boundaries.
3. Dimensions should not be scaled. All dimensions should be checked on site before any fabrication / construction.
4. All drainage connections shown are sounded only. They have not been water tested.
5. Copyright of all data produced by ARCHIDATA shall remain with ARCHIDATA unless otherwise specifically agreed.
6. Information provided should not be altered or modified in any way. It should not be used for any purpose other than for which it was intended and should not be issued to other parties without prior agreement of ARCHIDATA.
7. ARCHIDATA cannot accept responsibility for any damage to computer systems which may result from viruses which may be contained in the data provided.
8. Preliminary data is generally unchecked therefore it is not guaranteed.
9. If the AutoCAD drawing is being read by any system other than AutoCAD it should be checked against a hard copy. ARCHIDATA cannot accept liability for omissions.
10. The tree species have been identified to the best of the surveyors knowledge. They have not been verified by an Arboriculturist and are not guaranteed. If they are important they should be verified. Tree heights are estimated, Trees have been shown diagrammatically (i.e. circular), however, their true shape in plan will be different.
11. Some CAD layers exists with additional information which are turned off.
12. This survey has been carried out to an accuracy consistent scale of 1:150; therefore interrogated dimensions will be within the tolerance associated with this scale. The same accuracies implied by the plottingscale are equally applicable to digital data supplied for CAD. The scale of this drawing should not be changed without permission.

Note:
Survey is related to OS grid and datum about survey control point RO1 (Elevation 64.816) shown ringed in red.

REV	DATE	BY	AMENDMENT

DRAINAGE ANNOTATIONS ADDED BY

First Local Services
24/7 DRAINAGE EXPERTS

FOLLOWING CCTV INSPECTION (July 2025)

KEY

- Surface Water Drainage
- Foul Water Drainage
- Combined Drainage
- FW Gully
- SW Gully
- SVP (FW Stack)
- RWP (SW Downpipe)
- Survey Abandoned

SURVEY

archidata
specialist land and building surveyors
THE DESIGN STUDIO
94 HIGH STREET, STEYNING
WEST SUSSEX BN44 3RD
TEL: (01903) 863225
MOB: (07762) 146343
info@archidata.co.uk
www.archidata.co.uk

CLIENT
Cityzen Design

JOB TITLE
Kings Court & Rosedale Care Homes
Kings Road,
Horsham,
RH13 5PP

DRAWING TITLE
Topographical Survey

DATE	SCALE-A1 SHEET	DRAWN BY	CHECKED
31.01.2024	1:150	RO	RM

JOB NO.	DRAWING NO.	REVISION
AD24013	1.01	

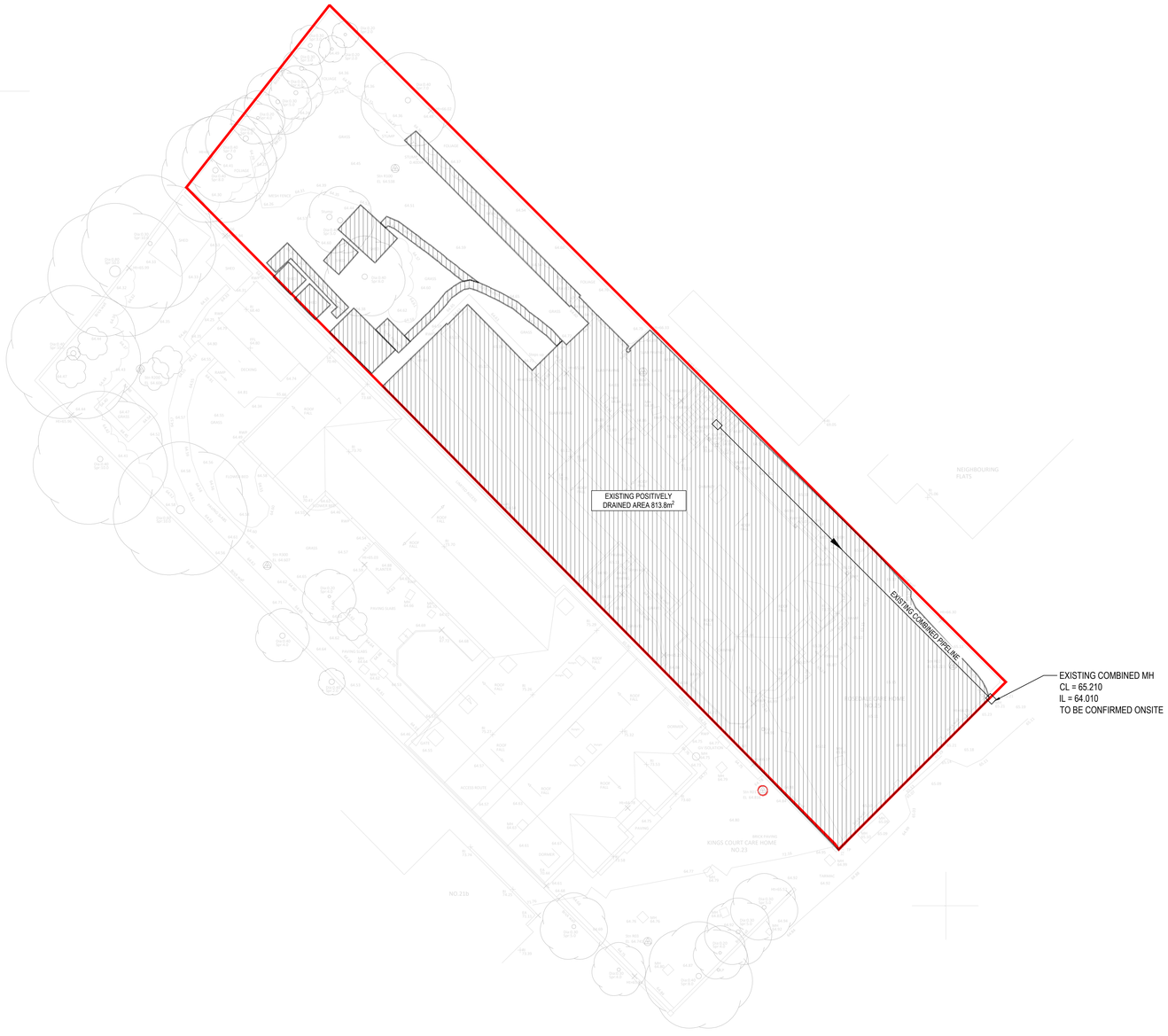
ArcEngineers
Consulting Civil & Structural Engineering

APPENDIX D

EXISTING AREAS AND FLOW RATES

The Institution of Structural Engineers

3 CADMAN COURT
MORLEY
LEEDS
LS27 0RX
T: 0113 253 3904
W:www.arc-engineers.co.uk



DO NOT SCALE

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2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS AND ARCHITECTS DRAWINGS,
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5. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE BUILDING IS FULLY COMPLETE. IT IS THE CONTRACTORS SOLE RESPONSIBILITY TO DETERMINE THE ERECTION PROCEDURE AND SEQUENCE AND ENSURE THAT THE BUILDING AND ITS COMPONENTS ARE SAFE DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE-DOWNS WHICH MAY BE NECESSARY, SUCH MATERIAL REMAINING THE PROPERTY OF THE CONTRACTOR UPON COMPLETION.
6. ALL WORK TO COMPLY TO CURRENT BUILDING REGULATIONS AND TO BE IN ACCORDANCE WITH THE RELEVANT BRITISH STANDARDS AND APPROPRIATE CODES OF PRACTICE.
7. FOR FURTHER NOTES REFER TO PROJECT SPECIFICATIONS.

SAFETY, HEALTH & ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following risks and information.	
Risks listed here are not exhaustive. Refer to Risk Assessment Register: 24074	
Construction:	
⚠	ADD PROJECT NOTES HERE
Demolition No Unusual hazards/risks	
For information relating to Use, Cleaning and Maintenance see Health & Safety File	
It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement	
●	INDICATES A RESIDUAL RISK REQUIRING A COMPULSORY ACTION
ⓘ	INDICATES A RESIDUAL RISK FOR INFORMATION
⊘	INDICATES A RESIDUAL RISK REQUIRING PROHIBITIVE ACTION
⚠	INDICATES A RESIDUAL RISK AS A WARNING

REV	DETAIL	BY	CHK	APP	DATE
P01	INITIAL ISSUE	DT	RP	MG	29.08.2025

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Phone: 0113 253 3904
www.arc-engineers.co.uk

CLIENT:
ROSEDALE CARE LTD

PROJECT:
No. 25 ROSEDALE CARE HOME
KINGS ROAD, HORSHAM
RH13 5PP

TITLE:
DRAINAGE
EXISTING IMPERMEABLE AREAS

DRAWING STATUS:
PRELIMINARY

DRAWN:	DATE:	CHECKED:	DATE:	APPROVED:	DATE:
DT	AUG 25	RP	AUG 25	MG	AUG 25

CONTRACT No.: 25021
SCALE @ A1: 1:200

PROJECT No. | ORIGINATOR | ZONE | LEVEL | TYPE | DISCIPLINE | NUMBER | REVISION
25021 - ARC - XX - XX - DR - C - 5001 - P01

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Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

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

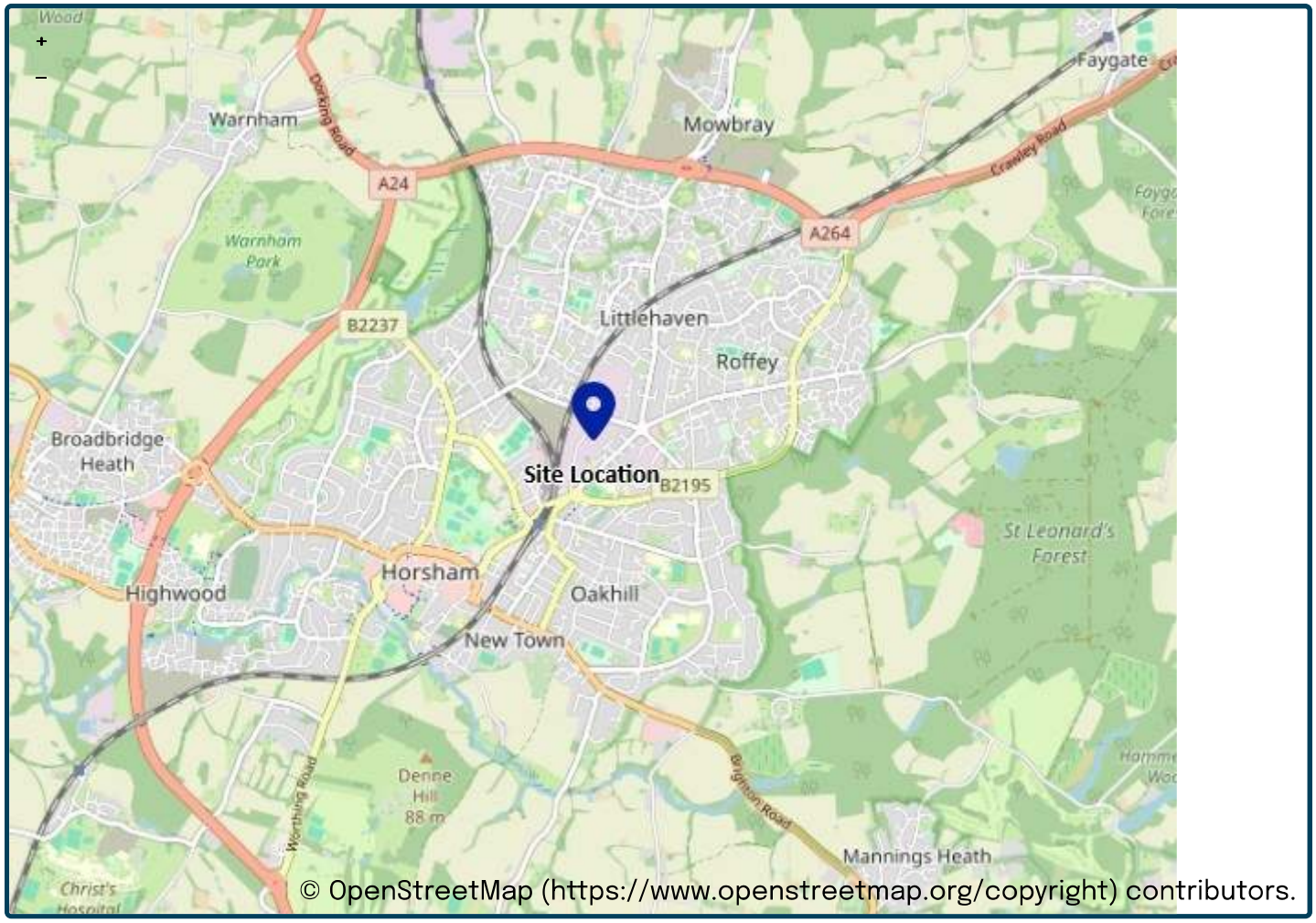
Project details

Date	22/07/2025
Calculated by	Dorothea Tomeli
Reference	25021 Rosedale Care Home
Model version	2.0.1

Location

Site name: No. 25 Rosedale Care Home

Site location: Kings Road, Horsham



Site easting: 518261

Site northing: 131377

Site details

Total site area (ha) 0.12 ha

Greenfield runoff

Method

Method	IH124

IH124

	My value		Map value
SAAR (mm)	799 mm		799
How should SPR be derived?	WRAP soil type		
WRAP soil type	4		4
SPR	0.47		
QBar (IH124) (l/s)	0.68 l/s		

Growth curve factors

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

Results

Method	IH124	
Flow rate 1 year (l/s)	0.57	l/s
Flow rate 2 year (l/s)	0.6	l/s
Flow rate 10 years (l/s)	1.1	l/s
Flow rate 30 years (l/s)	1.6	l/s
Flow rate 100 years (l/s)	2.2	l/s
Flow rate 200 years (l/s)	2.5	l/s

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.0.1) developed by HR Wallingford and available at uksuds.com (https://www.uksuds.com/). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (https://www.uksuds.com/terms-conditions). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

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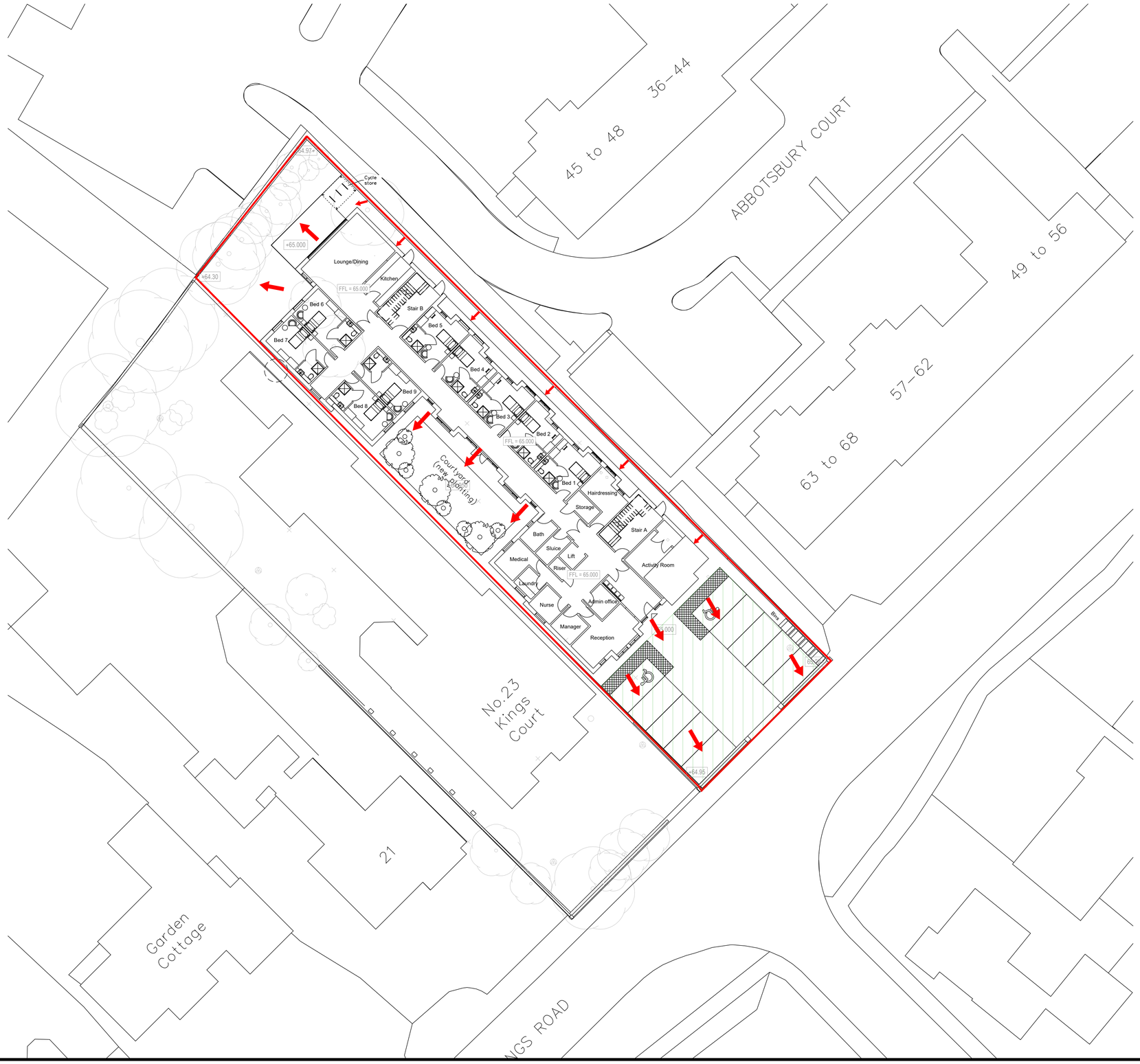
APPENDIX E
EXCEEDENCE FLOW ROUTES

The Institution of Structural Engineers

3 CADMAN COURT
MORLEY
LEEDS
LS27 0RX
T: 0113 253 3904
W:www.arc-engineers.co.uk



DRAINAGE EXCEEDANCE KEY:

PERMEABLE PAVING AREA
OPEN GRADED CRUSHED ROCK SUB-BASE. MIN 30% VOIDS (NON-SOAKAWAY)

EXCEEDENCE FLOW

SITE BOUNDARY

DO NOT SCALE

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7. FOR FURTHER NOTES REFER TO PROJECT SPECIFICATIONS.

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In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following risks and information.
Risks listed here are not exhaustive. Refer to Risk Assessment Register: 24074
Construction:
⚠ ADD PROJECT NOTES HERE
Demolition No Unusual hazards/risks
For information relating to Use, Cleaning and Maintenance see Health & Safety File
It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

●	INDICATES A RESIDUAL RISK REQUIRING A COMPULSORY ACTION
ⓘ	INDICATES A RESIDUAL RISK FOR INFORMATION
⊘	INDICATES A RESIDUAL RISK REQUIRING PROHIBITIVE ACTION
⚠	INDICATES A RESIDUAL RISK AS A WARNING

REV	DETAIL	BY	CHK	APP	DATE
P01	INITIAL ISSUE	DT	RP	MG	29.08.2025

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CLIENT:
ROSEDALE CARE LTD

PROJECT:
No. 25 ROSEDALE CARE HOME
KINGS ROAD, HORSHAM
RH13 5PP

TITLE:
DRAINAGE
FLOOD EXCEEDENCE ROUTE

DRAWING STATUS:
PRELIMINARY

DRAWN:	DATE:	CHECKED:	DATE:	APPROVED:	DATE:
DT	AUG 25	RP	AUG 25	MG	AUG 25

CONTRACT No.: 25021
SCALE @ A1: 1:200

PROJECT No.	ORIGINATOR	ZONE	LEVEL	TYPE	DISCIPLINE	NUMBER	REVISION
25021	ARC	XX	XX	DR	C	5005	P01

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APPENDIX F

PROPOSED DRAINAGE CALCULATIONS

The Institution of Structural Engineers

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W:www.arc-engineers.co.uk

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
SWRE1	0.010	5.00	64.250	Junction			518241.000	131405.260	0.700
SWMH1			64.400	Manhole	Adoptable	450	518247.804	131412.061	1.012
SWMH8	0.003	5.00	65.175	Manhole	Adoptable	450	518289.020	131370.831	2.737
Rain Garden 1	0.003	5.00	64.750	Junction			518264.960	131392.983	0.513
SWMH9			65.162	Manhole	Adoptable	1200	518287.179	131368.990	2.739
SWMH10			65.175	Junction			518286.185	131367.997	2.760
SWMH4	0.010	5.00	64.750	Manhole	Adoptable	450	518265.099	131394.760	1.902
SWMH11	0.028	5.00	65.175	Junction			518284.831	131363.694	3.335
SWMH12			65.120	Manhole	Adoptable	1200	518286.531	131361.993	3.294
EXSWMH 2351			65.120	Manhole	Adoptable	1200	518286.698	131344.586	3.408
SWMH7			64.760	Manhole	Adoptable	450	518270.908	131388.949	1.993
SWMH2	0.017	5.00	65.240	Manhole	Adoptable	450	518251.725	131385.811	0.700
SWMH3	0.003	5.00	65.200	Manhole	Adoptable	450	518254.813	131383.314	0.727
SWMH6	0.017	5.00	65.240	Manhole	Adoptable	450	518260.219	131377.906	0.774
SWMH5	0.002	5.00	65.200	Manhole	Adoptable	450	518259.063	131379.537	0.700
Rain Garden 2	0.003	5.00	64.760	Junction			518270.129	131387.812	0.538

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Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	SWRE1	SWMH1	9.620	0.600	63.550	63.388	0.162	59.4	100	5.16	50.0
1.001	SWMH1	SWMH4	24.463	0.600	63.388	62.898	0.490	49.9	100	5.53	50.0
2.000	SWMH2	SWMH3	3.971	0.600	64.540	64.473	0.067	59.3	100	5.07	50.0
2.001	SWMH3	Rain Garden 1	14.016	0.600	64.473	64.237	0.236	59.4	100	5.30	50.0
1.004	SWMH8	SWMH9	2.604	0.600	62.438	62.423	0.015	169.0	225	6.14	50.0
1.005	SWMH9	SWMH10	1.405	0.600	62.423	62.415	0.008	169.0	225	6.16	50.0
1.006	SWMH10	SWMH11	4.511	0.600	62.415	61.840	0.575	7.8	225	6.18	50.0
1.007	SWMH11	SWMH12	2.405	0.600	61.840	61.826	0.014	169.0	225	6.22	50.0
1.008	SWMH12	EXSWMH 2351	17.408	0.600	61.826	61.712	0.114	152.7	225	6.49	50.0
2.002	Rain Garden 1	SWMH4	1.782	0.600	64.237	64.207	0.030	59.4	100	5.33	50.0
1.002	SWMH4	SWMH7	8.217	0.600	62.848	62.767	0.081	100.9	150	5.67	50.0
3.000	SWMH5	SWMH6	1.999	0.600	64.500	64.466	0.034	58.8	100	5.03	50.0
3.001	SWMH6	Rain Garden 2	14.012	0.600	64.466	64.222	0.244	57.4	100	5.26	50.0
3.002	Rain Garden 2	SWMH7	1.378	0.600	64.222	64.003	0.219	6.3	100	5.27	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.001	7.9	2.6	0.600	0.912	0.010	0.0	39	0.897
1.001	1.093	8.6	2.6	0.912	1.752	0.010	0.0	38	0.960
2.000	1.002	7.9	4.5	0.600	0.627	0.017	0.0	54	1.030
2.001	1.001	7.9	5.2	0.627	0.413	0.020	0.0	60	1.072
1.004	1.003	39.9	17.8	2.512	2.514	0.068	0.0	105	0.974
1.005	1.003	39.9	17.8	2.514	2.535	0.068	0.0	105	0.974
1.006	4.700	186.9	17.8	2.535	3.110	0.068	0.0	47	3.006
1.007	1.003	39.9	25.2	3.110	3.069	0.096	0.0	130	1.058
1.008	1.055	42.0	25.2	3.069	3.183	0.096	0.0	125	1.100
2.002	1.001	7.9	6.0	0.413	0.443	0.023	0.0	66	1.104
1.002	1.000	17.7	11.3	1.752	1.843	0.043	0.0	87	1.059
3.000	1.006	7.9	0.5	0.600	0.674	0.002	0.0	18	0.567
3.001	1.018	8.0	5.0	0.674	0.438	0.019	0.0	57	1.075
3.002	3.102	24.4	5.8	0.438	0.657	0.022	0.0	33	2.546

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Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.003	SWMH7	SWMH8	25.618	0.600	62.767	62.513	0.254	100.9	150	6.10	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.003	1.000	17.7	17.0	1.843	2.512	0.065	0.0	119	1.136

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	9.620	59.4	100	Circular	64.250	63.550	0.600	64.400	63.388	0.912
1.001	24.463	49.9	100	Circular	64.400	63.388	0.912	64.750	62.898	1.752
2.000	3.971	59.3	100	Circular	65.240	64.540	0.600	65.200	64.473	0.627
2.001	14.016	59.4	100	Circular	65.200	64.473	0.627	64.750	64.237	0.413
1.004	2.604	169.0	225	Circular	65.175	62.438	2.512	65.162	62.423	2.514
1.005	1.405	169.0	225	Circular	65.162	62.423	2.514	65.175	62.415	2.535
1.006	4.511	7.8	225	Circular	65.175	62.415	2.535	65.175	61.840	3.110
1.007	2.405	169.0	225	Circular	65.175	61.840	3.110	65.120	61.826	3.069
1.008	17.408	152.7	225	Circular	65.120	61.826	3.069	65.120	61.712	3.183

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	SWRE1		Junction		SWMH1	450	Manhole	Adoptable
1.001	SWMH1	450	Manhole	Adoptable	SWMH4	450	Manhole	Adoptable
2.000	SWMH2	450	Manhole	Adoptable	SWMH3	450	Manhole	Adoptable
2.001	SWMH3	450	Manhole	Adoptable	Rain Garden 1		Junction	
1.004	SWMH8	450	Manhole	Adoptable	SWMH9	1200	Manhole	Adoptable
1.005	SWMH9	1200	Manhole	Adoptable	SWMH10		Junction	
1.006	SWMH10		Junction		SWMH11		Junction	
1.007	SWMH11		Junction		SWMH12	1200	Manhole	Adoptable
1.008	SWMH12	1200	Manhole	Adoptable	EXSWMH 2351	1200	Manhole	Adoptable

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Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
2.002	1.782	59.4	100	Circular	64.750	64.237	0.413	64.750	64.207	0.443
1.002	8.217	100.9	150	Circular	64.750	62.848	1.752	64.760	62.767	1.843
3.000	1.999	58.8	100	Circular	65.200	64.500	0.600	65.240	64.466	0.674
3.001	14.012	57.4	100	Circular	65.240	64.466	0.674	64.760	64.222	0.438
3.002	1.378	6.3	100	Circular	64.760	64.222	0.438	64.760	64.003	0.657
1.003	25.618	100.9	150	Circular	64.760	62.767	1.843	65.175	62.513	2.512

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
2.002	Rain Garden 1		Junction		SWMH4	450	Manhole	Adoptable
1.002	SWMH4	450	Manhole	Adoptable	SWMH7	450	Manhole	Adoptable
3.000	SWMH5	450	Manhole	Adoptable	SWMH6	450	Manhole	Adoptable
3.001	SWMH6	450	Manhole	Adoptable	Rain Garden 2		Junction	
3.002	Rain Garden 2		Junction		SWMH7	450	Manhole	Adoptable
1.003	SWMH7	450	Manhole	Adoptable	SWMH8	450	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
SWRE1	518241.000	131405.260	64.250	0.700		Junction		 0	1.000	63.550	100	Circular
SWMH1	518247.804	131412.061	64.400	1.012	450	Manhole	Adoptable	1	1.000	63.388	100	Circular
								 0	1.001	63.388	100	Circular
SWMH8	518289.020	131370.831	65.175	2.737	450	Manhole	Adoptable	1	1.003	62.513	150	Circular
								 0	1.004	62.438	225	Circular

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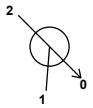
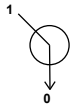
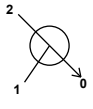
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
Rain Garden 1	518264.960	131392.983	64.750	0.513		Junction		 1	2.001	64.237	100	Circular
								0	2.002	64.237	100	Circular
SWMH9	518287.179	131368.990	65.162	2.739	1200	Manhole	Adoptable	 1	1.004	62.423	225	Circular
								0	1.005	62.423	225	Circular
SWMH10	518286.185	131367.997	65.175	2.760		Junction		 1	1.005	62.415	225	Circular
								0	1.006	62.415	225	Circular
SWMH4	518265.099	131394.760	64.750	1.902	450	Manhole	Adoptable	 1	2.002	64.207	100	Circular
								2	1.001	62.898	100	Circular
								0	1.002	62.848	150	Circular
SWMH11	518284.831	131363.694	65.175	3.335		Junction		 1	1.006	61.840	225	Circular
								0	1.007	61.840	225	Circular
SWMH12	518286.531	131361.993	65.120	3.294	1200	Manhole	Adoptable	 1	1.007	61.826	225	Circular
								0	1.008	61.826	225	Circular
EXSWMH 2351	518286.698	131344.586	65.120	3.408	1200	Manhole	Adoptable	 1	1.008	61.712	225	Circular
SWMH7	518270.908	131388.949	64.760	1.993	450	Manhole	Adoptable	 1	3.002	64.003	100	Circular
								2	1.002	62.767	150	Circular
								0	1.003	62.767	150	Circular

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
SWMH2	518251.725	131385.811	65.240	0.700	450	Manhole	Adoptable	 0				
									0	2.000	64.540	100	Circular
SWMH3	518254.813	131383.314	65.200	0.727	450	Manhole	Adoptable	 1				
									1	2.000	64.473	100	Circular
									0	2.001	64.473	100	Circular
SWMH6	518260.219	131377.906	65.240	0.774	450	Manhole	Adoptable	 1				
									1	3.000	64.466	100	Circular
									0	3.001	64.466	100	Circular
SWMH5	518259.063	131379.537	65.200	0.700	450	Manhole	Adoptable	 0				
									0	3.000	64.500	100	Circular
Rain Garden 2	518270.129	131387.812	64.760	0.538		Junction		 1				
									0	3.002	64.222	100	Circular

Simulation Settings

Rainfall Methodology	FEH-22	Winter CV	0.840	Drain Down Time (mins)	1440	Check Discharge Rate(s)	x
Rainfall Events	Singular	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0	Check Discharge Volume	x
Summer CV	0.750	Skip Steady State	x	Starting Level (m)			

Storm Durations

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

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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	35	0	0
100	40	0	0

Node SWMH12 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	61.826	Product Number	CTL-SHE-0026-5000-2424-5000
Design Depth (m)	2.424	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	0.5	Min Node Diameter (mm)	1200

Node Rain Garden 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	64.237
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	4

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	3.1	3.1	0.350	3.1	5.3	0.351	0.0	5.3

Node Rain Garden 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	64.222
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	0

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	3.1	3.1	0.350	3.1	5.3	0.351	0.0	5.3

Node SWMH11 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	61.840
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

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Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	99.0	99.0	0.800	99.0	127.2	0.801	0.0	127.2

Node SWMH11 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Width (m)	16.000	Depth (m)	0.300
Side Inf Coefficient (m/hr)	0.00000	Invert Level (m)	64.570	Length (m)	13.200	Inf Depth (m)	
Safety Factor	2.0	Time to half empty (mins)	0	Slope (1:X)	75.0		

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Results for 1 year Critical Storm Duration. Lowest mass balance: 93.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWRE1	10	63.573	0.023	0.9	0.0067	0.0000	OK
15 minute winter	SWMH1	11	63.410	0.022	0.9	0.0035	0.0000	OK
15 minute winter	SWMH8	11	62.504	0.066	6.2	0.0120	0.0000	OK
15 minute winter	Rain Garden 1	11	64.275	0.038	2.1	0.0403	0.0000	OK
15 minute winter	SWMH9	11	62.483	0.060	6.2	0.0675	0.0000	OK
15 minute winter	SWMH10	11	62.445	0.030	6.1	0.0000	0.0000	OK
15 minute winter	SWMH4	11	62.899	0.051	3.9	0.0134	0.0000	OK
360 minute winter	SWMH11	344	61.966	0.126	2.0	11.8392	0.0000	OK
360 minute winter	SWMH12	344	61.966	0.140	0.2	0.1580	0.0000	OK
180 minute winter	EXSWMH 2351	140	61.723	0.011	0.2	0.0000	0.0000	OK
15 minute winter	SWMH7	11	62.828	0.061	6.0	0.0097	0.0000	OK
15 minute winter	SWMH2	10	64.572	0.032	1.6	0.0208	0.0000	OK
15 minute winter	SWMH3	11	64.506	0.033	1.9	0.0080	0.0000	OK
15 minute winter	SWMH6	10	64.500	0.034	1.8	0.0205	0.0000	OK
15 minute summer	SWMH5	11	64.511	0.011	0.2	0.0024	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWRE1	1.000	SWMH1	0.9	0.699	0.115	0.0128	
15 minute winter	SWMH1	1.001	SWMH4	0.9	0.704	0.104	0.0309	
15 minute winter	SWMH8	1.004	SWMH9	6.2	0.678	0.154	0.0237	
15 minute winter	Rain Garden 1	2.002	SWMH4	2.2	0.816	0.275	0.0047	
15 minute winter	SWMH9	1.005	SWMH10	6.1	1.103	0.153	0.0081	
15 minute winter	SWMH10	1.006	SWMH11	6.1	2.901	0.033	0.0125	
15 minute winter	SWMH4	1.002	SWMH7	3.9	0.661	0.223	0.0493	
360 minute winter	SWMH11	1.007	SWMH12	0.2	0.098	0.006	0.0585	
360 minute winter	SWMH12	1.008	EXSWMH 2351	0.2	0.283	0.005	0.0133	14.9
15 minute winter	SWMH7	1.003	SWMH8	5.9	0.891	0.334	0.1696	
15 minute winter	SWMH2	2.000	SWMH3	1.6	0.713	0.200	0.0088	
15 minute winter	SWMH3	2.001	Rain Garden 1	1.8	0.744	0.235	0.0352	
15 minute winter	SWMH6	3.001	Rain Garden 2	1.8	1.000	0.220	0.0249	
15 minute summer	SWMH5	3.000	SWMH6	0.2	0.157	0.025	0.0027	

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Results for 1 year Critical Storm Duration. Lowest mass balance: 93.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Rain Garden 2	11	64.243	0.021	2.1	0.0218	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	Rain Garden 2	3.002	SWMH7	2.0	1.801	0.084	0.0016	

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Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 93.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWRE1	10	63.609	0.059	4.9	0.0169	0.0000	OK
15 minute winter	SWMH1	12	63.450	0.062	4.8	0.0099	0.0000	OK
15 minute winter	SWMH8	12	62.597	0.159	27.0	0.0287	0.0000	OK
15 minute winter	Rain Garden 1	12	64.371	0.134	9.7	0.1402	0.0000	SURCHARGED
15 minute winter	SWMH9	12	62.558	0.135	26.9	0.1532	0.0000	OK
15 minute winter	SWMH10	12	62.472	0.057	26.9	0.0000	0.0000	OK
15 minute winter	SWMH4	12	63.360	0.512	18.7	0.1352	0.0000	SURCHARGED
960 minute winter	SWMH11	930	62.444	0.604	3.0	56.9272	0.0000	SURCHARGED
960 minute winter	SWMH12	930	62.444	0.618	0.3	0.6992	0.0000	SURCHARGED
960 minute winter	EXSWMH 2351	930	61.725	0.013	0.3	0.0000	0.0000	OK
15 minute winter	SWMH7	12	63.258	0.491	26.2	0.0780	0.0000	SURCHARGED
15 minute winter	SWMH2	11	64.759	0.219	8.3	0.1412	0.0000	SURCHARGED
15 minute winter	SWMH3	12	64.680	0.207	8.8	0.0500	0.0000	SURCHARGED
15 minute winter	SWMH6	11	64.611	0.145	8.8	0.0865	0.0000	SURCHARGED
15 minute winter	SWMH5	11	64.611	0.111	1.0	0.0240	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWRE1	1.000	SWMH1	4.8	1.071	0.616	0.0441	
15 minute winter	SWMH1	1.001	SWMH4	4.7	0.879	0.553	0.1586	
15 minute winter	SWMH8	1.004	SWMH9	26.9	0.981	0.676	0.0714	
15 minute winter	Rain Garden 1	2.002	SWMH4	9.7	1.237	1.231	0.0138	
15 minute winter	SWMH9	1.005	SWMH10	26.9	1.656	0.675	0.0231	
15 minute winter	SWMH10	1.006	SWMH11	26.9	3.434	0.144	0.0983	
15 minute winter	SWMH4	1.002	SWMH7	16.8	0.953	0.950	0.1447	
960 minute winter	SWMH11	1.007	SWMH12	0.3	0.127	0.007	0.0956	
960 minute winter	SWMH12	1.008	EXSWMH 2351	0.3	0.305	0.007	0.0157	33.5
15 minute winter	SWMH7	1.003	SWMH8	25.8	1.465	1.459	0.4443	
15 minute winter	SWMH2	2.000	SWMH3	7.4	0.960	0.939	0.0311	
15 minute winter	SWMH3	2.001	Rain Garden 1	8.4	1.077	1.071	0.1097	
15 minute winter	SWMH6	3.001	Rain Garden 2	8.2	1.350	1.026	0.0832	
15 minute winter	SWMH5	3.000	SWMH6	1.6	0.280	0.205	0.0156	

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Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 93.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Rain Garden 2	11	64.273	0.051	9.6	0.0536	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	Rain Garden 2	3.002	SWMH7	9.6	2.614	0.394	0.0051	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 93.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWRE1	13	63.767	0.217	6.4	0.0620	0.0000	SURCHARGED
15 minute winter	SWMH1	13	63.726	0.338	6.4	0.0537	0.0000	SURCHARGED
1440 minute winter	SWMH8	1110	62.638	0.200	2.1	0.0362	0.0000	OK
15 minute winter	Rain Garden 1	12	64.406	0.169	11.9	0.1774	0.0000	SURCHARGED
1440 minute winter	SWMH9	1080	62.645	0.222	2.1	0.2510	0.0000	OK
1440 minute winter	SWMH10	1170	62.628	0.213	5.3	0.0000	0.0000	OK
15 minute winter	SWMH4	13	63.625	0.777	20.9	0.2052	0.0000	SURCHARGED
1440 minute winter	SWMH11	1080	62.633	0.793	3.0	74.6985	0.0000	SURCHARGED
1440 minute winter	SWMH12	1080	62.633	0.806	0.3	0.9122	0.0000	SURCHARGED
1440 minute winter	EXSWMH 2351	1080	61.725	0.013	0.3	0.0000	0.0000	OK
15 minute winter	SWMH7	13	63.493	0.726	30.8	0.1154	0.0000	SURCHARGED
15 minute winter	SWMH2	12	64.998	0.458	10.9	0.2954	0.0000	FLOOD RISK
15 minute winter	SWMH3	12	64.874	0.401	11.0	0.0971	0.0000	SURCHARGED
15 minute winter	SWMH6	12	64.772	0.306	10.9	0.1829	0.0000	SURCHARGED
15 minute winter	SWMH5	12	64.774	0.274	1.4	0.0591	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWRE1	1.000	SWMH1	6.4	1.117	0.810	0.0753	
15 minute winter	SWMH1	1.001	SWMH4	5.7	0.859	0.664	0.1914	
1440 minute winter	SWMH8	1.004	SWMH9	2.1	0.503	0.053	0.1001	
15 minute winter	Rain Garden 1	2.002	SWMH4	11.9	1.520	1.512	0.0138	
1440 minute winter	SWMH9	1.005	SWMH10	5.3	0.826	0.134	0.0552	
1440 minute winter	SWMH10	1.006	SWMH11	2.1	1.139	0.011	0.1780	
15 minute winter	SWMH4	1.002	SWMH7	19.2	1.089	1.084	0.1447	
1440 minute winter	SWMH11	1.007	SWMH12	0.3	0.069	0.008	0.0956	
1440 minute winter	SWMH12	1.008	EXSWMH 2351	0.3	0.316	0.007	0.0170	44.4
15 minute winter	SWMH7	1.003	SWMH8	30.4	1.725	1.718	0.4464	
15 minute winter	SWMH2	2.000	SWMH3	9.2	1.182	1.175	0.0311	
15 minute winter	SWMH3	2.001	Rain Garden 1	10.4	1.324	1.317	0.1097	
15 minute winter	SWMH6	3.001	Rain Garden 2	10.1	1.434	1.263	0.0886	
15 minute winter	SWMH5	3.000	SWMH6	2.1	0.415	0.269	0.0156	

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 93.69%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	Rain Garden 2	11	64.281	0.059	11.8	0.0617	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	Rain Garden 2	3.002	SWMH7	11.7	2.717	0.482	0.0060	

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ArcEngineers
Consulting Civil & Structural Engineering

APPENDIX G

PROPOSED DRAINAGE LAYOUT

The Institution of Structural Engineers

3 CADMAN COURT
MORLEY
LEEDS
LS27 0RX
T: 0113 253 3904
W:www.arc-engineers.co.uk

DO NOT SCALE

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GENERAL NOTES

1. THESE NOTES ARE INTENDED TO AUGMENT DRAWINGS AND SPECIFICATIONS. WHERE CONFLICT OF REQUIREMENTS EXISTS THE ORDER OF PRECEDENCE SHALL BE AS SHOWN IN THE SPECIFICATIONS. OTHERWISE THE STRICTEST PROVISION SHALL GOVERN.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS AND ARCHITECTS DRAWINGS,
3. DRAWINGS NOT TO BE SCALED.
4. ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR. ANY DISCREPANCIES TO BE NOTIFIED TO THE ENGINEER/ARCHITECT AND FURTHER INSTRUCTIONS OBTAINED BEFORE WORK IS COMMENCED.
5. ALL WORK TO COMPLY TO CURRENT BUILDING REGULATIONS AND TO BE IN ACCORDANCE WITH THE RELEVANT BRITISH STANDARDS AND APPROPRIATE CODES OF PRACTICE.
6. FOR FURTHER NOTES REFER TO PROJECT SPECIFICATIONS.

- FOUL WATER RUN
- SURFACE WATER RUN
- EXISTING FOUL WATER RUN
- EXISTING SURFACE WATER RUN
- FOUL WATER MH
- SURFACE WATER MH
- HYDROBRAKE
- FG FLOOR GULLY
- SVP SOIL VENT PIPE
- SG SHOWER GULLY
- RE RODDING EYE
- RWP RAIN WATER PIPE
- RE RODDING EYE
- DIFF RWP DIFFUSER BOX
- SW CHANNEL DRAINAGE (CH)
- SW THRESHOLD DRAINAGE (TH)
- SURFACE WATER ATTENUATION TANK
- PERMEABLE HARD AREA (SUDS) NON-INFILTRATION
- PERMEABLE SOFT AREA (SUDS) NON-INFILTRATION
- PERFORATED PIPE
- SITE BOUNDARY

ⓘ DENOTES SVP CLASH WITH STRUCTURAL ITEMS. SVP LOCATION TO BE REVIEWED AND RELOCATED

SWRE1
CL: 64.250
IL: 63.550
D: 0.700

FWMH..
CL: 64.36
IL: 63.660
D: 0.700

SWMH1
CL: 64.400
IL: 63.388
D: 1.012

FWMH2
CL: 65.240
IL: 64.540
D: 0.700

SWMH2
CL: 65.240
IL: 64.540
D: 0.700

SWMH3
CL: 65.200
IL: 64.473
D: 0.727

SWMH..
CL: 65.200
IL: 64.500
D: 0.700

FWMH..
CL: 65.155
IL: .....
D: .....

SWMH..
CL: 65.240
IL: 64.466
D: 0.774

SWMH4
CL: 64.750
IL: 62.848 PIPE
D: 1.902 TO PIPE

SWMH7
CL: 64.760
IL: 62.767 PIPE
D: 1.993 TO PIPE

SWMH8
CL: 65.175
IL: 62.438D: 2.737

FWMH5
CL: 65.200
IL: 62.841
D: 2.359

FWMH6
CL: 65.188
IL: 62.785
D: 2.403

FWMH4
CL: 65.200
IL: 63.838
D: 1.362

FWMH8
CL: 65.120
IL: 62.611
D: 2.509

FWMH7
CL: 65.120
IL: 62.682
D: 2.438

SWMH9
CL: 65.162
IL: 62.423 PIPE
D: 2.739 TO PIPE

SURFACE WATER ATTENUATION TANK CRATE TYPE
99m² x 0.8m DEEP
VOL = 75.24m³
CL: CIRCA 65.175
TOT: 62.640
IL: 61.840
D: CIRCA 2.61m

SWMH12 (HB)
CL: 65.120
IL: 61.826 PIPE
D: 3.294 TO PIPE

> 1.000 100Ø 9.620m 1:59 >
< 1.000 100Ø 24.537m 1:70 <
< 1.001 100Ø 24.463m 1:50 <
< 1.001 100Ø 24.537m 1:70 <
< 2.000 100Ø 3.971m 1:59 <
> 2.001 100Ø 14.016m 1:59 >
< 2.000 100Ø 53.832m 1:70 <
< 1.002 150Ø 8.217m 1:100 <
> 3.001 100Ø 14.012m 1:57 >
< 1.003 150Ø 25.618m 1:100 <
> 1.002 100Ø 10.885m 1:70 >
< 1.003 150Ø 3.894m 1:70 <
< 1.004 225Ø 2.604m 1:169 <
< 1.007 225Ø 2.405m 1:169 <
< 1.004 150Ø 7.204m 1:70 <
< 1.005 150Ø 4.996m 1:70 <
< 1.006 150Ø 5.654m 1:70 <
< 1.008 225Ø 17.408m 1:153 <

PROVIDE CATCH PIT TO SWMH4 (500mm DEEP FROM INVERT PIPE)

PROVIDE CATCH PIT TO SWMH7 (500mm DEEP FROM INVERT PIPE)

PROVIDE CATCH PIT TO SWMH9 (500mm DEEP FROM INVERT PIPE)

EXTENT OF ATTENUATION TANK

AREA OF PERMEABLE GEOTEXTILE PLACED ON TOP OF TANK BELOW PERMEABLE PAVING TO DRAIN DIRECTLY INTO TOP OF TANK

PROVIDE SUMP TO HYDROBRAKE, REFER TO DETAILS FOR SIZE

No.23 Kings Court

EXFWM 2303

< EXISTING 225 VC FW <

EXFWM 2301

EXISTING MANHOLE INVERT LEVELS UNKNOWN

EXSWM 2352

< EXISTING 400 VC SW <

EXSWM 2351

225 VC SW

EXISTING MANHOLE INVERT LEVELS UNKNOWN

GREASE TRAPS

NOTE: GREASE TRAPS TO BE CONSIDERED FOR ALL KITCHEN AREAS. THESE MAY BE INTERNAL AND PART OF THE KITCHEN SUPPLIERS WORKS, OR EXTERNAL WITH SIZE AND LOCATION TO BE ADVISED BY SPECIALIST SUPPLIER FOR INDICATIVE INCLUSION ON ENGINEERS DRAWINGS.

FW DRAINAGE ASSUMPTIONS

- LOCATIONS OF ALL SVP's AND FOUL GULLIES TO BE CONFIRMED BY ARCHITECT/ M&E. LOCATIONS SHOWN INDICATIVE.
- FOUL WATER DRAINAGE LEVELS INSIDE THE BUILDING TO BE CONFIRMED BY M&E/ STRUCTURAL ENGINEER TO AVOID CLASHES.
- OCCUPANCY TO BE CONFIRMED BY ARCHITECT.
- INTERNAL RODDING ACCESS ON ALL INTERNAL SVP's - SEE DETAILS.

SW DRAINAGE ASSUMPTIONS

- PERMEABLE PAVEMENT AREAS AND SURFACES TO BE CONFIRMED BY ARCHITECT/LANDSCAPE ARCHITECT.
- LOCATIONS OF ALL RWP's TO BE CONFIRMED BY ARCHITECT/ LANDSCAPE ARCHITECT.
- PROPOSED LEVELS AND FINISHED FLOOR LEVEL TO BE PROVIDED BY ARC AND ARCHITECT. LEVELS MUST FALL AWAY FROM BUILDING TOWARDS SITE BOUNDARY.

REV	DETAIL	BY	CHK	APP	DATE
P01	INITIAL ISSUE	JBD	CS	AR	16.10.2026

ArcEngineers
CONSULTING STRUCTURAL AND CIVIL ENGINEERS
3 CADMAN COURT, LEEDS, LS27 0RX
Phone: 0113 253 3904
www.arc-engineers.co.uk

CLIENT:
ROSEDALE CARE LTD

PROJECT:
No. 25 ROSEDALE CARE HOME
KINGS ROAD, HORSHAM
RH13 5PP

TITLE:
DRAINAGE
GENERAL ARRANGEMENT

DRAWING STATUS:
TENDER

CONTRACT No.: 25021
SCALE @ A1: 1:125

PROJECT No. | ORIGINATOR | ZONE | LEVEL | TYPE | DISCIPLINE | NUMBER | REVISION
25021 - ARC - XX - XX - DR - C - 5001 - P01

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APPENDIX H

SuDS DETAIL DRAWING

The Institution of Structural Engineers

3 CADMAN COURT
MORLEY
LEEDS
LS27 0RX
T: 0113 253 3904
W:www.arc-engineers.co.uk

DO NOT SCALE

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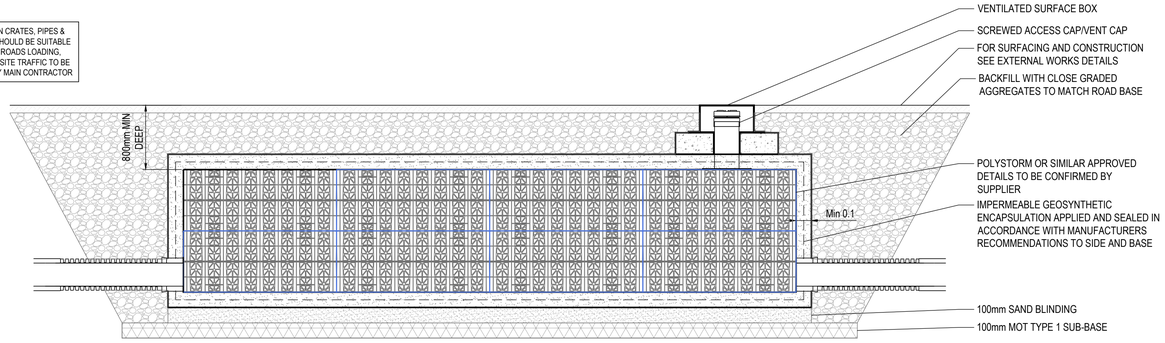
GENERAL NOTES

1. THESE NOTES ARE INTENDED TO AUGMENT DRAWINGS AND SPECIFICATIONS. WHERE CONFLICT OF REQUIREMENTS EXISTS THE ORDER OF PRECEDENCE SHALL BE AS SHOWN IN THE SPECIFICATIONS. OTHERWISE THE STRICTEST PROVISION SHALL GOVERN.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS AND ARCHITECTS DRAWINGS,
3. DRAWINGS NOT TO BE SCALED.
4. ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR. ANY DISCREPANCIES TO BE NOTIFIED TO THE ENGINEER/ARCHITECT AND FURTHER INSTRUCTIONS OBTAINED BEFORE WORK IS COMMENCED.
5. ALL WORK TO COMPLY TO CURRENT BUILDING REGULATIONS AND TO BE IN ACCORDANCE WITH THE RELEVANT BRITISH STANDARDS AND APPROPRIATE CODES OF PRACTICE.
6. FOR FURTHER NOTES REFER TO PROJECT SPECIFICATIONS.

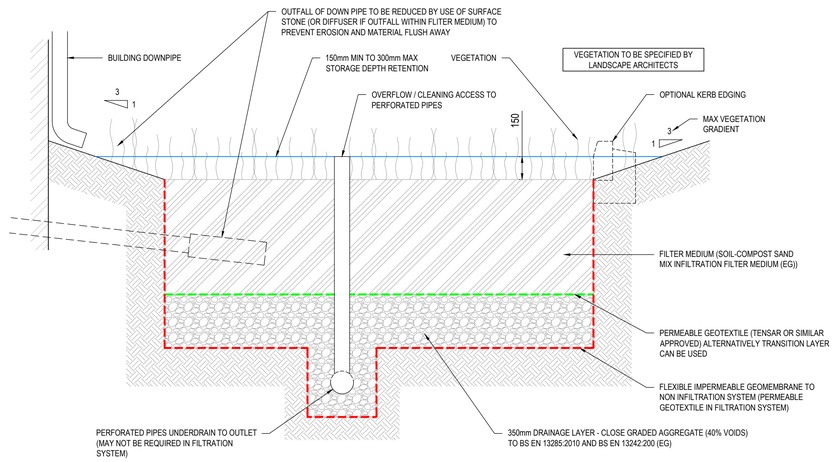
ATTENUATION CRATES, PIPES & MANHOLES SHOULD BE SUITABLE FOR ACCESS ROADS LOADING, TEMPORARY SITE TRAFFIC TO BE CONSIDER BY MAIN CONTRACTOR



INDICATIVE SECTION THOUGH ATTENUATION TANK

SCALE 1:20

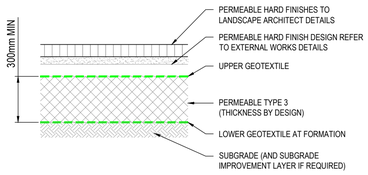
INSTALLATION TO MANUFACTURERS RECOMMENDATIONS



RAIN GARDEN AREA

SHOWING TYPICAL MAKE-UP

SCALE 1:20



PERMEABLE HARD AREA

TOTAL INFILTRATION

SCALE 1:20

REV	DETAIL	BY	CHK	APP	DATE
P01	INITIAL ISSUE	JBD	CS	AR	19.10.2026

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CONSULTING STRUCTURAL AND CIVIL ENGINEERS

3 CADMAN COURT, LEEDS, LS27 0RX
Phone: 0113 253 3904
www.arc-engineers.co.uk

CLIENT:

ROSEDALE CARE LTD

PROJECT:

No. 25 ROSEDALE CARE HOME
KINGS ROAD, HORSHAM
RH13 5PP

TITLE:

DRAINAGE DETAILS
SHEET 1

DRAWING STATUS:

TENDER

CONTRACT No.: 25021

SCALE @ A1: AS SHOWN

PROJECT No. | ORIGINATOR | ZONE | LEVEL | TYPE | DISCIPLINE | NUMBER | REVISION

25021 - ARC - XX - XX - DR - C - 5011 - P01

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APPENDIX I

SOUTHERN WATER CORRESPONDENCE

The Institution of Structural Engineers

3 CADMAN COURT
MORLEY
LEEDS
LS27 0RX
T: 0113 253 3904
W:www.arc-engineers.co.uk

from Southern Water

Jim Emmerson
3 Morley Street
West Yorkshire
LS27 0RX

Your ref
21652

Our ref
DSA000045973

Date
12 August 2025

Contact
Tel 0330 303 0119

Dear Mr Emmerson,

Level 1 Capacity Check Enquiry: 25 Kings Road, Horsham, West Sussex, RH13 5PP.

We have completed the capacity check for the above development site and the results are as follows:

Foul Water

The enquiry has been reassessed to determine the capacity available for 0.45 l/s at manhole reference TQ18312303 Grid Reference: 518269 , 131343.

There is currently inadequate capacity within the foul sewerage network to accommodate a foul flow of 0.45 l/s for the above development at manhole reference TQ18312303. The proposed development would increase flows to the public sewerage system which may increase the risk of flooding to existing properties and land. Additional off-site sewers or improvements to existing sewers will be required to provide sufficient capacity to service the development. Southern Water has a duty to provide Network capacity from the point of practical connection (point of equivalent or larger diameter pipe) funded by the New Infrastructure Charge.

Southern Water aim to provide this within 24 months following the date that planning has been granted for developments not identified as strategic sites in our current business plan. Strategic sites are larger developments and will often take longer than 24 months for a full solution to be provided.

The nearest point where capacity is currently available is at Hone WwTW. Rights are not issued for a direct connection to Wastewater Treatment Works (WTW). Please note that connection to the WTW will have to be agreed by Southern Water Services before being carried out.

Please note: there is no capacity for any additional flows due to Flooding at DG5s.

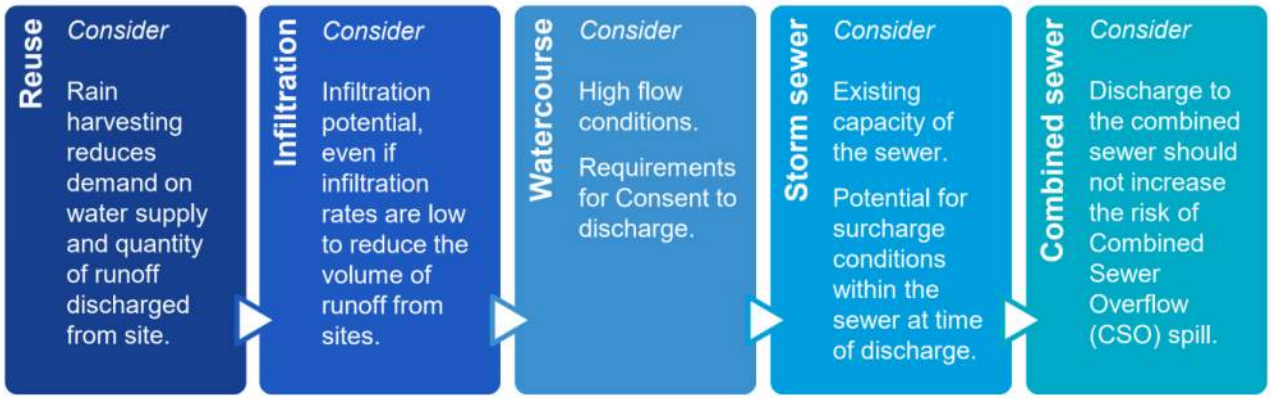
Southern Water Services Ltd, Registered Office: Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX Registered in England No. 2366670

Surface Water

The enquiry has been reassessed to determine the capacity available for 3.0 l/s at manhole reference TQ18312351 Grid Reference: 518286 , 131344.

There is currently inadequate capacity within the local surface water/foul sewerage network to accommodate a flow of 3.0 l/s at manhole reference TQ18312351.

In situations where surface water is being considered for discharge to our network, we require the below hierarchy for surface water to be followed which is reflected in part H3 of the Building Regulations. Whilst reuse does not strictly form part of this hierarchy, Southern Water would encourage the consideration of reuse for new developments.



Guidance on Building Regulations is here: gov.uk/government/publications/drainage-and-waste-disposal-approved-document-h

We would like to engage with you on the design for disposal of surface water, with a particular focus on the potential for incorporating Sustainable Drainage Systems (SuDS), for this development at the earliest opportunity and we recommend that civil engineers and landscape architects work together and with Southern Water. In many cases this may negate or reduce the need for network reinforcement and allow earlier completion of the development.

Where a surface water connection to the foul or combined sewer is being considered, this should be agreed by the Lead Local Flood Authority, in consultation with Southern Water.

Southern Water has a duty to provide Network capacity from the point of practical connection (point of equivalent or larger diameter pipe) funded by the New Infrastructure Charge.

Southern Water aim to provide this within 24 months following the date that planning has been granted for developments not identified as strategic sites in our current business plan. Strategic sites are larger developments and will often take longer than 24 months for a full solution to be provided.

Please note: there is no capacity for any additional flows due to predicted Flooding due to existing flows.

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New Infrastructure Charging

Please note as of 1st April 2018 we have moved to the “New Connections Services Charging Arrangements”. We understand that this may cause uncertainty for customers, particularly where they may have already committed to a development based on previous charging arrangements. We have worked with our stakeholders and Water UK to agree a set of principles by which we will base our charges. Please read through our new charging arrangement documents available at the following link: Connecting Charging Arrangements - Southern Water

Alternatively, New Appointees and Variations (NAVs), also known as ‘inset’ companies, can provide new connection services or take ownership of the new water and wastewater connection infrastructure provided for a new development. NAVs are appointed by Ofwat and replace the regional water company. It is for the developer to choose whether to use a NAV or the regional water company to supply services for new sites, according to certain legal criteria.

Connecting to our network

It should be noted that this information is only a hydraulic assessment of the existing sewerage network and does not grant approval for a connection to the public sewerage system. A formal Sewer Connection (S106) application is required to be completed and approved by Southern Water Services. To make an application visit: developerservices.southernwater.co.uk

Please note the information provided above does not grant approval for any designs/drawings submitted for the capacity analysis. The results quoted above are only valid for 12 months from the date of issue of this letter. **Any revisions in flow rate or alternative point of connection will require a new Pre-Planning Application to be submitted.**

Please get in touch via the Get Connected customer dashboard if you have any queries.

Should it be necessary to contact us please quote our above reference number in all communications relating to this application by email at southernwaterplanning@southernwater.co.uk

Yours sincerely,

Future Growth Planning Team
Developer Services

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

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

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APPENDIX J

MAINTENANCE AND MANAGEMENT

The Institution of Structural Engineers

3 CADMAN COURT
MORLEY
LEEDS
LS27 0RX
T: 0113 253 3904
W:www.arc-engineers.co.uk

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SUDS MANAGEMENT AND MAINTENANCE STRATEGY	
PROJECT	No. 25 ROSEDALE CARE HOME
PROJECT NUMBER	25 021
REFERENCE	25 021 - ARC-XX-XX-RP-S-9502
CLIENT	ROSEDALE CARE LIMITED
DATE WRITTEN	NOVEMBER 2026

The Institution of StructuralEngineers

3 CADMAN COURT
MORLEY
LEEDS
LS27 0RX
T: 0113 253 3904
W:www.arc-engineers.co.uk

REV	DATE	NOTES	WRITTEN BY	REVIEWED BY
P0	23.09.2025	INITIAL ISSUE	JBD	MG
P01	04.11.2026	REVISION 1	SM	NJ

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3. MAINTENANCE RESPONSIBILITIES 4
4. MAINTENANCE REGIME 4
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1. INTRODUCTION

This management strategy has been prepared by ARC Engineers on behalf of Rosedale Care Limited in respect of the proposed development at No. 25 Rosedale Care Home, Kings Road, Horsham to detail the operational requirements and functionality of the development whilst it is in use.

The development operates as a fully functioning care home under a single point of ownership and management. This aspect differs significantly from models where communal infrastructure and external works are transferred to independent management companies, which can lead to a disregard of operational responsibilities. Under this unified ownership framework, the Care Home Operator is aware of its obligations and retains direct accountability for executing a rigorous, ongoing maintenance strategy. This continuous oversight is fundamental to ensuring, well-maintained living environment, attractive for both residents and visitors.

---

2. SUDS PROVISION WITHIN THE DEVELOPMENT

The SuDS incorporated into this development are employed to:

- Reduce and manage surface water runoff.
- Improve the quality of water being discharged from the site.

The above provided for a design return period of one hundred years plus climate change, such that the development will not increase the risk of flooding to the site and its environs.

SUDS methods incorporated are:

- Geocellular system for attenuation
- Permeable paving – Type C (No infiltration to ground)
- Biodiversity / rain garden

This document outlines the long-term maintenance of the proposed surface water system and will make reference to the following documents, some of which provide further detail on the maintenance operations required:

- CIRIA Report C753 ‘The SUDS Manual’, 2015
- CIRIA Report C625 ‘Model Agreements for Sustainable Water Management Systems’, 2004
- Interpave (MPA Precast), ‘The Permeable Paving Manual’, ed. 7, 2026.

3. MAINTENANCE RESPONSIBILITIES

The Care Home Operator will appoint a specific, named, care home manager for the site in accordance with Care Quality Commission (CQC) legislation who will maintain ultimate responsibility for all operational aspects of the site. To support the care home manager with general maintenance issues, a site-based caretaker / maintenance operative will be directly employed. This internal team will conduct regular inspections of all aspects of the building, identify maintenance issues and coordinate with specialist contractors. Pertaining to external works and Sustainable Drainage Systems (SuDS) features, a term contractor will be appointed to guarantee compliance with all statutory Health and Safety requirements and method statements.

4. MAINTENANCE REGIME

The inspection of the SUDS features will be carried out by the site-based maintenance operative.

This will include inspecting:

- All external gullies draining hard landscaping areas.
- Inspecting external Rainwater Pipe connections.
- Inspecting hard landscaping areas with permeable paving to ensure there is no vegetation growth or trapped debris in the gaps between paviours.
- Lifting the PPIC inspection covers to all silt traps in the car parking and access road area to determine when to instruct specialist contractor to clear them.
- Inspection of the swale outfall to ensure there is no debris blocking the head wall.

The following section describes the required maintenance for each feature in turn. The SuDS Maintenance requirements listed below should be reviewed after the first 5 years, with a view to agreeing a new regime for the ongoing maintenance.

Notwithstanding, routine inspections and maintenance requirements, after severe storm events all features shall be inspected to clear debris and repair damaged structures or features. Records of the maintenance carried out shall be prepared by the maintenance manager / team.

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

PROPRIETARY TREATMENT SYSTEM – DOWNSTREAM DEFENDERS		
Maintenance Schedule	**Required Action**	**Typical Frequency**
Regular Maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation	Six monthly
	Change the filter media	As recommended by manufacturer
	Remove sediment, oil, grease and floatables	As necessary- indicated by system inspections or immediately following a significant spill
Remedial Actions	Replace malfunctioning parts or structures	As required
Monitoring	Inspect evidence of poor operation	Six monthly
	Inspect filter media and establish appropriate replacement frequencies	Six monthly
	Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months

PERMEABLE PAVEMENTS		
Maintenance Schedule	**Required Action**	**Typical Frequency**
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over the whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required- once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)

Monitoring	Initial inspection	Monthly for three months after inspection
	Inspect for evidence of poor operation and/or weed growth – if required take remedial action	Three monthly 48h after large storms in first six months
	Inspect slit accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

WETLANDS / PONDS / SWALES / BASINS / BIO-DIVERSITY AREAS		
Maintenance Schedule	**Required Action**	**Typical Frequency**
Regular Maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass- public areas	Monthly (during growing season)
	Cut the meadow grass	Half yearly (Spring, before nesting season, Autumn)
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework, etc. for evidence of blockage and/or physical damage	Monthly
	Inspect water body for signs of poor water quality	Monthly (May-October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once build-	Half yearly

	up has occurred to inform management and disposal options	
	Check any mechanical devices, eg penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; include max 25% pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to minimum of 1m above water level	Annually
	Tidy all dead growth (scrub clearance) before start of growing season (note: tree maintenance is usually part of overall landscape maintenance contract)	Annually
	Remove sediment from any forebay	Every 1-5 years, or as required
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays	Every 5 years, or as required
Occasional Maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment this will only be required rarely, eg every 20-25 years
Remedial Actions	Repair erosion or other damage	As required
	Replant where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair/rehabilitate inlets, outlets and overflows	As required

MANHOLES AND PIPES		
Maintenance Schedule	**Required Action**	**Typical Frequency**
Regular Maintenance	Remove and surface litter and detritus.	Monthly
	Inspect manhole covers for damage.	Annually
	Clean sumps and remove silt.	Annually
Occasional Maintenance	Carry out CCTV of outgoing pipework to identify problems.	Ten yearly
Remedial Actions	Replace damaged manhole covers.	As required
	Repair damaged manholes.	As required and as identified by CCTV
	Remove any root ingress or damage to pipework.	As required and as identified by CCTV

GULLIES		
Maintenance Schedule	**Required Action**	**Typical Frequency**
Regular Maintenance	Visually inspect gullies for surface damage.	Six monthly
	Remove and surface litter and detritus.	Monthly
	Inspect external covers for damage.	Annually
	Clean gullies and remove silt.	Annually
Occasional Maintenance	Carry out CCTV of outgoing pipework to identify problems.	Ten yearly
Remedial Actions	Replace damaged covers and gratings.	As required
	Replace or repair damaged outgoing pipework.	As required and as identified by CCTV
	Remove any root ingress or damage to outgoing pipework	

FLOW CONTROL		
Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove any surface litter and detritus.	Monthly
	Inspect manhole covers for damage.	Annually
	Clean sumps and remove silt.	Annually
	Inspect flow control device and seals.	Annually
Occasional Maintenance	Carry out CCTV of incoming and outgoing pipework to identify problems.	Ten yearly
Remedial Actions	Replace damaged manhole covers.	As required
	Repair any damage to flow control device.	As required
	Replace seals to flow control device.	As required
	Repair damaged manholes.	As required and as identified by CCTV
	Remove any root ingress or damage to pipework.	As required and as identified by CCTV

5. INSPECTION LOGS

SUDS / EXTERNAL SURFACE WATER DRAINAGE MAINTENANCE INSPECTION CHECKLIST				
SITE NAME AND ADDRESS				
Date of inspection		Details	Action Required (y/n)	Date Completed
Undertaken by				
Page 1 of 3				
Is there any evidence of erosion, channelling, ponding (where not desirable) or other poor hydraulic performance to car parking / access road?				
Is there any evidence of accidental spillages, oils, poor water quality, odours or nuisance insects?				
Have health and safety risks been identified to either the public or maintenance operatives?				
Silt/Sediment Accumulation				
Is there any sediment accumulation at inlets (or other defined accumulation zones such as the surface of filter drains, swales or infiltration basins and within proprietary devices)? If yes, state depth (mm) and extent. Is removal required? If yes, state waste disposal requirements and confirm that all waste management requirements have been complied with (consult environmental regulator)				

SUDS / EXTERNAL SURFACE WATER DRAINAGE MAINTENANCE INSPECTION CHECKLIST				
SITE NAME AND ADDRESS				
Date of inspection		Details	Action Required (y/n)	Date Completed
Undertaken by				
Page 2 of 3				
Is surface clogging visible potentially problematic where water has to soak into the underlying construction or ground (e.g. under drained swale or infiltration basin)?				
Does permeable or porous surfacing require sweeping to remove silt?				
Is there evidence of litter accumulation in the system? If yes, is blockage a risk?				
Is there any evidence of any other clogging or blockage of outlets or drainage paths?				
Is the vegetation condition satisfactory (density, weed growth, coverage, etc.)? (check against approved planning regime)				
Does any part of the system require weeding, pruning or mowing? (check against maintenance frequency state in approved design)				
Is there any evidence of invasive species becoming established? If yes, state action required				
Are any check dams or weirs in good condition?				

SUDS / EXTERNAL SURFACE WATER DRAINAGE MAINTENANCE INSPECTION CHECKLIST				
SITE NAME AND ADDRESS				
Date of inspection		Details	Action Required (y/n)	Date Completed
Undertaken by				
Page 3 of 3				
Is there any evidence of any accidental damage to the system (eg wheel ruts)?				
Is there any evidence of cross connections or other unauthorised inflows?				
Is there any evidence of tampering with the flow control?				
Are there any other matters that could affect the performance of the system in relation to the design objectives for hydraulic, water quality, biodiversity and visual aspects?				
OTHER OBSERVATIONS				
Information appended (eg photos)				
Continue as current Increase maintenance Decrease maintenance				
Proposed date for next inspection				