



Civil Engineers & Transport Planners

The Swan, Three Mile Cross

Drainage Strategy

September 2024

241836/DS/AG/KBL/01



Civil Engineers & Transport Planners

LANMOR Consulting Ltd,
Thorogood House, 34 Tolworth Close
Surbiton, Surrey, KT6 7EW

Tel: 0208 339 7899 Fax: 0208 339 7898

E-mail: info@lanmor.co.uk

Internet: www.lanmor.co.uk

DOCUMENT STATUS

Project: The Swan, Three Mile Cross

Title: Drainage Strategy

Client:

Reference: 241836/DS/AG/KBL/01

Produced by: AG Date:

Checked by: KBL Date:

Approved by: KBL Date:

<u>Issue/revision</u>	<u>Date</u>	<u>Status</u>	<u>Issued by</u>
First	11/09/24	For Approval	KBL

CONTENTS

1	INTRODUCTION	1
1.1	General	1
1.2	Scope	1
2	SITE LOCATION AND DESCRIPTION	3
2.1	Existing Site	3
2.2	Regional Geology.....	3
2.3	Proposed Development	3
3	EXISTING DRAINAGE	4
3.1	Foul Water	4
3.2	Surface Water.....	4
4	PROPOSED DRAINAGE	5
4.1	Foul Water	5
4.2	Surface Water.....	5
5	SUDS / SURFACE WATER MAINTENANCE.....	9
6	SUMMARY AND CONCLUSION	13

TABLES

TABLE 4.1 – EXISTING AND PROPOSED DISCHARGE RATES	7
TABLE 5.1 – PERMEABLE PAVING MAINTENANCE SCHEDULE	10
TABLE 5.2 – ATTENUATION TANK MAINTENANCE SCHEDULE.....	11

FIGURES

FIGURE 1.1 – SITE LOCATION	1
FIGURE 4.1 – SUDS HIERARCHY.....	6

APPENDICES

APPENDIX A

Existing Site Plan – SK.030
Proposed Site Plan – SK.031

APPENDIX B

CCTV Survey
Thames Water Sewer Records

APPENDIX C

Proposed Drainage Strategy – 241836/DS/01

APPENDIX D

MicroDrainage Calculations

1 INTRODUCTION

1.1 General

- 1.1.1 Lanmor Consulting Ltd has been appointed to prepare a Drainage / SuDS Strategy for the proposed development at The Swan, Basingstoke Road, Three Mile Cross, Reading, RG7 1AT. Figure 1.1 below shows the location of the site.

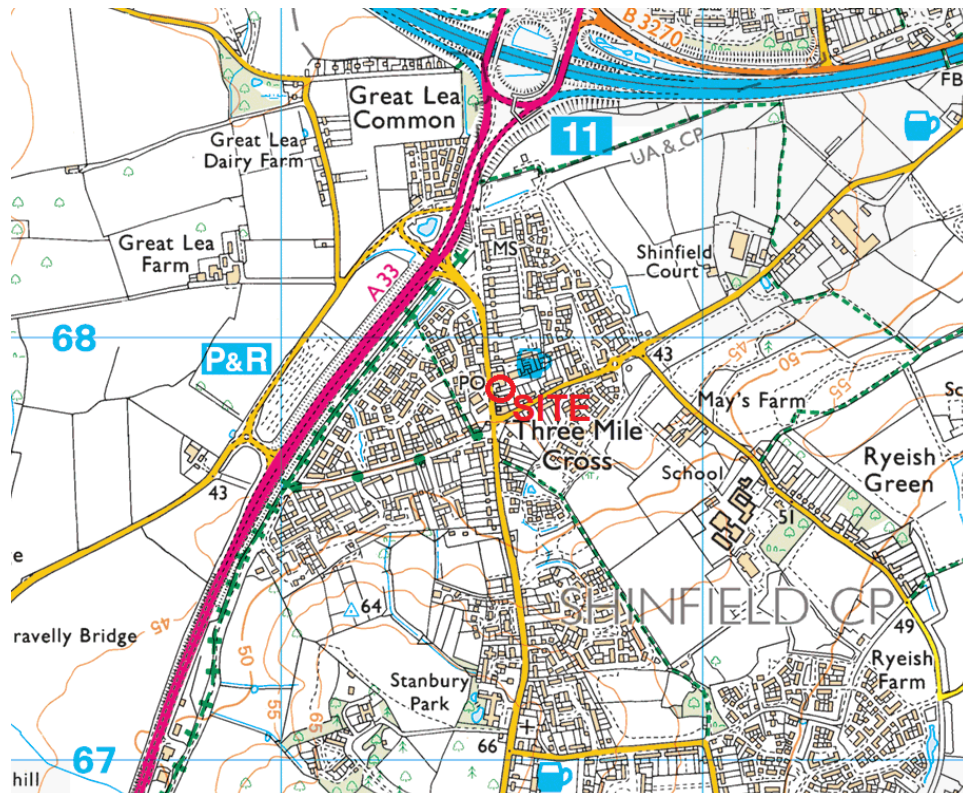


Figure 1.1 – Site Location

1.2 Scope

- 1.2.1 This report will consider the proposed drainage strategy for the site, it will assess the site's current Greenfield and Brownfield runoff rates, suitable methods of discharging the runoff from the development and set the drainage strategy for the proposed development, including discharge rates and any requirements for attenuation.
- 1.2.2 The information and details within this report will be refined, modified, and updated as the detailed designs progressed, post planning. The scope of works for this drainage strategy report is outlined below:

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

1.2.3 This report will also consider the risk of flooding for the site. It will assess the sources of flooding as well as the flooding extents and the potential impacts on the development, including an assessment of any dangers. The report will therefore demonstrate that the proposed development will be safe for its lifetime and will not increase the risk of flooding in the surrounding area.

2 SITE LOCATION AND DESCRIPTION

2.1 Existing Site

- 2.1.1 The application site is located off Basingstoke Road in the village of Three Mile Cross and is currently occupied by an historic public house called The Swan, with outbuildings and a large parking area to the rear. The existing site plan has been included in Appendix A.

2.2 Regional Geology

- 2.2.1 The British Geological Survey (BGS) indicates that the site is underlain by London Clay Formation – Clay, silt and sand. Sedimentary bedrock formed between 56 and 47.8 million years ago during the Palaeogene period. There was no available information regarding the superficial geology of the site.

2.3 Proposed Development

- 2.3.1 The proposals seek to renovate the site by extending the footprint of the existing public house at the rear to provide increased dining facilities including a canopied dining area at the back of the property. The existing outbuildings at the north of the site will be demolished to enable vehicular access. The proposed site layout for the development has been included in Appendix A as drawing SK.031.

3 EXISTING DRAINAGE

3.1 Foul Water

3.1.1 A CCTV survey has been prepared for the site by Drain & Able Ltd following a site inspection in June 2024. The survey shows that the public house is currently served by a network of privately maintained foul pipes and manholes which outfall to FWMH7 which is likely a Thames Water manhole and part of the public sewerage infrastructure which runs beneath the site, flowing northwards. Asset records obtained for the site show that this sewer is a foul sewer with a diameter of 150mm. Copies of the CCTV survey and the Thames Water asset records have been included in Appendix B.

3.2 Surface Water

3.2.1 No surface water sewer is indicated on the Thames Water asset records. The CCTV survey did not indicate any onsite surface water pipes however FWMH6 which is indicated to be a “tank” is more likely to be a soakaway. FWMH4 was full of water so it was not possible to establish where this manhole connects to, but connection to a road gully was proved. It is likely that it connects to MH6 and given the poor ground conditions the soakaway is unlikely to be infiltrating adequately and is resulting in standing water building up in the drainage system.

3.2.2 It was not possible to trace the rainwater pipes from the roof of the building around the frontage of the site and it is likely they connect to the existing foul network and therefore the Thames Water sewer.

4 PROPOSED DRAINAGE

4.1 Foul Water

4.1.1 It is proposed to reuse the existing foul connection to the Thames Water sewer at FWMH7 however FWMH1 and 2 will likely be abandoned due to the extent of the new building and the section of drain replaced up to FWMH7. The proposed foul drainage for the site has been indicated on drawing 241836/DS/01 in Appendix C.

4.2 Surface Water

4.2.1 With regards to discharge of surface water runoff from the development, the SuDS hierarchy has been considered when designing the drainage strategy for the site. The development will have pitched roofs with a pergola structure to the rear and so green / blue roof attenuation systems are not considered to be viable for the site and have been discounted.

4.2.2 Rainwater harvesting was also considered as a means of reusing surface water runoff within the building. However, these systems require a separate network of pipes within the property, as well as tanks and pumps to store the rainwater and then distribute it throughout. It was considered impractical to implement rainwater harvesting systems on the site due to site constraints and the excessive cost for the development.

4.2.3 In addition, for these systems to be successfully implemented there must be sufficient demand for water reuse otherwise this may lead to water quality issues. Furthermore, rainwater harvesting tanks should not be included in the assessment of attenuation required to store runoff from a development as there is no guarantee that the tank will be sufficiently empty to receive another storm.

4.2.4 Should the rainwater harvesting tank be full at the start of the storm, it will not be able to receive any more runoff, therefore additional storage of a similar size would be required to cater for all storm events and the rainwater harvesting tank will provide no benefit in terms of attenuation. For those reasons, and the excessive cost of providing the system, this method has been discounted.

- 4.2.5 Next on the Sustainable Drainage Hierarchy is the use of ground infiltration techniques such as soakaways. The British Geological Survey (BGS) indicates that the site is underlain by London Clay Formation – Clay, silt, and sand and so it is unlikely that any soakaway designed for the site would achieve a half drain time of less than 24 hours in compliance with Building Regulations, potentially causing a surcharge of the system. For these reasons the use of soakaways has been discounted.
- 4.2.6 Discharge to a nearby watercourse is the next option on the Sustainable Drainage Hierarchy, however as the proposed development is not situated near any suitable watercourse, discharging via this method would not be a viable option and so has been discounted.
- 4.2.7 Next on the hierarchy is discharging to a surface water sewer and attenuating the flows. There is no surface water sewer within the immediate vicinity of the site and nor is there a combined sewer. Discharging to either a surface water or a combined sewer has therefore been discounted.

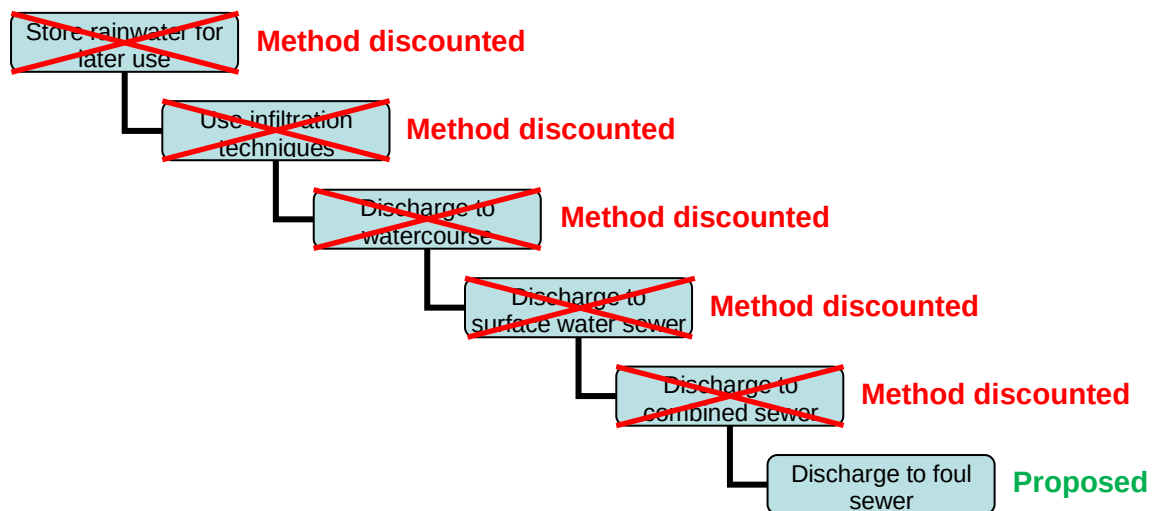


Figure 4.1 – SuDS Hierarchy

4.2.8 The last option is to discharge surface water runoff to a foul sewer and attenuate the flows. The asset records obtained from Thames Water indicate that there is a foul sewer which runs through the site and flows northwards. It has been assumed based on the asset records and the CCTV survey that surface water runoff from the site is currently drained through a combination of the foul sewer and the tank / soakaway at the edge of the site.

4.2.9 Calculations have been undertaken to determine the Greenfield and Brownfield rates for the site. The existing rates were compared against the total proposed discharge rates to determine the effects of the proposed drainage regime on the peak discharge rate of surface water runoff from the property. The calculations are tabulated below in Table 4.1. The full calculations are included in Appendix C.

<i>Return Period</i>	<i>Greenfield Rate (l/s)</i>	<i>Brownfield Rate (l/s)</i>	<i>Proposed Discharge Rate (l/s)</i>	<i>% Reduction</i>
<i>Qbar</i>	0.0	-	-	n/a
<i>1 in 1</i>	0.0	3.3	2.0	40%
<i>1 in 30</i>	0.0	8.2	2.0	75%
<i>1 in 100</i>	0.0	10.6	2.0	81%
<i>1 in 100 +40%</i>	-	-	2.0	n/a

Table 4.1 – Existing and Proposed Discharge Rates

4.2.10 The Greenfield discharge rate from the small, developed area does not generate any noticeable discharge, and so it is not possible to restrict the proposed development to this rate so a maximum discharge rate of 2.0 l/s has been adopted.

4.2.11 The existing drainage at FWMH4 & 6 will remain as it is unknown at this time what is feeding these so it will be necessary to undertake intrusive investigations of the connections to them and this will need to be assessed when works are underway on site.

- 4.2.12 This proposed strategy will consider only the outdoor seating area, the new extension and existing roof area draining onto it, the remainder of the building and car park area which is unaffected by these proposals will continue to drain as per the current situation.
- 4.2.13 The proposed strategy will therefore adopt a permeable paving for the outdoor seating area which will cascade into a tank that will also receive the runoff from the roof area. The permeable paving has been designed with a 300mm deep granular sub-base with 30% voids, the ground conditions are not suitable for infiltration so the paving will provide storage for a storm event with a probability of 1 in 100 year +40%.
- 4.2.14 The discharge from the paving will be restricted by a 20mm orifice to the underground attenuation tank. The tank will receive the runoff from the paved area and the unrestricted flow from the roof of the extension. The discharge from the tank will be restricted by a Hydro-Brake with a maximum rate of 2.0 l/s. The tank has also been designed to accommodate a 1 in 100 year + 40% CC event and has been sized at 3m x 6m x 0.4m deep.
- 4.2.15 Drawing 241836/DS/01 included in Appendix C shows the proposed strategy for the foul and surface water drainage from the development. The full drainage calculations for the development are included in Appendix D.

5 SUDS / SURFACE WATER MAINTENANCE

- 5.1.1 Regularly inspection of the surface water drainage network for blockages and clearing unwanted debris / silt from the system should improve the performance of the surface water network and decrease the need for future repairs. In the event of blockages, high pressure water jets can be used to clear the gullies and pipes to ensure they are functioning correctly, this should be undertaken by certified trained professionals.
- 5.1.2 The level and frequency of maintenance required on site is dependent on the type of facility. The type of maintenance will fall into one of three categories “regular maintenance”, “occasional maintenance” and “remedial maintenance”.
- 5.1.3 Regular maintenance of the drainage and SuDS features will include, inspections, removal of litter / debris and sweeping of the surfaces. Occasional maintenance will include removal of sediment etc. and remedial maintenance may include structural repairs and infiltration reconditioning if required.
- 5.1.4 The drainage and SuDS elements after an initial inspection following construction should be inspected on a monthly basis for the first 12 months and after large storms, thereafter the following maintenance regime should be applied and adjusted if the 12-month monitoring process has identified any issues.
- 5.1.5 Following completion of the development and the final handover the owners of the site / pub management will be fully responsible for maintaining the onsite drainage network, including the SuDS elements.

Permeable Paving

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

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

Table 5.1 – Permeable Paving Maintenance Schedule

Attenuation Tanks

5.1.7 For the attenuation tanks, the following maintenance is recommended.

Attenuation Tank Maintenance Schedule		
	Required Action	Typical Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Annually
	Remove debris from the catchment surface (where it may cause risk to performance).	Monthly
	For systems where rainfall infiltrates in 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.	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 tanks for sediment build-up and remove if necessary	Every 5 years or as required

Table 5.2 – Attenuation Tank Maintenance Schedule

- 5.1.8 For specialist equipment, such as the Hydro-Brake, maintenance brochures will be provided by the manufacturer. These will set out the frequency of inspections and correct methods of cleaning etc. that should be followed. It is recommended that once installed the facility should be inspected monthly for the first three months and thereafter at six monthly intervals or as advised in the maintenance brochure.
- 5.1.9 The above information is only intended as guidance to standard maintenance practise for surface water drainage and SuDS features. The above measures should be reviewed regularly and modified to suit the site conditions.

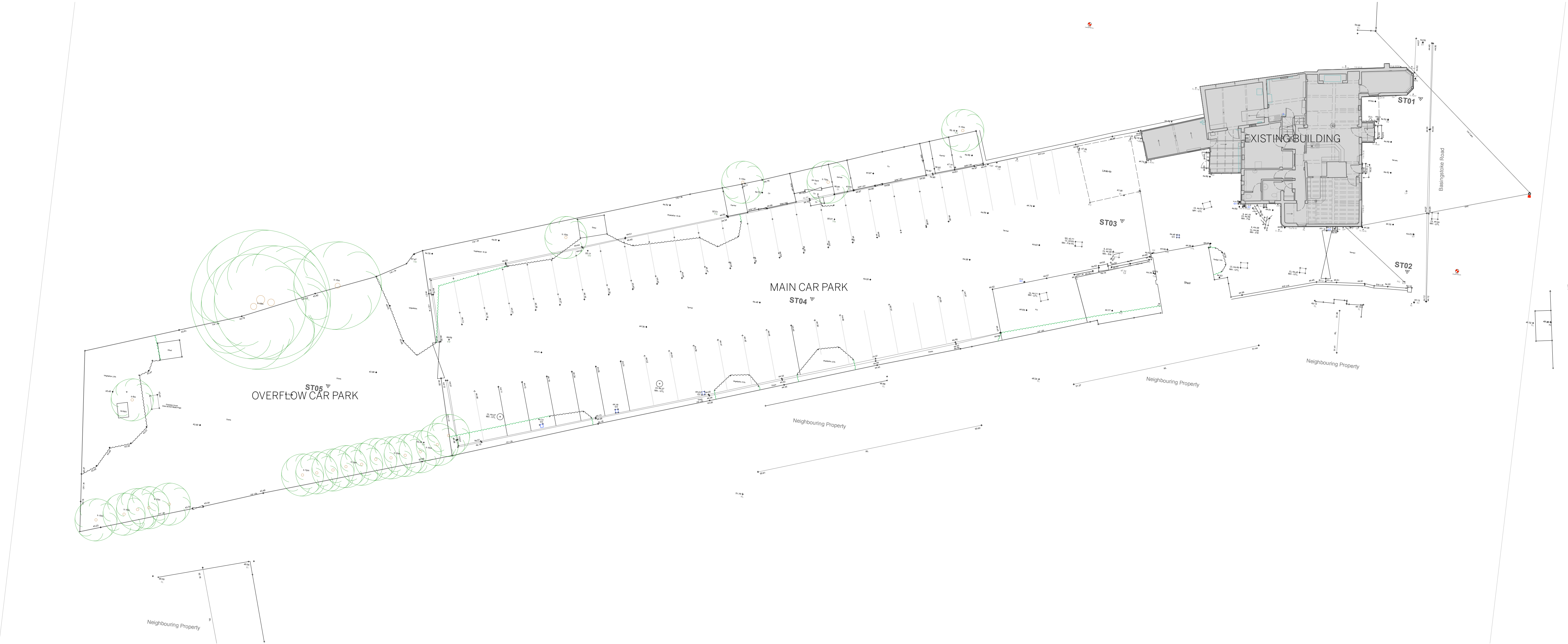
6 SUMMARY AND CONCLUSION

- 6.1.1 The site is located on Basingstoke Road in Three Mile Cross and the proposals seek to extend the footprint of the existing public house to make additional provision for indoor and outdoor seating space.
- 6.1.2 It is presumed based on the CCTV survey and the sewer asset records that the existing site is drained through the onsite foul system which collects runoff from the roofs of the buildings and outfalls to the Thames Water sewer. It is also likely that part of the existing building is drained by a soakaway which the CCTV survey indicated was not draining properly causing a build up of standing water, which suggests that the ground conditions are not suitable for soakaways.
- 6.1.3 Manholes FWMH1 and 2 will likely be abandoned and the surface water drainage provision for the site will be kept separate from the onsite foul pipework. The proposed surface water drainage strategy has incorporated a combination of permeable paving and an attenuation tank.
- 6.1.4 The paving will be located beneath the proposed canopy / outdoor seating area and will cascade into the attenuation tank through a 20mm orifice plate. The tank has been designed to store runoff for all return periods up to and including the 1 in 100-year plus 40%CC, and this will also capture the unrestricted flow from the roof of the extension. The outfall from the tank into the Thames Water foul sewer will be restricted by a Hydro-Brake with a design flow of 2.0 l/s.
- 6.1.5 This proposed strategy has considered only the outdoor seating area, the new extension and existing roof area draining onto it. The remainder of the building and car park area which is unaffected by these proposals will continue to drain as per the current situation.
- 6.1.6 For the reasons outlined in this report we see no reason to refuse planning permission on the grounds of there being insufficient capacity to discharge runoff from the development.

APPENDIX A

Existing Site Plan – SK.030

EXISTING SITE PLAN



EXISTING SITE PLAN

DRAFT



Contact
5 Kelburne Close,
Wolverhampton, WV4 5JG
info@taitchitects.co.uk
taitchitects.co.uk
019022503

General Notes
1. ISSUED ONLY FOR PURPOSE INDICATED.
2. THIS IS TO BE READ IN CONJUNCTION WITH ALL OTHER
CONSULTANTS INFORMATION.
3. CHECK SITE CONDITIONS PRIOR TO COMMENCEMENT.
4. ANY DISCREPANCIES TO BE REPORTED DIRECTLY TO THE
ARCHITECT.
5. ALL DIMENSIONS TO BE CHECKED ON SITE.
6. THIS DRAWING IS COPYRIGHT.
7. DO NOT SCALE OFF DRAWING. USE FIGURED DIMENSIONS
ONLY.

Revisions:
REV DATE DESG
(DRAWN, CHECKED)

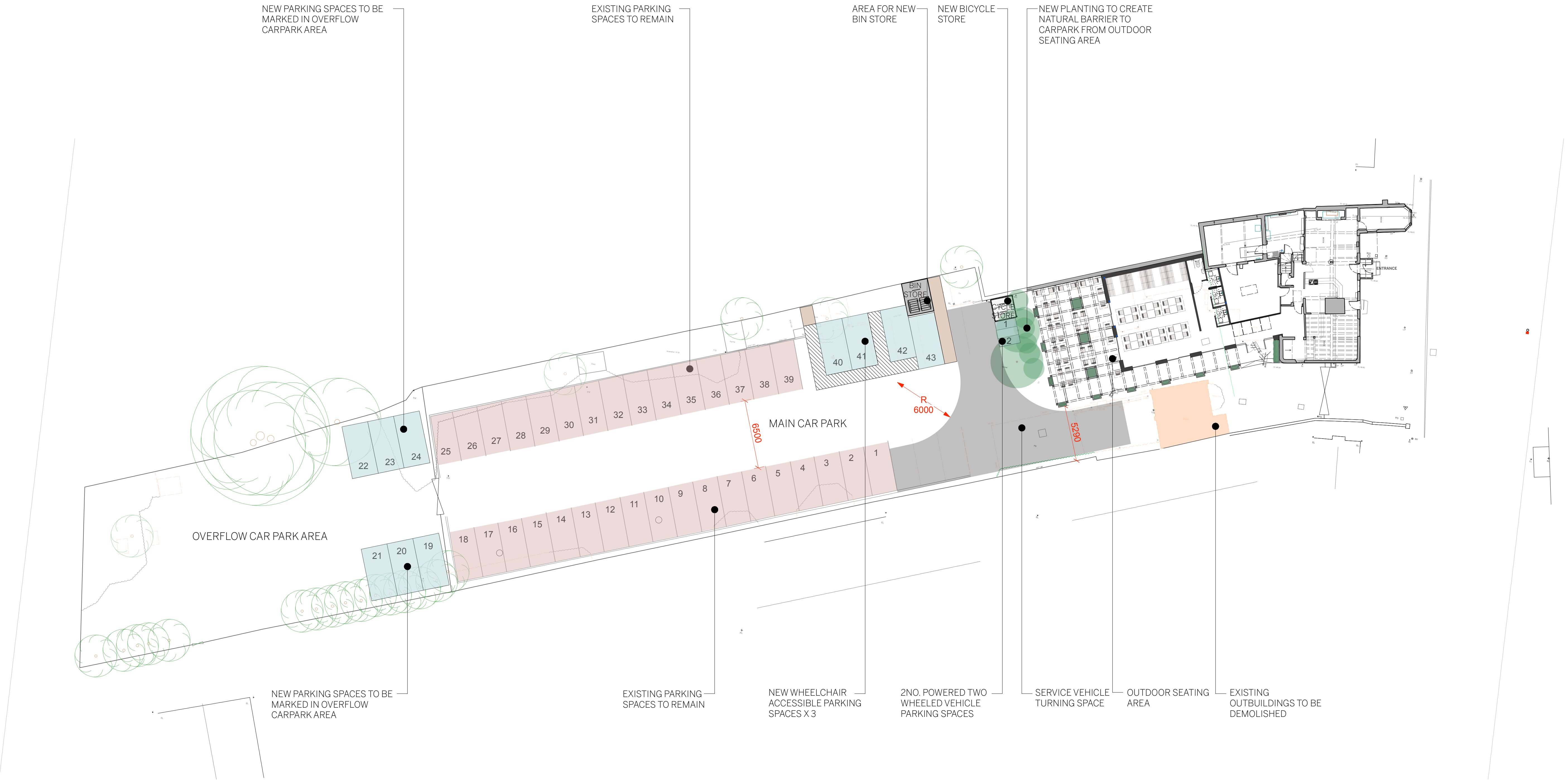


Project name:
THE SWAN
Client:
FRASER'S RETAIL LTD
Discipline:
PLANNING
Job No:
22.475

Description:
EXISTING SITE PLAN
Date:
JULY 24
Scale:
1:100@A3 / 1:500@A1
Rev:

Proposed Site Plan – SK.031

PROPOSED SITE PLAN



PROPOSED CAR PARKING SPACES TOTAL
- 43 CAR PARK SPACES (INCLUDING 3 WHEELCHAIR ACCESSIBLE SPACES)
- 2 CYCLE SPACES
- 2 POWERED TWO WHEELED VEHICLE SPACES

PARKING SPACE REQUIREMENTS
CALCULATED USING THE FOLLOWING AREAS:
RESTAURANT DINING: 98 SQM = 20 SPACES
BAR AREA: 33 SQM = 11 SPACES
OUTDOOR DINING: 57 SQM = 12 SPACES
TOTAL = 43 SPACES

Contact
a 5 Kelburne Close,
Worcester, RG4 1JG
e info@taichitects.co.uk
w taichitects.co.uk
p 01169072593

General Notes
1. ISSUED ONLY FOR PURPOSE INDICATED.
2. THIS IS TO BE READ IN CONJUNCTION WITH ALL OTHER CONSULTANTS INFORMATION.
3. CHECK SITE CONDITIONS PRIOR TO COMMENCEMENT.
4. ANY DISCREPANCIES TO BE REPORTED DIRECTLY TO THE ARCHITECT.
5. ALL DIMENSIONS TO BE CHECKED ON SITE.
6. THIS DRAWING IS COPYRIGHT.
7. DO NOT SCALE OFF DRAWING. USE FIGURED DIMENSIONS ONLY.

Revisions:
REV DATE DESG

(DRAWN CHECKED)



Project name:
THE SWAN
Client:
FRASER'S RETAIL LTD
Drawing:
PLANNING
Job No:
22.475

Description:
PROPOSED SITE PLAN
Date:
JULY 24
Scale:
1:100@A3 / 1:500@A1
Rev:

SK.031

APPENDIX B

CCTV Survey

Drainage Report



Prepared For
The Swan
Basingstoke Road
Reading

RG7 1AT

Site
The Swan
Basingstoke Road
Reading

RG7 1AT



DRAIN & ABLE LTD
Surveyor: Ben Clarke
info@drainandable.co.uk
01189576244

Total Defects for Project

Total DRB Grades for Project



The Swan Basingstoke Road Reading RG7 1AT - CCTV Survey Report : 28/06/24

Name : DRAIN & ABLE LTD
 Contact : Ben Clarke
 Location : Norcot Road
 Town : Reading
 Region :
 Postcode : RG30 6BP
 Email : info@drainandable.co.uk
 Contact Number : 01189576244
 Surveyor : Ben Clarke
 Valid Certification No :

Client Information

Name : The Swan
 Contact :
 Location : Basingstoke Road
 Town : Reading
 Region :
 Postcode : RG7 1AT
 Tel :
 Mobile :
 Email :
 Fax :

Site Information

Name : The Swan
 Contact :
 Location : Basingstoke Road
 Town : Reading
 Region :
 Postcode : RG7 1AT
 Tel :
 Mobile :
 Email :
 Fax :

Total Defects for Project



Total DRB Grades for Project



Report interpretation.

Overview:

Each section of the drainage system is allocated a score indicating areas that require attention. These areas are detailed in the Overview section on the following page and also at the bottom right of the first few pages. We use colour coding as an indicator of severity. Additional information concerning rehabilitation options/recomendations is included in the Overview page, which can also be used as an, "at a glance" indication of system condition. More in depth information for each section, Including images can be found later in the report. Grade indicators are as follows:

Grade A: Drain is serviceable no recommendations required

Grade B: There is an issue that might require remedial works

Grade C: There is a defect that requires remedial works, the drain is not serviceable.

Observations:

Each section of drainage reported on (manhole to manhole for example), contains detailed information about that drain and any observations made concerning condition are detailed below the header section. The observations are colour coded and given a severity score, with more significant defects being given a higher score, using a scale from 1 to 5 as detailed below:

Severity 1 to 2: These defects may require remedial monitoring

Severity 3: These defects probably require some form of remedial works

Severity 4 to 5: Defects that will require remedial repair or replacement

General:

The information provided is relevant at the time of survey. The coding system in this report is based on the Manual of Sewer Condition Classification, 5th edition (MSCC5) domestic codes (BS EN 13508-1:2003). This is the official standard for the water industry.

The severity system is based on significant experience in general practice and the 1 -5 grades represent the severity of individual defects: 5 representing a more serious defect.

Please feel free to contact us for further explanation or pricing for remedial works required.

Total Defects for Project



Total DRB Grades for Project



Overview

Section: 1 From: MH1 B1 U/S To: RESTBEND MH	Grade A	DRB Grade: A Pipe Size: 100 Material: Polypropylene Use: Foul
Section: 2 From: MH1 B2 U/S To: GULLY POT MH	Grade B	DRB Grade: B Pipe Size: 100 Material: Polypropylene Use: Foul
Section: 3 From: MH1 B2 U/S To: MH2 MH	Grade B	DRB Grade: B Pipe Size: 100 Material: Polypropylene Use: Foul
Section: 4 From: MH1 B3 U/S To: MH2 MH	Grade B	DRB Grade: B Pipe Size: 100 Material: Polypropylene Use: Foul
Section: 5 From: MH1 MAINRUN U/S To: TRAP MH	Grade A	DRB Grade: A Pipe Size: 100 Material: Polypropylene Use: Foul
Section: 6 From: MH1 MAINRUN D/S To: MH3 MH	Grade B	DRB Grade: B Pipe Size: 100 Material: Polypropylene Use: Foul

Total Defects for Project



Total DRB Grades for Project



Section: 7 From: MH2 B1 U/S To: RESTBEND MH	Grade B	DRB Grade: B Pipe Size: 100 Material: Polypropylene Use: Foul
Section: 8 From: MH2 B2 U/S To: GULLY POT MH	Grade B	DRB Grade: B Pipe Size: 100 Material: Polypropylene Use: Foul
Section: 9 From: MH2 MAINRUN U/S To: UNKNOWN MH	Grade A	DRB Grade: A Pipe Size: 100 Material: Polypropylene Use: Foul
Section: 10 From: MH3 B1 U/S To: UNKNOWN MH	Grade A	DRB Grade: A Pipe Size: 100 Material: Polypropylene Use: Foul
Section: 11 From: MH3 B2 U/S To: MH1 MH	Grade B	DRB Grade: B Pipe Size: 100 Material: Polypropylene Use: Foul
Section: 12 From: MH3 MAINRUN U/S To: UNKNOWN MH	Grade A	DRB Grade: A Pipe Size: 100 Material: Polypropylene Use: Foul
Section: 13 From: MH3 MAINRUN D/S To: UNKNOWN MH	Grade C	DRB Grade: C Pipe Size: 100 Material: Polypropylene Use: Foul

Total Defects for Project

Total DRB Grades for Project



Section: 14 From: MH3 MAINRUN D/S To: MH5	Grade C	DRB Grade: C Pipe Size: 100 Material: Polypropylene Use: Foul
MH		
Section: 15 From: MH4 To: UNKNOWN	Grade A	DRB Grade: A Pipe Size: 100 Material: Polypropylene Use: Foul
MH		
Section: 16 From: MH5 D/S To: UNKNOWN	Grade A	DRB Grade: A Pipe Size: 100 Material: Polypropylene Use: Foul
MH		
Section: 17 From: MH5 D/S To: MH7	Grade A	DRB Grade: A Pipe Size: 100 Material: Polypropylene Use: Foul
MH		
Section: 18 From: MH7 U/S To: UNKNOWN	Grade A	DRB Grade: A Pipe Size: 100 Material: Polypropylene Use: Foul
MH		
Section: 19 From: MH7 D/S To: UNKNOWN	Grade A	DRB Grade: A Pipe Size: 100 Material: Polypropylene Use: Foul
MH		
Section: 20 From: MH4 BR1 To: SVP	Grade B	DRB Grade: B Pipe Size: 100 Material: Polypropylene Use: Foul
MH		

Total Defects for Project



Total DRB Grades for Project



Section: 21 From: MH4 B1 To: GULLY POT MH	Grade A	DRB Grade: A Pipe Size: 100 Material: Polypropylene Use: Foul
Section: 22 From: MH8 BR1 To: SVP MH	Grade B	DRB Grade: B Pipe Size: 100 Material: Polypropylene Use: Foul
Section: 23 From: MH8 BR2 To: GULLY POT MH	Grade A	DRB Grade: A Pipe Size: 100 Material: Polypropylene Use: Foul

Total Defects for Project



Total DRB Grades for Project



Site: Basingstoke Road, Reading

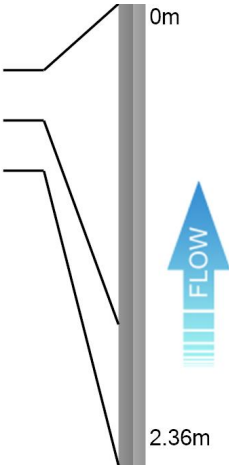
Section 1

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH1 B1 U/S 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	RESTBEND 0.00	Direction: Use: Material:	U F PP Height/Dia: 100 Shape: C Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	2.36	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		0_0	
01.64m	REM	General remark		0_1	
02.36m	OCF	Finish node type, other special chamber		0_99	



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 1

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH1 B1 U/S	Image Provided - Ref: 0_0 
01.64m		REM	General remark We would advise cleaning works to be undertaken at this location	Image Provided - Ref: 0_1 
02.36m		OCF	Finish node type, other special chamber ENTERS RESTBEND	Image Provided - Ref: 0_9999 

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

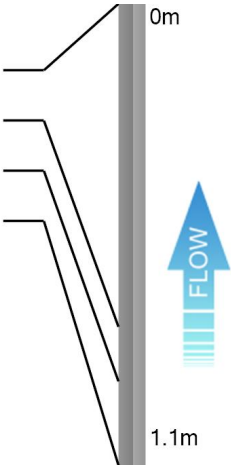
Section 2

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: MH1 B2 U/S	Finish Node Ref: GULLY POT	Direction: U	Height/Dia: 100		
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C		
Start Node Coordinate:	Finish Node Coordinate:	Material: PP	Cleaned N		

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	1.1	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		1_0	
00.77m	REM	General remark		1_1	
00.90m	JDM	Joint displaced medium		1_2	0:00:11
01.10m	OCF	Finish node type, other special chamber		1_99	



Total Defects for section



DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 2

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH1 B2 U/S	Image Provided - Ref: 1_0 
00.77m		REM	General remark Small deposits identified. Advisory - cleaning works required in this location.	Image Provided - Ref: 1_1 
00.90m	0:00:11	JDM	Joint displaced medium - Severity 3 Displaced Joint identified, with no evidence to suggest that this is resulting in any issues at present however the condition of this may deteriorate over a period of time.	Image Provided - Ref: 1_2 

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
01.10m		OCF	Finish node type, other special chamber ENTERS GULLY POT	Image Provided - Ref: 1_9999 

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

Section 3

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH1 B2 U/S 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	MH2 0.00	Direction: Use: Material:	U F PP Height/Dia: 100 Shape: C Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	1.09	

Position Code Description

00.00m MH Start node type, manhole

00.40m JDM Joint displaced medium

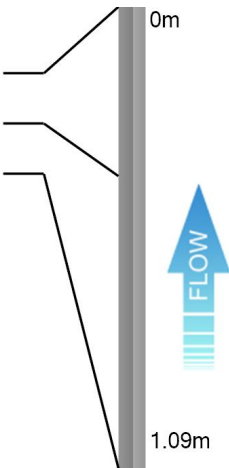
01.09m MHF Finish node type, manhole

CD Pic Video Ref

2_0

2_1

2_99



Total Defects for section



DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 3

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH1 B2 U/S	Image Provided - Ref: 2_0 
00.40m		JDM	Joint displaced medium - Severity 3 Displaced Joint identified, with no evidence to suggest that this is resulting in any issues at present however the condition of this may deteriorate over a period of time.	Image Provided - Ref: 2_1 
01.09m		MHF	Finish node type, manhole ENTERS MH2	Image Provided - Ref: 2_9999 

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

Section 4

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: MH1 B3 U/S	Finish Node Ref: MH2	Start Node Depth: 0.00	Finish Node Depth: 0.00	Direction: U	Height/Dia: 100
Start Node Coordinate:	Finish Node Coordinate:			Use: F	Shape: C
				Material: PP	Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	1.19	

Position Code Description

00.00m MH Start node type, manhole

00.40m JDM Joint displaced medium

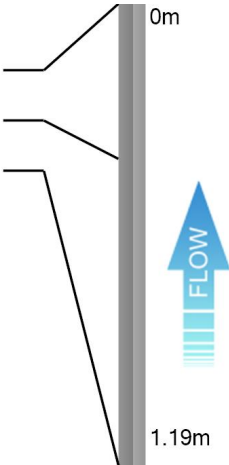
01.19m MHF Finish node type, manhole

CD Pic Video Ref

3_0

3_1

3_99



Total Defects for section



DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 4

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH1 B3 U/S	Image Provided - Ref: 3_0 
00.40m		JDM	Joint displaced medium - Severity 3 Displaced Joint identified, with no evidence to suggest that this is resulting in any issues at present however the condition of this may deteriorate over a period of time.	Image Provided - Ref: 3_1 
01.19m		MHF	Finish node type, manhole ENTERS MH2	Image Provided - Ref: 3_9999 

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

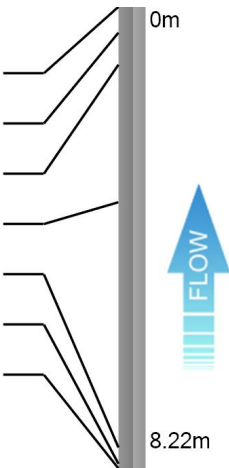
Section 5

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH1 MAINRUN U/S 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	TRAP 0.00	Direction: Use: Material:	U F PP Height/Dia: 100 Shape: C Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	8.22	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		4_0	
00.46m	REM	General remark		4_1	
01.03m	REM	General remark		4_2	0:00:07
03.48m	REM	General remark		4_3	0:00:19
07.85m	REM	General remark		4_4	0:00:39
08.14m	CU	Loss of vision		4_5	0:00:55
08.22m	OCF	Finish node type, other special chamber		4_99	



Total Defects for section



DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 5

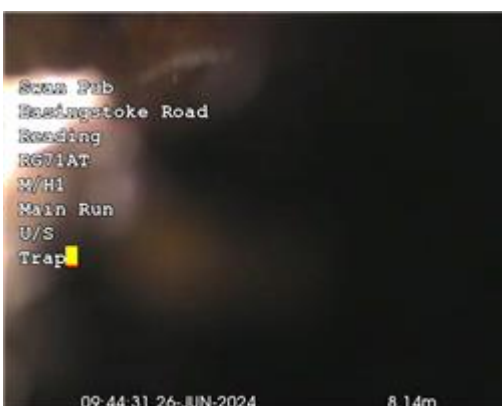
Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH1 MAINRUN U/S	Image Provided - Ref: 4_0
00.46m		REM	General remark ADVISORY CLEANING WORKS REQUIRED IN THIS LOCATION	Image Provided - Ref: 4_1
01.03m	0:00:07	REM	General remark ADVISORY - CLEANING WORKS REQUIRED IN THIS LOCATION	Image Provided - Ref: 4_2

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
03.48m	0:00:19	REM	General remark ADVISORY - CLEANING WORKS REQUIRED IN THIS LOCATION	Image Provided - Ref: 4_3 
07.85m	0:00:39	REM	General remark ADVISORY - CLEANING WORKS REQUIRED IN THIS LOCATION	Image Provided - Ref: 4_4 
08.14m	0:00:55	CU	Loss of vision ADVISORY - LOSS OF VISION - CLEANING WORKS REQUIRED AT THIS LOCATION	Image Provided - Ref: 4_5 

Total Defects for section

DRB Grade for Section



Pos	Video Ref	Code	Description	Image
08.22m		OCF	Finish node type, other special chamber ENTERS TRAP	Image Provided - Ref: 4_9999 

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

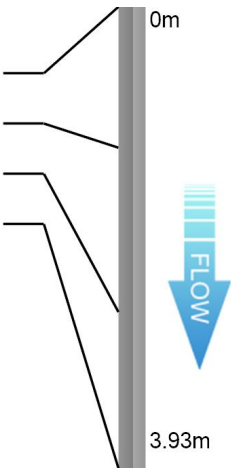
Section 6

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH1 MAINRUN D/S 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	MH3 0.00	Direction: Use: Material:	D F PP Height/Dia: 100 Shape: C Cleaned: N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	3.93	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		5_0	
01.20m	JDM	Joint displaced medium		5_1	
02.60m	JDM	Joint displaced medium		5_2	0:00:24
03.93m	MHF	Finish node type, manhole		5_99	



Total Defects for section



DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 6

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH1 MAINRUN D/S	Image Provided - Ref: 5_0 
01.20m		JDM	Joint displaced medium - Severity 3 Displaced Joint identified, with no evidence to suggest that this is resulting in any issues at present however the condition of this may deteriorate over a period of time.	Image Provided - Ref: 5_1 
02.60m	0:00:24	JDM	Joint displaced medium - Severity 3 Displaced Joint identified, with no evidence to suggest that this is resulting in any issues at present however the condition of this may deteriorate over a period of time.	Image Provided - Ref: 5_2 

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
03.93m		MHF	Finish node type, manhole ENTERS MH3	Image Provided - Ref: 5_9999

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

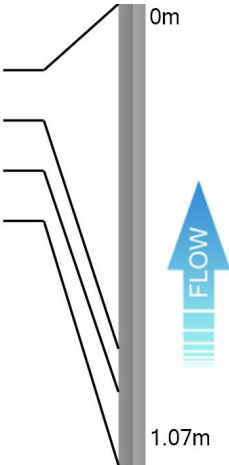
Section 7

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH2 B1 U/S 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	RESTBEND 0.00	Direction: Use: Material:	U F PP Height/Dia: 100 Shape: C Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	1.07	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		6_0	
00.80m	JDM	Joint displaced medium		6_1	
00.90m	JDM	Joint displaced medium		6_2	0:00:12
01.07m	OCF	Finish node type, other special chamber		6_99	



Total Defects for section



DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 7

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH2 B1 U/S	Image Provided - Ref: 6_0 
00.80m		JDM	Joint displaced medium - Severity 3 Displaced Joint identified, with no evidence to suggest that this is resulting in any issues at present however the condition of this may deteriorate over a period of time.	Image Provided - Ref: 6_1 
00.90m	0:00:12	JDM	Joint displaced medium - Severity 3 Displaced Joint identified, with no evidence to suggest that this is resulting in any issues at present however the condition of this may deteriorate over a period of time.	Image Provided - Ref: 6_2 

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
01.07m		OCF	Finish node type, other special chamber ENTERS RESTBEND	Image Provided - Ref: 6_9999 

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

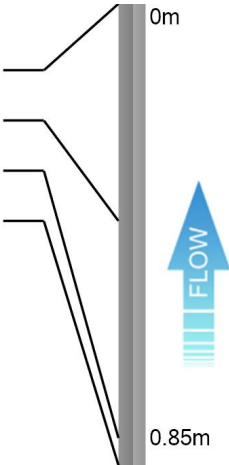
Section 8

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH2 B2 U/S 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	GULLY POT 0.00	Direction: Use: Material:	U F PP Height/Dia: 100 Shape: C Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	0.85	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		7_0	
00.40m	JDM	Joint displaced medium		7_1	
00.80m	JDM	Joint displaced medium		7_2	0:00:20
00.85m	GYF	Finish node type Gully		7_99	



Total Defects for section



DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 8

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH2 B2 U/S	Image Provided - Ref: 7_0 
00.40m		JDM	Joint displaced medium - Severity 3 Displaced Joint identified, with no evidence to suggest that this is resulting in any issues at present however the condition of this may deteriorate over a period of time.	Image Provided - Ref: 7_1 
00.80m	0:00:20	JDM	Joint displaced medium - Severity 3 Displaced Joint identified, with no evidence to suggest that this is resulting in any issues at present however the condition of this may deteriorate over a period of time.	Image Provided - Ref: 7_2 

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
00.85m		GYF	Finish node type Gully ENTERS GULLY POT	Image Provided - Ref: 7_9999  Swan Pub Basingstoke Road Reading RG71AT M/H2 Branch 2 U/S Gully Pot 09:58:46.26 09/09/2024 0.85m

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

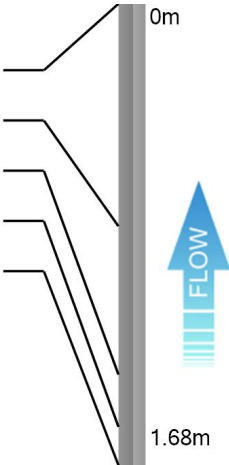
Section 9

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH2 MAINRUN U/S 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	UNKNOWN 0.00	Direction: Use: Material:	U F PP Height/Dia: 100 Shape: C Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	1.68	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		8_0	
00.81m	REM	General remark		8_1	
01.35m	REM	General remark		8_2	0:00:16
01.54m	REM	General remark		8_3	0:00:20
01.68m	MHF	Finish node type, manhole		8_99	



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 9

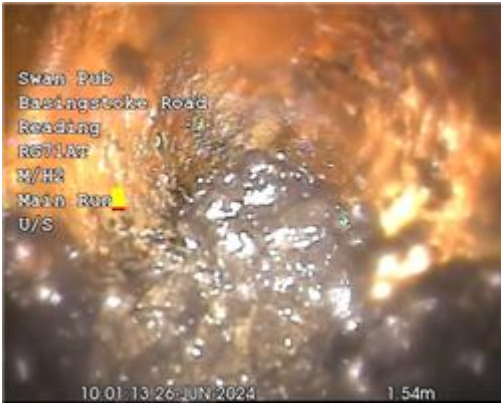
Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH2 MAINRUN U/S	Image Provided - Ref: 8_0 
00.81m		REM	General remark ADVISORY - CLEANING WORKS REQUIRED AT THIS LOCATION	Image Provided - Ref: 8_1 
01.35m	0:00:16	REM	General remark ADVISORY - CLEANING WORKS REQUIRED AT THIS LOCATION	Image Provided - Ref: 8_2 

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
01.54m	0:00:20	REM	General remark ADVISORY - CLEANING WORKS REQUIRED AT THIS LOCATION	Image Provided - Ref: 8_3 
01.68m		MHF	Finish node type, manhole UNKNOWN	Image Provided - Ref: 8_9999 

Total Defects for section

DRB Grade for Section



Site: Basingstoke Road, Reading

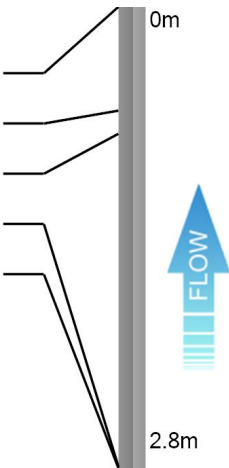
Section 10

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: MH3 B1 U/S	Finish Node Ref: UNKNOWN	Direction: U	Height/Dia: 100		
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C		
Start Node Coordinate:	Finish Node Coordinate:	Material: PP	Cleaned N		

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	2.8	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		9_0	
00.63m	REM	General remark		9_1	
00.77m	CC	Crack, circumferential		9_2	0:00:09
02.79m	REM	General remark		9_3	0:00:42
02.80m	OCF	Finish node type, other special chamber		9_99	



Total Defects for section



DRB Grade for Section

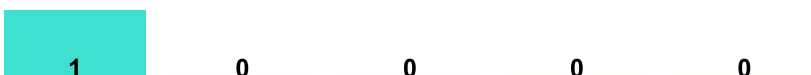


Descriptive Report with Remarks and Observation Images

Section 10

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH3 B1 U/S	Image Provided - Ref: 9_0 
00.63m		REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 9_1 
00.77m	0:00:09	CC	Crack, circumferential - Severity 1 CIRCUMFERENTIAL CRACK FROM 9 O' CLOCK TO 3 O' CLOCK	Image Provided - Ref: 9_2 

Total Defects for section

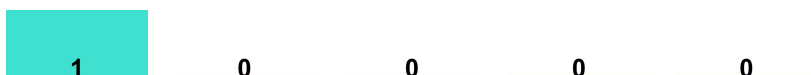


DRB Grade for Section



Pos	Video Ref	Code	Description	Image
02.79m	0:00:42	REM	General remark ADVISORY - CLEANING WORKS REQUIRED AT THIS LOCATION	Image Provided - Ref: 9_3 
02.80m		OCF	Finish node type, other special chamber UNKNOWN	Image Provided - Ref: 9_9999 

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

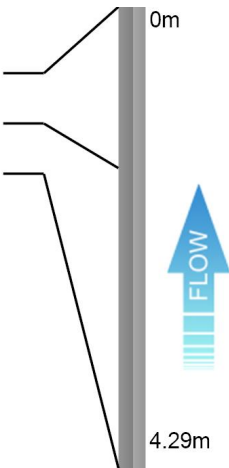
Section 11

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: MH3 B2 U/S	Finish Node Ref: MH1	Direction: U	Height/Dia: 100		
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C		
Start Node Coordinate:	Finish Node Coordinate:	Material: PP	Cleaned N		

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	4.29	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		10_0	
01.50m	JDM	Joint displaced medium		10_1	
04.29m	MHF	Finish node type, manhole		10_9	



Total Defects for section



DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 11

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH3 B2 U/S	Image Provided - Ref: 10_0 
01.50m		JDM	Joint displaced medium - Severity 3 Displaced Joint identified, with no evidence to suggest that this is resulting in any issues at present however the condition of this may deteriorate over a period of time.	Image Provided - Ref: 10_1 
04.29m		MHF	Finish node type, manhole ENTERS MH1	Image Provided - Ref: 10_9999 

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

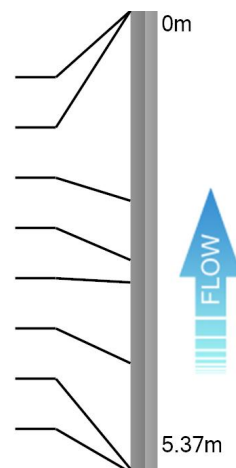
Section 12

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: MH3 MAINRUN U/S	Finish Node Ref: UNKNOWN	Direction: U	Height/Dia: 100		
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C		
Start Node Coordinate:	Finish Node Coordinate:	Material: PP	Cleaned N		

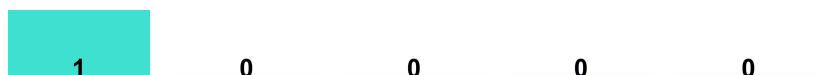
Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	5.37	

Position	Code	Description	CD	Pic	Video Ref	
00.00m	MH	Start node type, manhole		11_0		
00.00m	REM	General remark		11_2	0:00:00	
02.21m	WL	Water level 50%		11_3	0:00:18	
02.90m	CC	Crack, circumferential		11_1		
03.16m	REM	General remark		11_4	0:00:32	
04.10m	WL	Water level 60%		11_5	0:00:43	
05.33m	REM	General remark		11_6	0:01:13	
05.37m	OCF	Finish node type, other special chamber		11_9		



Total Defects for section



DRB Grade for Section

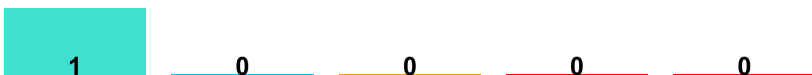


Descriptive Report with Remarks and Observation Images

Section 12

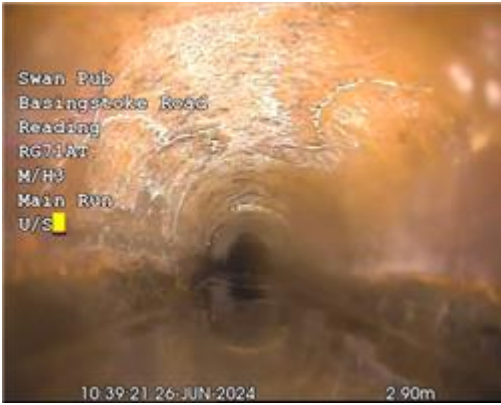
Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH3 MAINRUN U/S	Image Provided - Ref: 11_0 
00.00m	0:00:00	REM	General remark DEPOSITS IDENTIFIED THEREFORE RESTRICTING FLOW	Image Provided - Ref: 11_2 
02.21m	0:00:18	WL	Water level: 50% Height/Diameter WATER RETENTION IDENTIFIED	Image Provided - Ref: 11_3 

Total Defects for section

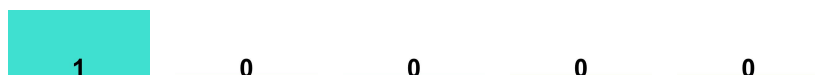


DRB Grade for Section



Pos	Video Ref	Code	Description	Image
02.90m		CC	Crack, circumferential - Severity 1 CIRCUMFERENTIAL CRACK IDENTIFIED FROM 9 O'CLOCK TO 3 O'CLOCK	Image Provided - Ref: 11_1 
03.16m	0:00:32	REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 11_4 
04.10m	0:00:43	WL	Water level: 60% Height/Diameter WATER RETENTION	Image Provided - Ref: 11_5 

Total Defects for section

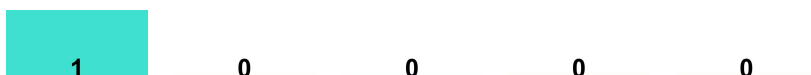


DRB Grade for Section



Pos	Video Ref	Code	Description	Image
05.33m	0:01:13	REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 11_6
05.37m		OCF	Finish node type, other special chamber UNKNOWN	Image Provided - Ref: 11_9999

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

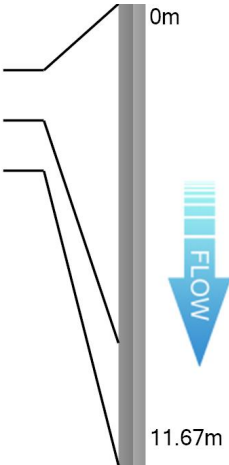
Section 13

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH3 MAINRUN D/S 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	UNKNOWN 0.00	Direction: Use: Material:	D F PP Height/Dia: Shape: Cleaned: 100 C N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	11.67	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		12_0	
08.58m	B	Broken pipe 11-02		12_1	
11.67m	OCF	Finish node type, other special chamber		12_9	



Total Defects for section



DRB Grade for Section

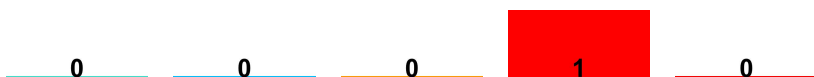


Descriptive Report with Remarks and Observation Images

Section 13

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH3 MAINRUN D/S	Image Provided - Ref: 12_0 
08.58m		B	Broken pipe from 11 o'clock to 02 o'clock - Severity 4 DAMAGE TO DRAIN IDENTIFIED	Image Provided - Ref: 12_1 
11.67m		OCF	Finish node type, other special chamber UNKNOWN	Image Provided - Ref: 12_9999 

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

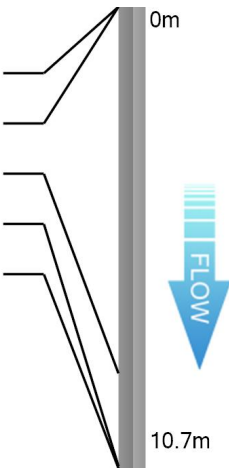
Section 14

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH3 MAINRUN D/S 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	MH5 0.00	Direction: Use: Material:	D F PP Height/Dia: 100 Shape: C Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	10.7	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		13_0	
00.00m	REM	General remark		13_3	0:00:00
08.50m	B	Broken pipe 11-01		13_1	
10.65m	REM	General remark		13_2	0:00:57
10.70m	MHF	Finish node type, manhole			



Total Defects for section



DRB Grade for Section

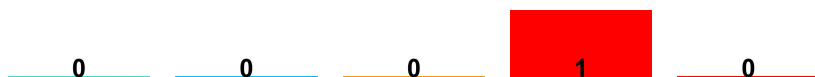


Descriptive Report with Remarks and Observation Images

Section 14

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH3 MAINRUN D/S	Image Provided - Ref: 13_0 
00.00m	0:00:00	REM	General remark DAMAGE TO INSPECTION CHAMBER COVER	Image Provided - Ref: 13_3 
08.50m		B	Broken pipe from 11 o'clock to 01 o'clock - Severity 4	Image Provided - Ref: 13_1 

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
10.65m	0:00:57	REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 13_2
10.70m		MHF	Finish node type, manhole ENTERS MH5	

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

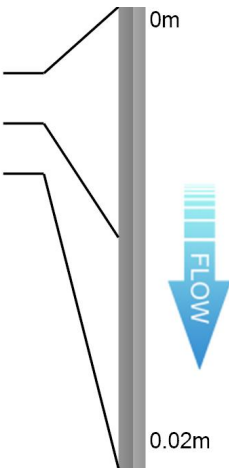
Section 15

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: MH4	Finish Node Ref: UNKNOWN	Direction: D	Height/Dia: 100		
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C		
Start Node Coordinate:	Finish Node Coordinate:	Material: PP	Cleaned N		

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	0.02	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		14_0	
00.01m	REM	General remark		14_1	
00.02m	OCF	Finish node type, other special chamber		14_9	



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 15

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH4	Image Provided - Ref: 14_0 
00.01m		REM	General remark MH4	Image Provided - Ref: 14_1 
00.02m		OCF	Finish node type, other special chamber UNKNOWN	Image Provided - Ref: 14_9999 

Total Defects for section

DRB Grade for Section

0 0 0 0 0



Site: Basingstoke Road, Reading

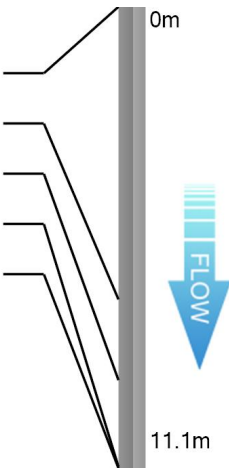
Section 16

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH5 D/S 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	UNKNOWN 0.00	Direction: Use: Material:	D F PP Height/Dia: Shape: Cleaned: 100 C N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	11.1	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		15_0	
07.04m	REM	General remark		15_1	
08.98m	REM	General remark		15_2	0:01:19
11.06m	REM	General remark		15_3	0:01:41
11.10m	MHF	Finish node type, manhole		15_9	



Total Defects for section



DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 16

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH5 D/S	Image Provided - Ref: 15_0 
07.04m		REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 15_1 
08.98m	0:01:19	REM	General remark ADVSORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 15_2 

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
11.06m	0:01:41	REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 15_3 
11.10m		MHF	Finish node type, manhole UNKNOWN	Image Provided - Ref: 15_9999 

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

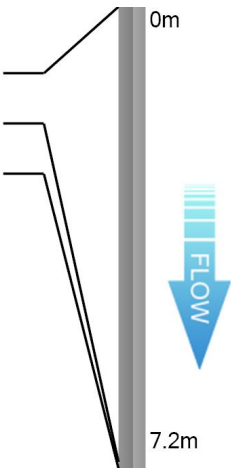
Section 17

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH5 D/S 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	MH7 0.00	Direction: Use: Material:	D F PP Height/Dia: 100 Shape: C Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	7.2	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		16_0	
07.10m	REM	General remark		16_1	
07.20m	MHF	Finish node type, manhole		16_9	



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 17

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH5 D/S	Image Provided - Ref: 16_0 
07.10m		REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 16_1 
07.20m		MHF	Finish node type, manhole ENTERS MH7	Image Provided - Ref: 16_9999 

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

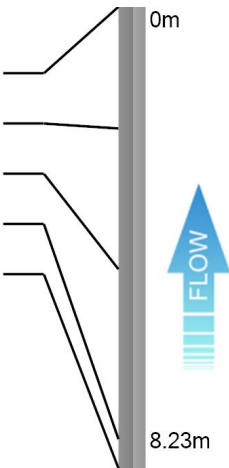
Section 18

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH7 U/S 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	UNKNOWN 0.00	Direction: Use: Material:	U F PP Height/Dia: 100 Shape: C Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	8.23	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		17_0	
02.17m	REM	General remark		17_1	
04.68m	CU	Loss of vision		17_2	0:00:40
07.71m	CUW	Loss of vision, camera under water		17_3	0:01:00
08.23m	OCF	Finish node type, other special chamber		17_9	



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 18

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH7 U/S	Image Provided - Ref: 17_0 
02.17m		REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 17_1 
04.68m	0:00:40	CU	Loss of vision ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 17_2 

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
07.71m	0:01:00	CUW	Loss of vision, camera under water ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 17_3
08.23m		OCF	Finish node type, other special chamber UNKNOWN	Image Provided - Ref: 17_9999

Total Defects for section

DRB Grade for Section



Site: Basingstoke Road, Reading

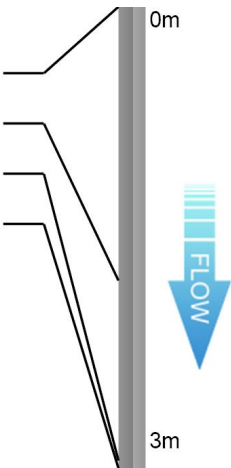
Section 19

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH7 D/S 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	UNKNOWN 0.00	Direction: Use: Material:	D F PP Height/Dia: 100 Shape: C Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	3	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		18_0	
01.78m	REM	General remark		18_1	
02.95m	REM	General remark		18_2	0:00:54
03.00m	MHF	Finish node type, manhole		18_9	



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 19

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH7 D/S	Image Provided - Ref: 18_0 
01.78m		REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 18_1 
02.95m	0:00:54	REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 18_2 

Total Defects for section

DRB Grade for Section

0 0 0 0 0



Pos	Video Ref	Code	Description	Image
03.00m		MHF	Finish node type, manhole UNKNOWN	Image Provided - Ref: 18_9999 

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

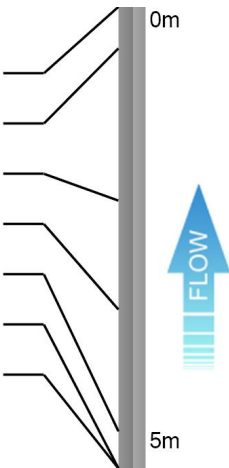
Section 20

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: MH4 BR1	Finish Node Ref: SVP	Direction: U	Height/Dia: 100		
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C		
Start Node Coordinate:	Finish Node Coordinate:	Material: PP	Cleaned N		

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	5	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		19_0	
00.45m	REM	General remark		19_1	
02.10m	REM	General remark		19_2	0:00:12
03.28m	REM	General remark		19_3	0:00:17
04.60m	JDM	Joint displaced medium		19_4	0:00:26
05.00m	JDM	Joint displaced medium		19_5	0:00:30
05.00m	MHF	Finish node type, manhole		19_9	



Total Defects for section



DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 20

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH4 BR1	Image Provided - Ref: 19_0 
00.45m		REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 19_1 
02.10m	0:00:12	REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 19_2 

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
03.28m	0:00:17	REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 19_3 
04.60m	0:00:26	JDM	Joint displaced medium - Severity 3 Displaced Joint identified, with no evidence to suggest that this is resulting in any issues at present however the condition of this may deteriorate over a period of time.	Image Provided - Ref: 19_4 
05.00m	0:00:30	JDM	Joint displaced medium - Severity 3 Displaced Joint identified, with no evidence to suggest that this is resulting in any issues at present however the condition of this may deteriorate over a period of time.	Image Provided - Ref: 19_5 

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
05.00m		MHF	Finish node type, manhole ENTERS SVP	Image Provided - Ref: 19_9999 

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

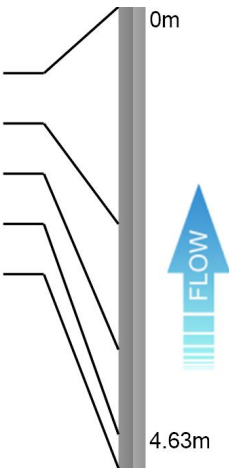
Section 21

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: MH4 B1	Finish Node Ref: GULLY POT	Direction: U	Height/Dia: 100		
Start Node Depth: 0.00	Finish Node Depth: 0.00	Use: F	Shape: C		
Start Node Coordinate:	Finish Node Coordinate:	Material: PP	Cleaned N		

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	4.63	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		20_0	
02.18m	REM	General remark		20_1	
03.44m	REM	General remark		20_2	0:00:23
04.29m	REM	General remark		20_3	0:00:32
04.63m	MHF	Finish node type, manhole		20_9	



Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 21

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH4 B1	Image Provided - Ref: 20_0
02.18m		REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 20_1
03.44m	0:00:23	REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 20_2

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
04.29m	0:00:32	REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 20_3  Swan Pub Basingstoke Road Reading RG71AT M/H4 Branch 1 Gully Pot 12.18.33.26 JUN 2024 4.29m
04.63m		MHF	Finish node type, manhole ENTERS GULLY POT	Image Provided - Ref: 20_9999  Swan Pub Basingstoke Road Reading RG71AT M/H4 Branch 1 Gully Pot 12.18.43.26 JUN 2024 4.63m

Total Defects for section

DRB Grade for Section



Site: Basingstoke Road, Reading

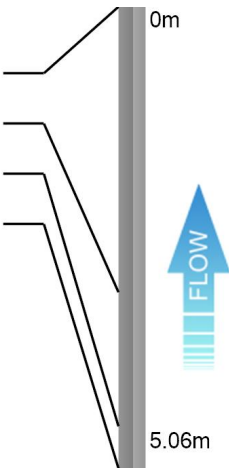
Section 22

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH8 BR1 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	SVP 0.00	Direction: U Use: F Material: PP	Height/Dia: 100 Shape: C Cleaned: N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	5.06	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		21_0	
03.13m	REM	General remark		21_1	
04.60m	JDM	Joint displaced medium		21_2	0:00:21
05.06m	MHF	Finish node type, manhole		21_9	



Total Defects for section



DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 22

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH8 BR1	Image Provided - Ref: 21_0 
03.13m		REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 21_1 
04.60m	0:00:21	JDM	Joint displaced medium - Severity 3 Displaced Joint identified, with no evidence to suggest that this is resulting in any issues at present however the condition of this may deteriorate over a period of time.	Image Provided - Ref: 21_2 

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
05.06m		MHF	Finish node type, manhole ENTERS SVP	Image Provided - Ref: 21_9999 

Total Defects for section



DRB Grade for Section



Site: Basingstoke Road, Reading

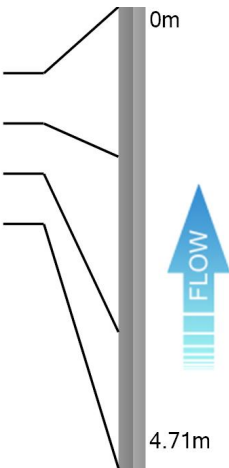
Section 23

Client: The Swan	Location (Street Name): Basingstoke Road	City/Town/Village Reading	Cust Job Ref.	Surveyors Name: Ben Clarke	Date: 28/06/2024
Start Node Ref: Start Node Depth: Start Node Coordinate:	MH8 BR2 0.00	Finish Node Ref: Finish Node Depth: Finish Node Coordinate:	GULLY POT 0.00	Direction: Use: Material:	U F PP Height/Dia: 100 Shape: C Cleaned N

Node Type	Cover Condition	Benching Condition	1/2 Channel Condition	Node Condition Remarks
MH	Good ✓	Good ✓		

Drain Type	Lining Type	Lining Mat.	Year Const.	Weather	Flow Cont.	Length	General Remarks
A				D	N	4.71	

Position	Code	Description	CD	Pic	Video Ref
00.00m	MH	Start node type, manhole		22_0	
01.53m	REM	General remark		22_1	
03.32m	CU	Loss of vision		22_2	0:00:14
04.71m	MHF	Finish node type, manhole		22_9	



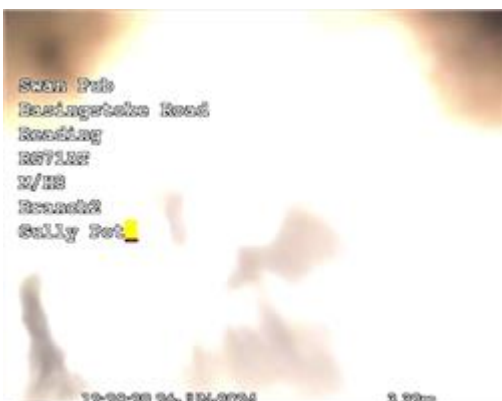
Total Defects for section

DRB Grade for Section



Descriptive Report with Remarks and Observation Images

Section 23

Pos	Video Ref	Code	Description	Image
00.00m		MH	Start node type, manhole MH8 BR2	Image Provided - Ref: 22_0 
01.53m		REM	General remark ADVISORY - CLEANING WORKS REQUIRED	Image Provided - Ref: 22_1 
03.32m	0:00:14	CU	Loss of vision LOSS OF VISION - CLEANING WORKS REQUIRED	Image Provided - Ref: 22_2 

Total Defects for section



DRB Grade for Section



Pos	Video Ref	Code	Description	Image
04.71m		MHF	Finish node type, manhole ENTERS GULLY POT	Image Provided - Ref: 22_9999 Swan Pub Basingstoke Road Reading RG71AT M/H8 Branch2 Gully Pot  12 28 43 26 JUN 20244.71m

Total Defects for section



DRB Grade for Section



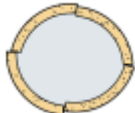
A guide to defects and other observations in drainage systems

More detailed information can be found in the National Standard (BS EN 13508-1:2003) and in the Manual of Sewer Condition Classification (MSCC) 5th Edition, written by the Water Research Centre (WRC).

Use	
Code	Description
C	Combined
F	Foul
S	Surface Water
T	Trade Effluent
W	Culverted Watercourse
Z	Other

Common Materials	
Code	Description
VC	Vitrified Clay
PVC	Polyvinyl Chloride
CO	Concrete
CI	Cast Iron
PF	Pitch Fibre
PE	Polyethylene
DI	Ductile Iron

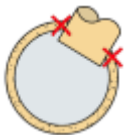
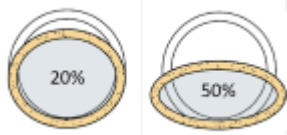
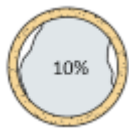
Start Node	Description	Finish Node
MH	Manhole	MHF
IC	Inspection Chamber	ICF
GY	Gulley	GYF
RE	Rodding Eye	REF
SK	Soakaway	SKF
BN	Buchan Trap	BNF
BR	Major Connection without Ref	BRF
CP	Catch Pit	CPF
OC	Other Special Chamber	OCF
OF	Outfall	OFF
OS	Oil Separator	OSF
WR	Winser Trap	WRF
LH	Lamphole	LHF

Code	Observation	Description	Attributes	
B	Broken	Pieces pipe have visibly moved	Defined by clock references. Associated with deformity in rigid pipe	
CC CL CM CR	Cracks	Cracks are break lines that are not visibly open	Defined by clock reference position/s. Longitudinal and radiating cracks attract only one clock reference	
CN	Connection	Lateral pipe has been connected after original construction	Described by clock reference position and diameter	

Total Defects for section

DRB Grade for Section



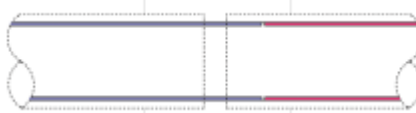
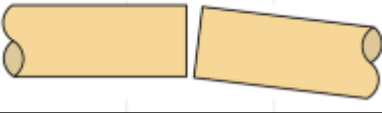
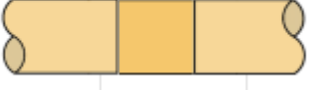
CX(I)	Defective Connection (Intruding)	Defective by intrusion or damage due to factors including: cracks, fractures, obstruction, position etc	Described by clock reference position and diameter (+ % intrusion)	
CU	Loss of Vision	Lens of camera is obscured by debris, water etc. Operator is unable to see drain clearly	'W' can be added if loss of vision is due to water	
D	Deformed	Pipe has lost its structure	Described by percentage loss of height or width. Recorded in 5% increments	
DEE	Deposits Encrustation	Eg. Attached scale deposits evident	Described by clock referenced position and percentage loss of cross-sectional area (5% increments)	
DEG	Deposits Grease	Attached grease deposits evident	Described by clock referenced position and percentage loss of cross-sectional area (5% increments)	
DER DES	Deposits Coarse/Fine	Settled deposits on the invert of the pipe.	Described by percentage loss of height or diameter. Recorded in 5% increments.	
FC FL FM FR	Fractures	Fractures are visibly open. Pieces of pipe have not moved	Defined by clock reference position/s. Longitudinal and radiating fractures attract only one clock reference	
H	Holes	Section of pipe fabric is missing	Defined by clock reference location. Normally two clock references	
I	Infiltration	Water is infiltrating the pipe, normally via a joint but could be via another defect	Can be described in Remarks using terms such as Seeper, Dripper and Runner	
JDL	Joint Displaced Large	Pipe has moved at joint, perpendicular to axis of pipe	More than 1.5 times the pipe wall thickness must be visible	

Total Defects for section

DRB Grade for Section

0 0 0 0 0



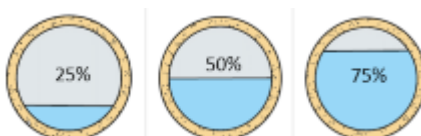
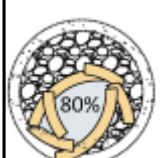
JDM	Joint Displaced Medium	Pipe has moved at joint, perpendicular to axis of pipe	Between 1 and 1.5 times the pipe wall thickness must be visible	
JN	Junction	Lateral pipe was installed at construction	Described by clock reference position and diameter	
JX	Defective Junction	Lateral pipe was installed at construction but is defective in some way	Joint can be defective due to factors including: cracks, fractures, obstruction, position etc	
LD LU LL LR	Line Deviation	LD = Line Down, LU = Line Up, LL = Line Left, LR = Line Right. Not related to CIPP lining.	Additional modifiers are added: Q = Quarter (22.5), H = Half (45), F = Full (90). In degrees.	
LC	Lining Changes	If the drain is lined, the lining material has changed	Position of lining material change	
MC	Material Change	The pipe material has changed	Position of change is noted. Type of material change can be defined	
OB	Obstruction/Obstacle	An obstruction or obstacle is affecting the flow through the pipe	Described in percentage loss of cross-sectional area	
OJL	Open Joint Large	Pipe has moved at joint, along the axis of pipe	More than 1.5 times the pipe wall thickness must be visible	
OJM	Open Joint Medium	Pipe has moved at joint, along the axis of pipe	Between 1 and 1.5 times the pipe wall thickness must be visible	
PC	Pipe Length Changes	Length of individual pipe changes	New length described at this position	

Total Defects for section

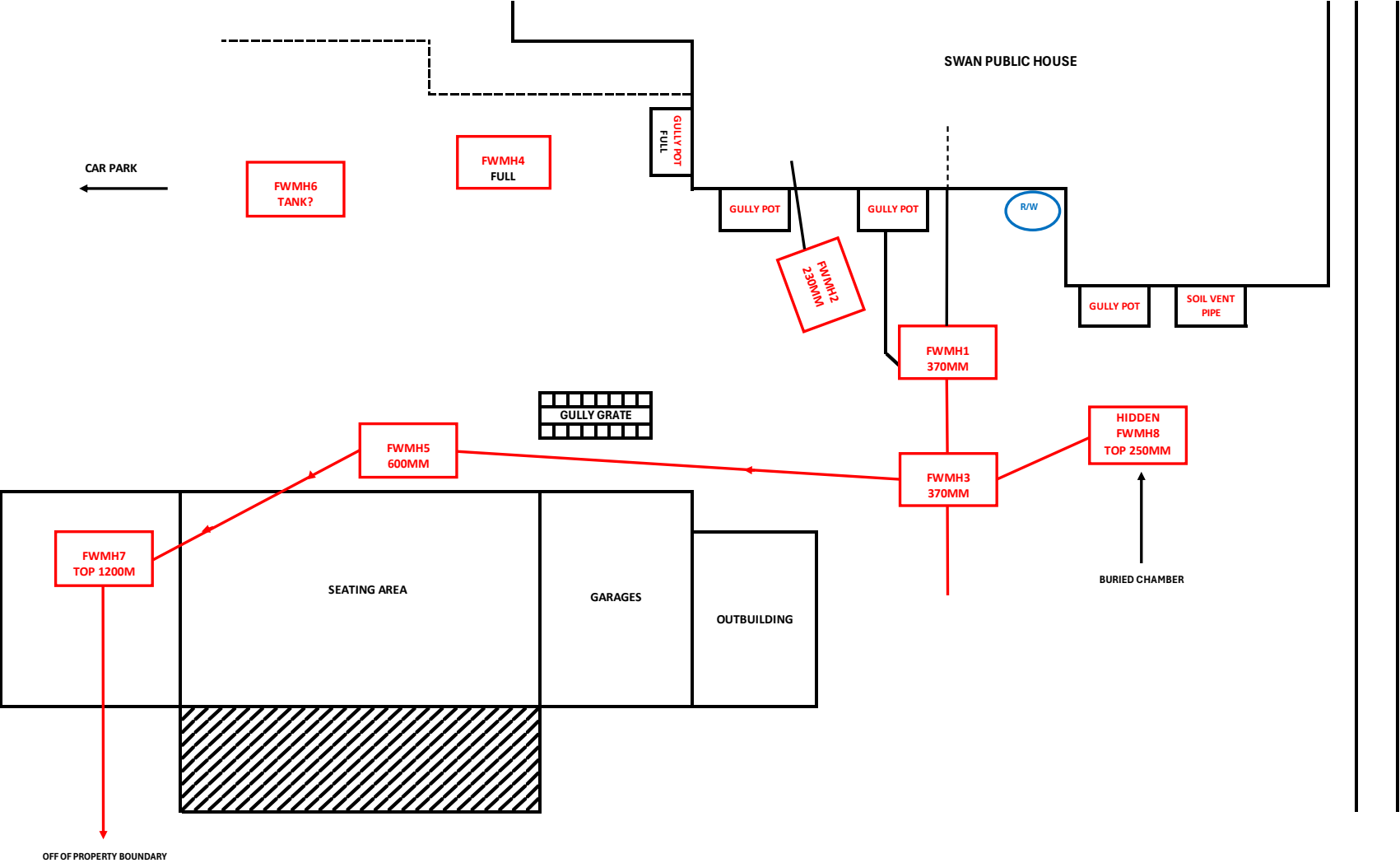
DRB Grade for Section

0 0 0 0 0



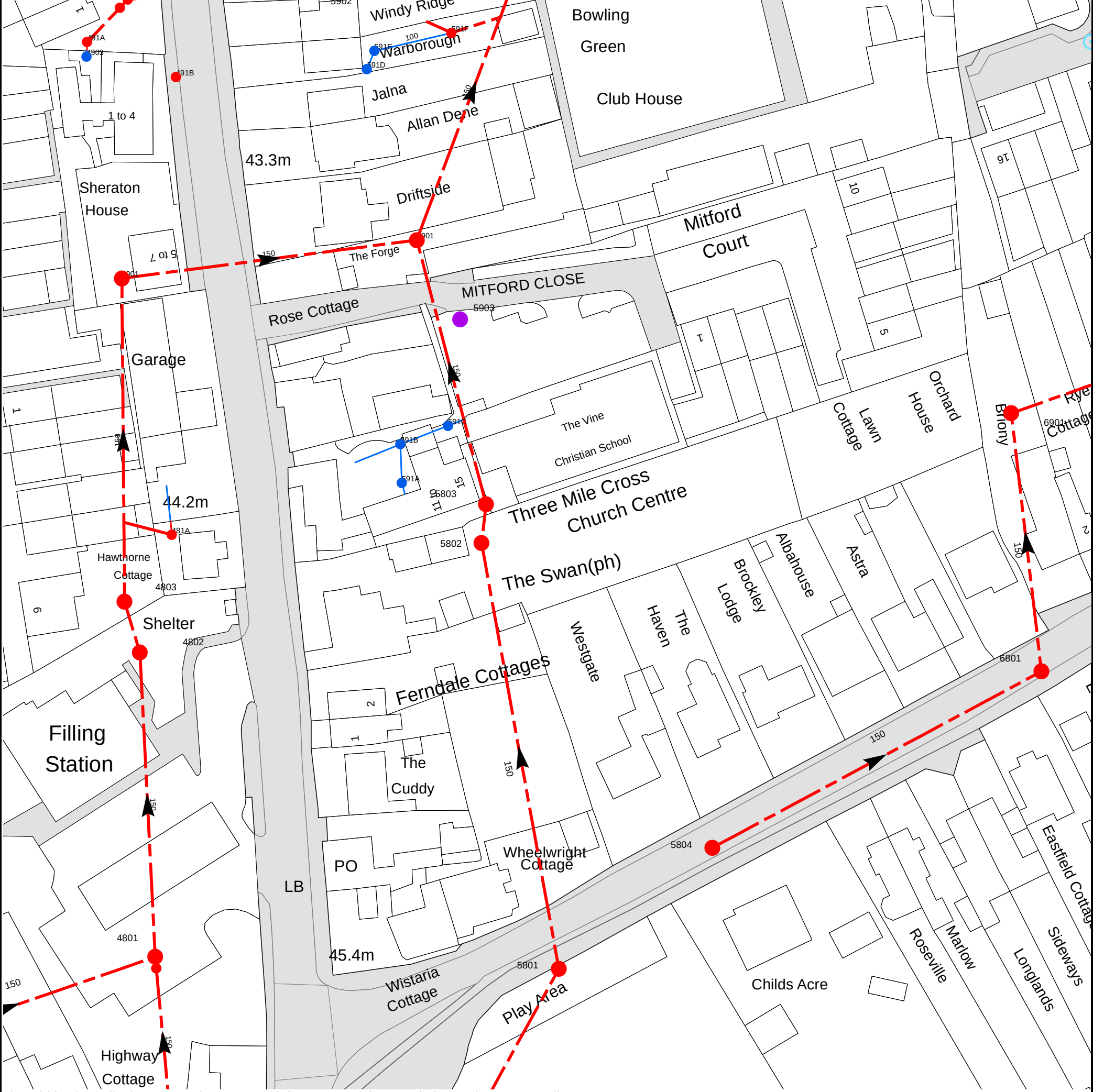
R	Roots	Evidence of root ingress	Roots will normally infiltrate via bad joints, cracks, fractures, breaks etc	
REM	Remark	General remark	Used for additional information	
S	Surface Damage	This might include corrosion, spalling and chemical attack	Position only. Additional information can be added in Remarks	
SA	Survey Abandoned	Used when a survey cannot continue for any reason	The reason for abandoning a survey should be noted in the remarks area	
SC	Shape Changes	Dimension of drain changes	Diameter dimension change recorded. Second dimension is recorded for no circular pipe changes	
SR	Sealing Ring	Sealing ring intrudes into pipe at joint	Described by clock reference position	
V	Vermin	Evidence of Vermin in pipe	Can also be used for evidence within manhole etc	
WL	Water Level	Used to record changes in water level. Always shown at the beginning of every survey, if dry noted as 00.	Described by percentage of height or diameter. Recorded in 5% increments	
XP	Collapsed	Drain is suffering from complete loss of structural integrity. Always followed by SA - Survey Abandoned	Percentage loss of cross-sectional area is recorded. Other related structural defects are not recorded	

Drainage Plan: The Swan, Basingstoke Road, Reading, RG7 1AT



Thames Water Sewer Records

Asset Location Search Sewer Map - ALS/ALS Standard/2024 5023583



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 471549,167891
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map (2020) with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
691E	42.82	41.54
4903	n/a	n/a
491A	42.8	41.72
4901	43.72	42.65
4902	42.73	40.64
491B	42.96	n/a
591D	n/a	n/a
591E	n/a	n/a
5901	44.17	42.24
591F	n/a	n/a
5903	n/a	n/a
5802	44.57	43.36
481A	n/a	n/a
5803	44.4	43.27
591A	n/a	n/a
591B	n/a	n/a
591C	n/a	n/a
5801	45.5	44.32
4801	45.54	43.24
4802	45.04	42.99
4803	44.53	42.95
5804	44.8	43.11
6901	n/a	n/a
6801	43.8	42.27
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.		



Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

	Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	Storm Sewer
	Sludge Sewer
	Foul Trunk Sewer
	Surface Trunk Sewer
	Combined Trunk Sewer
	Foul Rising Main
	Surface Water Rising Main
	Combined Rising Main
	Vacuum
	Thames Water Proposed
	Vent Pipe
	Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

	Sewer		Culverted Watercourse
	Proposed		Decommissioned Sewer
	Content of this drainage network is currently unknown		Ownership of this drainage network is currently unknown

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plan are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

	Air Valve		Meter
	Dam Chase		Vent
	Fitting		

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

	Ancillary		Drop Pipe
	Control Valve		Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

	Inlet		Outfall
	Undefined End		

Other Symbols

Symbols used on maps which do not fall under other general categories.

	Change of Characteristic Indicator		Public / Private Pumping Station
	Invert Level		Summit

Areas

Lines denoting areas of underground surveys, etc.

	Agreement
	Chamber
	Operational Site

Ducts or Crossings

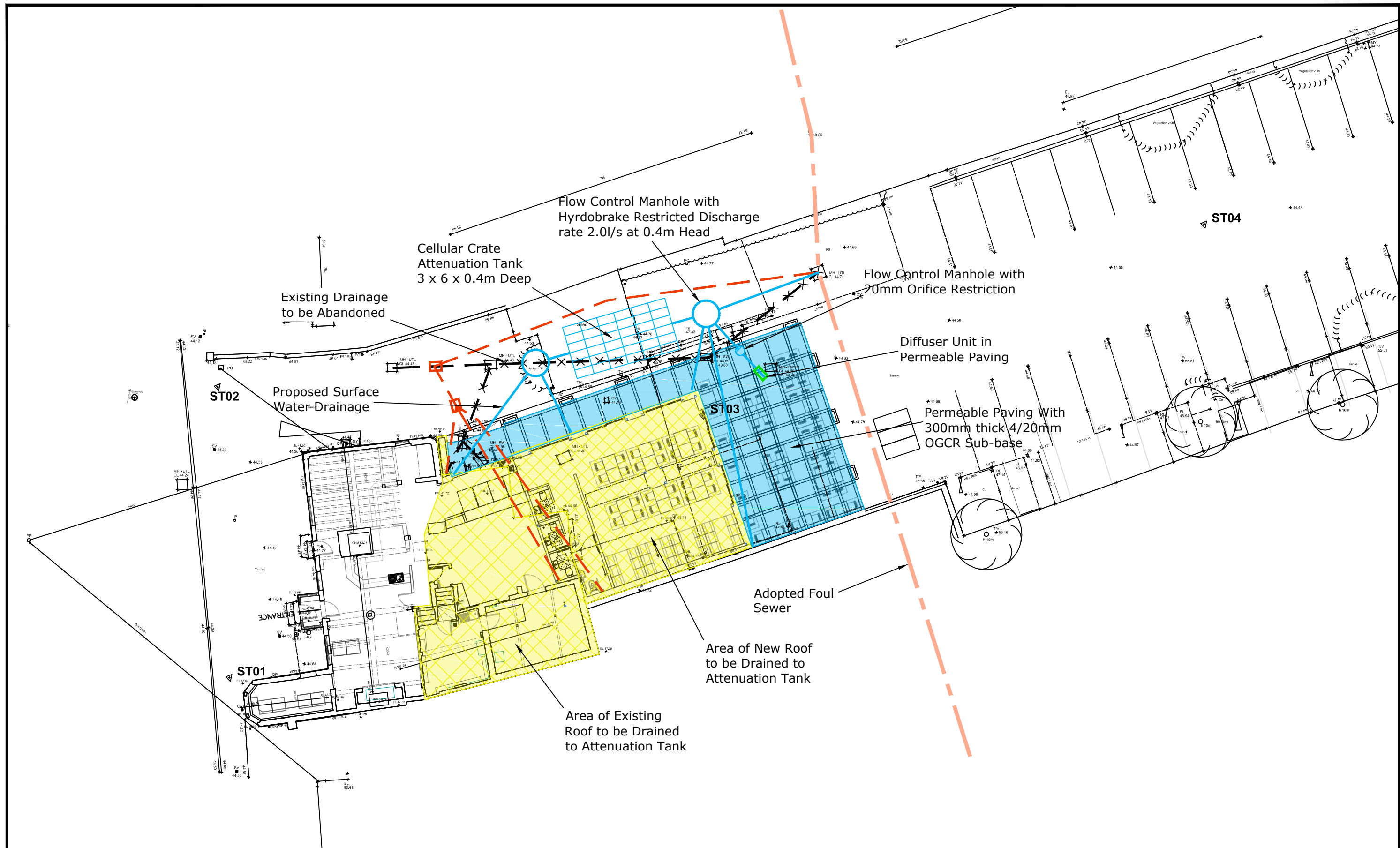
	Casement	Ducts may contain high voltage cables. Please check with Thames Water.
	Conduit Bridge	
	Subway	
	Tunnel	

5) 'na' or '0' on a manhole indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

APPENDIX C

Proposed Drainage Strategy – 241836/DS/01



The Swan
Public House

Proposed Drainage
Strategy

SCALE 1:200

DRAWN BY KBL

PRJ No. 241836

DWG No. 241836/DS/01

LANMOR Consulting
Civil Engineers & Transport Planning

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

APPENDIX D

MicroDrainage Calculations

Lanmor Consulting Ltd		Page 1
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW		
Date 09/09/2024 22:57 File	Designed by Kunal Checked by	
XP Solutions		
Source Control 2015.1		

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.150
Area (ha)	0.029	Urban	0.000
SAAR (mm)	700	Region Number	Region 6

Results 1/s

QBAR Rural	0.0
QBAR Urban	0.0
Q1 year	0.0
Q1 year	0.0
Q30 years	0.0
Q100 years	0.0

Lanmor Consulting Ltd				Page 1																							
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW																											
Date 09/09/2024 23:00 File																											
		Designed by Kunal Checked by																									
XP Solutions		Source Control 2015.1																									
Summary of Results for 1 year Return Period <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Control (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>60 min Summer</td><td>19.064</td><td>0.064</td><td>3.3</td><td>0.1</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Discharge Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>60 min Summer</td><td>11.871</td><td>0.0</td><td>3.4</td><td>32</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status	60 min Summer	19.064	0.064	3.3	0.1	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	60 min Summer	11.871	0.0	3.4	32
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status																						
60 min Summer	19.064	0.064	3.3	0.1	O K																						
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)																							
60 min Summer	11.871	0.0	3.4	32																							
©1982-2015 XP Solutions																											

Lanmor Consulting Ltd		Page 1
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW		
Date 09/09/2024 23:00 File	Designed by Kunal Checked by	
XP Solutions		Source Control 2015.1

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
60 min Summer	19.100	0.100	8.2	0.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Summer	28.763	0.0	8.3	32

Lanmor Consulting Ltd		Page 1
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW		
Date 09/09/2024 23:01 File	Designed by Kunal Checked by	
XP Solutions		Source Control 2015.1

Summary of Results for 100 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
60 min Summer	19.114	0.114	10.6	0.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
60 min Summer	37.780	0.0	11.0	32

Lanmor Consulting Ltd		Page 3
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW		
Date 09/09/2024 23:24 File Cascade.casx	Designed by Kunal Checked by	
XP Solutions		Source Control 2015.1

Cascade Rainfall Details for Paving.srcx

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	18.700	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.010

Time (mins) Area		
From:	To:	(ha)
0	4	0.010

Lanmor Consulting Ltd		Page 4
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW		
Date 09/09/2024 23:24 File Cascade.casx	Designed by Kunal Checked by	
XP Solutions Source Control 2015.1		

Cascade Model Details for Paving.srcx

Storage is Online Cover Level (m) 20.000

Porous Car Park Structure

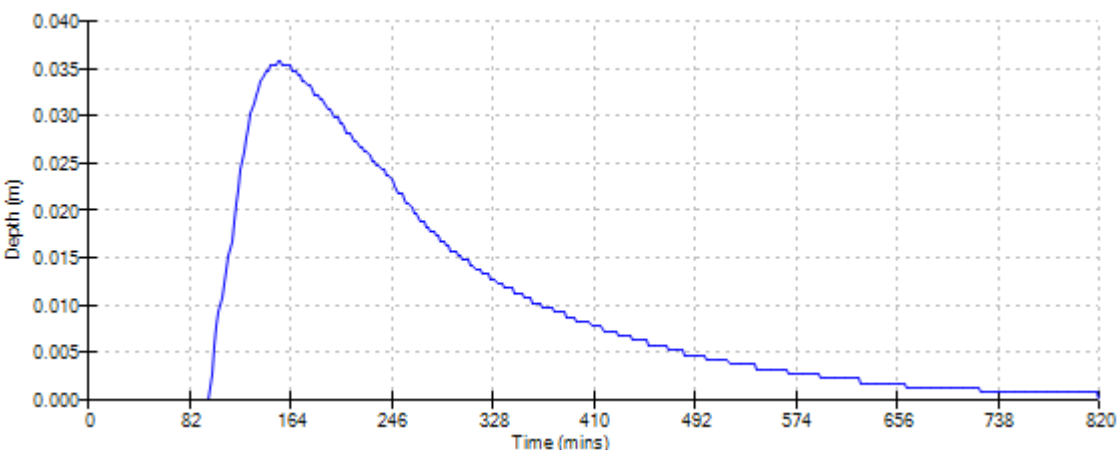
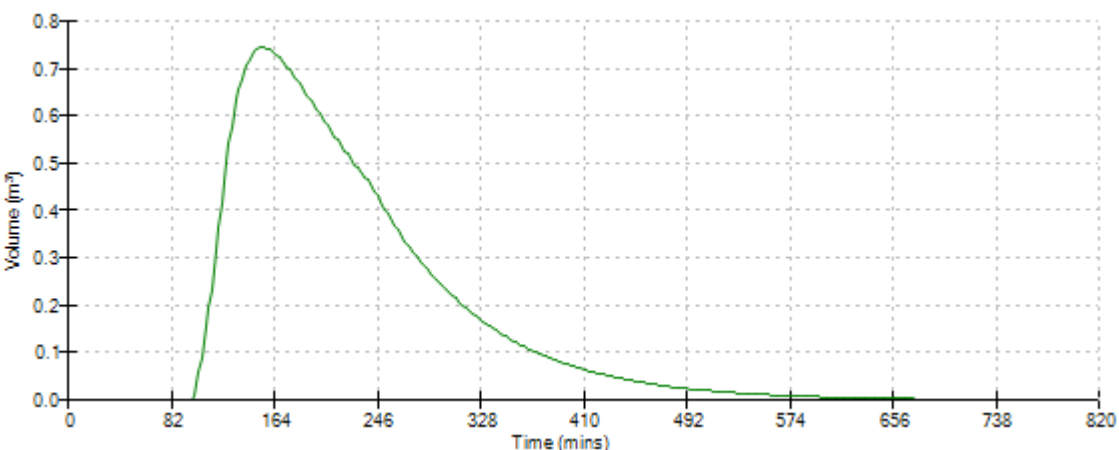
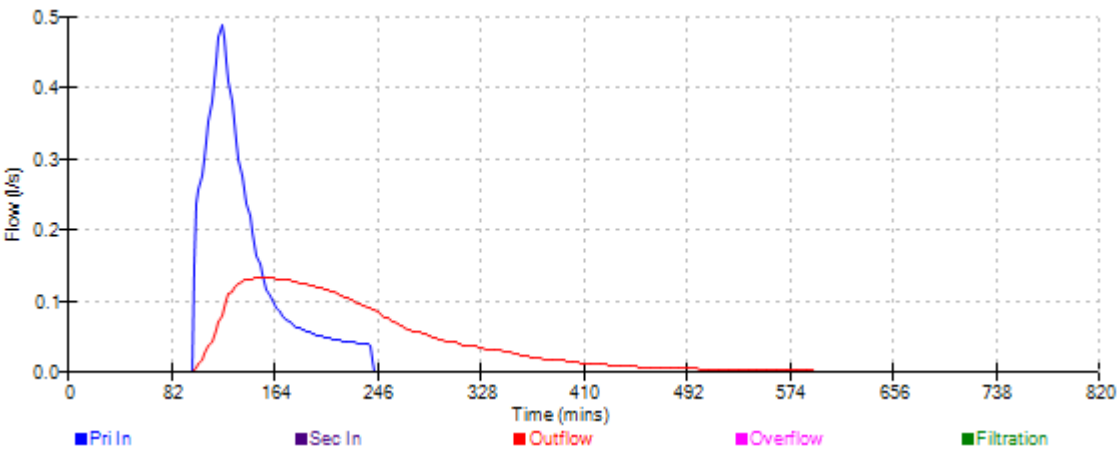
Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.0
Membrane Percolation (mm/hr)	1000	Length (m)	12.0
Max Percolation (l/s)	23.3	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	19.500	Cap Volume Depth (m)	0.300

Orifice Outflow Control

Diameter (m) 0.020 Discharge Coefficient 0.600 Invert Level (m) 19.500

©1982-2015 XP Solutions

Cascade Event: 240 min Summer for Paving.srcx



Lanmor Consulting Ltd		Page 3																																	
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW																																			
Date 09/09/2024 23:23 File Cascade.casx	Designed by Kunal Checked by																																		
XP Solutions Source Control 2015.1																																			
<u>Cascade Rainfall Details for Paving.srcx</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>30</td> <td>Cv (Summer)</td> <td>1.000</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>1.000</td> </tr> <tr> <td>M5-60 (mm)</td> <td>18.700</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.400</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+0</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.010 <table> <tr> <th colspan="2">Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To:</th> <th>(ha)</th> </tr> <tr> <td>0</td> <td>4</td> <td>0.010</td> </tr> </table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	30	Cv (Summer)	1.000	Region	England and Wales	Cv (Winter)	1.000	M5-60 (mm)	18.700	Shortest Storm (mins)	15	Ratio R	0.400	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+0	Time (mins)		Area	From:	To:	(ha)	0	4	0.010
Rainfall Model	FSR	Winter Storms	Yes																																
Return Period (years)	30	Cv (Summer)	1.000																																
Region	England and Wales	Cv (Winter)	1.000																																
M5-60 (mm)	18.700	Shortest Storm (mins)	15																																
Ratio R	0.400	Longest Storm (mins)	10080																																
Summer Storms	Yes	Climate Change %	+0																																
Time (mins)		Area																																	
From:	To:	(ha)																																	
0	4	0.010																																	
©1982-2015 XP Solutions																																			

Lanmor Consulting Ltd		Page 4
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW		
Date 09/09/2024 23:23 File Cascade.casx	Designed by Kunal Checked by	
XP Solutions Source Control 2015.1		

Cascade Model Details for Paving.srcx

Storage is Online Cover Level (m) 20.000

Porous Car Park Structure

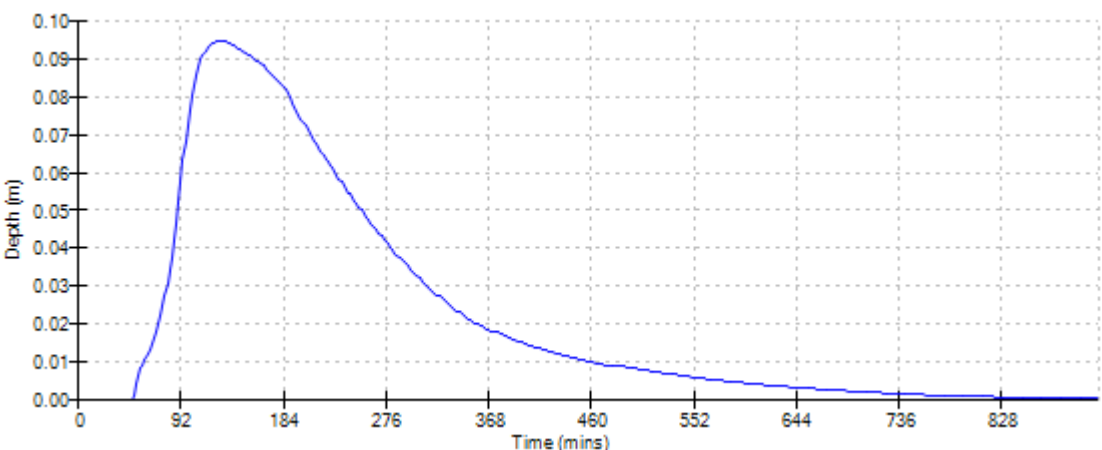
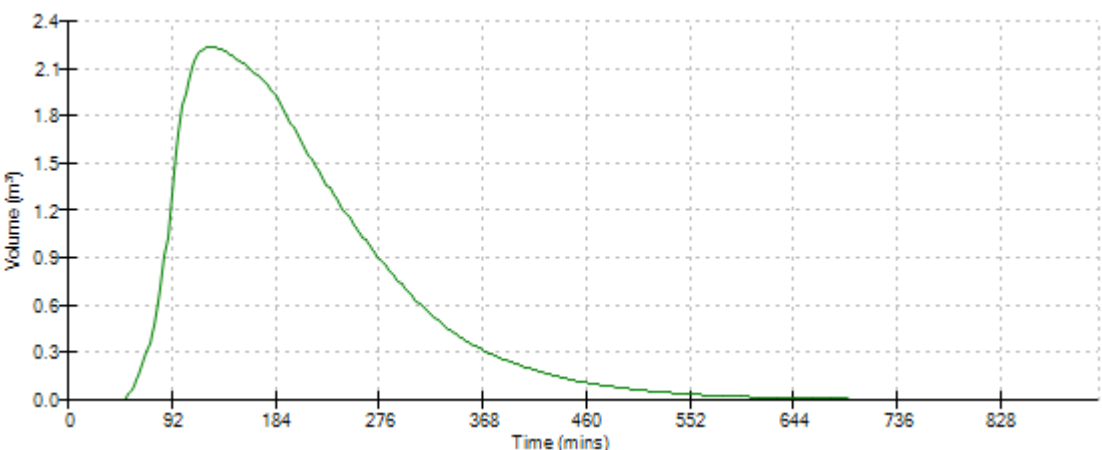
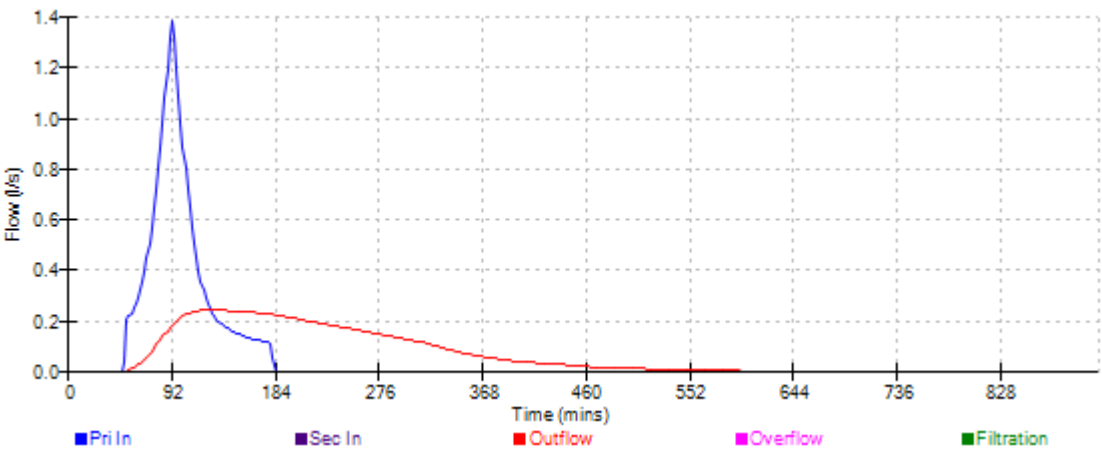
Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.0
Membrane Percolation (mm/hr)	1000	Length (m)	12.0
Max Percolation (l/s)	23.3	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	19.500	Cap Volume Depth (m)	0.300

Orifice Outflow Control

Diameter (m) 0.020 Discharge Coefficient 0.600 Invert Level (m) 19.500

©1982-2015 XP Solutions

Cascade Event: 180 min Summer for Paving.srcx



Lanmor Consulting Ltd		Page 3																																	
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW																																			
Date 09/09/2024 23:20 File Cascade.casx	Designed by Kunal Checked by																																		
XP Solutions Source Control 2015.1																																			
<u>Cascade Rainfall Details for Paving.srcx</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>1.000</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>1.000</td> </tr> <tr> <td>M5-60 (mm)</td> <td>18.700</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.400</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+0</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.010 <table> <tr> <th colspan="2">Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To:</th> <th>(ha)</th> </tr> <tr> <td>0</td> <td>4</td> <td>0.010</td> </tr> </table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	100	Cv (Summer)	1.000	Region	England and Wales	Cv (Winter)	1.000	M5-60 (mm)	18.700	Shortest Storm (mins)	15	Ratio R	0.400	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+0	Time (mins)		Area	From:	To:	(ha)	0	4	0.010
Rainfall Model	FSR	Winter Storms	Yes																																
Return Period (years)	100	Cv (Summer)	1.000																																
Region	England and Wales	Cv (Winter)	1.000																																
M5-60 (mm)	18.700	Shortest Storm (mins)	15																																
Ratio R	0.400	Longest Storm (mins)	10080																																
Summer Storms	Yes	Climate Change %	+0																																
Time (mins)		Area																																	
From:	To:	(ha)																																	
0	4	0.010																																	
©1982-2015 XP Solutions																																			

Lanmor Consulting Ltd		Page 4
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW		
Date 09/09/2024 23:20 File Cascade.casx	Designed by Kunal Checked by	
XP Solutions Source Control 2015.1		

Cascade Model Details for Paving.srcx

Storage is Online Cover Level (m) 20.000

Porous Car Park Structure

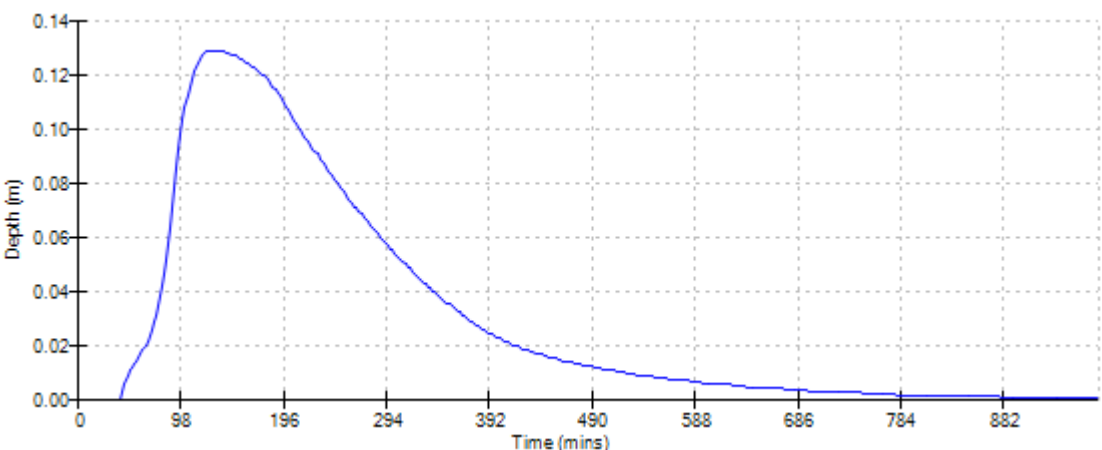
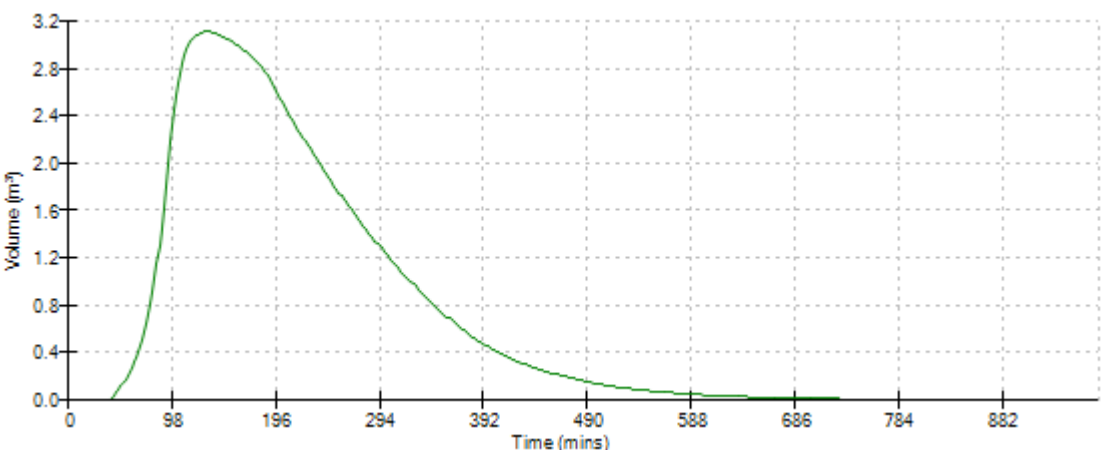
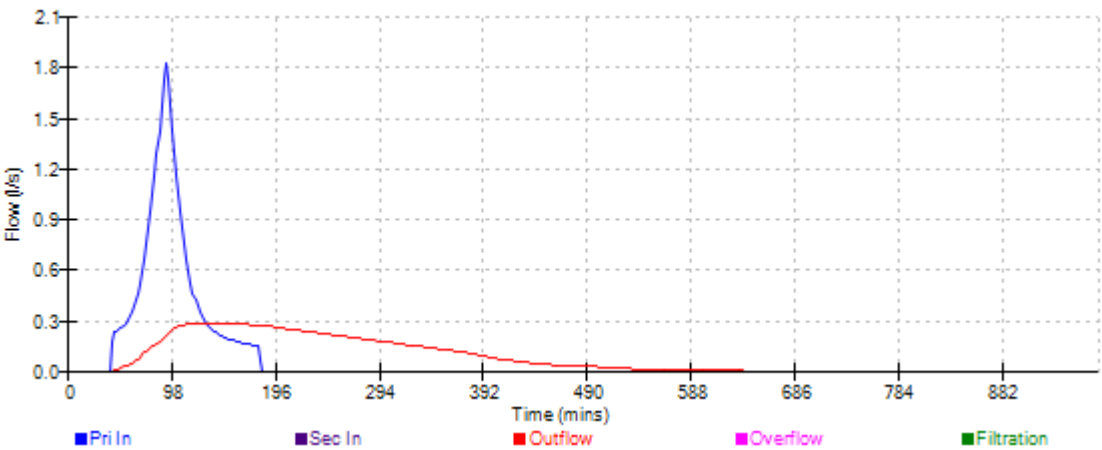
Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.0
Membrane Percolation (mm/hr)	1000	Length (m)	12.0
Max Percolation (l/s)	23.3	Slope (1:X)	1000.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	19.500	Cap Volume Depth (m)	0.300

Orifice Outflow Control

Diameter (m) 0.020 Discharge Coefficient 0.600 Invert Level (m) 19.500

©1982-2015 XP Solutions

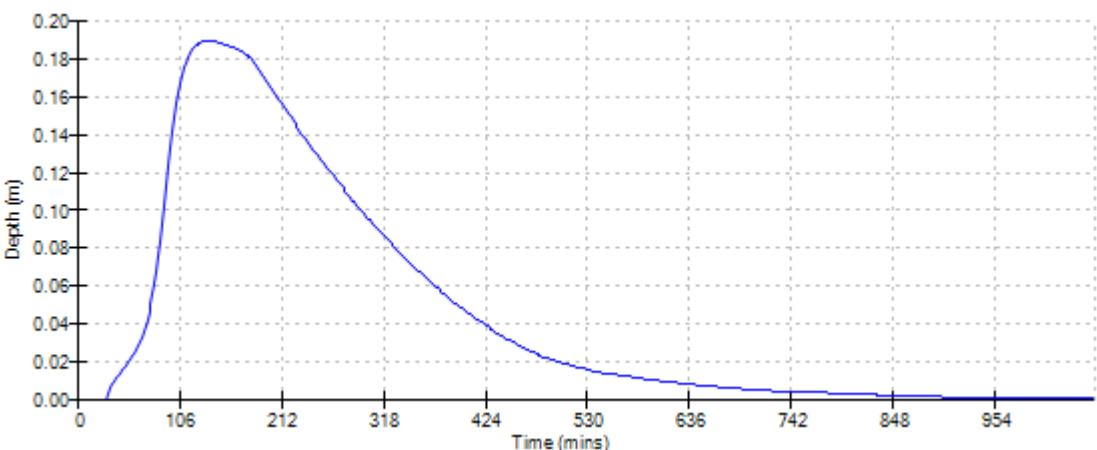
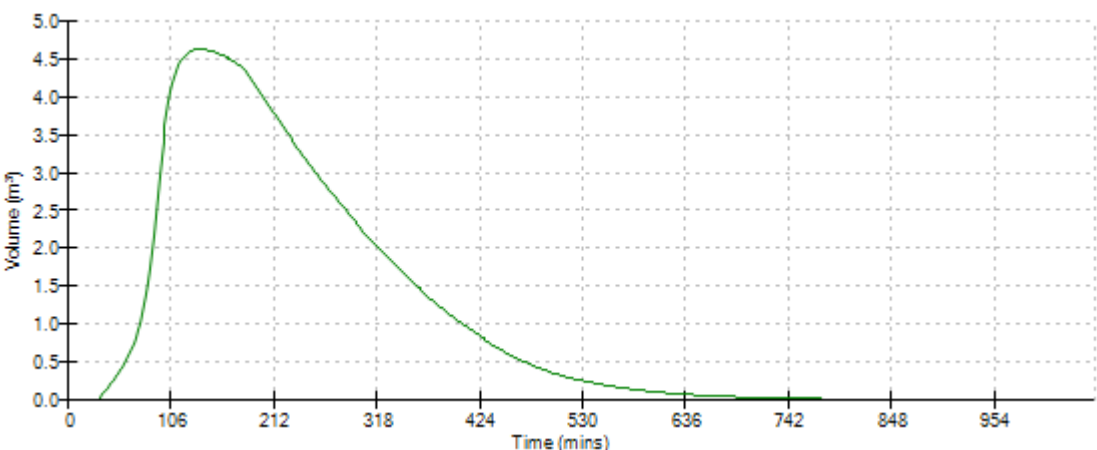
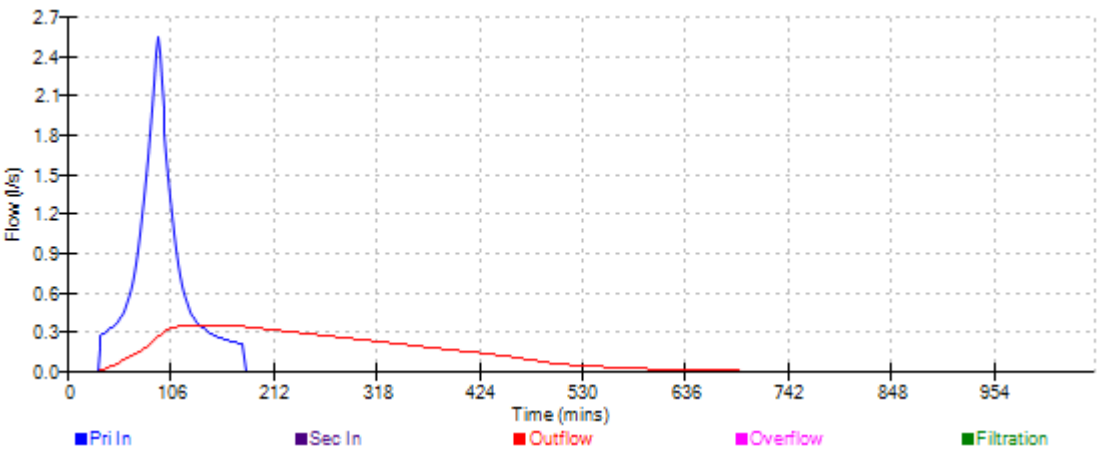
Cascade Event: 180 min Summer for Paving.srcx



Lanmor Consulting Ltd		Page 3																																	
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW																																			
Date 09/09/2024 23:16 File Cascade.casx	Designed by Kunal Checked by																																		
XP Solutions Source Control 2015.1																																			
<u>Cascade Rainfall Details for Paving.srcx</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>1.000</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>1.000</td> </tr> <tr> <td>M5-60 (mm)</td> <td>18.700</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.400</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.010 <table> <tr> <th colspan="2">Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To:</th> <th>(ha)</th> </tr> <tr> <td>0</td> <td>4</td> <td>0.010</td> </tr> </table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	100	Cv (Summer)	1.000	Region	England and Wales	Cv (Winter)	1.000	M5-60 (mm)	18.700	Shortest Storm (mins)	15	Ratio R	0.400	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+40	Time (mins)		Area	From:	To:	(ha)	0	4	0.010
Rainfall Model	FSR	Winter Storms	Yes																																
Return Period (years)	100	Cv (Summer)	1.000																																
Region	England and Wales	Cv (Winter)	1.000																																
M5-60 (mm)	18.700	Shortest Storm (mins)	15																																
Ratio R	0.400	Longest Storm (mins)	10080																																
Summer Storms	Yes	Climate Change %	+40																																
Time (mins)		Area																																	
From:	To:	(ha)																																	
0	4	0.010																																	
©1982-2015 XP Solutions																																			

Lanmor Consulting Ltd		Page 4																								
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW																										
Date 09/09/2024 23:16 File Cascade.casx	Designed by Kunal Checked by																									
XP Solutions		Source Control 2015.1																								
<u>Cascade Model Details for Paving.srcx</u> Storage is Online Cover Level (m) 20.000 <u>Porous Car Park Structure</u> <table><tr><td>Infiltration Coefficient Base (m/hr)</td><td>0.00000</td><td>Width (m)</td><td>7.0</td></tr><tr><td>Membrane Percolation (mm/hr)</td><td>1000</td><td>Length (m)</td><td>12.0</td></tr><tr><td>Max Percolation (l/s)</td><td>23.3</td><td>Slope (1:X)</td><td>1000.0</td></tr><tr><td>Safety Factor</td><td>2.0</td><td>Depression Storage (mm)</td><td>5</td></tr><tr><td>Porosity</td><td>0.30</td><td>Evaporation (mm/day)</td><td>3</td></tr><tr><td>Invert Level (m)</td><td>19.500</td><td>Cap Volume Depth (m)</td><td>0.300</td></tr></table> <u>Orifice Outflow Control</u> Diameter (m) 0.020 Discharge Coefficient 0.600 Invert Level (m) 19.500			Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.0	Membrane Percolation (mm/hr)	1000	Length (m)	12.0	Max Percolation (l/s)	23.3	Slope (1:X)	1000.0	Safety Factor	2.0	Depression Storage (mm)	5	Porosity	0.30	Evaporation (mm/day)	3	Invert Level (m)	19.500	Cap Volume Depth (m)	0.300
Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	7.0																							
Membrane Percolation (mm/hr)	1000	Length (m)	12.0																							
Max Percolation (l/s)	23.3	Slope (1:X)	1000.0																							
Safety Factor	2.0	Depression Storage (mm)	5																							
Porosity	0.30	Evaporation (mm/day)	3																							
Invert Level (m)	19.500	Cap Volume Depth (m)	0.300																							
©1982-2015 XP Solutions																										

Cascade Event: 180 min Summer for Paving.srcx



Lanmor Consulting Ltd		Page 3
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW		
Date 09/09/2024 23:24 File Cascade.casx	Designed by Kunal Checked by	
XP Solutions Source Control 2015.1		

Cascade Rainfall Details for Tank.srcx

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	1	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	18.700	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.019

Time (mins)	Area
From:	To: (ha)
0	4 0.019

©1982-2015 XP Solutions

Lanmor Consulting Ltd		Page 4
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW		
Date 09/09/2024 23:24 File Cascade.casx	Designed by Kunal Checked by	
XP Solutions Source Control 2015.1		

Cascade Model Details for Tank.srcx

Storage is Online Cover Level (m) 20.000

Cellular Storage Structure

Invert Level (m) 19.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	18.0	18.0	0.401	0.0	25.2
0.400	18.0	25.2			

Hydro-Brake Optimum® Outflow Control

Unit Reference MD-SHE-0075-2000-0400-2000
Design Head (m) 0.400
Design Flow (l/s) 2.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 75
Invert Level (m) 19.000
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

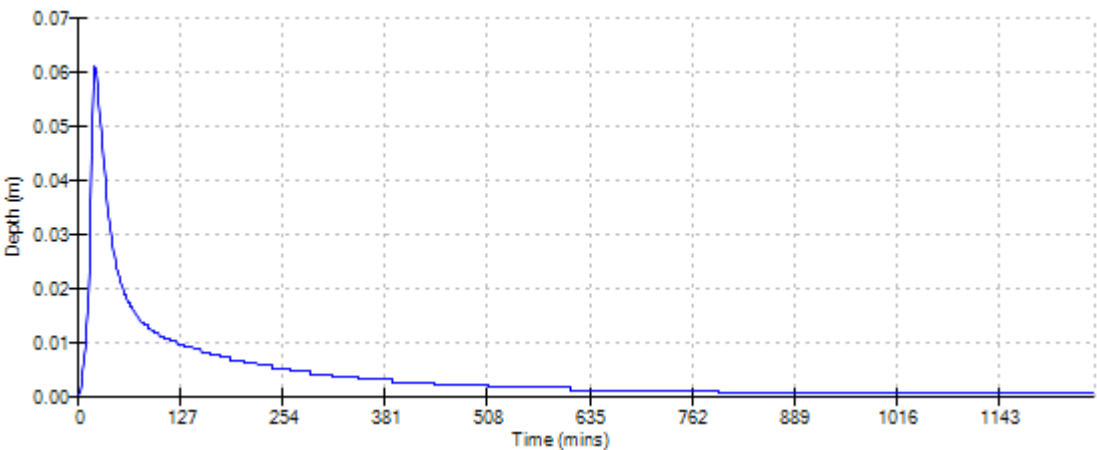
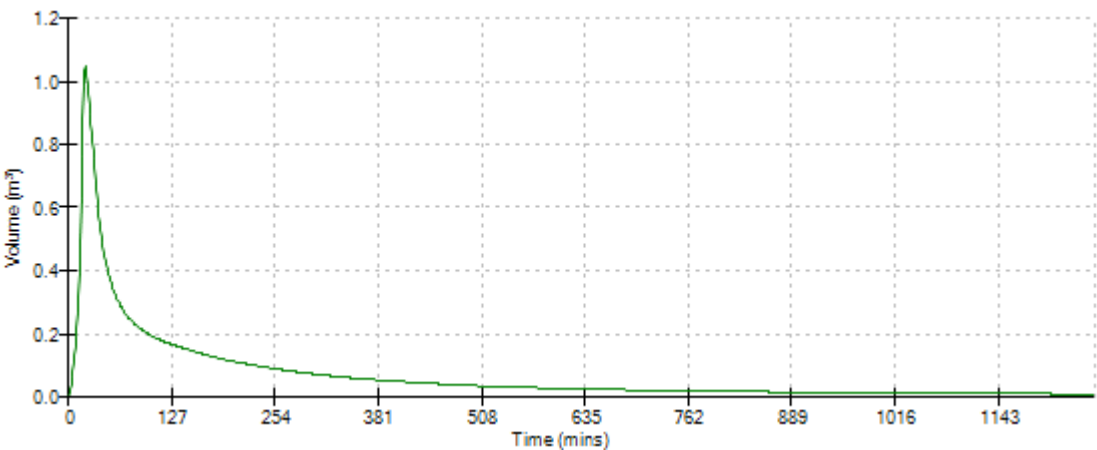
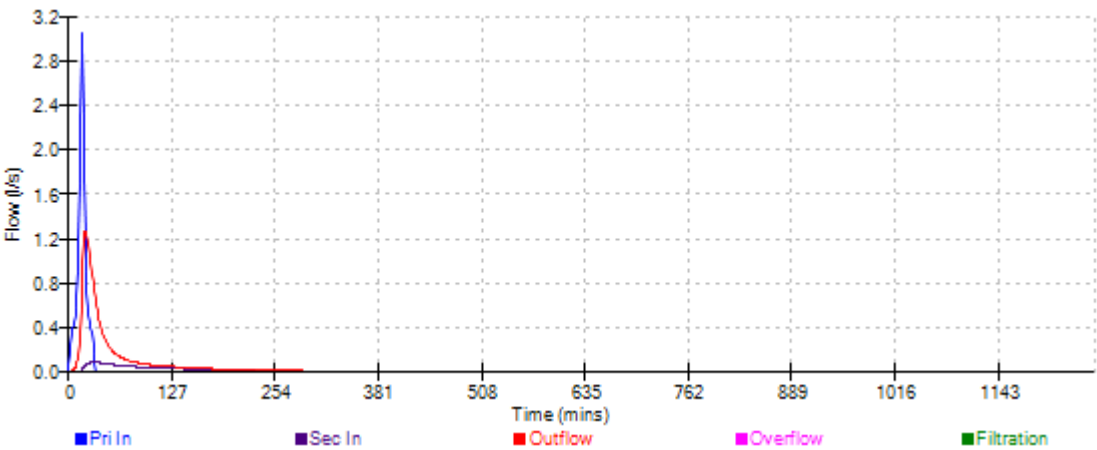
Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	2.0
Flush-Flo™	0.124	2.0
Kick-Flo®	0.285	1.7
Mean Flow over Head Range	-	1.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.0	1.200	3.3	3.000	5.0	7.000	7.5
0.200	1.9	1.400	3.5	3.500	5.4	7.500	7.8
0.300	1.7	1.600	3.7	4.000	5.7	8.000	8.1
0.400	2.0	1.800	3.9	4.500	6.0	8.500	8.3
0.500	2.2	2.000	4.1	5.000	6.4	9.000	8.6
0.600	2.4	2.200	4.3	5.500	6.7	9.500	8.8
0.800	2.7	2.400	4.5	6.000	7.0		
1.000	3.0	2.600	4.7	6.500	7.3		

©1982-2015 XP Solutions

Cascade Event: 30 min Summer for Tank.srcx



Upstream Structures	Outflow To	Overflow To
------------------------	------------	-------------

Half Drain Time : 16 minutes.

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
----------------	-----------------	--	--	---------------------

©1982-2015 XP Solutions

Lanmor Consulting Ltd		Page 4
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW		
Date 09/09/2024 23:22 File Cascade.casx	Designed by Kunal Checked by	
XP Solutions Source Control 2015.1		

Cascade Model Details for Tank.srcx

Storage is Online Cover Level (m) 20.000

Cellular Storage Structure

Invert Level (m) 19.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	18.0	18.0	0.401	0.0	25.2
0.400	18.0	25.2			

Hydro-Brake Optimum® Outflow Control

Unit Reference MD-SHE-0075-2000-0400-2000
Design Head (m) 0.400
Design Flow (l/s) 2.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 75
Invert Level (m) 19.000
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

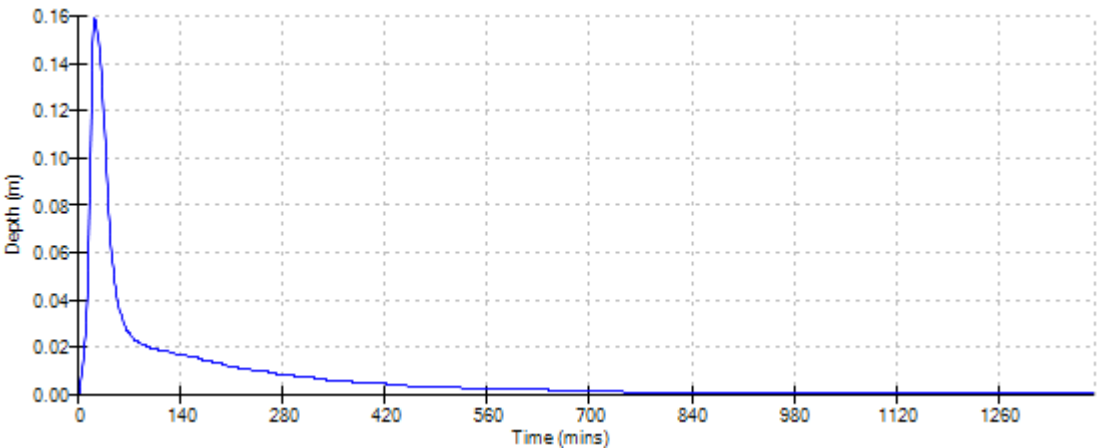
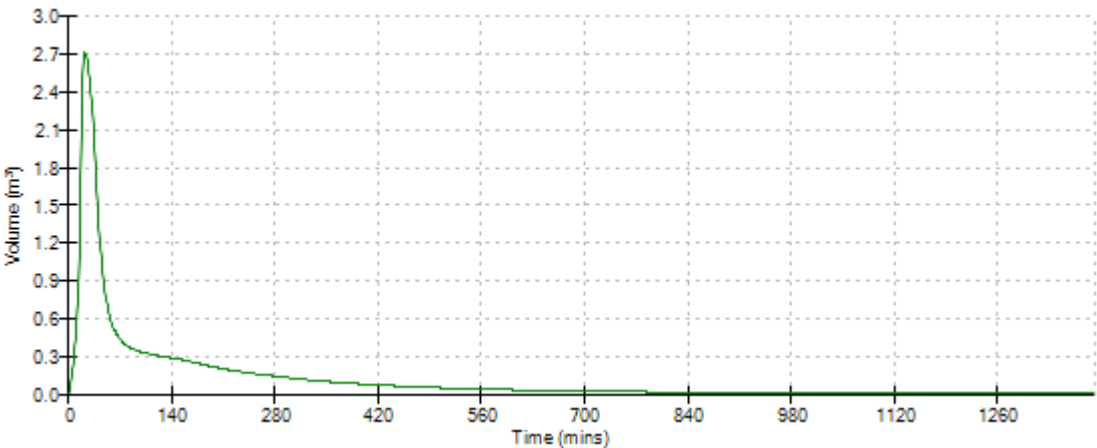
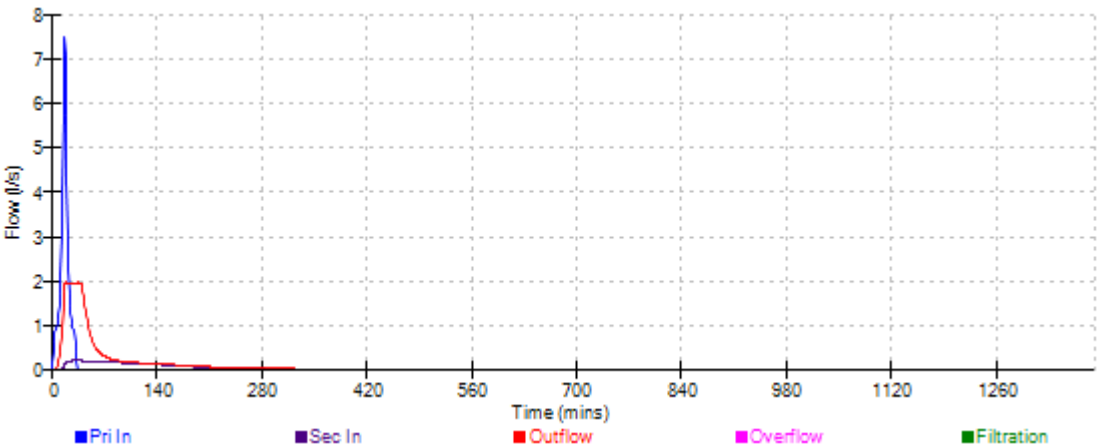
Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	2.0
Flush-Flo™	0.124	2.0
Kick-Flo®	0.285	1.7
Mean Flow over Head Range	-	1.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.0	1.200	3.3	3.000	5.0	7.000	7.5
0.200	1.9	1.400	3.5	3.500	5.4	7.500	7.8
0.300	1.7	1.600	3.7	4.000	5.7	8.000	8.1
0.400	2.0	1.800	3.9	4.500	6.0	8.500	8.3
0.500	2.2	2.000	4.1	5.000	6.4	9.000	8.6
0.600	2.4	2.200	4.3	5.500	6.7	9.500	8.8
0.800	2.7	2.400	4.5	6.000	7.0		
1.000	3.0	2.600	4.7	6.500	7.3		

©1982-2015 XP Solutions

Cascade Event: 30 min Summer for Tank.srcx



Lanmor Consulting Ltd		Page 3
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW		
Date 09/09/2024 23:19 File Cascade.casx	Designed by Kunal Checked by	
XP Solutions Source Control 2015.1		

Cascade Rainfall Details for Tank.srcx

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	1.000
Region	England and Wales	Cv (Winter)	1.000
M5-60 (mm)	18.700	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.019

Time (mins) Area		
From:	To:	(ha)
0	4	0.019

©1982-2015 XP Solutions

Lanmor Consulting Ltd		Page 4
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW		
Date 09/09/2024 23:19 File Cascade.casx	Designed by Kunal Checked by	
XP Solutions Source Control 2015.1		

Cascade Model Details for Tank.srcx

Storage is Online Cover Level (m) 20.000

Cellular Storage Structure

Invert Level (m) 19.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	18.0	18.0	0.401	0.0	25.2
0.400	18.0	25.2			

Hydro-Brake Optimum® Outflow Control

Unit Reference MD-SHE-0075-2000-0400-2000
Design Head (m) 0.400
Design Flow (l/s) 2.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 75
Invert Level (m) 19.000
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

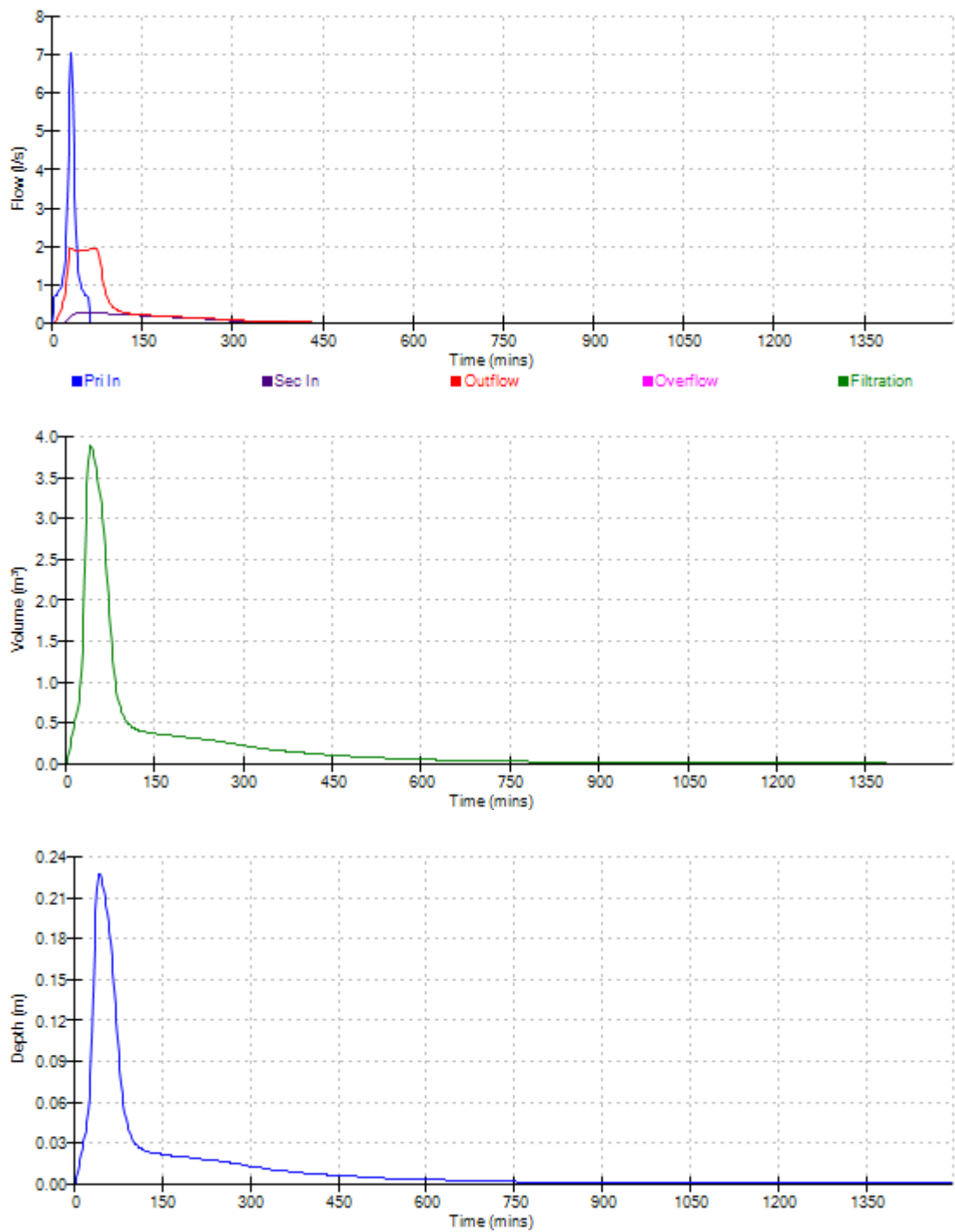
Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	2.0
Flush-Flo™	0.124	2.0
Kick-Flo®	0.285	1.7
Mean Flow over Head Range	-	1.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.0	1.200	3.3	3.000	5.0	7.000	7.5
0.200	1.9	1.400	3.5	3.500	5.4	7.500	7.8
0.300	1.7	1.600	3.7	4.000	5.7	8.000	8.1
0.400	2.0	1.800	3.9	4.500	6.0	8.500	8.3
0.500	2.2	2.000	4.1	5.000	6.4	9.000	8.6
0.600	2.4	2.200	4.3	5.500	6.7	9.500	8.8
0.800	2.7	2.400	4.5	6.000	7.0		
1.000	3.0	2.600	4.7	6.500	7.3		

©1982-2015 XP Solutions

Cascade Event: 60 min Summer for Tank.srcx



Lanmor Consulting Ltd		Page 4
Thorogood House 34 Tolworth Close Surbition Surrey KT6 7EW		
Date 09/09/2024 23:15 File Cascade.casx	Designed by Kunal Checked by	
XP Solutions Source Control 2015.1		

Cascade Model Details for Tank.srcx

Storage is Online Cover Level (m) 20.000

Cellular Storage Structure

Invert Level (m) 19.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	18.0	18.0	0.401	0.0	25.2
0.400	18.0	25.2			

Hydro-Brake Optimum® Outflow Control

Unit Reference MD-SHE-0075-2000-0400-2000
Design Head (m) 0.400
Design Flow (l/s) 2.0
Flush-Flo™ Calculated
Objective Minimise upstream storage
Diameter (mm) 75
Invert Level (m) 19.000
Minimum Outlet Pipe Diameter (mm) 100
Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	2.0
Flush-Flo™	0.124	2.0
Kick-Flo®	0.285	1.7
Mean Flow over Head Range	-	1.6

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake Optimum® as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.0	1.200	3.3	3.000	5.0	7.000	7.5
0.200	1.9	1.400	3.5	3.500	5.4	7.500	7.8
0.300	1.7	1.600	3.7	4.000	5.7	8.000	8.1
0.400	2.0	1.800	3.9	4.500	6.0	8.500	8.3
0.500	2.2	2.000	4.1	5.000	6.4	9.000	8.6
0.600	2.4	2.200	4.3	5.500	6.7	9.500	8.8
0.800	2.7	2.400	4.5	6.000	7.0		
1.000	3.0	2.600	4.7	6.500	7.3		

©1982-2015 XP Solutions

Cascade Event: 60 min Summer for Tank.srcx

