CONSULTING ENGINEER

DRAINAGE STRATEGY NOTE

Client: RWP Properties Ltd

Project: Former CSN Engineering

Site – Neath Abbey

Issue date: 07/11/2025

Job No: C2345

Revision: A

Prepared By:

Adam Jablonski

MEng (Hons)

Approved By

Dylan Huws

BEng (Hons), MSc, CEng MICE

Introduction

This Drainage Strategy Note has been prepared to support a planning submission for the development of a 2No. new industrial blocks with associated facilities including access road and car parking at the former CSN Engineering building, Neath Abbey Road, SA10 7BR.

Existing Site

The development site is located on the land to the east of the former CSN Engineering site, as demonstrated within Figure 1, with the site classified as a greenfield site. The site will utilise the existing site access to serve the development site.

Figure 1: Aerial View of Site

It is evident from the CCTV survey that the former CSN Engineering site is served by separate foul and storm positive drainage system. A private combined sewer is located to the west of the CSN Engineering site coming in from the Aldi store to the north. A second combined sewer is highlighted on DCWW public sewer records along the eastern boundary of the application site, however during initial investigation, the sewer has not been located.

From the CCTV survey it is evident that the existing CSN Engineering site is served by a positive storm drainage system, whereby similar to the combined system, pipework enters the site from the Aldi store carpark. The drainage system discharges in a southernly direction offsite.

A copy of the CCTV survey results is included in Appendix A and a mark up of the existing site plan and topographical survey is included in Appendix B.

Development Proposals

It is proposed to develop the land to the east of the former CSN Engineering site into a 2No. industrial blocks with associated car parking, hardstanding and landscaped areas. Further maintenance works are proposed to the existing private road running through the development, slightly widening it to 6.5m within the extent of existing hard standing, with existing drainage to be made good to suit. The proposed architectural site plan is included in Appendix C and the proposed Drainage Strategy is included in Appendix D.

A flood water consequences assessment has been commissioned to be undertaken by JBA Consulting. Please refer to their findings for further information.

From the 7th of January 2019 Schedule 3 of the Flood and Water Management Act has been implemented by the Welsh Government which requires any development of more than 1 unit or where the construction area is greater than 100m² to comply with the SuDS Approving Bodies (SAB's) design guidance and ministers' standards which will require all sites to adopt SuDs in their design. As this development site falls within this category the development site will require SAB approval.

Drainage Strategy

Foul Drainage

It is proposed that all foul flows are to be collected within a gravitational network, and discharges into the existing public combined sewer located to the west of the proposed development. The proposed point of connection will need to be confirmed via a slit trench to confirm an accurate line and level of the existing sewer.

The final connection will be subject to a S104 and S106 agreement with DCWW.

Surface Water Drainage

The primary objective of any surface water drainage strategy is to comply with The Flood and Water Management Act 2010 (Schedule 3) established in County Councils and requires new developments to include Sustainable Drainage Systems (SuDS) features that comply with national standards.

New developments of more than one dwelling or where the area covered by construction work equals or exceeds 100m2 require approval before construction can commence from the SuDS Approval Body (SAB).

The proposed surface water system and associated flows should discharge by one of the following mechanisms, shown below in order of preference;

- S1 – Surface Water Runoff Destination
- S2 – Surface Water Runoff Hydraulic Control
- S3 – Water Quality
- S4 – Amenity
- S5 – Biodiversity
- S6 – Design of Drainage for Construction, Operation and Maintenance

S1 - Surface Water Runoff Destination

Collection for use

A number of raingardens have been proposed across the development along with green roofing for the proposed bin store, with surface water to be reused through the hydration of planting. Further to this, as per the Statutory National Standards for Sustainable Drainage Systems (SNSSuDS) guidance, G1.4, the site displays exemption for further requirements of rainwater harvesting as there is no foreseeable demand for non-potable water on the site throughout its design life.

Infiltration Methods

Soakaway testing in accordance with BRE365 has been carried out on 29/10/25 by Integral Geotechnique Ref:14511. It was found that 3 out of 4 test pits across the site achieved a

suitable infiltration rate. As such, a hybrid surface water disposal solution is proposed for this development site with majority of the development utilising an infiltration disposal strategy, with a localised area at the access utilising a positive connection due to ground levels and negative infiltration results.

Based on the proposed site layout and the soakaway test results achieved within the proposed car park area, it is proposed that this location will serve as the primary infiltration zone for the surface water drainage system, with flows from the car park and roof runoff directed to this region. An overflow connection from the infiltration system will be provided into the existing identified surface water system. Runoff from the rear of the units is proposed to captured and discharged to ground at source through the use of permeable surfacing.

As an unviable infiltration result was achieved within the access road and due to the low level of the access road in comparison to the site wide car parking area, a positive connection to the existing on site private surface water sewer is proposed. A connection from the access into the main car park would drive the subbase deep which would increase the quantity of material to be excavated and increase the volume of subbase material required to be imported to site which is not a viable SuDs solution.

Draft infiltration test results are included in Appendix E.

Discharge to Water body

No watercourses were identified within the immediate vicinity of the site.

Discharge to Surface Water Sewer

During site investigation, Trial Pit SA2 at the site access did not achieve a viable infiltration result, as such it is proposed that the site access as indicated on the Drainage Strategy drawing included in Appendix D will be served by a positive connection. The site access will discharge at a controlled rate into the existing system serving the current CSN Engineering site.

Discharge to Combined Sewer

Based upon the above, the option should not be required.

S2 – Surface Water Runoff Hydraulic Control

This standard requires surface water to be managed to prevent as far as possible any discharge form the development for rainfall events less than 5mm. The surface water runoff rate and volume for up to a 1 in 100-year return period plus 30% climate change should be managed to protect people, properties, and the receiving water body.

A hybrid surface water disposal strategy will be utilised for the development site. As viable infiltration results were achieved onsite, an infiltration disposal solution will be utilised for majority of the development.

Three positive infiltration test results were recorded across the development, with testing conducted within what will form the proposed car park and two rear spaces behind each unit. Recorded infiltration rates varied between that of $1.2x10^{-5}$ m/s and $3.1x10^{-5}$ m/s, with the appropriate rates from each trial pit location utilised within modelling. A safety factor of 3 has been applied to all calculations.

The infiltration system will be designed to accommodate all flows onsite up to a return period of 100yr plus 30% climate change. At this maximum water level an overflow will be provided discharging into the positive system as a safety factor.

The infiltration system will utilise the proposed access and parking bay granular subbase to discharge the surface water runoff to ground.

The development site is classified as greenfield, as only small section of the land is used as asphalt access road. The greenfield discharge rate for the extent of development is 0.2l/s, however proposed discharge rates have been increased to 0.5l/s due to ensure buildability and maintenance of the flow control device. Surface water runoff will be attenuated within the lower level of access road subbase which will be designed with a permeable geotextile surround to promote infiltration where possible.

Calculations for both the infiltration and attenuated systems are included in Appendix F

A SuDS train will be required to achieve water quality and interception for the site, this will include a combination of raingardens, green roofing and permeable surfaces across the site.

Exceedance from the development site will typically be directed in a southernly direction, away from the proposed units and surrounding developments. The onsite system will be stressed tested to a 1 in 200yr event to identify possible flooding in the system.

S3 – Water Quality

This standard requires treatment of surface water runoff to prevent negative impacts on the receiving water quality and/or protect downstream drainage systems including sewers.

The aim of the surface water management strategy with regards to water quality is to use natural processes that promote biodiversity and long-term sustainability. As such, it employs a SuDS management train approach, providing drainage components in series.
In accordance with Table G3.1 from the Statutory Standards, the level of hazard will typically be classified as Low to Medium Hazard. Pollution is to be mitigated across the site, through a SuDS train consisting of onsite treatment through the use of planted raingardens and permeable surfacing.

S4 – Amenity

This standard requires that the design of the surface water management system should maximise amenity benefits.

The primary amenity focus of the SuDS scheme should be to improve the health and well-being of the users. The scheme will need to be based on natural forms that mimic natural landscapes found within the region. Other key amenity benefits should include improving air quality around the development, increasing carbon sequestration, and improving water quality through removal of pollutants.

S5 – Biodiversity

This standard requires that the surface water management system should maximise biodiversity benefits.

The SuDS scheme biodiversity strategy should revolve around the creation of significant and varied habitat to increase the overall biodiversity of the site and ecological value. The inclusion of plant species that will enhance the general eco system and simultaneously act as a water filtration system to clean pollutants and contaminants should be used and where possible provide meandering raingardens to maximise the variety of habitats available.

S6 – Design of Drainage for Construction and Maintenance and Structural Integrity

The surface water drainage system should be designed with the overriding ethos of simplicity in construction, use and maintenance. This then allows a very simple translation from the principles described within standard S6, namely that all elements of the surface water drainage system should be designed so that they can be constructed, as well as maintained and operated easily, safely and cost-effectively.

Information with regards to the construction methodology and requirements of the proposed system will be developed as part of the detailed design stage of the project, likewise the maintenance requirements and regime of the proposed system will be developed into the full maintenance strategy for the site during the next phase of design development.

Summary

The proposed development will use a fully gravitational surface water and foul drainage system, designed per the latest “Sewers for Adoption” standards and DCWW requirements. The surface water strategy aims to replicate natural drainage and comply with the statutory ‘Sustainable Drainage Systems Standards for Wales’ and local SAB guidelines.

Site investigations showed suitable infiltration in most areas, so infiltration will be the primary drainage method. However, the access road area lacks sufficient infiltration, so runoff there will be attenuated and discharged at a controlled modified greenfield rate of 0.5l/s into the existing sewer system, assumed to connect to Tennant Canal.

The infiltration system is designed for storm events up to a 100-year storm plus 30% climate change.

Overflow safety features will be included, and the access road subbase will support infiltration where possible with permeable geotextile surrounds.

Appendix A

CCTV Survey Results

274532,197505

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Job/Plan ref: 20819 - 01 - 001

Scale: 1:750

06/10/2025

Dŵr Cymru
Welsh Water

N
W E
S

LEGEND

- Sluice Valve
- Air Valve SINGLE
- Tap
- Pressure Reducing Valve
- Meter
- Bulk Meter
- Fire Hydrant
- Cap
- Non Dwr Cymru
- Existing Distribution Main
- Inspection Chamber
- Gravity Sewer
- Rising Main
- Outfall
- Pumping Station
- Lamphole
- Combined Sewer Overflow
- Special Purpose Chamber
- Treatment Works
- Private Sewer Transfer
- Lateral Drain

NB:
Sewer symbol colour indicates the sewer type.

RED - Combined
GREEN - Surface Water
BROWN - Foul

EXACT LOCATION OF ALL APPARATUS TO BE DETERMINED ON SITE

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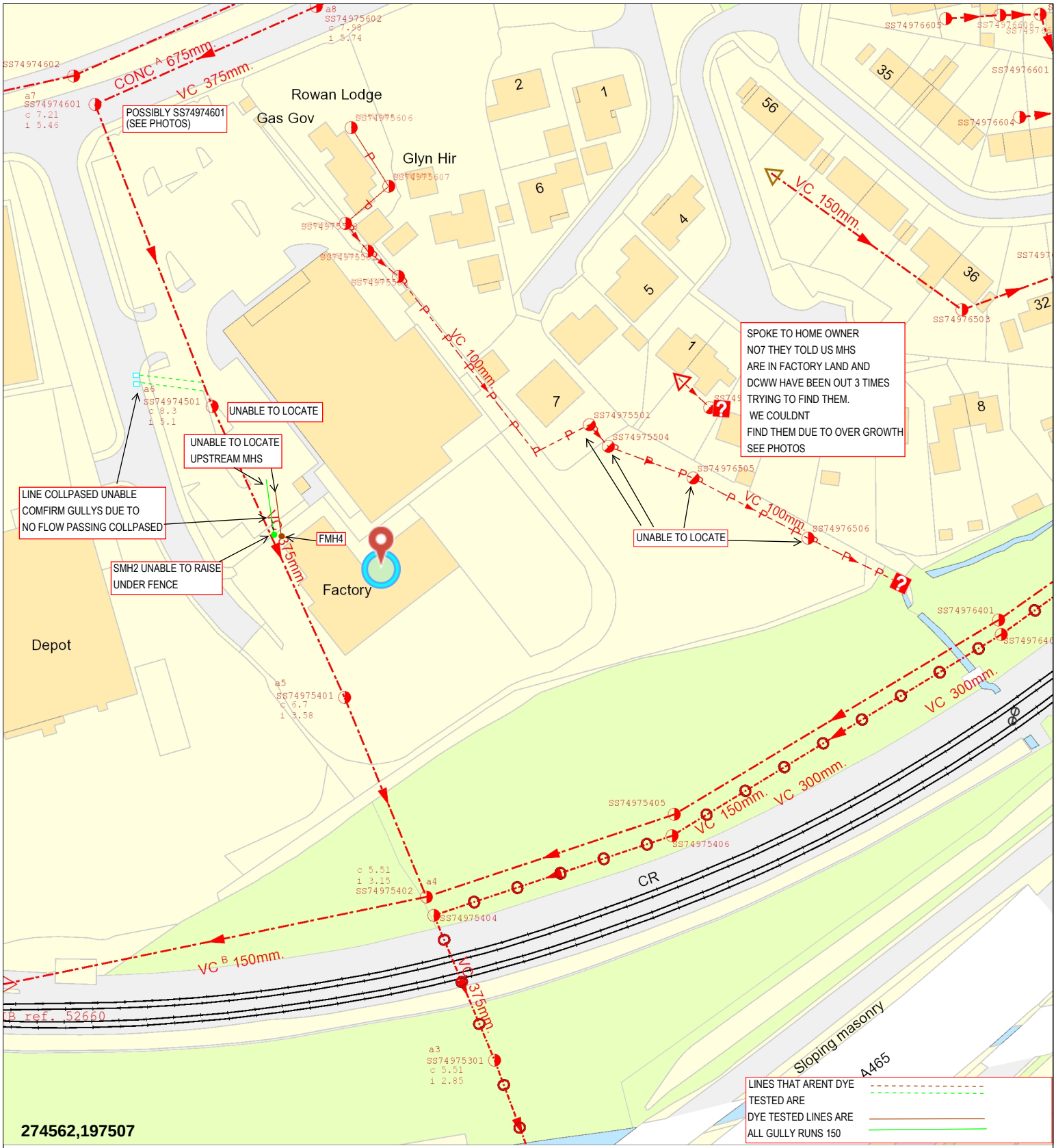
Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF) . It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Dwr Cymru Cyfyngedig ('the Company') gives this infirmation as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus and any onus of locating the apparatus before carrying out any excavations rests entirely on you. The information which is supplied hereby by the company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 based particular, but without prejudice to be generality of that foregoing, it should be noted that the records that are available to the company may not disclose the existence of a drain sewer or disposal main laid before 1 September 1989, or if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of thisinformation is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the company's right to be compensated for any damageto its apparatus.



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Job/Plan ref: 20819 - 01 - 02

Scale: 1:1250

06/10/2025

Dŵr Cymru
Welsh Water

N W E S

LEGEND

- Sluice Valve
- Air Valve SINGLE
- Tap
- Pressure Reducing Valve
- Meter
- Bulk Meter
- Fire Hydrant
- Cap
- Non Dwr Cymru
- Existing Distribution Main
- Inspection Chamber
- Gravity Sewer
- Rising Main
- Outfall
- Pumping Station
- Lamphole
- Combined Sewer Overflow
- Special Purpose Chamber
- Treatment Works
- Private Sewer Transfer
- Lateral Drain

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Name/Job number – 20819 CSN Engineering Neath Abbey

REFERENCE	EASTING	NORTHING	COVER LEVEL
SMH2	274501.107	197516.630	6.882
FMH4	274501.755	197516.653	6.847
G12	274503.108	197505.472	6.866
FMH5	274506.837	197503.085	6.683
SMH10	274506.802	197501.138	6.740
FMH6	274509.500	197499.273	6.731
FMH8	274508.624	197498.612	6.668
FMH7	274509.574	197497.449	6.641
FMH9	274511.645	197495.133	6.648
G11	274507.096	197497.381	6.586
G13	274502.622	197497.886	6.712
FMH3	274501.776	197493.426	6.612
SMH1	274501.016	197488.452	6.554
SMH5	274522.101	197486.325	6.596
SMH6	274535.330	197496.765	6.864
G4	274546.630	197485.818	6.077
G3	274541.069	197482.297	5.962
G2	274535.119	197478.820	5.868
G1	274531.592	197476.381	5.892
G5	274550.290	197479.662	6.067
SMH5	274551.951	197478.085	6.105
G6	274537.289	197471.041	5.848
G7	274536.949	197470.682	5.872
G8	274524.575	197466.688	5.985
G9	274514.570	197471.214	6.163
FMH1	274513.312	197475.448	6.392
FMH2	274511.179	197475.999	6.365
SMH4	274515.616	197482.076	6.401
SMH7	274524.792	197475.028	6.142
SS74975401	274508.862	197475.765	6.306

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helping to improve the drainage network

Drainage Survey Report

Job Number : 20819

Project Number: 1

Project Name: CSN Engineering, Neath Abbey Rd, Neath SA10 7BR

Company: CB3 Consult

Site Date: 07-10-2025

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20819 CSN Engineering Neath Abbey		07/10/2025

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Project Information

Project Name	Project Number	Project Date
20819 CSN Engineering Neath Abbey		07/10/2025

Client

Company: CB3 Consult
Contact: Dylan Huws

Site

Company: Draintech Surveys LTD
Contact: Jack Jones

Contractor

Company: DRIANTECH SURVEYS LIMITED

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Section Inspection - 08/10/2025 - SMH2X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
1	1	08/10/25	9:45	Not Specified	No Rain Or Snow	Yes	SMH2X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Draintech JJ	CA70SZJ	Minicam	Not Specified	Not Specified	Not Specified

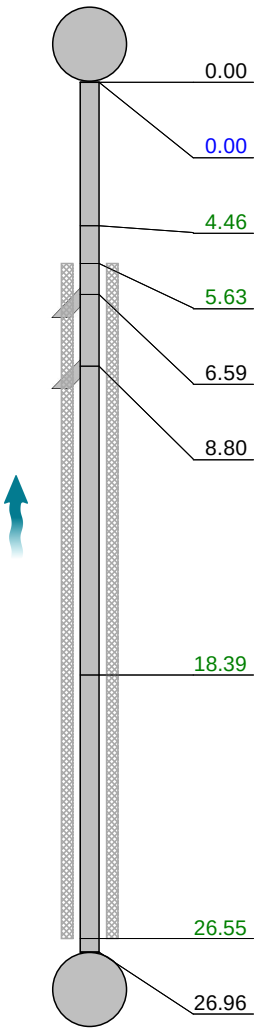
Town or Village:	Neath Abbey	**Inspection Direction:**	Upstream	**Upstream Node:**	SMH2
Road:	Csn Engineering	**Inspected Length:**	26.96 m	**Upstream Pipe Depth:**	
Location:	Road	**Total Length:**	26.96 m	**Downstream Node:**	SMH1
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	2.450 m

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	300 mm
Flow Control:	No flow control	**Pipe Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:		**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:234

Depth: 2.45 m
SMH1



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: SMH1	00:00:00		
0.00		WL	Water level, 5% of the vertical dimension	00:00:10		
4.46		DES	Settled deposits, fine, 5% cross-sectional area loss	00:00:43		3
5.63	S01	DES	Settled deposits, fine, 5% cross-sectional area loss, start	00:00:51		
6.59		JN	Junction at 2 o'clock, 150mm dia	00:00:58		
8.80		JN	Junction at 2 o'clock, 150mm dia	00:01:10		
18.39		LU	Line deviates up	00:01:49		
26.55	F01	DES	Settled deposits, fine, 5% cross-sectional area loss, finish			3
26.96		MHF	Finish node, manhole, reference: NODE	00:02:36		

SMH2
Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	2	2.0	1.6	44.0	3.0

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Section Inspection - 08/10/2025 - NODEX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
2	1	08/10/25	9:51	Not Specified	No Rain Or Snow	Yes	NODEX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Draintech JJ	CA70SZJ	Minicam	Not Specified	Not Specified	Not Specified

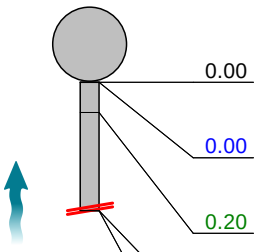
Town or Village:	Neath Abbey	**Inspection Direction:**	Upstream	**Upstream Node:**	NODE
Road:	Csn Engineering	**Inspected Length:**	0.85 m	**Upstream Pipe Depth:**	
Location:	Road	**Total Length:**	0.85 m	**Downstream Node:**	SMH2
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	300 mm
Flow Control:	No flow control	**Pipe Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:		**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50

Depth: m
SMH2



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: SMH2	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension	00:00:10		
0.20	DES	Settled deposits, fine, 30% cross-sectional area loss	00:00:13	1	4
0.85	XP	Collapsed drain or sewer, 50% cross-sectional area loss	00:00:23	2	5
0.85	SA	Survey abandoned: LINE COLLPASED	00:00:25		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
1	165.0	194.1	165.0	5.0	1	5.0	5.9	5.0	5.0

Section Pictures - 08/10/2025 - NODEX

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

1, 00:00:13, 0.20 m
Settled deposits, fine, 30% cross-sectional area loss

2, 00:00:23, 0.85 m
Collapsed drain or sewer, 50% cross-sectional area loss

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Section Inspection - 08/10/2025 - SMH1X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
3	1	08/10/25	9:58	Not Specified	No Rain Or Snow	Yes	SMH1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Draintech JJ	CA70SZJ	Minicam	Not Specified	Not Specified	Not Specified

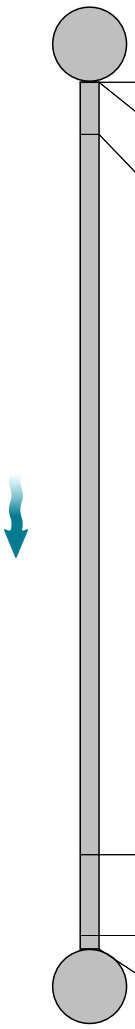
Town or Village:	Neath Abbey	**Inspection Direction:**	Downstream	**Upstream Node:**	SMH1
Road:	Csn Engineering	**Inspected Length:**	13.44 m	**Upstream Pipe Depth:**	2.450 m
Location:	Road	**Total Length:**	13.44 m	**Downstream Node:**	754975401
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	2.350 m

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	300 mm
Flow Control:	No flow control	**Pipe Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:		**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:117

Depth: 2.45 m
SMH1



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: SMH1	00:00:00		
0.00	WL	Water level, 5% of the vertical dimension	00:00:12		
0.81	CC	Crack, circumferential from 1 o'clock to 5 o'clock	00:00:19	1	2 / 2
11.97	DES	Settled deposits, fine, 10% cross-sectional area loss	00:01:02	2	3
13.23	LR	Line deviates right	00:01:10		
13.44	MHF	Finish node, manhole, reference: 754975401	00:01:18		

754975401
Depth: 2.35 m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
1	10.0	0.7	10.0	2.0	2	2.0	0.2	3.0	3.0

Section Pictures - 08/10/2025 - SMH1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
3	Downstream	SMH1X		

1, 00:00:19, 0.81 m
Crack, circumferential from 1 o'clock to 5 o'clock

2, 00:01:02, 11.97 m
Settled deposits, fine, 10% cross-sectional area loss

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Section Inspection - 08/10/2025 - 754975401X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
4	1	08/10/25	10:02	Not Specified	No Rain Or Snow	Yes	754975401X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Draintech JJ	CA70SZJ	Minicam	Not Specified	Not Specified	Not Specified

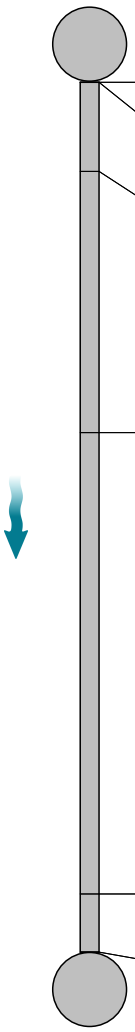
Town or Village:	Neath Abbey	**Inspection Direction:**	Downstream	**Upstream Node:**	754975401
Road:	Csn Engineering	**Inspected Length:**	43.33 m	**Upstream Pipe Depth:**	2.350 m
Location:	Road	**Total Length:**	43.33 m	**Downstream Node:**	SMH3
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:		**Dia/Height:**	300 mm
Flow Control:	No flow control	**Pipe Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:		**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:376

Depth: 2.35 m
754975401



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: 754975401	00:00:00		
0.00	WL	Water level, 5% of the vertical dimension	00:00:13		
4.46	DES	Settled deposits, fine, 5% cross-sectional area loss	00:00:41	1	3
17.46	IG	Infiltration, gushing from 11 o'clock to 12 o'clock	00:01:38	2	
40.43	DES	Settled deposits, fine, 5% cross-sectional area loss	00:03:33	3	3
43.33	MHF	Finish node, manhole, reference: SMH3	00:03:54		

SMH3
Depth: m

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	2	2.0	0.1	4.0	3.0

Section Pictures - 08/10/2025 - 754975401X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
4	Downstream	754975401X		

1, 00:00:41, 4.46 m
Settled deposits, fine, 5% cross-sectional area loss

2, 00:01:38, 17.46 m
Infiltration, gushing from 11 o'clock to 12 o'clock

3, 00:03:33, 40.43 m
Settled deposits, fine, 5% cross-sectional area loss

DRAINTECH
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Section Inspection - 08/10/2025 - FMH1X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
5	1	08/10/25	15:58	Not Specified	No Rain Or Snow	Yes	FMH1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
Draintech JJ	CA70SZJ	Minicam	Not Specified	Not Specified	Not Specified

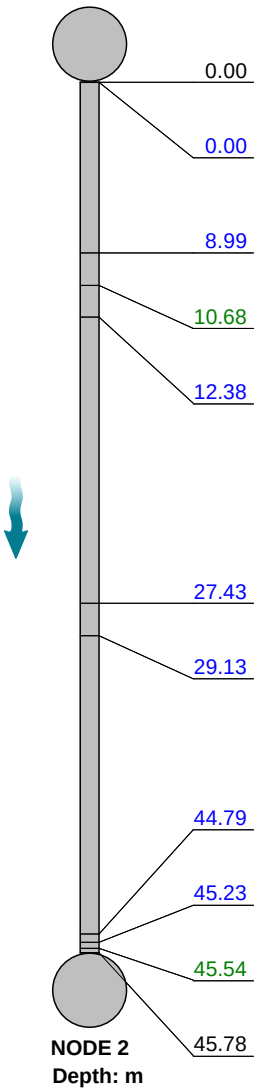
Town or Village:	Neath Abbey	**Inspection Direction:**	Downstream	**Upstream Node:**	FMH1
Road:	Csn Engineering	**Inspected Length:**	45.78 m	**Upstream Pipe Depth:**	2.600 m
Location:	Road	**Total Length:**	45.78 m	**Downstream Node:**	NODE 2
Surface Type:		**Joint Length:**		**Downstream Pipe Depth:**	

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

Comments:
Recommendations:

Scale: 1:397

Depth: 2.60 m
FMH1



NODE 2
Depth: m

Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: FMH1	00:00:00		
0.00	WL	Water level, 5% of the vertical dimension			
8.99	WL	Water level, 10% of the vertical dimension			
10.68	DEEJ	Attached deposits, encrustation at joint from 7 o'clock to 8 o'clock, 5% cross-sectional area loss			3
12.38	WL	Water level, 5% of the vertical dimension			
27.43	WL	Water level, 10% of the vertical dimension			
29.13	WL	Water level, 5% of the vertical dimension			
44.79	WL	Water level, 10% of the vertical dimension			
45.23	WL	Water level, 25% of the vertical dimension			
45.54	DEGJ	Attached deposits, grease at joint from 12 o'clock to 12 o'clock, 50% cross-sectional area loss			5
45.78	MHF	Finish node, manhole, reference: NODE 2			

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	2	15.0	0.4	17.0	5.0

Appendix B

Existing Site Plan and Topography

Notes:

- SURVEYED FEATURES ARE ANNOTATED APPROPRIATELY.
- TREE SPECIES IS ONLY ANNOTATED WHERE KNOWN.
- SERVICE COVERS ARE SURVEYED WHERE ACCESSIBLE
- DRAINAGE PIPE SIZES HAVE BEEN VISUALLY INSPECTED/ASSESSED FROM GROUND LEVEL ONLY AND SHOULD BE TREATED AS APPROXIMATE
- HEALER SURVEYS CANNOT ACCEPT LIABILITY FOR MISSING COVERS DUE TO THEM BEING BURIED OR OBSCURED BY PARKED VEHICLES AT THE TIME OF THE SITE VISIT.

Station Table:

Station	Easting	Northing	Level
S1	274519.335	197469.200	6.216
S2	274582.175	197500.290	6.961
S3	274557.022	197533.373	7.623
S4	274522.203	197513.444	6.885
S5	274511.353	197523.872	6.925
S6	274488.610	197506.091	7.108

Grid Origin and Level Datum:

Ordnance Survey GPS OSGB36(15) Grid and Levels used.
GPS Grid to Ground Scale Factor used 1.000

For TPS measures use Ground to Grid Mean Scale Factor 0.99980035

Revisions:

A:	
B:	
C:	
D:	
E:	
F:	
G:	
H:	

Client:

RWP Properties

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healer surveys
Land Surveyors
8 Oldfield Road, Bocam Park, Pencoed, Bridgend, CF35 5LJ
tel. 01656 865566
web. www.healersurveys.co.uk

Project:

CSN Engineering, Neath

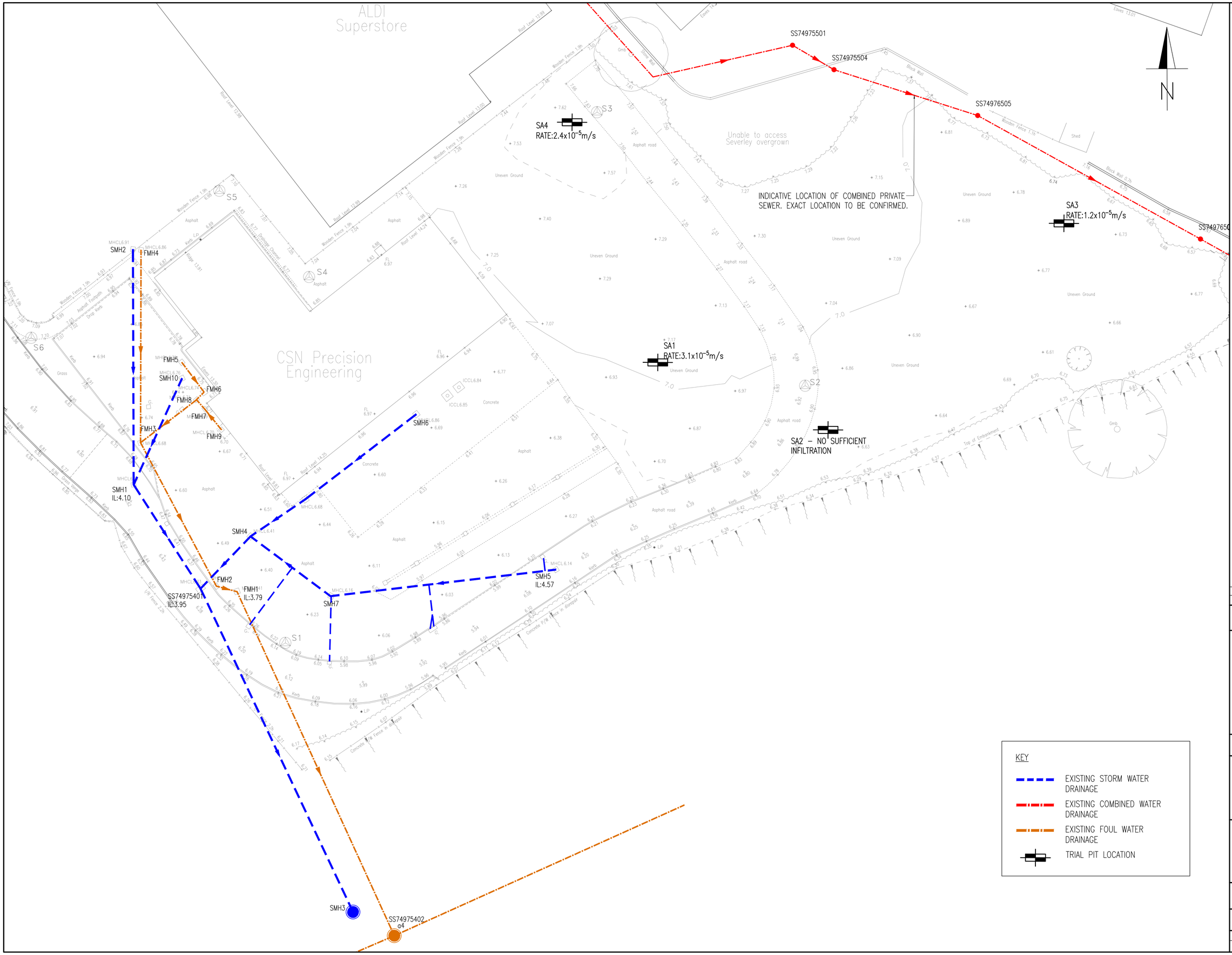
Drawing:

Topographic Survey

Date:	June 2025
Surveyed:	JAE
Drawn:	JAE
Checked:	RE

Scale:	Sheet Size:	Sheet No:
1:500	A2	1 of 1

Job No:	Rev.
P4034	



KEY

- EXISTING STORM WATER DRAINAGE
- EXISTING COMBINED WATER DRAINAGE
- EXISTING FOUL WATER DRAINAGE
- TRIAL PIT LOCATION

GENERAL NOTES

1. DO NOT SCALE THIS DRAWING.
2. CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ENGINEER.
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7. INFORMATION REGARDING THE LOCATION AND DEPTH OF EXISTING SERVICES CANNOT BE GUARANTEED BY THE STATUTORY UNDERTAKER.
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9. TEMPORARY WORKS DESIGN ASSOCIATED WITH THE CONSTRUCTION OF THE WORKS SHALL BE RESPONSIBILITY OF THE CONTRACTOR.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL TRAFFIC MANAGEMENT PROPOSALS & PHASING. SUCH DETAILS SHALL BE SUBMITTED TO THE LOCAL HIGHWAY AUTHORITY FOR APPROVAL PRIOR TO THE START OF THE WORKS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ASSOCIATED COSTS AND ORDERS.

Rev.	Detail	By	Date
A	DRAINAGE ANNOTATION REVISED TO CLARIFY FLOW TYPE AND OWNERSHIP	TE	30.03.26

Revisions

Reinforcement schedules nos.

CB3 CONSULT
Structural & Civil Engineering Consultants
First Floor
7 St James Crescent
Swansea
SA1 6DP
Telephone +44 1792 473 182
e-mail admin@cb3consult.co.uk
web www.cb3consult.co.uk

Client
RWP PROPERTIES

Project
FORMER CSN ENGINEERING
NEATH ABBEY ROAD
NEATH

Drawing Title
EXISTING SITE PLAN

PRELIMINARY

Project No.	Drawing No.	
C2345	C-SK03	
Scales 1:200	Date 06.11.25	Revision A
Drawn AJ / Checked DH	Sheet Size A1	

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Appendix C

Proposed Architectural Plan

Planning
Drg No 01B

Notes

Where dimensions are not given, drawings should not be scaled, and in the event of any dimensional conflict, the matter must be referred to Thorpe Building Consultancy Ltd for clarification.

The Contractor must also refer to any separate Thorpe Building Consultancy Ltd specification document to be read in conjunction with this drawing.

Revisions

THORPE
BUILDING CONSULTANCY
www.thorpebc.co.uk

Client
RwP Properties

Project
CSN Engineering Site,
Neath

Drawing
PLanning
Site Plan

JobNo.		DWGNo.	
PLANNING		01B	
Scale	Date	Drawn	Checked
1:500 @ A3	March 2026	ABN	ST

Appendix D

Proposed Drainage Strategy Plan

DRAINAGE STRATEGY

SURFACE WATER

INFILTRATION TESTING WAS CARRIED OUT IN 4 TEST PITS ACROSS THE SITE TP1–TP4 IN ACCORDANCE WITH BRE365. THREE OUT OF FOUR TEST PITS ACHIEVED SUITABLE/VARIOUS INFILTRATION RATES. THEREFORE, SITE INVESTIGATION PROVES THAT LOCALISED INFILTRATION IS A VIABLE SURFACE WATER DISPOSAL METHOD. SuDS FEATURES ARE PROPOSED ACROSS THE SITE, INCLUDING PERMEABLE SURFACES AT BOTH THE FRONT AND REAR OF UNITS ALONG WITH RAINGARDENS WHERE APPROPRIATE AT DOWNPIPE LOCATIONS. GREEN ROOFING IS ALSO PROPOSED TO BE UTILISED ON THE ON SITE BIN STORE.

SURFACE WATER RUNOFF WILL BE COLLECTED WITHIN THE POROUS SURFACES AND DISCHARGED DIRECTLY TO THE GROUND WHERE SUITABLE. THE RAINGARDENS ARE DESIGNED TO COLLECT REAR ROOF RUNOFF PRIOR TO CONVEYANCE TO THE FRONT OF THE UNIT FOR DISCHARGE TO SOURCE. WHERE INFILTRATION DOESN'T PROVE VIABLE, AN ATTENUATED CONNECTION IS PROPOSED TO THE ONSITE PRIVATE SURFACE WATER SYSTEM.

IN ACCORDANCE WITH THE SAB STANDARDS

STANDARD 1

- REUSE – SURFACE WATER RUN-OFF TO BE COLLECTED WITHIN SOFT LANDSCAPED AREAS, REUSED BY THE HYDRATION OF PLANTING.
- INFILTRATION – INFILTRATION TESTING WAS CARRIED OUT IN 4 TEST PITS ACROSS THE SITE TP1–TP4 IN ACCORDANCE WITH BRE365. THREE OUT OF FOUR TEST PITS ACHIEVED SUITABLE/VARIOUS INFILTRATION RATES. LOCALISED INFILTRATION IS PROPOSED FOR THE SCHEME
- WATER BODY – NOT REQUIRED FOR THIS DEVELOPMENT
- SURFACE WATER SEWER – DURING SITE INVESTIGATION, TRIAL PIT SA2 WAS TESTED FOR INFILTRATION SUITABILITY WITHIN THE PROPOSED ACCESS ROAD AREA. THE RESULTS INDICATED THAT THE PIT DID NOT ACHIEVE A SUITABLE INFILTRATION RATE, RENDERING THE LOCATION UNSUITABLE FOR DIRECT INFILTRATION-BASED DRAINAGE. AS A RESULT, SURFACE WATER RUNOFF FROM THIS AREA WILL BE TREATED VIA PERMEABLE SURFACES, ATTENUATED WITHIN THE PROPOSED SITE AND SUBSEQUENTLY DISCHARGED AT A CONTROLLED RATE OF 0.5L/s VIA CONTROL FLOW DEVICE INTO THE EXISTING SURFACE WATER SEWER NETWORK.
- COMBINED SEWER – NOT REQUIRED FOR THIS DEVELOPMENT

STANDARD 2

- FIRST 5mm OF RAINFALL FROM THE IMPERMEABLE AREAS WILL BE INTERCEPTED AND STORED WITHIN A VARIETY OF SuDS FEATURES, INCLUDING RAINGARDENS AREAS, POROUS SURFACING AND GREEN ROOFING
- SURFACE WATER SYSTEM TO BE DESIGNED FOR A RETURN PERIOD OF 100YRS + 30% CLIMATE CHANGE.
- OVER-FLOW WEIR CHAMBER TO BE INSTALLED WITHIN THE MAIN ATTENUATION AREA TO BE CONNECTED TO CONTROL FLOW DEVICE BEFORE CONNECTING TO EXISTING SURFACE WATER DRAINAGE.

STANDARD 3

- WATER QUALITY WILL BE ACHIEVED VIA VARIOUS SUDS TECHNIQUES, INCLUDING RAINGARDENS, PERMEABLE HARD SURFACES AND GREEN ROOFING.

STANDARD 4

- RAINGARDENS AND GREEN ROOFING ARE AN IMPORTANT PART OF THE LANDSCAPE DESIGN. THESE FEATURES WILL BE PLANTED AS PER THE LANDSCAPE ARCHITECTS SPECIFICATION AND WILL PROVIDE AMENITY CONTRIBUTION.

STANDARD 5

- RAINGARDENS WILL BE PLANTED WITH NATIVE PLANT SPECIES TO PROVIDE DENSE AND DURABLE COVER OF VEGETATION THAT CREATES APPROPRIATE HABITAT FOR INDIGENOUS SPECIES.

STANDARD 6

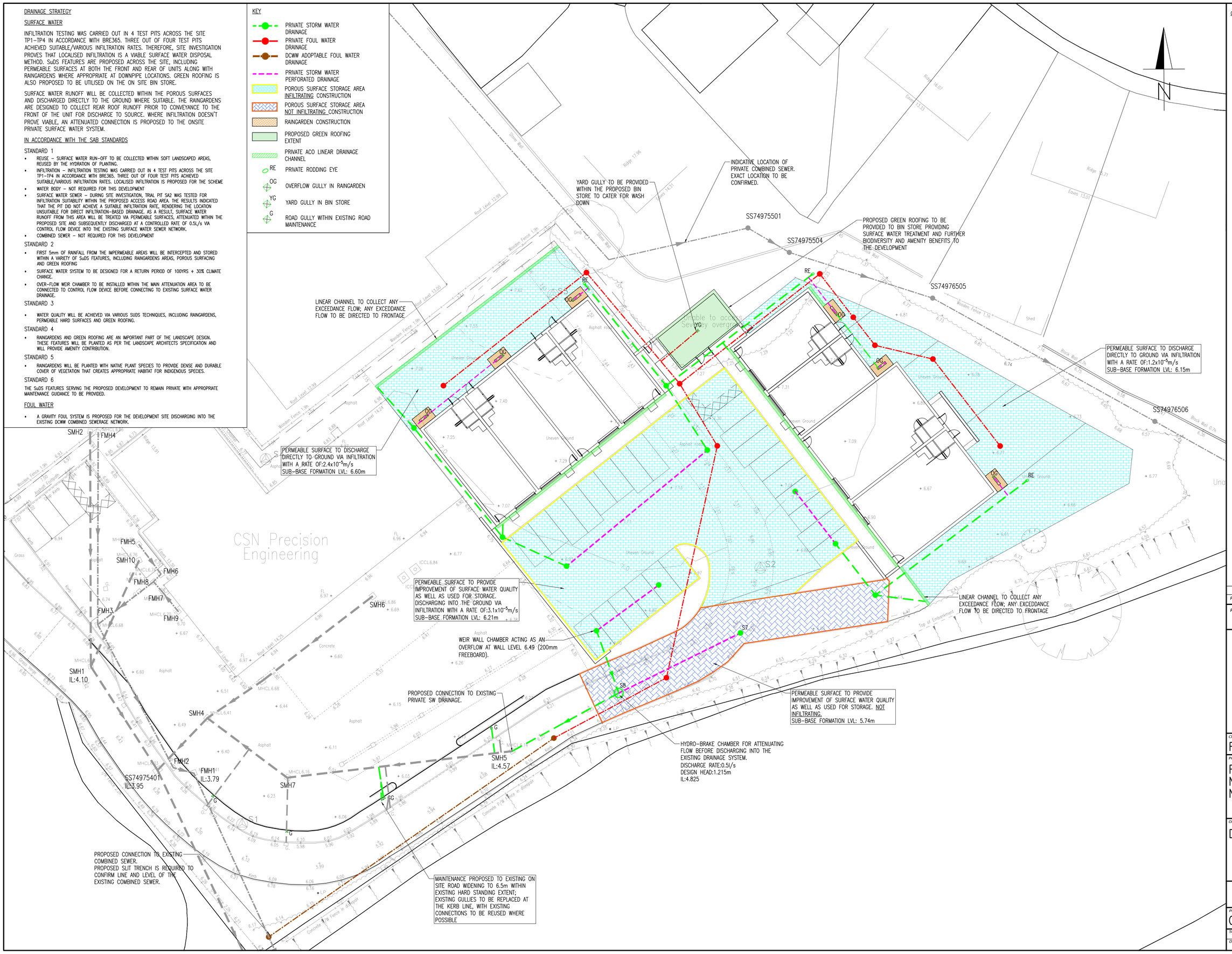
THE SuDS FEATURES SERVING THE PROPOSED DEVELOPMENT TO REMAIN PRIVATE WITH APPROPRIATE MAINTENANCE GUIDANCE TO BE PROVIDED.

FOUL WATER

- A GRAVITY FOUL SYSTEM IS PROPOSED FOR THE DEVELOPMENT SITE DISCHARGING INTO THE EXISTING DCWW COMBINED SEWERAGE NETWORK.

KEY

- PRIVATE STORM WATER DRAINAGE
- PRIVATE FOUL WATER DRAINAGE
- DCWW ADOPTABLE FOUL WATER DRAINAGE
- PRIVATE STORM WATER PERFORATED DRAINAGE
- POROUS SURFACE STORAGE AREA INFILTRATING CONSTRUCTION
- POROUS SURFACE STORAGE AREA NOT INFILTRATING CONSTRUCTION
- RAINGARDEN CONSTRUCTION
- PROPOSED GREEN ROOFING EXTENT
- PRIVATE ACO LINEAR DRAINAGE CHANNEL
- RE PRIVATE RODDING EYE
- OG OVERFLOW GULLY IN RAINGARDEN
- YG YARD GULLY IN BIN STORE
- G ROAD GULLY WITHIN EXISTING ROAD MAINTENANCE



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Rev.	Detail	By	Date
A	DRAINAGE STRATEGY REVISED TO SUIT UPDATED SITE LAYOUT	TE	27.03.26

Revisions

Reinforcement schedules nos.

CB3 CONSULT
Structural & Civil Engineering Consultants
First Floor
7 St James Crescent
Swansea
SA16DP
Telephone +44 1792 473 182
e-mail admin@cb3cconsult.co.uk
web www.cb3consult.co.uk

Client
RWP PROPERTIES

Project
FORMER CSN ENGINEERING
NEATH ABBEY ROAD
NEATH

Drawing Title
DRAINAGE STRATEGY

PRELIMINARY

Project No.	Drawing No.	
C2345	C-SK02	
Scales 1:200	Date 06.11.25	Revision A
Drawn AJ / Checked DH	Sheet Size A1	

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Appendix E

Draft infiltration test results

Figure 2: Exploratory Hole Location Plan

Project: CSN Engineering Site, Neath Abbey	Job No.: 14511	Intégral Géotechnique	Integral House, 7 Beddau Way, Castlegate Business Park, Caerphilly, CF83 2AX. Tel: 029 2080 7991
Client: RWP Properties Limited	Scale: NTS		

BRE365 SOIL INFILTRATION RATE TEST - SA1

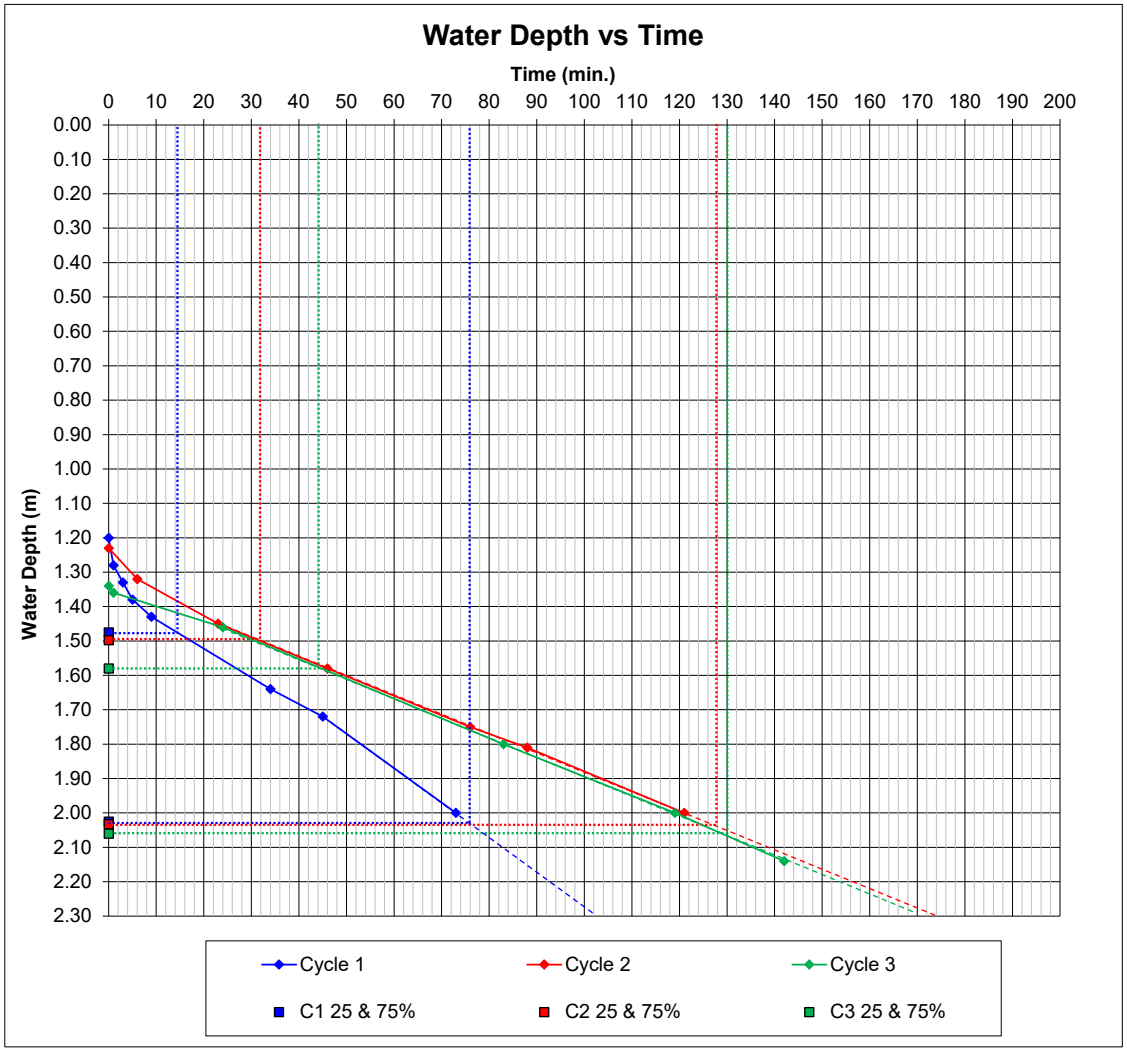
CSN Engineering Site, Neath Abbey 14511

Trial Pit Information	
Length (m)	2.30
Width (m)	0.70
Depth (m)	2.30
Groundwater	n/a
Weather Conditions	Mild
Date	29-Oct-25

Remarks

Cycle 1		Cycle 2		Cycle 3	
Time (min)	Depth (m)	Time (min)	Depth (m)	Time (min)	Depth (m)
0	1.20	0	1.23	0	1.34
1	1.28	6	1.32	1	1.36
3	1.33	23	1.45	24	1.46
5	1.38	46	1.58	83	1.80
9	1.43	76	1.75	119	2.00
34	1.64	88	1.81	142	2.14
45	1.72	121	2.00		
73	2.00				

Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	2.30	2.30	2.30
Water Depths (m)			
Water depth at start of test	1.20	1.23	1.34
Water depth at end of test	2.00	2.00	2.14
Effective depth (measured)	0.80	0.77	0.80
% Effective storage depth	0.73	0.72	0.83
Effective Storage Depths (m)			
Effective storage depth (100%)	1.10	1.07	0.96
Effective storage depth (75%)	0.83	0.80	0.72
Effective storage depth (50%)	0.55	0.54	0.48
Effective storage depth (25%)	0.28	0.27	0.24
Outflow Time (min)			
Time for measured outflow	73	121	142
Time for 100% outflow	102	174	170
Time for 75-25% outflow	61	96	86
Volume of Outflow (m^3)			
Over measured effective depth	1.29	1.24	1.29
Over 100% effective depth	1.77	1.72	1.55
From 75% - 25% effective depth	0.89	0.86	0.77
Surface Area (m^2)			
For 100% effective storage	8.21	8.03	7.37
For 50% effective storage	4.91	4.82	4.49
Over measured depth	6.41	6.23	6.41
Soil Infiltration Rate (m/s)	**Cycle 1**	**Cycle 2**	**Cycle 3**
Over 100% effective depth	3.5E-05	2.1E-05	2.1E-05
Over measured depth	4.6E-05	2.7E-05	2.4E-05
Over 75% - 25% effective depth	**4.9E-05**	**3.1E-05**	**3.3E-05**



Design Soil Infiltration Rate: 3.1E-05 m/s

Intégral Géotechnique

BRE365 SOIL INFILTRATION RATE TEST - SA2

CSN Engineering Site, Neath Abbey 14511

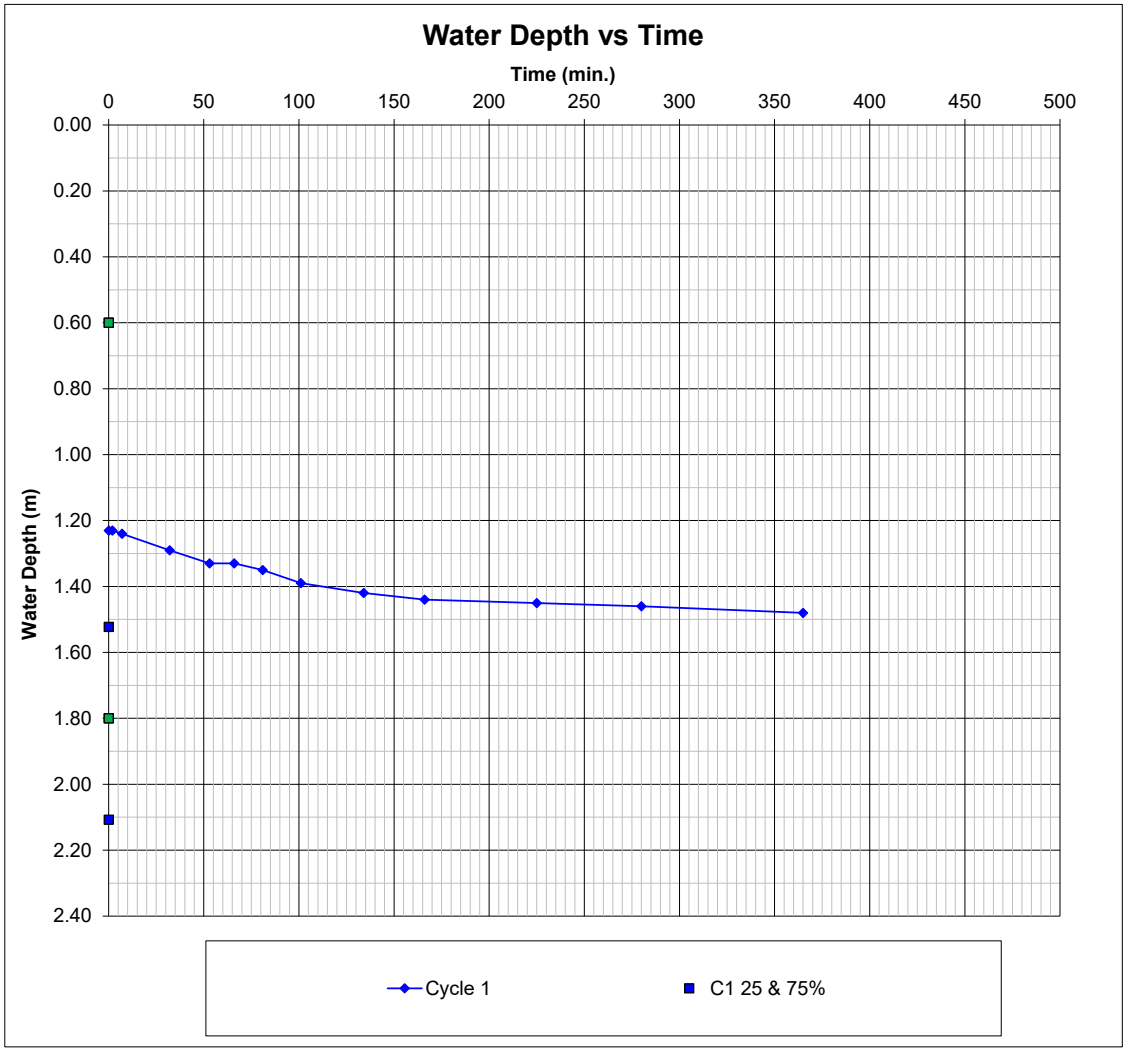
Trial Pit Information	
Length (m)	2.20
Width (m)	0.80
Depth (m)	2.40
Groundwater	n/a
Weather Conditions	Mild
Date	30-Oct-25

Remarks

Negligible infiltration. Unable to calculate soil infiltration rate

Cycle 1		Cycle 2		Cycle 3	
Time (min)	Depth (m)	Time (min)	Depth (m)	Time (min)	Depth (m)
0	1.23				
2	1.23				
7	1.24				
32	1.29				
53	1.33				
66	1.33				
81	1.35				
101	1.39				
134	1.42				
166	1.44				
225	1.45				
280	1.46				
365	1.48				

Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	2.40		
Water Depths (m)			
Water depth at start of test	1.23		
Water depth at end of test	1.48		
Effective depth (measured)	0.25		
% Effective storage depth	0.21		
Effective Storage Depths (m)			
Effective storage depth (100%)	1.17		
Effective storage depth (75%)	0.88		
Effective storage depth (50%)	0.59		
Effective storage depth (25%)	0.29		
Outflow Time (min)			
Time for measured outflow	n/a		
Time for 100% outflow	n/a		
Time for 75-25% outflow	n/a		
Volume of Outflow (m^3)			
Over measured effective depth	0.44		
Over 100% effective depth	2.06		
From 75% - 25% effective depth	1.03		
Surface Area (m^2)			
For 100% effective storage	8.78		
For 50% effective storage	5.27		
Over measured depth	3.26		
Soil Infiltration Rate (m/s)	**Cycle 1**	**Cycle 2**	**Cycle 3**
Over 100% effective depth	n/a		
Over measured depth	n/a		
Over 75% - 25% effective depth	**n/a**		



Design Soil Infiltration Rate: 0.0E+00 m/s

Intégral Géotechnique

BRE365 SOIL INFILTRATION RATE TEST - SA3

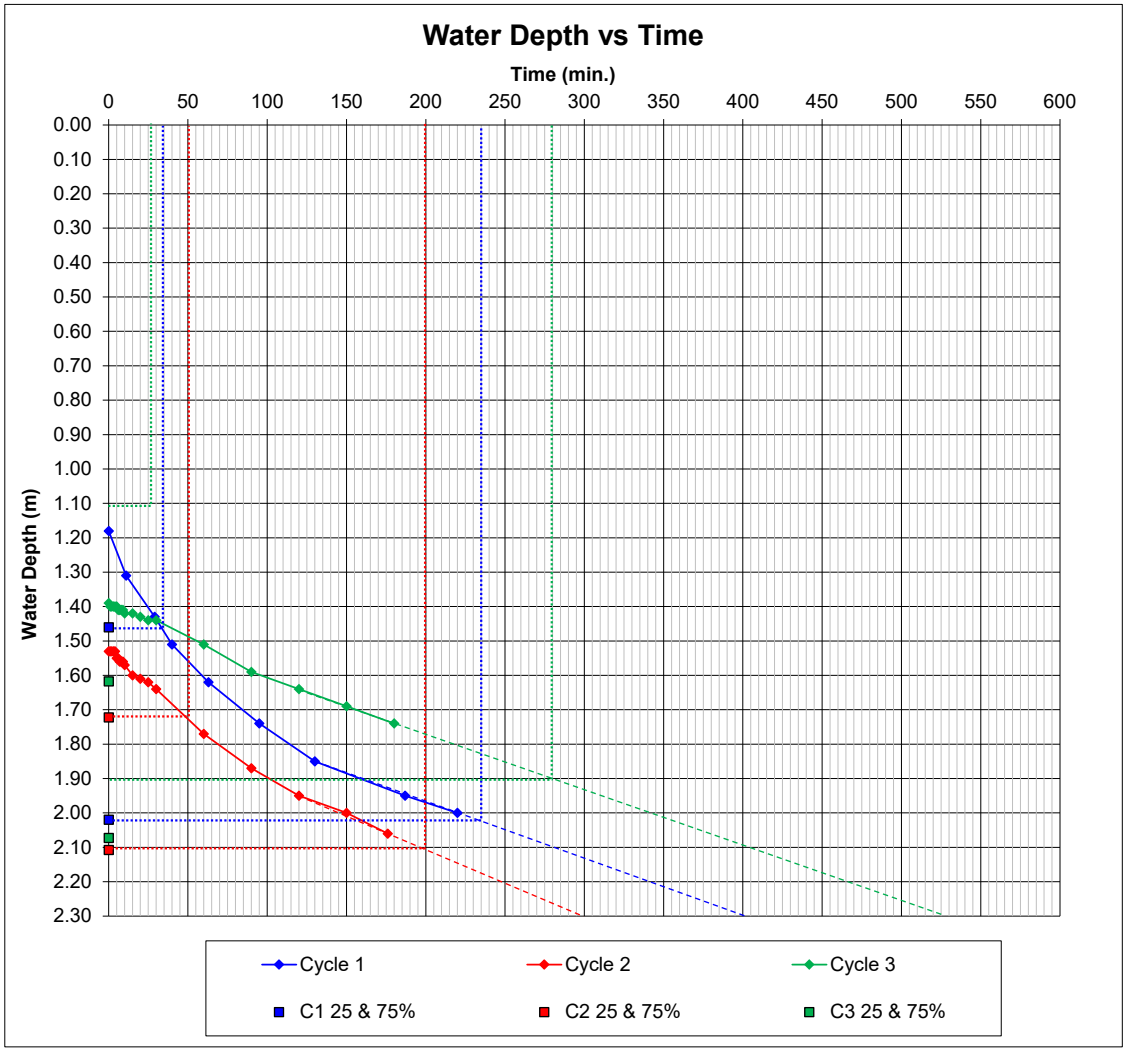
CSN Engineering Site, Neath Abbey 14511

Trial Pit Information	
Length (m)	2.20
Width (m)	0.80
Depth (m)	2.30
Groundwater	n/a
Weather Conditions	Mild
Date	29-Oct-25

Remarks

Cycle 1		Cycle 2		Cycle 3	
Time (min)	Depth (m)	Time (min)	Depth (m)	Time (min)	Depth (m)
0	1.18	0	1.53	0	1.39
11	1.31	1	1.53	1	1.40
29	1.43	2	1.53	2	1.40
40	1.51	3	1.53	3	1.40
63	1.62	4	1.53	4	1.40
95	1.74	5	1.55	5	1.40
130	1.85	6	1.55	6	1.41
187	1.95	7	1.56	7	1.41
220	2.00	8	1.56	8	1.41
		9	1.56	9	1.41
		10	1.57	10	1.42
		15	1.60	15	1.42
		20	1.61	20	1.43
		25	1.62	25	1.44
		30	1.64	30	1.44
		60	1.77	60	1.51
		90	1.87	90	1.59
		120	1.95	120	1.64
		150	2.00	150	1.69
		176	2.06	180	1.74

Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	2.30	2.30	2.30
Water Depths (m)			
Water depth at start of test	1.18	1.53	1.39
Water depth at end of test	2.00	2.06	1.74
Effective depth (measured)	0.82	0.53	0.35
% Effective storage depth	0.73	0.69	0.38
Effective Storage Depths (m)			
Effective storage depth (100%)	1.12	0.77	0.91
Effective storage depth (75%)	0.84	0.58	0.68
Effective storage depth (50%)	0.56	0.39	0.46
Effective storage depth (25%)	0.28	0.19	0.23
Outflow Time (min)			
Time for measured outflow	220	176	180
Time for 100% outflow	400	300	525
Time for 75-25% outflow	200	150	255
Volume of Outflow (m^3)			
Over measured effective depth	1.44	0.93	0.62
Over 100% effective depth	1.97	1.36	1.60
From 75% - 25% effective depth	0.99	0.68	0.80
Surface Area (m^2)			
For 100% effective storage	8.48	6.38	7.22
For 50% effective storage	5.12	4.07	4.49
Over measured depth	6.68	4.94	3.86
Soil Infiltration Rate (m/s)	**Cycle 1**	**Cycle 2**	**Cycle 3**
Over 100% effective depth	9.7E-06	1.2E-05	7.0E-06
Over measured depth	1.6E-05	1.8E-05	1.5E-05
Over 75% - 25% effective depth	**1.6E-05**	**1.8E-05**	**1.2E-05**



Design Soil Infiltration Rate: 1.2E-05 m/s

Intégral Géotechnique

BRE365 SOIL INFILTRATION RATE TEST - SA4

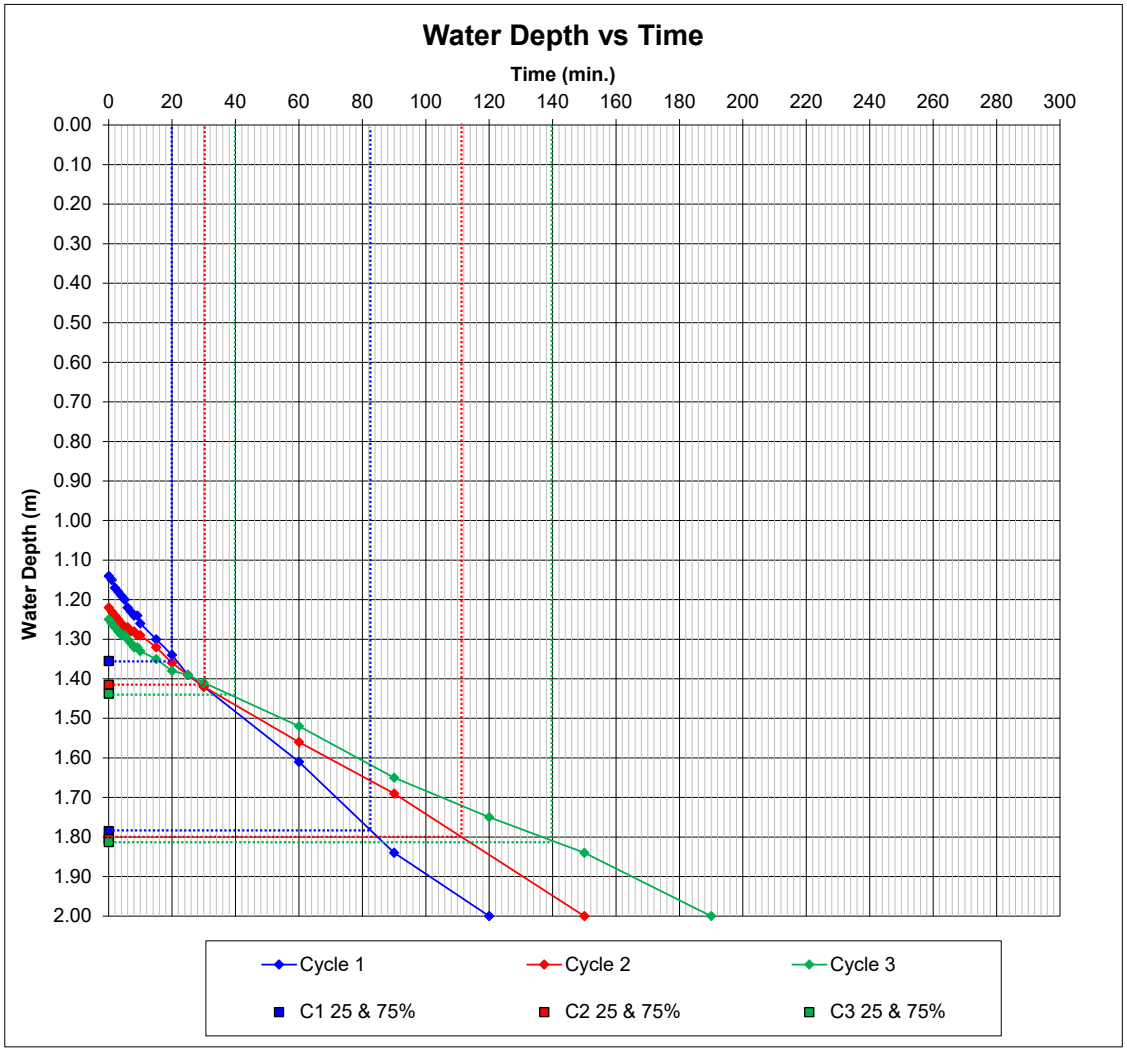
CSN Engineering Site, Neath Abbey 14511

Trial Pit Information	
Length (m)	2.00
Width (m)	0.60
Depth (m)	2.00
Groundwater	n/a
Weather Conditions	Mild
Date	29-Oct-25

Remarks

Cycle 1		Cycle 2		Cycle 3	
Time (min)	Depth (m)	Time (min)	Depth (m)	Time (min)	Depth (m)
0	1.14	0	1.22	0	1.25
1	1.15	1	1.23	1	1.26
2	1.17	2	1.24	2	1.27
3	1.18	3	1.25	3	1.28
4	1.19	4	1.26	4	1.29
5	1.20	5	1.27	5	1.29
6	1.22	6	1.27	6	1.30
7	1.23	7	1.28	7	1.31
8	1.24	8	1.28	8	1.32
9	1.24	9	1.29	9	1.32
10	1.26	10	1.29	10	1.33
15	1.30	15	1.32	15	1.35
20	1.34	20	1.36	20	1.38
25	1.39	25	1.39	25	1.39
30	1.42	30	1.42	30	1.41
60	1.61	60	1.56	60	1.52
90	1.84	90	1.69	90	1.65
120	2.00	150	2.00	120	1.75
				150	1.84
				190	2.00

Final Excavation Depth (m)	Cycle 1	Cycle 2	Cycle 3
At end of testing cycle	2.00	2.00	2.00
Water Depths (m)			
Water depth at start of test	1.14	1.22	1.25
Water depth at end of test	2.00	2.00	2.00
Effective depth (measured)	0.86	0.78	0.75
% Effective storage depth	1.00	1.00	1.00
Effective Storage Depths (m)			
Effective storage depth (100%)	0.86	0.78	0.75
Effective storage depth (75%)	0.65	0.59	0.56
Effective storage depth (50%)	0.43	0.39	0.38
Effective storage depth (25%)	0.22	0.20	0.19
Outflow Time (min)			
Time for measured outflow	120	150	190
Time for 100% outflow	120	150	190
Time for 75-25% outflow	62	80	100
Volume of Outflow (m^3)			
Over measured effective depth	1.03	0.94	0.90
Over 100% effective depth	1.03	0.94	0.90
From 75% - 25% effective depth	0.52	0.47	0.45
Surface Area (m^2)			
For 100% effective storage	5.67	5.26	5.10
For 50% effective storage	3.44	3.23	3.15
Over measured depth	5.67	5.26	5.10
Soil Infiltration Rate (m/s)	**Cycle 1**	**Cycle 2**	**Cycle 3**
Over 100% effective depth	2.5E-05	2.0E-05	1.5E-05
Over measured depth	2.5E-05	2.0E-05	1.5E-05
Over 75% - 25% effective depth	**4.0E-05**	**3.0E-05**	**2.4E-05**



Design Soil Infiltration Rate: 2.4E-05 m/s

Intégral Géotechnique

Appendix F

Drainage Calculations

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 169 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	5.780	0.040	0.0	0.4	0.4	2.7	O K
30 min Summer	5.803	0.063	0.0	0.5	0.5	4.2	O K
60 min Summer	5.826	0.086	0.0	0.5	0.5	5.8	O K
120 min Summer	5.845	0.105	0.0	0.5	0.5	7.1	O K
180 min Summer	5.851	0.111	0.0	0.5	0.5	7.4	O K
240 min Summer	5.852	0.112	0.0	0.5	0.5	7.5	O K
360 min Summer	5.851	0.111	0.0	0.5	0.5	7.4	O K
480 min Summer	5.848	0.108	0.0	0.5	0.5	7.3	O K
600 min Summer	5.844	0.104	0.0	0.5	0.5	7.0	O K
720 min Summer	5.840	0.100	0.0	0.5	0.5	6.7	O K
960 min Summer	5.830	0.090	0.0	0.5	0.5	6.1	O K
1440 min Summer	5.810	0.070	0.0	0.5	0.5	4.7	O K
2160 min Summer	5.783	0.043	0.0	0.4	0.4	2.9	O K
2880 min Summer	5.764	0.024	0.0	0.4	0.4	1.6	O K
4320 min Summer	5.743	0.003	0.0	0.4	0.4	0.2	O K
5760 min Summer	5.740	0.000	0.0	0.4	0.4	0.0	O K
7200 min Summer	5.740	0.000	0.0	0.3	0.3	0.0	O K
8640 min Summer	5.740	0.000	0.0	0.3	0.3	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	99.940	0.0	3.0	18
30 min Summer	71.540	0.0	4.7	32
60 min Summer	49.114	0.0	6.9	62
120 min Summer	32.408	0.0	9.5	120
180 min Summer	24.842	0.0	11.0	154
240 min Summer	20.458	0.0	12.2	186
360 min Summer	15.542	0.0	14.1	254
480 min Summer	12.757	0.0	15.5	324
600 min Summer	10.930	0.0	16.6	392
720 min Summer	9.624	0.0	17.6	462
960 min Summer	7.861	0.0	19.2	598
1440 min Summer	5.891	0.0	21.5	854
2160 min Summer	4.397	0.0	24.0	1228
2880 min Summer	3.577	0.0	25.8	1560
4320 min Summer	2.677	0.0	28.7	2208
5760 min Summer	2.182	0.0	30.8	0
7200 min Summer	1.866	0.0	32.5	0
8640 min Summer	1.644	0.0	33.9	0

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	5.740	0.000	0.0	0.3	0.3	0.0	O K
15 min Winter	5.787	0.047	0.0	0.4	0.4	3.2	O K
30 min Winter	5.813	0.073	0.0	0.5	0.5	4.9	O K
60 min Winter	5.840	0.100	0.0	0.5	0.5	6.7	O K
120 min Winter	5.864	0.124	0.0	0.5	0.5	8.3	O K
180 min Winter	5.871	0.131	0.0	0.5	0.5	8.8	O K
240 min Winter	5.872	0.132	0.0	0.5	0.5	8.9	O K
360 min Winter	5.870	0.130	0.0	0.5	0.5	8.7	O K
480 min Winter	5.865	0.125	0.0	0.5	0.5	8.4	O K
600 min Winter	5.858	0.118	0.0	0.5	0.5	7.9	O K
720 min Winter	5.851	0.111	0.0	0.5	0.5	7.4	O K
960 min Winter	5.834	0.094	0.0	0.5	0.5	6.3	O K
1440 min Winter	5.802	0.062	0.0	0.5	0.5	4.2	O K
2160 min Winter	5.763	0.023	0.0	0.4	0.4	1.6	O K
2880 min Winter	5.741	0.001	0.0	0.4	0.4	0.1	O K
4320 min Winter	5.740	0.000	0.0	0.3	0.3	0.0	O K
5760 min Winter	5.740	0.000	0.0	0.3	0.3	0.0	O K
7200 min Winter	5.740	0.000	0.0	0.2	0.2	0.0	O K
8640 min Winter	5.740	0.000	0.0	0.2	0.2	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	1.480	0.0	35.2	0
15 min Winter	99.940	0.0	3.5	18
30 min Winter	71.540	0.0	5.5	32
60 min Winter	49.114	0.0	7.9	60
120 min Winter	32.408	0.0	10.8	118
180 min Winter	24.842	0.0	12.5	172
240 min Winter	20.458	0.0	13.9	200
360 min Winter	15.542	0.0	15.9	274
480 min Winter	12.757	0.0	17.5	352
600 min Winter	10.930	0.0	18.8	428
720 min Winter	9.624	0.0	19.9	504
960 min Winter	7.861	0.0	21.6	646
1440 min Winter	5.891	0.0	24.3	910
2160 min Winter	4.397	0.0	27.1	1256
2880 min Winter	3.577	0.0	29.3	1524
4320 min Winter	2.677	0.0	32.5	0
5760 min Winter	2.182	0.0	34.9	0
7200 min Winter	1.866	0.0	36.9	0
8640 min Winter	1.644	0.0	38.7	0

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	5.740	0.000	0.0	0.2	0.2	0.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	1.480	0.0	40.2	0

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.700	Shortest Storm (mins)	15
Ratio R	0.242	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.022

Time (mins) From:	To:	Area (ha)
0	4	0.022

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Model Details

Storage is Online Cover Level (m) 6.240

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	6.4
Membrane Percolation (mm/hr)	1000	Length (m)	35.0
Max Percolation (l/s)	62.2	Slope (1:X)	0.0
Safety Factor	3.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	5.740	Cap Volume Depth (m)	0.300

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0031-5000-1215-5000
Design Head (m)	1.215
Design Flow (l/s)	0.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	31
Invert Level (m)	4.825
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.215	0.5	Kick-Flo®	0.274	0.3
Flush-Flo™	0.135	0.3	Mean Flow over Head Range	-	0.4

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	0.3	1.200	0.5	3.000	0.7	7.000	1.1
0.200	0.3	1.400	0.5	3.500	0.8	7.500	1.1
0.300	0.3	1.600	0.6	4.000	0.8	8.000	1.2
0.400	0.3	1.800	0.6	4.500	0.9	8.500	1.2
0.500	0.3	2.000	0.6	5.000	0.9	9.000	1.2
0.600	0.4	2.200	0.6	5.500	1.0	9.500	1.3
0.800	0.4	2.400	0.7	6.000	1.0		
1.000	0.5	2.600	0.7	6.500	1.1		

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Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 72 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.329	0.119	7.7	26.6	O K
30 min Summer	6.376	0.166	7.7	37.2	O K
60 min Summer	6.418	0.208	7.7	46.4	O K
120 min Summer	6.444	0.234	7.7	52.3	O K
180 min Summer	6.445	0.235	7.7	52.6	O K
240 min Summer	6.438	0.228	7.7	51.1	O K
360 min Summer	6.419	0.209	7.7	46.7	O K
480 min Summer	6.396	0.186	7.7	41.7	O K
600 min Summer	6.374	0.164	7.7	36.7	O K
720 min Summer	6.353	0.143	7.7	32.0	O K
960 min Summer	6.316	0.106	7.7	23.8	O K
1440 min Summer	6.270	0.060	7.7	13.4	O K
2160 min Summer	6.252	0.042	6.5	9.4	O K
2880 min Summer	6.245	0.035	5.4	7.8	O K
4320 min Summer	6.236	0.026	4.0	5.8	O K
5760 min Summer	6.232	0.022	3.3	4.8	O K
7200 min Summer	6.228	0.018	2.8	4.1	O K
8640 min Summer	6.226	0.016	2.5	3.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	99.940	0.0	17
30 min Summer	71.540	0.0	31
60 min Summer	49.114	0.0	54
120 min Summer	32.408	0.0	88
180 min Summer	24.842	0.0	124
240 min Summer	20.458	0.0	158
360 min Summer	15.542	0.0	226
480 min Summer	12.757	0.0	292
600 min Summer	10.930	0.0	356
720 min Summer	9.624	0.0	418
960 min Summer	7.861	0.0	532
1440 min Summer	5.891	0.0	752
2160 min Summer	4.397	0.0	1104
2880 min Summer	3.577	0.0	1468
4320 min Summer	2.677	0.0	2200
5760 min Summer	2.182	0.0	2912
7200 min Summer	1.866	0.0	3672
8640 min Summer	1.644	0.0	4352

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	6.225	0.015	2.3	3.2	O K
15 min Winter	6.347	0.137	7.7	30.6	O K
30 min Winter	6.402	0.192	7.7	42.9	O K
60 min Winter	6.451	0.241	7.7	53.9	O K
120 min Winter	6.478	0.268	7.7	60.0	O K
180 min Winter	6.476	0.266	7.7	59.4	O K
240 min Winter	6.463	0.253	7.7	56.5	O K
360 min Winter	6.428	0.218	7.7	48.7	O K
480 min Winter	6.390	0.180	7.7	40.3	O K
600 min Winter	6.354	0.144	7.7	32.3	O K
720 min Winter	6.322	0.112	7.7	25.1	O K
960 min Winter	6.274	0.064	7.7	14.3	O K
1440 min Winter	6.252	0.042	6.4	9.3	O K
2160 min Winter	6.241	0.031	4.8	6.9	O K
2880 min Winter	6.235	0.025	3.9	5.7	O K
4320 min Winter	6.229	0.019	3.0	4.3	O K
5760 min Winter	6.226	0.016	2.4	3.5	O K
7200 min Winter	6.223	0.013	2.0	2.9	O K
8640 min Winter	6.222	0.012	1.8	2.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Summer	1.480	0.0	5136
15 min Winter	99.940	0.0	17
30 min Winter	71.540	0.0	31
60 min Winter	49.114	0.0	58
120 min Winter	32.408	0.0	94
180 min Winter	24.842	0.0	134
240 min Winter	20.458	0.0	172
360 min Winter	15.542	0.0	244
480 min Winter	12.757	0.0	312
600 min Winter	10.930	0.0	374
720 min Winter	9.624	0.0	434
960 min Winter	7.861	0.0	532
1440 min Winter	5.891	0.0	746
2160 min Winter	4.397	0.0	1100
2880 min Winter	3.577	0.0	1472
4320 min Winter	2.677	0.0	2200
5760 min Winter	2.182	0.0	2912
7200 min Winter	1.866	0.0	3640
8640 min Winter	1.644	0.0	4336

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	6.221	0.011	1.7	2.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Winter	1.480	0.0	4984

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.700	Shortest Storm (mins)	15
Ratio R	0.242	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.187

Time (mins) From:	To:	Area (ha)
0	4	0.187

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Model Details

Storage is Online Cover Level (m) 6.800

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.11160	Width (m)	27.0
Membrane Percolation (mm/hr)	1000	Length (m)	27.6
Max Percolation (l/s)	207.0	Slope (1:X)	0.0
Safety Factor	3.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	6.210	Cap Volume Depth (m)	0.390

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Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 28 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.637	0.037	1.1	2.1	O K
30 min Summer	6.651	0.051	1.5	2.9	O K
60 min Summer	6.665	0.065	1.5	3.7	O K
120 min Summer	6.673	0.073	1.5	4.2	O K
180 min Summer	6.671	0.071	1.5	4.0	O K
240 min Summer	6.666	0.066	1.5	3.8	O K
360 min Summer	6.656	0.056	1.5	3.2	O K
480 min Summer	6.649	0.049	1.5	2.8	O K
600 min Summer	6.644	0.044	1.3	2.5	O K
720 min Summer	6.640	0.040	1.2	2.3	O K
960 min Summer	6.635	0.035	1.1	2.0	O K
1440 min Summer	6.627	0.027	0.8	1.6	O K
2160 min Summer	6.621	0.021	0.6	1.2	O K
2880 min Summer	6.618	0.018	0.5	1.0	O K
4320 min Summer	6.613	0.013	0.4	0.8	O K
5760 min Summer	6.611	0.011	0.3	0.6	O K
7200 min Summer	6.609	0.009	0.3	0.5	O K
8640 min Summer	6.608	0.008	0.3	0.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	99.940	0.0	16
30 min Summer	71.540	0.0	25
60 min Summer	49.114	0.0	42
120 min Summer	32.408	0.0	78
180 min Summer	24.842	0.0	110
240 min Summer	20.458	0.0	142
360 min Summer	15.542	0.0	202
480 min Summer	12.757	0.0	260
600 min Summer	10.930	0.0	320
720 min Summer	9.624	0.0	382
960 min Summer	7.861	0.0	502
1440 min Summer	5.891	0.0	740
2160 min Summer	4.397	0.0	1104
2880 min Summer	3.577	0.0	1468
4320 min Summer	2.677	0.0	2204
5760 min Summer	2.182	0.0	2936
7200 min Summer	1.866	0.0	3672
8640 min Summer	1.644	0.0	4360

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	6.607	0.007	0.2	0.4	O K
15 min Winter	6.643	0.043	1.3	2.5	O K
30 min Winter	6.660	0.060	1.5	3.4	O K
60 min Winter	6.674	0.074	1.5	4.2	O K
120 min Winter	6.678	0.078	1.5	4.5	O K
180 min Winter	6.671	0.071	1.5	4.1	O K
240 min Winter	6.662	0.062	1.5	3.6	O K
360 min Winter	6.649	0.049	1.5	2.8	O K
480 min Winter	6.642	0.042	1.3	2.4	O K
600 min Winter	6.637	0.037	1.1	2.1	O K
720 min Winter	6.633	0.033	1.0	1.9	O K
960 min Winter	6.628	0.028	0.8	1.6	O K
1440 min Winter	6.621	0.021	0.6	1.2	O K
2160 min Winter	6.616	0.016	0.5	0.9	O K
2880 min Winter	6.613	0.013	0.4	0.7	O K
4320 min Winter	6.610	0.010	0.3	0.5	O K
5760 min Winter	6.608	0.008	0.2	0.4	O K
7200 min Winter	6.607	0.007	0.2	0.4	O K
8640 min Winter	6.606	0.006	0.2	0.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Summer	1.480	0.0	5136
15 min Winter	99.940	0.0	16
30 min Winter	71.540	0.0	27
60 min Winter	49.114	0.0	46
120 min Winter	32.408	0.0	84
180 min Winter	24.842	0.0	118
240 min Winter	20.458	0.0	150
360 min Winter	15.542	0.0	206
480 min Winter	12.757	0.0	266
600 min Winter	10.930	0.0	326
720 min Winter	9.624	0.0	386
960 min Winter	7.861	0.0	508
1440 min Winter	5.891	0.0	738
2160 min Winter	4.397	0.0	1108
2880 min Winter	3.577	0.0	1496
4320 min Winter	2.677	0.0	2196
5760 min Winter	2.182	0.0	2944
7200 min Winter	1.866	0.0	3640
8640 min Winter	1.644	0.0	4488

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	6.605	0.005	0.2	0.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Winter	1.480	0.0	5104

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.700	Shortest Storm (mins)	15
Ratio R	0.242	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.019

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

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Model Details

Storage is Online Cover Level (m) 7.050

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.08640	Width (m)	6.8
Membrane Percolation (mm/hr)	1000	Length (m)	28.0
Max Percolation (l/s)	52.9	Slope (1:X)	0.0
Safety Factor	3.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	6.600	Cap Volume Depth (m)	0.250

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Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 74 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	6.191	0.041	1.4	5.4	O K
30 min Summer	6.210	0.060	1.8	7.9	O K
60 min Summer	6.230	0.080	1.8	10.5	O K
120 min Summer	6.246	0.096	1.8	12.7	O K
180 min Summer	6.251	0.101	1.8	13.3	O K
240 min Summer	6.252	0.102	1.8	13.5	O K
360 min Summer	6.249	0.099	1.8	13.0	O K
480 min Summer	6.243	0.093	1.8	12.2	O K
600 min Summer	6.235	0.085	1.8	11.3	O K
720 min Summer	6.228	0.078	1.8	10.3	O K
960 min Summer	6.215	0.065	1.8	8.6	O K
1440 min Summer	6.199	0.049	1.7	6.5	O K
2160 min Summer	6.189	0.039	1.4	5.2	O K
2880 min Summer	6.183	0.033	1.2	4.4	O K
4320 min Summer	6.176	0.026	0.9	3.4	O K
5760 min Summer	6.171	0.021	0.7	2.8	O K
7200 min Summer	6.168	0.018	0.6	2.4	O K
8640 min Summer	6.166	0.016	0.6	2.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	99.940	0.0	17
30 min Summer	71.540	0.0	31
60 min Summer	49.114	0.0	54
120 min Summer	32.408	0.0	88
180 min Summer	24.842	0.0	124
240 min Summer	20.458	0.0	158
360 min Summer	15.542	0.0	226
480 min Summer	12.757	0.0	292
600 min Summer	10.930	0.0	356
720 min Summer	9.624	0.0	418
960 min Summer	7.861	0.0	538
1440 min Summer	5.891	0.0	764
2160 min Summer	4.397	0.0	1124
2880 min Summer	3.577	0.0	1472
4320 min Summer	2.677	0.0	2204
5760 min Summer	2.182	0.0	2936
7200 min Summer	1.866	0.0	3672
8640 min Summer	1.644	0.0	4400

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	6.165	0.015	0.5	1.9	O K
15 min Winter	6.197	0.047	1.7	6.3	O K
30 min Winter	6.220	0.070	1.8	9.3	O K
60 min Winter	6.243	0.093	1.8	12.3	O K
120 min Winter	6.260	0.110	1.8	14.5	O K
180 min Winter	6.264	0.114	1.8	15.0	O K
240 min Winter	6.262	0.112	1.8	14.8	O K
360 min Winter	6.254	0.104	1.8	13.7	O K
480 min Winter	6.242	0.092	1.8	12.2	O K
600 min Winter	6.231	0.081	1.8	10.6	O K
720 min Winter	6.219	0.069	1.8	9.2	O K
960 min Winter	6.202	0.052	1.8	6.9	O K
1440 min Winter	6.191	0.041	1.4	5.3	O K
2160 min Winter	6.181	0.031	1.1	4.1	O K
2880 min Winter	6.176	0.026	0.9	3.4	O K
4320 min Winter	6.169	0.019	0.7	2.5	O K
5760 min Winter	6.166	0.016	0.6	2.1	O K
7200 min Winter	6.163	0.013	0.5	1.7	O K
8640 min Winter	6.162	0.012	0.4	1.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Summer	1.480	0.0	5080
15 min Winter	99.940	0.0	17
30 min Winter	71.540	0.0	31
60 min Winter	49.114	0.0	58
120 min Winter	32.408	0.0	96
180 min Winter	24.842	0.0	134
240 min Winter	20.458	0.0	172
360 min Winter	15.542	0.0	246
480 min Winter	12.757	0.0	314
600 min Winter	10.930	0.0	376
720 min Winter	9.624	0.0	436
960 min Winter	7.861	0.0	540
1440 min Winter	5.891	0.0	768
2160 min Winter	4.397	0.0	1128
2880 min Winter	3.577	0.0	1496
4320 min Winter	2.677	0.0	2204
5760 min Winter	2.182	0.0	2928
7200 min Winter	1.866	0.0	3672
8640 min Winter	1.644	0.0	4328

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	6.161	0.011	0.4	1.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Winter	1.480	0.0	5200

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.700	Shortest Storm (mins)	15
Ratio R	0.242	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.044

Time (mins) From:	To:	Area (ha)
0	4	0.044

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Model Details

Storage is Online Cover Level (m) 6.600

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.04320	Width (m)	20.0
Membrane Percolation (mm/hr)	1000	Length (m)	22.0
Max Percolation (l/s)	122.2	Slope (1:X)	0.0
Safety Factor	3.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	6.150	Cap Volume Depth (m)	0.250

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