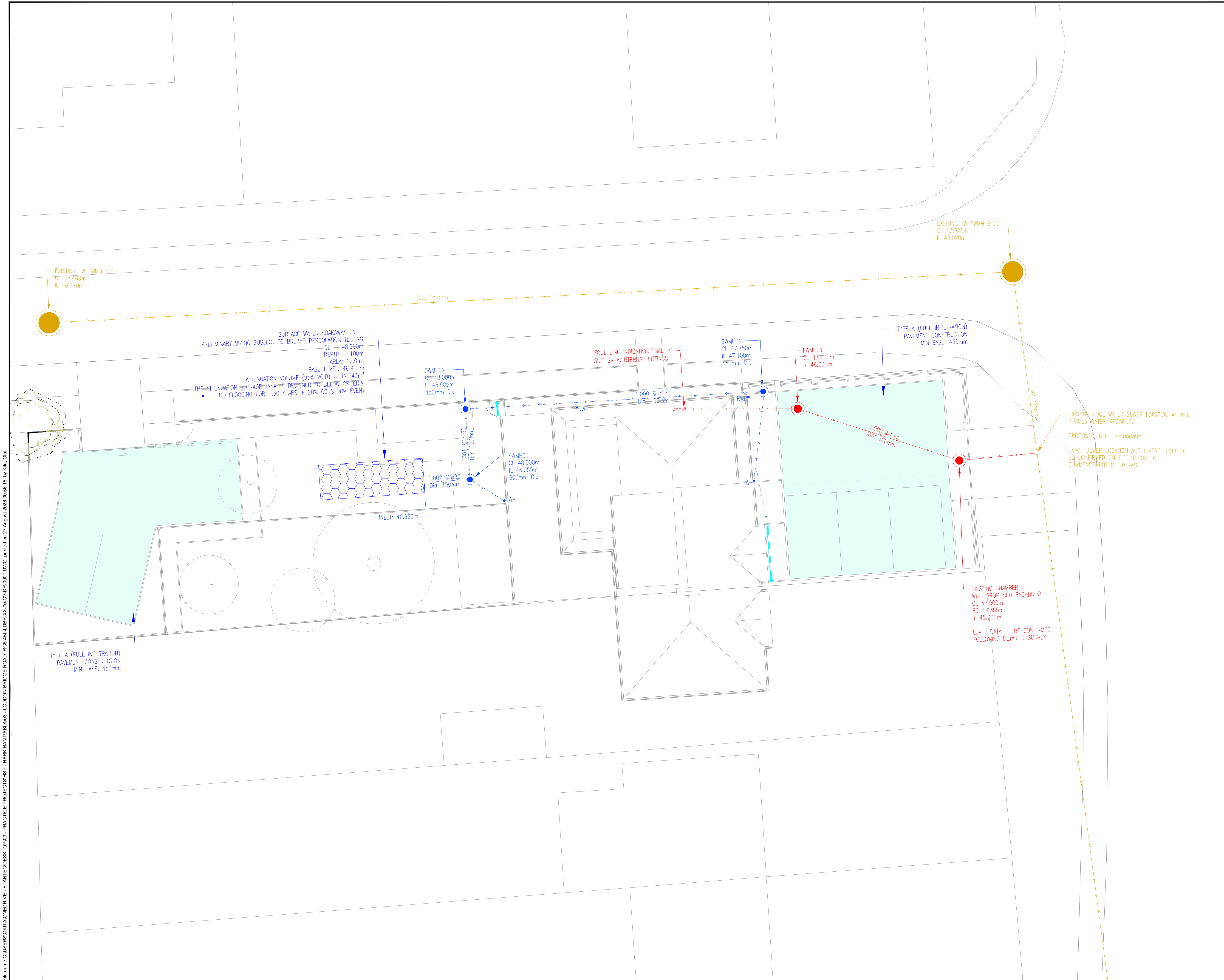


File name: C:\USERS\KATIA\ONEEDRIVE - STANTEC\DESKTOP\09 - PRACTICE PROJECTS\HSP - HARKIRAN PABLA\03 - LODDON BRIDGE ROAD, RG5 4BL\LBDR-XX-00-CV-DR-0001.DWG, printed on 27 August 2026 10:56:15, by Ktia, Oiaf



DO NOT SCALE

NOTES:

1.

DRAWING TO BE READ IN CONJUNCTION WITH THE SPECIFICATIONS AND ALL OTHER EMPLOYERS REQUIREMENTS/TENDER/CONTRACT DOCUMENTS, INCLUDING THE STRUCTURAL AND ARCHITECTURAL PACKAGES.

2.

ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METERS UNLESS OTHERWISE STATED.

3.

ALL DROP POINT LOCATIONS ARE INDICATIVELY SHOWN AND BASED ON RECEIVED INFORMATION.

4.

KITA ENGINEERING ACCEPTS NO RESPONSIBILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS CLIENT AND ONLY FOR THE PURPOSE FOR WHICH IT WAS PREPARED AND PROVIDED.

5.

THE DESIGN ASSUMES THAT ALL CONTRACTORS ARE COMPETENT AND THAT THEY ARE INDUCTED AND CO-ORDINATED BY THE CONTRACTOR IN ORDER TO CO-OPERATE AND IMPLEMENT SAFE WORKING PRACTICES ON SITE.

6.

IF ISSUED IN AN ELECTRONIC FORMAT, IT IS THE RESPONSIBILITY OF THE RECIPIENT TO CHECK THAT THIS DRAWING HAS BEEN REPRODUCED ACCURATELY AND COMPLETELY.

7.

ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH LOCAL AND NATIONAL REGULATIONS, NATIONAL STANDARDS AND CODES OF PRACTICE, INCLUDING THE RELEVANT STANDARDS.

8.

ALL DRAINAGE RUNS TO BE CLAY EXCEPT PERFORATED PERMEABLE LANDSCAPING UNDERDRAINS WHICH ARE HDPE OR SIMILAR.

9.

ALL EXISTING DRAINAGE TO BE RETAINED SHOULD BE SURVEYED AND REPAIRED IN ACCORDANCE WITH BS EN 1610 CONSTRUCTION AND TESTING OF DRAINS AND SEWERS

10.

ALL PIPE SIZES STATED ARE NOMINAL INTERNAL DIAMETERS IN MILLIMETERS.

11.

ALL DRAINAGE IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE BUILDING REGULATIONS, BS EN 752 AND RELEVANT AGREEMENT CERTIFICATES

12.

DRAINS TO BE CONSTRUCTED USING FLEXIBLY JOINTED VITRIFIED CLAY PIPES TO BS EN 285:2013 (1-3) OR UPVC BUILDING DRAINAGE SYSTEM PIPEWORK TO BS EN 1401, BEDDED AND BACKFILLED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS AND THE SPECIFICATIONS.

13.

BACKFILLING OF DRAIN TRENCHES ADJACENT TO DWELLINGS OF OTHER STRUCTURES TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS PART H: DIAGRAM 8.

14.

ALL RAIN WATER PIPE LOCATIONS ARE INDICATIVE ONLY. FOR ACTUAL LOCATIONS PLEASE REFER TO ARCHITECTS & MEP ENGINEERS PLANS AND ELEVATIONS.

15.

WHERE PROPOSED WORKS MAY REQUIRE THE ABANDONMENT OF ANY PIPEWORK, APPROPRIATE CHECKS SHOULD BE UNDERTAKEN TO ENSURE THAT THERE ARE NO OTHER PROPERTIES CONNECTED TO THAT RUN.

16.

ALL PRIVATE DRAINAGE IS TO COMPLY AND BE LAID IN ACCORDANCE WITH CURRENT PART H OF BUILDING REGULATIONS, BS EN 752:2017 AND BS 5955.

17.

POSITION & INVERT LEVELS OF ALL EXISTING MANHOLES, SEWERS AND LATERALS TO BE CONFIRMED PRIOR TO CONSTRUCTION & ANY DISCREPANCIES REPORTED TO THE ENGINEER.

18.

THE POSITION OF EXISTING SERVICES SHOULD BE VERIFIED PRIOR TO COMMENCEMENT OF WORKS ON-SITE.

19.

PROPOSED SOAKAWAY SUBJECT TO DETAILED DESIGN AND BRE365 INFILTRATION TESTING. FINAL LOCATION, SIZE AND DEPTH TO BE CONFIRMED BASED ON SITE GROUND CONDITIONS AND TEST RESULTS.

KEY:

REDLINE BOUNDARY

EXISTING FOUL WATER DRAINAGE

PROPOSED FOUL WATER DRAINAGE

PROPOSED SURFACE WATER DRAINAGE

PROPOSED SOIL VENT PIPE

PROPOSED RAINWATER PIPE

PROPOSED FRENCH DRAIN OR SIMILAR

PROPOSED SOAKAWAY

PROPOSED TYPE A PERMEABLE PAVING

P04

27/08/2026

OK

ISSUED TO REFLECT ARCHITECTURAL CHANGES

P03

22/06/2026

OK

ISSUED TO REFLECT HIGHWAYS OFFICER COMMENTS

P02

01/04/2026

OK

ISSUED FOR REVIEW

P01

18/03/2026

OK

FIRST ISSUE

REV

DATE

BY

DESCRIPTION

DRAWING STATUS:

S4 - FOR CONSTRUCTION APPROVAL

HSP

STRUCTURAL

ENGINEERS

SITE/PROJECT:

LODDON BRIDGE ROAD
RG5 4BL

TITLE:

PROPOSED DRAINAGE
OVERALL SITE LAYOUT

SCALE @ A1:

DESIGNED:

DRAWN:

DATE:

1:100

OK

OK

MARCH 2026

DRAWING No:

REV:

LBDR-XX-00-CV-DR-0001

P04

Drainage Calculations: Loddon Bridge Road RG5 4BL	Date: 27/08/2026			
	Designed by: okita	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Loddon Bridge	HSP STRUCTURAL ENGINEERS: P04			



Catchment Area (2)

Type : Catchment Area

Area (ha)	0.004
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (3)

Type : Catchment Area

Area (ha)	0.002
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (7)

Type : Catchment Area

Area (ha)	0.004
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (10)

Type : Catchment Area

Area (ha)	0.002
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Drainage Calculations: Loddon Bridge Road RG5 4BL	Date: 27/08/2026			
	Designed by: okita	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Loddon Bridge	HSP STRUCTURAL ENGINEERS: P04			



Catchment Area (11)

Type : Catchment Area

Area (ha)	0.008
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area

Type : Catchment Area

Area (ha)	0.005
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.750
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (1)

Type : Catchment Area

Area (ha)	0.005
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (4)

Type : Catchment Area

Area (ha)	0.001
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Drainage Calculations: Loddon Bridge Road RG5 4BL	Date: 27/08/2026		
	Designed by: okita	Checked by:	
Report Details: Type: Manhole Schedule Storm Phase: Loddon Bridge	HSP STRUCTURAL ENGINEERS: P04		

Name	Cover Level (m) Invert Level (m)		Connection Details				Type
Coordinates (m)	Depth (m)	Manhole Size (m)	Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
SWMH2	48.000 46.985	Diameter / Length: 0.450	{1} 1.000	Pipe	46.985	Diam/Width:150	Manhole
E:476654.715 N:173187.276	1.015		{a} 1.001	Pipe	46.985	Diam/Width:150	Not Applicable
SWMH3	48.000 46.955	Diameter / Length: 0.600	{1} 1.001	Pipe	46.955	Diam/Width:150	Manhole
E:476655.068 N:173183.278	1.045		{a} 1.002	Pipe	46.955	Diam/Width:150	Not Applicable
SWMH1	47.750 47.100	Diameter / Length: 0.450					Manhole
E:476671.727 N:173188.421	0.650		{a} 1.000	Pipe	47.100	Diam/Width:150	Not Applicable

Drainage Calculations: Loddon Bridge Road RG5 4BL	Date: 27/08/2026			
	Designed by: okita	Checked by:	Approved By:	
Report Details: Type: Network Design Criteria Storm Phase: Loddon Bridge	HSP STRUCTURAL ENGINEERS: P04			

Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Manhole Options

Apply Offset	☐
--------------	--------------------------

Drainage Calculations: Loddon Bridge Road RG5 4BL	Date: 27/08/2026			
	Designed by: okita	Checked by:	Approved By:	
Report Title: Rainfall Analysis Criteria	HSP STRUCTURAL ENGINEERS: P04			

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Drainage Calculations: Loddon Bridge Road RG5 4BL	Date: 27/08/2026			
	Designed by: okita	Checked by:	Approved By:	
Report Details: Type: Junctions Summary Storm Phase: Loddon Bridge	HSP STRUCTURAL ENGINEERS: P04			



FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH2	FSR: 100 years: +40 %: 720 mins: Summer	48.00 0	46.98 5	47.754	0.769	1.0	0.122	0.000	1.4	8.717	Flood Risk
SWMH3	FSR: 100 years: +40 %: 480 mins: Winter	48.00 0	46.95 5	47.756	0.801	1.1	0.227	0.000	3.4	10.091	Flood Risk
SWMH1	FSR: 100 years: +40 %: 720 mins: Summer	47.75 0	47.10 0	47.751	0.651	0.3	0.862	0.759	0.4	3.631	Flood

Drainage Calculations: Loddon Bridge Road RG5 4BL	Date: 27/08/2026		
	Designed by: okita	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Loddon Bridge	HSP STRUCTURAL ENGINEERS: P04		





FSR: 30 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH2	FSR: 30 years: +20 %: 600 mins: Winter	48.000	46.985	47.475	0.490	0.5	0.078	0.000	0.6	5.423	Surcharged
SWMH3	FSR: 30 years: +20 %: 600 mins: Winter	48.000	46.955	47.475	0.520	0.9	0.147	0.000	0.8	7.485	Surcharged
SWMH1	FSR: 30 years: +20 %: 600 mins: Winter	47.750	47.100	47.475	0.375	0.2	0.060	0.000	0.2	2.138	Flood Risk

Drainage Calculations: Loddon Bridge Road RG5 4BL	Date: 27/08/2026		
	Designed by: okita	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Loddon Bridge	HSP STRUCTURAL ENGINEERS: P04		





FSR: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Soakaway 01	FSR: 100 years: +40 %: 720 mins: Summer	47.751	47.751	0.851	0.851	1.8	9.701	0.000	6.810	0.0	0.756	22.639	OK
Porous Paving 01	FSR: 100 years: +40 %: 720 mins: Winter	48.348	48.348	0.198	0.298	0.4	5.707	0.000	3.542	0.0	0.000	29.223	OK
Porous Paving 02	FSR: 100 years: +40 %: 600 mins: Winter	47.346	47.346	0.196	0.296	0.3	3.825	0.000	2.032	0.0	0.000	29.757	OK

Drainage Calculations: Loddon Bridge Road RG5 4BL	Date: 27/08/2026			
	Designed by: okita	Checked by:	Approved By:	
Report Details: Type: Stormwater Controls Summary Storm Phase: Loddon Bridge	HSP STRUCTURAL ENGINEERS: P04			



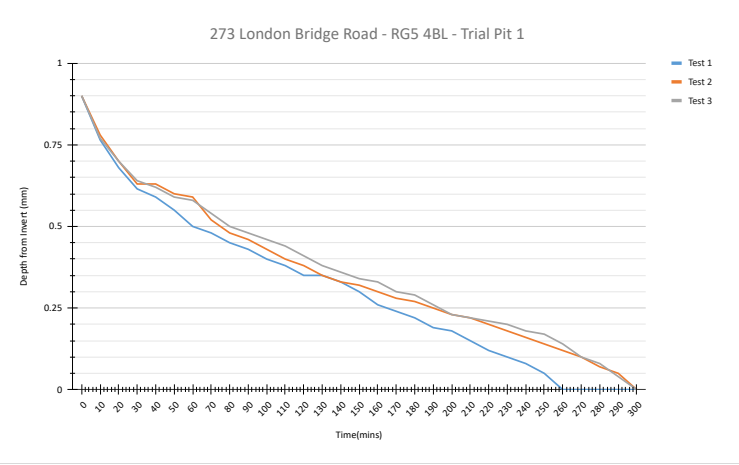
FSR: 30 years: Increase Rainfall (%): +20: Critical Storm Per Item: Rank By: Max.
Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Soakaway 01	FSR: 30 years: +20 %: 600 mins: Winter	47.474	47.474	0.574	0.574	1.0	6.549	0.000	4.716	0.0	0.395	47.773	OK
Porous Paving 01	FSR: 30 years: +20 %: 480 mins: Winter	48.247	48.247	0.097	0.197	0.4	3.381	0.000	2.288	0.0	0.000	58.070	OK
Porous Paving 02	FSR: 30 years: +20 %: 360 mins: Winter	47.246	47.246	0.096	0.196	0.3	2.273	0.000	1.176	0.0	0.000	58.252	OK

	Freeflush Water Management, Unit 3 Astra Business Park, Guinness Road, Trafford Park, Manchester M17 1SU
---	---

Test Type	Infiltration Test BRE 365
Site	273 London Bridge Road - RG5 4BL - Trial Pit 1
Date	12/06/2026
Supervised By:	J Patel CEng MICE
Weather Conditions on the day	Sunny
5 day Antecedent conditions	Medium to mild rainy/ cloudy conditions
Observations	300mm topsoil, gravel/ clay to invert
Trial pit location	Centered on proposed soakaway
Notes	N/A

Depth of Trial Pit (m)	1.2	m	Effective Depth (m) h75-25	0.450	m
Plan Length	1	m	V 75-25	0.135	m3
Plan Width	0.3	m	P	2.6	m
			a 50	1.470	m2
			t 75-25	11400	s
			Soil Infiltration rate f	8.1E-06	m/s
			Does the Trial pit drain 50% in 24 hrs	YES	



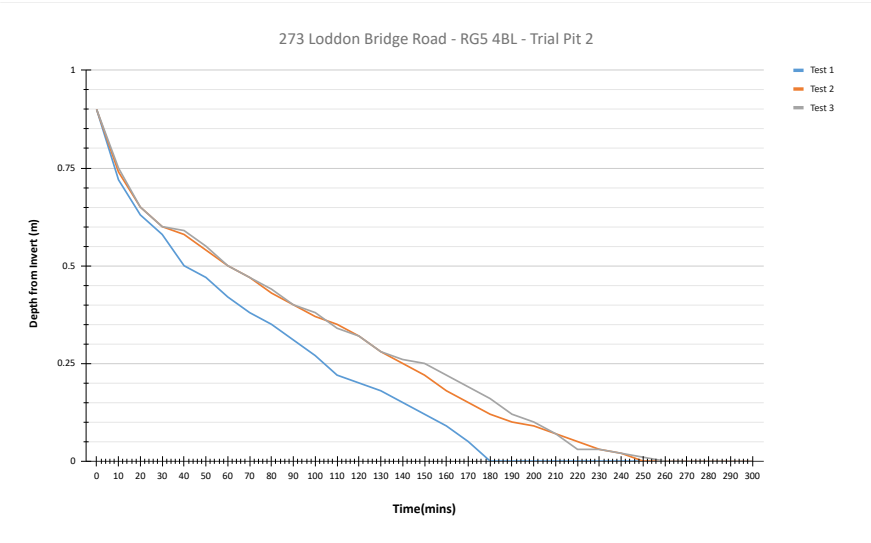
	Freelfush Water Management, Unit 3 Astra Business Park, Guinness Road, Trafford Park, Manchester M17 1SU
---	---

Test Type	Infiltration Test BRE 365
Site	273 London Bridge Road - RG5 4BL - Trial Pit 2
Date	12/06/2026
Supervised By:	J Patel CEng MICE
Weather Conditions on the day	Sunny
5 day Antecedent conditions	Medium to mild rainy/ cloudy conditions
Observations	300mm topsoil, sandy gravel to invert
Trial pit location	Centered on proposed soakaway
Notes	N/A

Depth of Trial Pit (m)	1.2	m
Plan Length	1	m
Plan Width	0.3	m



Effective Depth (m) h75-25	0.450	m
V 75-25	0.135	m3
P	2.6	m
a 50	1.470	m2
t 75-25	8520	s
Soil Infiltration rate <i>f</i>	1.1E-05	m/s
Does the Trial pit drain 50% in 24 hrs	YES	



	Freeflush Water Management, Unit 3 Astra Business Park, Guinness Road, Trafford Park, Manchester M17 1SU
---	---

Test Type	Infiltration Test BRE 365
Site	273 London Bridge Road - RG5 4BL - Trial Pit 3
Date	12/06/2026
Supervised By:	J Patel CEng MICE
Weather Conditions on the day	Sunny
5 day Antecedent conditions	Medium to mild rainy/ cloudy conditions
Observations	300mm topsoil, clay to invert
Trial pit location	Centered on proposed soakaway
Notes	N/A

Depth of Trial Pit (m)	1.2	m	Effective Depth (m) h75-25	0.450	m
Plan Length	1	m	V 75-25	0.135	m3
Plan Width	0.3	m	P	2.6	m
			a 50	1.470	m2
			t 75-25	12780	s
			Soil Infiltration rate f	7.2E-06	m/s
			Does the Trial pit drain 50% in 24 hrs	YES	

