

Appendix D – Surface Water Drainage Calculations



Project:	Date: 12/08/2025			
	Designed by: bjmurphy	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Company Address:			



Catchment Area

Type : Catchment Area

Area (ha)	0.408
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.950
Winter Volumetric Runoff	0.750
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project:	Date: 12/08/2025		
	Designed by: bjmurphy	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address:		





Pond

Type : Pond

Dimensions

Exceedance Level (m)	99.500
Depth (m)	1.000
Base Level (m)	98.500
Freeboard (mm)	150
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	3.243
Total Volume (m³)	179.001

Depth (m)	Area (m²)	Volume (m³)
0.000	144.00	0.000
1.000	315.00	223.993

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Filtration
Permeability Coefficient (m/hr)	0.453
Safety Factor	10.000
Bed Depth (m)	0.450
Area (m²)	92.37
Invert Level (m)	98.500

Advanced

Base Infiltration Rate (m/hr)	0.453
Side Infiltration Rate (m/hr)	0.453
Safety Factor	2.0
Perimeter	Circular
Length (m)	15.662
Friction Scheme	Manning's n
n	0.03

Project:	Date: 12/08/2025		
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Report Details: Type: Inflow Summary Storm Phase: Phase	Company Address:		



Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Pond		Time of Concentration	0.408	100	0	100	0.408
TOTAL		0.0		0.408				0.408

Project:	Date: 12/08/2025			
	Designed by: bjmurphy	Checked by:	Approved By:	
Report Details: Type: Outfall Details Storm Phase: Phase	Company Address:			

Outfalls

Outfall	Outfall Type	Gated	Fixed Surcharged Level (m)	Level Curve
Pond	Free Discharge			

Project:	Date: 12/08/2025			
	Designed by: bjmurphy	Checked by:	Approved By:	
Report Title: Rainfall Analysis Criteria	Company Address:			

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	☐

Rainfall

FSR Type: FSR

Region	England And Wales
M5-60 (mm)	18.9
Ratio R	0.350
Summer	☒
Winter	☒

Return Period

Return Period (years)	Increase Rainfall (%)
1.0	0.000
30.0	40.000
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project:	Date: 12/08/2025		
	Designed by: bjmurphy	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address:		





FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 1 years: +0 %: 15 mins: Summer	0.41	61.4	26.956

Project:	Date: 12/08/2025		
	Designed by: bjmurphy	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address:		





FSR: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 30 years: +40 %: 15 mins: Summer	0.41	212.2	92.549

Project:	Date: 12/08/2025		
	Designed by: bjmurphy	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address:		





FSR: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 100 years: +45 %: 15 mins: Summer	0.41	284.5	123.969

Project:	Date: 12/08/2025		
	Designed by: bjmurphy	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		





FSR: 1 years: Increase Rainfall (%): +0: 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. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Pond	FSR: 1 years: +0 %: 60 mins: Summer	98.631	98.631	0.131	0.131	37.3	20.025	0.000	42.720	1.5	3.693	88.813	OK

Project:	Date: 12/08/2025		
	Designed by: bjmurphy	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		





FSR: 30 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
Pond	FSR: 30 years: +40 %: 120 mins: Summer	99.082	99.082	0.582	0.582	92.8	109.321	0.000	168.946	2.7	24.107	38.927	OK

Project:	Date: 12/08/2025		
	Designed by: bjmurphy	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		





FSR: 100 years: Increase Rainfall (%): +45: 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
Pond	FSR: 100 years: +45 %: 120 mins: Summer	99.296	99.296	0.796	0.796	126.4	163.815	0.000	197.280	3.2	31.986	8.484	OK

Project:	Date: 12/08/2025		
	Designed by: bjmurphy	Checked by:	Approved By:
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address:		





Pond
Critical by Return Period: FSR: 1 years: Increase Rainfall (%): +0: 60 mins: Summer

Type : Pond

Tables

Half Drain Down Time (mins)	19
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Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	4.2	0.001	0.000	0.031	0.000	3.0
10	5.0	0.008	0.000	0.392	0.000	4.1
15	6.0	0.012	0.000	0.587	0.000	5.5
20	8.3	0.015	0.000	0.896	0.000	6.3
25	16.2	0.023	0.004	2.075	0.000	9.2
30	36.7	0.049	0.048	7.118	0.000	10.2
35	37.3	0.100	0.100	14.900	0.000	11.4
40	16.8	0.128	0.129	19.758	0.000	11.8
45	8.7	0.131	0.131	20.025	0.000	11.8
50	6.2	0.122	0.122	18.670	0.000	11.7
55	5.0	0.111	0.111	16.839	0.000	11.5
60	4.4	0.098	0.098	14.821	0.000	11.4
65	0.2	0.081	0.081	12.274	0.000	11.0
70	0.0	0.060	0.060	8.931	0.000	10.5
75	0.0	0.040	0.040	5.965	0.000	10.0
80	0.0	0.020	0.020	3.067	0.000	9.5
85	0.0	0.001	0.001	0.266	0.000	9.1
90	0.0	0.000	0.000	0.000	0.000	0.0
95	0.0	0.000	0.000	0.000	0.000	0.0
100	0.0	0.000	0.000	0.000	0.000	0.0
105	0.0	0.000	0.000	0.000	0.000	0.0
110	0.0	0.000	0.000	0.000	0.000	0.0
115	0.0	0.000	0.000	0.000	0.000	0.0
120	0.0	0.000	0.000	0.000	0.000	0.0

Project:	Date: 12/08/2025			
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Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address:			



Pond
Critical by Return Period: FSR: 30 years: Increase Rainfall (%): +40: 120 mins: Summer

Type : Pond

Project:	Date: 12/08/2025		
	Designed by: bjmurphy	Checked by:	Approved By:
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address:		



Tables

Half Drain Down Time (mins)	63
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Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	8.5	0.009	0.000	0.452	0.000	4.4
10	9.5	0.016	0.000	1.281	0.000	7.9
15	10.1	0.018	0.001	1.575	0.000	9.2
20	10.9	0.019	0.008	1.938	0.000	9.3
25	12.0	0.020	0.016	2.539	0.000	9.4
30	13.5	0.025	0.023	3.487	0.000	9.6
35	15.6	0.034	0.034	4.911	0.000	9.8
40	19.4	0.049	0.049	7.123	0.000	10.2
45	27.0	0.074	0.074	10.900	0.000	10.8
50	41.8	0.118	0.118	17.941	0.000	11.6
55	63.4	0.191	0.191	30.079	0.000	12.5
60	92.4	0.299	0.299	49.484	0.000	13.9
65	92.8	0.418	0.417	72.898	0.000	15.5
70	63.8	0.506	0.504	91.629	0.000	16.7
75	42.3	0.551	0.553	102.510	0.000	17.3
80	27.3	0.574	0.574	107.600	0.000	17.6
85	19.6	0.582	0.582	109.321	0.000	17.7
90	15.7	0.582	0.581	109.293	0.000	17.7
95	13.5	0.578	0.578	108.353	0.000	17.7
100	12.0	0.572	0.571	106.920	0.000	17.6
105	10.9	0.564	0.563	105.084	0.000	17.5
110	10.1	0.555	0.555	103.036	0.000	17.4
115	9.5	0.545	0.545	100.779	0.000	17.2
120	9.0	0.535	0.535	98.405	0.000	17.1
125	0.0	0.518	0.518	94.674	0.000	16.9
130	0.0	0.496	0.496	89.736	0.000	16.5
135	0.0	0.473	0.473	84.773	0.000	16.2
140	0.0	0.451	0.451	80.002	0.000	15.9
145	0.0	0.428	0.428	75.197	0.000	15.6
150	0.0	0.406	0.406	70.592	0.000	15.3
155	0.0	0.383	0.383	66.058	0.000	15.0
160	0.0	0.361	0.361	61.628	0.000	14.7
165	0.0	0.339	0.339	57.240	0.000	14.4
170	0.0	0.317	0.317	52.919	0.000	14.1
175	0.0	0.295	0.294	48.677	0.000	13.8
180	0.0	0.272	0.272	44.578	0.000	13.6
185	0.0	0.250	0.250	40.606	0.000	13.3
190	0.0	0.228	0.228	36.665	0.000	13.0
195	0.0	0.206	0.206	32.753	0.000	12.7
200	0.0	0.184	0.184	29.015	0.000	12.5
205	0.0	0.163	0.162	25.304	0.000	12.2
210	0.0	0.141	0.141	21.736	0.000	11.9
215	0.0	0.119	0.119	18.126	0.000	11.6
220	0.0	0.097	0.097	14.772	0.000	11.4
225	0.0	0.076	0.076	11.470	0.000	10.9
230	0.0	0.055	0.055	8.186	0.000	10.4
235	0.0	0.035	0.035	5.214	0.000	9.9
240	0.0	0.015	0.015	2.302	0.000	9.4

Project:	Date: 12/08/2025			
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Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address:			



Pond
Critical by Return Period: FSR: 100 years: Increase Rainfall (%): +45: 120 mins: Summer

Type : Pond

Project:	Date: 12/08/2025		
	Designed by: bjmurphy	Checked by:	Approved By:
Report Details: Type: Stormwater Control Results Storm Phase: Phase	Company Address:		



Tables

Half Drain Down Time (mins)	79
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Time (mins)	Total Inflow (L/s)	US Depth (m)	DS Depth (m)	Resident Volume(m³)	Flooded Volume (m³)	Total Outflow (L/s)
0	0.0	0.000	0.000	0.000	0.000	0.0
5	11.6	0.015	0.000	0.723	0.000	6.1
10	13.0	0.021	0.005	2.049	0.000	9.3
15	13.7	0.024	0.021	3.220	0.000	9.6
20	14.8	0.032	0.031	4.591	0.000	9.8
25	16.3	0.043	0.043	6.272	0.000	10.1
30	18.4	0.057	0.057	8.401	0.000	10.4
35	21.2	0.075	0.075	11.147	0.000	10.8
40	26.5	0.100	0.100	14.944	0.000	11.4
45	36.9	0.137	0.137	20.909	0.000	11.9
50	56.9	0.199	0.199	31.426	0.000	12.6
55	86.4	0.296	0.296	48.942	0.000	13.9
60	125.9	0.432	0.436	76.297	0.000	15.7
65	126.4	0.583	0.581	109.242	0.000	17.7
70	86.9	0.691	0.688	135.753	0.000	19.3
75	57.3	0.752	0.750	151.446	0.000	20.2
80	37.2	0.780	0.780	159.517	0.000	20.6
85	26.6	0.792	0.792	162.876	0.000	20.8
90	21.3	0.796	0.796	163.815	0.000	20.9
95	18.5	0.795	0.795	163.522	0.000	20.9
100	16.4	0.791	0.791	162.490	0.000	20.8
105	14.8	0.785	0.785	160.943	0.000	20.7
110	13.8	0.778	0.778	159.027	0.000	20.6
115	13.0	0.770	0.770	156.891	0.000	20.5
120	12.2	0.762	0.762	154.556	0.000	20.4
125	0.1	0.746	0.746	150.355	0.000	20.1
130	0.0	0.723	0.723	144.380	0.000	19.8
135	0.0	0.700	0.700	138.444	0.000	19.5
140	0.0	0.678	0.677	132.730	0.000	19.1
145	0.0	0.655	0.655	126.995	0.000	18.8
150	0.0	0.632	0.632	121.477	0.000	18.5
155	0.0	0.609	0.609	115.939	0.000	18.1
160	0.0	0.587	0.587	110.501	0.000	17.8
165	0.0	0.564	0.564	105.191	0.000	17.5
170	0.0	0.542	0.542	100.060	0.000	17.2
175	0.0	0.519	0.519	94.900	0.000	16.9
180	0.0	0.497	0.496	89.874	0.000	16.6
185	0.0	0.474	0.474	85.016	0.000	16.2
190	0.0	0.452	0.452	80.299	0.000	15.9
195	0.0	0.429	0.429	75.425	0.000	15.6
200	0.0	0.407	0.407	70.743	0.000	15.3
205	0.0	0.384	0.384	66.200	0.000	15.0
210	0.0	0.362	0.362	61.725	0.000	14.7
215	0.0	0.340	0.340	57.343	0.000	14.4
220	0.0	0.318	0.318	53.070	0.000	14.1
225	0.0	0.295	0.295	48.847	0.000	13.9
230	0.0	0.273	0.273	44.783	0.000	13.6
235	0.0	0.251	0.251	40.698	0.000	13.3
240	0.0	0.229	0.229	36.796	0.000	13.0

Appendix E – Proposed Drainage Strategy



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NOTES

- All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
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- This drawing is to be read in conjunction with relevant architects, engineers and specialist manufacturers drawings, reports and specifications.
- All levels are shown in metres above Ordnance Datum (m AOD).
- All private drainage to comply with current Building Regulations, BS EN-752 Drain and Sewer systems outside Buildings and other relevant British Standards and Codes of Practices.
- Drainage pipework routes under building footprint will require Co-ordination with foundations.
- Final foul pipe connection routes and manholes are subject to confirmation of above ground drainage design discharge points at ground level by others to allow final pipe sizes, configuration and connections.
- Door threshold drainage channel requirements to be advised by others.
- Surface water drainage RWP locations to be confirmed by Architect.
- External levels shown on this drawing relating to the civils, drainage works etc are to be confirmed on receipt of final external levels drawing (by others).

P01 ISSUED FOR PLANNING.	BM	JM	16.12.25	
Issued/Revision	By	Appd	DD.MM.YYYY	
	BM	JM	16.12.25	
	Dwn.	Dsgn.	Chkd.	DD.MM.YYYY

Issue Status

S2 - FOR INFORMATION

This document is suitable only for the purpose noted above. Use of this document for any other purpose is not permitted.

Client/Project Logo

Client/Project
SARUM ACADEMY

EXPANSION PROJECT

Title
PROPOSED DRAINAGE STRATEGY
8FE BUILDING

Project No.	A1 Scale
36089	1:250
Revision	Drawing No.
P01	75CC13-STN-00-XX-D-C-7000

LEGEND

PROPOSED DRAINAGE - FOUL

1000@1:100 — FOUL WATER DRAIN - PVCu
Approx. gradient and diameter as noted, 100mm Ø UNO

FW-01 — FOUL WATER MANHOLE
PC Ring 1.2m Ø UNO

FW-01 — FOUL WATER INSPECTION CHAMBER
PVCu 450mm Ø UNO. Max 3.0m with reduced access
Connections over 150mm - chamber to be **RANGE 600**

Note: All internal foul MH's and IC's to have recessed covers, double sealed and locking to prevent odours. Refer to layout for location.

FW-01 — FOUL WATER RECTANGULAR MANHOLE
Minimum 1.2m x 0.9m PC chamber sections UNO

RE — FOUL RODDING EYE
Ø as noted

YG — FOUL YARD GULLY (to be trapped)
Gully reference as noted on drawing.
Cover grade to suit loading.

FD — FLOOR DRAIN (to be trapped)
Internal use only, refer to architect for details / specification.
Roddable from above slab into standard (01) fitting.
Floor Drain / Gully to be kept charged to avoid odours.

01 & 01A — FOUL OUTLET / STACK POSITION
Shown indicative, refer to architect for setting out.
All branches 100mm Ø UNO.
01 - Outlet connects into standard 90° rest bend.
01A - Indicates access required in above slab plumbing for rodding, refer to service engineers drawings for details.
SVP - Indicates soil vent pipe by service engineer, with access.

BD — FOUL WATER BACKDROP
Refer to limits on drawing 7100

PROPOSED DRAINAGE - STORM

1500@1:100 — STORM WATER DRAIN - PVCu
(Structured walled pipe required at diameter >150mm)
Approx. gradient and diameter as noted, 100mm Ø UNO

SW-01 — STORM WATER MANHOLE
PC Ring 1.2m Ø UNO

SW-01 — STORM WATER INSPECTION CHAMBER
PVCu 450mm Ø UNO. Max 3.0m with reduced access
Connections over 150mm - chamber to be **RANGE 600**

SW-01 — STORM WATER RECTANGULAR MANHOLE
Minimum 1.2m x 0.9m PC chamber sections UNO

RE — STORM RODDING EYE
Ø as noted

BD — CONCRETE ENCASMENT TO PIPE
Refer to limits of cover table drawing 7101

BD — STORM WATER BACKDROP
Refer to limits on drawing 7100

01 & 01A — RAIN WATER OUTLET
Shown indicative, refer to architect for setting out.
Branch Ø to suit RWO diameter.
01 - Outlet connects into standard 90° rest bend.
01A - Indicates access required in above slab plumbing for rodding, refer to service engineers drawings for details.

RC — RAIN CHAIN (TO ARCHITECT'S SPECIFICATION)

AG — RAIN WATER OUTLET ACCESS GULLY
Branch Ø to be max 100mm.
AG - Outlet connects to gully.

RG — ROAD GULLY (to be trapped)

YG — YARD GULLY (to be trapped)

PG — PAVED AREA GULLY (to be trapped)

DC — CONCRETE DISHED CHANNEL

DC — DRAINAGE CHANNEL
(Refer to layout for specification)

TH — THRESHOLD DRAINAGE CHANNEL
(Assumed not required. Architect to confirm.
Refer to architect for details / specification)

GRASS COVERED FILTER TRENCH

P-B1(P) — PERMEABLE BLOCK PAVING -
SEE NOTE BOX FOR INFORMATION.
REFER TO DRAWING 7300 FOR DETAIL.

RG — RAIN GARDEN -
SEE NOTE BOX FOR INFORMATION.
REFER TO DRAWING 7300 FOR DETAIL.

PRIVATE EXISTING DRAINAGE

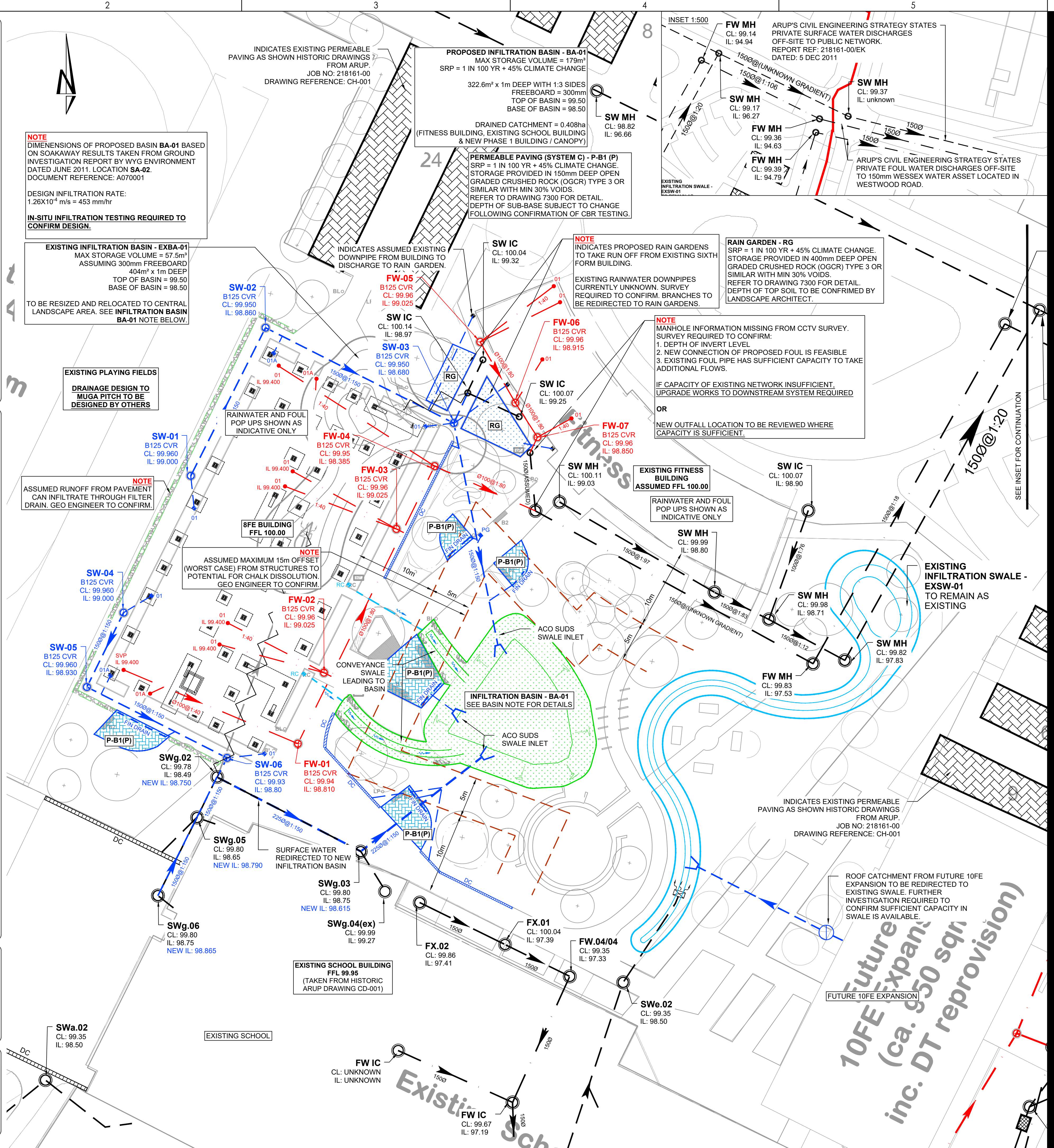
1500@1:100 — EXISTING PRIVATE FOUL SEWER

1500@1:100 — EXISTING PRIVATE STORM SEWER

FOUNDATIONS

— INDICATES PIPE THROUGH FOUNDATION

T.O.F. 0.000 — TOP OF FOUNDATION (TYPICAL)



With every community, we redefine what's possible.



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Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.