

1 Introduction

A Flood Risk Assessment and separate Drainage Strategy Report (ref M00514-ENG-XX-ZZ-RP-C-0002 and M00514-ENG-ZZ-XX-RP-C-0003) were prepared by Engenuiti and submitted to South Holland District Council (SHDC) for the proposed construction of a two-storey extension to the existing Castle Sports Complex building in Spalding, PE11 2AJ. The SHDC application reference is H16-0462-24.

The planning application was approved, with a condition imposed for the surface water drainage (Condition 7). The purpose of this Technical Note is to provide the information required to discharge the condition.

2 Recommended Condition

The recommended condition is outlined below, along with Engenuiti's response.

2.1 Condition 7

No development shall take place until a surface water drainage scheme has been submitted to and approved in writing by the Local Planning Authority. The approved scheme shall be completed before the development is used. The scheme shall:

- be based on sustainable drainage principles and an assessment of the hydrological and hydrogeological context of the development;*
- provide flood exceedance routing for storm event greater than 1 in 100 year;*
- provide details of how run-off will be safely conveyed and attenuated during storms up to and including the 1 in 100 year critical storm event, with an allowance for climate change, from all hard surfaced areas within the development into the existing local drainage infrastructure and watercourse system without exceeding the run-off rate for the undeveloped site;*
- provide attenuation details and discharge rates which shall be restricted to no more than what would be the greenfield run-off rate of the undeveloped land;*
- provide details of the timetable for and any phasing of implementation for the drainage scheme and*
- provide details of how the scheme shall be maintained and managed over the lifetime of the development, including any arrangements for adoption by any public body or Statutory Undertaker and any other arrangements required to secure the operation of the drainage system throughout its lifetime.*

-the use of the permitted development shall not be commenced until the approved scheme has been completed or provided on the site in accordance with the approved phasing. The approved scheme shall be retained and maintained in full, in accordance with the approved details.

Reason: *To ensure that the site can be adequately drained This Condition is imposed in accordance with Policies 2 and 3 of the South East Lincolnshire Local Plan, 2019 and national guidance contained in the National Planning Policy Framework, December 2024.*

2.2 Response

An updated drainage design is included in Appendix A and further information is provided below.

Sustainable drainage principles and an assessment of the hydrological and hydrogeological context of the development

As noted in Section 6.3 of the Drainage Assessment Report submitted for planning, the surface water drainage has been designed in accordance with national standards and local requirements. This development type falls within the central allowance and the surface water drainage has been designed to store the 1 in 30-year storm event below ground, and the 1 in 100-year plus 25% climate change event is managed safely on site.

In line with Lincolnshire County Council's Sustainable Drainage design and Evaluation Guide, the proposed discharge rate from the site has been limited to the Qbar greenfield rate of 1.65l/s. Calculations are provided in Appendix B, indicating the parameters used.

The following SuDS measures are proposed as part of the drainage design:

- An attenuation basin
- A swale
- Permeable paving (tanked to prevent infiltration)
- A below ground attenuation tank

Flood exceedance routing for storm event greater than 1 in 100-year

The site is designed such that surface water exceedance flows are directed away from the proposed building. Within the proposed hardstanding areas, levels fall such that exceedance flows will be directed north to the existing water course. Within the soft landscaping areas, the existing flow routes towards the water course will be retained. An exceedance flow plan can be found in Appendix C.

Details of how run-off will be safely conveyed and attenuated during storms up to and including the 1 in 100-year critical storm event, with an allowance for climate change AND attenuation details and discharge rates which shall be restricted to no more than what would be the greenfield run-off rate of the undeveloped land

The proposed strategy is to convey surface water to the ordinary watercourse to the north of the site. The discharge rate will be limited to Qbar greenfield rate of 1.65l/s for all storm events up to and including the 1 in 100 year +25% climate change event (this has been agreed with the local IDB).

The following volumes of attenuation are required across the site to limit the flow into the watercourse:

- 197m³ of attenuation is provided within a lined attenuation basin.
- 156m³ of attenuation is provided within a lined attenuation swale.
- 761m³ of attenuation is within sub-base replacement geo-cellular tanks below permeable paving.
- Additional storage is also provided within the stone sub-base below permeable paving (refer to calculations in Appendix B).

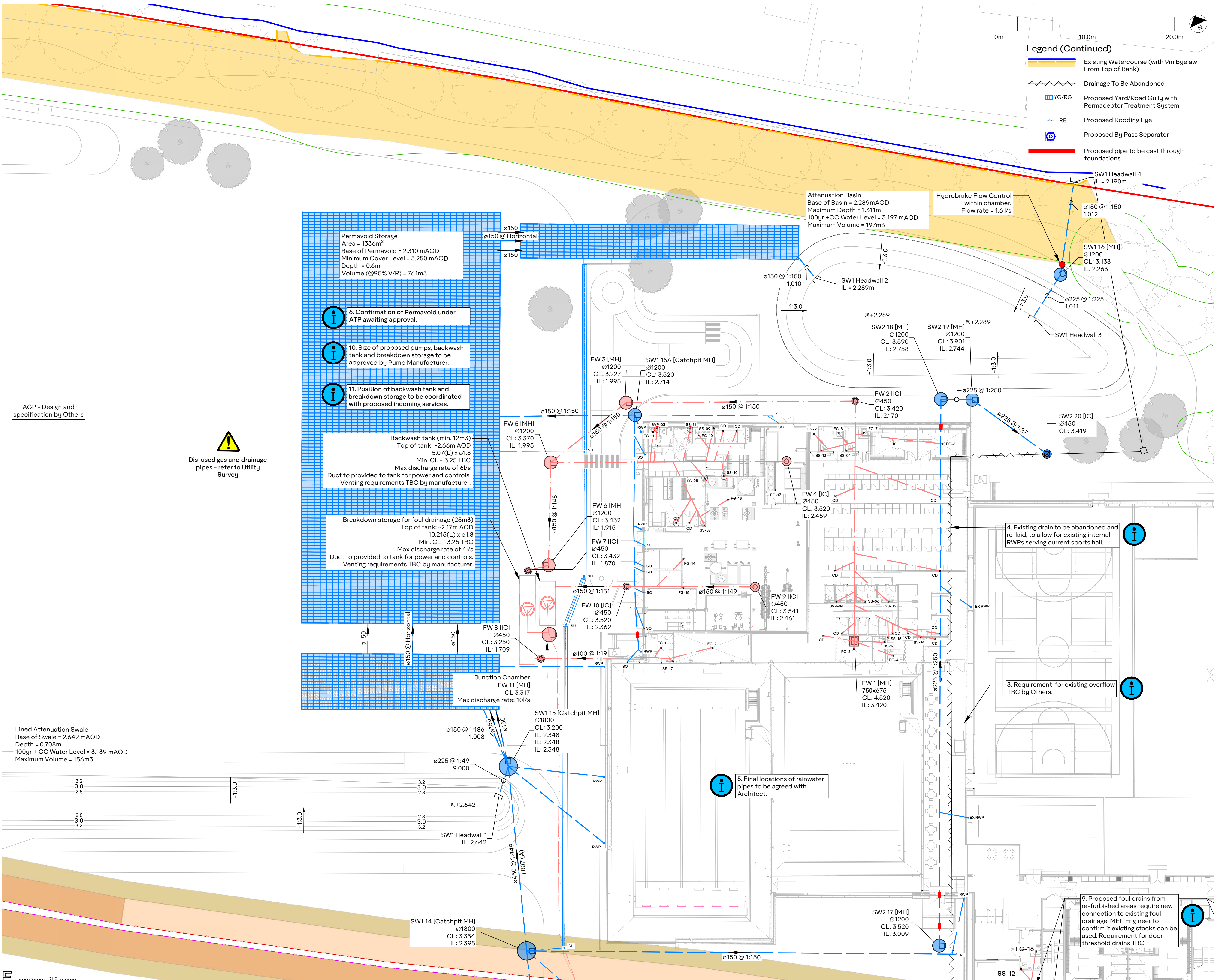
Timetable for and any phasing of implementation for the drainage scheme and details of how the scheme shall be maintained and managed over the lifetime of the development

- Early works drainage (Existing Car Park) - July to Sep 2025
 - Drainage and Ducting
 - Kerbs and edging
 - Sub-base stone for permeable surface
- Main drainage - May / June to Sep 2026
 - New storm and foul drainage (including pump chambers)
 - Attenuation below AGP
 - Attenuation Basin
 - Complete drainage runs
 - Kerbs and edging
 - Sub-base
 - Paving

Please refer to Section 8 of the Drainage Assessment Report submitted for planning, which includes maintenance details for each of the SuDS features proposed

- Attenuation basin
- Swale
- Permeable paving (tanked to prevent infiltration)
- A below ground attenuation tank

Appendix A – Proposed Drainage Strategy



- Notes**
- Engenuiti shall have no responsibility for any use made of this document other than for that which it was prepared and issued.
 - All dimensions should be checked on site.
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 - This drawing is to read in conjunction with all Engenuiti specifications as well as the architect's and other consultants drawings and specifications.
 - This drawing is to be read in conjunction with the Civils General Notes drawing C-0001, including Section B of the general notes that outlines the survey and record information sources this drawing is based on and Section X & Y that expand on information & H&S notes.

- Legend**
- Proposed Site Boundary
 - Proposed Surface Water Drainage
 - Proposed Surface Water Rising Main and Pump
 - Proposed Foul Water Drainage
 - Proposed Foul Rising Main and Pump
 - Existing Public Foul Water Rising Main (With 3&5m Sewer Easement)(Known Location)
 - Existing Public Foul Water Rising Main (With 3&5m Sewer Easement)(Assumed Location)
 - Existing Public Combined Sewer
 - Existing Public Foul Sewer
 - Existing Private Drainage
 - Proposed Perforated Pipe
 - Proposed Linear Channel Drain
 - Proposed Subbase Storage
 - Proposed Permeable Surface
 - Proposed Permavoid Storage
 - Proposed Attenuation Basin
 - Proposed Attenuation Swale
 - Proposed Flow Control
 - Proposed Headwall
 - Tree Root Protection Zone (RPZ)
 - Proposed Concrete Surround

Keyplan

1	2	3
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T1	14.04.25	UN	MM	Tender Issue
Rev	Date	By	Chk	Description

Client: **WILLMOTT DIXON** SINCE 1852

Architect: **Saunders Boston Architects**

ENGENUITI

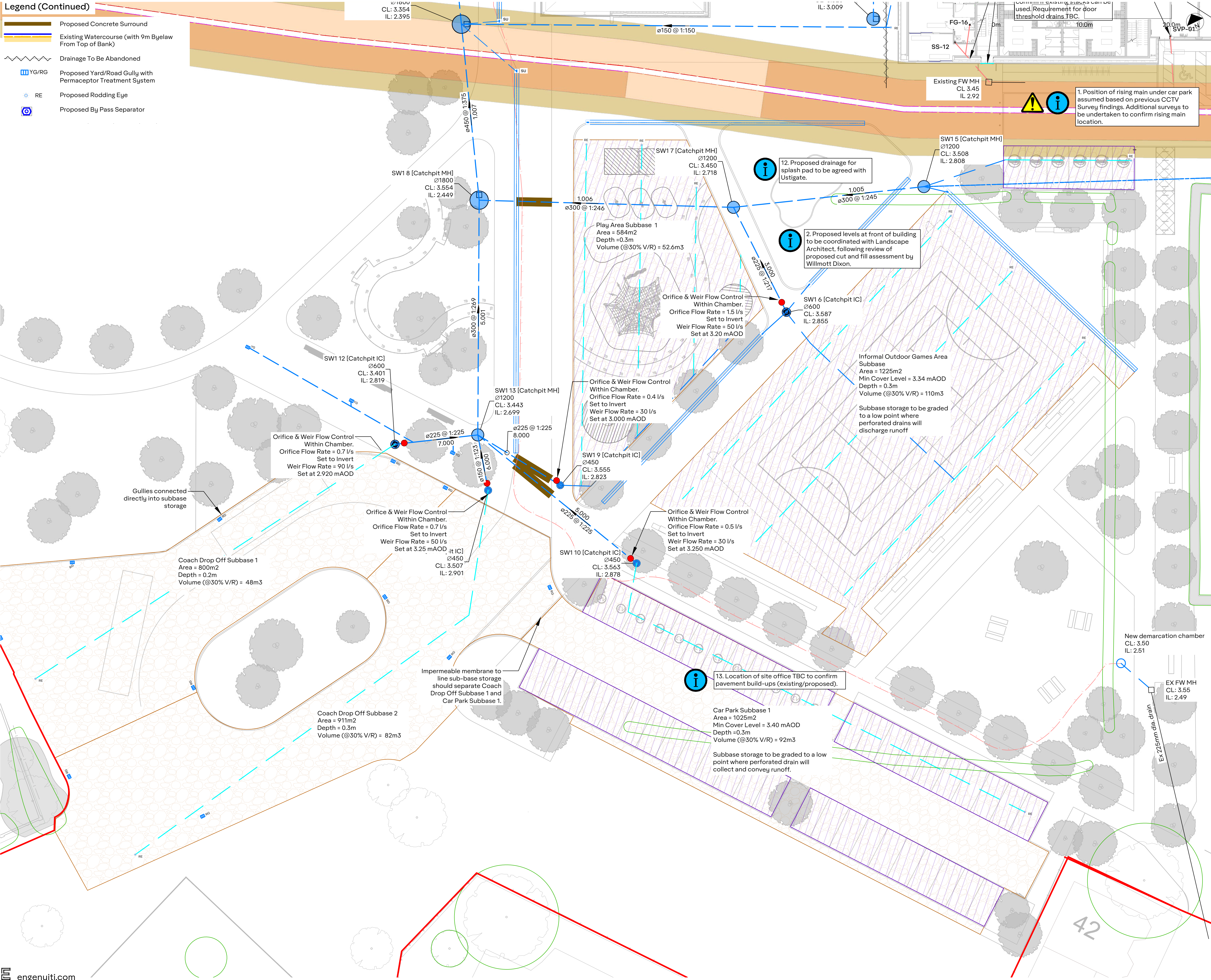
Project title
South Holland Health And Wellbeing Hub

Drawing title
Proposed Below Ground Drainage - Sheet 1

Purpose of Issue					Scale at A1	
Tender					1:200	
Engenuiti Project No.		Project ID			Suitability	
02048		M00514			S3	
PID.	Orig.	Vol.	Level	Type	Role No.	Revision
M00514- ENG -ZZ -XX -DR -C -3001						T1

Legend (Continued)

- Proposed Concrete Surround
- Existing Watercourse (with 9m Byelaw From Top of Bank)
- Drainage To Be Abandoned
- YG/RG Proposed Yard/Road Gully with Permacceptor Treatment System
- RE Proposed Rodding Eye
- Proposed By Pass Separator

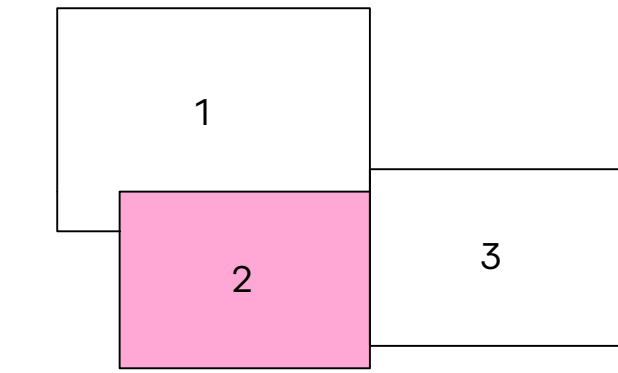


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Keyplan



Rev	Date	UN	MM	Tender Issue
T1	14.04.25	UN	MM	Tender Issue

Client: **WILLMOTT DIXON** (SINCE 1852)

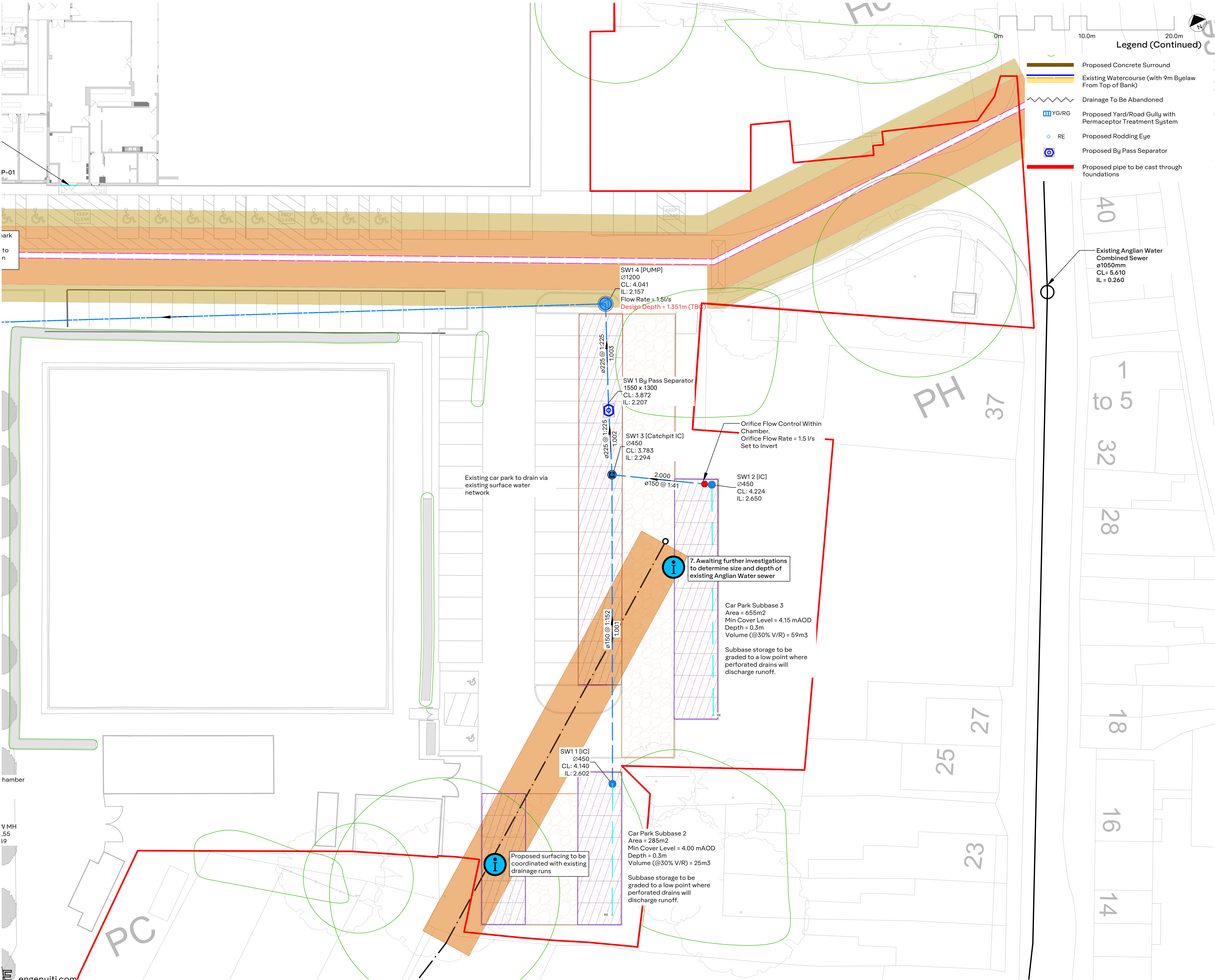
Architect: **Saunders Boston Architects**

ENGENUITI

Project title
South Holland Health And Wellbeing Hub

Drawing title
Proposed Below Ground Drainage - Sheet 2

Purpose of Issue		Scale at A1
Tender		1:200
Engenuiti Project No.	Project ID	Suitability
02048	M00514	S3
PID.	Orig.	Vol.
M00514- ENG -ZZ -XX -DR -C -3002		
	Level	Type
	Role No.	Revision
		T1



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Keyplan

1	2	3
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T1	14.04.25	UN	MM	Tender Issue
Rev	Date	By	Chk	Description

Client: **WILLMOTT DIXON** SINCE 1852

Architect: **Saunders Boston Architects**

ENGENUITI

Project title
South Holland Health And Wellbeing Hub

Drawing title
Proposed Below Ground Drainage - Sheet 3

Purpose of Issue		Scale at A1	
Tender		1:200	
Engenuiti Project No.	Project ID	Suitability	
02048	M00514	S3	
PID.	Orig.	Vol.	Level Type Role No. Revision
M00514- ENG -ZZ -XX -DR -C -3003			T1

Appendix B – Calculations



Design Settings

Rainfall Methodology	FEH-13	Minimum Velocity (m/s)	1.00
Return Period (years)	30	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	0.900
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Easting (m)	Northing (m)	Depth (m)
Car Park Subbase 3	0.067	5.00	4.150	525124.155	323041.816	1.500
Car Park Subbase 2	0.025	5.00	4.000	525094.518	323016.169	1.375
SW1 3 [IC]			3.783	525111.309	323048.466	1.489
SW1 4 [PUMP]			4.041	525117.362	323067.127	1.884
SW1 5 [MH]	0.050	5.00	3.508	525030.507	323106.744	0.728
Play Area Subbase 2	0.026	5.00	3.291	525011.829	323108.730	0.383
Informal Outdoor Games Area	0.148	5.00	3.340	525014.011	323099.256	0.485
SW1 7 [MH]	0.058	5.00	3.450	525008.366	323111.785	0.732
SW1 10 [Catchpit IC]	0.000	5.00	3.563	524978.520	323081.128	0.685
Coach Drop Subbase 2	0.091	5.00	3.400	524967.861	323096.596	0.499
Play Area 1	0.059	5.00	3.233	524976.712	323093.591	0.410
SW1 13 [MH]	0.025	5.00	3.443	524970.791	323103.462	0.744
SW1 1 [IC]			4.140	525096.111	323019.348	1.538
SW1 12 [IC]	0.000	5.00	3.401	524961.354	323106.514	0.582
SW1 6	0.028	5.00	3.587	525012.369	323103.053	0.732
SW1 8 [MH]	0.037	5.00	3.365	524981.859	323123.323	0.916
Swale 1	0.040	5.00	3.200	524998.163	323174.563	0.558
SW1 15 [MH]	0.134	5.00	3.283	525008.379	323171.721	0.936
Carpark 1		5.00	3.400	524977.829	323078.749	0.490
Permavoid	0.174	5.00	3.260	525015.622	323182.156	0.957
Pond	0.040	5.00	3.320	525051.875	323201.720	1.031
SW1 16 [MH]			3.325	525054.880	323205.841	1.062
SW1 By Pass Separator			3.872	525113.745	323056.348	1.665
Coach Drop Subbase 1	0.080	5.00	3.200	524960.624	323106.132	0.376
SW1 14	0.000	5.00	3.354	524990.723	323140.298	0.959

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.001	SW1 1 [IC]	SW1 3 [IC]	35.425	0.600	2.602	2.369	0.233	152.0	100	6.05	50.0
2.000	Car Park Subbase 3	SW1 3 [IC]	11.502	0.600	2.650	2.369	0.281	40.9	150	5.12	50.0
1.002	SW1 3 [IC]	SW1 By Pass Separator	8.240	0.600	2.294	2.257	0.037	222.7	225	6.20	50.0
1.004	SW1 4 [PUMP]	SW1 5 [MH]	98.037	0.600	2.157	2.780	-0.623	-157.4	225	8.06	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.001	0.621	4.9	4.5	1.438	1.314	0.025	0.0	76	0.705
2.000	1.577	27.9	12.1	1.350	1.264	0.067	0.0	69	1.520
1.002	0.872	34.7	16.6	1.264	1.390	0.092	0.0	109	0.862
1.004	1.000	39.8	16.6	1.659	0.503	0.092	0.0	225	0.000

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/
1 avoid	SW1 5 [MH]	SW1 7 [MH]	21.967	0.600	2.808	2.718	0.090	244.1	300	8.42	5
	Informal Outdoor Games Area	SW1 7 [MH]	13.471	0.600	2.855	2.793	0.062	217.3	225	5.25	5
	Play Area Subbase 2	SW1 7 [MH]	2.411	0.600	2.908	2.868	0.040	60.3	150	5.03	5
	SW1 7 [MH]	SW1 8 [MH]	29.199	0.600	2.718	2.599	0.119	245.4	300	8.91	5
	SW1 10 [Catchpit IC]	SW1 13 [MH]	23.435	0.600	2.878	2.774	0.104	225.3	150	5.67	5
	Coach Drop Subbase 1	SW1 12 [IC]	1.000	0.600	2.824	2.819	0.005	200.0	225	5.02	5
	SW1 12 [IC]	SW1 13 [MH]	10.114	0.600	2.819	2.774	0.045	224.8	225	5.21	5
	Coach Drop Subbase 2	SW1 13 [MH]	7.863	0.600	2.901	2.849	0.052	151.2	150	5.16	5
	Play Area 1	SW1 13 [MH]	11.087	0.600	2.823	2.774	0.049	226.3	225	5.21	5
	SW1 13 [MH]	SW1 8 [MH]	26.934	0.600	2.699	2.599	0.100	269.3	300	6.14	5
	SW1 8 [MH]	SW1 15 [MH]	20.299	0.600	2.449	2.395	0.054	375.9	450	9.24	5
	Swale 1	SW1 15 [MH]	3.848	0.600	2.642	2.572	0.070	55.0	225	5.04	5
	SW1 15 [MH]	Permavoid	5.183	0.600	2.347	2.310	0.037	140.1	450	9.29	5
	Carpark 1	SW1 10 [Catchpit IC]	2.477	0.600	2.910	2.899	0.011	225.2	100	5.08	5
	Permavoid	Pond	41.195	0.025	2.303	2.289	0.014	2942.5	30700	11.39	5
Pond	SW1 16 [MH]	5.100	0.025	2.289	2.263	0.026	196.2	150	11.66	5	
Car Park Subbase 2	SW1 1 [IC]	3.556	0.600	2.625	2.602	0.023	154.6	100	5.10	5	
1	SW1 By Pass Separator	SW1 4 [PUMP]	11.373	0.600	2.207	2.157	0.050	227.5	225	6.42	5
	SW1 6	SW1 7 [MH]	13.471	0.600	2.855	2.793	0.062	217.3	225	5.25	5
	SW1 14	SW1 15 [MH]	21.259	0.600	2.395	2.348	0.047	452.3	450	5.37	5

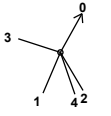
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.005	1.002	70.8	25.7	0.400	0.432	0.142	0.0	125	0.923
3.000	0.883	35.1	26.7	0.260	0.432	0.148	0.0	147	0.969
4.000	1.298	22.9	4.7	0.233	0.432	0.026	0.0	46	1.023
1.006	0.999	70.6	72.6	0.432	0.466	0.402	0.0	256	1.130
5.000	0.665	11.8	0.0	0.535	0.519	0.000	0.0	0	0.000
7.000	0.921	36.6	14.4	0.151	0.357	0.080	0.0	98	0.867
7.001	0.868	34.5	14.4	0.357	0.444	0.080	0.0	102	0.830
6.000	0.815	14.4	16.4	0.349	0.444	0.091	0.0	150	0.830
8.000	0.865	34.4	10.7	0.185	0.444	0.059	0.0	86	0.764
5.001	0.953	67.4	46.0	0.444	0.466	0.255	0.0	183	1.024
1.007	1.042	165.8	125.3	0.466	0.438	0.694	0.0	293	1.141
9.000	1.767	70.3	7.2	0.333	0.486	0.040	0.0	49	1.152
1.008	1.715	272.8	156.8	0.486	0.500	0.868	0.0	245	1.772
6.000_1	0.508	4.0	0.0	0.390	0.564	0.000	0.0	0	0.000
Permavoid	0.326	6009.0	188.2	0.357	0.431	1.042	0.0	57	0.108
1.011	0.320	5.7	195.4	0.881	0.912	1.081	0.0	150	0.326
2.001	0.616	4.8	4.5	1.275	1.438	0.025	0.0	77	0.700
1.003	0.863	34.3	16.6	1.440	1.659	0.092	0.0	110	0.856
4.000_1	0.883	35.1	5.1	0.507	0.432	0.028	0.0	58	0.631
1.0071	0.949	151.0	0.0	0.509	0.485	0.000	0.0	0	0.000

Pipeline Schedule

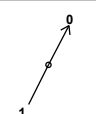
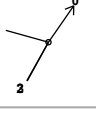
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.001	35.425	152.0	100	Circular	4.140	2.602	1.438	3.783	2.369	1.314
2.000	11.502	40.9	150	Circular	4.150	2.650	1.350	3.783	2.369	1.264
1.002	8.240	222.7	225	Circular	3.783	2.294	1.264	3.872	2.257	1.390
1.004	98.037	-157.4	225	Circular	4.041	2.157	1.659	3.508	2.780	0.503
1.005	21.967	244.1	300	Circular	3.508	2.808	0.400	3.450	2.718	0.432
3.000	13.471	217.3	225	Circular	3.340	2.855	0.260	3.450	2.793	0.432
4.000	2.411	60.3	150	Circular	3.291	2.908	0.233	3.450	2.868	0.432
1.006	29.199	245.4	300	Circular	3.450	2.718	0.432	3.365	2.599	0.466
5.000	23.435	225.3	150	Circular	3.563	2.878	0.535	3.443	2.774	0.519
7.000	1.000	200.0	225	Circular	3.200	2.824	0.151	3.401	2.819	0.357
7.001	10.114	224.8	225	Circular	3.401	2.819	0.357	3.443	2.774	0.444
6.000	7.863	151.2	150	Circular	3.400	2.901	0.349	3.443	2.849	0.444
8.000	11.087	226.3	225	Circular	3.233	2.823	0.185	3.443	2.774	0.444
5.001	26.934	269.3	300	Circular	3.443	2.699	0.444	3.365	2.599	0.466
1.007	20.299	375.9	450	Circular	3.365	2.449	0.466	3.283	2.395	0.438
9.000	3.848	55.0	225	Circular	3.200	2.642	0.333	3.283	2.572	0.486
1.008	5.183	140.1	450	Circular	3.283	2.347	0.486	3.260	2.310	0.500
6.000_1	2.477	225.2	100	Circular	3.400	2.910	0.390	3.563	2.899	0.564
Permavoid	41.195	2942.5	30700	Permavoid	3.260	2.303	0.357	3.320	2.289	0.431
1.011	5.100	196.2	150	Circular	3.320	2.289	0.881	3.325	2.263	0.912
2.001	3.556	154.6	100	Circular	4.000	2.625	1.275	4.140	2.602	1.438
1.003	11.373	227.5	225	Circular	3.872	2.207	1.440	4.041	2.157	1.659
4.000_1	13.471	217.3	225	Circular	3.587	2.855	0.507	3.450	2.793	0.432
1.0071	21.259	452.3	450	Circular	3.354	2.395	0.509	3.283	2.348	0.485

Link	US Node	Node Type	DS Node	Node Type
1.001	SW1 1 [IC]	Junction	SW1 3 [IC]	Junction
2.000	Car Park Subbase 3	Junction	SW1 3 [IC]	Junction
1.002	SW1 3 [IC]	Junction	SW1 By Pass Separator	Junction
1.004	SW1 4 [PUMP]	Junction	SW1 5 [MH]	Junction
1.005	SW1 5 [MH]	Junction	SW1 7 [MH]	Junction
3.000	Informal Outdoor Games Area	Junction	SW1 7 [MH]	Junction
4.000	Play Area Subbase 2	Junction	SW1 7 [MH]	Junction
1.006	SW1 7 [MH]	Junction	SW1 8 [MH]	Junction
5.000	SW1 10 [Catchpit IC]	Junction	SW1 13 [MH]	Junction
7.000	Coach Drop Subbase 1	Junction	SW1 12 [IC]	Junction
7.001	SW1 12 [IC]	Junction	SW1 13 [MH]	Junction
6.000	Coach Drop Subbase 2	Junction	SW1 13 [MH]	Junction
8.000	Play Area 1	Junction	SW1 13 [MH]	Junction
5.001	SW1 13 [MH]	Junction	SW1 8 [MH]	Junction
1.007	SW1 8 [MH]	Junction	SW1 15 [MH]	Junction
9.000	Swale 1	Junction	SW1 15 [MH]	Junction
1.008	SW1 15 [MH]	Junction	Permavoid	Junction
6.000_1	Carpark 1	Junction	SW1 10 [Catchpit IC]	Junction
Permavoid	Permavoid	Junction	Pond	Junction
1.011	Pond	Junction	SW1 16 [MH]	Junction
2.001	Car Park Subbase 2	Junction	SW1 1 [IC]	Junction
1.003	SW1 By Pass Separator	Junction	SW1 4 [PUMP]	Junction
4.000_1	SW1 6	Junction	SW1 7 [MH]	Junction
1.0071	SW1 14	Junction	SW1 15 [MH]	Junction

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Connections	Link	IL (m)	Dia (mm)	
Car Park Subbase 3	525124.155	323041.816	4.150	1.500					
					0	2.000	2.650	150	
Car Park Subbase 2	525094.518	323016.169	4.000	1.375					
					0	2.001	2.625	100	
SW1 3 [IC]	525111.309	323048.466	3.783	1.489		1 2	2.000 1.001	2.369 2.369	150 100
					0	1.002	2.294	225	
SW1 4 [PUMP]	525117.362	323067.127	4.041	1.884		1	1.003	2.157	225
					0	1.004	2.157	225	
SW1 5 [MH]	525030.507	323106.744	3.508	0.728		1	1.004	2.780	225
					0	1.005	2.808	300	
Play Area Subbase 2	525011.829	323108.730	3.291	0.383					
					0	4.000	2.908	150	
Informal Outdoor Games Area	525014.011	323099.256	3.340	0.485					
					0	3.000	2.855	225	
SW1 7 [MH]	525008.366	323111.785	3.450	0.732		1 2 3 4	4.000 4.000_1 3.000 1.005	2.868 2.793 2.793 2.718	150 225 225 300
					0	1.006	2.718	300	
SW1 10 [Catchpit IC]	524978.520	323081.128	3.563	0.685		1	6.000_1	2.899	100
					0	5.000	2.878	150	
Coach Drop Subbase 2	524967.861	323096.596	3.400	0.499					
					0	6.000	2.901	150	
Play Area 1	524976.712	323093.591	3.233	0.410					
					0	8.000	2.823	225	
SW1 13 [MH]	524970.791	323103.462	3.443	0.744		1 2 3 4	6.000 8.000 7.001 5.000	2.849 2.774 2.774 2.774	150 225 225 150
					0	5.001	2.699	300	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Connections	Link	IL (m)	Dia (mm)
SW1 1 [IC]	525096.111	323019.348	4.140	1.538		1 2.001	2.602	100
SW1 12 [IC]	524961.354	323106.514	3.401	0.582		1 7.000	2.819	225
SW1 6	525012.369	323103.053	3.587	0.732		0 7.001	2.819	225
SW1 8 [MH]	524981.859	323123.323	3.365	0.916		1 5.001	2.599	300
Swale 1	524998.163	323174.563	3.200	0.558		0 4.000_1	2.855	225
SW1 15 [MH]	525008.379	323171.721	3.283	0.936		1 9.001	2.599	300
Carpark 1	524977.829	323078.749	3.400	0.490		2 1.006	2.599	300
Permavoid	525015.622	323182.156	3.260	0.957		0 1.007	2.449	450
Pond	525051.875	323201.720	3.320	1.031		0 9.000	2.642	225
SW1 16 [MH]	525054.880	323205.841	3.325	1.062		1 9.000	2.572	225
SW1 By Pass Separator	525113.745	323056.348	3.872	1.665		2 1.0071	2.348	450
Coach Drop Subbase 1	524960.624	323106.132	3.200	0.376		3 1.007	2.395	450
SW1 14	524990.723	323140.298	3.354	0.959		0 1.008	2.347	450
						0 6.000_1	2.910	100
						1 1.008	2.310	450
						0 Permavoid	2.303	30700
						1 Permavoid	2.289	30700
						0 1.011	2.289	150
						1 1.011	2.263	150
						0 1.002	2.257	225
						1 1.003	2.207	225
						0 7.000	2.824	225
						0 1.0071	2.395	450

Simulation Settings

Rainfall Methodology	FEH-13	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x
Analysis Speed	Detailed	Additional Storage (m³/ha)	20.0		

Storm Durations

30	60	120	180	240	360	480	600	720	960	1440	2160	2880
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
10	0	0	0
30	0	0	0
100	0	0	0
100	25	0	0

Node SW1 4 [PUMP] Online Pump Control

Flap Valve	x	Design Depth (m)	1.351	Switch off depth (m)	0.000
Replaces Downstream Link	✓	Design Flow (l/s)	1.0		
Invert Level (m)	2.157	Switch on depth (m)	0.001		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.001	1.500	5.000	1.500

Node SW1 16 [MH] Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	2.263	Product Number	CTL-SHE-0061-1600-0937-1600
Design Depth (m)	0.937	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.6	Min Node Diameter (mm)	0

Node ATP Subbase 1 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.480	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	5.0		
Invert Level (m)	0.000	Diameter (m)	0.059		

Node J1 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.370	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	0.2		
Invert Level (m)	0.000	Diameter (m)	0.015		

Node J1 Online Weir Control

Flap Valve	x	Design Depth (m)	0.370	Discharge Coefficient	0.590
Replaces Downstream Link	✓	Design Flow (l/s)	2.5		
Invert Level (m)	0.000	Width (m)	0.006		

Node J2 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.350	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	0.2		
Invert Level (m)	0.000	Diameter (m)	0.015		

Node J2 Online Weir Control

Flap Valve	x	Design Depth (m)	0.138	Discharge Coefficient	0.590
Replaces Downstream Link	✓	Design Flow (l/s)	2.5		
Invert Level (m)	0.000	Width (m)	0.026		

Node Car Park Subbase 3 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.450	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.6		
Invert Level (m)	2.650	Diameter (m)	0.020		

Node SW1 10 [Catchpit IC] Online Weir Control

Flap Valve	x	Design Depth (m)	0.250	Discharge Coefficient	0.590
Replaces Downstream Link	✓	Design Flow (l/s)	30.0		
Invert Level (m)	3.250	Width (m)	0.130		

Node SW1 10 [Catchpit IC] Online Orifice Control

Flap Valve	x	Design Depth (m)	0.580	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	0.5		
Invert Level (m)	2.878	Diameter (m)	0.017		

Node Coach Drop Subbase 2 Online Weir Control

Flap Valve	x	Design Depth (m)	0.617	Discharge Coefficient	0.590
Replaces Downstream Link	✓	Design Flow (l/s)	50.0		
Invert Level (m)	3.250	Width (m)	0.056		

Node Coach Drop Subbase 2 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.617	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	0.7		
Invert Level (m)	2.901	Diameter (m)	0.020		

Node Informal Outdoor Games Area Online Weir Control

Flap Valve	x	Design Depth (m)	0.275	Discharge Coefficient	0.590
Replaces Downstream Link	✓	Design Flow (l/s)	50.0		
Invert Level (m)	3.200	Width (m)	0.188		

Node Informal Outdoor Games Area Online Orifice Control

Flap Valve	x	Design Depth (m)	0.575	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	1.5		
Invert Level (m)	2.855	Diameter (m)	0.031		

Node Play Area 1 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.550	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	0.4		
Invert Level (m)	2.823	Diameter (m)	0.016		

Node Play Area 1 Online Weir Control

Flap Valve	x	Design Depth (m)	0.299	Discharge Coefficient	0.590
Replaces Downstream Link	✓	Design Flow (l/s)	30.0		
Invert Level (m)	3.000	Width (m)	0.099		

Node SW1 12 [IC] Online Orifice Control

Flap Valve	x	Design Depth (m)	0.645	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Flow (l/s)	0.7		
Invert Level (m)	2.819	Diameter (m)	0.020		

Node SW1 12 [IC] Online Weir Control

Flap Valve	x	Design Depth (m)	0.495	Discharge Coefficient	0.590
Replaces Downstream Link	✓	Design Flow (l/s)	90.0		
Invert Level (m)	2.920	Width (m)	0.140		

Node Play Area Subbase 2 Online Orifice Control

Flap Valve	x	Design Depth (m)	0.500	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	0.2		
Invert Level (m)	2.908	Diameter (m)	0.011		

Node Play Area Subbase 2 Online Weir Control

Flap Valve	x	Design Depth (m)	0.500	Discharge Coefficient	0.590
Replaces Downstream Link	✓	Design Flow (l/s)	20.0		
Invert Level (m)	3.150	Width (m)	0.031		

Node Coach Drop Subbase 2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	2.901	Slope (1:X)	999.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.300
Safety Factor	2.0	Width (m)	20.000	Inf Depth (m)	
Porosity	0.30	Length (m)	47.500		

Node Car Park Subbase 3 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	3.700	Slope (1:X)	999.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.300
Safety Factor	2.0	Width (m)	20.000	Inf Depth (m)	
Porosity	0.30	Length (m)	32.750		

Node Informal Outdoor Games Area Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	2.970	Slope (1:X)	999.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.300
Safety Factor	2.0	Width (m)	30.000	Inf Depth (m)	
Porosity	0.30	Length (m)	40.800		

Node Play Area Subbase 2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	2.908	Slope (1:X)	999.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.300
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	18.300		

Node Car Park Subbase 2 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	3.220	Slope (1:X)	999.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.300
Safety Factor	2.0	Width (m)	14.250	Inf Depth (m)	
Porosity	0.30	Length (m)	20.000		

Node Coach Drop Subbase 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	2.824	Slope (1:X)	999.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.200
Safety Factor	2.0	Width (m)	20.000	Inf Depth (m)	
Porosity	0.30	Length (m)	40.000		

Node Carpark 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	2.910	Slope (1:X)	999.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.300
Safety Factor	2.0	Width (m)	25.000	Inf Depth (m)	
Porosity	0.30	Length (m)	41.000		

Node Play Area 1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	2.844	Slope (1:X)	999.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Depth (m)	0.300
Safety Factor	2.0	Width (m)	20.000	Inf Depth (m)	
Porosity	0.30	Length (m)	29.200		

Node Pond Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.289
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	251.7	0.0	0.600	404.3	0.0	0.601	0.0	0.0

Node Swale 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	2.642
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	281.0	0.0	0.558	281.0	0.0	0.559	1.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.64%

	Node Event		US	Peak	Level	Depth	Inflow	Node	Flood	Status	
		Node		(mins)	(m)	(m)	(l/s)	Vol (m³)	(m³)		
	180 minute summer	Car Park Subbase 3		120	3.733	1.083	3.3	4.2080	0.0000	SURCHARGED	
	30 minute summer	Car Park Subbase 2		18	2.677	0.052	2.6	0.0189	0.0000	OK	
	30 minute summer	SW1 3 [IC]		26	2.346	0.052	3.3	0.0000	0.0000	OK	
	30 minute summer	SW1 4 [PUMP]		26	2.349	0.192	3.5	0.0000	0.0000	OK	
	30 minute summer	SW1 5 [MH]		18	2.870	0.090	6.7	0.1232	0.0000	OK	
	600 minute summer	Play Area Subbase 2		600	3.000	0.092	0.6	4.6016	0.0000	OK	
	240 minute summer	Informal Outdoor Games Area		196	3.028	0.173	6.4	14.9031	0.0000	OK	
	30 minute summer	SW1 7 [MH]		18	2.815	0.097	16.3	0.1530	0.0000	OK	
	30 minute summer	SW1 10 [Catchpit IC]		1	2.878	0.000	0.0	0.0000	0.0000	OK	
	600 minute summer	Coach Drop Subbase 2		495	2.975	0.074	2.0	14.5272	0.0000	OK	
	480 minute summer	Play Area 1		448	2.908	0.085	1.6	8.7778	0.0000	OK	
	30 minute summer	SW1 13 [MH]		18	2.741	0.042	3.0	0.0284	0.0000	OK	
	30 minute summer	SW1 1 [IC]		19	2.652	0.050	2.6	0.0000	0.0000	OK	
	720 minute summer	SW1 12 [IC]		525	2.892	0.073	0.4	0.0000	0.0000	OK	
	30 minute summer	SW1 6		18	2.898	0.043	2.9	0.0332	0.0000	OK	
30 minute summer	SW1 8 [MH]		18	2.558	0.109	22.8	0.0881	0.0000	OK		
360 minute summer	Swale 1		216	2.657	0.015	1.3	4.1672	0.0000	OK		
30 minute summer	SW1 15 [MH]		18	2.456	0.109	36.3	0.3110	0.0000	OK		
30 minute summer	Carpark 1		1	2.910	0.000	0.0	0.0000	0.0000	OK		
	Link Event	US	Link		DS		Outflow	Velocity	Flow/Cap	Link	Discharge
	(Upstream Depth)	Node			Node		(l/s)	(m/s)		Vol (m³)	Vol (m³)
	180 minute summer	Car Park Subbase 3	2.000		SW1 3 [IC]		0.9	0.714	0.031	0.0139	
	30 minute summer	Car Park Subbase 2	2.001		SW1 1 [IC]		2.6	0.662	0.538	0.0143	
	30 minute summer	SW1 3 [IC]	1.002		SW1 By Pass Separator		3.4	0.566	0.097	0.0886	
	30 minute summer	SW1 4 [PUMP]	Pump		SW1 5 [MH]		1.5				
	30 minute summer	SW1 5 [MH]	1.005		SW1 7 [MH]		6.7	0.457	0.095	0.3290	
	600 minute summer	Play Area Subbase 2	4.000		SW1 7 [MH]		0.1	0.298	0.003	0.0006	
	600 minute summer	Play Area Subbase 2	Weir		SW1 7 [MH]		0.0				
	240 minute summer	Informal Outdoor Games Area	Weir		SW1 7 [MH]		0.0				
	240 minute summer	Informal Outdoor Games Area	Orifice		SW1 7 [MH]		0.8				
	30 minute summer	SW1 7 [MH]	1.006		SW1 8 [MH]		16.1	0.828	0.228	0.5689	
	30 minute summer	SW1 10 [Catchpit IC]	Weir		SW1 13 [MH]		0.0				
	30 minute summer	SW1 10 [Catchpit IC]	Orifice		SW1 13 [MH]		0.0				
	600 minute summer	Coach Drop Subbase 2	Weir		SW1 13 [MH]		0.0				
	600 minute summer	Coach Drop Subbase 2	Orifice		SW1 13 [MH]		0.2				
	480 minute summer	Play Area 1	Orifice		SW1 13 [MH]		0.1				
	480 minute summer	Play Area 1	Weir		SW1 13 [MH]		0.0				
	30 minute summer	SW1 13 [MH]	5.001		SW1 8 [MH]		2.9	0.498	0.043	0.1563	
	30 minute summer	SW1 1 [IC]	1.001		SW1 3 [IC]		2.5	0.631	0.510	0.1398	
	720 minute summer	SW1 12 [IC]	Orifice		SW1 13 [MH]		0.2				
	720 minute summer	SW1 12 [IC]	Weir		SW1 13 [MH]		0.0				
	30 minute summer	SW1 6	4.000_1		SW1 7 [MH]		2.9	0.544	0.083	0.0717	
	30 minute summer	SW1 8 [MH]	1.007		SW1 15 [MH]		22.7	0.805	0.137	0.5716	
	360 minute summer	Swale 1	9.000		SW1 15 [MH]		0.6	0.539	0.008	0.0042	
	30 minute summer	SW1 15 [MH]	1.008		Permavoid		35.8	1.222	0.131	0.1522	
	30 minute summer	Carpark 1	6.000_1		SW1 10 [Catchpit IC]		0.0	0.000	0.000	0.0000	

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.64%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute summer	Permavoid	1290	2.408	0.105	8.4	0.3801	0.0000	OK
1440 minute summer	Pond	1320	2.407	0.118	5.7	31.6925	0.0000	OK
1440 minute summer	SW1 16 [MH]	1320	2.406	0.143	1.4	0.0000	0.0000	OK
30 minute summer	SW1 By Pass Separator	27	2.348	0.141	3.4	0.0000	0.0000	OK
720 minute summer	Coach Drop Subbase 1	525	2.892	0.068	1.5	11.9067	0.0000	OK
30 minute summer	SW1 14	19	2.456	0.061	0.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
1440 minute summer	Permavoid	Permavoid	Pond	5.3	0.009	0.001	141.0326	95.7
1440 minute summer	Pond	1.011	SW1 16 [MH]	1.4	0.179	0.255	0.0822	
1440 minute summer	SW1 16 [MH]	Hydro-Brake®		1.4				
30 minute summer	SW1 By Pass Separator	1.003	SW1 4 [PUMP]	3.5	0.965	0.102	0.3475	
720 minute summer	Coach Drop Subbase 1	7.000	SW1 12 [IC]	0.4	0.108	0.010	0.0107	
30 minute summer	SW1 14	1.0071	SW1 15 [MH]	-0.9	-0.074	-0.006	0.4445	

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute summer	Car Park Subbase 3	168	3.795	1.145	8.3	16.3933	0.0000	SURCHARGED
30 minute summer	Car Park Subbase 2	20	2.951	0.326	8.3	0.1185	0.0000	SURCHARGED
120 minute summer	SW1 3 [IC]	88	2.917	0.623	4.8	0.0000	0.0000	SURCHARGED
120 minute summer	SW1 4 [PUMP]	88	2.917	0.760	2.7	0.0000	0.0000	SURCHARGED
30 minute summer	SW1 5 [MH]	18	2.910	0.130	18.1	0.1789	0.0000	OK
480 minute summer	Play Area Subbase 2	456	3.098	0.190	1.6	10.0534	0.0000	FLOOD RISK
240 minute summer	Informal Outdoor Games Area	244	3.115	0.260	15.6	47.1232	0.0000	FLOOD RISK
30 minute summer	SW1 7 [MH]	18	2.893	0.175	47.4	0.2780	0.0000	OK
30 minute summer	SW1 10 [Catchpit IC]	1	2.878	0.000	0.0	0.0000	0.0000	OK
600 minute summer	Coach Drop Subbase 2	600	3.050	0.149	4.5	36.0974	0.0000	OK
600 minute summer	Play Area 1	600	2.987	0.164	2.9	22.9007	0.0000	OK
30 minute summer	SW1 13 [MH]	18	2.771	0.072	8.8	0.0487	0.0000	OK
30 minute summer	SW1 1 [IC]	21	2.928	0.326	7.3	0.0000	0.0000	SURCHARGED
480 minute summer	SW1 12 [IC]	312	2.946	0.127	1.3	0.0000	0.0000	OK
30 minute summer	SW1 6	18	2.933	0.078	9.3	0.0599	0.0000	OK
30 minute summer	SW1 8 [MH]	18	2.640	0.191	68.1	0.1540	0.0000	OK
120 minute summer	Swale 1	78	2.670	0.028	6.6	8.0491	0.0000	OK
2160 minute summer	SW1 15 [MH]	2280	2.561	0.214	20.3	0.6120	0.0000	OK
30 minute summer	Carpark 1	1	2.910	0.000	0.0	0.0000	0.0000	OK

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Results for 10 year Critical Storm Duration. Lowest mass balance: 99.64%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute summer	Permavoid	2220	2.557	0.254	21.9	0.9228	0.0000	OK
2160 minute summer	Pond	2220	2.557	0.268	12.6	76.6950	0.0000	SURCHARGED
2160 minute summer	SW1 16 [MH]	2280	2.555	0.292	1.5	0.0000	0.0000	OK
120 minute summer	SW1 By Pass Separator	88	2.917	0.710	3.1	0.0000	0.0000	SURCHARGED
480 minute summer	Coach Drop Subbase 1	312	2.946	0.122	4.9	24.8757	0.0000	OK
2160 minute summer	SW1 14	2220	2.559	0.164	3.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2160 minute summer	Permavoid	Permavoid	Pond	12.2	0.008	0.002	329.7856	162.4
2160 minute summer	Pond	1.011	SW1 16 [MH]	1.5	0.177	0.272	0.0898	
2160 minute summer	SW1 16 [MH]	Hydro-Brake®		1.5				
120 minute summer	SW1 By Pass Separator	1.003	SW1 4 [PUMP]	2.7	0.987	0.078	0.4523	
480 minute summer	Coach Drop Subbase 1	7.000	SW1 12 [IC]	1.3	0.137	0.037	0.0224	
2160 minute summer	SW1 14	1.0071	SW1 15 [MH]	3.6	0.148	0.024	1.3197	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.64%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute summer	Permavoid	3060	2.673	0.370	25.9	1.3435	0.0000	OK
2880 minute summer	Pond	3060	2.673	0.384	12.4	115.5301	0.0000	SURCHARGED
2880 minute summer	SW1 16 [MH]	3060	2.671	0.408	1.6	0.0000	0.0000	OK
120 minute summer	SW1 By Pass Separator	94	3.226	1.019	3.5	0.0000	0.0000	SURCHARGED
360 minute summer	Coach Drop Subbase 1	224	2.970	0.146	8.9	30.8790	0.0000	OK
2880 minute summer	SW1 14	3060	2.673	0.278	5.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute summer	Permavoid	Permavoid	Pond	12.0	0.008	0.002	476.2177	220.8
2880 minute summer	Pond	1.011	SW1 16 [MH]	1.6	0.176	0.275	0.0898	
2880 minute summer	SW1 16 [MH]	Hydro-Brake®		1.5				
120 minute summer	SW1 By Pass Separator	1.003	SW1 4 [PUMP]	2.9	0.987	0.084	0.4523	
360 minute summer	Coach Drop Subbase 1	7.000	SW1 12 [IC]	3.2	0.116	0.088	0.0278	
2880 minute summer	SW1 14	1.0071	SW1 15 [MH]	6.1	0.109	0.041	2.3916	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.64%

	Node Event		US	Peak	Level	Depth	Inflow	Node	Flood	Status
		Node		(mins)	(m)	(m)	(l/s)	Vol (m³)	(m³)	
	360 minute summer	Car Park Subbase 3		360	3.932	1.282	10.7	43.5342	0.0000	FLOOD RISK
	180 minute summer	Car Park Subbase 2		144	3.283	0.658	6.1	4.7693	0.0000	SURCHARGED
	180 minute summer	SW1 3 [IC]		144	3.275	0.981	4.2	0.0000	0.0000	SURCHARGED
	180 minute summer	SW1 4 [PUMP]		144	3.275	1.118	2.4	0.0000	0.0000	SURCHARGED
	30 minute summer	SW1 5 [MH]		18	2.998	0.218	32.6	0.2989	0.0000	OK
	480 minute summer	Play Area Subbase 2		288	3.233	0.325	3.2	16.3025	0.0000	FLOOD RISK
	480 minute summer	Informal Outdoor Games Area		320	3.242	0.387	18.4	94.6440	0.0000	FLOOD RISK
	30 minute summer	SW1 7 [MH]		18	2.989	0.271	85.5	0.4294	0.0000	OK
	30 minute summer	SW1 10 [Catchpit IC]		1	2.878	0.000	0.0	0.0000	0.0000	OK
	720 minute summer	Coach Drop Subbase 2		720	3.197	0.296	7.9	78.5337	0.0000	FLOOD RISK
	360 minute summer	Play Area 1		232	3.059	0.236	9.4	35.5633	0.0000	FLOOD RISK
	2880 minute summer	SW1 13 [MH]		3120	2.830	0.131	3.4	0.0883	0.0000	OK
	180 minute summer	SW1 1 [IC]		144	3.282	0.680	5.0	0.0000	0.0000	SURCHARGED
	240 minute summer	SW1 12 [IC]		148	3.003	0.184	6.6	0.0000	0.0000	OK
	30 minute summer	SW1 6		18	2.996	0.141	17.4	0.1082	0.0000	OK
	2880 minute summer	SW1 8 [MH]		3120	2.830	0.381	9.9	0.3081	0.0000	OK
	2880 minute summer	Swale 1		3120	2.830	0.188	1.7	53.2005	0.0000	OK
	2880 minute summer	SW1 15 [MH]		3120	2.830	0.483	61.7	1.3839	0.0000	SURCHARGED
	30 minute summer	Carpark 1		1	2.910	0.000	0.0	0.0000	0.0000	OK
	Link Event (Upstream Depth)	US Node	Link	DS Node			Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
360 minute summer	Car Park Subbase 3	2.000	SW1 3 [IC]			1.1	0.729	0.038	0.2025	
180 minute summer	Car Park Subbase 2	2.001	SW1 1 [IC]			5.0	0.689	1.044	0.0278	
180 minute summer	SW1 3 [IC]	1.002	SW1 By Pass Separator			3.3	0.491	0.094	0.3277	
180 minute summer	SW1 4 [PUMP]	Pump	SW1 5 [MH]			1.5				
30 minute summer	SW1 5 [MH]	1.005	SW1 7 [MH]			31.8	0.618	0.449	1.2506	
180 minute summer	Play Area Subbase 2	4.000	SW1 7 [MH]			0.1	0.359	0.006	0.0010	
180 minute summer	Play Area Subbase 2	Weir	SW1 7 [MH]			1.4				
180 minute summer	Informal Outdoor Games Area	Weir	SW1 7 [MH]			3.0				
180 minute summer	Informal Outdoor Games Area	Orifice	SW1 7 [MH]			1.2				
30 minute summer	SW1 7 [MH]	1.006	SW1 8 [MH]			83.6	1.348	1.185	1.8080	
30 minute summer	SW1 10 [Catchpit IC]	Weir	SW1 13 [MH]			0.0				
30 minute summer	SW1 10 [Catchpit IC]	Orifice	SW1 13 [MH]			0.0				
720 minute summer	Coach Drop Subbase 2	Weir	SW1 13 [MH]			0.0				
720 minute summer	Coach Drop Subbase 2	Orifice	SW1 13 [MH]			0.4				
360 minute summer	Play Area 1	Orifice	SW1 13 [MH]			0.3				
360 minute summer	Play Area 1	Weir	SW1 13 [MH]			2.6				
2880 minute summer	SW1 13 [MH]	5.001	SW1 8 [MH]			3.4	0.526	0.051	1.1849	
180 minute summer	SW1 1 [IC]	1.001	SW1 3 [IC]			4.0	0.598	0.826	0.2772	
240 minute summer	SW1 12 [IC]	Orifice	SW1 13 [MH]			0.3				
240 minute summer	SW1 12 [IC]	Weir	SW1 13 [MH]			6.2				
30 minute summer	SW1 6	4.000_1	SW1 7 [MH]			17.1	0.678	0.486	0.4241	
2880 minute summer	SW1 8 [MH]	1.007	SW1 15 [MH]			15.9	0.555	0.096	3.0469	
2880 minute summer	Swale 1	9.000	SW1 15 [MH]			-1.2	0.630	-0.017	0.1449	
2880 minute summer	SW1 15 [MH]	1.008	Permavoid			37.2	0.535	0.136	0.8212	
30 minute summer	Carpark 1	6.000_1	SW1 10 [Catchpit IC]			0.0	0.000	0.000	0.0000	

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2880 minute summer	Permavoid	3120	2.830	0.527	40.2	1.9175	0.0000	OK
2880 minute summer	Pond	3120	2.830	0.541	24.2	173.9488	0.0000	SURCHARGED
2880 minute summer	SW1 16 [MH]	3120	2.829	0.566	1.6	0.0000	0.0000	OK
180 minute summer	SW1 By Pass Separator	144	3.275	1.068	3.3	0.0000	0.0000	SURCHARGED
240 minute summer	Coach Drop Subbase 1	148	3.004	0.180	16.8	39.0312	0.0000	OK
2880 minute summer	SW1 14	3120	2.831	0.436	7.6	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2880 minute summer	Permavoid	Permavoid	Pond	23.2	0.019	0.004	675.8744	
2880 minute summer	Pond	1.011	SW1 16 [MH]	1.6	0.177	0.276	0.0898	
2880 minute summer	SW1 16 [MH]	Hydro-Brake®		1.5				219.0
180 minute summer	SW1 By Pass Separator	1.003	SW1 4 [PUMP]	2.4	0.994	0.071	0.4523	
240 minute summer	Coach Drop Subbase 1	7.000	SW1 12 [IC]	6.6	0.224	0.180	0.0344	
2880 minute summer	SW1 14	1.0071	SW1 15 [MH]	11.9	0.195	0.079	3.3529	

Results for 100 year +25% CC Critical Storm Duration. Lowest mass balance: 99.64%

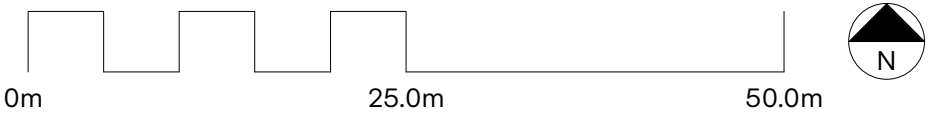
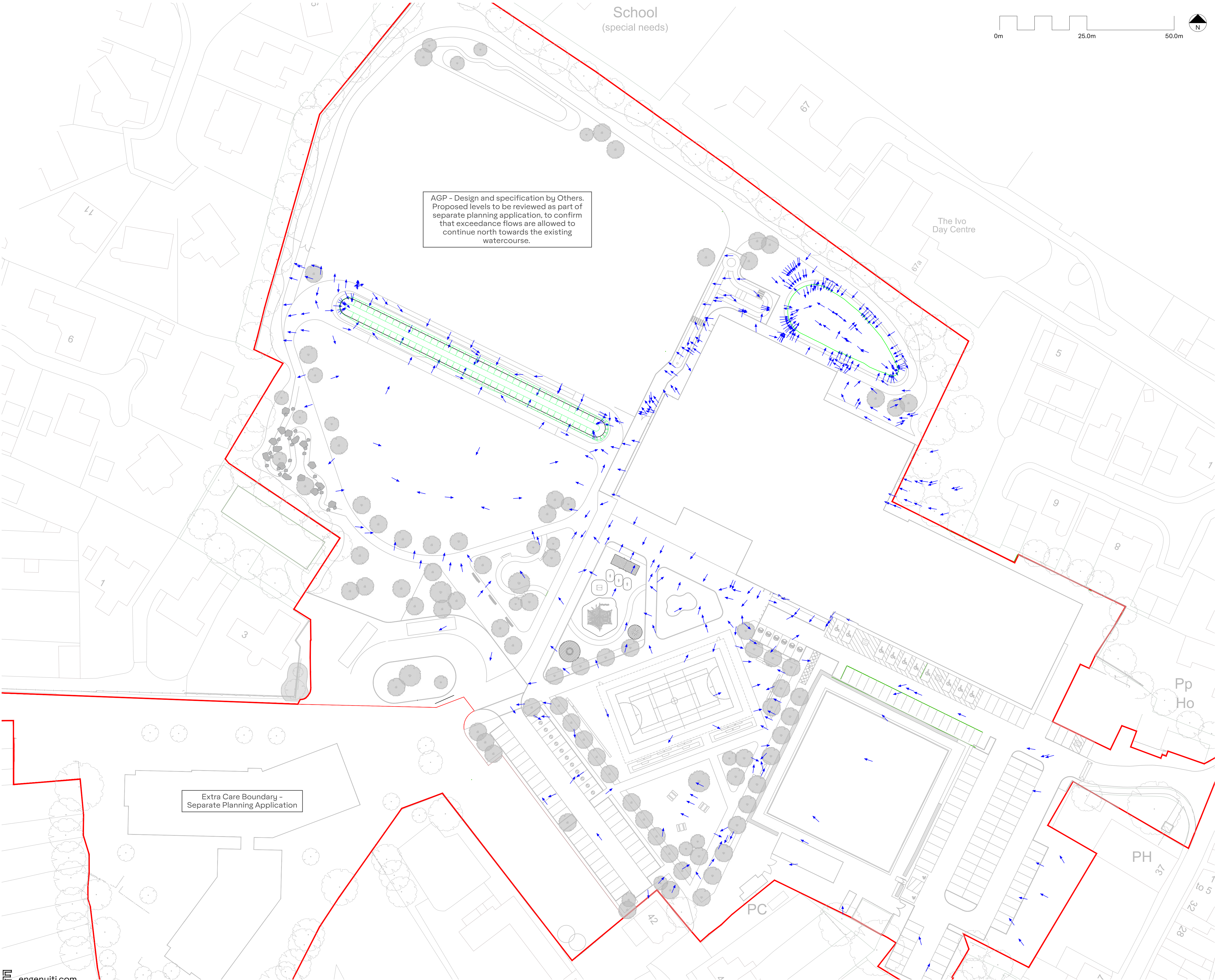
	Node Event		US	Peak	Level	Depth	Inflow	Node	Flood	Status	
		Node		(mins)	(m)	(m)	(l/s)	Vol (m³)	(m³)		
	360 minute summer	Car Park Subbase 3		336	4.150	1.500	13.4	57.1472	0.7773	FLOOD	
	240 minute summer	Car Park Subbase 2		192	3.328	0.703	6.6	8.6005	0.0000	SURCHARGED	
	240 minute summer	SW1 3 [IC]		192	3.320	1.026	3.6	0.0000	0.0000	SURCHARGED	
	240 minute summer	SW1 4 [PUMP]		192	3.320	1.163	2.2	0.0000	0.0000	SURCHARGED	
	30 minute summer	SW1 5 [MH]		18	3.132	0.352	40.4	0.4833	0.0000	SURCHARGED	
	180 minute summer	Play Area Subbase 2		108	3.291	0.383	8.0	16.3814	0.4143	FLOOD	
	360 minute summer	Informal Outdoor Games Area		216	3.306	0.451	29.6	105.5736	0.0000	FLOOD RISK	
	30 minute summer	SW1 7 [MH]		18	3.102	0.384	106.3	0.6087	0.0000	SURCHARGED	
	2880 minute summer	SW1 10 [Catchpit IC]		3120	2.960	0.082	0.2	0.0000	0.0000	OK	
	480 minute summer	Coach Drop Subbase 2		304	3.367	0.466	14.1	80.5028	0.0000	FLOOD RISK	
	2160 minute summer	Play Area 1		2280	3.095	0.272	2.3	42.1046	0.0000	FLOOD RISK	
	2160 minute summer	SW1 13 [MH]		2220	3.096	0.397	6.1	0.2665	0.0000	SURCHARGED	
	240 minute summer	SW1 1 [IC]		192	3.327	0.725	4.4	0.0000	0.0000	SURCHARGED	
	2160 minute summer	SW1 12 [IC]		2280	3.096	0.277	3.0	0.0000	0.0000	SURCHARGED	
	30 minute summer	SW1 6		18	3.126	0.271	21.8	0.2075	0.0000	SURCHARGED	
	2160 minute summer	SW1 8 [MH]		2220	3.095	0.646	16.2	0.5217	0.0000	FLOOD RISK	
	2160 minute summer	Swale 1		2280	3.095	0.453	3.9	128.0693	0.0000	FLOOD RISK	
	2160 minute summer	SW1 15 [MH]		2280	3.097	0.750	19.0	2.1472	0.0000	FLOOD RISK	
	2880 minute summer	Carpark 1		3120	2.960	0.050	0.2	9.0681	0.0000	OK	
	Link Event (Upstream Depth)	US Node	Link	DS Node				Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
360 minute summer	Car Park Subbase 3	2.000	SW1 3 [IC]				1.1	0.715	0.038	0.2025	
240 minute summer	Car Park Subbase 2	2.001	SW1 1 [IC]				4.4	0.652	0.916	0.0278	
240 minute summer	SW1 3 [IC]	1.002	SW1 By Pass Separator				2.9	0.484	0.084	0.3277	
240 minute summer	SW1 4 [PUMP]	Pump	SW1 5 [MH]				1.5				
30 minute summer	SW1 5 [MH]	1.005	SW1 7 [MH]				39.4	0.610	0.557	1.5469	
180 minute summer	Play Area Subbase 2	4.000	SW1 7 [MH]				0.2	0.369	0.007	0.0020	
180 minute summer	Play Area Subbase 2	Weir	SW1 7 [MH]				3.0				
360 minute summer	Informal Outdoor Games Area	Weir	SW1 7 [MH]				12.1				
360 minute summer	Informal Outdoor Games Area	Orifice	SW1 7 [MH]				1.3				
30 minute summer	SW1 7 [MH]	1.006	SW1 8 [MH]				105.1	1.506	1.488	1.9466	
2880 minute summer	SW1 10 [Catchpit IC]	Weir	SW1 13 [MH]				0.0				
2880 minute summer	SW1 10 [Catchpit IC]	Orifice	SW1 13 [MH]				0.0				
180 minute summer	Coach Drop Subbase 2	Weir	SW1 13 [MH]				4.1				
180 minute summer	Coach Drop Subbase 2	Orifice	SW1 13 [MH]				0.6				
2160 minute summer	Play Area 1	Orifice	SW1 13 [MH]				0.2				
2160 minute summer	Play Area 1	Weir	SW1 13 [MH]				1.7				
2160 minute summer	SW1 13 [MH]	5.001	SW1 8 [MH]				6.1	0.619	0.090	1.8967	
240 minute summer	SW1 1 [IC]	1.001	SW1 3 [IC]				3.6	0.561	0.735	0.2772	
2160 minute summer	SW1 12 [IC]	Orifice	SW1 13 [MH]				0.3				
2160 minute summer	SW1 12 [IC]	Weir	SW1 13 [MH]				2.7				
30 minute summer	SW1 6	4.000_1	SW1 7 [MH]				21.7	0.678	0.618	0.5358	
2160 minute summer	SW1 8 [MH]	1.007	SW1 15 [MH]				14.9	0.565	0.090	3.2162	
2160 minute summer	Swale 1	9.000	SW1 15 [MH]				-2.7	0.700	-0.039	0.1530	
2160 minute summer	SW1 15 [MH]	1.008	Permavoid				48.9	0.674	0.179	0.8212	
2880 minute summer	Carpark 1	6.000_1	SW1 10 [Catchpit IC]				-0.2	-0.126	-0.056	0.0111	

Results for 100 year +25% CC Critical Storm Duration. Lowest mass balance: 99.64%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
2160 minute summer	Permavoid	2220	3.095	0.792	55.8	2.8814	0.0000	FLOOD RISK
2160 minute summer	Pond	2280	3.094	0.805	14.4	197.6247	0.0000	FLOOD RISK
2160 minute summer	SW1 16 [MH]	2280	3.093	0.830	1.6	0.0000	0.0000	OK
240 minute summer	SW1 By Pass Separator	192	3.320	1.113	2.9	0.0000	0.0000	SURCHARGED
2160 minute summer	Coach Drop Subbase 1	2220	3.096	0.272	3.2	44.4484	0.0000	FLOOD RISK
2160 minute summer	SW1 14	2220	3.095	0.700	8.1	0.0000	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
2160 minute summer	Permavoid	Permavoid	Pond	13.2	0.017	0.002	759.2354	176.1
2160 minute summer	Pond	1.011	SW1 16 [MH]	1.6	0.175	0.279	0.0898	
2160 minute summer	SW1 16 [MH]	Hydro-Brake®		1.5				
240 minute summer	SW1 By Pass Separator	1.003	SW1 4 [PUMP]	2.2	0.994	0.065	0.4523	
2160 minute summer	Coach Drop Subbase 1	7.000	SW1 12 [IC]	3.0	0.110	0.082	0.0398	
2160 minute summer	SW1 14	1.0071	SW1 15 [MH]	-8.1	-0.186	-0.053	3.3683	

Appendix C – Exceedance Flow Plan



- Notes**
- Engenuiti shall have no responsibility for any use made of this document other than for that which it was prepared and issued.
 - All dimensions should be checked on site.
 - Do not scale from this drawing.
 - Any drawing errors or divergences should be brought to the attention of Engenuiti immediately.
 - This drawing is to read in conjunction with all Engenuiti specifications as well as the architect's and other consultants drawings and specifications.
 - This drawing is to be read in conjunction with the Civils General Notes drawing C-0001, including Section B of the general notes that outlines the survey and record information sources this drawing is based on and Section X & Y that expand on information & H&S notes.

Legend

→ Direction of flow

P1	28.04.25	UN	MM	For Planning	
Rev	Date	By	Chk	Description	

Client



WILLMOTT DIXON
SINCE 1852

Architect



Saunders Boston Architects

ENGENUITI

Project title
South Holland Health And Wellbeing Hub

Drawing title
Exceedance Flow Plan

Purpose of Issue For Planning		Scale at A1 1:500	
Engenuiti Project Ref 02048	Client Ref M00514	Suitability S2	
Proj. M00514 ENG-ZZ-XX-DR-C-3600	Orig.	Vol.	Level Type Role No. Revision P1