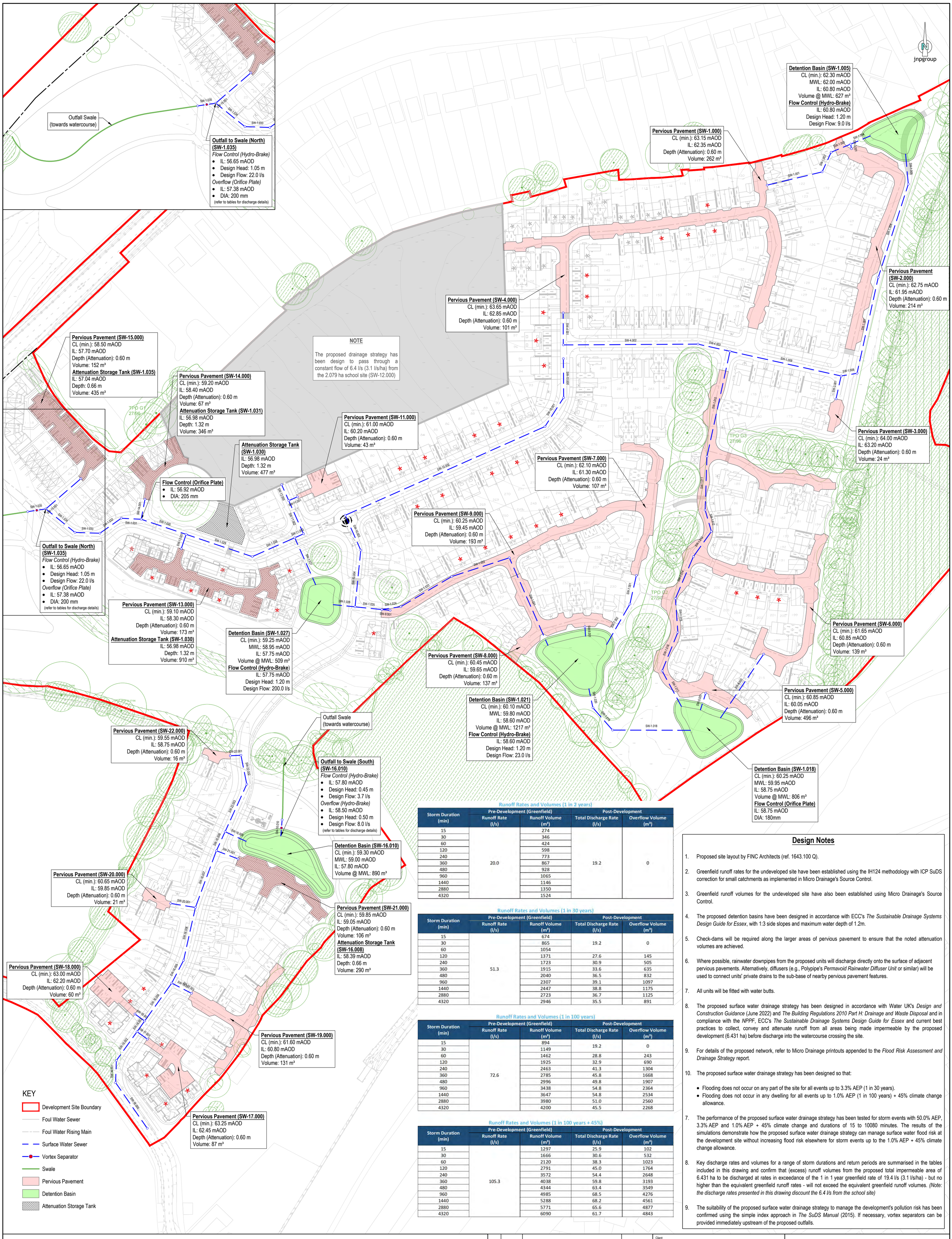

Runoff Rates and Volumes (1 in 2 years)

Storm Duration (min)	Pre-Development (Greenfield) Runoff Rate (l/s)	Pre-Development (Greenfield) Runoff Volume (m³)	Post-Development Total Discharge Rate (l/s)	Post-Development Overflow Volume (m³)
15	20.0	274	19.2	0
30		346		
60		424		
120		598		
240		773		
360		867		
480		928		
960		1065		
1440		1146		
2880		1350		
4320		1524		

Runoff Rates and Volumes (1 in 30 years)

Storm Duration (min)	Pre-Development (Greenfield) Runoff Rate (l/s)	Pre-Development (Greenfield) Runoff Volume (m³)	Post-Development Total Discharge Rate (l/s)	Post-Development Overflow Volume (m³)
15	51.3	674	19.2	0
30		865		
60		1054		
120		1371	27.6	145
240		1723	30.9	505
360		1915	33.6	635
480		2040	36.5	832
960		2307	39.1	1097
1440		2447	38.8	1175
2880		2723	36.7	1125
4320		2946	35.5	891

Runoff Rates and Volumes (1 in 100 years)

Storm Duration (min)	Pre-Development (Greenfield) Runoff Rate (l/s)	Pre-Development (Greenfield) Runoff Volume (m³)	Post-Development Total Discharge Rate (l/s)	Post-Development Overflow Volume (m³)
15	72.6	894	19.2	0
30		1149		
60		1462	28.8	243
120		1925	32.9	690
240		2463	41.3	1304
360		2785	45.8	1668
480		2996	49.8	1907
960		3438	54.8	2364
1440		3647	54.8	2534
2880		3980	51.0	2560
4320		4200	45.5	2268

Runoff Rates and Volumes (1 in 100 years + 45%)

Storm Duration (min)	Pre-Development (Greenfield) Runoff Rate (l/s)	Pre-Development (Greenfield) Runoff Volume (m³)	Post-Development Total Discharge Rate (l/s)	Post-Development Overflow Volume (m³)
15	105.3	1297	25.9	102
30		1666	30.6	532
60		2120	38.3	1023
120		2791	45.0	1764
240		3572	54.4	2648
360		4038	59.8	3193
480		4344	63.4	3549
960		4985	68.5	4276
1440		5288	68.2	4561
2880		5771	65.6	4877
4320		6090	61.7	4843

Design Notes

1. Proposed site layout by FINC Architects (ref. 1643.100 Q).
2. Greenfield runoff rates for the undeveloped site have been established using the IH124 methodology with ICP SuDS correction for small catchments as implemented in Micro Drainage's Source Control.
3. Greenfield runoff volumes for the undeveloped site have also been established using Micro Drainage's Source Control.
4. The proposed detention basins have been designed in accordance with ECC's *The Sustainable Drainage Systems Design Guide for Essex*, with 1:3 side slopes and maximum water depth of 1.2m.
5. Check-dams will be required along the larger areas of pervious pavement to ensure that the noted attenuation volumes are achieved.
6. Where possible, rainwater downpipes from the proposed units will discharge directly onto the surface of adjacent pervious pavements. Alternatively, diffusers (e.g., Polypipe's *Permavoid Rainwater Diffuser Unit* or similar) will be used to connect units' private drains to the sub-base of nearby pervious pavement features.
7. All units will be fitted with water butts.
8. The proposed surface water drainage strategy has been designed in accordance with Water UK's *Design and Construction Guidance* (June 2022) and *The Building Regulations 2010 Part H: Drainage and Waste Disposal* and in compliance with the *NPPF*, ECC's *The Sustainable Drainage Systems Design Guide for Essex* and current best practices to collect, convey and attenuate runoff from all areas being made impermeable by the proposed development (6.431 ha) before discharge into the watercourse crossing the site.
9. For details of the proposed network, refer to Micro Drainage printouts appended to the *Flood Risk Assessment and Drainage Strategy* report.
10. The proposed surface water drainage strategy has been designed so that:
    - Flooding does not occur on any part of the site for all events up to 3.3% AEP (1 in 30 years).
    - Flooding does not occur in any dwelling for all events up to 1.0% AEP (1 in 100 years) + 45% climate change allowance.
7. The performance of the proposed surface water drainage strategy has been tested for storm events with 50.0% AEP, 3.3% AEP and 1.0% AEP + 45% climate change and durations of 15 to 10080 minutes. The results of the simulations demonstrate how the proposed surface water drainage strategy can manage surface water flood risk at the development site without increasing flood risk elsewhere for storm events up to the 1.0% AEP + 45% climate change allowance.
8. Key discharge rates and volumes for a range of storm durations and return periods are summarised in the tables included in this drawing and confirm that (excess) runoff volumes from the proposed total impermeable area of 6.431 ha to be discharged at rates in exceedance of the 1 in 1 year greenfield rate of 19.4 l/s (3.1 l/s/ha) - but no higher than the equivalent greenfield runoff rates - will not exceed the equivalent greenfield runoff volumes. *(Note: the discharge rates presented in this drawing discount the 6.4 l/s from the school site)*
9. The suitability of the proposed surface water drainage strategy to manage the development's pollution risk has been confirmed using the simple index approach in *The SuDS Manual* (2015). If necessary, vortex separators can be provided immediately upstream of the proposed outfalls.

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Rev.	Date	Description	Drn / Chk'd / App'd
P03	09/02/2024	Updated site layout (Rev Q). ECC comments addressed.	RM / RM / RM
P02	05/09/2023	Updated site layout (Rev P).	RM / RM / RM
P01	17/08/2023	First issue.	RM / RM / RM

Suitability: S2 - Suitable for Information

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Job: Officers' Meadow, Shenfield

Title: Sustainable Drainage Strategy Surface Water

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Scale @ A1: 1:1000

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