TECHNICAL NOTE

Project:	TE1609 New Classroom – Ingfield Manor School, Five Oaks
Client:	Ingfield Manor School
Date:	01/02/24 **(Revision 2 11/07/24)**
Author:	Robert Spriggs (01225 303523)
Title:	Water Neutrality Statement

Introduction

1. This Technical Note forms the Water Neutrality Statement prepared for a planning application for a new classroom at Ingfield Manor and in response to the Validation Letter from Horsham District Council Planning Department of 18th December 2023 in which it was stated:

    1. *Please provide a Water Neutrality Statement to support this application. Details of what is required can be found on the Horsham District Council website.*

2. It is our understanding that as the site is located within the Sussex North Water Supply Zone, and as an application that will create demand, a Water Neutrality Statement that sets out the existing and proposed consumption figures for the scheme and how water neutrality can be achieved is required.

Background

3. There are no changes proposed to the school as part of this application other than the installation of the new modular classroom to replace a demolished building.

4. The planning application for the site is to consist of a new modular class room which is located within the central area of the school (see Figure 1). This replaces an existing single storey building which has been demolished. The modular classroom was fabricated off-site and transport to the school for installation. The new classroom will provide additional capacity at the school for those students that are on the Woodview Pathway. This provides provision for children with social and communication special educational needs. The provision is currently for year 7 but the new classroom will also offer provision for year 8.

5. An elevation of the new classroom is shown in Figure 2 and a plan view in Figure 3.

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Figure 1: Location of new classroom

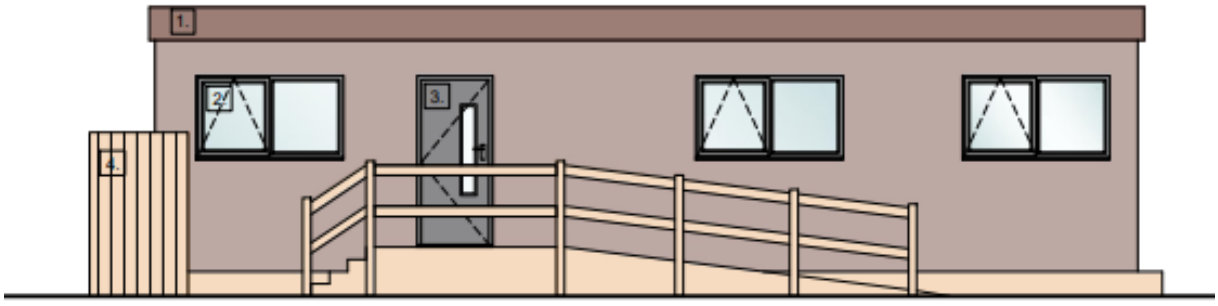

Figure 2: Image of proposed modular classroom

6. In plan view, the classroom layout shown in Figure 3 has been annotated to show those parts of the development that will consume water. These are two toilets and two wash basins.

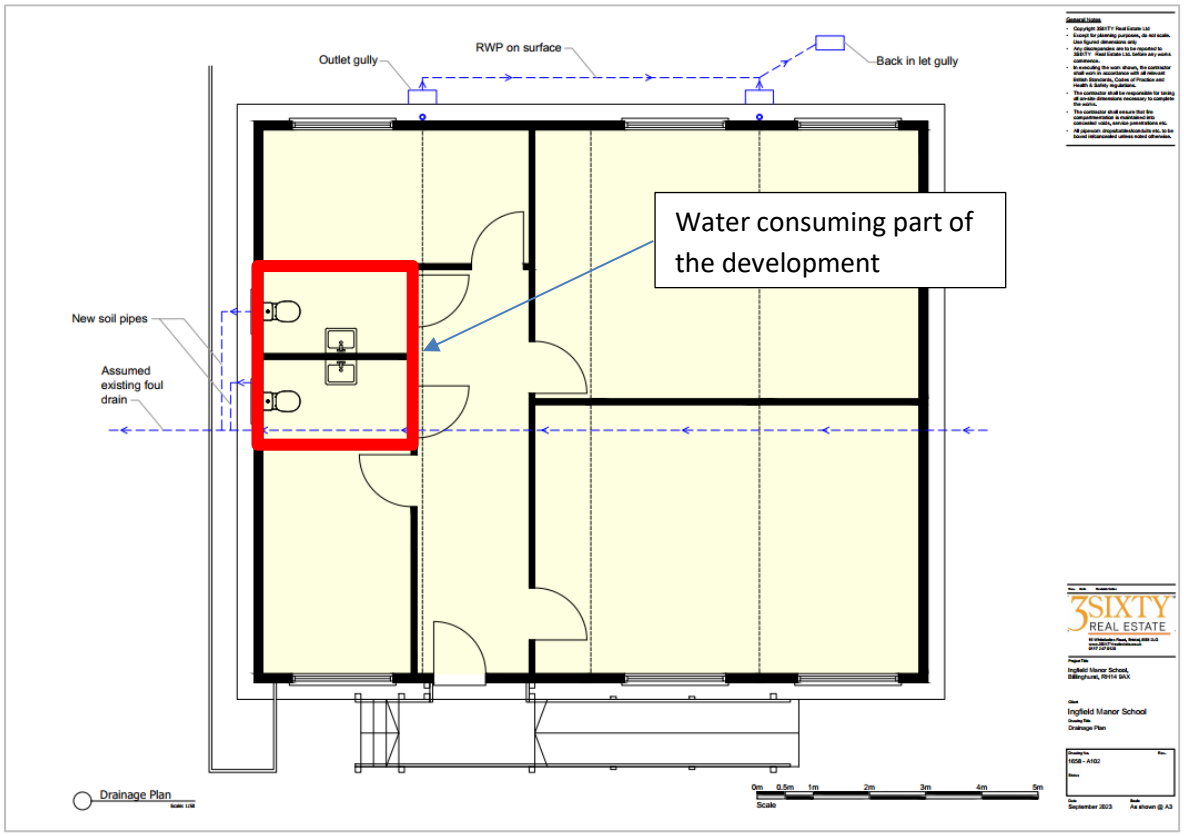

Figure 3: Classroom – plan view (source: 3Sixty Real Estate)

7. The difference between the current use and the proposed use is shown in Table 1. This shows that the proposed classroom represents a small increase in gross floor area (GFA) at the school overall.

Existing GFA (demolished)	Proposed GFA (modular)	Net Difference
Approx. 60sqm	120sqm	+60sqm

Table 1: Summary of GFA for existing and proposed use

Baseline Calculations

8. The approach to understanding water consumption is twofold; firstly the water bills have been obtained for the school from their utility service provider for the most recent 7 months from June to December 2023. Secondly, the BREEAM WAT 1 Water Efficiency Tool has been used and applied to the classroom description.

9. For the water bills that have been obtained, the usage has been recorded and is summarised in Table 2 below. Copies of the water bills can be provided on request.

10. The table under column 'Potable Water>Volume' shows the usage of water for the entire school between June and December. The new classroom did not come into operation until the Autumn term which began in September. So the water consumption for the new classroom is included in the water bills from September onwards. Furthermore, there were periods when the school was on holiday, the dates of which were:

- Spring term – ends 25th July
- Autumn Term:
    - 6th September to 23rd October
    - 27th October to 15th December

Date (2023)	Potable Water				Foul Water			
	Start Reading	End Reading	Volume(m^3)	Average daily (m^3)	Start Reading	End Reading	Volume(m^3)	Average daily (m^3)
June	79907	80268	361	12.03	79907	80268	361	12.03
July	80268	80641	373	12.03	80268	80641	373	12.03
August	80641	81014	373	12.03	80641	81014	373	12.03
September	81014	81375	361	12.03	81014	81375	361	12.03
October	81375	81748	373	12.03	81375	81748	373	12.03
November	81748	82109	361	12.03	81748	82109	361	12.03
December	82109	82482	373	12.03	82109	82482	373	12.03

Table 2: Summary of water bill usage records

11. It can be seen from the table that the volume of potable water used (in cubic metres) fluctuates between 361m^3 and 373m^3 (this is also shown graphically in Figure 4). Other than this there is no discernible difference between term time and school holidays. Also there is no discernible difference from when the new classroom was brought into operation in September.

12. The average daily volume of water usage is a fixed amount estimated by the utility service provider and is given at 12.03m^3 per day.

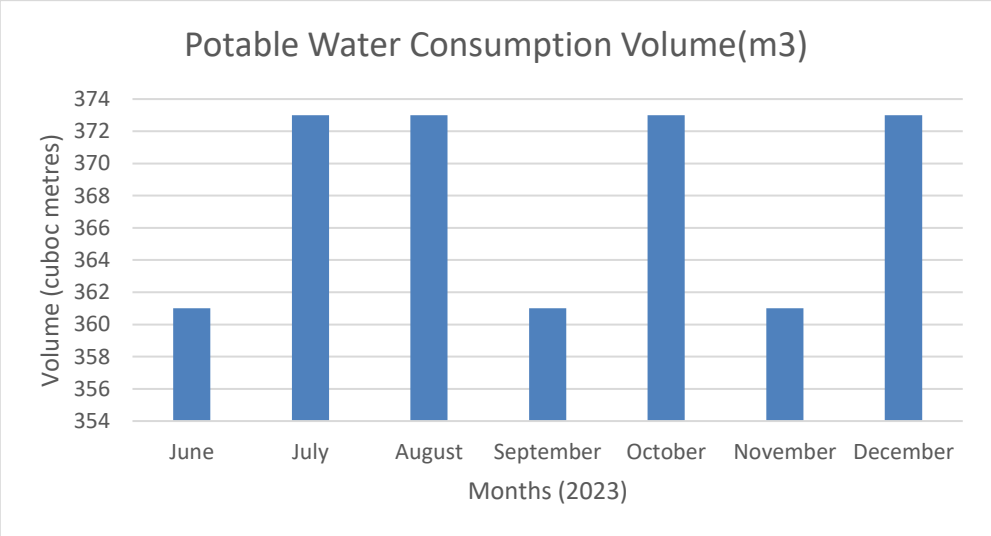

Figure 4: Ingfield Manor School monthly water consumption (source: WaterPlus Utility Provider)

13. Using the BREEAM Wat 1 Water Efficiency tool (see Appendix A), the predicted water usage has been calculated using the building type as 'Education' and accepting the default values for building occupancy, days and hours of operation. The tool forecasts that for the two toilets and wash basins, that 15.96 litres/ person/ day will be consumed, the equivalent

of 0.016m³ per person/ day. For a class of 25, this would represent 0.4m³/ day. Using the average daily usage provide by the service provider of 12.03 m³/ day, this represents 3% of the school's overall usage per day.

14. Overall, the water usage associated with the additional classroom is very small and likely to be less than the daily variation in water usage by the school as a whole. Therefore, the impact on the Sussex North Water Supply Zone would be considered unmeasurable.

Water Reduction Measures

15. The new classroom uses modern toilet and basin appliances. The toilets are type approved by the Water Regulations Approval Scheme (WRAS) to BS EN997, Class 2. This relates to the integral water trap and the cistern flushing volume.

16. The details of the package for all the washroom components are provided in Appendix B.

17. As a modular unit that was construction off-site, the classroom was not manufactured with any specific water re-use systems such as grey water harvesting. However, its relatively low usage combined with modern washroom components means that it will have an imperceptible impact on the water supply.

Rainwater reclamation

18. Rainwater reclamation involves collecting and storing rainwater from roofs and other catchment areas for various applications, including toilet flushing and irrigation. System types include indirectly pumped, directly pumped and gravity (source: National Building Specification)

19. Benefits include:

    - Reduces consumption of treated mains water.
    - Can help reduce surface water run-off and risk of flooding.

20. Limitations include:

    - Requires water filtration and treatment.
    - Roof materials may affect the quality of harvested water.
    - Regular cleaning and removal of debris is required to reduce the risk of water contamination.
    - A balance between water collection and usage is required.
    - Providing sufficient rainwater storage capacity may present a problem; large storage tanks may be required.

- Installation and ongoing costs may not justify savings.

21. Recognising the above benefits and limitations, it is proposed that a couple of water butts are installed (similar to that shown in Figure 5) on the rainwater pipe (RWPs) to the low rise building neighbouring the new classroom. These will provide grey water collection that can be used for irrigation as an alternative to using hosepipes connected to the potable water supply. This will help to offset water usage.



Figure 5: Example water butt (source: Water Butts Direct)

Cistern Displacement Device

22. In addition to the above, it is proposed that cistern displacement devices are placed in other toilets around the school. Examples include small bags filled with crystals that expand to reduce water usage by up to 1.2l for every large flush. These could be used at selected toilet blocks around the school, perhaps were current usage is very high and regular low volume flushes will still maintain the self-cleansing requirements of the system.

Conclusion

23. This Technical Note represents the Water Neutrality Report submitted in support of the planning application for a new modular classroom at Ingfield Manor School. The classroom replaces a previous building that was demolished, and represents a net increase in floor area of 60sqm.

24. Water bills obtained from the school's utility service provider show that the consumption of water did not change following the occupation of the new classroom thereby indicating that the new classroom represents only a fraction of the daily water usage of the school. As such, the usage is likely to be less than that of the daily variation in water usage for the whole of the school.

25. The BREEAM Wat 1 Water Efficiency tool has been used to forecast daily water usage for

the classroom. The forecast results indicate that the classroom represents approximately 3% of the usage of the rest of the school.

26. Whilst no specific water re-use systems were included with the new classroom, which is modular and was fabricated off site, the washrooms do use the latest components that are efficient and designed to modern manufacturing standards.

27. Overall, the water usage of the new classroom is very low and represents only a small fraction of the schools overall water usage. As a result, its impact in the Sussex North Water Supply Zone will be negligible.

Appendix A

BREEAM Wat 1 Tool Results

BREEAM 2018 Wat 01 Water consumption: Water efficiency calculator for new non domestic education buildings

BREEAM UK
Delivered by bre

Buildtne type	Description of buildtne type	Default buildtne occupancy	Default annual days/operation	Default daily hours of operation
Education - secondary school or academy	Non-residential secondary schools, academies and all-age range schools	32	195	10

Main buildtne activity areas	Description of activity area	Activity area present in buildtne?	Net Floor Area (m²)
Education - Classroom areas	Include basic classroom areas only. Exclude halls, specialist practical classrooms, i.e. ICT, and learning resource/library areas.	Yes	60
Education - Staff office and administration areas	Cellular or open plan office space, including staff rooms and staff kitchen where present/adjacent and reception areas (including library reception desk areas if present). Excludes meeting rooms, visitor waiting or circulation areas and other such spaces not permanently occupied.	No	
Education - Common room	Student common room.	No	
Education - dining area	Seated dining areas that accompany a permanently staffed kitchen preparing food for consumption on the premises (excludes small un-staffed kitchen's used by staff to re-heat food, make tea etc.)	No	
Education - Changing facilities with showers	Changing facility with showers to be used by pupils	No	

Water consumption - building microcomponent

WC component - all activity areas	units	Specification	Usage/person/day	Usage factor	Consumption (l)/person/day)
WC - male (no urinals installed)	Effective flush volume (Litres)	6.00	2.13	1.00	6.39
WC - female	Effective flush volume (Litres)	6.00	2.10	1.00	6.30

Urinal component - all activity areas	units	Specification	No. of cisterns	Flushtne frequency (flushes/hour)	Consumption (l)/person/day)

	units	Specification	Usage/person/day	Usage factor	Consumption (l)/person/day)

	units	Specification	Usage/person/day	Usage factor	Consumption (l)/person/day)

	units	Specification	Usage/person/day	Usage factor	Consumption (l)/person/day)
Tap components (personal hygiene) - all activity areas					
Wash hand basin taps	Flow rate (litres/min)	3.60	2.13	0.25	1.30
Shower use	Flow rate (litres/min)		0.002	5.60	0.00
Fixed use - vessel filling	Litres/person/day	-	-	-	1.97
Tap components (cleaning) - staff kitchenette					
Kitchen taps - kitchenette	Flow rate (litres/min)		0.0600	0.67	0.00
Dishwasher	Litres/cycle		0.0026	1.00	0.00
Tap components (cleaning and food preparation) - school canteen food preparation area					
Fixed use - food preparation		-		-	0.00
Fixed use - kitchen cleaning		-		-	0.00

	Microcomponent consumption (l)/person/day)
Total	15.96

Non potable water yield - greywater system

Has, or will, the greywater system be specified and installed in compliance with BS8525-1:2010 Greywater Systems - Part 1 Code of Practice	No

Greywater source (buildtne components)		Greywater Collected	Proportion of components collected from (%)	Greywater yield (l)/person/day)
Greywater source (other components)	Typical greywater yield (litres)	Frequency of yield (days)	Greywater yield (litres/day)	Greywater yield (l)/person/day)

	Greywater yield (l)/person/day)
Total	0.00

Minimum requirements according to EU taxonomy for sustainable finance

Do all the installed wash hand basin taps and kitchen taps have a maximum water flow of 6 litres/min?	Yes
Do all the installed showers have a maximum water flow of 8 litres/min?	System not specified
Do all WCs, including suites, bowls and flushing cisterns, have a full flush volume of a maximum of 6 litres and a maximum average flush volume of 3,5 litres?	Yes
Do all urinals use a maximum of 2 litres/bowl/hour and flushing urinals have a maximum full flush volume of 1 litre?	System not specified
Is all the EU taxonomy requirements for sanitary equipment met?	Yes

Non potable water yield - rainwater system

Has, or will, the rainwater system be specified and installed in compliance with BS EN 16941-1:2018 Rainwater Harvesting Systems - Code of practice	System not specified
How has the storage capacity for the proposed system been calculated?	

Rainwater yield if basic approach:

Collection area (m2)	Rainfall (average mm/yr)	Hydraulic filter efficiency (%)	Yield co-efficient (%)	Annual rainwater yield (Litres)	Rainwater yield (l)/person/day)

Rainwater yield if detailed:

Daily rainfall collection (litres)	Rainwater yield (l)/person/day)

Non potable water demand - building components

	Greywater and/or rainwater yield (l)/person/day)
Total	

Component	Greywater and/or rainwater utilised for component	Proportion of components using greywater and/or rainwater yield (%)	Maximum permissible demand (l)/person/day)

	Demand met by yield (l)/person/day)
Total	

Other permissible components

	Maximum permissible demand (l)/day)

	Demand met by yield (l)/person/day)
Total	

	Greywater and/or rainwater demand met by yield (l)/person/day)
Total	

Water consumption calculation results

	Litres/person/day	m³/person/yr
Water consumption - modelled baseline performance benchmark (excludes fixed uses)	**16.30**	**3.18**
Microcomponent Water consumption - modelled performance (excludes fixed uses)	**13.99**	**2.73**
Modelled water demand met via greywater and rainwater sources	**0.00**	**0.00**
If greywater/rainwater systems specified has the minimum % efficiency improvement for component specifications been met	**System not specified**	
Net modelled water consumption (excludes fixed uses)	**13.99**	**2.73**
Percentage improvement	**14.15%**	
Total Wat 01 BREEAM credits achieved, before checking minimum requirements according to EU taxonomy for sustainable finance	**1 credit**	
Total Wat 01 BREEAM credits achieved	**1 credit**	
Total Wat 01 BREEAM Exemplary credits achieved	**Exemplary level not achieved**	
Key performance indicator - use of freshwater resource (excludes fixed uses)	**15.96**	**3.11**

Appendix B

Classroom Water Components







Compare | Compare variants

I.Care DOCM L/L Pack - WC Pack

Verified by manufacturer 3 months ago

1900R.L.L.B - i.Care DOCM L/L Lever Handle with Rimless WC Pan (Blue rail & Seat)

Variant:

1900R.L.L.B - i.Care...

Doc M WC pack with cistern and WC pan.

Jump to:

Specification data

BIM objects

Add to spec

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Website

Contact manufacturer

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WC seats	Polypropylene, blue.
Washbasins	-
Material	Ceramic.
Handrails	Steel, blue.
Water supply fittings	Lever-operated thermostatic mixer tap.
Water supply temperature (maximum)	90°C.
Integral accessories	1902.00 - Sink. 1924.B - Toilet roll holder. 1923.B.800 - Arm rest. 1918 - Tap. 1919/ 1920 - Trap and waste.
Automation	Manual, lever handle.
Cistern capacity	6 L.

BIM objects

NBS BIM object standard

This BIM object has been authored to meet the requirements of the NBS BIM object standard.

Find out more about the NBS BIM object standard.

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Cistern.

Width	365 mm

NBS Source UK Search NBS Source... All Sign in

Variant: 1900R.L.L.B - i.Care DOCM L/L Lever Handle with Rimless ...

Height	468 mm WC Pan. 367 mm Cistern.
Uniclass	Pr_40_20_60_02 Accessible WC equipment packages Primary
CAWS	N13/12 Unisex accessible WC equipment packages (Document M) N13/311 Unisex accessible WC equipment packages (Document M)

Specification data - Accessible WC equipment packages

Standards	To BS EN 997, Class 2.
Type approval certificate	Water Regulations Approval Scheme (WRAS)-approved.
Form	Complete accessible WC Doc M package and fittings.
Arrangement	Back-to-wall pack.
Material and colour	-
WC pans	Ceramic, white.

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