Consulting Civil Engineers

Water Neutrality Report

Land at Rudgwick Brickworks, Lynwick Street, Horsham RH12 3DH

For

Harrison Rural Partners Ltd

Rev – **P2**

Reference **C2525**

Date **14th May 2024**

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1 Introduction

1.1.1 CGS Civils Ltd has been appointed by Harrison Rural Partners Ltd to undertake a Water Neutrality Report for a proposed development at Rudgwick Brickworks, Lynwick Street in Horsham.

1.1.2 The purpose of this report is to therefore provide an overview on the potential water usage changes on the site as a result of the proposed development, and to confirm that the site is water neutral.

1.1.3 The proposed development is located at OS Grid Reference TQ 08457 34232 and has the post code RH12 3DH

Fig 1. Site Location



1.1.4 Waterwise defined Water Neutrality as:

'For every new development, total water use in the region after the development must be equal to or less than the total water uses in the region before the new development.'

1.1.5 Achieving water neutrality usually involves using a three-step approach. However, in this case there will be only two steps. First, the demand for water from the new development must be reduced as far as is practicable, followed by the remaining demand being offset within the region. Following this two-step approach allows the volume that requires offsetting to be reduced which ultimately reduces the cost of the overall scheme. This is noted within the Waterwise neutrality definition, which defines the steps which should be undertaken in order to achieve water neutrality in their recent review dated January 2021.

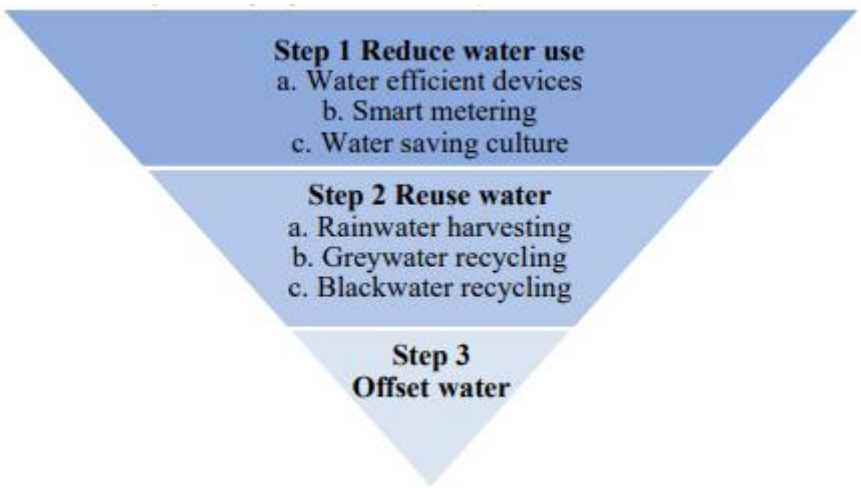
- Reduce water demand in the new development through improvement in efficiency.
- Offset the remaining water demand from the new development if required.

1.1.6 The report will be split into the following sections:

- A Review of Water Neutrality demand reduction
- A calculation of estimate water usage from proposed development
- Identification of measures that can be first used to reduce this demand
- Establish solutions to offset that demand in order to achieve neutrality.

1.1.7 This report will follow the methods documented within *'A Review of Water Neutrality in the UK'* carried out by Waterwise in January 2021. The document provides details on how developments can achieve water neutrality by utilising a 2-stage approach. Step 2 will not be utilised in this report.

Fig 2. 3-stage approach



1.1.8 Some increase in water demand within the region from planned development during the local plan period is inevitable. However, it can be minimised by making the site as water efficient as possible.

1.1.9 The benefits of water neutrality are wide ranging, from financial and reputational to environment and social. For a new domestic building, they could include:

- **Saving Water** – Over 100,000 litres of water can be saved per year for each water neutral home built
- **Saving Carbon** – A significant CO2 saving can be achieved by reducing the demand for hot water for baths, showers, basins, dishwashers and washing machines
- **Saving Money** – Both water and energy bills will reduce
- **Reducing environmental impact** – Decreasing water abstracted from rivers and groundwater sources
- **Improved Resilience** – For the future by minimising the additional pressure on water resources
- **Enabling future housing growth** – In water scarce areas by reducing the impact of new homes and buildings
- **Reducing discharge to sewage** – by using less water, collecting rainwater and recycling greywater, less water is discharged to the drainage network
- **Short pay-back time** – After approximately 5 years the saving of water neutrality will outweigh the costs of doing so.

2 Calculation of estimate water usage from the proposed development

2.1.1 Due to the nature of the proposed development, there will be no increase in water demand as the proposed building will not house any water using facilities and there is no anticipated increase in workers. The accompanying design and access statement carried out by Rural Regeneration states that the erection of the new building will allow the businesses on site to retain the existing number of staff and will give them more space. However, the following calculations will be based upon an increase of 15 additional employees to ensure that the proposed development in water neutral.

2.1.2 Any additional staff will utilise the existing amenities within the site, which comprise of kitchen sinks, toilets, and basin taps. The flow rate of the existing fittings at the site were measured by the client and the values are as follows:

- Kitchen sink – 20 l/min
- Kitchen prep sink – 18 l/min
- Ladies basin sink – 18 l/min
- Gents basin sink 1 – 18 l/min
- Gents basin sink 2 – 18 l/min

2.1.3 By utilsing the BREAAM calculator, it is determined that these fittings use on average **31.1 l/p/day (See Appendix A)**, which in an increase in **466.5 l/day** across the 15 additional employees.

3 Step 1 – Identifying measures that can be used to reduce this demand

3.1.1 The first and most important step in achieving water neutrality will be to ensure that the water used by the proposed development is used as efficiently as possible; the smaller the water demand of the building due to the design and fittings, the less water is needed to be reused and offset. There are a number of ways of achieving a smaller water demand:

- Fitting buildings with efficient products, such as:

  - Aerated Taps

  - Low Flush Toilets, or air flush toilet

3.1.2 By installing aerators to the existing basing taps, it is possible to reduce the water on site from **466.5 l/day** down to **303.75 l/day**

15 x 20.25 l/p/d

= **303.75 l/day**

- *15 (Potential increase in employees) x 20.25 (Appendix B – BREEAM calcs with aerated taps)*

Table 1 Schedule of Example Fittings

Water Fitting	Water Usage	Example Fitting:
WC	4/2.6 litres dual flush	E8967 Sandringham 21
Basin Taps	2.5 l/min	EcoVand Tap Aerator 2.5 l/min

Please note that the above fittings are examples only. Ensure that your chosen fittings meet the required water usage. All basin and Kitchen taps can be fitted with flow restrictors instead of a reduced flow tap in order to achieve necessary reduced water usage.

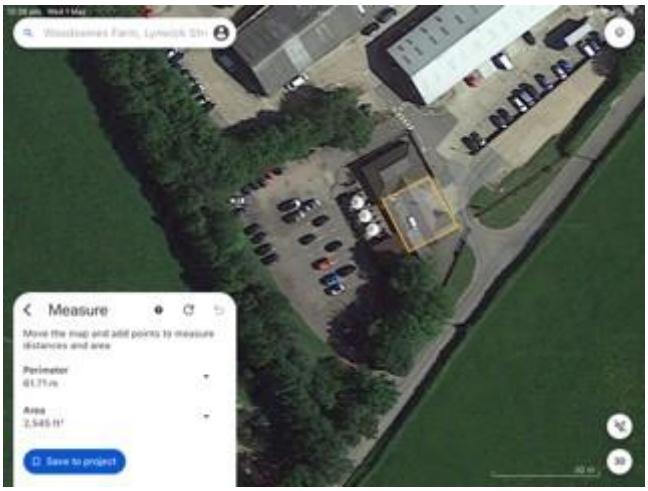
Fig 3. Photos of Existing Fittings








Fig 4. Location of Existing Fittings



4 Step 3 – Offsetting remaining water demand

4.1.1 The client is willing to undertake some works within the existing buildings at Rudgwick Brickworks in order to reduce the water usage on site. The client is willing to attach aerators to the existing basin taps within the properties in order to reduce the water usage and provide betterment within the region.

4.1.2 By fitting existing basin taps with aerators, an approximate **10.85 l/p/d** (Appendix A and Appendix B) can be saved. The current businesses house 91 total workers which results in a saving of approximately **987.35 l/day**, which is sufficient to offset a potential increase in 45 employees. The site is water neutral and the proposed works will provide betterment within the region.

5 Conclusion

5.1.1 To summarise:

- There is a potential increase in 15 employees due to the proposed development which will increase the water demand by **466.5 l/day.**
- By fitting aerators to existing basin taps, the water demand can be reduced down to **303.75 l/day.**
- The installation of aerators to existing basin taps on site will also reduce the water demand from the existing 91 workers on site, which will save approximately **987.35 l/day** which is enough to offset the potential increase in employees.

6 Appendices

6.1 Appendix A:

BREEAM Calcs with standard basin tap

BREEAM-NOR 3.0 Wat 01 Water consumption: Average flow rate calculator

Building details

Building name	Rudgwick Brickworks
BRE assessment reference no.	

WCs

	WC type	Specification effective flush volume (litres)	Quantity (no.)		Total per fitting type
1	Toilet	4.50	1		4.50
2					0.00
3					0.00
4					0.00
5					0.00
	Total		1		4.50

Average effective flushing volume (litres)	4.50	*Enter this average component consumption figure in to the rel*

Urinals

Urinals - automatically operated flushing cisterns

	Urinal flushing system type	Specification cistern capacity (litres)	Flushing frequency (flushes/hr)	Quantity (no.)		Total per fitting type
1					0	0.00
2					0	0.00
3					0	0.00
4					0	0.00
5					0	0.00
					0.00	0.00

Average cistern capacity (litres)	
No. of cisterns	0
Average flushing frequency (flushes/hour)	

Urinals - Manual or automatically operated pressure flushing valves

	Urinal flushing system type	Specification flush volume (litres)	Quantity (no.)		Total per fitting type
1					0.00
2					0.00
3					0.00

4					0.00
5					0.00
		Total	0		0.00

Average flush volume (litres)

Taps (excluding kitchen sink taps)

Tap type		Specification flow rate (litres/minute)	Quantity (no.)		Total per fitting type
1	Tap	18.00	1		18.00
2					0.00
3					0.00
4					0.00
5					0.00
		Total	1		18.00

Average flow rate (litres/min) 18.00 *Enter this average component consumption figure in to the rel*

Proportionate flow rate (litres/min) 12.60

Kitchen sink taps

Tap type		Specification flow rate (litres/minute)	Quantity (no.)		Total per fitting type
1	Kitchen Sink	20.00	1		20.00
2					0.00
3					0.00
4					0.00
5					0.00
		Total	1		20.00

Average flow rate (litres/min) 20.00 *Enter this average component consumption figure in to the rel*

Proportionate flow rate (litres/min) 14.00

Showers

Shower type		Specification flow rate (litres/minute)	Quantity (no.)		Total per fitting type
1					0.00
2					0.00
3					0.00
4					0.00

6.2 Appendix B:

BREEAM Calc with basin tap fitted with aerator

BREEAM-NOR 3.0 Wat 01 Water consumption: Average flow rate calculator

Building details

Building name	Rudgwick Brickworks
BRE assessment reference no.	

WCs

	WC type	Specification effective flush volume (litres)	Quantity (no.)		Total per fitting type
1	Toilet	4.50	1		4.50
2					0.00
3					0.00
4					0.00
5					0.00
	Total		1		4.50

Average effective flushing volume (litres)	4.50	*Enter this average component consumption figure in to the rel*

Urinals

Urinals - automatically operated flushing cisterns

	Urinal flushing system type	Specification cistern capacity (litres)	Flushing frequency (flushes/hr)	Quantity (no.)		Total per fitting type
1					0	0.00
2					0	0.00
3					0	0.00
4					0	0.00
5					0	0.00
					0.00	0.00

Average cistern capacity (litres)	
No. of cisterns	0
Average flushing frequency (flushes/hour)	

Urinals - Manual or automatically operated pressure flushing valves

	Urinal flushing system type	Specification flush volume (litres)	Quantity (no.)		Total per fitting type
1					0.00
2					0.00
3					0.00

4					0.00
5					0.00
		Total	0		0.00

Average flush volume (litres)

Taps (excluding kitchen sink taps)

	Tap type	Specification flow rate (litres/minute)	Quantity (no.)		Total per fitting type
1	Tap	2.50	1		2.50
2					0.00
3					0.00
4					0.00
5					0.00
		Total	1		2.50

Average flow rate (litres/min) 2.50 *Enter this average component consumption figure in to the rel*

Proportionate flow rate (litres/min) 1.75

Kitchen sink taps

	Tap type	Specification flow rate (litres/minute)	Quantity (no.)		Total per fitting type
1	Kitchen Sink	20.00	1		20.00
2					0.00
3					0.00
4					0.00
5					0.00
		Total	1		20.00

Average flow rate (litres/min) 20.00 *Enter this average component consumption figure in to the rel*

Proportionate flow rate (litres/min) 14.00

Showers

	Shower type	Specification flow rate (litres/minute)	Quantity (no.)		Total per fitting type
1					0.00
2					0.00
3					0.00
4					0.00