Water Neutrality - Demonstration of Compliance. 10 May 2024.

Discharge of Pre-Occupation Condition, No.4.

Ref DC/21/1073 Dousters (Horsham Planning). Permission granted 19 Oct 2022.

The purpose of this document is to show how the water neutrality condition in the above has been met.

This is demonstrated through a number pieces of information, including:-

1).The new, actual, litres per day of mains water is LESS than the consented 810 litres per day.
See Summary of Findings, below.
This is supported by a spreadsheet, Appendix A – Actual Measured Usage, which shows flow rates for all rooms and each individual tap, shower, and appliance.

2).How was it achieved?

3).Notes to explain the calculations.

4).Methods of measurement.

5).Flow restrictors.

6).Rainwater harvesting.
Confirmation of the number of days without rain provided by the storage tank.

7).Attachments / Appendices:-
Appendix A – Actual Measured Usage, including flow rates for all rooms and each individual tap, shower, and appliance. (Spreadsheet).

Appendix B – Original, consented, Water Neutrality Statement, including proposed flow rates and WAT 1 frequency of use. Also available on the planning portal, under DC/21/1073.

8).Conclusion.

1). Summary of findings:-

The consented litres per day of mains water is 810.
(DC/21/1073, planning including water neutrality, approved 19-10-22).

The actual measured new litres per day of mains water is 795.
This is before being multiplied by the WAT1 Normalisation factor of 0.91.
After the Normalisation factor, the litres per day is 724.

Both figures are less than the consented, thus Pre-Occupation Condition No. 4 has been discharged.

Consented litres per day. 810 ltr.
In a nutshell, the existing litres per day (l/d) were 810, being 135 litres per person per day (l/p/d) x a maximum of 6 occupants, and permission was granted for up to 11 occupants provided the 810 l/d was not exceeded. The latter equates to a maximum of 73.64 l/p/d although this last figure is slightly academic because the limiting factor is 810 litres per day of mains water overall.

2). How was it achieved? / Main drivers for the reduction in mains water usage.

After showers, toilet flushing and outside garden use were the biggest users of mains water (17.44 & 5 respectively = 22.44 litres per person per day) and these last two have been replaced by rain water harvesting. Showers, easily the largest usage of mains water, and taps have had flow restrictors applied where necessary. In a few cases, taps had excessive jetting flow rates, in one example 20 litres a minute, with the norm being 3 - 8, where water could potentially splatter the user if the tap was opened fully, however, once the flow restrictor was applied the normally-called-for flow remained calm, but, due to the restrictor, it is now impossible to achieve the excessive flow and splattering effect even by mistake.

3). Notes on the calculations.

a).The references for the flow rates and frequency of use per day of the various types of water-using appliances are from WAT 1 – calculator, Code for Sustainable Homes. This was used in the original planning application DC/21/1073, which received consent on 22-10-2022, to show how a usage of 810 litres per day could support up to 11 occupants.

b).For example, WAT1 says, for a shower, the average minutes per day is 4.37. If the flow rate per minute was 7 litres per minute, then the litres per person per day would be 30.59. The 'budgeted' flow rate, for showers, for up to 11 to keep within 810 litres per day, was 9 litres per minute which equates to 39.33 l/min. Given the

new, actual, rate is around 7 l/min this represents a reduction of 8.74 l/min (39.33 – 30.59), x up to 11 occupants = 96.14 ltrs per day saving against the consented amount of 810 litres per day overall. This is significant, and contributes across the board. In practice, flow rates of 6 to 7 litres per minute have been found to be more than acceptable to existing occupants.

c).The calculations show, of course, how even with 11 occupants, the overall mains water usage is within the 810 litres per day. In practice, it is most likely that the number of occupants will be fewer than 11, so that will further reduce the usage in reality, but this has not been built into or relied on in the calculations.

d).Washing machines. These are located in the utility area of the main kitchen and so are common to all occupants. For this reason, the calculations show washing machine usage is multiplied by 11 occupants to arrive at the mains water volume overall. Separately, the calculation for this line is based on litres per kg of washing per person per day, to arrive at the water usage for this appliance.

e).As already stated, the water calculations are based on (up to) 11 occupants. This means some of the bigger flats, e.g. those with three of four rooms, multiply the usage by 2 occupants rather than 1, in order to take the number of occupants, and associated water usage, up to 11 overall.

f).The spreadsheet in Appendix A shows each raw recorded measurement and subsequent calculation of litres per minute, for every tap, shower, and appliance. It has also been recorded on video, some 20 clips, samples of, or all of which, are available on request.

4).Methods of measurement.

a).Flow cup. (For taps).
This is the size of a coffee mug, designed specially for plumbers, etc, for measuring flows on taps, where the spout of the tap is placed into a hole at the top of the device, and the outflow of water, via a vertical slit, indicates the flow rate on a vertical scale. In all cases the taps were put fully on and, where mixer taps, on the setting with strongest flow.

b).Bucket, timer, and kitchen / cookery measuring jar. (For showers).
Method:- The shower is set at normal temperature, and turned fully on. A stopwatch times for 15 seconds while the bucket is placed under the shower head. The contents of the bucket is measured using the cookery volume-measuring jar, as litres per 15 seconds, by pouring each half litre down the sink at a time, then the reading is multiplied by four to get litres per minute. A typical measurement might be, say, 3 x half litre jar = 1.5 ltrs, + 0.2ltr = 1.7 ltr / 15 seconds, = 6.8 ltr / 60 seconds = 6.8 ltrs / minute.

5).Flow restrictors.

These have been fitted to some of the shower heads and taps. They were purchased from Amazon, for example the Flintronic variety come in different colours for different flow rates, e.g. from 3 to 12 litres per minute, and are supplied with a rubber washer. As mentioned elsewhere, many of the showers were already running at below 9 ltrs / min which was the original 'budget' for showers. Also, flow rates of 6 to 7 ltrs / min have proven to be more than acceptable in practice with existing tenants. Regarding taps, where they were found to need restricting, in order to prevent their maximum flow rate from exceeding the 'flow budget', in practice, the users invariably tended to use a setting that was calm and within the budgeted flow rate anyway, although a restrictor was always added to ensure exceeding the recorded flow rate was never a possibility thereafter.

6).Rainwater harvesting.

Confirmation of the number of days without rain provided by the storage tank.

a).As mentioned in the consented proposal, the anticipated rain water usage is 17.44 + 5 ltrs per day per person for toilet flushing and outdoor use, eg car washing, respectively, x (up to) 11 occupants = 22.44 x 11 = 246.84 litres per day. Rounded up, this is 250 l/day. The tank holds 10,000 litres, so this equates to 40 days of no rain (10,000 / 250 = 40). The consented minimum cover against rainless days is 35 days, so this is more than covered.

b).From experience over the recent winter, since the rainwater harvesting system was installed, it has filled up from the roof gutters readily, and has not needed a delivery of water from outside the County to initiate supply from outside the water neutrality - affected area.

c).The specification and installation of the rainwater harvesting system has been signed-off by Building Control on 27-3-2024. Ref SBC/23/1510/CG, date of deposit 20 Oct 2023.

7).Attachments / Appendices:-

Appendix A – Actual Measured Usage, including flow rates for all rooms and each individual tap, shower, and appliance. Totalled to show the overall litres per day.

Appendix B – Original, consented, water neutrality statement, including proposed flow rates and WAT 1 frequency of use. Also available on the planning portal, under DC/21/1073.

8).Conclusion.

The above and attached show how Pre-Occupation Condition No. 4 has been discharged, and we would be grateful if the Planning Department would give consideration to it. [redacted]

End.