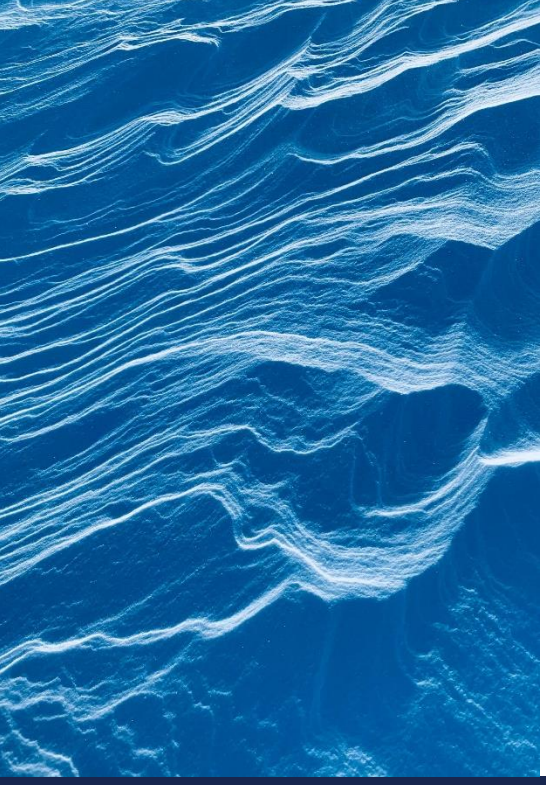




Water Neutrality Statement

AEG6538_RH20_Pulborough

Site Address: Tesla Engineering

Water Lane

Storrington

RH20 3EA

aegaea

Flood risk, water and environment

UK Experts in Flood Modelling, Flood Risk Assessments, and Surface Water Drainage Strategies

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Flood risk, water and environment

Document Issue Record

Project: Water Neutrality Statement

Reference: AEG6538_RH20_Pulborough

Site Location: Tesla Engineering, Water Lane, Storrington RH20 3EA

Date: 06/12/2024

Proposed Development: Construction of a new industrial unit, unit 12A Machine Hall

Please Note:

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1. Introduction

1.1. This Water Neutrality Statement (WNS) has been prepared as part of a planning application for a new industrial development on an existing site to demonstrate that the development can meet the necessary requirement of "water neutrality" due to the current concerns over the protected Arun Valley sites in Horsham District.

1.2. The development is designated as Unit 12A and is to be a machine hall.

1.3. The development is an extension to the existing Tesla facilities which also houses industrial Units 1-12 (including storage units) and is owned and operated by Tesla Engineering and is located in Water Lane, Storrington, West Sussex.

1.4. The site is located within Horsham District and importantly within the North Sussex Water Supply Zone and therefore there is a requirement to demonstrate water neutrality.

1.5. Water neutrality is defined as ensuring the development does not result in an increased water usage as compared to before the development has occurred.

1.6. This statement has been prepared in accordance with all the relevant guidance from Natural England and Horsham District Council including the following:

- Natural England (NE) Position Statement (September 2021)
- Natural England FAQ's (December 2021)
- Horsham District Council Water Neutrality FAQ's (Water Neutrality and Planning Applications) – Updated May 2023.

1.7. Calculations are included in this document to show the potential for offsetting the water consumption in Unit 12A by undertaking the retrofitting of existing Unit 2. Through discussions within Local Planning Authorities within the Sussex North Water Supply Zone, have advised that this approach is acceptable and it adopts the methodology and guidance set out by Horsham District Council and Natural England guidance.

1.8. The statement concludes that water neutrality can be achieved via offsetting measures as is subsequently laid out below.

Background

1.9. The site is owned and operated by Tesla Engineering and is located in Water Lane, Storrington, West Sussex.

1.10. Mains water is supplied by Southern Water

1.11. The site plan below shows the Tesla ownership as indicated by the blueline and the redline showing the proposed unit 12A.

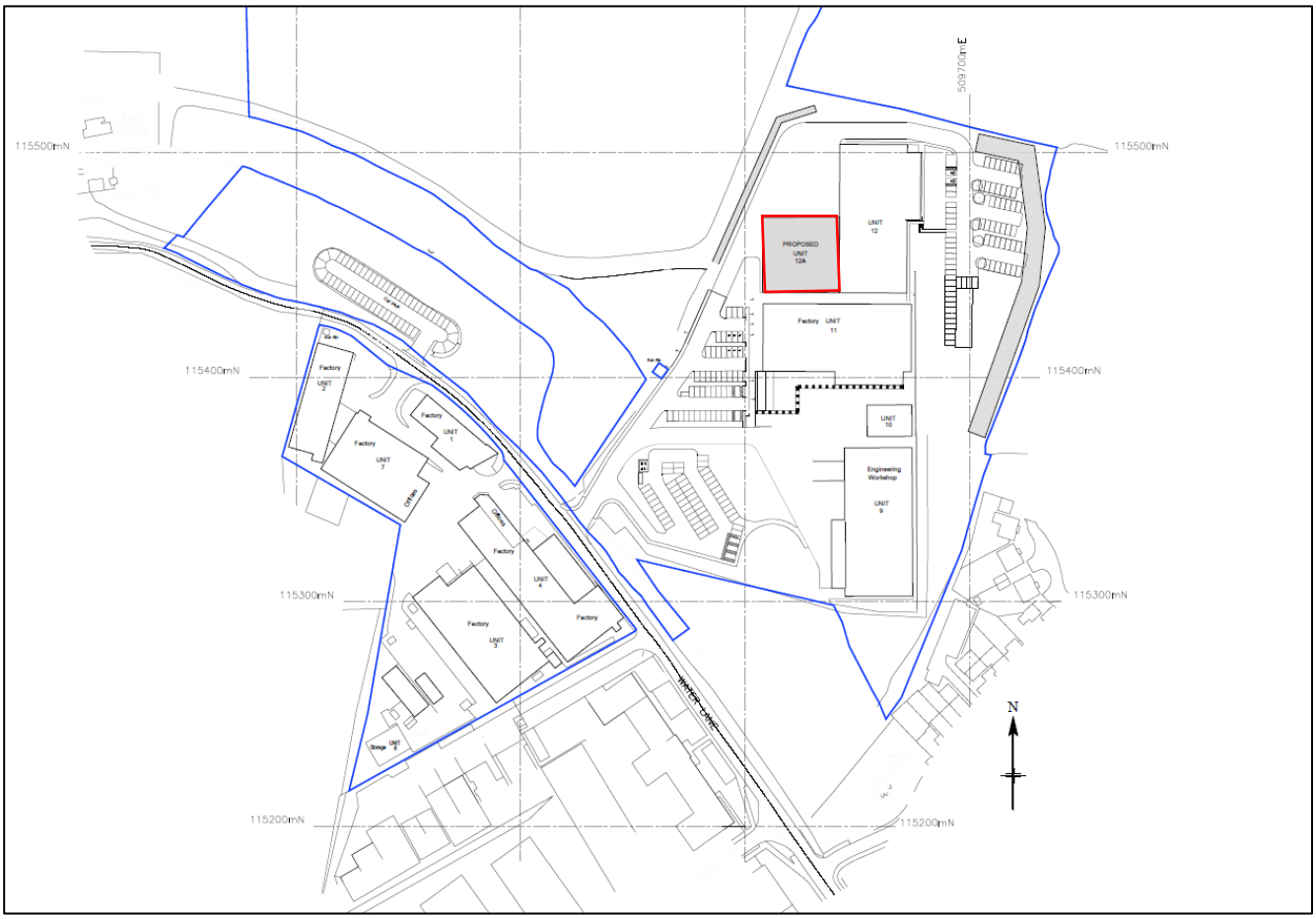


Figure 1: Site Location, blue line showing extent of TESLA engineering, with redline showing the proposed unit 12 A.

2. Baseline Conditions

2.1. Baseline water consumption calculations for Unit No.2 have been undertaken using BREEAM WAT 01 for Industrial Applications and then aligned with the actual water consumption.

Baseline Calculations (Unit No.2) – Metered Water Consumption

2.2. Metered water consumption has been provided by the client for Unit 2 for a period greater than 3 years. Please see Appendix No.1

2.3. According to the metered information and evidence provided by the client the average water consumption per day is as follows:

Average Daily Water Consumption = 2037 litres/day(l/d).

2.4. Please also see Appendix 1 for a table summary of the water usage and calculation to determine the average daily use over the period.

2.5. In order to meet the requirement of water neutrality, the total water consumption of Unit 12A and Unit 2 combined must not exceed the baseline of 2037l/d after the development.

Baseline Calculations – BREEAM WAT 01

2.6. BREEAM WAT 01 has been used to calculate the average daily water consumption l/p/d for Unit 2 based on the installed fittings.

2.7. The fittings installed in the Unit 2 are listed in Appendix 2 and replicated below in Table 1.

Table 1 - Fittings installed in Unit 2

Installation	Number	Unit of Measure	Source
WC (Single Flush)-Female	1	6l	Manufacturer Standard
WC (Single Flush)-Male	2	6l	Manufacturer Standard
WC (Single Flush)-Disabled Male/Female	1	6l	Manufacturer Standard
WC (Urinals)	2 bays	9l	Manufacturer Standard
Taps (excluding kitchen taps/kitchenette)	8	21.41l/min	Measured by Aegaea
Kitchen taps/kitchenette	2	23.30l/min	Measured by Aegaea
Water Heater	3	-	See 2.12 below

2.8. The following supporting comments show how the water consumption for each fitting type has been calculated in Table 1 above and these figures are used in the BREEAM WAT 01 Water Efficiency Calculator for Unit 2.

Supporting Comments of Table 1

2.9. WC's (Single Flush)- the average flush capacity is 6l and is derived by multiplying the number of units (4) by the manufacturers stated single flush capacity ((6l*4)/4=6l) for each unit and dividing the total capacity by the number of units (4).

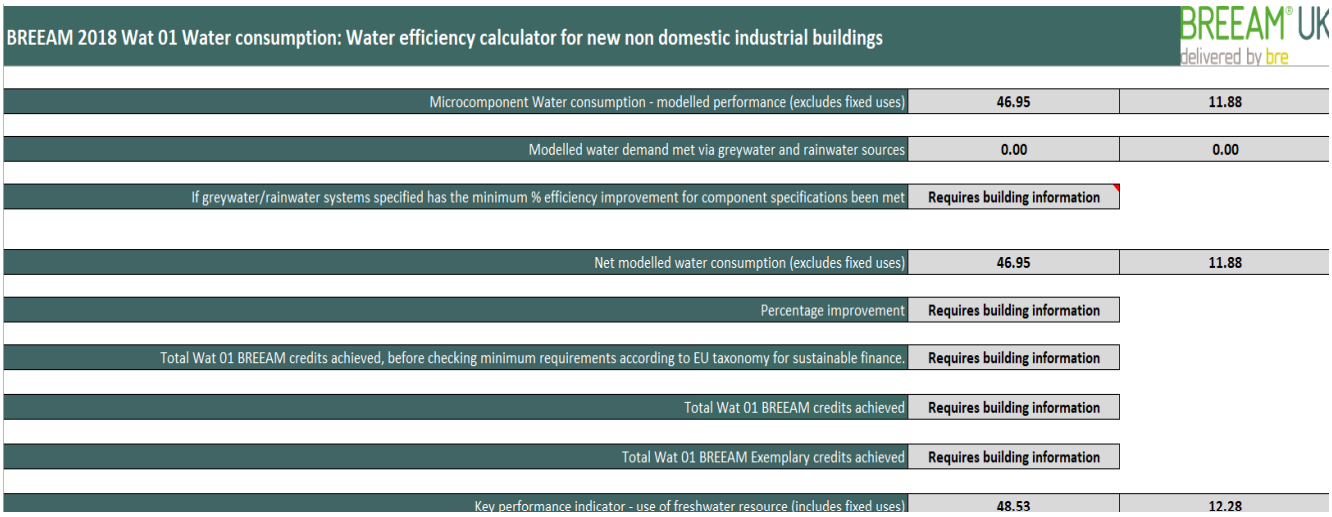
2.10. Taps (excluding kitchen/utility room)- the average flow (21.41l/min) stated above is derived by multiplying the number of units (8) by the by the measured flow for each unit (13.5l/min +27l/min +30l/min+ 15l/min +30l/min +15l/min +30l/min +10.8l/min) respectively and dividing the total flow by the number of units (8). When the average flow is greater than the greatest flow rate multiplied by 0.7. Average flow used is higher than the highest flow rate, (30 l per min) multiplied by 0.7 (21.00 l / min).

2.11. Kitchen taps/kitchenette- the average flow (23.30l/min) stated above is derived by multi- plying the number of units (2) by the measured flow rate for each unit (31l/min+15.6l/min) and dividing the total flow by the number of units (2). Average flow used is higher than the highest flow rate, (31 l per min) multiplied by 0.7 (21.70 l / min).

2.12. Water Heater is a fixed use in BREEAM.

Water Efficiency Calculator (Unit 2 – Existing)

2.13. The water efficiency calculator has been completed and is provided in full in Appendix 4 to clearly demonstrate the daily water consumption per person in Unit 2 before retrofit.



BREEAM 2018 Wat 01 Water consumption: Water efficiency calculator for new non domestic industrial buildings		
Microcomponent Water consumption - modelled performance (excludes fixed uses)	46.95	11.88
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	Requires building information	
Net modelled water consumption (excludes fixed uses)	46.95	11.88
Percentage improvement	Requires building information	
Total Wat 01 BREEAM credits achieved, before checking minimum requirements according to EU taxonomy for sustainable finance.	Requires building information	
Total Wat 01 BREEAM credits achieved	Requires building information	
Total Wat 01 BREEAM Exemplary credits achieved	Requires building information	
Key performance indicator - use of freshwater resource (includes fixed uses)	48.53	12.28

2.14. Table 2 summarizes the results with respect to the actual consumption and calculated consumption in accordance with BREEAM Wat 01.

2.15. It should be noted that as part of the site visit, taps were opened fully to understand maximum flows. It is recognised that the actual water consumption will vary depending on the actual behaviour of the occupants on site.

Table 2 – Unit No. 2 Before Retrofit (BREEAM Wat01) / Actual Consumption

	1	2	
Unit No	BREEAM Wat01l/p/d	Actual l/p/d (metered water)	ALIGNMENT % (2/1)
2	48.53	47.73	98.35%

2.16. Aligning actual water consumption to BREEAM Wat 01 which is a calculated water consumption has been undertaken to allow for comparison by dividing the actual water consumption by the BREEAM Wat 01 calculated water consumption, for Unit 2 this equates to 98.35% (48.53l/p/d versus 47.73l/p/d).

3. Proposed Additional Demand

3.1. It is now necessary to determine the increase in water usage and consumption which will be attributable to Unit 12A.

3.2. BREEAM Wat 01 has been used to calculate the average daily water consumption l/p/d for Unit 12A based on the installed fittings in Unit 11 see Appendix 2. Unit 12A according to the client will use the same fittings as Unit 11.

3.3. The fittings to be installed in the Unit 12A are shown below in Table 3.

Table 3 - Fittings to be installed in Unit 12A

Installation	Number	Unit of Measure	Source
WC (Dual Flush)-Female	2	4.5l(6/4l)	Manufacturers Data
WC (Dual Flush)-Male	2	4.5l(6/4l)	Manufacturers Data
WC (Single Flush) – Disabled - Male or Female	2	6l	Manufacturers Data
WC (Urinals)	1	9.5l(3 bays)	Manufacturers Data
Taps (excluding kitchen taps/kitchenette)	14	9.23l/min	Measured by client (Unit 11)
Taps (excluding kitchen taps/kitchenette)	2	3.9l/min	Manufacturers Data
Kitchen taps/kitchenette	2	10l/min	Measured by client (Unit11)

3.4. The following supporting comments show how the water consumption for each fitting type has been calculated from Table 3 above, these figures are used in the BREEAM Wat 01 Water Efficiency Calculator for Unit 12A and are shown in bold.

BREEAM Wat 01 inputs for Unit 12A

3.5. WC's (Dual Flush)- the average flush capacity is 4.5l and is derived by multiplying the number of units (4) by the manufacturers stated dual flush capacity ((6l*1) + (4l*3))/4=4.5) for each unit and dividing the total capacity by the number of units (4).

3.6. WC's (Single Flush)-the average flush capacity is 6.0l and is derived by multiplying the number of units (2) by the manufacturers stated flush capacity (6l) for each unit and dividing the total capacity by the number of units (2).

3.7. Note: BREEAM requires that where there are WC's designated both male and female that this number of units is added separately to the number of male and female WC's.

3.8. The average flush is **5.00l** and is derived by multiplying the average flush capacity of each WC (4.5l and 6l) by the number of units (4) and dividing the total capacity by the number of units ((4.5l*4) + (6l*2))/6 = 5.00l)

3.9. Urinal **9.5** litres (**3** bays) every **30mins**.

3.10. Taps (excluding kitchen/utility room)- the average flow **8.56l/min** is derived by multiplying the number of units (16) by the by the measured flow/manufacturers maximum stated flow for each unit ((9.23l/min * 14) +(3.9l/min*2))/16) respectively and dividing the total flow by the number of units (14).

3.11. Kitchen taps/kitchenette- the average flow **10l/min** is derived by multi- plying the number of units (1) by the measured flow rate ((10l/min) and dividing the total flow by the number of units (1).

3.12. Water Heater is a fixed use in BREEAM.

Water Efficiency Calculator - Unit No. 12A

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

BREEAM UK delivered by bre

Water consumption calculation results

	Litres/person/day	m^3/person/yr
Water consumption - modelled baseline performance benchmark (excludes fixed uses)	33.00	8.35
Microcomponent Water consumption - modelled performance (excludes fixed uses)	26.78	6.78
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	Not applicable	
Net modelled water consumption (excludes fixed uses)	26.78	6.78
Percentage improvement	18.84%	
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 (includes fixed uses)	28.36	7.18

3.13. The water efficiency calculator has been completed and is provided in full in Appendix 3 to clearly demonstrate the daily water consumption per person in Unit 12A.

3.14. Therefore, as detailed the mains water consumption is calculated for Unit 12A at 28.36l/p/d.

3.15. The client has advised that the average occupancy of Unit 12A will be approx. 17.

3.16. Therefore, the offsetting measures on Unit 2 will need to show daily water savings of at least 482.12/d (28.36l/p/d*17)).

3.17. The offsetting measures are now detailed below in the next section.

Offsetting Measures

3.18. For Unit 2 it is proposed to reduce mains water consumption by retrofitting water efficient devices to limit the flow from kitchen and basin taps to 6l/m and 4l/m respectively, see below Table 4. At this stage no improvement to the existing WC's (including urinals) is proposed.

Table 4 - Fittings to be installed in Unit 2 after retrofit

Installation	Number	Unit of Measure	Source
WC (Dual Flush)-Female	2	6/4l	Manufacturer Standard
WC (Dual Flush)-Male	1	6/4l	Manufacturer Standard
WC (Urinals)	4 bays	13l	Manufacturer Standard
Taps (excluding kitchen taps/kitchenette)	10	4l/min	TBA
Kitchen taps/kitchenette	1	6l/min	TBA
Water Heater	3	-	See 3.21 below

3.19. The following supporting comments show how the water consumption for each appliance or fixture has been calculated in Table 4 above and these figures are used in the BREEAM WAT 01 Water Efficiency Calculator for Unit 2 after retrofit,

Supporting Comments of Table 1

3.20. WC's (Dual Flush)- the average flush capacity is 4.5l and is derived by multiplying the number of units (3) by the manufacturers stated dual flush capacity ((6l*1) + (4l*3))/4=4.5) for each unit and dividing the total capacity by the number of units (3).

3.21. Taps (excluding kitchen/utility room)- the average flow (4l/min) stated above is derived by multiplying the number of units (10) by the by the measured flow/manufacturers maximum stated flow for each unit 6l/min respectively and dividing the total flow by the number of units (10).

3.22. Kitchen taps/kitchenette- the average flow (6l/min) stated above is derived by multiplying the number of units (1) by the measured flow rate ((l/min) and dividing the total flow by the number of units (1).

3.23. Water Heater is a fixed use in BREEAM.

Water Efficiency Calculator for Unit 2(after retrofit)

BREEAM 2018 Wat 01 Water consumption: Water efficiency calculator for new non domestic industrial buildings		
Microcomponent Water consumption - modelled performance (excludes fixed uses)	30.98	7.84
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	Not applicable	
Net modelled water consumption (excludes fixed uses)	30.98	7.84
Percentage improvement	16.52%	
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 (includes fixed uses)	32.56	8.24

3.24. BREEAM WAT01 calculations have been undertaken for Unit 2 before and after retrofit, see Appendix 4. Survey of the existing appliances are included in Appendix 2. Total Savings are discussed in Table 4 below.

Table 4 – Total Savings by implementing partial retrofits on Unit 2

	1	2	3	4	5	6	7
Unit	Before retrofit L/P/D	After retrofit L/P/D	Saving L/P/D (1-2)	Alignment %	Aligned Savings L/P/D (1*4)	Occupants	Total saving L/D (column 5*6)
2	48.53	32.56	15.97	98.35	15.71	43	675.53

3.25. The total saving is 675.53l/d, the required offset is 482.12/d. Thus, water neutrality for 12A can be achieved.

4. Conclusion

Summary

- Unit 2 to be retrofitted with water efficient kitchen and basin taps.
- Unit 12A to use same fittings, where applicable, as Unit 11.

Discussion

4.1. The calculations in this document show that the reduction in consumption of mains water by partially retrofitting Unit 2 as listed above could offset the increase in water consumption in the new development unit 12A.

- The offset by partial retrofitting Unit 2 as detailed above, equates to 675.53 l/d.
- The increase in demand as a result of the development of Unit 12A, is 482.12l/d.
- The total saving in water consumption could be as great as 193.41/d (675.53l/d – 482.12l/d)

4.2. **Offset required for Unit 12A is 482.12l/d. Partial retrofit of Unit 2 as discussed above provides additional savings/credit of 193.41/d thus water neutrality is achieved.**

4.3. If during the development of Unit 12A, the appliances (table 3) are changed the calculations as part of this WNS are recommended to be resubmitted as per the relevant guidance.

APPENDIX 1 - ANALYSIS OF EXISTING WATER USAGE (METERED INFORMATION)

Water Consumption – Litres /per person/per day

The client has provided extensive records for metered information for Unit 2. These can made available to Horsham District Council if required. Table 4 summarizes the meter readings at intervals of 6 months.

Table 4 – Meter Readings*

UNIT	2
08/01/16	3645
15/12/16	4521
18/06/18	6040
11/06/19	7008
06/04/20	8183
26/04/21	8532
16/04/22	8826
06/03/23	9124
13/03/23	9132
26/06/23	9261
17/07/23	9288

11/09/23	9356
Total Domestic (m3)	5711
Duration(days)	2804
Litres/day(l/d)	2037
Occupancy Rate	43
Litres/person/day(l/p/d)	47.37

*NOTE 1

With respect to the metered information provided by the client, the client believes that this information should provide excellent evidence of actual consumption, the readings are taken from a check meter installed on the supplies to individual units. The client aims to take meter readings weekly to identify leaks asap, some weeks may be missed due to holidays, sickness etc.

APPENDIX 2 – SURVEY OF EXISTING FITTINGS FOR UNIT 2 AND 11(WHERE APPLICABLE TO 12A) UNDERTAKEN BY AEGAEA/CLIENT.

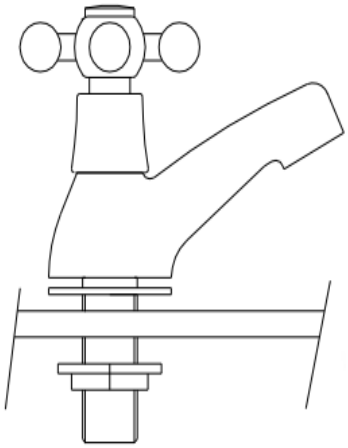
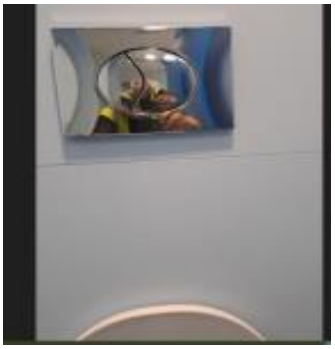
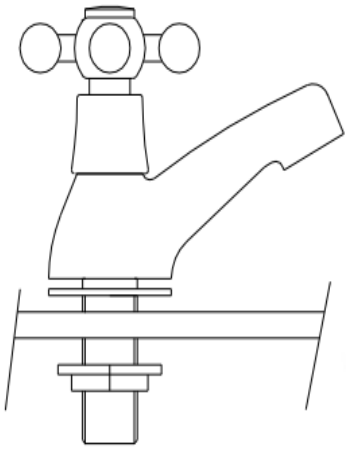
Unit	Fitting	No	Manufacturer	Flow	Photgraphic Evidence
Unit 2 Male	WC (Single Flush)	1	Not known	6l	
Unit 2 Male	WC (Single Flush)	1	Not known	6l	
Unit 2	Kitchen Tap	1	Not known	Cold 31l/m Hot 15.6l/m	

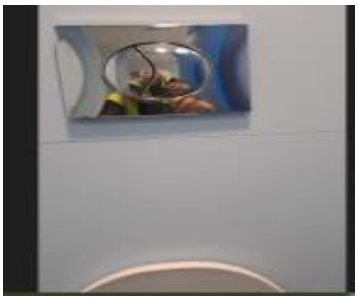
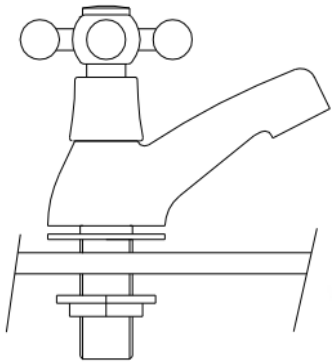
Unit 2	Water Heater	1			
Unit 2	Hot/Cold Water Dispense	1			
Unit 2 Female	WC (Single Flush)	1	Not known	6l	

Unit 2 Disabled	WC (Single Flush)	1	Not known	6l	
Unit 2 Disabled	Basin Taps	1	Not known	Cold 13.5l/m Hot 27l/m	
Unit 2	Water Heater	1	Redring	Not measured	

Unit 2 Male	Basin Taps	1	Not known	Cold 30l/m Hot 15l/m	
Unit 2 Male	Urinal (2 bowels)	1	Not known	9l	
Unit 2 Male	Basin Taps	1	Not known	Cold 30l/m Hot 15l/m	
Unit 2 Female	Basin Taps	1	Not known	Cold 30l/m Hot 10.8l/m	

Unit 11 and to below adopted in 12A	Outside Tap	1	Not known	Not measured	
Unit 11 and to be adopted in 12A Ground Floor wheelchair accessible W/C	WC Single Flush	1	INSTINCT	6l/min	
Unit 11 and to be adopted in 12A Ground Floor wheelchair accessible W/C	Basin Taps	1	VAL	3.9l/min	

To be adopted in Unit 12A Ground floor	Basin Taps (Bulter Sinks x 2)	4	Bristan	9.23l/min	
Unit 11/12A Mezzanine Floor WC Male	WC (Dual Flush)	2	Miniflow Cisterns	6/4l	
Unit 11/12A Mezzanine Floor WC Male	Basin Taps	6	Bristan	9.23l/min	

Unit 11/12A Mezzanine Floor WC Male	Urinal trough (three bay), high level cistern.	1	Stainless Steel supplies with infra Cistermiser control.	9.5l every 30mins	
Unit 11 /12A Mezzanine Floor WC Female	WC (Dual Flush)	2	Miniflow Cisterns	6/4l	
Unit 11 /Mezzanine Floor WC Female	Basin Taps	4	Bristan	9.23l/min	
Unit 11 /12A Mezzanine Floor wheelchair accessible W/C	WC Single Flush	1	INSTINCT	6l/min	

Unit 11/12A Mezzanine Floor wheelchair accessible W/C	Basin Taps	1	VAL	3.9l/min	
To be adopted in Unit 12A Mezzanine floor level	Kitchen Tap	1	Not known	10l/min	

Notes

- No. of fittings and locations are for Unit 12A

APPENDIX 3 – BREEAM CALCULATIONS FOR UNIT 12A

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

BREEAM® UK delivered by bre

Building type	Description of building type	Default occupancy	Default annual days/operation	Default daily hours of operation
Industrial - typical business hours of operation	General and specialist industrial and warehouse and storage units operating 24 hours a day 7 days a week.	48.06	253	10

Main building activity areas	Description of activity area	Activity area present in building?	Net Floor Area (m^2)
Industrial - process area	Main process based operational/manufacturing/workshop area	No	
Industrial - Laboratory area	Large or small category 1 laboratory area.	No	
Industrial - Warehouse storage	Permanently or intermittently occupied warehouse storage areas.	Yes	4450
Industrial - Office areas	Cellular or open plan office space, including staff kitchen where present/adjacent and reception areas. Exlcude meeting rooms, visitor waiting or circulation areas.	Yes	
Industrial - Staff canteen 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 office staff to re-heat food, make tea etc.)	No	
Industrial - Fitness suite/gym (with changing facility and showers)	A fitness suite or gym that is part of the office building/development and used by the building's employees only. The gym will have its own changing facility with showers.	No	

Water consumption - building microcomponent

WC component - all activity areas	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
WC - male (urinals installed)	Effective flush volume (Litres)	5.00	1.00	1.00	2.50
WC - female	Effective flush volume (Litres)	5.00	4.00	1.00	10.00

Urinal component - all activity areas	units	Specification	No. of cisterns	Flushing frequency (flushes/hour)	Consumption (L/person/day)
Automatically operated flushing cistern	Cistern capacity (Litres)	9.50	1.00	2.00	3.95
	No. of urinal bowls	3.00			
	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
Manual/automatic operated pressure flushing valve (all activity areas)	Flush volume (litres)		3.00	1.00	0.00
	No. of urinal bowls				
	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
Waterless urinals (all activity areas)	Flush volume (litres)	Waterless urinals - not specified	3.00	1.00	0.00
	No. of urinal bowls				

	Units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
Taps components (personal hygiene) - all activity areas					
Wash hand basin taps	Flow rate (litres/min)	8.56	4.00	0.25	5.80
Shower use	Flow rate (litres/min)	0.00	0.030	5.60	0.00
Fixed use - vessel filling	Litres/person/day	-	-	-	1.58
Tap components (cleaning) - staff kitchenette					
Kitchen taps - kitchenette	Flow rate (litres/min)	10.00	1.00	0.67	4.54
Dishwasher	Litres/cycle		0.04	1.00	0.00
Tap components (cleaning and food preparation) - staff canteen food preparation area					

	Microcomponent consumption (L/person/day)
Total	28.36

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?	No
Do all the installed showers have a maximum water flow of 8 litres/min?	No
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?	No
Do all urinals use a maximum of 2 litres/bowl/hour and flushing urinals have a maximum full flush volume of 1 litre?	No
Is all the EU taxonomy requirements for sanitary equipment met?	No

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	Please select

Greywater source (building 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

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	No
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	m^3/person/yr
Water consumption - modelled baseline performance benchmark (excludes fixed uses)	**33.00**	**8.35**
Microcomponent Water consumption - modelled performance (excludes fixed uses)	**26.78**	**6.78**
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	**Not applicable**	
Net modelled water consumption (excludes fixed uses)	**26.78**	**6.78**
Percentage improvement	**18.84%**	
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 (includes fixed uses)	**28.36**	**7.18**

APPENDIX 4 – BREEAM CALCULATIONS FOR UNIT NO.2 (PRIOR TO AND AFTER PARTIAL RETROFIT)

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

BREEAM® UK delivered by bre

Building type	Description of building type	Default occupancy	Default annual days/operation	Default daily hours of operation
Industrial - typical business hours of operation	General and specialist industrial and warehouse and storage units operating 24 hours a day 7 days a week.	26.1296	253	10

Main building activity areas	Description of activity area	Activity area present in building?	Net Floor Area (m^2)
Industrial - process area	Main process based operational/manufacturing/workshop area	Yes	776
Industrial - Laboratory area	Large or small category 1 laboratory area.	No	
Industrial - Warehouse storage	Permanently or intermittently occupied warehouse storage areas.	No	
Industrial - Office areas	Cellular or open plan office space, including staff kitchen where present/adjacent and reception areas. Exlcude meeting rooms, visitor waiting or circulation areas.	Yes	88
Industrial - Staff canteen 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 office staff to re-heat food, make tea etc.)	No	
Industrial - Fitness suite/gym (with changing facility and showers)	A fitness suite or gym that is part of the office building/development and used by the building's employees only. The gym will have its own changing facility with showers.	No	

Water consumption - building microcomponent

WC component - all activity areas	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
WC - male (urinals installed)	Effective flush volume (Litres)	6.00	1.00	1.00	3.00
WC - female	Effective flush volume (Litres)	6.00	4.00	1.00	12.00

Urinal component - all activity areas	units	Specification	No. of cisterns	Flushing frequency (flushes/hour)	Consumption (L/person/day)
Automatically operated flushing cistern	Cistern capacity (Litres)	9.00	1.00	2.00	6.89
	No. of urinal bowls	2.00			
	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
Manual/automatic operated pressure flushing valve (all activity areas)	Flush volume (litres)		3.00	1.00	0.00
	No. of urinal bowls				
	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
Waterless urinals (all activity areas)	Flush volume (litres)	Waterless urinals - not specified	3.00	1.00	0.00
	No. of urinal bowls				

	Units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
Taps components (personal hygiene) - all activity areas					
Wash hand basin taps	Flow rate (litres/min)	21.41	4.00	0.25	14.49
Shower use	Flow rate (litres/min)	0.00	0.030	5.60	0.00
Fixed use - vessel filling	Litres/person/day	-	-	-	1.58
Tap components (cleaning) - staff kitchenette					
Kitchen taps - kitchenette	Flow rate (litres/min)	23.30	1.00	0.67	10.57
Dishwasher	Litres/cycle		0.04	1.00	0.00
Tap components (cleaning and food preparation) - staff canteen food preparation area					

	Microcomponent consumption (L/person/day)
Total	48.53

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?	No
Do all the installed showers have a maximum water flow of 8 litres/min?	No
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?	No
Do all urinals use a maximum of 2 litres/bowl/hour and flushing urinals have a maximum full flush volume of 1 litre?	No
Is all the EU taxonomy requirements for sanitary equipment met?	No

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	Please select

Greywater source (building 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

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	Yes

How has the storage capacity for the proposed system been calculated?	BS EN 16941-1 'basic approach'

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)
1980	0	100.00%	70.00%	0	0.00

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	0.00

Component	Greywater and/or rainwater utilised for component	Proportion of components using greywater and/or rainwater yield (%)	Maximum permissible demand (L/person/day)
WC flushing	Yes	100%	15.00
Urinal flushing	Yes	100%	6.89

	Demand met by yield (L/person/day)
Total	0.00

Other permissible components

Are there other permissible components present which demand greywater and/or rainwater yield?	No

	Maximum permissible demand (L/day)
	0
Proportion of maximum permissible demand utilised by other permissible components (%)	

	Demand met by yield (L/person/day)
Total	0.00

	Greywater and/or rainwater demand met by yield (L/person/day)
Total	0.00

Water consumption calculation results

	Litres/person/day	m^3/person/yr
Water consumption - modelled baseline performance benchmark (excludes fixed uses)	**34.06**	**8.62**
Microcomponent Water consumption - modelled performance (excludes fixed uses)	**46.95**	**11.88**
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	**Requires building information**	
Net modelled water consumption (excludes fixed uses)	**46.95**	**11.88**
Percentage improvement	**Requires building information**	
Total Wat 01 BREEAM credits achieved, before checking minimum requirements according to EU taxonomy for sustainable finance.	**Requires building information**	
Total Wat 01 BREEAM credits achieved	**Requires building information**	
Total Wat 01 BREEAM Exemplary credits achieved	**Requires building information**	
Key performance indicator - use of freshwater resource (includes fixed uses)	**48.53**	**12.28**

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

BREEAM® UK delivered by bre

Building type	Description of building type	Default occupancy	Default annual days/operation	Default daily hours of operation
Industrial - typical business hours of operation	General and specialist industrial and warehouse and storage units operating 24 hours a day 7 days a week.	17.059	253	10

Main building activity areas	Description of activity area	Activity area present in building?	Net Floor Area (m^2)
Industrial - process area	Main process based operational/manufacturing/workshop area	Yes	482
Industrial - Laboratory area	Large or small category 1 laboratory area.	No	
Industrial - Warehouse storage	Permanently or intermittently occupied warehouse storage areas.	No	
Industrial - Office areas	Cellular or open plan office space, including staff kitchen where present/adjacent and reception areas. Exlcude meeting rooms, visitor waiting or circulation areas.	Yes	63
Industrial - Staff canteen 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 office staff to re-heat food, make tea etc.)	No	
Industrial - Fitness suite/gym (with changing facility and showers)	A fitness suite or gym that is part of the office building/development and used by the building's employees only. The gym will have its own changing facility with showers.	No	

Water consumption - building microcomponent

WC component - all activity areas	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
WC - male (urinals installed)	Effective flush volume (Litres)	6.00	1.00	1.00	3.00
WC - female	Effective flush volume (Litres)	6.00	4.00	1.00	12.00

Urinal component - all activity areas	units	Specification	No. of cisterns	Flushing frequency (flushes/hour)	Consumption (L/person/day)
Automatically operated flushing cistern	Cistern capacity (Litres)	9.00	1.00	2.00	10.55
	No. of urinal bowls	2.00			
	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
Manual/automatic operated pressure flushing valve (all activity areas)	Flush volume (litres)		3.00	1.00	0.00
	No. of urinal bowls				
	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
Waterless urinals (all activity areas)	Flush volume (litres)	Waterless urinals - not specified	3.00	1.00	0.00
	No. of urinal bowls				

	Units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
Taps components (personal hygiene) - all activity areas					
Wash hand basin taps	Flow rate (litres/min)	4.00	4.00	0.25	2.71
Shower use	Flow rate (litres/min)	0.00	0.030	5.60	0.00
Fixed use - vessel filling	Litres/person/day	-	-	-	1.58
Tap components (cleaning) - staff kitchenette					
Kitchen taps - kitchenette	Flow rate (litres/min)	6.00	1.00	0.67	2.72
Dishwasher	Litres/cycle		0.04	1.00	0.00
Tap components (cleaning and food preparation) - staff canteen food preparation area					

	Microcomponent consumption (L/person/day)
Total	32.56

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?	No
Do all the installed showers have a maximum water flow of 8 litres/min?	No
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?	No
Do all urinals use a maximum of 2 litres/bowl/hour and flushing urinals have a maximum full flush volume of 1 litre?	No
Is all the EU taxonomy requirements for sanitary equipment met?	No

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	Please select

Greywater source (building 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

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	Yes
How has the storage capacity for the proposed system been calculated?	BS EN 16941-1 'basic approach'

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)
1980	0	100.00%	70.00%	0	0.00

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	0.00

Component	Greywater and/or rainwater utilised for component	Proportion of components using greywater and/or rainwater yield (%)	Maximum permissible demand (L/person/day)
WC flushing	Yes	100%	15.00
Urinal flushing	Yes	100%	10.55

	Demand met by yield (L/person/day)
Total	0.00

Other permissible components

Are there other permissible components present which demand greywater and/or rainwater yield?	No
	Maximum permissible demand (L/day)
	0
Proportion of maximum permissible demand utilised by other permissible components (%)	

	Demand met by yield (L/person/day)
Total	0.00

	Greywater and/or rainwater demand met by yield (L/person/day)
Total	0.00

Water consumption calculation results

	Litres/person/day	m^3/person/yr
Water consumption - modelled baseline performance benchmark (excludes fixed uses)	**37.11**	**9.39**
Microcomponent Water consumption - modelled performance (excludes fixed uses)	**30.98**	**7.84**
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	**Not applicable**	
Net modelled water consumption (excludes fixed uses)	**30.98**	**7.84**
Percentage improvement	**16.52%**	
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 (includes fixed uses)	**32.56**	**8.24**

APPENDIX 5 – PROPOSED LAYOUT OF NEW DEVELOPMENT UNITS 12A

4.4.

