

Features	Benefits
Reduced storage needs compared to MBR systems.	Ideal for builds with spatial restrictions in the plant room.
Compatible with above- or below- ground tank installations.	Suitable for use in all building types (subject to max distances).
Various tank sizes and shapes available.	Provides maximum flexibility of application.
Recommended for partnering with SDS-supplied water tanks.	A back-up mains water supply in the treated water tank ensures seamless water delivery. SDS supplies and installs the complete system.
Conforms to BS and Water Supplies (Water Fittings) Regulations (when partnered with SDS-supplied tanks).	Provides legislative compliance.
High efficiency disc filtration removes all grey water particulates >100 microns.	Extends Ultrafiltration Membrane life, whilst allowing high treatment rates.
Integral pressure monitoring and self-clean cycle.	Ensures system operation is maintained at maximum efficiency and is uninterrupted between service visits.
Intelligent chlorine dosing of both collection tank and supplied water.	Ensures treated grey water is maintained in a sanitary condition obviating the need for further UV treatment.
Variable speed pump standard.	Specified bespoke to each application.
Water meter and remote production monitoring as standard.	Provides client access 24/7 to accurate information on grey water production, mains water usage and savings.
Variable time control for operation and automatic shut-down.	Perfect for variable demand situations and shut-down periods such as over weekends and holidays. System does not require rebooting or recommissioning following shut-down.
Standardised start-up and shut-down procedure.	Suitable for periods when usage demand is low e.g. Christmas and holidays.
Includes capacity for IoT / real time control via GSM signal.	Link to a SDS SYMBiotIC™ web-based client portal provides viewing of operating data and reports.



SPECIFICATIONS	GWR LS2	GWR LS5	GWR LS9
Maximum flow rate (m ³ /hour)	2	5	9
Motor output (kW)	6.5	7.9	13.5
Power	1 x 3 phase 400v, 32A		
Width* (mm)	1500	1700	1700
Height* (mm)	2400	2400	2400
Length* (mm)	2500	3200	4500
Grey water inlet connection	1" (adjustable)	1 1/4" (adjustable)	1 1/2" (adjustable)
Outlet connection	1" (adjustable)	1 1/4" (adjustable)	1 1/2" (adjustable)
Overflow connection	1" (adjustable)		
Remote monitoring	GSM production monitoring via SDS SYMBiotIC™ (optional extra)		
Noise	95dbL @ 1 metre (1 min/hour) (option to reduce to 45db)		
Chemical additive	Sodium hypochlorite		

*Excludes clearances, exact dimensions provided on order

GWR(LS) DS/0821

Appendix H Design BREEAM WAT01 Calculator Outputs

Building S4 - BREEAM Wat 01 calculation with Greywater harvesting

BREEAM 2018/Version 6 Wat 01 Water consumption: Water efficiency calculator for new office buildings



Building type	Description of building type	Default occupancy	Default annual days/operation	Default daily hours of operation
Office	ICP Classification B3: Offices and workshop/business (including those with a basic category 1 laboratory area)	1191.252	253	10

Main building activity areas	Description of activity area	Activity area present in building?	Net Floor Area (m ²)
Office - Office areas	Call or open plan office space, including staff kitchen where present/adjacent and reception areas. Exclude meeting rooms, visitor waiting or circulation areas.	Yes	10732
Office - Small workshop / laboratory space	Small scale workshop or category 1 laboratory area	No	
Office - 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	
Office - 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	

Note: The activity areas defined opposite are used to estimate the assessed building's default occupancy and therefore water consumption benchmark. These areas are chosen as they are deemed, by its design, to represent the permanently occupied space in the building and therefore reflect the number of building occupants/users. As a result it is not necessary to include all areas of the building that may be present, as the areas not defined are assumed to be used by the occupants of the building already accounted for by those areas that are listed.

Note: Only select this activity if there is a permanently staffed kitchen that will prepare hot and cold meals for the building's staff (and visitors). Enter the area of the seated dining area only (not kitchen/entry areas). This is used to estimate the number of covers per day for the restaurant and subsequently the number of kitchen staff and water consumption from food preparation activity areas.

Water consumption - building microcomponent

WC component - all activity areas	Units	Specification	Usage/person/day	Usage factor	Consumption (l/person/day)
WC - male (unless specified)	Effective flush volume (litres)	3.50	1.00	1.00	3.50
WC - female	Effective flush volume (litres)	3.50	4.00	1.00	7.00

Note: Where the WC facilities are non-gender specific, please still enter the WC specification against both WC male and WC female categories i.e. if there are two WCs with a 6 litre effective flush, then enter 6 litres against both male and female categories. The calculation will not double count water consumption in this instance as the consumption figure calculated for each WC component is adjusted by the ratio of male to female users for this building type.

WC components (excluding) - all activity areas	Units	Specification	Usage/person/day	Usage factor	Consumption (l/person/day)
Automatic/operated pressure flushing urinals	Cistern capacity (litres)	20.00	20.00	6.00	0.76
Manual/automatic operated pressure flushing valves (all activity areas)	Flush volume (litres)	0.00	3.00	1.00	0.00
Waterless urinals (all activity areas)	Units	Specification	Usage/person/day	Usage factor	Consumption (l/person/day)
	No. of urinal bowls	Waterless urinals - not specified	3.00	1.00	0.00

Note: This consumption total accounts for the ratio of male users for this building type i.e. the ratio of building users who will operate the flush. Where more than one type of urinal flushing control is specified in the building, this consumption figure is adjusted by a ratio of use, the ratio is determined according to the proportion of urinal bowls in the building operated using the type of control.

Task components (personal hygiene) - all activity areas	Units	Specification	Usage/person/day	Usage factor	Consumption (l/person/day)
Wash hand basin taps	Flow rate (litres/min)	4.00	4.00	0.25	2.71
Shower use	Flow rate (litres/min)	5.00	0.030	5.60	0.84
Fixed use - vessel filling	Flow rate (litres/min)	-	-	-	1.58

Task components (kitchen) - staff kitchenette	Units	Specification	Usage/person/day	Usage factor	Consumption (l/person/day)
Kitchen taps - kitchenette	Flow rate (litres/min)	5.00	1.00	0.67	3.27
Dishwasher - staff kitchenette	litres/cycle	-	0.04	1.00	0.00

Note: This total includes the contributions from fixed uses, including where applicable vessel filling, kitchen cleaning and food preparation. Default fixed use totals are included with the calculations to provide a more accurate reflection of the building's total water consumption. The fixed use totals are not however included in the water consumption total used to determine the assessed building percentage improvement and the number of BREEAM credits achieved. The percentage improvement is based only on the consumption of water from uses that can be heavily influenced by the microcomponent specification e.g. WC flushing.

Non potable water yield - greywater system

Has, or will, the greywater system be specified and installed in compliance with BS825-1:2010 Greywater Systems - Part 1 Code of Practice	Yes			
Greywater source (building components)	Greywater collected	Proportion of components collected (%)	Greywater yield (l/person/day)	
Wash hand basin taps	Yes	100%	2.71	
Showers	Yes	100%	0.84	
Kitchen taps - kitchenette	No			
Dishwasher - staff kitchenette	No			
Greywater source (other components)	Typical greywater yield (litres)	Frequency of yield (days)	Greywater yield (litres/day)	Greywater yield (l/person/day)
Other source of greywater				3.55
Total				3.55

Note: If greywater is collected from a component/source not accounted for above i.e. their consumption is not estimated, then the amount of greywater collected can be added here so that it may be accounted for. This can include wastewater from active hygiene flushing, i.e. a regular hygiene flushing programme to minimise poor water quality in a potable cold or hot water system.

Non potable water yield - rainwater system

Has, or will, the rainwater system be specified and installed in compliance with BS EN 1894-1:2018 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 (m ²)	Rainfall (average mm/yr)	Hydraulic filter efficiency (%)	Yield co-efficient (%)	Annual rainwater yield (litres)	Rainwater yield (l/person/day)
Rainwater yield if detailed					Rainwater yield (l/person/day)
Daily rainfall collection (litres)					

Non Potable Water Demand - Building Components

Component	Greywater and/or rainwater utilized for component	Proportion of components using available greywater/rainwater yield (%)	Maximum permissible demand (l/day)
WC-flushing	Yes	100%	3.75
Urinal flushing	Yes	100%	0.76
Total			3.55
Other permissible components			
Are there other permissible components present which demand greywater and/or rainwater yield?			
Proportion of maximum permissible demand utilized by other permissible components (%)			Demand met by yield (l/person/day)
			3.55
Greywater and/or rainwater demand met by yield (l/person/day)			3.55
Total			3.55

Water consumption calculation results

	litres/person/day	m ³ /person/yr
Water consumption - modelled baseline performance benchmark (excludes fixed uses)	29.58	7.48
Microcomponent water consumption - modelled performance (includes fixed uses)	15.32	3.88
Modelled water demand met via greywater and rainwater sources	3.55	0.90
If greywater/rainwater systems specified has the minimum % efficiency improvement for component specifications been met?	Yes	
Net modelled water consumption (includes fixed uses)	11.77	2.98
Microtags improvement	60.15%	
Total Wat 01 BREEAM credits achieved	5 credits	
Total Wat 01 BREEAM exemplary credits achieved	Exemplary level not achieved	
Key performance indicator - use of freshwater resource (includes fixed uses)	13.35	3.38

Building S6 - BREEAM Wat 01 calculation with Greywater harvesting

BREEAM 2015/Version 6 Wat 01 Water consumption: Water efficiency calculator for new office buildings					BREEAM UK IMPROVED BY YOU
Building type	Description of building type	Default occupancy	Default annual days/operation	Default daily hours of operation	
Office	ICP Classification B1: Offices and workshop business (including those with a basic category 3 laboratory area)	655.367	253	10	
Main building activity areas		Description of activity area	Activity area present in building?	Net Floor Area (m ²)	
Office - Office areas	Cellular or open plan office spaces, including staff kitchen where present/adjacent and reception areas. Exclude meeting rooms, visitor waiting or circulation areas.		Yes	3077	
Office - Small workshop / laboratory space	Small scale workshop or category 1 laboratory area		Yes	4615	
Office - 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.)		Please select		Note: Only select this activity if there is a permanently staffed kitchen that will prepare hot and cold meals for the building's staff (and visitors). Enter the area of the seated dining area only (not kitchen/serve areas), this is used to estimate the number of covers per day for the restaurant and subsequently the number of kitchen staff and water consumption from food preparation activity area.
Office - 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.		Please select		Note: Only select this activity if there is a permanently staffed kitchen that will prepare hot and cold meals for the building's staff (and visitors). Enter the area of the seated dining area only (not kitchen/serve areas), this is used to estimate the number of covers per day for the restaurant and subsequently the number of kitchen staff and water consumption from food preparation activity area.
Water consumption - building microcomponent					
WC component - all activity areas	units	Specification	Usage/person/day	Usage Factor	Consumption (l/person/day)
WC - male (urinals included)	Effective flush volume (litres)	3.75	4.00	1.00	1.50
WC - female	Effective flush volume (litres)	3.75	4.00	1.00	7.50
Note: Where the WC facilities are non-gender specific, please still enter the WC specification against both WC male and WC female categories i.e. if there are two WCs with a 6 litre effective flush, then enter 6 litres against both male and female categories. The calculation will not double count water consumption in this instance as the consumption figure calculated for each WC component is adjusted by the ratio of male to female users for this building type.					
Urinal component - all activity areas	units	Specification	No. of urinals	Flushing frequency (flushes/hour)	Consumption (l/person/day)
Automatically operated flushing system	Urinal capacity (litres)	4.50	20.00	1.00	0.00
Manually/automatic operated persons flushing valve (all activity areas)	Flush volume (litres)	0.00	0.00	1.00	0.00
Waterless urinals (all activity areas)	Flush volume (litres)	Waterless urinals - not specified	0.00	1.00	0.00
Note: This consumption total accounts for the ratio of male users for this building type i.e. the ratio of building users who will operate the flush. Where more than one type of urinal flushing control is specified in the building, this consumption figure is adjusted by a ratio of use. The ratio is determined according to the proportion of urinals bowls in the building operated using this type of control.					
Tap components (operational/functional) - all activity areas	units	Specification	Usage/person/day	Usage Factor	Consumption (l/person/day)
Wash hand basin taps	Flow rate (litres/min)	5.00	4.00	0.25	3.39
Drinking fountains	Flow rate (litres/min)	6.00	0.254	0.50	0.27
Fixed use - vessel filling	litres/person/day	-	-	-	1.58
Tap components (cleaning) - staff kitchens	units	Specification	Usage/person/day	Usage Factor	Consumption (l/person/day)
Kitchen taps - kitchenette	Flow rate (litres/min)	6.00	1.00	0.67	2.72
Dishwasher	litres/cycle	-	0.94	1.00	0.00
Tap components (kitchen and food preparation) - staff kitchens/food preparation areas	units	Specification	Usage/person/day	Usage Factor	Consumption (l/person/day)
Drinking fountains - pre-rinse nozzle	Flow rate (litres/min)	-	60.00	0.00	0.00
Dishwasher	litres/cycle	5.00	-	0.217	0.00
Waste disposal units	Flow rate (litres/min)	-	30.00	0.00	0.00
Fixed use - food preparation	litres/person/day	-	-	-	0.00
Fixed use - kitchen cleaning	litres/person/day	-	-	-	0.00
Note: This total includes the contributions from fixed uses, including where applicable vessel filling, kitchen cleaning and food preparation. Default fixed use totals are included with the calculations to provide a more accurate reflection of the building's total water consumption. The fixed use totals are not however included in the water consumption total used to determine the assessed building's percentage improvement and the number of BREEAM credits achieved. The percentage improvement is based only on the consumption of water from uses that can be heavily influenced by the microcomponent specification e.g. WC flushing.					
Microcomponent consumption (litres/person/day)					22.69
Total					
Non potable water yield - greywater system					
Has, or will, the greywater system be specified and installed in compliance with BS EN 12059-1:2000 Greywater Systems - Part 1 Code of Practice					Yes
Greywater source (building components)	Greywater collected	Proportion of components collected from (%)	Greywater yield (l/person/day)		
Wash hand basin taps	Yes	30%	1.02		
Showers	Yes	100%	5.27		
Kitchen taps - kitchenette	No	-	0.00		
Dishwasher - staff kitchenette	No	-	0.00		
Kitchen taps - pre-rinse nozzle	No	-	0.00		
Dishwasher - food preparation area	No	-	0.00		
Greywater source (other components)	Typical greywater yield (litres)	Frequency of yield (days)	Greywater yield (litres/cycle)	Greywater yield (l/person/day)	
Other source of greywater	-	-	-	0.00	
Total					6.19
Non potable water yield - rainwater system					
Has, or will, the rainwater system be specified and installed in compliance with BS EN 12058-1:2008 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 (m ²)	Rainfall (litres/m ² /hr)	Hydraulic filter efficiency (%)	Yield coefficient (%)	Annual/rainwater yield (litres)	Rainwater yield (l/person/day)
Daily rainfall collection filtered					Rainwater yield (l/person/day)
Total					0.00
Non Potable Water Demand - Building Components					
Greywater and/or rainwater yield (l/person/day)					6.19
Total					6.19
Component	Greywater and/or rainwater utilized for component	Proportion of components using greywater and/or rainwater yield (%)	Maximum permissible demand (l/person/day)		
WC flushing	Yes	20%	0.38		
Urinal flushing	Yes	100%	0.45		
Demand met by yield (l/person/day)					0.00
Total					6.19
Other permissible components					
Are there other permissible components present which demand greywater and/or rainwater yield?					No
Maximum permissible demand (l/person/day)					0
Proportion of maximum permissible demand utilised by other permissible components (%)					0
Demand met by yield (l/person/day)					0.00
Total					0.00
Greywater and/or rainwater demand met by yield (l/person/day)					6.19
Total					6.19
Water consumption calculation results					
Water consumption - modelled baseline performance benchmark (excludes fixed uses)		litres/person/day	19.84	m ³ /person/yr	7.15
Microcomponent water consumption - modelled performance (excludes fixed uses)		litres/person/day	22.11	m ³ /person/yr	5.34
Modelled water demand met via greywater and rainwater sources		litres/person/day	6.19	m ³ /person/yr	1.57
If greywater/rainwater systems specified has the minimum % efficiency improvement for component specifications been met		Yes/No	Yes		
Net modelled water consumption (excludes fixed uses)		litres/person/day	14.92	m ³ /person/yr	3.78
Percentage improvement		%	61.87%		
Total Wat 01 BREEAM credits achieved		credits	5 credits		
Total Wat 01 BREEAM Exemplary credits achieved		credits	Exemplary level not achieved		
Key performance indicator - use of freshwater resource (includes fixed uses)		litres/person/day	16.50	m ³ /person/yr	4.18

Building S7 - BREEAM Wat 01 calculation with Greywater harvesting

BREEAM 2015/Version 6 Wat 01 Water consumption: Water efficiency calculator for new office buildings					BREEAM UK WELLER BY WAT
Building type	Description of building type	Default occupancy	Default annual days/operation	Default daily hours of operation	
Office	T1 Classification B1: Offices and workshop business (including those with a basic category 3 laboratory area)	680.39	253	10	
Main building activity areas		Description of activity area		Activity area present in building?	Net Floor Area (m ²)
Office - Office areas	Cellular or open plan office spaces, including staff kitchen where present/adjacent and reception areas. Exclude meeting rooms, visitor waiting or circulation areas.			Yes	3194
Office - Small workshop / laboratory space	Small scale workshop or category 1 laboratory area			Yes	4702
Office - 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.)			Please select	
Office - 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.			Please select	
Water consumption - building microcomponent					
WC component - all activity areas	units	Specification	Usage/person/day	Usage Factor	Consumption (l/person/day)
WC - male (urinals included)	Effective flush volume (litres)	3.75	3.00	1.00	3.75
WC - female	Effective flush volume (litres)	3.75	4.00	1.00	7.50
Note: Where the WC facilities are non-gender specific, please still enter the WC specification against both WC male and WC female categories i.e. if there are two WCs with a 6 litre effective flush, then enter 6 litres against both male and female categories. The calculation will not double count water consumption in this instance as the consumption figure calculated for each WC component is adjusted by the ratio of male to female users for this building type.					
Urinal component - all activity areas	units	Specification	No. of urinals	Flushing frequency (flushes/hour)	Consumption (l/person/day)
Automatically operated flushing system	Urinal capacity (litres)	4.50	20.00	1.00	0.44
Manually/automatic operated persons flushing valve (all activity areas)	Flush volume (litres)	0.00	2.00	1.00	0.00
Waterless urinals (all activity areas)	Flush volume (litres)	Waterless urinals - not specified	3.00	1.00	0.00
Note: This consumption total accounts for the ratio of male users for this building type i.e. the ratio of building users who will operate the flush. Where more than one type of urinal flushing control is specified in the building, this consumption figure is adjusted by a ratio of use. The ratio is determined according to the proportion of urinals bowls in the building operated using this type of control.					
Tap components (operational/functional) - all activity areas	units	Specification	Usage/person/day	Usage Factor	Consumption (l/person/day)
Wash hand basin taps	Flow rate (litres/min)	5.00	4.00	0.25	3.39
Drinking fountains	Flow rate (litres/min)	6.00	0.154	5.80	0.27
Fixed use - vessel filling	litres/person/day	-	-	-	1.58
Tap components (cleaning) - staff kitchens	units	Specification	Usage/person/day	Usage Factor	Consumption (l/person/day)
Kitchen taps - kitchenette	Flow rate (litres/min)	6.00	1.00	0.67	2.72
Dishwasher	litres/cycle	-	0.94	1.00	0.00
Tap components (kitchen and food preparation) - staff kitchens/food preparation areas	units	Specification	Usage/person/day	Usage Factor	Consumption (l/person/day)
Drinking fountains - pre-rinse sprayer	Flow rate (litres/min)	-	60.00	0.00	0.00
Dishwasher	litres/cycle	5.00	-	0.217	0.00
Waste disposal units	Flow rate (litres/min)	-	30.00	0.00	0.00
Fixed use - food preparation	litres/person/day	-	-	-	0.00
Fixed use - kitchen cleaning	litres/person/day	-	-	-	0.00
Note: This total includes the contributions from fixed uses, including where applicable vessel filling, kitchen cleaning and food preparation. Default fixed use totals are included with the calculations to provide a more accurate reflection of the building's total water consumption. The fixed use totals are not however included in the water consumption total used to determine the assessed building's percentage improvement and the number of BREEAM credits achieved. The percentage improvement is based only on the consumption of water from uses that can be heavily influenced by the microcomponent specification e.g. WC flushing.					
Microcomponent consumption (litres/person/day)					22.08
Total					
Non potable water yield - greywater system					
Has, or will, the greywater system be specified and installed in compliance with BS EN 15464-1:2010 Greywater Systems - Part 1 Code of Practice					Yes
Greywater source (building components)	Greywater collected	Proportion of components collected from (%)	Greywater yield (l/person/day)		
Wash hand basin taps	Yes	28%	0.95		
Showers	Yes	100%	5.27		
Kitchen taps - kitchenette	No	-	-		
Dishwasher - staff kitchenette	No	-	-		
Kitchen taps - pre-rinse sprayer	No	-	-		
Dishwasher - food preparation area	No	-	-		
Greywater source (other components)	Typical greywater yield (litres)	Frequency of yield (days)	Greywater yield (litres/day)	Greywater yield (l/person/day)	
Other source of greywater	-	-	-	0.00	
Total					6.12
Note: If greywater is collected from a component/source not accounted for above i.e. their consumption is not estimated, then the amount of greywater collected can be added here so that it may be accounted for. This can include wastewater from active hygiene flushing, i.e. a regular hygiene flushing programme to minimise poor water quality in a potable cold or hot water system.					
Non potable water yield - rainwater system					
Has, or will, the rainwater system be specified and installed in compliance with BS EN 15464-1:2010 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 (m ²)	Rainfall (litres/m ² /hr)	Hydraulic filter efficiency (%)	Yield coefficient (%)	Annual rainwater yield (litres)	Rainwater yield (l/person/day)
Daily rainfall collection filtered					Rainwater yield (l/person/day)
Total					6.12
Non Potable Water Demand - Building Components					
Greywater and/or rainwater yield (l/person/day)					6.12
Total					6.12
Component	Greywater and/or rainwater utilized for component	Proportion of components using greywater and/or rainwater yield (%)	Maximum permissible demand (l/day)		
WC flushing	Yes	20%	0.38		
Urinal flushing	Yes	100%	0.44		
Demand met by yield (l/person/day)					0.82
Total					6.12
Other permissible components					
Are there other permissible components present which demand greywater and/or rainwater yield?					Please select
Proportion of maximum permissible demand utilised by other permissible components (%)					
Demand met by yield (l/person/day)					
Total					
Greywater and/or rainwater demand met by yield (l/person/day)					6.12
Total					6.12
Water consumption calculation results					
Water consumption - modelled baseline performance benchmark (excludes fixed uses)	litres/person/day	m ³ /person/yr			
	34.86	9.33			
Microcomponent water consumption - modelled performance (excludes fixed uses)			22.00	5.34	
Modelled water demand met via greywater and rainwater sources			6.12	1.56	
If greywater/rainwater systems specified has the minimum % efficiency improvement for component specifications been met?					
Yes					
Net modelled water consumption (excludes fixed uses)					
14.87					
Percentage improvement					
61.86%					
Total Wat 01 BREEAM credits achieved					
5 credits					
Total Wat 01 BREEAM Exemplary credits achieved					
Exemplary level not achieved					
Key performance indicator - use of freshwater resource (includes fixed uses)					
16.55					
4.19					

Building S8 - BREEAM Wat 01 calculations with Greywater harvesting

BREEAM 2015/Version 6 Wat 01 Water consumption: Water efficiency calculator for new office buildings



Building type	Description of building type	Default occupancy	Default annual days/operation	Default daily hours of operation
Office	ICP Classification B1: Offices and workshop business (including those with a basic category 3 laboratory area)	955.044	253	10

Main building activity areas	Description of activity area	Activity area present in building?	Net Floor Area (m ²)
Office - Office areas	Cellular or open plan office spaces, including staff kitchen where present/adjacent and reception areas. Exclude meeting rooms, visitor waiting or circulation areas.	Yes	8604
Office - Small workshop / laboratory space	Small scale workshop or category 1 laboratory area	No	
Office - 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	
Office - 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	

Note: The activity areas defined opposite are used to estimate the assessed building's default occupancy and therefore water consumption benchmark. These areas are chosen as they are deemed, by a large, to represent the permanently occupied spaces in the building and therefore reflect the number of building occupants/users. As a result it is not necessary to include all areas of the building that may be present, as the areas not defined are assumed to be used by the occupants of the building already accounted for by those areas that are listed.

Note: Only select this activity if there is a permanently staffed kitchen that will prepare hot and cold meals for the building's staff (and visitors). Enter the area of the seated dining area only (not kitchen/serve areas), this is used to estimate the number of covers per day for the restaurant and subsequently the number of kitchen staff and water consumption from food preparation activity area.

Water consumption - building microcomponent

WC component - all activity areas	units	Specification	Usage/Person/Day	Usage Factor	Consumption (l/Person/Day)
WC - male (no urinals included)	Effective flush volume (litres)	3.50	4.00	1.50	2.00
WC - female	Effective flush volume (litres)	3.50	4.00	1.00	7.00

Urinal component - all activity areas	units	Specification	No. of urinals	Flushing Frequency (flashes/hour)	Consumption (l/Person/Day)

Tap components (operational/functional) - all activity areas	units	Specification	Usage/Person/Day	Usage Factor	Consumption (l/Person/Day)
Wash hand basin taps	Flow rate (litres/min)	4.00	4.00	0.25	2.71
Shower cist	Flow rate (litres/min)	3.50	0.50	3.50	0.84
Foam use - vessel filling	litres/person/day				1.58
Tap components (cleaning) - staff kitchens/ette					
Kitchen taps - kitchenette	Flow rate (litres/min)		1.00	0.67	0.00
Dishwasher	litres/cycle		0.94	1.00	0.00

Tap components (cleaning and food preparation) - staff canteen food preparation area	units	Specification	Usage/Person/Day	Usage Factor	Consumption (l/Person/Day)

Note: Where the WC facilities are non-gender specific, please still enter the WC specification against both WC male and WC female categories i.e. if there are two WCs with a 6 litre effective flush, then enter 6 litres against both male and female categories. The calculation will not double count water consumption in this instance as the consumption figure calculated for each WC component is adjusted by the ratio of male to female users for this building type.

Note: This total includes the contributions from fixed uses, including where applicable vessel filling, kitchen cleaning and food preparation. Default fixed use totals are included with the calculations to provide a more accurate reflection of the building's total water consumption. The fixed use totals are not however included in the water consumption total used to determine the assessed building's percentage improvement and the number of BREEAM credits achieved. The percentage improvement is based only on the consumption of water from uses that can be heavily influenced by the microcomponent specification e.g. WC flushing.

Non potable water yield - greywater system

Has, or will, the greywater system be specified and installed in compliance with BS EN 15464-1:2010 Greywater Systems - Part 1 Code of Practice	Yes		
Greywater source (building components)	Greywater collected	Proportion of components collected from (%)	Greywater yield (l/Person/Day)
Wash hand basin taps	Yes	100%	2.71
Shower cist	Yes	100%	0.84
Kitchen taps - kitchenette	No		
Dishwasher - staff kitchenette	No		
Greywater source (other components)	Typical greywater yield (litres)	Frequency of yield (days)	Greywater yield (litres/Day)
Other source of greywater			0.00
			Greywater yield (l/Person/Day)
			3.55

Note: If greywater is collected from a component/source not accounted for above i.e. their consumption is not estimated, then the amount of greywater collected can be added here so that it may be accounted for. This can include wastewater from active hygiene flushing, i.e. a regular hygiene flushing programme to minimise poor water quality in a potable cold or hot water system.

Non potable water yield - rainwater system

Has, or will, the rainwater system be specified and installed in compliance with BS EN 12054-1:2018 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 (m ²)	Hydraulic filter efficiency (%)	Yield coefficient (%)	Annual rainwater yield (litres)	Rainwater yield (l/Person/Day)
			Adjusted yield (litres)	Rainwater yield (l/Person/Day)
			Daily rainfall collection (litres)	

Non Potable Water Demand - Building Components

Component	Greywater and/or rainwater utilized for component	Proportion of components using greywater and/or rainwater yield (%)	Maximum permissible demand (l/Person/Day)
WC flushing	Yes	100%	14.00
			Demand met by yield (l/Person/Day)
			3.55
Other permissible components			
Are there other permissible components present which demand greywater and/or rainwater yield?		No	Maximum permissible demand (l/Person/Day)
			0
Proportion of maximum permissible demand utilised by other permissible components (%)			Demand met by yield (l/Person/Day)
			0.00
			Greywater and/or rainwater demand met by yield (l/Person/Day)
			3.55

Water consumption calculation results

	litres/Person/Day	m ³ /Person/Year
Water consumption - modelled baseline performance benchmark (excludes fixed uses)	22.29	8.29
Microcomponent water consumption - modelled performance (includes fixed uses)	17.55	6.44
Modelled water demand met via greywater and rainwater sources	3.55	0.90
If greywater/rainwater systems specified has the minimum 5% efficiency improvement for component specifications been met	Yes	
Net modelled water consumption (includes fixed uses)	14.00	5.14
Percentage improvement	57.20%	
Total Wat 01 BREEAM credits achieved	5 credits	
Total Wat 01 BREEAM Exemplary credits achieved	Exemplary level not achieved	
Key performance indicator - use of freshwater resource (includes fixed uses)	15.58	5.94

Building S9 - BREEAM Wat 01 calculation with Greywater harvesting

BREEAM 2015/Version 6 Wat 01 Water consumption: Water efficiency calculator for new office buildings



Building type	Description of building type	Default occupancy	Default annual days/operation	Default daily hours of operation
Office	ICP Classification B1: Offices and workshop business (including those with a basic category 3 laboratory area)	1303.56	253	10

Main building activity areas	Description of activity area	Activity area present in building?	Net Floor Area (m ²)
Office - Office areas	Cellular or open plan office spaces, including staff kitchen where present/adjacent and reception areas. Exclude meeting rooms, visitor waiting or circulation areas.	Yes	6120
Office - Small workshop / laboratory space	Small scale workshop or category 1 laboratory area	Yes	9180
Office - 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.)	Please select	
Office - Fitness centre (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.	Please select	

Note: The activity areas defined opposite are used to estimate the assessed building's default occupancy and therefore water consumption benchmark. These areas are chosen as they are deemed, by its large, to represent the permanently occupied spaces in the building and therefore reflect the number of building occupants/users. As a result it is not necessary to include all areas of the building that may be present, as the areas not defined are assumed to be used by the occupants of the building already accounted for by those areas that are listed.

Note: Only select this activity if there is a permanently staffed kitchen that will prepare hot and cold meals for the building's staff (and visitors). Enter the area of the seated dining area only (not kitchen/serve area), this is used to estimate the number of covers per day for the restaurant and subsequently the number of kitchen staff and water consumption from food preparation activity area.

Water consumption - building microcomponent

WC component - all activity areas	units	Specification	Usage/Person/Day	Usage Factor	Consumption (l/Person/Day)
WC - male (no urinals included)	Effective flush volume (litres)	6.75	4.00	1.00	2.50
WC - female	Effective flush volume (litres)	3.75	4.00	1.00	7.50

Urinal component - all activity areas	units	Specification	No. of urinals	Flushing Frequency (flashes/hour)	Consumption (l/Person/Day)

Tap components (operational) - all activity areas	units	Specification	Usage/Person/Day	Usage Factor	Consumption (l/Person/Day)
Wash hand basin taps	Flow rate (litres/min)	5.00	4.00	0.25	3.39
Drinking water	Flow rate (litres/min)	6.00	0.154	5.80	5.27
Flood use - vessel filling	litres/person/day				1.58
Tap components (cleaning) - staff kitchens					
Kitchen taps - kitchenette	Flow rate (litres/min)		1.00	0.67	0.00
Dishwasher	litres/cycle			1.00	0.00
Tap components (kitchen and food preparation) - staff kitchens food preparation area					
Kitchen taps - pre-rinse nozzle	Flow rate (litres/min)	7.30	-	60.00	0.34
Dishwasher	litres/rack	5.00	-	0.217	0.00
Waste disposal unit	Flow rate (litres/min)		-	30.00	0.00
Flood use - food preparation	litres/person/day		-	-	0.00
Flood use - kitchen cleaning	litres/person/day		-	-	0.00

Note: Where the WC facilities are non-gender specific, please still enter the WC specification against both WC male and WC female categories i.e. if there are two WCs with a 6 litre effective flush, then enter 6 litres against both male and female categories. The calculation will not double count water consumption in this instance as the consumption figure calculated for each WC component is adjusted by the ratio of male to female users for this building type.

Note: This total includes the contributions from fixed uses, including where applicable vessel filling, kitchen cleaning and food preparation. Default fixed use totals are included with the calculations to provide a more accurate reflection of the building's total water consumption. The fixed use totals are not however included in the water consumption total used to determine the assessed building's percentage improvement and the number of BREEAM credits achieved. The percentage improvement is based only on the consumption of water from uses that can be heavily influenced by the microcomponent specification e.g. WC flushing.

Non potable water yield - greywater system

Has, or will, the greywater system be specified and installed in compliance with BS EN 15464-1:2010 Greywater Systems - Part 1 Code of Practice					Yes
Greywater source (building components)	Greywater collected	Proportion of components collected from (%)	Greywater yield (l/Person/Day)		
Wash hand basin taps	Yes	28%	0.95		
Showers	Yes	100%	5.27		
Kitchen taps - kitchenette	No				
Dishwasher - staff kitchenette	No				
Kitchen taps - pre-rinse nozzle	No				
Dishwasher - food preparation area	No				
Greywater source (other components)	Typical greywater yield (litres)	Frequency of yield (days)	Greywater yield (litres/Day)	Greywater yield (l/Person/Day)	
Other source of greywater				0.00	
				Greywater yield (l/Person/Day)	
				Total	6.12

Note: If greywater is collected from a component/source not accounted for above i.e. their consumption is not estimated, then the amount of greywater collected can be added here so that it may be accounted for. This can include wastewater from active hygiene flushing, i.e. a regular hygiene flushing programme to minimise poor water quality in a potable cold or hot water system.

Non potable water yield - rainwater system

Has, or will, the rainwater system be specified and installed in compliance with BS EN 15464-1:2010 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 (m ²)	Rainfall (litres/m ² /hr)	Hydraulic filter efficiency (%)	Yield coefficient (%)	Annual/rainwater yield (litres)	Rainwater yield (l/Person/Day)
Alternative yield if advanced					
Daily rainfall collection (litres)					Rainwater yield (l/Person/Day)

Non Potable Water Demand - Building Components

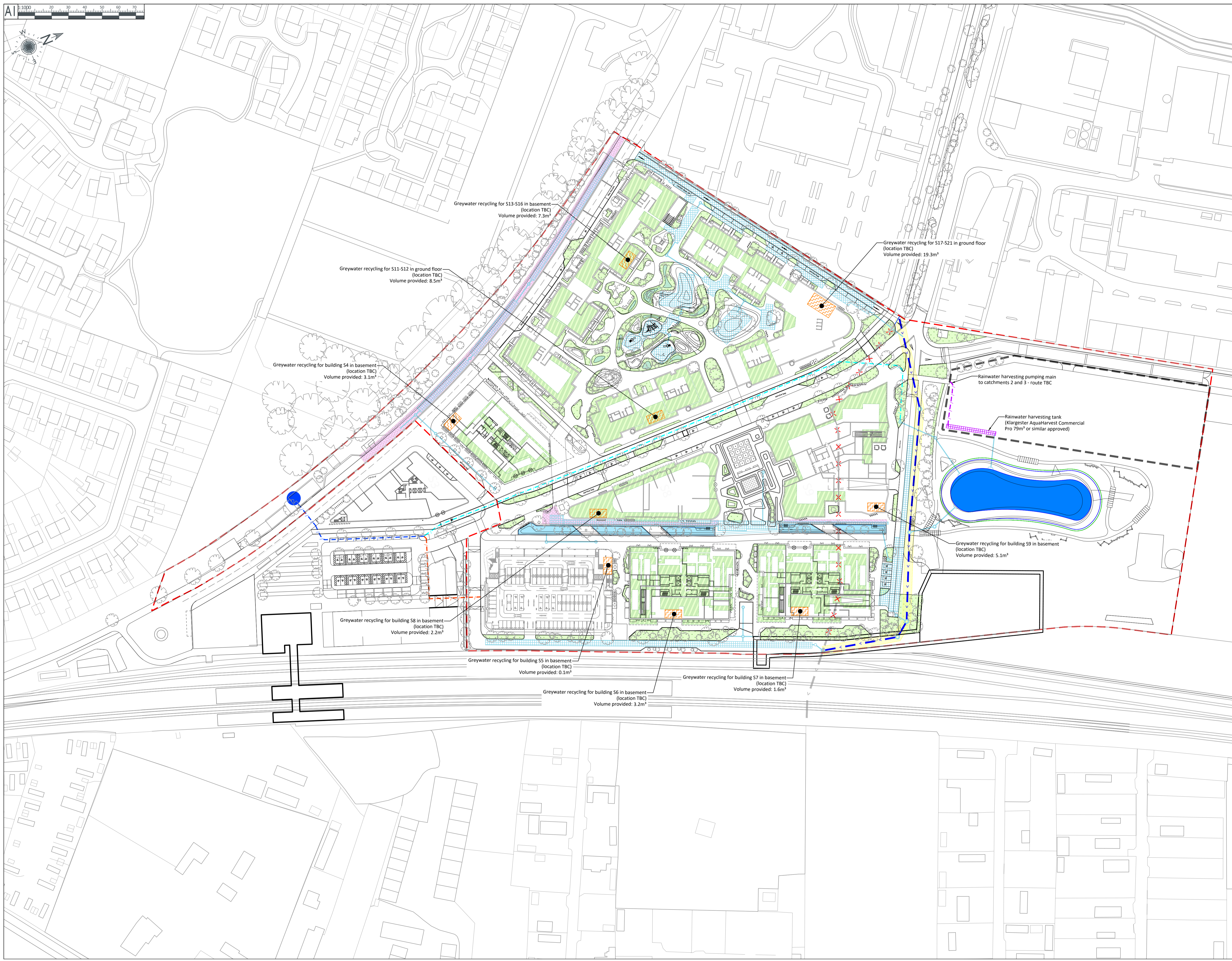
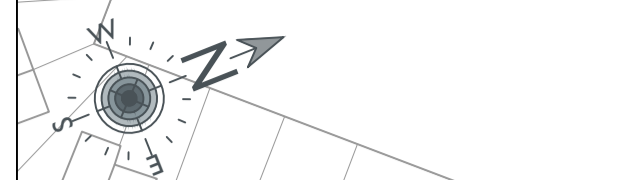
Component	Greywater and/or rainwater utilized for component	Proportion of components using greywater and/or rainwater yield (%)	Maximum permissible demand (l/Person/Day)
WC flushing	Yes	100%	55.00
Demand met by yield (l/Person/Day)			6.12
Other permissible components			
Are there other permissible components present which demand greywater and/or rainwater yield?			No
Proportion of maximum permissible demand utilised by other permissible components (%)			0
Demand met by yield (l/Person/Day)			0.00
Greywater and/or rainwater demand met by yield (l/Person/Day)			6.12

Water consumption calculation results

	litres/Person/Day	m ³ /Person/yr
Water consumption - modelled baseline performance benchmark (excludes fixed uses)	43.59	39.52
Microcomponent water consumption - modelled performance (includes fixed uses)	23.90	6.05
Modelled water demand met via greywater and rainwater sources	6.12	1.55
If greywater/rainwater systems specified has the minimum 5% efficiency improvement for component specifications been met	Yes	
Net modelled water consumption (includes fixed uses)	17.77	4.90
Percentage improvement	57.26%	
Total Wat 01 BREEAM credits achieved	5 credits	
Total Wat 01 BREEAM Exemplary credits achieved	Exemplary level not achieved	
Key performance indicator - use of freshwater resource (includes fixed uses)	19.35	4.90



Appendix I Proposed Water Management Strategy Plan



NOTES

These drawings have been produced with reference to the CDM Regulations 2015. Please note that these are pre-construction phase drawings and should be subject to further design risk management as required in accordance with Regulation 9

NOTES

1. Site layout provided by ACME (drawing ref. 239-ACME-PLA-S00-0013 ILLUSTRATIVE MASTERPLAN - GROUND FLOOR) received 23/05/2022.
2. Balancing pond is sized to attenuate runoff from the adjacent temporary logistics area North of Cowley Road in addition to the pumped flow from Catchment Area 1 and 5.
3. Green / brown roofs to be provided on structures S4, S6, S7, S8 and S9/S10.
4. Existing rain gardens for highway drainage adjacent to Cowley Road to be retained.
5. Tree pits to be provided with 'Arborcell' water attenuation within the sub-base.
6. Drainage Strategy based on design return period of 100 years with a 40% allowance for climate change. For further details refer to the Drainage Strategy drawing (PIA ref. 05425-C-1003) and supporting Flood Risk Assessment Addendum (PIA ref. 05425-R-04), and Technical Note (PIA ref. 05425-T-07).

KEY

- Proposed Greywater Recycling System
- Proposed Rainwater Harvesting Tank
- Proposed Rainwater Harvesting Pumped Outlet
- Proposed Surface Water Drainage
- Proposed Attenuation Tank
- Proposed FPD Diversion
- FPD 5m Easement
- Proposed Attenuation Pond
- Proposed Swale
- Existing Surface Water Rising Main to be Abandoned
- Existing Surface Water Rising Main to be Retained
- Proposed Green / Brown Roof Area
- Proposed Rain Gardens
- Proposed Permeable Paving
- Red Line Boundary

Greywater recycling for S13-S16 in basement (location TBC)
Volume provided: 7.3m³

Greywater recycling for S11-S12 in ground floor (location TBC)
Volume provided: 8.5m³

Greywater recycling for building S4 in basement (location TBC)
Volume provided: 3.1m³

Greywater recycling for building S8 in basement (location TBC)
Volume provided: 2.2m³

Greywater recycling for building S5 in basement (location TBC)
Volume provided: 0.1m³

Greywater recycling for building S6 in basement (location TBC)
Volume provided: 3.2m³

Greywater recycling for building S7 in basement (location TBC)
Volume provided: 1.6m³

Greywater recycling for S17-S21 in ground floor (location TBC)
Volume provided: 19.3m³

Greywater recycling for building S9 in basement (location TBC)
Volume provided: 5.1m³

Rainwater harvesting pumping main to catchments 2 and 3 - route TBC

Rainwater harvesting tank (Klargester AquaHarvest Commercial Pro 79m³ or similar approved)

PO	04/04/23	First Issue	JG
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Proposed Water Management Strategy

INFORMATION

PJA JOB No. SUB-CODE
05425 - C - 1021 - P0









SCALE	DRAWN	REVIEWED	DATE
AI@1:1000	JG	MC	04/04/2023



Appendix J Phasing Plan

CAMBRIDGE NORTH DEVELOPMENT OVERVIEW - PHASING

PHASING

	COMPLETION	ACCOMMODATION SCHEDULE (* APPROX NIA AREAS)	POTENTIAL FULL OCCUPATION
 PHASE 1 S 02 : HOTEL	2021	217 BEDROOMS	
 PHASE 2 S 03 : OFFICE	2023	100,000 FT ²	
 PHASE 3 S 05: MOBILITY HUB S 06: LABORATORY S 07: LABORATORY	2026 2027 2027	100 DEVELOPMENT CAR SPACES 600 RAIL CAR SPACES 87,000 FT ² 92,000 FT ²	S 06: 2028 S 07: 2028
 PHASE 4 S 04: OFFICE	2027	120,000 FT ²	S 04: 2028
 PHASE 5 RESIDENTIAL QUARTER S 17 - S 21: S 11 - S 16:	2028 2029	192 UNITS (BTR) 78 UNITS (BTR) 61 UNITS (AFFORDABLE) 94 UNITS (PRIVATE)	S 17-S 21: 2029 S 11-S 16: 2030
 PHASE 6 S 09: LABORATORY	2028	160,000 FT ²	S 09: 2030
 PHASE 7 S 08 : OFFICE	2029	90,000 FT ²	S 08: 2030
 TEMPORARY LOGISTICS AREA:	2024		

S08 . OFFICE (LEFT)
S09 . LABORATORY (RIGHT)



S11-S21 . RESIDENTIAL QUARTER



S04 . OFFICE



S03 . ONE CAMBRIDGE SQUARE



S06/S07 . LABORATORY



S05 . MOBILITY HUB (RIGHT)
S08 . OFFICE (LEFT)



S02 . NOVOTEL HOTEL



S01 . CAMBRIDGE NORTH STATION

