

Water calculator for the Code for Sustainable Homes and Building Regulations Part G

(Using the method defined by CLG in "The Water Efficiency Calculator for new dwellings" May 2009 and subsequent versions)

Instructions for completing the calculator

Start at 'The calculator (Table 1) and follow instructions in right hand column.

Note: enter data or answers into cells shaded green

This spreadsheet has been put together by Artesia Consulting.

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Installation Type	Unit of measure	Capacity / flowrate	Use factor	Fixed use (l/person/day)	Litres/person/day =[(1)*(2)]+(3) (4)
		(1)	(2)	(3)	(4)
WC (single flush)	Flush volume (litres)		4.42	0	
WC (dual flush)	Full flush volume (litres)		1.46	0	
	Part flush volume (litres)		2.96	0	
WCs (multiple fittings)	Average effective flushing volume (litres)	4.01	4.42	0	17.7021
Taps (exc kitchen taps)	Flow rate (l/min)	5.00	1.58	1.58	9.48
Bath (where shower also present)	Capacity to overflow (l)	155	0.11	0	17.05
Shower (where bath also present)	Flow rate (l/min)	8	4.37	0	34.96
Bath only	Capacity to overflow (l)		0.5	0	
Shower only	Flow rate (l/min)		5.6	0	
Kitchen sink taps	Flow rate (l/min)	5.00	0.44	10.36	12.56
Washing machine	l/kg dry load	8.17	2.1	0	17.157
Dishwasher	l/place setting	1.25	3.6	0	4.5
Waste disposal unit	l/use	If present = 1 If absent = 0	3.08	0	
Water softner	l/person/day	0	1	0	0
	(5)	Total calculated use (l/person/day) = Σ [column (4)]			113.41
	(6)	Contribution from greywater (l/person/day) from Table 4.6			0
	(7)	Contribution from rainwater (l/person/day) from Table 5.5			0
	(8)	Normalisation factor			0.91
	(9)	Total water consumption (CSH) = [(5)-(6)-(7)]*(8) (l/person/day)			103.20
	(10)	External water use			5
	(11)	Total water consumption (Part G) = (9)+(10) (l/person/day)			108.20

Instructions

Complete 'Table 2.7 WCs'

Complete 'Table 2.7 WCs'

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Complete 'Table 2.7 WCs'

Complete 'Table 2.1 Taps'

Complete 'Table 2.2 Baths'

Complete 'Table 2.6 Showers'

Complete 'Table 2.2 Baths'

Complete 'Table 2.6 Showers'

Complete 'Table 2.3 Taps Kitchen'

Complete 'Table 2.5 WM'

Complete 'Table 2.4 DW'

If present enter 1 in column (1), if not enter 0

Complete 'Table 3 Softeners'

Complete 'Table 4.6 Greywater'

Complete 'Table 5.5 Rainwater'

Table 2: Consumption calculator for multiple fittings for new dwellings

Taps (excluding kitchen sink taps)			
Tap fitting type	Flow rate (l/min)	Quantity (No.)	Total per fitting type =(a)*(b) (c)
1	5	1	5
2			
3			
4			
Total (sum of all quantities)		(d) 1.00	
Total (sum of all totals per fitting type)			(e) 5.00
Average flow rate (l/min)		=(e)/(d)	5.00
Maximum flow rate (l/min)		(f)	5.00
Proportionate average flow rate (l/min)			3.50

Flow rate to use for table 1 (l/min)			5.00
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Table 2: Consumption calculator for multiple fittings for new dwellings

Baths			
Bath fitting type	Capacity to overflow (l)	Quantity (No.)	Total per fitting type
	(a)	(b)	=(a)*(b) (c)
1	155	1	155
2			
3			
4			
Total (sum of all quantities)		(d)	
		1.00	
Total (sum of all totals per fitting type)			(e)
			155.00
Average capacity to overflow (l)		=(e)/(d)	155.00
Highest capacity to overflow (l)		(f)	155.00
Proportionate capacity to overflow (l)		=[(f)*0.7]	108.50
Capacity to overflow to use for table 1 (l)			155.00

Table 2: Consumption calculator for multiple fittings for new dwellings

Taps (Kitchen/Utility room sink)			
Tap fitting type	Flow rate (l/min)	Quantity (No.)	Total per fitting type =(a)*(b) (c)
1	5	1	5
2			
3			
4			
Total (sum of all quantities)		(d) 1.00	
Total (sum of all totals per fitting type)			(e) 5.00
Average flow rate (l/min)		=(e)/(d)	5.00
Highest flow rate (l/min)		(f)	5.00
Proportionate flow rate (l/min)		=[(f)*0.7]	3.50
Flow rate to use for table 1 (l/min)			5.00

Table 2: Consumption calculator for multiple fittings for new dwellings

Dishwashers			
Dishwasher fitting type	Litres per place setting (l)	Quantity (No.)	Total per fitting type =(a)*(b) (c)
(a)	(b)		
1	1.25	1	1.25
2			
3			
4			
Total (sum of all quantities)		(d)	1.00
Total (sum of all totals per fitting type)			(e)
			1.25
Average litres per place setting (l)		=(e)/(d)	1.25
Highest litres per place setting (l)		(f)	1.25
Proportionate litres per place setting (l)			0.88
litres per place setting to use for table 1 (l)			1.25

Table 2: Consumption calculator for multiple fittings for new dwellings

Washing machines			
Washing machine type	Litres per kg of dry load (l)	Quantity (No.)	Total per fitting type =(a)*(b) (c)
	(a)	(b)	(c)
1	8.17	1	8.17
2			
3			
4			
Total (sum of all quantities)		(d)	1.00
Total (sum of all totals per fitting type)			(e)
Average litres per kg of dry load (l)			=(e)/(d)
Highest litres per kg of dry load (l)			(f)
Proportionate litres per kg of dry load (l)			5.72
litres per kg of dry load to use for table 1 (l)			8.17

Table 2: Consumption calculator for multiple fittings for new dwellings

Showers			
Shower fitting type	Flow rate (l/min)	Quantity (No.)	Total per fitting type
	(a)	(b)	=(a)*(b) (c)
1	8	1	8
2			
3			
4			
Total (sum of all quantities)		(d)	1.00
Total (sum of all totals per fitting type)			(e)
Average flow rate (l/min)			8.00
Highest flow rate (l/min)			8.00
Proportionate average flow rate (l/min)			5.60
Flow rate to use for table 1 (l/min)			8.00

Table 2: Consumption calculator for multiple fittings for new dwellings

WCs						
WC type	Dual flush WCs		Single flush WCs	Effective flushing volume (l) (a)	Quantity (No.) (b)	Total per fitting type =(a)*(b) (c)
	Full flush volume (l)	Part flush volume (l)	Flush volume (l)			
1			7.5	7.50		
2	3	4.5		4.01	4.66	18.6633
3				0.00		
4				0.00		
5				0.00		
6				0.00		
Total (sum of all quantities)				(d)	4.66	
Total (sum of all totals per fitting type)					(e)	18.66
Average effective flushing volume (l)				=(e)/(d)		4.01

Table 3: The Water Softener consumption calculation for new dwellings

Water softeners		
Total capacity used per regeneration (%) (note 1)	(a)	
Water consumed per regeneration (litres)	(b)	
Average number of regeneration cycles per day (No.)	(c)	
Number of occupants served by the system (No.) (note 2)	(d)	
Water consumed beyond 4% (l/day) = $[1 - (4/(a))] * [(b) * (c)]$	(e)	#DIV/0!
Water consumed beyond 4% (l/person/day) = $[(e)/(d)]$		0

Note 1: the total capacity is the volume of water that flows through the water softener between regeneration cycles. This volume is dependent on the hardness of the water and the total capacity used in this calculation needs to reflect the hardness of water specific to the geographic location of the specific development.

Note2: Number of occupants is based on two occupants in the master bedroom and 1 occupant per additional bedroom.

Table 4.1: The greywater demand calculations for new dwellings - WCs

Greywater for WCs

Effective flushing volume (litres) (a)	Number of fittings present (b)	Quantity using greywater (c)	Greywater demand (d) = (a)*(c)
			0
			0
			0
			0
			0
Total fittings consumption (e)) = Sum of (b)	0	Total Greywater demand fittings consumption (f) = Sum of (d)	0
Average greywater demand from WCs			#DIV/0!

Table 4.2: The greywater demand calculations for new dwellings - washing machines

Greywater for WM

Litres per kg (a)	Number of fittings present (b)	Quantity using greywater (c)	Greywater demand (d) = (a)*(c)
			0
			0
			0
			0
			0
Total fittings consumption (e)) = Sum of (b)	0	Total Greywater demand fittings consumption (f) = Sum of (d)	0
Average greywater demand from washing machines			#DIV/0!

Table 4.3: The greywater collection calculations for new dwellings - taps

Greywater for taps

Litres per minute (a)	Number of fittings present (b)	Quantity using greywater (c)	Greywater supply (d) = (a)*(c)
			0
			0
			0
			0
			0
Total fittings consumption (e)) = Sum of (b)	0	Total Greywater demand (f) = Sum of (d)	0
Average greywater supply from taps			#DIV/0!

Table 4.4: The greywater collection calculations for new dwellings - showers

Greywater for showers

Litres per minute (a)	Number of fittings present (b)	Quantity using greywater (c)	Greywater supply (d) = (a)*(c)
			0
			0
			0
			0
			0
Total fittings consumption (e)) = Sum of (b)	0	Total Greywater demand (f) = Sum of (d)	0
Average greywater supply from showers (where bath present)			#DIV/0!
Average greywater supply from showers (shower only)			#DIV/0!

Table 4.5: The greywater collection calculations for new dwellings - baths

Greywater for baths

Litres per minute (a)	Number of fittings present (b)	Quantity using greywater (c)	Greywater supply (d) = (a)*(c)
			0
			0
			0
			0
			0
Total fittings consumption (e)) = Sum of (b)	0	Total Greywater demand (f) = Sum of (d)	0
Average greywater supply from baths (where shower present)			#DIV/0!
Average greywater supply from baths (bath only)			#DIV/0!

Table 4.6: The greywater collection calculations for new dwellings

Greywater collection for new dwellings

Bath , shower and wash hand basin usage (litres/person/day)	Percentage of used water (a) to be recycled (%)	Greywater available for use (litres/person/day)	Greywater demand (litres/person/day)	Greywater savings (litres/person/day)
(a)	(b)	$(c) = (a) * [(b) / 100]$ (c)	(from Table 1 or 4.2 and 4.3) (d)	Where (c) is greater than (d), (e) = (d), otherwise (e) = (c) (e)
		0		0

Table 5.1: The rainwater collection consumption calculation for new dwellings

The rainwater collection calculation for new dwellings - BS8515 Intermediate approach		
Collection area (m ²)	(a)	
Yield co-efficient and hydraulic filter efficiency (e.g. 0.7)	(b)	
Rainfall (average mm/year)	(c)	
Daily rainfall collection (litres) $=[(a)*(b)*(c)]/365$	(d)	0
Number of occupants (note 1)	(e)	
Daily rainwater per person (litres) $=[(d)/(e)]=f$		#DIV/0!

Note1: Number of occupants is based on two occupants in the master bedroom and 1 occupant per additional bedroom.

Table 5.2: The rainwater collection consumption calculation for new dwellings

The rainwater collection calculation for new dwellings - BS8515 Detailed approach		
Daily rainwater collection (litres)	(a)	
Number of occupants (note 1)	(b)	
Daily rainwater per person (litres) $=[(a)/(b)]=(c)$		#DIV/0!

Note1: Number of occupants is based on two occupants in the master bedroom and 1 occupant per additional bedroom.

Table 5.3: The rainwater demand calculations for new dwellings - WCs

Rainwater for WCs

Effective flushing volume (litres) (a)	Number of fittings present (b)	Quantity using rainwater (c)	Rainwater demand (d) = (a)*(c)
			0
			0
			0
			0
			0
Total fittings consumption (e)) = Sum of (b)	0	Total Rainwater demand fittings consumption (f) = Sum of (d)	0
Average rainwater demand from WCs			#DIV/0!

Table 5.4: The rainwater demand calculations for new dwellings - washing machines

Greywater for WM

Litres per kg (a)	Number of fittings present (b)	Quantity using rainwater (c)	Rainwater demand (d) = (a)*(c)
			0
			0
			0
			0
			0
Total fittings consumption (e)) = Sum of (b)	0	Total Rainwater demand fittings consumption (f) = Sum of (d)	0
Average rainwater demand from washing machines			#DIV/0!

Table 5.5: Rainwater saving calculations for new dwellings

Rainwater savings for new dwellings

Bath , shower and wash hand basin usage (litres/person/day)	Litres per person per day
(a)	(b)
Rainwater collected (a)	
Rainwater demand (b)	
Rainwater savings* (c)=(a)/(b)*(b)	0

* where the amount collected (a) is greater than the demand (b), the rainwater savings (c) are equal to the demand (b)