Consultant Advice

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General - Energy and Sustainability Consultation Response Water efficiency and SuDS (including rainwater and greywater harvesting)

This consultant advice addresses comments received from Camden Council on the Sustainability and Energy Strategy from St Pancras Commercial Centre (SPCC).

Residential Water Consumption

Comment from Camden Council: *Issue 11: Confirmation is required that the residential development will not exceed 110 litres per person per day as above. ACTION: Further information required.*

Policy 5.15 *Water use and supplies* of the London Plan requires the design of residential development so that mains water consumption would meet a target of 105 litres or less per day. This excludes an allowance of 5 litres or less per head per day for external water consumption.

A fittings based approach has been taken to determine the expected water consumption of the residential development. Accordingly, fixtures and fittings within the residential development will comply the maximum consumptions listed within Table 2.2 of Approved Document G. These are repeated below:

Water fitting	**Maximum consumption**
WC	4/2.6 L dual flush
Shower	8 L/min
Bath	170 L
Basin taps	5 L/min
Sink taps	6 L/min
Dishwasher	1.25 L/place setting

Washing machine	8.17 L/kg

If, during design development, the above consumptions are varied, then it will be demonstrated using the water efficiency calculator that the 105 L/person/day requirement is still met.

Greywater Harvesting

Comment from Camden Council: Issue 12: *No greywater harvesting is proposed. ACTION: A feasibility assessment for greywater harvesting should be undertaken.*

It is understood that Camden Council expects developments over 10 units or 1000 m^2 and/or intense water use developments, e.g. the residential development, to include grey water harvesting or demonstrate that this is not feasible.

The following have been considered:

- cost of system
- projected grey water generation
- projected grey water demand
- projected water savings
- costs savings for owner/occupier over 10 years
- payback period

Overview

A greywater system will require:

- Duplication of wastewater pipework, stacks and vents serving wash hand basins, baths and showers (i.e. bathrooms).
- Grey water treatment system consisting of:
    - Coarse filtration
    - Buffer tank(s) to accept fluctuating volumes of screened wastewater for treatment
    - Membrane Bio-Reactor (MBR) including aeration and submerged membrane
    - Non-potable water storage tanks to store treated water
    - Control system
    - Automatic drain system to discharge any stagnant process water after a defined time period
    - Booster pump system
    - Ancillary items such as pipework, valves, meters, power supplies, vent pipework
    - Commissioning
    - Remote monitoring (or an equivalent in-person attendance)
- Duplication of water supply pipework including risers, meters and branches to apartments to supply toilet flushing and possible washing machines. It is not considered appropriate to supply treated grey water to gardens due to limited planting other than green roofs which will have limited capacity to capture nutrient.
- Regular maintenance including monitoring, testing, servicing and replacement of components.

Cost of system

Estimated costs are as follows:

Item	Cost
Initial costs	
Duplicate wastewater pipework	£10,000
Grey water treatment system	£20,000
Non-potable water supply pipework, meters and branches	£10,000
Total	£40,000
On-going costs	
Maintenance (assume twice yearly)	£1,000
Component replacement	£500
Total	£1,500

Projected grey water generation

The projected grey water generation is as follows. Water consumption calculations are based on Approved Document G Appendix A - Water efficiency calculator for new dwellings using the consumptions tabled above.

Unit split:

Unit	Number of dwellings	Assumed people per dwelling	Total people
1 bedroom, 2 person	11	1.5	16.5
2 bedroom, 4 person	14	3	45
3 bedroom, 5 person	5	4	20
4 bedroom, 6 person	1	5	5
4 bedroom, 7 person	1	6	6
Total	32		89.5

Greywater sourced from:

Fixture	L/person/day
Taps (excluding kitchen/utility room taps)	9.48
Bath (where shower also present)	18.7
Shower (where bath also present)	34.96
Total (L/person/day)	63.14
Number of people	89.5
Total (L/day)	5651

Projected grey water demand

Greywater used for:

Fixture	L/person/day	L/person/day
	no washing machine use	with washing machine
WC (dual flush) full flush	5.84	5.84
WC (dual flush) part flush	7.696	7.696
Washing machine		17.157
Total (L/person/day)	13.536	30.693
Number of people	89.5	89.5
Total (L/day)	1211	2747

For the purpose of feasibility, it is assumed that treated greywater is used for washing machines.

Over the year, the amount of mains water expected to be saved by substituting with greywater is 2747 L/day x 365 days/year = 1003 kL/year (i.e. demand limited).

Projected water savings

Thames Water metered charges for 2019-2020 are:

- 140.01 p/m^3 for water supply
- 86.72 p/m^3 for wastewater supply

Assuming a discharge factor of 0.9, the total saving water and wastewater supply charges is £2,186 in the first year.

Cost savings for owner/occupier over 10 years

The estimated cost saving per year is £2,186 (supply charges saving) less ongoing maintenance and component replacement costs (£1,500). This is a saving of £686 per year.

Payback period

It is understood that Camden Council expects a payback period of up to 20 years to be acceptable.

Against an initial estimated capital outlay of £40,000, the simple payback period is 58 years.

Assuming water and wastewater supply charges escalation of 3% per annum and 2% per annum for maintenance and component replacement, the payback period would reduce to 29 years.

The calculated payback period confirms that a greywater recycling scheme is not feasible for the development.

Should you require further information, please contact the undersigned.

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