Report

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Kentish Town : Rain Water Harvesting Feasibility

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1. Introduction

This report covers the investigation of the feasibility of using rain water harvesting for the Kentish town project.

2. Feasibility Analysis

The system of rain water harvesting is best applicable where there are large areas of landscape or gardens on a project which could benefit from the use of stored rainwater for irrigating those areas.

There is also the option to use rain water harvesting for grey water for flushing toilets within the apartments. This system requires a dedicated pipework network to supply water to the WC cisterns throughout the building with a mains water back-up and this is not viable economically or practically in terms of the additional complexity and maintenance required for these type of systems.

It has also been found that grey water systems have proved problematic due to odour of the stored grey water and require a high level of maintenance and cleaning to overcome this problem. We would not recommend a grey water system for this building.

The supply of grey water for flushing the WCs also relies on the landlords supply from the harvesting tank and the whole building could lose the supply of water to flush WCs if there was any fault with the rainwater harvesting system, this introduces a potential problem as the building is not manned and would rely on maintenance callout.

For the Kentish Town project there is only a very small roof area of green roof that is not of a large enough size to make a rain water harvesting system viable. We advise that an area in excess of approximately 500m2 would be needed for a viable rain water harvesting system.The site is also very tight for space and there is no space externally or within the building to locate a storage vessel and pump system that are required.

We also note that the study by the Environmental Agency, Energy and Carbon Implications of Rainwater Harvesting and Greywater Recycling (2010), showed that buildings using harvested rainwater or treated grey water typically increase CO2 emissions.

3. Cost & Payback Analysis

The cost of a grey water harvesting system applied to provide grey water for flushing the WCs within the 14 flats is estimated to be £32,000.00.

The cost savings to the owner/occupier over a period of 10 years is based on a dual flush cistern with a calculated average usage of 6.57 l/p/day and the grey water system providing 40% of the total:

Q = 6.57 x 0.4 x 44 x 10 x 365 = 422m3

Present day cost of 1 m3 of water 138p

Cost saving over 10 years based on present day cost = 422 x 138 = £582.00

Note that this cost would be divided over the 14 units providing a cost saving to each dwelling of £41 over 10 years or approximated £4 per year.

Projected grey water generation : 422 m3.

Projected demand for grey water = 422 m3.

Payback for the system =32000/582 = 54 years.

Note that in the payback calculation the cost of maintaining the rainwater harvesting system, the cost in electricity to run the pumps and the cost of treating the water to make it safe has not been factored in, this can be quite high and would further outstretch the payback period.

3. Blue Roof Information

The blue roof for this project is designed for a return period of 100 years with a climate change factor of 40%. The total effective roof area for the blue roof is 183m2. The details and calculations for the blue roof are included in the appendix of this report.

4. Conclusion

We have investigated the feasibility of rain water harvesting for the Kentish Town project and concluded that it is not viable for this project due to the very limited space on this tight site, very small area of green roof which is not viable for such a system, the maintenance and potential odour of grey water systems, the increase in carbon emissions when using such systems, and the very long payback period.

APPENDIX - BLUE ROOF INFORMATION