

URBAN GREENING CATEGORY

Rathbone Market 1-3

In 2007 Churchman were invited by CZWG Architects to develop landscape proposals for this high-rise mixed-use and residential scheme in a challenging urban context.

The Rathbone Market project is a joint venture between developer English Cities Fund and the London Borough of Newham as development partner and Notting Hill Housing Group as affordable housing provider. The scheme consists of a series of multi-storey blocks enclosing a series of public and private squares, courtyards and gardens developed over three phases and totalling 650 residential units with community and commercial units at ground floor. The landscape provides significant new public realm spaces, not least of which a new home for the historic Rathbone Market, one of London's oldest street markets established by royal decree as early as 1253AD.

The use of water across the scheme adopts a multifaceted approach to rain water management to support the widest range of planting typologies, harnessing the water shed initially through a combination of biodiverse and blue roofs, excess water is collected into amenity features including a large pond and serpentine rill, water harvesting tanks for irrigation of roof top allotments and rain gardens. At street level this is complimented by positive drainage of the surface water into large areas of tree cells to support street trees.

A protective environment has been created by virtue of a continuous 4.5m high living noise attenuation barrier located on the elevated roof podium closest to the A13 flyover. This is richly planted with swathes of semi evergreen herbaceous plants designed for full sun on the southern face and full shade on the northern face which provides the backdrop to the elevated residents garden.

From the projects inception Churchman wanted to demonstrate the potential for water sensitive design to maximise biodiversity through features that enhance the quality of amenity space across the scheme.

Biodiverse & Blue Roofs - High level roofs provide the capacity to absorb pollutants and dust and the first means of rainwater attenuation across the site, the combination of infiltration through the soil (average 160mm depth), drainage boards (40mm depth) and attenuation layers (50mm depth) serve to reduce the requirement for conventional below ground storm water attenuation and increase moisture levels in the biodiverse roof substrate which in turn supports more diverse plant species. With the attenuated water held on the roof for a sustained period of up to 48 hours the loss of water to the conventional drainage board that irrigates the plants is reduced increasing its efficiency. This helps the planting to thrive whilst limiting the need for irrigation to sustain the plants through the summer. With summer storms often providing intense but short rainfall events the effect is to even out the impact of these storms. With high levels of moisture retained for longer periods the effects of urban heat gain are reduced.

Rain Water Harvesting for Growing Gardens - An obvious inclusion to the scheme several water tanks collect runoff from adjacent roofs to reduce use of potable water for the production of vegetables and is well known to provide a better balance of chemicals and pH to promote healthy plant growth.

Attenuation Pond and Serpentine Rill - The main feature of largest podium garden on Phase 1 is the pond, this collects excess water from the paved and bio diverse roofs which are not part of the blue roof system to sustain the water feature and rill. The water level is allowed to fluctuate by 300mm

providing 250mm of storm water attenuation across the surface or 40m³ total attenuation, the last 50mm fluctuates to essentially eliminate the need for potable water to sustain the feature. Filtration is biological through gravel staging and re-circulated via a serpentine rill to animate the space and add water play to the garden.

Rain Gardens - Primarily used on Phase 3 these features are again connected into the blue roof system and contribute to the sites overall storm water attenuation. This phase has eliminated the need for any additional attenuation tanks below ground. The rain gardens provide a dynamic feature occasionally inundated with rain water that due to the reduced planting level form an effective defensible space separating the residential terraces from the public realm.

Living noise barrier - This feature runs the length of elevated podium garden closest to the A13 arterial road where the flyover to the Lea River starts. The need for noise attenuation was highlighted in the environmental statement. By combining a 300mm thick rock wool based noise barrier with hydroponic irrigation system we were able to provide conditions suitable for plant growth. The barrier absorbs 10dB and insulates 29dB of sound to create an oasis of calm next to the busy road. Two planting palettes were devised to enable the wall to be planted on both the sunny side and the shaded side. This was done to help reduce particulate pollutants and dust from the road to cleanse the atmosphere.

Tree Cells - An unseen part of the urban greening is that each street tree has between 14 and 23m³ of uncompacted rooting zone established using tree cells below the pavements, with surface water collected in the cells to promote good tree health particularly during drought conditions. This infrastructure is to promote the long term health of the trees avoiding decline as the trees become mature due to root restrictions and limited access to nutrients and water.

Cost Benefit and Energy Reductions

The project has significantly reduced below ground drainage costs during construction and due to the overall reduction in storm water run off could be argued to provide further cost savings to the wider drainage infrastructure in the Borough of Newham. The widespread application of biodiverse and blue roofs will also extend the lifespan of the waterproofing membranes installed at roof level due to reduced exposure to damaging ultra violet light. The extent of irrigation required to sustain the various roof gardens has been minimised or eliminated saving capital cost and use of metered potable water. The pond provides multiple amenity and biodiversity benefits with limited or zero potable water use and saved on below ground excavation and attenuation tank costs. Residents growing gardens enable local food production and direct composting reducing carbon related to food miles and green waste disposal. Overall the scheme will help to reduce ambient air temperatures during the summer months, which in turn reduces the power required to cool residential and commercial spaces within and around the scheme.

Monitoring and Research

Although there are many direct savings achieved during construction from the combination of water sensitive design techniques the longer term cost benefit analysis has not been fully quantified by this project. We are currently working with research students from Department of Civil and Environmental Engineering, Imperial College London who have identified the Living Noise Attenuating Barrier for their research paper titled Blue Green Dream. Monitoring is due to commence shortly which will validate the acoustic performance of the wall.