



Vertical Rain Garden, Tooley Street.
Designed: Green Infrastructure Consultancy. Page 6

This Issue:

Page 2

- What About London's Air?

Page 3

- Gary Grant: Rain Gardens

Page 4

- Lancaster University

- Events

Page 5

- What's all the Buzz about?

Page 6

- Tooley Street Vertical Rain Garden

Living Wall Workshops :

Come along to one of our hands on workshops and learn:

- Why green walls are a 'must have'
- How our systems compare with others currently in offer
- Discover how green walls can improve air quality
- Understand the benefits that planting vertically can provide
- Think about how green walls fit into future cities
- Practical solutions of urban farming
- See how vertical walls fit current government policy.
- See www.treebox.co.uk for more details.

Hello!

As the Autumnal red curtain falls on summer, this issue takes a look back over what has been a show stopping season for us here at Treebox. We've made the most of what the unpredictable British weather had to throw at us during the extension of the Tooley Street Vertical Rain Garden, and caught up with Gary Grant from the Green Infrastructure Consultancy to discuss the importance of living walls and roofs for urban drainage.

We are extremely proud to bring you news about our latest project, using living walls as active air purification units. Air pollution levels have continued to make headlines for all the wrong reasons this Summer, and we hope our latest venture can help tackle this problem, moving our industry forward as a viable solution to healthy living in our urban cores.

We also bring you news from the town using living walls to impress at this years RHS Bloom awards and take a tour of Alexandra Frogatt's 30 square meter living walls at Lancaster University. We will also be discussing the role living walls can play in enhancing biodiversity, with Buglife's Director, Paul Hetherington.

And as always we bring you a round up of where you can catch us in the upcoming season, starting with a summary of this years Landscape show.

So grab a coffee, take a seat and enjoy our curtain call on Summer as we welcome the colours of Autumn.

What About London's Air?

Air quality in London is a growing concern that now claims over 9,500 lives prematurely each year. Long-term exposure to air pollution can reduce a person's life span by as much as 9 years¹. Although measures are being taken to clean up the capital's air, levels continue to rise above EU safety guidelines.

The Problem

The main offenders are fine particulate matter (PM 2.5) and nitrogen dioxide (NO₂) created primarily by local diesel emissions from cars, Lorries and buses that are congesting the cities roads and streets². Once at street level the dispersal of pollutants is made increasingly difficult due to the street canyon effect between buildings, a phenomenon that prevents polluted air from escaping immediately into the atmosphere. When combined with times of high atmospheric pressure the air at pedestrian level becomes a deadly soup of toxic fumes.



“A single 2 sqm unit is capable of filtering 2 million litres of air to 99% purity every 24 hours”

Our Research

Treebox has been working towards improving Air quality by dealing with emissions at street level nearest to the source. Committed to Greening Grey Britain the team has spent the last two years researching and trialling various methods to tackle what we believe to be a significant environmental and health issue facing our cities today, poor air quality. There has been considerable research conducted over the years indicating that plants provide clean air through dust repression and photosynthesis but our research shows this can be further enhanced, by transitioning a living wall from a passive greening solution into Active greening systems. These systems draw polluted air into small water filled pressure chambers that then direct the air directly into plant root zones, where the micro-organisms break down harmful pollutants into less harmful particles. This process, known as Aerogation, does more than just filter the air, it purifies it over 99%. Thus removing PM 2.5, NO₂ and VOCs along with unwanted odors and even pollen.

The Vision

The Air Purification Unit (APU) is a micro Active greening system that can be deployed almost anywhere for short term or permanent applications. They are powered by solar or other renewable sources and designed to last for over 10 years. Each unit can produce over 800,000L of purified air each day and make a significant improvement immediately. Our vision is to take these to the streets and there is no better location to start than bus shelters. They are at pedestrian level, close to the emission sources and utilizing a space which is often overlooked for green infrastructure projects.

We are in process of producing a fleet of these systems, our vision is to soon see entire bus routes turned to clean air zones, that have the potential to purify millions of litres of polluted air each day, which in turn, offsets diesel emissions on any given route.

Staffordshire University is currently testing the effectiveness of the units at extracting NO₂ and will be publishing results later this year.



Sustainable Urban Drainage: Rain Gardens



*By Gary Grant,
The Green
Infrastructure
Consultancy*

Twenty five years ago in Maryland, USA, a housing developer was looking for a way of saving land. He needed to replace four large ponds, designed to attenuate surface water runoff, with something that would save space and provide room for more housing plots. The answer was to create areas within each plot where water would be allowed to pool for a while before infiltrating into the soil. These features were dubbed 'rain gardens'. The local planning officer on this project was Larry Coffman, who went on to found the [Low Impact Development Center](#).



Photo: Wardens Grove rain gardens in Southwark, designed and planted by Green Infrastructure Consultancy

Since that time, the rain garden concept has gone from strength to strength in the United States, with many cities producing their own guide and in many cases, local residents and volunteers getting involved in the building and maintenance of rain gardens. Now that enthusiasm has reached our shores. We already have Sustainable Drainage Systems (SuDS) and rain gardens are a component of SuDS, but there is no doubt that people react much more positively to the idea of rain gardens than to that of SuDS.

So what are rain gardens? In their simplest form they are a shallow permeable planted bed that is designed to receive run-off from a paved area or roof. Water flows into the rain garden. That means that the rain garden needs to be a little lower than the point where the water flows in and some freeboard is useful to allow temporary inundation as the bed fills during a storm. When designing a rain garden it is important to establish how and where the bed will overflow if it ever become full. If a rain garden does fill, it can overflow into another rain garden or other sustainable drainage feature or into a conventional drain. Some water that enters a rain garden may infiltrate into the ground (depending on the underlying geology) and some may evaporate from the bed later or be transpired through plants. Rain gardens work by slowing the flow of water into the drainage system, reducing the volume of water that enters the drains and by cleaning surface runoff and thereby improving the quality of water in watercourses (surface water drainage usually enters streams where it can pollute and damage ecosystems).

Rain gardens work by slowing the flow of water into the drainage system, reducing the volume of water that enters the drains and by cleaning surface runoff and thereby improving the quality of water in watercourses (surface water drainage usually enters streams where it can pollute and damage ecosystems).

Rain gardens should use free draining yet water absorbent soil. So even where the ground is permeable, it is usually necessary to improve the soil. Rain garden soils are usually a mix of sand and organic material, although occasionally crushed brick and other materials used in green roofs have been used. Even where the soil is impermeable, it is still possible to create a rain garden excavating material and replacing it with rain garden soil. Even if water cannot infiltrate into the underlying rock, the rain garden can still perform a useful function in slowing and evaporating some of the runoff.

In most situations, rain gardens are not wetlands. They may be waterlogged for a short period after heavy rain, however they will dry out and will remain relatively dry between downpours. Therefore they should be planted with species that can withstand temporary inundation and then survive for a while without being watered. The amount of plant species which can be planted in rain gardens is extensive and continues to grow. For a list see the [UK Rain Garden Guide](#). It is important to avoid plants that do not like being waterlogged at any time. In choosing plants for a rain garden, don't miss the opportunity to provide habitat for wildlife, including flowers for pollinators. To find out which ornamental plants attract pollinators, see the [RHS's comprehensive guide](#).

Lancaster University gets tops marks!

Northern based garden design company [Alexandra Froggatt Design](#) have teamed up with Landscape contractors, Equator Developments to install a 30 square metre living wall at Lancaster University. The University has been undergoing a transformation with new, innovative buildings being constructed around the campus. The living wall marks the entrance of the new Biochemistry and Life Sciences building and alongside being aesthetically pleasing, also increases the biodiversity of the area. Alexandra Froggatt worked closely with the architects and university to create a contemporary design with vertical bandings of evergreen perennials, ferns and grasses. The design continues into the soft planting in the ground to help ground the wall in it's surroundings. The site is very exposed and shaded so reliable and hardy species were chosen that will thrive in the tough environment.



Upcoming Events

Landscape 2015

We had a great time at this years Landscape Show thanks to everyone who came by over the two days. It was a great opportunity to discuss the growth of Treebox from living walls to green screens, air purification units, training courses and beyond.

It also enabled us to think outside the box and improve our future products and services to you through listening and by taking your comments onboard. As always it was great to meet old friends there as well as making new ones. We hope those of you that made it had as great a time as we did, and we hope to see you at a future event, fingers crossed with better weather!



Workshop Dates: 11 November

Training Dates: 25 November

More details and bookings can be found in Events on www.treebox.co.uk

What's all the buzz about?

As the concrete jungle expands to accommodate the human population, it comes at a cost to our wildlife, rapidly transforming fertile fields into an uninhabitable patchwork of puzzles for our insects, birds, bats and mammals. Our cities occupy just 2% of the Earth's surface and yet use 75% of the planet's resources. When we think of what is required in order to maintain a fully functioning city our minds often jump to infrastructure, business, retail and entertainment. However, what we often overlook is the very thing which makes all of these things possible: healthy ecosystems and biodiversity. Staffordshire University have conducted in depth research regarding the role living walls can play in sustaining and promoting our cities wildlife, with studies confirming many advantages to not only invertebrates but also our [bird species](#). Following on from the success of Treebox's collaboration with Buglife for last years pop-up living wall at [Sloane Square](#), we revisited the concept of how our cities structures have the potential to enhance urban biodiversity and asked Buglife's Director, Paul Hetherington, about the significance of these projects around our cities.

wildlife as large scale farming has removed hedgerows, reduced wildflowers and dusted the fields with pesticides. Increasingly it is in the urban environment that much of our cherished wildlife relies on for food and shelter. Several of our rarest bees, that twenty years ago were common throughout the UK, are now only found in significant numbers on Thames Gateway brownfield sites. This is why we must do all we can to nurture our wildlife. Pollination generates over half a billion pounds every year for the UK economy.

“Our rural landscape has become increasingly sterile for wildlife as large scale farming has removed hedgerows, reduced wildflowers and dusted the fields with pesticides. Increasingly it is in the urban environment that much of our cherished wildlife relies on for food and shelter. Several of our rarest bees, that twenty years ago were common throughout the UK, are now only found in significant numbers on Thames Gateway brownfield sites. This is why we must do all we can to nurture our wildlife. Pollination generates over half a billion pounds every year for the UK economy.



The urban landscape too is becoming hostile as more and more land is built on, gardens are paved and street trees removed. But there are creative ways to counter this loss and support our wildlife: the addition of living walls and roofs to buildings. To do this is truly greening, providing insulation improvements, pollution alleviation, temperature control and potential habitat. It is therefore important that we plant our living walls and roofs with the correct plants to provide food as all year round flower provision is a key issue as is the availability of suitable shelter. Encouraging the right kind of bugs onto living walls is also a great way to ensure low cost control of some of the less desirable bugs that can otherwise wreak havoc with your plants.”

Our cities do not have to be the problem; they can be part of the solution. Living walls and green roofs offer a vast potential for reintroducing and sustaining biodiversity in our urban centers - a little green goes a long way and in this case it's less that the walls have ears and more that they have eyes....bug eyes.

To find out more about Buglife, learn how to make homes for friendly bugs, find out where to buy bespoke bug homes that work or just to learn more about bugs visit www.buglife.org.uk

Tooley Street Secret Garden



"Team London Bridge installed the Treebox vertical rain garden on Fair Street in the Spring of 2013 as part of the Drain London sustainable urban drainage programme. The green wall was an instant hit with local business and residents. After a successful trial period we decided to triple the length of the green wall in the Spring of 2015. Again local businesses and residents have been fulsome in the praise of the project. Not only a beautiful addition to London Bridge but a properly sustainable one as well. Every wall should have one!"

Shane Clarke, Environmental Programme Manager
Team London Bridge

The London Bridge Vertical Rain Garden has been providing a colourful stretch of scenery for pedestrians passing Tooley Street since May 2013. However, what you may not know is that behind that leafy facade lies a secret. No, unfortunately not a gateway to a secret garden or a portal to another world, but a unique design feature that is the first of its kind anywhere in the world - a vertical rain garden system which uses no power and is sustained only by rain water. With these two innovative factors it has ability to harvest and regulate rain water. Producing a self sustaining passive irrigation system. If apple were to make a living wall, this would be it, simple effective design - they'd probably name it the iWall.

The site chosen for the wall couldn't have been more suitable. Conveniently located opposite the town hall, it provides the perfect spot for council members to make visiting guests marvelled and more importantly is close to a local flooding hotspot. The wall came to fruition thanks to designs by the [Green Infrastructure Consultancy](#) and London Bridge Green Infrastructure Audit. Like any well-designed living wall the inclusion of mixed native planting attracts biodiversity, adds winter colour and provides texture. However, the most important feature specific to this location is the addition of a large storm water tank; which allows plants to absorb water in a controlled way via capillary action. This means water has the potential to be held for 6weeks worth of rainfall and during periods of intense rainfall this prevents local flooding, reduces stormwater and in the process provides a reservoir to irrigate the wall without the use of pressurized water or energy. Due to the innovation of the system, Tooley Street's vertical rain garden has just been nominated for a sustainability award by [Sustainable Water Industries Group](#) (SWIG).

The success of this project has enabled Treebox to work again with Team London Bridge by extending the original wall an extra 60sqm, and we were happy to complete this project in June with some help from members of the local community who were willing to get their hands dirty!

We'd like to take this opportunity to thank [Team London Bridge](#) who commissioned and paid for the project as well as the [Green Infrastructure Consultancy](#) for developing the designs. We hope this project can encourage other districts in the London area to implement similar green infrastructure, incorporating innovative technology. Never judge a book by it's cover - it's often the simple things which are a great success and make design so much more appealing.