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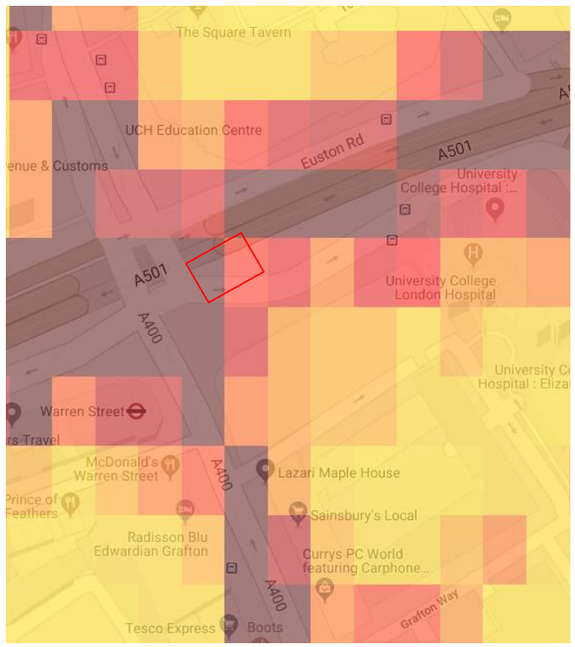
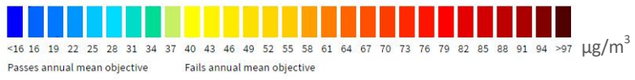
Living Wall Installation

Air Quality Benefits

Air pollution can have a significant effect on peoples health and is responsible for nearly 9,500 premature deaths each year in London alone. Improving air quality is a key aim of Government through local and national policies and initiatives such as the Clean Air Action Plan 2016-18. Camden Council, as with other London Borough's consistently breach World Health Organisation WHO limits on air pollution.

Every urban realm is different with each area having its own impact which contributes to poor local air quality. The expert opinion from statistical modelling by the Greater London Authority concluded that air quality in this part of the City is one of the worst in London and has a significant impact on the health of those working, visiting and living in the area.





The density of commercial use within the area with the concomitant need for car and van based deliveries together with other public and private vehicles that travel along the road exacerbate an already polluted environment. The map opposite illustrates the problem along the Euston Road corridor, one of the busiest and most polluted streets in the Capital.

WHO suggests that where levels of NO_2 reach 40 or above the air you breath begins to have an effect on your health.

Causes and type of pollutants include;

- Combustion engine emissions - diesel vehicles and gas boilers
- The pollutants of concern are Particulate Matter (PM) and Nitrogen Dioxide (NO2)
- Poor air quality is associated with cardiovascular and cardiopulmonary disease, lung cancer and respiratory disease taking years from the average life

Street-level concentrations of nitrogen dioxide (NO2) and particulate matter (PM) exceed public health standards in many cities, causing increased mortality. Concentrations can be reduced by controlling emissions, increasing dispersion, or increasing deposition rates, which is the primary benefit of green walls as a pollution control method. Both NO2 and PM are deposited onto the surfaces of vegetation at a higher rate than hard, built surfaces. Within densely built up areas the effectiveness of vegetation as a air purifier is enhanced due to the resident time of air in street canyons created by tall buildings either side of a transport corridor, such as Euston Road.

Studies have shown that the planting of vegetation in street canyons can reduce street-level concentrations by as much as 40% for NO2 and 60% for PM. Substantial street-level air quality improvements can be gained through action at the scale of a single street canyon. Moreover, vegetation will continue to offer benefits in the reduction of pollution even if the polluting source is removed from the environment. The use of vegetation to dress a buildings exterior can therefore create an efficient urban pollutant filter, yielding rapid and sustained improvements in street-level air quality in dense urban areas.

Elephant and Castle Station

JOB 2AF	Euston Road Vent London NW1
CLIENT	TfL/LUL
SCALE	N/A
DRAWING	Living Wall Benefits
REFERENCE	**A01348/20**

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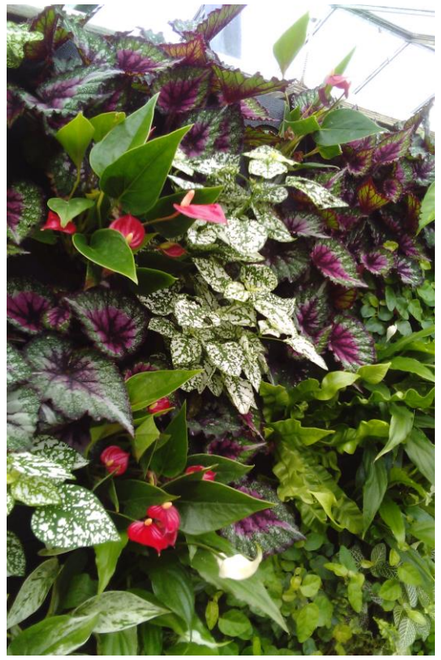
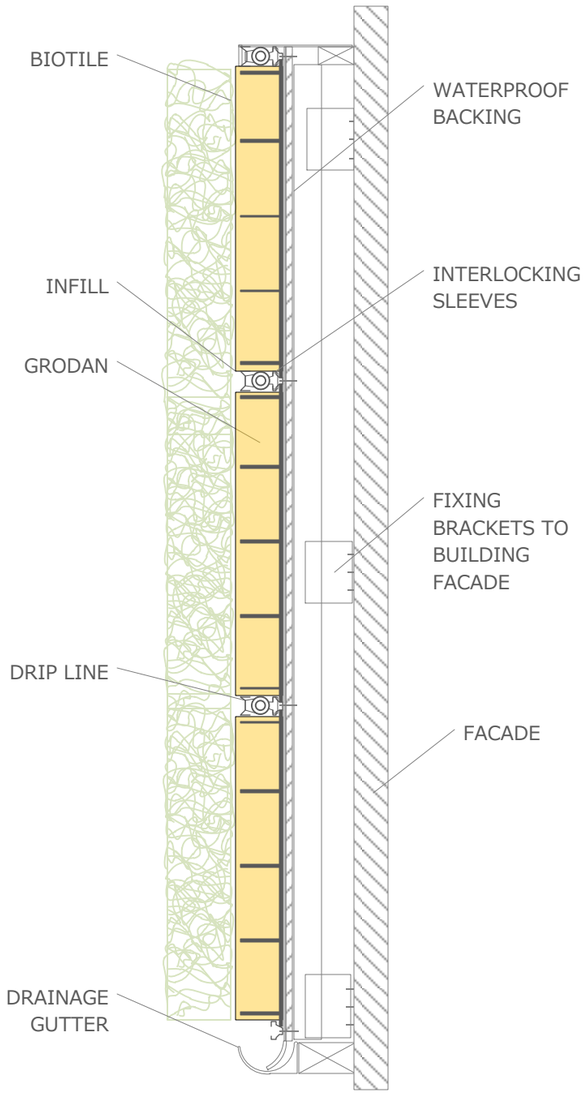
Biotile with Grodan liners



Diverse Species Grown for Function and colour

Cross Section of a Biotile



How It Works

The plant species within the green wall modules have a variety of textures and growth habits which enhance their ability to trap particular matter. The Natural Purifier Passive vegetation captures microscopic pollutants (PM10) whilst microorganisms in the substrate break down harmful NO2 along with other unwanted emissions and odours. Pollutants in the air are drawn in through the plant and slowly decomposed and mineralised to end up as plant fertiliser. The vertical greenwall therefore acts as a wide air cleaning ecosystem

The plants are grown in 62mm tiles supplied by Biotecture, which contain a material called Grodan, a rockwool which does not biodegrade and has a European ecolabel award.

Bio tiles are made of a modular box design containing the Grodan and irrigated by a low energy consuming automated system that keeps the hydroponic growing medium moist. Each plant is contained within the individual aperture at 100mm centres and are easily replaced and the space replanted in the event of a plant dying. The multiple individual apertures enable a range of patterns and designs to be created to dramatic effect.

Plants are installed at the very end stage of construction to avoid all potentially hazardous works. The plants are pre-grown vertically in a modular hydroponic system with nutrients provided through irrigation channels enabling long-term, stable conditions for them to flourish, while also reducing pest risks

An Integrated design enables moisture control and thereby reduce water consumption and includes sun resistant plants such as lavender, geranium and Stachys Modular system which allows quick construction. Each panel has capillary breaks for water descent control.

Existing installations are continually monitored to assess the selected plants for their ability to release oxygen and remove pollutants from the air. A living green wall will boost biodiversity while also reducing noise pollution. It is also predicted that evapotranspiration by the plants will reduce the temperature of the air, mitigating the urban heat island effect.

JOB	Euston Road Vent London NW1
CLIENT	TfL/LUL
SCALE	N/A
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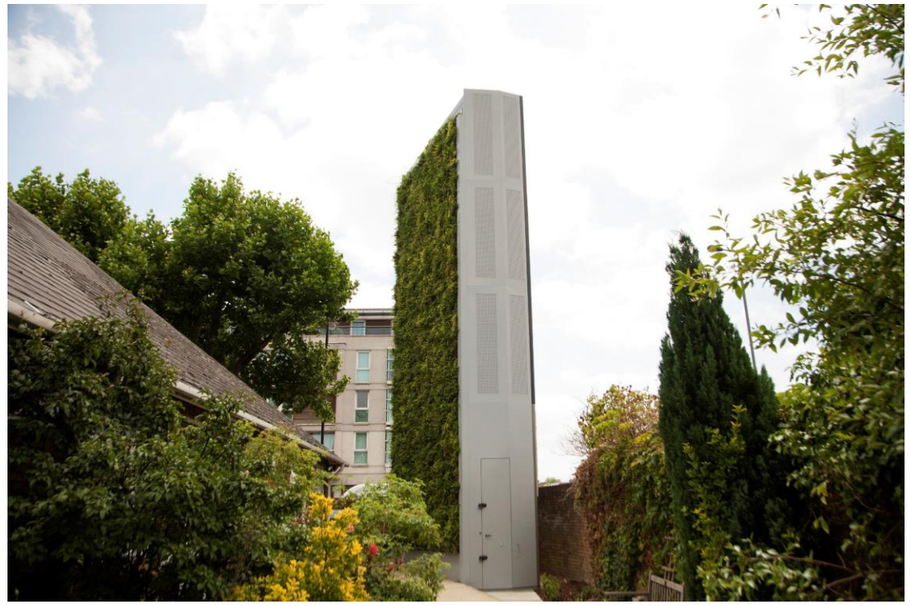
Examples of Living Walls



Sloane Square Knightsbridge

A standard 600mm x 445mm panel contains 20 plants. Plants are irrigated with a remote control system at an average of 1 litre per m2 per day. Comparative traditional planting bed systems require 3-4 litres per m2 per day.

Advances in recent years have allowed the living wall industry to mature. By combining innovative developments with comprehensive horticultural expertise has allowed the industry to expand into areas hitherto considered too challenging for vertical horticulture. Living wall systems, such as those supplied by Biotecture's hydroponic system, precisely monitor the health of each plant to ensure longevity and resilience.

Biotecture has installed over 200 vertical gardens including the above advertised site in LB Wandsworth, and is working on Europe's largest living wall. Dripline irrigation is used to control the volume of water the plants receive, whilst remote monitoring allows the duration, frequency and timing of the irrigation to be meticulously regulated and adapted according to the needs of the plants throughout the year.

Biotecture have been supplying, installing and maintaining living walls for over a decade and are now the recognised experts in this unique area. The long-term health of the living wall is assured from the beginning, with maintenance and accessibility considered early in the design process.

The plant species are thoughtfully chosen to suit the characteristics of the wall, such as the location, aspect and microclimate, among others. Extensive monitoring and trialing of plant species across the years has allowed us to establish the most successful species for living walls.

JOB	Euston Road Vent London NW1
CLIENT	TfL/LUL
SCALE	N/A
DRAWING	Living Wall Examples
REFERENCE	**A01348/22**

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Testimonials

Hatton Place, London

"The living wall in the courtyard of our office has totally transformed the space we work in. It's going strong and we're currently working with Biotecture on several projects for living walls, which is itself an endorsement"

Michael Friel,
Principal Architect, David Morley Architects, May 2014

New Street Square, London

"We recommend Biotecture because of the importance we place on selecting a supplier who has the expertise and commitment to design, install and maintain a successful large-scale green wall"

Neil Pennell, Head of Sustainability and Engineering,
Land Securities plc, May 2014

Edgware Road Tube Station, London

"I've just stopped off to see the green wall and am pleased to report that it looks splendid!"

Nicola Cheetham, Head of Environment,
Surface Transport, Transport for London, July 2014

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