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## An Introduction to ANS Global



By Scott Anderson

Hello and welcome. We've been creating living walls for the past ten years and it's been quite a journey. Within these pages you will find some of the best and most interesting living walls that we've had the pleasure of working on.

So what is a living wall anyway? First popularised by French botanist Patrick Blanc in the 1980's, living walls are a wall cladding method using living plants (also referred to as green walls, vertical gardens and plant walls, many methods of vertical greening have been experimented with around the world). Fast forward thirty years and living walls have come on in leaps and bounds. The ANS Living Wall system was developed with the express intent of creating a living wall system that would last, giving the plants what they need to thrive for years in a system that mimics the natural environment as closely as possible.

Living walls are far more than a passing design trend. This innovative landscaping method is increasing in popularity around the world and for good reason. Where space is at a premium, in cities for example, moving the landscape from horizontal space to vertical elevations can unlock a

site's potential. These lush green façades offer great biodiversity, a stunning aesthetic feature, sound insulation, a temperature regulator and a significant contribution towards solving air pollution.

As well as creating our own living wall system, we deliver an end-to-end service including consultancy, design, off-site planting and establishment, installation and ongoing maintenance. By delivering the whole package we have developed a wide range of experience and knowledge that allows us to deliver more successful projects. We're always up for a challenge and love working on projects that push the boundaries. With our living walls, the only limit is your imagination.

We hope you find the articles and case studies within this brochure both inspirational and educational and we would love to hear from you when you want to add a living wall to your project.



EXTERIOR LIVING WALLS

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INTERIOR LIVING WALLS

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# Peace and Quiet: Add a natural sound barrier



With the rise of agile working and companies investing more into better workspaces for their teams, acoustic insulation is becoming more important. New ways of deadening sound to make staff more comfortable and productive are on the rise. However most systems are aimed solely at sound insulation and therefore don't look particularly appealing. How about something that makes a stunning design statement, works as an acoustic barrier and delivers a range of other benefits as well? Living walls might be the solution for the office of the future.

Plants can absorb, reflect and diffract noise. This effect could lead to a more comfortable and pleasant environment in urban areas. The efficiency appears to be dependent on the plant type, planting density, location and sound frequency.

Modular living wall systems can be seen as a multi-layered system and due to the materials used, it is likely that the effect on sound adsorption will be larger. Research conducted at the National University of Singapore, was focussed on the effect of sound adsorption by different vertical greening systems. They measured the inertial loss and sound absorption coefficient of vertical green cladding systems

placed above the ground 1m in front of the façade and 2m behind the green wall systems. A sound calibrator was placed 2m in front of the greened façades.

Plant species *Nephrolepis Exaltata* (Boston fern) was used for this experiment. In total 140 pots of plants were defined as covering the façade by 100% with foliage, subsequently 100 and 60 plants were defined as 71% and 43% covering. The materials used for this experiment were the same as for the field measurements. The used reverberation chamber was 136m<sup>3</sup>. From the insertion loss experiment it was found that there was a strong attenuation at low to middle

## Sound absorption coefficients for a number of single indoor plant species according to Costa (1995)

SOUND FREQUENCY (HZ)



frequencies due to the effect of the substrate used while a smaller attenuation was observed at high frequency due to the scattering of the greenery. The eight tested systems are more effective at reducing lower frequency noise source. A reduction of around 5-10 dB for the low to middle frequency range was measured, which is perceptible or even clearly noticeable for human perception in the change of sound intensity.

The sound absorption coefficient of the tested vertical greenery system (three different percentages of foliage cover) in the reverberation chamber has one of the highest values compared with other building materials and furnishings. The substrate in the systems does most of the absorption. The green wall seems to have a lot of effect on the reverberation

time, especially in the range of 200 Hz - 1 KHz. The soil performs well at low frequencies and the plants perform better at high frequencies. The relationship between the greenery coverage and the sound absorption coefficient is observed that with greater greenery coverage, there is an increase in the sound absorption coefficient.

As well as adding a sound barrier in the office, a living wall will create a stunning verdant display adding a sense of well-being. The plants also help with indoor air quality and replenish the stale air-conditioned air that we breathe every day. See also our article on Biophilia - offices in cities can well do with reconnecting with the natural world. It will make staff more productive too.

**The Costa experiment does not include soil, which is more efficient than just foliage at absorbing sound in many frequencies.**

# Longevity: How long can a living wall last?



It's a common question, and for good reason. We've all had the experience of spending money on something that breaks sooner than we'd hoped. By some stroke of fate it seems that whenever a kettle, iron or toaster breaks we look back for the guarantee only to find it expired just two weeks before! Most living walls will be a significantly greater investment than these simple household appliances so carrying out enough research into possible solutions is highly recommended.

We've all heard the expression "pay cheap, pay twice" and we have seen few other industries where the truth of this mantra is more evident. There are a number

of living wall options available and while they almost all look great at the time of installation, the real proof of a system is in years to come. It is relatively easy to stack plant pots in a pattern that will create roughly the same effect as a living wall system, but anyone with basic horticultural knowledge will know that without irrigation or regular watering they will fail, and even if they receive enough water it is only a matter of time before they become pot-bound. A good living wall system allows for a healthy root cycle to ensure longevity.

Asking "how long will a living wall last" is like asking the proverbial "how long is a piece of string" - simply not all living wall systems

are created equal. Furthermore you can use a great living wall system and it can still fail if you do not invest in regular maintenance by trained experts.

The key to a long lasting living wall lies almost entirely in the design stage. Choosing the most suitable location in terms of light levels and exposure and choosing suitable plants for the chosen location that create the desired visual effect and more importantly last well. The chosen plants must be able to cope with the micro-climatic conditions and the unique horticultural brings. The importance of plant choices cannot be overemphasised it has the ability to determine the

long term maintenance cost of the wall; using species that look nice but struggle to survive in the environment is always going to mean an uphill struggle leading to increased plant replacements for the years that follow.

From our experience as the leading living wall installers in the UK (and with global experience in different climates behind us too) we have found that there is no reason that a living wall should not outlive a building. We have been installing living walls for ten years now and have a wealth of practical experience which we can invest in the design stage to produce a living wall of plants that will

thrive for years. We have tested hundreds of plant species and found varieties which will work for the local conditions and aspect of each project.

A good case study in longevity is the wall which we installed for The Mailbox in Birmingham outside the Côte Brasserie restaurant. We installed the living wall in March 2010 and have maintained it ever since. Even as it reaches its 8th year the foliage is still thriving. Part of the wall is actually a very shady environment which adds its own challenges, but choosing the right species is once again the key to success.

*"The living wall - surrounding Côte Brasserie's outdoor terrace - is a fantastic addition to the Mailbox's bustling canal side area. The natural lush greenery perfectly complements the urban backdrop of the Mailbox and offers visitors an oasis of calm in a busy city centre. ANS Global was great to work with - the team understood our vision and requirements from the offset and met these with enthusiasm and top quality service."*

David Pardoe, Head of Marketing, Retail and Tenant Engagement at The Mailbox



# Illumination: How to light your living wall



Sources:  
xavio-design.com  
greenroofs.com

Lighting is one of the most important aspects in the success of a living wall. There are two main reasons that living walls have a lighting scheme: aesthetics and plant health. These factors can be somewhat conflicting as the right light levels and colour temperature for the plants' requirements may not give the desired visual effect. We always recommend that the plants' needs are given precedence.

Most plants have a few basic needs to survive and thrive including (but not limited to); water, light, nutrients, air and a suitable temperature. There are however a range of more complex needs to consider such as correct humidity levels, suitable substrate, aspect, wind exposure and salinity

levels. The design of a living wall needs to take into account all of these factors, only some of which are variable. Beyond adjusting the environment, it is a case of choosing suitable plants for the existing environment.

Lighting is one of the main factors that can be controlled in a living wall scheme but is often overlooked. As in natural environments, different plant species thrive in various light levels. We can select plants to accommodate the aspect and natural light intensity of each project. In areas where little or no natural light is present (particularly indoors) it is essential to artificially create or supplement the right light intensity and colour temperature to support healthy plant growth.

**Water** - Controlled by automatic irrigation system

**Light** - Can be controlled or supplemented

**Nutrients** - Controlled by automatic irrigation system and substrate

**Air** - Can be controlled indoors with ventilation and air-conditioning

**Temperature** - Controlled indoors by heating and air-conditioning systems

**Humidity** - If required, can be controlled with misting systems

**Substrate** - Controlled with ANS Global unique tested organic substrate

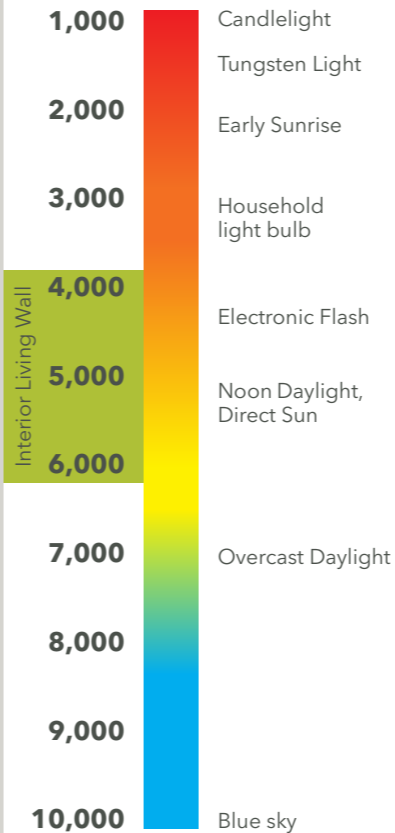
**Aspect** - Affects exterior applications, all aspects are feasible

**Wind** - Controlled indoors, constant outdoors

## Light colour temperature

Light colour temperature is measured in Kelvin (K). Natural sunlight provides a full spectrum of colour and indoor living walls will thrive with a similar light balance.

### Colour Temperature in the Kelvin Scale



The colour of the light will determine the plant's ability to produce strong stems, leaves, and flowers. For vegetable growers, flowering is important since flowers equal produce. The blues, colour temperatures over 5,000K, encourage good leaf and stem growth while reds and oranges (2,700-3,000K) promote flowering. Natural sunlight provides a full spectrum of colour while the interior market must rely on supplemental lighting designed according to the types of plants in the living wall. A typical indoor living wall will thrive on 4,500K to 6,000K on the colour spectrum.

## Light Intensity

Light intensity is dictated by the strength of the light, the number of light sources and their proximity to the living wall. Light is the driver of photosynthesis which involves the splitting of water to create energy. As a minimum photosynthesis requires light levels of 1000 lux, but this often increases to levels of 2500 lux with certain types of plant.

As a guide a living wall on the outside of a building will experience levels around 30,000 lux. It would be impractical to provide this level of illumination indoors, so internal lighting needs to be managed to ensure that the necessary levels of illumination are achieved.

The amount of illumination needed for a living wall is determined by the kind of planting, but uniformity of light needs to be found. A minimum of 250 FC is required for a long lasting living wall.

## Photoperiodism

If plants need light, they also need dark. Like every living organism, plants need their rest time. This is known as 'photoperiodism'. This can be difficult in spaces that operate throughout the day and night, such as hotel entrances. To manage this we would always suggest that the lighting control system is programmed to reduce the illumination levels below the switch-off point for photosynthesis. The range of the photoperiod on any specific wall can be determined by the plant species used.

While lighting is only one factor in designing a successful living wall, it is one that can be controlled without huge additional expense and should without doubt be considered. All variables which affect a plants' growth (and therefore a successful living wall) need to come together and mimic the balance of nature in order for a living wall to thrive.

# Biophilia: Create a healthy environment

Sources:  
www.epa.gov  
wikipedia.org  
biourbanism.org  
revisesociology.com



**“Man’s best friend” is a common term used in relation to domestic dogs. At the core of the millennia-long relationship with our canine friends is a deeply held tendency of humans to love other living things. Consider also the thousands who take to nature every year to walk, cycle or swim and thereby get closer to our natural world. This passion for nature and the life we find around us starts young; children are fascinated by finding a bird’s nest, watching a spider catch a fly in its web or planting a sunflower seed and monitoring its progress day by day. This is borne out by the fact that in recent times 9.2 million people watched Planet Earth 2. This is biophilia.**

The biophilia hypothesis suggests that humans possess an innate tendency to seek connections with nature and other forms of life. There is an obvious connection between humans and animate forms of life including our pets, domestic animals and even our interest in wild animals demonstrated by the growing wildlife tourism industry. However our relationship with plants is equally important and should also be given attention.

With more than half of the world population inhabiting urban spaces we run the risk of losing that vital connection to nature. It is interesting to consider that in some densely urbanised areas, children

can grow up in a world with few plants or animals around them. Worse still, some will never be able to stare up at the stars in the night sky, thanks to the prevalent light pollution. Even the effect of the seasons is less noticeable. Spring has less meaning without bulbs and plants springing to life and baby animals entering the world and what is ‘Fall’ without the falling leaves and rustling carpet of colour underfoot? Even the ambient temperature in cities is more constant than the countryside with the urban heat island effect.

In his book, Richard Louv coins the term ‘Nature deficit disorder’ to describe decreased exposure of children to nature and how this

harms both children and society. The book concludes that direct exposure to nature is essential for healthy childhood development and for the physical and emotional health of children and adults. In short, we need the natural world and by shutting it out of our lives and the architecture of our cities we are doing ourselves more harm than good.

In architectural terms, biophilic design is a sustainable design strategy that includes reconnecting people with the natural environment. It differs from (but can work alongside) green architecture, which focuses on decreasing the environmental impact of the built environment. Living walls are a perfect example of a biophilic design statement and can form a key part of an urban scheme. While traditional planting of green space and the addition of trees, rain gardens and parks is welcomed, in the city, space is often at a premium and there is a clear financial reward for

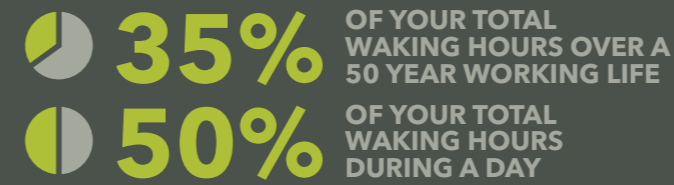
developers who convert space to usable commercial or residential property. Living walls take the wasted space of the building façade and turn it into a green oasis in the city.

In isolation it might seem that a living wall is a small contribution, but by getting behind the green agenda we can transform the world’s cities one building at a time. Bringing it closer still, most of us spend more than 50% of our waking hours at work. Adding greenery can make a huge difference and contribute to a healthy workspace. Not only does a living wall add a pleasing visual backdrop in an office, it can contribute to improving indoor air quality. Many office buildings have significant air pollution sources. Some of these buildings may be inadequately ventilated and people generally have less control over the indoor environment in their offices than they do in their homes. Another clear application for living walls in the city is at schools.

Children who live in the city will benefit from the scientific learning opportunity that a wall of nature brings. For many it may be their most constant link to the natural world, and with a natural soil living wall, bulbs can be added giving them a welcome seasonal change to their play area or school building. As well as living walls, schools should try to fit in more interactive natural spaces if possible – schemes such as the Green Bronx Machine are an inspiration to us all, growing veg and changing lives at the same time. Visit [greenbronxmachine.org](http://greenbronxmachine.org) for more on that.

Overall, it is important that the architects of our cities’ future buildings take up the responsibility that they have and remember to incorporate sustainable features of biophilic design. Together we can change the future of our cities so let’s make that future a green one.

### HOW LONG DO WE SPEND AT WORK?



## Air Quality: How living walls can absorb pollution

Air pollution in 2015 has been linked to nine million deaths worldwide, according to a report in *The Lancet*. In the UK alone, outdoor air pollution contributes to about 40,000 early deaths a year, according to the Royal Colleges of Physicians and of Paediatrics and Child Health. In the capital the air is particularly polluted with new figures released by London Mayor Sadiq Khan showing every area of London exceeds World Health Organisation (WHO) limits for PM2.5.

Those most at risk are those living in cities. Londoners are breathing in air that exceeds global WHO guidelines for one of the most dangerous toxic particles. PM2.5 are toxic air particles which can increase the likelihood of respiratory and cardiovascular diseases. Mr Khan described the

results as "sickening". Children exposed to these toxic pollutants are more likely to develop reduced lung function and asthma when they get older.

**"This research is another damning indictment of the toxic air that all Londoners are forced to breathe every day"**  
Sadiq Khan Mayor of London

Solving air pollution needs more than one approach. Firstly it is important to reduce the really big individual polluters, this includes diesel engines, old buses and HGV's in cities and also wood burning within the city. Most big cities are already doing that, although it could be argued that it is not fast enough. While preventing more pollution being added to the air is a welcome

move, there will always be some produced. It is therefore key to look at ways of removing this particulate matter from the air at the same time.

Leaves of plants provide a large surface area which is capable of filtering out particulate matter (PMx), other pollutants such as NOx (conversion to nitrate (NO3), nitrate (NO2)) and CO2 in daytime. A green façade will block the movement of particulate matter particles along the side of a building and filter them. Vegetation has a large surface area and also promotes vertical transport by enhancing turbulence.

When concrete, brick, stone, glass and asphalt surfaces are heated during the summer period, vertical thermal air movements (upwards) are created and dust particles

Sources:  
bbc.co.uk  
Hosker and Lindberg  
(1982)

found on the ground are carried and spread in the air.

Plants are an efficient sink for particulate matter. According to Hosker and Lindberg (1982) fine dust (PM2.5 and PM10) concentrations are reduced when particles adhere to the leaves and stems of plants. Literature claims that by rainfall the adsorbed particulate matter is washed off into the soil or substrate below.

Heavy metal concentrations and fine particles were found on leaves of a green façade in the inner city of Dusseldorf (daily traffic level 12,500 vehicles). The same results were found by comparing ivy leaves from different sites (by counting particles on ivy leaves), the leaves from the sites exposed to a high daily traffic level, had collected a significant higher number of particles compared to the sites that are less exposed.

Besides particle binding, plants are also known to absorb gaseous pollutants through the stomata (CO2 and NOx). Via photosynthesis CO2 is sequestered in the leaves. Negative health effects of particulate matter pollution for humans are decreasing lung function, increased respiratory problems, and other health care visits for respiratory and cardiovascular diseases. Besides these effects, durability problems are involved and include accelerated corrosion of metals, as well as damage to paints, sculptures and soil-exposed surfaces on man-made structures.

The improved air quality by green facades has direct benefits for people who suffer a lung disease. A decrease of smog formation will occur, and also durability or corrosion problems are reduced of urban infrastructure that is susceptible to damage from air pollution.

**"Pollution is much more than an environmental challenge - it is a profound and pervasive threat that affects many aspects of human health and wellbeing"**  
Prof Philip Landrigan, Icahn School of Medicine

A tree with a combined leaf surface area of 1600m<sup>2</sup> creates 1.71kg of O2 and 1.6kg of glucose every hour (using 2.4kg of CO2, 96kg of H2O, and 25.5KJ heat energy). This level of production is equal to the oxygen intake of 10 humans every hour. Another study carried out by the University of Dresden (2009) with regard to the organic balance of a greened façade with 1000m<sup>2</sup> Hedera helix pointed out that in one year: 1019kg of water and 2351kg of CO2 is consumed and bound respectively. In this reaction 5854 of organic mass (water content 4409kg and dry mass 1415kg) and 1712kg of O2 is produced.

With the assumption of an leaf area index (ratio between leaf surface in m<sup>2</sup> and covered wall surface in m<sup>2</sup>) for Hedera Helix of 2.6 up to 7.7m<sup>2</sup> leaf/m<sup>2</sup> wall (Bartfelder and Kohler, 1987). The following leaf surface area can be calculated for

the façade.

Average value of the leaf area index of Hedera Helix = 5.2m<sup>2</sup> leaf/m<sup>2</sup> wall taking a greened wall surface of 1000m<sup>2</sup> this results to: 5.2 x 1000 = 5200m<sup>2</sup> of leaf surface.

Comparing this with the investigated mature beech tree of Minke (1982) with a leaf surface of 1600m<sup>2</sup>, a greened façade with Hedera Helix is more efficient to adsorb CO2 and to produce O2. There needs to be further research on the success of other plant types besides Hedera Helix in living walls as research already exists to show that hairy leaved plants are still more efficient at trapping particulate matter.

In summary living walls should be welcomed as an efficient answer to air pollution and be used as part of a wider approach to solve the air pollution problem that all urban dwellers are facing.



Living walls installed for TFL in Walthamstow to reduce air pollution

## Why natural soil works best for vertical planting

As plants naturally grow in soil, you would be forgiven for thinking that all living walls use soil. This is not the case. Some systems use a man-made substrate to replace the soil and pump a mixture of water and fertiliser to keep them alive. This is called a hydroponic system. We believe that nature's way is best and have proved that living walls with natural soil have a number of indisputable benefits over these synthetic systems.

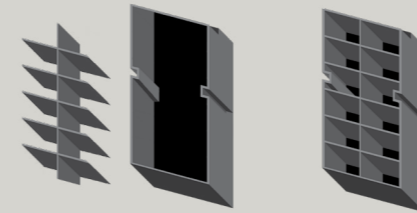
### Healthy root cycle

Not all natural soil living wall systems are equivalent. Some systems fall under a category known as 'pocket' living wall systems. These systems are either made from woven fabric with pockets for each plant or with plastic pots with one or more plant per pot. These systems can look impressive with a full coverage when initially planted. In the long term, however, the constrained rooting space causes plants to fail frequently. This leads to higher maintenance costs with plant replacements or an unsightly failing wall.

Some pocket systems are very basic and even lack automatic irrigation systems, while others do include irrigation. Overall these systems offer a false economy with low initial costs but a long term struggle to keep the plants alive.

The ANS Living Wall system is a modular living wall system with each module split into 12 sections. Unlike a pocket living wall system however, the dividing part is separate and moves. This allows the plant roots to migrate around the entire module. The plants are planted in an organic substrate which is produced to a unique and specific mix and in time the plants roots will regenerate as part of

their natural process. As the plants roots mature they die and fresh root growth will push out; as the old roots decompose they provide natural nutrients for the plant.



### Full plant coverage and range of plant species

The ANS Living Wall system holds a minimum of 96 plants per square meter. This allows for more accurate shapes and swathes within the wall, and contributes a greater level of biodiversity to the wall area.

**96 PLANTS / SQUARE METER**

The modules' design and use of natural soil allows for a much greater mixture of plant types than a hydroponic system. Many flowering species and especially bulbs and tubers simply are not compatible with a hydroponic environment as they will rot rather than being protected by the soil

throughout their natural cycle. This allows for ANS Living Walls to give greater seasonal impact with stunning bursts of flowers in spring and summer as well as a wider array of plants all year round.

**3 BULB SPECIES: SNOWDROPS DAFFODILS CROCUSES**

### Accurate irrigation application and Irrigation failure

The built in irrigation system within an ANS Living Wall is carefully zoned to cater for different plants moisture requirements. The irrigation keeps the back of the module just damp enough to stimulate the organic composting process of old roots. An irrigation pipe is run along the top of each row of modules, so every 500mm there is another pipe. This gives accurate application of water to the six rows of plants below it.

**500 MM IRRIGATION SPACING**

Nature is your friend when things go wrong too. Consider how a garden changes with the seasons. In winter when the ground freezes, the plants go into dormancy, in

spring when the ground is damp and the weather is mild, the plants grow and burst into life and in summer when the sun bakes the ground hard, the soil contracts with the plants' roots, protecting them. You might see the grass in parks turn yellow in the hot summer months; this does not mean the grass is dead. It is the plants' natural response to the season. When it rains, the grass quickly greens up again - it is nature's way.



The same principle applies in vertical planting. If something goes wrong with the irrigation system, natural soil living walls can last for weeks. The plants might suffer, but will not die as the soil protects the root system. In a hydroponic system a failure of the irrigation means cutting off the plants' lifeline of feed. When you cut the supply it means devastation for all of the plants in the green wall in a matter of days. Nature's way proves to be the most resilient.

# How to choose the perfect living wall plant mix

If you have ever stood and admired the verdant expanse of a large, well designed living wall you will understand the emotion that it creates. Swathes of different plant varieties in all manner of natural shades sweep the wall, endless green leaves spread out before you reaching up to the sky and the occasional flower bursts through the foliage attracting pollinators. Even wild strawberries can be seen growing in the wall, their succulent fruits tantalisingly out of reach. This stunning horticultural display also raises a number of questions. Perhaps most importantly: how is each plant type selected?

Over the past ten years we have tried hundreds of plant species in our living wall system with varying degrees of success. This constant learning experience has taught us which plants will thrive in the unique environment of a living wall. There is not just a 'one-size-fits-all' mixture of plants however. With many factors influencing the micro-climate around a living wall, what works in one wall will struggle in another. Our horticulturists will assess each project in its own merits looking at a number of factors before producing a bespoke plant mix. We have taken the time to explain the basic factors influencing these choices in this article.

While this list is not necessarily comprehensive, it forms a good starting point when planning a living wall. We love a challenge at ANS Global and if you've got a new idea for a living wall we would love to make that dream a reality by helping choose plants not only to fulfil your concept, but also to thrive in their environment for years to come.



### Interior or Exterior

The main deciding factor is whether the wall will be placed inside a building or outside. Each environment calls for a radically different range of plants. Interior walls enjoy a sheltered space with relative consistency of temperatures, but outside things change. Most of the following factors apply only to exterior living walls.



### Climate

When planning a living wall in Dubai, a different range of plant species is required from Sweden and a different mixture again for projects in England. Each climate brings its own challenges, from the scorching heat and direct sunlight in the Middle East to the snow and ice of Northern Europe.



### North, East, South, West

Within each climate different plants will work on each elevation dependant on the aspect and how sheltered the wall is. North facing walls get less sunlight than South as a general rule, but then a wall between tall buildings might be a very shady location regardless of aspect.



### Monoculture or variety

Normally an aesthetic decision, should the living wall be an expanse of just one consistent plant type? If the rest of a scheme has a busy mixture of design features it can be a relief to find some consistency in a wall of green. That said, the shapes, patterns or swathes of a mixed living wall can create a stunning effect. There is also the opportunity to add a logo or wording within the planting if the area is large enough.



### Seasonality

Living walls should always have what we refer to as an 'evergreen backdrop' providing a good coverage of plants which will thrive throughout the seasons. The beauty of a natural soil living wall system like ours, however, is that bulbs, tubers and a wider range of flowering plants can be included in the wall. This makes a wonderful splash of seasonal colour in spring and summer which goes a long way in the city where the seasons pass less noticeably.



### Native and Localised

A good place to start when designing a living wall plant mix is with the immediate area. Are there plants which exist only locally? If so, would they work in the living wall? Our recent living wall project at London Wall Place (later in this brochure) used species that traditionally colonised the ancient city walls, giving back to nature what has been removed by the urban developments.



### Edible herbs and fruit

Human interaction with living walls is wonderful. They really can be a delight to the senses, the visual impact is obvious and movement created by wind between the leaves adds another dimension to this, with a faint rustling sound. Herbs and flowers create pleasant fragrances, if the wall is within reach it is pleasant to touch and small fruits like strawberries can be grown for their sweet taste; herbs too add a potential utility to the wall. Chefs or bartenders could pluck fresh herbs from the living wall, giving another level of interest in a bar or restaurant.

# Giving nature a home: How to boost biodiversity



As cities grow they push nature out. Trees, shrubbery and habitats for local wildlife give way to concrete, metal and glass. Every ten years, an area the size of Britain disappears under a jungle of concrete. Humans and nature can and should thrive alongside each other. In Planet Earth 2, Sir David Attenborough describes cities as the newest habitat on earth. He goes on to say "How and whether we decide to invite the wildlife back is up to us. Greening the walls and roofs of our building could create a rich and extensive habitat if we wanted it to do so."

In this decade the urban environment is predicted to grow by nearly 30%. It may appear hostile to animal life, but nature has a way of adapting and some species are happy to call the city home. Animals like pigeons, squirrels and foxes make their homes amongst the buildings. This proliferation of only certain species is often disliked, and we even refer to plants like creeping ivy, dandelions and nettles as weeds as they grow from cracks and spaces of wasteland in our concrete urban metropolis. We are the creators of this habitat and therefore have only ourselves to blame. Most cities are not conducive to biodiversity.

## GLOBAL URBAN GROWTH

# 30%

PREDICTED GROWTH OF THE URBAN ENVIRONMENT IN THE NEXT DECADE



# 10

YEARS FOR AN AREA THE SIZE OF BRITAIN TO BE URBANISED

### What is Biodiversity?

The term refers to the variety of life on Earth. Biodiversity is not distributed evenly on Earth, and is richest in the tropics. Tropical forest ecosystems cover less than 10 percent of earth's surface, yet contain about 90 percent of the world's species. While it may be impossible for a city to match the diversity of a tropical forest, increasing the number of species can make significant changes. From radically different architecture to improved well-being for the human inhabitants.

*"Could it not be possible to build cities more in harmony with nature? How, and whether, we decide to invite the wildlife back is up to us. Greening the walls and roofs of our buildings could create a rich and extensive habitat if we wanted it to do so. This is a new urban world that we have now designed and built with others in mind. Create the space and the animals will come."*

- Sir David Attenborough

A shining example of a futuristic city is Singapore, they have planted over 2 million trees in the last 45 years, and are now richer in plant species than any other city in the world. But they do not use only trees and traditional planting methods, they are also pioneers of urban greening methods including living walls, green roofs and urban forests.

Living walls with their hundreds of plant species provide a welcome boost to the biodiversity of a façade. One building at a time this can change the urban landscape, softening the hard angular environment and adding a stunning visual effect. The beauty of the ANS Living Wall system is that it can be designed to cater for completely bespoke requirements. Some clients do not want to encourage insects or birds to visit the wall and by tailoring the plant types this can be catered for; these walls still increase biodiversity in terms of the number of plant species in the area.

In the main however, living walls are recognised for their full potential in adding a valuable habitat for nature and this is encouraged. Flowering plants provide pollen and attract a range of pollinators including bees, hover-flies and other insects. These insects along with small fruits (such as strawberries) which grow in the wall provide a valuable food source for small birds. Larger woody plants can even support birds nesting within the planting, hidden from view of predators. To promote quicker habitation following the installation of a living wall, we have also tailored our living wall module to be able to support bird nesting boxes, bat boxes and insect hotels to encourage wildlife.

To finish, it seems only appropriate to use another quote from David Attenborough: "It's surely our responsibility to do everything within our power to create a planet that provides a home not just for us, but for all life on earth."



BLACKBIRDS NESTING DIRECTLY IN THE LIVING WALL



ANS NESTING BOXES

# Large Exterior Living Walls

- 1 Air Quality**  
Cities are facing the challenge of polluted air which poses a health risk to their inhabitants. Living walls filter particulate matter and improve the air quality.
- 2 Increase Biodiversity**  
Rather than making a hostile environment to nature, invite it back to the built environment. Living walls provide a habitat and food source for wildlife including birds, bees and butterflies.
- 3 Positive Social Impact**  
Greener cities are healthier places. Enhancing public areas can reduce vandalism including graffiti and can have a further positive impact on physical health and mental well-being.
- 4 Structural Facade Protection**  
Living walls naturally protect structures from deterioration caused by acid rain and driving rain, temperature changes, direct ultraviolet sunlight and corrosive dust particles in the air.
- 5 Temperature Regulation**  
Green walls reduce the 'urban heat island' effect in cities. They also act as insulation helping to regulate a building's temperature, keeping it warmer in winter and cooler in summer.



*Working with architects One World Design we designed the scheme to incorporate one of Europe's largest green walls. National Grid are truly thrilled with the end result and to win the award was the cherry on top of the icing!*

CASE STUDY

## National Grid Carpark

Warwick, United Kingdom

 24 PLANT SPECIES

 1060 SQUARE METERS

National Grid's HQ is located on the outskirts of Warwick, within view of historic Warwick Castle, and it houses some 2,800 staff. This 24 hour site is critical to the power distribution infrastructure across the UK. National Grid's commitment to sustainability meant that they wanted something extraordinary for their new car park; now finished, it has literally come alive!

ANS Global was approached to help National Grid to fulfil the green ethos that the company seeks to embody. The living wall incorporates more than 97,000 plants and 20 different species including fruit bearing plants, including strawberries. These particular plants were selected to include predominantly native and wildlife-friendly species, the majority of which are evergreen in order to provide coverage all year round. The living wall was designed to add both ecology and biodiversity to the area, but also it will flower and bloom, providing a pop of colour and variety with the seasons. ANS Global were delighted to have been part of this project which has won the Best New Car Park award.





*ANS Global installed and maintain the living wall at The Core, Science Central. The team is efficient, friendly and knowledgeable. Our living wall is well maintained, frequently photographed and is a real feature of the site.*

CASE STUDY

## Science Central

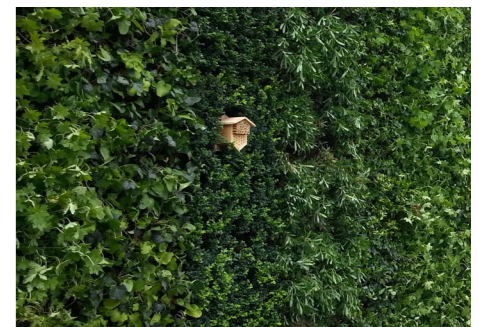
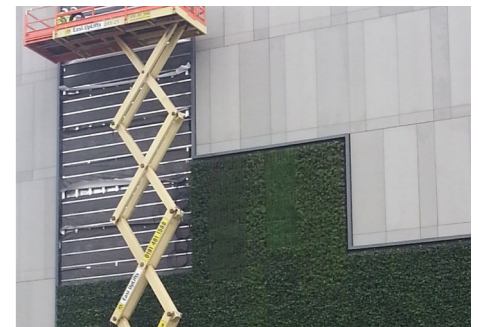
Newcastle, United Kingdom

 17 PLANT SPECIES

 357 SQUARE METERS

Science Central is delivered by a long-term, committed partnership between Newcastle City Council and Newcastle University and brought together as the Science Central LLP. The partnership purchased the land with the aim of creating a unique location where the public sector, academia, industry and communities would come together to shape a future to benefit us all.

The exterior living wall was part of a planning condition and helps towards achieving a BREEAM excellence award. It has a large expanse of green area that uses over 35,000m<sup>2</sup> of plants reaching to a total height of 28m from ground level and has become Europe's tallest exterior living wall. Part of the design was to use native species that attract insects, and most importantly bees. Therefore, the living wall includes ten bee hotels. The living wall became an intricate part of the rain screen cladding design, forming a good insulation barrier to help with the efficiency of the building.





CASE STUDY

## London Wall Place

London, United Kingdom

 27 PLANT SPECIES

 740 SQUARE METERS

London Wall Place creates a new destination in the heart of London, providing two new state of the art office buildings that can house up to 5,000 employees, as well as an exclusive arrangement of city gardens that will become a reserve in the Square Mile. This extensive scheme is transforming the historic London Wall and creating a thriving new business quarter and public amenity space.

ANS Global have been involved with designing the living walls on the scheme, working with Spacehub and Make Architects including plant assessments of native species growing in the London Wall and incorporating these into the new living walls. The ANS Living Wall system was chosen for the scheme as a modular pre-grown system that uses natural soil and ANS Global have completed all works including planting and installation.





CASE STUDY

## University of Leicester

Leicester, United Kingdom

 15 PLANT SPECIES

 285 SQUARE METERS

**The University of Leicester's new Centre for Medicine is the largest ultra-energy efficient Passivhaus in the UK.**

The building has a large green wall as well as a green roof and a ground level planting scheme to attract wildlife to promote biodiversity and pollination. The living wall includes strawberries and flowering plants. ANS Global designed and installed the wall and continue to maintain the project.





*The development is a notable addition to our portfolio of high-quality offices in the City including a magnificent plant façade to help green the glass and concrete all around.*



CASE STUDY

## Moor Place

London, United Kingdom

 12 PLANT SPECIES

 420 SQUARE METERS

Brookfield Properties Partners is a global office property group that owns, manages, and develops premier assets in the world's most dynamic and resilient markets. The company's signature properties define the skylines of cities around the globe, including New York, Washington, Los Angeles, Toronto, London and Sydney.

ANS Global was delighted to work with the client on this new commercial development in the heart of London, featuring six landscaped roof terraces and a living wall covering the top six storeys of the 20,204sqm office building. This new development is one of the first in the UK to achieve both BREEAM excellent and LEED platinum. Both are expected to award the building high scores for its low impact on the environment. A selection of low maintenance plants were chosen for this project, including Erica carnea "Springwood White", thymus serpyllum and sedum spurium. The plants chosen were to give colour and interest at all times of the year whilst creating a natural and bio-diverse backdrop in an area famous for its glass and concrete.





To enhance the look of our new multi-deck car park, we have installed a modular living wall system. The system turns wasted walls into a vertical living garden.



CASE STUDY

## Granta Park Carpark

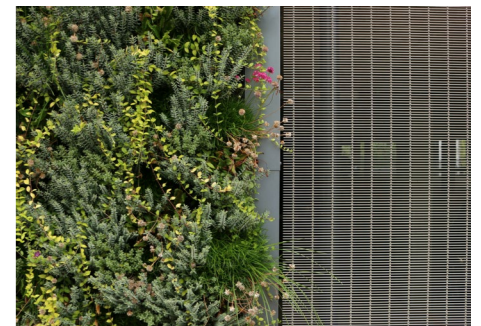
Cambridge, United Kingdom

 25 PLANT SPECIES

 315 SQUARE METERS

This large business park near Cambridge includes a three storey car park with living walls on the external facade. Along with the other landscaping such as trees, the plants help disguise the building and make it blend in to the surroundings.

ANS Global designed these living walls with suitable plants for the local environment as well as planting and installing them. "Unlike some other living wall systems, the ANS Living Wall system does not rely on artificial fertilizers being pumped through the wall constantly. However, the irrigation system can be used to add a natural fertiliser or organic pesticides throughout the whole wall, if required"





*The Environmental Building is a flagship project where the University has demonstrated its unwavering commitment to sustainability and environmentally friendly design, construction and building operation. The living wall is a stunning example of that commitment and is something that the University are justifiably proud of.*



CASE STUDY

## University of York

York, United Kingdom

 19 PLANT SPECIES

 225 SQUARE METERS

The University of York has demonstrated its commitment to advancing knowledge and sustainability in the built environment by installing a verdant living wall. Designed, planted and installed by ANS Global, the living wall is sited on the south elevation of the University's new Environmental Building. It formed a fundamental planning condition of the construction project, which incorporates a number of sustainable features.

The 220 m2 living wall incorporates a series of large windows, which means it actually covers 143 m2 of the building's exterior. More than 21,830 plants were used in its construction, all chosen for their important contribution to biodiversity and wildlife. The objective was to attract bees and butterflies in particular; hence the planting arrangement of blue, purple, pink, white and yellow foliage - selected because the insects are drawn to these colours. Incorporating a range of species indigenous to the local area, the wall will change with the seasons and continue to bloom all year round.





## Dilijan International School

Dilijan, Armenia

 18 PLANT SPECIES

 1000 SQUARE METERS

An exciting extension of the UWC (United World College) movement into the Caucasus region at the junction of Asia and Europe, halfway between Yerevan and Tbilisi, the capitals of Armenia and Georgia. An international co-educational boarding school, UWC Dilijan has an international body of students from over 40 different countries and the curriculum is taught in English.

This project included the first living walls in Armenia. As with most of our living walls, we researched species native to the region of planting which would survive and thrive in the wall. And as well as being an important ecological and learning tool for pupils at the school, it was an economic boost to the region. We employed local labour in this traditionally poor area to help with the installation of our walls and, aided by the schoolchildren, to handpick plants from the nearby woodlands and mountainsides with which to populate the walls they'd assembled. Working with a whole team of landscapers, builders and casual labourers, ANS Global pulled the whole project together through to completion in June 2014.



*We are extremely pleased with everything, right from the initial meeting and design concept, through to the tender stage and construction. Everyone from the entire team remained totally committed to see the great project through to completion*

CASE STUDY



*M&S Newcastle is one of our most important stores and the finished green wall and store's eco energy refit is hugely exciting for everyone at the company. The green wall is a real standout, and with summer just around the corner it will be exciting to watch it continue to flourish.*

CASE STUDY

## Marks & Spencer

Multiple Locations, United Kingdom

 7 COMPLETED STORES  1047 SQUARE METERS

Founded in 1884, M&S has grown from a single market stall to an international, multi-channel retailer. Selling stylish, high quality, great value clothing and home products as well as outstanding quality food, responsibly sourced from around 3,000 suppliers globally, M&S has it all covered; especially when it comes to living walls on their stores!

The ANS Living Wall system has been proved by M&S as being the most sustainable, boasting very little water usage and an organic substrate. This enables us to have natural living walls with indigenous planting in each varied location. We design the planting palate and the rainwater harvesting systems based on individual stores whether they are new build or retro-fitted. However, although the plant species are varied based on each location, the visual appearance of the M&S brand is kept consistent. The living walls at Newcastle always evergreen with colour and interest throughout the changing seasons. They also provide a cleaner air quality to the busy urban streets and precincts.



Deansgate - Castlefield



*The Deansgate - Castlefield stop is really taking shape and the living wall particularly makes a striking impression. The stop has a unique green look and I'm sure the thousands of people using it every day will appreciate the many touches that make it an oasis in the city.*

CASE STUDY

## Deansgate Metrolink Station

Manchester, United Kingdom

 14 PLANT SPECIES

 260 SQUARE METERS

Manchester has been delivering a £1.5 billion investment programme that will see its Metrolink network triple in size. With more stops, more trams and better facilities, it will provide customers with more choices and contribute to better public transport for communities across Greater Manchester. The works will see key stops in the City Centre transformed and a new Second City Crossing (2CC) built to enable more tram services to run through the heart of the city.

The Deansgate - Castlefield stop has been completely transformed so passengers can enjoy a calm and peaceful green environment while they wait for the tram. The stop now offers a pleasing, modern gateway to the south of the city. With trees, a living wall and sedum panels teeming with wildflowers between the tram tracks, it's an oasis right in the heart of Manchester. ANS worked on the project from the initial stages when the living wall was just a concept. There were many unique challenges, not least being that the living wall runs behind the glass balustrade of the staircase.





*From start to finish it has been an enjoyable project. ANS Global have answered our questions and our concerns regarding the final product and the installation was smooth and finished before our outlined time schedule.*



## Ursvik Recycling Centre

Sundbyberg, Sweden

 14 PLANT SPECIES

 267 SQUARE METERS

When Ursvik Council appointed us to create a living wall to decorate the wall of the recycling facility, provide essential sound insulation and to achieve the necessary environmental credentials, it really reinforced that green message. We're really rather in awe of the way the centre works; forget recycling trucks - here the centre 'sucks' the recyclable materials straight from around 800 local houses via an underground vacuum system. ANS felt honoured to be part of such an advanced and futuristic sustainability system.

Due to the extreme weather conditions that Sweden experiences, there were a number of concerns raised about the long-term sustainability of a living wall on a scale of these proportions. To assist us with our plant selection for the living wall, ANS Global installed a small trial wall on site for over a year. A large selection of plants were trialled and the wall was closely monitored throughout the seasons to determine the qualities of each.



CASE STUDY



CASE STUDY

## Volkswagen Showroom

Brentford, United Kingdom

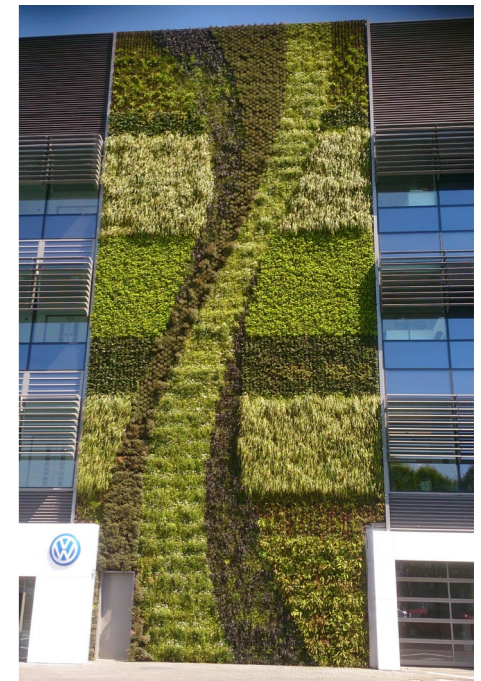
 9 PLANT SPECIES

 230 SQUARE METERS

VW is one of the best known car brands in the world. When building their new showroom in West London they chose to include a huge green wall to improve air quality in the area as well as making the building stand out.

The ANS Living Wall installed included a stunning pattern, reminiscent of a winding road, to inspire their visitors. The wall is maintained by the specialist ANS Global team. We recently completed installing one of our trademark exterior living walls up the façade of West London Volkswagen, Volkswagen's showroom HQ in Brentford. The installation stretches 23m high and 10m wide. It took our team less than a week to install all 1840 modules, working from a scissor lift platform.

VW's architect chose a living wall to boost the building up to a BREEAM sustainability rating of 'Excellent' and achieve an 'A' energy performance rating.



# Small Exterior Living Walls

- 1 Air Quality**  
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- 2 Increase Biodiversity**  
 Rather than making a hostile environment to nature, invite it back to the built environment. Living walls provide a habitat and food source for wildlife including birds, bees and butterflies.
- 3 Positive Social Impact**  
 Greener cities are healthier places. Enhancing public areas can reduce vandalism including graffiti and can have a further positive impact on physical health and mental well-being.
- 4 Structural Facade Protection**  
 Living walls naturally protect structures from deterioration caused by acid rain and driving rain, temperature changes, direct ultraviolet sunlight and corrosive dust particles in the air.
- 5 Temperature Regulation**  
 Green walls reduce the 'urban heat island' effect in cities. They also act as insulation helping to regulate a building's temperature, keeping it warmer in winter and cooler in summer.



*We absolutely love the living wall - we couldn't be more pleased with it! It provides a constant talking point when we entertain visitors and generates a lot of interest from everyone who visits us. We find your maintenance staff very helpful.*

CASE STUDY

## Private Client

London, United Kingdom

 10 PLANT SPECIES

 19 SQUARE METERS

This private client in London wanted a stunning feature wall to capture attention and make a design statement in the driveway of their home. The client wanted to include features including gnomes, stone gabions, flowers in vases, a watering can, an animal skull and a street sign.

The ANS Living Wall's modular design meant that it could work around the features in the wall. The plants selected were also planted in rectangles to compliment the features and draw the design together. The plants change colour with the seasons, adding further interest and seasonality to the space.





CASE STUDY

## Bird Street

London, United Kingdom

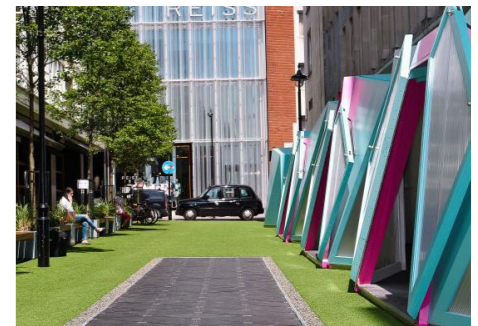
 9 PLANT SPECIES

 30 SQUARE METERS

This scheme is London's first sustainable smart street. The scheme includes a number of futuristic sustainability technologies, including paving that generates electricity which is used in real time to power speakers playing the sound of bird song, or to power lighting in the evening and night time. There are a number of air purification measures, including the living wall.

ANS Global were chosen to install the living wall as part of the improvement process to the street, the wall includes over 2,200 plants to improve the air quality, give a green backdrop and showcase a modern greening technology.

"Bird Street - Launched in June 2017, the world's first smart-street combines visionary technology in a previously an underutilized space just off Oxford Street. Transforming Bird St into a unique public space in the heart of London's West End to unwind, relax and enjoy innovative technology."





*We are delighted with our living walls and we feel they add a great sense of welcome to our customers.*

CASE STUDY

## Notcutts Garden Centre

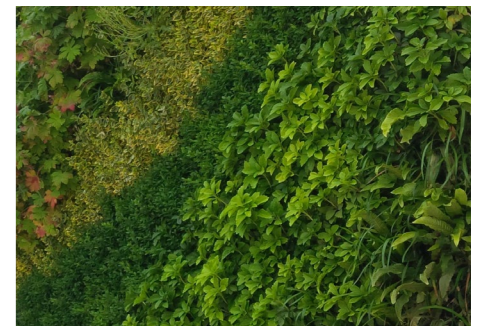
Tunbridge Wells, United Kingdom

 8 PLANT SPECIES

 38 SQUARE METERS

Notcutts is a family-owned business and is proud to announce that it has served the general public now for over a century. The redevelopment of a brand new garden centre at Pembury was the ideal opportunity to create three magnificent living walls! The beautiful building encourages lots of natural light and has been built with sustainability in mind, unlike most other garden centres. It is full of character and has some truly stunning features.

ANS Global was given the brief to install three living walls as part of a planning requirement, and to help create a visual sensation that places the beauty of plants at the heart of the shopping experience. These living walls heavily feature evergreen species with highlights of colour and texture in order to provide a warm welcome to the store. A short list of ten plant species were chosen, including Euphorbias, Geraniums, Liriopes, and Spring flowering bulbs such as Galanthus nivalis (to give seasonal interest).





The living wall is a fantastic addition to the bustling canalside area. The natural lush greenery perfectly complements the urban backdrop and offers visitors an oasis of calm in a busy city centre. ANS was great to work with – they understood our vision from the offset and met this with enthusiasm and top quality service.



CASE STUDY

## Côte Restaurant in Mailbox

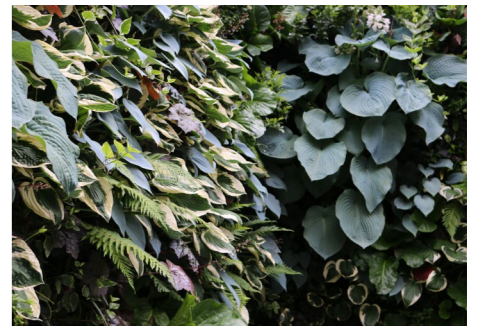
Birmingham, United Kingdom

 14 PLANT SPECIES

 60 SQUARE METERS

The Mailbox is the UK's largest mixed-use building and home to well-known brands such as Malmaison, Ramada hotels and Harvey Nichols. Located within Birmingham's city centre, being mindful of the surrounding environment was a key consideration and resulted in the specification of ANS Global's living wall. Over seven years later and the living wall, which surrounds Côte Brasserie's outdoor terrace, looks just as healthy as when it was first installed.

Living walls can dramatically enhance their surroundings and, with design options being endless, each wall can be unique to its application. As long as there is wall space available, vertical gardens can be created pretty much anywhere. They also help to protect exterior walls from weather damage and corrosion, providing further longevity for the space and ultimately reducing life cycle costs for the building owners. The Mailbox is also an excellent example of the longevity of living walls. Having taken advantage of ANS Global's maintenance contract, the results are long lasting. This is self-evident as the wall was installed seven years ago and is still very healthy.





CASE STUDY

## Private Client

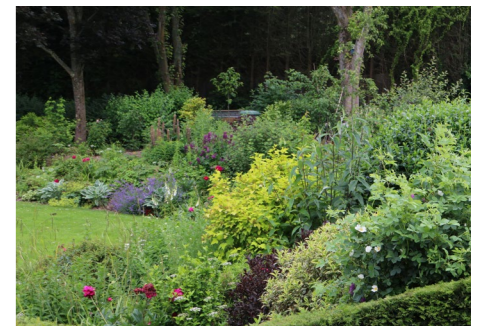
High Wycombe, United Kingdom

 11 PLANT SPECIES

 20 SQUARE METERS

**This residential client was having various home and garden improvements made and wanted to bring the garden closer to their house, while keeping their large patio area.**

The ANS Living Wall was the perfect way to bring beautiful planting closer to the house. The finished wall includes a range of species carefully chosen to a colour scheme and also arches over a wooden doorway in the middle of the wall.





Thanks to all the team at ANS Global for the professional delivery of the new living walls at Ritz Bahrain. We enjoyed the process of creating this living wall and visitors are always very impressed with the installation!



CASE STUDY

## Ritz Carlton Hotel

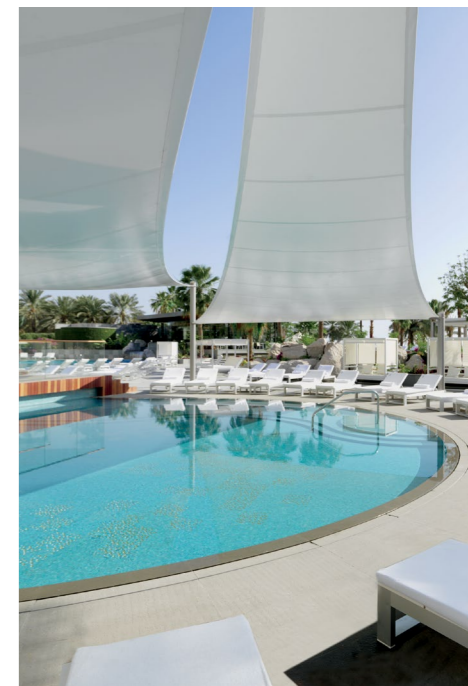
Manama, Bahrain

 1 PLANT SPECIES

 300 SQUARE METERS

The Ritz-Carlton, Bahrain Hotel & Spa, is one of the most magnificent luxury Bahrain hotels, located on a private island between Manama Bay and the city centre. Featuring 245 rooms and suites on a 20-acre resort complex, guests can enjoy awesome views of the Arabian Gulf from the quintessential Italian dining areas, the Al Ghazal ballroom or the outdoor pool and Jacuzzi!

As with all living wall installations in the Middle East, the correct plant selection was critical for the success of this stunning project. The ANS Global team carried out a full site and area survey and composed a list of plants that were native to the local area. By using native species, ANS could be assured that the plants would survive the extreme weather conditions long-term. The components for the project were all sent out to the nursery and the team followed along afterwards. Plants and growing medium were sourced from the local area and all the modules were planted up and left to establish. The installation team then went to site a few weeks later to assist the local construction company with the installation.



# Large Interior Living Walls

- 1 Visual Design Feature**  
Living walls look amazing. A stunning alternative to common building products, effective lighting and plant choice will make the wall stand out even more.
- 2 Green Branding Opportunity**  
Presenting your brand logo with foliage is a unique environmental statement. Not only can it reflect a brand's sustainability policy, but it can also help justify the expense of a living wall.
- 3 Sound Insulation**  
Whether indoors or outside, plants absorb and deflect noise. In independent tests on living walls, systems with a modular design (including the ANS Living Wall system) were proven to absorb sound better.
- 4 Healthy Air Quality**  
Indoor air quality can be worse than outdoors. Living walls can regulate an office temperature and moisture levels, and purify the air as well.
- 5 Team Morale**  
Many studies have shown the positive effect that plants can have on staff morale in the workplace. A living wall is a stunning way to include plants in an office environment and transform the space.



*The substantial living wall is certainly a talking point of the newly renovated building. It's a great way of introducing nature to the interior of a building providing the ideal link back to the work of CCI.*



CASE STUDY

## David Attenborough Building

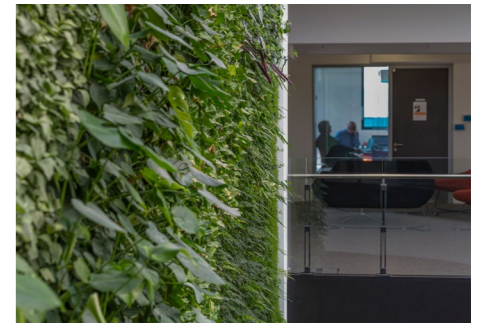
Cambridge, United Kingdom

 24 PLANT SPECIES

 105 SQUARE METERS

The original Arup Building at the University of Cambridge has recently seen a major refurbishment. Following its refurbishment, the building has been renamed the David Attenborough Building with the grand opening featuring Sir David Attenborough himself abseiling the 50ft wall. The building will now be used as the new global conservation hub. Nicholas Hare Architects LLP, was keen to include a feature that would have some relevance to the building's users, which resulted in the design of the living wall.

David Lowe of Nicholas Hare Architects LLP, specifiers of the wall said, "The living wall, which stretches the three storeys of the central atrium, aims to be educational and functional as well as ornamental. The design was based on an abstracted world map with the plants used relating to species from the different regions. We approached both the Green Infrastructure Consultancy and ANS during early stages of the project as we wanted the feature to be ambitious as possible in terms of its scale and visual impact within the space and this has certainly been achieved thanks to this collaboration."





CASE STUDY

## Great Western Quarter

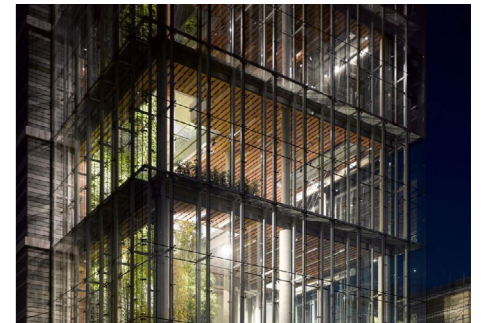
London, United Kingdom

 19 PLANT SPECIES

 111 SQUARE METERS

**Barratt Homes is the market-leading residential developer in London. With over 30 years of experience it has literally helped shape one of the world's most exciting, diverse and dynamic cities.**

This project is our biggest interior wall installed to date. Stretching over eight floors high, the living wall consists of 880 modules containing over 20 different species of plants. By the time the living wall was installed, the project was well on its way to completion with all the timber surrounds and décor installed; this meant that Motor Elevated Work Platforms (MEWP's) could not be used for the install. Thankfully, ANS Global always provide solutions to any challenge, so the living wall was installed by a team of abseillers! Coupled with a team working on the ground and from a scaffold tower, the whole installation (including first fix) was completed within three weeks. As with any living wall installation, maintenance is vital to the ongoing success of the wall, and a team will regularly visit to carry out routine tasks. Once or twice a year, abseillers will scale the wall to replace any plants, and check the plants for pests and diseases.





CHRISTCHURCH AIRPORT

Feedback gained from both airport staff and customers is that the wall is a great addition to the area.



CASE STUDY

## Christchurch Airport

Christchurch, New Zealand

 28 PLANT SPECIES

 30 SQUARE METERS

Christchurch airport is New Zealand's tourism gateway. This NZ airport is in the South Island and is located near many iconic tourism highlights, approx. 12km to the northwest of the city centre.

This unique living wall runs alongside the luggage conveyor belt in the arrivals lounge, giving passengers a fantastic arrival into New Zealand! The brief was to install a living wall that brought some of the native species inside, but also depicted some of the country's most iconic mountain ranges. To construct the whole design from plants wasn't feasible, so the mountains were printed onto a large canvas (this also means it can be changed as required, to another setting). The living wall sits snugly underneath the terminal sign, bringing to life the whole scene in a truly superb way! Plants consist mainly of interior tropical type plants, planted to a random design. Consisting of 240 individually planted modules, the living wall is maintained regularly by our New Zealand distributor.





*ANS Global's commitment to detail throughout the whole project was very impressive. They were a pleasure to work with, and the end result was breath-taking.*



CASE STUDY

## ECCO Conference Centre

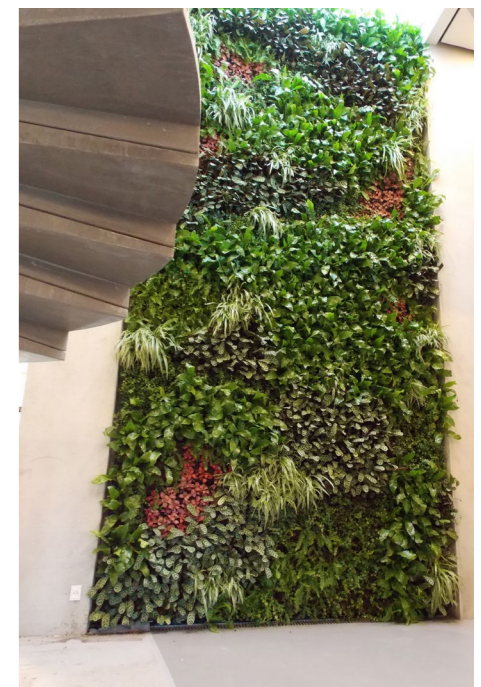
Tønder, Denmark

 6 PLANT SPECIES

 46 SQUARE METERS

**ECCO is a world renowned family-owned business, with a philosophy of making shoes that are shaped to fit the foot. They have shops around the world, and when they constructed a brand new Conference Centre on their head office site in Tønder, Denmark they wanted it to reflect the values and proud traditions of craftsmanship that are an inherent part of the company.**

The main atrium is dominated by two stunning indoor living walls. These stand over 6m tall, and their lush foliage wows visitors as they enter the venue. ANS Global was involved from the initial design stages, working closely with the architects to incorporate the irrigation systems and drainage within the building fabric, as well as designing the planting scheme to complement the modern, Scandinavian design of the Centre. The living wall modules were grown in the UK, and after being established they were shipped in dedicated, temperature-controlled transport across to Denmark.





*We were so excited about such a masterpiece, that we decided to situate it in the main entrance hall where our customers were given the sense of a warm welcome.*



CASE STUDY

## Rizon Jet

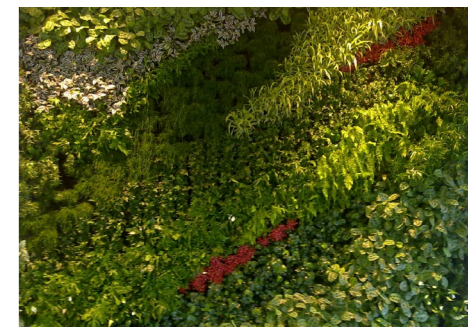
Bromley, United Kingdom

 14 PLANT SPECIES

 18 SQUARE METERS

Rizon Jet's award-winning, multi-million pound VIP terminal and maintenance operation (based at London Biggin Hill Airport) opened in May 2011. The Rizon Jet Biggin Hill FBO combines exquisitely appointed VIP lounges, dining areas and business suites with efficient, discreet, attentive services. This allows visitors to work, relax and dine in luxury. Founded in 2006, it provides a turnkey solution to private aviation and business jet travel.

The brief from the client was to create "a six star hotel reception," an atmosphere of richness and structural drama that our full-height living wall instantly communicates. The living wall design features more than 14 interior plant species which have a wide spectrum of colours and textures, including 'Maranta leuconeura 'Kerchoveana', Spathiphyllum sweet benito, Asparagus sprengeri and Tradescantia zebrina. These plant choices create swathes of colour and leaf sizes that help contribute towards the simple and calm colour palette found throughout the luxurious building.





*The living wall is beautiful and remains our most highly photographed feature. Many of our guests want to have a selfie in front of the wall so we're very proud of it.*



CASE STUDY

## Workshop Coffee Clerkenwell Café

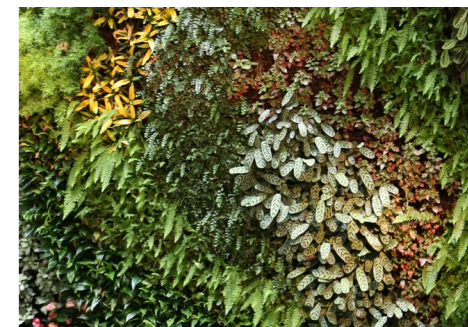
London, United Kingdom

 20 PLANT SPECIES

 23 SQUARE METERS

Workshop Coffee owns the Clerkenwell Cafe which produces artisan coffee alongside a food menu. The venue has exposed bricks and pipework with wooden tables and atmospheric lighting. Having recently refurbished their flagship cafe, the old roastery now offers a bright seating space beneath the ever-popular living wall. Upstairs holds further seating that includes larger tables, providing an ideal space for smaller or larger meetings, parties or just a quiet corner to get some work done.

The ANS Living Wall features a treble-clef shape in the planting, it is situated at the back of the cafe with a glass roof-light above it and additional lighting for visual effect.





CASE STUDY

## ANZ Koru Lounge

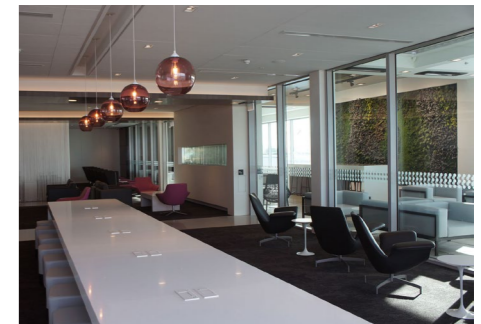
Auckland, New Zealand

 20 PLANT SPECIES

 23 SQUARE METERS

Air New Zealand, winner of the Airline of the year award for 3 consecutive years, upgraded their flagship Air New Zealand Koru Lounge at Auckland International Airport. The rapidly expanding and successful Airline designed a sleek and modern lounge incorporating stylish meeting rooms, VIP lounges, and luxury dining areas. Discreet and attentive service allows customers to work, relax, or dine in modern and luxury surroundings.

Oasis worked with the Los Angeles design team to create 7 detailed planting designs, each creating a unique atmosphere, with particular focus on structural effect, along with detailed consideration of the natural ambience. Once the final design was created and refined, Oasis grew the wall in our dedicated nursery. Installation was carried out and resulted in an instant impact, creating a natural expansive atmosphere, aligning with an impression of possibility the designers sought to form. As the living wall was such a key part of the project design, the architect and designers carefully situated the living wall so it could be seen from almost anywhere in the luxurious complex.





CASE STUDY

## Zoopla Property Group

London, United Kingdom

 4 PLANT SPECIES

 42 SQUARE METERS

Zoopla Property Group are renowned as one of the largest apps for streamlining the house purchasing process. Previously the group had three offices in London and in merging these three offices they moved to a new location in Southwark, London.

The ANS Living Wall system was installed in the foyer waiting area beside a wooden staircase and with an artificial grass, trees and seating. The planting mix was chosen to be predominantly shades of green with the occasional white flower included.





ANS Global are adaptable to any situation, installing on a cruise ship is no easy task but they went to great lengths to make our walls truly spectacular. We would like to take this opportunity to thank all of you at ANS Global for your help all hours of the day & night.



CASE STUDY

## Crystal Cruises

Los Angeles, United States

 13 PLANT SPECIES

 120 SQUARE METERS

Crystal cruises is a luxury cruise company, who care for their guests, employees and the environment in a truly unrivalled way. With a spirit of goodwill, Crystal sail the globe connecting intimately with communities in ways that are both meaningful & conscientious. Their motto, 'Crystal Cares', says it all.

When travelling on a luxury cruise ship like Crystal Serenity there's a lot of ocean between each destination with very little sign of life. Now travellers can relax and eat beside a beautiful living green wall, giving a sense of terra firma even in the middle of the ocean. ANS Global had to be especially careful in choosing the plants, as these ships - and therefore the walls - would face wildly differing climates as they moved from country to country. We used more sub-tropical plants than we usually might on a single project. These are the first (and still the only) living walls ever to be installed on a cruise ship. We're delighted to report that there's been very little need to replace plants, despite those climatic changes.



# Small Interior Living Walls

- 1 Visual Design Feature**  
Living walls look amazing. A stunning alternative to common building products, effective lighting and plant choice will make the wall stand out even more.
- 2 Green Branding Opportunity**  
Presenting your brand logo with foliage is a unique environmental statement. Not only can it reflect a brand's sustainability policy, but it can also help justify the expense of a living wall.
- 3 Sound Insulation**  
Whether indoors or outside, plants absorb and deflect noise. In independent tests on living walls, systems with a modular design (including the ANS Living Wall system) were proven to absorb sound better.
- 4 Healthy Air Quality**  
Indoor air quality can be worse than outdoors. Living walls can regulate an office temperature and moisture levels, and purify the air as well.
- 5 Team Morale**  
Many studies have shown the positive effect that plants can have on staff morale in the workplace. A living wall is a stunning way to include plants in an office environment and transform the space.



CASE STUDY

## XL Catlin

London, United Kingdom

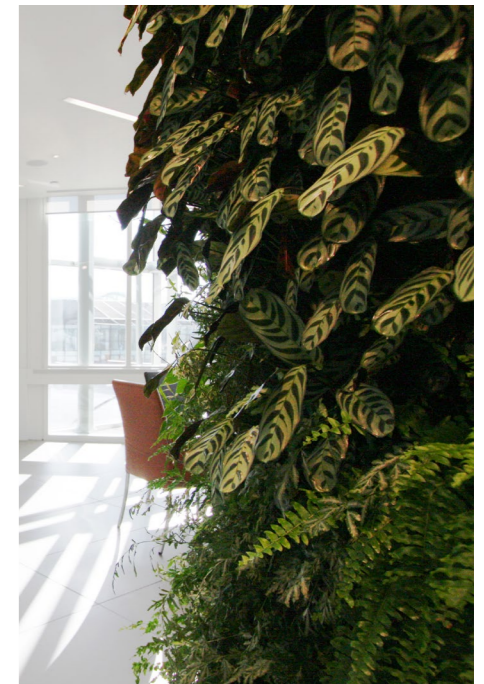
 11 PLANT SPECIES

 60 SQUARE METERS

XL Catlin underwrites insurance and reinsurance for industrial, commercial and professional firms, insurance companies and other enterprises throughout the world. The merger of XL with Catlin brings together an incredible blend of people, products, services and technology to help businesses in every sector.

A refurbishment in the main office reception area was undertaken and to complete the look of the stunning fit-out, a living wall was required. As usual, it was a bespoke project with unique requirements. Due to the wall being double sided and on the Seventh floor, weight was a critical consideration. The ANS Global living wall modules were fixed to a wooden framework (fabricated by ANS Global) which ran the length of the corridor in a curved shape.

The modules worked very well with the framework and all the irrigation including the tank were housed in a small cupboard located in the centre of the living wall.





CASE STUDY

## The Button Factory

Birmingham, United Kingdom

 9 PLANT SPECIES

 12 SQUARE METERS

The Button Factory (previously Vertu bar) is an eclectic bar serving an Italian menu. The bar is known as The Button Factory due to the buildings historical use. Situated in the heart of Birmingham's Jewellery Quarter, The Button Factory has restored and extended one of the quarter's traditional buildings. Sympathetic to the original design, The Button Factory's welcoming environment provides the perfect sanctuary all day long, from a coffee in the morning to late night drinks. In the warmer months watch the world go by on our expansive roof garden.

The living wall was chosen to provide a unique feature upstairs and was fixed back directly to the brick wall. A bespoke steel gutter was used to match in with the exposed pipe work in the ceiling space. The blend of 9 interior plants creates theatrical depth and pleasing colour variation.





CASE STUDY

## Melissa Galeria

London, United Kingdom

 8 PLANT SPECIES

 12 SQUARE METERS

Melissa is a pioneering brand in jelly shoes and fashion accessories. Their Galeria (concept store) in Covent Garden, London is described as a meeting place for fashion, art and design. They wanted to add a lush green backdrop to transform the space and give a unique retail experience.

The ANS Global team installed the two living walls during the night to prevent disruption to the stores opening hours. The walls provide a stunning green display with 8 species of interior plants including Ficus pumila 'Green Sunny', Philodendron scandens (heart-leaf) and Adiantum raddianum 'Fragrans' fern.



*The work completed by ANS Global was great, all of their team were very helpful and supported us every time we had doubts about the process. We are very happy with our new green wall, Galeria Melissa now looks different and new!*



CASE STUDY

## Fitbit Office

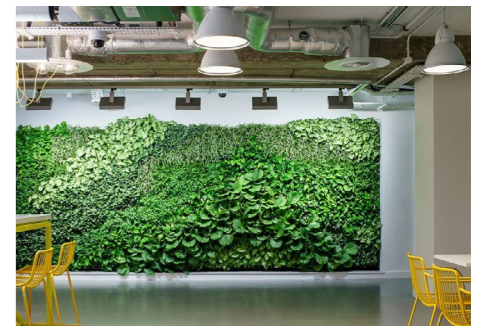
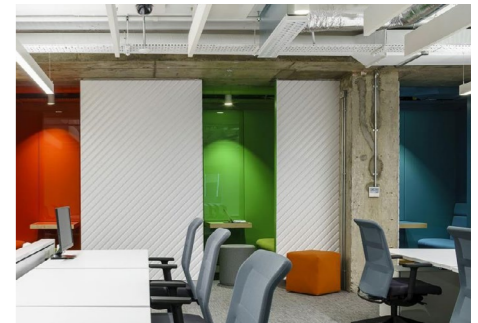
Dublin, Ireland

 8 PLANT SPECIES

 11 SQUARE METERS

The new Fitbit offices in Dublin needed to provide an excellent working environment to help their talented staff perform to the best of their abilities. The living wall was chosen to add a stunning feature to the office, provide acoustic properties and promote biophilia - the innate connection between humans and nature.

The ANS Living Wall system was chosen for its modular design and long lasting impact (with maintenance in place the living wall should last forever!). Also as the system uses natural soil, this provides even better sound insulating properties than some other living wall systems. The living wall was installed by our certified partners in Ireland.





CASE STUDY

## Planteria Group Office

Henham, United Kingdom

 9 PLANT SPECIES

 8 SQUARE METERS

**Planteria is an independent family-run business of botanical experts specialising in plants for offices, showrooms and public buildings.**

ANS Global were used to install the curved living wall in the entrance of their new offices. It gives an impressive welcome to the building and sets the scene for conversations about plants. Being a plant company is truly a wonderful thing, so when Planteria's 40th anniversary came around the bend at tremendous speed they set an awesome task for all their employees. This task was to design their own living wall and then the best would be chosen by all the employees and then installed in their Head Office!





CASE STUDY

## Tartufi & Friends

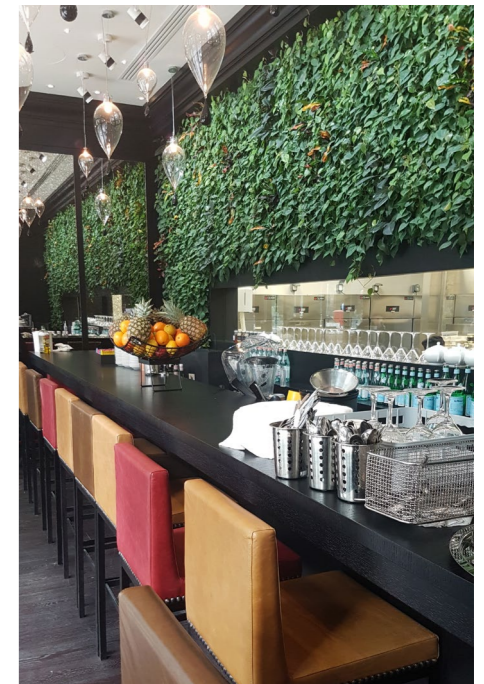
Dubai, United Arab Emirates

 4 PLANT SPECIES

 28 SQUARE METERS

This top quality restaurant is found in Harrods offering Italian cuisine, fine wine and specialising in truffles. Overlooking the Burj Khalifa tower with 2 terrace (indoor and outdoor) the 750 sqm space with a 20 sqm vertical garden is perfect to fit all needs and to welcome any customers that wants to relax!

The living walls were installed using the ANS system and provide a wonderful backdrop for the bar. The addition of a mirror at the end of the living wall extends the greenery and makes it look larger.





CASE STUDY

## Jaguar Land Rover

Multiple Locations, Europe

 11 PLANT SPECIES

 12 SQUARE METERS

The Geneva Auto Show is one of the most important events in the automotive industry calendar. Every exhibitor feels the pressure to put together a stand that will do their new vehicle launch justice. Jaguar Land Rover works hard on reducing its environmental impact - it won the BITC Responsible Business of the Year award in 2013 - so the Geneva and Paris motor shows are a perfect opportunity to reinforce those green credentials.

A creative design company, Imagination, had been appointed to create a state of the art, 1500m<sup>2</sup> exhibition stand for the show. They came to us to design an interior living wall as the backdrop to the all-important client meeting area on-stand. The living wall featured beautiful swathe of colour and leaf shape variation that provided a calming and positive environment for Jaguar Land Rover's client meetings. Our concept enables the living wall to be taken from show to show.





CASE STUDY

## Nike Lab Store

London, United Kingdom

 6 PLANT SPECIES

 10 SQUARE METERS

Tucked down Bateman's Row, just off Shoreditch High Street is the latest addition from a little sportswear brand that we all know and love. Nike's newest project is NikeLab, a new retail platform - both digital and physical with six locations around the world - which will provide an outlet for all of Nike's innovations, limited edition drops and collaborations. Designed to give customers an easier way into Nike's myriad of spin-offs it highlights the innovation of Nike's design. This NikeLab store in London needed a living wall as part of scheme to make the store feel calming and remind shoppers of the outdoor use of the products for sale.

ANS Global installed the lush green living wall overnight to provide minimal disruption to the retail operations. This living wall was temporary and therefore did not require an irrigation system.



# Glossary of Terms

Sources:  
[www.thenibble.com](http://www.thenibble.com)  
[en.wikipedia.org](http://en.wikipedia.org)  
[www.planetpals.com](http://www.planetpals.com)

<b>Adsorption</b>	Adsorption is the adhesion of atoms, ions or molecules from a gas, liquid or dissolved solid to a surface. This process creates a film of the adsorbate on the surface of the adsorbent. This process differs from absorption, in which a fluid is dissolved by or permeates a liquid or solid. Adsorption is a surface-based process while absorption involves the whole volume of the material. The term sorption encompasses both processes, while desorption is the reverse of it.
<b>Biophilia</b>	The term "biophilia" means "love of life or living systems." The biophilia hypothesis also called BET suggests that humans possess an innate tendency to seek connections with nature and other forms of life. Edward O. Wilson introduced and popularized the hypothesis in his book, Biophilia (1984).
<b>Coir</b>	Coir (or coconut fibre) is a natural fibre extracted from the husk of coconut. In horticulture, coir is a substitute for sphagnum (peat moss) and peat because it is widely available and environmentally friendly.
<b>Compost</b>	Compost is organic matter that has been decomposed and recycled as a fertilizer and soil amendment. Compost is a key ingredient in organic farming. Compost is rich in nutrients. It is used in gardens, landscaping, horticulture, and agriculture. The compost itself is beneficial for the land in many ways, including as a soil conditioner, a fertilizer, addition of vital humus or humic acids, and as a natural pesticide for soil.
<b>Cradle-to-cradle</b>	(also referred to as C2C or regenerative design) is a biomimetic approach to the design of products and systems that models human industry on nature's processes viewing materials as nutrients circulating in healthy, safe metabolisms. The phrase is a play on the phrase "Cradle to Grave", implying that the C2C model is sustainable and considerate of life and future generations.
<b>Deciduous Plant</b>	A plant that sheds all or nearly all its leaves each year
<b>Decompose</b>	To rot or decay as a result of being broken down by micro-organisms.

<b>Drip Irrigation</b>	The practice of applying water directly on the base of plants so that less water is needed to help them grow.
<b>Eco</b>	Anything pertaining to the positive interaction between manmade processes and the delicate organic balance found in our environment.
<b>Eco-Friendly</b>	Having minimal to no harmful or threatening impact on the natural environment.
<b>Ecologist</b>	A scientist who studies organisms and their environment.
<b>Ecology</b>	The study of living things in their environment
<b>Ecosystem</b>	A distinct area that combines biotic communities and the abiotic environments with which they interact.
<b>Environment</b>	The natural surroundings of an organism, which include everything, living and nonliving, that affects the organism.
<b>Environmental Impact</b>	The result of our negative and positive actions on the environment.
<b>Epiphyte</b>	A plant that grows on another plant in a relationship of commensalism
<b>Evergreen</b>	A plant whose needles or leaves remain green throughout the year
<b>Fauna</b>	All the animals in a particular area
<b>Flora</b>	All the plants in a particular area

# Glossary of Terms

## (continued)

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<b>Fluorocarbons</b>	Carbon-fluorine compounds that often contain other elements such as hydrogen, chlorine, or bromine. Common fluorocarbons include chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs).
<b>Global Warming</b>	The terms “climate change” and “global warming” are often used to mean the same thing. Global warming emphasises the rise in average temperatures
<b>Green</b>	A philosophy of creating eco-friendly products, using sustainable technologies that will not deplete our planet of its remaining resources.
<b>Habitat</b>	The physical place, such as a desert, forest, or single tree, where a plant or animal lives and which is usually described by its physical features; also the natural home of a community
<b>Hydroponics</b>	Hydroponics is a subset of hydroculture, the method of growing plants without soil, using mineral nutrient solutions in a water solvent. Terrestrial plants may be grown with only their roots exposed to the mineral solution, or the roots may be supported by an inert medium, such as perlite or gravel. The nutrients in hydroponics can come from an array of different sources; these can include but are not limited to byproducts from fish waste, chemicals, duck manure, or normal nutrients.
<b>Lichen</b>	A combination of two organisms, fungus and green algae, that live in a relationship of mutualism.
<b>Modular design</b>	A design approach that subdivides a system into smaller parts called modules, that can be independently created and then used in different systems. Besides reduction in cost (due to less customization and shorter learning time), and flexibility in design, modularity offers other benefits such as augmentation and exclusion.
<b>Organic</b>	All living things, and products that are uniquely produced by living things, such as wood, leather, and sugar. All chemical compounds or molecules, natural or synthetic, that contain carbon atoms as an integral part of their structure.

<b>Organism</b>	All living things, including people, plants, animals, bacteria, and fungi.
<b>Oxygen cycle</b>	The recycling of oxygen-containing gases between plants and animals.
<b>Parasite</b>	An organism that lives on or in a host organism and that gets its food from or at the expense of its host.
<b>Particulates</b>	Atmospheric aerosol particles, also known as particulate matter (PM), or particulates are microscopic solid or liquid matter suspended in Earth’s atmosphere. They have impacts on climate and precipitation and adversely affect human health. Particulates are the deadliest form of air pollution due to their ability to penetrate deep into the lungs and blood streams unfiltered, causing permanent DNA mutations, heart attacks, and premature death.
<b>Perlite</b>	Perlite is an amorphous volcanic glass that has a relatively high water content, typically formed by the hydration of obsidian. In horticulture, perlite can be used as a soil amendment or alone as a medium for hydroponics or for starting cuttings. When used as an amendment it has high permeability / low water retention and helps prevent soil compaction. Perlite is also an excellent filtration aid.
<b>PH</b>	The unit of measure for determining whether a solution is acidic, basic, or neutral.
<b>Photosynthesis</b>	The process by which plants use light energy trapped by chlorophyll to change carbon dioxide and water into food.
<b>Pollutants</b>	Substances that destroy the purity of air, water, or land
<b>Precipitation</b>	Water that returns to the earth as rain, hail, sleet, or snow
<b>Prevailing winds</b>	Winds that blow consistently from one direction
<b>Recycled</b>	Manufactured from used or waste materials that have been reprocessed for further use.

# Glossary of Terms

## (continued)

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<b>Recycling</b>	Collecting and reprocessing a resource so it can be used again.
<b>Renewable</b>	Able to be replaced or replenished, either by the earth's natural processes or by human action. Air, water, and forests are often considered to be an example of renewable resources.
<b>Respiration</b>	An ongoing process by which plants and animals take in oxygen and give out carbon dioxide.
<b>Rock wool</b>	Rock wool (mineral wool) is the most widely used medium in hydroponics.
<b>Succulent plants</b>	Plants that have thick, fleshy leaves or stems for storing water
<b>Sustainable Material</b>	Materials that are generated from resources that are managed in a way that they are, for all practical purposes, sustainable over an extended period of time (i.e., the resource is not depleted).
<b>Sustainability</b>	To keep in existence; maintain. To supply with necessities or nourishment; provide for earth also "sustainable living".
<b>Transpiration</b>	The loss of water into the atmosphere through the stomata of plants
<b>Urban Heat Island</b>	Buildup of heat in the atmosphere above an urban area.



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