

— 2024

Exterior Living Wall

Product Guide

Welcome

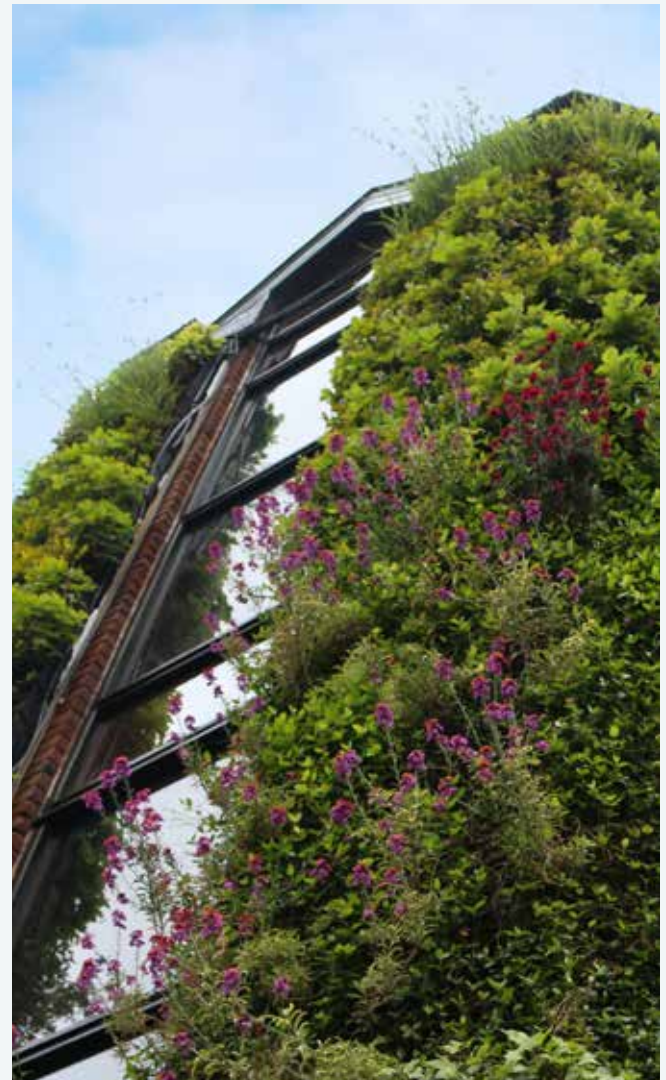
Leaving a legacy of biophilic and biodiverse spaces.

We realise buildings that actively improve urban biodiversity and air quality, and solve environmental regulatory challenges such as Biodiversity Net Gain (BNG) and Urban Greening Factor (UGF).

Where space is at a premium an organic living wall is the perfect solution to provide valuable ecological benefits and create a long-term environmental asset.

We hope we inspire you to enhance structures naturally.

Richard Silcock
Managing Director



The ANS Living Wall System

What do we do differently?

Building on the right foundation. There is one key element that is essential for the success of all the GI habitats for biodiversity and wider ecosystem services: soil. This one but hugely important factor allows for multiple added benefits, including:

- Solitary bees
- Water storage/buffer
- Fungal biodiversity
- Resilience against adverse conditions

Plants are growing in their natural habitat. This means greater resilience and a **long-term solution.**



The ANS Living Wall System

What's the difference between natural soil, hydroponic and wire systems?



Hydroponic

Uses a man-made substrate (such as rock-wool or insulation) for the plants to take root in. As there is no soil to retain moisture, it requires an almost constant irrigation supply containing chemical based nutrients feed the plants. As the plants are not growing in their natural habitat, plant design choice is limited.

The plants root hairs have insufficient protection and should the irrigation fail even for just two days, the entire wall is susceptible to drying out with devastating effect (pictured above).

We do not install hydroponic systems. While they can work in some applications the risk of failure is too great.

The ANS Living Wall System

What's the difference between natural soil, hydroponic and wire systems?



Wire / Climber System

This living wall system comprises of stainless steel wires which trailing plants grow up. This method provides a cost effective solution for large areas with the added benefit of low annual maintenance. The plants will however take a number of years to establish and are never likely to achieve full coverage. The planting is restricted to trailing plants only and it is impossible to create shapes, patterns or wording in the wall.

Viritopia can install wire systems where required, however it is not a true alternative to the ANS Living Wall system.

The ANS Living Wall System

What's the difference between natural soil, hydroponic and wire systems?



Natural Soil

This living wall system uses a natural soil based media as the plant substrate. The plants are therefore growing in their natural environment which allows for healthy natural growth, and greater flexibility with planting design to fulfil the purpose (eg. biodiversity). The system allows for a huge range of plant species and the planting facilitates creativity with shapes, patterns and words. The living wall can be installed fully established giving instant impact.

Natural soil is a long-term stable environment for the plants that retains water efficiently and provides greater biodiverse benefits. Even if the irrigation should fail, the plants root hairs are protected by the contracting soil, guaranteeing longevity.

The Process

1

Consultation

2

Design

3

Production

4

Installation

5

Maintenance

Consultation

What's your purpose?

Improving Local Biodiversity

Using natural soil affords us the chance to be creative with the plant palette, allowing specific selection of species with biodiverse properties.

We've worked on a wide range of projects where we've helped successfully achieve targets such as Biodiversity Net Gain.



Achieving Planning

Restoring some of the nature lost to the construction works and meeting local targets often helps to achieve planning permission.

As on the project below, we worked closely with the architect to ensure the MSCP received planning permission.



Consultation

Improving Air Quality

Soil is able to capture and filter particulate matter, and plants are naturally equipped with the ability to filter, absorb and trap particulate matter.

Some species have better air purification properties than others, and using soil as the foundation allows us to be specific when selecting the most effective species.



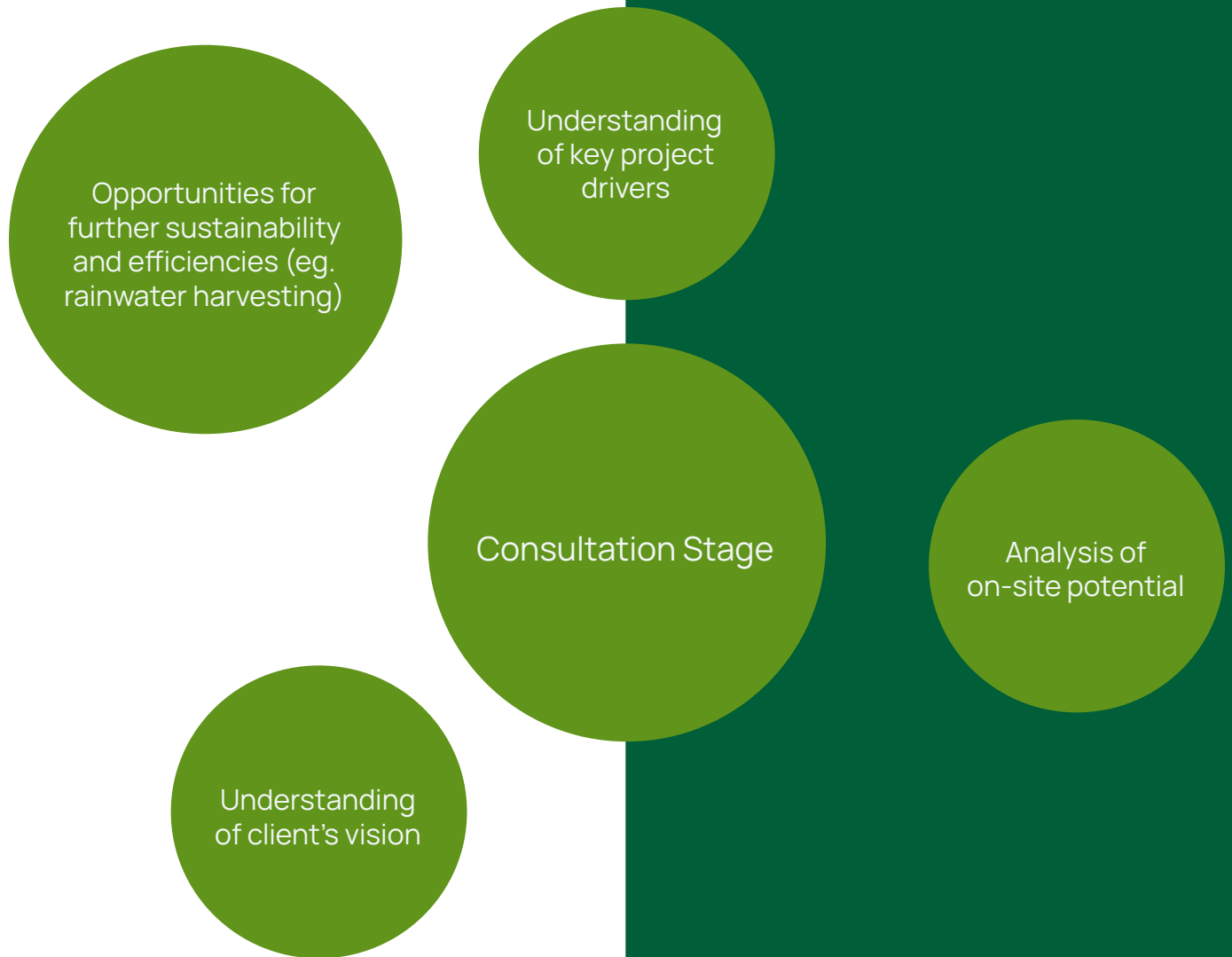
Biophilia + Well-being

Understanding the aim of a living wall is to promote well-being, our design team are able to propose concepts that take advantage of the biophilic properties of natural design.

Patterns, colours and textures can be used to mimic a particular scene or feeling.



Consultation



Design: Plant Selection


Plant selection is critical to the long-term success of a living wall. Our in-house horticulturists have crafted comprehensive plant lists based on a range of locations, aspects and design considerations. These are kept up to date with climate changes to ensure each project is a long-term success.

As well as climate, elevation and aspect, the desired aesthetic and project drivers are also key factors that affect the plant selection. For example, we create plant palettes:

- To improve biodiversity
- For air purification
- Provide seasonal interest with bulbs and flowering plants
- Meet specific regulations such as BNG



Design: Plant Selection



A challenge on a smaller scale: create a continuous tapestry of plants between the kitchen and the garden, using interior and exterior plant palettes.

Design: Concept Design



Our design team can produce full colour mock-up and design concepts either for a decided location, or to highlight the potential for living walls on multiple locations on -site.

These designs are helpful to show the benefits of different planting designs using the chosen plant palette, playing with colour, pattern, texture and 3D effects.

For this project, the final choice was a simple design using only three plant varieties, for a minimalist but textured finish.



Production



Each plant chosen for the wall is numbered according to its position within the module as well as the main wall. The modules are hand planted in accordance with the design's numbering.

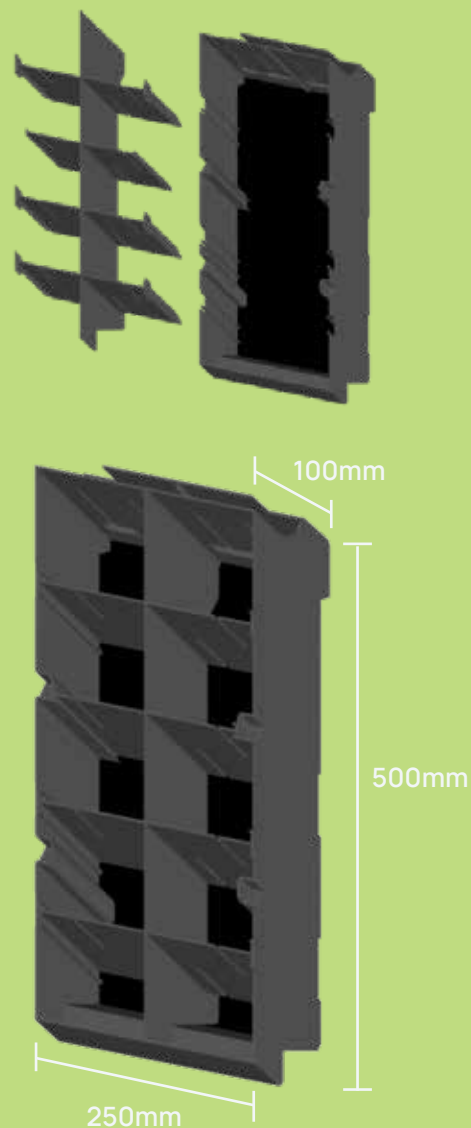
Our dedicated nursery team have years of horticultural experience, so the plants are carefully maintained and tended to throughout the establishment period.

We normally allow for a minimum establishment time of 3-4 weeks for internal living walls and 6-8 weeks for external, although this is dependant on the plant species used in the wall.

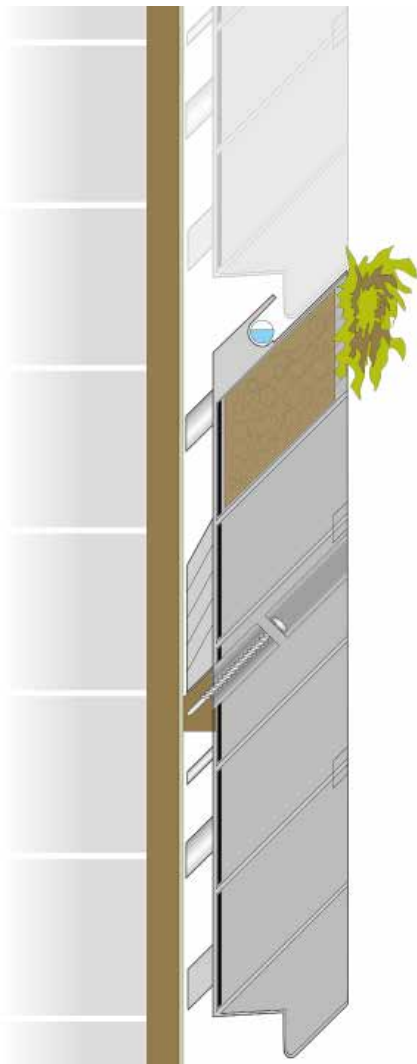
Once the wall is planted, the client is welcome to visit the nursery to inspect their wall and make any finer adjustments they feel are necessary to ensure the product's design and growth is to their satisfaction.

The ANS Living Wall Module

- Manufactured in the UK from 100% recycled material
- Wind resistant to 140mph
- Modules are planted and plants are acclimatised prior to installation
- 68kg per m² fully saturated
- In extreme weather the module is designed to expand externally
- 8 modules per m²
- No visual exposure of the module on the frontage
- 80 plants per m²
- Central section is separate to allow for deeper root movement in the module. This allows for larger plant species to develop.



The ANS Living Wall Module



Fire Regulations

The ANS Living Wall System has achieved the top fire rating to BS EN 13501-1:2018:

Class B-s2-d0

This is the highest possible fire rating for a living wall system.

Let's break down this rating.

Class A = non-combustible

Class B = limited combustibility

Class C = medium combustibility

s1 = little or no smoke

s2 = quite a lot of smoke

s3 = substantial smoke

d0 = none

d1 = some

d2 = quite a lot

(flaming droplets and particles)

Having zero droplets is key as it means limited or no surface spread of flame.

Fire Regulations

What does this rating mean?

You can design and integrate living walls into nearly all buildings apart from:

- Residential buildings over 11m in height

To learn more about where you can and can't design living walls and design amendments to improve fire safety, we recommend joining one of our 15 minute online learning sessions on this topic. Upcoming sessions are listed on our website [here](#).

It's impossible for any natural living wall system to achieve Class A.

Plants will always be combustible, no matter which types are used and how moist they are kept.

Be aware of natural systems that claim to be Class A. This is often the fire rating of the build-up and/or module, not the full system!



Installation

We use multiple build-up systems which enables us to work with most structures and surfaces.

This includes:

- Steel frame
- Brick
- Concrete

Designing and selecting a living wall system early on in the scheme allows for configuration of the right build-up system into the building structure (see image of Granta Park MSCP).

This not only reduces costs from doubling up on facade materials, but also gives the advantage of the opportunity to incorporate sustainable rain-screen cladding with added biodiverse benefits.



Helpful Tip

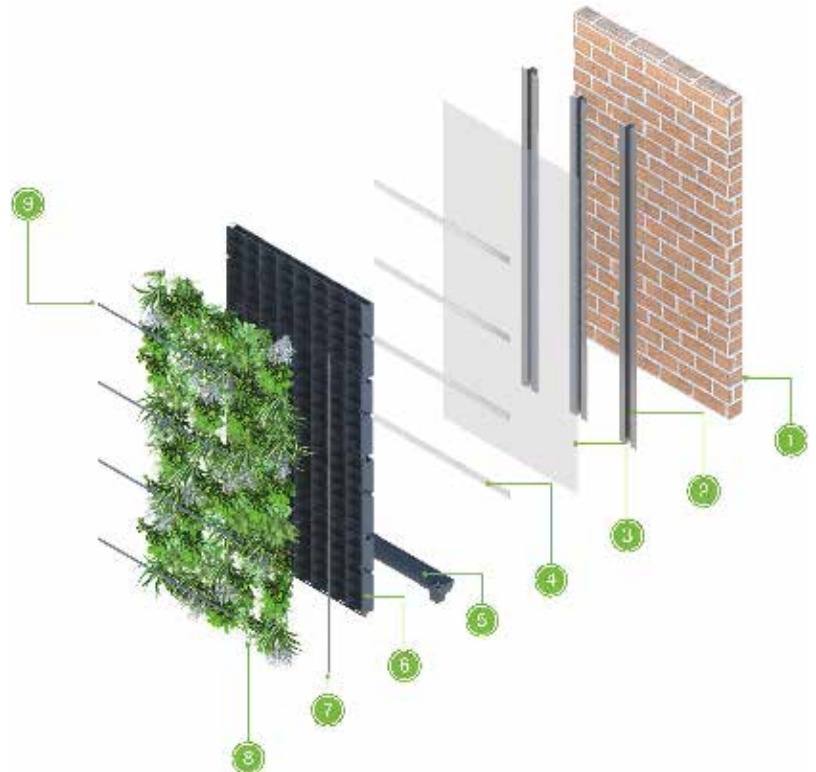
Ensure build-up and installation is considered early on in the scheme (early design stages). This can cause substantial cost savings.

Installation

Aluminium Tophat Build-up System (Standard)

This build-up can be used to retrofit a living wall onto new brick work and masonry facade. This option is suitable for any application where there is a solid brick or concrete surface to fix back to.

1. Indicative brick or concrete surface
2. Vertical Omega carrier rail
3. Breathable membrane
4. Fixing Rail
5. Squareline Gutter or client specified
6. ANS Living Wall Module 250x500x100mm
7. 16mm vertical irrigation pipe
8. Planting
9. 16mm inline emitter pressure regulated irrigation pipe

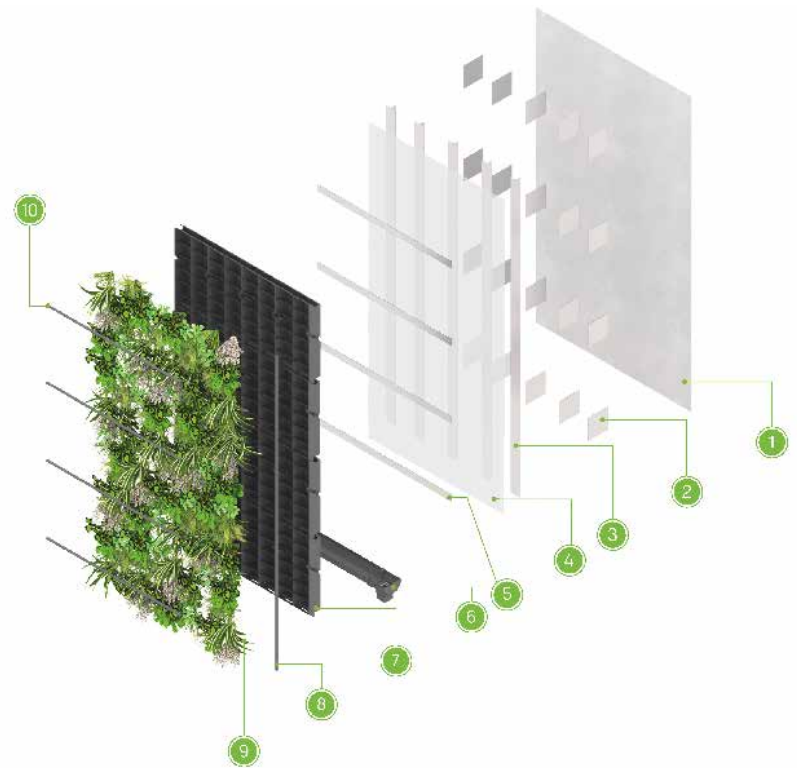


Installation

Helping Hand Build-up System

This build-up is suitable for a living wall that is to be applied as a cladding system onto a steel structure.

1. Indicative steel structure or cladding
2. Helping hand 'L' bracket
3. Vertical 'T' Rail
4. Breathable membrane
5. Fixing Rail
6. Squareline Gutter or client specified
7. ANS Living Wall Module 250x500x100mm
8. 16mm vertical irrigation pipe
9. Planting
10. 16mm inline emitter pressure regulated irrigation pipe



Installation

Steel Frame Build-up System

A purpose-built steel frame can be used to serve as a biodiverse sound barrier or site divider -

1. Indicative steel frame - centres and size
TBC by structural engineer

2. Breathable membrane

3. Fixing Rail

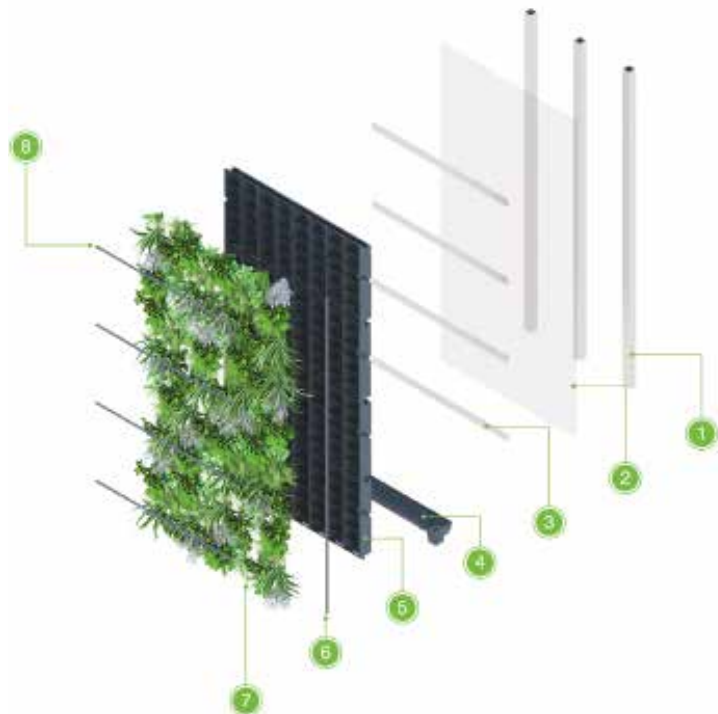
4. Squareline Gutter or client specified

5. ANS Living Wall Module 250x500x100mm

6. 16mm vertical irrigation pipe

7. Planting

8. 16mm inline emitter pressure regulated
irrigation pipe



Irrigation

The irrigation pipes are hidden from view but fulfil a critical role. The supply of water to the wall is essential to healthy plant development. The back of each living wall module is kept moist facilitating the natural composting of mature roots.

For living walls under 30m², we'll use an irrigation system without a tank, and for any living wall over 30m² there'll be a tank.

Using natural soil means we can keep the water usage to a minimum, as soil efficiently retains moisture - more than a man-made material can.

Every ANS Living Wall includes a built in irrigation system.

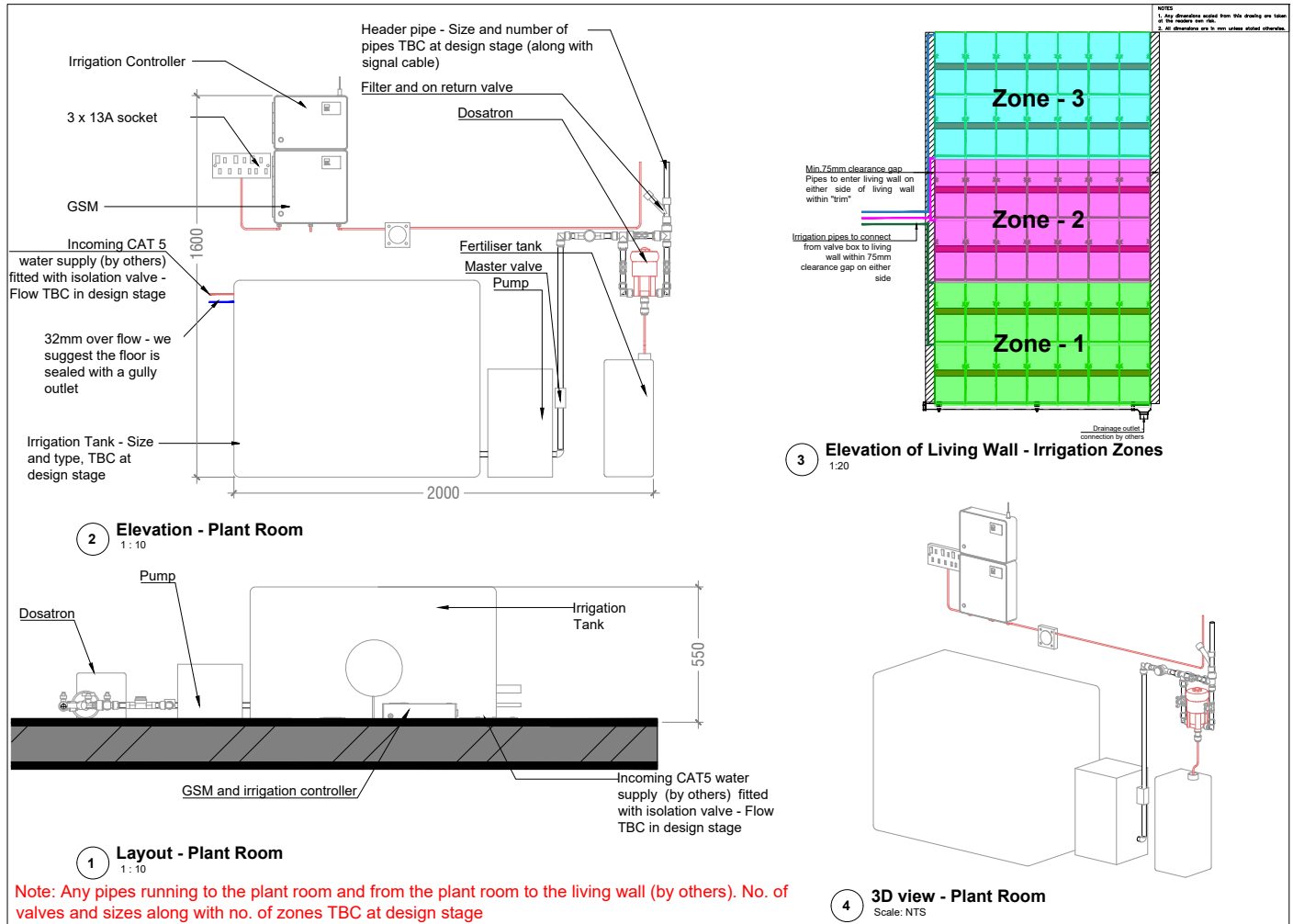
Rainwater Harvesting

Harvested rainwater from the building roof can be used for the wall.

We can work with you in the early stages to design in and integrate a rainwater harvesting system.

This is where we collect rainwater and use it to irrigate the living wall where possible. This not only increases the sustainability of the scheme by reducing mains water usage, but is effectively an alternative approach to SuDS (Sustainable Drainage Systems).

Irrigation with tank



Lighting

Lighting is an important consideration when designing a living wall. As in natural environments, different plant species thrive in various light levels.

Lighting



Top
Fitbit

Right
MOYO Hair

We can select plants to accommodate the aspect and natural light intensity of each project.

In areas where no natural light is present (particularly indoors) it is essential to artificially create the right light intensity and colour temperature to support healthy plant growth. Light intensity is measured in foot candles (FC) or lumen's.

For reference a clear summer day is around 15000 FC. We require a minimum of 250 FC for a long lasting living wall. 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 (4500 K to 6000 K). For a healthy living wall we require a minimum of 3000 K.

If you are unsure whether you will need extra lighting for your living wall, give us a call on +44 1243 545818 and we can discuss.

Drainage

Drainage is needed to cater for the minimal run-off at the bottom of the living wall.

As standard practise we will install a 107mm x 51mm black plastic gutter. However there is no limit to your creativity in specifying different drainage channels, as per the following examples:



Top Right
XL Catlins

Top Left
University of Leicester

Bottom
Traflagar Place



Maintenance



Maintenance and forward planning are key for product longevity and to ensure your living wall remains an environmental asset.

This will require regular visits to ensure the computer controlled irrigation system is distributing the correct amount of water throughout the wall. We recommend that this visit is monthly. At the same time, there will be a visual inspection to the plants checking for any early signs of pest and disease. Should there be any concerns, our technicians will apply a biological treatment which is safe for the environment through the irrigation system. Plant growth will be monitored and any localised trimming or pruning will be carried out.

These monthly visits ensure the walls are kept healthy and continue to flourish.

Maintenance



The Mailbox

Helpful Tip

The maintenance costs should be calculated at the design stage to become part of the management costs of the building and reflected in the service charge within the cost consultants' reports.

Twice a year a full plant husbandry visit will be arranged. This will require full access to whole of the wall. The plants will be pruned back in accordance with standard horticultural practice and any aged plants or failed plants can simply be replaced in their module (this is all covered in our maintenance contract).

Once the wall has had its overall prune, we then apply an organic phosphate/potassium feed through the dosatron to encourage root development over the coming year.

Details of maintenance should be included within the specifications, O&M manuals, and on-going management plans for the building.

The Benefits of Living Walls

We'll go into a bit more detail on the power of natural living walls, focusing on the following key advantages:

- Air Quality
- Biodiversity
- Planning and Regulation
- Temperature Regulation
- Protective Cladding
- Acoustics
- Property Value

Air Quality

Did you know that more than 300 cities in UK are over the WHO recommended limit of 10 mcg per cubic metre (PM2.5)?

Green infrastructure filters out up to **95% of the pollutants** generated by vehicles and industry and living walls are a powerful method to aiding air purification, covering a large expanse of otherwise wasted façade, and unlike traditional landscaping, without taking up precious space.

How does this happen?

Plants clean the air through the process of photosynthesis: absorbing carbon dioxide and producing oxygen, whilst soil assists in capture of particulate matter. Using soil also gives us flexibility with plant selection which allows us maximum opportunity to select species that hold air purification properties.

Fact

1m² of plant cover traps 130 grams of dust per year, and generates the oxygen required by a person throughout the year. Now imagine how effective hundreds of square metres on just one otherwise wasted façade would be?


Biodiversity

Biodiversity is hugely important to our quality of life, and this is especially pertinent in our urban spaces, where nature (and therefore biodiversity) is often constructed out.

Our system allows us to incorporate a diverse range of plant species that support the local ecology. Design can be tailored specifically to meet the project objectives and we can bring significant biodiverse value with specific plant species, including spring bulbs, native species and pollinator planting to create habitats for bees and encourage natural colonisation.

Natural substrate is the foundation from which we design for biodiversity. Without soil, we couldn't provide for biodiversity as much as we do on our living wall projects.

See the birds making themselves at home at [this development](#).



Living walls
at National Grid
Car Park

Planning & Regulation

Solve regulatory challenges and planning conditions by designing the wall to hit the environmental targets.

We've worked on several projects where the living wall has been specified to help the scheme meet specific standards, such as:

- Biodiversity Net Gain (BNG)
- Urban Greening Factor (UGF)
- Circular Economy
- BREEAM

Pictured: Living balustrade at London Wall Place



Biodiversity Net Gain



Soil-based living walls are hugely beneficial in helping projects hit the 10% BNG targets. We can design the plant palette to provide for biodiversity (either as the sole purpose of the living wall with 100% of the species providing significant biodiverse value, or a compromise). We can also integrate a rainwater harvesting system with the living wall for extra sustainability.

Urban Greening Factor

Incorporating a living wall can help you meet your local Urban Greening Factor target (they differ depending on project and location), as it increases the level of greening on your project.

The added benefit here is unlike a pond or wetland, a living wall does not take up space that could otherwise be developed, which means local targets can be hit **without compromising on ROI** of the build.

Pictured: The highwalk at London Wall



Circular Economy

A living wall is an effective way to **over-clad an existing building rather than demolishing**. Our modules are also made of recycled material and are recyclable, meaning we are not unnecessarily wasting materials.

The Mailbox is a great example of the Circular Economy principles in practice, where an old building needed a refurb and the architects used what was there to enhance the original structure and work with what they had. This included integrating a living wall instead of using traditional façade materials (we can integrate a living wall as an alternative rain screen cladding), which not only looks beautiful but supports local biodiversity too.



The Mailbox



BREEAM

Aiding a design focused on achieving a certain BREEAM rating, a living wall can help improve a buildings efficiency, and support on-going sustainability.

This was the case at the University of Nottingham, where the living wall supported achievement of BREEAM Excellent. This building was specifically designed to meet BREEAM and Passivhaus standards.



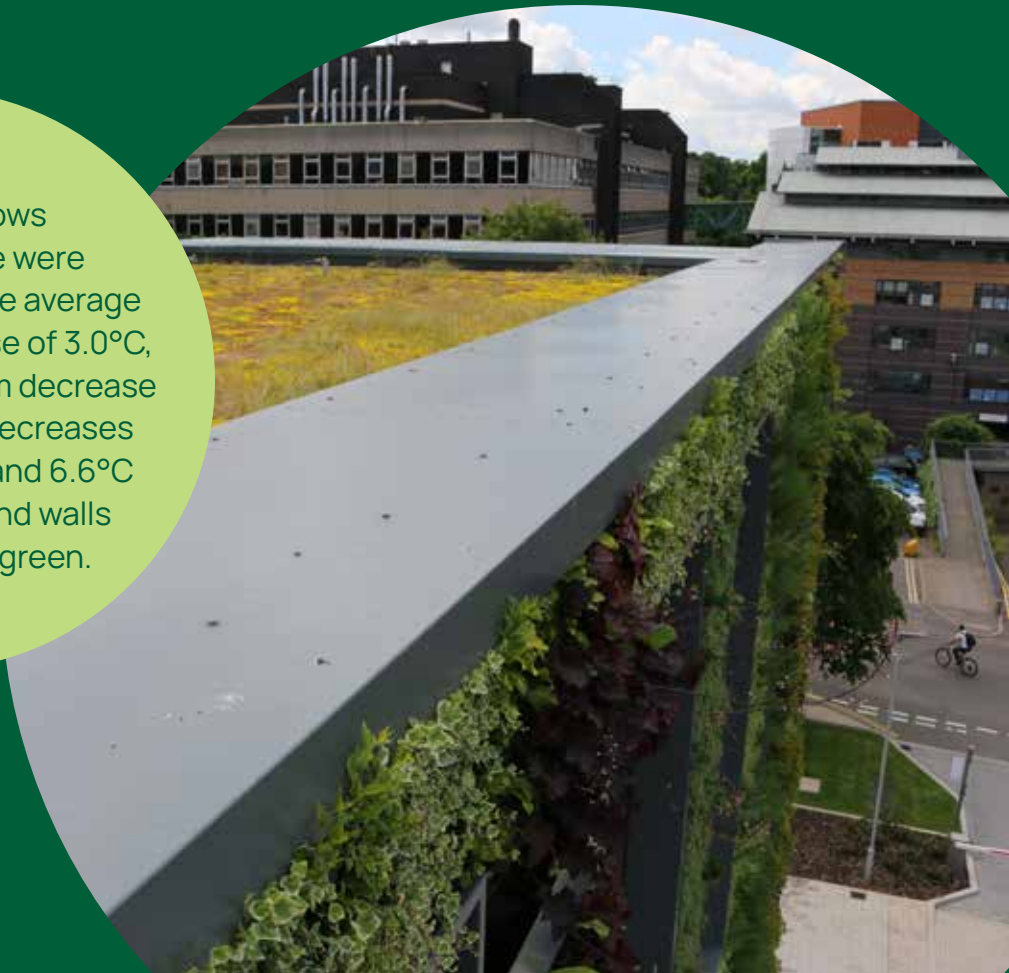
Temperature Regulation

In hot, dry summers, green walls have been shown to reduce the temperature of the external building wall behind them by as much as 16°C. Living walls also significantly reduce the 'urban heat island effect' (where human activity and development, like our cities, causes a 'heat island' that is hotter than surrounding rural areas).

Vegetation cools the environment through evapotranspiration and also by creating a shading surface that otherwise absorbs short-wave radiation.

One study shows that where there were living walls, a daytime average temperature decrease of 3.0°C, with a 4.5°C maximum decrease was noted. These decreases increased to 5.6°C and 6.6°C when both roofs and walls are covered with green.

University of Leicester



Protective Cladding

Many buildings must stand up to driving rain, temperature changes, direct sunlight and corrosive dust particles in the air. Living walls provide a natural answer to these issues.

The combination of plants and soil provide effective protection against rain and wind, furthermore 50% of solar energy is absorbed by foliage and a further 30% is reflected. When compared to cladding, paints and other building coatings which deteriorate, green walls can be an effective solution for the long-term sustainability of a structure, and also do not show the build-up of dust which is often noticed on façades next to busy urban areas.



Acoustics

In one study, an 80mm thick green wall reduced noise by 15dB.



Our living wall solution at [The NEC](#) was designed for the purpose of providing a site barrier and reducing noise transmission. Integrated into a purpose-built steel frame, the combination of the soil and variety of plants provide a solid sound barrier that successfully deadens unwelcome noises.



The same applies for the vertical greening at [London Wall Place](#), where a calm and tranquil oasis has been created next to one of the busiest roads in the area. When inside the gardens, you'd hardly believe you were in the middle of a bustling noisy city.

Property Value

Studies have shown that there is 7-8% less crime in areas with access to nature and increases of **4-5% in property price**. Nature is a premium in the city, and when there is a piece of nature integrated into a property design, this automatically increases the property value.

The biophilia effect highlights our instinctive attraction to nature. We are drawn to places with natural features and we are more likely to spend time there. Research has shown that having plants around a building can **increase real estate values** by up to 20%. Living walls aren't only an environmental asset, but an economic one too.

In a retail setting, the use of vegetation and landscaping leads to increases in rental rates on retail spaces with an increased customer spend of 8-12%.

The Avenue Centre



The Foundation of Success

What matters to us is creating something that is going to last a long time and will continue to fulfil the purpose it was designed for.

But this doesn't happen automatically. The design stage is the most important part of the process, usually allowing us to find and take advantage of the opportunities for greater sustainability, decrease costs and ensure the purpose of the living wall is fulfilled. Spending time on this stage will mean a successful finish.

What makes a living wall a long-term asset?

There are 4 key factors which are the founding principles of a successful long-term solution for any green infrastructure system:

- Natural organic substrate
- Correct plant species selection
- Water management
- Maintenance

Research References

The Times Investigation

<https://www.thetimes.co.uk/edition/news/join-our-campaign-5lnvhcl3c>

London Living Roofs and Walls Report 2019 - Dusty Gedge and Gary Grant

The Impact Of Green Walls And Roofs To Urban Microclimate In Downtown Dallas, Texas

https://rc.library.uta.edu/uta-ir/bitstream/handle/10106/24068/BielazSclar_uta_2502M_12471.pdf?sequence=1

Green Roofs and Green Walls Could they Mitigate the Heat Island Effect

https://www.researchgate.net/publication/317904611_Green_Roofs_and_Green_Walls_Could_they_Mitigate_the_Heat_Island_Effect

Biophilic Design Research Findings - Mott MacDonald

Our Mission

More than half the world's population lives in cities and the number keeps increasing. As development increases and space becomes more precious, we've looked to the wasted surfaces in our urban areas to re-introduce nature and provide long-term environmental benefits.

ANS Living Walls can clad walls both inside and out, while the ANS GrufeKit Green Roof System transforms wasted flat roofs into pockets of nature.

If you have a project or any questions please do get in touch.

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