



GREEN WALL  
SYSTEMS

# Specification Brief

# Welcome

Green living walls are an emerging architectural design feature in the urban built environment. With horizontal space at a premium, we have taken plants up the walls to bring the benefits of nature to commercial environments, both inside and out.

This guide is tailored for architects and design professionals to assist in specifying the proper system for common applications, general design considerations and a basic understanding of what it takes to design, install and maintain a successful green living wall.



creating environments where  
**PEOPLE THRIVE!™**



Natura is a preferred installation & maintenance firm for:

content copy and imagery credits to:



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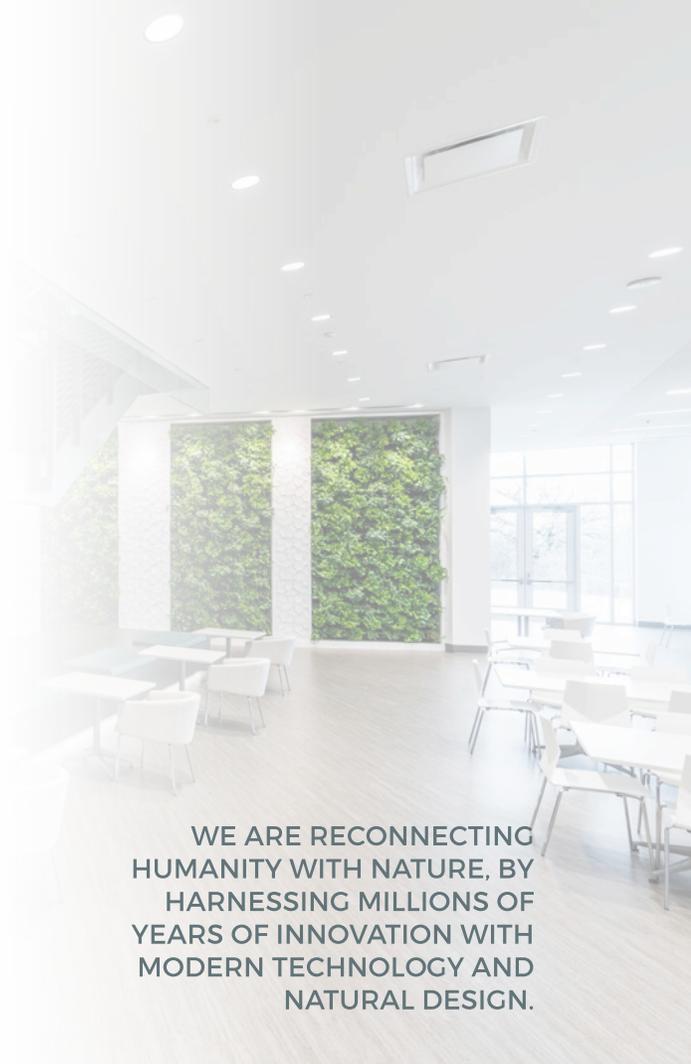


The inclusion of green living walls has exploded in the built-world and their application into our modern living and working environments. Architects, urban planners, designers and green industry specifiers have realized the underutilization of nature and have begun to take advantage of the environmental, aesthetic and human well-being benefits by incorporating their presence.

**INNOVATION AND EXPERIENCE ARE DRIVING COSTS DOWN AND DEMAND UP.**

It is important to note that significant improvements in greenwall technology and manufacturing processes have led to efficiencies, functionality, improved plant failure rates and overall system value.

Regulations are also beginning to shift in the favor of nature with cities and government regulators requiring vegetation in, on and around our buildings.



**WE ARE RECONNECTING  
HUMANITY WITH NATURE, BY  
HARNESSING MILLIONS OF  
YEARS OF INNOVATION WITH  
MODERN TECHNOLOGY AND  
NATURAL DESIGN.**

# Purpose



## Aesthetics

Planting patterns with varied species provide a stunning alternative to common building products.



## Improved Air Quality

Plant leaves filter out pollutants from the air and absorb dust particles.



## Increased Biodiversity

Living walls provide an alternative ecological habitats for insects, bats and birds.



## Branding Opportunity

Presenting your brand logo with foliage is a unique environmental statement.



## Staff Morale

Many studies have shown the positive effect that plants can have on staff morale in the workplace.



## Sound Insulation

Whether indoors or outside, plants absorb and deflect noise.



## Property Value

Living walls have the potential to increase residential and commercial property value and can also help secure planning permission.



## Structure Protection

Outdoor structural protection from both ultraviolet rays and acid rain is increasingly important. Plants provide a natural answer to both of these considerations.



## Social Impact

Enhancing public areas can reduce vandalism including graffiti. Can have a further positive impact on both physical health and mental wellbeing.



## Temperature Regulation

Reduces the effects of 'urban heat island' in cities. Also acts as insulation to regulate a building's temperature which can even allow for the reduction in air conditioning requirements.

## THE BENEFITS OF

Incorporating nature into our built environments directly impact the performance, happiness and well-being of human occupants as well as the building itself and the greater environmental ecosystem alike.

**Bioremediation is the use of micro-organism metabolism to remove pollutants at the microbial level. Phytoremediation is a specific type of bioremediation that uses plants to remove contaminants from the air, water, or soil.**



## VERTICAL SUCCESS

### A SUCCESSFUL LIVING WALL PROJECT STARTS WITH THOROUGH PLANNING AND DESIGN

We work with you to understand the project needs and constraints and identify the right system for your unique application. Our design team will prepare shop drawings and visualizations to ensure what's on paper aligns to the place.

### Green walls are impactful and dramatic!

Employees and visitors marvel at the lush greenery and calming displays. Creatively designed vertical gardens provide attractive color, texture and incredibly stunning displays. The emerging living green wall trend requires design inspiration and an in-depth knowledge of plant species that work. With proper selections, the results will be spectacular!

Many reputable installers require maintenance contracts for the first year or two to ensure plant establishment and proper system function. We are extremely reluctant to consider installing a living wall if the client declines first-year maintenance. Beyond establishment, continued stewardship is still recommended to promote long-term plant health and to maintain aesthetics.





## ENGINEERED TO THRIVE

**We believe in creating solutions based on Nature.**

Green Wall Systems are available in all shapes and sizes, for indoors and out, hydroculture or soil based plants, modular or made to measure.

**For every need there is an appropriate solution.**

But how do you know what system best suits your needs? What design considerations need to be taken into account to ensure consistent success?





**BEFORE SPECIFYING A GREEN LIVING WALL SYSTEM, IT IS IMPORTANT TO TAKE A FEW THINGS INTO CONSIDERATION AND ASK FOR ADVICE.**

Above all else a professional experienced in green wall installation and maintenance should be consulted to assist with the proper system and appropriate plant selections. For too often companies invest in living green wall systems that look great initially but gradually—and sometimes rapidly—deteriorate due to lack of proper care and maintenance by an experienced landscape professional.



## WATER SUPPLY

Irrigation delivery and automated control is crucial for the prolonged success of any greenwall system. Integrated irrigation systems reduce the maintenance costs and enhance the consistency of care necessary for healthy plant life.

Proper irrigation controls ensure the appropriate amount of water is even distributed through the entire system, minimal run-off, and long-term reliability.

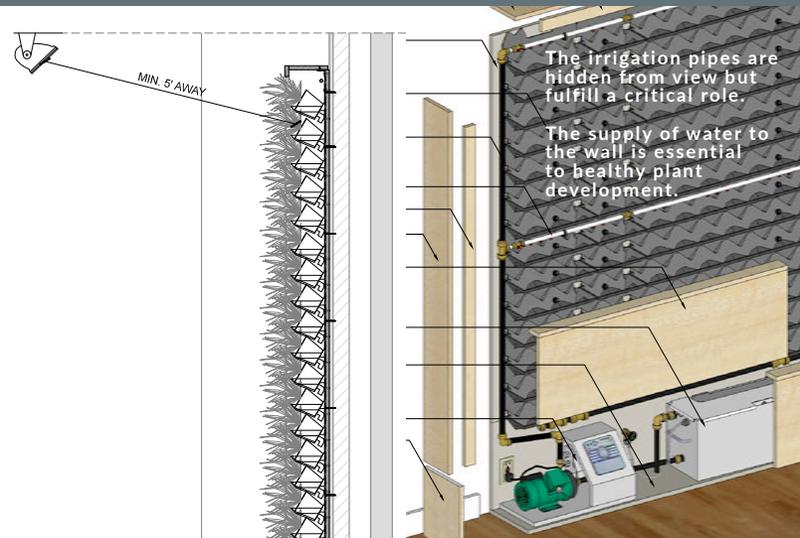
Typical water times are every 7-10 days depending on wall scale and plant varieties.

## LIGHTING

As in natural environments, different plant species thrive in various light levels. Regardless of the natural light intensity & availability, it is essential to artificially create the right light intensity and color temperature to support healthy plant growth.

An even flood of 150 fc / 1500 lux of light provided evenly across the entire surface of the wall for approx. 10-12 hours per day with a color temp of 4000-4500° K

Proper lighting is absolutely essential to the success of a living wall, or any indoor plants for that matter.



IT IS IMPORTANT TO SPECIFY  
THE APPROPRIATE PLANTS  
THAT CAN PERFORM WITHOUT  
SACRIFICING FORM OR  
FUNCTION.



## SERVICEABILITY & MAINTENANCE

Clients that are committed to greening their vertical space should be prepared to expense \$100-300 per square foot for a fully installed living wall. These figures take into account the continual product R&D, project planning and design, outside expertise, materials, growing media, plant materials, grow-out time and installation.

Cost significantly vary with scale, location, accessibility, plant palette, design, custom features and project timeline.

There must be an access point from which you can service the entire wall with either ladders, scaffolding or hydraulic lifts.

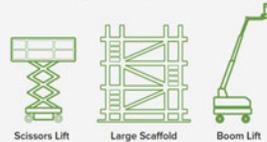
## PLANT SELECTIONS

It is important at this stage in your project, if not sooner, to consult with a horticultural expert. Natura representatives work collaboratively with architects and lighting specialists to ensure proper plant selections for each unique application.

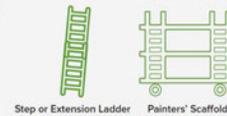
Selecting plant varieties is contingent upon design, climate, and available lighting.

To simplify, we recommend plants palettes that have similar light and moisture requirements to each other and the wall conditions.

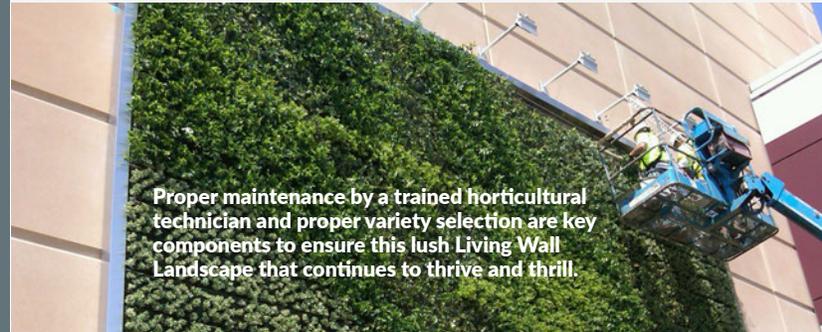
Wall Height of 13' / 4m and Above



Wall Height of 13' / 4m or Below



Wall Height of 8' / 2.5m or Below



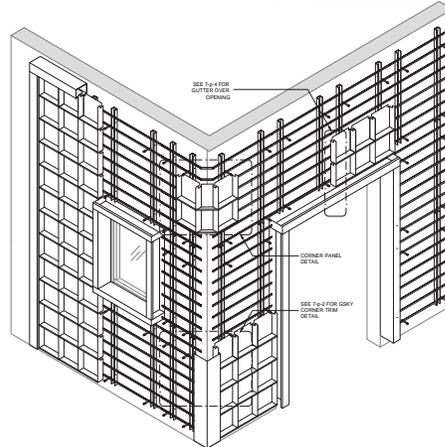
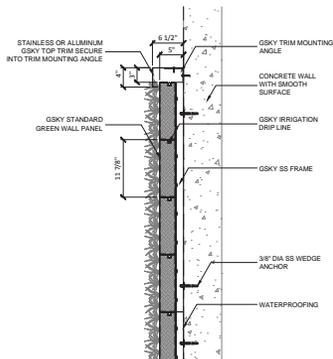
**Proper maintenance by a trained horticultural technician and proper variety selection are key components to ensure this lush Living Wall Landscape that continues to thrive and thrill.**

## PANEL SYSTEMS

Modular Panels are a robust and intensive green wall system that incorporate planting media and irrigation systems into panels or tiles. The grow media can range from soil, soil-less aggregates, rockwool, foam or synthetic fabrics.



### 2 PLAN DETAIL / CONCRETE WALL SCALE 3/4" = 1'-0" (PL# F10-2)



Panel systems are meant to accommodate artistic flair with a fullness of design, and are engineered to withstand challenging environments.

The process involves design of the wall, pre-growth of the panels in a nursery, and finally placement of the panels on the wall.

The grow media can range from soil, soilless aggregates, rockwool, foam or synthetic fabrics.

These systems are pre-grown in modular panels, fully irrigated, automated, and designed for both interior and exterior applications.



The benefits to these systems are the flexibility in large-scale design, engineered irrigation and fertigation controls that can be fine-tuned for the climate and season and the ability for the system to maintain the long-term growth of plant material for years to come.



## FEATURES

- Exceptionally intricate design flexibility
- Structural growth medium
- Plant material must be pre-grown in system modules for a minimum of 16-weeks in a nursery
- Highly durable under severe exterior conditions



## TRAY SYSTEMS

This system is designed to mount directly to a wall and displays plant material in their grow pots. A capillary wick is placed into the drainage holes of the grow pots and the plants are able to drink water from the tray reservoir as needed.

The planter trays come in various sizes and can be arranged in any form and fashion to fit space and design configurations. The beauty of the planter tray systems are ease of installation, instant appeal as no pre-planting is required and ease of replacement and seasonal plant variety swaps because the plants are not directly planted but remain in their nursery pots.



### Most used system today.

TRAY SYSTEMS ARE BY FAR THE MOST WIDELY SPECIFIED WALLS DUE TO THEIR FLEXIBLE CUSTOMIZATION, ECONOMICAL DURABILITY AND EASE OF SEASONAL PLANT ROTATIONS AND MAINTENANCE REPLACEMENTS.



## FEATURES

- Quick Installation
- No pre-growing of plant material required
- Integrated & automated irrigation systems for any application
- Versatile mounting options: Concrete, CMU, wood, metal
- Trays facilitate easy seasonal plant rotations



## FREE-STANDING

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We offer a variety of free-standing and movable indoor/outdoor modular systems. These walls are quick to install and relatively easy to maintain.

They are ideal for leased space or floor plans that change over time. They can be placed against a wall or in the middle of a room to create partitions and privacy barriers.





## ADVANTAGES

- Integrated irrigation system
- No electricity required
- No water pump required
- Easy to move
- Visual privacy
- Reduces ambient noise
- Fully self-contained



## CASSETTE SYSTEMS

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Cassette systems are as easy to install as framed artwork and hangs on your wall just like a painting. Living Art or Live Pictures are flexible and functional and available in a variety of sizes and finishes. Each interchangeable cassette holds 4" plants and snaps in and out of the frame for easy maintenance or rotation. The water reservoir concealed behind the frame holds a 4 to 6 week supply of water and incorporates a wicking system for easy of maintenance.





## BENEFITS

- Integrated irrigation system
- No electricity required
- No water pump required
- Easy to move
- Visual privacy
- Reduces ambient noise
- Water every four weeks
- Provides a healthy indoor environment and increased oxygen levels
- Easy to change out plants for maintenance & seasonal displays
- Lightweight, no need to affix to studs

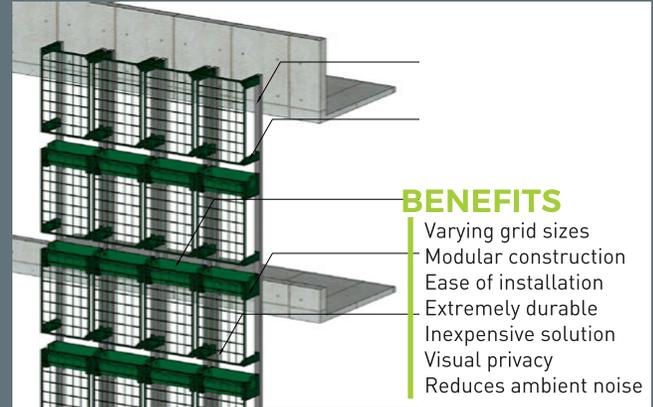




## TRELLIS

Trellis systems utilize wire or cables arranged in a mesh grid to provide structural support for vine and running type plants. These systems are excellent for any exterior applications where a large area needs to be covered and instant impact is not required.

The plants are either planted in the ground or staggered within the system. Full-coverage is usually obtained within an annual growth cycle depending on initial plant size and distribution density.



- BENEFITS**
- Varying grid sizes
  - Modular construction
  - Ease of installation
  - Extremely durable
  - Inexpensive solution
  - Visual privacy
  - Reduces ambient noise

# SUSTAINABILITY AND LEED

Leadership in Energy and Environmental Design (LEED) is a rating system devised by the United States Green Building Council (USGBC) to evaluate the environmental performance of a building and encourage sustainable design.

Planted walls can make the building more energy efficient by providing a shield from strong summer sunlight and provide protective insulation during the winter months. This reduces energy consumption and the building's carbon footprint. Exterior living green walls also provide a habitat for butterflies, ladybugs and small birds within their ecosystem.

The use of living green walls can help a building to earn LEED points making it more attractive to occupants and increase the property's overall value.



## 1. Initial Consultation

Review project criteria, timelines, scope, budget, design goals, etc.

## 2. Design Phase

Select appropriate system that aligns to budget and design intent  
 Determine plant pallet, design, irrigation method and supplemental lighting requirements

## 3. Pre-Installation Planning

Shop drawings, field measurements, MEP documents, lighting studies, technical specifications, etc.  
 Plants are sourced or contract grown for project specifications

## 4. Installation

Hardware arrives to site and supporting structures are configured: backers, membranes, irrigation controls & delivery systems  
 System is tested for function, leaks & stability.

## 5. Maintenance

Every green wall project requires ongoing plant maintenance

### INITIAL PROJECT QUESTIONS:

- What is the primary purpose of this living wall?  
(Aesthetics, marketing, air quality, water efficiency, LEED Points, etc.)
- What is the scale of this project?
- What is the ideal project timeline?
- How will the plants receive light and water?
- Any plant preferences? (tropical, succulent, natives, herbs)
- Any plant design ideas? (random, pattern, custom art)
- Are there design complexities? (wall curves, 90o turns, custom trim, etc.)
- How will the living wall system be affixed? (structural wall, frame, free-standing)
- Favor permanence or mobility?
- Who will install and/or hook up utilities?
- What is the budget for maintenance? (natural and adaptive, pruned like a golf-course)

### CRITICAL CONSIDERATIONS:

- WEIGHT**  
 10-20 lbs per sf, fully saturated
- ATTACHMENT**  
 Structural wall  
 Supporting structure  
 Free-standing
- SYSTEMS**  
 Modular panels or fabric layers  
 Designed for root support, water retention, and drainage  
 Soil-based or soilless  
 Some systems may integrate with HVAC
- IRRIGATION**  
 Integrated drip irrigation  
 Direct-sourced from the tap or recirculated from a storage tank  
 Fertilizer typically delivered via irrigation
- LIGHTING**  
 Lighting will dictate the plant palette  
 Interior living walls: near skylights or windows, may require supplementals  
 Outdoor systems: orientation, nearby shade from buildings, trees, seasonal light
- PLANTS**  
 Interior: tropical plants that thrive in low-light  
 Exterior: succulents, perennials, grasses, ferns, wildflowers, and even food.  
 Modules arrive pre-planted or planted on-site





## THE BOTTOM LINE

Living Walls can be a significant financial investments, but integrating nature into urban and indoor environments begets numerous benefits, enhances our lives, and improves our health. Your clients may be willing to pay for that.

When you need us, we are ready...



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INDOOR  
PLANTS



OUTDOOR  
PLANTS



GREEN WALL  
SYSTEMS



HOLIDAY  
DECOR

