



**VERTICAL  
GARDENS**  
**Technical Information**

# 01

## VERTICAL GARDENS SINGULARGREEN

Our vertical gardening systems offer multiple possibilities for the integration of vegetation: very light hydroponic systems where irrigation is a fundamental part or mixed and substrate systems, heavier but less dependent on irrigation.

In any of our systems, water consumption is optimised to avoid waste and achieve greater sustainability.

### SYSTEMS SINGULARGREEN

F+P



LEAFSKIN



ECOBIN



**Energy** savings

Improved **thermal and acoustic** insulation

Extending the **life of the façade**

Improved **air quality**

Increasing **biodiversity**





El Corte Inglés, Valladolid, 2020



Torre Realia, Barcelona, 2020

## 02

### VERTICAL GARDEN

#### F+P

The F+P system is currently our bet for all types of gardens, both indoors and outdoors.

It is a garden system with specific inert substrate for hydroponic vertical gardening, formed by SG-L40 panels. Thanks to the characteristics of this substrate, constant aeration of the roots is ensured, which makes plant development perfect.

These panels retain and distribute water very well, which allows a greater possibility of plant species and also allows plants to withstand extreme temperatures, both hot and cold.

# 02.1

## F+P

### DESCRIPTION OF THE SYSTEM

**TYPE OF SYSTEM:** Hydroponic, with inert substrate.

**LOCATION:** Outdoor and indoor.

**MANUFACTURING:** SG-P35 waterproof support panels with SG-L40 substrate panels mechanically fixed.

**INSTALLATION:** Panels pre-assembled in our facilities, ready to fix to the support, install the irrigation network and plant the selected plant species.

**NEEDS:** Water point, light point and water outlet connection to return or drainage.

**TYPE OF IRRIGATION:** SG-A24 hydroponic system adapted to the scale of the vertical garden, with the option of recirculating waste water.

The main advantage of this system is its lightness, **not exceeding 50 kg/m<sup>2</sup>**, making it the ideal system for large vertical gardens.



Valencia, 2020

Irrigation pipe SG-R16  
SG-A24 irrigation system

SG-P35 panel:  
Supporting and waterproof layer

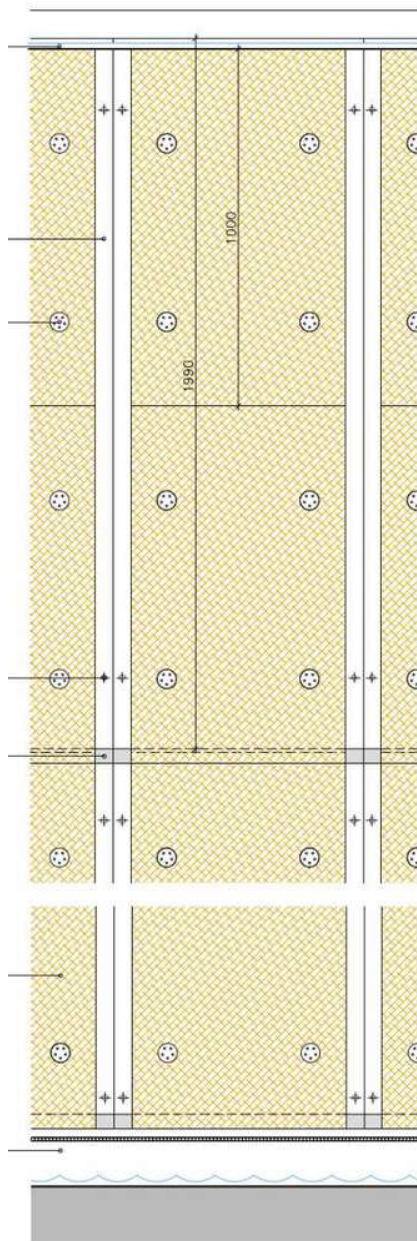
Screw with washer to fix the  
substrate panel to the  
waterproofing.

Direct anchoring to receiving wall  
(according to project)

Z-profile fixed to the waterproof  
panel (ensures contact between  
substrate panels)

SG-L40 PANEL:  
Synthetic substrate panel  
specifically for vertical hydroponic  
gardening

Water collection system.  
Metal grille and channel.



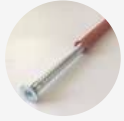
## 02.2

F+P

### SYSTEM COMPOSITION TYPE

The F+P system is composed of SG-L40 panels of inert substrate, specifically for vertical hydroponic gardening, mechanically fixed to SG-P35 waterproof support panels that are anchored to the supporting wall.

The vegetation is finished by planting the selected plant species at a rate of 20 to 40 units/m<sup>2</sup> in the existing holes in the substrate.



### BEARING AND RETAINING LAYER

#### DIRECT ANCHORING:

Metal screw with dowel, according to project.



#### SG-P35 PANEL:

35 mm thick cellular PVC panel, anchored by screws to the garden wall, with joints and holes sealed with polyurethane mastic.



### PLANT SUPPORT

#### SG-L40 PANEL:

Synthetic substrate panel specifically for vertical hydroponic gardening, 40 mm thick.



### PLANT SUPPORT FASTENING

Plastic washer Ø60 mm. and metal screw for fixing self-supporting rigid insulating materials.



### VEGETABLE FINISH

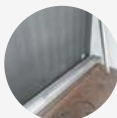
Plant species selected by the SingularGreen technical team according to the project and climate zone, at a rate of 20-40 plants/m<sup>2</sup>.



### IRRIGATION PIPE

#### SG-R16 PIPE:

16 mm diameter pipe with self-compensating and anti-drainage drippers with fixed flow rate, separated according to project requirements.



### WATER COLLECTION SYSTEM

Metal channel with water outlet, recirculation or drainage.



## Easy maintenance and replacement of plants



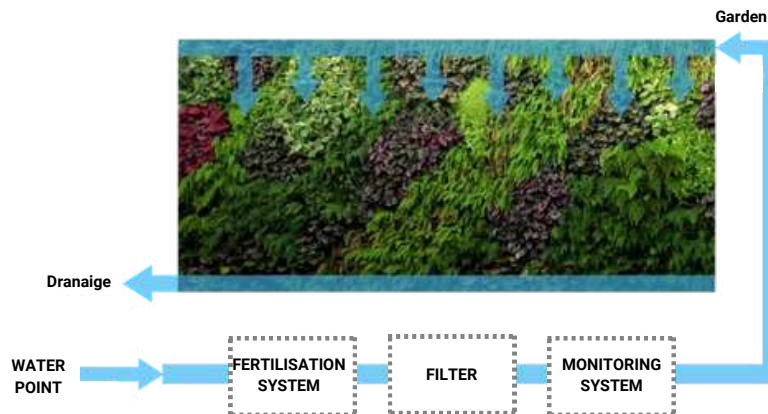
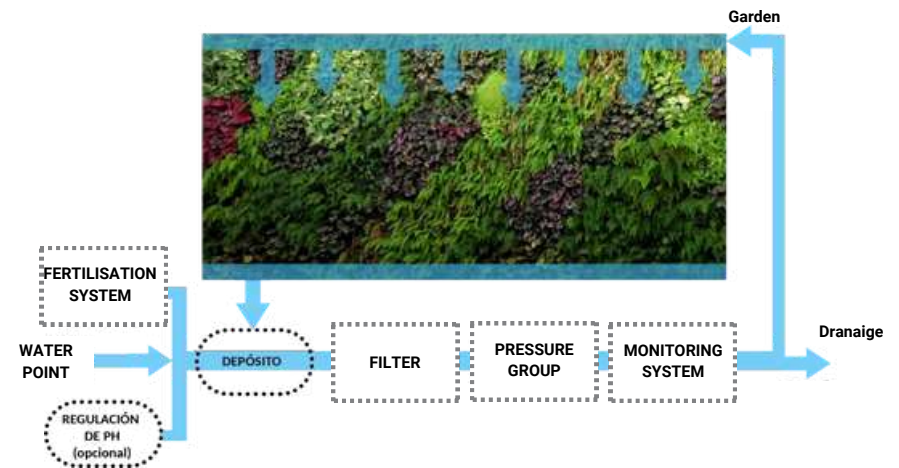


# 02.3

## F+P IRRIGATION SYSTEM

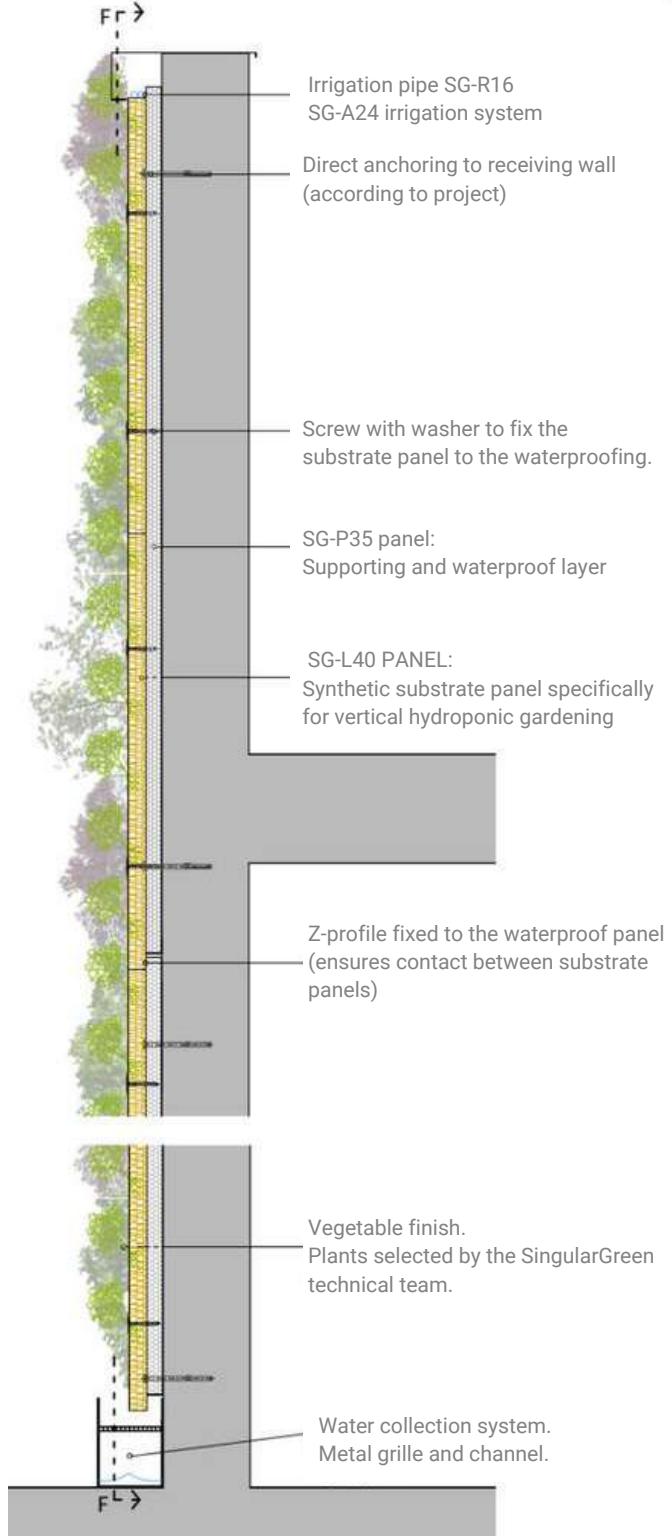
### WATER RECIRCULATION: SG-A24R IRRIGATION SYSTEM

The SG-A24R irrigation system allows for maximum water savings since consumption is reduced to almost only evapotranspiration and water consumed by the plants. In a Mediterranean climate, water consumption during winter is approximately 1 liter per square meter per day, while water consumption during summer is around 5 liters per square meter per day.



### CONTINUOUS WATER DRAINAGE: SG-A24P IRRIGATION SYSTEM

The SG-A24P irrigation system minimizes the space required for the irrigation system. Therefore, it is recommended for projects where the available installation space is very limited.



# 02.4

## F+P

### GENERIC CONSTRUCTION DETAIL

DETAIL  
GENERIC CONSTRUCTION  
DWG



DETAIL  
GENERIC CONSTRUCTION  
PDF



# 02.5

## F+P

### TECHNICAL DOCUMENTATION

#### APPLICABLE REGULATIONS

- CTE. DB HS Health and Safety.
- CTE. DB SI Fire Safety.
- CTE. DB-HE Energy Efficiency.
- NTJ 11V Vertical Landscaping.

\*This regulation is mandatory in Spain. If the work is to be carried out in another country, please consult the specific regulations of that country.

#### SPECIFICATIONS



El Corte Inglés, Valladolid, 2020

# 03

## VERTICAL GARDEN LEAFSKIN

The LeafSkin® system improves the performance of traditional vertical gardening systems. A lightweight seeded garden, with 40% less weight than the rest of hydroponic vertical gardens, only 30 kg/m<sup>2</sup>.

It stands out for its easy installation, its minimum thickness and its adaptation to walls with any geometry.

It is the most economical system and is especially suitable for large surfaces.



Jardín vertical Canal de Isabel II, Madrid, 2020

**Ultralight  
system**

**Thickness  
minimum**

**Adaptation to any  
type of wall**

**Easy  
installation**



Jardín vertical Azuqueca de Henares

# 03.1

## DESCRIPTION OF THE SYSTEM

### **TYPE OF SYSTEM:**

Hydroponic, with sprayed substrate.

### **LOCATION:**

Outdoor and indoor. Ideal for large areas.

### **MANUFACTURING:**

Standard size panels adaptable to different shapes and sizes.

### **INSTALLATION:**

Delivered pre-assembled and seeded, ready to be anchored to the support and connected to the irrigation pipes. All that is required is a water supply and drainage connection.

### **TYPE OF IRRIGATION:**

Recirculation of water or discharge to the drainage network.

The main advantage of this system is its lightness, not exceeding 30 kg/m<sup>2</sup>, and its versatility, as the panels adapt to all shapes and sizes.



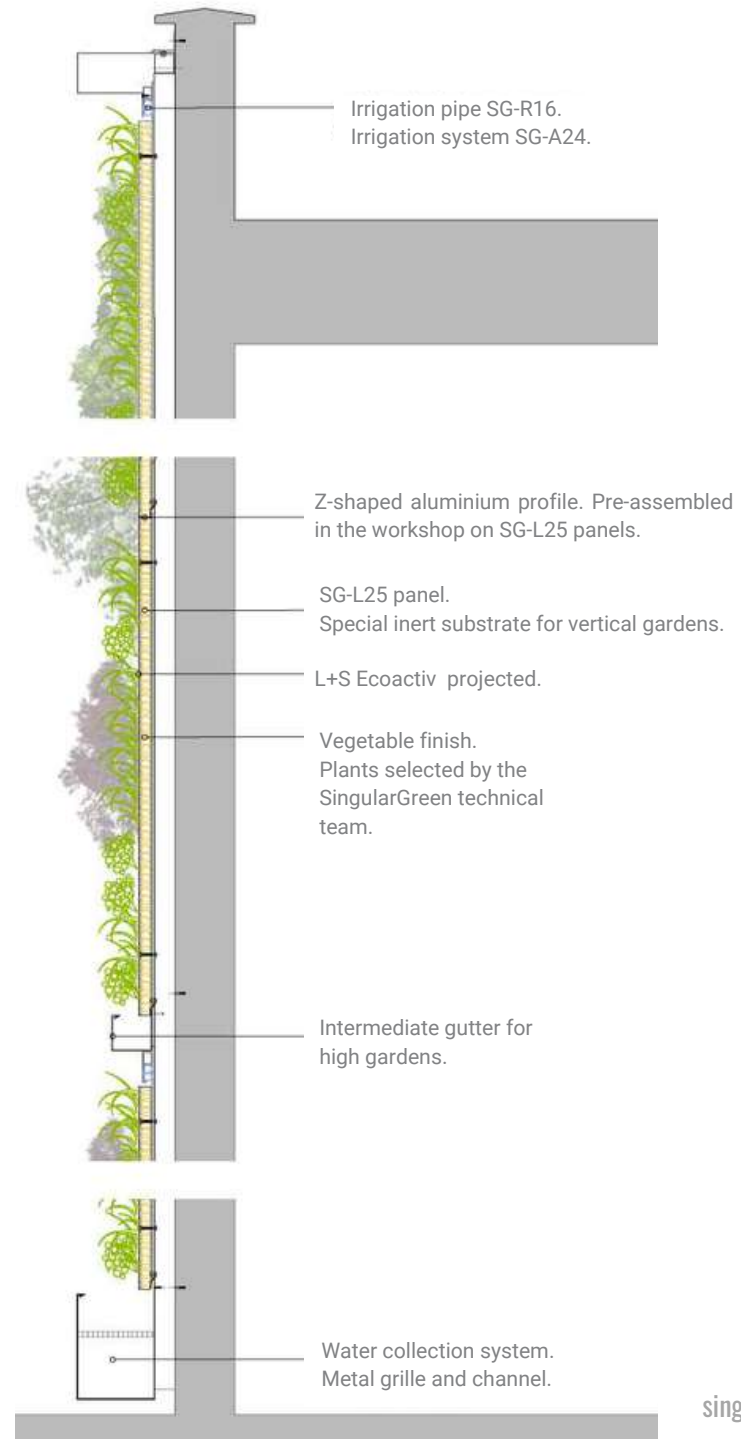
Juan Bravo, Madrid.

# 03.2

## LEAKSKIN

### COMPOSITION TYPE OF SYSTEM

The LeafSkin® system consists of multi-layer panels that are attached to an aluminium substructure, through which the irrigation system is installed and the garden is anchored to the supporting wall. The vegetation layer arises from the substrate sprayed with a seed mixture.





## BEARING AND RETAINING LAYER

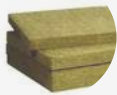
### DIRECT ANCHORING:

Metal screw with dowel, according to project.



### SG-P35 PANEL:

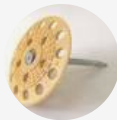
35 mm thick cellular PVC panel, anchored by screws to the garden wall, with joints and holes sealed with polyurethane mastic.



## PLANT SUPPORT

### SG-L25 PANEL:

Synthetic substrate panel specifically for vertical hydroponic gardening, 25 mm thick.



## PLANT SUPPORT FASTENING

Plastic washer Ø60 mm. and metal screw for fixing self-supporting rigid insulating materials.



## VEGETABLE FINISH

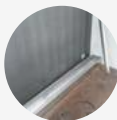
The vegetation is finished by projection of L+S Ecoactiv including seeds of the selected plant species.



## IRRIGATION PIPE

### SG-R16 PIPE:

16 mm diameter pipe with self-compensating and anti-drainage drippers with fixed flow rate, separated according to project requirements.



## WATER COLLECTION SYSTEM

Metal channel with water outlet, recirculation or drainage.



## Ultra-lightweight system



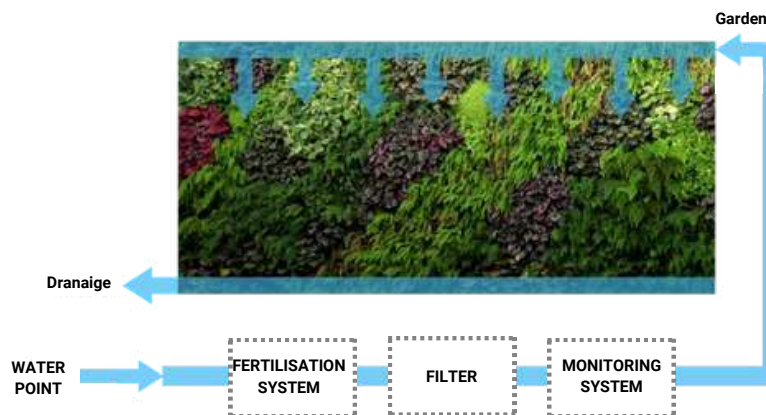
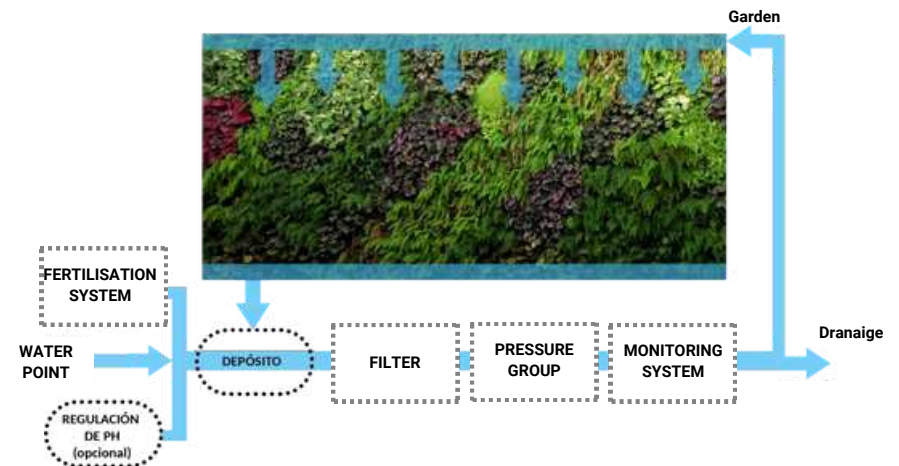
Jardín vertical Palacio de Congresos de Vitoria, 2014

# 03.3

## LEAFSKIN IRRIGATION SYSTEM

### WATER RECIRCULATION: SG-A24R IRRIGATION SYSTEM

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### CONTINUOUS WATER DRAINAGE: SG-A24P IRRIGATION SYSTEM

The SG-A24P irrigation system minimizes the space required for the irrigation system. Therefore, it is recommended for projects where the available installation space is very limited.

# 03.4

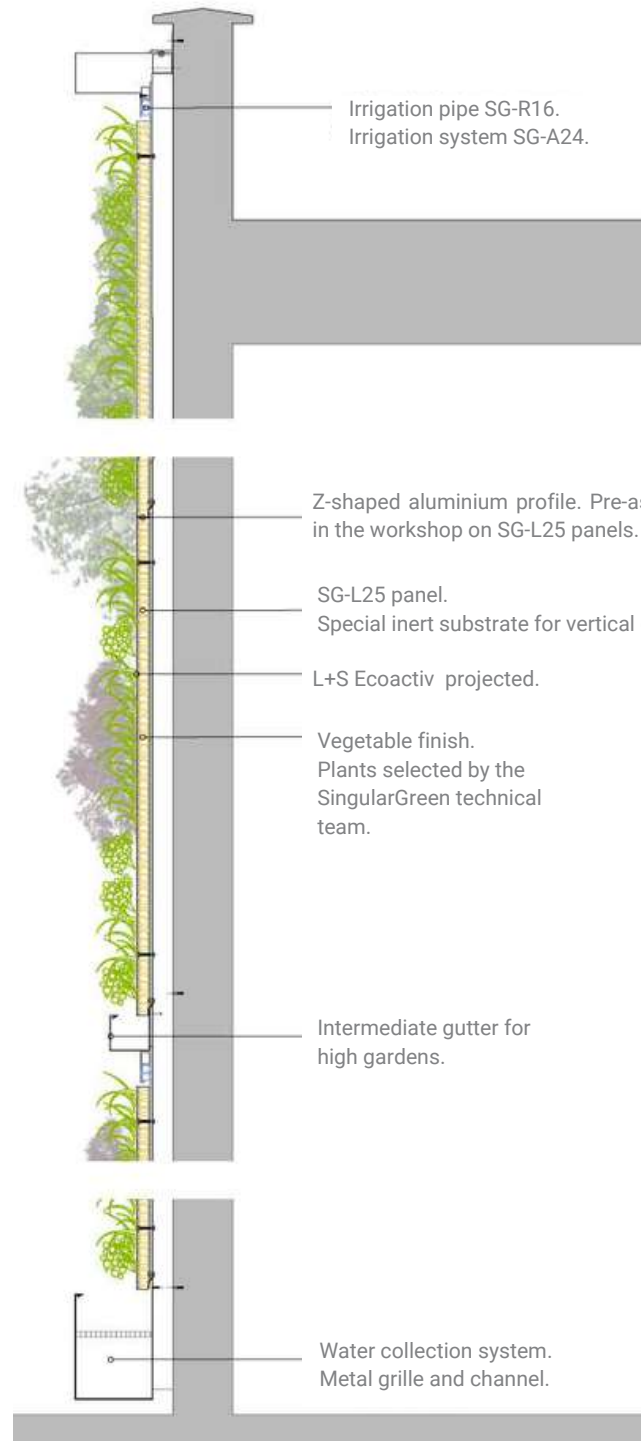
## LEAKSKIN

### DETAIL GENERIC CONSTRUCTION

DETAIL  
GENERIC CONSTRUCTION  
DWG



DETAIL  
GENERIC CONSTRUCTION  
PDF





Vertical garden Vitoria Congress Centre, 2014

# 03.5

## LEAKSKIN TECHNICAL DOCUMENTATION

### APPLICABLE REGULATIONS

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- CTE. DB SI Fire Safety.
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### SPECIFICATIONS



# 04

## JARDÍN VERTICAL ECO BIN



Vertical garden Nando's Restaurant, London.

The Eco Bin system stands out for its unique design and finish.

It is a panel of bottle racks with ceramic pieces that are intercalated and used as a planting medium for the garden.

In each hole is located a plant that takes water from the watering water from the panel behind the garden. Suitable for spaces where a ceramic finish is required.

# 04.1

## ECO BIN DESCRIPTION OF THE SYSTEM

**TYPE OF SYSTEM:** Hydroponic, with inert substrate.

**LOCATION:** Outdoor and indoor.

**MANUFACTURING:** Factory of ceramic pots with aerating substrate and retentive substrate that are intercalated and used as a planting medium in the garden.

**INSTALLATION:** Panels pre-assembled in our facilities, ready to fix to the support, install the irrigation network and plant the selected plant species.

**NEEDS:** Water point, light point and water outlet connection to drainage.

**TYPE OF IRRIGATION:** SG-A24P system, characterised by continuous water drainage.

The main advantage of this system is its design, combining the plants with the ceramic-finished bottle racks.



# Flexible design



Teatre del Raval vertical garden, Barcelona

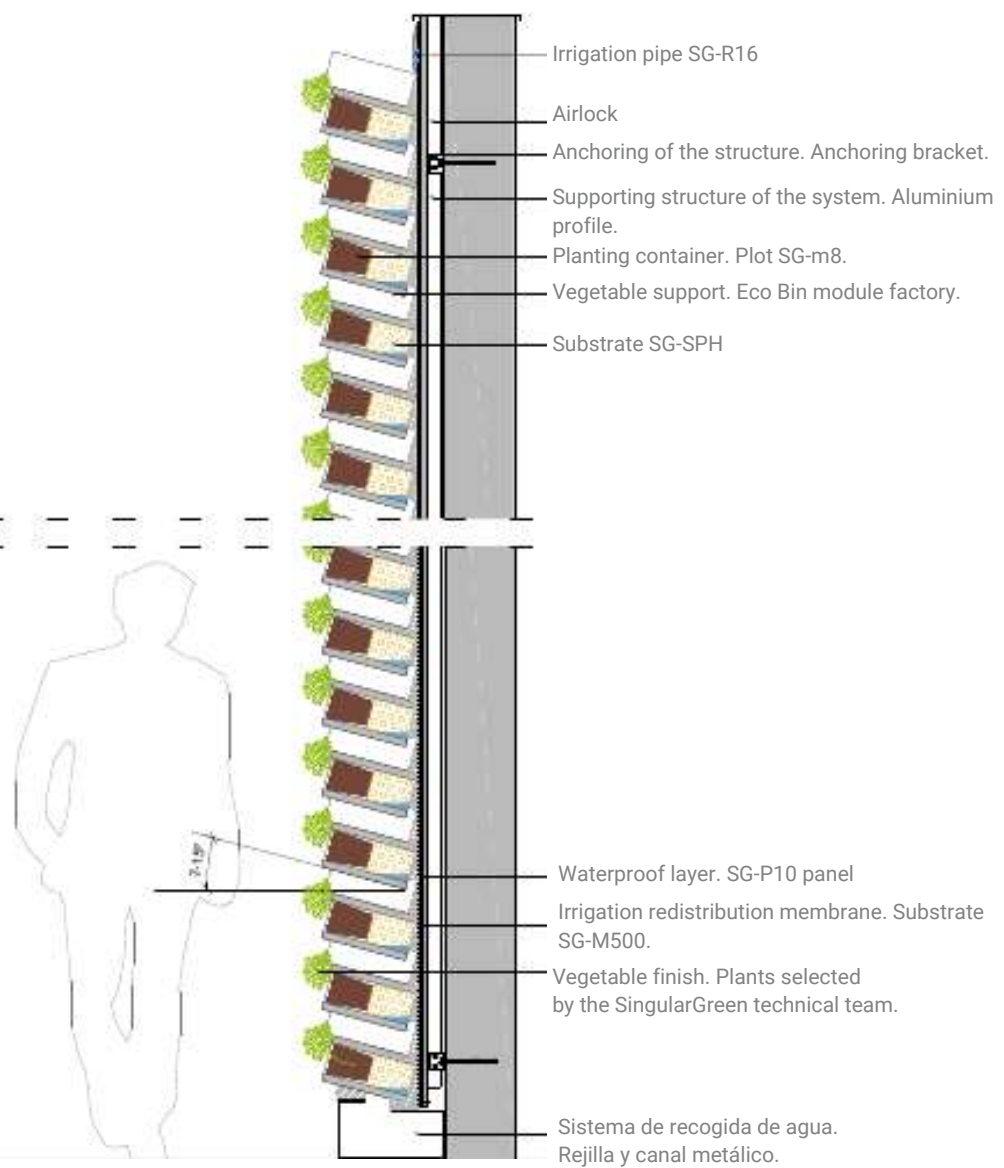
# 04.2

## ECO BIN

### TYPE COMPOSITION OF THE SYSTEM

EcoBin system is composed of a supporting structure, waterproof panel, irrigation redistribution membrane and planting medium formed by a factory of ceramic bottle racks with aerating and retaining substrate.

Plant finish with species selected for the climate of the area.







## BEARING AND RETAINING LAYER

### ALUMINIUM PROFILE

Anodised aluminium profile with a rectangular cross-section of 40x40x30 mm.



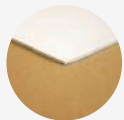
### DIRECT ANCHORING

Zinc-plated self-drilling screw with hexagonal head and flange, DIN 7301.



### ANCHORING BRACKET:

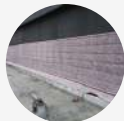
AISI 304 stainless steel anchoring bracket. Dimensioned according to wind load stresses and condition of the support.



## WATERPROOF LAYER

### SG-P10 PANEL

10 mm thick foamed PVC panel, anchored by screws to the supporting structure with joints and holes sealed with polyurethane mastic.



## IRRIGATION REDISTRIBUTION MEMBRANE

### GEOTEXTILE SG-M500

Non-woven mineral geotextile with double membrane, thickness 3.8 mm, anchored by means of stainless steel staples.



## PLANT SUPPORT

### ECO BIN MODULE FACTORY

Factory of waterproof ceramic bottle racks of 90 mm internal diameter, received with M5.L cement mortar.



### **SUSTRATUM**

#### **G-SPH:**

Substrate formed by dehydrated sphagnum moss, rehydrated to be placed inside Eco Bin racks.



### **PLANTING CONTAINER**

#### **SG-m8 PIPE:**

Biodegradable container made of vegetable fibres, 80% wood fibre and 20% blonde peat.



### **VEGETABLE FINISH**

Plant species selected by the SingularGreen technical team according to the project and climate zone. Density at a rate of two units per Eco Bin module.



### **IRRIGATION PIPE**

#### **SG-R16 PIPE:**

16 mm diameter pipe with self-compensating and anti-drainage drippers with fixed flow rate, separated according to project requirements.



### **WATER COLLECTION SYSTEM**

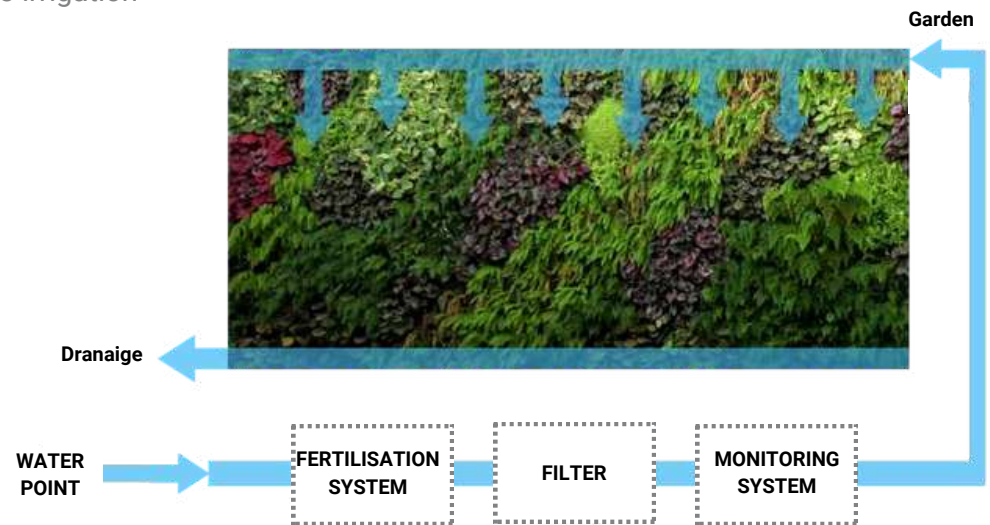
Metal channel with water outlet, to recirculation or to drainage

# 04.3

## ECO BIN IRRIGATION SYSTEM

### CONTINUOUS WATER DRAINAGE: SG-A24P IRRIGATION SYSTEM

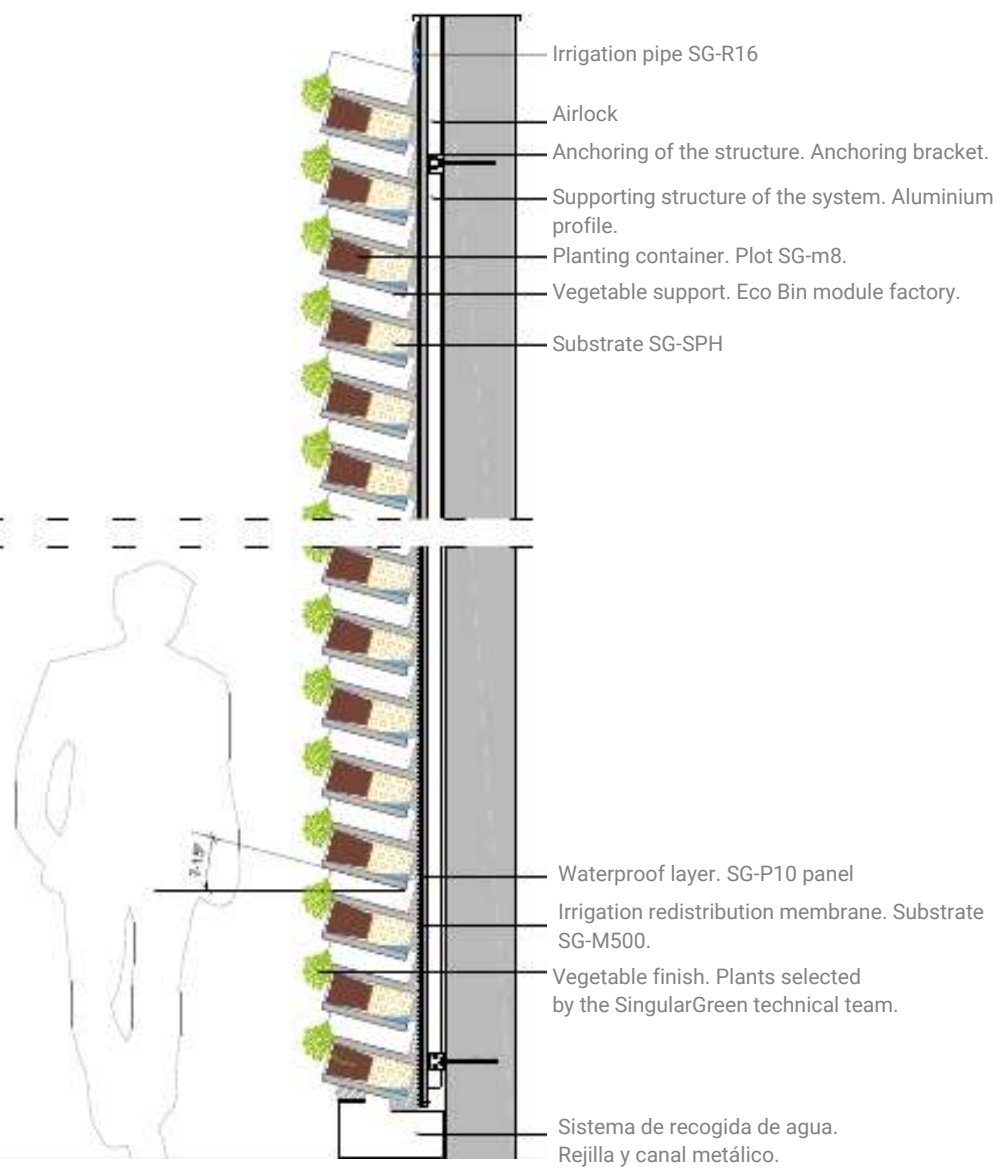
The SG-A24P irrigation system is characterised by the fact that it carries out programmed watering according to the water needs of the garden. These irrigations are introduced into the control system, which is responsible for opening and closing the water flow to the garden. This system also reduces the space required for the irrigation system to a minimum.



# 04.4

## ECO BIN

### DETAIL GENERIC CONSTRUCTION



DETAIL  
GENERIC CONSTRUCTION  
DWG



DETAIL  
GENERIC CONSTRUCTION  
PDF



## Improved sound insulation



Vertical garden Nando's Restaurant, London.

# 04.5

## ECO BIN DOCUMENTACIÓN TÉCNICA

### APPLICABLE REGULATIONS

- CTE. DB HS Health and Safety.
- CTE. DB SI Fire Safety.
- CTE. DB-HE Energy Efficiency.
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### SPECIFICATIONS



Vertical garden Nando's Restaurant, London.

# 05

## COMPROMISO MANTENIMIENTO

### **MONITORIZACIÓN DEL JARDÍN DE FORMA GRATUITA**

Instalación de sistema de riego SG-A24 con telecontrol y alarmas

### **ASESORAMIENTO 100% GRATUITO**

Tanto si realizamos nosotros el servicio de mantenimiento como si lo realiza otra empresa.

### **SERVICIO DE MANTENIMIENTO**

Realización de todas las labores de mantenimiento necesarias: puesta en marcha y mantenimiento mensual del sistema de riego, control de plagas, poda, control remoto del sistema de riego, etc.

### **GARANTÍA DE PLANTA**

Garantía de planta 100% en nuestros mantenimientos.



# 06

## WHO ARE WE?

At SingularGreen, we specialize in providing cities with green spaces through Nature-Based Solutions and the integration of architecture and vegetation, with the aim of improving the quality of life for those who inhabit them.

That's why we don't just design, we take action by creating all kinds of unique landscaping projects.

Innovation is in our DNA, and our R&D department has been conducting constant research for over 15 years to develop our own technology, adapting to each environment.

At SingularGreen, we are passionate about what we do, and we are characterized by creating creative solutions for your project, offering comprehensive advice, execution, and maintenance services, always adapting to your needs.

SingularGreen: Creative Solutions Based on Nature.



Jardín vertical Canal de Isabel II, Madrid, 2020





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