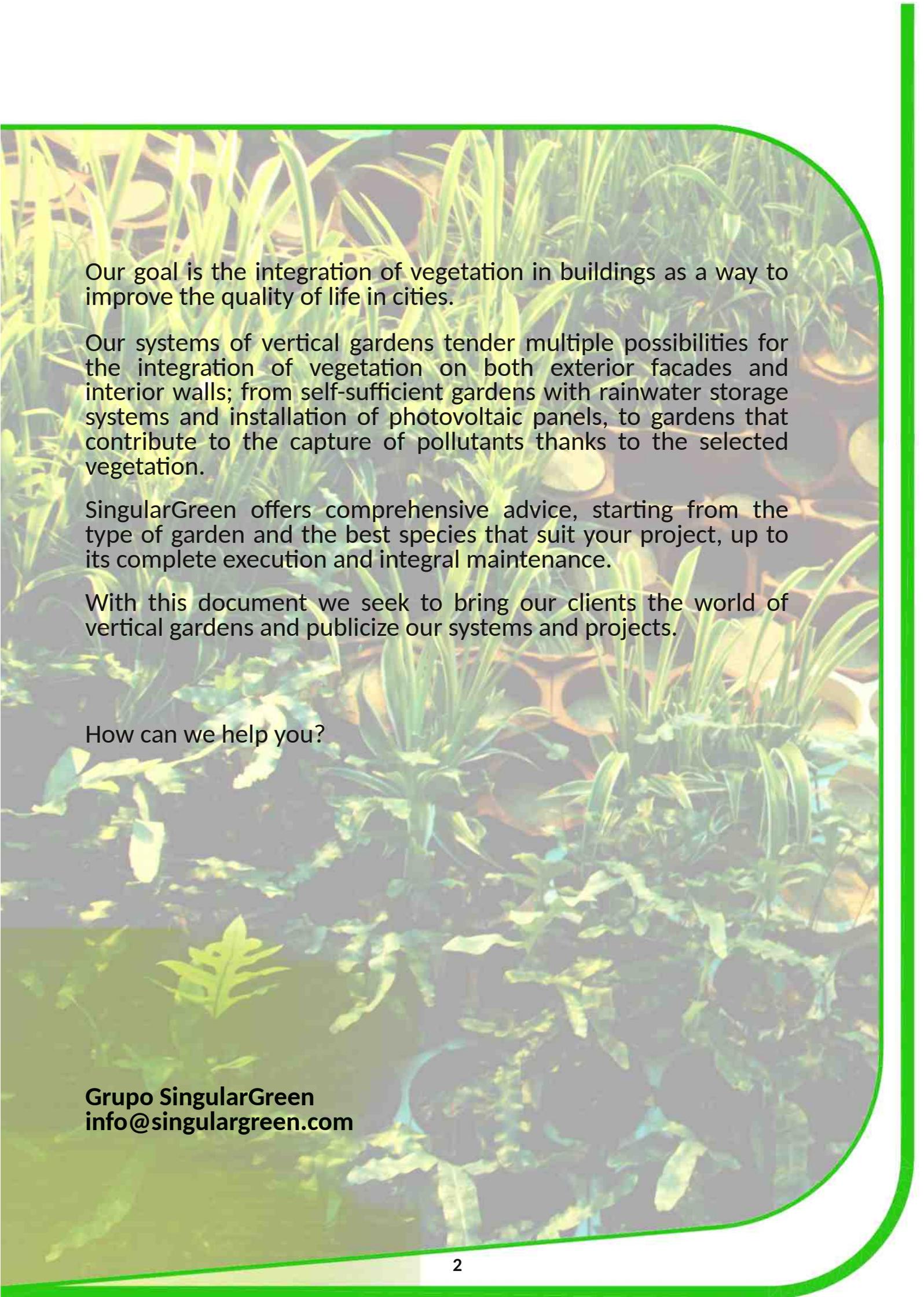


Commercial dossier. 2020 Revision

VERTICAL Gardens

S singular
green

A vertical garden system featuring a grid of circular pots. Each pot contains a different type of green plant, including tall grasses, leafy herbs, and ferns. The plants are arranged in a dense, layered fashion, creating a lush, green wall of vegetation. The background is a soft, out-of-focus green, suggesting an outdoor setting.

Our goal is the integration of vegetation in buildings as a way to improve the quality of life in cities.

Our systems of vertical gardens tender multiple possibilities for the integration of vegetation on both exterior facades and interior walls; from self-sufficient gardens with rainwater storage systems and installation of photovoltaic panels, to gardens that contribute to the capture of pollutants thanks to the selected vegetation.

SingularGreen offers comprehensive advice, starting from the type of garden and the best species that suit your project, up to its complete execution and integral maintenance.

With this document we seek to bring our clients the world of vertical gardens and publicize our systems and projects.

How can we help you?

Grupo SingularGreen
info@singulargreen.com

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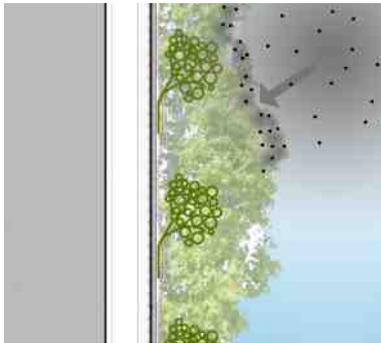
SingularAir

Frequently asked questions



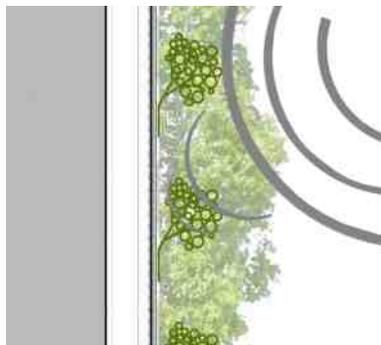
Vertical Gardens Benefits

Reduction of environmental pollution



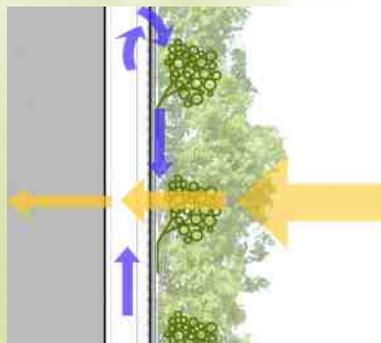
- 1 m² of plant cover generates the oxygen required by a person throughout the year. (Darlington, 2001)
- A 4-storey building with a green facade filters 40 tons of harmful gases per year. (Wolverton, et al 1989)
- A 4-storey building with a green facade is able to trap and process 15 kg of heavy metals. (Darlington, 2001)

Improvement of acoustic isolation



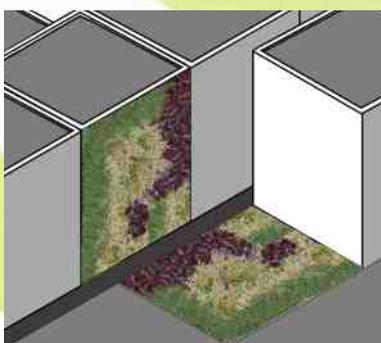
- The vegetal layer reduces noise pollution up to 10 decibels. (Akira Hoyano - Profesor, Tokyo Institute of Technology)
- The vegetal covering (plants + substrate) reduces the noise by absorbing the waves in the substrate, and the reflection in the vegetation.

Enhancing energy saving



- They reduce the interior temperature of a building in summer to 5°C, as well as keep it in winter, saving up to € 500 / m² per year.(Akira Hoyano, profesor del Tokyo Institute of Technology)
- Water consumption is balanced and optimized due to the possibility of installing a closed water circuit.

Other benefits



- Improves performance and reduces ailments of people who have vegetation in their workplace. (Lohr et al. 1996; Bringslimark, et al. 2007)
- They save space: The plants hang vertically, taking advantage of a previously existing space.

Our systems



F+P

It stands out for its speed of assembly, low weight and ease of maintenance. The substrate of the vegetation is a combination of felts in which the roots grow up and where a hydroponic irrigation solution circulates.



LEAF BOX

Bespoke modular construction of metal structure panels filled with Sphagnum moss. The roots of the vegetation are placed inside these panels, from where they take the water thanks to the installation of a watering that soaks the moss.



ECO BIN

Masonry of ceramic wine racks as receivers for the plants of the garden. In each hole there is a plant that takes irrigation water from the back panel to the garden.



LEAFSKIN

It is the most economical system. It excels for its easy installation, its minimum thickness and its adaptation to walls with any geometry.

External vertical garden F+P Preplant Palace of Congress of Vitoria-Gasteiz

Construction year: 2013

Location: Congress Palace, Vitoria-Gasteiz

Area: 1500 m²

Sistem Applied: F+P Preplant

Species: 97% of the species used in this vertical garden are autochthonous, many of them endemic from Álava.

Benefits of the used solution:

- Ease of maintenance. Plant species are planted and replaced very easily, without affecting the rest of the garden.
- Planting speed. The preplanted system allows to build the garden in peerless time.



Photo of the garden in June 2018

Interior vertical garden F+P

Matimex, Castellón

Construction year: 2014

Location: Matimex Showroom, Almassora, Castellón

Area: 50 m²

System Applied: F+P

Species: Different indoor species with few requirements for fertilization and easy maintenance.

Benefits of the used solution:

- Fast assembly, low weight and easy maintenance.
- Air purification, fixation of pollutants, and reduction of ambient temperature in summer.



The garden's design is inspired on the Matimex logo

Interior vertical garden F+P

Organics, Barcelona

Construction year: 2014

Location: Shop, Barcelona

Area: 8 m²

System Applied: F+P

Species: Different indoor species with few requirements for fertilization and easy maintenance.

Benefits of the used solution:

- Quick assembly, low weight and easy maintenance.
- Air purification, fixing of pollutants, and reduction of ambient temperature in summer.

The garden welcomes guests to the establishment



Interior vertical garden F+P

Ferring's offices, Madrid

Construction year: 2014

Location: Private offices, Madrid

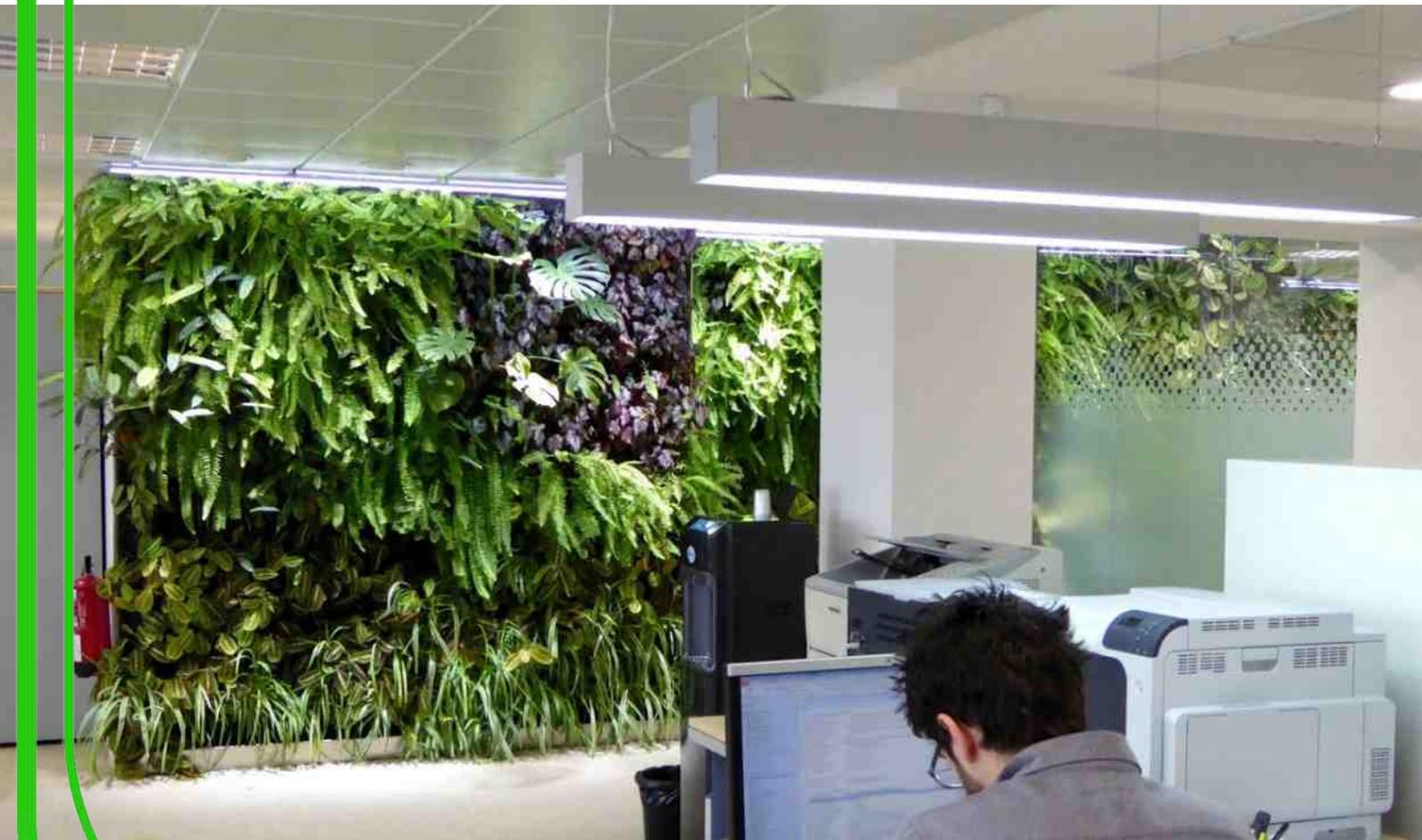
Area: 30 m²

Sistem Applied: F+P

Species: Different indoor species with few requirements for fertilization and easy maintenance.

Benefits of the used solution:

- Quick assembly, low weight and easy maintenance.
- Some species are air purifying plants, which help to counteract the "Sick Building Syndrome", which work very well indoors. They also help fix pollutants and reduce ambient temperature in summer.



External vertical garden F+P

Cheese Bar, Barcelona

Construction year: 2014

Location: Cheese Bar Restaurante, Barcelona

Area: 70 m²

Sistem Applied: F+P mixto

Species: Selection of species for interior.

Benefits of the used solution:

- Quick assembly, low weight and easy maintenance.
- Air purification, and reduction of the ambient temperature in summer.



The garden adapts to the restaurant's interior design



Garden appearance three months after planting

Vertical garden F+P Genovés Park, Cádiz

Construction year: 2015

Location: Genovés Park, Cádiz.

Area: 70 m²

Used system: F+P Mixed

Species: Selected species resistant to "saline spray" and weather conditions that usually whip Cádiz in winter time.

Benefits of the used solution:

- Optimal system cost for medium surfaces, easy to install and light weight.
- The used plants on this garden are resistant to marine environment.

Vertical garden F+P

Navalmoral, Cáceres

Construction year: 2015

Location: "La Gota" building, Navalmoral.

Area: 185 m²

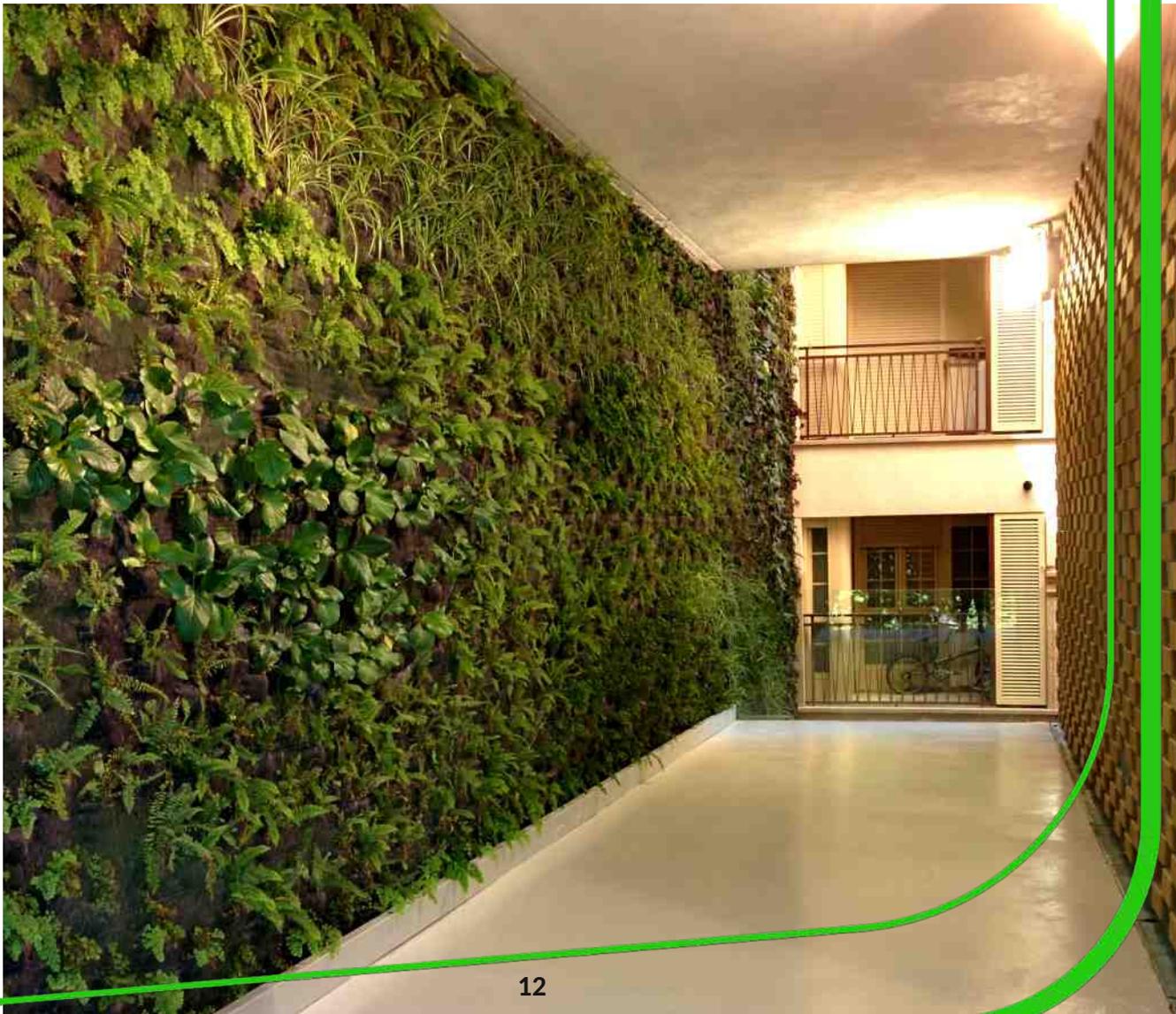
System applied: F+P Mixed

Species: Plants with low lighting requirement.

Benefits of the used solution:

- Lightness. It is the most light system. It can be applied at any wall, whether indoors or outside.
- Easy replacing for irrigation sytem and plants. Plants and pipes are easily replaced by stapling a new layer of felt.

View of one of the false interior garden



Vertical garden F+P

HM Tropical Hotel, Mallorca

Construction year: 2015

Location: Hotel HM Tropical, Palma, Mallorca

Area: 110 m²

System used: F+P

Species: Selected species based on their high resistance and adaptability, due to the facade north orientation and significant gusts of wind.

Benefits of the used solution:

- Possibility of creating an air chamber between the facade and the garden, that has great thickness, in this case 90 cm.
- Ease of assembly and maintenance.



Garden view 6 months after installation

Vertical garden F+P

Lucena Town Hall, Córdoba

Construction year: 2015

Location: Lucena Town Hall, Córdoba

Area: 250 m²

System applied: F+P

Species: the species used in this vertical garden are autochthonous and low maintenance.

Benefits of the used solution:

- Easy system maintenance.
- Species resistant to any problem.

Overview of the integration of the garden into the building



Vertical garden F+P, Bilbao

Construction year: 2016

Location: Calle Jardíntxikerra, Bilbao

Area: aprox. 100 m²

System applied: F+P mixed

Species: Selection of species resistant to cold and wet weather, especially taking into account the north orientation.



Plant paintings F+P, Vertical orchard Makro

Construction year: 2016

Location: Food Fair, Barcelona

Area: 6,4 m²

System applied: Plant paintings F+P

Species: Selection of species for exposure (lettuces, tomatoes and strawberries).

Benefits of the used solution:

- Lightness. It's the lightest system. It can be transferred to any wall.
- The planting was carried out using plant lines, simulating the real planting in an orchard, with the visual license to place the plant lines alternately, to cover the maximum possible area.



Vertical garden F+P Cold

Azuqueca of Henares, Guadalajara



Aspect of the garden 2 years after its planting

Construction year: 2017

Location: Square Azafrán, Azuqueca de Henares, Guadalajara

Area: 81,48 m²

System applied: F+P Cold

Species: Selection of species resistant to the cold winters of the area.

Benefits of the used solution:

- The selected plant support protects plants' roots from cold.
- With the automatic pipe emptying system prevents freezing and breaking.

Vertical garden F+P

Gandía, Valencia

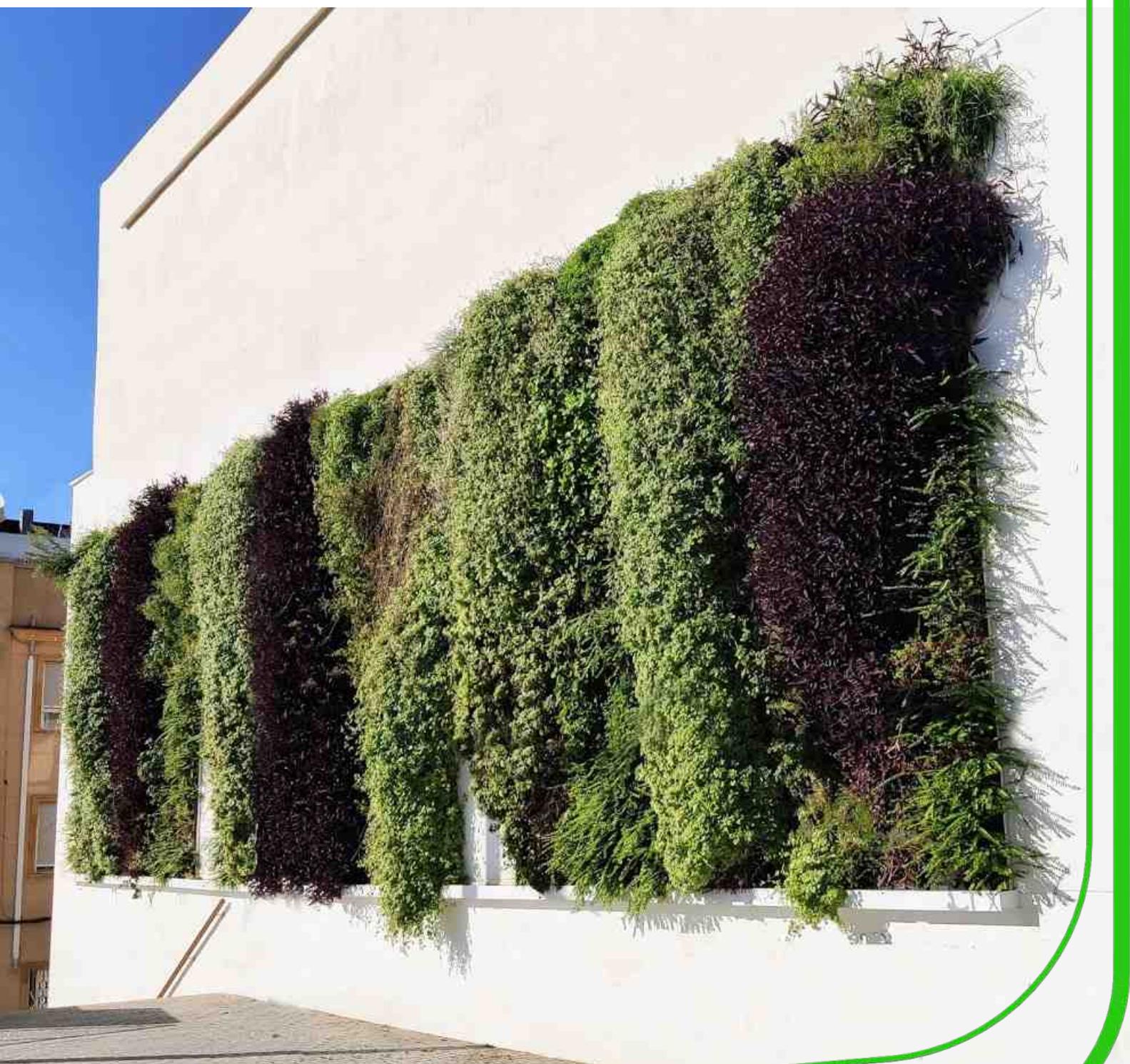
Construction year: 2018

Location: Gandía

Area: 70 m²

System applied: F+P mixed

Species: Selection of species for the Mediterranean weather.



Vertical garden F+P

Ontinyent, Valencia

Construction year: 2018

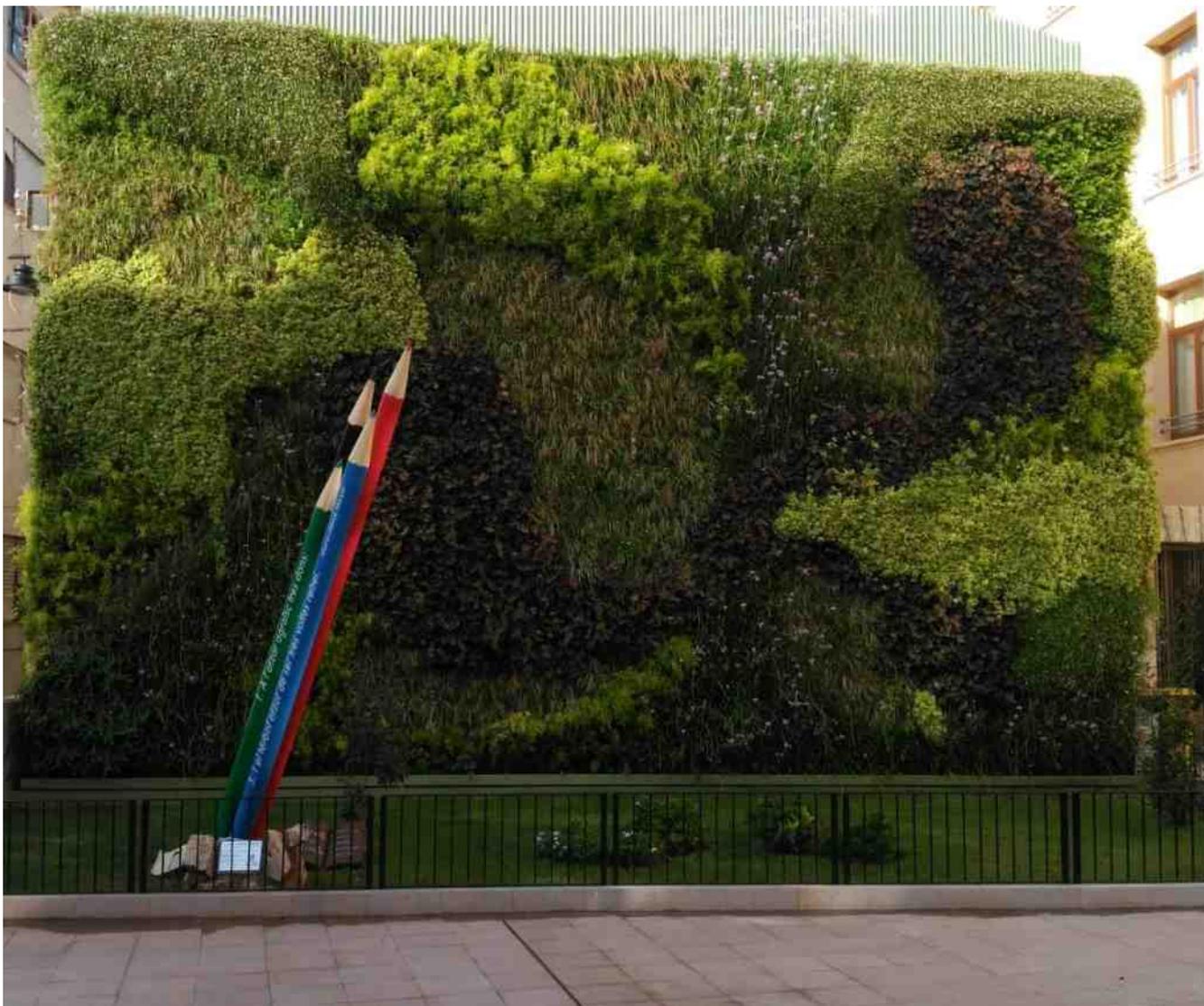
Location: Sant Carles' Square

Area: 121 m²

System applied: F+P

Species: Selection of species resistant to weather, this selection also bring to the design greater variety of color.

Garden view 6 months after installation





Appearance of the garden 5 months after planting

Vertical garden F+P **Cap Negret Hotel, Altea**

Construction year: 2018

Location: Cap Negret Hotel, Altea, Alicante

Area: 250 m²

System applied: F+P

Species: Selection of species resistant to saltpeter from the sea and wet.

Benefits of the used solution:

- Easy maintenance.
- Plants are easily replaced.

Exterior vertical gardens F+P

Oviedo

Construction year: 2018

Location: Penthouse in private housing, Oviedo

Area: approx. 4 m² + 5 m²

System applied: F+P

Species: Different outdoor species suitable for the cold and wet climate of the city.

Benefits of the used solution:

- Lightness. It is the lightest system. It can be transferred to any wall, either indoors or outdoors. In this case, we have used both side walls of the two exterior terraces of the house, which adjoin the neighboring buildings.



Vertical garden F+P

Catedral Hotel, Granada

Construction year: 2019

Location: Catedral Hotel, Granada

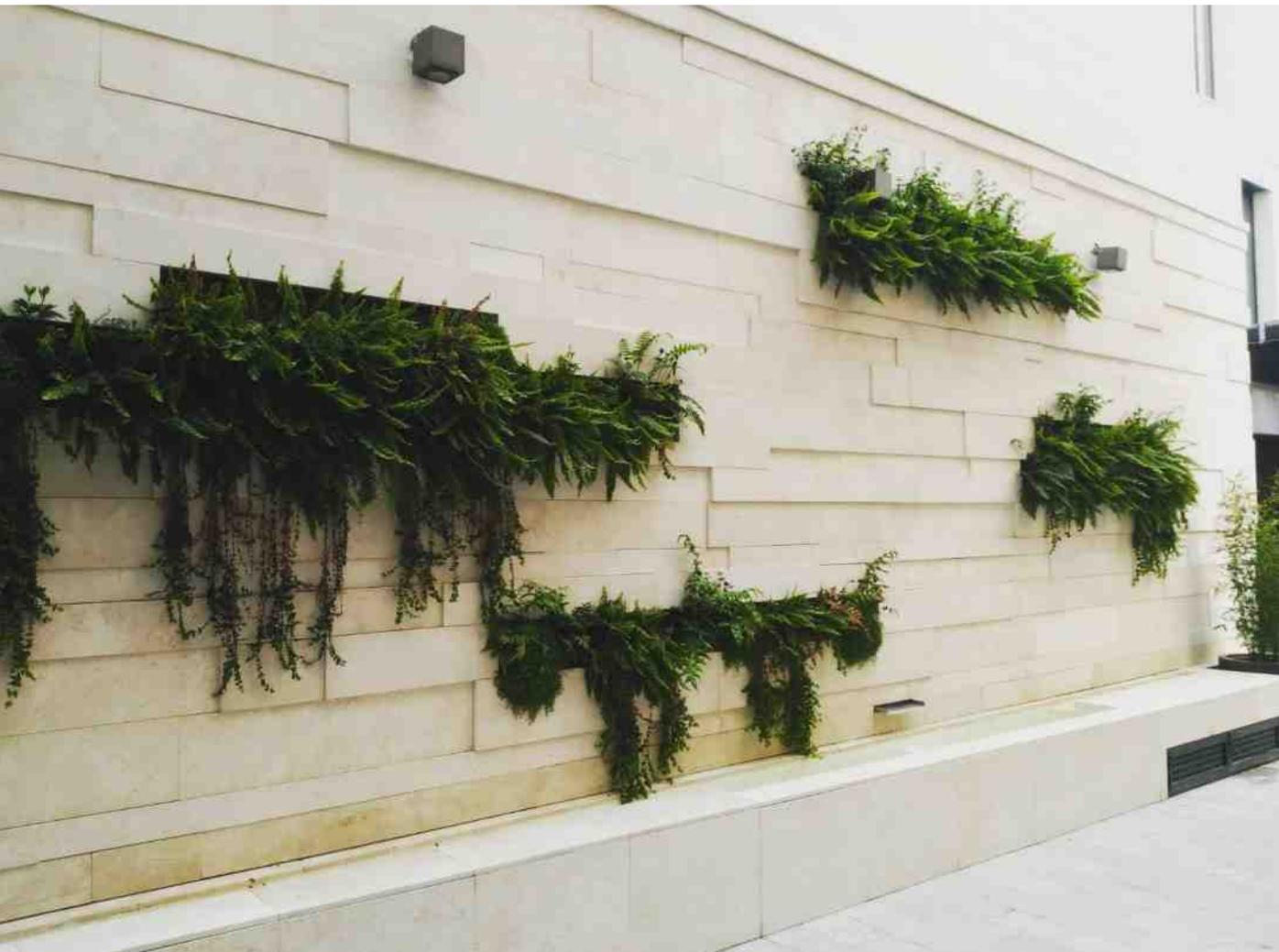
Area: 30 m²

System applied: F+P

Species: Selection of species for the weather of the city.

Benefits of the used solution:

- Adaptability: This garden had to be located behind a stone wall, for which the F + P system was perfectly adapted.
- Easy maintenance.



Vertical garden F+P

Realia Tower, Madrid

Construction year: 2019

Location: Realia Tower's Hall, Madrid

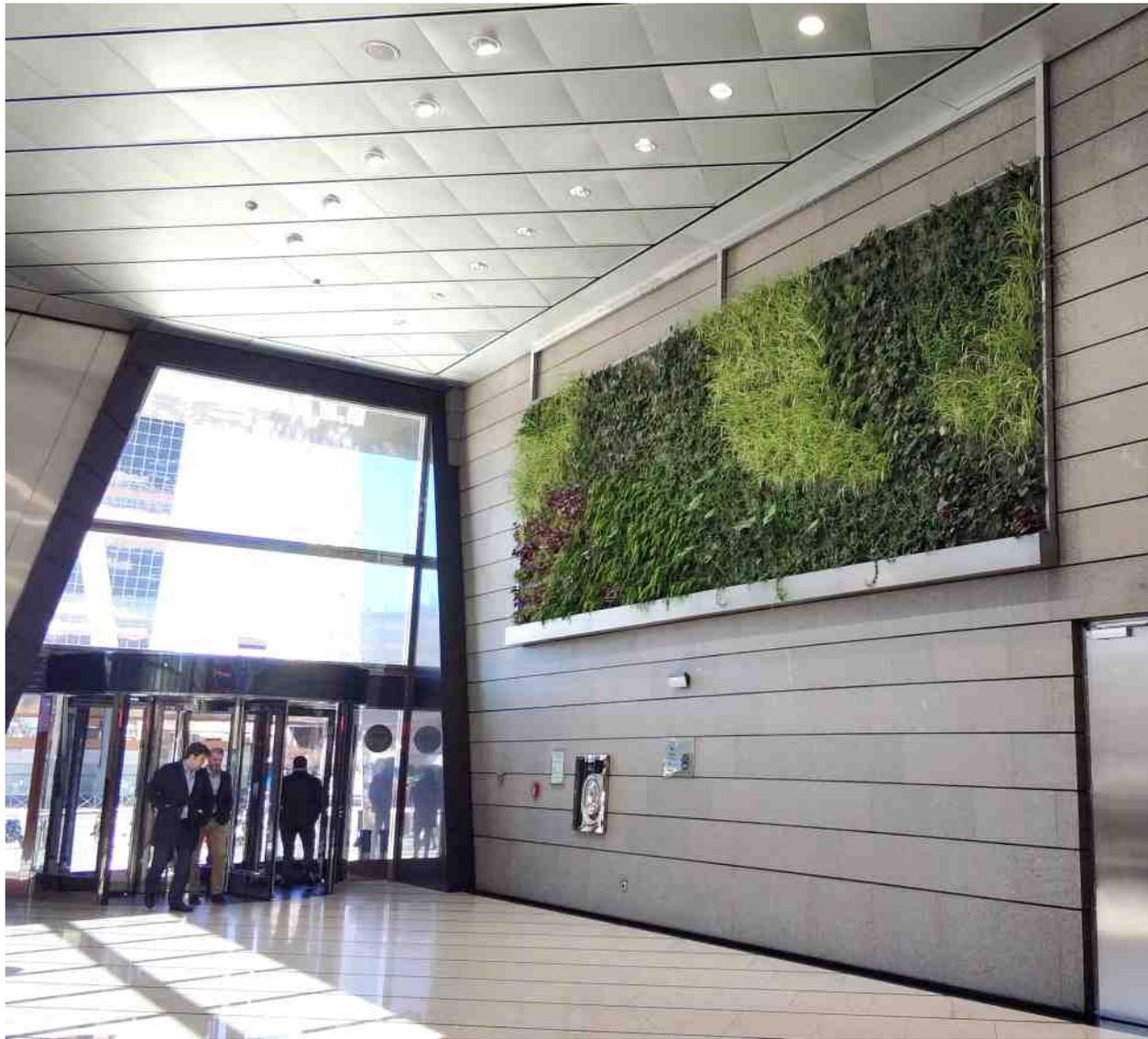
Area: 29 m²

System applied: F+P

Species: Selection of species for interior.

Benefits of the used solution:

- Lightness. It is the lightest system. In this case this was very important, since in order to conserve the facing marble we had to anchor the system to a structure hanging from the slab, not resting on the wall.



Vertical garden F+P

San Juan, Alicante

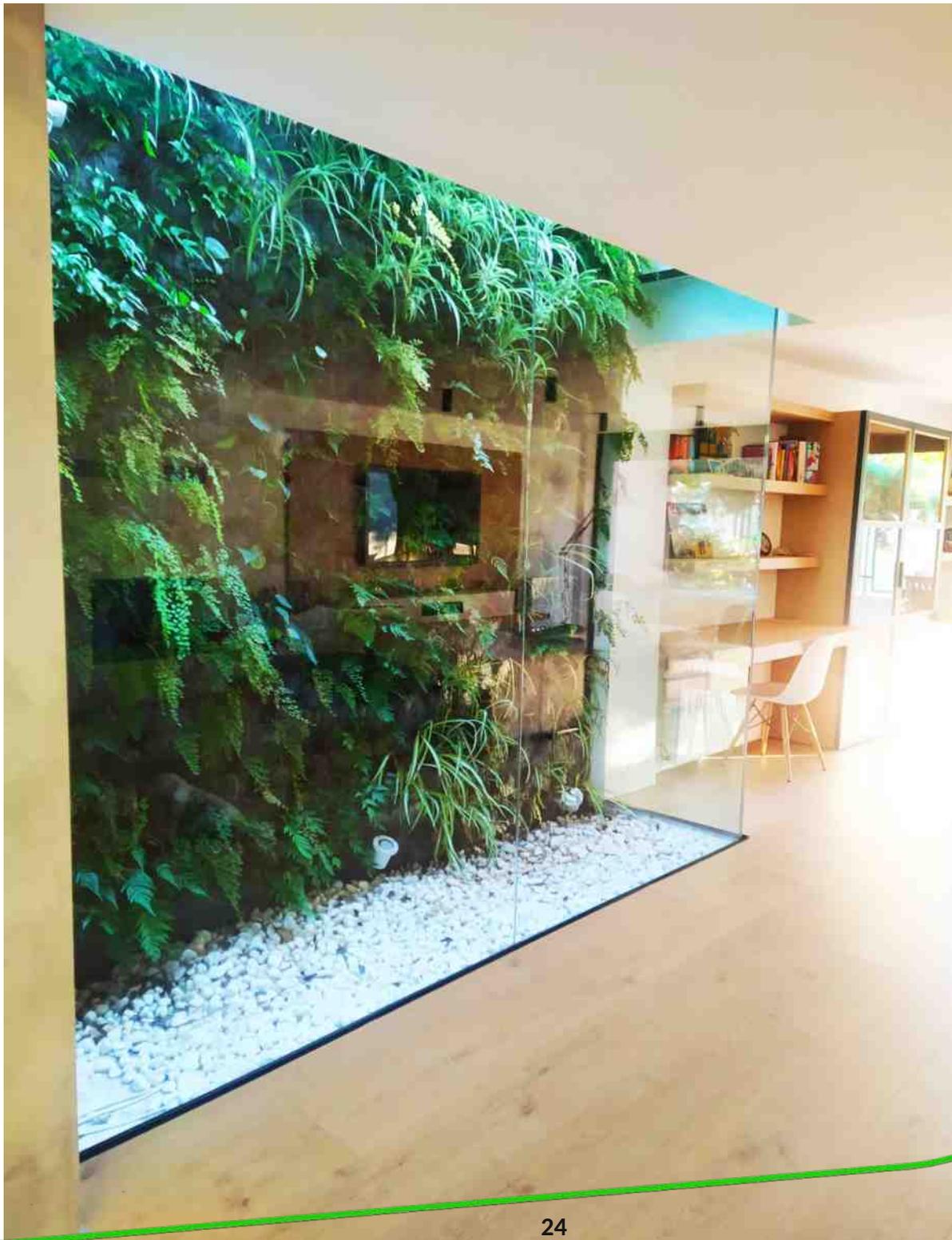
Construction year: 2019

Location: Private housing, San Juan, Alicante

Area: 16 m²

System applied: F+P mixed

Species: Especially resistant to sunstroke and high temperatures.



Interior vertical gardens F+P

Ferring's Offices, Madrid

Construction year: 2019

Location: Private offices, Madrid

Area: 41 m²

System applied: F+P mixed

Species: Different indoor species with few requirements of fertilization and easy maintenance.

Benefits of the used solution:

- The company moved its offices and counted on us again for some new vertical gardens.
- Some of the species are air purifying plants, which help to counteract the "Sick Building Syndrome", which work very well indoors. They also help fix pollutants and reduce ambient temperature in summer.



Interior vertical garden F+P

Weleda's Office, Madrid

Construction year: 2019

Location: Private offices, Madrid

Area: 7 m²

System applied: F+P

Species: Different indoor species with few requirements of fertilization and easy maintenance.

Benefits of the used solution:

- Lightness. It is the lightest system. It can be transferred to any wall, either indoors or outdoors.
- Ease of irrigation and plant replacement. Plants and facilities are easily replaced by stapling a new layer of felt.



Vertical garden F+P

Sant Vicent's Town Hall, Alicante

Construction year: 2019

Location: Square of Comunidad Valenciana, Sant Vicent del Raspeig

Area: 310 m²

System applied: F+P

Species: Species are suitable for both sun and shade due to the garden situation, and low maintenance.

Benefits of the used solution:

- Lightness and adaptability. The garden restores an earlier vertical garden, with problems by compaction of the substrate and oxidation, reusing the supporting structure.
- Ease of irrigation and plant replacement. Plants and facilities are easily replaced by stapling a new layer of felt.



LeafBox

Vertical garden LeafBox Celler cooperatiu, Rubí

Construction year: 2013

Location: Celler Cooperatiu, Rubí, Barcelona.

Area: 240 m²

System applied: LeafBox

Species: Distribution of the species according to the different insulations of the facades.

Benefits of the used solution:

- The substratum is an excellent administrator and distributor of humidity. Sphagnum moss, retains up to 20 times its weight in water.
- Substrate of airy texture that allows the oxygenation of the plants roots.



Detail of LeafBox panels in the vertical garden



Vertical garden LeafBox

Private Office, Madrid

Construction year: 2013

Location: Munich RE Office, Madrid.

Area: 8 m²

System applied: LeafBox

Species: Low light-needed indoor species.

Benefits of the used solution:

- Excellent substrate manager and moisture distributor. Sphagnum moss retains up to 20 times its weight in water.
- Lightweight textured substrate that allows oxygenation of the roots of plants.
- Some of the species are air purifying plants, which help to counteract the "Sick Building Syndrome", which work very well indoors. They also help fix pollutants and reduce ambient temperature in summer.



EcoBin

Vertical garden EcoBin Usuaïa Hotel, Ibiza

Construction year: 2011

Location: Bossa beach, Ibiza.

Area: 350 m²

System used: Eco Bin

Species: Different types of succulents, species compatible with the weather.

Benefits of the used solution:

- Each one of the racks acts as an element of acoustic absorption.
- The configuration of the garden, the substrate and the vegetation collaborate for this anechoic effect.



Final image of one of the hotel gardens



Vertical garden EcoBin Square of Pedró, Barcelona

Construction year: 2014

Location: Raval neighborhood, Barcelona.

Area: 45 m²

System used: Eco Bin

Species: They have been selected based on the climate and taking into account the usual species on balconies of nearby houses.

Benefits of the used solution:

- The materials of the system are in perfect harmony with the historic center of the city; In addition, a part of the facade serves as an advertising support for the announcement of the theater's plays.
- Its operation is completely self-sufficient, both in the management of water and the energy that feeds it.

Vertical garden EcoBin Nando's Kitchen, Londres

Construction year: 2015

Location: Nando's Putney Kitchen

Area: 30 m²

System used: EcoBin interior



Garden view 2 years after installation

Hanging vertical garden

Private Offices, Madrid

Construction year: 2013

Location: Munich RE office, Madrid

Area: 8 m²

System used: Hanging flower pots

Species: Low light need indoor species.

Benefits of the used solution:

- The irrigation in this garden is hidden, achieving a perfect autonomous plant wall effect, and the irrigation is fully automated, so that the pots and plants develop without problems.
- Some of the species are air purifying plants, which help to counteract the "Sick Building Syndrome", which work very well indoors. They also help fix pollutants and reduce ambient temperature in summer.



LeafSkin®

Vertical garden LeafSkin® San Fernando, Cádiz

Construction year: 2019

Location: San Fernando, Cádiz

Area: 350 m²

System used: LeafSkin®

Species: Seeds of species compatible with the weather.

Benefits of the used solution:

- It is our cheapest and fastest solution to install at the same time.
- The seeds grow in the space of a month and a half to three months, covering the surface of the garden completely.



SingularAir

Interior vertical garden Office of SingularGreen, Alicante

Construction year: 2018

Location: Alicante

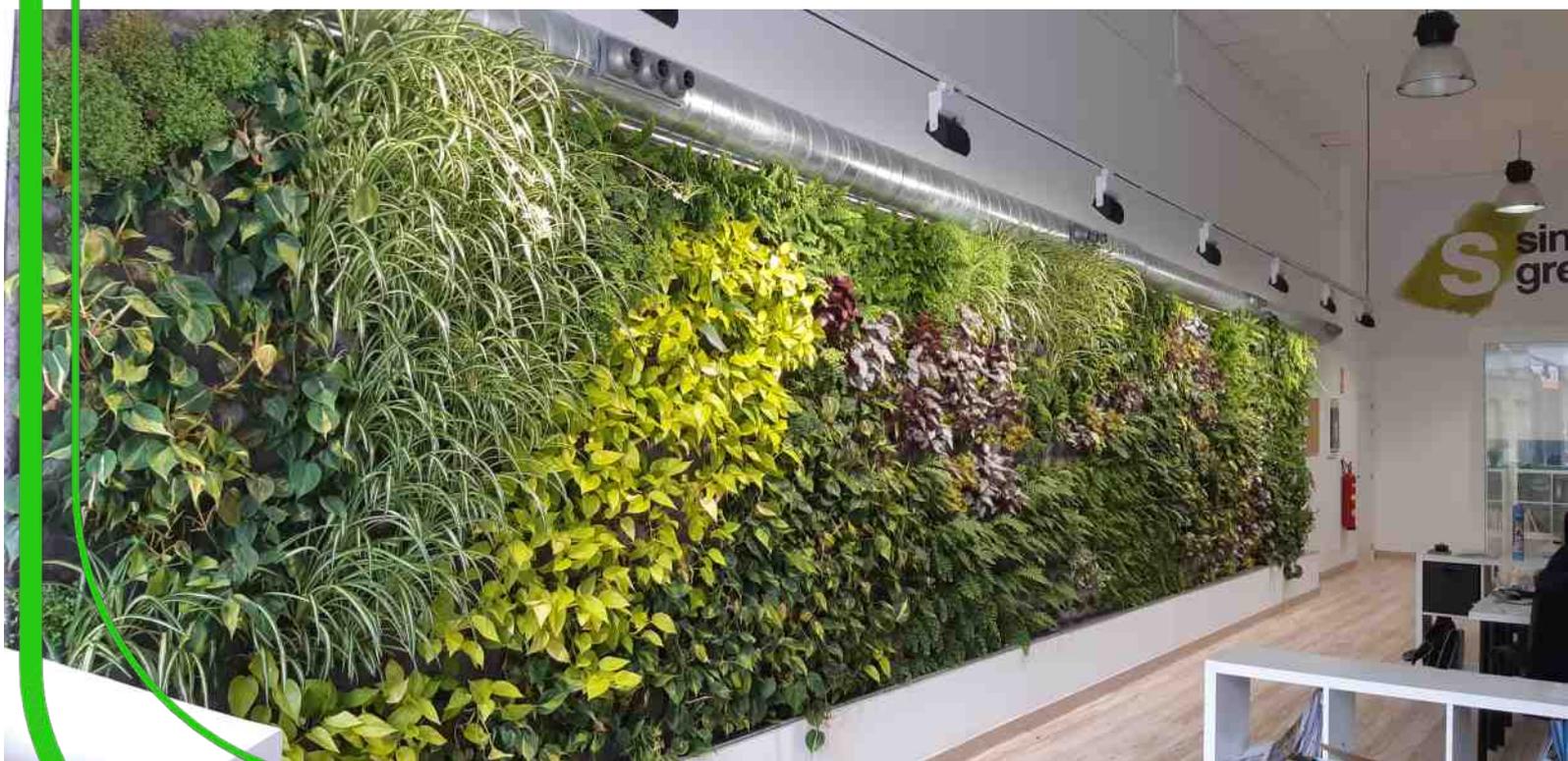
Area: 25 m²

System used: Singular Air

Species: Selection of species for interior.

Benefits of the used solution:

- The air is recirculated through the vertical garden, which causes a great evapotranspiration in the plants. In order to cool itself, the vegetation cools all the air necessary to keep the room at an adequate temperature.
- Some of the species are air purifying plants, which help to counteract the "Sick Building Syndrome", which work very well indoors. They also help fix pollutants and reduce ambient temperature in summer.
- Energy saving. Vegetable air conditioning consumes 6 times less energy than a conventional system, including the consumption of lighting, if necessary.



Frequently asked questions

Which system is the most suitable for my house?

When considering a vertical garden we have to select the system that we are going to use, for this we must take into account the following properties to evaluate the suitability of it:

- 1. Physical resistance of the substrate.** The ability of the substrate to preserve its structure over time.
- 2. Chemical durability.** Useful life of the substrate subjected to the fertirrigation conditions necessary for its operation.
- 3. Water retention.** It is the ability of a vertical garden to survive without the need for irrigation.
- 4. Nutrient retention.** It is the ability of a vertical garden to survive without the provision of nutrients.
- 5. Easy of plant replacement.** Easily replacing the failed plants is of vital importance for the garden.
- 6. Ease of irrigation substitution.** Irrigation must be perfectly accessible and replaceable in case of failure.
- 7. Complexity of the irrigation and fertigation system.**
- 8. Variety of plant species.**
- 9. Cold resistance.** In cold climates, some systems present the problem of roots freezing.
- 10. Weight.** It is a very important input to consider, specially in interventions on existing facades.
- 11. Modularity.** Vertical gardens can be modular or built "in situ".
- 12. Planting method.** Preplanted or planted "in situ".
- 13. Type of maintenance.**



- substrate resistance
- durability
- water retention
- cold resistance
- nutrient retention



Do insects appear in the vertical garden?

Insects do not appear, we use natural products in the irrigation system that prevent their appearance, their main objective is to conserve the health of the plants.



¿Is the water consumption very high?

Our fertirrigation system recirculates the water that irrigates the vertical garden so that consumption is minimal, and the spent water reverts to the environmental quality of the place by cooling the environment through evapotranspiration.



And the maintenance, ¿is it excessive?

The maintenance in our vertical gardens is minimal, and it is reduced to small plant substitutions, small adjustments in the irrigation network, related to the use and supervision of the general state of the garden itself.



If you are interested in installing a vertical garden and you do not know what solution to adopt, you can contact our technical service and we will solve any doubt about it. Not only will we advise you the best solution, but we can also design customized solutions for your case.

Our clients



Ayuntamiento
de Vitoria-Gasteiz



Ajuntament
de Barcelona



Ayuntamiento de
Valladolid



OVIEDO
AYUNTAMIENTO



OHL

REAL JARDÍN
BOTÁNICO



Sheraton



Nandu's
chicken

+34 966 282 640



info@singulargreen.com



C/ Francisco Carratalá Cernuda, 34 Bajo
03010 Alicante (España)



S singular
green

www.singulargreen.com

www.alicanteforestal.es

www.urbanarbolismo.es

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