



26 NOV 2020 -
1ST EXTERNALWEBINAR

ALICIA VILLAZÁN
VALLADOLID CITY COUNCIL
ISABEL DIAZ
SINGULARGREEN S.L.



Ayuntamiento de
Valladolid

valladoli+D
adelante
AGENCIA DE INNOVACIÓN
Y DESARROLLO ECONÓMICO
DE VALLADOLID

VALLADOLID

GREEN INFRASTRUCTURE IN THE SPECIFIC CONTEXT OF THE CITY THE URBAN GREENUP PROJECT

This project has received funding from
the European Union's Horizon 2020
research and innovation programme
under grant agreement No 730426



AGENDA

- **URBAN GREENUP IN VALLADOLID: GREEN INFRASTRUCTURE**
 - **KEY CHALLENGES**
 - **RESULTS IN THE CITIZENS**
 - **LESSONS LEARNT**
- **PUBLIC-PRIVATE COLLABORATION**
- **MAINTENANCE OF GI**



VALLADOLID

URBAN GreenUP in the city



Covering
shelter &
Mobile
gardens

Vac27- Green Covering Shelter.

Green area 488 m²





Green area 488 m²

Green canopies of España Sq during the COVID crisis (April 2020)

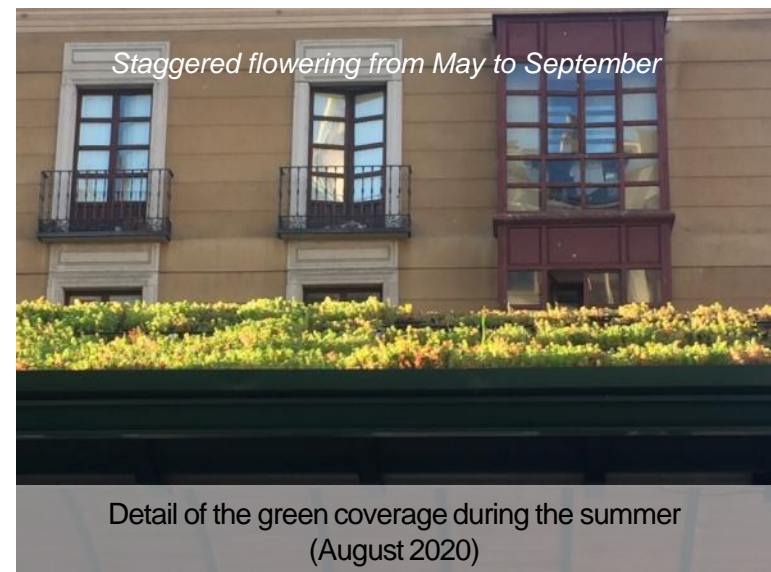


Vac27- Yellow covering shelter

Spring in the Yellow Marquees (May 2020)



Green canopies of España Square during the Summer (August 2020)



Staggered flowering from May to September

Detail of the green coverage during the summer
(August 2020)

Sedum coverage with different species of the gender Sedum that allow staggered flowering from May to September

TopSedum

Sedum album, Sedum acre, Sedum spurium, Sedum hispanicum, Sedum montanum



CHALLENGES IN VALLADOLID

GREEN COVERING SHELTER

Rainwater collection:

- The first gutter did not cover the rainwater collection area.
- Rainwater accumulation in the square through the downspout.

The designed gutter did not cover enough width.
We installed a new gutter, with extra cost.



Rainwater fell through the grate



Installing a new gutter

Leaks and puddles of water on the square.
Water from the drain returns to the square.

Dissatisfaction with the daily fruit and vegetable market.



Accumulation of water in the square





TYPES of VAc24

VEGETAL SCULPTURE

VALLADOLID

GREEN BOARD WITH BENCH

STACKABLE FRAMES (14)

Type 1. VEGETAL SCULPTURE

VALLADOLID

- Two species of grass.
- Water connection to the fountain of the square.
- Rotated to adjust location.



Vac24- Green Vertical Mobile Garden

Three types of Green vertical Mobile gardens

Vac24

Green area 54.71 m²

The postcard of the city of Valladolid

Type 1. Letters
Green area 12.07 m²



50% Ray grass inglés 50% Poa pratensis

Vegetal sculpture: VALLADOLID Letters located in Zorrilla Sq (June 2020)



Covering
shelter &
Mobile
gardens

Vac24- Green Vertical Mobile Garden

Type 1. VEGETAL SCULPTURE



Vegetal Sculpture with “long hair” (August 2020)

The vegetal sculpture is already part of the life of the city.

SOCIAL IMPACT IN CITIZENS



Twitter



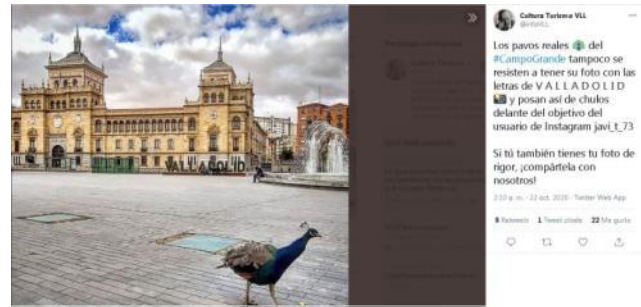
Oscar Puente
@oscar_puente

No ha quedado mal. Aunque la orientación está condicionada por la toma de agua. Si se puede la mejoraremos. En todo caso la foto es estupenda.

Mayor of
Valladolid



10:45 a. m. · 15 jun. 2020 · Twitter for iPhone



Coronavirus crisis (March 2020)



Covering
shelter &
Mobile
gardens

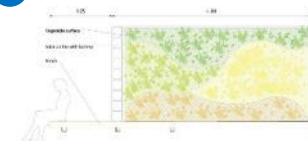
Vac24- Green Vertical Mobile Garden

Vac24

Green area 54.71 m²

Type 2. BOARD WITH BENCH (1/2 units)

GREEN BOARD WITH BENCH



Type 2. Board with bench
Total green area 12.92 m²/
garden = 25.84 m²



Cathedral of Valladolid

Board with bench located in Portugalete Square



Hard square without vegetation



Covering
shelter &
Mobile
gardens



Vac24- Green Vertical Mobile Garden

Type 2. BOARD WITH BENCH (2/2 units)

Type 2. Board with bench
Total green area 12.92 m²/
garden = 25.84 m²

Vac24

Green area 54.71 m²

Valladolid Main Street (Santiago St)



Green shady
structures
Santa Maria Street

Solar powered ventilation system



Detail of the vegetation (back side)



Mobile: Re-located from Rinconada Sq

This main street has no other benches.

Board with bench located in Santiago Street (in front of Las Francesas Convent)



Covering
shelter &
Mobile
gardens

Vac24- Green Vertical Mobile Garden

Vac24

Green area 54.71 m²

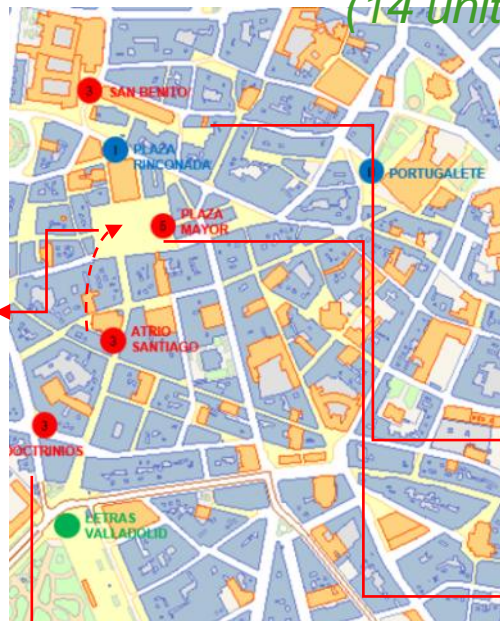


Type 3. STACKABLE FRAMES MOBILE GARDENS

(14 units)



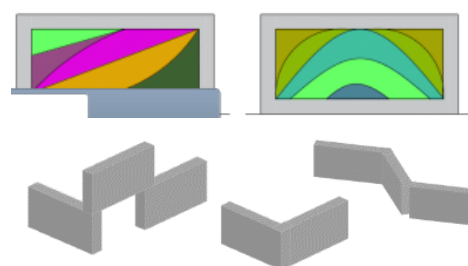
Vertical mobile gardens in Plaza Mayor (Main Square)
(5 units)



Vertical mobile gardens in San Benito Sq (3 units)



Vertical mobile gardens in María de Molina St
(3 units)



- Anchoring several frames to increase security: risk of falling and displacement, vandalism.
- Fully mobile.
- Irrigated manually.

Type 3. Stackable frame
Total green area 1.20 m²/
garden = 16.8 m²



Vertical mobile gardens in Mayor Square (3 units)



Covering
shelter &
Mobile
gardens

Vac24- Green Vertical Mobile Garden

Vac24

Green area 54.71 m²

Type 3. STACKABLE FRAMES MOBILE GARDENS (14 units)

ADVANTAGES

- Mobile vertical gardens
- Low frequency manual irrigation

DISADVANTAGES

- Subject to vandalism
- Metallic back side, not green



Initial location: Atrio de Santiago St (Santiago St)



Moved to Mayor Square (where there are not green areas)



Type 3. Stackable
frame

Total green area

1.20 m²/ frame =
16.8 m²



Back of the VMG in María de Molina St



Some species are better adapted

CHALLENGES IN VALLADOLID

VERTICAL MOBILE GARDEN

Find suitable locations in urban environments, such as streets and squares.



Enough visibility



Singular places

Public spaces



Avoid underground parkings



Close to the water and waste-water systems

Avoiding underground service networks

Multiple needs in one place

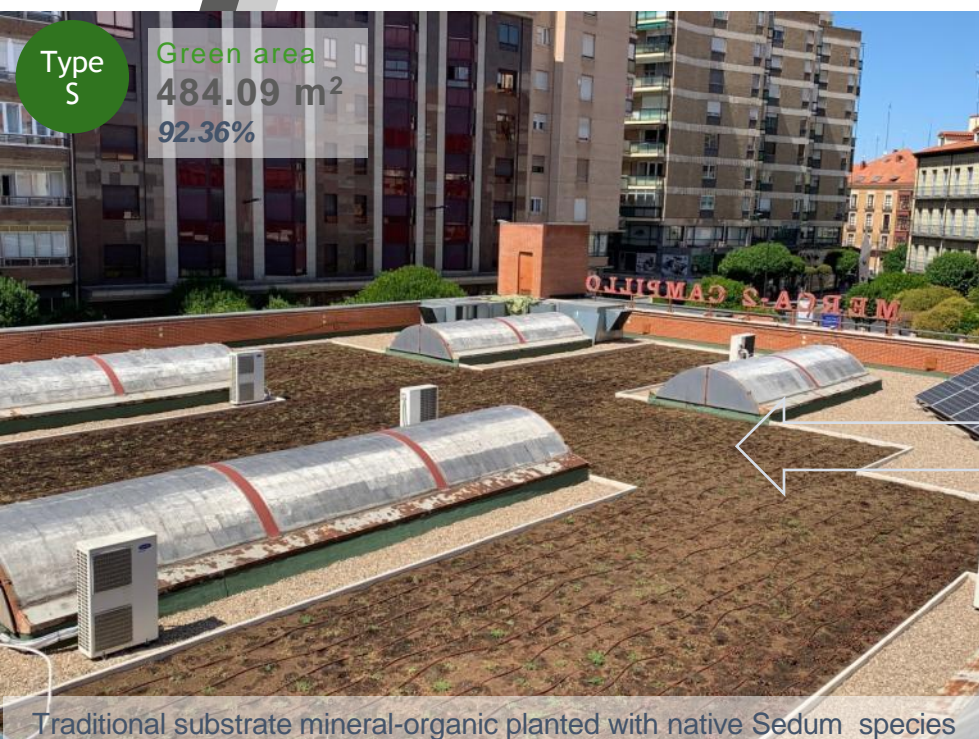


Green
roof

Green roof

Green area 524,09 m²

Green roof in El Campillo Market.



Type
S

Green area
484.09 m²
92.36%

Traditional substrate mineral-organic planted with native Sedum species

Vac28- Green roof

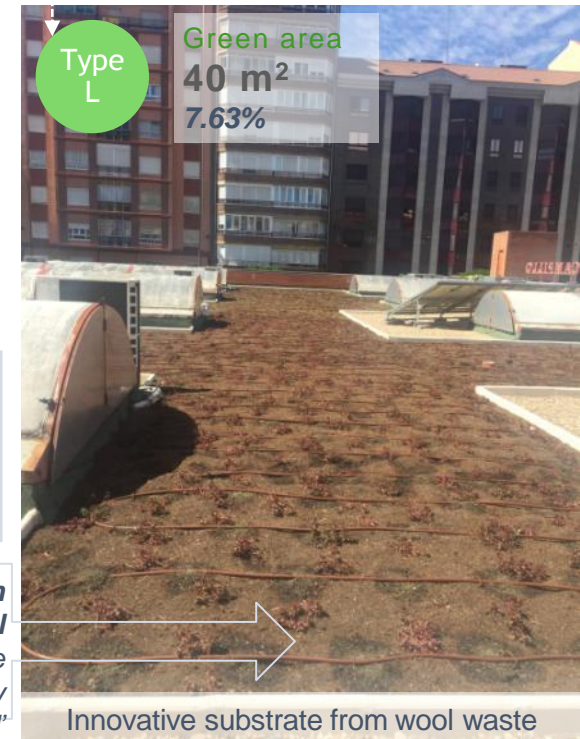
- Complete renovation of the roof:
Waterproofing + Green roof.

(S) Organic-mineral substrate

Multiple vegetation (crass, cespitose, sedum, grassesvivacious, bushes or trees). Variable maintenance (like a garden). Selection of native sps.

(L) Inorganic substrate based on sheep wool

Sedum vegetation in an innovative substrate from a Circular economy Project named 'Lanaland'



Type
L

Green area
40 m²
7.63%

Innovative substrate from wool waste

- Implementation fully finished on August 2020.

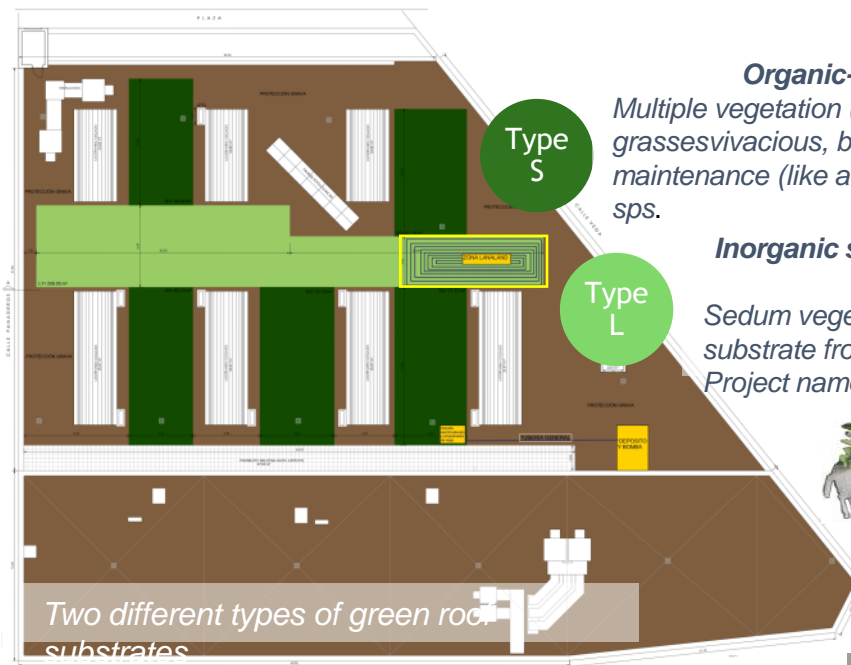


El Campillo municipal Market roof EX ANTE (Dec 2019)



Green area 524,09 m²

El Campillo Market EX POST (August 2020)



Organic-mineral substrate

Multiple vegetation (grass, cespitose, sedum, grassesvivacious, bushes or trees. Variable maintenance (like a garden). Selection of native sps.

Inorganic substrate based on sheep wool

Sedum vegetation in an innovative substrate from a Circular economy Project named 'Lanaland'



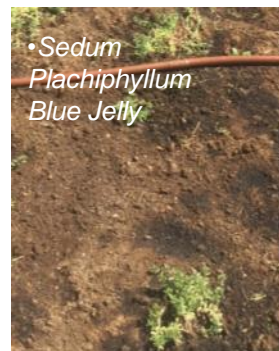
ECONOMÍA CIRCULAR
EN VALLADOLID

Two different types of green roof substrates

- Native Sedum from a local nursery.

• Sedum spurium
Schorbuser Blut
(Dragon Blood)

• Sedum
Plachiphyllum
Blue Jelly

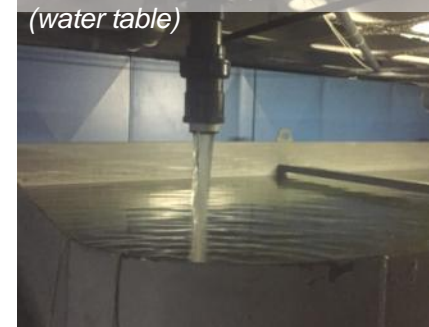


Plants: two types of native Sedum



Sustainable Water management

Water for irrigation is pumped up from the underground (water table)



Water for irrigation from the water table



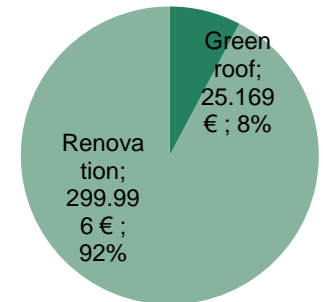
Ayuntamiento de
Valladolid

CHALLENGES IN VALLADOLID

GREEN ROOF : El Campillo Municipal Market

- Leaks and poor condition of the roof.
- Total renovation of the roof.
- Increase in budget, municipal financing.

Tendering (€)



- **Challenges:** Building with structural problems: Leaks and roof waterproofing.



Challenges Who is responsible for repairing the roof?

- City Council (it is a public building)
- Merchants (they signed a operation and maintenance contract)

- **Potential:** Walkable roof. Public access allowed. There is space available for a bar with terrace.





Green Sedum Plachiphyllum Blue Jelly (Nov20)



Comparison between two types of sedum



Red Sedum spurium Schorbuser Blut
(Dragon Blood) (Nov20)



El Campillo Market EX POST (Nov 2020)



PUBLIC-PRIVATE COLLABORATION

Vac25- Green façade.

El Corte Inglés department store

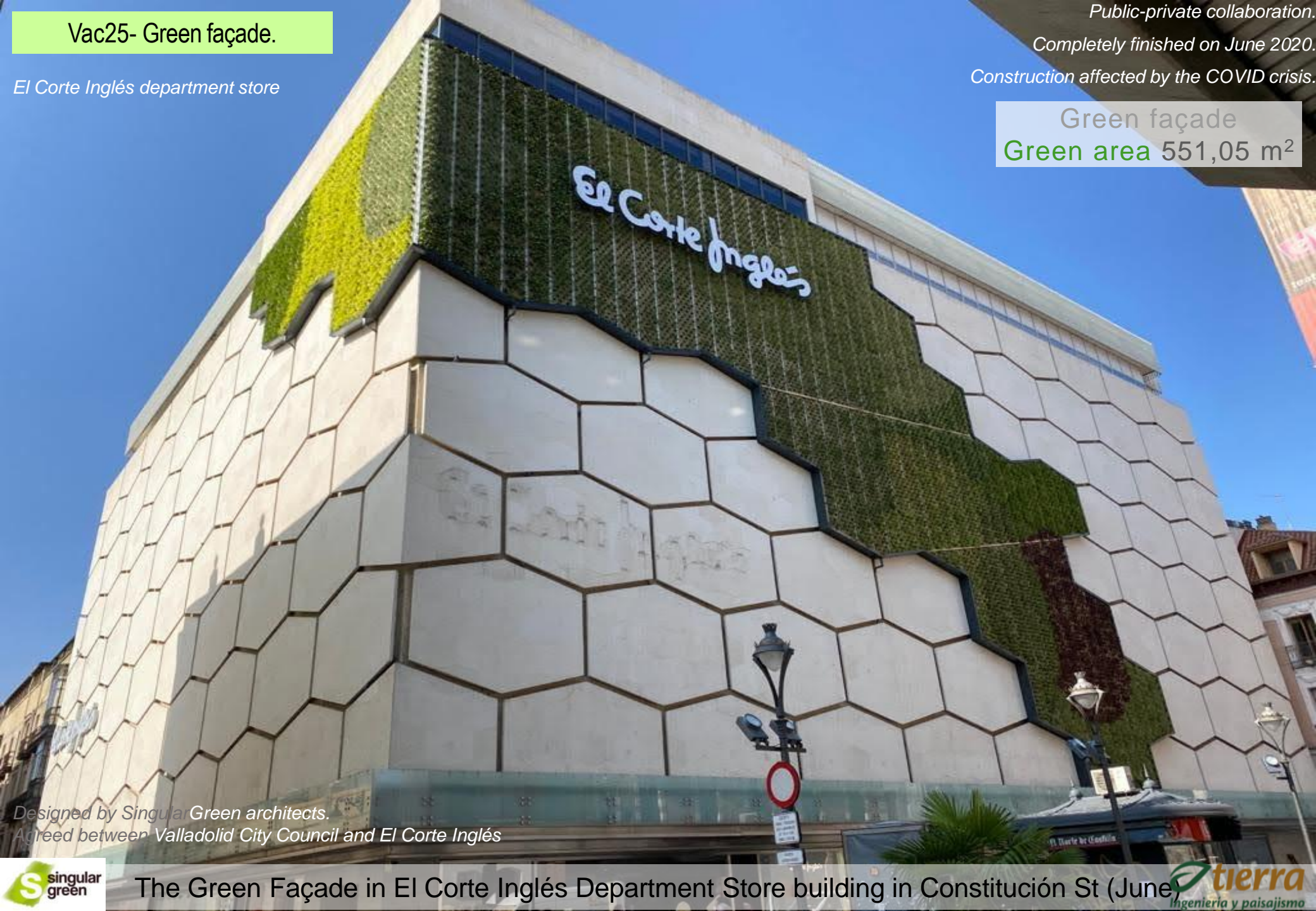
Public-private collaboration.

Completely finished on June 2020.

Construction affected by the COVID crisis.

Green façade

Green area 551,05 m²



Designed by Singular Green architects.

Agreed between Valladolid City Council and El Corte Inglés

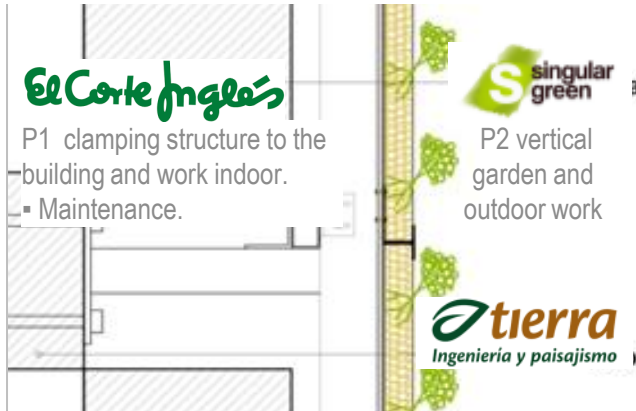


Planting the Green Façade (11th June)

Vac25- Green façade.

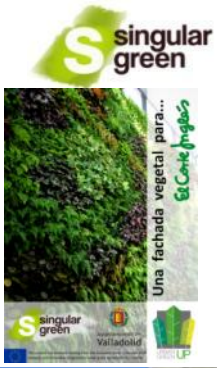
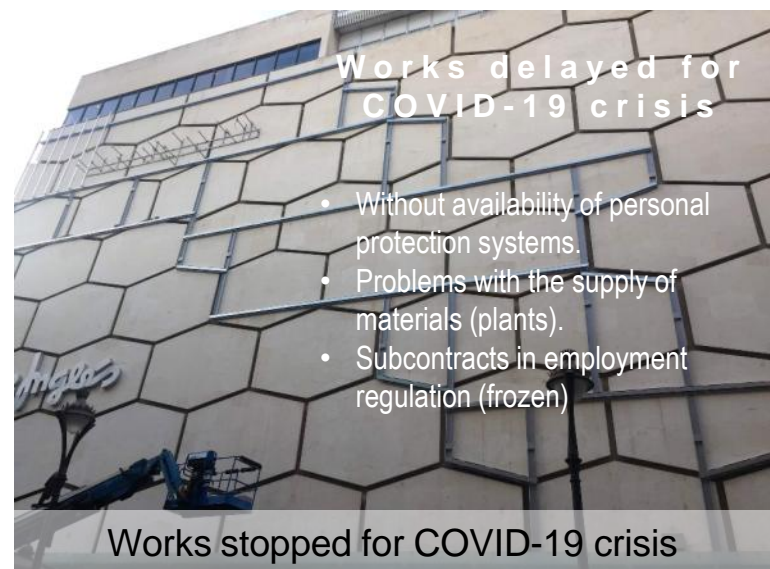
- Public-private collaboration through the signature of an agreement on May 2019.
- Sub-project 1: El Corte Inglés built the clamping structure and are in charge of the maintenance.
- Sub-project 2: Valladolid City Council installed the vertical garden.

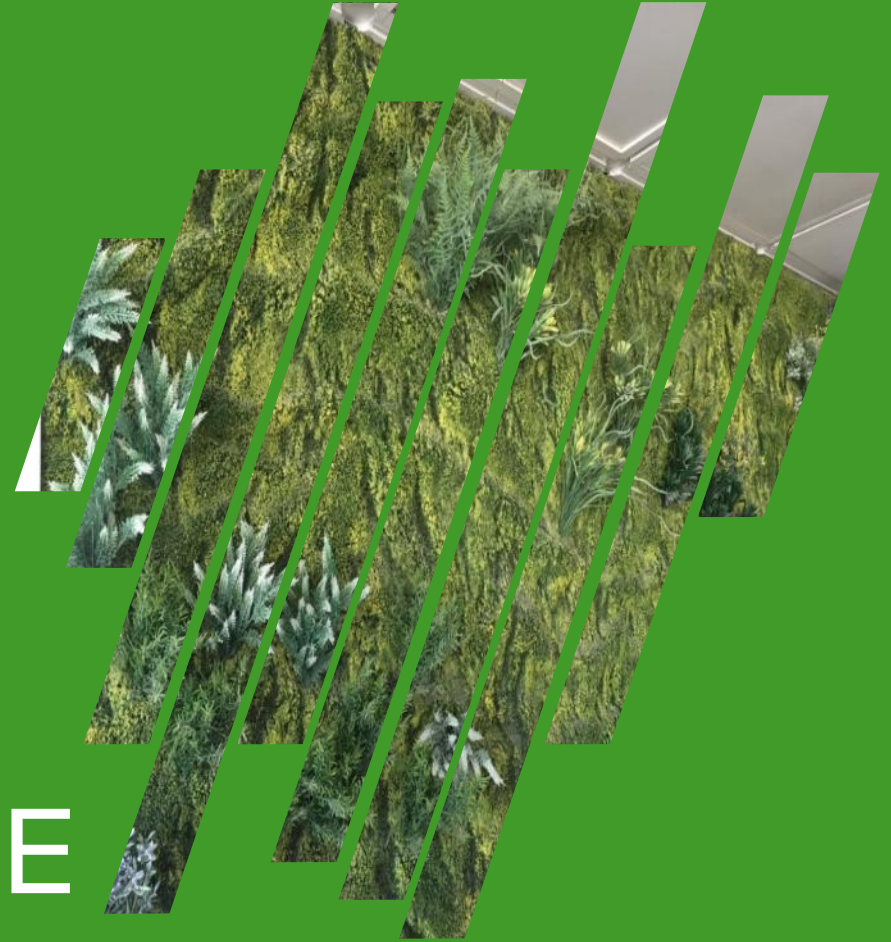
Public-private collaboration
(Agreement signed on May 2019)



Green façade
Green area 551,05 m²

Constructive details
Technical modification to the project: Changes in the anchoring structure (problems when drilling the facade)

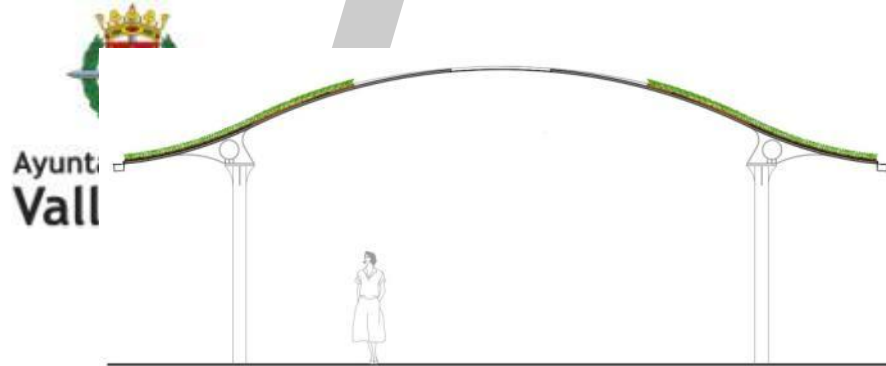




MAINTENANCE

MAIN DESIGN CRITERIA

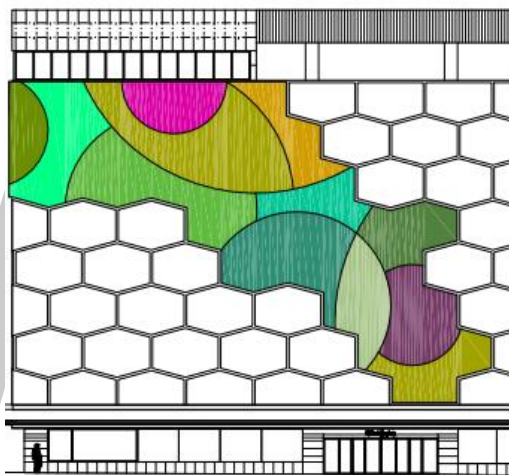
- Minimum maintenance requirements.
- High durability.
- Species selection: a wide range of irrigation possibilities, resistance and local aspects)















Green covering shelters project

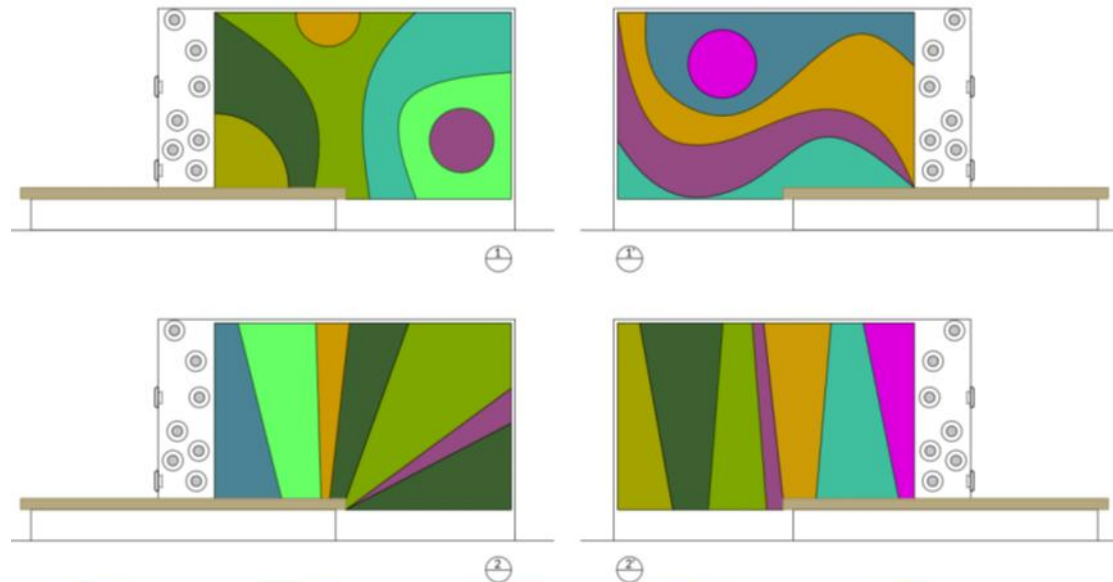











Vegetal sculpture project



Species selection in the green façade



Species selection in the vertical mobile gardens

MAINTENANCE REQUIREMENTS

Green covering shelters



- **Continuous review** through a remote control system)
- **Monthly maintenance**: visual inspection, control of the good functioning of the irrigation system, gutter cleaning, acid and fertilizer levels
- **Semiannual / Annual maintenance**: Cleaning the filter and system elements

Approximate cost of annual gardening services: included in the municipal gardening work.



Remote control system

MAINTENANCE REQUIREMENTS

Green façade and vertical mobile gardens (except stakable frames)



- **Continuous review** through a remote control system (only in the green façade)
- **Monthly maintenance**: visual inspection, control of the good functioning of the irrigation system, gutter cleaning, acid and fertilizer levels.
- **Semiannual / Annual maintenance**: Pruning and cleaning the filter and system elements.

Approximate cost of annual gardening services:

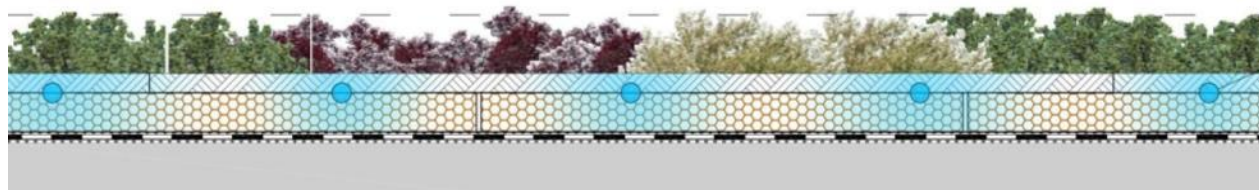
- Green façade: 6.000 €/year (including lifting equipment)
- Vertical mobile gardens (all of them): included in the municipal gardening work.



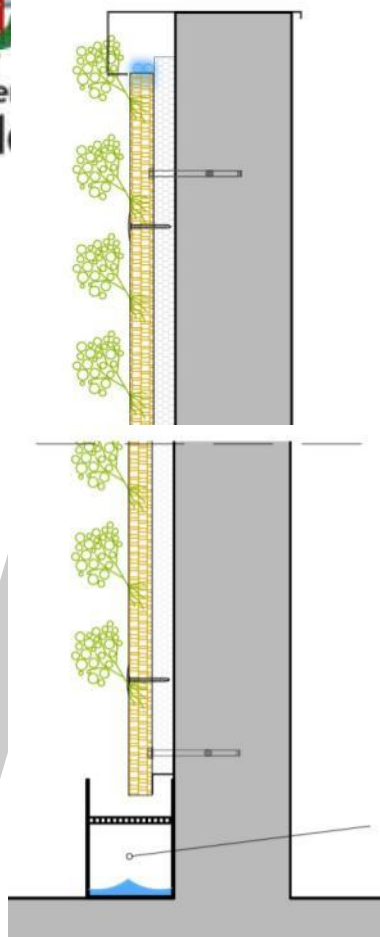
WATER DEMAND

Approximate cost: 2-3 €/m²/year

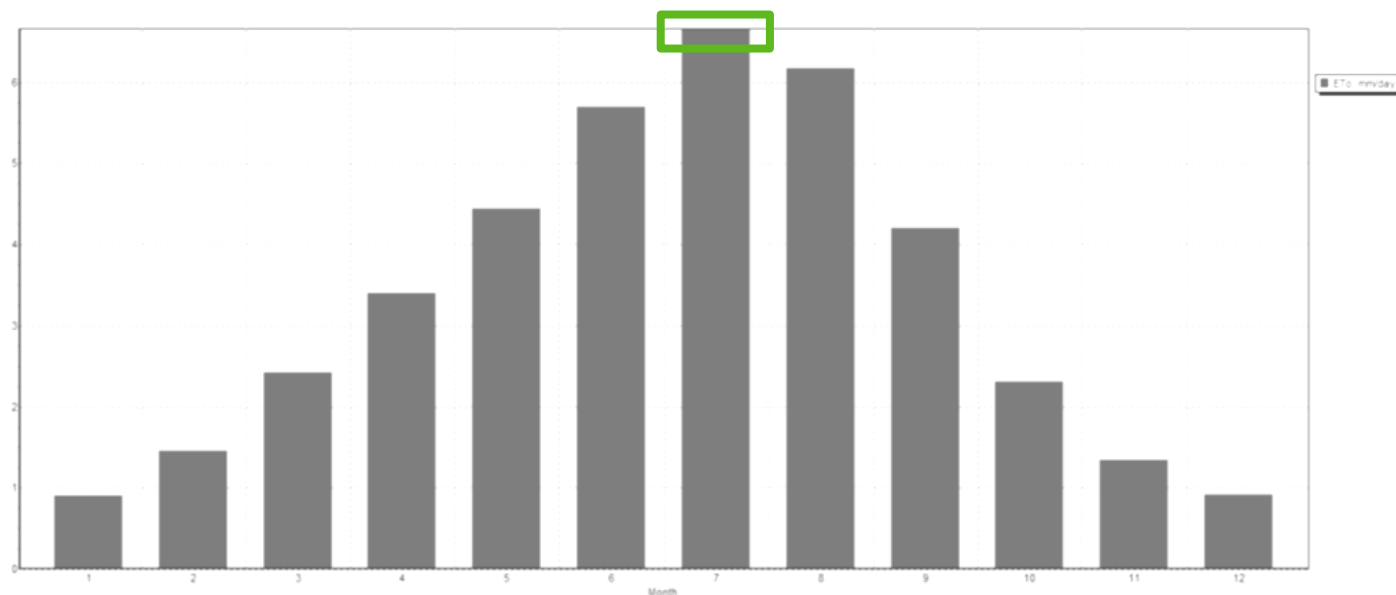
Maximum evapotranspiration: 6.6 mm/day



Green roof irrigation



Vertical garden irrigation



Local evapotranspiration levels according to the Penman-Monteith equation

ENERGY DEMAND

Approximate cost:

- Green façade: 330 €/year (1.5 kw pump + irrigation programmer)
- Green cover shelter: 6-10 €/year (irrigation programmer)



Vertical garden irrigation system: water recirculation with pumping system



Green roof garden irrigation system



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THANK YOU FOR YOUR ATTENTION

VALLADOLID CITY COUNCIL & SINGULAR GREEN S.L.

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