

24 JUNE 2021 -
4TH EXTERNALWEBINAR

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GREEN ROOFS IN VALLADOLID
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 INFRAESTRUCTURE
- GREEN COVERING SHELTER, GREEN ROOF AND GREEN CANOPIES
  - KEY CHALLENGES
  - RESULTS IN THE CITIZENS
  - LESSONS LEARNT
- MAINTENANCE OF GI

URBAN GreenUP in the city

VALLADOLID

Green roofs

Covering shelter & Mobile gardens

Vac27- Green Covering Shelter.

Green area 488 m²

Daily market under the Green Canopies in España Square (February 2020)

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

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

Spring in the Yellow Marquees June 2021

CHALLENGES IN VALLADOLID

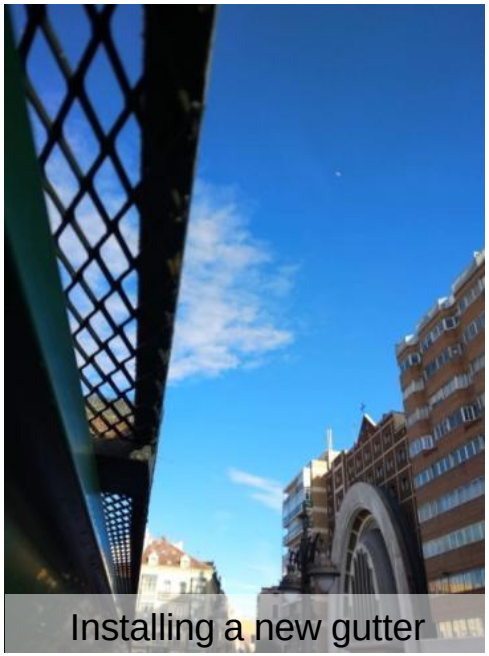
GREEN COVERING SHELTER

Rainwater collection:

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

The designed gutter was not wide enough.
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

Green roof

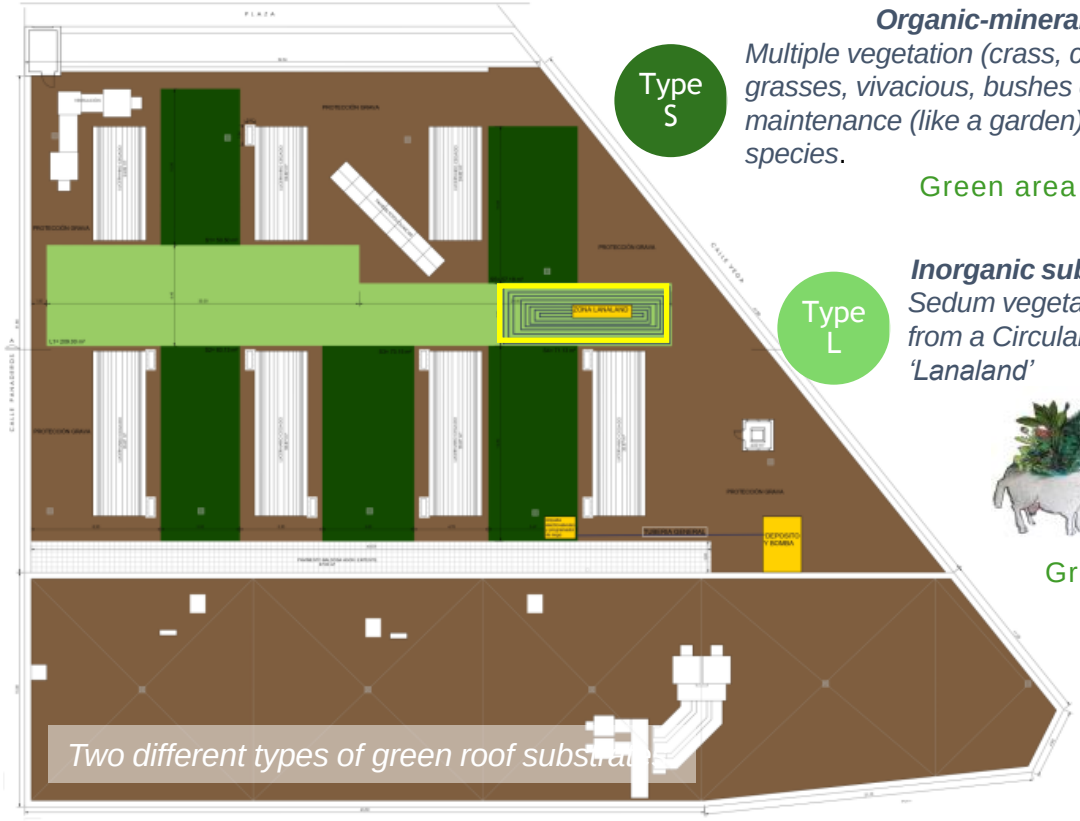
Vac28- Green roof

Green area 524,09 m²

- *Green roof in the Municipal Market El Campillo*
- *Implementation fully finished on August 2020.*

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

Water for irrigation from the water table



Two different types of green roof substrate

Type S

Organic-mineral substrate
Multiple vegetation (crass, cespitose, sedum, grasses, vivacious, bushes or trees. Variable maintenance (like a garden). Selection of native species.

Green area **484.09 m² *92.36%***

Type L

Inorganic substrate based on sheep wool
Sedum vegetation in an innovative substrate from a Circular economy Project named 'Lanaland'

ECONOMÍACIRCULAR EN VALLADOLID

Green area **40 m² *7.63%***

Installing wool substrate

@artencanal

Sheep wool substrate – Lanaland (Artencanal association, 2019)

Panoramic view of the Green roof in the municipal Market of El Campillo (1st September)

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

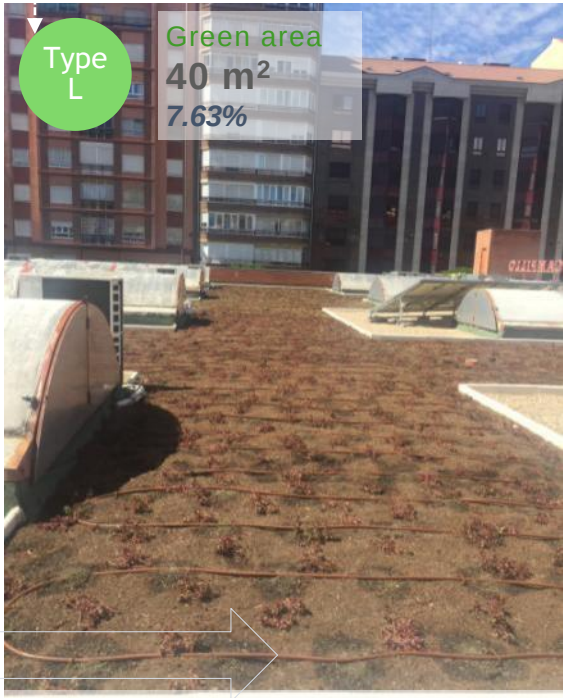
•Complete renovation of the roof: Waterproofing + Green roof.

(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

Vac28- Green roof in El Campillo municipal market

EX ANTE AND EX POST SCENARIOS

El Campillo municipal Market roof EX ANTE (Dec 2019)

El Campillo Market in Autumn (November 2020)

El Campillo Market in winter (February 2021)

Green roof

Vac28- Green roof

Green *Sedum Plachiphyllum Blue Jelly* (Nov20)

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

GREEN COVERAGE

Green roof

Green area 524,09 m^2

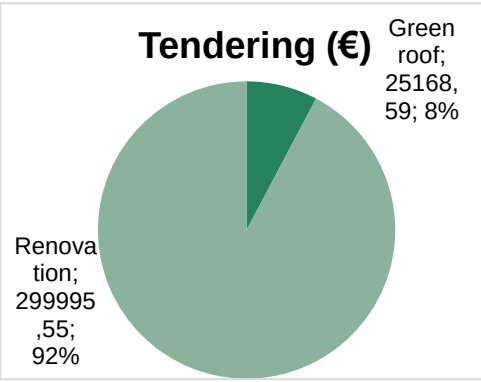
Comparison between two types of sedum

El Campillo Market EX POST (Nov 2020)

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.

FINANCING

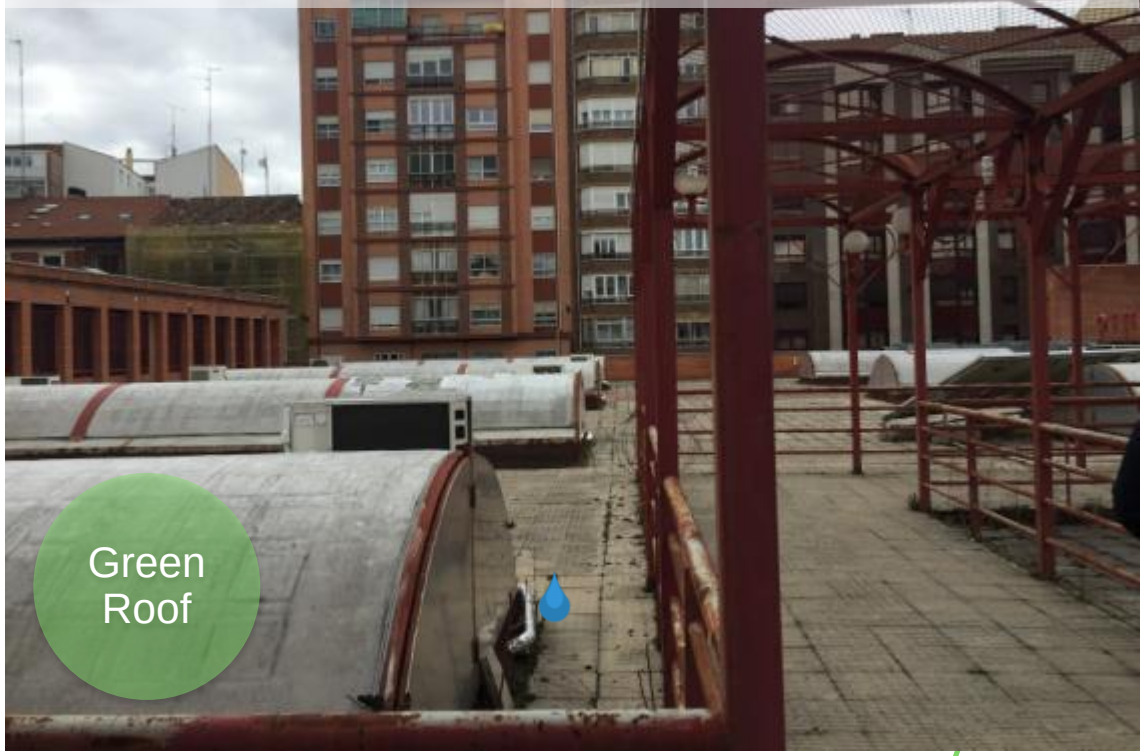


- **Challenges:** Building with structural problems: Leaks and roof waterproofing.

Challenges

Who is responsible for reparing the roof?

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



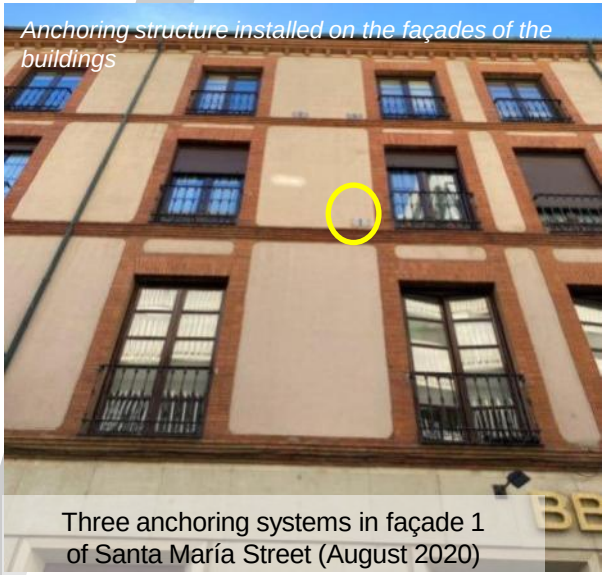
- **Potential:** Walkable roof. Public access allowed. There is space available for a bar with terrace.

Vac29- Green shady structures

Green shady structures
Green area 145,53 m^2

Canopies in façade 1
of Santa María Street (Oct 2020)

Canopies in the first section
of Santa María Street (Nov 2020)



Three anchoring systems in façade 1
of Santa María Street (August 2020)

Hanging canopies where vegetation is seeded and grow

Old press kiosk renovated

Green canopies for shadow and lightning

Vac29- Green shady structures

Green shady structures
Green area 145,53 m^2

PLANTS SPECIES SEEDED IN THE AWNINGS

General view of the green canopies Section I (Feb 2021)

Detail of a seeded awning (Feb 2021)

Canopies growing up (Apr 2021)

Green canopies in green, growing (April 2021)

Green canopies for shadow and lightning

Vac29- Green shady structures

Green shady structures

Green area 145,53 m^2

General view of the green canopies (Mar 2021_Tribuna_jpostigo)

Gren canopies for a pedestrian (May 2021)

Green canopy detailed (Mayo 2021) (Source: SGR)

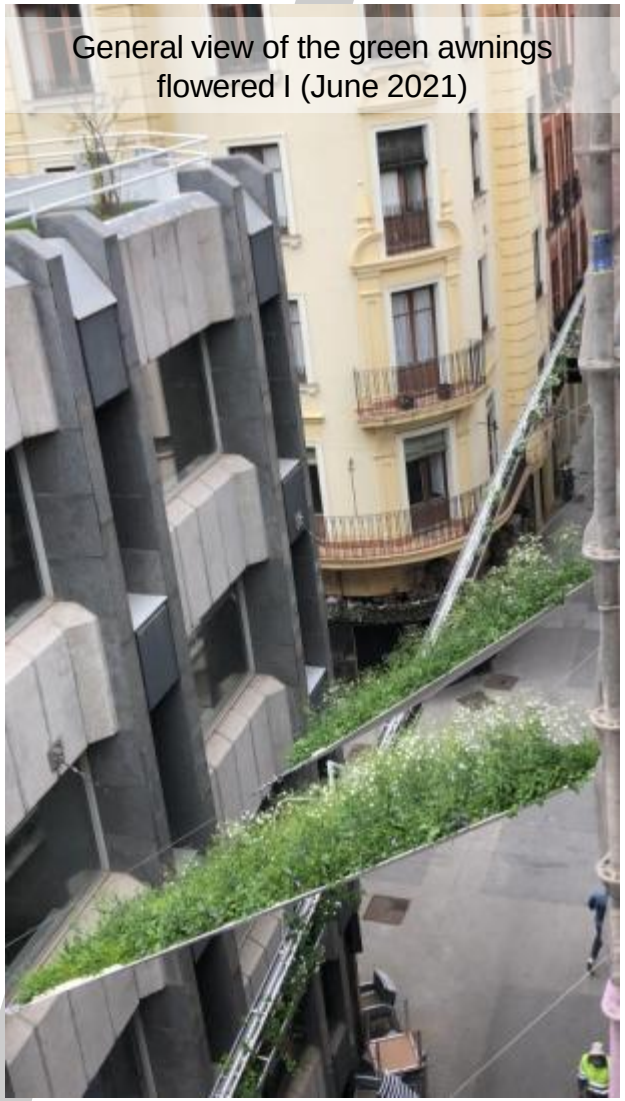
Green canopies greening (Abr 2021)

Detail (Abr 2021) SGR

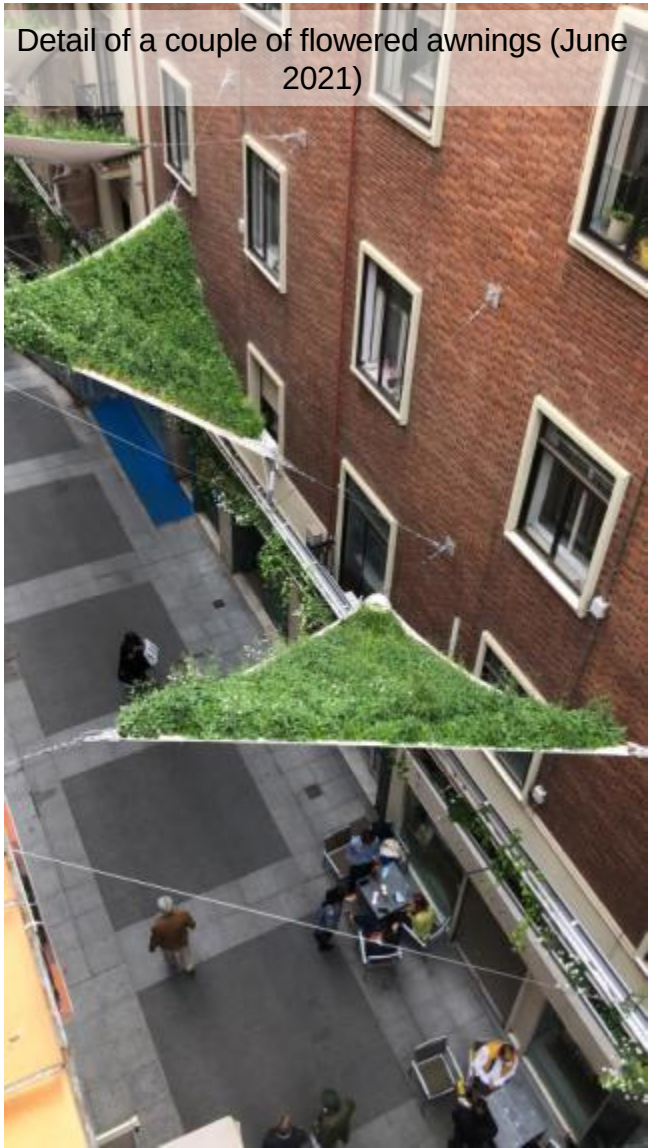
Green canopies for shadow and lightning

Vac29- Green shady structures

Green shady structures
Green area 145,53 m^2



General view of the green awnings flowered I (June 2021)



Detail of a couple of flowered awnings (June 2021)

General view of the green awnings from the floor (June 2021)

Green canopies for shadow and lightning

Vac29- Green shady structures

Green shady structures
Green area 145,53 m^2

General view of the green awnings flowered (June 2021)

The green awnings from the floor (June 2021)

Detail of a couple of flowered awnings (June 2021)

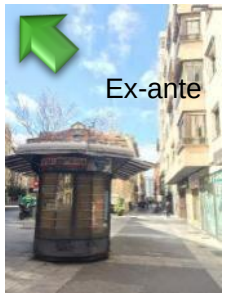
CHALLENGES IN VALLADOLID

GREEN SHADY STRUCTURES: Canopies in Santa María St

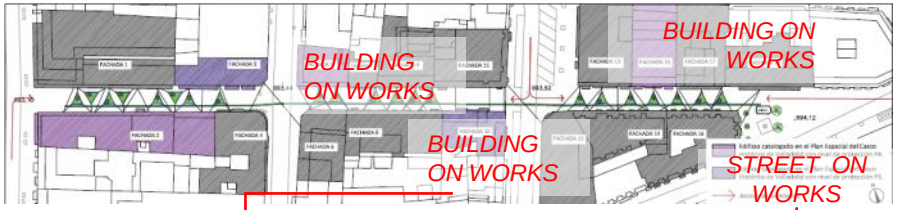
- Adaptation of an old press kiosk to keep the systems.
- Modifications of the project in the execution phase.

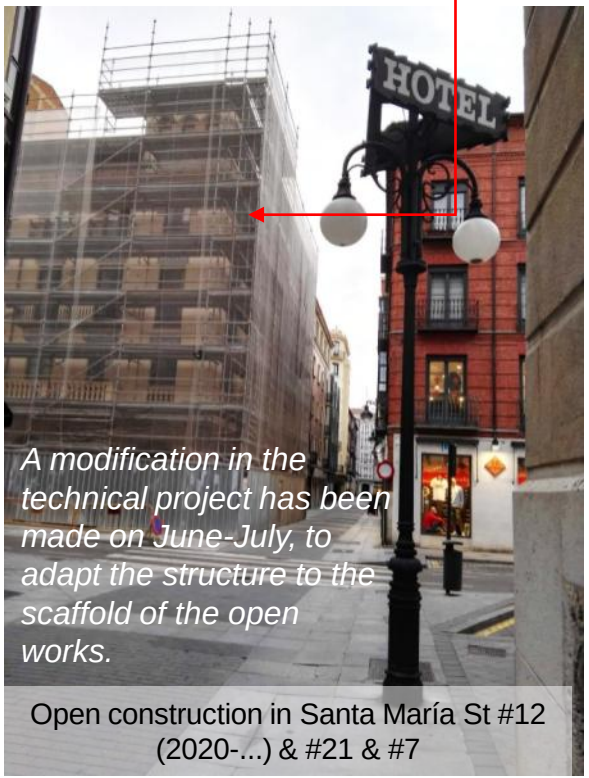
Re-use an old kiosk – Circular economy

Challenge Irrigation and control infrastructure.
Solution Use unused kiosks to hide those items and the connections to networks.



Modifications of the project – once awarded





A modification in the technical project has been made on June-July, to adapt the structure to the scaffold of the open works.

Open construction in Santa María St #12 (2020-...) & #21 & #7

singular green

Coordination between coexisting works.

Pedestrianisation of Claudio Moyano Street (June 2020)

CHALLENGES IN VALLADOLID

Vac29- Green shady structures

Canopies in Santa María St.

Green canopies for shadow and lightning

Firemen's handbook

Fire Protection Service

Challenge Access of the fire truck.

Solutions

- Maintain a minimum height of the system over 4.5 m high.
- Develop a fuse break system.
- Establish a protocol for the firemen brigades.
- Practice with experience (fire truck)

CHALLENGES IN VALLADOLID

GREEN SHADY STRUCTURES: Canopies in Santa María St

- Dissatisfaction of some neighbors because of the installation on their façades (28)

Challenge Anchor to the private façades, with public lighting.
Solution Citizen co-creation with neighbors and shopkeepers.

Citizen co-creation. Communication.

Citizen information stand.
Specific informative sessions to all neighbors and traders.
Informative letters to neighborhood communities.

Informative letters sent to all affected neighborhood communities (19) June 2020

RESULTS

Low participation. No answers, no communication with the City Council.
Neighborhoods complaints after the start of the *in situ* works.

Neighbours (3) and Traders (6) in two sessions (morning, evening)

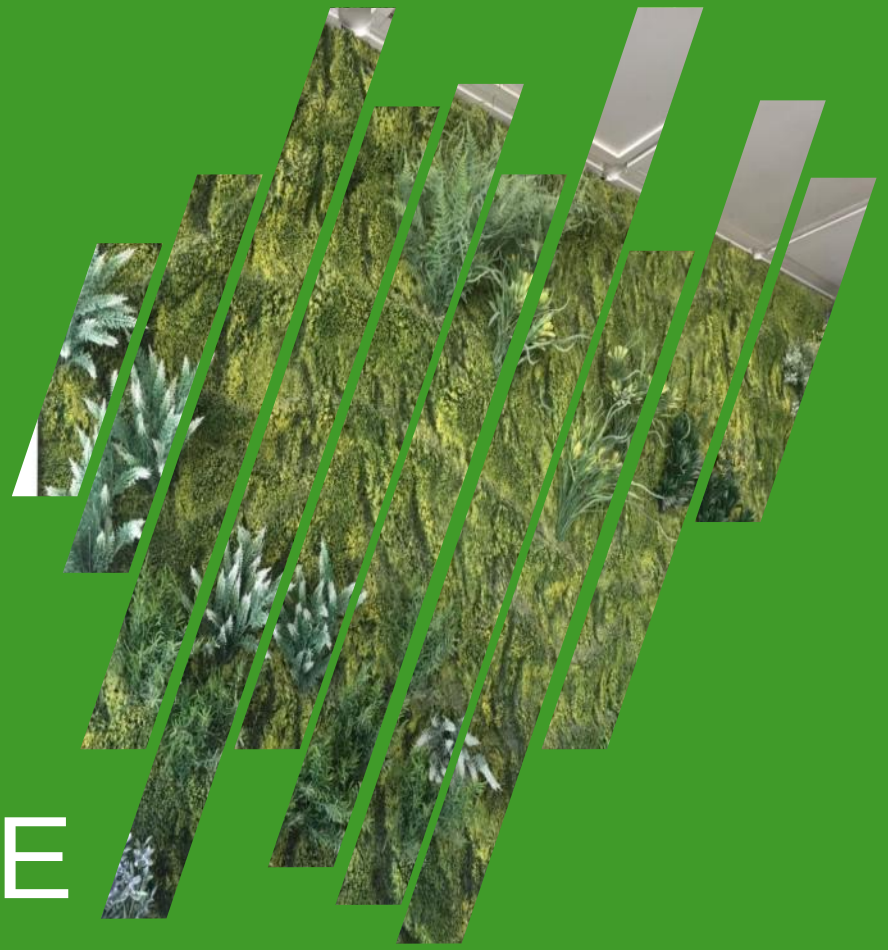
How did we warn the citizens directly affected by this NBS? Through posters on the portals, leaflet in the mail boxes and door to door campaign.

Informative session on Green canopies in Sta. María St. (April 2018)

LESSONS LEARNT

Conduct more informative sessions to ensure participation of the citizen directly affected. Involve those directly affected in the design or the planning process of the intervention.

Placing the anchors on the façades (Nov 2020)



MAINTENANCE

Design for maintenance

Monitoring data

MAIN DESIGN CRITERIA

SPECIES SELECTION

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

Vac28- Green roof

•*Native Sedum from a local nursery.*

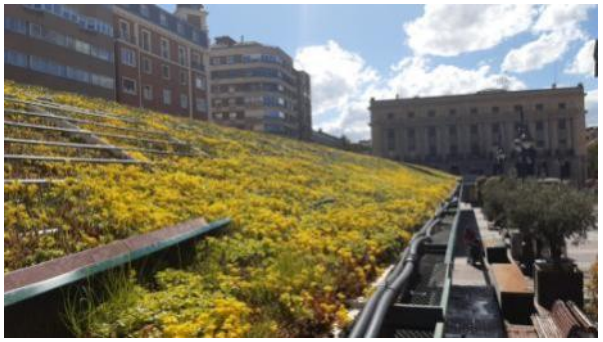
- *Sedum spurium Schorbuser Blut (Dragon Blood)*

- *Sedum Plachiphyllum Blue Jelly*

Plants: two types of native Sedum

Vac27- Green covering shelters

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

MAIN DESIGN CRITERIA

Vac29- Green shady structures

EXECUTION: PLANTS SPECIES SEEDED IN THE AWNINGS

- *Evergreen herb perennial plants species. Native Mediterranean or European.*
- *Low maintenance, easy to grow. Propagated by seeds.*

Gypsophila repens

Aubrieta hybrida

Arabis alpina sb.caucasica

Lolium perenne top gun

PLANTS SPECIES FOR THE METAL TRUSS

- *Evergreen perennial plants. Native Mediterranean or European.*
- *Groundcover species and climbing species.*

Vinca major

Arabis alpina sb.caucasica

Hedera helix

MAITENANCE REQUIREMENTS

VAc27 - Green covering shelters

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. Approx. 5.000 € - 7.000 €/year.

Remote control system

MAITENANCE REQUIREMENTS

Green coverages

Green roof in El Campillo municipal market

- Continuous review through a remote control system (except in the green roof)
- 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 roof in El Campillo market: 5.000 – 7.000 €/year.

- Green shady structures in Santa María St: Still not defined (Maintenance with lifting crane)

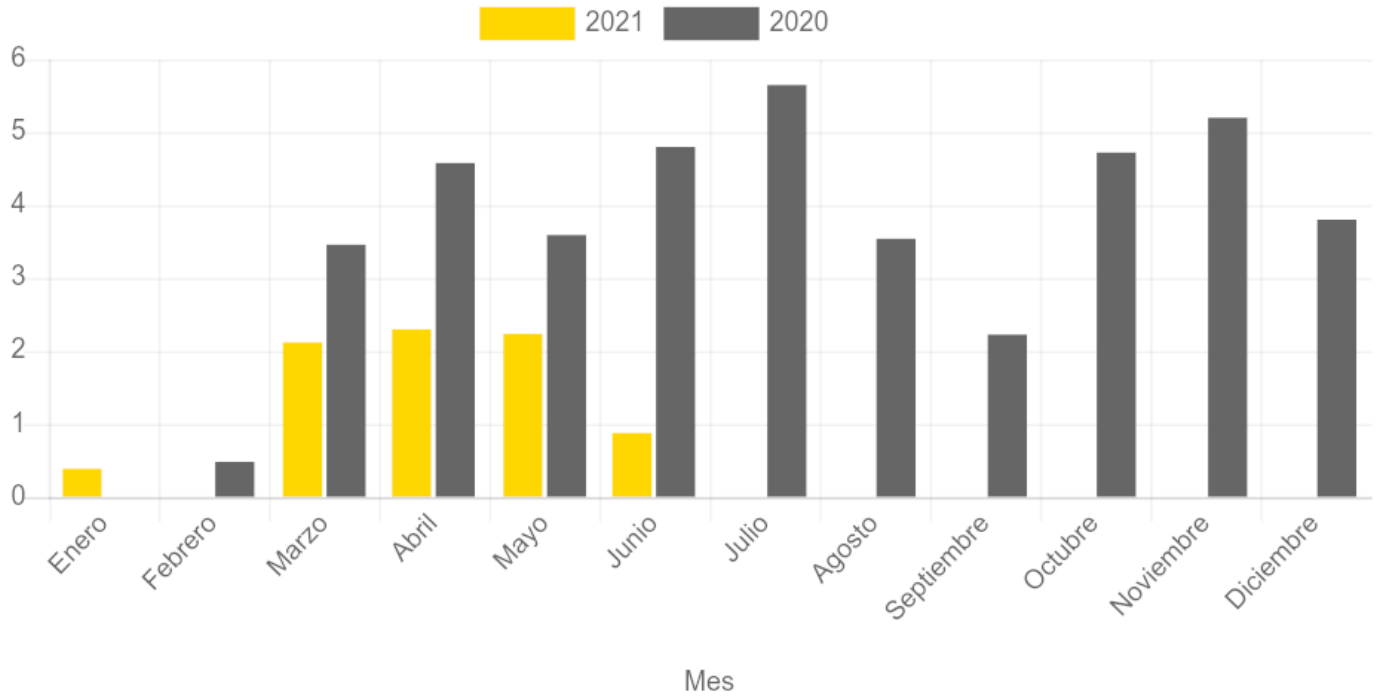
Green shady structures in Santa María Street

Remote control system

WATER DEMAND

Vac27 - Green covering shelters in España Sq

Vegetated surface: 488 m2
Total m3 per year: 42,65 m3 water



The first irrigation was oversized because we were just starting to test the behaviour of the vegetation. In october we had a pipe break so the water demand was increased considerably. It was fixed in January 2021. In February the irrigation stopped due to Filomena tempest.

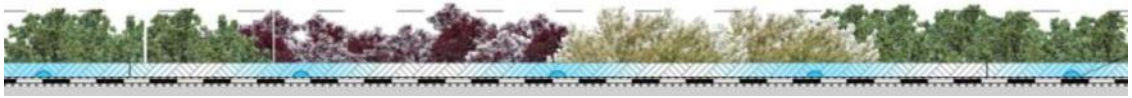
WATER DEMAND

Vac29 - Green shady structures in Santa María St

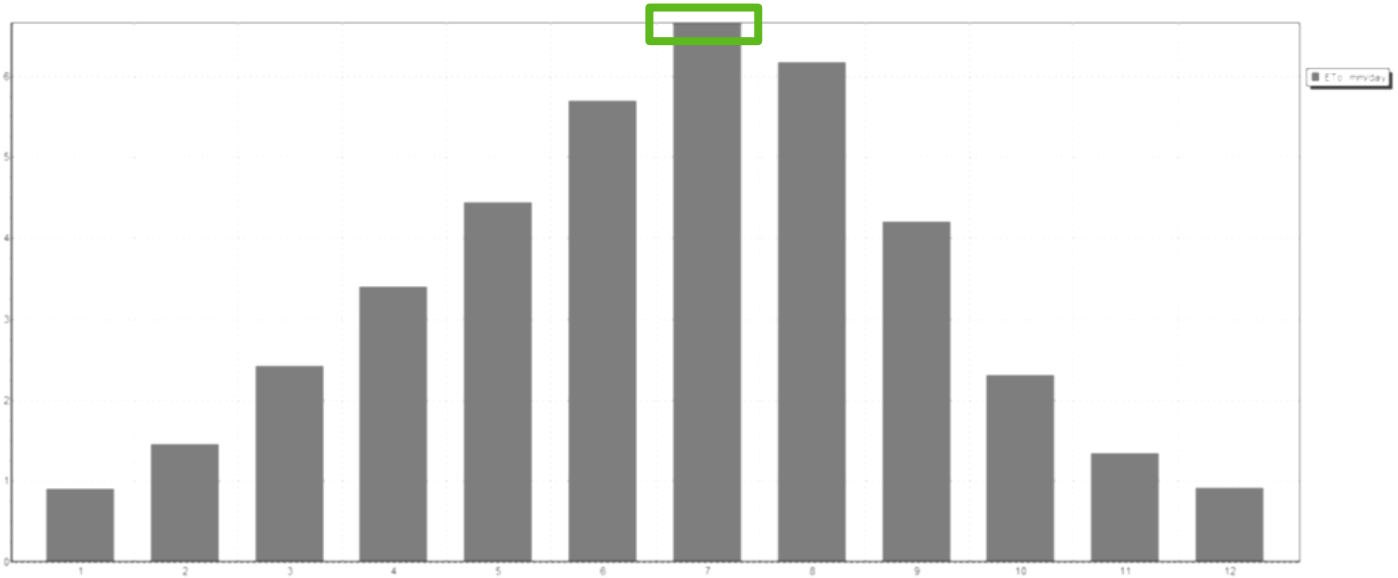
Maximum evapotranspiration: 6.6 l x m2/day in summer
1.3 l x m2/day in winter

Vegetated surface: 145,53 m2

Total m3 per year: 170 m3 (theoretical)



Green roof irrigation



Local evapotranspiration levels according to the Penman-Monteith equation

ENERGY DEMAND

Approximate cost:

- Green cover shelters: 6-10 €/year (irrigation programmer)

Green shady structures irrigation system:
water recirculation with pumping system

Green roof garden irrigation system

URBAN GREEN UP

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THANK YOU
FOR YOUR ATTENTION

VALLADOLID CITY COUNCIL & SINGULAR GREEN S.L.

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