

MODULAR VERTICAL GARDENS THE EXEMPLE OF BETEVÉ BUILDING

Institut M. del Paisatge Urbà i la Qualitat de Vida
Party Wall regeneration program

2022



Since its inception, the Municipal Institute of Urban Landscape has worked for the recovery of the urban fabric, through urban suturing. The actions of remodeling of party walls promoted and managed by the Municipal Institute of Urban Landscape aim to integrate these ruptures by transforming their historic provisionality into normalized façades that are consistent with their immediate surroundings. The Party Walls Recovery Program groups the remodeling actions both own and supervised by the private initiative.



1 Background

PARTY WALLS REMODELING PLAN

- NATURALIZATION AND BIODIVERSITY
- ENERGY SELF-SUFFICIENCY
- SINGULARIZATION
- PEDAGOGY AND THE FUTURE
- URBAN SUTURE



2 Characteristics

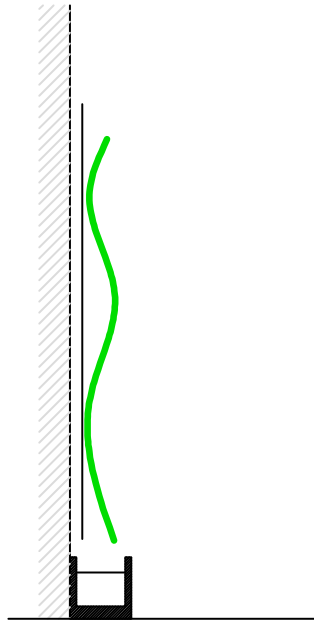
Architectural composition as the basis of any intervention

Added values:

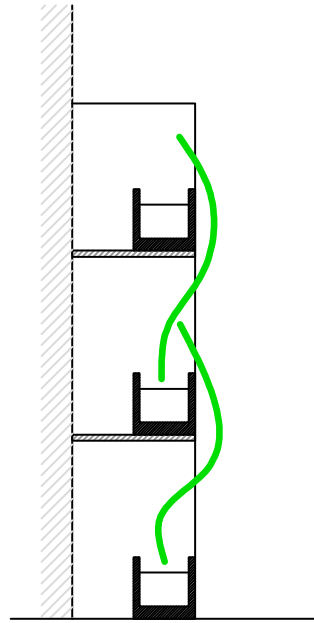
- Restoring the dignity of spaces
- Provide meaning and identity
- Improving the living conditions of the property
- **NATURALIZATION**
- **ENERGY SELF-SUFFICIENCY**
- **SUSTAINABILITY AND PEDAGOGY**



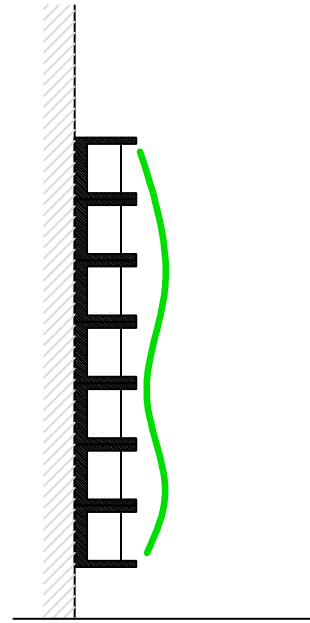
3 Greening party walls strategies.



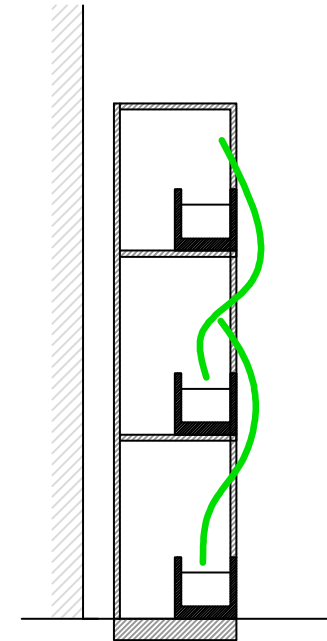
Ground floor
planter and vertical
support elements



Planters in height



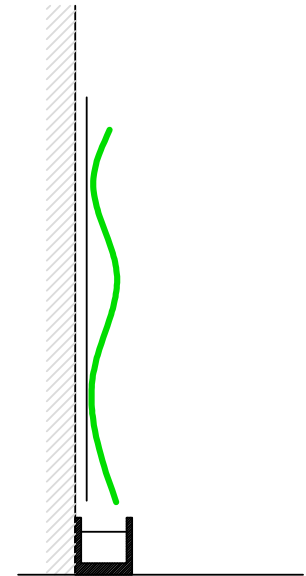
Vertical gardens



**Greening system.
MODULAR
GARDEN**



3 Greening party walls strategies. Ground floor planter and vertical support



strengths:

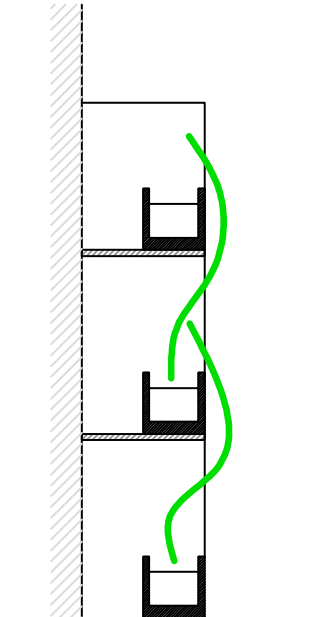
- Standard construction
- Small public space occupation
- Low cost
- Easy maintenance and repairs

weakness:

- Limited green surface (12-15m high)
- Slow grow
- Limited variety of species



3 Greening party walls strategies. Planters in height



strengths:

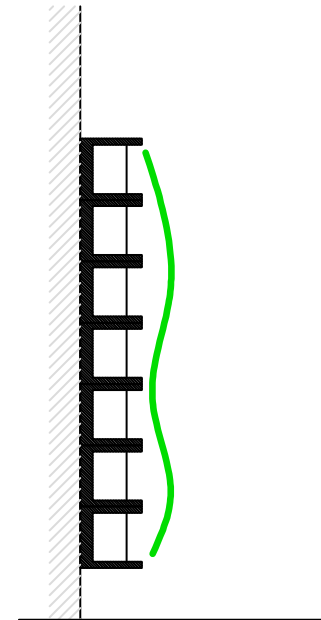
- Large vegetal surfaces
- Fast vegetation cover
- High variety of species
- Easy maintenance and repairing

weakness:

- Maximum civil works
- Big public space occupation
- High cost



3 Greening party walls strategies. Vertical garden



strengths:

- Minimum construction works
- Minimum public space occupation
- Large vegetal surfaces
- High variety of species

weakness:

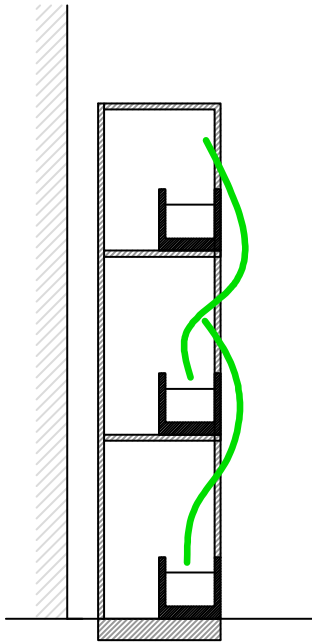
- Vegetal cover hard to maintain
- High cost in repairing
- High cost in construction
- Lack of previous experiences for evaluation



3 Greening party walls strategies. MODULAR Vertical Garden

strengths :

- Simple civil works
- Large vegetal surfaces
- Fast vegetation cover
- Easy maintenance and repairing
- High variety of species
- Systematized intervention
- Self-supporting structure
- Adaptability to multiple configurations



weakness :

- Public space occupation
- Lack of previous examples executed for evaluation
- Possible impact on underground facilities



4 MODULAR Vertical Garden . Characteristics

SYSTEMATIZATION OF VERTICAL GARDENS

INFRASTRUCTURE OPTIMIZATION

Other benefits:

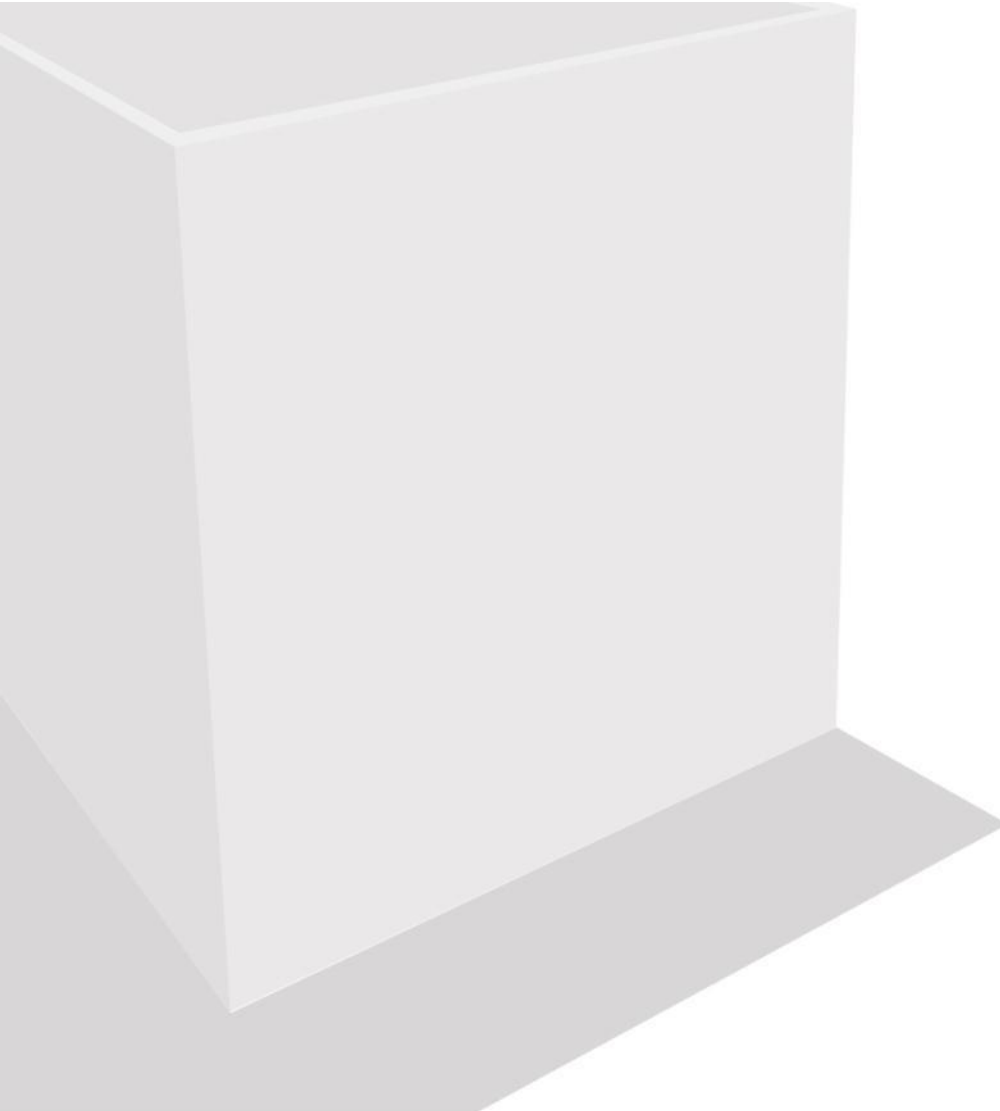
- Unity in diversity
- Cost rationalization
- Deadline control

1. STANDARDIZATION
2. VOLUMETRIC
ADAPTABILITY
3. FORMAL DIVERSITY
4. ACCESSIBILITY
Garden maintenaince
5. NATURALIZATION -
BIODIVERSITY
6. VERSATILITY OF USES
7. DISCLOSURE
8. APPLICATIONS TO THE
CITY

MODULAR GARDENS



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

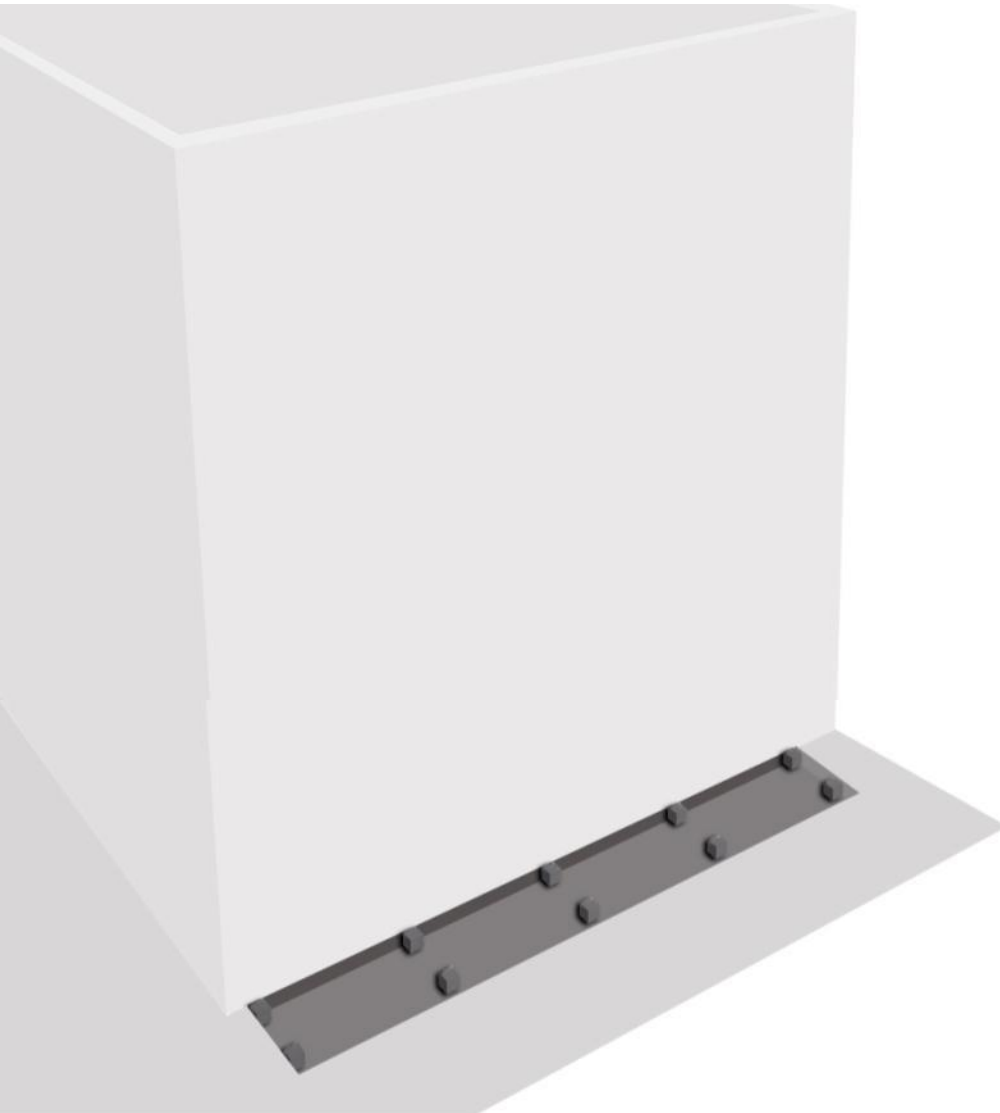
1. STANDARDIZATION Structural elements

Existing Party wall

Application in consolidated
partition walls facing public
spaces.



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

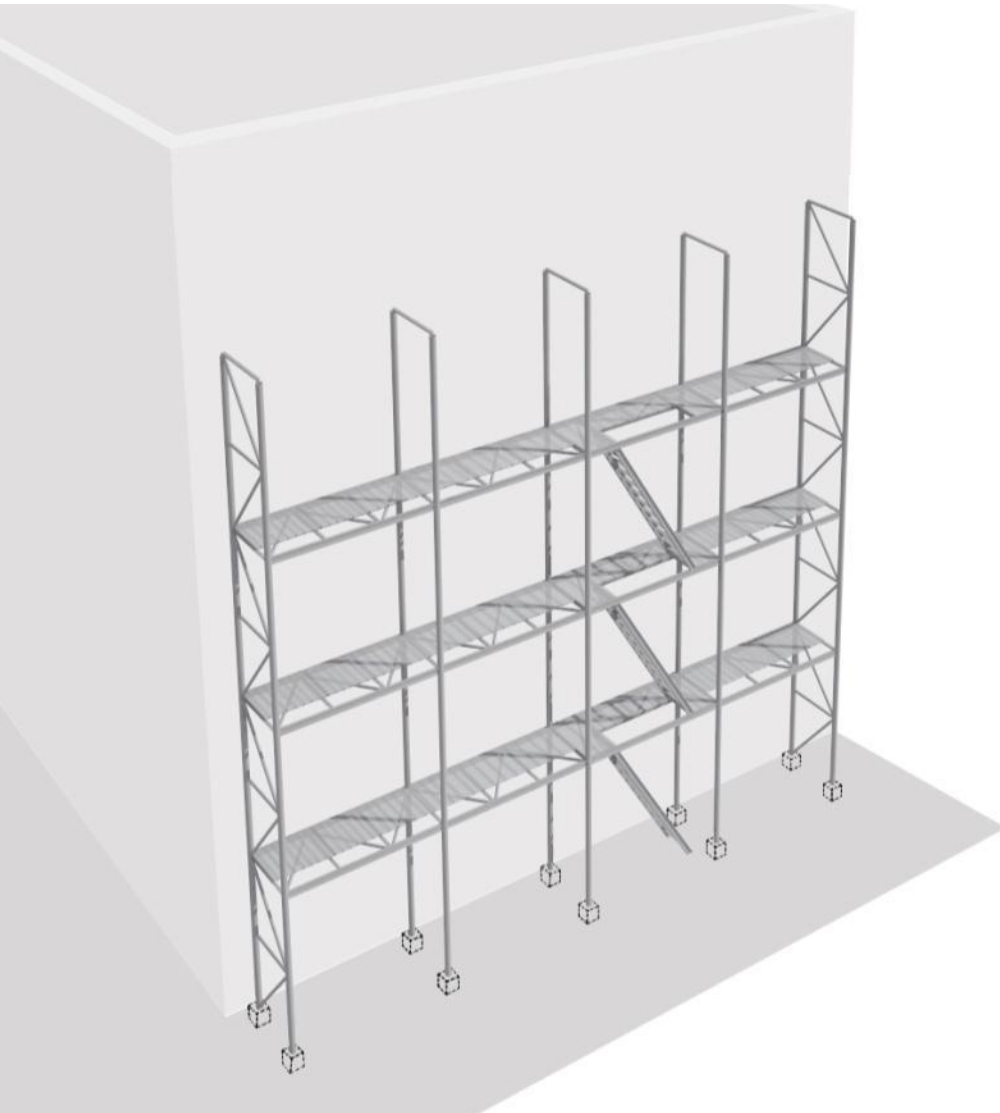
1. STANDARDIZATION Structural elements

Foundation

Solved by micropiles, a non-destructive and quick-to-run option.



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

1. STANDARDIZATION Structural elements

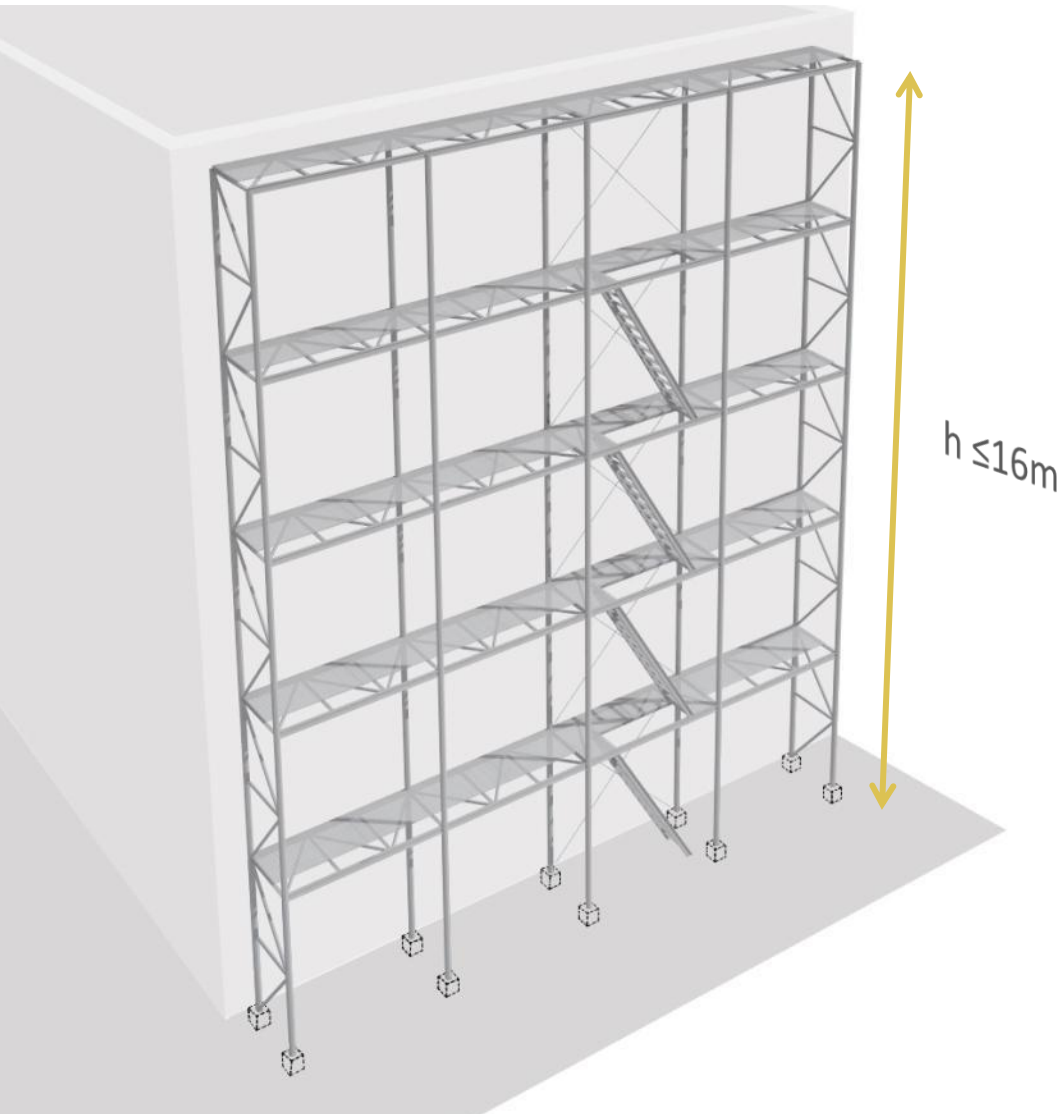
Foundations

Frames

Lightweight prefabricated structure formed by vertical supports and horizontal platforms.



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

1. STANDARDIZATION Structural elements

Foundations

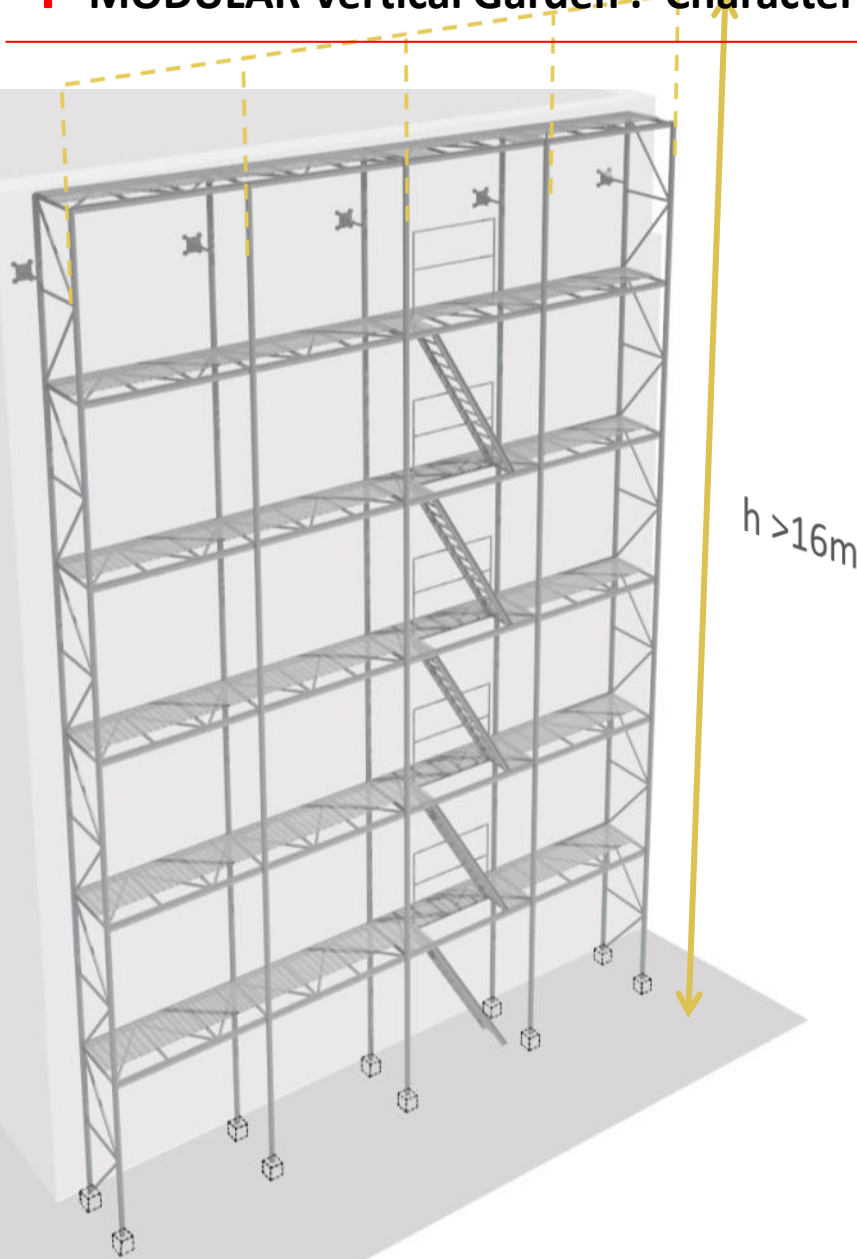
Frames

Walkways / stairs

Autonomous structure with
limited high



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

1. STANDARDIZATION Structural elements

Foundations

Frames

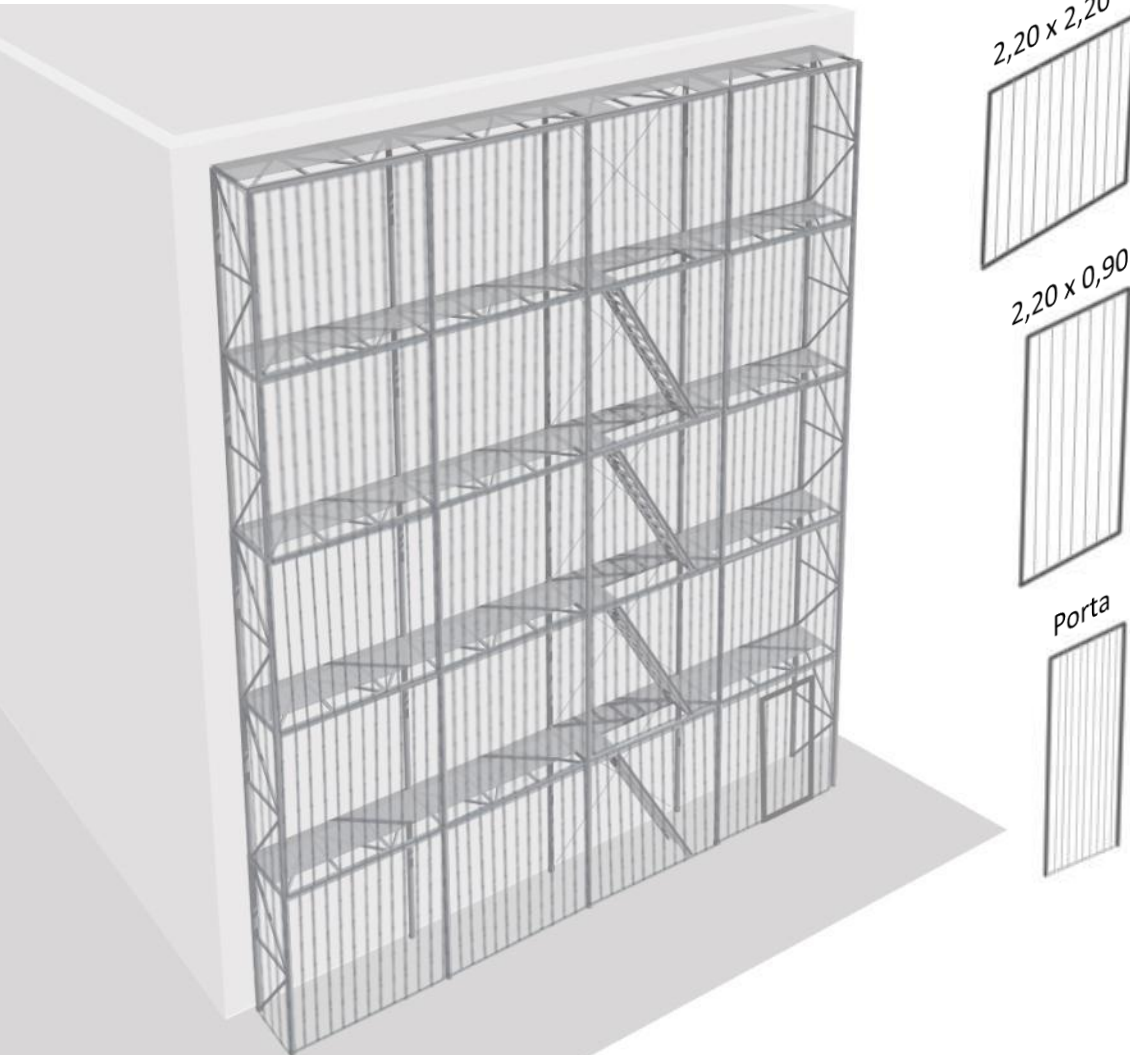
Walkways / stairs

Connectors

Structure with connectors allows
increase the height.



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

1. STANDARDIZATION

Structural Elements

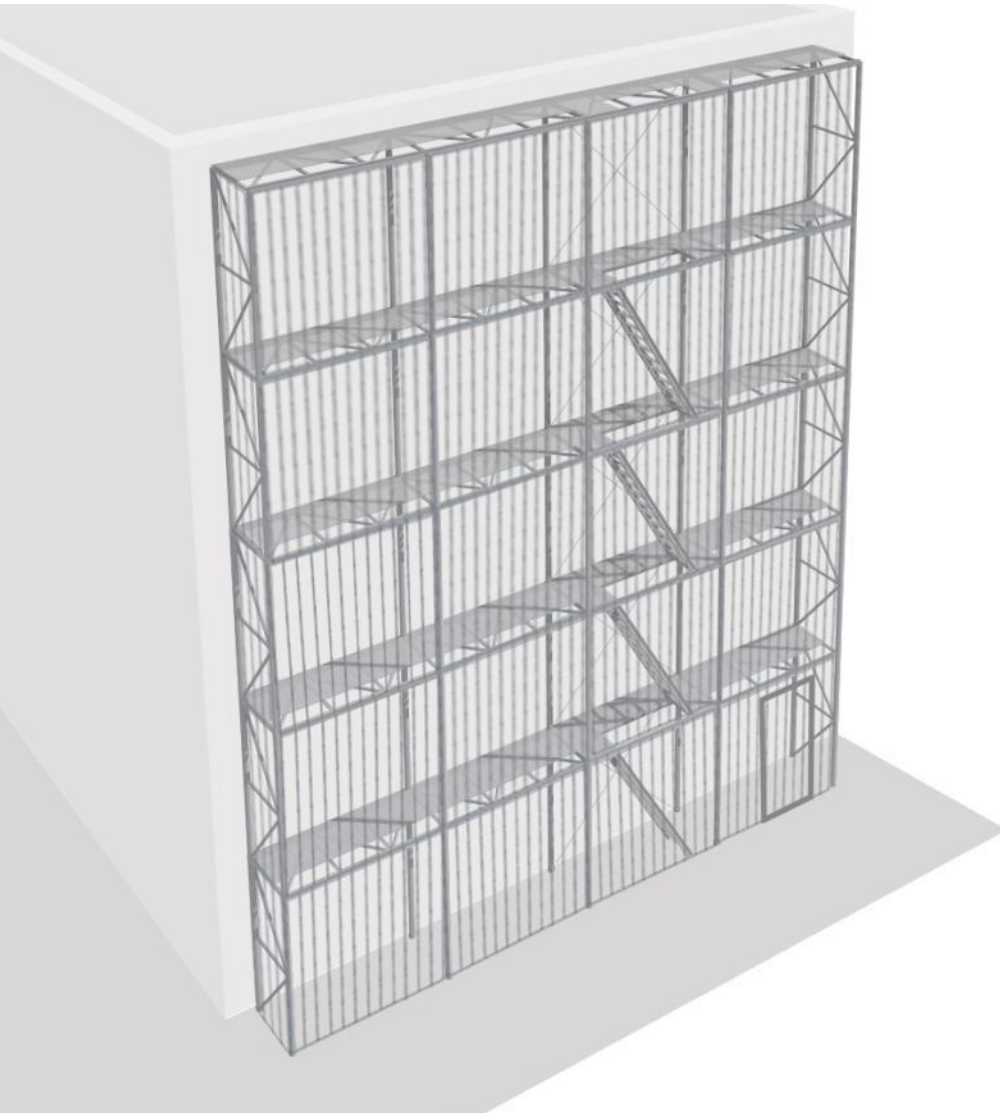
Closing elements

Closing panells

Mechanized panells for protection and support of plantation .



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

1. STANDARDIZATION

Structural elements

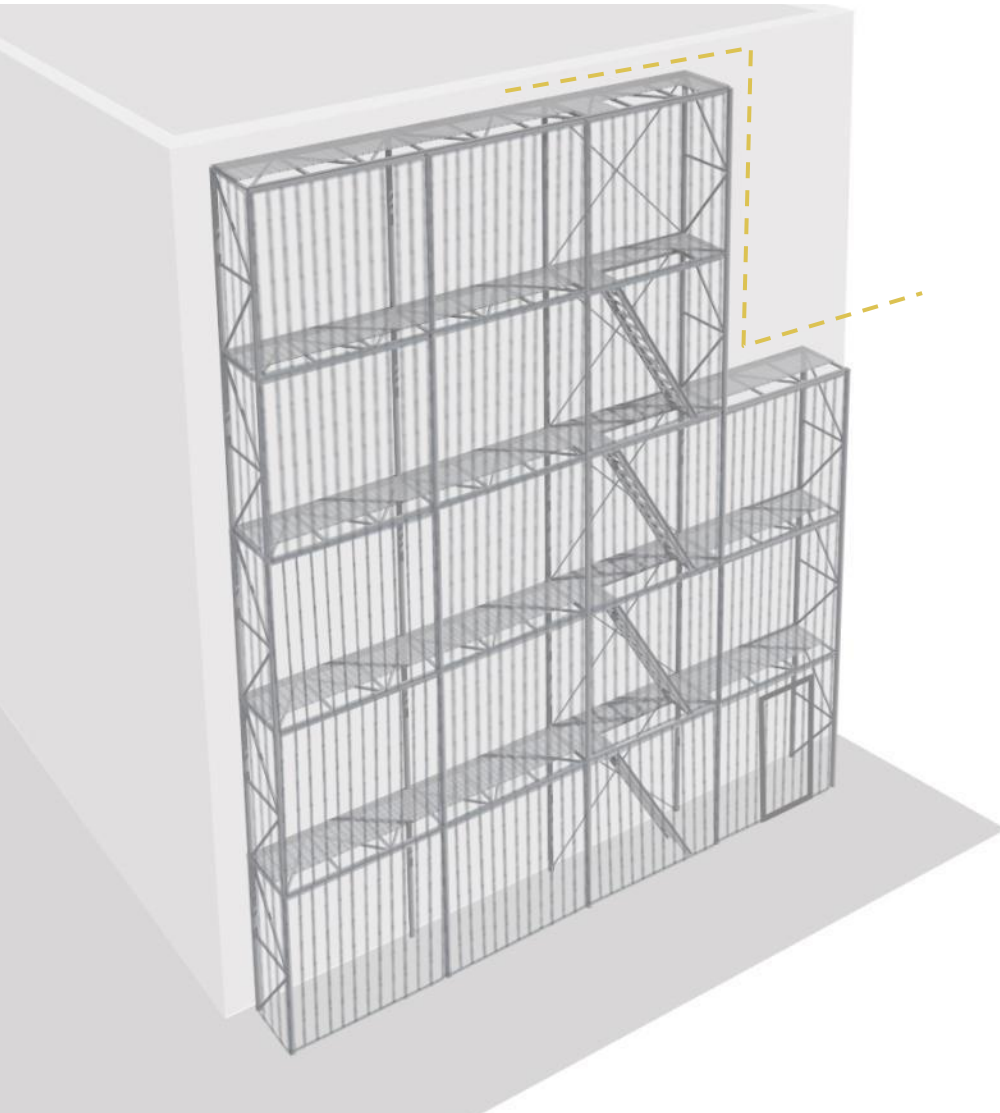
Closing elements

Maintenance of the structure

Antioxidant protection: galvanization.
Mechanized joints.



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

1. STANDARDIZATION

2. **VOLUMETRIC
ADAPTABILITY**

Integration of the structure with the existing building.

Possibility to compose several volumes according to the pre-existence party wall.



4 MODULAR Vertical Garden . Characteristics

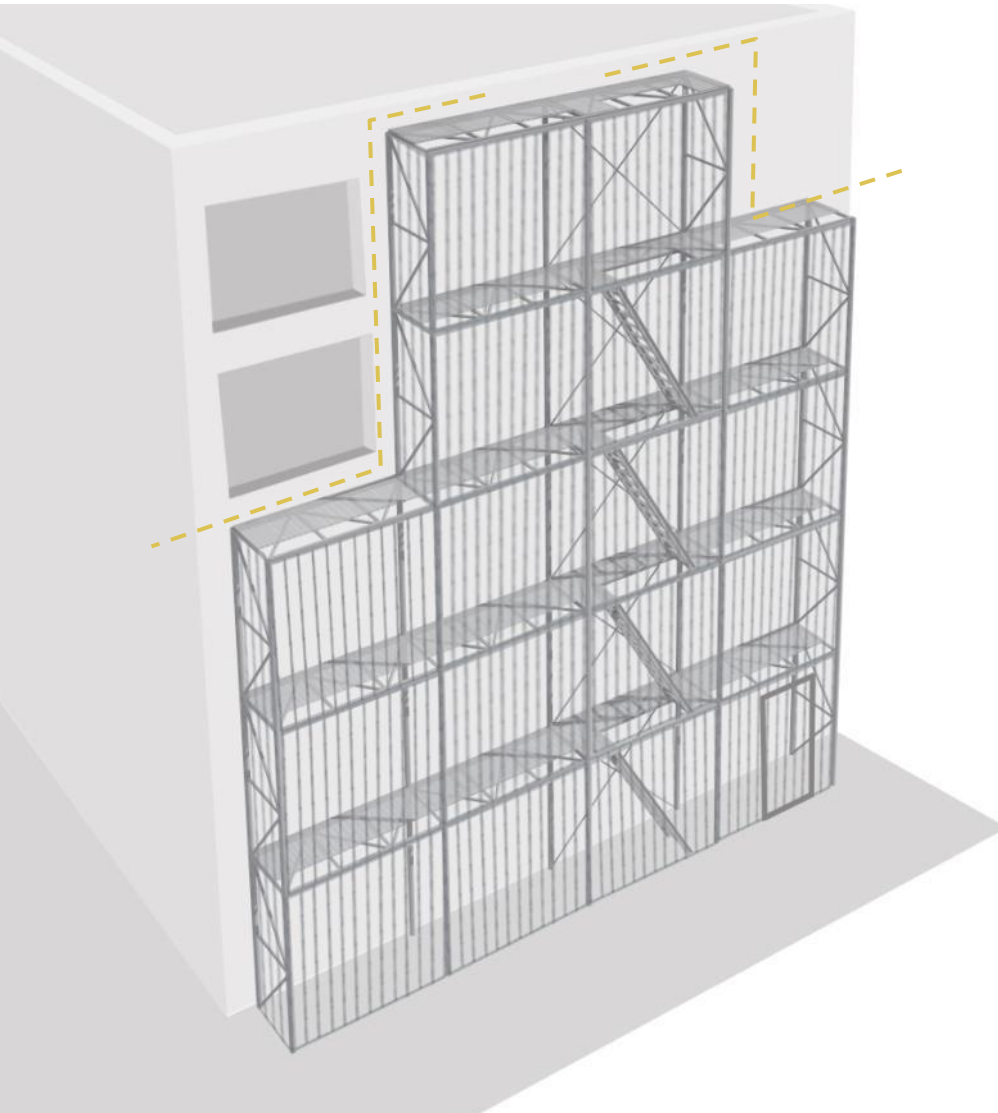
MODULAR SYSTEM

1. STANDARDIZATION

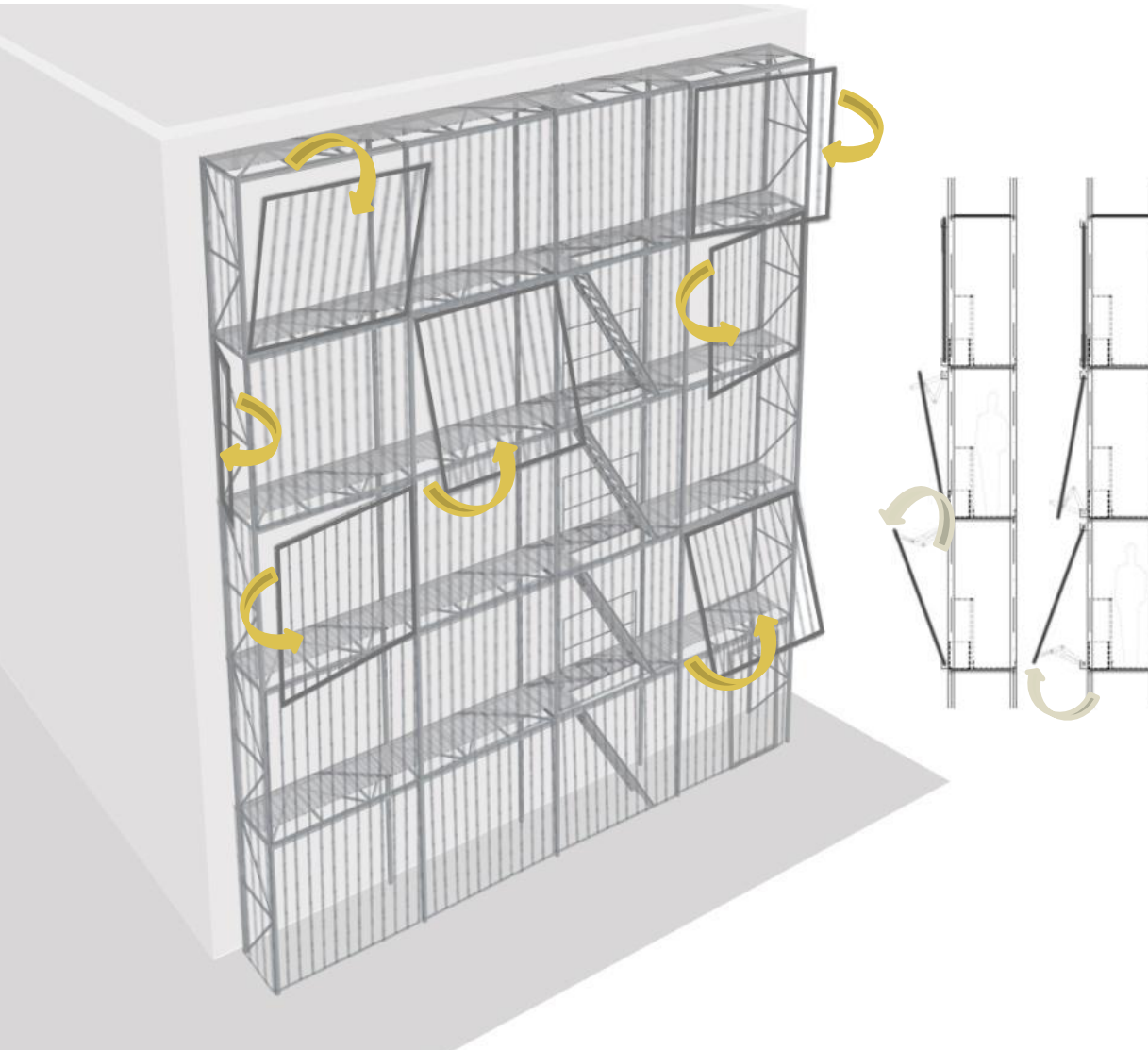
2. VOLUMETRIC
ADAPTABILITY

Integration of the structure with the existing building.

Possibility to compose several volumes according to the pre-existence façade.



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

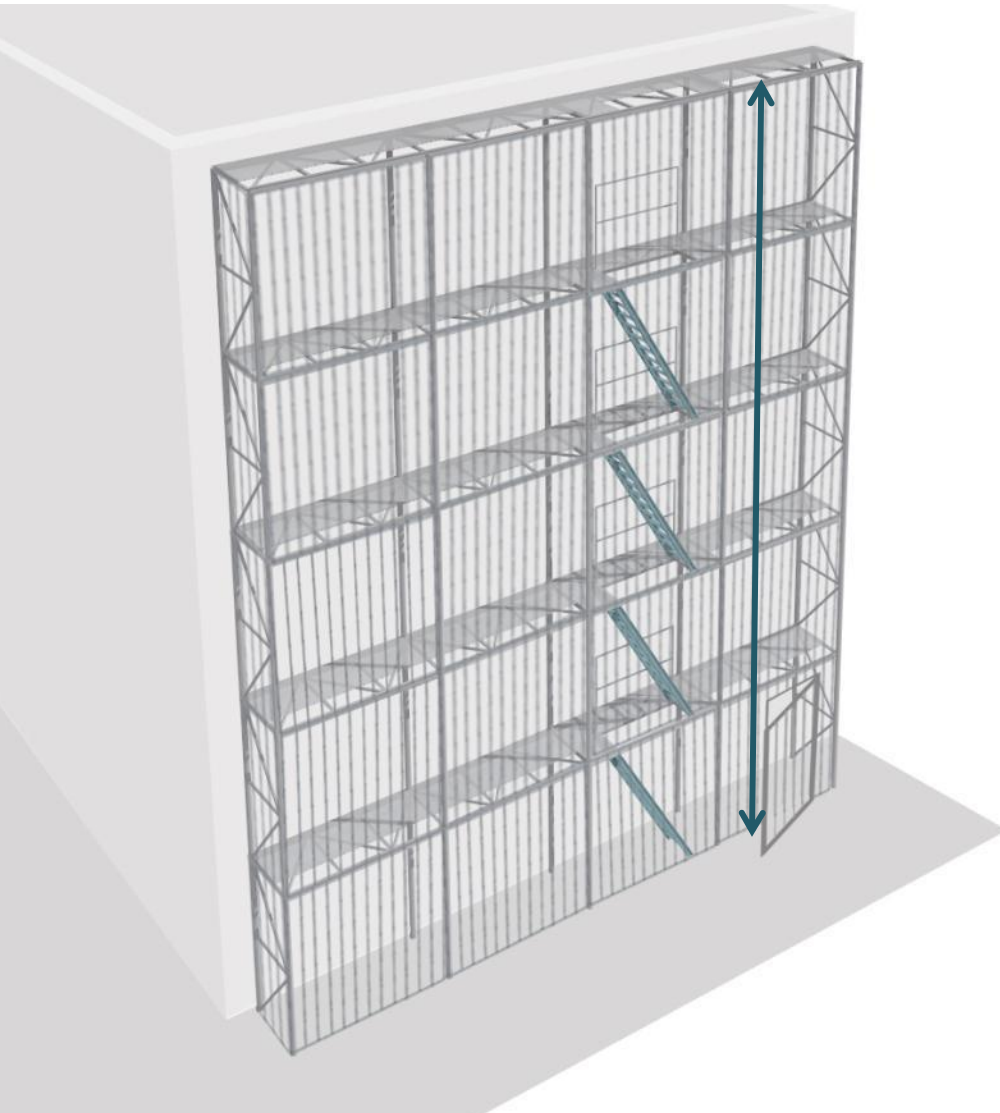
1. STANDARDIZATION
2. VOLUMETRIC ADAPTABILITY
3. FORMAL DIVERSITY

Flexibility and mobility

By turning and lowering, openings and movements of 15, 30 and 45° are achieved.



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

1. STANDARDIZATION

2. VOLUMETRIC
ADAPTABILITY

3. FORMAL DIVERSITY

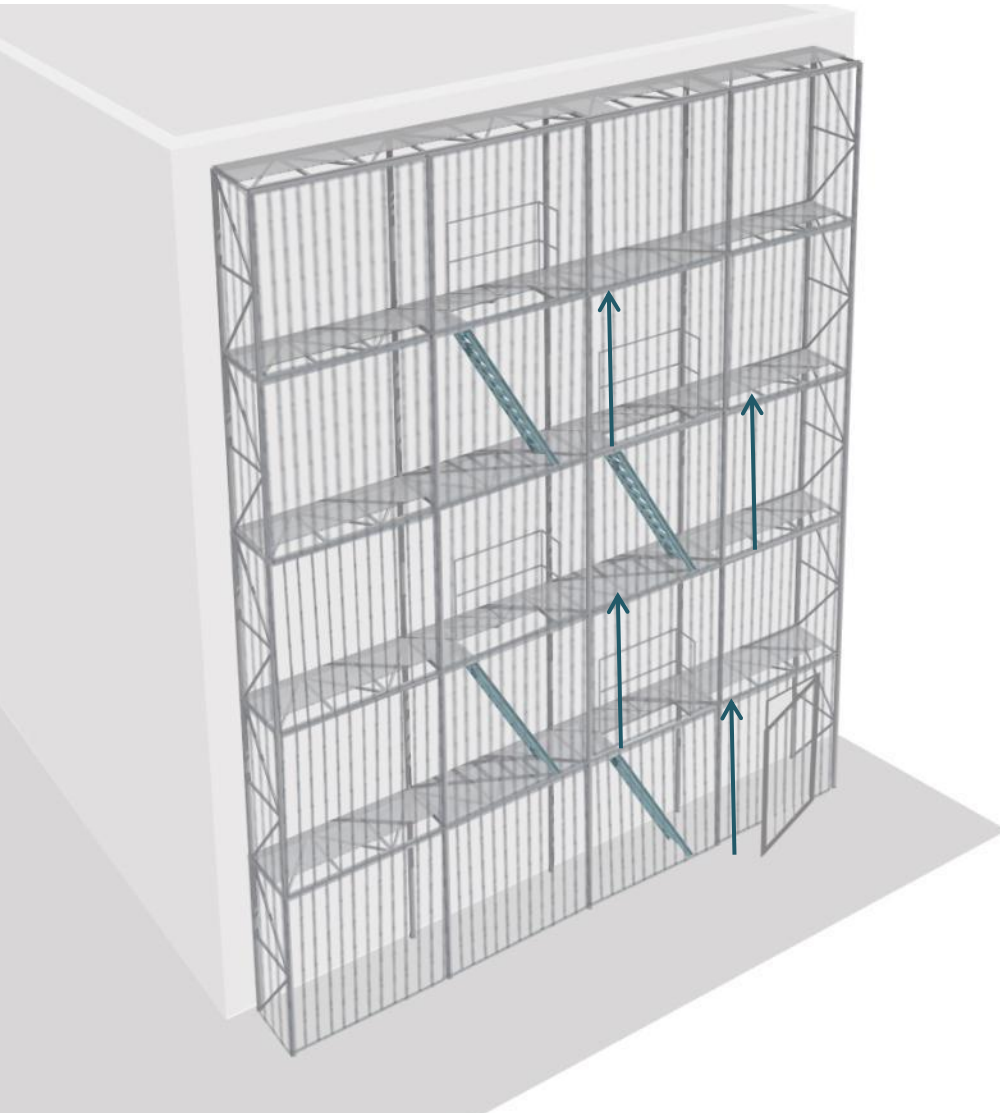
4. ACCESSIBILITY
Garden maintenance

Linear

Indoor accessibility is guaranteed for the maintenance and use of the garden.



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

1. STANDARDIZATION

2. VOLUMETRIC
ADAPTABILITY

3. FORMAL DIVERSITY

4. ACCESSIBILITY
Garden maintenance

Alternate

Indoor accessibility is guaranteed for the maintenance and use of the garden.



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

1. STANDARDIZATION
2. VOLUMETRIC ADAPTABILITY
3. FORMAL DIVERSITY
4. ACCESSIBILITY
Garden maintenance
5. NATURALIZATION -
BIODIVERSITY

Planters

Planters 100 x 32 50 cm



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

1. STANDARDIZATION
2. VOLUMETRIC ADAPTABILITY
3. FORMAL DIVERSITY
4. ACCESSIBILITY
Garden maintenance
5. NATURALIZATION - BIODIVERSITY

Plantation

There are two types of naturalization effect: fall and climbing. The movement of the closing elements reinforces the chromatic effects and brings spontaneity.



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

1. STANDARDIZATION
2. VOLUMETRIC ADAPTABILITY
3. FORMAL DIVERSITY
4. ACCESSIBILITY
Garden maintenance
5. NATURALIZATION - BIODIVERSITY

Biodiversity

New habitat for protected birds and reptiles in the city



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

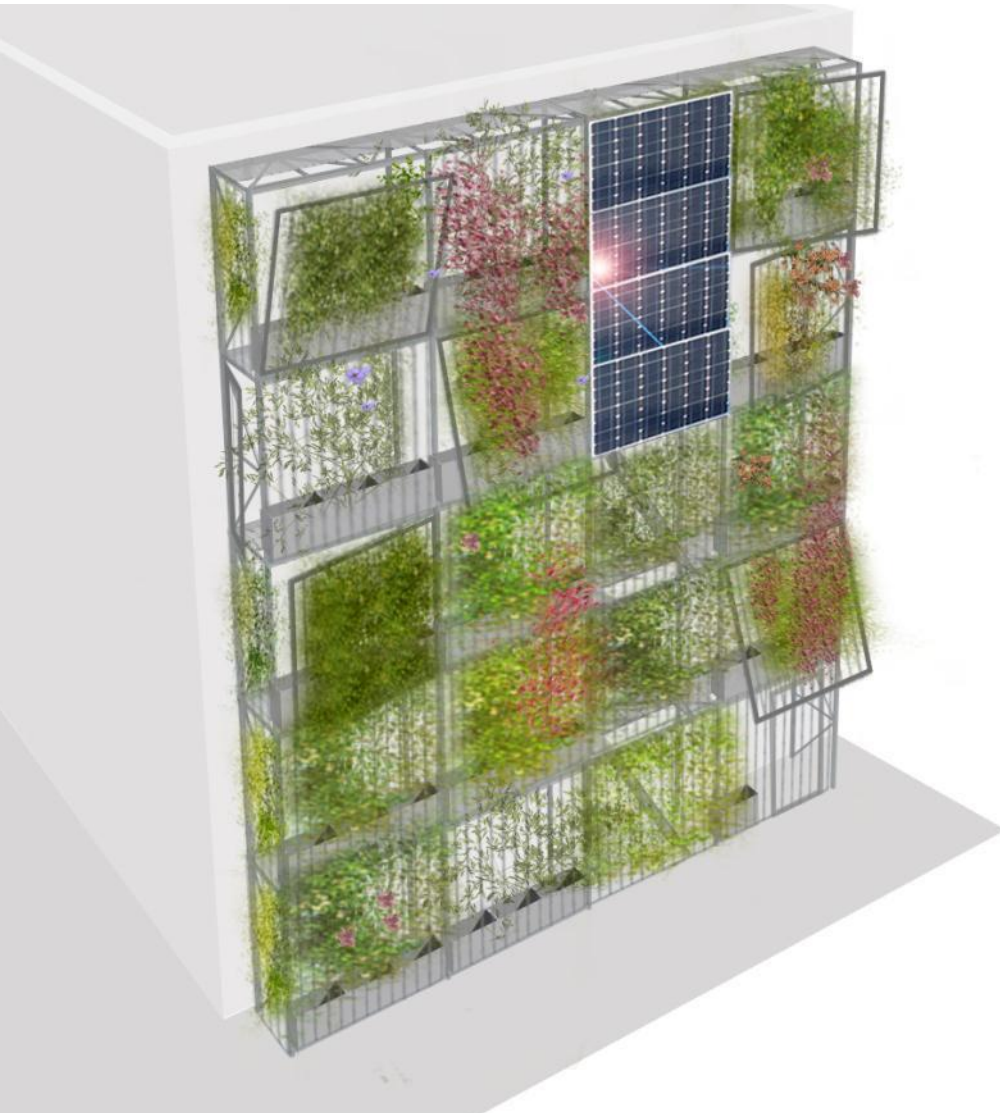
1. STANDARDIZATION
2. VOLUMETRIC ADAPTABILITY
3. FORMAL DIVERSITY
4. ACCESSIBILITY
Garden maintenance
5. NATURALIZATION - BIODIVERSITY
6. VERSATILITY OF USES

Water recovery

Use of rainwater as an irrigation supply.



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

1. STANDARDIZATION
2. VOLUMETRIC ADAPTABILITY
3. FORMAL DIVERSITY
4. ACCESSIBILITY
Garden maintenance
5. NATURALIZATION - BIODIVERSITY
6. VERSATILITY OF USES

Energy

Use of renewable energy for pumping recovered water.



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

1. STANDARDIZATION
2. VOLUMETRIC ADAPTABILITY
3. FORMAL DIVERSITY
4. ACCESSIBILITY
Garden maintenance
5. NATURALIZATION - BIODIVERSITY
6. VERSATILITY OF USES

advertising

Possibility of self-financing through advertising sponsorship.



4 MODULAR Vertical Garden . Characteristics



MODULAR SYSTEM

1. ESTANDARITZACIÓ
2. ADAPTABILITAT VOLUMÈTRICA
3. DIVERSITAT FORMAL
4. ACCESSIBILITAT
Manteniment del jardí
5. NATURALITZACIÓ -
BIODIVERSITAT
6. VERSATILITAT D'USOS
7. DISCLOSURE

Communication of environmental benefits through illustrations



4 MODULAR Vertical Garden . Real site applications

Real site applications





MODULAR SYSTEM

1. ESTANDARITZACIÓ
2. ADAPTABILITAT VOLUMÈTRICA
3. DIVERSITAT FORMAL
4. ACCESSIBILITAT
Manteniment del jardí
5. NATURALITZACIÓ - BIODIVERSITAT
6. VERSATILITAT D'USOS
7. DISCLOSURE
8. EXEMPLES OF APPLICATION IN THE CITY

Arago Street





MODULAR SYSTEM

1. ESTANDARITZACIÓ
2. ADAPTABILITAT VOLUMÈTRICA
3. DIVERSITAT FORMAL
4. ACCESSIBILITAT
Manteniment del jardí
5. NATURALITZACIÓ - BIODIVERSITAT
6. VERSATILITAT D'USOS
7. DISCLOSURE
8. EXEMPLES OF APLICATION IN THE CITY

Víctor Balaguer Square



4 MODULAR Vertical Garden . Real site applications



MODULAR SYSTEM

1. ESTANDARITZACIÓ
2. ADAPTABILITAT VOLUMÈTRICA
3. DIVERSITAT FORMAL
4. ACCESSIBILITAT
Manteniment del jardí
5. NATURALITZACIÓ -
BIODIVERSITAT
6. VERSATILITAT D'USOS
7. DISCLOSURE
8. EXEMPLES OF APPLICATION
IN THE CITY

Sants-Montjuic District





MODULAR SYSTEM

1. ESTANDARITZACIÓ
2. ADAPTABILITAT
VOLUMÈTRICA
3. DIVERSITAT FORMAL
4. ACCESSIBILITAT
Manteniment del jardí
5. NATURALITZACIÓ -
BIODIVERSITAT
6. VERSATILITAT D'USOS
7. DISCLOSURE
8. EXEMPLES OF APLICATION
IN THE CITY

University acces
Ramalleres street



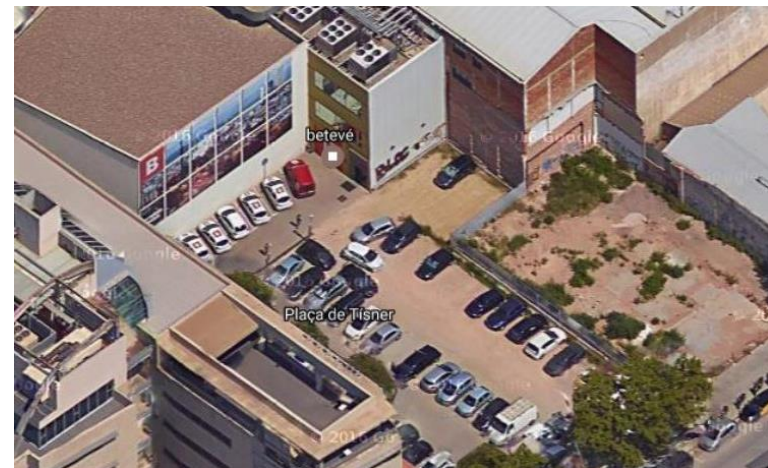
4 MODULAR Vertical Garden . Pilot test

Pilot test

Betevé Building party wall



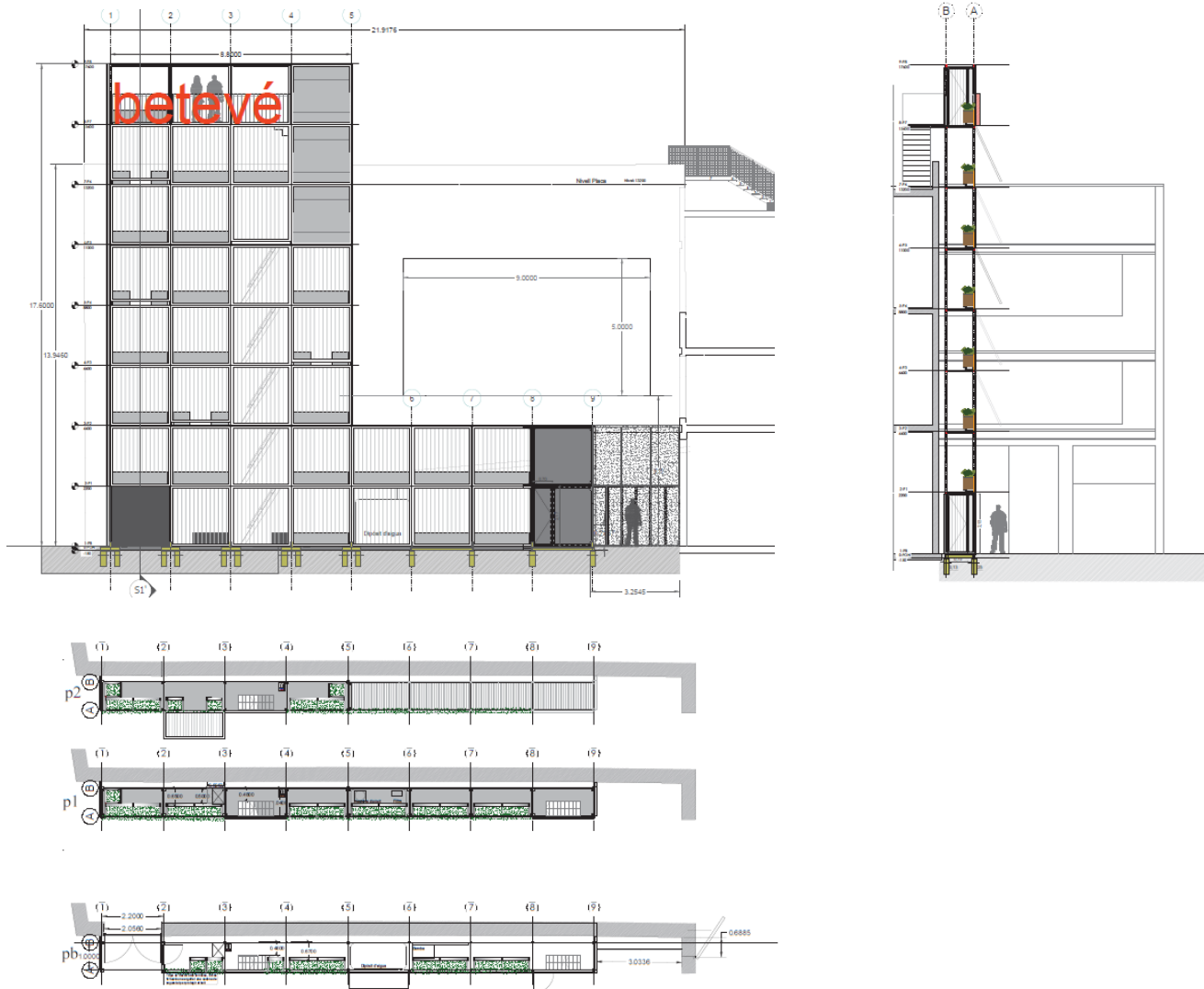
5 Betevé building. Existing façade.



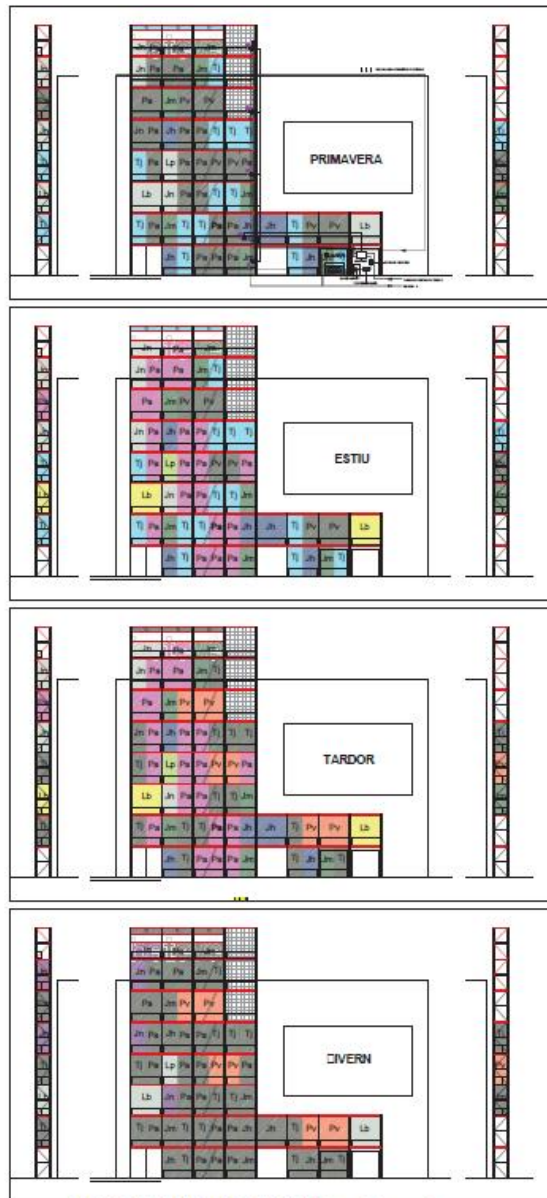
5 Betevé building. Existing façade.



5 Betevé building. New modular vertical garden. Project



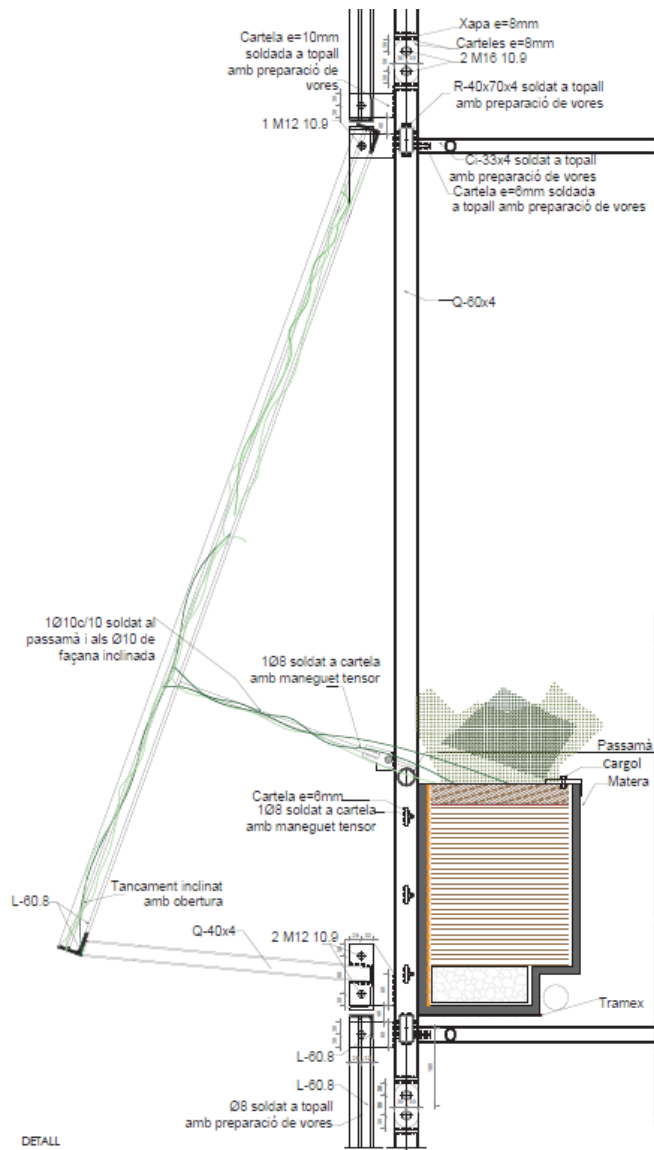
5 Betevé building. New modular vertical garden. Project



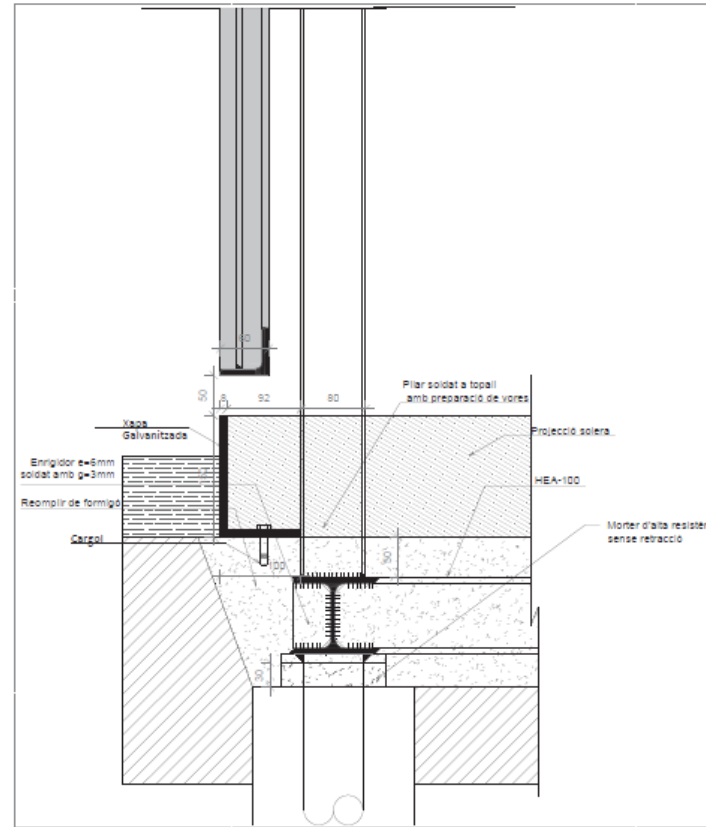
NOM COMÚ	CODI	NOM CIENTÍFIC	PRIMAVERA	ESTIU	TARDOR	HIVERN	FULLA
Bigonia d'hivern	Pv	<i>Pyrostegia venusta</i>					persistent
Gessamí estrella	Jm	<i>Jasminum multiflorum</i>					persistent
Gessamí d'hivern	Jh	<i>Jasminum nudiflorum</i>					caduca
Xudamei comú	Lb	<i>Lonicera brownii</i> "Dropmore scarlet"					caduca
Malvesc	Lp	<i>Lonicera periclymenum</i>					caduca
Jasmi gros	Pa	<i>Plumbago auriculata</i>					persistent
Jasmi groc	Jh	<i>Jasminum humile</i>					persistent
Gessamí estrella	Tj	<i>Trachelospermum jasminoides</i>					persistent



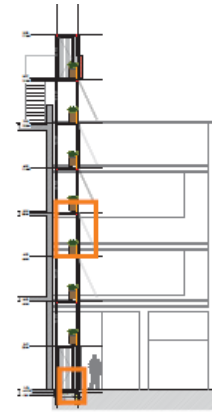
5 Betevé building. New modular vertical garden. Project



DETALL



DETALL
E/C 1/5



5 Betevé building. New modular vertical garden. Construction process

FOUNDATIONS



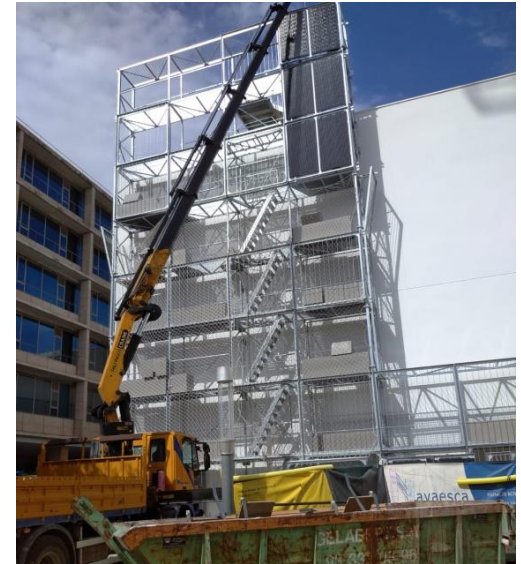
MODULAR
STRUCTURE



5 Betevé building. New modular vertical garden. Construction process

MODULAR STRUCTURE

Last moduls incorporates fotovoltaic panells



GARDENING WORKS AND IRRIGATION SYSTEM



5 Betevé building. New modular vertical garden. Construction process

BIRD NEST INSTALLATION



INSTALLATION OF BOXES FOR PATS





betevé



B



Ajuntament
de Barcelona

B