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**COMPONENTS**

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</table>
low density transformed land (1990-2000)
Housing: 500 detached houses

Street network: Discontinuous and winding streets

Green structure Full of vegetation

Topography Montanious area
Sant Muç is located 5 km away from Rubí city centre. One of the most important problems is the car dependence of its inhabitants. So, they have a forced mobility based on the use of the private car.
1. Football
2. Joan Maragall Primary School
3. Nursing home
4. Private tennis club
5. Little church
Places of opportunity

As we can see, Sant Muç urban fabric is not uniform, there are areas full of edification and areas with empty plots and full of vegetation, without homogeneity throughout the territory.

Specially, there are many empty plots due to low buildable, 25% of which are publics and 75% are private.

These plots are places of opportunity and we have analysed which are the most appropriate to carry out our proposal.

Most central empty and public plots

1

2

3

Component
Drawing number
GE-306
Urban Project Location: empty plots
1/10000

first contact survey

deep survey

Urban project location: surveys map

GE-307

Component

13
A detached Ressò house is built in a public plot. It is used as a collective house open to all kinds of needs and people, a place where activities, resources and services are shared by the neighbours.

The families will go to the building because of social issues, where they can meet together, celebrate parties, do workshops... and also, some families will use the house to do domestic activities in thermal comfort, as cooking, having meals, watching TV...

The collectivization helps to modify people’s behaviour and provides the awareness about the importance of energetic resources and about the need of energetic rehabilitation.

The Ressò house optimizes the energetic resources because of the community ideal, and also it allows to generate energetic and economic savings. Using this community space will bring consumption savings that could help to invest in an energetic improvement of their homes when the rehabilitation market makes it possible.

The spread of the other four Ressò houses in other strategic points in Sant Muç will encompass all the urbanization and revitalize the urban fabric. Then, Sant Muç will have more energetically efficient homes and a place where socialise.
Our proposal starts with the aim of strengthening the two main axes of the urban fabric by placing the prototypes along them. Consequently, we generate activity in the most important places of Sant Muç.

The first phase of the strategy is to implement a Ressò house (for different social uses) as central as possible in an empty public space with a influence area of 350 meters (10-15 minutes walking).

Then, over the years, placing more prototypes to strengthen the main axes and to distribute them over the urban fabric with a reasonable distance close enough to be reachable by foot for everyone.
First phase (year 1)

- Car sharing
- Social activities
- Collective kitchen

Second phase (year 6)

- New bus route
- Weekly market
- Car sharing
- Social activities

Third phase (year 13)

- New train station
- New pedestrian paths
- New services
- New uses
- Car sharing
- Social activities
Mobility: Green connections

We propose complementary initiatives about the mobility of Sant Muç that depends on other factors and agents to be completed.

On the one hand, if we take in consideration current development plans there will be an important transformation of the south-east area. This transformation consists in reinforce the connection with Rubí through a natural area and establish a new education issues.

On the other hand, we propose to improve the green connections inside the urbanization with new walkable paths and shortcuts.

So, Ressò spaces has an important part of the non-forced mobility needs. The number of travels are mainly made by foot, and consequently, costs and emissions has been reduced.

This proposal, depends on a modification of the current legislation that would allow new uses and help to reduce the city-services dependence.
Implementation site (first step)

The urban proposal consists in an implantation of a network of five Ressò houses distributed over the neighbourhood, increasing the radious influence to cover the needs of all the neighbours. The Ressò prototype that is going to participate in SDE’14 is just the first step of the urban rehabilitation process in Sant Muç.

We have analysed public plots where the prototype could be placed. And the appropriate plot is situated in the main street, Can Tapis Avenue, coinciding with the ridge of the mountain.

It is situated in a centre point of the avenue, so that the prototype will be situated in a visible site in the neighbourhood and it also will reinforced the main axes of the urban fabric.

Furthermore, it has been the nerve centre of Sant Muç: the place where historically all of the neighbours have met every day or where festival or events were celebrated, as it name Plaça Catalunya shows.
Public plot of detached Ressò house with an influence area of 350m approximately (10 min walk)

Future implementation in Sant Muç, Rubí
study area
workshops: yoga
collective meal
film sessions
board game area
weekly exchange of goods
Exterior Render in post Solar location (st Muç)

Component

Drawing number
GE-401

Description
Exteriors rendering

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Exterior Render in st Muç context
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ARCHITECTURAL
(AR)
Scale 1/400

Drawing number: AR-002

Component: ARCHITECTURAL

Site Plan AR-002
activated floor panel n°1
activated floor panel n°2
activated floor panel n°3

32.62 m²

19.08 m²

11440

Measurable Area: 32.62 + 19.08 = 51.70 m²
Floor Plan

ARCHITECTURAL

Drawing number
AR-020

Description
south access
Catalan typical tradition "castellers" in winter
Chess and similar games competition

Scale 1/100
Drawing number
AR-026
Component
ARCHITECTURAL
Description
Diagrams D
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As Built Documentation
November 3rd-2014
Project Drawings #7
Neighbourhood’s cinema
Platforms each 50 centimeters as stands
ARCHITECTURAL

Roof Plan

AR-031

Description

Scale 1/80

November 3rd-2014
Project Drawings #7

As Built Documentation

RESSÒ team
UPC BarcelonaTech
www.resso.upc.edu

Component

ARCHITECTURAL

Drawing number

AR-031

Description

Roof Plan

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50
Measurable Area: 32.62 + 19.08 = 51.70 m²
As Built Documentation
November 3rd, 2014
Project Drawings #7

Scale 1/50
Drawing number
AR-114
Component
ARCHITECTURAL

Description
Building Elevations

Page 58
Window Schedule and details

AR-301 Front View and Cross-Section: 1:15
Cross-Section Detail: 1:10

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Component: Door Schedule and Details

AR-311

Cross-Section Detail: 1:10

Front View and Cross-Section: 1:15

As Built Documentation
November 3rd-2014
Project Drawings #7

MATERIAL | AREA (m²) | THERMAL TRANSP. (W/m²K)
--- | --- | ---
WOOD | 1.27 | 1.78
GLASS | 2.68 | 0.85
TOTAL | 3.95 | 1.48

Drawing number

Description
Door Schedule and Details
Page 67
1. CLT 40mm
2. CLT 500x500 54mm
3. Elevation piece of the concrete panel M16
4. Drainage layer 1mm
5. PVC waterproof layer 2mm
6. Adjustable base UJB 17-28/50 380mm
7. Pillar UVH 50 500mm
8. Pedestal Eterno-iva 120/370mm
9. Ledger UH 2m 30 x 60mm
10. Timber batten 90 x 90mm
11. UHP grey Concrete 1200Ømm
12. 6Ø Inox steel tied Rebar 100 x 100mm
13. 8Ø Inox steel tied Rebar 100 x 100mm
14. Steel plate UJP
15. Descale treatment
1. Plywood
2. CLT 1000x1000
3. CLT 500x500
4. Drainage layer
5. PVC waterproof layer
6. Adjustable base UJB 17-28/50
7. Pillar
8. Reinforced Ledger UHV 2m
9. Ledger UH 2m
10. Timber batten
11. UHP black Concrete
12. 6Ø Tied Rebar
13. 8Ø Tied Rebar
14. Underground heater water pipe
15. Rock wool
16. Elevation piece of the concrete panel
17. Junction
18. Descale and water repellent treatment
1. Plywood
2. Pine timber laminated batten 60x140mm
3. Steel plate
4. Steel nut
5. Plywood
6. Plywood barrier layer
7. Steel plate
8. Cotton insulation 100mm
9. Cotton insulation 50mm
10. Pine timber laminated batten 60x180mm
11. EPDM waterproof layer 1.2mm
12. Plywood 100mm strips 3mm
13. Steel threaded rod 600mm M20
14. Geotextile layer 1mm
15. Steel plate profile 5mm 150x50mm M24
16. Eyebolt
17. Photovoltaic panel
1. Steel coupler 30x60mm
2. Ledger UH 72 60mm
3. Cellular policarbonate S613 60mm
4. Cellular policarbonate 324 20mm
5. 324 Policarbonate frame of aluminium 70x32mm
6. Steel profile 1mm 60x30mm
7. S613 Policarbonate frame of aluminium 88x83mm
8. Cotton insulation 50mm
9. Plywood 22mm
10. Steel beam 3mm 150x50mm
11. Sunscreen axis with integrated motor 100mm
12. Sunscreen fabric 1mm
13. Geotextile layer 1mm
14. Pneumatic piston
15. Metallic foil
16. Husillo
17. Neoprene 27mm 100x100mm
18. Rib of glued and nailed plywood 3x18mm
19. Pillar UVH 200 500mm
20. EPDM layer 1.2mm
21. Tray of steel rods
22. Junction
23. Timber batten 160x60mm
24. Diagonal brace UBC 72-104/200 500mm
25. Ledger UH 200 30x60mm
26. "U" shape steel profile 140x50mm
27. Timber batten 80x60mm
28. Timber batten 60x60mm
29. Timber batten 45x45mm
30. Vapour barrier 1mm

As Built Documentation
November 3rd-2014
Project Drawings #7
PRODUCIDO POR UN PRODUCTO EDUCATIVO DE AUTODESK

1. Cellular polycarbonate 324
2. Sunscreen fabric
3. Cellular polycarbonate 5613
4. UVR 300
5. Diagonal brace UBC 72-104/200
6. Timber batten
7. Steel coupler
8. Ledger UH 72
9. Polyethylene water pipes
10. 5613 Polycarbonate frame of aluminium
11. Rib of glued and nailed plywood
12. 324 Polycarbonate frame of aluminium
13. Timber batten
14. Pneumatic piston
15. Cotton insulation
16. Plywood
17. Timber batten
18. Junction
19. Ledger UH 200
20. Plywood bodywork truck
21. Underground heater water pipe
22. Cotton insulation
23. Plywood
24. Neoprene
25. Reinforced Ledger UH 200
26. UHP Black Concrete
27. Timber batten
28. Pillar UVR 24
29. Adjustable base UBE 17-28/50
30. PVC waterproof layer
31. Drainage layer
32. CLT 500x500
33. CLT 1500x1000
34. Cotton insulation
35. Plywood
36. Timber batten
37. Descale and water repellent treatment

RESSÒ team
UPC BarcelonaTech
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As Built Documentation
November 3rd-2014
Project Drawings #7

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Component: ARCHITECTURAL
Description: Wall Sections and Construction details
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1. Steel coupler  
2. Ledger UH 72  
3. Pillar UVH 200  
4. Diagonal brace UBC 72-104/200  
5. OSB board  
6. Timber batten  
7. Ledger UH 200  
8. "U" shape steel profile  
9. Tray of steel rods  
10. Steel beam 3mm  
11. Neoprene 27mm  
12. Husillo  
13. Cotton insulation  
14. Undulating polycarbonate P0039  
15. Polycarbonate frame of aluminium  
16. Timber batten  
17. Metallic foil  
18. Junction  
19. Cotton insulation  
20. EPDM layer  
21. Geotextile layer  
22. Plywood  
23. Plywood  
24. Pine timber laminated batten  
25. Pine timber laminated batten  
26. Intelligent Membrane  
27. Plywood OSB
1. Undulating polycarbonate P0039
2. Cotton insulation
3. OSB board
4. UVR 300
5. Diagonal brace UBC 72-104/200
6. Timber batten
7. Steel coupler
8. Ledger UH 72
9. Polyisotylene water pipes
10. Intelligent Membrane
11. Timber batten
12. Polycarbonate frame of aluminium
13. Pillar UVB 24
14. Adjustable base UJB 17-28/50
15. CLT 500x500
16. CLT 1500x1000
17. Drainage layer
18. Junction
19. Ledger UH 200
20. Plywood bodywork truck
21. Underground heat water pipe
22. Cotton insulation
23. Plywood
24. Neoprene
25. Reinforced Ledger UHV 200
26. UHP black Concrete
27. Timber batten
28. PVC waterproof layer
29. Cotton insulation
30. Plywood
31. Descale and water repellent treatment
32. Plywood OSB

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100x60mm
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180x30mm
108mm
90 x 90mm
2mm
90mm
18mm
9mm

ARCHITECTURAL
Wall Sections and Construction details

Drawings number
AR-341d
Component
ARCHITECTURAL
Description
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<th>Component Description</th>
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1. Laminated glass 4/4/4 $u=2.51$ W/m²K
2. Window frame of chestnut timber 78mm
3. Timber batten 100x60mm
4. Ledger UHD 200
5. Steel pillar UVR 200 50Ømm
6. Ledger UHD 72
7. Diagonal brace UBC 72-104/200 50Ømm
8. Deck UDS 200 320x2000mm
9. Deck UDS 72 320x720mm
10. Polycarbonate frame of aluminium 700x32mm
11. Ledger UH 72
12. Ledger UH 200 30x60mm
13. Undulating polycarbonate P0039 1mm
14. EPDM 2mm
15. Cotton insulation 100mm
16. Rockwool 40mm
17. Intelligent Membrane 1mm
18. Polycarbonate frame of aluminium 70x32mm
19. Stainless steel 2mm
20. Timber batten 60x60mm
21. OSB board 16mm
22. Cotton insulation 50mm
23. Perforated plaster board 3x12.5mm = 37.5mm
24. Steel profile 1mm 60x30mm
25. Cellular polycarbonate 324 20mm
26. Rib of glued and nailed plywood 3x18mm = 54mm
27. Steel wire for the sunscreen 88x33mm
28. S613 Polycarbonate frame of aluminium
29. Junction
30. OSB board 9mm
31. Cellular polycarbonate S613 60mm
32. Vapour barrier 1mm

Description
ARCHITECTURAL
Page 78
1. Laminated glass 4/4/4mm u=2.51 W/m²k
2. Window frame of chestnut timber 78mm
3. Steel pillar UVR 300 50Ømm
4. Diagonal brace UBC 72-104/200 50Ømm
5. Ledger UH 72 30x60mm
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19. Stainless steel 2mm
20. Steel wire for the sunscreen 88x83mm
21. 5613 Policarbonate frame of aluminium 60mm
22. Cellular policarbonate 5613 60mm
As Built Documentation
November 3rd, 2014
Project Drawings #7

Description
Wall Sections and Construction details

Component
ARCHITECTURAL

Drawing number
AR-344b

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OPENABLE PANELS

CENTRAL PANEL

ELEVATION

FLOOR PLAN A-A'

FLOOR PLAN B-B'

ARCHITECTURAL

Drawing number
Component
As Built  Documentation
November 3rd-2014
Project Drawings #7

Partitions Details
AR-353
OPENABLE PANELS

RIGHT CORNER PANEL

ELEVATION

FLOOR PLAN A-A'

FLOOR PLAN B-B'

Component
ARCHITECTURAL

Drawing number
AR-354

Description
Partitions Details
FIX PANELS

ELEVATION

FLOOR PLAN A-A'

FLOOR PLAN B-B'

ARCHITECTURAL

Drawing number
AR-356

Description
Partitions Details

As Built Documentation
November 3rd-2014
Project Drawings #7
FIX PANELS

LEFT CORNER PANEL

A

B

C

D

E

F

B'

A'

ELEVATION

FLOOR PLAN A-A'

FLOOR PLAN B-B'

ARCHITECTURAL

Drawing number

Component

As Built Documentation

November 3rd-2014

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Partitions Details

AR-358
3 BIOCLIMATIC ANALYSIS (BA)
CLIMATE DATA & WEATHER ANALYSIS COMPARISON
These comparative graphs show the values of each analysed parameter according to a corresponding colour scale. "Y" axis show the hours of the day and "X" axis all the weeks of the year.

**Rubi's and Versailles' average temperatures comparison.**

**Rubi's and Versailles' relative humidity comparison.**

**Rubi's and Versailles' direct solar radiation comparison.**

**Rubi's and Versailles' diffuse solar radiation comparison.**

**Rubi's and Versailles' average cloud cover comparison.**

**Rubi's and Versailles' average wind speed comparison.**

SANT MUÇ (RUBÍ) CLIMATE DATA AND WEATHER ANALYSIS

VERSAILLES CLIMATE DATA AND WEATHER ANALYSIS
Summer weekly performance

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Occupancy (people)

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BA-002
Component: BIOCLIMATIC ANALYSIS

As Built Documentation
November 3rd-2014
Project Drawings #7
**Case A**

**Day with radiation > 0.4 KW/m²**

**Summer day**

---

**Solar Protection**
- Protection of inertia from direct radiation.
- Chamber façades act as solar chimneys thanks to venturi effect and the pressure difference between the outside air and the overheated one at the top of the chamber.

**Solar Chimney**

**Windchill temperature**
- Humidity and air velocity helps to thermal comfort.

---

**Inertia**
- Inertia does absorb heat from the interior.

**Ventilation**
- Cross ventilation to avoid stagnant air in the interior.

**Storage**
- Storaging water for active inertia when needed.

---

**Bioclimatic Analysis**

**Component**

**BA-011**

**As Built Documentation**
November 3rd-2014
Project Drawings #7
Bioclimatic Analysis

Case B
Day without radiation
Summer night

Double-Skin Façade
-Double-skin allows to ventilate the inner space when necessary.

Ventilation
-Cross ventilation to avoid stagnant air in the interior

Inertia
-Inertia does release possible heat absorbed during hot days

- Double-skin allows to ventilate the inner space when necessary.
- Cross ventilation to avoid stagnant air in the interior
- Inertia does release possible heat absorbed during hot days
Case C
Day with radiation < 0.4 kW/m²
Winter day

Bioclimatic drawings

Partition
- Space partitions to reduce volume and optimize heating system.

Double skin façade
- Façades are closed, only allowing ventilation when necessary.

Inertia
- Inertia absorbs heat from the room or does release possible heat absorbed during hot days.

Storage
- No stored inertia for the active system.
Case D
Day with radiation > 0.4 KW/m²
Winter day

Convection
- Convective loop within the chamber air heats the inner space. It regulates the inner temperature avoiding stratification.

Storage
- Storing water for active inertia when needed.

Inertia
- Inertia absorbs heat from the room.

Double skin façade
- Façades are closed, only allowing ventilation when necessary.

Convection
- Convective loop regulates the stratification of the inner temperature.

Storage
- Storing water for active inertia when needed.
**Double skin façade**
- Double skin façades act as a thermal buffer delaying the exchange of temperature with the exterior.

**Partition**
- Space partitions to reduce volume and optimize heating system.

**Inertia**
- Inertia does release possible heat absorbed during hot days.

**Storage**
- No stored inertia for the active system.

**Case G**
Day without radiation
Winter Night
**AIR RENOVATION**

Day without radiation
Winter Night

**Component**
BA-017

**Bioclimatic drawings**

---

**Special Chambers**
Inertia absorbs solar radiation heat and releases it to the air inside in order to preheat it.

**Fan**
An axial and low power fan blows a controlled flow of clean and preheated air into the space when air renovation is needed.

**Air extraction**
Exhausted air is extracted from the partition and the intermediate space through the north envelope.

---

4°C 25°C
18°C 19°C 14°C 25°C 4°C
4 INTERIORS (IN)
As Built Documentation
November 3rd-2014
Project Drawings #7
INTERIORS
Secon Floor
IN-002
Description
* There is only one furniture module. Some pieces change in order to adapt different uses.
* There is only one furniture module. Some pieces change in order to adopt different uses.

- **Fixed wall**
  - DM wood with white oak veneer frame
  - Glass sliding door

- **Mobile wall**
  - DM wood with white oak veneer frame

- **Counter Mobile Furniture**
  - DM wood with white oak veneer

- **Hob Fixed Furniture**
  - DM wood with white oak veneer

- **Sink Fixed Furniture**
  - DM wood with white oak veneer

- **Laundry Fixed Furniture**
  - DM wood with white oak veneer

**Activated floor panel n°3**
- Screencore UHPC
- (Ultra High Performance Concrete)

**Kitchen Plan**

**Component**

**IN-401**

**Project Drawings #7**

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**November 3rd-2014**

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**Component**

**Drawing number**

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November 3rd, 2014

**Project Drawings #7**

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1. **Freezer**
2. **Fridge**

---

**IN-413**

**Component**

**INTERIORS**

---

**Description**

**Appliances and sanitary**

---

**Page**

118
1. WC Sink
2. Dry Toilet
3. Washing Machine

dry toilet ECODOME

distance from de wall 80 mm

INTERIORS
* There is only one furniture module. Some pieces change in order to adapt different uses.
FURNITURE 4: WC1 SINK x 1

INTERIORS

Component: IN-604

Drawing number: #7

Description: Furniture Catalog

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Project Drawings 77
We won’t bring this furniture in Versailles. We will make it for the second life of our prototype in Sant Muç.
INTERIORS

Drawing number
IN-701

Component
INTERIORS

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Project Drawings #7

Description
Interior Rendering

Page
132
5

STRUCTURAL (ST)
Component: Foundation Plan and Details
Drawing number: ST-002
Component: STRUCTURAL
Description: Foundation Plan and Details
Page: 135
Ramp          ST-004

Scale 1/50

Drawing number
ST-004
Component
STRUCTURAL

Description
Ramp

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Page 137
GROUND FLOOR, +0,0

Drawing number
ST-012
Component
STRUCTURAL

Scale 1/75

Description
Structural Floor Plan

Page
139

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FIRST FLOOR, +3

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Drawing number
ST-013
Component
STRUCTURAL

Scale 1/75

Description
Structural Floor Plan

Page 140

[Academic use only]
SECTION E-E’

Drawing number
ST-112
Component
STRUCTURAL

Scale 1/50

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STRUCTURAL

Scale 1/50
Timber beam composed by several bi-laminated wood strip

20mm metal bars

Tubular structure made with 50mm pipe. Pipe made with galvanize steel
Galvanize steel platform. 30cm width

Foundation made with Cross Laminated Wood and plywood

Galvanized steel adjustable foot

Concrete prefabricated floor

Foundation made with Plywood
6
FIRE PROTECTION (FP)
PLUMBING (PL)
1. Filling point for the primary circuit
2. Filling point for the DCW storage tank, 10cm diameter
3. Shutoff valve
4. Anti-return valve
**Description**

**Component**

1. Filling point for the primary circuit
2. Shutoff valve
3. Anti return valve
4. Three-way motorized valve
5. Electric support
6. Security valve
7. Pumping station
8. Purger
9. Three-way thermostatic valve
10. Water meter
11. Expansion vessel
12. Pumping group
13. Filling valve
14. Filter
15. Consumption point

**Drawing number**

PL-002

**Component**

- **PLUMBING**
1. Removal point for the black water storage tank, 1" diameter
2. Removal point for the greywater storage tank, 1" diameter
3. Lifting station
Drawing number
PL-211

Component
PLUMBING

Description
Removal Isometric
(rain/grey/black water)

Page
161

1 Lifting station
SOLAR WATER HEATING (SW)
1 Filling point for the Underfloor heating accumulation tank, 3/4" diameter
2 Filling point for the primary circuit
3 Shutoff valve
4 Anti return valve
5 Three-way motorized valve
6 Removal point for the primary circuit
7 Security valve
8 Primary circuit pumping station
9 Purger
10 Three-way thermostatic valve
11 Expansion vessel
12 Underfloor heating pump
13 Consumption point
14 Underfloor heating manifold
1 Three-way motorized valve
2 Anti return valve
3 Security valve
4 Primary circuit pumping station
5 Shut-off valve
6 Expansion vessel
7 Three-way thermostatic valve
8 Purger
9 Underfloor heating pump
10 Consumption point
11 Underfloor heating manifold

Drawing number
SW-101
Component
SOLAR WATER HEATING

As Built Documentation
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Project Drawings #7
9
MECHANICAL
(ME)
1. Filling point for the primary circuit
2. Filling point for the DCW storage tank, 10cm diameter
3. Shutoff valve
4. Anti-return valve
1 Filling point for the primary circuit
2 Shutoff valve
3 Anti-return valve
4 Three-way motorized valve
5 Electric support
6 Security valve
7 Pumping station
8 Purger
9 Three-way thermostatic valve
10 Water meter
11 Expansion vessel
12 Pump
13 Filling valve
15 Domotic and electrical controls
16 Collector
17 Hot water radiant floor pipe
18 Hot water return pipe
19 Heating circuit pipe
20 Cooling circuit pipe
21 Heating system module
22 Cooling system module

Scale: 1_50
1 Filling point for the primary circuit
2 Shutoff valve
3 Anti-return valve
4 Three-way motorized valve
5 Electric support
6 Security valve
7 Pumping station
8 Purger
9 Three-way thermostatic valve
10 Water meter
11 Expansion vessel
12 Pump
13 Filling valve
14 Domestic and electrical controls
15 Collector
16 Heat exchanger
17 Hot water radiant floor pipe
18 Hot water return pipe
19 Heating circuit pipe
20 Cooling circuit pipe
21 Heating system module
22 Cooling system module

Scale: 1:50

Component
MECHANICAL

Drawing number
ME-021

Description
Heating plan
1. Filling point for the primary circuit
2. Shut-off valve
3. Anti-return valve
4. Three-way motorized valve
5. Electric support
6. Security valve
7. Pumping station
8. Purger
9. Three-way thermostatic valve
10. Water meter
11. Expansion vessel
12. Pump
13. Filling valve
14. Domestic and electrical controls
15. Collector
16. Hot water radiant floor pipe
17. Hot water return pipe
18. Heating circuit pipe
19. Cooling circuit pipe
20. Heating system module
21. Cooling system module
1. Filling point for the primary circuit
2. Shut-off valve
3. Anti return valve
4. Three-way motorized valve
5. Electric support
6. Security valve
7. Pumping station
8. Purger
9. Three-way thermostatic valve
10. Water meter
11. Expansion vessel
12. Pump
13. Filling valve
14. Domestic and electrical controls
15. Collector
16. Hot water radiant floor pipe
17. Hot water return pipe
18. Heating circuit pipe
19. Cooling circuit pipe
20. Heating system module
21. Cooling system module
22. Heating section

Scale: 1_50
Component: MECHANICAL
Drawing number: ME-023
Description: Heating section
1. Filling point for the primary circuit
2. Shutoff valve
3. Anti-return valve
4. Three-way motorized valve
5. Electric support
6. Security valve
7. Pumping station
8. Purger
9. Three-way thermostatic valve
10. Water meter
11. Expansion vessel
12. Pump
13. Filling valve
14. Domotic and electrical controls
15. Collector
16. Hot water radiant floor pipe
17. Hot water return pipe
18. Heating circuit pipe
19. Cooling circuit pipe
20. Cooling system module
21. Heating system module
22. Cooling system module
The air renewal fans are in four extreme facade chambers, on the top. The outdoor air enters by the gate from the bottom.

1 Electric panel
2 Electric cable
3 Air renewal fan HV-230A (Soler i Palau)
4 Bottom Gate
The air renewal fans are in four extreme facade chambers, on the top. The outdoor air enters by the gate from the bottom.

1 Electric panel
2 Electric cable
3 Air renewal Fan HV-230A (Soler i Palau)
4 Bottom Gate
The air renewal fans are in four extreme facade chambers, on the top. The outdoor air enters by the gate from the bottom.  

1 Electric panel  
2 Electric cable  
3 Air renewal fan HV-230A (Soler i Palau)  
4 Bottom Gate
On heat demand we use an underfloor heating system using accumulated water heated by solar thermal vacuum tubes:

- we activate the pump of this circuit moving water through the collectors and distributed hot water for underfloor heating modules.

- Meanwhile, cooling circuit is kept under the floorboards temperature colder than the environment.

On cooling demand we use a secondary circuit located underground. This is fresh water and we use it to dissipate the floor heat.

- we activate the pump of this circuit moving water through the collectors and distributed hot water for underfloor heating modules.

- Meanwhile vacuum tubes is dissipated through a special heatsink.

Cooling mode schematic drawings

Heating mode schematic drawings
Electric panel room

CDS Grid box

Cross section 3x16 mm²

Drawing number
EL-001
Component
ELECTRICAL
Description
Grid interconnection plan
Page
187

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1 Electric Panel Room
2 Standard derivation (2 plugs)
3 Cable tray
4 2Plug
5 Splice box
PHOTOVOLTAIC SYSTEM (PV)
Grounding connection
DC Side
AC Side
230 V
FUSE
FUSE
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Description
PHOTOVOLTAIC SYSTEM
Component PV-001
As Built Documentation November 3rd-2014 Project Drawings #7
Drawing number
Description
PHOTOVOLTAIC system: general
Page 202
TELECOMMUNICATIONS & BUILDING AUTOMATIZATION SYSTEMS (BAS)
Power Supply 24V

IP gateway

knx logic module

analog inputs

S1_Temperature exterior 1
S2_Temperature façade 1
S3_Temperature façade 2
S4_Radiation
S5_Temperature heating floor 1
S6_Temperature heating floor 2

Drawing number
BAS-102
Component
BUILDING AUTOM. SYSTEM

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13
SDE INSTRUMENTATION DRAWINGS (ID)
Temperature sensor used for scientific purpose length_33m.

Temperature sensor used for the scoring of the competition length_22m.

Temperature, relative humidity CO2 sensor used for the scoring of the competition and
monitoring cable pass

electrics cable pass

monitoring cable pass

electrics cable pass
SDE water meter
Connection 3/4

100 mm

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Description

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Component
SDE INSTRUMENTATION

Drawing number
ID-001d

Description
Water meter location
PV System

Monitoring Panel

- PV Array
- Strings
- Inverter
- DC Protections
- AC Protections
- Loads
- Electrical Terminal Blocks
- AC BUS
- Solar Decathlon Grid
- Low Voltage Grid

Component
SDE INSTRUMENTATION
Drawing number
ID-003
Description
Electricity meters
topology
home electronics + appliances
+ lighting sde energy meter

0.95

home electronics

energy meter

0.95

Electricity meters
connection space
14

SITE OPERATIONS
(SO)
Trailer 4 40Tm
L:13.6 | W: 2.48 | H: 2.7

South Façade

Indoor Floor

Water tanks

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Description
Page

230

Drawing number
SO-004
Component
SITE OPERATIONS

Trucks shipment

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Project Drawings #7
Outdoor concret floor

Trailer 5 40Tm
L: 13.6 | W: 2.48 | H: 2.7
The demarcation of the team's lot is the first thing to establish. The assembly of the perimetral fence and the first aids tent are the first interventions that must be done.
DAY 1

After the determination of the house location the first trailer will arrive with the foundations of the prototype and the zero level of the vertical structure and other parts of the prototype. The truck will be unloaded and all the material will be stockpiled on the plot.
DAY 1

The installation of the foundation has to be done very conscientiously as it is the base of all the prototype. To guarantee a pressure of less than 40 kN/m² the zero level of the structure will be leaning on a 50x50 cm steel plate that will be leaning on a large laminated wooden panel. It is mandatory to achieve a perfect leveling because the rest of the building will lean on it. Any small mistake at this stage could lead to a serious problem later. No machinery will be used so far.
DAY 1

Once the foundation is assembled, in the morning of the second day will arrive the second trailer with the first parts of the prototype. The north facades, the wood timbers, the edge slab, and the modules of the roof will be stockpiled on the plot. To unload the truck we will use a forklift. By the time, we will start the assembly of the concrete slap. One by one, the ten pieces will be assembled. Before of it we will have placed all the deposits that goes under the slap.
DAY 2

The third trailer will arrive while we continue assembling the concrete slap. By the time the edge slab, wooden insulated boxes, will be assembled one by one without the help of any crane. As all these pieces are prefabricated there is no more work beyond sealing all the joins correctly.
DAY 2

The third trailer will arrive while we continue assembling the concrete slap. By the time the edge slab, wooden insulated boxes, will be assembled one by one without the help of any crane. As all these pieces are prefabricated there is no more work beyond sealing all the joints correctly.
DAY 2

Once the whole slap, both concrete and the wooden perimeter, is finished we will begin to assemble the wood beams above the same slap. The forth trailer will arrive by the time with all the missing parts of the prototype, except of the exterior slap.
DAY 3

Once the main structure of the roof is finished we will place it on the operations area. This action has been previously asked to the organization via WAT. In a way to assure security and safety of our team and neighbored team this measure has been exceptionally accepted. From now we will have two work fronts. One on the concret slap and the other one on the operations are where all the parts of the roof will be assembled.
DAY 3

On the first work front we will begin to assemble the vertical structure while on the second one another team will be assembling the parts of the roof.
DAY 3

When the vertical structure is finished we will begin to assemble the facade panels. We will begin with the north ones, which are the ones that have the major part of the interior facilities. This way we will be able to start working on them as soon as possible. One team will be placing the panels with the help of the crane while another one will be adjusting them on its correct place and sealing the joins between them.

By the time, once the impermeable layer has been placed over the roof an other team will start the assembly of the roof facilities (the PV panels and the vacuum tubes with their own connections).
DAY 3

Once the north facades are assembled we will begin the interior facilities assembly.

By the time, another team will continue with the roof facilities assembly.
DAY 4

While the interior facilities are being placed, another team will begin to assemble the remaining facing (the south ones) with the same procedure of the north facades.

By the time, the other team will continue with the roof facilities assembly.
DAY 4

Once all the facades are placed and the roof facilities are finished we will proceed with the roof lifting from the operations area to its places.
DAY 5-10

At the morning of the next day the first task that will be done will be the installation of all the safety elements (such as a perimetral railing and a lifeline) to guarantee that all the roof works are done with the maximum safety for all the participants. Only then we will proceed to work on the finishings of the last roof connections.

At the same time an other team will start with the inside enclosures.

The facilities team will be also working at the same time.
DAY 7-8

Before the last trailer arrive we will begin to assemble the outdoor decking structure.

The facilities team will continue working inside the prototype.
DAY 9

At the eighth day the last trailer will arrive with the exterior deck that will be placed using the same procedure as the inner platform.

Inside the prototype we will continue working on the facilities and the interior stu
DAY 10

For the last day we will have finished all the task and we will spent the day clean and preparing the lot and the prototype for the competition.
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Component
Drawing number
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SITE OPERATIONS

Disassembly Phases
SO-302
Component
SITE OPERATIONS

Drawing number
Description
Page
252
DAY 3

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Disassembly Phases
SO-306
Component
SITE OPERATIONS

Drawing number
Description
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[Exclusivamente para uso académico]
DASY 3

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Description
Page 259

Component
Drawing number
As Built Documentation
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SITE OPERATIONS

Disassembly Phases

Drawing number
SO-309
Component
SITE OPERATIONS
Description
Disassembly Phases
HEALTH & SAFETY (HS)
EMERGENCY Tel. NUMBERS:
Emergency (112)
Firefighter (17)
Police (18)
Ambulance (15)
H&S Coordinator (+ 34.652.50.13.30)

IN CASE OF ACCIDENT:
1- Stop the work
2- Help injured workmate
3- Call H&S Officer
4- Call H&S Coordinator
5- Call H&S SDE Coordinator
6- Call Emergency 112

WHERE WE ARE:
Chantier CSTB SOLAR DECATHLON, Domaine du château de Versailles, Allée des Matelots. VERSAILLE

Hôpital André Mignot 177, rue de Versailles
78157 Le Chenay
Tél. 01 39 63 91 33
Health & Safety HS-002:

First of all, set up all the areas over the plot and prepare the fences that surround all the plot.

Emergency Numbers:
- Emergency (112)
- Firefighter (17)
- Police (18)
- Ambulance (15)
- H&S Coordinator (+34.652.30.13.30)
Component: HEALTH AND SAFETY
Drawing number: HS-301
Description: H&S during load/unload
Health & Safety Works:

Once we have done the assembly of foundation and level 0, the team of assembly of roof, will wear the personal protective equipment.

The unload of the roof elements over the work area. Avoiding that the workers will be waiting under the load.

The work area, will be over the level 0 of the prototype, previously the workers had prepared the support trestles there will be shushed the beams for beam's roof assembly.

During the work, anybody can't cross the area between the crane and work area. Only the workers could be next the work area. But not under the elements subject by the crane.

The work of assembly will be over the level 0 of the prototype, previously the workers had prepared the support trestles where the beams' roof will be shushed for a good assembly without any injury.
HS-402

Description:
H&S during assembly/dismantling
HEALTH AND SAFETY

HS-408

Description: H&S during assembly/disassem.
HEALTH AND SAFETY

Description: H&S during assembly/disassembly

Component: C350T

Drawing number: HS-409

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Project Drawings #7

footings structure roof floor facade facilities interiors
HEALTH AND SAFETY

Component: HS-411
Description: H&S during assembly/disassembly

Health & Safety Work: Replace the roof assembled:

After we finished the facades and roof assembly. The next step will be the roof replace.

The workers must have worn all the EPI and use the PPE. Nobody could be under the roof when the crane move on the top of the structure of steel.

After crane replace the roof, the team of assembly can fix the roof and all the components.
HEALTH AND SAFETY

Drawing number
HS-413

Description
H&S during assembly/disassembly
16
PUBLIC TOUR
(PT)