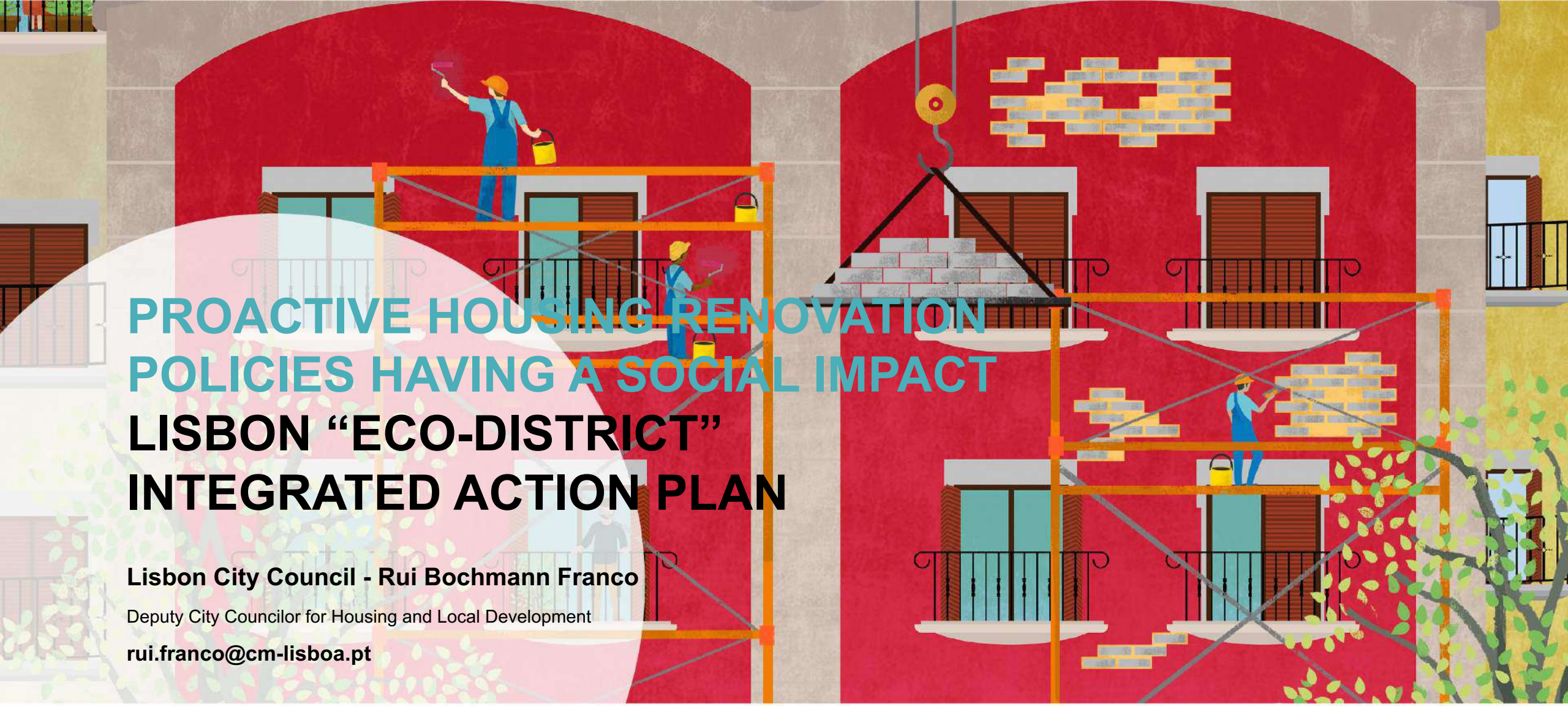

PROACTIVE HOUSING RENOVATION POLICIES HAVING A SOCIAL IMPACT

LISBON "ECO-DISTRICT" INTEGRATED ACTION PLAN

Lisbon City Council - Rui Bochmann Franco

Deputy City Councilor for Housing and Local Development

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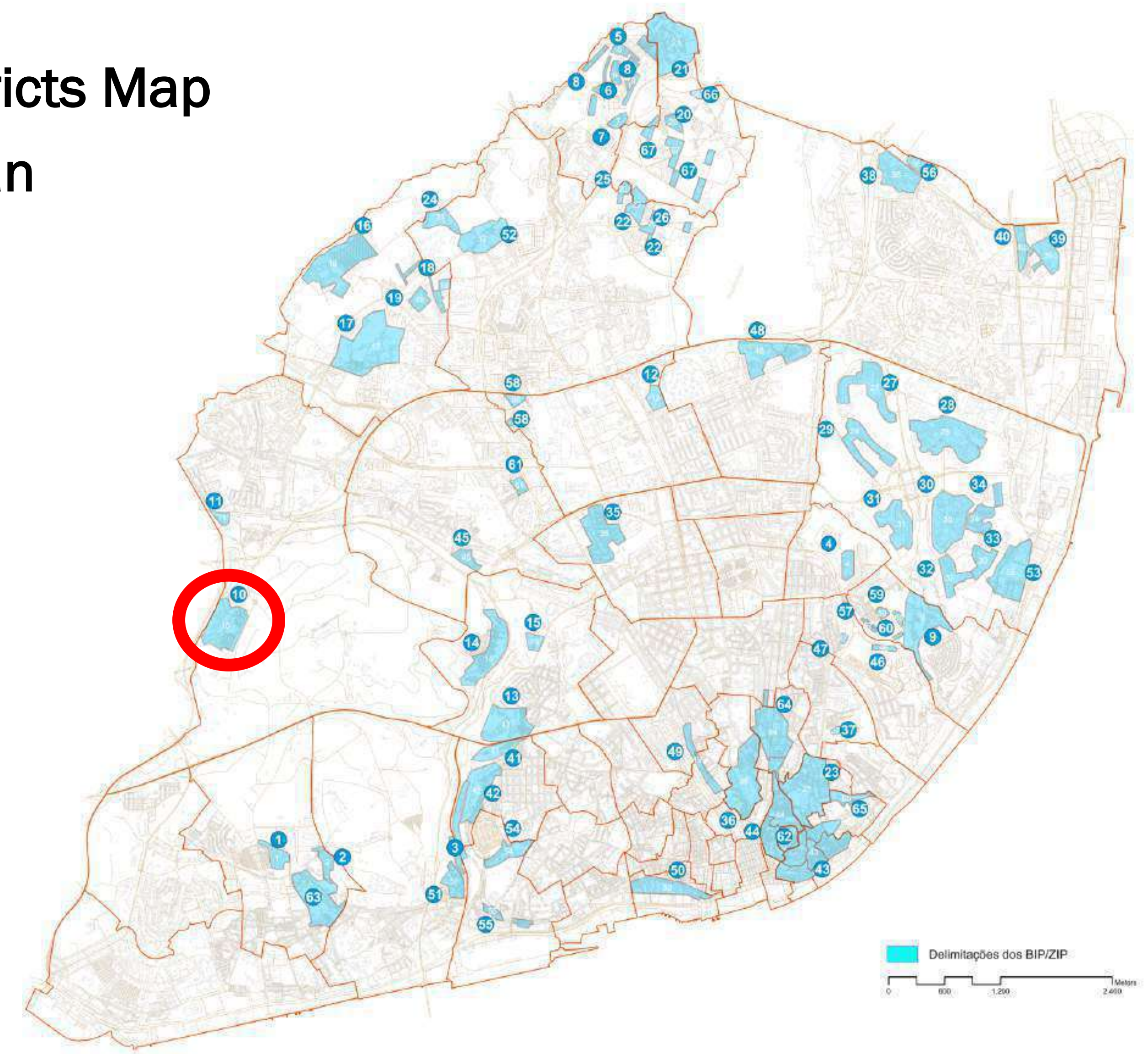
Priority Intervention Districts Map on the Lisbon Master Plan



Carta dos BIP/ZIP

Bairros e Zonas de Intervenção Prioritária de Lisboa

	Designação - BIP/ZIP	Freguesias
1	Casalinho da Ajuda	Ajuda
2	Dois de Maio	Ajuda
3	Quinta do Cabrinha / Quinta do Loureiro / Av. De Ceuta Sul	Alcântara /Santo Condestável
4	Portugal Novo	Alto do Pina
5	Grafanil	Ameixoeira
6	Quinta da Torrinha	Ameixoeira
7	Quinta da Mourisca	Ameixoeira
8	Ameixoeira (PER)	Ameixoeira
9	Ourives / Estrada de Chelas	Beato
10	Boavista	Benfica
11	Bom Pastor / [illegible]	Benfica
12	Murtas	Campo Grande
13	Bela Flor	Campolide
14	Liberdade	Campolide
15	Quinta do Tarujo	Campolide
16	Padre Cruz	Carnide
17	Centro Histórico de Carnide	Carnide
18	Azinhaga dos Lameiros / Azinhaga da Torre do Fato	Carnide
19	Horta Nova	Carnide
20	Sete Céus	Charneca
21	Galinheiras - a) Ameixoeira b) Charneca	Ameixoeira/Charneca
22	Alta de Lisboa Sul	Charneca / Lumiar
23	Graça / Sapadores	Graça
24	Quinta do Olival	Lumiar
25	Cruz Vermelha	Lumiar
26	Pedro Queiroz Pereira	Lumiar
27	Lóios	Marvila
28	Amendoeiras	Marvila
29	Flamenga	Marvila
30	Condado	Marvila
31	Armador	Marvila
32	Quinta das Salgadas / Alfinetes	Marvila
33	Marquês de Abrantes	Marvila
34	PRODAC	Marvila
35	Rego (Bairro de Santos e PER)	Nossa Senhora de Fátima
36	Pena	Pena
37	Alto da Eira	Penha de França
38	Quinta do Morgado	Santa Maria dos Olivais
39	Quinta das Laranjeiras	Santa Maria dos Olivais
40	Casal dos Machados	Santa Maria dos Olivais
41	Sete Moinhos	Santo Condestável
42	Casal Ventoso	Santo Condestável
43	Alfama	Santo Estêvão / São Miguel / São Vicente de Fora / Sé
44	Mouraria	São Cristóvão e São Lourenço / Socorro
45	Furnas	São Domingos de Benfica
46	Quinta do Lavrado	São João
47	Horizonte	São João
48	Bairro São João de Brito / Pote de Água	São João de Brito
49	São José / Santa Marta (eixo)	São José
50	Rua de São Paulo (eixo)	São Paulo
51	Cascalheira / Alvito Velho	Alcântara
52	Paço do Lumiar	Lumiar
53	Marvila Velha	Marvila
54	Rua Possidónio da Silva	Prazeres
55	Pampulha	Prazeres
56	Alfredo Bensaúde	Santa Maria dos Olivais
57	Empreendimento Municipal - Rua João Nascimento Costa	Beato
58	Cooperativas 25 de Abril e Unidade do Povo	Campo Grande
59	Empreendimento Municipal Rua Carlos Botelho	Beato
60	Cooperativas - Rua João Nascimento Costa/ Carlos Botelho	Beato
61	Rua Direita da Palma	S. Domingos de Benfica
62	Castelo	Castelo
63	Rio Seco	Ajuda
64	Anjos	Anjos / São Jorge de Arroios
65	Quinta do Ferro	São Vicente de Fora
66	Charneca do Lumiar	Charneca
67	Alta de Lisboa Centro	Ameixoeira / Charneca

10 de Novembro de 2010

#0 - The Boavista District

Situated on the western outskirts of Lisbon and surrounded by the Monsanto Forest, the Boavista District was built by the Municipality in the 40s, with a view to rehousing families from the shanty towns.

Subject to successive phases of rehousing, its current population is estimated at around **5,000 inhabitants**; **1,559 houses**, 41 of which have already been bought by the families; of the rest, 510 in the older ‘alvenaria’ area.

In 2011 the district was classified as a **Priority Intervention District (BIP)**, due to economic, social, environmental and urban deficits, integrated in the Priority Intervention Districts Map on the Lisbon Master Plan.

Participation of the population and partners

This whole process has been organized with the **Junta de Freguesia de Benfica** (locally elected Council) and **ARMABB** (Residents Association of the Boavista District).

GABIP-Boavista was set up (Support Office for the Priority Intervention District of Boavista) in order to ensure permanent coordination between the various sectors.

GABIP-Boavista gathers all services of the municipality, Gebalis and EPAL which are involved in the programme, and is complemented by an Executive Committee which ensures coordination with the Local Council and the Residents Association, and also an Extended Committee with the presence of all programme partner organizations.

The **Executive Committee** ensures the regular and objective flow of information for all stakeholders and the monitoring of Programme operations.

The **Extended Committee** is for reflection and systematic review of the development of the Programme, and may submit concrete proposals concerning its implementation.

‘Eco-District Boavista Environment+’ integrated Action Plan

ERDF grant of 2,5m€ and total investment of 4,4m€:

	Investment areas distribution:	components/contracts (63):	investment:	%
#1	Residential buildings renewal, improvement of environmental efficiency	1.29, 1.30, 1.31, 1.32, 1.33, 1.34, 1.35, 1.37, 1.39.1, 1.39.2 and 1.41	2.401.535,04 €	55%
#2	Building of new Community Equipment	1.1, 1.3, 1.5, 1.6, 1.7, 1.9.1, 1.9.2, 1.9.3, 1.10, 1.11, 1.12, 1.13, 1.14, 1.15, 1.18, 1.21, 1.22 and 1.23	955.878,82 €	22%
#3	Renewable Energy installations	1.2, 1.8.1, 1.8.2, 1.19, 1.20, 1.43.1, 1.43.2 and 1.43.3	372.574,97 €	8%
#4	‘Net-Verde’ district free WIFI	1.24	32.500,00 €	1%
#5	Energy and Environmental education and monitoring	1.17.4, 1.25 and 12.4	80.580,00 €	2%
#6	Participation and Media	1.16, 1.17.1, 12.1.1, 12.1.2, 12.1.3, 12.2 and 12.3	71.725,50 €	2%
#7	Recreational and Sporting Activities	1.17.2, 1.17.3, 1.26, 1.27.1, 1.27.2, 1.28.1 and 1.28.2	87.000,00 €	2%
#8	‘Alvenaria’ renewal: urban and architectural projects	1.4.1, 1.4.2, 1.4.3, 1.4.4, 1.4.5 and 1.43.3	226.350,00 €	5%
#9	Project coordination, management and monitoring	12.5 and 12.6	162.000,00 €	4%
			4.390.144,33 €	

#1 Residential buildings renewal

Improvement of environmental performance. All studies, project design and testing were supported by E-Nova and LNEC. All completed works:

a) - Coating and complete ecological insulation of façades: lots 11/18.

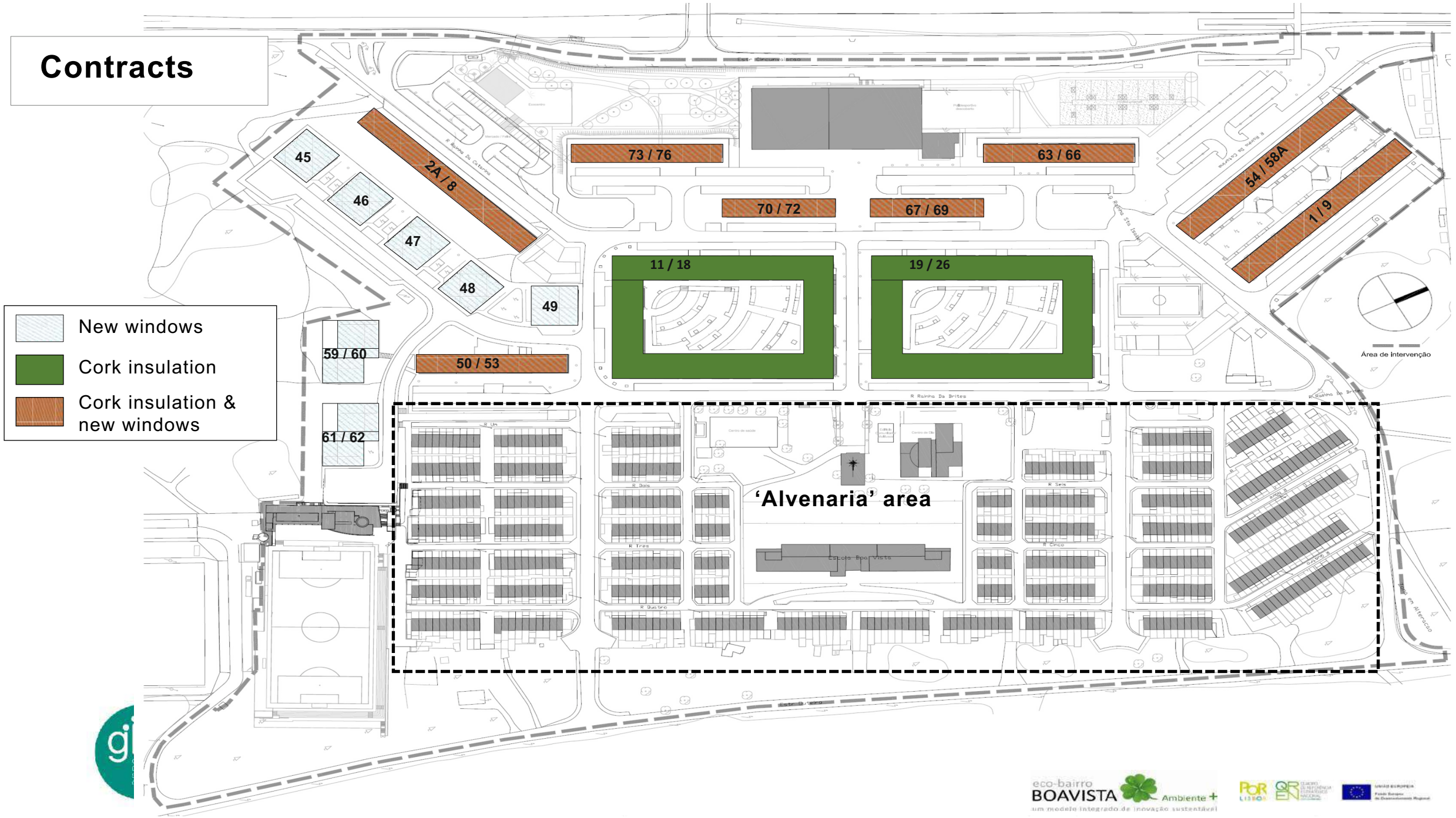
b) - Coating and complete ecological insulation of façades: lots 19/26.

c) - Efficient windows: lots 1/9, 2A, 8, 45/49, 54/58A, and 59A/62D.

d) - Coating and ecological insulation of blind gables: lots 1, 9, 2A, 8, 50, 53, 54, 58A, 63, 66, 67, 69, 70, 72, 73 and 76.

e) - Efficient windows: lots 50/53, 63/66, 67/69, 70/72 and 73/76.

Contracts



eco-bairro BOAVISTA Ambiente + um modelo integrado de inovação sustentável

Improvement of buildings' environmental efficiency

Even in the more recent flats, one of the more common of the inhabitants' complaints includes **cold**, **humidity** and **flooding**, and evidence of cracks/fissures in the façades of these buildings has been confirmed.

As a response to these problems, support was requested from Lisboa E-Nova (Municipal Energy and Environment Agency) and LNEC (National Civil Engineering Laboratory).

The proposed solutions were the application of an **outer layer of cork insulation** with a non-cement mortar which, in addition to **solving the afore-mentioned issues**, would allow for an **improvement of the effiency of the façades**, and **reduce future maintenance costs**.

In one of the buildings, several tests to the system have taken place in order to guarantee quality and the best investment choice.

After a public competition to select the contractor, **more than 20.000m2 of this ecological solution were applied**.

A second proposal consisted of the replacement of the previously inefficient windows by more than **3,000 (4,000m2) new eco-efficient windows with regulated ventilation**.

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Coating and ecological insulation of façades

ETIC System final cost of 38€/m2

(Buildings 11/18 and 19/26: > 400 houses)

Efficient window with regulated ventilation

1.2x1.1m window (all works): 258€
Ventilation unit: 40€ (>3,000 new windows and >4,000m2)

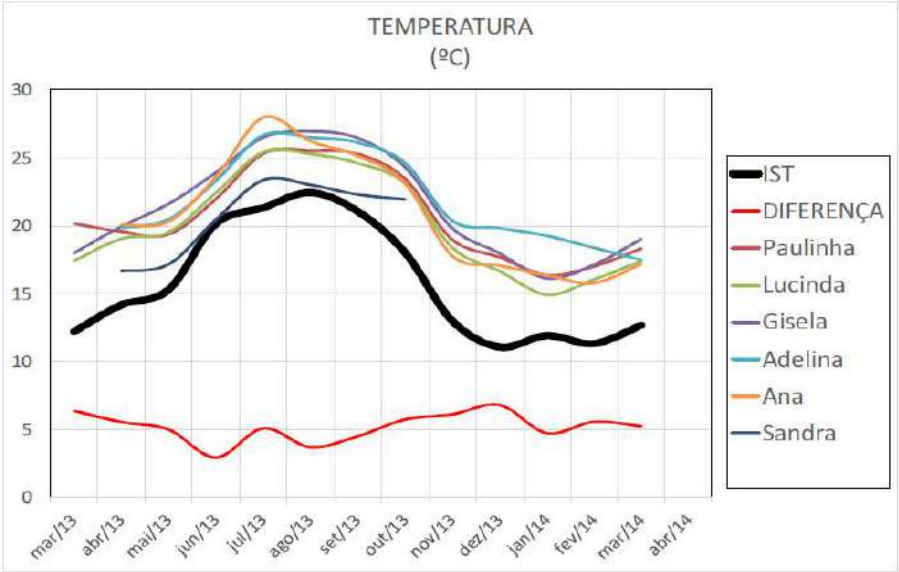
Monitoring study and reports on housing comfort impact and energy consumptions before, during and after the interventions.

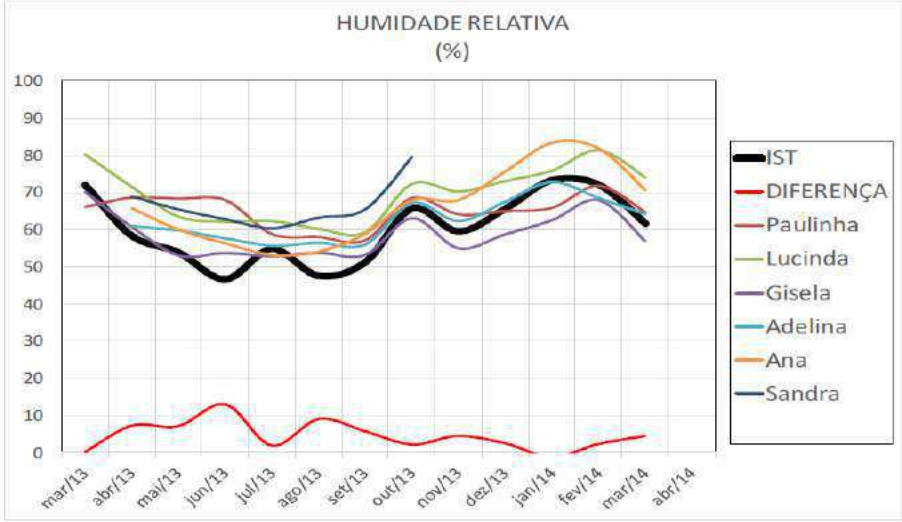
In March 2013 in 6 flats, Lisboa E-Nova installed equipment designed to continuously measure electricity consumption and environmental temperature and relative humidity.

The 6 flats were chosen according to varied typology and positioning, although the existence of a computer and internet connection to communicate results was a conditioning factor. It is important to note that of the 6 residents, Sandra's flat is on the ground floor and its walls had not undergone intervention by the ETIC system.

These measurements aim to evaluate the impact of the ETIC system installation, and nem windows which took place in the 2nd semester of 2013, on electricity consumption and interior comfort conditions.

This graphics show the average monthly temperature and relative humidity readings collected, alongside the atmospheric temperature and relative humidity levels obtained from ILISBOAL8 weather station, located in the IST - Instituto Superior Técnico.





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International certification and opportunities for tecnological exportation

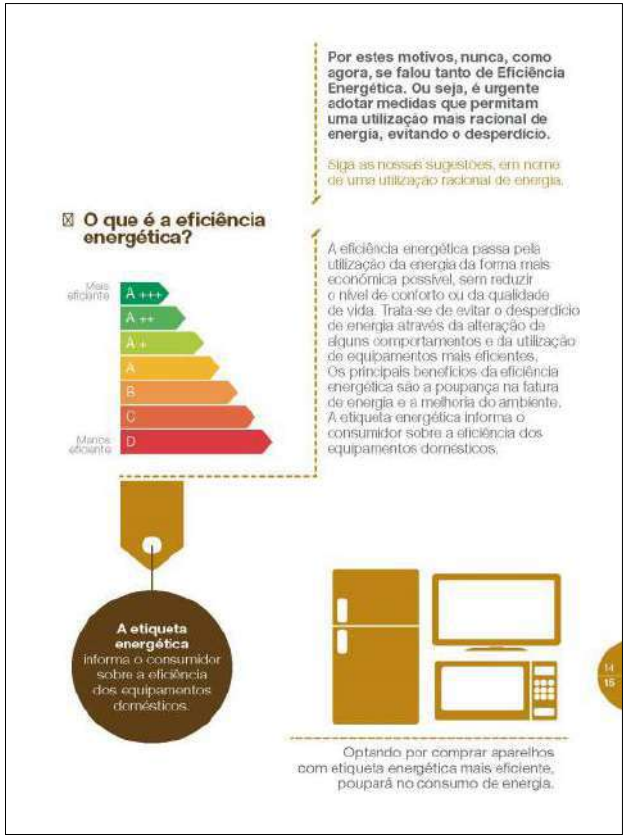
Todo o processo de contratação e selecção da tecnologia foi apoiado pelo LNEC (vide relatórios) de modo a promover o desenvolvimento e a certificação de tecnologias ecológicas, apoiadas na característica experimental da intervenção, de modo a permitir a sua replicação e exportação.

A tecnologia de revestimento ecológico com cortiça e argamassa não cimentícia seleccionada foi entretanto **homologada pelo LNEC (DH 931) em Setembro de 2013 e pela ETA (ETA 14/0200) em Julho de 2014.**

#5 Energy and Environmental education and monitoring:

- Door-to-door distribution and presentation of especially designed ‘Eco-Booklet’ manual.
- Competition for saving and reduction of household consumptions.
- Monitoring study and reports on housing, facilities and urban energy consumptions before, during and after interventions.

The ‘Eco-Booklet’
household consumption
saving manual



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'COOPETITION' programme

- Publication of the ***Boavista Environment+ Eco-Booklet***.

- Training and hiring of local youth to raise awareness, monitor consumption and advise families in the district.

- Savings and reduction of household energy and water consumption competition amongst 100 families with awarding prizes (groceries vouchers up to 250€).


residents' presentation


facilitators' course


competition awards

'COOPETITION' programme

monthly family consumption report and counciling

eco-bairro BOAVISTA Ambiente + | LISBOA e·nova | LISBOA

Programa COOPETIR

Desafio de poupança de água, eletricidade e gás natural

Monitor: Marco - Consumos de Setembro/2013

Dica do Mês

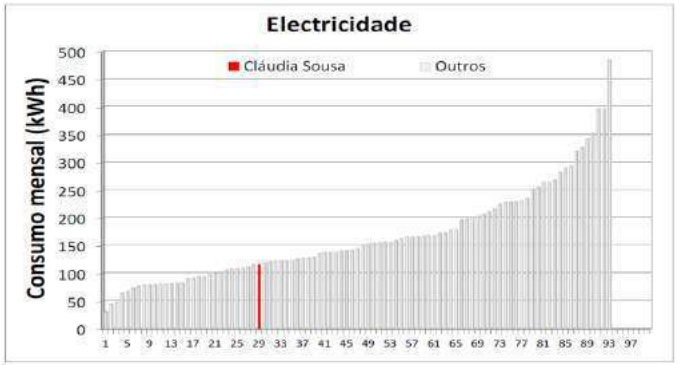
Este mês, para o ajudar na sua poupança, oferecemos-lhe uma lâmpada eficiente. Esta consome cerca de 80% menos energia do que as incandescentes, para além de durar muito mais tempo.
Mas atenção, esta lâmpada não deve ser colocada no lixo comum quando avariar. A página 32 de ECO-caderneta explica onde deve depositá-la.
No próximo mês tentaremos ajudá-lo a poupar água.

---------- // ----------

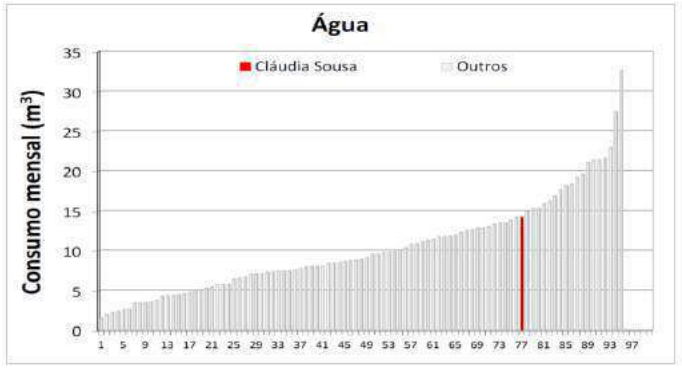
Pense duas vezes antes de decidir qual o sistema de gás que vai usar na sua casa.
Sabia que o gás canalizado é cerca de 20% mais barato do que o gás de garrafa? Sem falar no impacto ambiental associado ao transporte até chegar a sua casa...

Poupe na sua carteira, e no ambiente de todos!

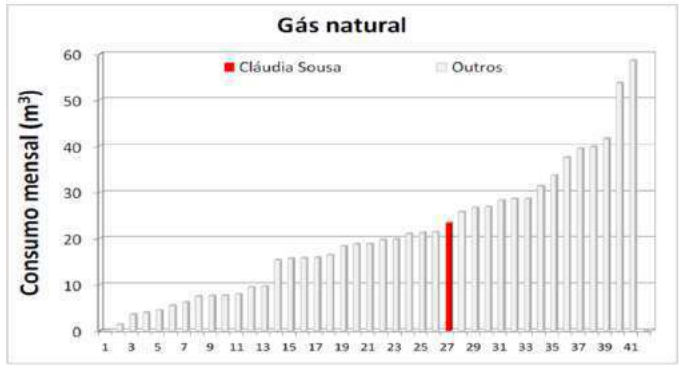
ADENE AGÊNCIA PARA A ENERGIA | GEBALIS | Projecto com financiamento: POR LISBOA | QREN | UNIÃO EUROPEIA Fundo Europeu de Desenvolvimento Regional



Este mês ficou na 29ª posição da Coopetição
(Ou seja, entre os participantes com menor consumo de electricidade)



Este mês ficou na 77ª posição da Coopetição
(Ou seja, entre os participantes com maior consumo de



Este mês ficou na 27ª posição da Coopetição
(Ou seja, entre os participantes com consumo médio de

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#8 ‘Alvenaria’ renewal:

Urban and architectural projects:

- Participatory definition of objectives, timing, Urban Operation and Resettlement Process phasing.
- Municipal Urban Plan for ‘Alvenaria area’.
- Selection of architectural solution for the ‘building module’ by public tender for the ‘Alvenaria area’ - setting of the tender specifications through participative methodology by establishment an advisory council and jury for selection and recruitment of detailed Project.
- Detailed project of ‘building module’ to ‘Alvenaria area’ by the winner of the public tender, with technical monitoring of GABIP and Advisory Board.

The renovated buildings, ‘Alvenaria’ area and Monsanto

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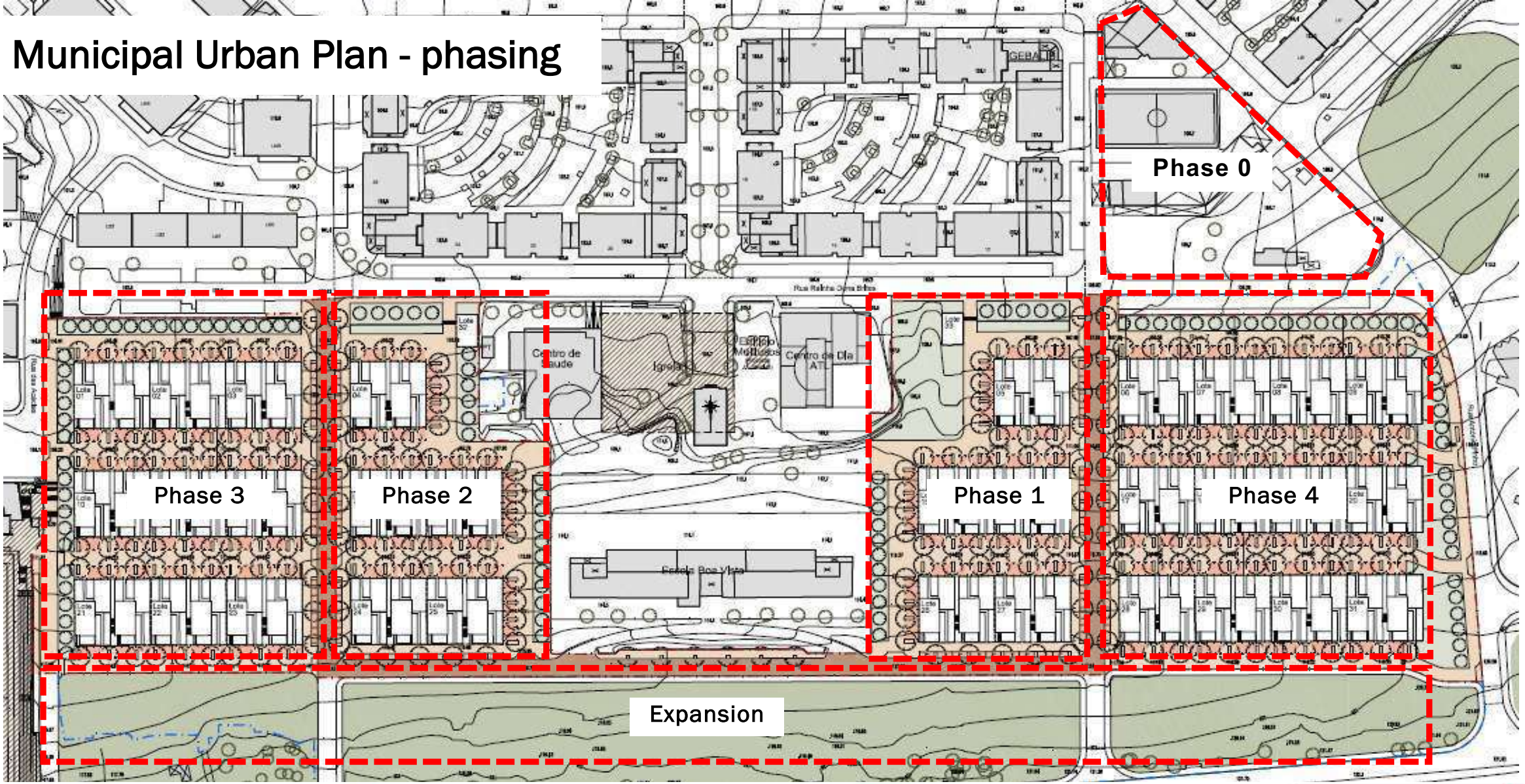
The ‘Alvenaria’ architectural solution goals:

1. **Substitution of all** degraded and critically undersized ‘alvenaria’ buildings;
2. Housing the same 350 families **in the same location**;
3. **Maintenance of the urban matrix**, road layout, population density and relationship with the Monsanto forest;
4. Allowing the **urban phased substitution**;
5. Avoiding economic and social **costs of temporary replacement**;
6. Implementing a **participative methodology** for the definition of urban and architectural projects;
7. Developing and enforcing the principles of energy and environment efficiency defined in the ‘**eco-district**’ action plan;
8. Developing and enforcing the principles of ‘**District 30’** (pedestrian priority) classification given to Boavista;
9. Developing and enforcing the principles of **post-‘PER’** social housing (90s large scale housing programme), namely in responses to subjects such as:
    a) exploration and maintenance costs control,
    b) high housing quality and comfort,
    c) reduced communal parts management needs,
    d) accessibility for elderly and disabled,
    a) promote neighbourly relations,
    b) social and cultural integration,
    c) house adaptability to family natural growth.

Municipal Urban Plan - phasing



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The final ‘Alvenaria’ architectural project

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The Sustainability Factors

Economic - Despite the apparent complexity of the built form, the project is highly rationalised. The material palette is very concise and proposes to deploy a very well established set of construction techniques of practical and rapid execution. The choice of materials took into account construction costs as well as maintenance costs.

Accessibility - The project takes advantage of the existing topography of the site by setting out two distinct levels of access at street level, providing step-free access to 80% of the residential units. Innovative bathroom design was adopted in order to ensure full accessibility and flexibility in less constructed areas.

Ecological - The fragmented architectural form provides the residential units with multiple orientations, gaining natural light from all quadrants throughout the day, mitigating the levels of energy consumption. This will be assisted by solar panels for water heating. The high level of insulation will also contribute to reducing energy consumption and running costs.

Social - Through the symbiosis between built mass and open space, the project defines an array of small plazas where the allotments will be located. These spaces set a framework for social engagement and will consolidate the sense of community amongst the residents.

Architectural - At an urban level, the fragmented architectural form expresses a balance between the individuality of each volume and the collective of the city. On a domestic scale, the centrality and form of the main living space provides each unit with spatial flexibility, offering the possibility of accommodating a pre-planned and tenant affordable additional bedroom in order to meet long term suitability.

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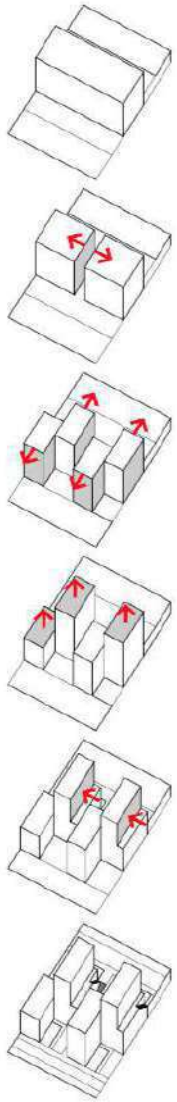
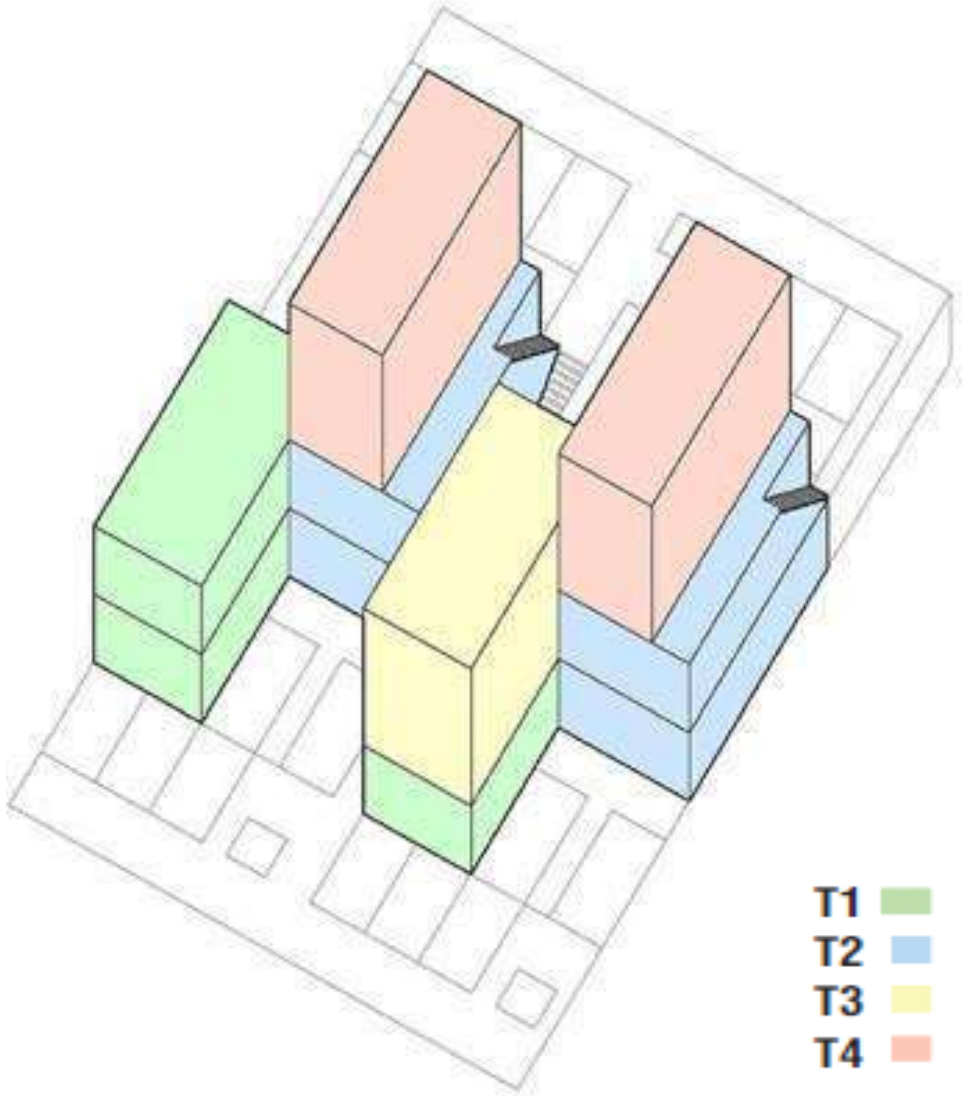
Massing

Starting from the solid bar running the full width of the plot, we broke it in two halves, opening a gap in the middle of the plot for urban pedestrian passage. Each half is then further broken into halves, generating four volumes.

Each volume is shifted away and towards the street either side, with the staggered arrangement generating two small plazas on each side of the plot, along each street. Vertical adjustments are made to accommodate the required volume and areas creating a variety of roof levels amongst the four volumes.

Lastly, horizontal adjustments create the external access into the upper units, correcting the volumes and areas to meet the brief requirements.

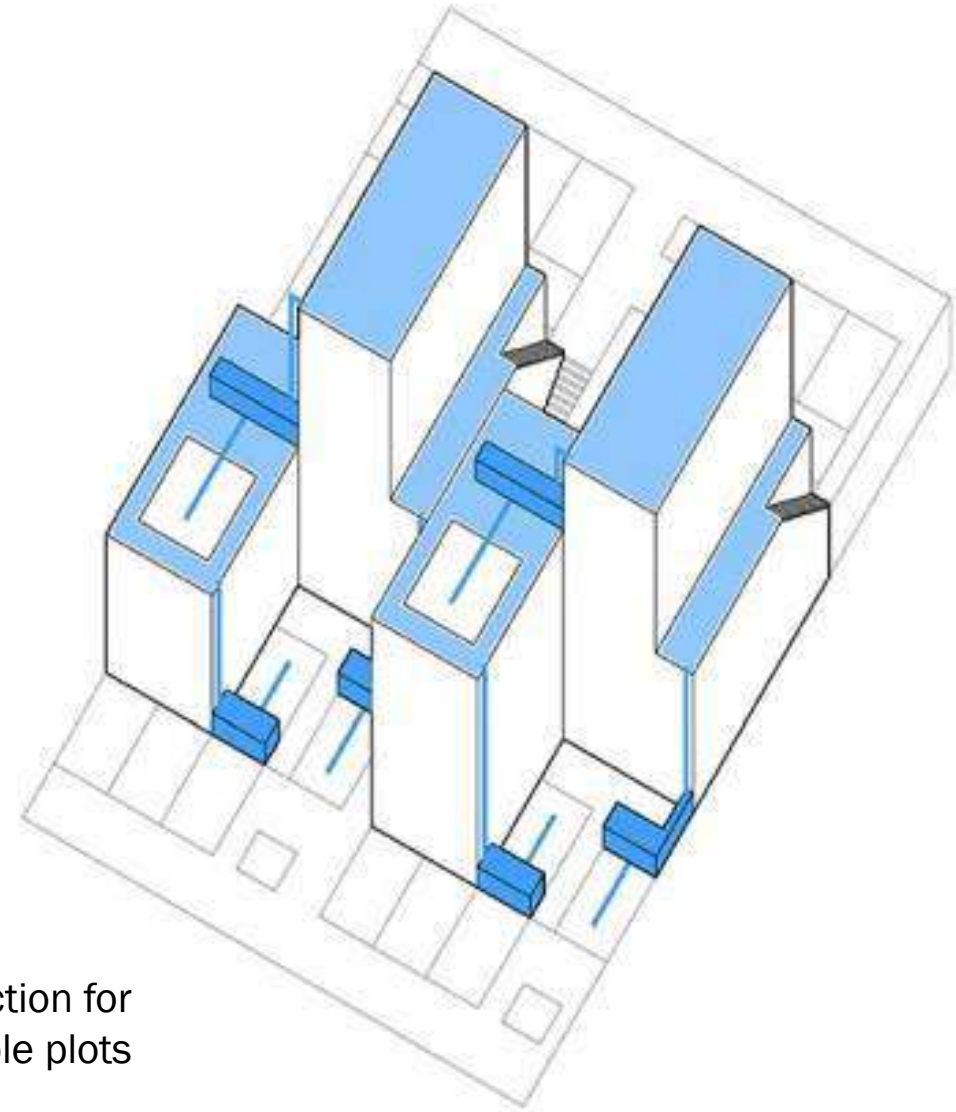




Water

Rain water is collected from the roof surfaces and stored in individual water tanks located within each allotment.

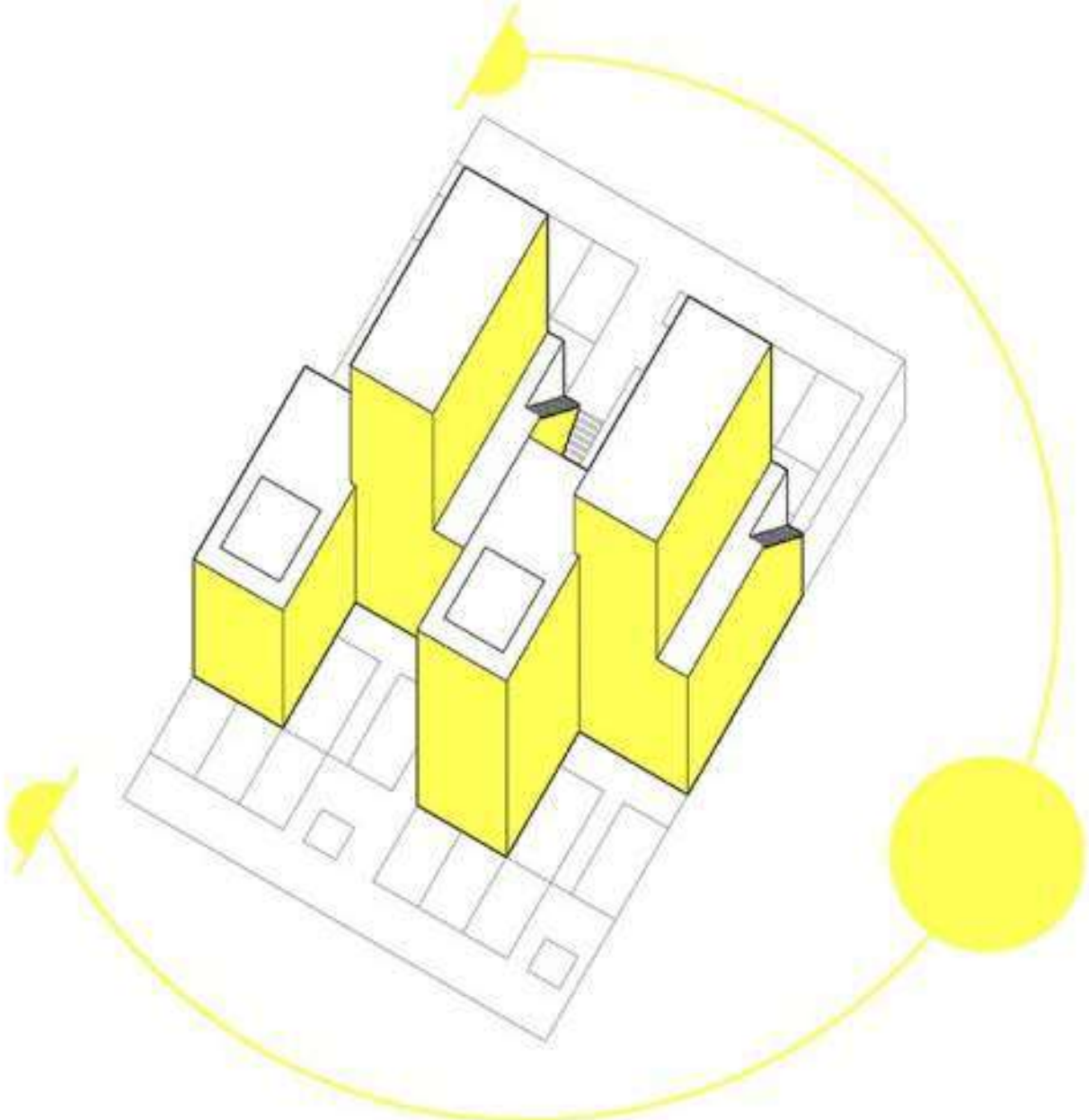
These masonry elements are integrated in the design of boundaries and thresholds that define the territories of the public space of the street and communal outdoor space of the allotments.



Rainwater collection for
use on the cultivable plots

Insolation

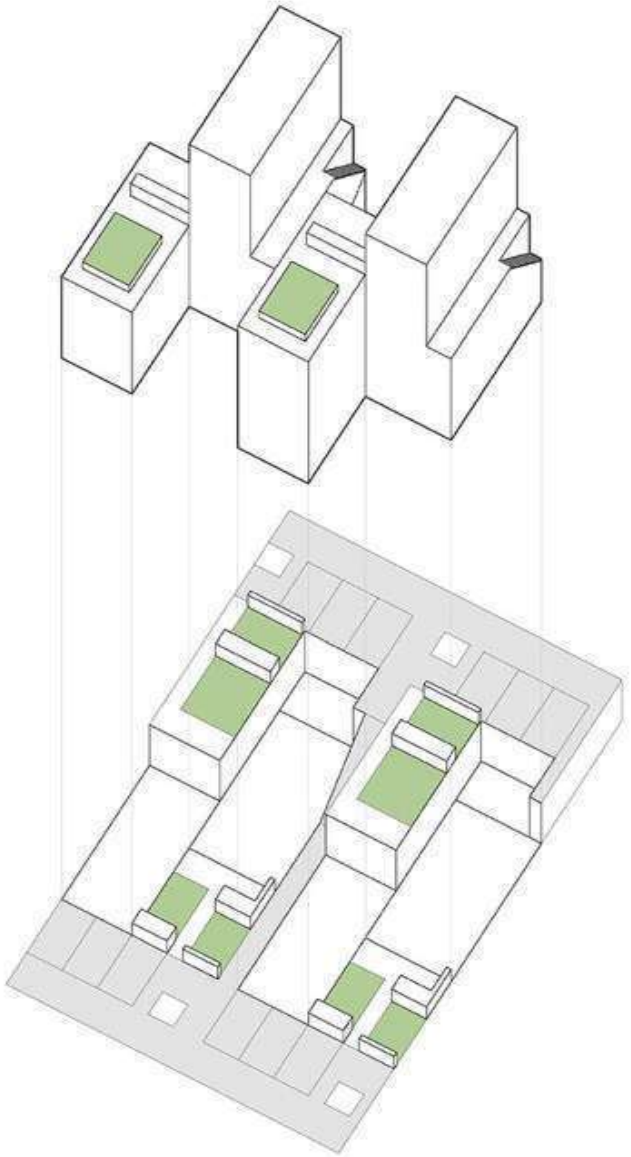
The fragmented massing allows for solar penetration to all units. All units have multiple aspects and orientation benefiting from good solar exposure.



Allotments

Each residential unit will have direct access to an allotment. Resulting from the access and topographical strategy, 80% of the units will have their allotment acting as a front garden.

The two elevated 3-bedroom residences occupying the taller volumes will have their allotments on the adjacent flat roof of neighbouring units of the lower volumes. This stategy promotes usability whilst contributing to urban and social sustainability.



Cultivable plots

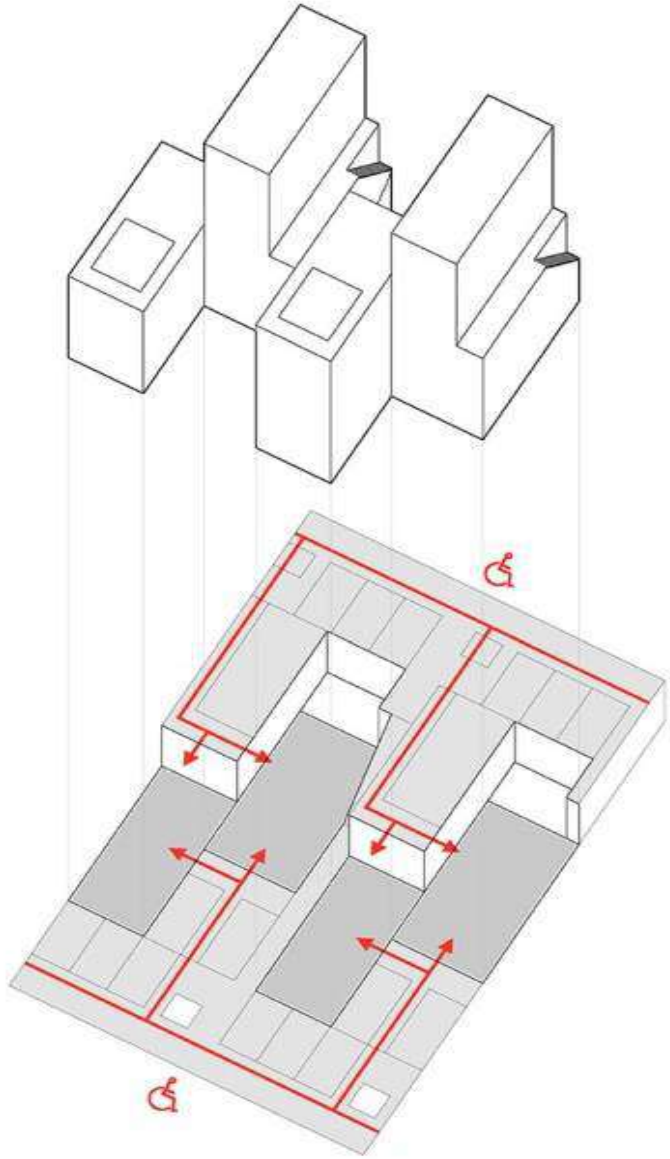
Access

The project takes advantage of the existing topography in order to maximise level access into the residential units. Each plot has two levels of access, one from each street bounding each plot.

As a strategy, all seven single level units alongside the 4-bedroom unit are located at one of the street levels.

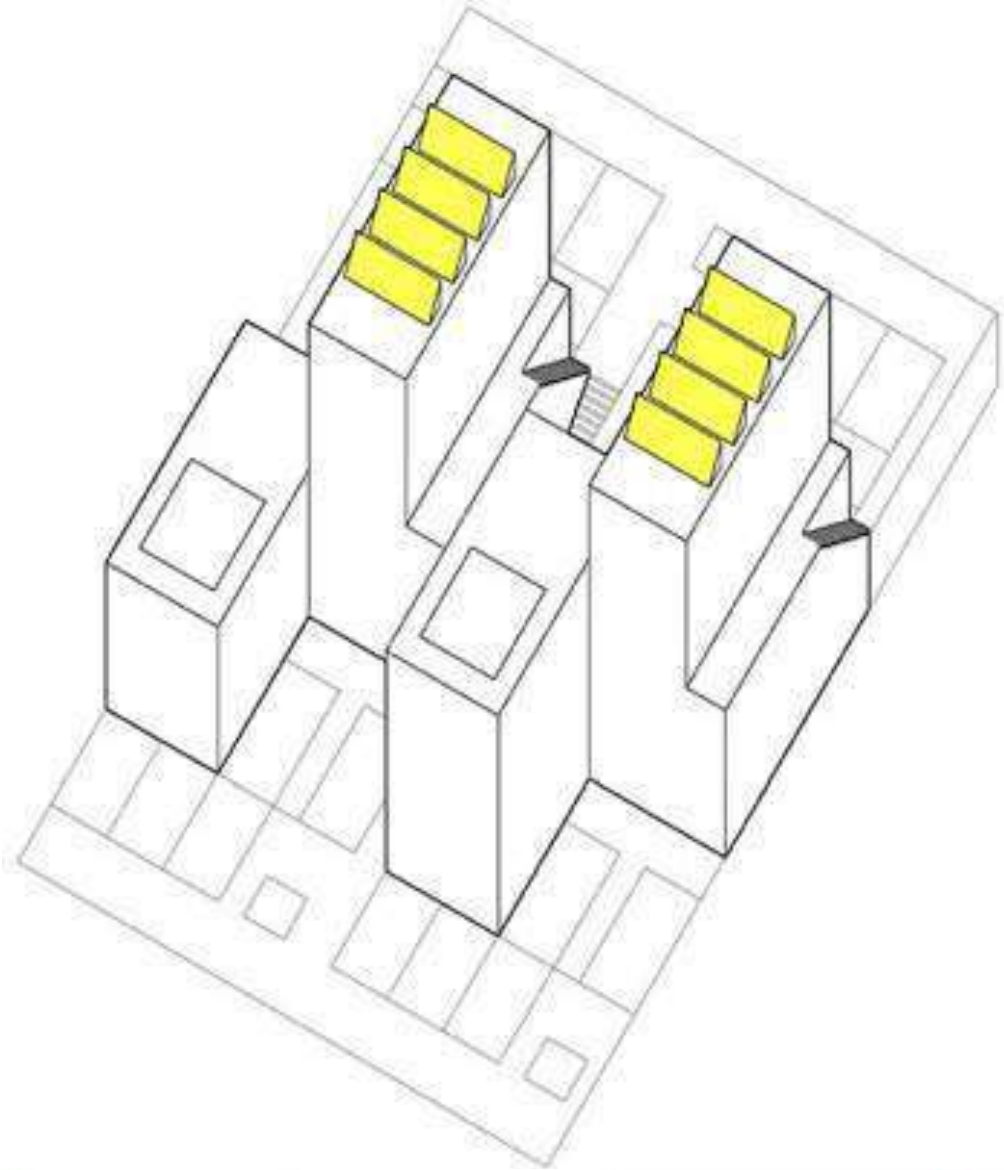
The three bedroom units are accessed via external steps and through a private elevated terrace.

This way, the project achieves 80% level access.

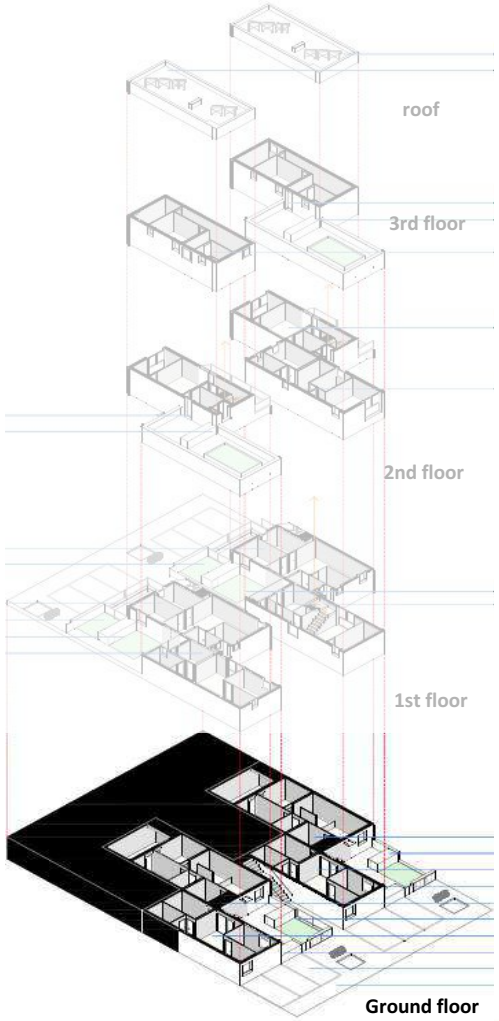


Solar Panels

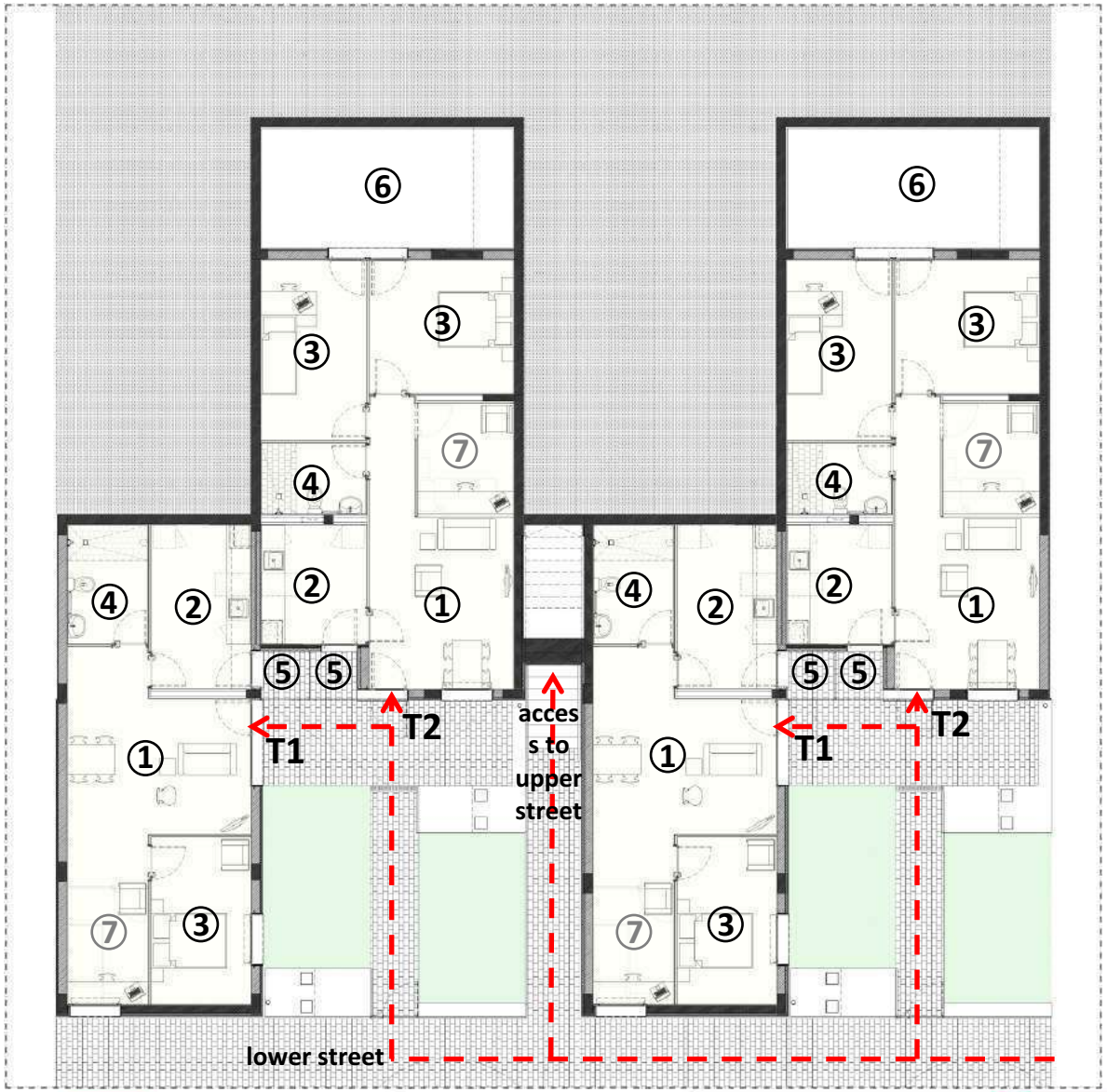
The taller volumes will be crowned by individual solar panels that will supply the hot water for each unit.



Ground level

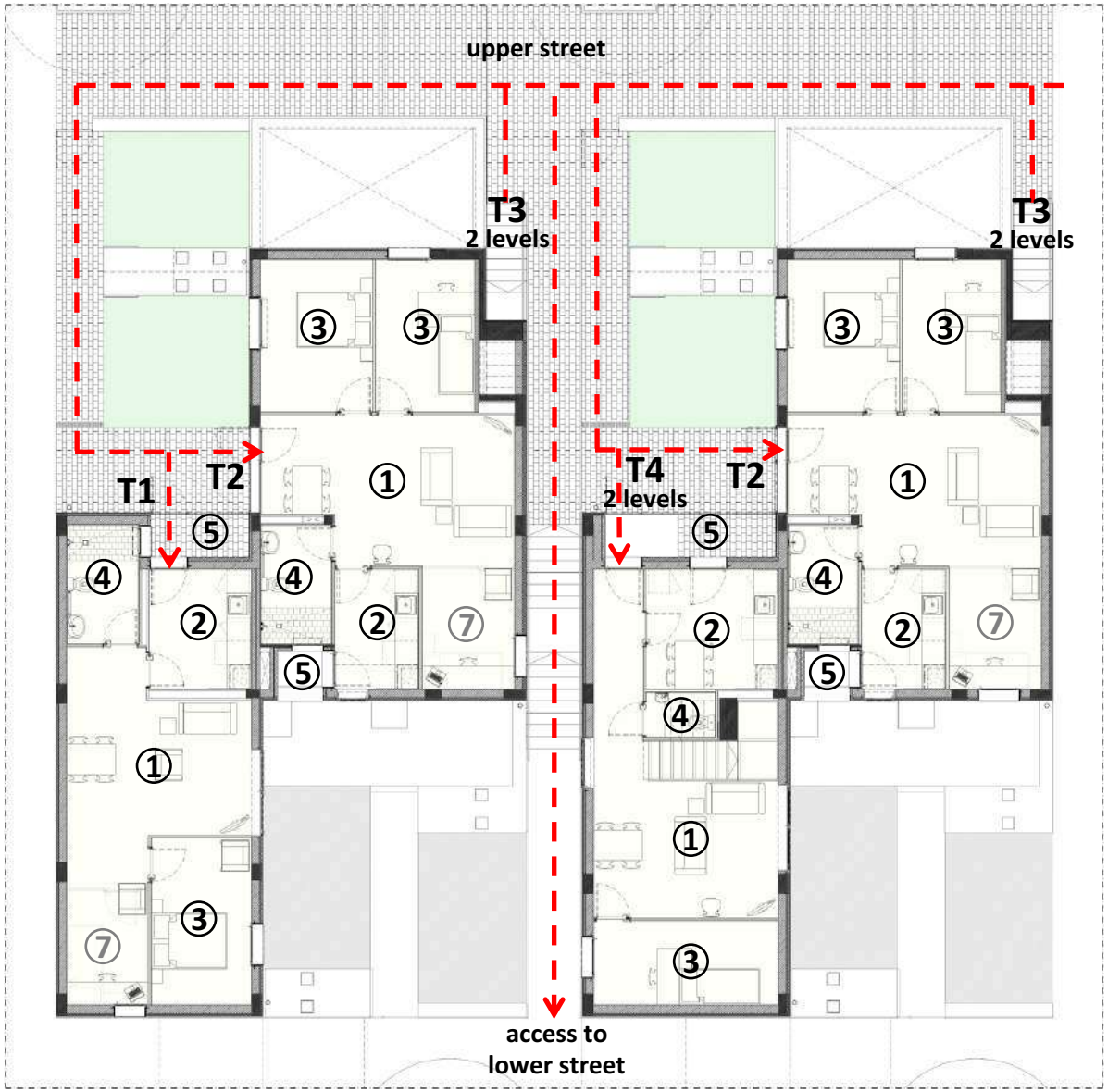


1 - Living Room
2 - Kitchen
3 - Bedroom
4 - Bathroom
5 - Drying room
6 - Terrace
7 – Convertible room
T1 - 1 Bedroom Unit, etc.

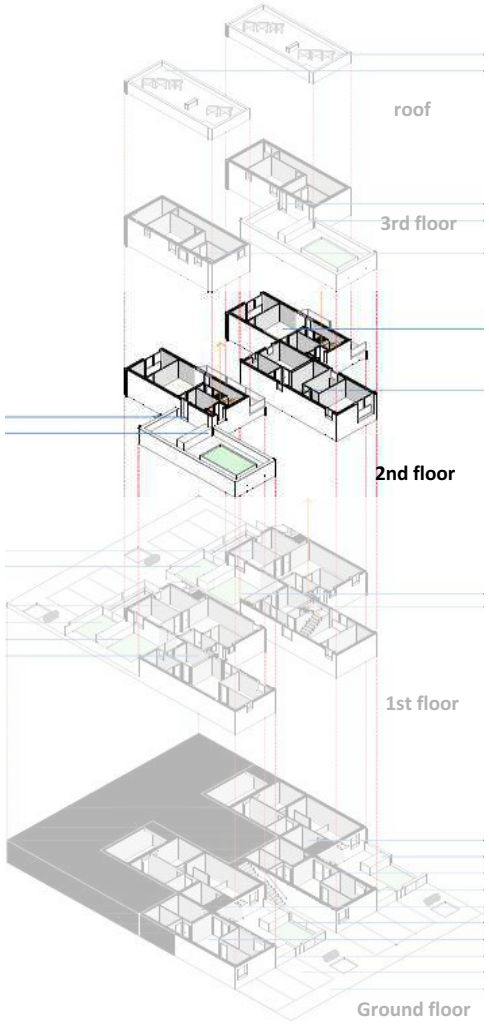


1st floor plan

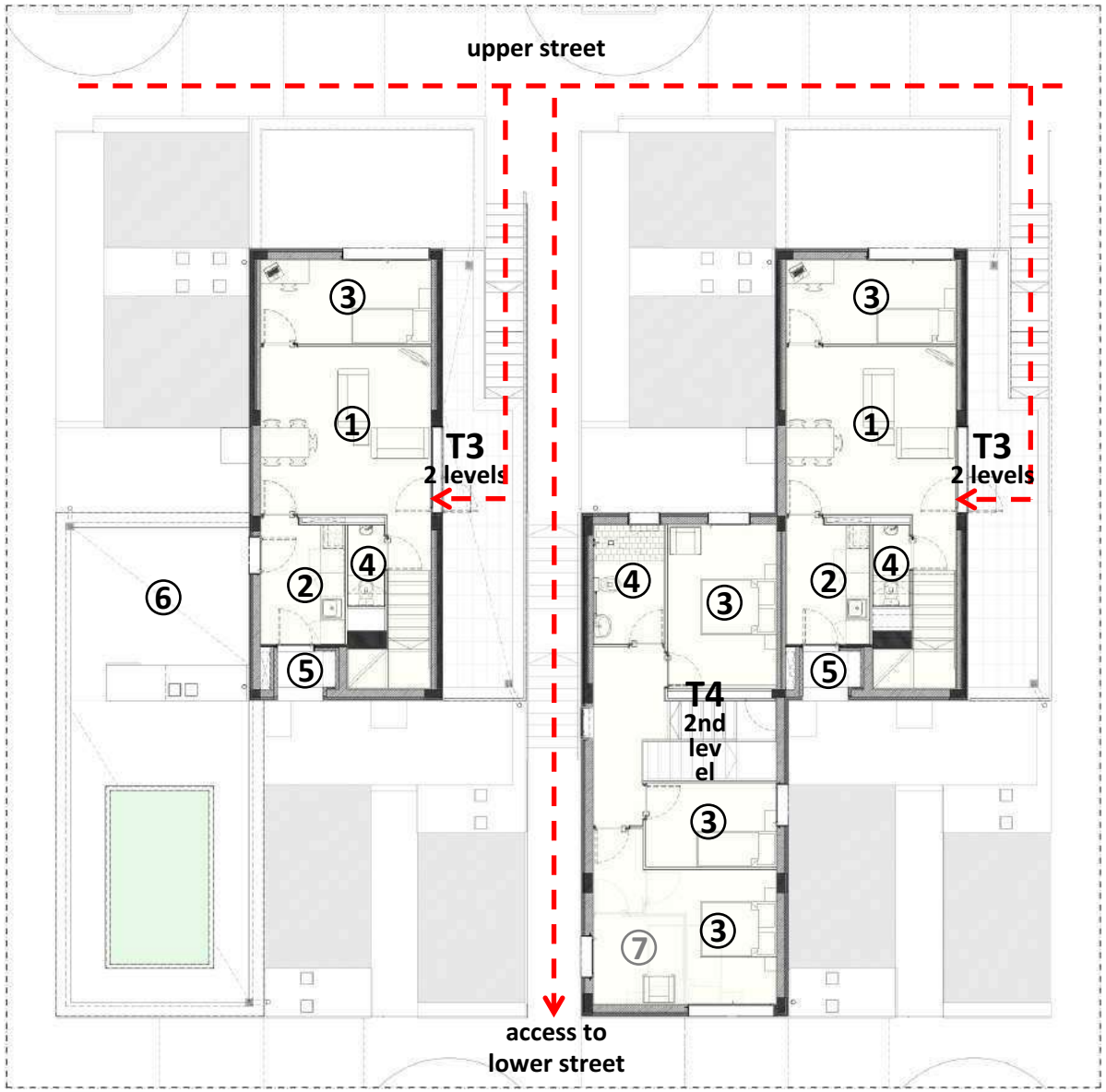
1 - Living Room
2 - Kitchen
3 - Bedroom
4 - Bathroom
5 - Drying room
6 - Terrace
7 – Convertible room
T1 - 1 Bedroom Unit, etc.



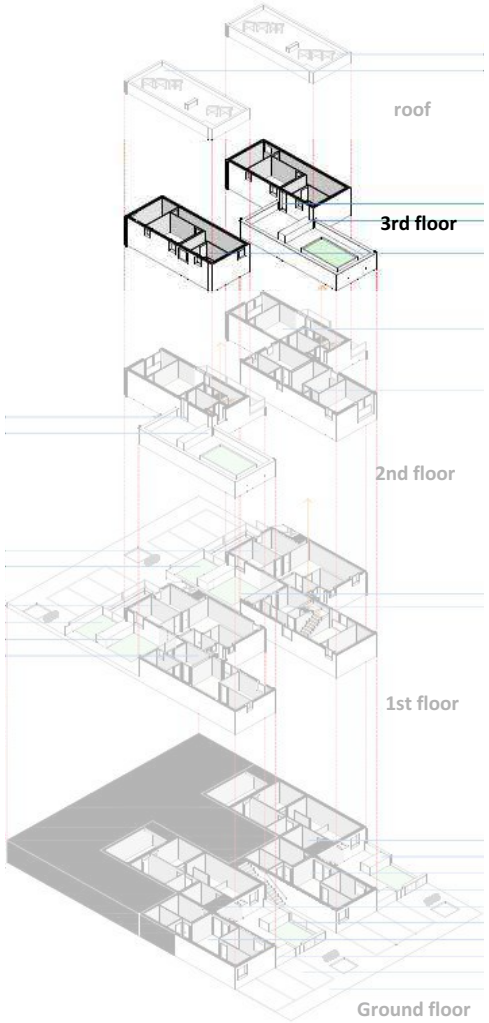
2nd floor plan



1 - Living Room
2 - Kitchen
3 - Bedroom
4 - Bathroom
5 - Drying room
6 - Terrace
7 – Convertible room
T1 - 1 Bedroom Unit, etc.

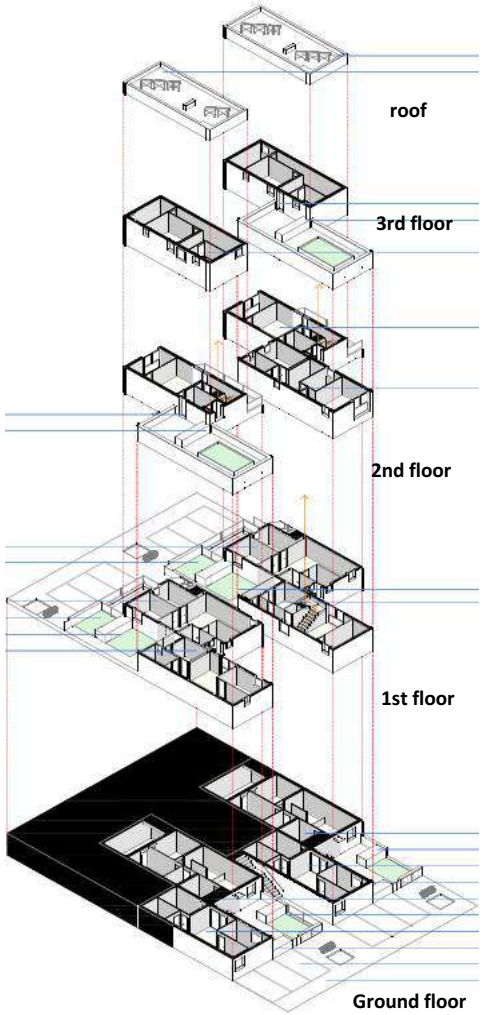


3rd floor plan

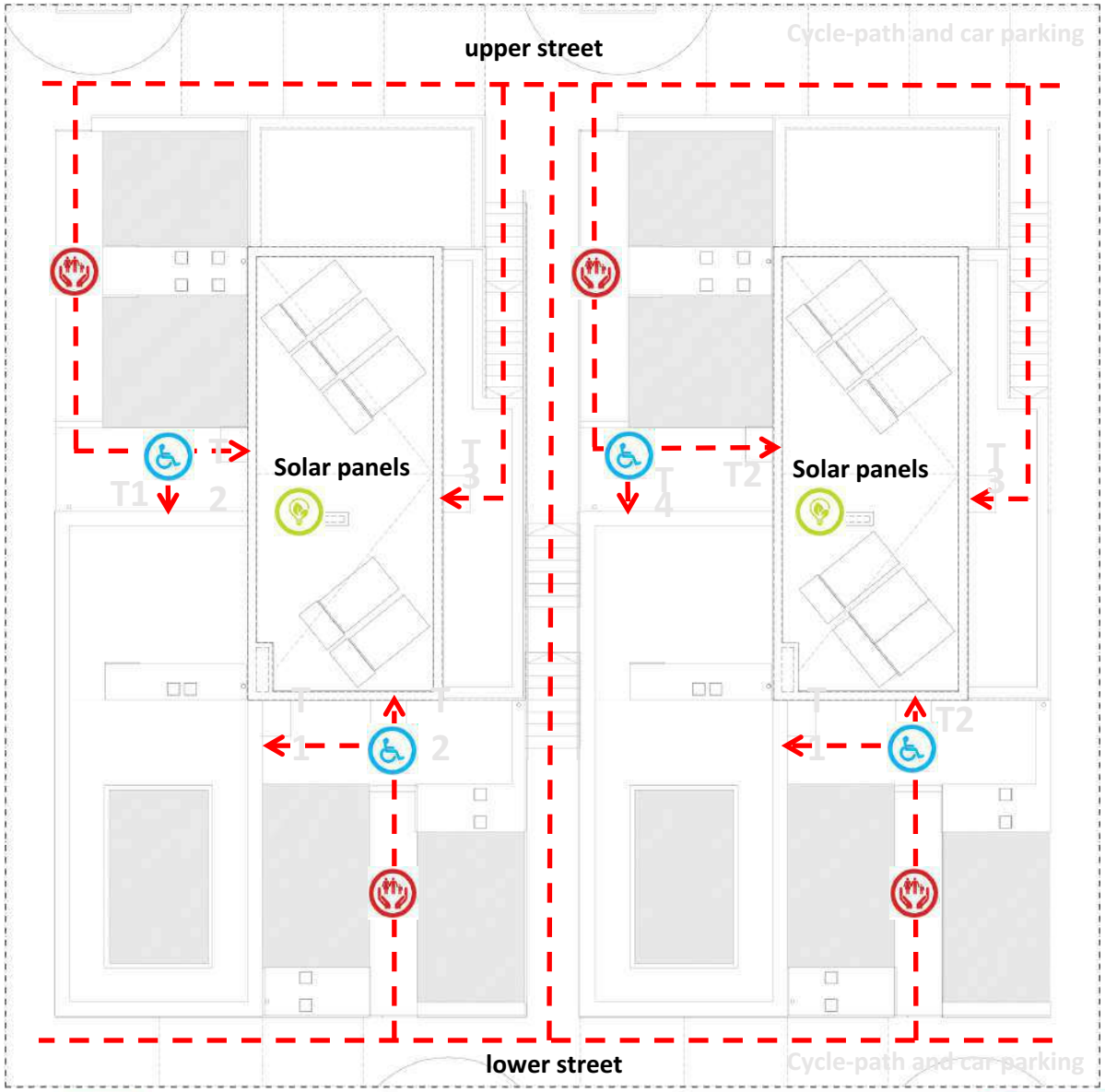


1 - Living Room
2 - Kitchen
3 - Bedroom
4 - Bathroom
5 - Drying room
6 - Terrace
7 – Convertible room
T1 - 1 Bedroom Unit, etc.

Top view



- Economic
- Accessibility
- Social
- Ecological
- Architectural



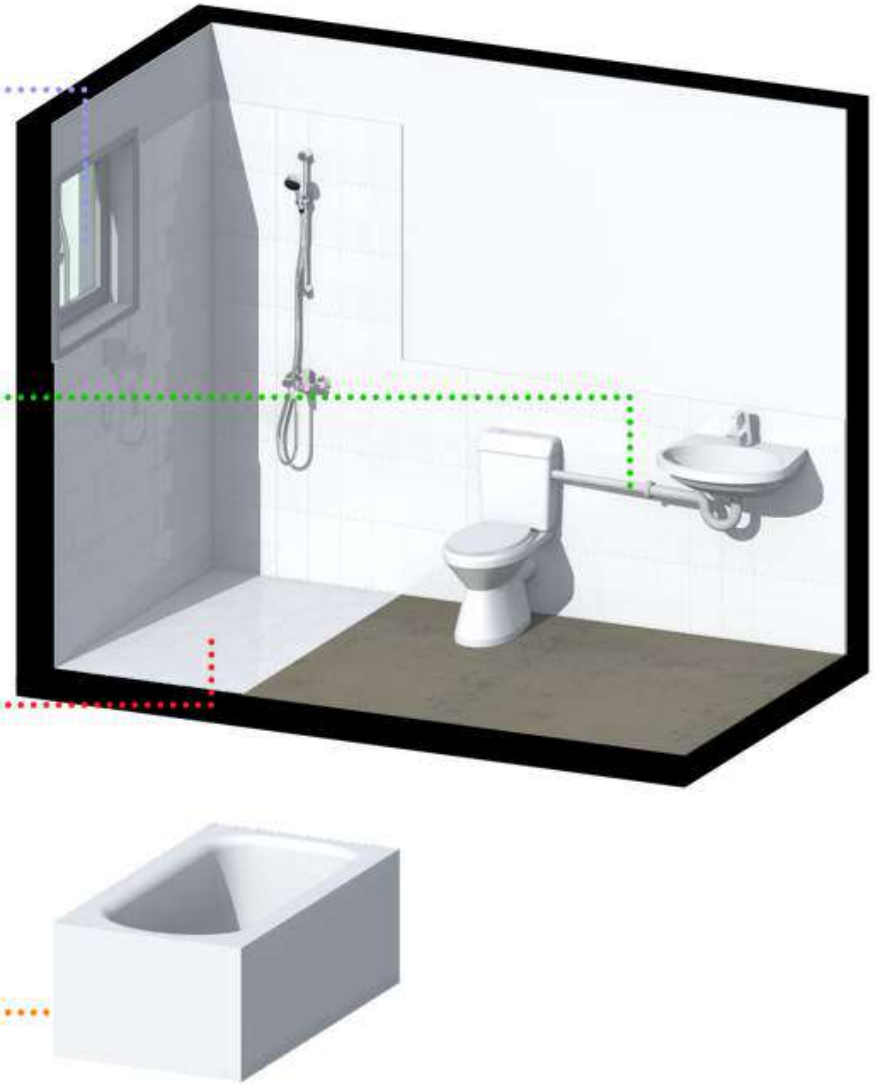
Acessibility and reuse of waters

NATURALLY VENTILATED BATHROOMS

WASH WATER RECYCLING SYSTEM FROM BASIN TO TOILET CISTERN

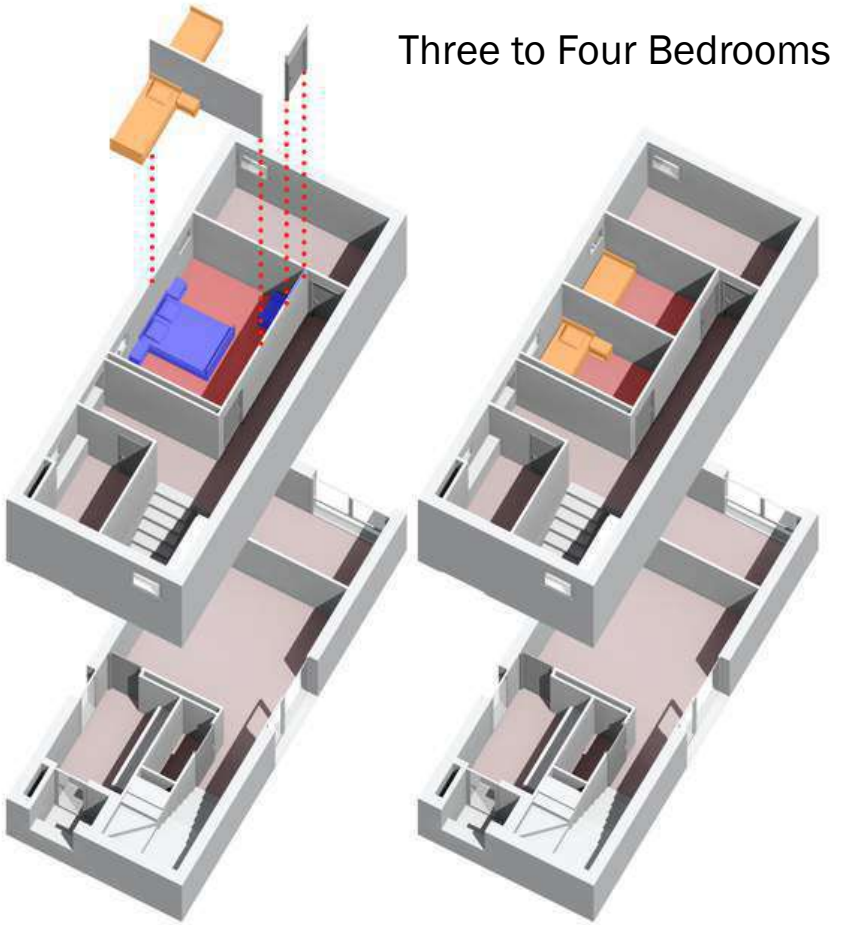
FULLY ACCESSIBLE SHOWER AREA WITH INSET FLOOR DRAIN

SHOWER AREA PREPARED TO ACCOMMODATE BATHTUB

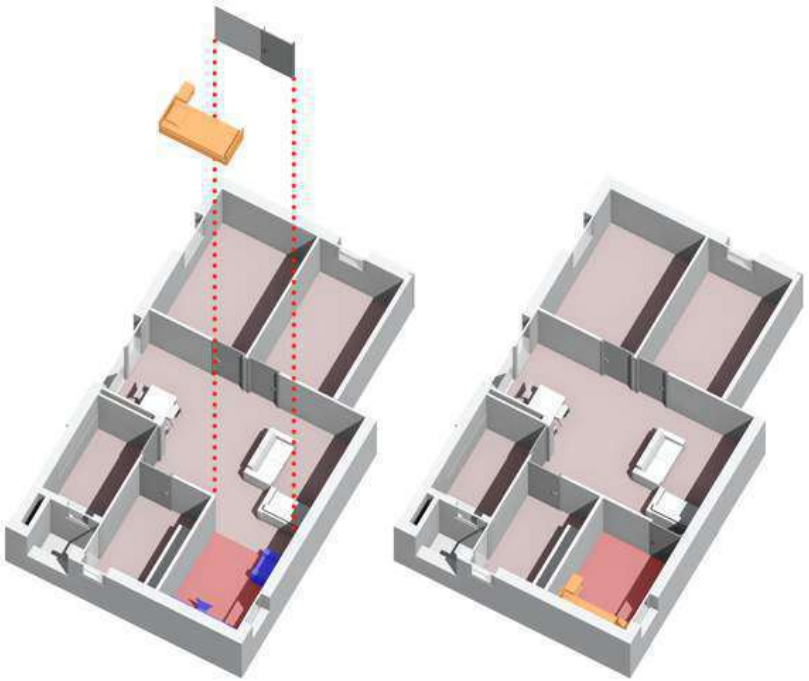


Typological evolution

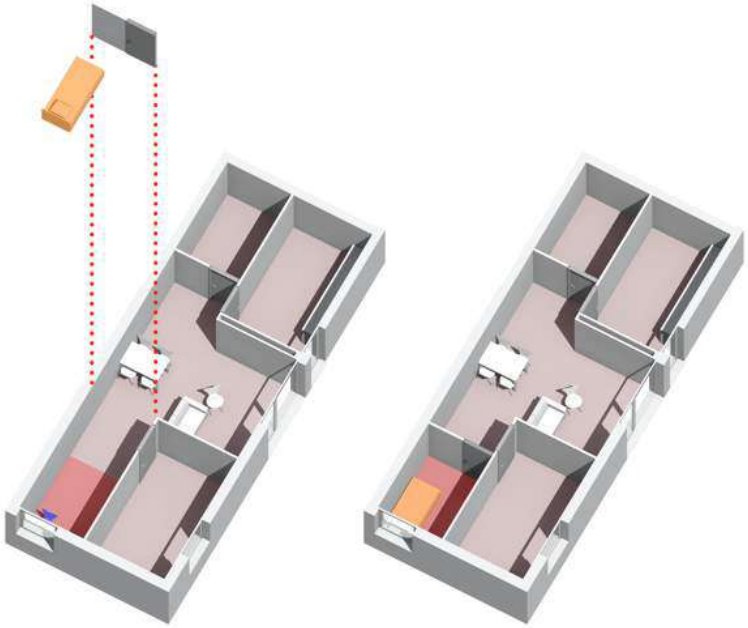
Three to Four Bedrooms



Two to Three Bedrooms



One to Two Bedrooms



The final ‘Alvenaria’ architectural project

Module and House Units area and cost	nº	Area (m2)	%	construction cost
House Units with 1+1 Bedrooms	3	65	23,6%	39 741 €
House Units with 2+1 Bedrooms	4	75	36,5%	46 087 €
House Units with 3+1 Bedrooms	2	102	24,8%	62 467 €
House Units with 4+1 Bedrooms	1	121	14,6%	73 836 €
TOTAL	10	824		504 735 €
			€ / m2	612 €
			Average Cost / House Unit	50 473 €

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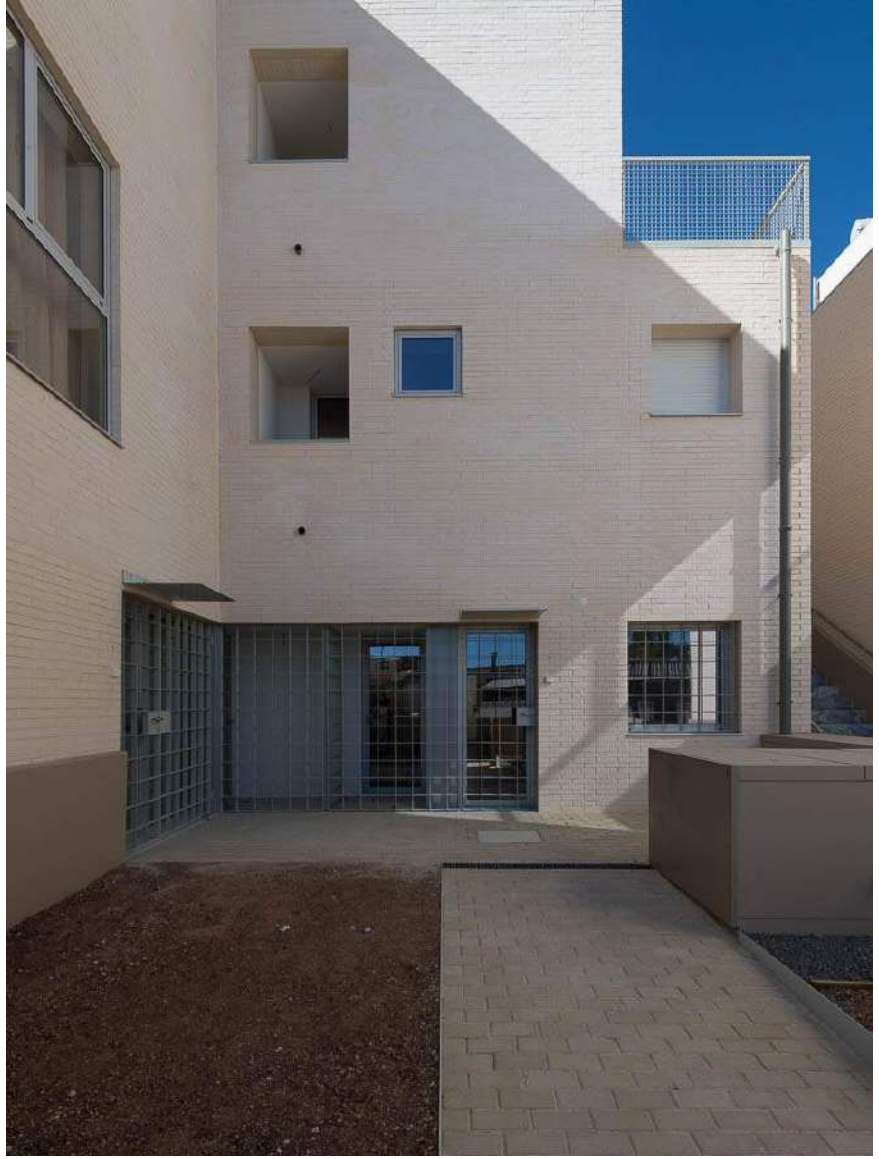

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