Lisbon City Council | Câmara Municipal de Lisboa

BOAVISTA
eco-district
an integrated model of sustainable innovation

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

Priority Intervention Districts Map on the Lisbon Master Plan
Boavista District BIP/ZIPs characterization

<table>
<thead>
<tr>
<th>Classification to: Importance of the proposed topics, a) to m?) (question 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Empty / Degraded homes</td>
</tr>
<tr>
<td>b) Public Transport</td>
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<tr>
<td>c) Facilities</td>
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<tr>
<td>d) Security</td>
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<tr>
<td>e) Urban Hygiene</td>
</tr>
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<td>f) Green Areas</td>
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<td>g) Local businesses</td>
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<tr>
<td>h) Unemployment</td>
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<tr>
<td>i) Marginality</td>
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<tr>
<td>j) Elderly Loneliness</td>
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<tr>
<td>k) Youth lack of occupation</td>
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<tr>
<td>l) School drop out / academic failure</td>
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<tr>
<td>m) Conflicts with neighbours</td>
</tr>
</tbody>
</table>

Selection of: 3 topics that most concern the respondents, a) to m?) (question 4)

<table>
<thead>
<tr>
<th>Deviation</th>
<th>Municipal answers Index - Total enquiries Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAIRRO</td>
<td>DA BOAVISTA</td>
</tr>
<tr>
<td>Newer dwellings</td>
<td></td>
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<tr>
<td>Alvenaria dwellings</td>
<td></td>
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</tbody>
</table>

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.

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**The Boavista Eco-District Action Plan**

*eco-bairro BOAVISTA*
The Eco-District Boavista Environment+ Action Plan

ERDF grant of 2.5m€ and total investment of 4.4m€:

<table>
<thead>
<tr>
<th>Investment areas distribution</th>
<th>components/contracts (63):</th>
<th>Investment:</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Residential buildings renewal, improvement of environmental efficiency</td>
<td>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</td>
<td>2.401.535,04 €</td>
<td>55%</td>
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<tr>
<td>#2 Building of new Community Equipment</td>
<td>1.1, 1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.1.5, 1.1.6, 1.2, 1.3 and 1.23</td>
<td>955.878,82 €</td>
<td>22%</td>
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<tr>
<td>#3 Renewable Energy installations</td>
<td>1.2, 1.8.1, 1.8.2, 1.10, 1.20, 1.43.1, 1.43.2 and 1.43.3</td>
<td>372.574,97 €</td>
<td>8%</td>
</tr>
<tr>
<td>#4 ‘Net-Verde’ district free WIFI</td>
<td>1.24</td>
<td>32.500,00 €</td>
<td>1%</td>
</tr>
<tr>
<td>#5 Energy and Environmental education and monitoring</td>
<td>1.17.4, 1.25 and 12.4</td>
<td>80.580,00 €</td>
<td>2%</td>
</tr>
<tr>
<td>#6 Participation and Media</td>
<td>1.16, 1.17.1, 1.17.2, 1.17.3, 1.17.4, 1.17.5, 1.17.6, 1.28.1 and 1.28.2</td>
<td>71.725,50 €</td>
<td>2%</td>
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<tr>
<td>#7 Recreational and Sporting Activities</td>
<td>1.17.2, 1.17.3, 1.26, 1.27.1, 1.27.2, 1.28.1 and 1.28.2</td>
<td>87.000,00 €</td>
<td>2%</td>
</tr>
<tr>
<td>#8 ‘Alvenaria’ renewal: urban and architectural projects</td>
<td>1.4.1, 1.4.2, 1.4.3, 1.4.4, 1.4.5 and 1.4.6</td>
<td>226.350,00 €</td>
<td>5%</td>
</tr>
<tr>
<td>#9 Project coordination, management and monitoring</td>
<td>12.5 and 12.6</td>
<td>162.000,00 €</td>
<td>4%</td>
</tr>
</tbody>
</table>

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.
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 efficiency 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.
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)

International certification and opportunities for technological exportation

Todo o processo de contratação e seleção 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 selecionada foi entretanto homologada pelo LNEC (DH 931) em Setembro de 2013 e pela ETA (ETA 14/0200) em Julho de 2014.
#2
New Community Equipment:

- Eco-center (completed)
- BMX Track and Bike path (completed)
- Market support Infrastructure (completed)
- Urban Agricultural Plots (completed)
- Public areas and green spaces (completed)
- Public Lighting (completed)
- Municipal and local club Sport facilities renewal (completed)
- ‘Pedibus’ on-foot assisted circuit with safe stops at school, kindergarten, sports facilities and others. (procedure underway)
BMX track and Cycle path

Market support Infrastructure
Urban Agricultural Plots

Public lighting in the ‘Jardins de Pedra’ (installation of 56 efficient lamps)
‘Pedibus’ assisted pedestrian circuit in the District
#3
Renewable Energy Facilities:

- Solar-thermal water heating for the swimming-pool and sports pavilion (completed)
- Photovoltaic energy production for the Eco-Centre (completed)
- Experimental / pedagogical Eolic Turbines Park (completed)
### Photovoltaic energy production for the Eco-Centre

- Self-built wind turbine during local workshop
- Horizontal axis turbine
- Vertical axis turbine
- Vertical axis turbine

### Experimental Eolic Turbines Park

- Turbine location
- Self-built wind turbine during local workshop
- Vertical axis turbine
- Horizontal axis turbine
- Vertical axis turbine
#4

‘Net Verde’ free urban WiFi:

- Free wireless Internet access in the District (completed)

‘Net Verde’ (Green internet) - Free wireless Internet in the district

Users
Boavista district municipal tenants, homeowners and school students.

How it works
All municipal tenants receive the network access login and monthly password with their rent receipt. Access will be given according to existing rent payment. On request, an annual specific login and password is given to homeowners and school students.

Potential
Permanent community survey tool for local management decision making.
#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

ECO-Caderneta
ECO-Bairro Boavista Ambiente +
‘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€).

- Monthly family consumption report and counselling.
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 ILIBOAL8 weather station, located in the IST - Instituto Superior Técnico.

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#6 Participation and Media:

- Specific Website and social networks.
- 3 specific district “Newsletters”.
- Workshops with the population.
- Eco-Boavista publication / Project final report.
- Project public exhibition
Participation and Media:

- Eco-District website and social networking.
- 3 Newsletters
- Workshops with the population.

Boavista Eco-District Environment+ website
Sport activities:

- Sports training and tournaments.
- Art and circus workshops.
- Summer camps program for all ages.
- BMX track construction and provision of equipment and monitoring.
- Improvement of School sports infrastructures in the District.

‘Chapitô’, working with kids in the streets in Boavista district.
DIVIRTA-SE E FIQUE EM FORMA

A nova dança fitness que vai conquistar o mundo! No Zumba Fitness, a dança é divertida e eficaz. Aproveite o ritmo e a energia para queimar calorias, aumentar a resistência e melhorar a saúde.

QUARTAS-FEIRAS, 18h
Salão Boavista

DANÇAS DE SALÃO

Dança é uma forma de expressão artística e esportiva. Na Danças de Salão, aproveite o momento para se divertir e se expressar através da dança.

QUARTAS-FEIRAS, 18h
Salão Boavista

PEDDY PAPERS

Um projeto criativo que melhora a comunidade. As Peddy Papers são dialetos de cartas que dialogam com o ambiente e a comunidade. Veja como participar.

22 DE JANEIRO:
MUSICA BÚFALO

22 DE FEVEREIRO:
MUSICA BÚFALO

22 DE MARÇO:
MUSICA BÚFALO

22 DE ABRIL:
MUSICA BÚFALO

Peddy-Paper
Traditional games

Visit to the Oceanarium – 181 students from Boavista primary school
#8

‘Alvenaria’ renewal:

Urban and architectural projects, all completed:

- Participatory definition of objectives, timing, Urban Operation and Resettlement Process phasing.
- Municipal Urban Plan for ‘Alvenaria area’.
- Detailed building Project for the phase 0 of relocation – adaptation and updating of the existing project “EPUL JOVEM”.
- 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 more recent buildings, ‘Alvenaria’ and Monsanto
Current Situation

Alvenaria, the architectural competition – video by Rui Franco
### The ‘Alvenaria’ architectural solution

#### Goals:

1. **Substitution of 510** 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 beginning of urban phased substitution in **2014**;
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) housing quality and comfort,
   c) communal parts management,
   d) accessibility for elderly and disabled,
   e) neighbourly relations,
   f) social and cultural integration,
   g) house adaptability to family natural growth.
### The ‘Alvenaria’ architectural solution

**Adopted methodology:**

- Open public competition.

- The **jury was composed of representatives** of the **Municipality**, Order of **Architects**, **GEBALIS** (Municipal Social Housing Management Enterprise) and **Residents** Association.

- In appraisal of proposals, members of the Jury will take into account the views transmitted by members of the advisory board within their respective areas of expertise: Order of Architects, **FA-UTL** (Lisbon Faculty of Architecture), **GEBALIS**, **Lisboa E-Nova** (Municipal Energy and Environment Agency), **APISOLAR** (Solar Energy Industry Portuguese Association) and **EPAL** (Public Water Company).

### The ‘Alvenaria’ architectural solution

**Competition objectives:**

- The public competition aims to **select the most appropriate solution** for new buildings to be constructed in the so-called ‘alvenaria’ in the Boavista district.

- Those who may compete are **Architects** - individually or in association - or Architecture Offices who meet the requirements specified in the Competition Programme.

- The jury will award a **prize of 5,000 € for each of the 5 best** classified.

- The **successful proponent will be awarded the development of all projects** required for the construction of the new buildings in accordance with the allotment project.

- The whole project development contract for the standard building will be made for the fixed amount of **75,000 €** and **500 €** for the technical assistance on the project adaptation for each of up to **46 buildings** to be built.
The Alvenaria Renewal provisional budget:

### Total future investment of 41,5M€:

<table>
<thead>
<tr>
<th>Planned works phasing</th>
<th>house units</th>
<th>m2</th>
<th>Estimated budget (VAT incl.)</th>
<th>reference</th>
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</thead>
<tbody>
<tr>
<td><strong>Phase 0</strong></td>
<td></td>
<td></td>
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<tr>
<td>Transfer process costs of the 442 resident families</td>
<td>-</td>
<td>-</td>
<td>€ 130,000,00</td>
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<tr>
<td>Rehabilitation of 114 empty house units for families transfer</td>
<td>114</td>
<td>-</td>
<td>€ 2,280,000,00</td>
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<tr>
<td>Urban infrastructures projects for phases 1, 2 and 3</td>
<td>-</td>
<td>-</td>
<td>€ 100,000,00</td>
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<tr>
<td>Demolitions and urban infrastructures for phase 0</td>
<td>-</td>
<td>-</td>
<td>€ 432,444,87</td>
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<tr>
<td>Social housing construction (ARIPA)</td>
<td>158</td>
<td>13,239</td>
<td>€ 8,488,807,13</td>
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<tr>
<td><strong>1st Phase - Alvenarias (North)</strong></td>
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<td></td>
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<tr>
<td>Urban Infrastructure and demolitions (160 house units / 141 families)</td>
<td>-</td>
<td>-</td>
<td>€ 1,356,246,118</td>
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<tr>
<td>Social housing construction of 12 building modules (ORANGE)</td>
<td>120</td>
<td>10,380</td>
<td>€ 6,781,240,79</td>
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<tr>
<td>Affordable housing private construction of 4 building modules (ORANGE)</td>
<td>40</td>
<td>3,460</td>
<td>€ 2,260,415,23</td>
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<tr>
<td><strong>2nd Phase - Alvenarias (Center)</strong></td>
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<tr>
<td>Urban Infrastructure and demolitions (210 house units / 182 families)</td>
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<td>-</td>
<td>€ 1,525,780,28</td>
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<td>Social housing construction of 10 building modules (ORANGE)</td>
<td>100</td>
<td>6,650</td>
<td>€ 5,651,038,58</td>
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<td>Affordable housing private construction of 6 building modules (ORANGE)</td>
<td>80</td>
<td>6,920</td>
<td>€ 4,520,830,90</td>
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<td><strong>3rd Phase - Alvenarias (South)</strong></td>
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<tr>
<td>Urban Infrastructure and demolitions (140 house units / 119 families)</td>
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<td>-</td>
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<td>Social housing construction of 7 building modules (ORANGE)</td>
<td>70</td>
<td>7,785</td>
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<td>5,555</td>
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<tr>
<td><strong>Totals</strong></td>
<td>732</td>
<td>53,039</td>
<td>€ 41,455,333,76</td>
<td></td>
</tr>
</tbody>
</table>
The ‘Alvenaria’ architectural solution

Main project features:

− The proposed projects should provide for the construction of a controlled costs housing building (aprox. 513€/m²) containing 10 flats with a total Gross Construction Area between 731 and 859 m² - 3 T1 (52 and 65 m²), 4 T2 (72 and 85 m²), 3 T3 (91 and 105 m²) e 1 T4 (105 and 114 m²).

− The building should sit within the lot limits defined in the allotment project, display up to 4 floors, in order to make the existence of lifts unnecessary, and should be attachable on both sides in a sequence of equal buildings if another solution is not shown to be more advantageous.

− Within the area of the lot there must be provided 1 car parking space per T1 and T2 flats and 2 spaces per T3 and T4. Garages will not be accepted.

The ‘Alvenaria’ architectural solution

Main project features:

− Within the limits of the lot still provided for each flat, there must be included the existence of a plot of arable land together with adequate space for storage, preferably in the space adjacent to each flat.

− The building should include a technical room for, in particular, the installation of a solar water heating collective solution, with easy and direct access to the public road. A storage solution for separate Municipal Solid Waste containers should also be provided, made comfortable for residents and functional to municipal services.

− The T1 and T2 flats should be equipped with universal accessibility and have direct and horizontal access to the street. The remaining flats should also have direct and exclusive access to the street, in order to make the existence of shared areas of circulation unnecessary.
The ‘Alvenaria’ architectural solution

Main project features:

- The design of the building should be able to support the typological evolution of the flats, in order to accommodate natural growth of the family, within the original implantation area, without prejudice to the other requirements of the programme and to provide for their architectural integration.

- The buildings should present common areas maintenance costs as low as possible and renovation ease of the flats’ interiors. Industrialized and modular solutions shall be privileged in order to enable easy renovation of floors, kitchens and toilet facilities as well as the flat’s adaptation to use by the elderly or disabled.

- The lead architect undertakes to present constructive solutions with a maximum cost consistent with the values set for controlled housing costs of less than 513.60€/m² (2nd trimester 2013).

Architectural project for ‘Alvenaria’ – Boavista district in Lisbon

- Building:
  - 4 floors maximum
  - 10 homes
  - Gross building area – 731 to 859 m²
  - 3 - 1 Bedroom – 52 to 65 m²
  - 4 - 2 Bedroom – 72 to 85 m²
  - 2 - 3 Bedroom – 91 to 105 m²
  - 1 - 4 Bedroom – 105 to 114 m²

- Parking
- Automobile circulation
- Pedestrian circulation
- Cultivable Plots
The ‘Alvenaria’ architectural solution competition

4 selection criteria:

1 - Social criteria:
   a. Ability to integrate the inhabitants’ expectations regarding the solution within the participatory methodology presented (0 to 10 points);
   b. Accessibility of the building and flats, especially for the elderly and disabled (0 to 10);
   c. Sizing and suitability of the cultivable plot solution presented (0 to 10);
   d. Feasibility of the typological evolution solutions for the flats presented (0 to 10).

2 - Energy / Environmental criteria:
   a. Solution and construction technologies sustainability, according to their environmental impact (0 to 10);
   b. Energy efficiency of the building and flats (0 to 10);
   c. Usage of rain-water and re-usage of grey-water systems adequacy (0 to 10);
   d. Sizing and suitability of the proposed collective solar water heating system (0 to 10).

3 - Economic criteria:
   a. Tectonic and architectural rationality of the solution presented (0 to 10);
   b. Guarantee of the construction cost estimate within the maximum value admitted (0 to 10);
   c. Communal parts (roofing, exterior walls, etc) maintenance costs according to construction systems adopted (0 to 10);
   d. Flats’ interior renovation costs according to construction systems selected for flooring, kitchens and WCs (0 to 10).

4 - Architectural criteria:
   a. Architectural quality of the solution presented (0 to 10);
   b. Project adequacy to topography, phasing and other urban allotment characteristics (0 to 10 points);
   c. Bioclimatic solutions integration for ventilation and passive climatisation (0 to 10);
   d. Innovative character of the solutions presented (0 to 10).
The final ‘Alvenaria’
Architectural Project

By: Architects Alexandre Dias, Bruno Silvestre, and Luís Spranger
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.

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 strategy promotes usability whilst contributing to urban and social sustainability.

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.
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

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
Construction detail

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

The final ‘Alvenaria’ architectural project
Reabilitação Urbana “Alvenarias” da Boavista – 1ª Fase Construção:

Critérios de selecção para adjudicação da empreitada:
40% - Preço (até 20% abaixo de 4.113.241€)
25% - Demonstração do cumprimento do prazo de construção (16 meses)
35% - Performance adicional (acima das exigências do projecto): ETICS, caixilharias, impermeabilização, divisórias interiores, etc

Proposta vencedora:

The Alvenaria Renewal – 1st phase Construction:

Building construction cost per Module:

<table>
<thead>
<tr>
<th>Module and House Units area and cost</th>
<th>m²</th>
<th>Area (m²)</th>
<th>%</th>
<th>construction cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>House Units with 1+1 Bedrooms</td>
<td>3</td>
<td>65</td>
<td>23,6%</td>
<td>39 741 €</td>
</tr>
<tr>
<td>House Units with 2+1 Bedrooms</td>
<td>4</td>
<td>75</td>
<td>36,5%</td>
<td>46 087 €</td>
</tr>
<tr>
<td>House Units with 3+1 Bedrooms</td>
<td>2</td>
<td>102</td>
<td>24,8%</td>
<td>62 467 €</td>
</tr>
<tr>
<td>House Units with 4+1 Bedrooms</td>
<td>1</td>
<td>121</td>
<td>14,6%</td>
<td>73 836 €</td>
</tr>
<tr>
<td>TOTAL</td>
<td>10</td>
<td>824</td>
<td>504 735 €</td>
<td></td>
</tr>
</tbody>
</table>

Average Cost / House Unit: 50 473 €
Projecto Urbano (Infra-estruturas e Espaço Público) – 1ª Fase

1 - Via de atravessamento
2 - Vias reservadas a moradores
3 - Parque Urbano
4 - Comércio
5 - Habitação (5 módulos)

Sistema RSU - Ilhas inteligentes:
- Enquadramento urbano nas vias de atravessamento;
- Contentores enterrados;
- Acesso com chave electrónica para contagem por utilizador;
- Informação online de contagem (débito/crédito) aos utilizadores;
- Informação à Central para optimização de frota/recolha.
Lessons learned from the Eco-District

European 2020 strategy and finance opportunities alignment testing for future Sustainable Renewal of Buildings and Local Based Development Plans.

1. Local community participation methodology;
2. Effective satisfaction monitoring tools;
3. Innovative and sustainable social housing construction model for the 1,000 families of the ‘Alvenarias’ in Boavista and Padre Cruz districts;
4. Powerful innovative house renewal technologies and strategies to reduce energy consumptions to be replicated, escalated and exported:
   a) Competitive cork based ecological national ETICS technology;
   b) Competitive and efficient national window with ventilation technology;
   c) Innovative and more efficient domestic and public solar water heating technologies;
   d) Innovative ‘Eco-Booklet & Coopetition’ household consumption reduction program.
#9
Project Coordination and management

Project Coordinator
Rui Franco, Architect

Project Manager
Carla Cupido, Engineer

Project Manager
Hugo Farizo, Manager

Urban Project
Eduardo Cabido, Architect

Project Assistant
Amália Luz, Administrator

BOAVISTA
ECO-DISTRICT
Project presentation – November 2016

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