

## Urban regeneration of the Vila d'Este neighbourhood

GaiaSocial, Portugal

### Procurement objectives

The revitalization of the Vila D'Este neighbourhood follows the commitment made by Vila Nova de Gaia over the past few years to revitalize peripheral areas of the municipality. The main objectives of the energy rehabilitation of this social housing complex were to eliminate any existing construction issues (e.g. weather damage, leaks, etc.), to meet current energy requirements, improve indoor air quality, and architecturally rehabilitate the neighbourhood.

The project began in October 2009, and was divided into two phases. Following the launch of the tender in July 2008 by GaiaSocial (Municipal Housing Agency), phase 1 was completed in 2011, and phase 2 started in the beginning of the year 2012 and will be completed in 2015.

### Background

Vila D'Este is a densely populated neighbourhood, with approximately 17,000 inhabitants. It is located in the parish of Vila de Andorinho, which lies within the municipality of Vila Nova de Gaia, Portugal. The initial construction in Vila D'Este occurred between 1976 and 1982, in order to meet the huge demand for affordable housing in this part of the Greater Porto area. Currently, the area comprises a total of 109 buildings distributed over 18 blocks, with 2,085 dwellings and 76 commercial spaces.

The urban regeneration of Villa d'Este is an example of the sustainable development measures implemented by the Municipality of Gaia over the last decade, among which social policies directly linked to urban regeneration are also worth mentioning.



### Criteria used

For the rehabilitation of Vila D'Este, Energaia (the Energy Agency of the Gaia municipality) developed an energy analysis of the recommended energy improvement measures, based on RCCTE (Thermal Performance Building Code). The RCCTE establishes the quality requirements for new builds and large construction projects, particularly in terms of limiting thermal losses and controlling excessive heating. The RCCTE also allows for the evaluation of a building's energy performance.

#### Tender specifications

##### Roof

- Installation of metallic coating type "Roofzip" to improve building insulation.
- Installation of 8cm thick rockwool insulation and windshield vapour barrier, heat transfer coefficients of  $0.39 \text{ W/m}_2 \text{ K}$  and  $0.38 \text{ W/m}_2 \text{ K}$ , for upward and downward flow, respectively;
- Application of wind driven fans on top of the ventilation conducts of sanitary facilities which balance the internal temperature and humidity without using electricity.

##### Exterior Walls

- Application of thermal insulation in exterior walls with expanded extruded polystyrene (ETICS), 5cm thick, heat transfer coefficients of  $0.59 \text{ W/m}_2 \text{ K}$ ;
- Installation of shading elements in window areas.

#### Award criteria

*Most economically advantageous offer based on:*

Price: 40%

Technical quality: 60%

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### Results

During the first phase of the project, 766 residences and 31 commercial spaces were rehabilitated, covering a total of 109 buildings. The second phase of the project is underway, which will allow the regeneration of 1319 residences and 45 commercial spaces.

Following the improvements, namely the introduction of thermal insulation, improved glazing and installation of shading, the estimated annual energy savings expected from the overall measures are 10.3 GWh/year. The project has the potential to generate economic savings of approximately € 1.3 million/year. In environmental terms, the revitalization will allow a potential annual saving of 4,800 tons of CO<sub>2</sub> emissions.

**Potential energy savings (%)**

Insulation (façade and roof)	43%
Glazing	3%
Shading	3%

The recommended improvement measures will not only allow a reduction in the energy consumption of the neighbourhood of Vila D'Este, but they will also improve thermal comfort and reduce existing problems in terms of condensation.

### Environmental impacts

Buildings account for a large percentage of energy consumption and CO<sub>2</sub> emissions – and construction works are also a major source of waste to landfill and other environmental impacts. Public procurers are increasingly becoming aware of the need to address these impacts, not only in the tender process, but in the pre-procurement planning stage and throughout the occupational phase. The use of environmental assessment tools is one approach to set targets and monitor a building's overall environmental performance. In addition, site selection, materials specification, waste management and overall resource efficiency should be taken into account in the procurement process and incorporated into the signed contract.

### Lessons learned

For a project of this calibre, there are engineering challenges which require adjustments to fit the realities of the construction project. Although the buildings were seemingly identical, they were originally erected by different companies and during different times. This made it challenging to complete the project on time and in the most economical way possible.