



Engineering Structures for Life



BUILDINGS - EDUCATION

## Expansion of Vermis School

### ABOUT

GEG, in collaboration with the architectural office AND+RE, won the competition to design the expansion and renovation of Vermis School, an Elementary and Kindergarten School in Guimarães.

GEG developed the preliminary and detailed design of all the engineering disciplines.

The structure proposed is based on the division of the school into 3 buildings with independent structural behaviour, to limit the deferred effects of concrete and the effects of thermal changes on the structure, as well as to allow the desired constructive phasing (enabling the construction of the new buildings while the current school remains in operation).

The structural scheme adopted was based on a solution of portal frame structure in reinforced concrete.

Environmental and energy sustainability do not depend entirely on one discipline. For this building to be efficient, several efforts must occur concurrently to achieve the same goal. Specific measures have been taken in all disciplines to meet the following goals:

- incorporation in the construction of materials of provenance near the construction site and maximum use of recycled materials;
- thermal insulation characteristics of the building in such a way as to limit energy losses during the winter and gains during the summer, thus limiting the energy consumption to guarantee the thermal comfort of the occupants;
- energy production for the various uses of the efficient building and incorporating a high percentage of energy from renewable

### FACTS

**Year:** 2018

**Client:** Guimarães Municipality

**Services:** Detailed design, Foundations design, Structural Engineering, Consulting and on-site technical support, Architecture, Water network, Wastewater network, Drainage design, Mechanical, Electrical and Plumbing design, Lighting design, Acoustics, noise & vibration design, Telecommunications & Security

### TEAM

### LOCATION

Guimarães, Portugal

sources.

The proposed volume respects the existing context, while at the same time creates bases for consolidating the urban fabric. The relation with the "Centennial Plan" building assumes a high importance role in the design of this implantation using alignments both in plan and volumetry. The proposal presupposes four distinct volumes, which, although intrinsically linked together, are interpreted visually as separate objects. These volumes, which organize and hierarchize the interior program, are interconnected at the ground floor level through an interstitial mass that unites them.

The implantation and orientation of the building, as well as the internal distribution of the program, is naturally related to the solar orientation, in order to relate the spaces more favourably to the individual needs of natural light and sun exposure.

The (de)composition in volumetric elements also provides a coherent organization of the accesses to the infrastructure, as well as collaborate in a positive organization of the exterior spaces. Through this volumetry it is possible, on the one hand, to mark, clarify and control the arrival of the building, but also to allow internal distribution from a centralized nuclear access.

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