

Extension of the «Haute école Charlemagne» in Liège

Rue des Rivageois, Liège (BE)



Complete stability, building engineering services, sustainable development and EPB-responsible mission

Owner
Haute-école Charlemagne

Architects
TC Baumans Deffet/Bogdan &
Van Broeck

Cost of the works
€ 12 M excl. vat of which
€ 2.6 M for the structure and
€ 2.3 M for the building engineering services

Studies
2021 - 2023

Execution
2024 - ...



Demolition and reconstruction of a building approximately 100m long and 12m wide on the site of the «Haute Ecole Charlemagne».

The new building comprises 5 levels, excluding the car park, and is intended to house a set of premises, work rooms, classrooms of various capacities, a study room, a cafeteria, multi-purpose rooms and the premises associated with these functions.

The floor elements are mainly made up of prestressed hourdis. This composition allows the acoustic requirements to be met. The spans are medium and therefore economical in terms of material, and these are repeated systematically.

The direction of the span of the hourdis has been chosen to:

- minimise conflicts between structural elements and technical ducts,
- maximising the use of elevated facade beams.

The beams on either side of the corridors have large spans of up to 10 metres. Therefore, the use of pre-stressed concrete beams appears to be the most appropriate solution.

This design allows for significant adaptation during the life of the building without the need for major structural changes.

Horizontal stability is provided by the vertical circulation core and the load-bearing walls. The diaphragm effect of the floors is achieved via the compression layer of the hourdis.

Heating is provided by two gas-fired condensing boilers (2x160 kW), using low temperature water.

The classrooms will be equipped with reversible radiant tiles (hot/cold), the other premises are treated by air or by radiators or ventilo-convectors (to ensure comfort and limit the overheating of the premises on the southern façades and the premises with a high density of people).

The building is equipped with 3 air handling units, combined supply/extraction, themselves equipped with an efficient energy recovery unit ($\eta \geq 75\%$). These units ensure hygienic ventilation and cooling of the premises in summer. Cold production is provided by a refrigeration unit (± 150 kW) of energy class A. It mainly supplies the cold batteries of the air handling units, the ventilo-convectors and the radiant floors.

The relatively low domestic hot water requirements are provided by electric boilers. This solution avoids the need for a DHW distribution loop, and therefore minimises line losses. A rainwater recovery system is used for the sanitary facilities. A fire protection system with axial feed reels completes the system.

The electricity supply is provided by a new high-voltage cabin with a capacity of 400 kVA.

The electrical installations include sockets, functional lighting, 100% LED managed by presence/absence detection in order to optimise energy consumption, control devices, autonomous emergency lighting, strong and weak current networks, a generalized fire detection and an intrusion detection on the ground floor.

A CAT 6A structured cabling installation is complemented by full wifi coverage of the building. The auditoriums are equipped with full audio-visual systems.

Addressable fire detection includes a central detection unit, several repeaters, automatic detectors, alarm buttons and sirens.