CHR Citadelle: refurbishment of the facades, technical networks and equipment for four new care units

Boulevard du Douzième de Ligne, Liège (BE)

Complete mission covering building engineering services, stability, energy design, circularity, EPB responsible and commissioning

Owner
CHR de la Citadelle

Architects
Assar & BAHG

Cost of the works
€ 92,2 M excl. vat of wich
€ 5,4 M for the structure
and € 37 M for the building engineering services

Studies
2025 - 2026

Execution
2026 - 2028

ST RV TS EN

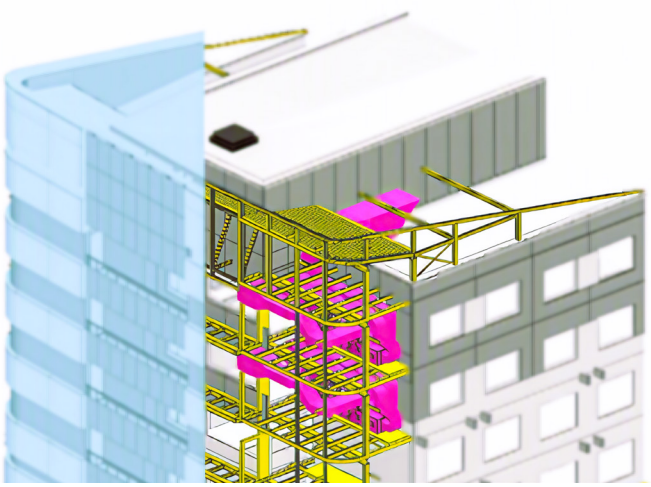
Before and after: facade renovation

An iconic building dominating the Liège skyline, the Citadelle hospital (900 beds, 130,417 m² of heated floor area, 36 GWh/year of gas and 10 GWh/year of electricity) is undergoing an ambitious refurbishment project. This large-scale project aims to enhance the institution's energy robustness while ensuring the continuity of its hospital services.

Organised into four phases, the renovation centers on major technical challenges:

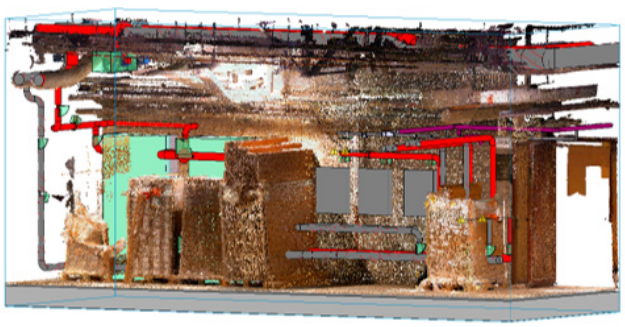
- the first phase involves the **complete renovation of the facade**s: replacement of window frames, improvement of thermal insulation and installation of a new external cladding system with 1,250 kWp of photovoltaic solar panels. This delicate work is accompanied by an in-depth stability study of the existing architectural elements, in particular the concrete structures used as sunshades, and the integration of two extensions;
- at the same time, the project involves **the construction of four new care units with a total of 142 beds**: 66 in paediatrics, 32 mothers and 44 babies in the neonatal unit, providing flexible hospital spaces adapted to the changing needs of the facility;
- as the hospital's technical installations are ageing and very energy-intensive, the CHR wishes to **refurbish the primary networks**: power supply and emergency power, heating, cooling, various water, and medical fluid systems. An initial planning phase enabled the prioritisation of interventions based on their technical, financial, and environmental urgencies. Fluid primary networks will be transformed into meshed networks. This innovative configuration ensures greater resilience of the facilities: in the event of maintenance or repairs, only limited sections will be affected;
- right from the start of the project – and therefore before work began – a real-time **commissioning system** was put in place to provide precise monitoring of the heating, cogeneration, cooling, ventilation, and domestic hot water systems. This tool enables the continuous optimisation of energy performance and the generation of energy savings, whilst providing useful information for the planning of further works.

One of the project's major challenges lies in organising the construction site: the hospital must continue to operate without interruption. To this end, the existing networks will remain operational whilst the new networks are being installed in **technical modules fitted within the thickness of the facades to be renovated**. Once these are up and running, the switchover to the new facilities will be carried out safely, thereby minimising the impact on hospital activities.



New technical modules installed within the thickness of the new facade

A 3D BIM model of the facades, service ducts, technical rooms, and existing structural elements was created using laser scans carried out by drone, which were then converted into point clouds. The planning permission has now been granted, most of the tender documents have been put out to tender, and work is about to begin.



Location of the new domestic hot water production system in the point cloud