

Terrassa

Terrassa hospital is a building used for in-hospital use and care predicted in 1989. It is located north-west of Barcelona, close to Sabadell. Following his inauguration, several reforms have been made in the building to expand the services the centre provides. The building is divided into 13 floors, one underground. Plants -1, 0, 1, 2 and 3 are distributed between the two volumes of the building, while the rest of floors refer only to the central body.



Figure 1



Figure 2

The main objectives of the Terrassa Demo site when we talk about environment is to reduce energy consumption without losing comfort for users of the different centres. The project aims to retrofit a hospital district with efficient strategies, which are identified as not energy efficient. Passive design strategies, heating & cooling sources and integration of renewables for building envelope is examined.

Current Status

The Terrassa hospital Demo site has been analysed and evaluated with the appropriate technologies selected to be implemented at the weak areas.

After the analysis of the Demo site, one of the main issues discovered was the building envelope not being very efficient. Therefore, the Terrassa site decided to apply a technology to insulate the external wall.

The 7th, 8th and 9th floor were selected as the ideal areas for the technologies with the west wing of the 7th floor implementing Aerogel based insulating mortar (as can be seen in figure 3).



Terrassa - West Wing 7th Floor

- Application of Onexit Technology
- Areas Affected by Retrofitting

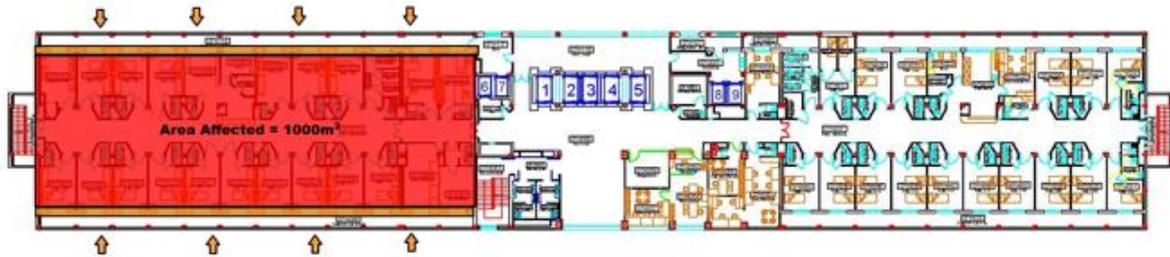


Figure 3

The east wing of the 8th floor was used to replace the low efficient windows to high efficient windows. The affected area of the retrofit can be seen in figure 4.

Terrassa - East Wing 8th Floor

- Application of High Efficiency Windows
- Areas Affected by Retrofitting

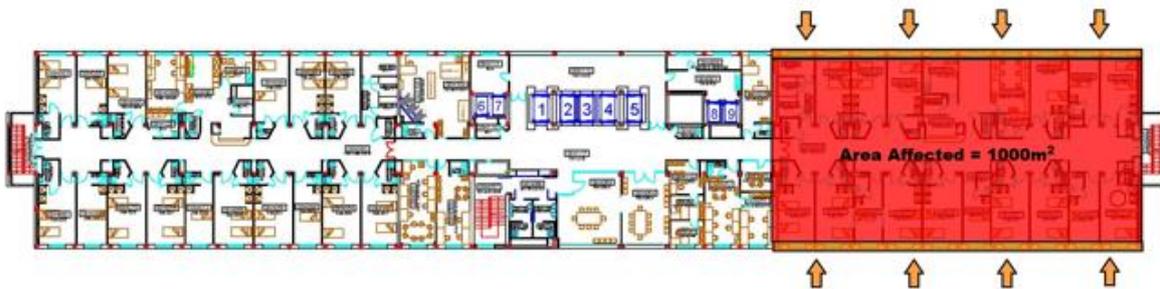


Figure 4

Similarly to the east wing of the 8th floor, the east wing of the 9th floor will also replace the windows with high efficiency windows. Additionally, two rooms will be selected to apply prototype versions of Electrochromic windows (see figure 5).

Terrassa - East Wing 9th Floor



Figure 5

All the floors mentioned will be occupied by patients, therefore it is essential the comfort levels are at a high standard. Implementing these technologies will affect 1000m² on each floor and will ensure the comfort levels remain at a high standard at same time reducing energy consumption.

Furthermore, the Demo site will be installing Solar Thermal Collectors north of the site to supply domestic hot water to the site (red area in figure 6).

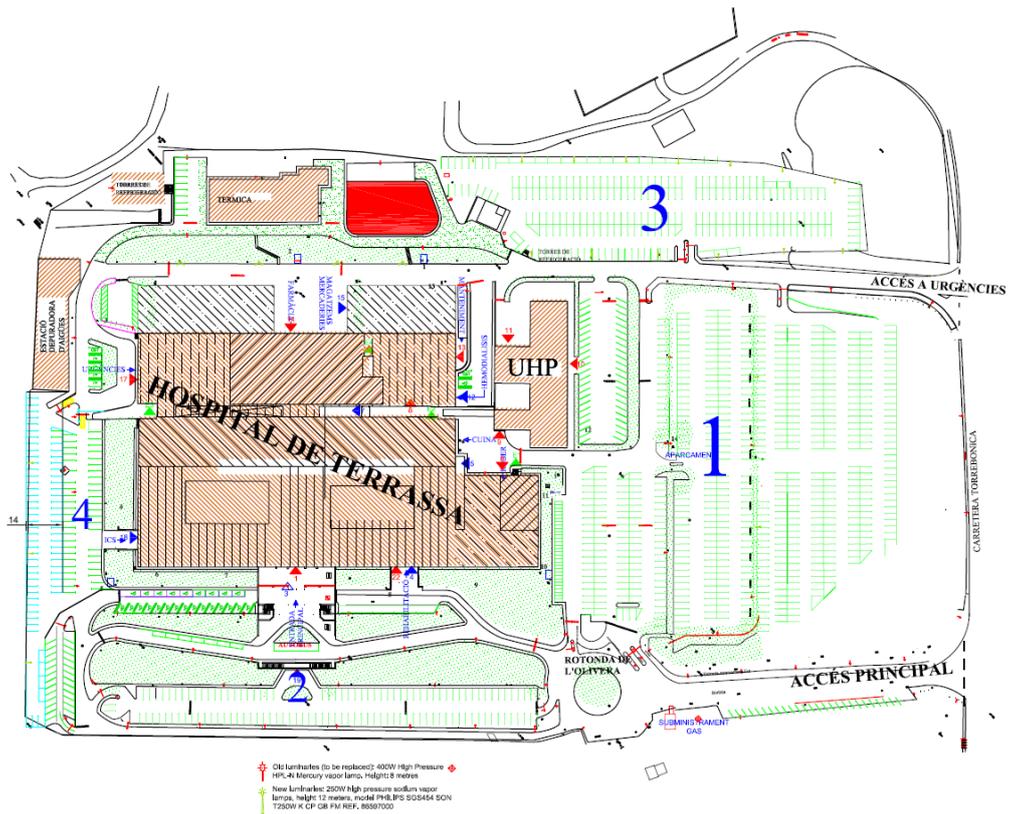


Figure 6

Another retrofit technology selected is LED lighting. LED lighting is more efficient than normal lighting and will enable the demo site to save on energy consumption as well as providing the correct lighting for comfort levels. The area selected for the retrofit is the whole site, which the area affected is potentially 80,000m² (see figure 7).

Demo-site Technology (m2)	Terrassa, Barcelona
Super-insulating Mortar	1,000
Vacuum Insulated Panels	x
Solar PV	x
Seasonal Thermal Energy Storage (Water and PCM)	x
EC Windows	2 Rooms
Ventilated Façade	x
LED Lighting	80,000
High Efficiency Windows	2,000
BIPV	x
Solar Thermal Collectors - UPC	x
Solar Thermal Collectors	55,000
Total Area of Site Affected	80,000