Partner of Stora Enso

Trent View College Scunthorpe, UK

Celebrated as a low-carbon success, Trent View College in Scunthorpe is a Special Educational Needs SEN school that has been designed to Passivhaus standards and utilises the benefits of a hybrid engineered timber and steel structure to provide life-changing opportunities for students in an ultra-modern, purpose-designed facility.

Trent View College is a single storey building with level access throughout and is zoned into two distinct areas: the main block of admin/entrance with large shared spaces and a teaching wing with associated support spaces.

This co-educational school is designed for 60 post-16 pupils with special educational beeds, including profound and multiple learning difficulties (PMLD), severe learning difficulties (SLD), speech-language and cognition needs (SLCN) and autistic spectrum disorder (ASD).

The college offers a diverse range of facilities, including a hydrotherapy pool, a design technology workshop, and a playing field, all of which are available for use by the local community outside of school hours.

Accessibility

Located to the southwest of Scunthorpe town centre with residential areas to the east, south and west, the site has significant level changes in two directions. These level changes were carefully considered throughout the design process to optimise access for wheelchair users.

Collaborative design for an inclusive learning environment

Emphasizing the collaborative design for an inclusive learning environment, the design proposals were developed in close association with the Trust and the UK's Department for Education (DfE) team through a series of weekly design-focused workshops.

This open approach to developing the detailed layouts proved vital and resulted in design proposals that fully met the school's specific requirements whilst also achieving compliance with the DfE Output Specification and Technical Annexes.

Architectural challenges

The project presented several challenges. The constraints of the selected site dictated the position of the building and its shape, resulting in a form factor of 2.76, which is less than ideal as the starting point for applying the Passivhaus standard.

Getting the orientation of a building right is a key step to working towards Passivhaus standards to ensure that the natural, 'passive' resources are optimised. Again, the orientation was restricted due to the site, but the team incorporated main glazed elevations to the West and East to optimise performance.

As a result of less-than-ideal form factor and orientation, the team had to compensate in other areas, including increased building fabric performance with u-values of 0.06-0.16W/m2K (floor), 0.11-0.16W/m2K (wall) and 0.1W/m2K (Roof).

Thermal airtightness

Some of the brief requirements for the college also added complexity to the design reaching Passivhaus standards. The Design Technology workshop brief required that a vehicle could be brought into the workshop. The challenge with this was in finding a door product on the market that was fit for purpose, as traditional roller shutters don't provide the thermal or airtightness properties required to meet the Passivhaus standard. An approach similar to car showrooms was therefore selected; by using a bi-folding door and recessing the threshold for protection, the architects were able to use a suitable product to maintain the integrity of the thermal envelope.

Heat distribution

Another challenge was the inclusion of a hydrotherapy pool. Due to the heightened temperature of the pool, this not only affects the internal temperature of that room, but also risks heat distribution to adjoining rooms. The team, therefore, had to include internal thermal lines to minimize the effect of the pool on the rest of the build.

Specifications and building solutions

As one of the UK's leading mass timber and steel specialists, our partners B&K Structures were selected to design and deliver the main structure and envelope of the single-storey building, utilising cross-laminated timber (CLT).

Sylva™ CLT Roofs and Walls have a high load-carrying capacity, excellent airtightness and carbon storage for the building's service life, making them a great fit for this project.

The superstructure and roof were also constructed with Sylva CLT Roof elements, which were specified in part to achieve strict air-tightness criteria, a high-performance thermal envelope, and a streamlined construction programme.

The elements were manufactured off-site in a quality-controlled environment and delivered to the site ready to install. This too helped lower emissions as the emissions to manufacture the CLT was very low -30 tonnes CO_2e and transporting emitted 28 tonnes CO_2e.

Digital tools

Overall, from design through to manufacturing, transportation and onsite installation, the project team used the latest digital tools collaboratively to ensure the project's efficient and accurate construction.

Early design collaboration between B&K Structures, HLM Architects, Engenuiti and the supply chain partners - including full 3D modelling - resulted in a seamless delivery for the client.

Sustainability

Stora Enso's wood products carbon footprints are some of the lowest on the market, so their CLT was a significant factor in designing the college to Passivhaus standards for energy performance, which sets very tight limits on air permeability as well as insulation.

HLM Architects said: "The Passivhaus design focuses on energy efficiency, thermal comfort and air quality to minimise heat losses from the building and to reuse heat from solar and internal heat gains to reduce the environmental impact of the building."

Sustainability achievements

Carbon footprint of the CLT

Manufacturing 30 tonnes CO2e

Transporting 24 tonnes CO2e

436 tonnes CO2 Carbon dioxide removed from the air and stored in your building

654 tonnes CO_2e emissions avoided by using wood instead of non-renewable construction materials

Heating Demand - 15 kWh/m2K

Heating Load - 10.3 W/m2

Airtightness Target - 0.6 PER - 65 kWh/m2/yr

Learn more about

Advantages of building with mass timber

Adapted from text provided by B&K Structures and HLM Architects

Education Project of the Year Structural Timber Award shortlisted

Low Energy Project of the Year Structural Timber Award Shortlisted

Photo credit: HLM Architects/©David Barbour

General

Delivery year

2022

Building type

Education

Area (m²)

3,000

Storeys

1

Products

Products and Services

Sylva™ CLT Floors and Roofs, Sylva™ CLT Walls

Product quality

NVI | Preinstalled lifting slings

Product volume (m³)

572

StoraEnso

Team

Partner of Stora Enso

B&K Structures

Developer

Department of Education DFE
Trent View College

Architect

HLM architects

Main contractor

Morgan Sindall

Timber Engineer

Engenuiti

Others

Total construction development cost (€)

1,000,000