

Sustainable building with prefabricated concrete

Sustainability is a matter of weighing up environmental, economic and social aspects. The starting point for sustainable development is to take a long-term view and weigh up all significant factors. From a sustainability perspective, concrete possesses valuable properties as a construction material.

Globally, more efficient energy consumption is the key to limiting climate change. It is therefore important to know that concrete is the most energy-efficient material over the entire lifecycle of a building. The thermal inertia of the heavy concrete frame means that it is able to absorb and store surplus heat or cold and emit that heat or cold when necessary. Concrete frames have a very long lifespan. Building with prefabricated concrete combines the good functional properties of concrete with an industrial construction process. Using concrete elements in the construction process means a reduction in the need for labour on the building site and a reduced construction time resulting in higher levels of productivity, lower construction site costs and a more efficient use of capital.

Concrete has low operating and maintenance costs. It is now a well-known fact that operating and maintenance costs are the most important part of a building project's life-long costs. Construction materials that demand a lot of servicing and maintenance become extremely expensive over the long term. A concrete structure has a very long lifespan. In addition, concrete is fully recyclable. After the old concrete has been crushed, it can be used in conjunction with road and street building, replacing naturally-sourced gravel as a fill material. Any leftover concrete can also be used as ballast in new concrete. Concrete that has not become contaminated never ends up going to landfill.

A good acoustic environment is of great importance to anyone living in a multi-occupancy building. The residential acoustic environment is determined by noise disturbance within the home from neighbours and installed facilities, and disturbances from outside such as traffic, plus the building's acoustic insulation capacity. Concrete structures often result in extremely good acoustic environments for the residents. Concrete has great mass, which greatly reduces low frequency sound at low acoustic frequencies. Its density reduces high-frequency sounds.

Concrete is an inorganic natural material and is not affected by fungal attack. The water damage and leaks that often occur in homes and in other buildings will therefore have less negative consequences in buildings with concrete frames than they would in timber-frame buildings, for example. Concrete also creates confidence in other ways, both because it tolerates fire and high temperatures better than other construction materials, and because it offers greater resistance to explosions and break-ins.

Cement production leads to emissions of carbon dioxide although concrete once again binds part of the carbon dioxide during its use and recycling. Progress has been made in recent years, and is still continuing to reduce emissions by means of improved processes and the increased use of alternative fuels, which in turn alleviates the problems of waste in society. Carbon capture will probably become an important technology for the cement industry. By reducing the proportion of cement in concrete, replacing it with other binders such as fly-ash, slag and limestone, the burden on the climate can be further reduced and probably halved up to and including the year 2020.