SHG
STEEL HOMES GROUP

MODERN METHODS: THE FUTURE OF EDUCATIONAL BUILDINGS

Through Building Schools for the Future, the Government has initiated one of the largest school building and refurbishment programmes ever undertaken. The £45 billion initiative aims to rebuild or refurbish every secondary school in the country. In total, over 3,000 schools will be revamped or rebuilt.

This presents a massive opportunity for the educational sector to radically overhaul their property and develop schools that more effectively meet the needs of teachers and children. It also presents a chance to build facilities that benefit the wider community more effectively, by incorporating extended community access and by being more sustainable.

However, it does represent a huge challenge. Educational buildings are not merely schools and, to meet the needs of the market and comply with Governmental expectations, educational buildings are evolving so as to extend access to pre-school and increase the number of university places. Again, this means building entirely new facilities which include accommodation blocks and residential buildings. The sheer scale of educational building taking place at present and over the coming decade represents a significant challenge for the construction industry, as well as the opportunity to demonstrate the cost effectiveness of modern methods of construction (MMC) and steel frame structural design.

Educational building projects do not happen in isolation. The UK is building extensively, with projects such as the Channel Tunnel Rail Link, T5 and widespread house building already underway. This brings considerable strain upon the building industry as materials and skills are becoming increasingly stretched, with project managers, for instance, having to learn to adopt the new processes demanded by MMC.

The Olympics and the Crossrail are examples of projects which will benefit from the deployment of new ways of working.

If the new educational buildings are to be delivered on time and on budget, while meeting users' aspirations as well as delivering improved sustainability, then best practice must be implemented at all levels. The new generation of educational buildings must entail the use of the latest technology and techniques to provide more valuable buildings, while erecting these buildings more quickly and in a more cost-effective way by utilising the labour force efficiently and reducing waste. If these techniques were adopted and implemented, they would most definitely provide better learning environments and the associated accommodations.

Of obvious importance for educational facilities is the disruption caused while work is underway, both to the school in question and to the neighbourhood. A shorter construction period can help minimise associated problems.

How can MMC help build the educational buildings of the future?

Building schools and other educational buildings of the future will inevitably include utilising MMC and frequently offsite construction. These methods utilise techniques such as factory production that until recently were rare within the construction industry. However, within the automotive sector and other manufacturing spheres they have been the norm and have facilitated an extremely high level of efficiency. This level of efficiency is desperately required in building if construction projects on the scale currently being undertaken are to be delivered.

One of the key benefits of MMC is their predictability. Indeed, with the use of MMC, educational authorities or universities, when planning a new facility, can be involved at the initial stage of the building design ensuring that the new educational building will fulfil both the needs of teachers and pupils/students. In addition, the use of these predictable modern construction techniques, where materials are manufactured offsite to a very high standard and no defects are tolerated, guarantees the client that the end-product delivered will meet their expectations.

Another benefit of modern construction techniques is the reduced "build time". Indeed because the major components of a building are being manufactured and finished offsite, once these materials are delivered they are rapidly assembled. As a result, buildings are completed far more quickly than using traditional methods, equally requiring less people on site. In fact, a recent study of MMC by the National Audit Office (NAO) highlighted that modern techniques can save 20-50% of "build time".

In the case of students' accommodation, for instance, reducing "build time" and costs will enable the client to rent the space more quickly and therefore satisfy the end users – the students – while securing the consequent and necessary revenues more promptly.

If not reduced to a minimum, the cost of waste, which seriously affects the overall cost of new buildings, would be hugely detrimental to educational building projects considering the level of budget allocated to this area.

The construction industry has been notorious over recent years for being wasteful with its building materials. However, conscious of this issue, both for its cost and environmental aspects, the construction industry is now willing to reduce its waste by using modern methods of construction. Although increased recycling methods have helped to a certain extent by preventing waste materials from simply becoming landfill, it would be far more suitable and cost effective to prevent waste in the first place. MMC clearly address the construction waste issue, substantially reducing it by delivering structures built to a precise design at the manufacturing stage. From steel frames down to sheets of plasterboard, materials are manufactured and finished to meet the exact requirements of an individual project, meaning that no onsite cutting is required, no excess material is produced and waste is therefore minimised.

Through the optimised use of the latest building materials, MMC also have the capacity of improving buildings' sustainability. Modern buildings, and particularly steel-framed ones, are able to meet the much anticipated Part L building regulations which aim to reduce the carbon footprint of buildings, without major changes. Considering that today about half of carbon dioxide emissions come from buildings, implementing MMC in educational residences would largely contribute towards compliance with the UK's targets for reduction of carbon dioxide emissions by 2010.

MMC not only represent a cost effective and sustainable approach to the new generation of educational, residential or commercial buildings, but these modern methods are equally energy and space efficient. Indeed, MMC, to comply with the new air tightness standards, do not require building walls' thickness to be

increased, which will help space-conscious architects to make the most of new buildings.
The cost effectiveness, robustness, sustainability and environmentally friendly attributes of MMC clearly evidence that these methods are the future of educational buildings, capable of meeting both the client and students' expectations.

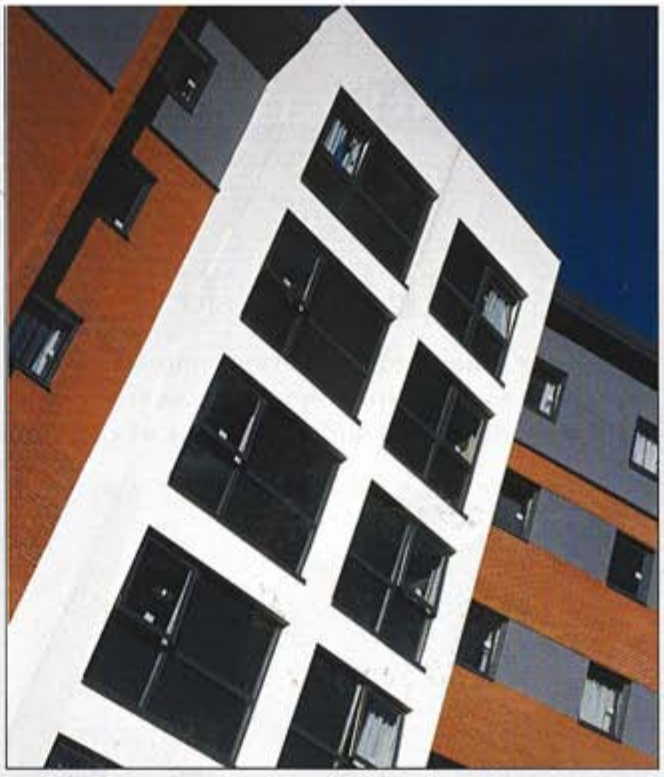
What can steel-framed buildings offer?

There is obviously a range of modern building methods available that could help to deliver educational buildings more efficiently than traditional techniques. However, steel-framed construction is intensively used for the larger building market, including schools, accommodation blocks and libraries. In fact, 70% of this market is steel framed.
This level of market dominance has not developed by chance. Light steel frames are made of galvanised steel and engineered to be lightweight but extremely resilient and durable. The stable properties of steel also help to ensure that finishes are not damaged during the pivotal drying out period.
Unlike traditional brick and block or timber materials, light steel framing requires fewer foundations and its components do not shrink or creep, minimising the need for long-term maintenance costs. The material also offers hard-wearing corrosion protection and its sophisticated jointing techniques prevent any movement in response to temperature change. In terms of the benefits to the end-user, steel's durability encourages fewer defects and curbs the need for costly follow-up work.
Finally, and perhaps most importantly, galvanised light steel components can promote the long-term performance of a building, effectively extending its predicted design life by more than 200 years.
Light steel framing performances clearly meet educational buildings' requirements and would most definitely represent a cost effective solution for this rising market.

Large or small buildings benefit from modern methods

Small

There is a general misconception that modern and offsite building techniques are only applicable to large-scale projects such as science blocks or halls of residence. However, this is not the case. MMC can help to provide solutions for even the smallest educational buildings.
One system that is suited to smaller construction projects, which is frequently used to build nurseries, is the Terrapin Uni-trex system. This is a factory-produced building method that can be used to construct buildings from 100 to 10,000 square metres. The buildings, consisting of the floor, walls and ceiling units, are flat-packed and transported to site where they are craned onto pre-prepared foundations. This simple building method enables extremely swift site completion, helping minimise disruption to the local neighbourhood.
One example of Uni-trex in use is the neighbourhood nursery located at Kingsway Primary School in Kirby, Ashfield. This nursery was funded by the Government's Neighbourhood Nursery Scheme and needed to be an extremely flexible building, able to provide facilities for children from six weeks to five years old and an after-school club for children up to eight years old. The completed building has a floor area of 605 square metres, is single storey with a pitched roof. The whole project was designed, manufactured and constructed by Terrapin, enabling the building to be completed in only 14 weeks, with minimum disruption to the main school.



Large

At the other end of the educational age range and on a larger scale than nursery buildings, UNITE Modular Solutions (UMS) provide a modern approach to the creation of university accommodation. UMS manufacture their accommodation offsite in a method reminiscent of an automotive production line. UMS has an in-house design team ensuring flexibility of product to align with their customers' requirements. The accommodation modules are manufactured to a high standard, and provide high levels of thermal, acoustic and fire resistance performance. UMS has seen considerable growth and demand for its products and by the end of 2006 will have produced some 10,000 units.
Last year, UMS completed their largest project to date. The Forge, which is home to 1,157 university students in Sheffield, is one of the largest modular builds ever undertaken in the UK.
UMS supplied the modules to The Forge for its parent company The UNITE Group plc (UNITE) and produced the high specification volumetric en-suite bedrooms, kitchens/dining rooms and corridor cassettes at its state-of-the-art factory in Stroud, Gloucestershire. All the fully furnished en-suite modules were delivered to The Forge and fitted within three months, averaging around 16 modules installed on a daily basis. The Forge was built in 14 months and opened in September 2005.
UMS has received their ISO 9001 Accreditation and are currently working with UNITE on 10 projects across the UK.

Educational buildings of the future require forward thinking methods

The coming years represent a fantastic opportunity to develop new and improved educational buildings that will serve future generations for many years. However, the funds to deliver this are not limitless, there is limited skilled labour available and high levels of sustainability must be delivered. To complete this mammoth building task on time and on budget while competing with numerous other priorities will be a real challenge.
However, it is certainly achievable. Although to make the aspirations for improved facilities a reality, rather than a pipe dream, there has to be a realisation that modern techniques must be whole-heartedly embraced.

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