



# Transforming the way that primary schools are designed and built.

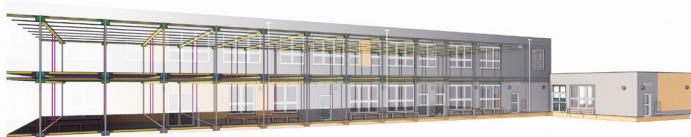
## The challenge

The demand for new and replacement primary schools continues to rise year on year. Typically, every school construction project has a bespoke design, is procured individually and delivered by a fragmented supply chain.

The focus of Seismic was to realise the Government's ambition for greater productivity in construction, and to change the way primary school projects are designed, procured and constructed. This will help to meet the rising demand for school places and increase capacity in the construction industry.

Funded by UK Research and Innovation (UKRI) through the Industrial Strategy Challenge Fund and Innovate UK, the Seismic Consortium comprises construction consultants blacc, the Manufacturing Technology Centre (MTC), technology-led design practice Bryden Wood and two of the UK's leading offsite manufacturers, Elliott and The McAvoy Group.

The Seismic project shows that the targets set out in the Construction 2025 Strategy are achievable. It is one of the first Innovate UK projects under Transforming Construction to be completed and demonstrates that this level of collaboration is the future of construction.



## A new offsite framing system for schools

The DfE was the catalyst for developing a platform using a range of standardised components for the building structure to achieve greater productivity and cost and efficiency improvements in the use of offsite construction to meet the rising demand for primary school places.

The consortium is using advanced offsite technology and will make the components available to the offsite market to aggregate demand and encourage collaboration with industry partners in order to drive down costs.

An engineered solution has been developed to connect each of the frames that make up a module – and to interconnect each module vertically and horizontally to make up a primary school building cluster. The result is fewer welded joints and fewer connections – which in turn means less steel, less weight, faster assembly and therefore reduced cost.

By rationalising the design of the steel frame, the number of components has been significantly reduced. This means faster module assembly in the factory – increasing productivity by up to 50%. Work on site to interconnect modules is also more efficient.

The partners' research has shown that the new engineered solution significantly reduces the number of frame components and will therefore use 25% less steel. The reductions in steel components and assembly time combine to generate a cost saving for these elements of up to 25%.

With fewer components, the weight of the modules will reduce by 25% with no compromise on structural rigidity – generating 25% lower carbon emissions for the offsite construction of an average 40-module school. This is equivalent to over 155,000 miles of car driving or 17 flights from London to Sydney.



## Seismic School Configurator

All too often feasibility studies are conducted that might focus on aesthetics but turn out much later in the process to be non-compliant with Department for Education planning rules, such as classroom sizes and layout.

The configurator tool is a user-friendly web-based app, which can be used by teaching professionals, to configure a primary school building on a specific site in line with DfE requirements, using a standardised offsite solution to optimise efficiency. This will significantly reduce the time and cost of the initial feasibility and design phase and facilitate the input of stakeholders.



The app reduces a process that normally takes weeks, to a matter of minutes. It subscribes to the core principles of design to value whereby the end users are given the opportunity to contribute to the design process so that the design merges form and function. In this way instead of just the typical people involved in the early design of a school such as the architect and local authority planner, other stakeholders such as teaching professionals, parents and even pupils can get involved.

It is being released as free and open sourced so that whilst the first version is specifically for either building a new school – or adapting/expanding an existing school – anyone can build more functionality.

**Further information, including a demonstration and details of how to access the app can be found at [seismic-school-app.io](http://seismic-school-app.io)**

## What can we expect next from the Seismic Consortium?

The team is in the process of finalising testing for the new framing solution and is collaborating with steel fabricators to develop the standardised components and establish a supply chain with a view to making these available to the offsite market in the coming months. This will aggregate demand and allow significant economies of scale to drive down costs.

The consortium aspires to apply the same manufacturing principles to 'componentise' other parts of a building to be able to offer a whole school solution, including walls and roofs. It also aims to develop a 'product family' for different types of buildings, such as housing and healthcare, acting as a catalyst for revolutionising the wider construction industry.

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# Seismic



UK Research and Innovation

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