

Delivering the requirements of SEN school design



- One of the UK's **Leading providers of energy efficient structures** since 2005
- **650+** Projects Delivered since 2005
- **175+** schools built over the past 2 years
- **Awarded top place** on the DfE's Modern Methods of Construction (MMC1) Construction Framework in 2020
- **Awarded one of the DfE's 1st Sustainability School Pilot Schemes** for Marjorie McClure School, Kent



Introduction to Innovaré Systems

Innovaré Systems is the only major SIP and superstructure frame provider in the UK to design, engineer, manufacture, deliver and install our own Structural Insulated Panel System (i-SIP).

i-SIP and **i-FAST** panels are produced at our state-of-the-art MMC manufacturing facility in Coventry. The digitally-enabled process moves construction from the building site to a highly controlled production environment.

The **i-SIP** and **i-FAST** solutions are prefabricated large format panel systems used for external or internal walls and roofs. The panels are made from an insulating layer sandwiched between either two timber sheets or calcium silicate facing boards.

Innovaré is a market leader in panelised offsite techniques. As your **full-service technology partner** we help to simplify the construction process. Our technology and expertise shortens construction programmes, improves predictability and delivers the cost advantages of offsite and MMC.

On every project, Innovaré are focused on delivering:

- Robustness against accidental damage
- Structural capacity to support wall and roof hung equipment
- Flexibility of layout for improved access and movement space
- Clear spans for future adaptability and improved daylighting
- Optimised thermal comfort for health and wellbeing
- Enhanced acoustics for reduced disturbance
- Timber-based structure for environmental sustainability

Our purpose is to create exemplar buildings quickly helping our clients manage safety, time, quality, cost, and risk more effectively.

The Key Criteria for Designing for SEN Schools with i-SIP/ i-FAST Solutions

The below outlines the design approach and detailed design requirements for SEN schools and how the Innovaré i-SIP and i-FAST systems respond to these needs.

Design Approach & Detailed Design Requirements		How the Innovare iSIP & iFAST system responds
The Design Approach	Robustness	Providing robustness and durability to take into account of the likely accidental damage including wear and tear caused by wheelchairs and other mobility equipment. All internal and external walls are rated Severe duty to BS 5234. Technical specification documents for factory fitted boards and Innovare K10 are available on request.
	Access	The Innovaré iSIP and iFAST approach is flexible and adaptable to deliver the designer's brief to create a simple and clear layout with accessible circulation routes. The spanning capability of timber or concrete floor systems provided wide open spaces and broad circulation routes.
	Space	The iSIP & iFAST component panelised construction (Category 2) allows for flexibility in wall layout to provide the space needed for moving around with use of specialist equipment and safe clearances around furniture and other equipment. Integrated steel or timber framing as part of a hybrid structure allows staggering of internal walls. Framed wall panels provide excellent racking resistance against wind loading.
	Flexibility & Adaptability	Schools need to be flexible for everyday use and also over time to meet the future changing needs of children with SEN and disabilities. Internal and external walls can be engineered to be moved or removed; future proofing spaces so their function can change over time. 3D model of structural components submitted as part of OEM.
	Health & Well-being	School buildings should promote health, and well-being creating pleasant and comfortable spaces to all. Thermal comfort, good ventilation and minimising disturbance from sudden background noise are key issues. Innovare iSIP & iFAST Wall and roof systems provide U-values from 0.2 to 0.1 W/m ² .K.. Intermediate concrete floors provide thermal mass of 113 kJ/m ² K and the buildings can achieve air permeability of 3m ³ /h/m ² .
	Environmental Sustainability	Schools should achieve a high quality of sustainable design aligned to all the DCSF's (Department for Children, schools & families) sustainability framework. Under Environmental school buildings should minimise any negative impact with efficient use of energy and resources. The use of timber in both iSIP and iFAST offsite manufactured systems serves to maximise sequestered carbon dioxide and minimise embodied carbon. The iSIP & iFAST building fabric thermal and air tightness can minimise operational carbon through reducing energy consumption. Timber procured from certified PEFC or FSC sustainable sources

Design Approach & Detailed Design Requirements		How the Innovare iSIP & iFAST system responds
Detail Design	Building construction: elements & finishes	<p>Walls</p> <p>Walls may need to support heavy equipment (for example, wall bars in a physiotherapy room and grab rails in toilets etc.)</p> <p>The iSIP and iFAST wall systems provide for withdrawal capacities up to 5kN per fixing into solid timber within walls and ceilings. Support for coordinating the design forms part of the Innovare service.</p>
		<p>Floors</p> <p>Floors should be easily maintained, impact resistant and hard wearing.</p> <p>The Innovare system can include either timber cassette floors, or pre-cast concrete units. The appropriation of either can be dependent upon a range of factors including Output Specification and the requirement for thermal mass.</p>
		<p>Ceilings</p> <p>Ceiling layouts need to ensure coordination between tracking for hoists and other elements such as services, roof lights, and other equipment. The structure must be able to support hoists and tracking in toilets/changing, physiotherapy spaces.</p> <p>The iSIP and iFAST systems provide for withdrawal capacities up to 5kN per fixing into solid timber within ceilings. Support for coordinating the design forms part of the Innovare service.</p>
		<p>Daylighting</p> <p>Daylighting is an important criteria for all schools and particularly important for children with limited mobility to have a connection to the outdoors and view out.</p> <p>The Innovare iSIP and iFAST systems are capable of including for a broad range of window sizes, areas of curtain walling and roof lights. These can easily be integrated into the structure of both wall and roof panel components.</p>
		<p>Stairs & Lifts</p> <p>Stairs which comply with the Approved Document Part M and also lifts which are essential for vertical circulation of wheelchair users are specific requirements.</p> <p>The Innovare scope can include for both stairs and pre-cast concrete lift shafts subject to the specific school design.</p>
		<p>Doors and Door Openings</p> <p>All openings and doors must be wide enough to give easy access to everyone, including disabled people.</p> <p>The Innovare iSIP and iFAST systems can accommodate flexible door opening widths and heights to suit any size requirement.</p>
Design Approach & Detailed Design Requirements		How the Innovare iSIP & iFAST system responds

Detail Design	Environmental services & sustainability	Acoustics	Many children with SEN and disabilities have a particular reliance on good room acoustics and sound insulation – between rooms and from outside noise – for their access to learning. Timber stud framed internal partition walls can achieve up to 60 dB DnTw with standard dry lining systems.
		Heating & thermal comfort	Extremes of temperature cause discomfort, particularly for children with SEN and disabilities, who may be more sensitive and have complex health needs. Buildings with exposed thermal mass combined with night cooling and/or ground-coupled ventilation may help to keep internal temperatures stable. Innovare iSIP & iFAST Wall and roof systems provide U-values from 0.2 to 0.1 W/m ² ·K. Intermediate pre-cast concrete floors provide thermal mass of 113 kJ/m ² ·K and the buildings can achieve air permeability of 3m ³ /h/m ² . “
	Warm water/hydrotherapy pools		Hydrotherapy pools are used by vulnerable people and must be safe and accessible. Successful design will include vapour tight membranes or lining systems in combination with hygrothermal modelling to quantify risk of interstitial condensation. Innovare can undertake condensation risk assessment and U-value calculation conducted with specialist software according to BS EN ISO 13788 and BS EN ISO 6946.”

(Source: Building Bulletin 102. Designing for disabled children and children with special educational needs. Guidance for mainstream and special schools)





Innovaré Portfolio of SEN(D) Schools

The list below outlines details of the SEN school projects we have secured and delivered.

SEN(D) Project Name	Contractor	Status	No. Storeys	Floor Type
Red Kite	Ashe	Delivered	1	N/A
Aspire	BAM	Delivered	1	N/A
Orchards	Conlon	Delivered	1	N/A
Merchants & Venturers	Galliford Try	Delivered	2	Timber Cassette
Skilts	Balfour Beatty	In Construction	2	Timber Cassette
Northfield	Morgan Sindall	Secured. Stage 4 Design	1	N/A
Marjorie McClure (DfE)*	Galliford Try	Secured. Stage 4 Design	1	N/A
Greenvale	Osborne	Secured. Stage 4 Design	2	Pre-cast Concrete

Red Kite Academy, Corby, Northamptonshire

Project	Red Kite Academy
Client	Northampton County Council
Contractor	Ashe Construction
Architect	Architecture Initiative
Value	£7m
Location	Corby, Northamptonshire
GIFA	3,150m ²



The Red Kite Academy project involved the design and build construction of a new Special Educational Needs Primary School in Corby.

The new 12-classroom SEN school featured special design elements to suit the specific needs of SEN learners including a hydrotherapy centre, sensory suite and studio flat.

Early design collaboration between Innovaré, Ashe Construction and Architecture Initiative ensured that the design met the specialist requirements set out by the client.

The 51 week, £7m new build school was constructed using Innovaré's i-SIPs system. The school was delivered two weeks ahead of schedule and the i-SIP System offered programme and financial savings to Ashe and Northamptonshire County Council.

Working with client representatives and Building Control helped the main contractor to agree quality standards. Inspection and test regimes removed any ambiguity over defect definitions and supported our soft-landing proposals.

99% of waste from the scheme was diverted from landfill.

Tom O'Dwyer, on behalf of the trust, said:

"We are thrilled to finally take this crucial step as we move towards providing a desperately needed resource for the children and their families. We look forward with immense anticipation to seeing Red Kite Academy take its place in the family of wonderful Northamptonshire special schools."

The Aspire School, Sittingbourne, Kent

Project	Aspire School
Client	Kent County Council
Contractor	BAM Construction
Architect	Bond Bryan
Value	£9m
Location	Sittingbourne, Kent
GIFA	3,250m ²



The Aspire School is a special free school in Sittingbourne for children aged from 4 to 11 years. It offers specialist provision for children with ASD or speech, language, and communication needs.

The design was developed in close collaboration with the architects and Grove Park Academies Trust following an in-depth review of SEN schools and their facilities. The aim was to create an environment that inspires young people and nurtures lifelong learning experiences.

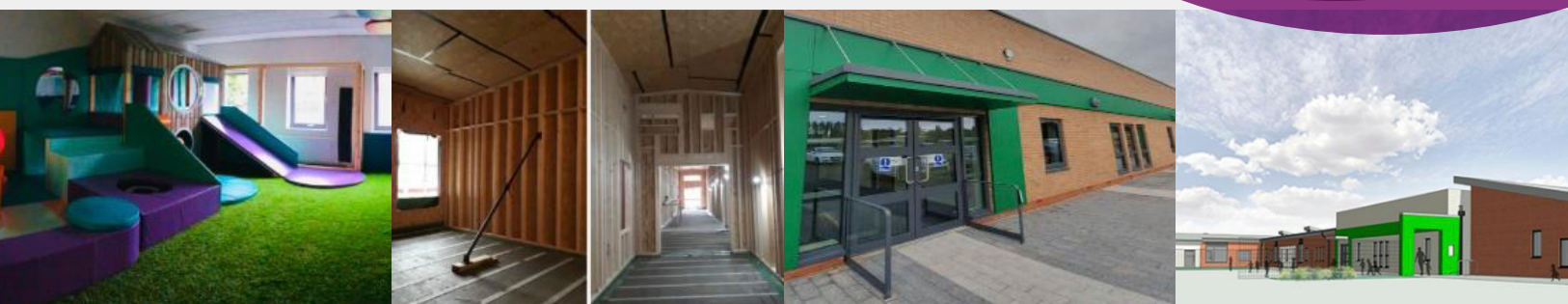
The new building used the Innovaré i-SIP superstructure solution. The integrated design and manufacturing process delivered greater freedom to create a building that enhances the day-to-day life of users while meeting sustainability and energy efficiency goals.

Careful design consideration was given to promoting engagement, well-being, and achievement of learners.

Aspire School aims to offer outstanding provision for students and be a leading school for children with ASD and SLCN. The school plans to develop links and provide expert support to other schools and the wider community.

The Orchards School, Stretford, Manchester

Project	The Orchards School
Client	Trafford Council/Dunham Trust
Contractor	Conlon Construction
Architect	Bowker Sadler Architecture
Value	£685,400
Location	Stretford, Manchester
GIFA	2,602m ²



Procured via Lot 6 ESFA Regional Framework (North West Region) this brand new campus includes for 14 classrooms, library, hall staff rooms and a nursery, in total accommodating 96 children aged 3 to 11.

A host of facilities were built to support the wellbeing and personalised curriculum of pupils, including a state-of-the-art hydrotherapy pool – marking The Orchards as one of Greater Manchester’s only schools with this level of provision.

Commissioned by the Education and Skills Funding Agency on behalf of The Dunham Trust, the new 25,000sq.ft school was completed in August 2020, just in time for the start of the new school year.

The Orchards caters for pupils with complex needs and speech and communication difficulties, including those with Speech, Language and Communication Needs (SCLN), Severe Learning Difficulty (SLD), Profound and Multiple Learning Difficulty (PMLD) and Autistic Spectrum Conditions (ASC).

The school will use the new facility to augment its innovative approaches, such as speech and language therapy and a bespoke need-led curriculum personalised to each and every pupil.

The main entrance to the building is clad in green while the buildings will be clad in red brickwork.

The staff-to-pupil ratio will be around one-to-two, while the school’s curriculum will be focussed on creativity and sport.

There is space for around 55 vehicles along with 14 cycle parking spaces.

Conclusion:

Innovare Systems has substantial experience in the delivery of SEN schools across the UK.

Key to our success, particularly with SEN schools, has been our early collaborative approach with all the stakeholders.

This approach is based on openness and using the experience of bid and delivery managers gained through similar projects. BIM technology is central to the process of developing efficient, risk reduced and fully costed designs alongside rapid project delivery and predictability.

Innovaré is uniquely placed to be a full-service technology partner. BIM Level 2 design capability supports the integrated **design, engineering, manufacture and installation** process for SEN Schools.

Early stage 3D Revit models enhance our ability to clash detect and coordinate our superstructure solutions with the MEP package. Practical building challenges are cheaper to overcome on a BIM Level 2 design platform than they are on site.

Manufacturing in a controlled environment ensures that 'actual' performance of the completed building matches levels determined at the pre-construction stage.

Innovaré understand the design approach and detail design requirements for creating successful SEN school facilities.



Supporting Information Available from:

- Designing for Disabled Children and Children with Special Educational Needs.
- BUILDING BULLETIN 102 DfE Output Specification BB93: Acoustic Design of Schools
- Thanks to Frank Shaw Associates & ADP Architecture in their help in preparing this document

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simplifying offsite

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