Think: Offsite

Thoughtful Design through MMC/DfMA

HLM
Architects

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Thoughtful design to make better places for people.

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About HLM Architects

Thoughtful design and the desire to make spaces and places that improve lives sits at the heart of every discipline within HLM. Places of education that inspire, healthcare environments that nurture, homes that are part of thriving communities, and infrastructure that is sustainable in its widest sense: environmentally, economically, and socially.

We listen to the ambitions of our clients and understand the needs of the people who will use the places and spaces we create. By encouraging an environment of openness, enjoyment, and creativity – and with our feet firmly on the ground we can create memorable, meaningful places that delight as well as satisfy.

One team

180 employees

Over 50 years

Since 1964

Values

Transparency

Creativity

Expertise

Commitment

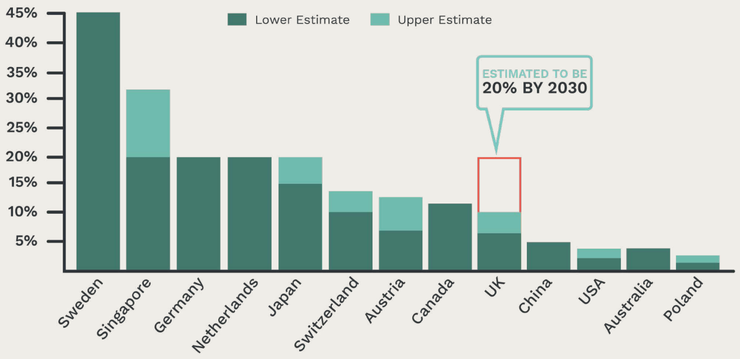
From more efficiency, to cost savings, improved quality, and sustainability, modern methods of construction (MMC) is increasingly recognised for the many benefits it can provide to the construction industry.

Anne Daw
Associate - Head of MMC Delivery

Why We Need To Think: Offsite

From materials efficiency, to cost savings, improved quality, and sustainability, Modern Methods of Construction (MMC) is increasingly recognised for the many benefits it can provide to the construction industry. Since 1994, every major review of the construction industry has in some way recommended a move towards offsite construction.

However, in some parts of the world, including the UK, uptake remains low, with less than five per cent of housing projects described as using MMC. Meanwhile, many other countries, such as Germany, Japan, China, and the Netherlands are growing their capabilities, with Sweden blazing a trail with 80 per cent of housing projects considered MMC-based.



Here in the UK, we remain conflicted. The experience of poorly performing post-war prefabricated buildings and temporary classrooms has left its mark on perceptions, and yet there is increasing evidence that a manufactured approach to building has many advantages over traditional construction methods. Government has recognised a need for investment in the offsite industry that addresses labour skills shortages and a drive to reduce carbon emissions. There is little doubt that the proportion of offsite manufactured buildings is set to increase dramatically over the next decade, and with good reason.

Firstly, offsite manufacture is a more environmentally sustainable way of building than traditional methods. Environmental impacts are significantly mitigated, with waste reduced by 50 per cent, emissions down by 50 per cent, site water consumption down by 30 per cent, and energy savings of around 80 per cent. Offsite also reduces traffic congestion and noise pollution levels.

Additionally, offsite construction can substantially reduce the risk of work-related accidents. On average, 36 people were killed on British work sites every year between 2017 and 2021. The overall cost of injury and work-related illness in the UK remains at around £16.2 billion a year. Offsite methods reduce the need to work at heights and underground, and production lines are proven to be a much safer working environment. If we universally adopted modular construction, we could see as much as an 80 per cent reduction in occurrence of work-related injury and death.

The National Audit Office has demonstrated that offsite construction methods can reduce onsite build times by up to 50 per cent if the project is considered to be offsite from the outset. In 2018, only 60 per cent of construction projects were completed on budget, and less than 40 per cent were delivered on time. Given that, offsite presents a huge opportunity for improvement by enabling speedier project completion and greater certainty.

When it comes to cost, it is difficult to be definitive due to the variety of construction methods and materials used, but it is reasonable to assert that for a like-for-like quality, the cost would be about the same. When you consider that offsite is more sustainable, safer, faster, and of better quality than traditional, there is no denying the greater advantages this method of construction holds over traditional approaches.

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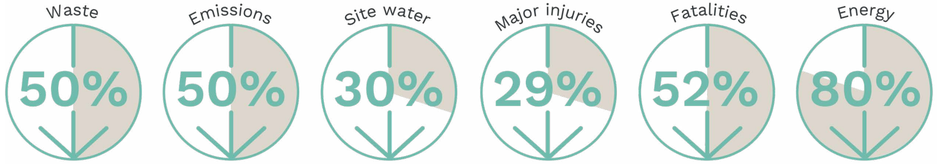


Offsite manufacturing compared to ‘traditional’

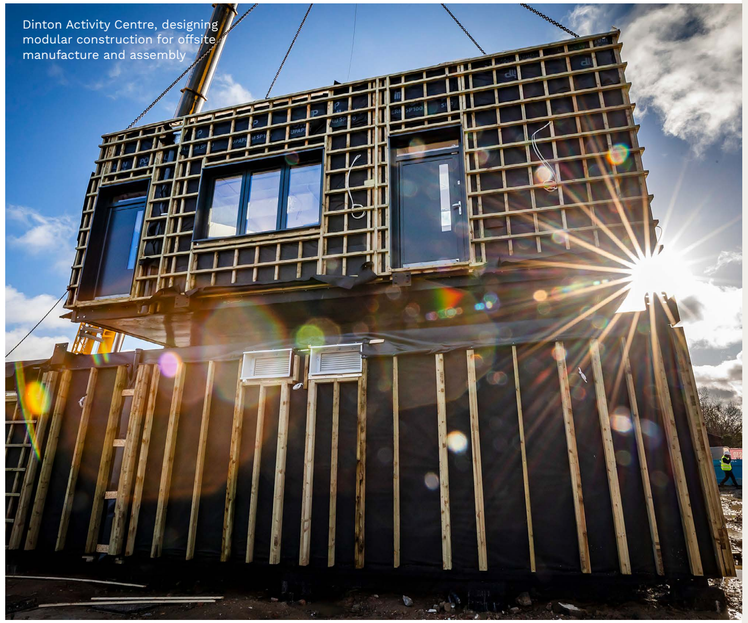
Our Approach

Unusually for architects, HLM entirely embraces offsite manufacture, believing this to be a safer, faster, greener, leaner, and better quality way to make buildings. Our experience across all of our seven sectors is informing our own 'Think: Offsite' initiative. This is our commitment to consider how each project could be delivered using offsite manufacture as our primary delivery approach on every project. We are now developing digital tools which make us more efficient in the way we produce information for offsite manufacture for construction.

Consequently, we have developed an Offsite/MMC Roadmap and are moving towards a common platform approach to design. This means creating libraries of building components, some of which are assemblies of multiple components, to make standard building elements such as rooms, walls, stairs and door sets etc. Collaboration with contractors and their supply chains enables the creation of a 'kit of parts' that reflects preferred approaches to construction that are affordable and reliable. Assembling buildings using a 'kit' will always produce the most efficient and robust approach to design and construction. We're working in a collaborative digital environment where sharing models and components is essential to realise these benefits. This is the position we need to get to across our industry.

Nominated - Offsite Awards 2021 - Architect of the Year
Nominated - Building Awards 2020 - Digital Construction Award

To truly realise the benefits of modern methods of construction, designers, manufacturers and contractors need to embrace digital collaboration.



Dinton Activity Centre, designing modular construction for offsite manufacture and assembly

DfMA

HLM Architects has pioneered offsite construction for over twenty years and in this time has delivered thousands of dwellings for the Ministry of Defence, multiple prisons for the Ministry of Justice, and thousands of school places for the Department for Education, as well as offices, healthcare facilities and hotels. In the process we have become a trusted partner for manufacturers and contractors alike who recognise that we embrace the concept and benefits of Offsite and Modern Methods of Construction (MMC).

Design for manufacture and Assembly (DfMA) is a formal design approach that focuses on designing for ease and efficiency of manufacture and assembly. We believe that DfMA is a prerequisite for considering MMC, especially offsite solutions and fully embrace its aims by managing interfaces, reducing material use, minimising the number of individual components, simplifying details and eliminating clashes.

Indeed, we are now looking beyond DfMA to consider how projects can be maintained, disassembled and reused in order to input to a circular economy and deliver on the sustainability agenda to address the climate challenge.

Early engagement and collaboration with all team members & supply-chain partners is critical to realise the maximum benefits of DfMA. We encourage the design team to utilise simulation & prototyping to optimise, standardise & digitise the design. This often includes building digital twins, which are a exact replica of the physical building, with added data. They enable design, manufacture, assembly and construction logistics to be tested and refined virtually, before any physical materials are required.

Digital solutions are critical to DfMA and alongside BIM tools, we have created a three-part, award winning `Thoughtful Design Toolkit' which contains a suite of digital tools that enable designers and commissioning clients to define, develop and assess their building projects in an evidence-based way.

Design for manufacture and Assembly (DfMA) is a formal design approach that focuses on designing for ease and efficiency of manufacture and assembly.

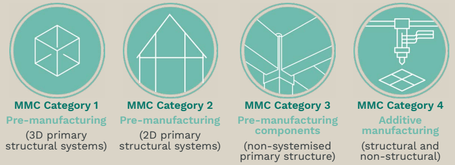
Havering SEND

MMC Typologies

There has historically been misunderstanding of terminology relating to MMC, but the MCHLG publication 'Modern Methods of Construction: introducing the MMC definition framework' seeks to provide clarity relating to what MMC means. Initially produced to relate to Housing projects, the definitions are also applicable to other sectors.

Providing seven types, the MMC framework outlines that MMC is not just about new ways of physically constructing buildings but also extends to innovation with traditional construction materials and methods, including digital techniques.

Further MMC definition reading.



MMC Category 1
Pre-manufacturing
(3D primary structural systems)

MMC Category 2
Pre-manufacturing
(2D primary structural systems)

MMC Category 3
Pre-manufacturing components
(non-systemised primary structure)

MMC Category 4
Additive manufacturing
(structural and non-structural)

MMC Category 5
Pre-manufacturing
(non-structural assemblies & sub-assemblies)

MMC Category 6
Traditional building product led site labour reduction / productivity improvements

MMC Category 7
Site process led site labour reduction / productivity / assurance improvements

Research & Development (R&D)

Innovation is an important component of HLM Architects' approach to improving solutions for Offsite and MMC. Utilising digital tools within R&D initiatives, we work to continuously develop our philosophical approach to DfMA, and we embed R&D alongside project work so they inform each other and help us to work with clients and collaborators to maximise value obtained from MMC and Offsite.

Circular Twin

HLM Architects collaborated with a multi-disciplinary team on this landmark study which involved digitally building a school that was completed in 2017 and reworking it from start to finish so that each design decision favoured a lower carbon outcome. Capital and operation costs were evaluated and forecast, but carbon was the key driver. The process allowed the traditional paradigms of value defined by cost to be challenged and the project radically experimented with new working methods, notably forming an early alliance of experts, with a shared goal to reduce the building's Whole Life Carbon, and ultimately helping to achieve long-term cost savings through operational efficiency. Not only did the Circular Twin utilise digital tools, which are a key element of successful MMC delivery, but also offsite construction, developed with a DfMA philosophy, was important in achieving the low-carbon aims.

Through comparison of the existing asset against a digitally refined model, the Circular Twin achieved:

- 67% reduction in Whole Life Carbon
- 72% reduction in upfront embodied carbon (EC) (48% reduction in lifecycle EC)
- 52% reduction in annual energy consumption
- 39% reduction in forest consumption (for products and 30-year UK offset)
- CAPEX delivered within standard budgetary parameters with multiple paybacks over asset lifetime

DfMA Overlay to the RIBA Plan of Work

HLM Architects contributed to the redrafting of the recently - published DfMA Overlay to the RIBA Plan of Work. The Overlay and the accompanying report provide a useful framework within which projects that embed MMC can be defined, designed, procured, delivered and used. It outlines requirements to obtain best value from DfMA and standardisation, not least of which is early engagement with the supply chain and appointment of appropriately skilled advisers at the right time.

Construction Innovation HUB Platform Design Programme

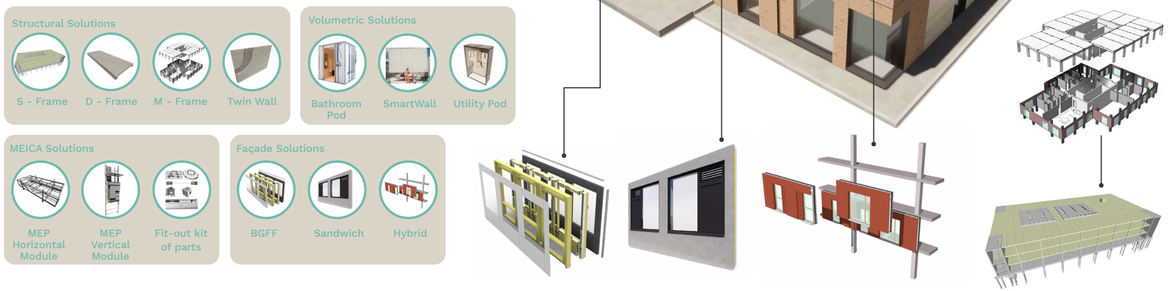
HLM Architects were invited to become Design Partners in the CIH Platform Design Programme, which is developing an approach to construction that consists of a standardised kit of parts that will be able to deliver social infrastructure and buildings. HLM are working with HUB partners to consider how rulebooks and design guides can be developed across sectors, with our particular focus being on the integration of the Healthcare sector.


Circular Twin Digital Model

Laing O'Rourke Demonstrator Project

The Laing O'Rourke Demonstrator project provides real-world testing of the design, manufacturing, and installation processes for Product Based Building Solutions (PBBS). PBBS provides an integrated suite of products that work together to realise significant benefits in flexible design standardisation, construction methodology, programme cost and safety, health, environment and quality. The products used in the Demonstrator can be scaled up to create buildings suitable for low to high rise construction and by combining multiple products, the quality and savings can be multiplied across a development. Installation methods are being trialled, timed, and repeated to incorporate training benefits for multi-skilled operators.

HLM Architects has taken a leading role in developing coordinated design proposals and has produced a design guide outlining how PBBS can be utilised for schools and residential projects. The project is now being extended to demonstrate how, by choosing the appropriate products to suit the brief, buildings in additional sectors can benefit from PBBS.



Our Projects

- Residential
- Schools
- Hospitality, Leisure & Culture
- Justice
- Workplace
- Defence
- Healthcare

Residential

Finalist, Home of 2030 RIBA Design Competition

Home 2030
Design concept

Finalist

Shortlisted out of more than 200 entries to one of six best and brightest talents of the housing industry to design environmentally friendly homes that support people in leading independent, fulfilling lives as our society ages.

Developed for 2020's RIBA Home of 2030 Design competition, we have created the concept of a universal manufacturing platform that enables flexible, affordable, and sustainable 'foreva' homes that are able to perpetuate a circular economy. These homes will be able to grow and shrink with their owners needs to create stable communities and a strong sense of place.

This concept was developed with support from the University of Sheffield Advanced Manufacturing Research Centre (AMRC) with the ambition to solve the issue of capacity and compatibility of offsite housing construction through development of a design standard that enables any offsite manufactured system to deliver the same high quality, sustainable design, with parts that are interchangeable.

Our ambition is to use the power of design and technology to create homes that are flexible, sustainable and affordable. These will be homes that adapt to people's needs over their lifetime so that they can put down strong roots, thus nurturing supportive communities. At a macro level we are also seeking to create a design platform that enables the entire construction and manufacturing industry to unite to solve our housing crisis

The Home of 2030 competition is a cross Government initiative that brings together MHCLG (the Ministry of Housing Communities and Local Government, responsible for housing supply, standards, planning and building safety), BEIS (Business, Energy and Industrial Strategy, responsible for innovation and business strategy) and DHSC (Department of Health and Social Care, responsible for health, wellbeing and issues arising from an ageing population). Each of the departments is seeking a benefit: increased housing supply through greater diversity in the market, improved quality and standards in homes through innovation and technology, and social, environmental and economic benefits arising from better health outcomes. Homes England, the Government's housing accelerator, are engaged in the initiative and may lead a subsequent development phase subject to successful development bids by Homes England Delivery Panel and Winner consortia.

Residential

Creating a new model for community led mixed-use development in the climate emergency.

Carnival Place
Wokingham

HLM are very proud to be working with Wokingham Borough Council and Mid Group on this exciting mixed-use project. The design seeks to create an important new community 'place' for Wokingham, bringing together residential and leisure functions in a highly sustainable central location. The residential block, while highly contemporary in almost every respect, has strong echoes of the Victorian terraces which form much of the wider context of the town.

The project was conceived directly in response to a brief to create a new model for community led mixed-use development in the climate emergency. The project adopts thermal performance and airtightness standards very similar to Passivhaus and will deliver a net zero carbon solution operationally. The development provides 55 new homes and was conceived at Planning Stage to promote MMC solutions. Following the successful tender by Mid Group, the project now adopts their proposal to construct the scheme using the Creagh concrete composite panel solution. The Passivhaus approach to the design inherently presents numerous complexities around creating a highly insulated volume, removing all cold bridges, with air-tightness values at less than a tenth of traditional Building Regulations standards, achieved through HLM's leadership, strong design management and fully coordinated design.

The spatial layout of the building is inherently simple and elegant, with all 3 floor levels stacked for simplicity of assembly of the off-site manufactured floor and wall sections. Our expertise in producing 3D technical design intent allowed us to fully articulate technical and visual standards expected for detailing elements such as junctions and materials interfaces. This was especially important around key geometries, balconies, and the like.

At a glance

Client
Wokingham Borough Council / Mid Group

Location
Wokingham

Project Facts
55 new homes, designed in conjunction with a new leisure complex

Services
Architecture, Landscape Architecture, Environmental Consultancy

Value
Residential element £10m

Residential

Development of a Volumetric Residential System

Residential apartment typology
UK, Various Sites

We are currently working with a modular contractor to develop a medium-density residential solution for their volumetric system, utilising experience gained in delivering projects in the education, commercial and healthcare sectors and adapting them to residential projects. We are collaborating with a multi-disciplinary team, including building services engineers and sustainability consultants, to ensure that the approach will deliver not only efficient and cost-effective buildings, but also provide homes of the highest quality.

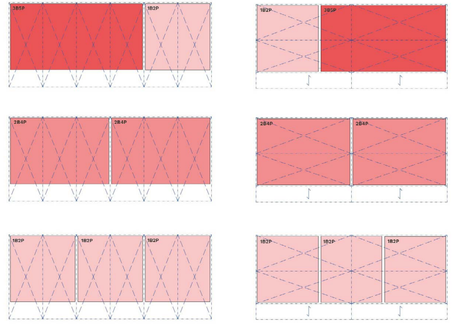
The first application of the system will be for a series of new social housing projects for a single Housing Association. The nature of these homes requires that a careful balance between cost, sustainability and aesthetics is achieved. Our aim is to ensure that the new homes will be affordable, will be delivered quickly and efficiently, will minimise both embodied and operational carbon levels with reduced running costs and, most importantly, will offer a sense of pride and belonging to the future residents.


Material Combination 01


Material Combination 02


Material Combination 03


Material Combination 04



Floor plans can be flexibly configured to include various unit sizes and module layouts.

A Collaborative Approach to Offsite Construction

Addington SEN School
Reading

At a glance

Client
Wokingham Borough Council

Location
Reading

Services
Architecture, Interior Architecture

Value
£4.4m

Winner - Offsite Awards 2021 - Education Project of the Year
Nominated - Offsite Awards 2021 - BIM/Digital Construction Award
Nominated - Building Awards 2021 - Offsite Project of the Year

For Addington SEN School, Wokingham Borough Council took the decision to appoint a specialist offsite contractor to deliver the design rather than a traditional route. This strategy gave them early cost certainty and reduced time on site while allowing more time for design engagement with the School and minimum disturbance for pupils. The project showcases HLM's digital consultation in the design process and Reds10 offsite manufacture and assembly.

Addington School is an Ofsted 'Outstanding' School for children and young people with special educational needs and disabilities. The need for expansion came after Wokingham Borough Council estimated about 130 local children needing a special school place were being educated outside of the borough.

This £4.4million expansion project delivers the school's educational objectives, creates an additional 50 SEN places and the Borough's commitment to reducing waste, reducing carbon, using new technologies and modern methods of construction.

Working with Reds10 meant that 70 per cent of the work was constructed offsite to reduce disruption to the school and its pupils, as well as providing high-quality building works.

This method of construction allowed for greater engagement with the school end user team allowing the time and tools to go through every step in detail and really involving them in the design decision making process. Having an open-minded team allowed full collaboration between all involved; Local Authority, School, Contractor, Design Team, Supply Chain, whilst making the most of technology but not in a complicated way resulting in a successful outcome. Taking time out from the process to visit both completed projects and the factory to see the project during construction meant there were no surprises and the vision was delivered.

The design of the new single-storey block pushed the boundaries of offsite construction and provided a visually amazing educational space.

The modular solution increased the speed of on-site construction

Sir Frederick Gibberd School
Harlow, Essex


Credit: www.sirfrederickgibberdcollege.org

At a glance

Client
Caledonian Modular
Department for Education

Location
Harlow, Essex

Project Facts
1,700 pupil places
300 place Sixth Form
Volumetric Modular
Timber cladding
General Teaching
Specialist Teaching
Labs
Halls
Sports
MUGA

Services
Architecture, Landscape Architecture, Interior Design

Value
£28m

Part of the ESFA Component Secondary School Framework, the new-build 1700 place secondary school, including a 500 place 6th form, was designed and built using modular components. The 12,460m2 design consists of a three-storey main teaching block based on BB103 areas, a separate sports facility and associated landscape works.

The modular solution increased the speed of on-site construction, minimised disruption to the local community and provided quality teaching spaces that maximised natural light and ventilation, and supported flexible future use. The design complied with the DfE's framework brief for room depths and dimensions, servicing and finishes to ensure a consistent, high-quality environment.

The plan was driven by school-specific adjacency requirements, with larger halls and specialist spaces occupying the ground floor, and general teaching, staff, and support spaces on the first and second floors. The design was then developed using a standard 3.5m wide module to enable ease of delivery to all sites. The standard module had a height of 3750mm, providing a 1000mm service and structural zone, and 2700mm floor-to-ceiling height.

Each module arrived on site with ICT, AV and MEP fully installed to be quickly linked back to final distribution connections in the circulation areas. Finishes for each module were factory installed, and simple joining elements applied on site. Over 90% of the construction works were carried out offsite.

The brief included specific environmental performance criteria, designed to reduce the future energy demands of the building which formed a core part of the design brief. Alongside this, the modular approach sought to reduce the environmental impact of construction through reduced material wastage, enhanced detailing and the reducing onsite construction works.

Developing a flexible offsite solution for differing school briefs required close collaboration between the design team and the modular contractor, Caledonian. This started with several factory visits to fully understand the opportunities and constraints of a modular system, and then intensive, coordinated design workshops to explore the optimal way to achieve the DfE performance criteria.

Schools

First MMC1 framework school & delivered through Covid Lockdown using HLM's digital services

MMC 1 with Reds10
Abbey Farm Primary School

At a glance

Client
Reds10

Location
Swindon

Services
Architecture, Interior Architecture

Value
£170k

HLM as partners to Reds10 were successful in gaining a place on the £3bn DfE MMC Framework in 2019. The tendering process was highly competitive and required close collaboration with the Reds10 team to design an off-site solution that demonstrated to the DfE the quality and adaptability of the design whilst maximising the pre-manufactured value (PMV) to both minimise time and on-site disruption and increase the cost efficiency.

A key strategy of the bid was to show that our solution can deliver the DfE baseline design without any derogations to either statutory or the DfE output specification requirements in all areas including, room adjacencies, the area schedule, daylighting and ventilation.

This together with utilising standard and repeatable details, whilst considering practical considerations such as module groupings for typical spaces, the size of modules for transportation/access to sites and the incorporation of heavily serviced 'core' modular units showed how the team had developed an enhanced off-site solution. A palette of materials was developed for a variety of façade treatments, each chosen to maximise the amount of off-site construction possible, while creating a robust and attractive aesthetic.

Abbey Farm Primary School is the first scheme via the framework, to provide a new 420 place school with nursery for Educate Together Trust in Swindon as part of a wider residential masterplan. The school engagement process was all done virtually from start to sign-off of design proposals, led by HLM using our consultation skills and digital tools during Covid 19 in May and June 2020, including the planning consultation with officers and residents.

HLM's design is an evolution of the framework solution that satisfies all the school specific requirements as well as the planning parameters for the school within the wider development, namely for the school to be a contemporary design, reflecting its status as the focal community building.

The next two schools via the framework for HLM and Reds10 have been identified and will commencing the school engagement process at the start of the autumn turn, whist Abbey Farm is in the detailed design and manufacture stages.

Hospitality, Leisure & Culture

Wokingham Borough Council's first Net Zero Carbon Operational (NZCOp) building.

Dinton Activity Centre
Wokingham


Credit: Dinton Activity Centre

Nominated - BCIA Awards 2021 - Carbon Net Zero Initiative of the Year
Nominated - Offsite Awards 2021 - Best Use of Volumetric Technology

Dinton Activity Centre is Wokingham Borough Council's first Net Zero Carbon Operational (NZCOp) building. It was built to replace the existing ageing building on the site. The building has many roles, acting as an activity centre, water sports centre and a teaching and meeting space. The council employed HLM Architects to undertake the design, and offsite specialist Reds10 to manage the construction.

As the borough's first Net Zero Carbon Operational building and given its role as a case study for future projects, it needed to be exemplar, showcasing how councils can provide real leadership on the climate issue as well as how embracing modern methods of construction can create a better development process from design to construction and performance in operation. Other key considerations were cost, quality and speed of delivery, as well as the need to minimise onsite disruption due to the landscape and an operational existing centre.

The environmental impact of this centre:

- Reduced by 50% through an increased use of natural ventilation, heat pumps, windcatchers and solar panels. The building now benchmarks extremely well against other similar buildings
- Sustainable features including windcatchers, photovoltaic panels on the roof and air source heat pumps
- 85% completed in the factory; 16 modular frames built offsite
- 60% less construction vehicle movement compared to traditional construction methods
- Offsite construction utilised recycled materials in manufacturing
- Enhance U-Values and air-tightness to assist with achieving Net Zero Carbon

Creating the development in a controlled environment means a higher quality standard. As a result, the project achieves higher U-values and air tightness and requires less maintenance and repair over the asset's life, than with other methods of construction.

The building's energy usage data will be monitored and reviewed, using Reds10's THRIVE building monitoring system, and the NZCOP can then be verified. Follow up reports detailing this verification of performance will be publicly released alongside lessons learned around the design.

Justice

Improving the balance of effectiveness, efficiency and affordability envisaged by the Prison Estate & Sustainability Strategy

HMP Five Wells
Wellingborough


Credit: Kier

Drawing on our custodial experiences from previous schemes at Addiwell, Peterborough, Forest Bank and Bronzefield, among others, we were able to make improvements to the operational function of the design, as well as efficiencies in construction methodology to form a new exemplar for roll-out by the Ministry of Justice (MOJ)

The design proposals were developed collaboratively with key stakeholders and the operational team to incorporate practical requirements of the design as well as the specific requirements of the prison cohort. The success of this project and the wider programme relies on an integrated approach that encompasses a DfMA Strategy, a Digital Strategy and Sustainability Strategy.

During the development of the design we have presented the use of offsite construction or DfMA. This is a radical re-think of construction methodology for the MOJ that provides opportunities for a more efficient delivery for future programmes of this scale. Working collaboratively with the main contractor, Kier, we agreed solutions that enable a more efficient delivery based on their technical expertise and understanding of the supply chain aligned to our experience of design for offsite.

At a glance

Client
Kier

Location
Wellingborough

Services
Architecture, Interior Architecture, Landscape Architecture

Value
£253m

Workplace

Embracing prefabrication to create quality, flexible working environments

HLM have been working with Elliott UK to provide modern, flexible solutions to the workplaces of today. The key points have been:

Mobile Workforce - Understanding how different roles and responsibilities influence task based activities.

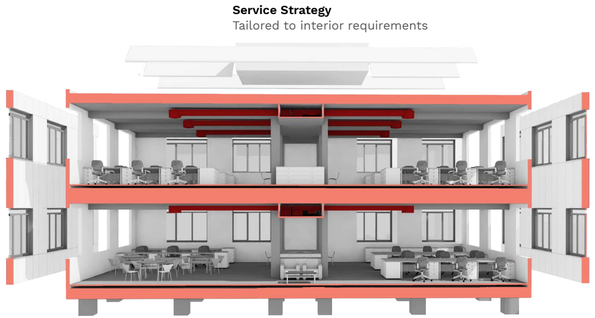
Agile Workplace - Adaptable, social workplace to accommodate differing behaviours.

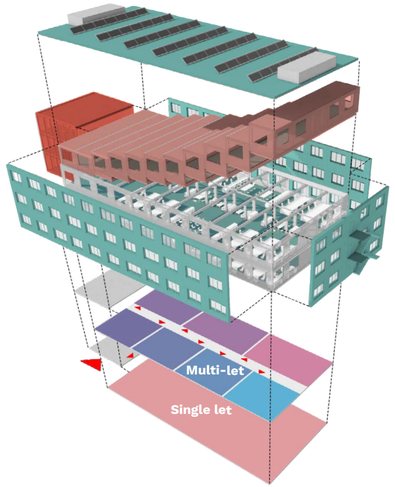
Sustainable Development - Creating the right environment to sustain business and buildings alike.

People First - Creating environments that nurtures and sustains talent.

Holistic Approach - Achieving mutually beneficial goals for both the individuals and businesses.

The Workplace with Elliott UK





Creating a new vision for heritage assets

HMS Nelson
Portsmouth

At a glance

Client
BAE Systems

Location
Portsmouth

Services
Architectural Design

Type
Refurbishment

Scheme Facts
Modernisation
Redevelopment
5no Grade II* Listed Buildings
Heritage at Risk Register
3 Different Development Options
26,000m2 Total Floorspace
7,000m2 External Landscaping
440no Junior & Senior Officer Beds
Officers Mess Provision
Off-site Manufacture
Commercial Catering

Value
Confidential

The Wardroom Relocation Assessment Study aims to resolve underlying operational deficiencies around the existing HMS Nelson and relocate within the historic quarters of the base. The existing Officer accommodation and social mess provisions cannot meet current or future personnel requirements. With over 50 heritage assets of Grade I, II* and II listings, many on the Historic England Heritage At Risk Register, falling out of use the scheme seeks a modern revival.

Following extensive consultations with multiple stakeholders and an initial viability assessment, the study captured three possible development routes up to RIBA stage 2 design. An uplift in capacity up to a maximum of 440 Junior and Senior Officer bed spaces support future projections through phased construction.

The Ropeworks building, once the sole production centre of the fleets ropes, becomes an enabler for future accommodation providing 400 bed spaces alone. Its current fabric remains as a shell making it ideal for insertion of sustainable Cross-Laminated-Timber offsite construction for a fast and reliable delivery, something not often possible for heritage assets. Restoration of The Parade Terraces makes up the remaining 40 bed spaces set aside for highest Senior Officers.

Concepts provide social spaces within the Old Fire Station - one of the original structures in the UK, along with an ideally located store with newly glazed courtyard atrium together created a new vision.

Utilising Cross-Laminated-Timber offsite construction for a fast and reliable delivery, something not often possible for heritage assets

Developing standard repeatable solutions that increase quality and certainty of delivery

Project SLAM
UK, Nationwide

At a glance

Client
Ministry of Defence

Location
Nationwide

Services
Architecture, Interior Architecture, Landscape Architecture

Value
£1bn+

Project SLAM (Single Living Accommodation Modernisation) is a national Functional Prime Contract awarded by the MOD to Debut Services (a joint venture partnership between Bovis Lend Lease and Babcock International) to deliver Single Living Accommodation to the armed forces service personnel. The contract is an example of the Defence Estates Prime Contracting initiative, delivering better value through collaborative working between the construction industry and the MOD.

Commencing back in 2003, Project SLAM is one the largest new build and refurbishment projects in the UK worth £1billion over 10 years and involves the upgrade/reprovision of over 19,000 bed spaces, together with utility and common areas and ancillary facilities for service personnel across the country.

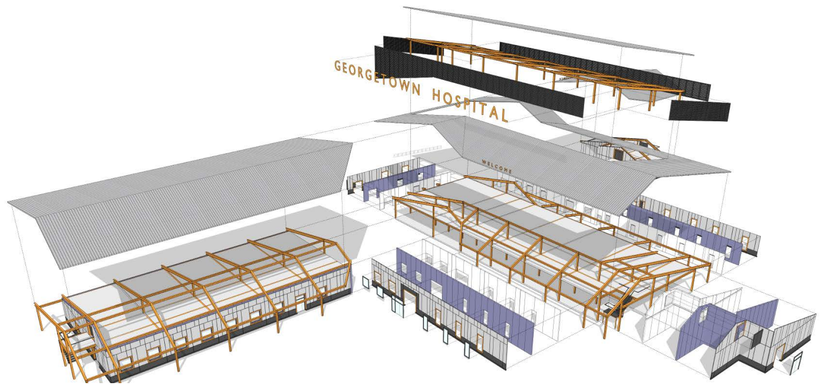
The SLAM project was set up to deliver the building programme in two distinct ways depending on the site and scales of the individual project: traditional construction with steel frames, dry lining, cladding and masonry and also modular construction which allowed for rapid completion of the works.

SLAM is better able to deliver value for money by utilising a standard model design. There is also opportunity with standard design and specification, to generate efficiency improvements from suppliers once they become familiar with the performance standards required. SLAM applies a combination of traditional onsite construction and modular offsite construction to suit the constraints of each site and to satisfy the challenging programme targets. However, to occupiers the form of construction is not apparent, as the fit out and finish of both traditional and modular versions is almost identical.

The improved living conditions have had a positive impact on recruitment and retention of service personnel with a consequential enhancement in operational effectiveness.

Maximum standardisation of components to reduce complexity onsite

Ascension Island Hospital
South Atlantic British Overseas Territory



HLM were appointed to review proposals for a fit-for purpose, cost-effective replacement to the current hospital, providing a full range of hospital services.

The approach involves maximum standardisation of components to reduce complexity onsite. The major advantages are:

- Reduction in the number of containers required for shipping due to the modularised components being far more space-efficient
- A large amount of the construction completed offsite and pre-assembled into flat panels;
- Reduced possibility of damage to components during shipping;
- Construction not requiring specialist skills, requiring a small group of contractors to complete on-site

The steel superstructure, foundation system, and base detail would be constructed on-site using pre-manufactured elements.

SFS infill would be constructed off-site and transported in small, easily handled assemblies. An insulated cladding system that combines the functions of insulation, weatherproofing, and cladding sheathing board would be pre-cut and easily fixed on-site to support a standardised rainscreen finish system.

At a glance

Client
Ascension Island Government (AIG)

Location
Ascension Islands

Services
Architecture, Landscape, MEP, Architect, Structures & QS

Value
£11.5m

State-of-the-art outpatients and medical training facility with a sustainable building solution

Ophthalmology and Clinical Skills Hull Royal Infirmary
Hull


Credit © Portakabin

At a glance

Client
Hull Royal Infirmary

Location
Hull

Services
Architecture, Interior Design

Value
£7m

Hull and East Yorkshire Hospitals NHS Trust needed a new state-of-the-art outpatients and medical training facility at Hull Royal Infirmary for up to 90,000 patients each year, as part of a £7m investment to help meet the increased demand for its services and replacing some out-dated buildings.

Key requirements for the project were to incorporate the structure of an existing two-storey modular ward block with new modules to construct the scheme; to minimise disruption to the adjacent hospital building, and to deliver the facility in the shortest possible time frame to the benefit of patient care.

A Sustainable Building Solution

In addition to its partially recycled structure, the scheme has a number of other sustainable features, including:

- A central atrium, which runs the full length of the building, maximising natural light and ventilation and reducing the reliance on artificial lighting whilst creating a high quality and welcoming patient environment
- Heating and hot water for the ground and first floor provided by an existing steam system
- Windows to all perimeter rooms to allow natural ventilation
- Movement and daylight sensors to control the high frequency lighting
- Air source heating and cooling pumps for the first floor
- Partial heat recovery ventilation
- Internal solar shading to every window to reduce heat gain
- Hard wood from sustainable, certified sources
- The modular approach ensured fewer vehicle movements to site and less material waste to further improve the building's carbon footprint.

Summary

We know there remains some way to go for MMC to become as acceptable and easy a solution as traditional construction, but there is no better time to start driving this change than now. We've already started, working with leading offsite providers to push the boundaries of design. Modular isn't about everything being the same, and MMC offers huge opportunities for sustainable development. Our work at Addington School and Dinton Activity Centre are just the latest examples of this.

Let's educate, collaborate and be brave – Think: Offsite.

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