

# A 10 YEAR CHANGE PROGRAMME

Developing offsite construction  
skills for the challenges ahead



# A 10 year change programme

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## Developing offsite construction skills for the challenges ahead

Recent estimates suggest that the UK's offsite construction sector accounts for seven per cent of total construction output, worth over £1.5 billion to the economy, but it has the potential to achieve much more. Key advantages of offsite construction are greater efficiency, sustainability and quality of the build process and 'cleaner' working conditions.

But research from the UK Commission for Employment and Skills (UKCES) found that the sector faces a number of skills barriers to realising its growth. These include the fragmentation of the sector, with a qualification offer considered inadequate by employers, and specific skills problems including:

- Little collaboration between professions in offsite construction
- Marketing and business development; combining technical knowledge with strong customer-facing skills
- Project management, particularly the interface between offsite and onsite activities
- Design and IT skills, covering the design, construct and operation of buildings

So in 2014, UKCES launched a 'call for innovation' through its UK Futures Programme, to identify new ways to address these problems. Five short term projects were announced in September 2014. Each of the five projects brought together offsite construction employers and partners to address skills gaps, by improving collaboration and providing better training opportunities for both new and existing workers. UKCES invested a total of £630,000 in these projects alongside employer contributions of over £660,000.

UKCES have produced this brochure to outline these five projects, and how they have each made progress in addressing the skills issues faced by the sector. The brochure also provides links and contacts, so you can take advantage of the progress made in understanding the nature of the skills challenge and the tools to tackle it.

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There is an opportunity for the offsite construction sector to embark on, in the words of one of our project leads, “a 10 year change programme” to ensure it has the skilled people it needs to fulfil its potential. We hope you are able to take advantage of the progress made by the projects and make the potential a reality.

## SUCCESSFUL PROPOSALS INCLUDED:

### **Skanska**

Creating an employer-led Offsite Management School

### **Laing O'Rourke**

Using a live site scenario to develop training solutions

### **Steel Construction Institute (SCI)**

Collecting good practice information to develop online learning and training opportunities

### **Edinburgh Napier University**

Creating a 'hub' to define and showcase skill requirements and encourage collaboration between profession

### **Buildoffsite**

Expanding an online comparison tool to evaluate onsite and offsite solutions at the early development stage

***Dr. Bill McGinnis CBE**, former Chair of McAvoy Group and former UKCES Commissioner. Whilst he was at UKCES, Bill was the lead Commissioner for the offsite construction productivity challenge, the first challenge within the UK Futures Programme.*



### Our solution

The UK Construction Strategy 2025 established three key challenges for employers in the construction industry:

- to construct infrastructure, building and homes that use 50% less CO2
- deliver projects in half the time
- reduce the cost of these assets over their operating lifetime by 33%

To meet these challenges, Skanska acted as the lead company, working in partnership with Action Sustainability, to create the employer-led Offsite Management School.

Using funding from the UK Futures Programme, the school offers online training, a resource library, free workshops and a self-assessment tool to help organisations to identify the skills they need to focus on to allow their business to address the 2025 Strategy challenges.

The School focuses on the five stages of the construction industrialisation process: digital design, offsite manufacturing, logistics, onsite assembly, and best in class maintenance.

To support this process the school concentrates on eight enabling management competencies to help businesses to build skills in these areas.

### HIGHLIGHTS AND SUCCESSES

Collaboration between prime contractors has produced significant market leverage to persuade supply chain companies to start their learning journeys.

*"If we can help the supply chain to embrace new tools and techniques, new skills and capabilities, then that will help ensure that they have a sustainable future."*

**Roger Bayliss, Executive Vice President, Skanska UK**

# What did we achieve?

The Offsite Management School is an online learning platform and was officially launched on 24 March 2015.

The school provides resources in a wide range of formats including e-learning, case studies and training workshops. All of the resources aim to increase knowledge and capability in 14 key competency areas:

- Offsite process
- Leadership and culture
- Collaborative planning
- Project management
- Marketing and business development
- Supply chain management
- Quality management
- Design: product and process
- Logistics
- Onsite process
- Best in class maintenance
- Change management
- Innovation
- Sustainability

Developed by leading employers, trade associations and academics, the training modules provide effective management of the offsite and onsite environments, as well as encouraging proficiency with the digital process covering the design, construction and operation processes to increase productivity.

## THIS PROJECT IN NUMBERS

**216** unique member companies

**297** individual learners

**61** company skills diagnostics  
(self-assessments) have been  
undertaken

**61%** of member companies are  
using personalised action  
plans to inform their  
development

*"We are backing the Offsite Management School because we value industrial sustainability. We also understand that taking a strategic approach in line with the government's strategy has the potential to strengthen supply chains and create the foundations for solid economic growth."*

**Mike Houghton, Managing Director, Siemens plc**

**WHAT CAN  
YOU DO?**

Come look at our School! Visit [www.offsiteschool.com](http://www.offsiteschool.com)  
Join the leadership group – contact Ian Heptonstall at  
[Ian.Heptonstall@actionsustainability.com](mailto:Ian.Heptonstall@actionsustainability.com)

# Laing O'Rourke

## Addressing Skills Deficiencies in the Offsite Construction Sector

### Our solution



This project researched skills issues which occur during the delivery of a “live” offsite construction project. Using a combination of real-time findings, feedback and lessons learned on recent other projects, Laing O'Rourke monitored, analysed and evaluated the delivery of a live project, and identified skills issues that are at the core of project delivery.

Through evaluating these activities and the interactions between the full project team and their supply chain - ranging from design, manufacture, logistics and onsite assembly - the project identified numerous areas where skills gaps exist, specifically relating to working on offsite manufacturing solutions, where many tasks and activities take place concurrently.

The project then developed learning modules focusing on developing these specific skills required for Offsite Construction – with a view to sharing the lessons learnt across the industry.

### What did we achieve?



*“The project helped identify the skills gaps and training needs in a live project environment and has been crucial in developing e-learning training modules that will provide a greater understanding of offsite construction.”*

**Alan Clucas, Director at Explore Manufacturing, LOR Group**

The live research project identified challenges across the whole delivery chain with a key element being the understanding of the impact and requirements when working on a major offsite construction project. These challenges included the management of logistics, as well as having the whole project team with mixed experience of working in an offsite construction project.

Learning modules were created and adapted to enable better knowledge between all parts of a business and its supply chain to improve its ability to work on offsite manufactured projects.

The learning modules are focused on: Understanding Design for Manufacture and Assembly (for Operatives, Construction Professionals or Design Partners), understanding Offsite Construction logistics (for people involved in moving components), and Lifting & Moving for Offsite Manufacturing and Onsite Assembly (for Construction Operatives).

A document looking at how skills deficiencies can be researched through a live project approach has also been written.

## HIGHLIGHTS AND SUCCESSSES

- The live learning approach allowed for changes in processes to be implemented during the development of the training materials. These changes had immediate impact by cutting delays, improving ways of working and reducing waste.
- The learning gained from the live research was more current and relevant to skills gaps than historic lessons learned approach. When a project is finished it is difficult to focus on the challenges - these are much better captured at the time they happen.

- Laing O'Rourke are working closely with CITB to look at existing training provision and with education providers to see how offsite can become more an ongoing part of construction education.
- Further e-learning modules are being developed, which will form a suite of learning material that will be part of the induction process for anyone moving onto an offsite construction project. This induction will include supply chain partners as well as stakeholders.

**WHAT CAN YOU DO?**

Look out for the learning modules being developed via CITB, and visit [www.laingorourke.com](http://www.laingorourke.com)

# Steel Construction Institute

## Best Practice Guidance and Management Training for Light Steel and Modular Construction

### Our solution



The technologies of light steel and modular construction are growing and developing, and companies are tackling larger and more complex projects. The industry has recognised there is a need for best practice information for the supply chain, including specifiers and checking authorities, and better training for site managers.

SCI's project sought to address these information needs through the preparation of practical best practice guidance and the creation of training and education resources.

The project aimed to help those working in these innovative areas to raise standards throughout the supply chain by collecting and sharing good practice information on different construction systems, as well as designing training and guidance on site management.

The project was also designed to improve collaboration between the different professionals involved at each stage of the design and construction process.

*"The best practice project with UKCES has been extremely beneficial for the light steel offsite sector and has provided an opportunity for those involved in offsite construction to collaborate generally across all material sectors."*

**Andrew Way, Associate Director, SCI**



### THIS PROJECT IN NUMBERS

- 1050** sets of best practice information sheets disseminated to the construction industry
- 482** visitors to best practice resources on the Light Steel Forum website
- 76** individual companies consulted during development and testing of project resources

# What did we achieve?

Four best practice guides have been launched to help site supervisors and project managers to improve efficiency on site and reduce waste, through being better informed about the whole construction process.

The best practice information sheets have been printed and circulated to the offsite construction sector through the members of the Light Steel Forum. Members of the forum have distributed these information sheets to relevant parties involved in live projects (main contractors, installers and specialist sub-contractors).

Initial feedback has been extremely positive as users have a fuller understanding of the offsite steel systems.

The project also created and trialled an accessible sector-wide online learning solution in the form of a Virtual Learning Environment (VLE), using learning materials developed with the University of Surrey.

## HIGHLIGHTS AND SUCCESSSES

- Users of the information have gained a more complete understanding of light steel framing and modular construction, as well as now being able to appreciate the implications and benefits of using these technologies for other parts of the construction project process.
- The members of the Light Steel Forum are committed to developing further guidance information and additional

best practice information sheets for the benefit of the steel offsite construction sector.

- Virtual Learning Environment (VLE) information will be made available more widely, with the expectation that a certification scheme will be available for people who successfully complete the online training.
- Plans are now in place to expand the range of information available into a range of areas, including modular construction.

**WHAT CAN  
YOU DO?**

Check out our best practice guides!  
[www.lightsteelforum.co.uk/best-practice](http://www.lightsteelforum.co.uk/best-practice)

# Edinburgh Napier University

## Offsite Construction Hub

### Our solution



Edinburgh Napier University created an Offsite Construction Hub in collaboration with Heriot-Watt University, Stewart Milne Timber Systems and CCG Construction Group.

The hub acts as a centre of expertise. It is responsible for defining skill requirements, delivering innovative offsite solutions and showcasing Scottish offsite construction, striving for industry-wide high standards. It also promotes and encourages collaboration between the different professions within construction. This ensures companies across the industry have an understanding of the interaction between design, engineering, manufacturing and construction.

Working with partners, Edinburgh Napier University also developed practical and interactive learning materials which could be used to upskill the workforce across the sector. These provide high level training on managing and delivering offsite construction projects.

### THIS PROJECT IN NUMBERS

The event, "The Future of Construction in Scotland - Build Offsite", had an audience of over **100** delegates, helping to raise the profile of the project and test some of the learning content being created for feedback.

Through its outreach events, the project engaged at least **200** employers, gathering a broader sector understanding which enabled the training material to be developed with wider applicability.

*"It is essential that developments taking shape on projects around the country are connected to the academic capability and innovation in our higher education sector as this will ensure that an innovative culture pervades our industry."*

*"The role of the Innovation Centre is to transform that mindset and ensure innovation becomes business-as-usual, creating a sector that is sustainable and one that generates greater economic impact for Scotland."*

**Ed Monaghan, Chair of Construction Scotland**

# What did we achieve?

The Offsite HUB created learning modules, based on a skills audit for both offsite and onsite assembly. This was done through a collaborative project with two competing organisations that otherwise would not have worked together. They also developed a general guide to offsite construction linked to interactive materials online.

The project partners also collaborated to hold an event in November 2014, which focused on innovations in construction and offsite manufacturing.

## HIGHLIGHTS AND SUCCESSES

- The project provided a good example of collaboration between an academic intermediary and construction industry employers, showing that competitors can work together effectively, particularly if brought together with a third party.
- Following this success, the hub concept is to be taken forward by the Construction Scotland Innovation Centre (CSIC) which was set up at the same time this project was developed.
- CSIC will provide a 'one-stop shop' for accessing expertise and support to all construction-related businesses across Scotland. Edinburgh Napier University will continue to be

involved as academic experts and as members of both the governance board and technical advisory group.

- Funding has been agreed to move the Offsite Hub forward. This includes developing a strategy for Internationalisation via a workshop with North American industry partners working with the University of Utah.
- Some industry partners have also implemented training academies as a result of this project.
- The Royal Institute of British Architects are hoping to endorse the skills material and associated publication and send it to their 44,000 members.

## WHAT CAN YOU DO?

The "Building Offsite : An Introduction" report and videos from the "Future of Construction in Scotland - Build Offsite" event in November 2014 can be downloaded from: [www.cs-ic.org](http://www.cs-ic.org)

# Buildoffsite Comparator project

## Our solution

Created by Buildoffsite, Comparator project is an online tool used to compare the sustainability and whole-life costs of offsite and onsite solutions.

Expanding on the functionality of an existing web-based tool, CombiCycle, the tool aims to give a fair and objective comparison of the two methods, allowing for comparison of costed, sustainability rated offsite assemblies, instead of individual components.

Information on the whole-life cost and sustainability for offsite solutions was generated by real-life projects, and extensive consultation with employers and industry professionals was carried out to ensure realistic and accurate evaluations.

Comparator can be used at the earliest possible stage - encouraging employers, surveyors, architects and engineers to consider offsite alternatives before committing to design solutions.

### THIS PROJECT IN NUMBERS

- 4 live case studies
- 4 Professional Institutions represented on Steering Group
- 11 Reporting centres for cost and sustainability
- 13 Output Review options

*"Not surprisingly my vision of a modern productive construction industry anticipates a substantially increased role for the design and construction process to accept and indeed demand that the starting point in any new build project should involve the optimisation of offsite construction methods.*

*"I do not want this shift in practice to be driven by government requirement. I want it to be driven by the availability of offsite solutions that demonstrably offer better value, take cost and waste out of the construction process, whilst enabling quality design and cost of ownership performance that is both honest and accurate."*

**Richard Ogden, Chair, Buildoffsite**

# What did we achieve? ←

The prototype model for the online tool has been developed and is now undergoing field testing and due diligence before commercial release.

The project has successfully incorporated access to BIM libraries and manufacturers' websites as well as linking to the Green Guide to Specification giving added value to the tool.

## HIGHLIGHTS AND SUCCESSES ←

- The tool makes it easier to measure the full cost of offsite construction opportunities at an early stage in the design development process, helping employers to meet the challenge of the government's 2025 Construction Strategy.
- Case studies have shown the considerable impact of offsite solutions on time and cost together with potentially more sustainable and energy-efficient solutions.
- The educational version of the model will be launched at the Buildoffsite exhibition in October, providing valuable insight for students in universities, free of charge.
- The commercial version of the program is being populated with additional construction specifications, with work in progress to allow more suppliers to include details of their products in Comparator appraisals.

*"The Comparator project enables employers and their consultants to review the whole-life cost and sustainability implications of alternative construction solutions at an early stage in the design process before people get wedded to solutions which preclude the efficiency of different approaches."*

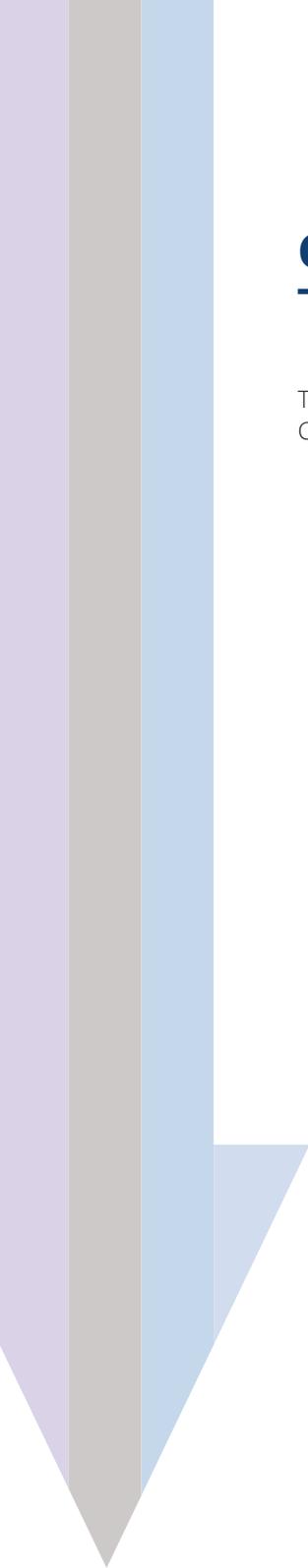
***Bernard Williams FRICS, Managing Director, IFPI Ltd***

**WHAT CAN  
YOU DO?**

Contact us to send in your cost data and try out the tool!

Email [bernardw@int-fpi.com](mailto:bernardw@int-fpi.com)

# Conclusions



Through working with these five collaborations, the UK Commission for Employment and Skills found:

- ➔ The scale of the skills challenges are greater than can be addressed through 6 month projects, but there is a sense of being at the start of a longer, **'10 year change programme'**, to make a real difference.
- ➔ The outputs have the **potential to address the challenges**, having been developed and tested with the audience, partners and experts.
- ➔ The fragmentation of the sector may not be fixed, but it is clear that **collaboration has grown** within the projects and across, which provides a basis for further and wider collaboration.
- ➔ There is the opportunity to build on this collaboration and improve the **qualification offer**: through the Innovation Centre in Scotland, Apprenticeship reform in England and using a consistent language for the sector with Higher Education to influence their provision.
- ➔ Some employers observed that **technological enhancements risked running faster than skills development** (and the ability of educators and clients to keep abreast). Educators and businesses must work together more closely to ensure innovation can be capitalised upon to enhance growth and productivity in the sector.

# What should you do now?



## As a Sector

There is a clear need for **industry leadership** to capitalise on the opportunities afforded by the industrialisation of the sector. How can you play a part in that leadership? Simply speak to the contacts within this brochure.

Employers, working with each other and with their employees and trade unions, should raise the bar on skills in sectors, regions and supply chains. **Collaboration** is vital to building the skills needed for competitiveness.

## In your own business

### *Don't have a skills gap? Think again!*

Employers involved in the projects found they had **greater skills gaps than realised** but were able to take corrective action. Can your people deliver your business ambition? Do they have the skills you need? Did your last job go as well as it should have? Is your current job progressing smoothly and are you actively reviewing it to find out? Reviewing processes on live projects can be really effective at identifying misunderstandings that can cost money!

### *'What if I do have a skills gap? What do I do?'*

The contacts and links in this brochure are hopefully a start. Management skills, operational skills, and developing contextual understanding of the offsite construction sector are all areas which have been progressed through these projects. CITB are also a good starting point for existing standards and provision. Talk to someone!

### *'We're only as good as our suppliers...'*

So work with them and support them! The projects here provide some great examples of how that can be done – through the leadership shown by prime and Tier 1 businesses.

Contact details for all the projects and their outputs are provided in this UKCES brochure – **could your firm benefit from some of the learning and embark on the "10 year journey"?**



The UK Commission for Employment and Skills (UKCES) is a publicly funded, industry-led organisation providing authoritative leadership on skills and employment issues across the UK.

For further information, please:

- visit [www.gov.uk/ukces](http://www.gov.uk/ukces)
- email [enquiries.futuresprogramme@ukces.org.uk](mailto:enquiries.futuresprogramme@ukces.org.uk)
- or call 01709 774 800

