



# Innovation and Offsite Construction

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06.02.18



# Innovation Centres

Supported by The Scottish Funding Council,  
Highlands and Islands Enterprise and  
Scottish Enterprise.



Scottish Funding Council  
Promoting further and higher education



Highlands and Islands Enterprise  
Iomairt na Gàidhealtachd 's nan Eilean



Scottish Enterprise

# our role...

CONSTRUCTION  
SCOTLAND  
INNOVATION  
CENTRE



**champion  
innovation &  
connect Scotland's  
construction  
industry to deliver  
transformational  
change**











# CSIC access to...

## expertise + funding:

networks of leading experts / coordination of partners  
investment funding / collaborators + networks

## projects + awareness:

workshops + events / live build projects / BIM programme  
calls + initiatives / hubs / local + international

## facilities + training:

prototyping + testing / skills development / training / CPD  
exploratory workshops



Universities  
Scotland



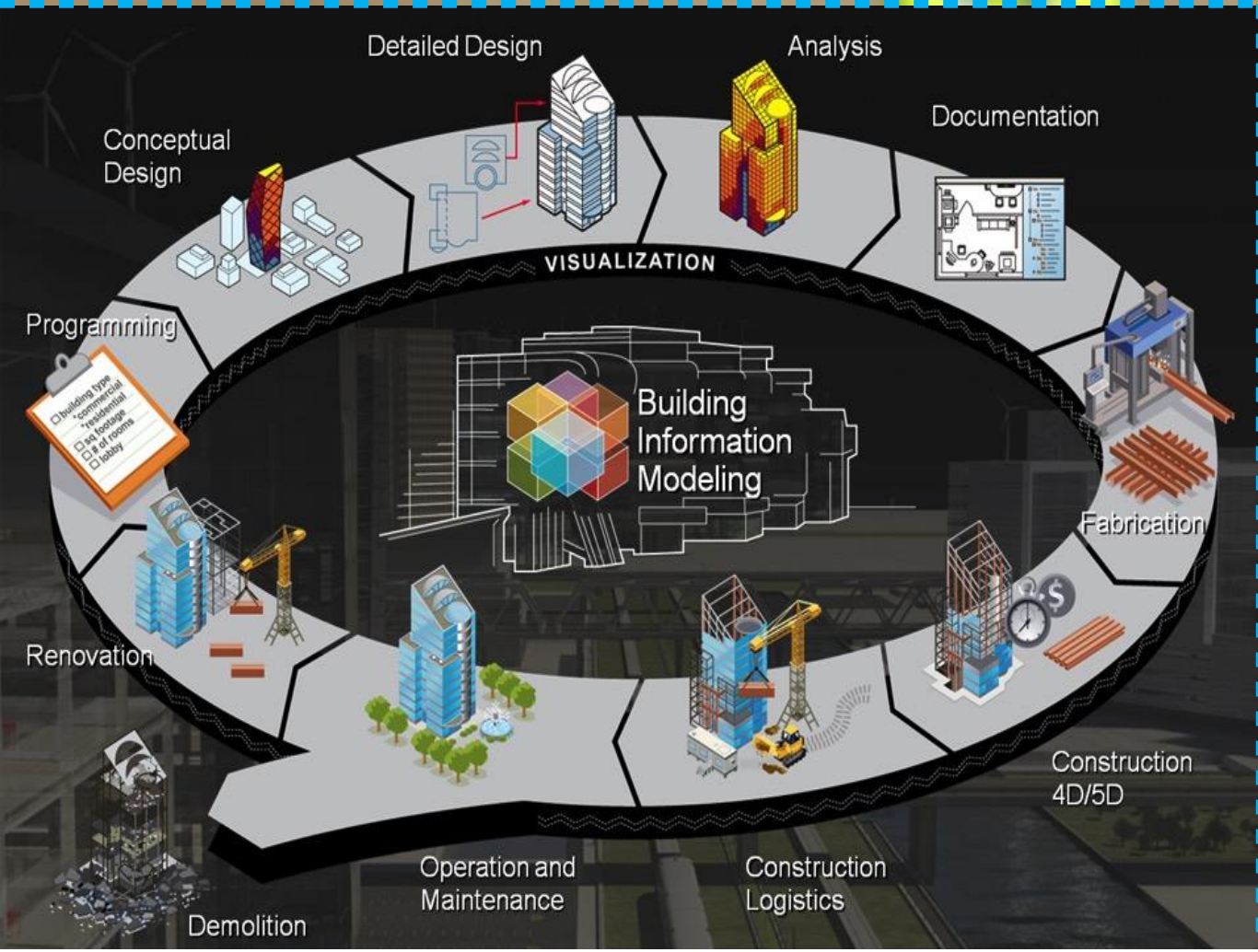
UWS UNIVERSITY OF THE  
WEST of SCOTLAND

THE GLASGOW  
SCHOOL of ART



University  
of Glasgow





TECH/IOT/BIM/MOBILITY









ENERGY & ICT





AR / WEARABILITY / ROBOTS





ADVANCED CONSTRUCTION



# industry priorities...

## culture + behaviour:

Innovative / Collaborative / Opportunity Focused / International  
Diverse Talent Pool / People Focused / Improved Image

## productivity + efficiency:

Offsite Manufacturing / More for Less / DfMA / Resource Efficient  
Speed & Quality / Mass Customisation / Lean / Skills & Training

## technology + data:

Automation / AR+VR+MR / Advanced Analytics / Digital Processes  
Robotics / Transferable Technologies / Early Adoption



# Project examples...

**Housing associations**

**Offsite construction**



# Offsite Solutions Scotland

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## Challenge

Establish Scotland's offsite sector as a world leading cluster of experts delivering advanced pre-manufactured building and infrastructure solutions

## Project

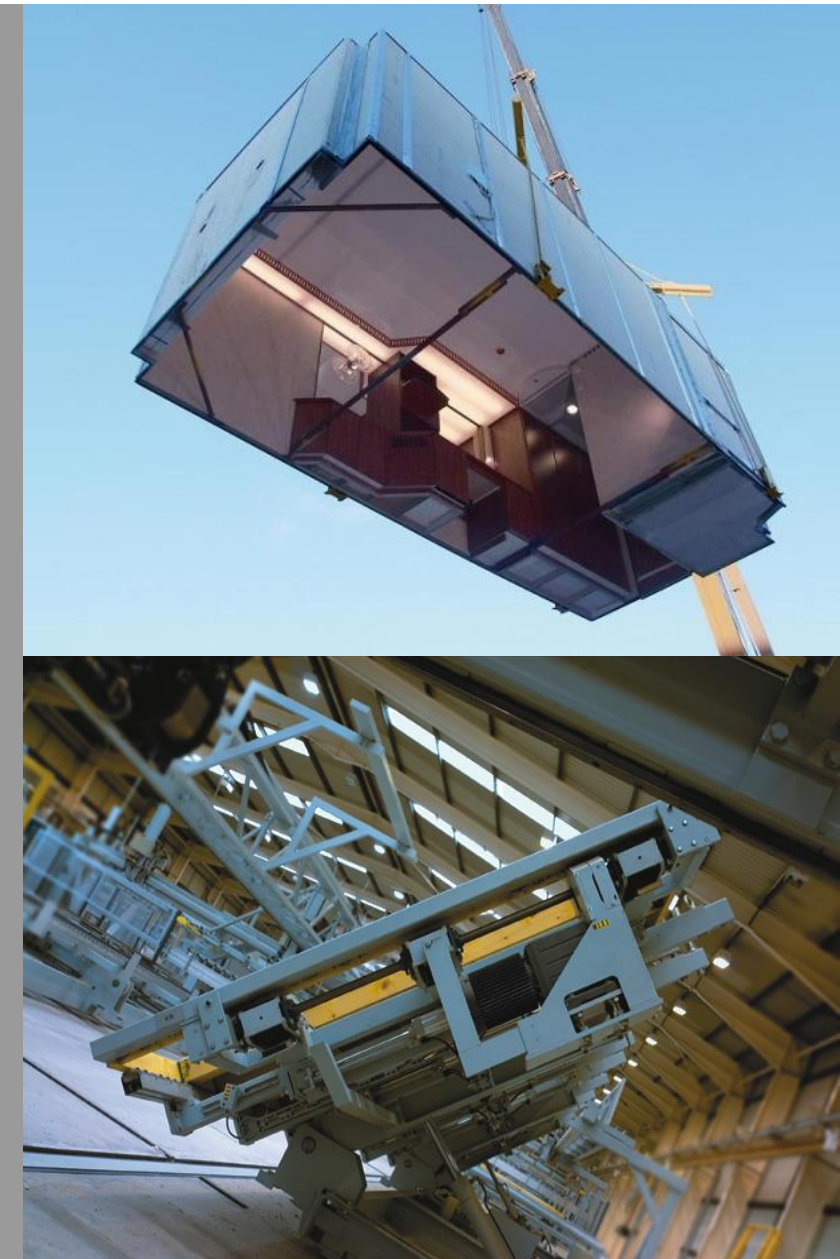
Support a formal collaboration partnership between 10 leading offsite manufacturers sharing R&D, training needs and developing best practice

## Outcomes

- A common approach to skills & training identification and development
- Collaborative technical R&D projects
- An integrated, sector wide marketing & communications strategy

## Support

- Total Project Value           £129,000
- CSIC Funding                 £ 20,000
- Project Duration             May 2017 - May 2018





# Healthy Buildings Project

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## Challenge

Develop a digital & data driven culture of improvement by embedding Building Performance Evaluation (BPE) processes within standard project practices

## Project

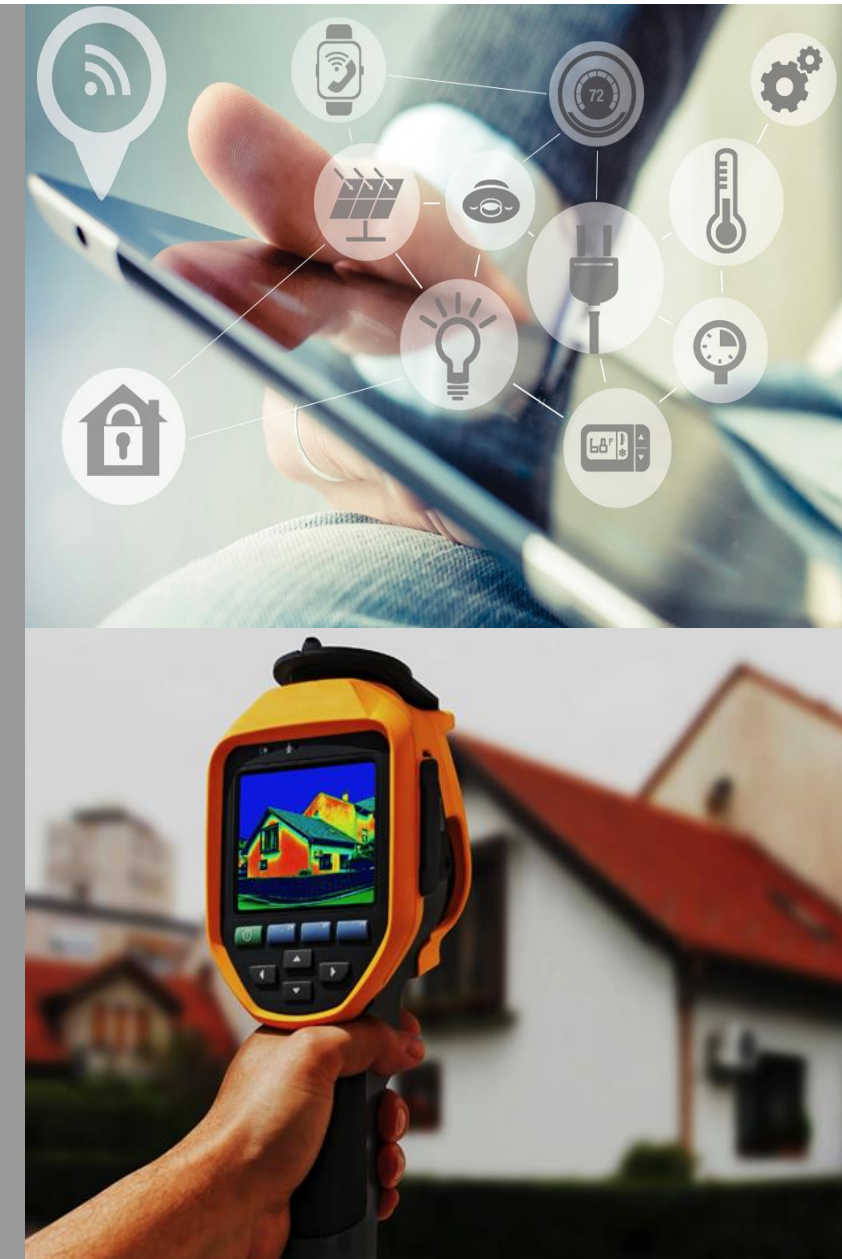
Utilising a live exemplar case study project, showcase how BPE can be successfully deployed to drive improvements in design and construction

## Outcomes

- Stimulate the practice of mainstreaming BPE within the construction industry
- Develop better quality and performance in design and construction
- Provide data that can lead to evidence based solutions for future projects

## Support

- Total Project Value           £35,619
- CSIC Funding                 £14,258
- Project Duration             October 2016 - June 2017





# The Emotional Gym

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## Challenge

Develop new housing solutions for over 60's that allow residents to live independently in their homes for longer

## Project

Pilot the use of building integrated and wearable technology within the retrofit of a high-rise development to encourage ongoing physical and mental stimulation

## Outcomes

- Tenants are more active and remain in their homes for longer
- New uses for under utilised spaces within high-rise buildings identified
- Technologies deployed within buildings to support independent living

## Support

- Total Project Value           £49,388
- CSIC Funding                 £19,755
- Project Duration             January 2017 - July 2017





# CLT Pilot Project

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## Challenge

Scottish Timber is not currently used to manufacture Cross Laminated Timber (CLT) components but could be if commercially viable and regulation compliant

## Project

Construct Scotland's tallest CLT building and evaluate the technical performance to inform future opportunities for home-grown CLT production

## Outcomes

- Delivery of the tallest CLT building in Scotland
- Robust evaluation data on structural, fire and acoustic performance
- Commercial evidence to support the manufacture of home-grown CLT

## Support

- Total Project Value           £606,195
- CSIC Funding                 £ 59,855
- Project Duration             January 2017 - November 2017





# Improved Indoor Air Quality for use in Airtight Dwellings

## Challenge

Trickle vents are proven to be ineffectual for delivering adequate indoor air quality, increasing CO<sub>2</sub> levels. An opportunity exists for a better solution

## Project

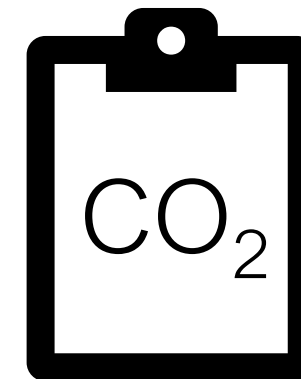
Design and test a technology enhanced natural ventilation solution within a live construction project, which is then monitored during a period of resident occupation

## Outcomes

- 1 new ventilation product
  - 2 new services
- 4 jobs safeguarded & 1 new job created

## Support

- Total project Value £27,000
  - CSIC Contribution £10,000
- Project Duration October 16 - June 19





# Offsite Manufactured Modular Roofing System

## Challenge

The timber roof truss market is mature and consequently new products such as roof panels or modular roof systems are gaining market share rapidly

## Project

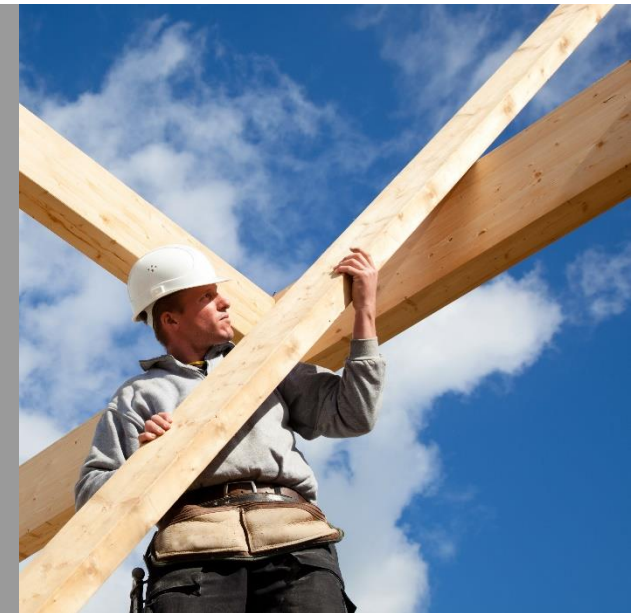
Development of a modular roofing system that can be mass customised, is cost competitive and reduces the likelihood of working at height accidents

## Outcomes

- The development of a modular system, improving speed and quality of build
- An additional 50 jobs planned to be created by 2020 between the company and the supply chain
  - On-site waste reduced from 20% to 3%

## Support

- Total Project Value £308,000
  - CSIC Funding £58,000
- Project Duration October 2016 – January 2018





# Scotland's First Off-site Manufactured Gold Standard Housing Development

## Challenge

With Scotland facing an acute affordable housing shortage, the use of volumetric construction lends itself to providing affordable and sustainable homes within benchmark housing association costs

## Project

48 new homes were built offsite using volumetric techniques - a first for this scale in the affordable sector. Whole life cycle costing, building performance & post occupancy evaluation

## Outcomes

- Delivery of Gold Standard sustainable quality housing with high thermal performance built in a significantly reduced timeframe at an affordable cost. Conventional construction times could readily be reduced by 50% a unit

## • Support

- Total project value £130,000
- CSIC contribution £61,000
- Project Duration November 2015 – April 2017







# The Innovation Factory





The background image shows a vast industrial manufacturing space, likely a factory or workshop. It features a high ceiling with a complex network of yellow overhead cranes. The floor is filled with various pieces of industrial machinery, including what appears to be a large metalworking machine in the foreground and several conveyor systems. The overall atmosphere is one of a modern, large-scale manufacturing environment.

the UK construction  
industry's first dedicated  
digital manufacturing,  
prototyping &  
future skills  
“centre of excellence”

Andrew Wolstenholme  
CEO, Crossrail / Chair, CLC

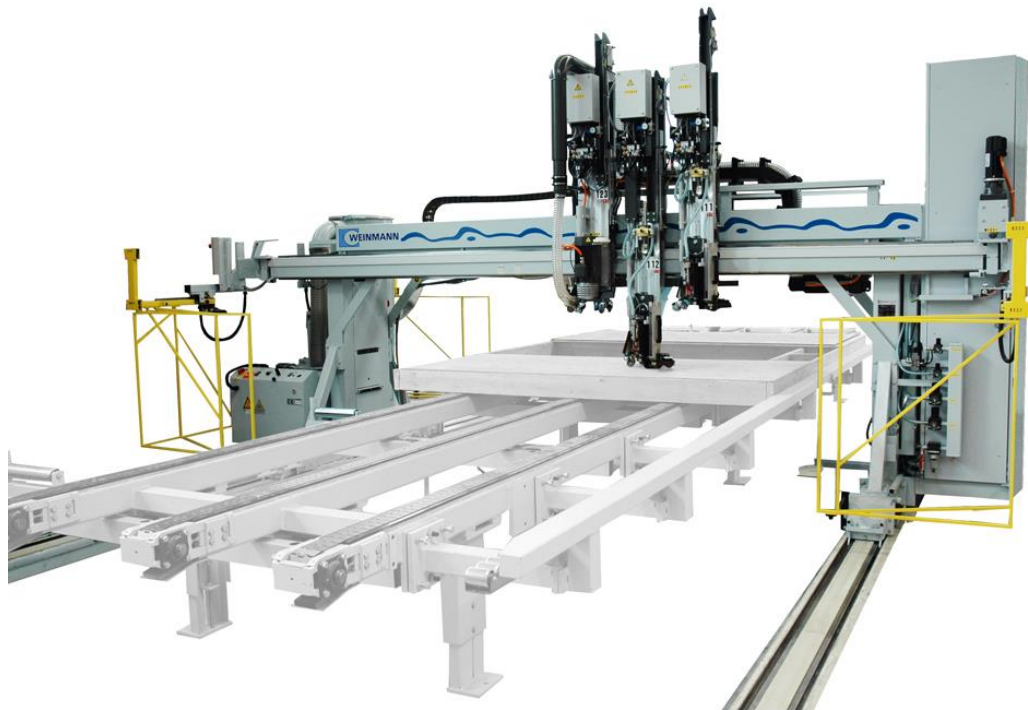




**Robotics**



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**WEINMANN**



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# Cross Laminated Timber





# Opportunities to access...

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## MEMBERSHIP PACKAGES

## INNOVATION FACTORY

CSIC is an industry-led, demand-driven Innovation Centre connecting Businesses; the Public Sector and Academia to deliver transformational change in construction.

Our new 35,000 sq ft. Innovation Factory in Hamilton helps construction related businesses:

**Develop** | We provide space, equipment and support for businesses and academia to develop new products, processes, business models and services.

**Demonstrate** | We provide space and equipment for businesses and academia to trial new technologies and showcase innovations.

**Disseminate** | We provide conference, meeting and training space for businesses and academia to share knowledge, learn and collaborate.

### EQUIPMENT

A range of product development, manufacturing, robotics and visualisation equipment are available. These can be hired on a Pay-As-You-Go basis or as part of an annual membership package.

## DISCOUNTED EQUIPMENT HIRE

### MEMBERSHIP BENEFITS:

- An allocation of credits for members to redeem against a wide range of CSIC products and services:
- Discounted equipment hire accompanied by technical and supervisory support
- Training workshops
- Information Events
- Access to the Innovation Factory – an inspiring venue to hold meetings and collaborate with colleagues, partners and academics in the heart of Scotland
- Incubation and Hot Desking facilities at the Innovation Factory
- Ability to purchase additional credit bundles at discount rates (see overleaf)
- Opportunities to exhibit at CSIC events throughout Scotland & within the Innovation Factory
- Dedicated business support to assist your organisation grow, innovate and reduce costs
- Profile on CS-IC.org and ability to share your organisation's news via our website
- Monthly newsletter - funding; partnering; business opportunities; initiatives and events
- Recognition as an industry leader and innovator



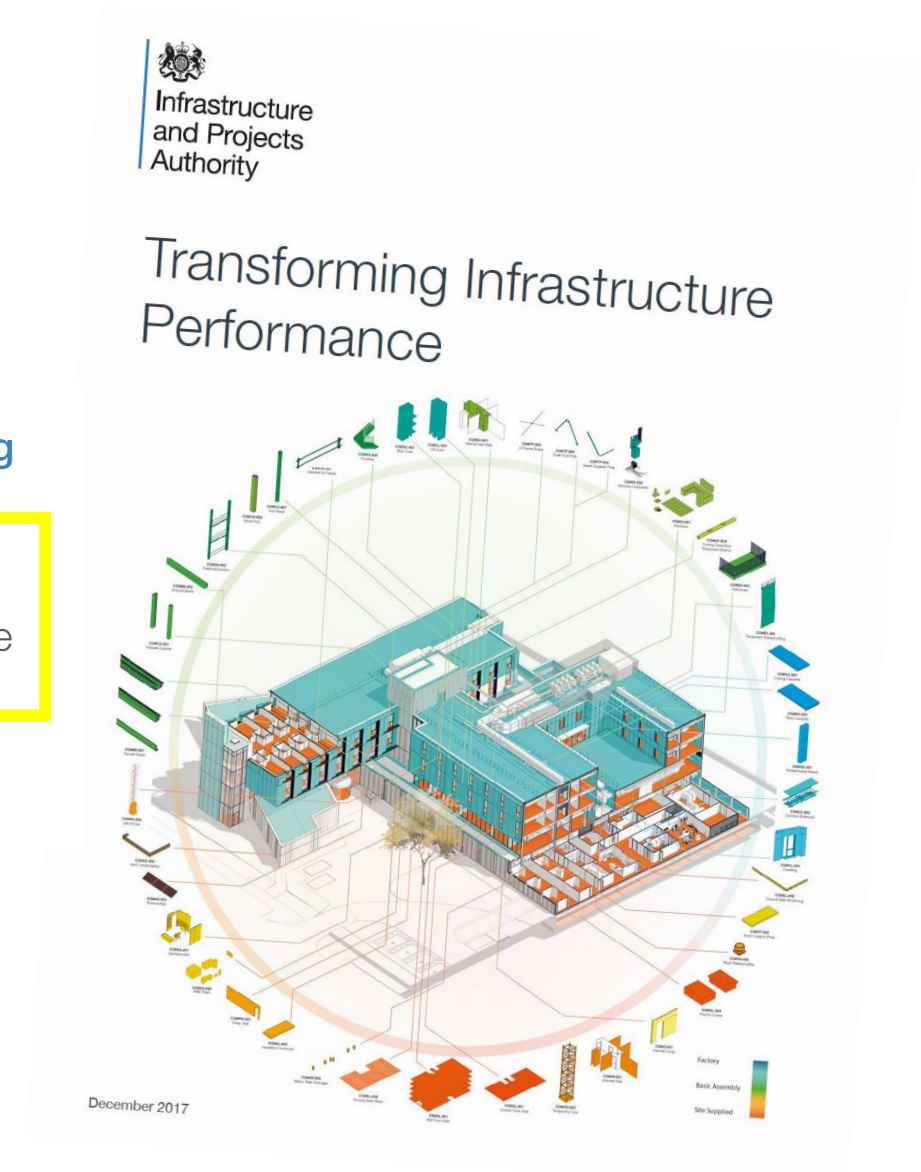
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# Coming up...

- More innovation support for HAs
- Technology & innovation strategy for HAs
- Policy context

The government responded to these challenges in Autumn Budget 2017 by committing to use its purchasing power to drive adoption of modern methods of construction, by **creating a large and stable pipeline**. Five departments – the Department for Transport, the Department of Health, the Department for Education, the Ministry of Justice, and the Ministry of Defence – will adopt a presumption in favour of offsite construction by 2019 across suitable capital programmes, where it represents best value for money. This will complement the measures to be taken as part of the Construction Sector Deal.





# get in touch...

- ✓ Offsite construction
- ✓ Innovation projects
- ✓ Access or visit the factory

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@CScotlC



construction scotland innovation centre

