

# Uplifting the Performance of Healthcare Infrastructure by MiC- the NHS Model

CIExpo 2019 –  
International Conference on MiC

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- **Executive Director, Healthcare, AECOM**
- **NHS Executive Director**
- **UK Govt Infrastructure Projects Authority (IPA) Review Team Leader (For high risk, high value or innovative major projects)**
- **Gold commander – Five Hospitals including major trauma centre**
- **NHS Construction Project Director**
- **Nurse**

# AECOM by the numbers

87k

People



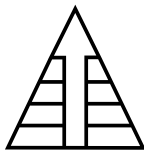
7

Continents



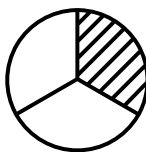
US\$20.2B

FY 2018 revenue



US\$6B

Market cap\*



#157

Fortune 500



Featured on  
**Fortune's "World's  
Most Admired  
Companies"**  
five years in a row

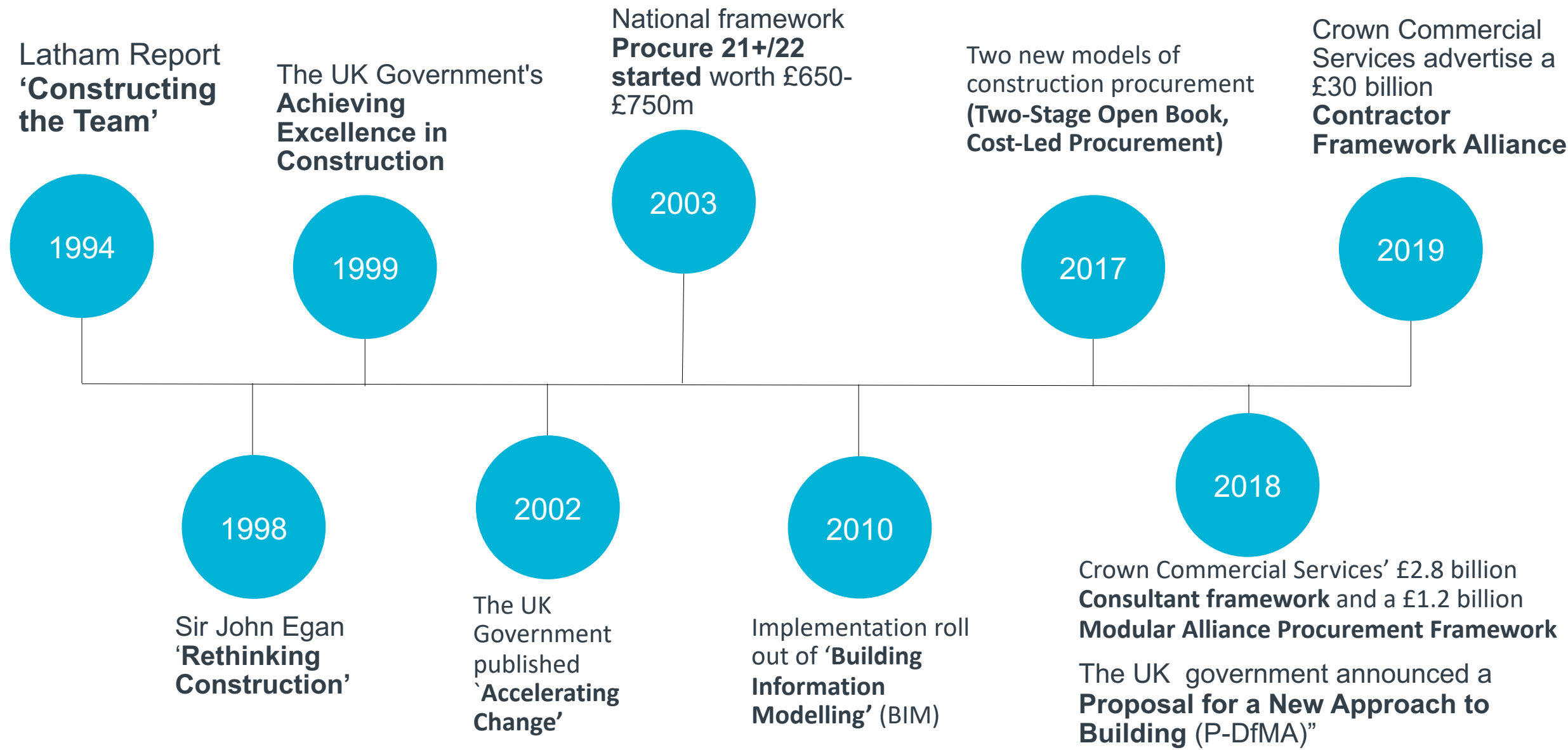
**Ranked #1** in  
Transportation and  
General Building in  
**Engineering-News  
Record's** 2018 "Top 500  
Design Firms"

Recognized by  
VIQTORY as a 2019  
**Military Friendly®  
Gold Employer**

Received a perfect score  
on the **Human Rights  
Campaign Foundation's**  
Corporate Equality Index

\*As of October 2019

# Background and History



# Benefits of MiC in the NHS



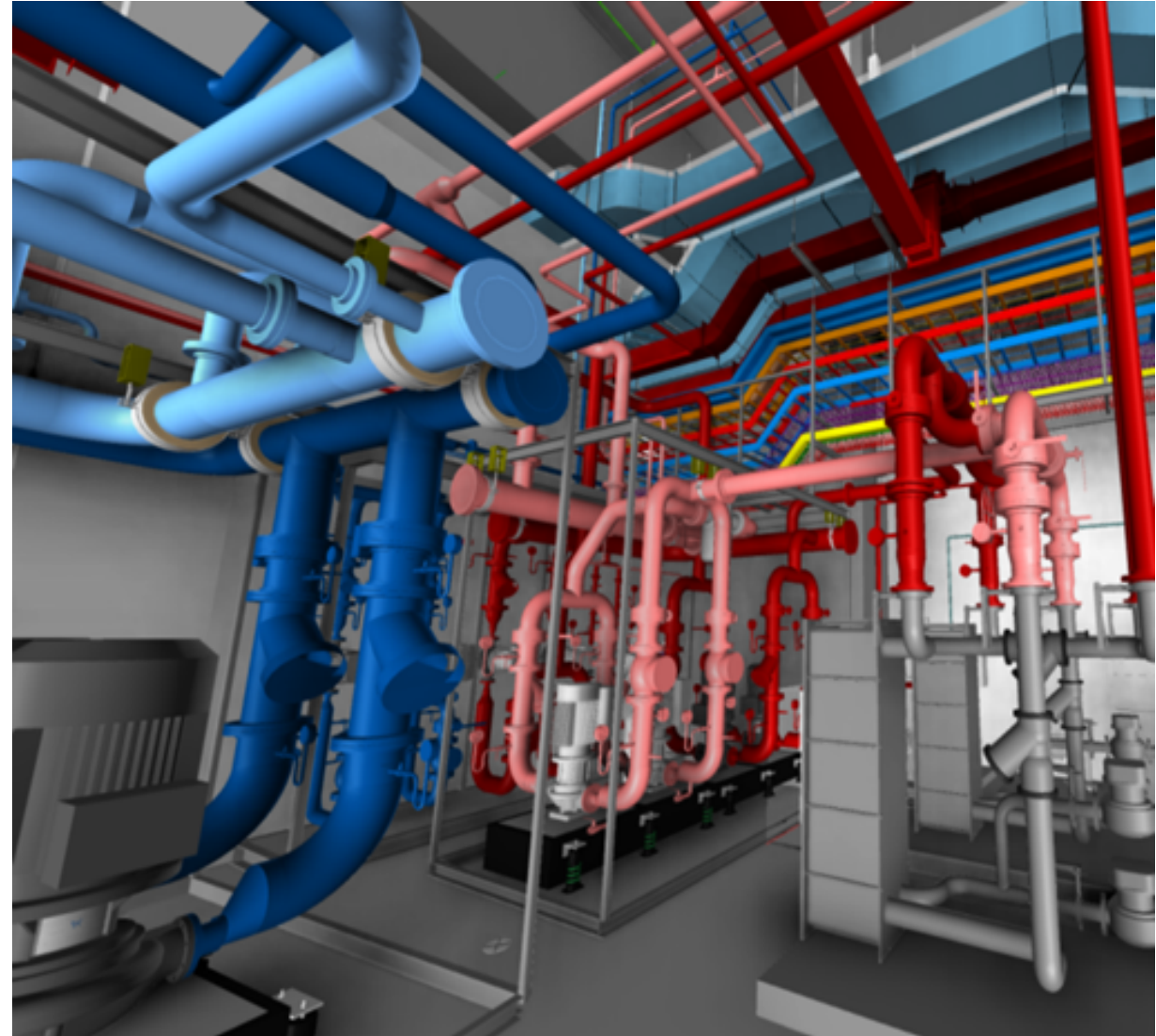
- Helps with managing demand and capacity (surge) issues
- Healthcare services are run without unnecessary impact 24/7
- Less impact to 'live' operations
- Can install at off peak times
- Deliver faster than traditional onsite construction
- No waste
- Variety of clinical layouts available
- Across healthcare sectors acute, primary care and mental health
- Life expectancy of the buildings approx. 70 years
- Ability to adapt the facilities to meet clinical changes and
- Re use the facilities for another service, particularly useful in decanting clinical/admin services

Through.....

- Purchasing
- Purchase and sale back
- Short term hire
- Leasing

# Barriers to adopting MiC in the NHS

- Nervousness about effectiveness, robustness, appropriateness of the construction method
- Need to engage with suppliers upfront & impact on procurement
- Lack of experience of specifying the output
- Lack of confidence in the product/components etc
- Lack of knowledge and awareness
- Digital skills and experience of the client



# Use of MiC & the NHS

## — Initially...

- Temporary wards and theatres
- Standard rooms e.g. bathrooms, bedrooms
- Standard components

## — Then....

- Community facilities such as Family Planning clinics
- GP surgeries
- Mobile MRI's
- Hospital Wards.
- Clinical Departments.
- Doctor's Surgeries.
- Surgical Theatres and Operating Rooms.
- Modular Office Spaces.
- Reception Areas.
- Clean Rooms

## — Now..

All of the above plus

- Hospitals
- Pharmacies

## Division/ Combination of Volumetric Precast Units

| TYPE (Example)                                 | Max Width (m) | Max Length (m) | Standard Height (m) | Approx. RC Weight (Tonnes) |
|--|---------------|----------------|---------------------|----------------------------|
| Divided Volumetric Precast Unit 1 & 3 or 2 & 4 | 3.0           | 2.5            | 2.8                 | ~10                        |



### Application of MiC in healthcare:-

- Consultation Room
- Interview Room
- Toilets
- Staircase
- Electrical Room
- CBS Room
- H&IT Room
- LAN Server Room
- Computer Server Room

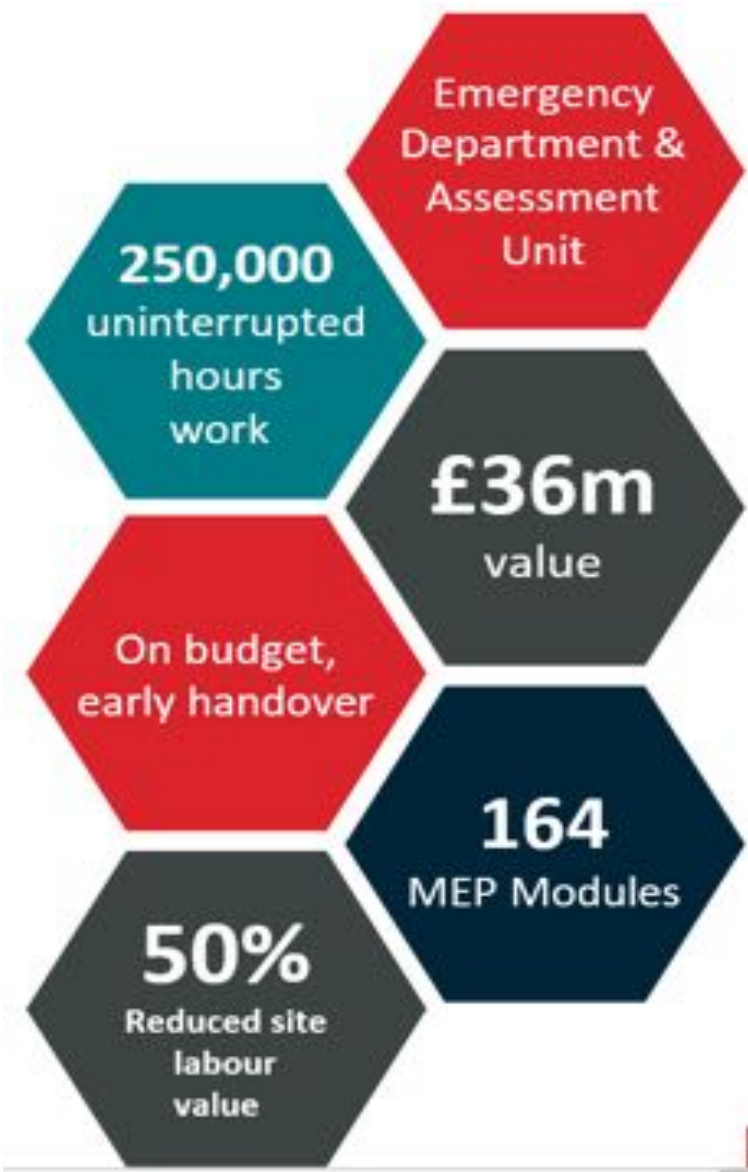
### Application of DfMA in healthcare:-

- Design of Operation Theatre
- Bed Head Trunking of Typical Patient Ward
- Services Risers and Ceilings
- Prefabricated MEP Equipment

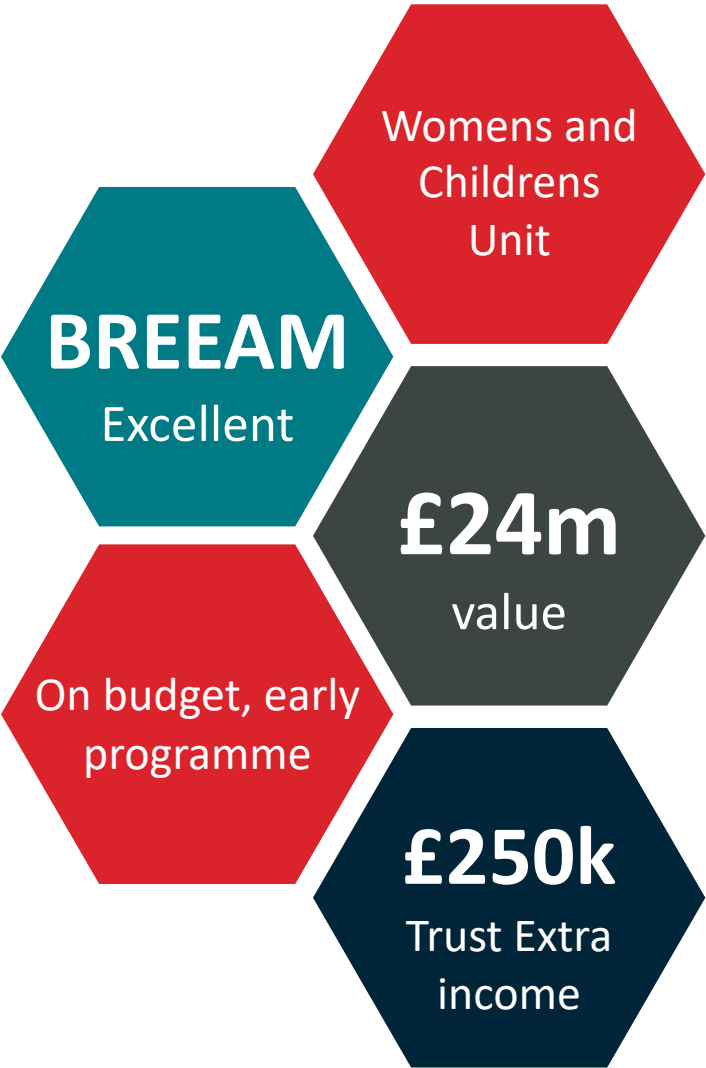
## Late 1990's - My First Modular Construction Project



# Emergency Assessment Centre- Wexham Park Hospital



# North Middlesex Hospital



## 3 T's Redevelopment Programme

The Royal Sussex County Hospital is undergoing a £485 million programme to replace all the buildings on the front of the main hospital site. We call the programme the '3Ts Redevelopment', which reflects our role in *Teaching, Trauma and Tertiary care*.

- Using procure 21 framework
- BIM
- Modular Construction



# The Clatterbridge Cancer Centre



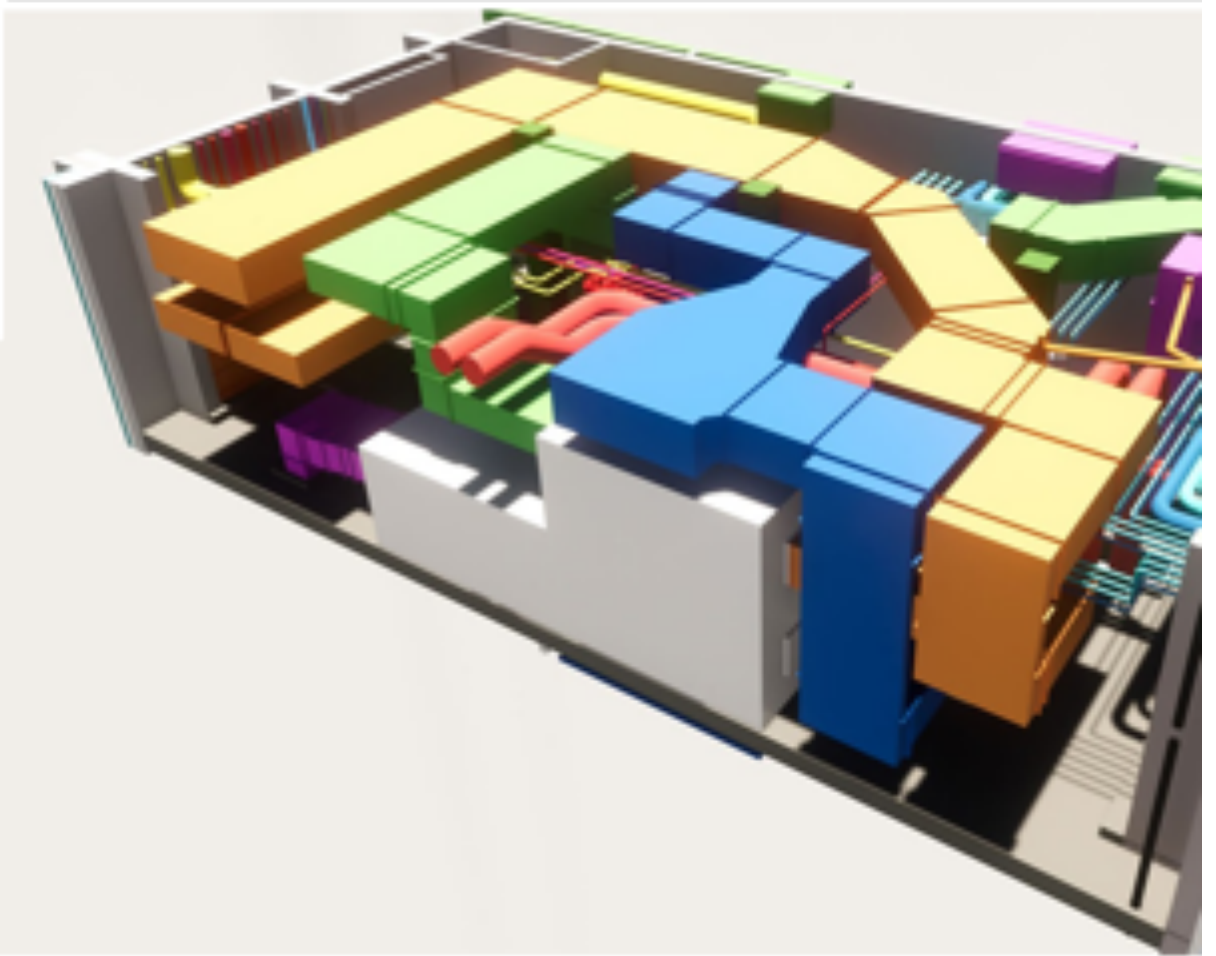
**70**  
YEARS  
OF THE NHS  
1948 - 2018

**NHS**  
The Clatterbridge  
Cancer Centre  
NHS Foundation Trust

**BDP.**

- The Clatterbridge Cancer Centre NHS Foundation Trust is developing a major new 11-floor specialist cancer hospital as part of its vision for Transforming Cancer Care.
- The new specialist cancer hospital is part of an exciting £162m programme of capital investment, by the NHS trust.
- When completed the new Clatterbridge Cancer Centre will provide highly-specialist chemotherapy and other drug therapies, radiotherapy, inpatient care, outpatients, cancer support and rehabilitation, bone marrow transplant, a teenage and young adult unit, and urgent cancer care.
- Start 2015
- Completion 2020
  - BIM level 2
  - BREEAM Excellent
  - MEP modular plantrooms that stack up at the back of the Triangular shaped building.
  - MEP Plant Modules.
  - MEP Corridor Modules.
  - Structural Components, twin wall, Explore concrete floor slabs
  - Nelco Blocks in the LInAcc – Demountable.

# The Clatterbridge Cancer Centre



Use of prefabrication, and modularisation to aid in the site construction, quality of build, reduce programme and onsite health and safety risks

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## MiC in the NHS has delivered..



- Impact on the healthcare facility-less disruption and for shorter time frames
- Safety-less accidents on sites, sites are secure off site
- Speed- projects completed 50% faster
- Quality- Production in controlled environment
- Procurement- Via Government/NHS frameworks
- Adoption of contract- direct awards/mini competition- faster appointments
- Cost control-5% reduction of preferential rates through frameworks
- Reduced vehicle movements on site
- Less on site waste
- Savings on energy costs
- More efficient use of public funds

# Procure 22 –NHS framework



## Other cost savings

- ProCure22 contracts not to EU rules- **Saves six months per contract.**
- The BCIS survey of tender prices (Q4-2007) forecasted a tender price rise of 5.1%- Six month time **saving equates to 2.55% capital cost saving over this period.**
- Shorter construction periods – 7 weeks for schemes between £1-5m and;
- 17 weeks for schemes between £5-15m. This could equate to cost savings of approximately 1% of capital cost depending on changing tender index figures.

ProCure22 performance KPI values for 2017 shown against national averages and previous



National figures derived from 2017 CITB UK industry performance report from Glenigan.

# Implementation in the NHS-Procure 22



- Department of Health led for NHS
- Creation of supply chains
- Pre procured government frameworks-NEC option C
- GMP and pain/gain sharing
- 11 Repeatable rooms in acute sector and rooms for mental health environments
- Working parties (clients, contractors, design teams, government agencies)
- Government targets and incentives
- Roadshows
- Visits to completed facilities

**The frameworks have provided more than 850 publicly funded NHS projects at a value of £6bn over the past 15 years.**

**852** projects have been completed with time and budget compliance consistently at more than **90%**

Client satisfaction has also consistently exceeded **80%**

No litigation on any project, **saving £150m to the NHS**

This represents a step change in public-sector construction, where in 2001 only 26% of schemes were completed on time, and 28% on budget, with 3% of the capital programme being spent on litigation.

# Procure 22-Standard components

Many standard component agreements offer additional benefits such as extended guarantees and savings of up to **30%**. The latest round of standard component agreements are in the procurement stage with suppliers, and will be in place when the current agreements expire. These current supplier agreements cover a range of products, such as:

- hard and soft flooring
- suspended ceilings
- sanitary ware
- lighting
- partitions
- doors and ironmongery

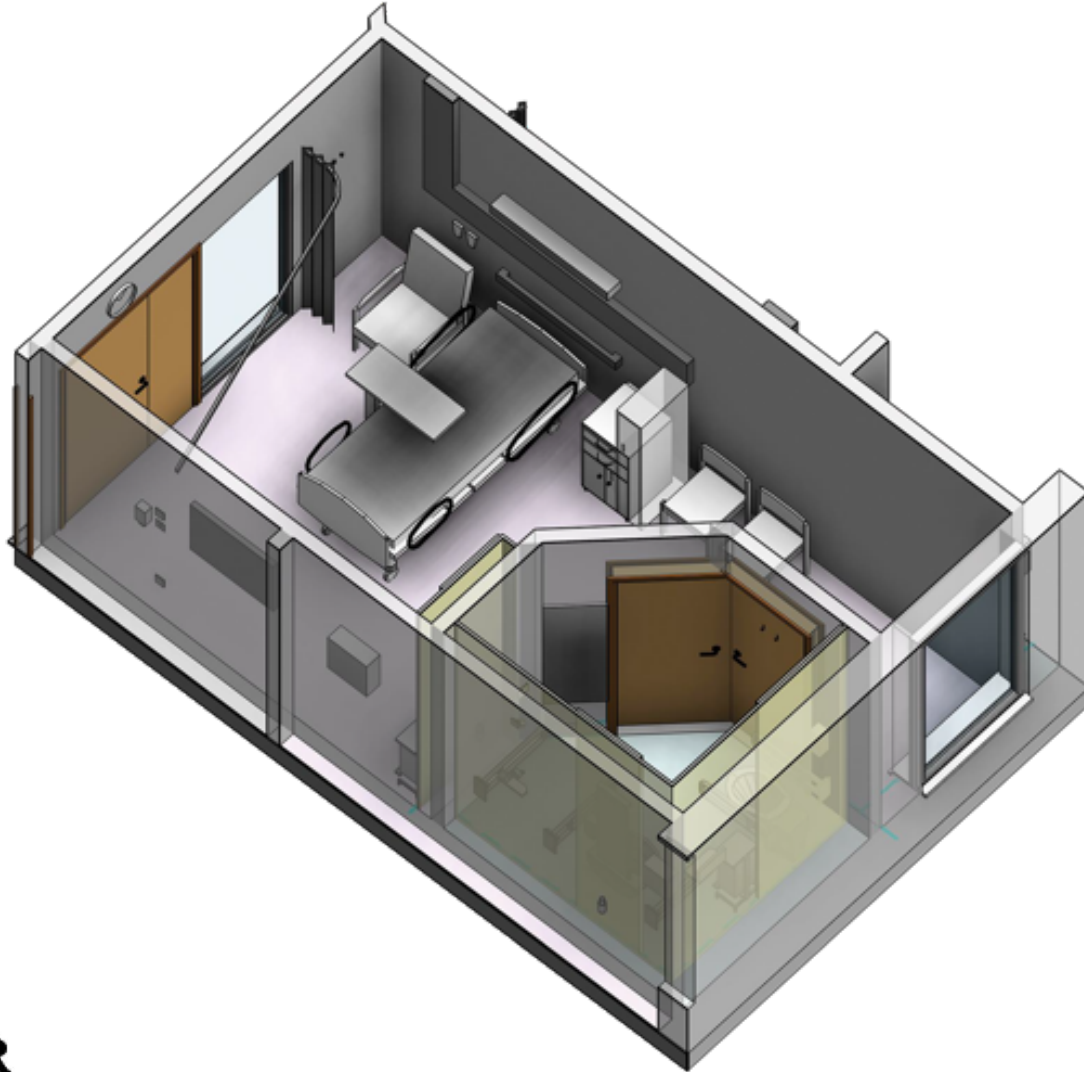
## MEP Design for DfMA (Design for Manufacture & Assembly)



DfMA – Modular Design of Toilet Block

- Pre-Fitting,
- On site connection to services risers,
- Ease of Maintenance,
- Economy of Scale

# Procure21+/P22 Modern Methods



**£13m**

Standard  
Components

Repeatable  
Rooms, up to

**11%**

Saving

Max Modules

# Key features of Procure 22 framework



free usage



free VAT advice  
service



free training and  
implementation  
support



free access to and  
use of design



information from  
previous projects



free use of award-  
winning repeatable  
room designs



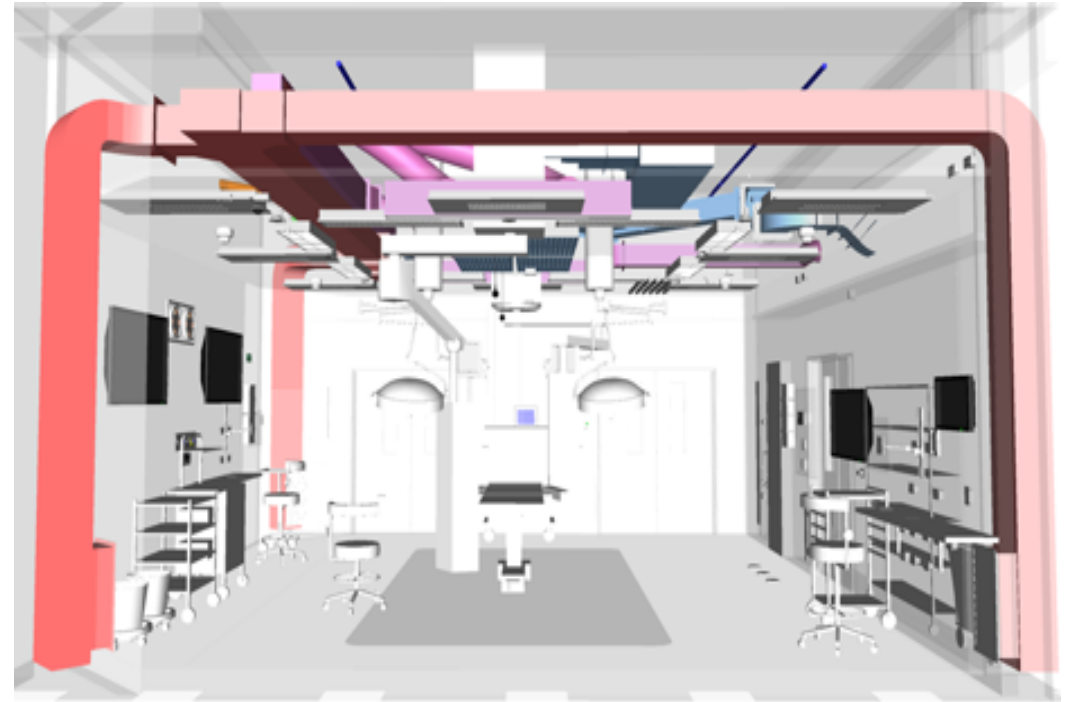
post-occupancy  
evaluation and  
project-end review  
templates



proven contract  
templates, developed  
and improved over 15  
years

## Observations so far in Hong Kong...

- Large public sector development programmes
- Societal pressure to make change and deliver
- Sites are very constrained-similar to UK
- No supply chains
- Buildability not integral to design teams at outset of the project
- Real opportunities to deliver projects faster, to a high standard of quality and with potential to save money
- Opportunities to help manage shortages of skilled labour
- Standardisation of rooms and components rooms
- If unsure... visit other units and start small



DfMA – Design in Operation Theatre

