



# Industrialised Construction Conference

**Andrew Dewdney**

Head of Modern Methods of  
Construction (MMC)





<https://www.kier.co.uk/our-360-approach/>





# What can we learn from the New Prisons Programme?

**1. Keys to Programme Success**

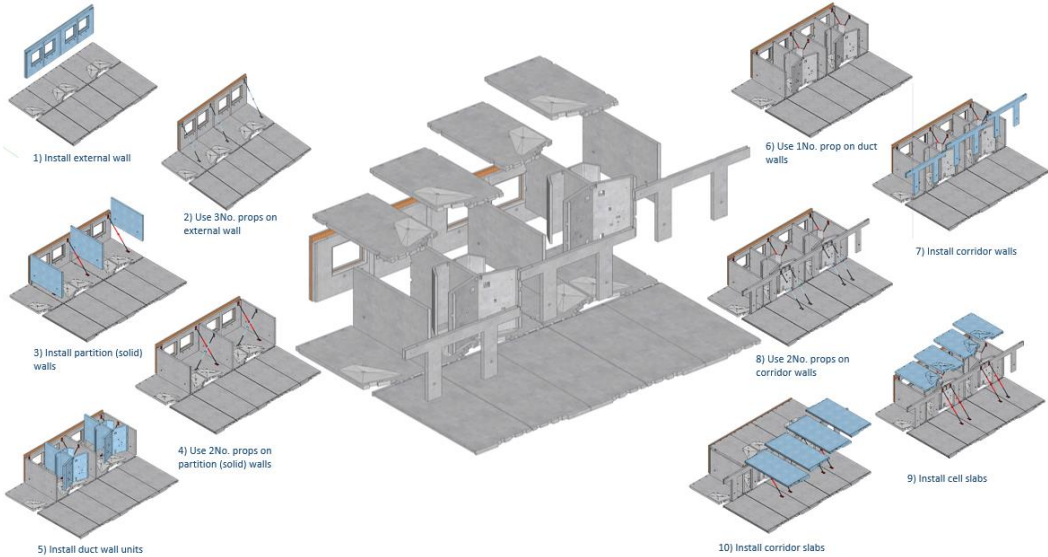
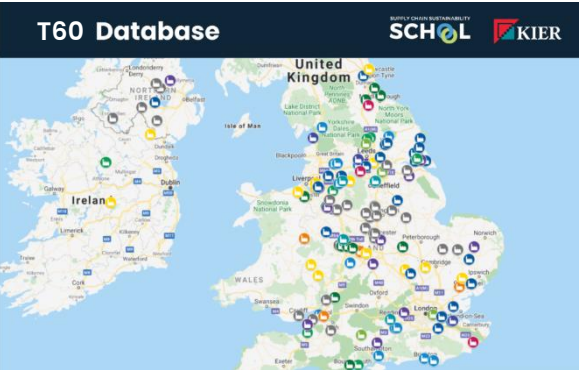
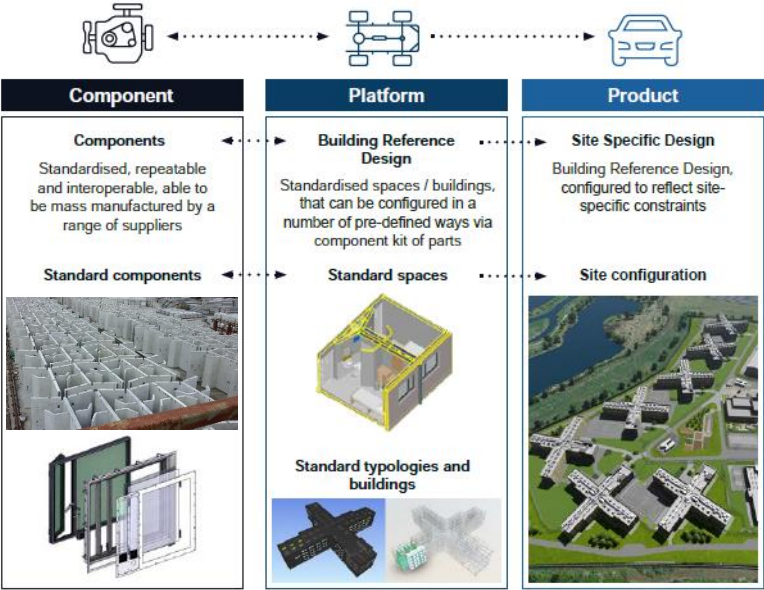
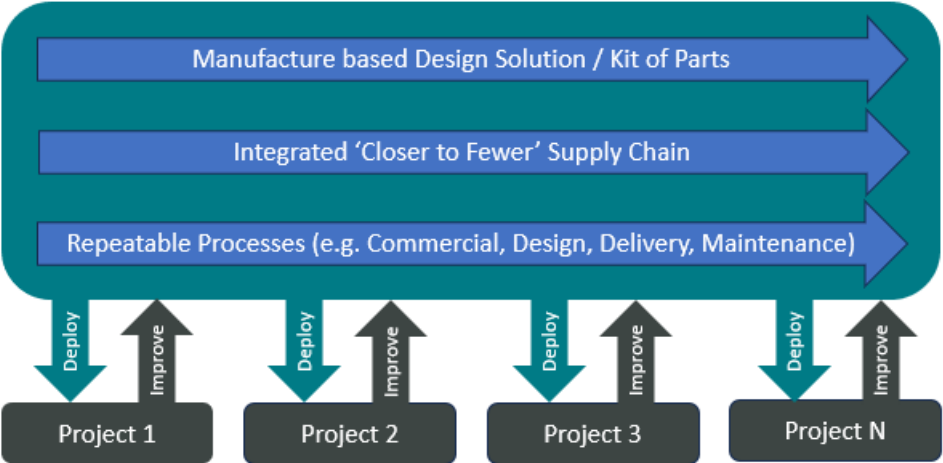
**2. Productivity & Continuous Improvement**

**3. Outcomes**

**4. Future Applications**



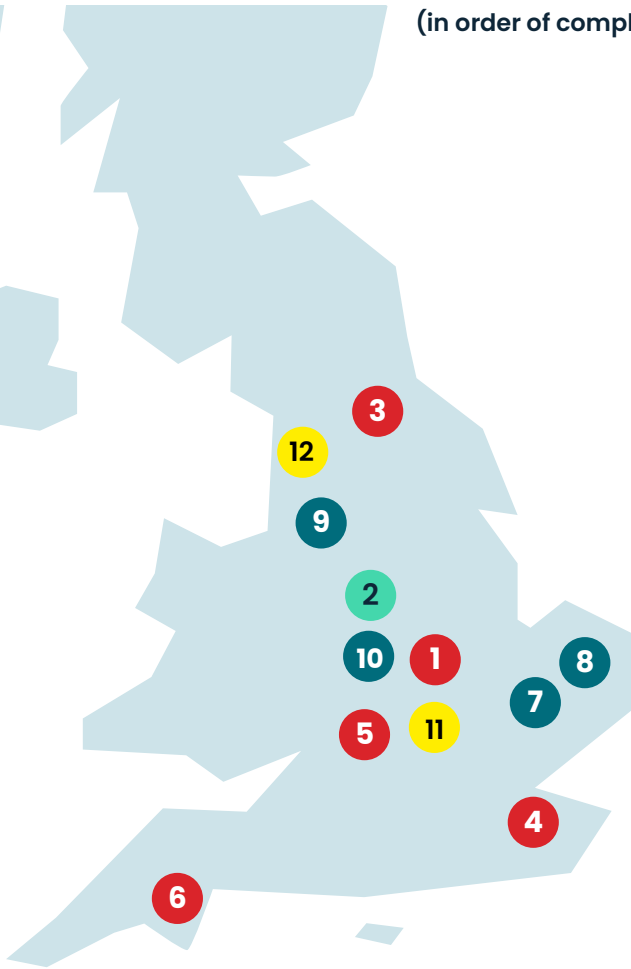
# Key to success : Industrialised Construction





# Key to success: Pipeline

(in order of completion)



1. HMP Five Wells - 1680 places



2. HMP Fosse Way - 1715 places



3. HMP Millsike - 1440 places



4. HMP Elmley - 247 places



5. HMP Bullingdon - 247 places



6. HMP Channings Wood - 494 places



7. HMP Highpoint - 741 places



8. HMP Wayland - 247 places



9. HMP Hindley - 494 places



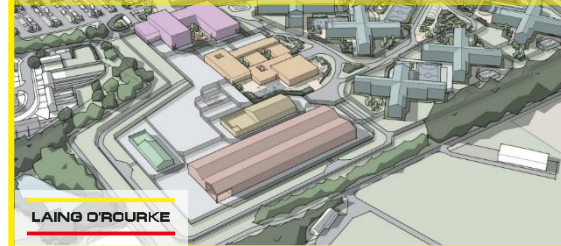
10. HMP Gartee - 1680 places



11. Buckinghamshire - 1680 places



12. Lancashire - 1680 places



# Key to success : Alliancing model and behaviours

- FAC-1 Alliance Contract
- Leave badge at door
- Collaboration not competition
- Review and improve the Reference Design
- Multiplied experience and expertise shared
- Develop a common Supply Chain and test/map capacity
- Shared Continuous Improvement and Innovation
- Consistent workflows, data structures and benchmarking

 Ministry of Justice	<b>Alliance 4 New Prisons (A4NP)</b>							
 Ministry of Justice	<b>Accelerated Houseblock Delivery Programme (AHDP)</b>							
 Ministry of Justice	<b>Small Secure Houseblock Programme (SSHP)</b>							
 Ministry of Defence	<b>Defence Estate Optimisation Portfolio (DEOP)</b>							
 Ministry of Defence	<b>SLA Strategic Alliance</b>							



# Productivity and Continuous Improvement

## Repeatable Design (Build)

- Increased roof parapet height (2.9m)
- Double the amount of underfloor heating
- RFIs/100 docs ↓43% (v Five Wells)
- Increased productivity during RIBA 4 (vs Five Wells)
- PMV 84.28% (target 68%, Five Wells 70%)
- Precast Embodied Carbon ↓14.9% (v Fosse Way)
- Improved buildability
- Pitched Roof on AHDP



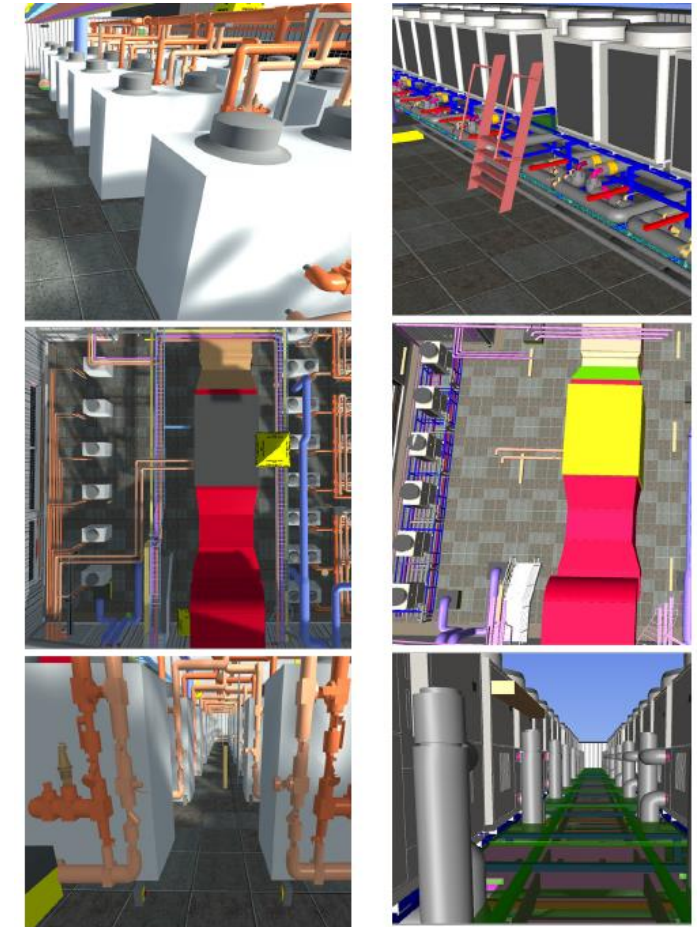
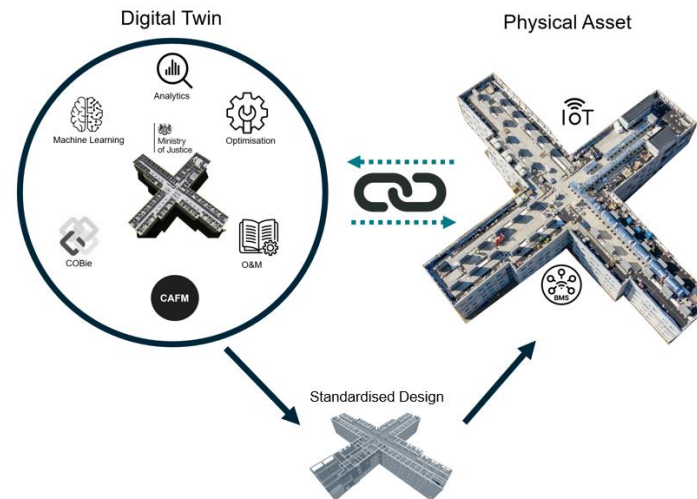
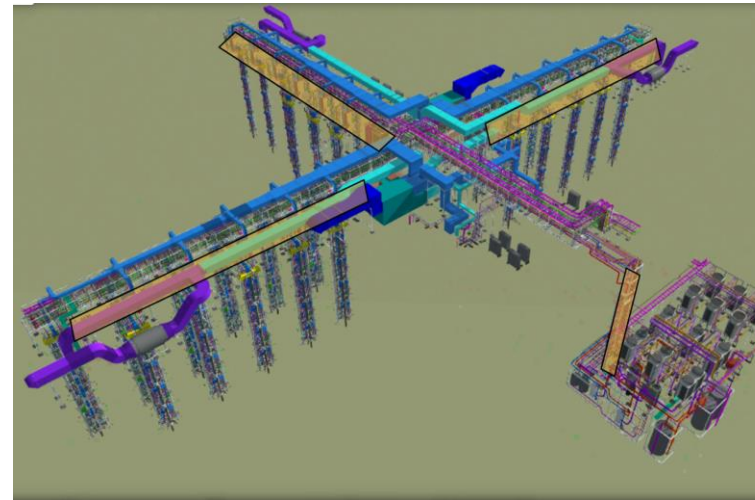
	RIBA 4 ( % drawings unchanged after Rev 3 )		
	Five Wells	Millsike	Change
Entrance	52%	92%	43%
Support	79%	84%	6%
Central	44%	86%	48%
Kitchen	82%	88%	6%
Workshop	75%	85%	11%
Houseblock*	93%	97%	4%
CASU	93%	93%	0%
Project Average	83%	85%	3%

\*4no Houseblocks didn't change after Rev3 RIBA 4 Millsike

# Productivity and Continuous Improvement

## Repeatable Design (MEP)

- Changed from Gas to fully electric
- 70% more energy efficient than a Victorian prison (£1.1m energy saving per year)
- Increased site-wide PV yield by 1% and reduced area by 6% (v Reference Design)
- Optimise Offsite MEP DfMA :
  - horizontal modules ↑198% ,
  - cast-ins for underfloor heating mats ↑ 32%
  - offsite bracketry and supports ↑ 100%
  - cast-in components ↑ 12% .
- Digital Twin Smart Building - c. 40% energy cost saving on ventilation and underfloor heating, scheduling of BMS following data collection and analysis.



Before-and-after images show the ASHP base design (left) and the optimised ASHP design (right) - with better heights for maintenance, clear walkway (CDM) and better access to pipes



# Productivity and Continuous Improvement

## Integrated Supply Chain

- Consistent Consultants
- Critical trades consistent e.g.
  - Superstructure
  - Houseblock MEP and modules
  - Ancillary Plant Modules
  - Package Substations
  - Cell windows, doors and Riser Doors
  - Steelwork
  - CCTV/Fire Alarm/Misting
  - Voice/Data/ICT
- New supply chain partners are fully vetted and well proven in the industry
- Provides long term employment, including ROTL and PL
- Innovation collaboration

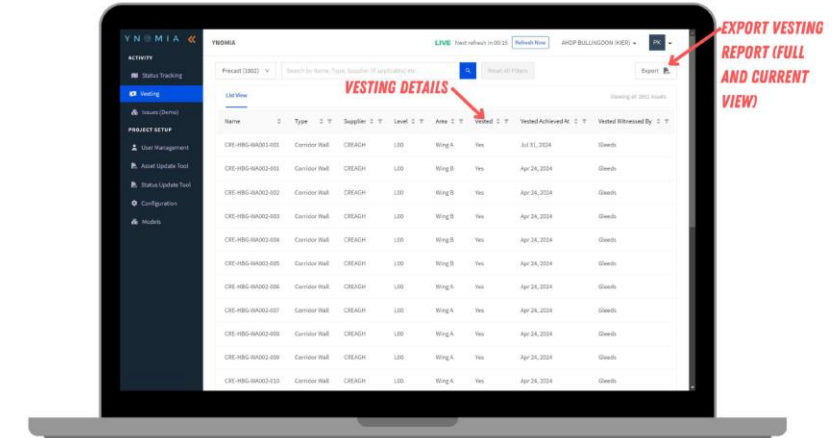
Total output demand per day ○ and capacity ■ (min & max)



# Productivity and Continuous Improvement

## Repeatable Processes

- Improved Model validation
- Improved Model review
- Superstructure install was 15% more consistent (v Five Wells)
- 54% plant was hybrid/electric
- Digital component tracking + Vesting (£1m savings)
- NCRs and Quality Observations / 100m<sup>2</sup> ↓14.9% (v Five Wells)
- Waste m<sup>3</sup>/100 m<sup>2</sup> ↓43% (exc. Groundworks v Five Wells)
- Improved Digital Handover process
- Consistent processes, workflows and data collection into a central Mission Control



## HMP Channings Wood

HMP  
Northumberland

HMP Elmley

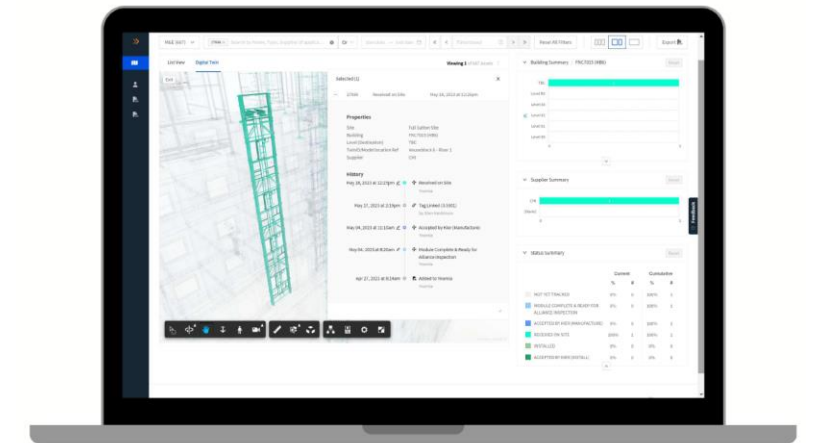
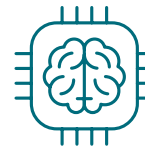
HMP  
Bullington

HMP Glasgow

HMP Millsike

HMP Five Wells

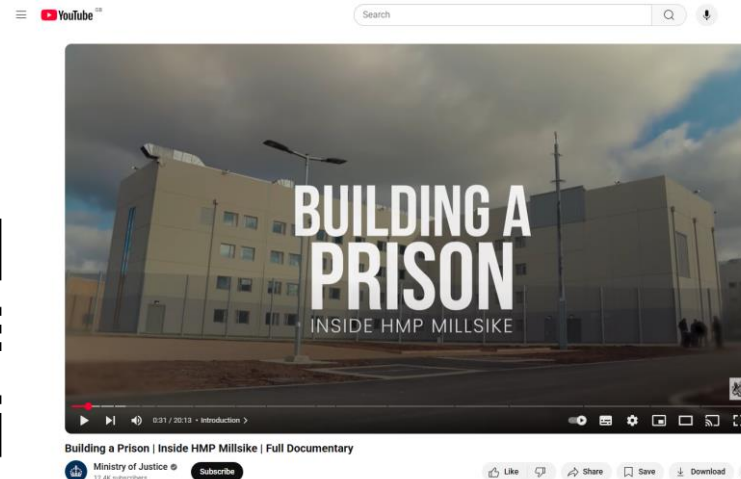
HMP Lancaster Farms



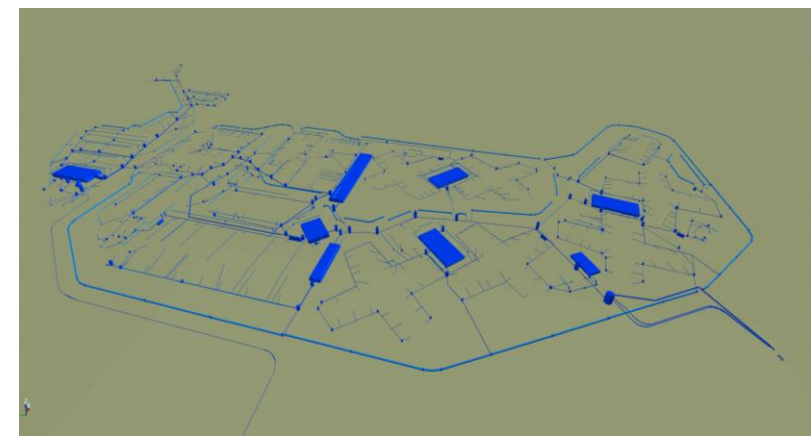


# Outcomes : HMP Millsike

- 6months enabling works inc. Ground stabilisation
- Complex Groundwater – 3 temporary lagoons and 8 precast attenuation tanks
- 128week programme RIDDOR free
- 45% spend within 50miles, 89% spend within 100miles
- £33,000+ in charity fundraising
- 5 National and International awards, 14 Finalist/ Highly Commended
- 1,524 volunteering hours
- 91 apprentices and trainees
- 10% Biodiversity Net Gain
- 45/45 CCS score on all 7 visits



<https://www.youtube.com/watch?v=EfpqKpPI7EI&t=1s>



On time.  
On budget.

# Future Applications



## Small Secure Prisons

240 places

---

R30 platform design.  
Similar components to T60.



## Glasgow Prison

1344 places

---

Amended T60 design to suit  
Scottish Prison requirements.



## Defence Alliances

16,000 bedspaces

---

Based on a RIBA 2 'Common  
Design' being delivered  
through two Alliances.





# Thank you

