



Ministry
of Justice



Delivering Modern Methods of Construction

UK Prison Construction

- October 2019



Why?



Lower costs

33%

reduction in the initial cost of construction and the whole life cost of built assets

Faster delivery

50%

reduction in the overall time, from inception to completion, for newbuild and refurbished assets

Lower emissions

50%

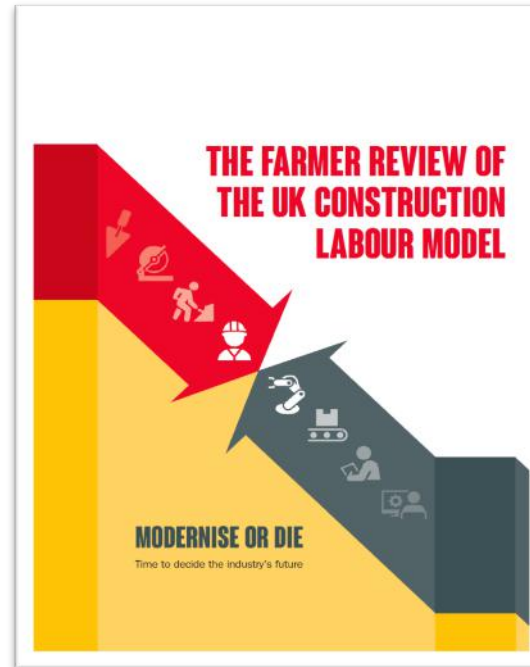
reduction in greenhouse gas emissions in the built environment

Improvement in exports

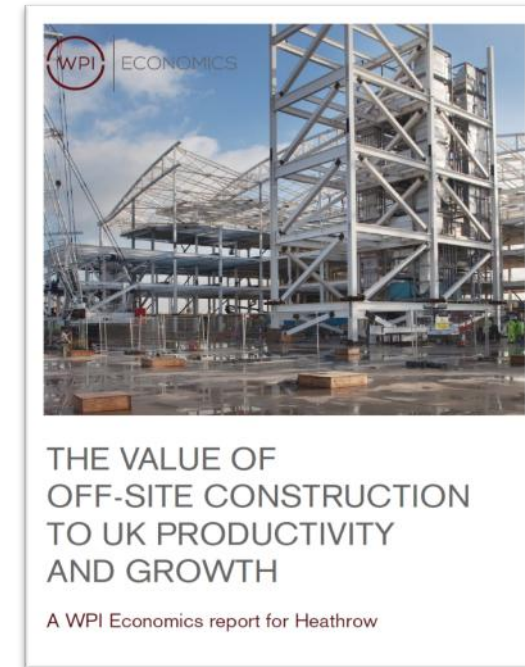
50%

reduction in the trade gap between total exports and total imports for construction products and materials

Good for the nation



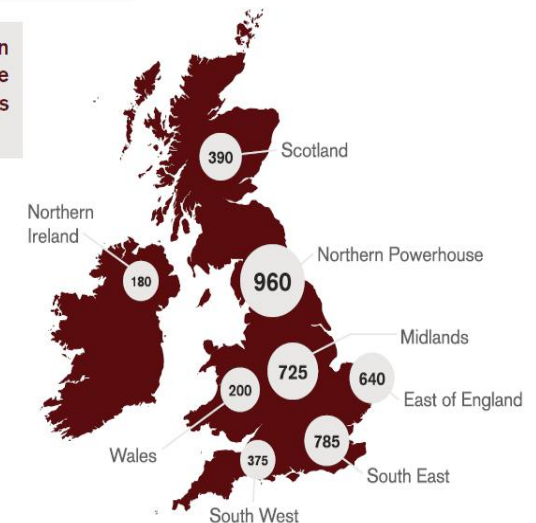
Changing a broken industry



Increasing the proportion of construction undertaken off-site to 25% would provide a significant economic boost to all regions outside of London.

Increased GVA in 2020 (£million)

Source: WPI Economics Modelling. Figure shows central case of 20% increase in productivity from off-site construction



Addressing north / south growth divide

What is it and how is it used?



Modern Methods of Construction (MMC)

A broad term to describe a variety of **innovative approaches** used to construct buildings and infrastructure that result in **increased efficiencies** and **improve productivity**. All types of 'Industrialisation' are captured within this definition.

Repeatable Rooms



Smart Motorways



Volumetric Framework



Skills Funding
Agency

Precast Components



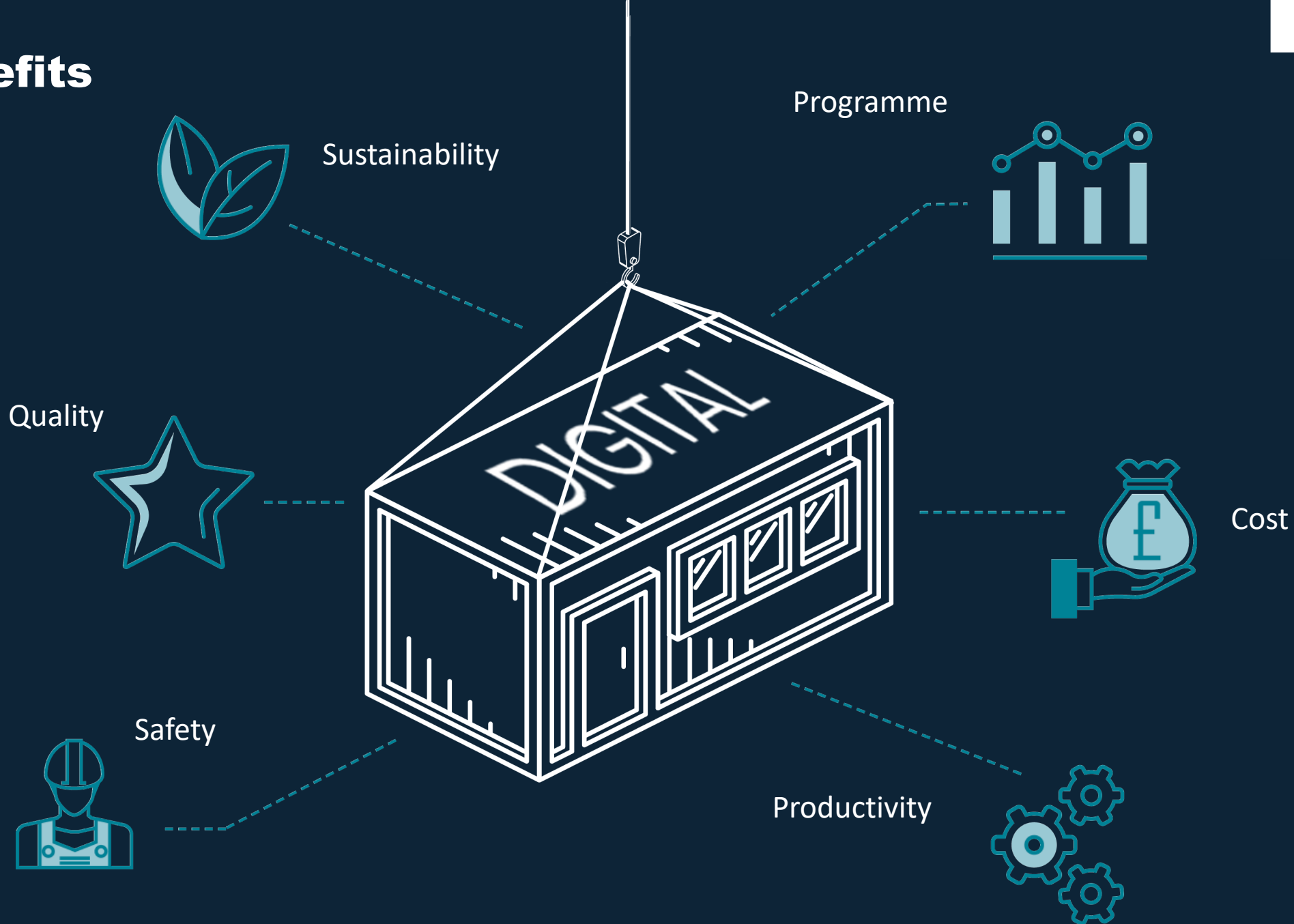
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Volumetric Single Living



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Benefits



The Prison Pipeline

Wellingborough Prison –	1680 place Category C (lower risk in closed environment) resettlement (approx. last 12mths of sentence) Completed Autumn 2021
Glen Parva Prison -	As Wellingborough, in design – complete 2023
Full Sutton 2 -	As Wellingborough but 1440 places – complete by 2025. Adjacent to the current establishment.
Further Category C	As Wellingborough – complete by 2025
2x more prisons	Type not yet confirmed, but likely Category C
Cat D (open prison) additional capacity	



Wellingborough

Approach



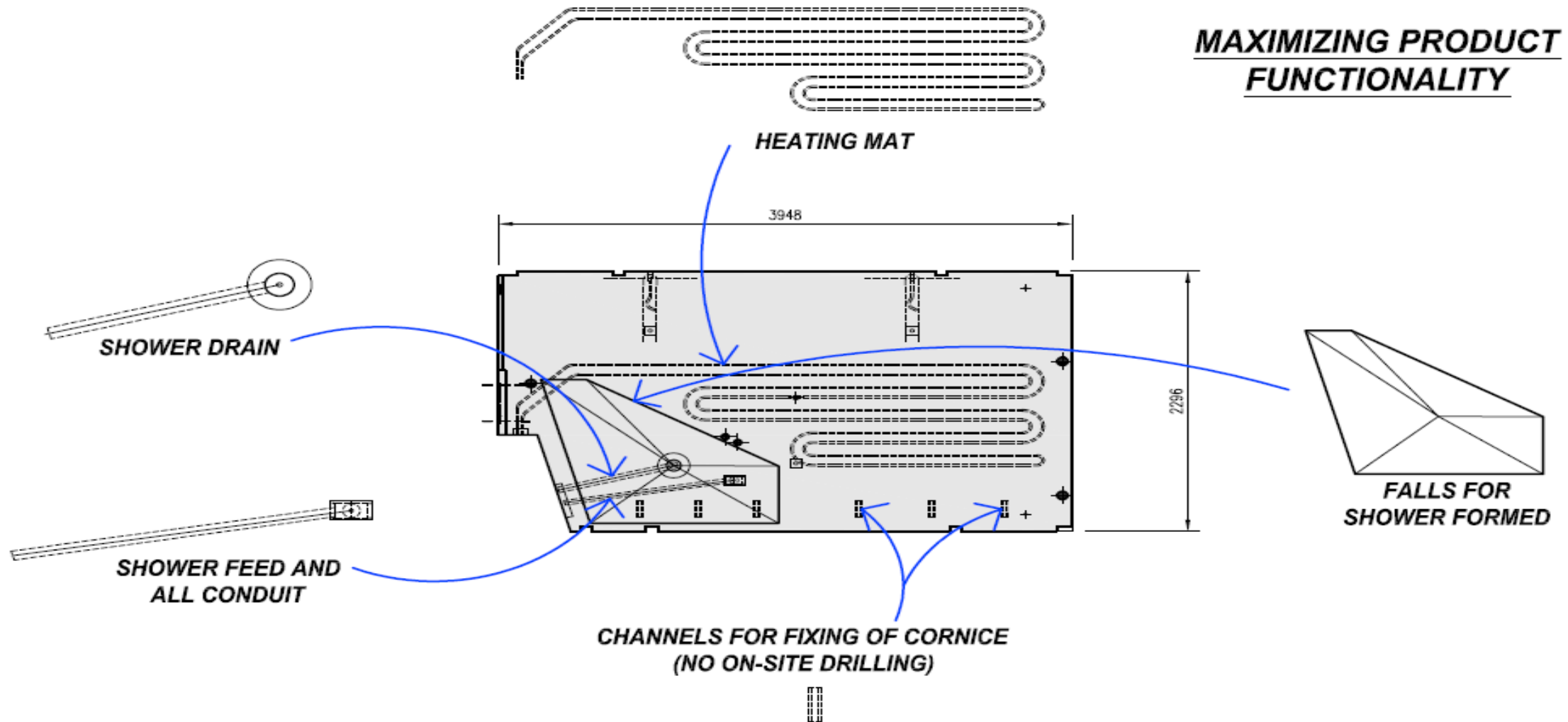
Precast for accommodation

Precast benefits:

- ☐ Secure
- ☐ Fireproof
- ☐ Acoustics
- ☐ Combined structure & façade
- ☐ Integrated MEPH maximising functionality
- ☐ Large components including sub assembly components (Doors, MEPH, Windows)
- ☐ Multiple room layout options
- ☐ Platform design (Custodial, Detention, Student Accommodation, Residential)
- ☐ Available supply chain
- ☐ Ideal for consolidation centre distribution
- ☐ Reduced deliveries, labour and time on site.



Precast optimisation



Maximising DFMA – Wellingborough

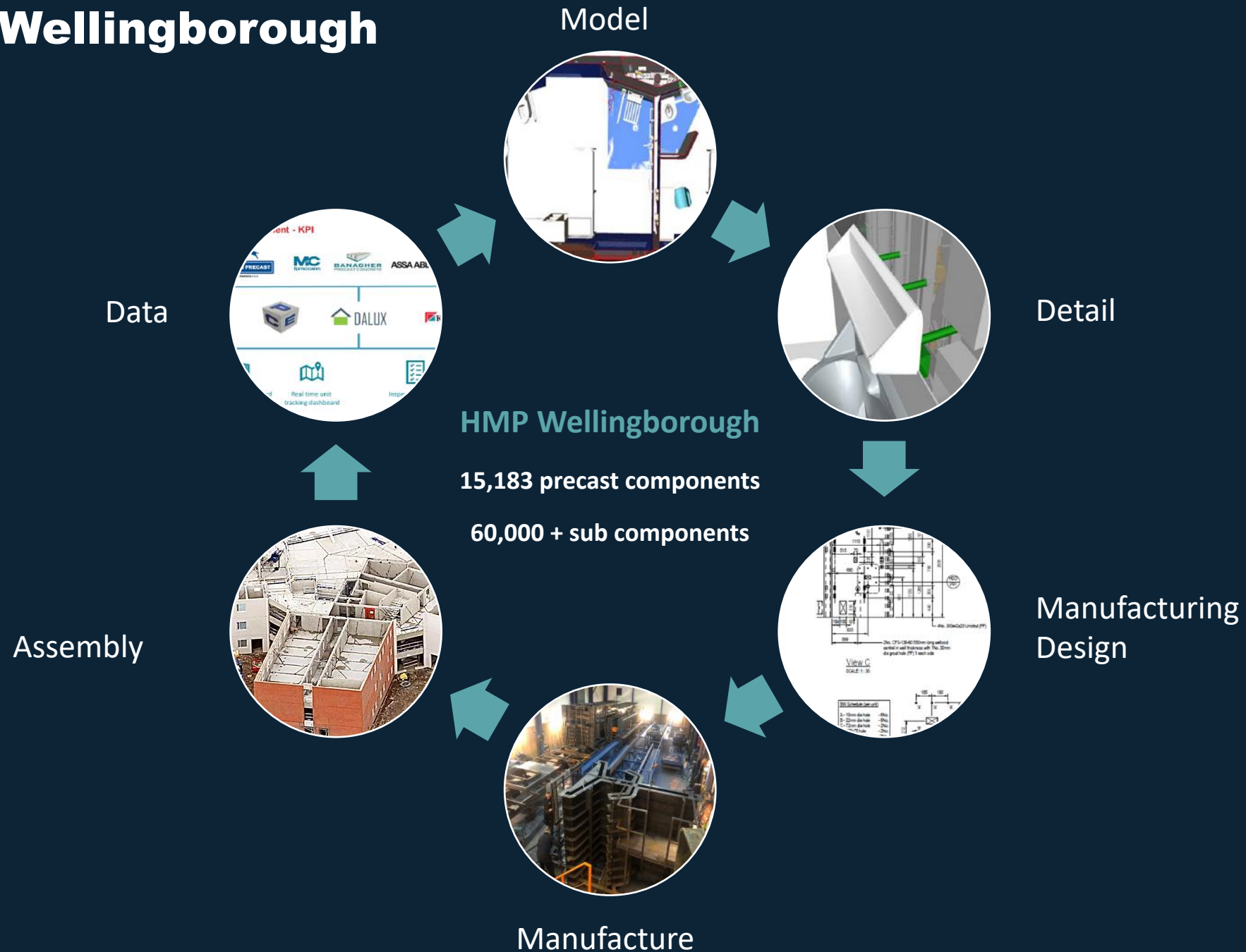
Precast structures incorporate (approximate):

- ❑ 15,183 precast components
- ❑ 1,682 cell doors
- ❑ 2,400 windows
- ❑ 19,680 conduits and 2,110 underfloor heating mats in the pre cast concrete panels
- ❑ 1,682 shower tray (dish) and drainage
- ❑ 27,000 provision for fixing M&E and joinery without the need for on site drilling

M&E prefabrication includes:

- ❑ Cell service risers
- ❑ Plant modules and skids
- ❑ Plug and play electrics and plumbing
- ❑ Multi services modular units down corridors and in ceiling voids

HMP Wellingborough



Time

ARCHITECTURE



Cost: 28% lower cost



Resource: 30% fewer working weeks



Waste & Duplication: 60% less duplication



Time: 22% faster

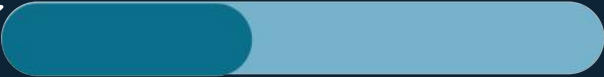
STRUCTURAL



Cost: 28% lower cost



Resource: 30% fewer working weeks



Waste & Duplication: 60% less duplication



Time: 22% faster

MEPH



Cost: 28% lower cost



Resource: 30% fewer working weeks



Waste & Duplication: 60% less duplication



Time: 22% faster

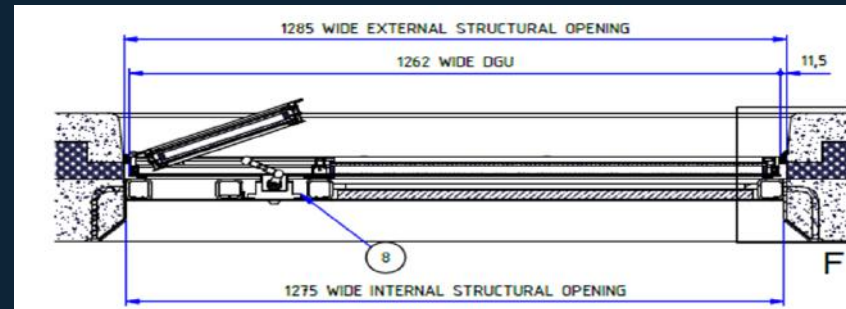


Innovations

Barless windows for a secure environment



- ❑ Window based on 2005 NOM's window for dimensions and sub-frame
- ❑ Utilises 2005 ventilator
- ❑ Attack glass build up
- ❑ Only window to pass new MOJ Category C barless window standard
- ❑ Cost effective
- ❑ Developed for casting into four-cell wide external precast panel



Sacrificial Attack Face: 6mm Polycarbonate

Attack Ply: 8mm Toughened (Fully Tempered) + Heat Soak tested

Interlayer: 6mm Ionomer Interlayer (Kuraray SentryGlas™)

Outer Ply: 8mm Heat Strengthened



Secure welcoming environment *Artists impression*





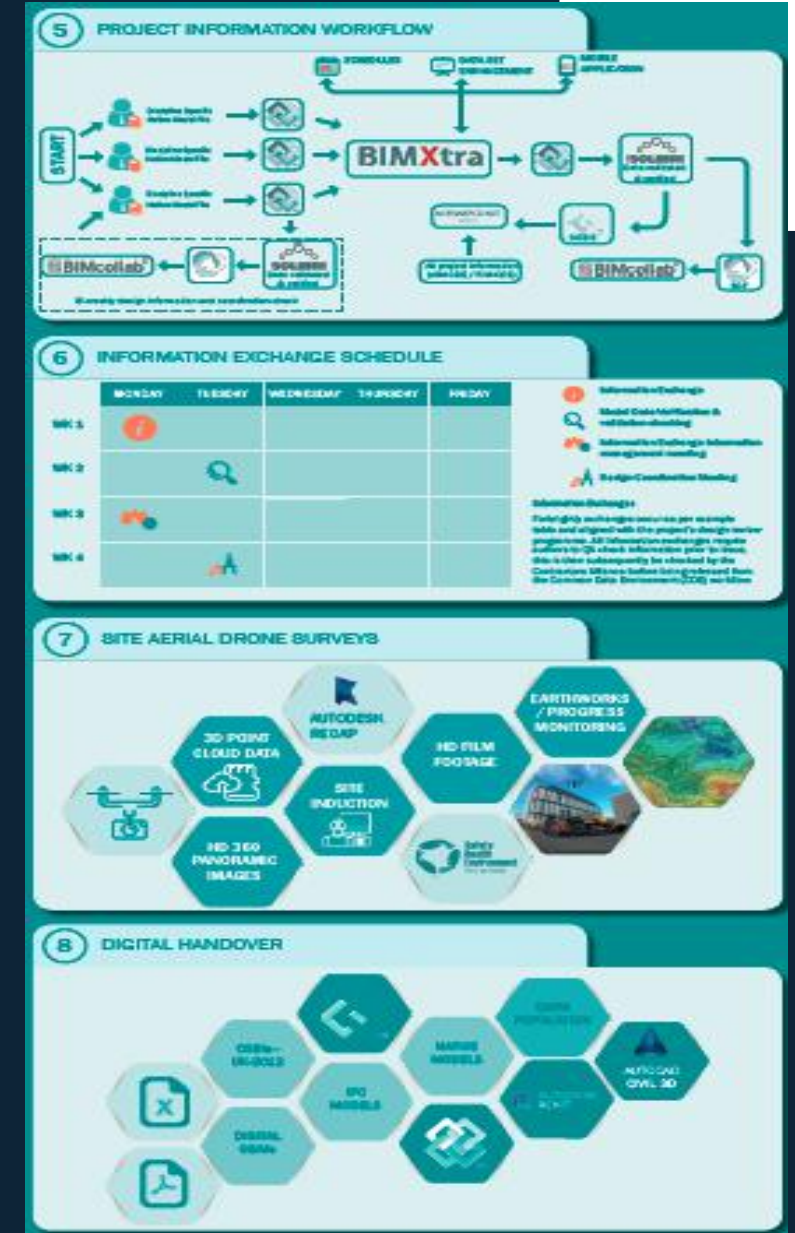
Use of Building information management systems

Digital



- ☐ BIM Level 2
- ☐ Secure data handling
- ☐ Component library
- ☐ Federated models between multiple designers
- ☐ Using models to manage cost
- ☐ Clash detection
- ☐ Rules based detection
- ☐ Programming
- ☐ Real time inventory management
- ☐ Data handover

Making future prison construction more predictable





Supply chain integration



Component Assembly

ASSA Abloy
Crown House Tech
WMS Underfloor Heating
William Hayley Engineering
Kingspan
British Gypsum

Precast

Bison
FP McCann
Banagher Precast

Site

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Multi location real time management

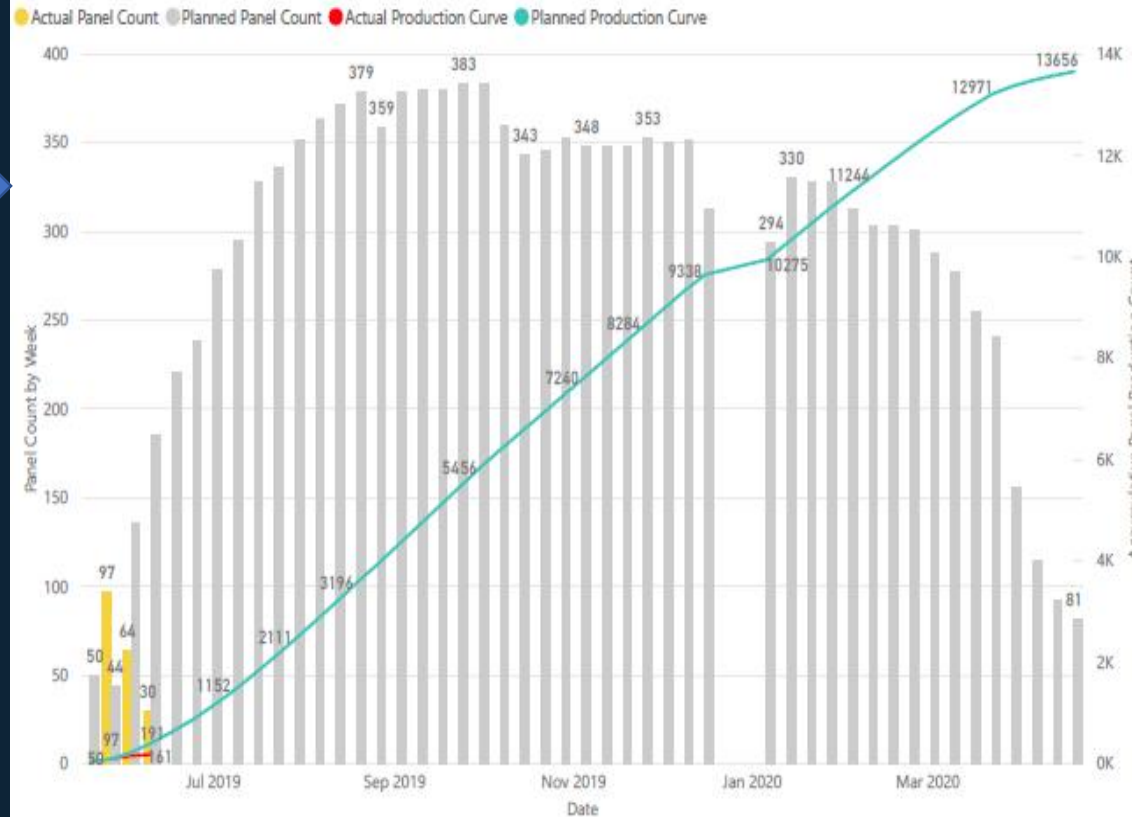


PRE-CAST PRODUCTION REPORTING DASHBOARD: WELLINGBOROUGH PRISON

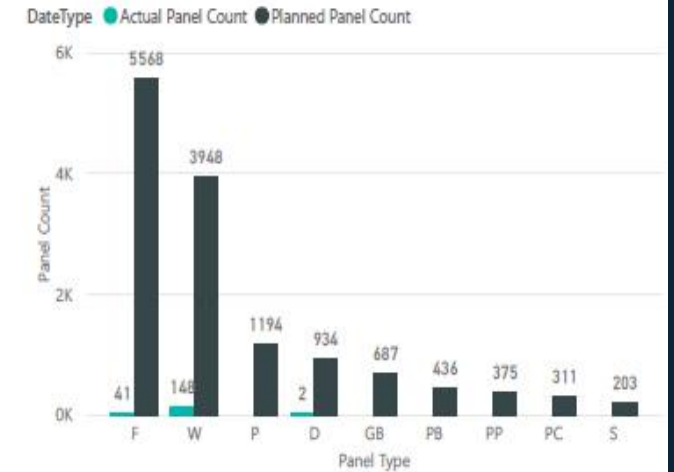
Today's Date: 12/06/2019
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Filter by Date Range: 20/05/2019 20/04/2020
 Filter by Company: All
 Filter by Panel Type: All
 Filter by Month: All

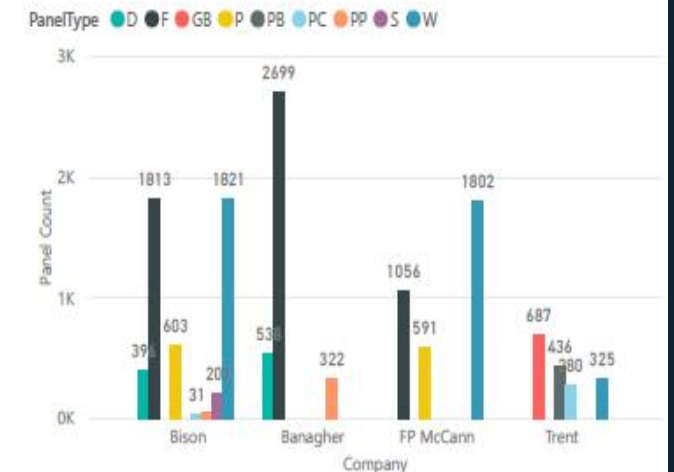
Pre-Cast Production Planned vs. Actual



Planned vs. Actual by Panel Type



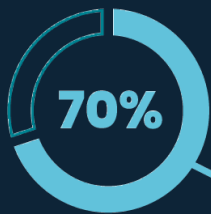
Planned Panel Type Count per Company



Benefits



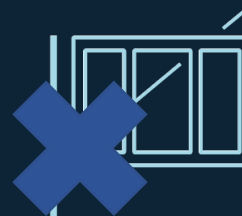
More energy efficient than a Victorian prison



Improved cell door



8,658 KWH of renewable energy generation (PV)



Barless windows



Family engagement through welcoming environments



Building fabric energy loss 1/10 of 1970 prison



Smaller prison communities

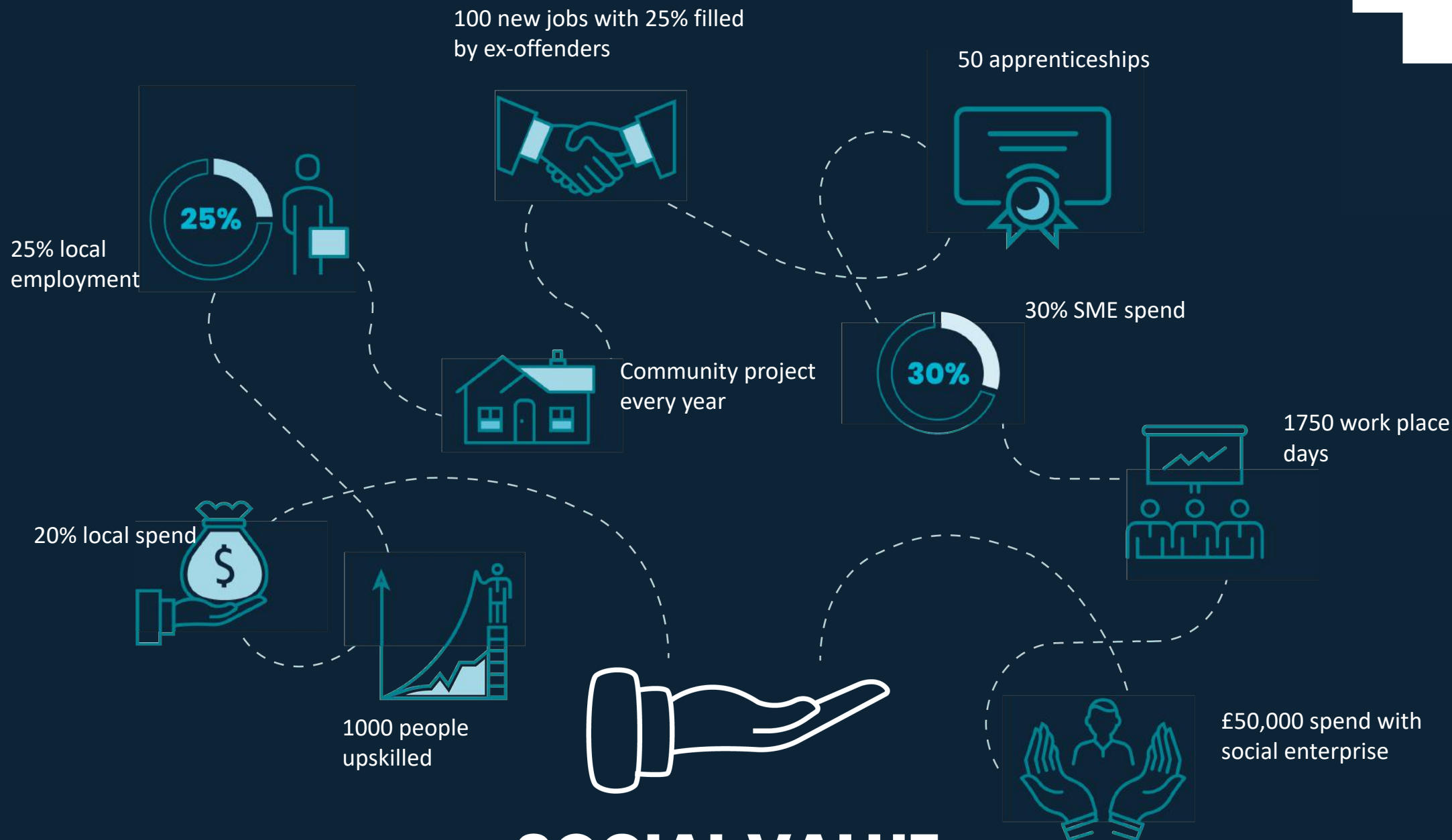
WIFI in every cell enabling in cell learning



Increased prison accessibility



**Rehabilitation
through the built
environment**



SOCIAL VALUE

Questions

