NHP0007

Written evidence submitted by the Manufacturing Technology Centre

Executive summary

- To tackle the declining condition of England's hospitals through the New Hospital Programme, the Government should:
    - Publish a RAAC Mitigation Strategy focused on data collection, growing the workforce, and developing remediation approaches, to achieve rapid intervention at scale.
    - Adopt "product platforms" across design standards to strengthen DHSC's programme to deliver new hospitals and improve existing buildings. Embedding a manufacturing-led approach to construction fully, will deliver better hospitals, more quickly, at lower overall cost.
    - Update procurement models to harmonise the process to implement value-based decision making, to reduce costs, and to accelerate project execution.
    - Improve quality assessment of building performance to inform remediation activities across the hospital estate, to enable prioritisation of future remediation programmes.

- If the Government increases its focus in these areas, it will:
    - Reduce the construction costs of building renewals by up to 31% through more innovative technology.
    - Accelerate timelines for renovating hospitals by improving productivity, improving quality assurance, reducing errors, duplication and waste.
    - Detect future problems earlier and more easily, including through the use of advanced metrology and non-destructive testing.
    - Improve the long-term sustainability of buildings, reducing costs yet further in the future.

- The MTC is pioneering technological development of manufacturing-led solutions. We develop and prove innovative manufacturing processes and technologies to achieve the goal of making the UK a global science superpower. We have a

dedicated team focused on developing the latest digitally connected construction solutions, and we have led the Construction Innovation Hub project (2018-2022). This brings new opportunities for the public sector to procure better buildings, at lower overall cost more quickly through the adoption of innovative technology.

What should the Government do to improve the condition of hospital buildings in England?

1. The safety of hospital buildings in England has been under strain for a number of years. In July 2020 the Public Accounts Committee found that NHS Trusts had a £6.5bn backlog of maintenance, a figure which has since risen to £10.2bn. That year, the Government announced the New Hospital Programme (NHP) which aimed to build 40 new hospitals by 2030 and provide maintenance to those buildings in most need of repair. In July 2023 the National Audit Office (NAO) assessed the Programme's progress to-date.[1]

2. The NAO report noted that, when launched, key decisions around the Programme's funding had not yet been made. It was only in 2023 that the scale of capital funding was agreed. By March 2023 £11.1bn had been spent on the NHP and the NAO has said that "Government has not achieved good value for money with [the] NHP so far."

3. A key element of the NHP is addressing the challenge of remediating existing hospitals constructed using reinforced autoclaved aerated concrete (RAAC). Beds are being taken out of action owing to unsafe conditions. Facilities are out of use pending temporary supports being put in place. Such struts are intrusive in wards and place restrictions on the use of hospitals e.g. in 2022 Hinchingbrooke Hospital stopped operating on patients weighing more than 120kg in two operating theatres because of floor loading concerns. The Queen Elizabeth Hospital, Kings Lynn currently employs circa 2000 props to hold up the ceiling and employs a team of 12 people to check the safety of the building 24 hours a day, 7 days a week. The removal of beds from operational use add to the 'bed-block' issue currently being experienced within the NHS and is reported to be costing the NHS £5m per day. The Government has said only five RAAC hospitals will be prioritised at an expected investment of £20bn.[2]

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[1] National Audit Office, *Progress with the New Hospital Programme,* July 17 2023 (link).
[2] Department of Health and Social Care, *New Hospital Programme – media fact sheet,* May 25 2023 (link).

4. In order to improve the chances of NHP delivering better value for money through to 2030, including in the years when spending will be highest, the Government needs to alter course. DHSC should prioritise research and development to identify more efficient ways of improving the condition of hospital buildings.

5. The Government can drive this R&D by:

- **Publishing an RAAC Mitigation Strategy.** The Government needs to set out a clear plan to deal with RAAC. This should be a cross-departmental effort, pulling together expertise from DHSC, DfE and the MoJ which need to tackle the problem of RAAC in hospitals, schools, courts and prisons respectively. Harrow Crown Court closed "for the foreseeable future" on 25 August 2023 because of safety concerns[3]. A RAAC Mitigation Strategy, using the work done by the Construction Innovation Hub, should catalyse three key elements:
    - Developing automatic data collection – including a 'heat map' of results – for the assessment of building degradation;
    - Addressing the need for intervention at scale and pace, focused on developing a manufacturing-based approach to the delivery of a renovation kit of parts;
    - Growing the workforce of professionally-registered engineers as the lack of sufficiently qualified engineers is a major barrier to resolving issues around the RAAC.

- **Adopting product platforms across design standards.** Product platforms are a basis from which bespoke construction parts can be customised to fit specific needs whilst enabling interoperability. They use digitally designed elements that provide improved and less costly outcomes for building challenges. Product platforms are already used in other industries such as the automotive sector, where a set of underlying common elements is shared across vehicle models and then customised according to each model's needs. They can play a key role in harmonising DHSC's efforts to improve hospitals.

- **Updating procurement models.** Publicly-procured social infrastructure represents around 14% of the total investment pipeline of the construction industry from 2021 to 2031.[4] Despite this large share of the market, the current public sector construction procurement system is fragmented, which leads to inefficiencies, higher costs, and

[3] Harrow Crown court closed after dangerous concrete found - BBC News
[4] UK Research and Innovation, *The Value of Platforms in Construction,* April 2023 (link).

delays to projects. Cross-departmental procurement decisions – which promote a harmonised, and digitised pipeline – are needed to streamline and accelerate the procurement process by aggregating demand for command parts.

- **Improving quality assessment of manufactured assets.** To help manufacturers increase their efficiency and productivity, while de-risking the manufacturing process, high quality assessment processes should be adopted. The MTC is well-positioned to support in this area, for example through its expertise in metrology and non-destructive testing (NDT), which are essential in assessing the quality and condition of manufactured assets.

How will this support the Government's goals?

6. By adopting our proposed solutions, the Government and DHSC will achieve a number of important aims:

- **Reduce costs.** A greater focus on innovative technology will help to reduce construction costs of building renewals by up to 31%, worth up to £1.8bn a year to Government's social infrastructure spending alone, and provide a multiplier effect to increase real GDP by up to £7.8bn a year on a sustained basis.[5] These savings are made through integrated commonalities across projects, while still catering for specific needs of buildings. Meanwhile, streamlining procurement processes will allow the Government to benefit from economies of repetition which is estimated to reduce costs by as much as 70% through reduced waste.[6]

- **Accelerate timelines for renovating hospitals.** By providing a proven basis from which to build hospitals, product platforms will reduce errors and waste, and contribute to accelerated building processes. As well as shortening timeline for renovating hospitals, product platforms will contribute to the Government's net zero targets through more efficient construction practices.

- **Detect future problems earlier and more easily.** Rapidly detecting existing issues in hospitals, and preventing further decay, are key elements of accelerating the process of improving hospital buildings and cutting costs. Alongside more RAAC-registered engineers, advanced metrology and non-destructive testing can play a crucial role in effectively carrying out this process.

[5] Ibid.
[6] Ibid.

- **Improve long-term sustainability of buildings.** A new approach to RAAC, in coordination with industry, will accelerate the move away from the material, reduce disruption, and cut costs. Due to a lack of suitable engineers, it is understood that one NHS site is incurring costs of over £300,000 per year to monitor a single RAAC building. The current approach is too slow and expensive owing to a lack of people with the right skills. The MTC is already testing new solutions to mitigating RAAC but if DHSC and the public sector wants to break out of the current trend of degradation, the Government must invest urgently in R&D activity.

About the MTC

7. The MTC develops and proves innovative manufacturing processes and technologies in partnership with some of Britain's leading innovators to achieve the goal of making the UK a global science superpower. A leader in translational research, we are part of the High Value Manufacturing Catapult, and take ideas from academia and make them cost-effective for industry to manufacture. With the MTC's help, Rolls-Royce, Jaguar Land Rover, Meggitt plc, SMEs and many more have invested in UK manufacturing capability to grow or reintroduce vital manufacturing functions to the UK.

8. We have a dedicated team, focused on developing the latest digitally connected construction solutions. In our role, we bring together academics, policymakers and the whole industry supply chain to develop a faster route for innovative adoption of new technology in real-world construction projects.

9. An example of our leadership is in construction robots which are becoming more commonplace, despite reticence from some in industry to deploy them. We are driving adoption of these novel solutions which improve productivity and the quality of end products, while reducing manual operations. This leads to fewer errors, shortens construction time, reduces costs and increases safety in hazardous working environments. We are also proud to have led the Construction Innovation Hub programme 2018-2023, which has played a leading role in driving the adoption of innovative technology to improve delivery, resilience and performance of infrastructure.

August 2023