



Health Estate

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**Step up in orthopaedic care
for Stockport Trust**

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Specialist in the design and construction of modular healthcare buildings MTX Contracts has recently completed, on time and on budget, Stockport NHS Foundation Trust's impressive new four-storey orthopaedic and surgical facility at Stepping Hill Hospital. The company claims the new facility offers a quality of build and finish "as close to that of traditional build as is possible using modular construction techniques". Jonathan Baillie reports.

Sited adjacent to a new hi-tech Cardiology and Surgical Unit (CSU) handed over to the Stockport NHS Foundation Trust in early 2007, the new 2,300 m², four-storey orthopaedic and surgical facility was built by MTX under a ProCure21 contract for principal supply chain partner Laing O'Rourke.

Completed to an extremely tight schedule, the unit opened to its first patients on 2 February this year, with the contractors on site for just 27 weeks. The largest modular health facility yet built by MTX (which constructed its first such building around 25 years ago), the new unit was designed with an external appearance, comprising brickwork at ground floor level, and an eye-catching render finish to the other three floors capped with Kingspan insulated panels, which very closely matches that of the neighbouring CSU.

Modular building not originally planned

Stockport NHS Foundation Trust director of estates Paul Holt and key projects manager Alan Wilde explained during a site visit that there was no original plan to specify a modular building. However, as two of the key project drivers for the Trust were to meet national NHS 18-week patient pathway "from GP referral to treatment" targets, and to have the new facility up and running as quickly as possible, a modular solution "became the most logical and practical choice".

Paul Holt explained: "When we first discussed the project with (architects) Taylor Young and Laing O'Rourke, it appeared that the construction sector was not offering anything really viable in terms of a building that would both meet our rapid completion timeframes and provide



The new modular building was completed to a tight schedule.

us with the high standard of medical facility we required. We produced a detailed performance specification, which stipulated, for instance, extremely low vibration response factors for the flooring in the first floor orthopaedic theatres, and MTX won the job principally because it developed a scheme which not only met all the specifications, but would also provide us with precisely what we required.

"This really distinguished the company from the other modular building suppliers that tendered, whose typical standpoint tended to be: 'This is our modular unit range; we can offer you a building within these particular constraints.' In contrast, MTX's refreshing can-do attitude was more one of: 'You tell us what facilities and layout/design you require, and we will design and build you a really high quality modular building around these criteria.'"

The new building's ground floor houses a 16-bed ward, comprising three four-bed bays and four single en-suite bedrooms, while the first floor incorporates two fully equipped orthopaedic operating theatres for day surgery, complete with ultra-clean laminar flow canopies, a four-bed recovery ward, and ancillary areas including store rooms, anaesthesia areas and scrub rooms, plus staff rest rooms. On the second floor is a further 16-bed ward and ancillary areas, all equipped to meet DDA requirements, while the third floor houses a dedicated plant room.

Operating facilities centralised

Along with the four new theatres within the adjoining CSU building completed in 2007 Stepping Hill Hospital now has a total of eleven theatres in its main operating suite, of which nine are equipped with laminar flow canopies. In addition to enabling the Trust to



The ground floor houses a 16-bed ward, comprising three four-bed bays (left) and four single en suite bedrooms.

significantly increase the efficiency of its orthopaedic treatment and surgery, and meet Government-set waiting times, the new facility has seen all the hospital's inpatient facilities centralised on a single floor, one of the project's other major goals.

MTX claims, and, on a brief tour, for example, of the first floor operating theatre area and accompanying recovery rooms, it is hard to disagree, that, while being up to 40% faster to build, its latest generation modular buildings are "virtually indistinguishable in appearance and performance from a more conventionally built structure". The high standard of both build and finish are immediately clear.

Commercial director (and FIHEEM) David Hartley enthused: "We are seeing increasing interest in our permanent modular buildings from NHS Trusts UK-wide, essentially, we believe, because of the speed with which they can be designed and built, but equally because architects and estates personnel now increasingly recognise that a modern modular facility can be designed and constructed to meet all relevant Department of Health HBN and HTM guidelines, as well as the stipulations set

out in part L of the Building Regulations. I think there's been a real sea change in the perception of such facilities, especially among architects."

Architects' changing opinion

Narciso Simioni of architects Taylor Young, who attended the site visit alongside key Laing O'Rourke and MTX personnel, agrees: "There is no doubt that many architects have been somewhat dismissive about modular buildings in the past, tending to view them almost exclusively as temporary facilities built down to a cost to serve a short-term need, for instance for additional ward capacity during refurbishment. However, I think perceptions are changing, and, from my viewpoint, this project has been a real eye-opener, both in terms of the standard of design we have been able to incorporate, and in the end result."

Awarded the contract to build the new modular facility last May, MTX began the initial groundworks to prepare the site – which was formerly a 32-space car park – in July, before beginning piling using a vibration-free piling system.

David Hartley explains: "This helped keep the noise levels adjacent to the cardiac facilities to an absolute

minimum, and we and Laing O'Rourke were proud that, throughout the entire construction programme, at no time were any cardiac or surgical procedures in the neighbouring building adversely affected.

"While we had to build close to adjacent facilities at the heart of a constricted site, undertaking the groundworks and piling proved fairly straightforward, although we had to avoid existing services, and make room for new foul and storm drains."

Paul Holt explained that, while the performance specification for the new building clearly set out criteria on aspects such as vibration-sensitive floors, air tightness, and HTM 02-06 compliance, the new facility also had to be designed to fit with the Trust's strategic development plans for the site as a whole. He said: "These stipulate that we should maximise site utilisation in terms of the medical and clinical facilities provided, and indeed a key element in the specification for this new building was expandability to accommodate, in future, either additions to the existing orthopaedic facilities, or other clinical activities. We may, for example, look at putting in additional theatres, wards, a high dependency unit, and even endoscopy facilities."



A first floor recovery area.



One of the two fully equipped orthopaedic operating theatres.



The main patient reception (left) and the staff room. Internal walls are attractively decorated with contrasting pastel colours.

Future flexibility

Alan Wilde added: "While providing for our immediate requirements, the new facility has also been designed to accommodate future additions to the building itself, as well as to its mechanical and electrical infrastructure."

In addition to occupying some of the car parking space originally provided for the CSU (The Trust addressed the loss of spaces by adding an additional deck to a nearby car park), the project required the demolition of two obsolete operating theatres.

One of MTX's key tasks, working with Taylor Young, was to ensure a seamless link of the new building's four floors to the adjoining CSU. David Hartley explained: "We initially looked at a system of DDA-compliant ramps, but instead tailored the height of the modules to fit alongside the adjoining structure as well as to link with existing services."

The 110 modules use to create the new facility were constructed off-site by MTX supply chain partner Servacomm, a specialist in modular and prefabricated building manufacture, at its six-acre Hull manufacturing site.

An 'excellent rapport'

MTX has worked with the company on similar projects for the past seven years, and says the two organisations have an excellent rapport and enjoy a number of synergies, leading to a fruitful working partnership.

Delivering the modules, each of which is, on average, some 12 m long by 3.5 m wide and 3.2 m high, to site, required careful co-ordination with the Trust, but was successfully undertaken over a two-week period late in September, despite what David Hartley describes as some "extremely inclement weather". The delivery was actually completed a week faster than originally envisaged.

Alan Wilde added: "Getting the modules to the required location for craning into position did require some minor road alterations, as there are a number of curves and bends around the estate that are naturally difficult for low-loaders carrying large structures to navigate. However careful co-ordination, and the excellent co-operation and teamwork which characterised the entire project, ensured a smooth delivery process."

During the modules' manufacture in Hull, each was fitted with pipework and electrical containment systems. David

Hartley elaborated: "Once this work, and internal partitions etc, had been completed by Servacomm, the modules were delivered and craned into position, after which our team immediately began installing the remainder of the internal mechanical and electrical services, working to a detailed brief from services engineers DSSR. We also installed the third floor plant room equipment, including dedicated air handling units, boilers, updated heat exchangers, and isolated and uninterruptible power supplies from Starkstrom."

HBN and HTM standards met

MTX emphasises that, while some modular building systems have been criticised for elements such as "bouncy floors", the flooring incorporated into its buildings meets all relevant HBN and HTM standards, a critical requirement in the orthopaedic theatres at the new Stepping Hill Hospital unit.

David Hartley said: "To meet the vibration response requirements set out under HTM 2045 we used a cast *in situ* concrete slab in a metal floor deck in the theatre areas." This flooring system, which also reportedly complies with British Standard BS 6472 on resistance



Attention to detail: Internal fittings feature extensive use of maple and beech.

A ground floor corridor.



Second floor 6-bay day ward.



The building is fully DDA-compliant.

to vibration in buildings, is a hollow rib system back-filled with concrete; “not a typical flooring structure for a modular building”, with a microfibre mesh providing further reinforcement.

David Hartley said: “This gives an extremely low vibration response factor of under 1, while the flooring for the corridors and other public areas incorporates 150 x 100 box section steel beams topped with timber joists and a 25mm quality ply deck surmounted by a further 6mm ply layer on top of that. Above this is the actual flooring surface – an Ardex self-levelling screed with polyfloor vinyl finish.” Here flooring has a vibration response factor of 3.

The modules themselves are largely constructed from a steel frame, including a steel floor and roof structures, which comply with all British Standards requirements.

David Hartley added: “In some areas, such as in the theatres, with their laminar flow canopies, a minimum 3 m finished ceiling height was critical. Since the modules are typically 3.2 m high in standard form we used spacer frames where necessary to meet HTM requirements, and to provide sufficient ceiling void space to accommodate all the mechanical and electrical services feeding the theatres.”

Time savings achieved

Once the modules were all in position, the internal fitting out, and (since the work could be done at the same time – a further cited benefit of modular construction) the completion of the external brickwork and rendering to the higher floors could all take place simultaneously, bringing further time savings.

Bob Turnbull, design manager for Laing O’Rourke, added: “Getting a new healthcare facility designed and constructed within such a short timescale and, simultaneously, to such a high standard, would generally be nigh on impossible using traditional build. I can honestly say that the teamwork that took place was among the best I have ever experienced. Regular meetings attended by representatives from ourselves, as main contractors, MTX, and the various sub-contractors, saw any difficult issues or problem areas robustly discussed and a solution quickly found, very much in the spirit of ProCure21. Thanks to careful planning, disruption to existing hospital services was also minimised.”

Of the contribution made by MTX, architect Narciso Simioni said: “MTX proved themselves extremely adept at providing what we, as architects, wanted. Some modular building suppliers offer

much less flexible systems, but we felt MTX brought to the scheme a really big commitment to providing what we and the Trust actually required.”

Colleague and Taylor Young director Paul Rushton added: “On a personal note I found the MTX solution to be surprisingly good, with a proactive teamwork approach different to any other modular building supplier I’ve encountered. The whole team – Trust, design and construction – gelled together well to deliver a complex project under tight time constraints. We’re already talking to Laing O’Rourke and MTX about delivering the next phase of the hospital’s master plan, so that says it all really.”

Working together

“With a building of this type,” said Laing O’Rourke’s Bob Turnbull, “you need a lot of detailed design data early on, and the way this team worked together to produce this, and to get decisions made quickly, was a key factor in the project’s success. We were also lucky to have a client, in the Trust’s estates team, who knew exactly what they wanted and, like all the key project participants, were happy to be frank and open at meetings. No information was ever hidden and, where we did hit bottlenecks, these were rapidly resolved.”



The interior and exterior (right) of the rooftop plant room.

Alan Wilde paid tribute, in his turn, to the very limited dust and noise generated during the project, saying: "Because the scheme involved much less use of concrete than a traditional build, noise, vibration and dust were minimal, and there was also very little construction waste to deal with, a considerable benefit given today's emphasis on sustainable building methods."

Matching exterior

The finished building features brickwork at ground floor level, with a rendered finish that also matches the adjacent CSU, to the remaining levels. Double-glazed throughout (the windows were pre-fitted off-site), the unit was designed to be light and airy, with maximum use of natural daylight and ventilation, and expansive views. The interior features attractive, contrasting pastel colours on walls, with the colour scheme varying from level to level, while extensive use of maple and beech on fittings such as the fascia of nurse stations lends further visual appeal. Narciso Simioni says the colours were chosen for their calming, relaxing feel, and to complement fabrics selected by the Trust.

As in most spheres, the client is king, and the final word on the project's success and speed of completion should go to the Stockport NHS Foundation Trust. Alan Wilde said: "We are delighted with the new unit, and with the excellent collaboration between all parties on a scheme completed within budget, within an extremely tight, but critical, timeframe. There really was no other effective way we could have had a facility of this standard designed and built



Once the modules were in place, MTX's team began installing the remainder of the internal mechanical and electrical services.



within such timeframes, and the unit's successful completion is a credit to Laing O'Rourke, MTX, and to the various sub-contractors. "It also highlights the fast-tracking benefits of the ProCure21 framework.

"Prior to this project we had only ever commissioned very small modular build schemes at the Stepping Hill site but, given the impressive results we've seen here, would have no hesitation in considering such an option again.

"It has also been great, having involved a range of stakeholders throughout the consultation and planning process, to have received some very positive feedback, particularly from senior clinicians, on the quality of the building, since its completion." +

The project team

Key participants

- Client – Stockport NHS Foundation Trust.
- Primary contractor – Laing O'Rourke.
- Modular healthcare construction specialist – MTX Contracts.
- Architects – Taylor Young.
- Project managers – Turner & Townsend.
- Cost advisors – Rider Hunt.
- Services engineers – DSSR.
- Structural engineers – AJP Structural Engineers.
- CDM co-ordinators – Spring & Co.
- Modular building supplier – Servacomm.

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