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The new face of prefabs

Can modular efficiency meet today's needs?

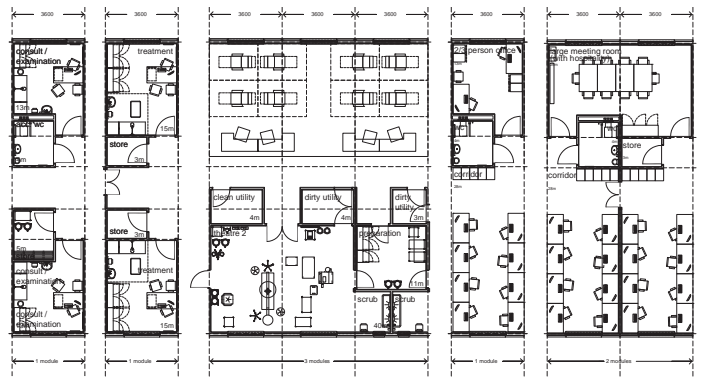
How fab is prefab: Very, if tailored to the times
Ready made: Where offsite construction works
Healthy option: The kit-of-parts hospital
Feel the heat: Timber frame under fire



MAAP

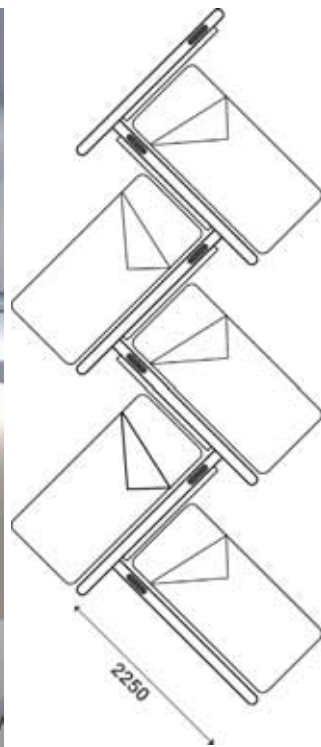


Stoke Mandeville Hospital: Two blocks of Yorkon modules are linked by an atrium. Flexible modules can be theatres, offices, meeting rooms and consultation spaces.





ABOVE: In-flight health check from Priestmangoode. Its herringbone bed plan, with panels demarcating private space and providing services and storage, draws on experience in the airline and hotel industries.



As the new government warns of drastic cost-cutting in the public sector, hospitals are looking to get more for their money. A **new type of plan and plug-in modules** could be the natural solution

Words Eleanor Young

HEALTH AND EFFICIENCY

ASK MEDICAL ARCHITECTURE ARTS PROJECTS

directors Christopher Shaw and Mungo Smith about efficiency in healthcare design and they come straight back with that fundamental question: 'What is efficiency?' MAAP is a dedicated healthcare practice, versed in the Lancet and the language of clinicians as well as Health Building Notes, with projects ranging from Canada and Australia.

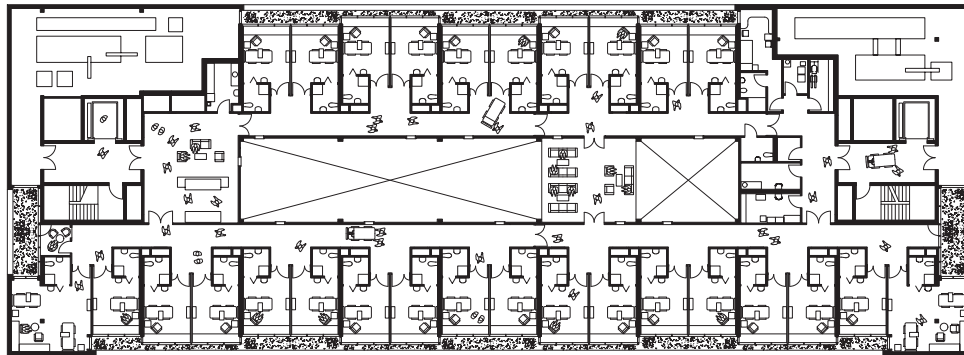
'Yes you can find efficiencies, but they are systemic,' says Shaw. The costs are not in building or in the plan. As with most buildings, they are in the operation. Of the NHS's £100bn a year annual budget, 60% goes on staff and only half its £5 billion capital expenditure is on buildings (along with contributions through public private partnerships). So a more efficient and pleasant environment can pay off through increased staff productivity and retention and fewer days absent over a workforce of 1.7 million.

So there are some big moves to make. Avoid deep plan designs that seal off light and air and make refurbishment all but impossible. Encourage staff to move around the hospital – the old-fashioned pins in the plan to measure nurse journeys is not helpful. And ensure

spaces are well used – which may mean tearing down departmental boundaries. Smith says: 'Outside the departmental stranglehold you can design to the optimum scale.' Then you can start to plan rationally.

Hospitals spaces aren't that special, Shaw points out. Generally they are 35% hotel, 15% factory, 35% offices or outpatients ('the NHS is very bad at offices') and only 15% core hospital – operating theatres, special imaging, critical care, intervention suites and high dependency units. He and Smith can happily see health buildings, including hospitals, as 'extended' office buildings: shell, core, circulation. 'Primary circulation and services reticulation could all be fixed,' he says. Specialist elements could be considered as just components to be slotted in.

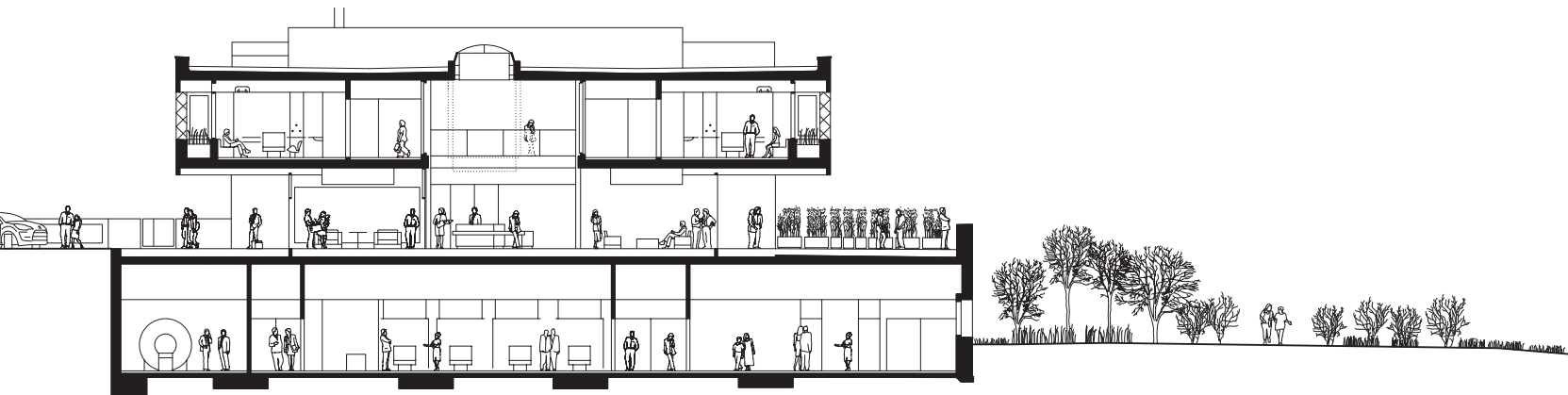
Back to components slotting in later: the shell strategy comes first. A diagram of Foster and Partners' CircleBath, a new private hospital in Somerset that was completed earlier this year, shows how an office plan has been transposed into healthcare – two banks of accommodation, circulation at either end and an atrium in between. And MAAP has one of its own. At Stoke Mandeville Hospital in Aylesbury



DIAGRAMS

LEFT: The first floor plan shows how Foster + Partners applied the simple shell and core diagram of the office to a £21m hospital for CircleBath.

BELOW: The section gives an idea of the varied spaces and articulation of this dramatic aluminium-clad building.



it got the chance to try its ideas with a modular shell and core solution. To fund development the hospital had sold off land from its existing building – so it had to get off that site quickly. After reducing the area from 10,000m² to 6500m² – with generic consulting rooms and other shared spaces split between departments to make it more efficient – the practice needed a simple construction system where the programme could be altered as it progressed, and that could be built fast. Two parallel blocks of Yorkon modules supporting a covered atrium were up in under two years.

Breaking hospitals into components is an attractive idea – conceptually and physically, and it has a history. Isambard Kingdom Brunel designed a modular hospital of wood and canvas for erection at Renkoi in the Crimea in 1855. The late Victorians favoured Florence's Nightingale Ward while the 1970s had the Nucleus planning template, but both fell out of favour as hospitals demanded changes. 'Nucleus was a dreary solution,' says Smith. 'But it was driven by the idea of efficiency. With its template of 1000m² – based on fire regulations – a hospital could be 'given' a department.' Newham General

Hospital was one of the first nucleus hospitals when it opened in 1983. But hospitals wouldn't accept a standard version, they wanted bespoke.

That is at the large scale, but perhaps smaller prefabrication components that can be plugged into existing hospitals can be more effectively standardised. A recent initiative from the Design Council and Department of Health invited ideas on the theme of dignity in hospitals. Designers and health architects with proven track records in health design took part. One of the winners was Nightingale Associates which, with Billings Jackson, has developed a prefabricated bed system complete with a ceiling and lights. It aims to allow under used spaces to be employed without major refurbishment. Another winner was the Avanti pod, a prefabricated plug in loo, designed by Avanti with manufacturer Panaloc. It can be used either inside in a ward or outside the building where pods can be stacked vertically as an addition to wards. A prototype has already been used for demonstrations and is now sitting in the Avanti offices (plugged but not plumbed in).

Avanti's Joanna Marriott explains that although there are already many pods on the

market, most are bespoke as well as designed for insertion into new builds. 'This is not just built off site, but factory made,' says Marriott. 'Every time you buy them there are myriad things to decide on, with conflicting legislation and different contracts and client preferences.' This time the team was free to navigate its own way through this maze without the normal 'power hierarchy' of procurement. The feedback from clinicians has been positive. Features include seamless joints to prefabricated panels, high quality materials like Corian rather than vinyl or laminate, one continuous grab rail rather than a forest of them, integrated bins and lights that dim as the door opens – to reduce the chance of waking the patient next door. Since touting the prototype around Avanti has found it is the ease speed of installation that is most valued. The Avanti pod travels in an ordinary hospital goods lift and can be erected in just 48 hours so won't put whole wards out of service.

Designer Priestmangoode has been in discussing products that could be brought in to healthcare but director Paul Priestman eventually decided to work off his own bat to



AVANTI POD PROTOTYPE

- 1: Hooks at two levels for standing and seated use
- 2: Large, recessed mirror with shelf below and light above
- 3: Soap dispenser, push operation
- 4: Thermostatic shower control, lever operated
- 5: Recessed shelves at two levels for standing and seated use
- 6: Folding shower screen
- 7: Folding shower seat
- 8: Integral accessible shower tray
- 9: Recessed pedal bin
- 10: Recessed paper towel dispenser

develop something more: a lounge concept. It sounds very leisure industry and it is.

Priestmangoode's experience is designing for airlines. It has made first class seats providing privacy and comfort in the smallest possible space for Lufthansa, Swissair, Qatar Airways and many more. 'You make everything do two or three things. You absolutely minimise the cost of the room and minimise things that touch the floor. It's just common sense, really,' he says. Product design was not proving enough: 'We need to be connected to architects and builders where you can really make a difference.' They already are in hospitality. Budget hotel chain Accor is rolling out 50,000 rooms to Priestmangoode's design. Here robustness and ease of cleaning are critical. The rooms are mocked up, cleaned and have adjustments made. It makes the hospital standard of rubber skirting on top of painted walls all the more incredible to Priestman.

Priestmangoode's recovery lounge is for outpatients who might otherwise be in waiting rooms, or in a recovery ward following minor operations. It is a panel system, each panel serving as a headboard with call panel, reading



light, gas, and electricity on one side while on the other are spaces for storing personal items, a fold down table and tv. For hygiene each panel would be prefabricated in the factory and sealed. Each panel touches the ground in just one place – for ease of cleaning. All the services come through this leg and are supported on the other side by the next panel.

Its herringbone layout uses the airline trick of avoiding eye contact to ensure a sense of privacy while packing in more beds in a given floor area than parking them along a wall does. Priestmangoode's bed would be moveable so doctors and nurses can get around the patient, along with portable screens, it can even provide visitor seating on a stool one the end. Priestman is testing out the idea with private healthcare providers such as Circle and Bupa, but would love to see it taken up by the NHS.

While it is clear that the major healthcare building programme of the last decade is now drawing to an end it is equally clear that efficient solutions will continue to be needed – whether reducing long term costs in new hospitals or plugging in solutions to help make existing buildings work better. ■