

A WINDOW ONTO MENTAL HEALTH

By Maria Morgan, senior product manager at architectural aluminium systems supplier Kawneer

The design and development of new architectural products is influenced by many factors – principally performance, cost, aesthetics, durability and maintenance requirements. But occasionally a new product is required for such a specialised application that the design brief goes well beyond normal boundaries.

Few applications are as demanding as mental healthcare, especially when mental illness makes patients a danger to themselves or to others, and where emphasis is on treatment but within a secure environment.

Detention under the Mental Health Act is aimed at providing clinical care in conditions of appropriate security but while other secure environments, such as prisons, are often purposely designed to look oppressive, in healthcare the reverse is encouraged. A pleasant healing environment is the aim, with the challenge being in providing a healthcare facility that is designed to be secure.



Just over two years ago we were approached by the main contractor with the consortium building the new £75 million Roseberry Park Mental Hospital in Middlesbrough. The contractor's preference was to develop an aluminium framed window product that met the rigorous design criteria laid down by the client - Tees, Esk & Wear Valleys NHS Foundation Trust.

Windows are a critical element in the design of any mental health hospital, as John Ord, associate project director for the trust, explained: "In mental health projects, windows inevitably become one of the biggest issues, they generate a huge amount of debate. Clinicians, architects and other project team members all have often conflicting opinions on optimum solutions. There is only limited Department of Health guidance on the whole issue and no common standards exist."

Windows, it transpires, have a direct impact on the risk of what the National Patient Safety Agency calls 'Never Events' – "serious, largely preventable patient safety incidents that should not occur if the available preventative measures have been implemented." That usually means attempted suicide or escape of a restricted patient.

From the security point of view, taking robustness as a given, the best window is one that cannot be opened. But this usually is not a practical option. It is generally acknowledged that a sealed building, reliant on an expensive and wasteful air conditioning system for ventilation, is not a healthy or normal environment for any patient. It is also acknowledged that any opening window poses some risk of ligature. The design should attempt to minimise this risk.



Roseberry Park therefore needed windows which could be opened but which would meet the trust's design criteria. These boiled down to the requirement that the window should have a limited opening range, be capable of being locked open as well as locked shut, that it should include a 'contraband mesh' (a steel screen to admit airflow and light into the room but prevent drugs or other prohibited items to be passed through), and that it should be capable of withstanding prolonged attack with any object a patient could obtain within the hospital.

Crucially, with self-harm and suicide an ever-present risk, the window had to be free of any features which could be used to attach a ligature. This automatically ruled out a casement or vertical sliding sash design, and we quickly decided on a horizontal sliding sash window.

Projecting handles, locks, hinges or vents were also ruled out. But it didn't stop there. Input from the trust's clinical experts revealed that the most determined patients will employ an astonishing degree of ingenuity and will find and exploit any weaknesses in a design to achieve their goals.

Our search for the optimum design began with an existing horizontal sash window which is popular and widely used on the continent, though less well known in the UK. This was coupled with experience and the use of components more normally associated with security screens as you would find in high street banks.

To test various design features, approved specialist contractor Polar (NE), who worked with us to develop the design, produced prototype fabrications and built a special test rig.

“Design development was almost a process of trial and error. The trust would identify a problem and the design team would then try to design it out,” said Polar managing director John Wilson.

This was unfamiliar territory for all of us. There are no test standards or window testing procedures in the NHS generally, all our tests had to be devised and agreed as the design developed.

“I don’t think any of us realised how complex this was going to be when we first started,” said Mr Wilson.

With the prototype installed in the test rig, various attempts were made to damage or destroy it. Workers from the Polar assembly line kindly volunteered to carry out the tests while the trust provided its own volunteers, one of whom was an experienced senior ward manager.

“We were able to dismantle the restriction device of the opening sash of the first mock-up using ordinary canteen cutlery. I think the product people got a bit of a shock when they realised how relatively easily it could be done. We must have tested at least four prototypes before we were satisfied that the design met the specification,” said John Ord.

The client’s clinical personnel, whose day-to-day contact with patients has exposed them to the full gamut of disruptive behavioural activity, were crucial in identifying weaknesses in the design which we would not have recognised.

Every component part of the window came under scrutiny. The frame and glazing itself was an important issue but so to were the more secondary elements like the glazing gasket. It was important we designed a system that had wraparound glazing so it could not be removed by the occupant. We also designed the gasket so it was perforated to ensure it broke into harmless pieces if there was an attempt to remove it. The clinical team were also instrumental in devising test procedures.

“We always said the window had to withstand attacks with any items a patient could reasonably be expected to get hold of so as well as the cutlery, that included pieces of furniture, a fire extinguisher, pool cues, and a snooker ball in a sock,” said Mr Ord.



The fire extinguisher test required the window assembly to survive a sustained attack with a 6.5-litre extinguisher for 15 minutes. A severely disturbed patient can sustain such a prolonged attack but most people tire after a couple of minutes and so the product test required a relay of five volunteers.

The trust also wished to test the windows to extremes, and outside the usual patient accessible implement range to test that of an assisted escape. Having conducted the accepted test criteria, the trust personnel also used jemmies and a crowbar on the window and frame. While some distortion took place, the integrity of the window remained intact after a near 30-minute attack test.

The new window also had to incorporate a sliding contraband mesh – a perforated steel screen which would automatically close across the frame as the glass pane was opened. The size and spacing of the perforations were critical as it was essential the screen provided the required security without blocking out too much light or air. The optimum configuration for this project proved to be a 3mm diameter hole at 5mm centres – too small to pass illicit materials or substances through but large enough and numerous enough to be able to see through it.



As John Ord said, the integrity of the window design is vital to the security of the whole development, approximately half of whose 312 beds will be in the medium-security 'forensic' wing of the hospital. The aim was to amalgamate the experience of the trust clinical staff with that of the window manufacturer in arriving at a solution (in this case our AA®3110HW horizontal sliding window) where security was paramount yet a more normal image is portrayed and not that of an oppressive or custodial regime.

Working on a development project is always a learning experience but this scheme was a real eye-opener for all concerned. Roseberry Park taught me and my colleagues at Kawneer a lot about the design process but more importantly, it challenged my assumptions about mental healthcare. Never before had I been required to delve so deeply into the needs of the end user and to see the final product from their point of view. It's changed the way I do my job.





For further information, please contact:

Jane Ashley @ Kawneer

T 01928 502500

F 01928 502526

E jane.ashley@alcoa.com

W www.kawneer.co.uk

For more detailed information on Kawneer's AA@3110HW Horizontal Sliding Window, including our useful 'Window Product Selector' please contact us for a copy of our Specialist Healthcare Brochure, please call **01928 502612**



INVESTOR IN PEOPLE
Kawneer UK Limited
Astmoor Road
Astmoor Industrial Estate
Runcorn
Cheshire
WA7 1QQ

01928 502500 **TEL**
01928 502501 **FAX**
kuk.kawneer@alcoa.com **EMAIL**
Registered in England No. 2917765

WWW.KAWNEER.CO.UK