Designing for the mind

Mental health
Mental health services play a vital role in society – one that is only becoming more important as greater longevity brings an accompanying rise in cases of degenerative brain disease, and disorders such as anxiety and depression increase.

Service providers face many challenges. They must expand capacity as the baby-boomer generation approaches old age and provide a growing range of specialist services to support patients with diverse needs. Many existing facilities are in need of modernisation to improve accommodation and meet new standards of care. And as hospitals and treatment centres are becoming more society-facing to improve awareness of mental health issues or raise funding for vital patient care and research, safety and security remain key priorities for patients, families, staff and communities.

WSP is a specialist in mental health buildings, and our teams have designed and delivered many different facilities around the world, including small hotel-style clinics, tertiary and acute assessment and treatment facilities, major behavioural health campuses, community outreach centres and high-security forensic hospitals.

We are supporting our clients to provide state-of-the-art care for sufferers of Alzheimer’s and schizophrenia at the Zucker Hillside Hospital in New York, and seamlessly integrate psychiatric services with medical care in Cardiff and Vancouver. Toronto’s 27-acre regeneration scheme will host clinical facilities alongside shops, businesses, parks and housing to help those with addiction problems re-engage with the community. Meanwhile, the landmark architecture of the Lou Ruvo Center for Brain Health in Las Vegas aims to change attitudes and support research into devastating degenerative conditions.

We provide innovative, efficient and sensitive solutions, carefully aligned to our clients’ therapeutic vision and model of care.
Clean, safe environments
Hygiene and patient safety are major considerations for healthcare and psychiatric staff. We help to put their minds at rest by creating robust fit-outs that require minimal maintenance and by making safety-by-design our guiding principle, in the smallest details and the most fundamental design decisions. We build natural surveillance into structures and layouts, and unobtrusive but effective alarm, security and communications systems. We specify anti-ligature, vandal-resistant building systems to prevent self-harm, ensure fixtures and surfaces can be easily cleaned, and avoid creating crevices or joints where grime can collect. We sensitively combine the most appropriate measures in each unique set of circumstances – from features that reduce the risk of falls, to fire and life safety systems that allow the smooth evacuation of patients with learning disabilities or severe mental disorders.

Positive experiences
The prospect of being admitted to a mental health facility can be a terrifying one for patients and their families. As healthcare providers strive to address outdated perceptions of mental illness and treatment, we support them with welcoming, friendly environments where people feel able to relax. We consult extensively with physicians, healthcare staff, patients and their families, and draw on the latest thinking on therapeutic design for our projects. Today’s mental health centres and hospitals are very different from typical institutional environments, with structural and acoustic strategies to optimise privacy and dignity, circulation spaces that offer areas for socialising or solitude, plenty of natural light and fresh air to enhance wellbeing, carefully chosen colour schemes and subtle visual clues to aid wayfinding.

Efficient buildings
As mental health service providers rise to the challenge of increasing demand, hospitals and treatment centres must play a crucial supporting role. We work with clients to design buildings around lean workflows, to maximise the effectiveness of treatment, shorten travel distances for healthcare staff and provide pleasant working environments that always function as they should. We apply best practice and the latest proven technologies to reduce energy and water consumption, and keep an eye on the future with flexible designs that can adapt as needs or treatments evolve, and climate change adaptation strategies to ensure they will remain cost-effective to run and safe for occupiers as the century progresses. A coordinated, holistic approach to design is vital to efficiency. Our strength lies in the range of specialist services we can offer, from strategic planning and owner’s representative project management to structural and mechanical engineering, to specialisms such as lighting, fire and life safety, security, IT and communications and environmentally sustainable design.

What makes a world-class mental health facility?
Modern mental health facilities are continually evolving, and the transformation continues with new technology and deeper understanding of the provision of care. Aside from facilitating responsive and compassionate treatment, today buildings may fulfil many other roles, from helping patients to reintegrate back into society to changing attitudes to mental health and facilitating groundbreaking research.

We support our clients to set new standards by combining world-class therapeutic design with innovation in materials, technologies and construction techniques. The Lou Ruvo Centre for Brain Health in Las Vegas, for example, offers a patient experience that is second-to-none with a stunning space for revenue-generating events. Our structural engineers worked with world-renowned architect Frank Gehry to realise his extraordinary vision, with a self-supporting structure and a rippling steel façade that makes a splash in a city hardly known for its reticence. Meanwhile, at the Long Bay correctional complex in New South Wales, our security and communications specialists helped to create a benign, healing environment to foster rehabilitation within a high-security forensic hospital.

It’s on designs like this where our use of advanced modelling tools really comes into its own – accuracy is crucial when almost every steel connection has to be individually fabricated, or when a secure perimeter is paramount. And we know that just because our clients want to take a fresh approach, there can be no compromise when it comes to delivering on time and on budget.
The $80m Lou Ruvo Center for Brain Health is a dramatic addition to the downtown Las Vegas skyline and a spur for research into degenerative brain disease. Pioneered by drinks entrepreneur and philanthropist Larry Ruvo, who lost his own father to Alzheimer’s, the 5,500m² facility is dedicated to caring for patients with cognitive brain disorders, supporting their families and continuing the search for improved treatments.

Designed by celebrated architect Frank Gehry, this remarkable complex is split into two distinct wings, representing the logical and creative aspects of brain function. To the north, a stack of splayed rectangular boxes, clad in white stucco render with glazed recesses, forms the ‘logical’ four-storey medical clinic, containing patient facilities, neuroimaging suites and research space. To the south, an undulating stainless steel and glass structure – reflecting creative thought – houses a large atrium, allowing the centre to double as a revenue-generating events facility.

Located in the city’s 61-acre Symphony Park, the bold structure is raising community awareness of Alzheimer’s, Huntington’s disease and other brain disorders. But it is designed very much with the patient experience in mind. With plenty of natural light and curved corridors, the centre deliberately veers away from the typical clinical environment.

The medical wing has a steel frame and composite concrete and metal deck floors, while a distinctive curved steel trellis cantilevers off its south side, marking the transition between two halves of the complex. The events centre, meanwhile, comprises a laser-cut prefabricated structural steel shell punctuated by 199 windows that flood the space with natural light. Supplemented only by two internal steel ‘tree’ columns, the unique structure is largely self-supporting, making possible the column-free atrium inside.

As structural engineer of record of the building, WSP worked tirelessly to create a building system as elegant and complex as the outer shell. The irregular elevation of the clinic’s north façade meant accurate detailing of the steelwork was crucial, while design of the curved trellis had to factor in large lateral seismic and wind forces. Virtually every steel connection had to be individually designed and fabricated. BIM was vital to the design process, allowing our team to accommodate the project’s complex geometry.
Long Bay Prison & Forensic Hospitals
Combining maximum security with sensitive design for a safe healing environment

Location: Sydney, Australia
Client: Brookfield Multiplex
Architect: peckvonhartel
Services: Mechanical, Electrical and Plumbing, Security Consulting, Fire Engineering, Audiovisual Systems
Project value: $130m
Project status: Completed in 2008

Construction of two new hospitals at Australia’s Long Bay Correctional Complex marks a fresh approach to secure care, as well as a major investment in mental health facilities for the state of New South Wales. The A$130m project in the Sydney suburb of Malabar comprises an 85-bed prison hospital and a 135-bed forensic hospital, providing care and treatment to mentally ill patients incarcerated for the safety of themselves and the community.

The guiding ambition behind the design was to do away with the typical, oppressive prison atmosphere and create a benign, healing environment better suited to addressing patients’ mental health issues and fostering rehabilitation. The challenge to the design team was to achieve this within the context of a high security facility; to produce a low-stress clinical environment without compromising the security measures essential to patient and public safety.

The forensic hospital showcases this approach, combining a hospital environment with a maximum-security perimeter. Since the facility allows prisoners who develop mental health issues to receive treatment without leaving the Long Bay complex, the design team had leeway to create a building that feels residential but maintains appropriate levels of security. It contains 91 beds for acute and sub-acute patients, 24 beds for sub-acute females and a 20-bed long-stay unit, plus a recreation and rehabilitation centre.

The prison hospital replaces an existing facility and includes medical and surgical wards, a facility for aged care and rehabilitation and a mental health unit, plus a hospital entry building and visitors’ centre, gatehouse and maximum-security perimeter wall. Outside the wall are parking facilities and a road.

WSP provided hydraulic, security, audio visual and fire-safety design services to the project, which was delivered through a public private partnership. We provided all engineering building services, including environmentally sustainable design. Our team took a holistic approach, with a strong emphasis on improved wellness and indoor environment quality. The design includes chilled beam technology, no recirculation of air, rainwater collection, solar water heating and future capacity for cogeneration. The centre is the first building in Victoria, and the largest in Australia to date, to achieve the Green Star Healthcare sustainability accreditation.
Mental health services are under pressure. Changing demographics and better understanding of mental illness are creating greater need, while expectations of care and facilities themselves are becoming much higher.

Meeting demand means managing resources effectively - financial, natural and, most importantly, the time and energy of healthcare staff. Our design teams help providers to do this in buildings that are meticulously tailored to their requirements and systems that perform faultlessly in high-pressure situations - while ensuring that they are always cost-effective to construct, operate and maintain.

As specialists not only in the mental health sector but in environmentally sustainable design, we've delivered some of the world’s most efficient buildings. We understand how to minimise energy and water consumption and maximise fresh air and natural light without compromising safety, as at Cardiff’s new adult mental health unit. This pioneering BREEAM Excellent facility is powered by an array of photovoltaic panels with dual fuel boilers and generators to ensure security of supply.

Our teams are also skilled at sustainable design and planning that complement the wellbeing of patients – the Joseph & Rosalie Segal Family Health Centre in British Columbia offers private, en-suite rooms, green spaces and dedicated areas for a range of therapeutic activities, within an exemplar building that will achieve LEED Gold performance.

Wherever we’re working, we combine best practice from across our global business to develop the very best, bespoke solution each time.
Location: Vancouver, British Columbia, Canada
Client: Vancouver Coastal Health Authority
Architect: Parkin Architects
Services: Mechanical, Electrical and Plumbing, Structural Engineering, Project Management
Project value: $82m
Project status: Due for completion in 2017

Due to open in 2017, the Joseph & Rosalie Segal Family Health Centre represents a major advance for mental health and substance use care in British Columbia. The eight-storey mental health and substance use facility on the Vancouver General Hospital campus is set to provide a unique, healing environment for patients suffering from schizophrenia, depression, mood disorders and other acute mental health conditions.

The 100-bed centre – the largest facility of its kind in the province – will bring a variety of services under one roof, including inpatient and outpatient care, outreach programmes and addiction services. Integrated in this way, Vancouver Coastal Health Authority is geared to provide patients with seamless and consistent care as they move from hospital life back into the community.

WSP has played a role on this innovative project from an early stage, providing project management services for planning, design and procurement of the 11,000m² facility. In tune with the patient-centred philosophy of the new centre, patients, families, physicians, UBC Research Institute and staff were all consulted during the design process. The result combines therapeutic treatment areas with plenty of natural light to create a bright and welcoming environment. All rooms will be private and have en-suite bathrooms, and every floor has access to outdoors and quiet space for reading and meditating. In recognition of the role of the outdoors in promoting wellbeing, the LEED Gold-rated design includes a public park and rooftop gardens for patient gardening. The centre, which also has dedicated family and visitor space, will be easy to expand in future, with built-in capacity for two additional floors.

Acting as the owner’s representative and project manager, our team has overseen the strategic planning and business case development as well as the indicative design and design-build procurement phases of the project. Working closely with a range of stakeholders, we kept the schedule and budget on track, helping to ensure this vision for an integrated, therapeutic environment becomes reality as quickly and cost-effectively as possible.
Realising that Cardiff’s crumbling Whitchurch hospital was no longer fit for purpose, hospital leaders seized the opportunity to build a more integrated mental health service for the community, housed in a state-of-the-art facility. The new Adult Mental Health Unit at the Llandough hospital campus brings adult and specialist services previously provided across two sites into one energy-efficient building. Located as near to the hospital’s other facilities as possible, the 19,800m² unit provides easy access to neighbouring clinics and reflects the guiding principle that mental health services should complement – and be integrated with – wider hospital care.

The 135-bed inpatient facility provides modern, flexible space to accommodate a range of functions, including crisis assessment, psychiatric intensive care and addiction support alongside recreational, relaxation and therapy areas. A neuropsychiatry inpatient unit cares for patients with acquired brain injuries. The centre’s 10 wards each have between 10 and 15 beds and accommodate all patients in private rooms. Flexible boundaries within wards allow for adaptable facilities while maintaining essential privacy and security. The largely two-storey structure also takes advantage of the sloping site to create additional space above and below the main floors. Patients and staff were consulted on the design, which sees increasing levels of privacy as users progress away from the public entrance and through the building.

WSP was engaged to deliver a range of services, including mechanical, electrical and public health design, as well as sustainability solutions. The client wanted to create an efficient, low-energy building that would achieve a BREEAM Excellent rating, while enjoying the security of supply necessary to this kind of 24-hour facility. Built on an old car park to reduce its environmental impact on the surrounding area, the unit is also designed for minimal energy consumption. Notable features include efficient lighting design, maximised daylight and presence-detecting lighting controls. Natural ventilation is used where possible and an array of solar PV panels are mounted on the roof.

The building services design also made use of innovative materials and offsite installation techniques to boost efficiency and reduce construction time. Dual fuel boilers and generators meanwhile ensure resilience. BIM was invaluable for making sure that all services were fully coordinated before construction began.

Hafan y Coed, the New Adult Mental Health Unit at University Hospital Llandough

A flexible, low-energy facility fit for 21st century care
Understanding of mental illness continues to improve, methods of treatment and care evolve – and healthcare providers need facilities that can incorporate new ideas and approaches to a range of disorders. As experts in mental health design, WSP supports healthcare providers to explore new ways of providing services, safe in the knowledge that they can meet the most demanding clinical and security standards.

Creating more home-like environments has become a driving ambition for many of our clients, so we support them with engineering solutions that offer privacy and comfort in an attractive range of spaces, from internal art galleries and meditation spaces, to family play areas and rooftop gardens.

Award-winning Roseberry Park may be a major, 365-bed hospital, but it aims to offer hotel-style accommodation on a domestic scale, with all patient rooms at ground-floor level in self-contained wards sheltered around landscaped courtyards. New York’s Zucker Hillside Hospital has long been renowned for its pioneering research into mental illness. For the latest addition to its campus, our design allowed all rooms to flex between private and semi-private according to individual patient needs, and facilitated an ingenious three-corridor system to physically separate patients, staff and visitors, and enable services such as laundry or rubbish collection to take place out of sight.

We can offer expert help with IT, communications and audio-visual technologies too, to provide features such as full wireless connectivity and bedside patient registration, or interactivity to stimulate the senses of patients with severe mental illness – at the Zucker, we helped to create floors that seem to ripple to the touch.

We always bring fresh thinking to the challenges our clients face, backed up by the technical expertise that’s essential to deliver truly cutting-edge care.
Roseberry Park
Revolutionary care in a home-like environment

The £75m facility, designed to be as comfortable as a hotel and provide plenty of outdoor space and greenery, comprises self-contained wards clustered around landscaped courtyards. All patient accommodation and shared amenities are at ground level, contributing to the building’s domestic scale and character. Bedrooms are mostly private and larger than standard hospital accommodation, and all have windows looking onto a courtyard. An inspirational and calming artwork collection, specially commissioned from 13 artists, adorns the corridors while the exterior’s white walls and wooden cladding reinforce the non-clinical vibe.

WSP was civil and structural engineer on this state-of-the-art PFI scheme, which also includes low and medium secure forensic units as well as a gym, therapy rooms and shared activity space. Our team contributed significantly to the smooth delivery of the project, finding innovative ways to boost efficiency during construction. Using frost-resistant material, for example, we reduced the depth of the ground improvement foundations, saving time and money. The adoption of 3D BIM packages also allowed full co-ordination of the structure and building services during design, ensuring there were no clashes on site.

Tees Esk and Wear Valley NHS Trust has undergone a major modernisation programme in recent years, transforming its approach to service provision and ensuring it has the facilities to offer cutting-edge care. Roseberry Park is its crowning achievement. The award-winning centre for patients with mental health conditions and learning disabilities replaces Middlesbrough’s St Luke’s Hospital, a Victorian psychiatric facility ripe for closure after more than a century of use.

The new 365-bed hospital has propelled the service into the modern era, offering spacious and bright accommodation to suit the needs of its diverse users, from children with learning disabilities to older people experiencing mental health issues. A new emphasis on treating people in their own homes has reduced the number of in-patient beds required, allowing for a smaller-scale hospital that can better foster individual and communal wellbeing.

Location: Middlesborough, North Yorkshire, UK
Client: Tees Esk and Wear Valley NHS Trust
Architect: Medical Architecture
Services: Structural Engineering, Green Building Design, Transport Planning
Project Value: £75m
Project status: Completed in 2010

Image by Jill Elford / Medical Architecture
Zucker Hillside Hospital
Dynamic building services design for a pioneering psychiatric facility

Location: Glen Oaks, New York, USA
Client: Northwell Health
Architect: Array Architects
Services: Mechanical, Electrical and Plumbing
Project value: $74m
Project status: Completed in 2013

Zucker Hillside Hospital is a psychiatric facility known for its groundbreaking work in the diagnosis, treatment and research of mental illness. In 2013, the hospital opened the doors to its new 115-bed building, designed to replace the old, out-dated facility and create an adaptable, efficient and compassionate care environment.

The dynamic 13,000m² facility incorporates latest best practice in healthcare design, resulting in a flexible space that can adapt to the needs of its individual patients, including sufferers of Alzheimer's disease and schizophrenia. In line with research suggesting shared bedrooms benefit some patients and not others, all rooms are able to flex from private to semi-private, while the original 24-bed patient clusters have been compressed into six 18-bed units. Separate wings, built around a central courtyard, are provided for the three distinct groups the hospital serves: adults, adolescents and geropsychiatric patients. Meanwhile, an innovative three-corridor system physically separates patients, staff and visitors into different circulation spaces.

Our team provided a range of engineering design services for the project's building systems, including infrastructure to support full wireless connectivity and features such as bedside patient registration. The centre also houses spacious family areas with refreshment facilities, indoor and outdoor recreation space, classrooms for school-aged children, quiet spaces and a games room, plus geropsychiatry units fitted with walking tracks and designed to minimise the risk of falls. Tactile materials, coloured lights, mirrors and interactive floors are also used in parts of the facility to engage the senses of patients with severe mental illness.

The facility, designed by Array Architects, successfully combines a residential atmosphere with appropriate security measures to meet the overarching goal of a welcoming but safe environment. Landscaped gardens, natural light and therapeutic colours help to create a soothing setting that respects patient dignity and fosters a sense of community. Meanwhile, all aspects of the design keep patient safety in mind. Floor-to-ceiling windows, for example, are built to withstand the impact of heavy objects such as items of furniture, allowing residents to connect with the landscape outside in a secure environment.
However pressing the demands of today, mental health care providers can’t afford to ignore the future. Demographic trends promise a sharp rise in patients with increasingly complex needs, while climate change will make comfort and safety a moving target as the century progresses. WSP has worked with many providers to future-proof their buildings, providing strategic advice, masterplanning and an array of specialist engineering services.

We support them to leverage the greatest value from their existing estates and find the best solutions for their communities, now and for the years to come. Where a complete redevelopment is not possible, we apply lateral thinking and new design and construction technologies to transform outdated buildings to meet modern standards of care.

Our teams work closely with clients to ensure that mental health facilities will be able to meet changing needs or can be cost-effectively expanded – foundations and structures to support the addition of extra floors, for example, or alternative room configurations. Mental health environments will continue to impose tough demands on building systems, especially as sufferers of mental illness are among the most at-risk groups from overheating, often unable to take action when temperatures become dangerously high. And we do this within the current constraints our clients face: on one of our projects in Australia, we managed to upgrade heating, ventilation and electrical infrastructure within a tight budget, while including scope for future expansion.

Planning is not only essential for the future – we always plan projects carefully, too, using the latest building design tools. That way, we can minimise disruption to operational facilities during refurbishment or neighbouring construction work, so they can carry on their vital work unaffected.
First built in 1863, Broadmoor Hospital has long provided specialist care for patients with serious mental health illnesses. As one of three high secure psychiatric hospitals in England, it is an important feature of the country’s mental health landscape, but in recent years the facility’s out-dated layout and ageing Victorian structures have hampered modernisation of its services, making introduction of the most advanced treatment methods increasingly difficult. In order to address this, West London Mental Health NHS Trust took the bold decision to completely redevelop Broadmoor Hospital – and create a facility fit for 21st century mental healthcare.

The £242m redevelopment project is now set to transform the experience of both patients and staff. Its core is a new secure hospital, built next to the existing facility, and due to open in 2017. The 234-bed complex will contain 16 wards, as well as a physical health centre, family visiting suite, therapy and education rooms and a multi-faith centre. Its layout has been designed to enable greater levels of patient independence, reducing the need for long periods of observation and ushering by staff. This in turn will allow greater focus on therapeutic activities, providing a boost to patient recovery and wellbeing.

Working closely with the main design and build contractor, Kier Construction, WSP is providing civil, structural, building services and geo-environmental consultancy services to this wide-ranging project, which includes delivery of a 1.5km access road, landscaped gardens, car park and secure perimeter fencing as well as eight brand new buildings and four refurbishments.

The ambitious scheme has posed complex challenges for the design team from the start. Most notably, the need to keep the existing hospital operational throughout construction called for a resourceful approach to phasing and security. The hospital is also located in countryside with Historic Parkland status, meaning ecologically sensitive solutions are essential. Our success in providing these is clear from the project’s award-winning enabling works. Sustainable features include a badger tunnel, bat bridge and permeable pavement for the new access road, plus remediation of contaminated land. A state-of-the-art energy centre, equipped for later installation of biomass and CHP technology, was built to replace the hospital’s ageing boiler and provide a sustainable, resilient and cost-effective energy supply for the new hospital.
Forensic Psychiatry, Hadamar
A fresh start for a cutting-edge clinic – and its patients

The Vitos Clinic in the small German town of Hadamar specialises in helping patients overcome troubled pasts and prepare for new lives free of drugs and crime. Its forensic psychiatry unit treats victims of addiction and mentally ill offenders with diminished responsibility, and strives to help them develop the skills necessary for social reintegration.

Vitos has housed forensic patients in Hadamar for almost 40 years. But in May 2016, it gained a new lease of life when the doors opened to a brand new facility geared to its cutting-edge clinical approach. The €40 million rebuild has brought a range of services previously spread between several outdated buildings into a single, state-of-the-art complex.

WSP was project manager on the scheme, which was funded by the state of Hessen as part of a wider hospital renovation programme and has capacity for 162 patients across eight wards. Every aspect of its three interconnected buildings is designed to meet the needs of the specific set of patients treated here, many of whom lack basic social competence as a result of drug abuse or broken family relationships. Carefully balancing security and freedom, the clinic is set up to cultivate a sense of responsibility and society.

Construction was carried out in phases, while maintaining the clinic in operation. The site was secured by a large safety wall with an advanced distance strip and was monitored by elaborate safety technology. The wall was adapted throughout the construction phase to ensure the smooth and safe running of the entire hospital operation.

Due to the size of the project and the large number of contributors involved, it required a high degree of communication in order to achieve the project targets and maintain efficient coordination between the ministry, builder, architects and planners as well as audit authorities.

Where possible, patients are given privacy with single and double rooms, but they are also grouped into small communities, with kitchens and lounges shared between a maximum of seven people. The clinic encourages residents to take control of various aspects of their lives, including cooking, cleaning and laundry, and provides them with an allowance to cover expenses, which they must budget themselves. A café, visitors’ room, gym and playing fields can also be accessed openly within the secure area, while large, bright corridors and warm colours create a welcoming ambience.

The new facility meets the stringent security standards required by a forensic institution, with specially designed gates, extensive video surveillance and a five-metre high wall around the entire complex, among other features. But thanks to the latest in security technology, it is also easy to move around, ensuring a better healing – and working – environment for all.
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Can we trace horizons, hold true to our ambitions, and hold ourselves accountable?

What if we can?