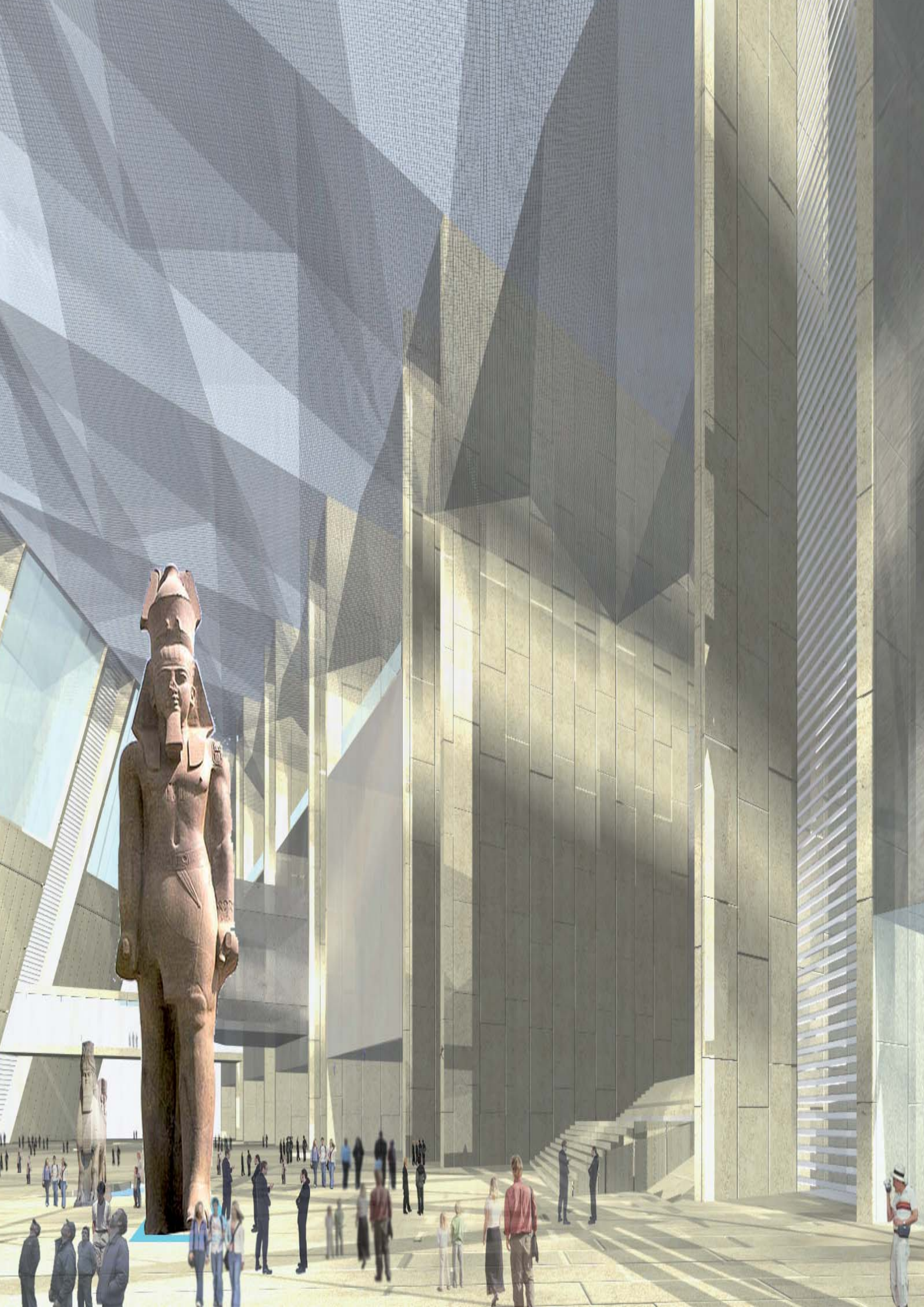




ICT
Capability Statement
2011



Buro Happold



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1. ICT : About Us

Delivering now for future technology

Today, IT has become the nervous system of any business, industry, enterprise or company. The better this system works, the better the company can compete in its markets.

Information and Communications Technology proliferates most things we do, buildings are no different. Without an adequate communications infrastructure the success of a development will be limited. It is no longer realistic to view ICT as a few computers connected together, ICT infrastructures now quite literally can be considered the nervous systems of modern constructions. Most systems can be integrated and use a common communications network to deliver information, control and monitor systems or people, or simply deliver entertainment and multimedia.

Regulations are changing as are social attitudes to energy consumption. However technology demands are increasing. Working alongside our colleagues at Buro Happold, we deliver a converged network that sensibly enables any system to use the network infrastructure. In doing so, we can help reduce the overall operating costs as well as reducing power consumption.

Our design solutions need to work in an ever changing and complex world. Users are more demanding. Technology is advancing at a fast rate, and ICT infrastructures must be flexible to support changes in use. We need to deliver now for the future.

The ICT team at Buro Happold provides a complete Information and Communications Technology design service, from concept through to user acceptance testing. By being involved with the client from the outset, we can influence and deliver the technology required to meet given aspirations now and in the future.

ICT Capabilities

Buro Happold established the ICT team to complement the existing disciplines and in recognition that ICT is in every project we work on.

We employ a rich mix of ICT Consultants, Network Designers and ICT Strategists enabling us to deliver designs that consider the user and operational functionality of an infrastructure, not just the technology that makes it up.

Buro Happold ICT is able to offer an integrated service that delivers the most effective, appropriate and creative ICT solutions.

Buro Happold ICT incorporates the full range of consulting and engineering skills needed to create and develop ICT solutions to meet the needs of our clients.

- ICT Masterplanning
- ICT Strategies for Buildings
- ICT Operational procedures
- ICT Infrastructure design

Buro Happold ICT have added value to the Buro Happold brand enabling the company to deliver more holistic designs and ensuring the entire building is considered from the outset. Buro Happold ICT have made contributions to many successful projects, including universities, schools, sport stadiums & leisure facilities, retail developments, state of the art commercial offices, galleries & museums all over the world, including Middle East, Africa, India, and Europe.

Buro Happold ICT has a wealth of experience working on projects within Saudi Arabia, Qatar, the UAE, India, UK and the rest of Europe. Most team members hold a variety of ICT related and internationally recognised qualifications including Cisco, RCCD, Microsoft, Prince2 and ITIL as well as University degrees and being members of BICSI, the British Computer Society and the Institute of Mechanical Engineers. They are actively involved in developing the ICT services offering within Buro Happold, including data centre design, unified communication technology and wireless friendly building operations.

INTEGRATED ICT INFRASTRUCTURE



Services

Our scope of services includes:

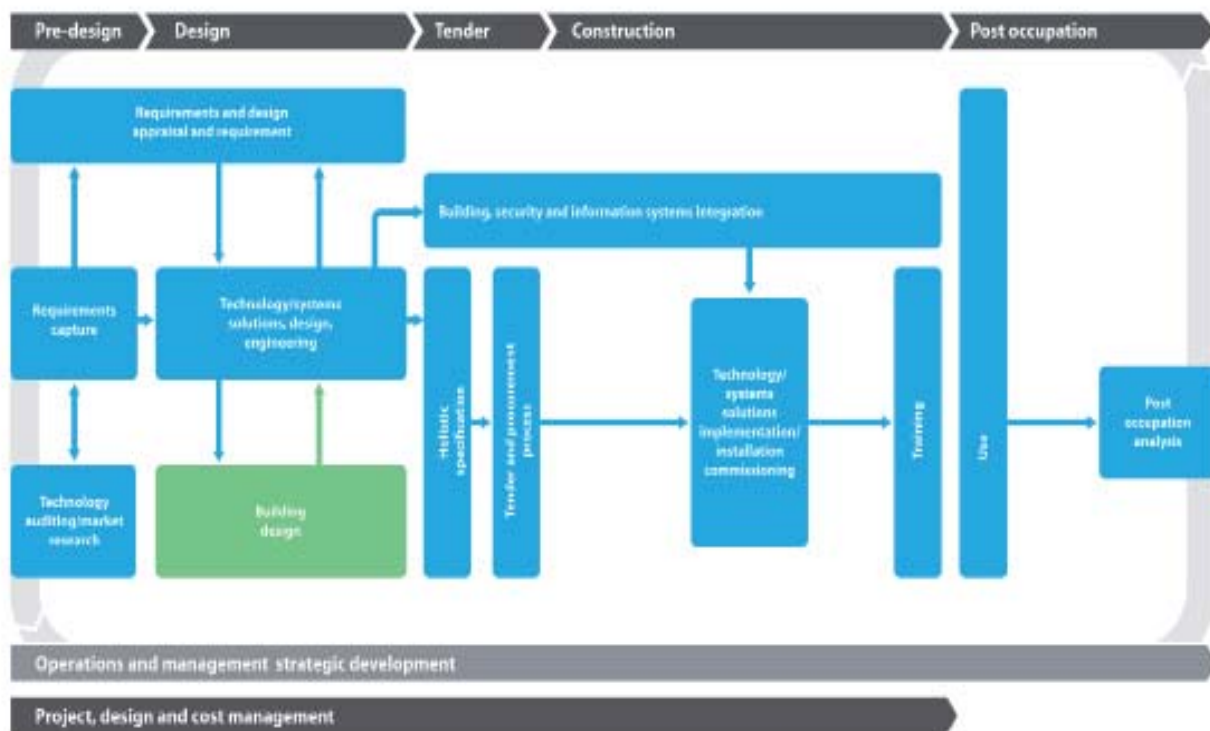
- **Development of ICT strategy** following our own project management methodology that aligns with construction work stages including RIBA and AIA. We answer the questions “What will the network be used for, and how?”
- **Design for a resilient and integrated network** of services onto a common structured cabling and resilient, passive and active, infrastructure. Taking the strategy and development of a network infrastructure that meets your needs from day one, and for the foreseeable future. We try and plan for the next 20 years, but this depends of course on the specific requirements of the project.
- **Design review** – objective review of an ICT infrastructure design to ensure it meets client’s needs and checking that internationally recognised and the latest standards have been applied. Where we find this is not the case, we would provide a list of recommendations for improvement. We do recognise that there is more than one way to deliver a project, so our reviews are unbiased and reflect the nature of the project.
- **Development of end-user network** e.g. VLANs, IP addressing, switching and routing protocols. This is the final chapter of network implementation, making it work for the user from day one. This involves setting up network switches and routers; assigning VLAN and IP addressing information, and providing network protocols. This is a two stage process, High Level Design for development of addressing schemes and use of network protocols; second stage, Low Level Design, to develop configurations for the active infrastructure.
- **Post Occupancy Services** - once the network is installed and up and running, we can assist with the set-up of operational procedures in line with the ITIL Service Level Management best practice framework. We can also review your network and make suggestions for improvement too.

Our particular strengths are:

- Considerable experience of, and indeed we are currently either working on or recently completed, major projects within the Middle East, UK, Europe, and Asia.
- Familiarity with local ICT legislative guidelines.
- Expertise in building design and construction processes and providing timely input to architectural, building services, security and audio visual designs.
- Development of a manageable and cost effective ICT infrastructure that will meet day one and future needs.
- Liaising with all ICT stakeholders and interface with client’s internal IT teams, when appropriate, to ensure collaboration of effort, whilst identifying any improvements or commercial opportunities that can be enabled in preparation for occupying the building.
- Working with the many Buro Happold disciplines, we can offer a one-stop solution for your building.

Our main objective is to provide a design ready for potential contractors to be able to install both active and passive network infrastructure for a truly integrated communications system.

PBO design process



2. ICT : Key People

CVs for the ICT team are shown on the following pages:

ICT Team Leader: Peter Genet

BEng (Hons) CEng MIMechE MBCS

Peter is a Chartered Engineer and Professional Member of the British Computer Society. He is a senior project and programme manager with over 20 years experience in delivering high contract value and leading edge business-critical technology projects within the private and public sectors throughout the UK, Europe and the Middle-East.

Peter adds value to clients through the utilisation of Prince2 and ITIL best practice frameworks customising and tailoring them to provide governance for the individual, or multiple, project's requirements to drive success in highly convoluted and technically diverse matrix team environments.

Extensive experience leading presales teams in qualifying the objectives of the client's needs, understanding the end-client requirements, developing proposals, and project planning for new work and value added propositions.



ICT Senior Engineer: Jack Treble

BSc (Hons) MIET RCDD PRINCE2 Practitioner MBCS

Jack is a senior member of Buro Happold's ICT team and has a wide base of knowledge and experience within the information and communications technology arena, with specific expertise in integrated network infrastructures and intelligent buildings.

As a consultant, Jack has a proven track record of identifying and compartmentalising technical and commercial issues in order to develop holistic ICT strategies that meet client requirements. In the design stages of construction projects, Jack has led the development and overseen the implementation of successful ICT solutions for world renowned buildings, across multiple sectors.



ICT Senior Engineer: Rick Clayton

MCSE PRINCE2 Practitioner MBCS

Rick has worked in the ICT industry for ten years gaining experience in both design and management of ICT infrastructures. Rick has worked for a number of hi-tech companies which have exposed him to a vast variety of technologies enabling him to develop innovative designs.

Rick has worked on a number of very different projects around the world and has developed his experience in range of different sectors including education, retail, sports, commercial, hotel, government, hospitals and airports.

**ICT Engineer: Kenneth Okai**

BSC (Hons) MSC CCNA OCP MBCS

Kenneth is a professional member of the British computer society and has a masters degree in Network computing. From various roles and projects, he has gained a well rounded knowledge of various ICT technologies, with specific expertise in network design, administration and optimization.

As a network specialist he has designed and maintained highly converged and scalable networks for a wide scope of clients in various sectors. Kenneth has a good understanding of network expectancies and has a well proven track record of designing bespoke network systems that always surpass the client's expectations.

Kenneth adds value to projects, by incorporating a network administrator's perspective in all network designs from the start. Thus, boosting total quality management for all ICT projects.



3. Project Experience & Case Studies

Cynon Valley Hospital (Cwm Afon)

Louvre Museum Abu-Dhabi

Grand Egyptian Museum

King Abdullah International Gardens

Abu-Dhabi Media Zone (Mina Zayed)

Sheikh Zayed Stadium

Exeter University Forum Project

Ritz Carlton

Library of Birmingham

Massar Children's Discovery Centre

Samba Bank

The Co-Operative HQ Manchester

Ibn Hani Resort Hotel

Heart of Doha Phase II



Cynon Valley Primary Care Unit Merthyr Tydfil, Wales

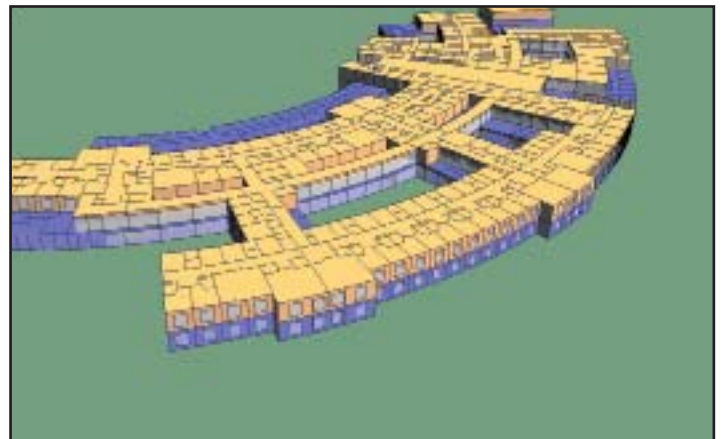
A new 20,000m² self-contained 140-bed neighbourhood hospital near Mountain Ash with outpatients, diagnostic, dental, day care and ward facilities.

This new primary care facility provides multi-disciplinary assessment and emergency response teams, active in-patient, day case and community rehabilitation, children's services, palliative care services for cancer and non-cancer patients, consultant out-patient services, radiology, minor injuries and surgery, maternity services and an adult mental health rehabilitation unit.

Alternative energy options such as boreholes, ground coupling, wind and solar power have been explored together with options for bio-mass boilers and combined heat and power.

Data and information is all important within a hospital. From storing and passing of patient records, to delivering on-demand television services to a patient's bedside.

Buro Happold ICT worked with the Trust in developing the overall ICT strategy, through to developing the ICT infrastructure and selecting the appropriate tenderer using a bespoke tender management process.



Images copyright HLM Architects

Key project information

Client	Cwm Taf NHS Trust
Architect	HLM Architects
Project value	£47m
Dates	Ongoing

Services provided by Buro Happold

Building services engineering, computational simulation and analysis, sustainability engineering, ICT.

The Louvre Museum Abu Dhabi

The Louvre Museum Abu Dhabi is located in the proposed new Cultural District of Saadiyat Island, on its north-west shoreline and facing the City across a narrow marine channel. The museum will provide around 58,000m² of world-class art exhibition galleries together with other related facilities, set out in the form of a 'museum city' and sitting beneath a shallow domed canopy.

An international exchange programme between the governments of France and Abu Dhabi provides for artworks from the Louvre and other leading Paris museums to be loaned for permanent and temporary exhibitions.

The Louvre buildings appear to float in the shallow inshore waters of the island's coastline. In fact extensive basements housing support facilities lie beneath the waterline, with the galleries and exhibition halls above water laid out in an arrangement reminiscent of a traditional Arab city.

The gallery buildings range in height from one to three storeys and will be accessible from concourses and promenades which also provide display opportunities for artwork and sculpture.

The complex includes public restaurants, gardens, pools and an auditorium which make the museum a destination for visitors beyond the main exhibitions themselves.

Key project information

Client	The Tourist Development and Investment Company of Abu Dhabi (TDIC)
Architect	Ateliers Jean Nouvel (AJN)
Date	2007 - 2013

Services provided by Buro Happold

Structural engineering, building services engineering, civil and marine engineering, geotechnical engineering, facade engineering, environmental engineering, acoustics, ICT and comms, security design, fire engineering and project design management



©AJN Architects

University of Exeter Forum

Exeter, UK

Buro Happold is providing a fully multi-disciplinary service on the scheme, providing a wide range of engineering services including many specialist disciplines. Our input on this basis was key to the team winning the project through an exacting architectural and technical competition process.

An important scheme for the University, this multi faceted project uses a naturally ventilated street space to unite a disjointed series of existing buildings to create a focus for the Campus. The scheme also provides a wealth of additional facilities, including teaching and study rooms, a retail development and new student services accommodation.

The street has a variable transmission ETFE roof and captures passive solar gain in winter for use in the surrounding buildings while also acting as a source of ventilation to selected areas. A series of stack vents and chimneys ensure that even the deep plan spaces in the new building are naturally ventilated, and the use of mechanical cooling in the auditorium space is avoided through the use of earth tubes which precool the incoming air in summer and pre warms it in winter. The existing library adjacent is also to be refurbished and offers an opportunity to unite the energy strategy for this part of the Campus.

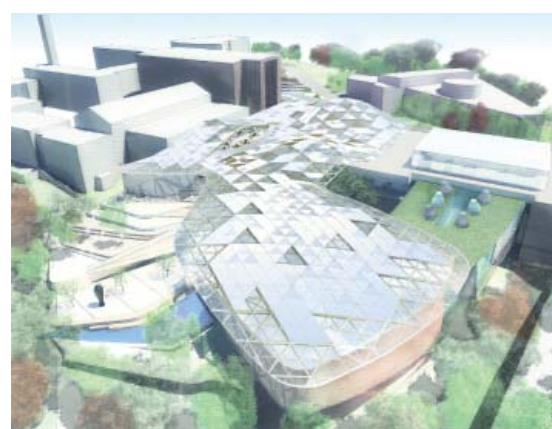
An undulating timber gridshell roof provides the common link across the site, connecting both new and existing buildings. It is designed as one continuous surface that flows across the site, sheltering the new Forum space below and maximising structural efficiency while creating column free spaces in open plan areas below.

The sloping site presents challenges and opportunities and requires considerable civil engineering works as well as resulting in many different levels across the site. The project also includes the review of transportation strategy for the campus, including provision for disabled access on a site where the gradients are much steeper than would normally allow this to be achieved easily.

The University embarked on an ambitious journey employing the latest innovations in teaching, communications and media technology.

BH ICT led the University in delivering an ICT strategy that catered for their current requirements and enabled for the future. This included:

- Determining and developing the ICT strategy
- Designing the structured cabling system utilising both fibre and copper
- Selecting and specifying appropriate active network infrastructure
- Selecting teaching tools such as table-top computers, integrated room booking systems and IP telephony.



University of Exeter Forum

Exeter, UK

Key project information

Client	University of Exeter
Architect	Wilkinson Eyre
Project value	£45m
Dates	Commenced November 2008

Services provided by Buro Happold

Structural Engineering, Mechanical and Electrical Engineering, ICT, Geo-environmental, Security, Water, Environmental (EIA), SMART



The Library of Birmingham

Birmingham, UK

The Birmingham Library project seeks to replace the existing Central Library with a new state-of-the-art centre for knowledge, learning and culture fit for the 21st century, which is to be integrated with the existing Repertory Theatre. This symbolises the city's mission of creating a 'global city with a local heart' and will be vital in developing Birmingham's knowledge-based economy and global success as a Science City.

The existing Library is the busiest public library in Britain and the city's most visited public building. The building fabric of the early 1970s building requires major renovation work and the layout is no longer suitable for modern day usage.

The nature of public libraries has changed over the last ten years as the internet provides an open-ended and easily accessible way to obtain information. Methods of identifying and finding books have changed as content and location are facilitated by ICT. This has resulted in a new way of working in libraries where staff are encouraged to be available to the public amongst the book stacks, rather than them behind a book return desk. The atmosphere of a library has changed from hushed searching of shelves to the lively exchange of ideas and access to the media, whether digital, virtual or printed. We have been involved in the research of new technologies and developing design concepts as to how these will be incorporated into the building.

The project has been developed through a series of site visits, technology days with industry leaders and workshops with library staff and the design team. Concepts have been developed by creating 'personas' who's experience of the building has been developed and described. This has helped shape the building through an understanding of the needs of operators and users.

The evolving nature of ICT has been a fundamental part of this project. Different teams have developed the following aspects:

- ICT Infrastructure - cabling and containment, server rooms, design, reliability and resilience, WiFi and hard wiring systems.

- ICT hardware – the use of mobile device computing, digital signage, public screening of events, shared touch screens
- ICT Systems – the shaping of on-line services to complement information finding within the building

Buro Happold has collaborated on how large shared touch screen computers can be used for accessing information and displaying team projects. A system for lending hand held devices has been developed to help people find their way through what will be the largest public library in Europe.

The project involves the upgrading of the 1960s REP Theatre. The major public spaces will be upgraded to meet the requirements of Part L of the Building Regulations. The back of house facilities are to be replaced and new theatre workshops and rehearsal areas have been designed.

CABE has been consulted during the design. The project working method has relied on the constant development of 3D models and views. This has allowed us to quickly explain the visual impact of the building. Environmental issues have been explained through an illustrated BREEAM compliance matrix that demonstrates how an 'Excellent' rating will be achieved.

The library is a major public sector project. We have been involved in the procurement process through the parallel development of design and tender information. The design has required rapid development to meet the client's aspirations while staying within a budget that was established before our appointment.



The project is to be constructed under a fixed price Design and Build NEC3 form of contract. The contractor was appointed prior to Stage C and has worked closely with the design team. They have taken responsibility for developing and tendering packages in parallel with the design process.

Birmingham City Council's aim is to set new standards for libraries in the 21st century by creating an outstanding resource for learning, information and culture. To achieve this, the new library and the REP Theatre will join together to share a number of facilities including a new 300 seat auditorium, meeting and conference rooms, plus cafe and restaurant facilities

Key project information

Client	Birmingham City Council
Architect	Mecanoo
Project value	£140m
Dates	Ongoing

Services provided by Buro Happold

Building services; structural engineering; ground engineering; facade engineering; fire engineering; lighting consultancy; security consultancy; computational simulation and analysis; sustainability and alternative technologies; access consultancy; acoustics consultancy; traffic and transport



Image copyright: Mecanoo

The Grand Museum of Egypt Cairo, Egypt

The Grand Museum of Egypt is a landmark cultural project of international importance. A state of the art exhibition facility will be constructed within sight of the pyramids at Giza to house the vast collection artefacts currently displayed in central Cairo.

The museum will be built on a 50-hectare area and house over 150,000 artefacts. It is anticipated that the new museum complex will attract three million visitors per year and is intended to be the first global virtual museum. Using the most recent technologies, the new museum complex will furnish all its visitors with a uniquely enjoyable, educational and cultural experience.

The exhibition will include the Tutankhamun collection. The exhibits will be arranged on a single 24,000m² floor plate with a view to the pyramids. An innovative mechanical system will maintain close control of temperature and humidity for conservation of the artefacts. In addition to mechanical and electrical engineering, Buro Happold is providing acoustic, security and ITC engineering services.

A strong visual linkage will exist between the new museum and the Giza. The competition is held under the patronage of UNESCO and supervised by the Union of the International Architects (UIA) in Paris.

Key project information

Client	Egyptian Ministry of Culture
Architect	Heneghan Peng Architects
Project value	£250m
Dates	Ongoing

Services provided by Buro Happold

Building services engineering, acoustic engineering, fire engineering design and risk assessment, security consultancy, ITC consultancy.



Images copyright: Heneghan Peng Architects

King Abdullah International Gardens

Riyadh, Saudi Arabia

The design brief for the site, which is set within the arid desert of the Saudi Central Region, sought to create botanical gardens to rival those at Kew and Singapore. The team, which includes the National History Museum and the Eden Project as advisors, saw this scheme as an opportunity to educate, entice, excite and entertain. The 160-hectare scheme will be a cornerstone of the City of Riyadh's growth and aims to provide a new visitor destination for both Saudis and international visitors.

A central component of the team's proposal is the desire to showcase sustainable development techniques. The scheme's power requirement incorporates sustainable solutions appropriate for the region, while rain, which falls intermittently in the late winter months, will be harvested and collected in underground reservoirs before being cleaned, used for irrigation and then recycled.

The centrepiece of KAIG is a 10-hectare paleobotanic building, designed as two adjoining crescents which accommodate a sequence of controlled environments. Each environment allows visitors to travel through time and recreates the experience of pre-existing ecosystems based on actual environments that have occurred on this precise piece of land through time.

The final enclosed garden within the crescent building is the Garden of Choices. An educational space, which explores and explains the choices we are still able to make and which have the potential to preserve the environment of our planet for future generations.

The project is now on site with completion achievable in 2012.

Key project information

Client	Riyadh Municipality
Architect	Barton Willmore
Dates	Ongoing

Services provided by Buro Happold

Structural engineering, building services engineering, civils and infrastructure, acoustic consultancy, bridge engineering, communications, computational simulation and analysis, facade engineering, fire engineering, ground engineering, sustainability and alternative technologies, security consultancy



Image copyright Barton Willmore

MASSAR - The Children's Project

Damascus, Syria

Buro Happold's Glasgow office, in collaboration with Henning Larsen Architects and American Landscape Architect Martha Schwartz, won the competition to design a new educational discovery centre for children in Damascus, Syria.

The Discovery Centre will be the heart of Massar and will support all Massar programmes including the Regional Discovery Centres, which will be developed in Governorates of Syria, the outreach activities, and Web Massar. The programmes, exhibitions and activities that will take place in the Discovery Centre will be a part of the multidisciplinary nationwide matrix of offerings.

The Discovery Centre and the Old International Fair Ground provide an unrivalled opportunity to carry out focussed urban regeneration and deliver a very high quality, visionary project. This also has the potential to positively influence wider regeneration in MASSAR: Discovery Centre.

Key project information

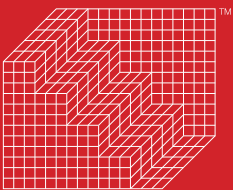
Client	MASSAR
Architect	Henning Larsen Architects
Project value	£35m
Dates	Completed 2006 - 2010

Services provided by Buro Happold

Structural Engineering, Ground Engineering, Building Services Engineering, Fire Engineering, Lighting Consultancy, Acoustics Consultancy, Inclusive Design, Computational simulation and analysis, Environment, Sustainability and Alternative Technology SAT, Security



Images courtesy of Henning Larsen Architect



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