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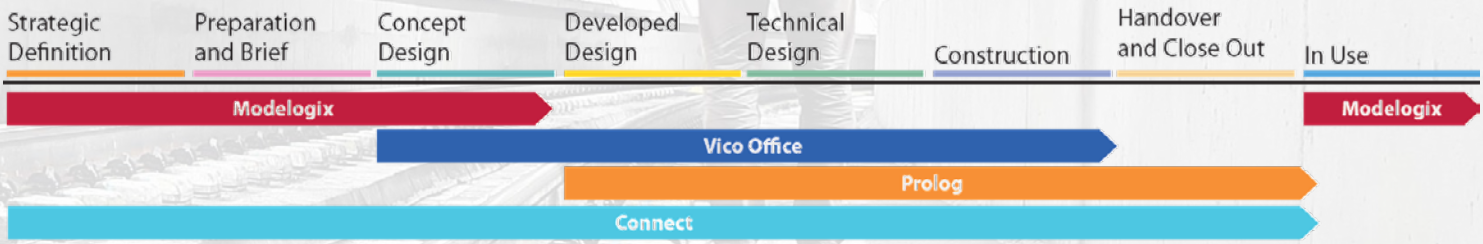

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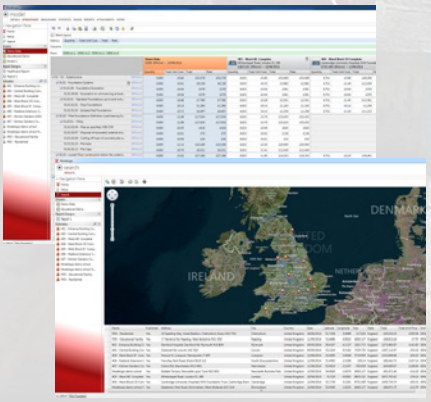

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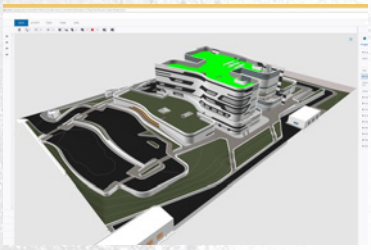

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BUILDING FUTURES: SPACES FOR OPTIMAL LEARNING

IT'S a time of change for UK education. Faced with tighter budgets, evolving educational methods, and a rapidly expanding pupil population; schools, designers, and construction companies must be ever more creative in their search for efficiencies, without sacrificing the quality of spaces for learning. Perhaps most urgently, schools must accommodate the increasing demand for places.

Overall pupil numbers are expected to grow 7% by 2020, with London boroughs alone facing a shortage of 118,000 primary and secondary school places up until 2016/17. As schools come under mounting pressure, building education facilities that fully address these demographic shifts, and place the needs of the student at the heart of the construction process – both today and into the future – is one of the key challenges in delivering education in the 21st Century.

Fundamental to achieving success is bringing together the best educational and building practice. A collaborative approach, from the school, architect, engineer, contractor and the supply chain, is necessary to ensuring greater operational efficiency and effectiveness in the end product. The Government-led Soft Landings initiative, for instance, is helping to facilitate a smoother transition for schools from design and construction to operational use. By setting required outcomes at the start of the design period, the construction process can focus on delivering the long-term cost efficiencies and operational requirements needed by schools in the years ahead. On hand-over, the Soft Landings approach requires designers and constructors to stay involved with the new school beyond practical completion and into the critical initial period of occupation, ensuring that a school remains well-maintained and operational for years to come.

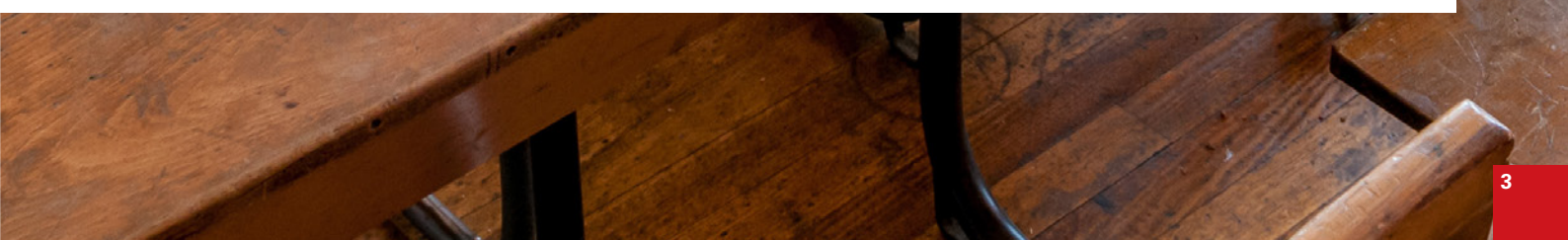
In order to maximise the lifecycle of school buildings, design should be kept simple, and function, not fashion should be the watch-word. Far from being uninspiring, uniform design can enhance the flexibility of space within a school, opening up possibilities for different configurations and settings in the future. Although eye-catching, bespoke designs can ultimately restrict the way in which valuable space is used. Furniture should be mobile for more agile, flexible teaching. A classroom must cater for the dynamic needs of the curriculum, transforming from theatre in one lesson to lecture hall in the next.

As school design must keep pace with the evolving needs of students and teachers, so too must technology, as it becomes ever more integrated into standard teaching practice. To that end, designers should ensure the availability of robust Wi-Fi throughout the building, and even outside. WiFi is no longer a luxury in education – it's a key ingredient. Poor WiFi in schools means an entire generation of technology, such as tablets, is not useable in classrooms, putting limitations on learning.

Finally the design should incorporate building materials which deliver the optimum environment i.e. temperature and light, for learning. As well as being visually inspiring, the use of glass in school buildings can, for instance, help to maximise serotonin-boosting natural daylight, and create a sense of openness and transparency.

Creating learning environments that are inclusive, inspirational, and sustainable can be challenging, particularly amidst the growing fiscal pressure on education in the UK. To cope, the construction industry must embrace a more holistic and collaborative approach to building spaces for optimal learning. Ultimately, integrated thinking is fundamental to delivering the design, build, use and management of next generation spaces for generations of students to come.

Craig Smailes, Head of Business Development for Education at Kajima Partnerships



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Acrypol's products have been used extensively across a number of hospitals including Hope Hospital, Manchester Royal Infirmary and Queens Medical Centre in Nottingham. The Company carried out work at Manchester Royal Infirmary, affecting repairs to a leaking roof on the front of the hospital lodge.

Acrypol System 15 was used on the project. This product has been developed to provide a fast and cost effective total refurbishment solution for commercial, industrial and public sector roofing.

Another advantage of using Acrypol 15 is that it offers a year-round application, even in damp weather conditions. It is unaffected by any changes in temperature and gives maximum solar reflectivity.

The system is cold applied and takes only a fraction of the time it can take to install other types of waterproof membranes. The tough acrylic resin dries to a durable elastic finish and prevents water penetrating the surface but simultaneously allows any trapped moisture to escape.

The installation at Manchester Royal Infirmary was completed in just eight days.

Hope Hospital in Manchester also saw the benefit of using Acrypol's System 15. The Urology department and four other roofs had the product installed to prevent leaking occurring in various areas.

Queens Medical Centre in Nottingham was also hit with leaking roofs as a link walkway was badly in need of repair. Acrypol had to put in special measures to complete the contract as areas within the building needed to be closed during the installation. Weekend work also undertaken to ensure the job was completed as quickly as possible using System 15.

Another Acrypol product that is ideally suited for use on hospitals is Acrypol System 10.

Along with Health Authorities, many other public authorities including the Department of Education, the Ministry of Defence, and educational establishments have selected the ten-year system to provide a cost effective alternative to a total replacement.

The System 10 package includes installation by Acrypol's skilled professionals and is backed by a ten-year life guarantee for materials and labour (guarantee only valid if work carried out by Acrypol).

Like System 15, System 10 can still be applied during damp weather conditions and offers maximum solar reflectivity and is unaffected by temperature change. As the system is totally seamless, vulnerable areas

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Acrypol Products winners of the Best for Structural Waterproof Coatings in the UK for 2015

such as upstands and vent outlets also get the same high level of protection as the rest of the roof.

Tayside NHS required Stracathro Hospital in Angus, Scotland to under go repairs to corridor roofs and Blocks A and B that was causing major problems with leaks to the below areas.

System 10 was specified to provide the complete waterproofing refurbishment solution due to its all in one solution providing exceptional performance, waterproofing integrity and solar protection. The system is installed in serveral easy steps that can be applied over virtually any roofing membrane, meaning that installation costs are extremely competitive and disruption kept to a minimum.

Arbroath Hospital also needed a solution to their leaking corridor and GP ward roofs. Again, Acrypol System 10 was identified as the best option with all work completed in 12 days. Last year, Acrypol Products Ltd was named 'Best for Structural Waterproofing Coatings in the UK' at the Build Construction & Engineering Awards. The award acknowledged the Company's efforts and expertise of its dedicated workforce and the unparalleled specification of its products.

The Company is completely dedicated to providing high specification products that fully meet the requirements of its wide-ranging client base. It is this guiding principle that has allowed Acrypol to cement its position as a tried and tested market leader.

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UNDERSTANDING THE IMPORTANCE OF IT PARTNERSHIPS IN SCHOOLS

AS schools start to come out of Building Schools for the Future (BSF) contracts, there are still many opportunities for the construction industry. However, there is also a danger that the same mistakes will be repeated. Neil Watkins of E2BN's Think IT, the EU tendered ICT framework for schools, talks us through the issues and dangers, and offers his advice to schools and the construction industry.

Starting in 2005 and ending in 2010, the BSF programme was plagued with controversy.

The then Prime Minister, Tony Blair said the investment "will see the entire secondary school building stock upgraded and refurbished in the greatest school renewal programme in British history". However, the problems were far reaching.

Reportedly, procurement was focused on construction without a full understanding of all the other factors involved, such as technology infrastructure. In their defence, the construction companies were employed to build the schools to the best standard, not to understand their specific, changing and very individual technology needs.

The majority of people outside the education sector don't fully understand these needs and the associated IT requirements; why would they? (for example, schools use the term ICT – Information Communication Technology, rather than the more commonly used 'IT'.)

So what went wrong and how can this be avoided in the future?

In the first year or two of their BSF contract, the technology in schools was new and probably a lot better than they had before. By year three it was starting to feel old. The contracts they were under meant that upgrade costs were expensive, and so it meant they had to make do with what they had. By year four the whole infrastructure started to feel expensive; they were paying year one prices for old technologies that often didn't work or didn't suit their evolving needs.

Five years on and many are starting to come out of their BSF contracts. While this heralds the arrival of a worrying time for our education system, it also presents significant potential for the construction industry: the BSF programme has ended, but many schools are still being rebuilt.

During the time schools have committed to their BSF contract, a lot has changed. They are hearing about how Voice-Over IP (VoIP), virtual desktops, a new print management infrastructure and Single Sign-On (SSO) will save them money and bring new levels of efficiency to the learning environment. Safeguarding, e-Safety, classroom management systems and mobile device management are also important parts of the 21st century classroom. After years of having their ICT controlled by others, considering all these elements is overwhelming.

Do they really want to take this control back in-house? If they go with the same as they had before it will be less disruptive, and although it won't be great and will cost a lot, it will tick the ICT box.

Won't it?

Actually, 'no' it won't. As international studies such as the OECD's 'Computers do not improve pupils' results' research suggested, only the right technology for a child's specific needs with the right level of teacher training, delivers results. If schools continue with the 'one size fits all' approach,

real improvements in learning outcomes will be limited.

When construction companies are rebuilding schools they must work from day one with a specialist education sector managed IT service provider. Getting the right technology infrastructure specified and planned for a school's very specific needs is a fundamental consideration.

Taking control and making the right decisions are both very achievable but must be done with the right 'partner'. I use the word partner rather than provider because in my experience, some school providers have a tendency to go back to the old ways of tying schools into rigid service contracts, which have little in-built flexibility to adapt to their changing circumstances for the future.

Here is my advice to construction companies:

NEVER TIE SCHOOLS INTO A 'ONE SIZE FITS ALL' CONTRACT
Increasingly over the years schools have learned to demand and get what they want; they also now have the power and budget to do this directly. Plan a meeting with the school to discuss their IT requirements. The Think IT framework has many partner companies providing hardware, software, networking, eSafety, and parental communication, to name just a few. They are all experts in their own field - something that even the most talented IT manager cannot compete with. However, more than anyone, the school's IT team knows what the school really needs. A meeting with all parties should be scheduled from day one.

CHANGE MANAGEMENT
Once the right ICT products and services have been agreed upon, the consultancy support should include change management; ensuring success through planning, implementation, training and communication.

PARTNERSHIP
Work with your IT managed service provider to build a project plan and timeline. This is an important process for the major aspects of a new ICT infrastructure, such as fiber-optic cabling, which is best scheduled for the school holidays and around your building.

EU REQUIREMENTS
Be aware of schools' public spending responsibilities; there is an EU requirement to tender public sector contracts for any investment over £172k. Thankfully, because Think IT comes under the E2BN EU tendered framework, our schools don't have to go through this process, but it is an important consideration when the schools you are working with are creating their project plan and timeline.

FUTURE-PROOFING
You, the school and the IT partner should continually monitor and evaluate the ICT infrastructure to ensure your school is always offering the very best learning opportunities that are right for each student's specific needs. Ensure it is contractually agreed who is responsible for what. If a future extension is built across some vital network cabling, who is responsible? Working together constructively is vital.

There are still huge opportunities for construction companies in the education sector but working effectively with an ICT partner can make the difference between winning / losing a contract and a successful / unsuccessful build. ■

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CONSTRUCTION FINANCE

Interim Payment Schedules – Getting Caught Between A Rock And A Hard Place

The Housing Grants Construction & Regeneration Act 1996 as amended by The Local Democracy, Economic Development and Construction Act 2009 ("the Act") requires a construction contract (that is intended to be on site longer than 45 days) to incorporate an adequate payment mechanism setting out when interim payments will become due and the final date for payment of these.

The Act goes on to set out the requirements for the issue of Payment Notices and Pay Less Notices which have to be issued within an agreed period of the payment's due date in the case of a Payment Notice or, in the case of a Pay Less Notice, by the final date for payment. The system can be confusing, mistakes are made, notices are not issued and if things go wrong an Employer can find itself contractually obliged to hand over a large sum of cash that may have been applied, which bears no resemblance to the value of works actually undertaken up to that point in time. Not a great situation.

To combat problems and confusion over the payment system, it has become quite popular to incorporate payment schedules into contracts to identify valuation dates for each month the contractor will be on site, with corresponding application dates, payment due dates, final dates for payment, Payment Notices, Pay Less Notices and so forth.

This is exactly what Grove Developments Ltd ("Grove") and Balfour Beatty Regional Construction Ltd ("Balfour Beatty") did in respect of a construction contract anticipated to last for 23 months, with the last interim payment scheduled to coincide with the contract completion date.

The system agreed by the Parties worked well until the contract completion date of 22 July 2015 came and passed by with Balfour Beatty still slaving away on site.

Perhaps not unsurprisingly, Balfour Beatty believed that it was still entitled to receive interim payments, even though the schedule of interim payments dates did not cover its extended presence on site. Balfour Beatty therefore submitted a further interim application for payment on 21 August 2015. Unfortunately, Grove refused to accept that Balfour Beatty was entitled to any further interim payments and so the matter came before the Technology and Construction Court in January of this year.

In a judgement that took many by surprise, the court decided that Balfour Beatty was not entitled to any further interim payments beyond the dates set out in the Parties' agreed schedule. The Court refused to find that there was either an implied term giving a right to ongoing interim payments or that The Scheme for Construction Contracts should apply to fill the void left between the last interim payment date set down in the Parties' Payment Schedule and the delayed date for completion. In effect, Balfour Beatty had lost the right to receive any further interim payments.

As Balfour Beatty would, no doubt, have been under an ongoing obligation to pay its Sub-Contractors and Suppliers whilst having no right to receive ongoing interim payments from Grove Developments, it will have found itself between a rock and a hard place. Never an enjoyable experience for any company and one to be avoided.

So where does this leave us?

Whilst it may seem practical and tempting to agree a Schedule of Payment Dates in order to provide clarity, it must not be forgotten that construction project delays are a fact of life in the UK. Any agreed Schedule of Payment Dates should therefore go well beyond the contractual date for completion in anticipation of the above scenario. Alternatively, you might want to insert a new mechanism to determine both payment due dates and final dates for payment after the contract completion date has passed but before practical completion is certified as having been achieved.

Peter Vinden is a practising Arbitrator, Adjudicator, Mediator and Expert. He is Managing Director of The Vinden Partnership and can be contacted by email at **pvinden@vinden.co.uk** For similar articles please visit **www.vinden.co.uk**

BUILDING SCHOOLS FOR THE FUTURE

THIS year got off to a bright new start for a number of schools, as the Department for Education announced that 13 new schools, from the South West to the North East of England, began the new term in modern buildings, thanks to the £4.4Bn priority school building programme.

Since its inception in the 2000s, political parties have supported the principle, while often questioning the effectiveness, of the Government's Building Schools for the Future investment programme in secondary school buildings. However, few would wish to dampen the enthusiasm of the schools and pupils who have left behind their old premises – buildings with leaky roofs and facilities that were inadequate for meeting the demands of modern school life – for outstanding new constructions with bright classrooms and specialist facilities.

And the good news for school building projects seems set to continue. Schools Minister Nick Gibb announced in January: "As the programme continues, I look forward to seeing even more schools reopening in modern buildings as we continue to deliver educational excellence everywhere." School construction projects look set to address the most urgent cases of need through capital and private finance funding.

To address the performance needs and sustainability of new school building programmes, the construction industry is moving into a digital era and the use of Building Information Modelling (BIM) is increasing. The UK Government has mandated level 2 BIM for its construction projects by 2016. There is an emphasis on construction professionals to promote effective, efficient, socially responsive and sustainable projects with the capability to integrate delivery processes, collaborative practices and BIM. The fundamental aspects of integrative design, multiple stakeholder collaboration, common goal-setting and the quick and efficient presentation of complex concepts to enable fast and effective decision-making are as fundamental to sustainable design processes as they are to BIM enabled construction.

When the new schools were recently announced by Department for Education, the Headteacher of Camberwell Park School stated: "Since we heard news of our new building, we have been fully involved in the planning and preparation of the building to ensure that it meets the holistic needs of our pupils who all have special educational needs." It is equally important to a school's long-term success that construction managers work closely with building managers, along with a quality Computer-Aided Facilities Management (CAFM) system, as early on as possible in the project.

As well as providing early cost certainty, BIM offers cost savings at both delivery and operational stages. By mandating Level 2 this year, the Government hopes to have achieved savings of up to 20% from construction budgets by the end of the previous Parliament. The costs benefits increase year on year, as around 80% of an asset's cost is incurred during its operational phase. BIM can help organisations to strip waste from their processes as

they can virtually build the facility as many times as necessary until they create the perfect model. Some estimates say that this could result in a 20-30% saving.

Integrating CAFM with BIM data provides a comprehensive solution for the management of public-private partnership projects. It enables a completely smooth transition from the financing, design and build stages, through to ongoing building management, by automatically and accurately populating details of a building's assets and physical attributes. The BIM/CAFM interface enables developers to provide their clients with a ready-configured facilities and space management software system, based upon the CAD drawing that they have used to design and build the infrastructure. In new schools projects, this will allow the optimal building management from day one.

BIM is both a process and a software solution. It is a way of designing, constructing, running and maintaining a school building as a collaborative process using one coherent and up-to-date system of computer models, rather than several sets of different tools and documents, making it easier to achieve business goals via the industry standard interface Construction Operations Building Information Exchange (COBie). BIM data can be imported into a CAFM system to pre-populate the system's asset register and streamline planned and reactive maintenance management. In turn, as asset and equipment data is updated within the CAFM software, attributes can be automatically pushed back to the BIM model to maintain an accurate, ongoing picture of building components.

BIM data can also be used to support accurate move management and scenario planning. Assets and equipment imported from BIM models can be automatically assigned to floors and classrooms based on their physical position within the BIM model.

Early adopters of BIM are, however, looking even beyond Level 3 (a completely integrated online project information model, providing complete building and product lifecycle management) to the benefits of augmented reality (AR). Combining AR software with BIM models offers a new set of tools for construction industry professionals. For site managers and construction workers, AR has the capacity to change how they access virtual information on project sites, by superimposing virtual models on a live view environment in real-time, from multiple perspectives. With this capability, site managers can overlay the BIM model on the site so that construction issues can be addressed in real time, saving time and valuable long-term school resources.

Enhancing BIM technology, supported by a quality CAFM system, significantly merges our digital and physical worlds, resulting in a more fluid design, construction and building management process. As the opportunity for new school buildings develops BIM, with augmented reality technology, will dramatically influence how the school built environment is understood.

Gary Watkins, Service Works Group CEO

NEW HOMES AND BROWNFIELD SITES

BRANDON Lewis announced in 2015 a new multi-million pound fund to help provide 200,000 new homes on brownfield sites across the country.

In the UK, a brownfield site is defined as "previously developed land" that has the potential to be redeveloped - often land that has been used for industrial or commercial purpose and is now derelict. Due to a decrease in available green spaces, brownfield sites are now becoming increasingly popular in the UK, particularly in places where new homes are needed.

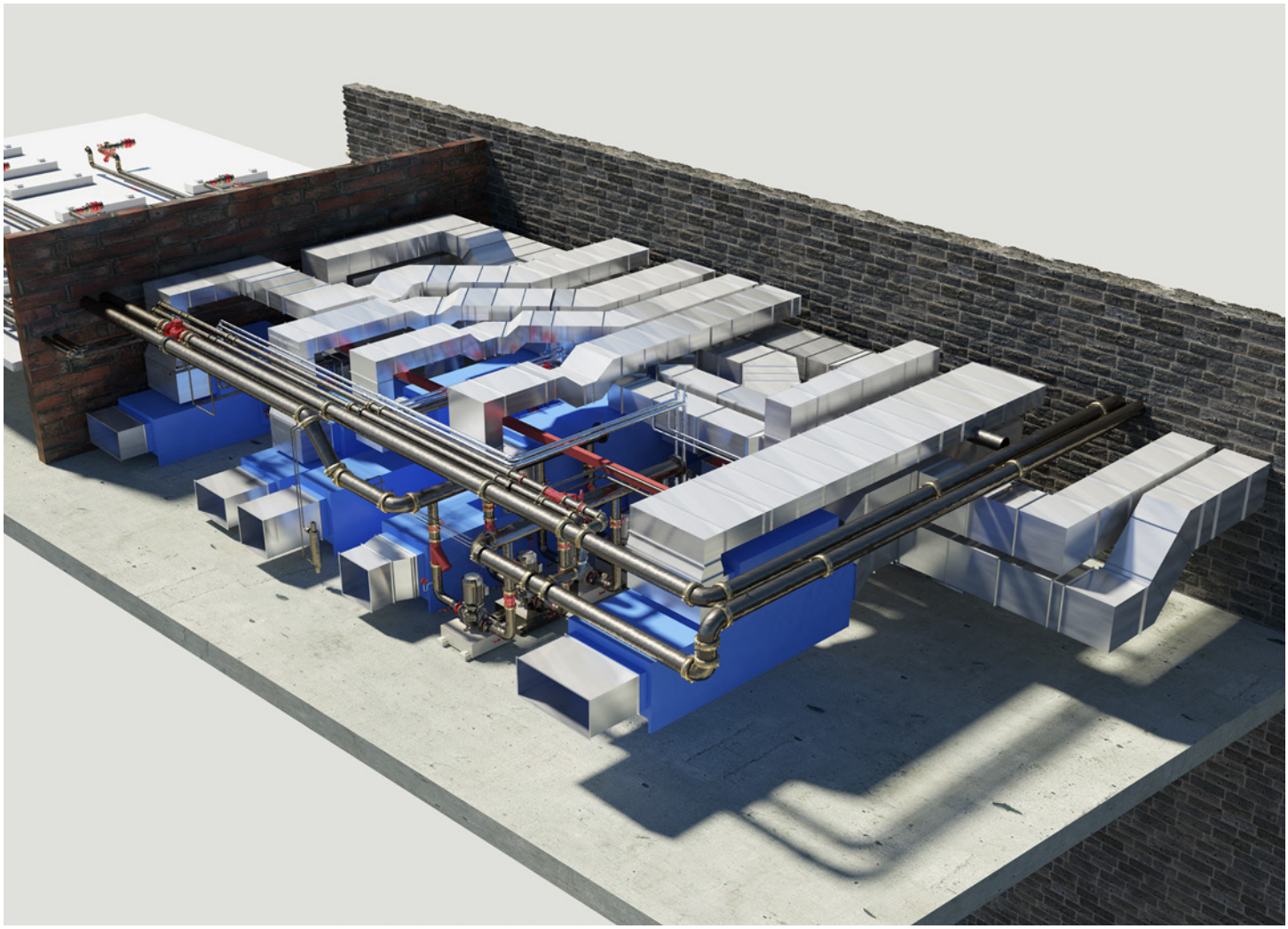
There are over 6,000 hectares of brownfield sites in England, with over one third being in high growth areas such as London, where the demand for the construction of houses is high. Since 2008, the UK has built over 60% of houses on brownfield sites.

The £4.4M funding announced in January last year, enables councils to bring forward brownfield sites of 100 homes or more in the area, making it quicker and easier for developers to get work started. The National Planning Policy Framework makes clear the need to prioritise building on previous-used brownfield land, while new measures make it easier to convert existing commercial, retail and agricultural buildings for residential use. More than two thirds of all new homes are now built on brownfield sites.

The Government aims to have local development orders granting planning permission for new homes in place on over 90% of suitable brownfield land by 2020, with planning permission granted through local development orders, giving the green light for new homes to be built on those sites.

The Government's proposals on sharing data on suitable brownfield land make clear that identified sites should meet four key criteria. The sites should be available for development immediately or in the near future, free of constraints, capable of development in a condition and location that makes the site a genuine option for developers, and capable of providing at least five homes. Any contaminated land should be excluded if there is clear evidence that the clean-up costs would make development unviable.

Other measures that have been introduced to get homes built on brownfield land includes a package of measures to get empty homes back into use, the development of a new garden city at Ebbsfleet on brownfield land, a programme to sell formerly-used, surplus public land, and a £150M Estate Regeneration Fund to accelerate the regeneration of housing estates.



Alder Hey Children's Hospital

Liverpool

Skills Needed:
Revit MEP 2012
Categories:
Prefabrication project

Alder Hey is a world renowned children's hospital in the North West of England. It has been a part of Liverpool for decades and in 2010 a new state of the art hospital was commissioned to be built.

We were employed by our client to help with the coordination and prefabrication of service modules for all MEP related services. This included ventilation, heating, chilled, domestics, containment, above ground drainage and extensive medical gas pipework throughout our area. Upon successful completion of our initial zone we were asked to complete further areas within the project such as; external trenches, plantrooms and the new Outpatients department (OPD) building. We completed all aspects of our contract and established a great working relationship with our client.

The Christie

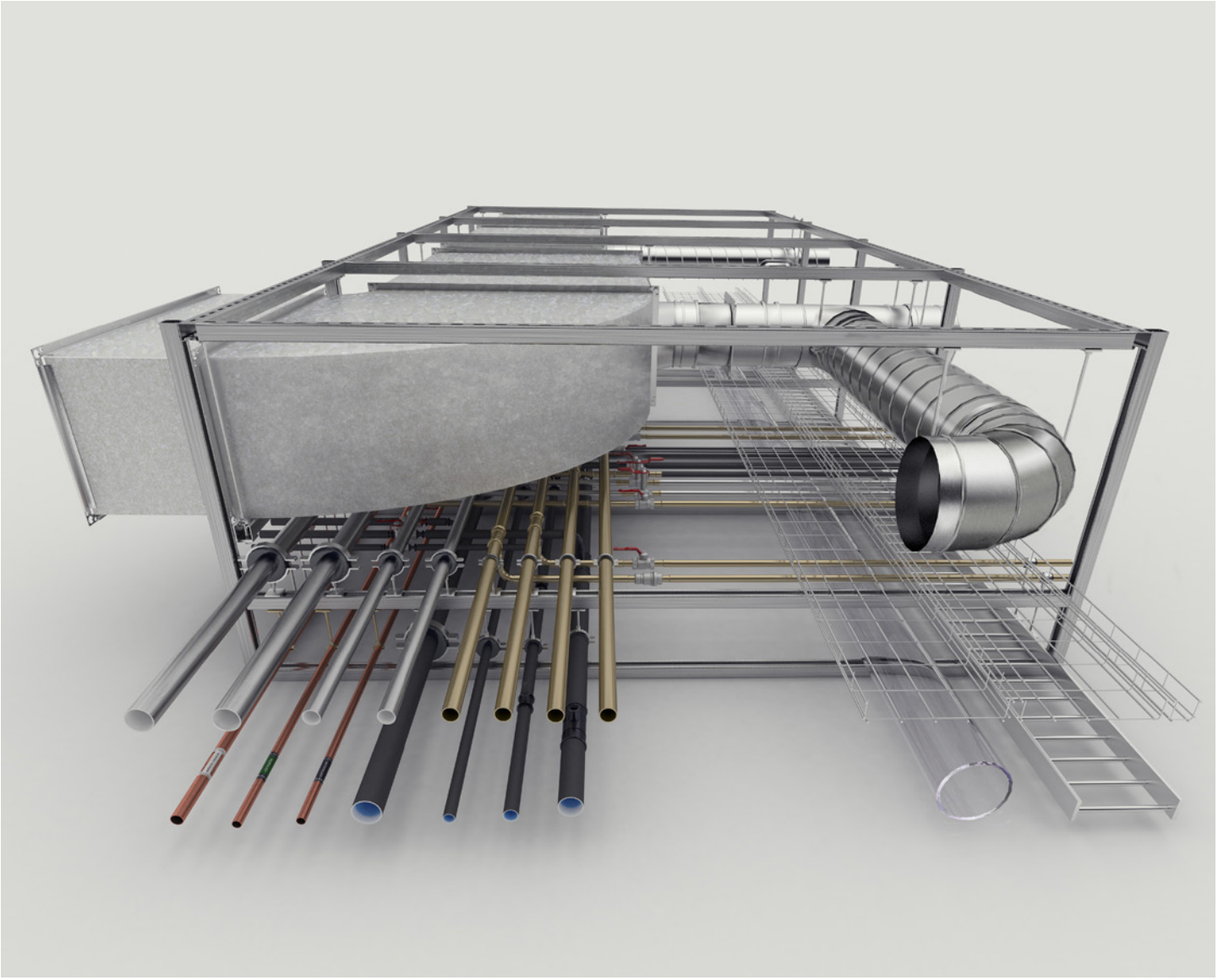
Proton Beam Therapy Unit

Manchester

Skills Needed:
Revit MEP 2015
Categories:
Prefabrication project

The Christies are renowned for their Cancer treat ment and aftercare; they have helped millions of peo ple over the years to successfully overcome this crip pling disease. The Christies are dedicated to curing cancer and as such invest millions in new and inno vative research to help the fight. The Christies have commissioned 2 new state of the art Proton Beam Therapy Units in London and Manchester.

The Cad Room are the lead projects coordinators for this BIM level 2 project, this includes prefabricated modules in all service corridors. Currently we are half way through the project and look to be completed in the next two months. As a company this is our most prestigious project to date, bearing in mind the nature of the building and we look forward to completing many more projects with our client Interserve Engineering services (IES).



Dumfries and Galloway

Woman and Children's Unit

Scotland

Skills Needed:
Revit MEP 2015
Categories:
Prefabrication project

Thanks to our ongoing success with our previous hospitals completed, The Cad Room were invited to coordinate the women and children's building for the new Dumfries and Galloway hospital in Scotland.
Although this project is of a smaller scale to our previous projects, our coordination expertise was very much utilised as this part of the build was heavily congested with services and we still had to add modules for prefabrication. Currently we are still on the project and looking forward to both a successful completion and a bright future with our client.

BIM TASK GROUP: MANDATE IS "UNPARALLELED ACHIEVEMENT"

THE delivery of the Government Construction Strategy (GCS) Level 2 BIM objectives represents "an internationally unparalleled achievement on the journey towards the digitalisation of the built environment sector", says BIM Task Group chairman Mark Bew MBE.

The GCS and the Low Carbon Construction Innovation and Growth Team: Final Report by Paul Morrell – outlines the key target of reducing the cost of Government construction projects by 15-20%.

Government departments achieved this targets ahead of the 4th April deadline, and now require tendering suppliers to demonstrate collaborative 3D Level 2 BIM maturity through defined and compliant information and data on projects.

With Government departments now committed to achieving BIM maturity – the outcome of the BIM Task Group's four-year collaboration with industry, Government client departments, private sector, institutions and academia – BIM is driving greater value at home and significant growth opportunities overseas, through improved delivery and operation of built assets.

Through achieving the mandate, the BIM Task Group and the Government Construction Board along with the Client Delivery Group can reaffirm its commitment to encouraging, supporting and enabling the full BIM adoption across the industry. The recent budget announced Level 3 BIM under the "Digital Built Britain Programme", allowing the development of the next generation of digital standards for the construction sector.

An investment of £15M over three years is designed to maintain the UK's global leadership in the use of this technology, saving owners of built assets billions of pounds per year and setting the infrastructure for the Smart Built economy.

BIM Task Group will unveil a new online website on 4th April, hosted and developed in partnership with the British Standards Institution (BSI) which will provide a common and clear point of reference for BIM documentation, standards and guidance.

Mark Bew MBE commented: "BIM will become a required UK standard across the entire built environment and our message to all stakeholders is: join us and grasp this incredible opportunity to reduce cost and waste while driving productivity and competitiveness.

"We have demonstrated that a partnership between Government and industry can deliver dramatic changes in the sector. This has been made possible by having a clear shared plan and commitment – the challenge now is to embed these techniques across the whole of the market to grow capacity and become business as usual.

"We have, at Level 2, improved the industry. Level 3 BIM and the realisation of Digital Built Britain will create a new industry to service the challenges of the future."

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THE BENEFITS OF USING BIM TO PLAN LIFE SAFETY SYSTEMS

THE adoption of BIM for Central Government funded construction projects has become a necessity rather than an option. In light of this, Tony Obadipe - London Sales Manager for Hochiki Europe - discusses BIM in the healthcare sector, how it can be used and the benefits it brings.

In recent years, BIM (Building Information Modelling) has become one of the biggest buzzwords in the construction industry. The Government has recognised that BIM is both cost effective and efficient, and in 2016, it has become a requirement that all public sector procurement projects are delivered within a BIM Level 2 framework.

The NBS National BIM Library has been, and continues to be, an essential resource for any construction professional. While many large-scale construction projects are already making the most of BIM, it's time to encourage the use of BIM across every sector of the built environment.

When we think about healthcare, we think about safety, care, and diagnostics – characteristics that are all well matched to the benefits and processes of BIM. In a sector built on the use of electronic records, such as patient information, pharmacy stock and treatment paths, you could say that the healthcare environment is already using a collaborative data framework to improve efficiency and maintain top level safety standards for its industry.

It seems only fitting then, that healthcare providers like hospitals, doctors surgeries and pharmacies, be treated much like patients themselves. If a doctor would not offer a treatment proven to be ineffective, why would an architect design a building using techniques recognised as unfit for purpose? Or why would a contractor use a building material with a documented history for being unreliable in certain environments?

This begs the question – how can we use BIM in the healthcare sector to keep patient care and safety a priority, while staying practical and keeping costs down?

DESIGN IN DIGITAL

For a life safety system to work effectively, it needs to be tried and tested. Using product information, thermal performance data and fire resistance information, building designers can create an accurate BIM model that depicts exactly how a fire might move through a building. This model helps inform the decisions on which products to use and where to use them in order to produce an efficient fire detection or emergency lighting network that minimises risk to building users.

Having an awareness of what products are needed helps limit over-ordering; since installers would know exactly how many devices they need for the project, saving both time and money. BIM enables the sharing of data

between all stakeholders in the project and in turn provides 'clash detection' – highlighting instances where one system install could negatively affect another. This consequently saves costs and wastage.

START TO FINISH

It isn't just building design where BIM can be beneficial. A BIM model will prove its worth for a lifetime as it can gather data from building components and put it together against external factors to provide comprehensive aftercare plans and maintenance proposals.

From construction to demolition, the life cycle of a building can be monitored, maintained and improved to keep the healthcare environment working to the highest standards of care and safety at all times. Long-term, there is a huge cost saving implication here, because facilities managers know exactly when to check, repair and replace life safety systems.

KEEP IN LINE

Hospitals and other healthcare environments present designers and contractors with a number of challenges, one of which is legislation. As part of the recently updated Construction, Design and Management regulations (CDM), which covers the actual construction of a project, reducing and controlling any risks to the health and safety of construction workers on-site is a requirement.

Using BIM modelling helps to foresee any potential hazards, and as such actively manages this risk. Using BIM modelling can also help installers plan systems more effectively, to ensure they are complaint with legislation such as the BS 5266 British Standard for Emergency Lighting products, and the ISO/TC 92 for Fire Safety.

SPACE SAVVY

One of the most hotly debated topics in the healthcare sector is access to care, specifically how many people can be treated at any one time. Whether a hospital is at full or half capacity, emergency lighting systems and life safety solutions need to be positioned effectively. To figure out how best to do this, designers can use BIM models to cross check coverage requirements with Lux level specifications, making sure evacuation routes are appropriately lit, and compliant with legislation.

London's University College Hospitals NHS Foundation Trust (UCLH) recently became the first UK hospital to use BIM to create a comprehensive life safety system, and refurbishment works supported by a BIM modelling framework are currently underway. It is hoped that other hospitals and trusts will follow the UCLH's lead, as the use of BIM increases across all sectors of the construction industry.

Whether healthcare or otherwise, if the industry is to move forward, and meet targets, it's essential that any construction project


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THE TRUE COST OF BAD QUALITY

ONLY a handful of studies on the implementation of cost of quality in the construction industry have ever been undertaken. However there is no data worldwide to cover the total cost of quality in the end product, according to Daniel Keeling, Chair of the CQI Cost of Quality Working Group, which is a supporting group of the CQI Construction Special Interest Group.

The Group therefore undertook the challenge to fill this gaping void. The aim of the report is to quantify the cost of poor quality and to develop measures to reduce failures and so reduce operational costs. "We have looked at the whole aspect of the cost of quality. One could say it is the cost of non-quality," says Keeling. "It is about the failure to deliver what the client actually wanted."

But this is not as easy as it initially sounds. "This failure comes in various forms a failure to: fully specify a project, to understand what is wanted or to give the correct direction to the contractor, all leading to a failure to meet the requirements of the customer."

Keeling says: "There is very little analysis done on costs and failure, yet you are talking projects that are big money. The UK construction industry is worth £100Bn each year, and if you take just a conservative estimate of 1-2% as a failure cost, you are talking of around £1Bn to £2Bn in the UK." An American study has found that 5-6% can be lost on defects.

The CQI group has been working for 18 months and has representatives from all sides of the industry, from clients, consultants and contractors. To begin the research, an accepted model of measurement would have to be agreed and implemented. Keeling explains: "We had to break it down and make it measurable. We decided to focus our efforts on the costs of not delivering client requirements post-handover. The cost of quality after handover is broken down in all types of paths. We will measure all these individual paths. We have therefore come up with a structure, suitable definitions and measurement."

To take the project forward, a relationship has been struck-up with University College London (UCL) and its construction research department. UCL Bartlett School of Construction and Project Management will be undertaking a mixed method research study. It is hoped that this work will contribute to the development of a new integration model that could support a reduction in operational failures.

The study will be three years in the making. Keeling enthuses about the final report and its appeal. "We think this will be of phenomenal interest to clients worldwide: a comprehensive report which can benefit all construction clients across the world."

CHALLENGES AND OPPORTUNITIES

Keeling confesses there are challenges ahead: "Organisations are not always giving us the information we need, as they are protecting their commercial interests. Insurance has also been more difficult than anticipated in the measurement of cost. Their models are difficult to get hold of and it is difficult to measure how they come up with a number relating to costs."

Nevertheless, this report and undertaking has also led to other interest for future projects, with thought being given to a second report being undertaken due to the scale of the whole project.

Keeling's experience in the field of construction and quality is mightily impressive, spanning 35 years. He began as a Senior Engineer in the Yanbu Industrial City in Saudi Arabia in the early 1980s when its population was 500. It is now over 200,000.

Reflecting on this time, Keeling considers how quality has changed, or at least its perception. "In Yanbu, quality and assurance sat together, reporting directly to the Director General. I had the power to disqualify any supplier. I had to approve every supplier and monitor them thoroughly. Since then, my power has come through being persuasive. It appears the power of the quality manager is not as great as it was then."

Other factors have come into play to shift the position of quality. "I would say safety is climbing up the commercial tree in importance and quality is slightly drifting down the tree." But, Keeling notes: "If you don't have quality you don't have safety: quality is all-encompassing."

LEARNING LESSONS

Since his time in Saudi Arabia Keeling has worked on, and been responsible for, the quality systems involved in the building of the Channel Tunnel and then as Head of Quality for HS1 during design construction testing and the first phase of operations when the trains began running. He moved over to Crossrail before settling into his current role as Director of his own quality consultancy firm, Dankeel Associates. "The construction industry doesn't learn lessons as quickly as it should," Keeling says, suggesting challenging times ahead.

So what is his biggest lesson learned? "You need to be technically able and focused enough to be able to influence the industry. You have to see the big picture. Focusing solely on inspection is not right. Focusing solely on processes is not right. You have to see the big picture and ask: what is the end product and what does it look like?"

And, as work begins in earnest on the cost of quality report, Keeling's final advice for everyone in quality: "Be proud in what you do and stand up for what you believe in."

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