BUILDING UTOPIA?

When Dudley College wanted to build a £10m Centre for Advanced Building Technologies, it plumped for a new form of procurement – an insurance model that benefits the whole supply chain and covers cost overruns. **Thomas Lane** reports on how the trial project, shortlisted for this year's Building Awards project of the year category, worked out

Dudley College procured a £10m advanced construction skills training facility for 16- to 18-year-olds using integrated project insurance

Imagine a world where clients could procure a building knowing it wasn't going to go over budget, and the contractor wasn't going to lose money building it. In this joyful, sun-kissed land, designers, contractors and specialist contractors work collaboratively, generating innovative, clever new ideas and get paid handsomely for their time. Meanwhile, construction lawyers are reduced to begging on the streets.

This fantasy isn't as far-fetched as it sounds. A new form of procurement aims to break the impasse of wafer-thin margins, a culture of dumping risk onto the next person along the supply chain, stifling innovation and a poor quality product. Called integrated project insurance (IPI), this fresh approach has benefits for the whole supply chain and the early indications are that it is catching on.

IPI offers much more than the dry title suggests. As the name implies, it offers public indemnity insurance for design teams and all-risk insurance for contractors with defects liability. The big plus is that IPI also covers cost overruns, which should be hugely appealing to clients and contractors.

First IPI trial project

For the Dudley College of Technology, IPI had enough appeal to get it to act as a guinea pig for the Cabinet Office, which is promoting innovative forms of procurement in a bid to cut construction waste. Dudley College had procured five buildings over the past eight years, the last four under design-and-build contracts. "We had good and bad experiences of design and build," says Steve Johnson, the college executive director of estates and capital projects. "In some cases the quality was good, but in others it wasn't and there were additional costs and legal action."

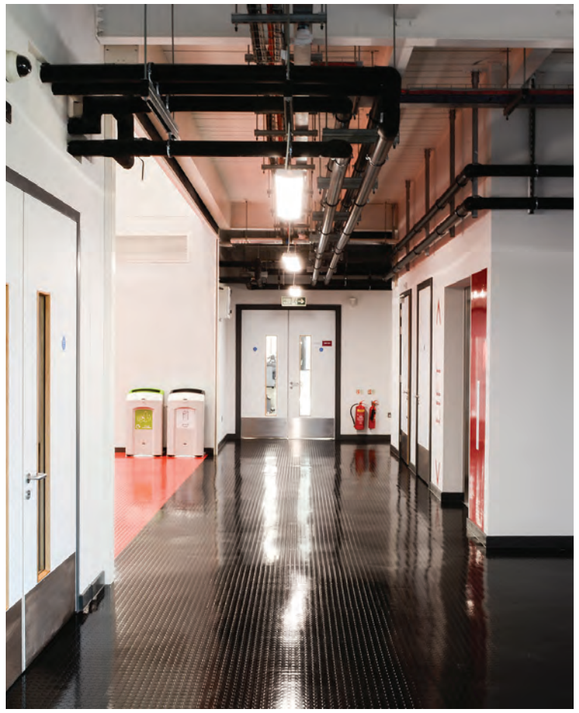
The college wanted to procure a £10m advanced construction skills training facility for 16- to 18-year-olds to act as a demonstrator of advanced construction. Dudley decided to build up a £1m contingency fund in case the job went over budget. Then it was presented with the opportunity to be the first IPI trial project.

"IPI gave us a cast-iron guarantee [of cost] so we knew what our liability would be if the job went wrong," says Johnson. "This gave us the benefit of not having to build up the £1m fund and enabled us to start the job 12 months earlier."

Project cost overrun liability is limited by a combination of a pain-gain mechanism shared among the client and project team and an insurance policy. In the case of the Dudley College Advance II Alliance – the name given to the consortium of six key members of the project team – a cost overrun of up to £500,000 on the agreed target build cost of £10m would be shared among the alliance, with overspend in excess of £10.5m picked up by the insurance policy.

The first £500,000 is similar to an insurance excess, but comes with the benefit that any savings up to 7.5% of the budget are shared among the alliance members. The insurance covers a cost overrun of £2.5m, which means the client would only feel the pain if the job bust the £13m barrier.

The Dudley College Advance II Alliance »



The building needed to demonstrate advanced construction technologies as it is an advanced construction skills training academy

» comprises Dudley College, Metz Architects, M&E engineer and project co-ordinator Fulcro, structural engineer Pick Everard, constructor Speller Metcalfe and M&E specialist Derry Building Services. There is no contractor or contract in the traditional sense; instead the alliance members work together under an IPI Alliance Contract to define the brief, agree the budget, create the design and construct the building.

A new approach to managing risk

According to Fulcro's Mike Murray, project co-ordinator at Dudley, project-wide insurance fundamentally changes the project dynamic. "The absence of individual public indemnity, which makes you risk adverse, really enabled us to be innovative," he says. "Because we are collectively insured it cuts out the waste of producing documents that just transfer the risk. It fundamentally changes the relationship between the consultants and suppliers."

The alliance works together in a non-hierarchical group to define the strategic brief for the project and how its success will be measured. The client has a total investment target, here £11.68m, which must not be exceeded and the team draws up solutions based on this. Unusually, team members are paid for their time rather than a percentage of their part of the job, which has big impact on the type of solutions that are adopted.

Dudley features natural ventilation, which reduced the amount of HVAC plant in the building (see "How IPI promotes innovation", right). "It's counterintuitive for a services engineer to design out ventilation systems as you are being paid a percentage of the value of your work – so reducing your fee," says Murray. Paying alliance members an hourly rate means they are free to adopt the most cost-effective solutions.

Close involvement with specialist contractors is a key part of alliancing: the Advance II alliance includes an M&E specialist. Early engagement is encouraged to take advantage of specialists' technical knowledge when working up best value solutions. The aim is to produce solutions that are deliverable for the target cost rather than the traditional approach where consultants work up designs and put these out to tender.

"It's not in anyone's interest to exceed the target cost as it affects everybody, not just the contractor," says project surveyor Scott Parton, Speller Metcalfe's representative at Dudley.

With traditional procurement, lots of time is spent putting together tender documentation with tenders often exceeding the budget. This leads to designs being "value engineered" to bring costs back in line with the budget, a process that generally compromises quality.

A no-blame culture

Another benefit of IPI is that shared liability is BIM friendly. "One of the problems with BIM is companies do not want to put data into the model as it's hellishly difficult to trace who did what," says Louise Lado-Byrnes of IPI Initiatives, the organisation that developed the IPI model. "With IPI it isn't an issue as there is a no-blame culture." Once the design and target cost of £10m was finalised, this was validated by independent technical and financial risk assessors and agreed by the client. Then construction work could begin. Specialists are paid out of a project bank account on the basis of forecasted costs rather than valuations, which benefits the supply chain and eliminates the cost of doing regular valuations.

Advance II completed last September. It was four weeks late but unusually was fully tested before handover – testing is usually squeezed, as this takes place at the end of a contract when the contractor is more concerned about avoiding late handover. Murray says there weren't any user complaints, which is almost unheard of.

The project came in under the client's investment target by a healthy 6.5% but exceeded the target build cost by 1.8%. "Although we all picked up a degree of pain, we still all made a profit on this project," says Parton. "We went further than we needed on the success criteria but it meant the client ended up with a fantastic project." The project met 99% of the success criteria and exceeded 23% of the targets. The insurance and cost of the independent assessors added up to 4% of the project cost – however, this was of course the first time the approach was used, and IPI Initiatives says the figure is likely to fall to 3% on future projects, once the concept has been proven.

Could IPI work elsewhere? "It lends itself to bigger jobs as a benefit would be greater supply chain engagement with BIM," says Parton, who points out the relatively modest nature of Advance II meant some of the specialist contractors weren't familiar with BIM. IPI is already gaining momentum: Speller Metcalfe is working with it on Derby Silk Mill, the conversion of a mill into a museum. Lado-Byrnes says IPI Initiatives is talking to "some very big clients" about using IPI procurement and insurers are more confident about the risks and are prepared to insure jobs with project values of up to £100m.

Would Dudley College do it again? Johnson says the college has just appointed the team to deliver its second IPI project, a £26m transformational technology centre. If the benefits of IPI are enough for Dudley and Speller Metcalfe to get involved again, that suggests it has real benefits. Given the challenges facing the industry, IPI might just be the tonic it needs.

HOW IPI PROMOTES INNOVATION

Delivering a low energy building was one of the strategic brief objectives set by the alliance team. Targets included aiming for Passivhaus levels of insulation, an airtight envelope and a low-energy ventilation strategy.

The building is largely naturally ventilated, which is unusual for a building of this nature. It features cladding panels that open on either side of the building, allowing cross ventilation. The opening panels feature window mechanisms, and actuators open these in banks. The panels are manually operated by building users in the daytime and maintenance staff in the evenings when night purging of the building is needed to cool it down.

Murray says the cost of the actuators came out of the M&E allocation, on the grounds people would not open each panel individually, which would make the system less effective. He adds that transferring the allocation would never happen on a conventionally procured building. The heating system was tested by heating the building up to 27°C. Then the panels were opened to cool the building down. The test was a success and the building handed over to the client secure in the knowledge that the heating and cooling system performed as specified.

The building features a central atrium. This is part of the natural ventilation strategy, with opening vents in the roof

PROJECT TEAM

Alliance members:

Client Dudley College
Architect Metz Architects
Structural engineer Pick Everard
M&E engineer/project co-ordinator Fulcro
Constructor Speller Metcalfe
M&E detailed design/installation Derry Building Services

Advisory/assurance:

Insurance broker Griffiths & Armour
Independent facilitator IPI Initiatives
Technical independent risk assessor SECO/BLP
Financial independent risk assessor Rider Levett Bucknall

The Edinburgh St James site is in the city's New Town area and is hemmed in by buildings, roads and people. The job is complicated by having to work around and under a John Lewis store that extends into the site (on the left side of the image)

JOHN GILCHRIST

ST JAMES II OF SCOTLAND

The redevelopment of Edinburgh's St James shopping centre with the addition of apartments, a hotel and retail is on a regal scale – but a distinctly small site. **Thomas Lane** reports

Rising above the polite Georgian terrace of Edinburgh's New Town is a cluster of eight white tower cranes densely packed into a site where York Place and Leith Street converge.

These cranes mark the redevelopment of the St James shopping centre, a tired and unloved brutalist relic of the early 1970s that is being replaced by a mixed-use scheme intended to revitalise this end of the city.

Developer Nuveen is investing more than £1bn into the new scheme, which has been christened Edinburgh St James. The gargantuan development will include 850,000ft² of retail – equivalent to 21% of Edinburgh's entire retail offer – as well as 152 apartments, a 244-room, 13-storey W hotel and a 75-room aparthotel. Controversially for a city-centre location with good public transport links, it will include three levels of basement parking for 1,500 cars, three times as many spaces as the scheme it is replacing.

Constructing this megaproject in the heart of Edinburgh on a site hemmed in by roads, buildings, shoppers, tourists and office workers is a challenge, as Laing O'Rourke's Tim Kelly, the project director on this job, explains. "We are extremely tight and have very little room to move," he says. "The excavation goes virtually up to the boundaries of the site, so we are building on every square foot that we have."

Parts of the job involve an unusually intimate relationship with a John Lewis store. The department store wanted to continue trading during the work despite the fact it extends right into the construction site. A crinkly tin partition is all that separated shoppers from the demolition of the building next door. Laing O'Rourke has also had to demolish some of the structure underneath the part of the store extending into the site and insert new columns, all while people continued to shop above.

Laing O'Rourke is delivering the project on a £475m design-and-build contract in 48 months. Work started in October 2016, with demolition followed by excavation for the basement. The job is now well into the construction phase with 10 cores distributed around the site almost completed. Work is taking place on multiple fronts. In some areas the precast system being used for the basement levels is being installed, while towards the perimeter on the north and east sides the steel frame is racing up, with the cladding installation under way at the York Place end of the scheme.

The work is further complicated by the topography of the site and the non-orthogonal nature of the architecture. The site slopes from the higher southern end, near where Leith Street meets Princes St, down towards York Place and Leith Walk. Architecturally the York Place and Leith Street side of the project is conceived as a sweeping crescent of stone-clad buildings intended to blend in more sympathetically with Edinburgh New Town's polite Georgian crescents and sandstone facades than did the scheme's concrete predecessor. An inner crescent of retail is separated from the outer by a street, while at the apex of the scheme is a cone-shaped hotel distinguished by a bronze-coloured ribbon of steel spiralling around the cone, terminating with a Mr Whippy-style flourish.

Information management

The complex geometry combined with the scale of the job and the constrained location meant careful planning and information management was essential. The approach adopted by Kelly has been to digitally engineer the job down to the last nut and bolt. This is combined with offsite manufacture, which helps address the tight site, improve efficiency and keep the programme on track. Kelly is evangelical about the benefits of digital technology. "It's absolutely essential, I can't see how it would have been successful without this," he enthuses, saying once this approach has been adopted there is no going back to more traditional forms of construction.

A team of five full-time digital engineers are responsible for managing the digital model. They take digital information from the design »

JOHN GILCHRIST

JOHN GILCHRIST

Left and above: A steel frame is being constructed over precast concrete basement parking. The curved geometry of the architecture adds to the complexity of the scheme

Right: A visualisation of the completed project. It is designed to blend in with the neoclassical style of Edinburgh's New Town and features a conical hotel in the centre

» teams and redraw this as necessary to ensure consistency and accuracy. The model includes information from the specialist contractors. Some of these, notably the glazing and structural steel specialists, had already become habituated to using 3D modelling but others don't – for instance the blockwork and partitioning specialists. Laing O'Rourke had to create digital information for these packages from scratch up to a degree of detail and accuracy enabling the information to be used for construction. This means Kelly has a huge amount of information at his fingertips "down to how many nails we need to complete the job".

Armed with this level of detail, the work packages are planned with the information in the model. "We solve as many problems as possible in the model," explains Kelly who says that everything is built twice, once in the model and once on site. "Once we get on site we just get on and build it without going backwards and forwards with the designers." Once the work is completed it is surveyed and the model updated to take account of any changes made during construction. This ensures there are no problems with follow-on work caused by out-of-date information.

Complex challenges

One of the most complex tasks was demolishing the lower part of the four-storey John Lewis store that extends into the site. Its lower two floors had to be demolished to allow construction of the basement below and the new superstructure above it while keeping the store operational.

The first task was to construct a secant piled wall under the structure to form the basement perimeter. Then steel trestles were constructed around the existing columns with steel beams spanning between the trestles to support the edge of the existing first floor slab. Gripper plates, which are supported by the trestles, were clamped onto the existing columns to take the loads of the floors above while the columns below were demolished. Loads from the columns were transferred to the trestles using hydraulic jacks, then the old columns and retaining wall were demolished and the basement excavated. Once at the lowest level of the basement, piles were constructed to support new columns, pile caps were cast and new steel columns erected. With the new columns in place loads could be transferred from the trestle structures to the new columns and the trestles removed.

> WE SOLVE AS MANY PROBLEMS AS POSSIBLE IN THE MODEL. ONCE WE GET ON SITE WE JUST GET ON AND BUILD IT WITHOUT GOING BACKWARDS AND FORWARDS WITH THE DESIGNERS
>
> **TIM KELLY, LAING O'ROURKE**

To manage the risks associated with this part of the job, the project team decided to use the 3D information to create a video detailing the construction sequence. This prompted them to change the process six times before they were satisfied they had devised the optimal methodology. The video was also used to reassure John Lewis the work did not pose any risk to its store's operation. "We've broken the process down so anyone can understand it – the client and people who don't understand engineering," says Kelly.

The 3D information is used for all parts of the job, including apparently simple jobs such as casting ground floor slabs. "We got half a dozen construction managers in a room to explain how this should be done and they couldn't agree on a way of doing it," explains Kelly. This prompted the team to define a single way of casting the slabs. Why were they keen to do this? "The workers could go through four or five sectors working with different supervisors each time," answers Kelly. "We wouldn't get the quality and efficiency that a single optimised process brings. It's all about introducing a manufacturing and assembly line mindset to the job."

The process is communicated to workers using simple pdf worksheets with a set of step-by-step instructions that can be downloaded onto an iPad. "It gets us away from those 30-odd-page method statements. This explains in a few words what needs to be done," says Kelly.

The reason why there are so many cranes on this job is because Laing O'Rourke is maximising the use of offsite manufactured components to increase construction output on the constrained site. This includes a mighty Terex CTL 1600 luffing jib crane with a lifting capacity of »

WHY LAING O'ROURKE GOT THE JOB

The Edinburgh St James project has taken well over a decade to realise. Work started on the new design for the shopping centre in 2006 and was approved by the planners in 2009, but then the scheme was put on hold because of the economic downturn. This gave the developer, TH Real Estate – now known as Nuveen – the opportunity to refine the design to suit the needs of operators that had expressed interest in taking space. A new planning application was consequently submitted and was approved in 2015.

Colin Palmer, Nuveen's director of development management for Europe, says that the complex nature of the job meant the expert input of a contractor at an early stage was needed. "When we were planning our strategy, we asked ourselves: how on earth can we deliver this project here?" he says. "It's surrounded by listed buildings, there is very limited access and the City of Edinburgh were planning to build a tram at the same time as our project which meant a huge amount of infrastructure work."

Astonished by offsite

Palmer says a chance meeting with Laing O'Rourke chief executive Ray O'Rourke prompted an invitation to go and visit the contractor's Explore factory, which he describes as an "astonishing" facility. Palmer adds that Laing O'Rourke's approach to construction – the use of offsite manufacture, a directly employed supply chain and digital engineering – was a key reason why Nuveen's investment team agreed to bring in the firm to advise on project delivery.

Recommendations made by Laing O'Rourke at this stage included greater overlap between demolishing the old shopping centre and building the new one, as well as a three-month study to see how offsite and digital construction techniques could be integrated into the scheme to bring greater certainty to the programme. This allowed Nuveen's original 51-month programme, which was based on limited information when it was drawn up, to be reduced to 48 months.

Palmer says Nuveen could have put the main contract out to tender. Instead, the decision was made to go with Laing O'Rourke to deliver the project: it felt sufficient cost surety had already been brought to the construction work, and this, combined with an open-book approach, was sufficient to satisfy the investment team.

"I can't imagine another way of doing it," says Palmer now. "I think we are getting value. The ongoing objective which was stated by Mr O'Rourke, that he would work more openly and more frankly with his client, has come to fruition. We tried to do something different and so far we are on track to deliver that."

Left: The extensive use of offsite components necessitated the use of eight cranes, including one of the biggest in the UK

Middle, left: Workers erecting temporary supports for the precast lattice planks used for the basement construction. Reinforcement is placed over the planks followed by concrete, once this has cured the supports can be removed

Bottom, left: The excavation goes right up to the perimeter of the site

» 66 tonnes and a 75m-long jib. One of only two in the UK, it is essential for lifting the heavy precast concrete columns and lattice planks for constructing the basement, the prefabricated service risers and horizontal modules – up to 12m long – and the prefabricated transformer rooms. Kelly says that about 35% of the scheme is being undertaken using offsite techniques.

Detailed advance planning

The highly digitised nature of this job combined with rigorous advance planning means all the crane movements have been worked out in advance according to the programme. "This means the cranes can all be utilised rather than trying to prioritise crane movements on a daily basis," explains Josh Murray, Laing O'Rourke's group director of human capital, corporate affairs and the office of the CEO. "It's such a safety benefit if the lifting programme is predetermined in advance."

The progress of every precast panel through the factory and its whereabouts during the journey from the factory at Explore Industrial Park in Nottinghamshire to Edinburgh is known, says Murray. As the lorries arrive, their contents are checked and approved.

PROJECT TEAM

Client	Nuveen
Residential developer	Native Land
Concept architect	Allan Murray and Associates
Architect for W hotel	Jestico + Whiles
Executive architect	BDP
Main contractor	Laing O'Rourke
Structural engineer	Arup
Services engineer	TUV SUD
QS	Gardiner & Theobald

IT'S SUCH A SAFETY BENEFIT IF THE LIFTING PROGRAMME IS PREDETERMINED IN ADVANCE

JOHN MURRAY, LAING O'ROURKE

For more facts and statistics on the St James scheme, go to **www.building.co.uk/buildings**

The cladding system neatly encapsulates how this rigorous construction approach comes together on site. The cladding system consists of a combination of precast panels, which are faced with stone or made from reconstituted stone to help the scheme blend in with the architecture of Edinburgh's New Town area. It was imperative that each panel lined up perfectly with its neighbour to help maintain the illusion that the shopping centre was traditionally built. However, it is difficult to get concrete products millimetre-perfect as concrete shrinks slightly when it dries, meaning each panel is a slightly different size.

So the size of each panel is checked when it arrives on site and the digital model updated with the actual dimensions of the panels. Armed with this information, the panel configuration can be test-driven in the model to get the right combination of panels and spacing to ensure the sightlines along the joints look perfect. This saves having to work out the best panel combination by physically manoeuvring these into position, a job that could be time-consuming.

This approach has paid off. There were no complaints from John Lewis during the delicate demolition and reconstruction works under their store, and the rest of the job has so far gone as planned. "The amount of work we've had to redo is minimal; we've haven't had to redo a single column," beams Kelly. A more traditional approach would have taken a lot longer and been less productive, he says. He cites a benchmarking exercise performed on earlier jobs using this approach, which demonstrated a 40% increase in productivity. A remarkable achievement, this signals clearly the direction UK construction needs to take to ensure it has a prosperous future.

ALL IMAGES BY JOHN GILCHRIST

Victory Plaza under construction with the two factories clearly visible. The project is now finished, with occupiers moving in

GIANT LEAP ONE

With the pressure on contractors to embrace innovation to improve margins, **Thomas Lane** finds out if new processes such as Mace's 'rising factories' might help deliver projects more quickly and efficiently

The residents of the former Olympic Village, now called East Village, in east London, were understandably surprised when workers, who were supposed to be building two new residential towers next door to their homes, started constructing two big industrial sheds instead.

Their suspicions that something was amiss were confirmed by the appearance of the words "Factory 1" and "Factory 2" in big lettering on the sides of the sheds. And surprise turned to astonishment when the structures started to rise into the air, revealing the perfectly finished facades of two residential buildings below.

What the locals did not know was that this unusual project was a bold experiment in offsite construction pioneered for the first time in the UK by contractor Mace on this project. Victory Plaza comprises two 26 and 29-storey towers of a buy-to-let scheme for developer Get Living. In the "rising factory" process, the sheds work as factories – used to construct the building structure including the slabs, services, bathrooms and the cladding – and jump up floor by floor in the same manner as jump-form rigs used for core construction.

"There were several key drivers for this approach," explains Shaun Tate, director of high-rise solutions for Mace. "We wanted to minimise the impact of construction on the neighbourhood by reducing traffic and leading edge working. And there is a microclimate here with more windy days so we wanted to reduce the risk of being winded off and losing valuable hook time."

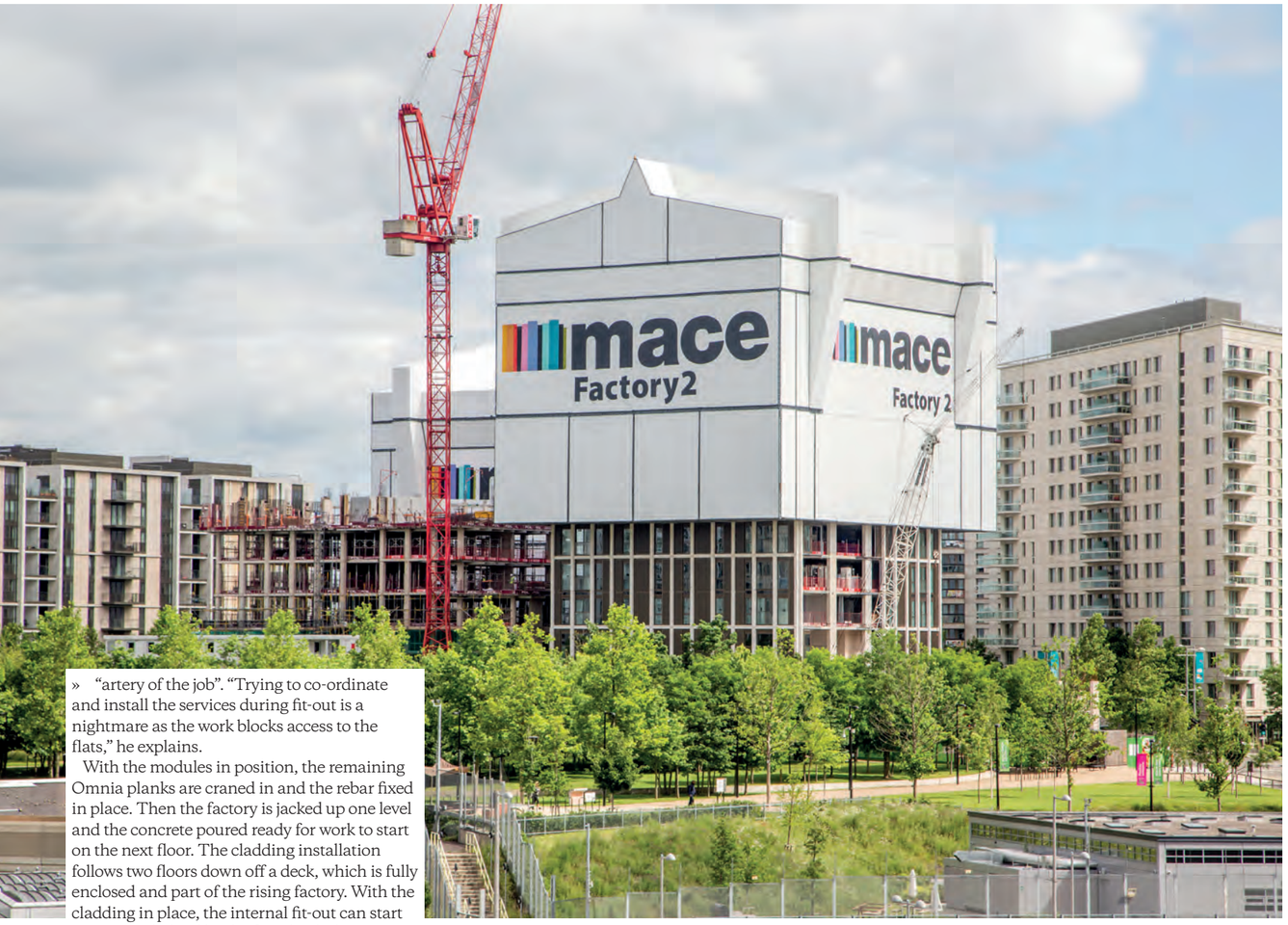
The rising factory is also an experiment in a bid to find quicker and more efficient forms of construction. Building visited the project just after completion to see if this unusual approach helped the project team deliver the project on time and whether it saved any money.

The method

The rising factory is constructed from portal frames covered in a waterproof fabric. Instead of tower cranes it incorporates two gantry cranes spanning the full width of the building. One of these extends beyond the floorplate and is used to lift materials from ground level up the side of the building and onto the slab, the other crane is used to position the materials in the right places.

The process starts on top of the finished floor slab. Precast columns are installed around the building perimeter with twin-wall structural panels used for the core and other internal structural walls. The propping system needed for the next floor is installed in parallel with the structure, while bathroom pods and utility cupboards incorporating boilers and other services are craned into place. The propping system beams can then be installed allowing precast Omnia slabs for the floor above to be lifted into position.

The last area to receive the Omnia slabs is the area around the core which allows time for horizontal service distribution modules supplying the apartments to be positioned. The fully fitted service modules even include the temporary electricity supply and lights to save time later. Tate describes the modules as the »



Far left: The structure, floor slab construction, services, bathrooms and cladding installation all take place within each rising factory. The factory is jacked up as each floor completes in the same way as jump-form rigs used for core construction

Left: The project is now complete, with construction starting on an almost identical scheme nearby

Below: The rising factory houses two gantry cranes that are used to lift materials from ground level and position these in the right places on the floorplate

» "artery of the job". "Trying to co-ordinate and install the services during fit-out is a nightmare as the work blocks access to the flats," he explains.

With the modules in position, the remaining Omnia planks are craned in and the rebar fixed in place. Then the factory is jacked up one level and the concrete poured ready for work to start on the next floor. The cladding installation follows two floors down off a deck, which is fully enclosed and part of the rising factory. With the cladding in place, the internal fit-out can start in earnest, helped by the fact the drylining materials were craned into the apartments while the structure was being built.

The benefits

Tate says there is much more to the rising factory than a reduction in vehicle movements and minimising the risk of wind stopping work. The ultimate goal is to improve the efficiency of the construction process by maximising the use of offsite manufactured and assembled components and minimising site work.

He explains the design had to be completed much earlier than is usual and the construction process had to be meticulously planned to maximise the time saving potential of offsite construction.

"All the different elements had to be on site on the right day at the right time, otherwise all the other elements around that would come to a grinding halt," says Tate.

The process was carefully modelled. Tate says the most effective way of planning the work was to get all the people involved in project delivery to explore how they would work collaboratively to deliver the job efficiently. Different scenarios were explored in a bid to come up with the most efficient process.

This careful planning paid off: Tate says the job worked like clockwork, describing it as "significantly more efficient, with a whole floor delivered over 55 hours.

"By the time we get to the end of a 55-hour cycle we had installed the structure, the cladding, vertical service risers, horizontal service distribution modules, the bathrooms, utility cupboards and we'd preloaded all the drylining materials ready for installation."

The team were constantly exploring small incremental changes to reduce the cycle time, which meant the final 18 floors of the job were delivered at the rate of one floor per week.

"The fastest we did one cycle was 38 hours," says Tate, adding that there was a total of 25 people on the working deck, significantly fewer than would be required for individual concrete, cladding and M&E packages.

Tate says that when the rising factory was operational it did drive far greater efficiency. But did the efficiency gains save Mace time and money once the costs of building and disassembling the factory had been factored in? Tate suggests not.

"Overall, we saw it as a learning opportunity," he explains. "If you are brave enough to innovate, you need to go through more than one cycle to realise the benefits." The lessons learned from this project will be applied to another, almost identical buy-to-let development for Get Living near Victory Plaza, which recently started on site.

Tate says the same approach to delivery will be used on this job but without the costs of building the rising factory: "The efficiency that drove us further than anticipated can be replicated without having to build the factory," he concludes.

This means no more surprises for the residents of East Village when these buildings start coming out of the ground later on this year.

PROJECT TEAM

Client Qatari Diar Delancy (QDD)
Building operator Get Living
Architect Lifschutz Davidson Sandilands
Executive architect Adamson Associates Architects
Structural engineer Walsh
M&E consultant Arup
QS/project manager Arcadis
Landscape consultant Townshend
Main contractor Mace

WHAT IS VICTORY PLAZA?

Victory Plaza is part of the latest phase of the East Village residential development in the Queen Elizabeth Olympic Park, *writes Ike Ijeh*.

While 2,818 homes were built here in time for the 2012 London Olympic Games, Victory Plaza is a key component of future masterplan stages that plan to add another 7,000 homes in the next 20 years. Victory Plaza itself comprises two towers of 26 and 29 storeys. They provide 482 homes for the build-to-rent or private rental sector, which comprises a little more than half of the total homes on the site.

The towers provide retail and leisure accommodation on ground-floor units. They emerge from a podium block, which links them on their lowest storeys and which is topped with private residential roof terraces. In future phases, four further towers with identical floorplates are planned near the existing two, with the two tallest of these joined by a crescent podium block.

Douglas Inglis, Lifschutz Davidson Sandilands' lead architect, accepts the tech innovations the Jump Factory system offers, but maintains it did not have any direct effect on the architectural appearance of the towers.

He says: "The benefits were huge, from a practical construction point of view – not having the building wrapped in scaffolding was a big plus as was the role the factory 'box' played in deafening noise. But we had designed the building to allow for a number of constructional scenarios and Jump Factory was one of them.

"What was far more influential in terms of design was the flexibility we introduced into the floorplate and the architectural articulation, such as aluminium fins and inset balconies, that we adopted to mitigate the unitised design system we employed for the facades."