

Case study: Kier Construction

Kier Turns Planning Upside Down at Five Pancras Square



About Kier Construction

Kier Construction is part of the Kier Group, a leading property, residential, construction and services group which operates across a range of sectors including defence, education, housing, industrials, power, transport and utilities. The Group employs over 24,000 people worldwide.

Kier Construction encompasses the group's UK regional building, major projects, infrastructure and international operations.

Kier is driven to succeed, with a strong commitment to corporate responsibility and high quality standards. Being enthusiastic, collaborative and forward-thinking are its core values, and underpin its excellent record in delivering customer care and value.

Delivering any £68m development requires careful planning – but the build that James Carpenter of Kier Construction's major projects business drove at Five Pancras Square, near King's Cross in London, definitely required extra care. This 14-storey mixed-use community, destined to house London Borough of Camden facilities and offices, required a re-think of the core building approach from the start. It also experienced some significant difficulties thanks to the collapse of subcontractors responsible for both the steel frame



James Carpenter receiving Gold Medal from Jason Ruddle, Managing Director at Elecosoft and Natasha Kaplinsky

and the cladding. This was in addition to a very complex core requirement, which included a 10-storey atrium with a cantilevered central stairway, and basement facilities including two swimming pools and a gymnasium.

James was involved from the outset as construction manager, and then appointed project manager. He was awarded a Gold Medal at the Construction Manager of the Year Awards for his prowess not only in delivering the building itself, but because of his handling of the challenges it presented. He used Powerproject throughout to help him mitigate and reduce risks to the project,

“I've been with Kier since 2000, and we've always used Powerproject – it's our standard.”

re-plan and re-sequence around some significant issues, and keep everyone informed and engaged.

Enabling work with good plans

The original plan was for Kier to move in and commence works after remediation of existing gasholders was completed by the client, Argent. James decided to do whatever he could to facilitate during that early phase, through workshops and meetings. In the process he realised that it might be possible for Kier to start earlier, and save the client time and money. “I came up with a plan to construct some of the outer walls and reduce the client's requirement for temporary works. Both we and the client produced programmes, but we collectively agreed to just use one programme, which was the one we produced in Powerproject. This was a lot clearer to understand in terms of how you format bars and links, and we

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Slipform core formwork completion and right, forming basement pool slabs around props

ended up planning the whole of the early enabling works for ourselves and the remediation contractor.”

The enabling phase also hit a few road-bumps, as James continued: “Although we were able to start work after just four months, earlier than expected, the remediation works did take longer than expected. We used Powerproject to help with re-sequencing not just the enabling works, but also some of our early key sectional handover dates. The software allowed all parties to clearly understand the current issues, but more importantly how we were going to achieve the handovers.”

Topsy-turvy thinking to meet design demands

The architect’s design for Five Pancras Square also created some challenges from the outset, because of the requirement to have no columns interrupting the space within the basement and triple-storey entrance areas, due to the inclusion of two swimming pools at basement level. An ‘upside down’ approach was envisaged, consisting of a steel frame for the first four storeys with a 10-storey concrete frame above. James explained: “The original plan called for four-storey high concrete columns, on top of which we would have to land 27-tonne steel beams, all requiring lots of temporary framework and propping. I believed

that using steel columns, rather than concrete, could help us build more effectively. I used Powerproject to programme out and consider the differences between the two approaches in detail, including how it would all work in practice in terms of affecting access etc. Using the software I could show both options and overlay them

“ The software allowed all parties to clearly understand the current issues. ”

on the baseline, to show the benefits of changing the scheme and structural design. I could show clearly that, if we built it the other way around from the bottom up, it would drastically reduce the need for temporary works, saving both time and money.”

Big project, big team

Such a complicated, multi-faceted development required the involvement of a large team, including many different specialist subcontractors. In all there were 35 site-based managers and a peak of 410 operatives on site, including some 50 different subcontractor firms, so keeping everyone informed and acting as a single delivery team was absolutely critical.

James held regular monthly planner sessions with all the subcontractors, using Powerproject: “We would mark up progress using the software and review the next month or six weeks on screen with subcontractors.” These were complemented by collaborative ‘Last Planner’ meetings, a Kier methodology: “At Last Planner meetings I would put charts on the wall to ensure buy-in for different areas from different subcontractors. Things like groundworks and the roofing were complicated, so we would make sure all the subcontractor managers were there, along with site teams. When several people contribute, you get a



©John Sturrock & Argent – 24 hour slipforming operations, a first for Argent at King's Cross

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much clearer answer about how you can actually build something.”

He continued: “Our team would mark up the progress in Powerproject at least weekly. The good thing about that is that you can see almost ‘as built’ progress; it’s a great tracker of what’s actually happened. Sometimes, if you have to investigate why something is not progressing as expected, it’s good to see progress highlighted above the planned baseline, and see actual dates and impacts. On a couple of occasions we spotted potential fragmentation of the steelwork installation, for example. With Powerproject you can break out or highlight the bars for a particular section of works, and see what’s going on – when the steelwork subcontractor wasn’t working consistently, we could see it in the programme.”

Rethink twice

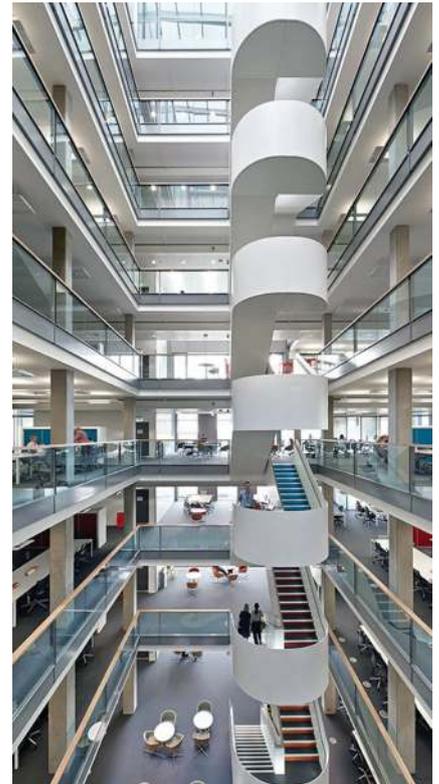
The project team had to move swiftly into recovery mode twice, thanks to the insolvency of not one but two major subcontractors. James recalls that: “When the steelwork contractor went into receivership it created a whole series of re-planning activities. They were due to be on site early on, for between three and four months. Delaying their work would have a critical impact on other activities.”

He went on: “We lost almost 12 weeks so, to recover, we not only

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reprogrammed lots of work in Powerproject but also re-sequenced the whole concrete frame that would go above the steel frame. We used the resource features of the software to work out how to bring on more resources in key areas, to speed up critical activities and to prove where the new critical path was. We recovered about six weeks by doing that. Although the client knew we were suffering delays because of the subcontractor insolvency, we were able to use the software to show them exactly what we planned, and demonstrate precisely how we were going to recover the time.”

The team was back in recovery mode again when the cladding subcontractor went bust, about half-way through the two-year build. Having come up with ideas to enable internal works to continue despite cladding work ceasing, James recalled that they turned to the software to help prove their case: “We planned for temporary waterproofing outside, and then inside re-sequenced



© Hufton & Crow – Central atrium with cantilevered stairs

some of the floors. Instead of building them in sections, we put the work together differently, and with Powerproject we were able to prove that it would save several weeks and the investment upfront would save money in the long run.”

Finessing final fit-out

The final phase of the two-year project included the complete fit-out of the leisure centre, library, café and more. On the office floors the contract originally specified only the toilets, lift lobby and stairs for full fit-out, with a CAT A fit-out of the offices, but the client altered its requirements and requested a full CAT B turnkey fit-out. James recalled: “Right at the very end, we did some re-planning exercises with the client, using Powerproject to show them the requirements for an extension of time. We agreed to the full fit-out – to include data and power cabling, ceilings, meeting rooms and breakout areas, so that they were ready to move into. It was finely tuned – we finished on the Friday, and Camden moved in on the Monday – and there were 400 people working in



© John Sturrock & Argent – Completed external

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the building by the end of the following week.”

Planning environmental excellence

With such a large development, the main Powerproject programme grew to in excess of 2,500 lines over the course of the build. However, it was also used to create some additional vital plans and programmes, as James explained: “We used Powerproject not just for the main programme but to plan other things like key safety elements. We also used it to help us hit our BREEAM Outstanding target – and we were delighted to get 97.6%; the highest for any building of this type.”

BREEAM (Building Research Establishment Environmental Assessment Methodology) is the world’s most comprehensive environmental assessment method and rating system for buildings. Within the scheme some credits relate to building process, others to materials and still others to how buildings operate. Getting ahead of it proved the key to maximising the credits that the project could gain. “We built BREEAM in from the start, with the client and also with London Borough of Camden. Everyone agreed it was a key target. Every month at our client meetings we would show the tracker programme, highlight anything coming up and flag up other potential credits, including the latest dates for their inclusion. For example, at tender stage we’d looked into the potential for using recycled aggregates and discounted them on cost grounds – but later on we revisited them prior to the decision date shown on the tracker. We went through the concrete mix design with the contractor, sat down with the concrete supplier Hansen, and found that we could in fact get more than 25% recycled aggregate in – at less than a quarter of the cost we had originally assumed.”

The team had a significant list of desirable targets to hit if they were to meet their self-imposed goal of outperforming other UK buildings. James elaborated: “We couldn’t afford to miss a single credit. Using Powerproject



©John Sturrock & Argent – Completed main pool, learner pool, spa and splash pool area feature LED wall

“ I’d definitely recommend the software to anyone. I know our planners find it easy, and I find it particularly useful as a tool to talk to clients. ”

we created a tracker programme to make sure we could check the progress on all the sustainability activities each month. That was important because for some key credits we had to do specific things half-way through; there was an interim assessment around transport systems, for example. This initiative had its own critical path! We also saw there were some potential extra credits for design and other things, so we set milestones in order not to miss those opportunities. Tracking these milestones with Powerproject meant that they never fell off the radar. It kept it front of mind for everyone, and became a focus for decisions.”

This use of the ‘BREEAM Tracker’ was a first for Kier, and for client Argent – but it is unlikely to be the last:

As an experienced construction and project manager, James relies on

his software. He said: “Having good software is key, especially when you’re on site. I’ve been with Kier since 2000, and we’ve always used Powerproject – it’s our standard. In the Kier major projects business we’ve used it on everything from RAF facilities to prisons and large residential developments. I’d definitely recommend the software to anyone. I know our planners find it easy, and I find it particularly useful as a tool to talk to clients.”

“It’s a good programme because it’s so easy to understand how links and relationship between bars work. I’m not a planner, but I find it really easy to navigate. At Kier we also use the free Powerproject reader, and many of us just have that – we can use it to navigate around a programme, rather than just having a PDF,” he finished.

Five Pancras Square was a weighty project to undertake, which was considerably complex and challenging throughout. Yet James proved the power of planning to overcome even quite extreme delaying changes, and found ways to innovate not only for the client but to prove Kier Construction’s commitment to sustainability. He used Powerproject as a valuable supporting tool to help deliver on all expectations.

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