Building Success

Lessons from suppliers and manufacturers who got it right – ten case studies

construction products association

CONSTRUCTING EXCELLENCE

Innovation ■ Best Practice ■ Productivity

Foreword

These case studies, which were researched in 2003, show that there are very positive benefits when suppliers and manufacturers are involved earlier in a construction project.

The Egan report 'Rethinking Construction' identified that too much time and effort is spent in construction on site, trying to make designs work in practice. Its conclusion being that design is often separated from the rest of the project. The report considers that 'design for construction' is a vital part of delivering efficiency and quality.

The evidence that a more integrated approach can work is seen in these studies. They also reflect the development of supply chain management in the construction industry, where suppliers and manufacturers are taking greater responsibility for quality, cost, design, delivery and management. This mitigates risk and insured warrantees may also be involved.

This has been enabled by a changing view on supplier and manufacturer selection, where the evaluation of value includes installation cost and delivery performance. One of the participants talks about the 'exit value' as a way of expressing this. A number of supply chain members have looked at the administrative cost of procurement. This has led to new innovative arrangements that cover outsourced procurement, including value engineering and logistics.

Many of these changes are made easier where there is a long-term relationship between supply chain members based on trust and openness. Contractors are applying the framework relationships that they seek with their clients to the next tier of suppliers and manufacturers down the supply chain. Such alliances create a learning environment and allow the costs of research & development to be amortised over a longer time period.

The benefits of these new supply chain arrangements have accrued not only to the suppliers and manufacturers, but to contractors, their clients and will feed through to the end-users of the facilities created. The Treasury and the Office for Government Commerce have emphasised the importance of achieving value for money in construction procurement, while having regard for propriety and regularity.

The lessons learned in these case studies illustrate what can be achieved and should inspire confidence in others to innovate. The learning points offer guidance that will underpin their success.

Nigel Griffiths MP
Minister for Construction

Summary of the findings

This is a study of ten successful construction projects. The idea behind this research was to see if there were any features common to all or most of them so others could learn from their success.

We see a successful project as one where everyone works well together to the benefit of the project. The client gets the end result he wants and the process goes well. There may be hitches, but they are worked on together and resolved without confrontation.

For this specific project we wanted to find instances where manufacturers and suppliers were working in a way that is unusual in the industry. We looked for projects where they were either involved early or brought something extra to the process.

The construction industry is not known for its innovation. With so many participants in the supply chain it is often easier to continue as before. However, this doesn't help move the industry forward. There are many organisations whose job it is to make sure this happens. In each of these case studies we have found something being done that is unusual or different. Companies are being involved in a process that is new for them. Often this has helped reduce the cost of the building.

Being involved early in the project has brought problems. For example, EU rules do not facilitate this. The tendering process must be fair. Bringing in one manufacturer early to improve the way the process works or to design products together may be seen as contradicting these rules. So, this works against saving time and money. Manufacturers may be worried about giving away information and then being cut out of the project, although this has not happened in any of the following cases. On the contrary it has made their participation important.

One thing we have found is that in all these cases companies would like to work in this way again. This may not be suitable for all projects. Some projects may be too small or just not complex enough. But all these companies have benefited and learned from what they achieved here.

As in the previous publication *Building Success – Lessons from clients who got it right* (available from Constructing Excellence), we did find that it was crucial to find project partners that have common values and goals. They preferred to work with like minded people who they like and trust. They felt it was important to meet their counterpart in the corresponding organisation. They thought that made it more difficult to be confrontational, which must be beneficial.

They were also very open in their attitude to the project partners. They took them round their production facilities. They gave away information. They were prepared to be understanding about problems and were even open on more sensitive issues like pricing.

There were many learning points in common and all of them have been put together on the following page.

ten case studies

Checklist for success

Build in planning time: build time in at the beginning of your project for planning, adding value, and identifying & resolving potential problems. Focus on big budget items or those that involve M&E co-ordination. People are too keen to get on site quickly.

Involve everyone early: develop a close working relationship with your suppliers, manufacturers and stakeholders, and talk to them face to face. It is more difficult to be confrontational when you know someone personally. It helps develop the most appropriate and cost-effective solution. It also enables everyone to focus together on what the customer wants.

Build long term relationships: a team which has worked together before, for example in a three-year framework contract, will communicate and work more efficiently and effectively. It is further down the experience curve and provides the environment where innovation can flourish. Framework contracts also create predictability of cost and volume.

Have single person responsibility: giving one person from each organisation sole responsibility means they know the buck stops with them. They get to know one another so contact is much easier and they are also in a better position to co-ordinate the project.

Be open: take your project partners around your production facility. This is not only a good PR exercise, but it reassures clients that you can meet their needs. It also enables them to understand your issues and how they can impact on them. Use partnering contracts to enable openness.

Add value: manufacturers can do this by passing on their know-how to others further up the supply chain. Everyone needs to find something where they add value. Otherwise, the only way they can make money is by doing the cheapest job with the cheapest products.

Be understanding of new ways and ideas: developing new products and ways of working is often an iterative process. So everyone needs to understand that there will be problems and work around managing this. You need to have a champion on the client's side.

Don't hide problems: be honest and open, even if you are having problems. This encourages trust. If everyone knows what the issues are, they may be able to work around them or contribute to the solution.

Don't buy the cheapest: look at the whole cost of using a product and not the cost of the product. Some companies waste money by buying the cheapest and then being let down on delivery and through the cost of administering small purchases.

People are one of your least controllable assets: there is an increasing lack of skilled labour. People don't necessarily do things to the same standards and in the same time. This could bring a move towards off-site production. So brief the contractor or sub-contractor who is installing your product. Don't assume they follow the manufacturer's design or recommendations. Building processes are more likely to be better quality if they are produced under controlled conditions.

Some clients are more risk averse: public sector clients and utilities particularly like the reassurance of reduced risk. So one way of moving up the value chain is to do something that reduces their feeling of risk and re-assures them, like warranties.

Use IT to help manage a project: using a traceable labelling format helps to manage logistics. A project collaboration tool is a good way of sharing information across the project team.

The projects

An integrated project team involving Marshalls early on delivered the highly complex Trafalgar Square remodelling

The Project Partners

Project: 'World Squares for All'

Type of building: Hard landscaping, heritage

Client: Transport for London (TfL)

Manufacturer: Marshalls plc

Architect: Foster and Partners

Engineer: WS Atkins plc

Contractor: Fitzpatrick plc

Project Managers: TPS Schal

Type of contract used: NEC Contract, Option D target cost

Graham Nash of TPS Schal explains how Marshalls' early involvement was crucial for bringing in the project on time.

Jaz Vilku and Chris Lyley of Marshalls give the manufacturer's viewpoint.

The masterplan for 'World Squares for All', which included two London squares, began in 1996. Trafalgar Square was phase one and Transport for London's brief was to redevelop it as an international heritage site.

THE SPECIFIC ISSUE

The site covers Trafalgar Square and the surrounding roads that run into it. One objective was to redress the balance between traffic and pedestrians. The project included a new staircase, lifts, toilets and a café, as well as the pedestrianisation of the north side of the square and re-design of the traffic flow on the south side. The project was taken over by Ken Livingstone when he was elected, as the Mayor manages both Trafalgar Square and Parliament Square. This brought it under the public spotlight.

The decision to use Yorkstone was made early on, because it had to match the original stone that had been laid there about twenty years earlier. However, it would be a challenge even for Marshalls to meet the order because of the amount of stone required. The design included 22,000sqm of Diamond Sawn Yorkstone Paving and 7,000m of Granite Kerb.

According to Marshalls: the project was unusual in that we were involved right from the start. This was in the design, manufacture and supply of the Yorkstone Paving. With such a prestigious and well-publicised project, it was also important to us that our stone was well laid, so it looked good.

The biggest issue for us was the lack of space on site for storage. With a huge amount of bespoke stone in different sizes and shapes we had to get the right ones there at the right time. This stone is expensive, so security was also an issue.

'Really it's down to client satisfaction – that's what I always strive for.'

Graham Nash of TPS Schal

How the solution was arrived at

We brought Marshalls in right at the start to satisfy ourselves that the order could be fulfilled. They took a group of representatives from TfL, TPS Schal and Fitzpatrick to see the quarries, offices, cutting and finishing facilities. This was very helpful because then we understood the sort of issues they had in quarrying and cutting the stone. I was amazed when I realised the amount of stone that was not suitable for this type of paving, and the issues they had over where in the quarry to take matching stone from. Another challenge was how to achieve the very large 1500mm sq slabs for the front of the National Gallery.

European rules on competitive tendering make it difficult to bring other members of the project team in early. But with an order as large as this, we needed to make sure we could get the materials. So we looked at the cost of procurement and the programme and asked Marshalls to book it into their supply and cutting schedule. TPS Schal then drafted a letter of intent that TfL sent to Marshalls.

According to Marshalls: we found various solutions to solve the challenges of the project. It was important to develop effective and regular communication amongst us all, so that problems were kept to a minimum. This way we could pro-actively identify any likely issues and come up with solutions.

What the innovation was

The way we worked together was unusual in that we had an informal partnering agreement and we were all working together for the benefit of the project. We used ProjectNet so that everyone could have ready access to all the drawings. Marshalls developed a way of labelling the stone, so that it was clear where it was to be laid. They were also involved in the choice of paving sub-contractor.

According to Marshalls: we used a traceable labelling format using an IT project management tool. This was used for transferring prices, scheduling and was available to everyone. The CAD design showed how they all fitted together. This in effect meant that each stone was bar-coded to show where it went on the ground and the time schedule.

How suppliers were involved in the process

We had developed a relationship with Marshalls on a previous project in Kensington High Street. When Fitzpatrick was appointed we had an 8-10 week lead-in period to develop the programming and sequencing. There was a lot of forethought. Marshalls began to set aside blocks of stone ready to use for the large slabs. They also worked with the designers on the radial paving. Fitzpatrick's yard was in Mile End, London, although some deliveries were direct to site. However, deliveries had to be planned carefully so that the right stones were delivered to the right place at the right time. Any mistake on this could have lost us a lot of time.

'I've certainly seen the benefits and I like the idea of the early involvement of specialists. We also achieved cost savings by discussing the issues early on in the project.'

Graham Nash of TPS Schal

According to Marshalls: our first contact was through TfL and so we were integrated into the team right at the start. At the pre-tender stage we were involved with Foster & Partners and TPS Schal, the project managers. We wanted to be involved in the choice of contractor because it was important to us that our stone was laid well. Taking the whole team to the quarry at Scoutmoor and the central sawing process facility at our Cromwell works was a good team-building exercise. It also meant that Fitzpatrick appreciated what detailed information we needed to produce and cut each stone.

This project was too highly visible to let the time-scale slip. We had regular meetings to identify any issues and discuss solutions.

Our biggest obstacle

We worked together so there was never any confrontation. The ribbed corduroy insets at the foot of the staircase were not exactly the same. They were actually within the tolerance levels we had stated, but aesthetically didn't look as good as they could have. Marshalls replaced them without any fuss.

We also had to find a way of putting in some drainage, but still keeping the stone look. Marshalls helped by drilling the stones at their works, so that the water went through the stone into a channel below.

We had other suppliers who didn't meet our programme, but even then Marshalls stepped in to help. There were also the challenges of bureaucracy, traffic and event liaison, and getting the design information through.

'Develop a collaborative approach to realising what the problem is and developing a solution together. Too often the legalities are brought in too early.'

Jaz Vilku of Marshalls

According to Marshalls: obviously with such a complicated design there were issues like some parts were needed that hadn't been designed. But because we had a relationship based on certainty this fostered an open culture and so there was no threat.

How we measured success

We worked together. The process went well and relationships were good. We had a 'completion dinner' and Fitzpatrick even invited representatives from all of its sub-contractors. Really it's down to client satisfaction – that's what I always strive for.

According to Marshalls: by working together we made sure that cost and waste was kept to a minimum. Deliveries were on time and in the right sequence. We think that 'World Squares for All' is a testament to partnering.

How this will change the way we will work in future

I've certainly seen the benefits and I like the idea of the early involvement of specialists. We also achieved cost savings by discussing the issues early on in the project.

According to Marshalls: we are using this project as a case study to try to encourage members of the supply chain to work together as early as possible. It will be easier now to work as part of a fixed-supply chain, now that we have established confidence in our ability.

'Because we had a relationship based on certainty this fostered an open culture and so there was no threat.'

Jaz Vilku of Marshalls

Our advice for other construction companies

Be honest, even if it's not what we want to hear, because then we can try to work round the problem.

Establish an early relationship with the project manager, the designer and the client. Unfortunately EU rules are a barrier to this. Talk regularly to suppliers because you may find better ways of meeting a client's needs by working together.

According to Marshalls: develop a collaborative approach to identifying the problem is and developing a solution together. Too often the legalities are brought in too early.

Use the experience that is already out there. The Constructing Excellence website for instance. Lots of people have already done things in a different and collaborative way so we need to learn from them.

What we would do differently another time

We had a good working relationship that will continue now and we will build on this.

According to Marshalls: I think I would want to be involved even earlier, possibly as soon as an idea is developed. For example, Leicester Square is bound to be done some time. We have already thought about what could be possible and have solutions in our minds. We have a responsibility to make these solutions aspiring, de-stressing and interesting, and not bland.

LEARNING POINTS

- Taking your project partners round your quarry or any other production facility can do two things. Not only does it re-assure them that you know what you are doing but it also enables them to understand what your particular issues are.
- Establish an early relationship with the project manager, the designer and the client so they can get to know one another and develop new ways of working together.
- Be honest and open, even if you are having problems, because if everyone knows what the issues are, they may be able to work around them.
- Working in a non-adversarial way makes projects run more smoothly.
- Having one person from each company being responsible for liaison between them means they get to know one another, so contact is much easier and they are also in a better position to co-ordinate the project.
- Use a traceable labelling format to manage logistics and a project collaboration tool to share information across the project team.

Housing Solutions and Solarcentury worked in an integrated team led by architect Bree Day Partnership to create sustainable social housing

The Project Partners

Project: 27 homes at Alpine Close, Maidenhead

The Integer Team for this project included:

Client: Housing Solutions Group (Housing Solutions Limited)

Architect: Bree Day Partnership

Supplier of PV technology: Solarcentury

Type of contract used: JCT 98

Peter Ware of Housing Solutions, based in Maidenhead, tells how they worked as part of an Integer project team led by architect Bree Day. The design of the houses incorporated photovoltaic panels to generate electricity.

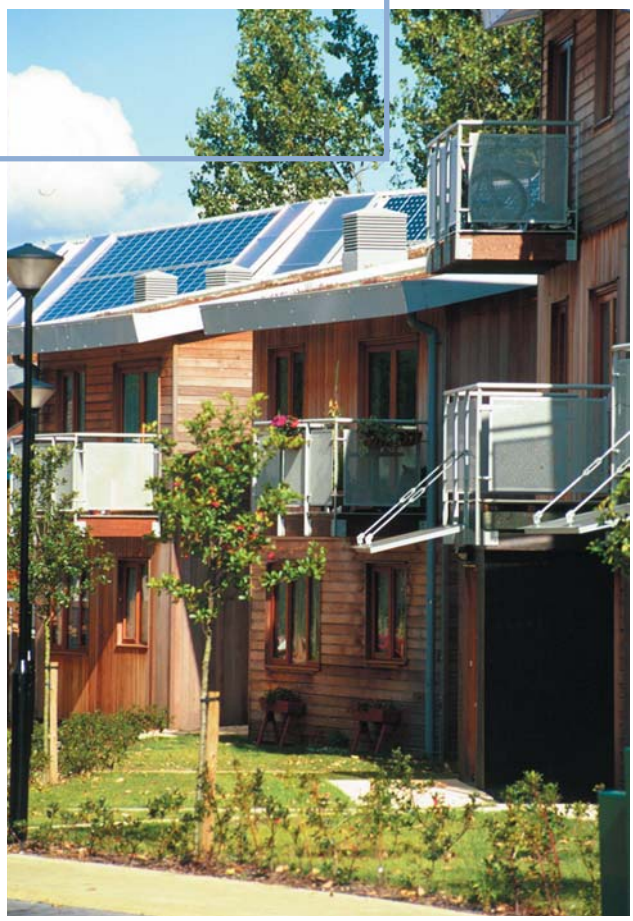
Tim Day & Damian Bree of Bree Day Partnership give the team leader's viewpoint.

Integer members come from all sides of the housing industry, including housing associations, private house builders, national housing organisations, architects and planners. They have one thing in common, which is to change the nature of housing to benefit the environment and residents.

Since it began, 77 organisations have been involved as partners. Hundreds of suppliers of innovative systems, products and services have supported the programme. It is a flexible, open network. Its partners work together to create opportunities to meet new environmental performance improvement targets.

'There was a high level of commitment to the project, it created a great deal of interest from the consultants because it was new and exciting – so much of what they do is more mundane.'

Peter Ware, Project Manager of Housing Solutions



THE SPECIFIC ISSUE

As a housing association providing homes for those on lower income, fuel, poverty and quality of life are issues close to our heart. We decided to pilot a fully-sustainable housing development that would also be a landmark project, to put Housing Solutions (HSG) on the map.

We wanted to build on a brownfield site in the centre of Maidenhead. So early in 1998, we went to the Integer team. The aim was to use as many intelligent technologies as possible. We included photovoltaic (PV) panels to generate electricity to reduce the bills for our tenants.

According to Bree Day: HSG was open to our ideas. They also wanted a sustainable, environmental solution. Public sector housing providers, in particular, have been keen to include intelligent and green technologies into their houses. HSG also chose to procure this project against best value, not lowest price.

How the solution was arrived at

The Integer consultants had used PV technology before. They designed the configuration and orientation of the houses to get the maximum passive solar gain.

Quite early on however, it became clear that we were not going to be able to afford PV technology. Consequently, the solar upstand part of the roof was designed conventionally.

Luckily, during construction, we found out that the Department for Trade and Industry (DTI) was making a grant available for pilot applications of PV technology. The grant was available for 100 roofs. We put in a bid which was successful and so we could incorporate 15 PV roofs in the project.

According to Bree Day: an energy officer from the local authority knew about the PV Field Trial and thought that it would help us. We set up a meeting with the contractor and a PV panel supplier to put in a bid for funding.

What the innovation was

It was unusual for a housing association to want to generate up to 20kW of electricity (using photovoltaic (PV) panels) and to return any energy not used to the grid.

Solarcentury provided the PV panels and monitoring equipment. Their package was unusual in that it also covered detailed design, supervision on site, commissioning and the long-term monitoring of the system's performance.

According to Bree Day: a successful part of this Solarcentury design was the adjustable framing system, which had to be provided to hold the solar panels. This was needed because the construction of the roof was proceeding ahead of the PV installation. The roofing sub-contractor installed this frame, which was connected to fixing points on the roof structure. It was then easy for Solarcentury to clip the panels into the framing system.

How suppliers were involved in the process

As a newer member of the Integer team, at first we felt a bit like an outsider. It was harder to feel in control, partly because we weren't familiar with the wide range of new technologies. All of the other members of the team had worked together before, so communication between them was easier.

According to Bree Day: we adopted an open partnering approach but, for the sake of formality, we used JCT98. There were some issues that caused uneasy moments with the contractors, but they were quickly resolved and did not affect the installation of the PV panels. Project construction had already started when Solarcentury became involved. We would have preferred it if they had been involved from the start, but the funding initiative was announced after we started on site. However, they had some input into the design, co-ordinated the PV technology package and provided a warranty.

Our biggest obstacle

One of the biggest issues that we faced was dealing with the utilities. Their top people understood our aims and agreed to connect to our designs. However, putting this into practice was difficult.

With an embedded generator, you need approval from your supplier to connect to the grid. But we could only find one electricity supplier, Scottish & Southern, who was prepared to pay the tenants for the excess electricity that was returned to the grid. Another supplier was prepared to take it free, but the rest declined.

Because the decision to install PV was taken late, it involved the Integer team members in extra work. This was a bone of contention, but the additional cost was absorbed. Everyone was very committed to the project. It created great interest from the consultants, because it was new and exciting – so much of what they do is more mundane.

According to Bree Day: although with the DTI grant we could now afford the PV technology, we were faced with a roof under construction. So we needed a new framing system quickly, one which would hold the panels and sit on the existing structure. However, it still had to look as if it was fully integrated with the building.

'This was a ground-breaking development for us, as it represents our first truly environmentally friendly and sustainable homes. As the homes are so energy efficient, we believe they will add a new dimension to the definition of affordability in the social housing sector.'

John Petitt, Chief Executive of Housing Solutions

'Get the right team together, including client and contractor and by using the synergy of the team you can create exemplar projects.'

Damian Bree, Bree Day Partnership

'You need an early agreement with the client on the concept and then parallel working with the consultants and suppliers.'

Damian Bree, Bree Day Partnership

How we measured success

By the original criteria, the project has been an outstanding success. It has created environmentally-friendly, sustainable housing and we have happy tenants. They have wonderful flats and houses. It has also been a great selling point for HSG and has won many awards.

The PV roof was funded by the DTI, so there is now an ongoing process to measure the energy savings.

According to Bree Day: the scheme has a big visual impact. It does not look like a traditional development. There were some delays, mainly due to the original timber frame manufacturer walking away from the project.

The higher cost of the project was partly offset by the DTI funding. The ultimate solution for the PV roof was bold, diligent and responsible.

How this will change the way we will work in future

We had to use JCT98, because there were no specific partnering contracts available. This is now generally thought to be a difficult route if things go wrong.

According to Bree Day: we undertook an end-of-project review of the innovative features of the scheme and the issues that came up. One of our conclusions was that you really need a partnering contract. (This was before PPC2000.)

Our advice for other construction companies

Talk to the key suppliers at the initial design phase. If I were doing it again, I would spend more time upfront, identifying and resolving potential problems. For example, the electricity suppliers refused to connect to our meters, which we had installed for monitoring. Eventually, they put in an extra meter of their own.

According to Bree Day: getting everyone to work together to jointly solve problems is the key. This was helped because the IT, M&E, structural engineering and QS consultants had worked with us before. They were supportive of each other's ideas.

The sub-contractors should be involved in the early design issues that impact on the budget or M&E services. Solar panels and PV technology are not so critical.

What we would do differently another time

For a future project, we would probably take the basic concept of a highly insulated timber building, with central services. Some special features like PV, grey water, remote monitoring and solar stores are harder to justify purely on economic grounds.

The PV technology has moved forward and further cost savings should be available. However, the benefits of PV technology are geared towards the tenants, not the Housing Association. This makes it difficult to make a direct case for the extra capital expense for PV technology, especially as rents are controlled.

According to Bree Day: we are now on our fifth integrated PV project. The technology isn't complicated – you just need to know what you're doing. This project was, in character, rather like a pilot. There are many ways to benefit from PV, whether it's for tenants, communal areas, re-charging electric vehicles or electricity being sold back to the grid.

LEARNING POINTS

- A virtual team which has worked together before is further down the experience curve, meaning that it communicates and works more efficiently and effectively.
- To engineer change, it is necessary to involve as many stakeholders as possible in a win-win, low-risk programme of applied innovation.
- Innovation will bring many challenges with it and time spent upfront, identifying and resolving potential problems, will have a pay-off.
- You need an early agreement with the client on the concept and parallel working between consultants and suppliers.
- Bring in the key suppliers of items that impact heavily on the budget or M&E early, like the timber frame, or bathroom pods.
- Use single-point responsibility, underpinned by a warranty, to deal with risk.
- Use post-project reviews to capture and disseminate the learning points, before the project team disperses.

Bekaert's approved contractor insurance scheme gives clients the re-assurance of knowing that their whole project is insured and not just the materials.

The Project Partners

Project: North Tyneside Partnering Agreement

Type of building: Fencing and security

Manufacturer: Bekaert Fencing Limited

Contractor: Dinnington Fencing Company Limited

Type of contract used: Partnering

John Thompson of Dinnington Fencing explains how manufacturer Bekaert's insurance scheme enabled Dinnington Fencing to give re-assurance to clients against failure of the fencing system.

Mike Pollard of Bekaert Fencing gives the manufacturer's viewpoint.

Bekaert Fencing is a member of the Construction Manufacturers Partnering Association (COMPASS). COMPASS' members commit to reform, are willing to get involved and have a 'can do' attitude. Its members actively push themselves to the front of the reform process. Dinnington Fencing belongs to Bekaert's licensed contractor scheme.

'This was a revolutionary concept in the fencing industry because there was nothing in place to guarantee the whole job. An independent auditor who works for the insurance company inspects each job as many times as it needed. This may be several times for a long job. He would pick up any defects that need remedying. Then when they are done the whole job is accepted and the insurance policy is issued to the end client.' *John Thompson of Dinnington Fencing*

THE SPECIFIC ISSUE

As a fencing contractor we needed to show that we were a reputable company, especially as we do a lot of work for local authorities and utilities.

According to Bekaert: we produce bespoke fencing and entry control systems but we had no control over how our products were installed and maintained. That bothered us, as fencing contractors are often seen as being at the bottom of the skills chain. Clients found that choosing fencing people was a bit like pot-luck and we wanted to address that. We also found that our specifications could be substituted and we wanted to defend our specifications.

How the solution was arrived at

About four years ago Bekaert set up their licensed contractor scheme which guaranteed not only the materials, but the work as well. You had to show quality, financial stability and give references to join. It sounded like a good idea.

The job we did for the fencing at West Moor primary school on Tyneside really was the start of our success. It was a competitive pricing tender, with a mesh fence system. We said they could have the one they specified, or they could have a better quality one but with a ten-year guarantee. The architect chose the guarantee.

According to Bekaert: we realised about five years ago that we needed to be responsible for the whole project and show a duty of care to customers. We needed a major point of differentiation so we came up with 'BekAssure'. This insurance policy guarantees both the product and the installation.

There are very few conditions too, as we felt the get-out clauses you often see can be unfair. Often they are just designed to protect the supplier. When it is signed off, we pass the contract to the insurer and pay a one-off premium that covers the installation for 10 years.

What the innovation was

This was a revolutionary concept in the fencing industry because there was nothing in place to guarantee the whole job. An independent auditor, who works for the insurance company, inspects each job as many times as it needed. This may be several times for a long job. He picks up any defects. Then, when they are remedied, the insurance policy is issued to the end client. We were accepted but it was slow to begin with, because then Bekaert's products were not widely known.

According to Bekaert: BekAssure is an insurance policy that we take out on every installation by one of our licensed contractors. It's there to prevent future charges. We pay the premium ourselves. It shows our commitment to continuous improvement and zero defects, delivered on time. There are currently £25m of contracts insured with BekAssure.

How suppliers were involved in the process

We were called in by the North Tyneside Metropolitan Council where we have done a lot of work. They looked at reports from the sites on our work and instigated a meeting. We were then invited to join the North Tyneside Partnering Agreement. This aims to achieve best value by cutting out the adversarial relationships between client and contractor. Only chosen contractors are awarded contracts and the work alternates between us.

We wondered how this guarantee was going to work for us, but through the Agreement, we are now being written into the spec.

According to Bekaert: we have a network of licensed contractors whose culture, reputation and value sets matched our own. BekAssure drives a 'right first time' approach.

Our biggest obstacle

We are keen to use the Bekaert system because of the guarantees and added value. However, not every job requires one of their systems. We have two other suppliers but they don't have guarantees. We are trying to get them to use warranties too, as we think this is the way forward.

We don't really have any problems. Occasionally we get builders who revert to treating us as sub-contractors rather than partners. Everyone has minor problems but we just look at how we can get round it. If you treat one another with mutual respect and there is no confrontation, then everyone benefits.

According to Bekaert: we didn't want to exclude other people from buying our equipment, so only licensed contractor installations will be backed up by the BekAssure policy.

> *'We believe that early supplier involvement can save 30% of the cost by stopping potential disputes. It makes sure that timescales are met and delivers a better design too.'*
>
> *Mike Pollard of Bekaert Fencing*

How we measured success

The first job was a security fence around a new school. The Agreement has its own key performance indicators and the job went well. Since then we have completed nearly forty projects through the scheme during the last two and a half years. I didn't think the whole thing would go quite so well. We don't want to be in the price business where we have to do poor work with poor products.

According to Bekaert: we believe that early supplier involvement can save up to 30% of the cost by stopping potential disputes. It makes sure that timescales are met and delivers a better design too. We also believe in system installations, as these are more cost-effective than one-off bespoke designs. We want repeat business and a long-term relationship with clients based on trust.

How this will change the way we will work in future

Now we get involved at the design stage. Architects might come directly to us to try to keep the costs down. Then they go through the process of getting the funding. We used this as an example to show other local authorities how we can work as construction partners with others.

We have a healthy order book, but that means it can be difficult to find the right people of the right quality. All our staff are registered with the Fencing Industry Skills Scheme, which is industry specific. Bekaert's approved contractors scheme requires it, but we did it anyway.

According to Bekaert: we're now introducing 'Chartered Contractor' status. For this, the contractor must agree to a set of performance criteria to show continuous improvement. We don't want to be accused of a closed shop, so we're allowing one year's grace for existing licensed contractors to demonstrate they can achieve what we want.

Chartered Contractors won't receive discounts on purchases – anyone can buy our stock at the same prices – but we will promote them pro-actively to clients.

We promote the 'whole-life' costing approach and have even undertaken independent research to ensure that our product claims stand up in practice. For example, our powder coatings are to be tested by the Building Products Research Association. We also train our contractors.

> *'I didn't think the whole thing would go quite so well. We don't want to be in the price business where we have to do poor work with poor products.'*
>
> *John Thompson of Dinnington Fencing*

Our advice for other construction companies

You don't have to be in the price business where you have to do poor work with poor products. You need to find something where you add value. You need to get yourself further up the supply chain where you can get an input early on in the project.

According to Bekaert: a good reason for specifying to the end-user is to drive value-engineering. Specifications can be substituted, but we help defend it. Building BekAssure into the spec helps avoid down-grading. Companies involved in PFI are now showing more interest in long-term costs and in maintenance too, and BekAssure provides assurance.

We pass savings onto our customers, unlike in traditional contractor relationships where they attempt to make savings wherever possible to boost their own margins.

What we would do differently another time

I am now very involved with Bekaert, because they add value to what they provide. They have awards and Continuous Professional Development conferences over the year. We won the award for best partnering contractor last year and have just achieved Charter status.

They have also got a new product development committee and I am on that. We meet regularly. It's good because we can give our views on the products, but we can also talk through the problems we have come across.

According to Bekaert: I think with our BekAssure we have moved the industry forward. In fact COMPASS has launched CompAssure now using BekAssure as the case study and offers similar cover to other construction manufacturers.

> *'We're now introducing 'Chartered Contractor' status. To gain this, the contractor must agree to a set of performance criteria and KPIs to show continuous improvement.'*
>
> *Mike Pollard of Bekaert Fencing*

LEARNING POINTS

- If there is no confrontation and you treat one another with mutual respect then everyone benefits.
- You need to find something where you add value so you are not working in a lowest price scenario, where you have to do the cheapest job with the cheapest products to make any money.
- Involving the whole supply chain early saves money by avoiding potential disputes.
- Involving the whole supply chain early enables everyone to focus together on what the customer wants and act as one.
- Get yourself further up the supply chain where you can get an input early on in the project.
- Success can bring its own problems such as a shortage of skilled labour.
- Public sector clients like the reassurance of reduced risk. So, warranted schemes covered by manufacturers, after third party inspection of the installation by an accredited contractor, are attractive to clients.

Bringing in Corus at the design stage and using their technical knowledge helped design composite structural columns which were integrated with the fire protection system for a cost effective solution at K2, St Katherine's Dock

The Project Partners

Project: K2, St Katherine's Dock

Type of building: Cat A office

Client: Taylor Woodrow Developments

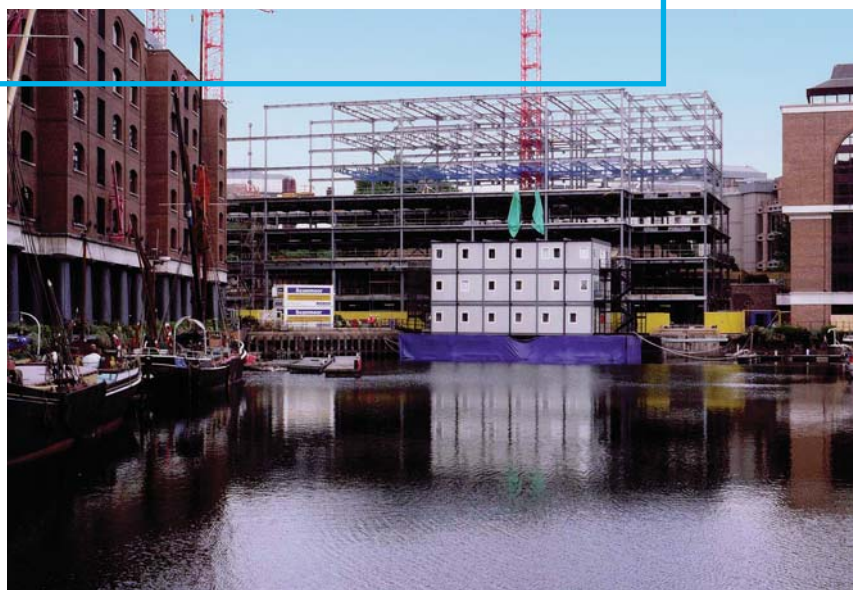
Consulting Engineer: Waterman Partnership

Manufacturer: Corus Tubes

Architect: Richard Rogers Partnership

Steel contractor: Rowecord Engineering

Type of contract used: Traditional



Jeremy Wedge of Waterman Partnership tells how bringing Corus into the project early-on provided valuable technical data for design. This enabled them to develop an integrated structural and fire protection solution, bringing together the structural benefit of using concrete-filled steel columns and reducing the cost of the fire protection.

Eddie Hole of Corus explains how, with their technical knowledge, Corus helped devise an innovative solution for the project.

THE SPECIFIC ISSUE

The building was designed by Richard Rogers. The site posed a number of challenges in the ground. A large open grid was adopted to minimise ground works. Only two internal columns are located on the floor plate with the remaining columns located around the perimeter. The visual impact of the columns was therefore an important consideration of the design. We wanted the columns in the building to be as slender as possible, with minimal finishing trades for aesthetics and cost. So, it was decided to use concrete-filled structural hollow sections. This has the benefit of allowing high load capacity with slender sections. Corus provided backup data to support our design.

According to Corus: we have worked with both Waterman and Richard Rogers before. Waterman do many types of work and so cannot have the expertise in everything. Richard Rogers like narrow round tubes. Waterman's wanted to use composite sections because they not only enable the tubes to be slimmer, but also they could save money by reducing the cost of the fire protection element.

'We work with Corus because they have a range of innovative products and we are always moving forward. We want to be at the forefront of design development.'

Jeremy Wedge of Waterman Partnership

'We worked together very well. They have assisted us by providing technical backup and data for external checking authorities.'

Jeremy Wedge of Waterman Partnership

How the solution was arrived at

This type of composite construction is used widely in Europe but is relatively new in the UK. Corus was brought in to provide technical backup and so that the design of elements could be engineered for the most cost-effective solution.

According to Corus: our brief was to come up with a cost-effective and aesthetically pleasing use of these composite columns. The use of composite columns has been around for some time but it is only recently that their real benefits are being taken advantage of.

The problem that sometimes arises is that the structural design may be done first and only later is the fire protection thought about. This means that the benefits of designing them together are not taken into account.

What the innovation was

We wanted to make use of the fact that we could use the increased load capacity and the concrete fill as a heat sink. This allowed us to design slender columns and thinner intumescent coatings.

According to Corus: the composite columns have a concrete core inside the hollow steel profile. This slows down the rate of heat transferral, reducing the outside temperature and enabling the use of a thinner coating of intumescent paint for fire protection on the outside. Consequently the column can be of a smaller diameter, and the whole thing costs less, because it uses less steel and fire protection paint, and it looks better.

How suppliers were involved in the process

We brought Corus in at an early stage of the design process. A great deal was learned from our earlier work on the Montevetro project where a similar solution was used. This was a residential project where we used structural hollow sections in conjunction with concrete flat slabs. We worked with Corus who provided data from tests that enabled a range of structural sections to be used in our design. Mike Edwards (Corus) was the brains behind turning the test data into a working design and subsequent software that we currently use.

We worked together very well. They assisted us by providing the backup data for external checking authorities. They followed up, and maintained close contact through the design and procurement process. They also worked with the fabricators and spent time early on looking at details, and engineering solutions early to keep costs down.

Corus supply two types of tube. We went for the non-seamless which is less expensive, but we orientated the tubes so that the seams faced outwards to maintain the clean lines required on aesthetic grounds.

According to Corus: we try to further the use of structural hollow sections by getting them into the project before going out to tender, to influence people to get a better solution, although we don't necessarily become the final supplier. Therefore, we need to keep track of the final projects to find out who will be the steelwork contractor, since we will be in competition with French and German steel producers.

'Because we understand the technology and the benefits of tubular steel concrete filled columns, we help with the detailed design and then we were available for technical backup.'

Eddie Hole of Corus

Because we understand the technology and the benefits of tubular steel concrete-filled columns, we can help show the benefits that most people are not aware of. So on the project we began by helping with the detailed design and then we were available for technical backup.

We try to get involved at each stage of the supply chain. We have to sell to the steel contractor, who in this case was Rowecord Engineering, and then sell our product into the project through them. But if we talk to people early, we understand the issues behind their particular projects and we know how we can help them solve them.

Typically we go in to meet with the designers early, take away the information we need back to our office, and our technical experts would come up with an appropriate design.

'It has been a very successful project. The budget has been tight with strict cost controls; and is reflective of the early design input. The project has been delivered within the constraints of the budget.'

Jeremy Wedge of Waterman Partnership

Our biggest obstacle

Only that storage space was at a premium on site, so we had to use just-in-time deliveries.

According to Corus: what we did was to look for the smallest component we could use, which meant that each floor would have had columns of different dimensions. So the volumes being made would have been quite small making it more costly because it wasn't making the best use of the economies of scale.

Not only that, but when you are putting a building together you want as few components as possible. This not only makes it cheaper but eliminates the possibility of a mix up over types and the numbers of each being delivered to site. With this in mind we ended up with one thickness of column for the whole building. With the benefit of hindsight it may have been better to have used two sizes.

How we measured success

It was a very successful project. The budget has been tight with strict controls; this worked in the client's favour with a design delivered within budget.

According to Corus: it certainly saved money. But also each application is increasing the understanding of the process to construction engineers. As more people understand and use the process they will become more common.

For us it was a commercial success. It was the right product used in the right location. It was a sensible application using sound technology. It also increased the use and therefore the profile of this technology. For the client it was a cost-effective solution.

How this will change the way we will work in future

We will use the process again. We have now built up the knowledge of how to use the product.

According to Corus: it has raised our profile and that of the technology.

Our advice for other construction companies

When the design is not developed in sufficient detail before going to tender, it can lead to problems further down the supply chain. Pressure to get projects on site means it is important to have a structured design period. This means bringing in the specialist early in the design development. This was the principle we adopted here, and has been reflected in the success of the project.

According to Corus: come and talk to us as soon as possible once the early ideas have evolved and we can help develop the most appropriate and cost-effective solution. It may mean using less steel, and sometimes people can't understand why we would advocate this. But if we can increase the use of this technology we will be happy as it will actually increase the use of steel. Players will gradually build up their own expertise in this area and then they will be able to do it themselves.

What we would you do differently another time

Nothing. I think we got it right. However, it is important to have thinking time early on in the design process.

According to Corus: with the benefit of hindsight you can usually improve products and services but the information flow was good, so nothing really.

LEARNING POINTS

- Involve everyone as early as possible as this will ensure a cost-effective solution.
- Allow thinking time to ensure sufficient design development ahead of the tender.
- When you are developing a new design, everyone needs to be involved in the design process.
- Work with the specialist to develop design and specifications in the early stages of the project.

'The problem that sometimes arises is that the structural design may be done first and only later is the fire protection thought about. This means that the benefits of designing them together are not taken into account.'

Eddie Hole of Corus

On the Belfast Gas project, the client, contractor and manufacturers formed an alliance to make the supply chain more efficient. The result was cost savings and reduced waste.

The Project Partners

Project: Belfast Gas Supply Chain

Type of project: Gas supply

The Belfast Gas Supply Chain Alliance included:

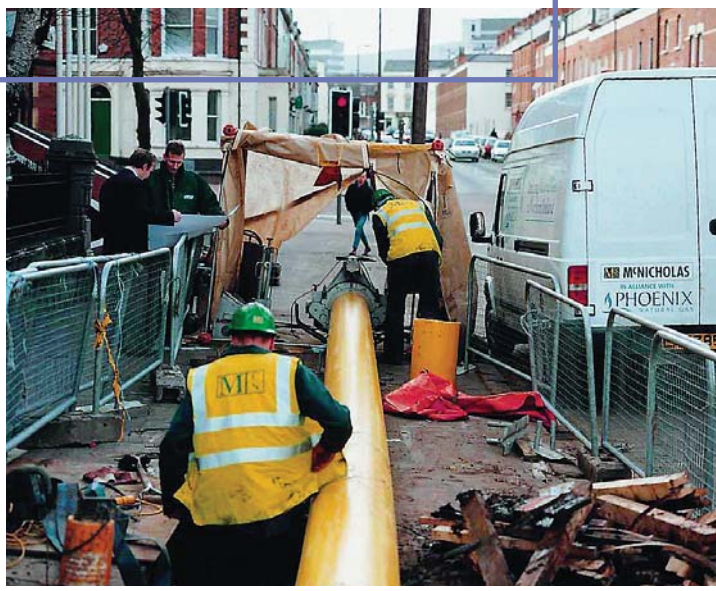
Client: Phoenix Gas

Contractor: McNicholas Construction Services Limited

Manufacturers: Fusion Provida Limited

Other manufacturers: Wavin, Francel

Type of contract used: Contract



Roger Waplington of McNicholas explains how the Belfast Gas Supply Chain Alliance was established and how it operates.

Mike Powell of Fusion Provida comments on the impact of the alliance on key suppliers.

THE SPECIFIC ISSUE

By the early 1970s it had become uneconomical to produce town gas and its use was phased out in Belfast.

In 1996 it was decided to run a natural gas pipeline from Scotland to Northern Ireland. The licence to supply and operate the gas supply was granted to Phoenix Natural Gas and it in turn awarded the contract to build the gas distribution network to our company, McNicholas Construction Services Limited. The contract covered all the infrastructure required to get the gas from the new pipeline to commercial and domestic premises. Phoenix allowed us to procure the necessary products and material. For the utility sector this was extremely forward-thinking, and the first major contract was awarded to Wavin to supply the pipes. Wavin brought in its long-term supply chain partner Fusion Provida, who in turn linked up with Francel to provide the metering and regulatory equipment.

From the start of the contract Phoenix wanted continuous improvements in operational performance focusing on factors such as improving customer service and reducing costs. To their credit Phoenix was always open to new ideas. Over time, an open, collaborative culture evolved, and in 1999 this was formalised as the Belfast Gas Supply Chain Alliance.

It was very much in our interest, and that of the key manufacturers, to make the alliance a success because, whilst we had a five year contract, we wanted to be in a position to win the contract again when it was re-tendered in 2001. We were successful in the 2001 bid and I have no doubt that the benefits generated by the alliance were central to this success.

According to Fusion Provida: initially the pipes, fittings and metering equipment were held in multiple locations across Belfast and at the manufacturers. As a result there was considerable overstocking at first as neither the manufacturers nor McNicholas wanted to be the cause of a stock-out. As the relationships between the parties evolved, we recognised that significant improvements could be made to the supply chain logistics and the alliance was formed in 1999.

How the solution was arrived at

We began the process with a two-day workshop in November 1999. Here we explored the potential for improved collaboration. We looked at how we could reduce stock levels and eliminate waste whilst still providing good customer service. We also wanted to be able to deal more efficiently with new designs generated by the client's design review group and especially if this resulted in new materials being needed. Everyone agreed that it was important to be able to accurately forecast future demand – both in term of quantity and timing.

The result of the workshop was a mutually agreed strategy which I presented to Phoenix in December 1999. Phoenix was supportive and encouraged us to implement the strategy straight away. The first step was to organise the training so that everyone understood what we were trying to achieve and how we were going to do it.

We all agreed that the alliance needed a dedicated supply chain manager. We also agreed the key performance indicators to be used and the reporting mechanisms.

All parties in the Belfast Gas Supply Chain Alliance, including the client, meet on a quarterly basis. The meeting is chaired by McNicholas.

According to Fusion Provida: all alliance members contributed to the cost of recruiting a supply chain manager who was based at our Lisburn depot. It was vital to have someone specifically responsible for managing the evolution of the supply chain.

What the innovation was

The IT stock control system that was put into the stores at Mallusk and Lisburn is called Strategix. It uses a bar-coding system and all materials taken out of the stores are swiped. All the data is then immediately available to alliance members. This investment in IT systems improved stock control and quickly led to a marked reduction in inventory levels. We also moved to a system of open-book accounting so all costs were transparent. The savings that resulted from these gains in efficiency were shared amongst the alliance members.

According to Fusion Provida: I think the key innovations were the micro-management of the supply chain and the introduction of an open IT infrastructure that made information visible to all participants on a real-time basis. We operate on an agreed margin and have separated out the costs incurred in running the supply chain.

We installed a new IT package and studied the flow of materials coming in and out of the store. Using the results from this study we systemised the process. All products were bar-coded and, in theory, the gangs just had to show their ID to identify which part of the project they were working on and then run the items through the bar-code reader. Within a very short time however they all knew the product code numbers and just keyed them in to the system. This process was innovative as it meant McNicholas were in effect self-invoicing as they withdrew materials from their own store.

The IT system gave us the information we needed to plan. We were now able to forecast work patterns and knew what materials would be needed. The project adopted the slogan 'replacing inventory with information'.

How suppliers were involved in the process

The supply chain changes were led by the contractor and manufacturers. Openness, trust and collaboration were the keys to success.

According to Fusion Provida: key suppliers such as Fusion Provida, Wavin and Francel were involved from the start. Secondary suppliers were invited to regular suppliers' forums and the forecast data generated by the new IT systems was made readily available.

> *'You need trust, openness and a willingness to share information in order to foster good working relationships. Good communication is key.'*
>
> *Mike Powell, Fusion Provida Limited*

Our biggest obstacle

It was important to get people to put time into the strategy process and build trust. This was easier in this case because there were no existing cultural barriers to break down. The chief executive of Phoenix was an enthusiastic advocate of supply chain integration and understood what we were setting out to achieve. The workshop was useful in establishing the principles of how we would work. It also showed Phoenix how the supply chain changes would help them achieve their goals. Their support was vital to the success of the alliance.

According to Fusion Provida: the process needed everyone to be very open and so resistance and parochialism could have been an issue – but it wasn't allowed to be! McNicholas was very open about wanting to do things differently and encouraged the development of the alliance philosophy centred on openness and teamwork. People from alliance member organisations worked together in the same offices. This seemingly small step promoted an open culture which helped in identifying further opportunities for improvement.

How we measure success

Senior managers from all the companies attend a quarterly alliance board meeting. Here we review our performance, people issues etc. The key performance indicators are always on the agenda. We have goals and targets and we review our progress against them.

According to Fusion Provida: we use our own balanced score card on a monthly basis. It is the usual traffic lights system with

green for being on target. We focus on the issues that are central to the success of the contract like stock availability and effective processing of defects. We decide on any actions we need to take at review meetings which everyone attends.

How this will change the way we will work in future

Our experience in the Belfast Gas Supply Chain Alliance gives us the opportunity – when our clients are ready – to introduce this approach to other markets. It shows our ability to collaborate. It is the collective power and knowledge of the alliance that will keep it going. We deal with the 'soft issues' as well as the practical ones. In fact the supply chain team won the European Supply Chain Excellence award in 2001, which was adjudicated by Accenture and was particularly commended for its innovative use of IT systems.

According to Fusion Provida: what was so pleasing was that we used IT systems which were not expensive. We changed and customised screens to get what we wanted. We now have what is, in effect, a self-invoicing system, although it seemed to the people taking items from the store as though it was only a logging system for stock.

This is the prime example of full open-book working. We have applied many of the principles to our core multi-utility product distribution business and have also managed supply chains in both the water and electricity sectors. This approach will not work with all clients because some remain suspicious of closer integration.

'This gives us the opportunity 'when our clients are ready' to introduce this approach to other Utility markets.'

Roger Waplington, McNicholas Construction Services Limited

Our advice for other construction companies

Spend time at the outset working on your strategy. State clearly what you want to do and how you intend to do it. Decide how to measure performance and choose a system that is simple, transparent and has the confidence of those whose performance is being measured.

I use five key leadership aspects for the process.

- First there is a vision of what you want to do
- The written plans and targets to back it up
- You need the desire to make it happen and it may take just one person to do this
- Self-confidence in your chosen strategy is vital
- Persistence and determination to see it through.

According to Fusion Provida: trust the other parties in the supply chain and don't be insular. Meet regularly and don't be afraid to brainstorm aspirational ideas of good ways to work together better in the future. You need trust, openness and a willingness to share information in order to foster good working relationships. Good communication is key.

What we would do differently another time

I don't think we would do anything differently, although we might have dealt with van stocks earlier. At the start there was too much going on to tackle this issue but we've sorted it now.

According to Fusion Provida: it took a lot of time and heartache. McNicholas did a great job in facilitating the two-day workshop which gave us a clear and concise outcome to aim for. So I don't think I would have changed anything. I suppose in retrospect we could have done it sooner, which would have meant that the physical infrastructure for the whole supply chain would have been designed from scratch.

LEARNING POINTS

- Put in time up-front agreeing the strategy to check decisions are consistent. Then, if the culture is right, things are more likely to happen swiftly.
- Involve key suppliers at the start.
- Good use of IT can enable information to reach everyone who needs it.
- You don't have to buy a bespoke IT system, often you can get exactly what you need by customising what you already have.
- Use single-point responsibility to manage systems because making it one person's job ensures it will be done.
- Learn to trust other parties in the supply chain and manage the process to enable this to happen, because there will always be some who are sceptical.
- Involving the whole supply chain as early as possible enables everyone to focus together on what the customer wants and to act in unison.

New Prospect Housing will reduce lifetime costs with a simple product innovation from BFL Bathroom Fixings

The Project Partners

Project: Cawdor Low-Rise & Philip Street, Eccles

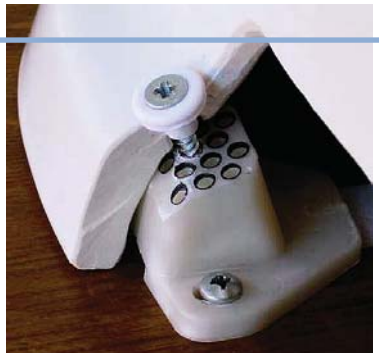
Type of building: Bathroom Refurbishment

Client: New Prospect Housing Limited

Supplier: BFL Bathroom Fixings Limited

Contractor: DLP Services (Northern) Limited

Type of contract used: Partnering form of contract using The Engineering & Construction Contract, Option D: Target Contract with Bill of Quantities 1995 edition



Ian Blake, Building Surveyor, New Prospect Housing Limited tells how a simple product for fixing toilet pans will reduce lifetime costs for New Prospect Housing Limited.

Fred Donnelly, Managing Director, BFL Bathroom Fixings Limited gives the manufacturer's viewpoint.

New Prospect Housing Limited is an independent, arms length, management organisation. Salford Council formed the company in September 2002, to take over the management and maintenance of its housing stock. The aim of this was to create a commercial environment to attract new capital and to create a culture where decisions would be made jointly with customers and based on best value.

> *'If manufacturers have got a product that's new, or never been used, they should come and talk to us so that we can assess it.'*
>
> *Ian Blake of New Prospect Housing Limited*

THE SPECIFIC ISSUE

We have 29,500 dwellings, and carry out significant annual refurbishment programmes. As part of this 500 bathrooms are refurbished each year. These refurbishment contracts are open to competition and all the sanitaryware is replaced to a high specification, approved by the customers.

We had let the 2002 Bathroom Refurbishment Contract to DLP Services. We had tendered this as a partnering form of contract. We interviewed all the tenderers on a broad range of issues, including training, recycling and local employment.

According to BFL Bathroom Fixings: housing organisations spend around £8m annually on WC pans. Yet clients have very little input into sanitaryware fixing specifications. We discovered that around 12% of all sanitaryware fixed directly to the floor is damaged during initial installation, or is smashed unnecessarily even for the simplest plumbing maintenance.

The typical method of fixing toilet pans is to use long screws into plugs, in holes drilled in the concrete floor, or screwed directly into a timber floor. However, the concrete floor method is time-consuming and it's fiddly to locate the fixings. Timber floors are often rotten and uneven. The pan works loose in both cases, so neither method is ideal.

Common practice with plumbers is to place the toilet pan on a bed of cement, or on a mix of paint and putty. The big problem with this is that, on a concrete floor, the only way to remove a pan is to smash it. If a new pan is being fitted, it still leaves the problem of hacking away the mortar bed that is stuck to the floor and then repairing the floor. We reckon that 9 out of 10 pans placed on a concrete floor are fixed in this way. Our estimate is that the cost of brass screws for fixing a pan is £1.25 – £1.75. Whereas, the cost of the concrete repair to the floor would be £2-3 for materials and around £5 for the labour.

How the solution was arrived at

BFL had approached us with a novel way of fixing toilet pans to the floor. Their proposition would slightly increase the fixing cost, but would save a considerable amount of money when maintenance work is required.

Fred Donnelly, BFL's Managing Director, showed us the new fixing for toilet pans that he had developed. He had been to the USA and had seen the advantages of being able to demount the pan easily. This had inspired him to find an improved method of fixing to suit the UK, which is quite different.

As soon as we saw the product, we could see that it would save us money. We decided to try it on the basis that there would be no increase in the cost of fixing the toilet pans. For the trial, we decided to specify it for the Cawdor Low-Rise & Philip Street bathroom refurbishment, which involved 262 dwellings.

According to BFL Bathroom Fixings: we found that in the UK, the sanitaryware industry doesn't focus on the mechanical aspects of fixing. So we had designed a new simple, adjustable pan-fixing system.

We had many discussions with sanitaryware manufacturers. We developed prototypes and then we trialled them with plumbers to make sure they worked.

> *'It's a simple product, but no-one else has produced one. We were happy to get on-board and give it a test.'*
>
> *Ian Blake of New Prospect Housing Limited*

> *'We are happy to look at cost effective new products.'*
>
> *Ian Blake of New Prospect Housing Limited*

What the innovation was

We have a policy of specifying materials which reduce future maintenance costs. We realised immediately that the BFL fixing, although only a small item, could save us a lot of money in the future.

It's very simple, but no-one else has produced one. We were happy to get on-board and give it a test. Under the old traditional procedures, we had to have two products to choose from, but now we are willing to specify a new product that is unique, when it offers potential future cost savings.

According to BFL Bathroom Fixings: the innovation is that the fixing gives a secure sub-frame, which can be used for all types of toilet pans. The first patent was taken out in 1996.

The installed cost of the fixing is similar to that of conventional fixing methods. But the real payback comes when the pan has to be moved or replaced. This becomes quick, clean and easy. The fixing is made of high-density polypropylene, with 15% talc, and the fixing screws can be inserted repeatedly into the pre-drilled brackets.

How suppliers were involved in the process

The contractor, DLP Services, changed their installation methods and used this new product without any extra cost. This was one of the benefits of having a partnering contract with them. However, the real savings will occur on future maintenance work.

The fixing comes with fitting instructions and there were no technical issues with the installation.

According to BFL Bathroom Fixings: clients have to dictate change and champion it, because if it's left up to the contractor, they won't generally think of the lifetime costs.

We found that some plumbers are resistant to change. Particularly the older guys who are less willing to learn. But when they were shown how to use the product, they actually found it easy. The attitude of many in the industry is that there's never been a problem, so why should we change now. But I say that there has never been a problem, because up until now there's never been a solution. Some plumbers are short term. They look at the immediate time and cost argument. Their view is that the eventual replacement is not their problem. Yet, the best plumbers see it as a clean, quality fixing that makes maintenance and repair easier.

'Some plumbers resist change on the time and cost argument, saying of the eventual replacement 'It's not my problem'.'

Fred Donnelly of BFL Bathroom Fixings Limited

Our biggest obstacle

As the client, we weren't aware of any obstacles.

According to BFL Bathroom Fixings: generally, the biggest obstacle for us is to get a hearing from clients. We have been trying to find the more innovative decision-makers in client organisations. However the new fixing is now being accepted through word of mouth.

We also found that manufacturers were much more interested in aesthetic design than in the fixing of the sanitaryware. They ignore the high costs that result from this.

How we measured success

The fixing has met the claims made for it and there is no reason that it won't deliver the lifetime savings expected. The quality of work was to the agreed standard, was finished on time and to budget.

According to BFL Bathroom Fixings: we measure success by having no problems on site. But this does mean that we don't hear anything at all.

How this will change the way we will work in future

Based on the trial at Cawdor Low-Rise & Philip Street, the BFL fixing will be specified for the future.

According to BFL Bathroom Fixings: the product is gaining more widespread acceptance and we expect builders' merchants will soon stock it.

Our advice for other construction companies

If manufacturers have got a product that's new, or never been used, they should come and talk to us. Then we can assess it and if we think there are benefits to us, we will find a project where we can evaluate it.

According to BFL Bathroom Fixings: you need to deal direct with the decision-maker and one who is prepared to try something new.

What we would do differently another time

We were pleased that the idea of a single trial agreed with the contractor worked well.

According to BFL Bathroom Fixings: there were no problems on site, but with hindsight, we would have preferred to have briefed the plumbers, or some of them, on site ourselves.

LEARNING POINTS

- Clients have to dictate change and champion it so its important to identify the decision-maker in the client.
- Brief the tradesmen who are involved with the new product installation because many can be reactionary and need persuasion, or they may block the adoption of new products.
- Partnering contracts encourage people to be more open-minded and so it's much easier for innovation to succeed.
- Contractors tend to focus on the purchase cost of items, not always seeing the total cost of fixing and rarely see the life-time cost picture. Even a small item can yield significant savings in the long-term.
- Manufacturers can be sheltered from seeing the true cost of fixing, or replacing, their products and the risk of damage on installation.
- Don't assume that installations follow the design, or the manufacturers' recommendations.
- Use trials to prove suppliers' claims for a new product.

'Clients have to dictate change and champion them. Contractors don't think of it.'

Fred Donnelly of BFL Bathroom Fixings Limited

Product development by Naylor Drainage enables efficiencies for Barhale Construction and Anglian Water, with less environmental disruption to the general public

The Project Partners

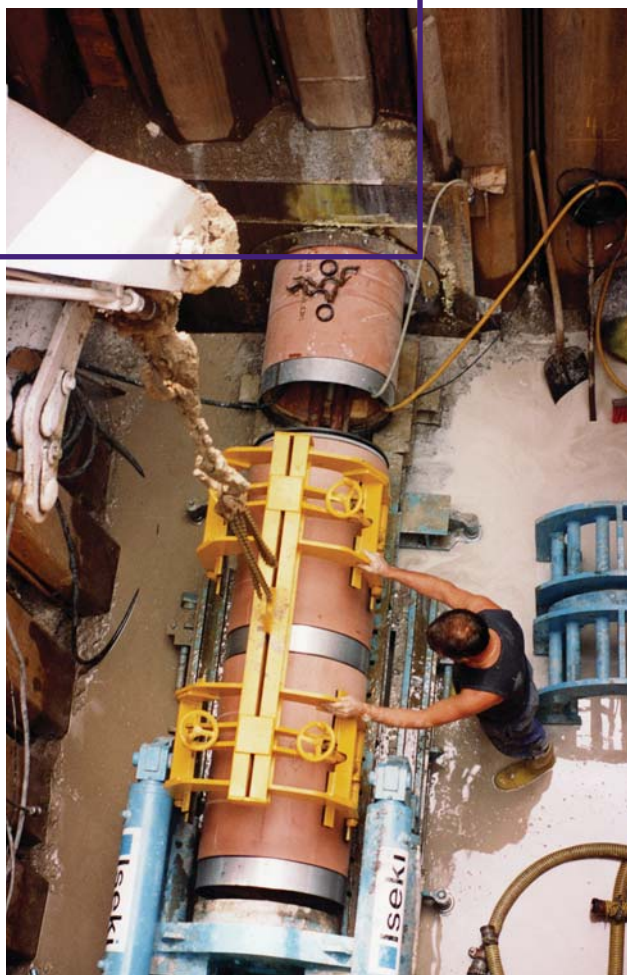
Project: The West Thurrock Trunk Sewer Scheme

Client: Anglian Water Services Limited

Manufacturer: Naylor Drainage

Contractor: Barhale Construction plc

Type of contract used: Framework contract



Ged McGuinness, Supply Chain Manager, of Barhale describes how the relationship with Anglian Water and supplier Naylor Drainage has led to significant efficiencies in sewer laying. It has also had significant environmental spin-offs with less disruption to road users and to pedestrians.

Edward Naylor of Naylor Drainage gives the manufacturer's viewpoint

THE SPECIFIC ISSUE

The problem with traditional open-trench construction for sewers is that a long deep trench can be a nuisance in a busy high street with people around. It may not even be the cheapest option. In many cases, microtunnelling is better.

A microtunnelling machine operates between pits at the end of each sewer run. It causes less disruption on the ground because there is no need for barriers and all the muck removal. Take the West Thurrock Trunk Sewer scheme for Anglian Water, where digging up the High Street and managing the resulting disruption, was almost unthinkable. We are a leader in microtunnelling technology.

'Form special relationships, keep close to each other, bring your problems to the supplier and don't reach for the standard procurement catalogue.' *Ged McGuinness of Barhale*

Microtunnelling uses powerful hydraulic jacks, to push specially designed pipes through the ground. They push off a substantial wall in the thrust pit. At the same time, the tunnelling machine excavates the ground ahead. As the tunnel is excavated, it produces a finished pipeline. The line and level is controlled by a laser guidance system so the result is very accurate.

Four years ago, the number of concrete pipe suppliers was reducing. But, we didn't want to use clay pipes because we thought they were too expensive and too fragile for microtunnelling.

According to Naylor: traditional open trenches can be unpredictable, because they are weather dependent. The pipes have to be strong enough to resist crushing from the ground above. However, for trenchless installations a pipe has to be strong enough to be pushed for up to 100 metres, so they need a strong pipe barrel and joint. But using them does give the advantage of more predictability.

How the solution was arrived at

When Naylor came to us offering a free trial of their clay pipes, we decided to try them. We found that the pipes passed the strength test, so we agreed to incorporate 50 metres of clay pipes into a 600 metre run we were driving in Dunstable. The risks for us were considerable. If the pipes had failed under the jacking forces, the cost of recovering the microtunnelling machine, which would have been stuck, would have been very high.

Fortunately, this trial was a success. The clay pipes not only had the necessary strength, but we found they also had a lower surface friction, which reduced the jacking forces and the risk of failure. The drive rate for clay was faster. Our main cost is the heavy plant and microtunnelling machine. The faster drive rate made the extra cost of the pipe less significant.

According to Naylor: the trial with Barhale gave us the chance to try out the use of clay in a trenchless installation.

What the innovation was

The innovation was driven by the development of a wider range of clay pipes suitable for microtunnelling and then the introduction of new procurement routes.

We have now adopted microtunnelling with clay pipes as a standard solution to many situations where the original design would have been less efficient. The original trial was with the 600mm diameter pipe, but now Naylor has developed a 700mm pipe to be used in a wider range of circumstances. We can now use microtunnelling where the design has been based on fabricated steel or glass reinforced plastic pipes, for example.

Our relationship with Naylor Drainage has developed to the point where we can sit down together and work out the best solution for a particular job. We know the problems and Naylor knows the solutions.

> *'The relationship with Naylor Drainage has developed to the point where we can sit down together and work out the best solution for a particular job. Barhale knows the problems and Naylor knows the solutions.'* *Edward Naylor of Naylor Drainage*

According to Naylor: the first stage was to introduce Barhale to microtunnelling with clay pipes.

Then we gradually expanded the range to include the new DN700 pipe so that Barhale could offer microtunnelling as a better option on other schemes.

How suppliers were involved in the process

Our relationship with Naylor built from the first 12 month contract, to a second 12 month contract, as trust and integrity were established. We now have a long-term contract with them. This means that the prices are agreed from 2003 to 2005. This gives us the predictability we need and assures Naylor of the volume of orders.

We won the Anglian framework partnering contracts. So we decided that we should form these types of relationships with our suppliers, which included Naylor Drainage. Before that we were buying from different suppliers at spot prices. This took a huge amount of effort and there was no predictability on cost and little innovation.

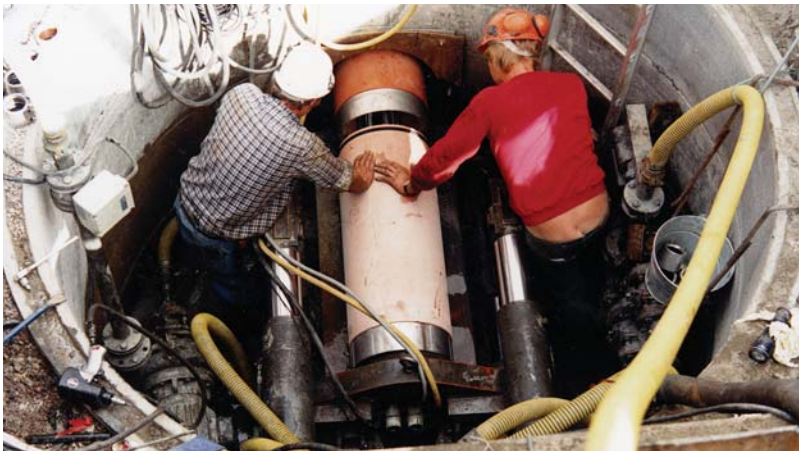
We now have a supply chain management philosophy which means that we get closer to our key suppliers. This has now developed to the point where EH Smith manages all our other purchases for us. Because microtunnelling is so specialist, we deal direct with Naylor Drainage for clay pipes. They have a dedicated account manager who keeps in regular contact.

Because Naylor Drainage know that our work is theirs, we have formed strong interpersonal relationships where we work together to find the optimum solution to construction problems.

According to Naylor: our relationship with Barhale goes back a long way. They are lateral thinkers. They are the most proactive when it comes to asking for our advice.

We are the nominated supplier to Barhale on the Anglian framework contract. Simon Marsh, the Naylor 'Denlok' Manager, acts as the project manager for all our work with Barhale. We will look at the operational needs of a project together to find the best solution.

> *'The no-blame culture was the key. There was no adversarial behaviour.'*
>
> *Ged McGuinness of Barhale*



'We have developed a mutual relationship to create a sustainable win-win for both of us. One of the most successful aspects is to afford the supplier the ability to withdraw prices if we don't deliver on volume.' *Edward Naylor of Naylor Drainage*

Our biggest obstacle

The biggest problem for us is forecasting volumes and prices.

Suppliers are naturally sceptical of long-term supply chain relationships and some deals can take 12 months to secure. If there is no trust and honesty then it won't work.

Ten years ago the price of clay pipes were prohibitive for microtunnelling. Now we have been able to offer a secure volume, prices have come down. We need the security of knowing what prices will be for the period of our framework contract.

According to Naylor: finding an innovative partner was a key challenge. It had to be someone who would bring us in at the planning stage of a job and not the last minute. We also needed time for product development. Many contractors don't take the opportunity to tap into the supplier's expertise.

How we measured success

As we approach Asset Management Programme 4, we have outsourced all our purchasing. It will make us slicker at measuring the performance of the supply chain. We will have 'vendor performance reports'. These will give us hard data to measure suppliers' performance and trading history, project by project.

According to Naylor: success has been the greater use of clay pipes for microtunnelling work and the development of a wider range of pipes. Partnering with Barhale has brought competitive advantage for both of us.

How this will change the way we will work in future

We have developed a mutual relationship to create a sustainable win-win for both of us. One of the most successful aspects is the trust we have built up. If we don't put enough volume through, Naylor can withdraw its prices.

According to Naylor: Barhale's approach was a tantalising vision of the future. It included a tidy site, precision equipment and a few highly trained operatives. This is a stark contrast to the industry's traditional image of brute force and an untidy site.

Our advice for other construction companies

You have to take a long-term view. Trying to get quick wins to drive prices down won't work. You have to find a long-term way of working – it may take four to five years to reap the benefits. This is a measure of the level of mistrust and lack of education on supply chain management.

According to Naylor: the team approach is key. Contractors need to involve manufacturers at the planning stage. This means they can tap into their expertise and identify opportunities for innovation. Keeping close to each other and sharing knowledge is vital. There also needs to be a background of openness and trust.

What we would do differently another time

The industry has a sceptical attitude towards supply chain management. Civil engineering especially has a long way to go towards working together for the benefits of both. Joint problem solving, with joint presentations to the utilities involving the contractor and supplier, would show the value of supply chain management.

According to Naylor: we wouldn't change anything. The no-blame culture was the key. There was no adversarial behaviour.

LEARNING POINTS

- Trying to get quick wins to drive prices down won't work. You have to find a long-term way of working – it may take years to reap the benefits. This is a measure of the level of mistrust and lack of education on supply chain management.
- Create the predictability of cost and volume. A framework contract over three years provides the environment where innovation can flourish
- If there is no trust and honesty then you have to forget it. Suppliers are naturally sceptical of long-term supply chain relationships and some deals can take 12 months to secure.
- Identify the cost drivers. The clay pipes not only had the necessary strength, but had a lower surface friction, which reduced the jacking forces and the risk of failure. The drive rate for clay was faster. With the driving cost dependent on the heavy plant, the extra cost of the pipe was less significant.
- Identify potential partners who are lateral thinkers and are the most proactive, when it comes to asking for our advice.
- Form strong interpersonal relationships, where you work together to find the optimum solution to construction problems.

Shepherd Construction found that Forticrete's use of a single point responsibility project manager for their complicated project enabled them to be confident that the right materials would arrive in the right place at the right time

The Project Partners

Project: Bishop Auckland Hospital

Type of building: Hospital

Client: Durham & Darlington Trust

Manufacturer: Forticrete Limited

Architect: Percy Thomas Partnership

Contractor: Shepherd Construction Limited

Type of contract used: PFI, Design & Build

Paul Surtees of Shepherd Construction explains how having just one point of contact with Forticrete gave him the certainty he wanted to make the job go smoothly.

Ian Raper of Forticrete gives the manufacturer's viewpoint.

The hospital was a PFI project, so Shepherd was keen to make sure that the building was constructed from good quality materials that would last for at least 30 years.

> *'You don't want to go through the whole evaluation process every time, so it's worth developing relationships with people you've worked with before.'*
>
> *Ian Raper of Forticrete*

THE SPECIFIC ISSUE

The architect specified natural stone to match the colour of the surrounding buildings. The corners of the building were designed as pillars, built of art stone blocks, while the in-fill walls were of cast, natural & reconstructed stone and render.

We needed to use a supplier with the ability and capacity to supply all the artstone, and of the right quality. Our quality manager went to each factory to check up on their quality control and manufacturing process. Working with cast stone is always a challenge. Obviously costs need to be considered, but the quality and life span of the materials are crucial.

The external façade of the hospital included almost fifty different artstone designs. It was like a jigsaw puzzle. The challenge was to co-ordinate this, so that all the different sizes and types ended up in the right place at the right time on site. This was a big issue because, if the materials were not there, progress would be delayed and activity on the site would come to a stop.

According to Forticrete: we have a collaborative working agreement with Shepherd and have an excellent relationship with their teams. This project included a lot of specials. Some of

'With Paul and Ian speaking regularly they can notify one another if there is a problem and change the schedule.'

Ian Raper of Forticrete

these were a special mix to match the stone of the original hospital. We provided a written guarantee. With so many different components and so little space on site, we also had to make sure that the right product was available and on site at the right time.

How the solution was arrived at

At the start, we had a lot of work to do to make sure that we got the right types of stone to the right place, at the right time. But we all worked closely and it went like clockwork.

The architect designed the different types of artstones and where they went. I transferred this into a format with schedules that Forticrete would understand. This had to be done well in advance, so that Forticrete could co-ordinate with their suppliers to get the products made.

According to Forticrete: we decided that the best solution would be to project manage the process. We felt that having just one point of contact between the two companies would be the most efficient way to co-ordinate the complex delivery schedule.

What the innovation was

We found it easy to develop a close working relationship with Forticrete. Their factory works manager, Ian Naylor, came to site to discuss our needs. He was very proactive in his approach and he came several times to see how we were getting on. When you see him sitting there, it's much easier to develop a close working relationship which is non-confrontational.

According to Forticrete: Ian Naylor from the Forticrete factory took on the project management role. Having a project manager on the manufacturer's side to co-ordinate deliveries is a fairly new initiative. There were a lot of specials and they had to be in the right place on site at the right time.

How suppliers were involved in the process

Forticrete came in with samples before we started on site. It is a big building and we needed to co-ordinate the deliveries with where we were working on site. We brought in a foreman bricklayer, to discuss how we were going to co-ordinate all these different pieces of stone. We decided to label the pallets with reference numbers, so that the bricklayers knew which ones they needed. It was crucial that this was done accurately.

According to Forticrete: we had been in touch with the designated architect. However, we actually became fully involved after the design had been finalised and they were just about to set up on site.

Ian Naylor went to the site and went through all the specials and their delivery programme. He liaised with Paul Surtees, the materials planner, over the delivery schedule. These two people liaised closely and so they became personally responsible for the process.

Shepherd gave us a very detailed and accurate delivery schedule. Because the whole process was open, if there had been a problem it could have been facilitated by changing the time-frames, or the order in which components were manufactured. So no-one was waiting on site for components that weren't there.

Our biggest obstacle

There weren't really any problems. Occasionally the design changed and then we had to change the types of products, but that was all. In fact if every project, where there was a supplier or manufacturer, went as well as that one did, it would make life a lot easier.

According to Forticrete: there were no problems.

'The external façade of the hospital included almost fifty different artstone designs. It was like a jigsaw puzzle. The challenge was to co-ordinate this so that all the different sizes and types ended up in the right place at the right time on site. This was a big issue because if the materials were not there, progress would be delayed and activity on the site would come to a stop.' *Paul Surtees of Shepherd Construction*

How we measured success

There weren't many problems. I knew that if I spoke to Ian then he would make sure the issues were dealt with. Usually you deal with one person, up until the scheduling that may be the representative, and then you might have to deal with someone else. You can spend a lot of time trying to find out who is the person with their 'finger on the pulse'. You leave messages but you don't know if they get to the person. I knew that if I agreed anything with Ian, he would put it into the production schedule.

According to Forticrete: there were no hitches, no delays on site, no-one walked off site and no-one complained.

How this will change the way we will work in future

I would like to meet the actual people I am dealing with as suppliers.

According to Forticrete: we will certainly use the project management route again. It doesn't have to be a large job, but if it has complex units then using a project manager will be beneficial. However, it is down to the contractor to place the order early, especially if there are specials. If this works well there will be no claims. The trouble is that people only remember the things that go wrong.

Our advice for other construction companies

Get the right people or company for a specific job. There won't be a shortage of people who can carry out a job, but some will be better than others. You don't want to go through the whole evaluation process every time, so it's worth developing relationships with people you've worked with before. It gives you more confidence. It means you are getting rid of problems rather than building them in. I think being able to meet the person you deal with 'face to face' worked well. I also thought that dealing with one person who was on the operational side made me feel confident that everything was going to plan.

According to Forticrete: speak to the manufacturer early and get them involved. We are quite open about people coming round the factory. We put a project manager into selected projects, especially if the products come from a number of different factories. Where this happens you need one person to co-ordinate the whole project. With Paul and Ian speaking regularly, they could notify one another if there was a potential problem – and change the schedule. If you can all get on together, then you can iron out any likely problems.

What we would do differently another time

I would meet the people I am dealing with as suppliers.

According to Forticrete: if you involve a manufacturer early, then they can learn about your project and you can form a relationship with them. Then, next time you have a similar situation, you can benefit from this understanding and work better together. But, that's rarely the way our industry works.

'The whole thing is about working together. There is too much confrontation in the construction industry.'

Paul Surtees of Shepherd Construction

LEARNING POINTS

- Develop a close working relationship with your suppliers and talk to them face-to-face. It is more difficult to be confrontational when you know someone personally.
- Taking your project partners around your production facility is a good PR exercise. But it also reassures the clients and enables them to understand your issues and how they can impact on them.
- If one person has sole responsibility they know the buck stops with them and they are also in a better position to co-ordinate deliveries of different products.
- Use a traceable labelling format to make sure the right product is available and on site at the right time.

Focus Housing was able to explore the benefits of off-site fabrication, compared with traditional construction, by bringing in Terrapin early in the design process

The Project Partners

Project: 131 flats for the frail-elderly in the Midlands

Client: Focus Housing Association

Architects: Walker Troup, with Roger Dudley and Wolverhampton MBC

Surveyors: Derek Evans & Partners

Contractor: E Manton Limited

Manufacturer: Terrapin Limited

Type of contract used: JCT Contract

Gordon Malcolm of Focus Housing Association tells how Focus Housing was able to explore the benefits of off-site fabrication, compared with traditional construction.

Tim Mason, of Terrapin gives the manufacturer's viewpoint

We had won four bids from the Housing Corporation for sheltered housing. Two were in Coventry, while the others were in Wolverhampton and Walsall. We realised that this gave us the opportunity to procure some of the buildings together. We decided to build one in Coventry by traditional construction methods and to 'bundle' the other three, to achieve the benefits of off-site fabrication.

THE SPECIFIC ISSUE

We wanted to find a fast and innovative way to deliver quality, affordable energy-efficient housing that was attractive and comfortable. We also wanted to cause the least disruption to neighbours and create low levels of waste. From a financial perspective we wanted more predictability in construction, while increasing our return on investment.

According to Terrapin: we had been involved in discussions with Focus Housing. Gordon Malcolm came up with the idea of three schemes, with a common layout for single and two bedroom flats on the three sites.

How the solution was arrived at

We thought that volumetric construction would be the best route. So, with our architects Walker Troup, we drew up the layout of a typical flat, to be built in two modules of 24sq metres each. The concept was to build the core, which included common areas, staff accommodation and kitchens, using traditional construction methods. Then we would build the two- and three-storey wings from pre-fabricated units.

According to Terrapin: the units were designed to meet the needs of the frail and elderly. These are defined by the Housing Corporation Scheme Development Standards. They even cover things like robustness for wheelchair access. The finished projects had to have a traditional feel, for example, with no joint cover strips down the walls.

'Focus Housing was an excellent client because they knew what they wanted.' *Tim Mason of Terrapin*

How suppliers were involved in the process

We asked four suppliers for indicative bids to supply 20 flats onto a prepared base. Terrapin's senior team made a presentation to us. They showed keen interest in what we wanted. Their bid was competitive and they wanted to enter into a partnering arrangement. We asked them to develop three schemes, using standard modules for all three.

Walker Troup were architects for the buildings in Coventry, but there were different architects for Walsall and Wolverhampton buildings. We used the same surveyors, structural engineers and building services engineers for all the projects.

We appointed a building contractor for the groundworks and core on the projects. They were prepared to put a low margin on the modular construction and to feed back ideas on buildability.

According to Terrapin: Focus Housing agreed to use the core product across all three sites to get the cost savings. They were an excellent client, because they knew what they wanted. Zurich Building Guarantee Company provided an insurance backed warranty over and above the normal building regulations approvals.

Our biggest obstacle

Initially, the architects were wary, but agreed to design around the standard modules. Over the 12-month design period, Terrapin regularly sent three staff to the co-ordination meetings. This meant that we could always get an answer. This encouraged the architects to work as a team.

We had a strong lead from Terrapin, with very strong support to get it right. This brought even the doubters on board.

Terrapin value-engineered the design and built a prototype. They decided to keep the prototype, rather than incorporate it. Altogether they constructed 293 modules. Terrapin never radically changed the cost of the volumetric construction. However, on the traditional construction, the costs of 'prelims' and 'craneage' changed as the project developed.

According to Terrapin: we decided to build a prototype, so we met with the architect and Focus Housing at the factory. It took eight hours to go through everything.

The prototype was invaluable for giving attention to detail. We saved an enormous number of wall tile cuts by moving the electrical sockets. We worked out the optimum size of wallboard (4.0m x 2.4m) and sourced this pre-cut. We also lowered the window handles to 1.2m from the floor.

In terms of an integrated team, we were well ahead. The other two firms of architects and the contractor came into the picture after us. I don't think that they realised how fast it could happen.

How we measured success

The projects were financed under the Housing Corporation 'Kickstart' programme. We used the standard Key Performance Indicators (KPIs) and we also received a grant to use off-site manufacturing.

We decided to benchmark against a similar project using traditional construction. The programme for this scheme was 16 weeks longer.

The volumetric elements worked well. They were delivered and installed without any damage or defects. However, there were difficulties with the traditional construction work. There were over-runs on the costs of 'prelims' and M&E work.

We ran over time on the first of our projects because the metal roof required purpose-made rooflight flashings and fascia soffit details. This delayed Terrapin and others due to lack of weather-tightness. The other projects had a timber roof structure with roof

'Pre-engineering drives waste out of the construction process and adds value in quality and running costs. It is more sustainable, yet people want to take advantage of the quality and speed of off-site manufacture at the price of traditional construction. This requires continuity to cover the fixed costs.' *Tim Mason of Terrapin*

'On this project, we didn't change our minds – there were significant repetitions of a few basic modules – and the end product wasn't fundamentally different from our first requirements.'

Gordon Malcolm of Focus Housing

tiles and did not experience weather-tightness issues. The benchmark project also over-ran by roughly the same amount as the initial volumetric scheme.

The project was a great success in terms of quality, high insulation levels and reduced site accidents. It also raised the profile of Focus Housing, which was one of our aims.

According to Terrapin: the grants for social housing are based on the number of houses built and so housing associations tend to look at cost, rather than value. Focus found it slightly more expensive than traditional construction, but have a more sustainable building. Also, neighbours weren't exposed to the noise, dust and potential hazards associated with traditional sites.

How this will change the way we will work in future

The JCT form of contract was potentially a problem. In future we will use a partnering form of agreement and may opt for a turn-key package.

Having been through the process of creating the model, it should be cheaper in future. Time over-run was the real issue.

According to Terrapin: off-site manufacturing is competing with traditional construction. But this is facing skill shortages, health & safety issues and changing building regulations so costs will rise. On the other hand, continuity can drive the cost of off-site manufacture down.

Our advice for other construction companies

You need to have clarity of vision, engage others and gain their commitment. When we have tried to be innovative, we have been clear about what we wanted to achieve. We made sure at the start that it was achievable. Then we stuck to the plan. It was important to get the repetitions of the basic module that we had designed.

According to Terrapin: pre-engineering drives waste out of the construction process and adds value in quality and running costs. It is more sustainable. Yet people want the quality and speed of off-site manufacture at the price of traditional construction. This requires continuity to cover the fixed costs, so you need to standardise. However, you can still provide individuality in the external appearance.

What we would do differently another time

We would look at a turnkey approach, to create single point responsibility.

Apart from the structure of the contract, we learnt some lessons about combining volumetric construction with traditional methods. For example, using 'wet' M&E systems is more complicated than traditional storage heaters, because of the additional pipework. Also, the design of the weatherproofing details of the metal roofing system on the first project affected the volumetric construction, and we would adapt simpler roof layouts and coverings in future schemes.

According to Terrapin: from a design and manufacturing viewpoint, we wouldn't suggest any changes. However, integrating the team was more difficult because two architects and the main contractor were not involved until later.

LEARNING POINTS

- Have clarity of vision, engage others and gain their commitment. Have a clear idea about what you want to achieve. Make sure at the outset that it is achievable and then stick to the plan.
- Use an off-site fabricator who can provide strong design support.
- Value-engineer the design and build a prototype, before committing to volume production.
- Use repetition to get cost savings.
- Bring all the designers in early with the off-site manufacturer so that the implications of the process are fully understood.
- Minimise the impact that traditional construction work can have on an off-site manufactured scheme.
- Use single-point responsibility, a partnering form of agreement and a turn-key package to aid co-ordination.

'The project was a great success in terms of quality, high insulation levels and reduced waste and site accidents. We also succeeded in raising the profile of Focus Housing, which was one of our aims.'

Gordon Malcolm of Focus Housing

Mowlem used outsourced supply chain management provided by Jewson to add value and save cost on Cambridge Retail Park Phase 2

The Project Partners

Project: Cambridge Retail Park Phase 2

Type of building: Retail

Client: Cambridge Retail Park Limited

Contractor: Mowlem Building East Anglia

Supplier: Jewson

Type of contract used: JCT98 with contractor's design

Dagan Herculson, Mike Cowan and Andy Knowles of Mowlem tell how they utilised outsourced supply chain management provided by Jewson to add value and save cost on Cambridge Retail Park Phase 2.

Dave Williams, Mike Fallows and Ben Giddings of Jewson give the supplier's viewpoint.

THE SPECIFIC ISSUE

The second phase of the Cambridge Retail Park was due for completion in December 2003, with Homebase as the key tenant. The contract was for 32 weeks, including 12 weeks of enabling work, meaning we had to maximise efficiencies wherever possible.

When Mowlem built the first phase, we only purchased a relatively small amount of materials and sourced everything on an item-for-item basis, constantly looking for best value. However, for this phase we decided to let all external and some internal sub-contract packages on a labour and plant only basis.

> *'Our industry is fairly cynical and some thought that it would fail. People need to be open minded about new ideas.'*
>
> *Dave Williams of Jewson*

> *'We had to find a supplier that would manage all of the materials on the project, delivering them when we wanted them. They would own them until we used them, so we wouldn't have to worry about damage or cost.'*
>
> *Dagan Herculson of Mowlem*

We wanted to source the materials ourselves, to maximise value, manage deliveries and prevent delays, but the tight programme left us with an operational problem; lack of manpower to do this. We decided that with the wide range of materials required we needed a solus supplier who could deliver and manage them all.

How the solution was arrived at

Consequently, we had to find a supplier who was large and diverse enough to negotiate a best value deal across the range of materials required and who could deliver everything. The supplier would store the materials until they were required, meaning that the risk of damage was minimised. We made a short list of companies and gave them an indicative list of the materials required to price.

'I think it would work on any project, but maybe for different reasons. Large projects are the obvious ones and this would work well on a confined city site.'

Dagan Herculson of Mowlem

According to Jewson: as the national account manager with responsibility for the Mowlem account at group level, I went to meet Dagan. We talked generally around the idea of delivering the complete package of materials. Jewson forms part of the Saint-Gobain group and so we could work with Mowlem on a group basis. This enables us to provide all the materials the site needed.

Jewson fitted the profile we needed. They are owned by Saint-Gobain and as such we could utilise the expertise of their other suppliers like Frazer. They were not the cheapest, but were selected on their potential 'exit value' – this includes the costs not only of the materials, but also the time and effort involved in purchasing them, getting quality materials to the right place at the right time. 'The contract was Jewson's to lose.'

According to Jewson: we knew that we needed to spend time on this project. It was not so much about making money but making improvements. Our industry is fairly cynical and some thought it would fail. People need to be open-minded about new ideas.

'They also have the benefit of having things delivered together without blocking the site because the space there is minimal.' *Dave Williams of Jewson*

What the innovation was

As a result Jewson took the responsibility and ownership of material sourcing and that saved us both time and resource. A single point of contact was set up between Andy Knowles, the Mowlem Site Manager and Ben Giddings, the local Branch Manager for Jewson.

According to Jewson: too often, the builders' merchant only performs the merchant role. But here we were able to add value. Because we knew what they needed, we could help them save time and money. We were given the opportunity to value-engineer the specification. We also updated the schedule and they agreed a price. The whole thing was done by email.

How suppliers were involved in the process

To finalise the order we agreed a price for all products that both parties felt comfortable with and worked together to value-engineer the materials to be supplied. To ensure we could cost the ongoing changes in product selection, something which could occur in a design-and-build project of this nature, we set a cost plus margin against each product line. This took a lot of trust.

Jewson provided a Contracts Manager to look after the project so there was someone who could take ultimate responsibility. Andy Knowles, in conjunction with Jewson, scheduled what materials were needed; this information was then electronically sent to Jewson to prevent errors and speed up the process.

'It saved time for Mowlem because it took away their buying problems. Our buying power is strong because we have the backing of the Saint-Gobain group.' *Dave Williams of Jewson*

According to Jewson: our buying power is strong because we have the backing of the Saint-Gobain group. Mowlem benefited from having things delivered together without blocking the site.

Our biggest obstacle

The main challenge was clearing invoices. For example, descriptions on invoices had to match the spreadsheets we were working to. Our accounts department was not set up in a way that was flexible enough to cope with this way of working, although we are now reviewing our systems. In the meantime have had to work round them. Consequently, this was a challenge for Jewson, as we had stipulated that they continue to supply us whatever happened.

'We have other projects where we are being even more innovative. In one, the customer has an office in our branch. There is QS on hand to answer technical problems. But crucially, he sees how we operate and we understand how they operate.'

Dave Williams of Jewson

According to Jewson: our challenge was dealing with products that we don't usually deal with. We were handling products from companies that we don't have existing contract agreements with. We were also supplying structural products that traditionally aren't part of our range, but had come through other Saint-Gobain companies.
I had to be the contact point between other Jewson division companies – and that was new. Sometimes it can be difficult for the other companies to understand that – and to take a back seat on this sort of project. But the more we do it, the more our understanding of the process improves, which benefits us all.

'We were given the opportunity to value-engineer the specification.'

Dave Williams of Jewson

How we measured success

For Mowlem, it was cost-effective as we managed our cash flow, had limited risk of damage, no part-load charges and minimised time wasting. We also had all materials delivered on time and the full backup of the Jewson organisation – when expertise was required.

We now get better service from an estimating point of view. We know more about how one another's businesses and Jewson picked up work from other contractors because of it.

According to Jewson: we have had very few phone calls or the sort of niggles that are common in the industry. There were no Key Performance Indicators (KPIs) as such, and it was not straightforward to measure cost-savings. Historically, we would measure the cost of materials, but here it was the cost of the process.

How this will change the way we will work in future

There is another Mowlem project in Norwich where we are using the same process as it has proved to work. It is easier now because we have learnt by our mistakes and trust one another more.

We will still need to keep our eye on the marketplace, to make sure that Jewson are getting the best price.

Our advice for other construction companies

Building long-term relationships should always add value and reduce risk. We have a better understanding of each other's business now.

According to Jewson: there were cost savings to us as well, because we would rather send one lorry load that was correct, than four lorry loads that were wrong. The earlier we are involved the better. We have core suppliers that we use and if we know what products are in the spec, we can say which manufacturers we deal with, to reduce the cost.

What we would do differently another time

We would have included the accounts departments earlier in our discussions.

According to Jewson: it was a new way of working utilising other Saint-Gobain companies. This is a new way of working for us and for them. Next time we will plan the use of our different companies more efficiently from the start of the project.

LEARNING POINTS

- Be truthful about your aspirations for the project, as this builds trust.
- Look at the whole cost of using a product and not the unit price of the product. Money is wasted by buying the cheapest and then being let down on delivery and through the cost of administering small purchases.
- Bundling all products can create enough volume to create efficiencies and save cost.
- Use single point responsibility to manage risk through others' knowledge, skill and experience.
- Giving one person responsibility to make sure things happen means that they are less likely to get missed.
- Leave the things that take up your time to the people who are experts at it.
- Two different views are better than one when it comes to value-engineering costs out.
- Involve all departments in the company that the process might affect, including the accounts department so they too become committed to making the project work.

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Contractor: Dagan Herculson, Mike Cowan and Andy Knowles of Mowlem Building East Anglia
Supplier: Dave Williams, Mike Fallows and Ben Giddings of Jewson

Getting help

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A self-assessment form for CPD certification is available from www.constructingexcellence.org.uk/service/cpd.jsp

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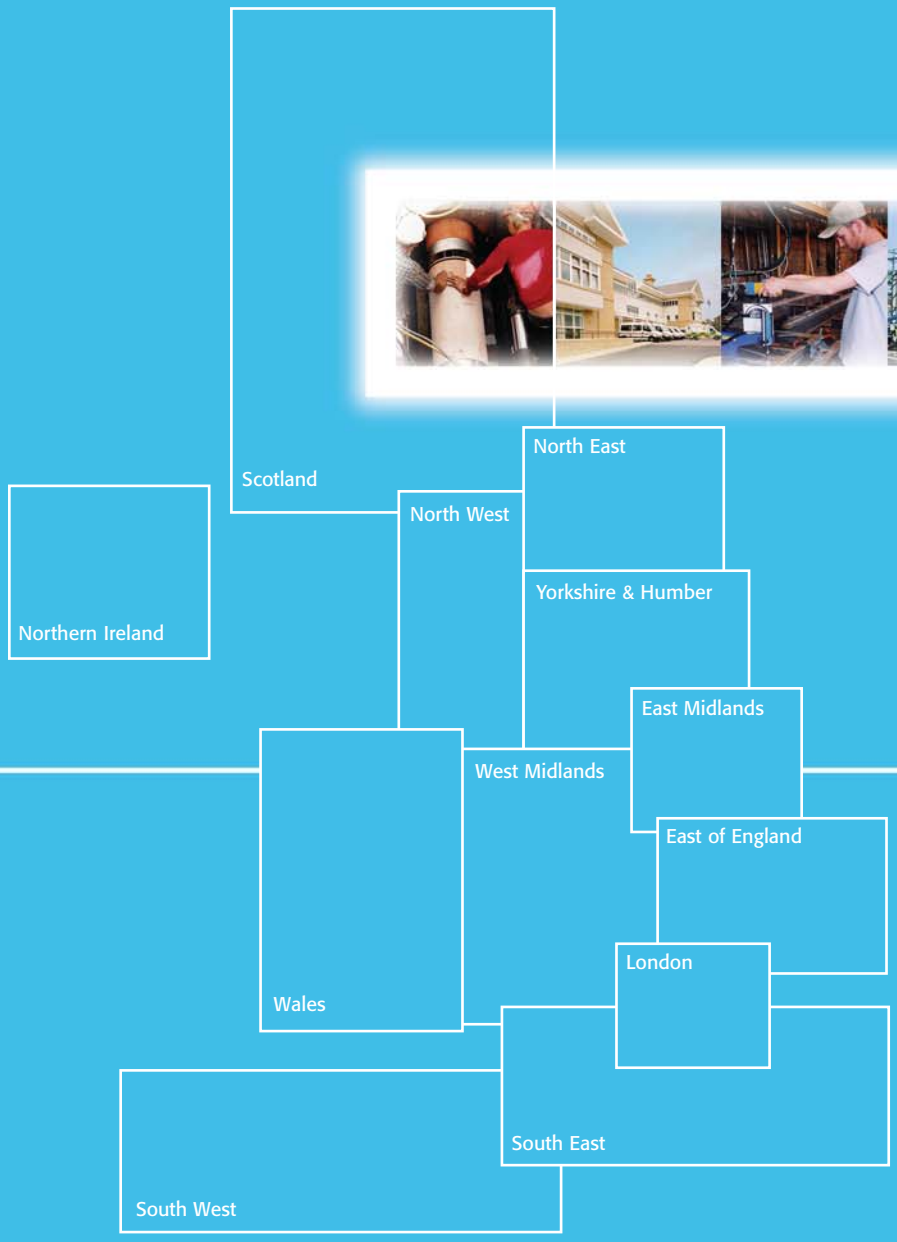

Building Success

Lessons from suppliers and manufacturers who got it right – ten case studies

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