



Movement for
Innovation
M⁴I



"Building Down Barriers"

Prime Contractor Handbook of Supply Chain Management

Sections 1 & 2
March 1999



**PRIME CONTRACTOR HANDBOOK OF SUPPLY CHAIN
MANAGEMENT
SECTIONS 1 & 2
MARCH 1999**

Richard Holti, The Tavistock Institute

Davide Nicolini, The Tavistock Institute

Mark Smalley, Warwick Manufacturing Centre

SECTION I - INTRODUCTION

1. The “Building Down Barriers” approach to Supply Chain Management

This document is designed to provide a high level view of the “Building Down Barriers” approach to Supply Chain Management. It has been developed within the Construction Supply Network Project (CSNP) supported by the Defence Estate Organisation, the Department of the Environment, Transport and the Regions, AMEC Construction and John Laing Construction.

1.1 What Is It?

Prime contracting is a systematic approach to the procurement and maintenance of buildings. It draws on the best available tools, techniques and practices, including through-life costing, supply chain management, value engineering and risk management, to achieve significant efficiency of the completed building.

1.2 Why Was It Needed?

For at least the last 70 years, there have been numerous reviews of the construction industry criticising the fragmentation, the adversarial attitudes, the inefficient use of labour, the wastage of materials, the high cost of construction and the functional inefficiencies of buildings. Despite this, the entrenched dysfunctional nature of the industry remains little changed. It is unlikely to

change unless forced to do so by a major and sustained Client-driven initiative.

1.3 How Is It Different?

Prime contracting replaces short-term, contractually driven single project adversarial inter-company relationships with long-term, multiple project relationships based on trust and co-operation. These long-term, strategic supply chain alliances incorporate continuous improvement targets to reduce costs and enhance quality, and focus on the through-life cost and functional performance of buildings. Continuous improvement, based on a systematic analysis of the weaknesses and strengths in existing design and construction process is fundamental to prime contracting and underpins every aspect of the process. Without the discipline of continuous improvement, it would be impossible to significantly reduce through-life costs, enhance quality, deliver functionality or improve profits.

There is ample evidence from other industries that the foundation of construction industry reform must come from importation of supply chain management techniques and strategic supply chain partnerships that have been the foundation of success in other industries. Such supply chain reforms can only have any real effect if they are applied to the entire procurement and maintenance process. This in turn can only be achieved if the entire procurement process is under the control of a single, or prime, contractor who is also required to

forecast the through-life costs and stand by them.

1.4 What Are the Benefits?

For owners and occupants, the benefits are buildings that are cheaper in both initial capital and long-term running costs, that provide a reasonably accurate forecast of the annual maintenance and energy costs, and that facilitate maximum effectiveness for the activities housed within them. For the construction industry, the benefits are a radical reduction in waste and inefficiency, improved profitability, non-adversarial supply chain relationships, greater certainty of repeat orders and delighted Clients.

2. The Construction Supply Network Project (CSNP)

The Construction Supply Network Project (CSNP) has been set up as a learning mechanism to establish the working principals of a prime contracting approach to construction procurement. The project has identified a specific process and set of tools to support the prime contracting procurement model, as well as a number of critical success factors. The tools are still under development and will be made publicly available at a later date

The CSNP Project has identified five specific phases in the whole life of a prime contracting construction project.

The model as applied to a typical public sector procurement is summarised in Figure 1. The Figure shows how lead responsibility for shaping the project can shift from a Client Team to the Prime Contractor at an early stage, even within given current public sector practices. The ideal is for the Prime Contractor to be involved even earlier.

2.1 Inception - establishment of the Client needs

The purpose of this phase is to establish the Client needs and how they can be met. During this phase the Client team indicates the business requirements and carries out an option analysis. The Client's business needs and the results of the option study are then summarised in a Strategic Brief which constitutes the basis for the involvement of the prime contractor. The Client may appoint an Advisor to assist with the development of the Strategic Brief. The appointment will depend on whether the Client has the in-house technical expertise to undertake the process that culminates in the Strategic Brief.

2.2 Definition and Qualification

During this stage the Prime Contractor will gain a full understanding of the project and develop an outline programme to provide the Client with a fee for taking the project to the end of the Concept Design Phase. The Prime Contractor will also begin the process of identifying which of its long-term supply chain partnerships need to be involved in this particular project.

Within a commercial environment the Prime Contractor can be single sourced, but for Government funded projects a formal pre-qualification and invitation to tender will be undertaken.

2.3 Concept Design

Having pre-qualified and been selected, the Prime Contractor will carry out a thorough value analysis to review in depth the user needs and to ensure that the Strategic Brief incorporates all the Client's and end user's functional or business requirements. Information will

be expanded and integrated into a Project Brief signed off by the Client. On the basis of the Project Brief, the Prime Contractor will develop and appraise a range of potential design solutions that satisfy the Client's functional requirement,

Together they optimise buildability and sequencing of both design and construction. They develop the design to a stage where the Prime Contractor can provide the Client with an initial guaranteed maximum price (GMP) based

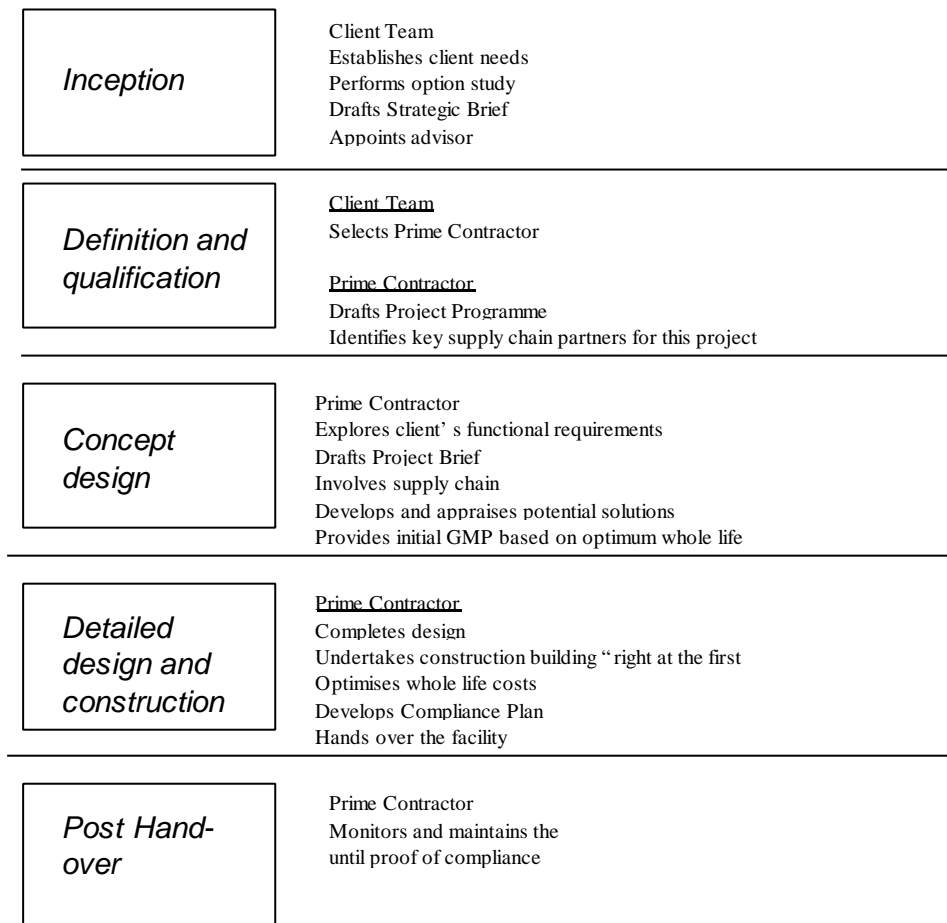


Figure 1 : CSNP Construction Process Model

undertaking, in conjunction with the Client, value engineering, risk analysis and through-life costing activities. All this results in a solution that will provide the best value on the through-life costing of the building.

The Prime Contractor develops these activities in conjunction with its key supply chain partners (Cluster Team Leaders).

on the optimum through-life cost. The GMP is signed off by all the parties and constitutes the basis for the further project actions. It includes provision for sharing savings obtained through further design development and process improvement activities. The Concept Design must also be accompanied by an outline "Proof of Compliance Plan", to enable the Client to

validate the through-life cost model, covering both capital and running costs.

This phase must begin with the use of the continuous improvement tool to carry out a systematic analysis of the weaknesses and strengths in existing design and construction processes that generate unnecessary cost. Continuous improvement should be used to focus the development of the concept design on minimising the key weaknesses which generate the most unnecessary cost in the Through-Life Cost Model.

2.4 Detailed Design and Construction

The design is developed and completed with the involvement of the supply chain undertaking value engineering and risk management in order to allow construction to be undertaken in the most efficient manner. Supply chain management of this kind ensures that all construction activities are “right first time”, that the construction solutions have optimum through-life cost characteristics, that labour is used to the maximum efficiency, and that there is minimum wastage of material. By the end of detailed design, the Prime Contractor will produce a refined GMP and further develop the “Proof of Compliance Plan”. On-site, the Prime Contractor manages in a collaborative fashion, using continuous improvement to eliminate waste. The completion of this phase is the hand-over of the facility to the Client for occupation.

2.5 Post Hand-over

The Prime Contractor will monitor the operation of the completed building and maintain the facility until the proving of the through-life costs in the Cost Model. This can be expected to take a minimum of 15

months from hand-over, depending on the nature of the compliance plan and the actual performance of the building in use.

3. Supporting Prime Contracting and Supply Chain Management

The CSNP has developed a number of tools and techniques to support the new project process. The project process and tools place special emphasis on the role of the Prime Contractor in managing the supply chain to deliver the best value-for-money to the Client. Together, they make up the CSNP “Tool-kit”. Because of its evolving nature the complete toolkit will not be published until the end of the project expected for Spring 2000. However, provisional versions of the tools will be made available to participants of seminars run by CIRA and BRE aimed at introducing the principles and practice of Prime Contracting.

Section II of this volume is intended to help the reader grasp what is really involved in using the new approach. It explains seven basic principles that underlie the CSNP Process and Tool-kit. These are:

1. Compete through offering superior underlying value rather than lower margins
2. Establish long-term relations with key suppliers
3. Manage the supply chain during a project through Supply Clusters
4. Make “value” explicit: design to meet a functional requirement for a through-life cost’.
5. Involve the supply chain in design and cost development – using target costing, value management and risk management

6. Develop Continuous Improvement within the supply chain
7. Promote collaboration through leadership, facilitation, training and incentives.

SECTION II

THE UNDERLYING PRINCIPLES

The Building Down Barriers process is based around the idea of a single player, the Prime Contractor, taking full responsibility for delivery of a building or facility that meets a client's needs. The Prime Contractor takes responsibility for mobilising the supply chain and co-ordinating all design and construction activities, as well as the process of developing the brief from an initial functional specification. Above all, the Prime Contractor takes full responsibility for assessing the cost of the project, negotiating a price and delivering to that price.

The Building Down Barriers approach depends on a Prime Contractor being guided by the following seven fundamental principles in everything they do. Each principle represents a significant point of departure from most that has characterised UK construction in recent years.

1. Compete through offering superior underlying value rather than lower margins

Mobilisation of key members of the supply chain by the Prime Contractor aims to achieve mutual benefit in the arrangement for all parties. The benefit for the client is better value - in principle a combination of a lower price and better quality, in whatever terms matter most to the client. If the Prime Contractor and key suppliers work together to offer lower prices or better solutions to meet

the client's needs, this may provide the basis for increasing market share. It should also mean the routine achievement of better and more predictable profit margins. Prime contracting has nothing to do with putting in bids at negative margins, and then extracting a profit by squeezing suppliers.

The key commercial issue is setting up long term relationships based on improving the value of what the supply chain delivers, improving quality and reducing underlying costs through taking out waste and inefficiency and over time. Profit and overhead recovery margins need not merely remain untouched but can even be increased, while improving the underlying benefit to the clients. This is the exact opposite of "business as usual" in the construction sector, where people do things on project after project in the same old inefficient ways, forcing each other to give up profits and overhead recovery in order to deliver at what seems to be the market price.

What usually results is a fight over who keeps any of the meagre profit margins (when there are any!) that result from each project, or attempts to recoup "negative margins" through "claims". The last thing that receives time or energy in this desperate, project-by-project, gladiatorial battle for survival is consideration of how to reduce underlying costs or improve quality.

The nature of the construction industry, with projects geographically distant and unique in their detailed design, has led to

the creation of a fragmented supply chain that responds only to local needs and lacks the financial strengths to invest in new product development or in new ways of working. As a result, and despite the fact that in some areas of the supply chain, such as roofing and cladding materials, manufacturers are generally large companies supplying the whole of the country, there has been little development of long-term relationships between Prime Contractors and what might be termed “preferred suppliers” or of sustained performance improvement, based on a sustained reinvestment of operational surpluses.

Instead, as we know, the relationships between Prime Contractors and suppliers are typically adversarial. The benefits which a carefully nurtured, financially secure and efficient supply chain could bring to improving the overall competitiveness and technological development of the construction sector have therefore been lost, not to mention the disadvantages that accrue to the customer in terms of high prices and poor quality.

2. Establish long-term relations with key suppliers

The products and services provided by the companies in the supply chain typically account for up to 90% of the total cost of a construction project. The way in which those products and services are procured - and the way in which their delivery is managed - have a profound effect on the outcome of the project. The performance of the whole supply chain impacts not only contract profitability for all parties, but also the way in which the completed building meets the client’s justifiable

expectations of cost, quality and functionality.

One of the fundamental requirements of the Building Down Barriers approach to the procurement of buildings is that Prime Contractors must demonstrate their determination and commitment to forming long-term relationships with those companies which will be the major suppliers of products and services to the kinds of construction project they see as making up their business. Underpinning this requirement is the belief that, once a Prime Contractor has achieved sufficient business focus to allow it to identify a set of key suppliers, long-term relationships can drive down both capital and through-life costs whilst also driving up quality.

This kind of performance improvement can be achieved through:

- the gradual establishment of better and more collaborative ways of working together so that the skills within the supply chain can be utilised more effectively and the building process optimised to eliminate waste of labour and materials, thus minimising the cost of construction
- the Prime Contractor working with preferred suppliers to exploit the latest innovations in equipment, materials and building processes in order to develop collective expertise in particular building systems or approaches.

At the project level this makes it possible to:

- ensure the supply chain is fully involved in the development of through-life cost calculations and the associated management of risk.
- improve the quality and functionality of the final building through early -

and constant - involvement of the supply chain partners in the planning and design of the project.

While long-term supply chain arrangements are rare in construction, they are increasingly common in other industries. The benefits such arrangements can deliver are achieved regularly (and, indeed, have become the norm), and these provide examples of the way in which long-term supply chain arrangements can be implemented.

Long-term supply chain relationships of the kind that the Building Down Barriers procurement process calls for will only come about - and deliver real benefit - if Prime Contractors develop a sound process for the development of *strategic relationships* with the major organisations in the supply chain which deliver that 90% of the value of any project.

3. Manage the supply chain during a project through Supply Clusters

So far, we have set out the importance of long-term relationships that goes well beyond the demands of any one project. But what does all this mean for how the Prime Contractor manages a particular construction project?

Just as it is not practicable for a Prime Contractor to have a long-term relationship with all suppliers on a project, nor is it possible to *manage* them all directly during the project. There has to be a mechanism to decide which suppliers should be seen as strategic long-term partners, and similarly has to be a mechanism by which the effective management of the suppliers on a project can be achieved.

The mechanism chosen in the Building Down Barriers process is that of *Clustering*. This mechanism groups suppliers who work together (in a *Cluster*) to complete a reasonably independent part of the overall work such as:

- Mechanical and Electrical Services
- Groundworks
- Frame and Envelope (including the roof)
- Internal finishes.

The term Cluster applies not just to the group of suppliers who work together (each of them being a Cluster Member) but also to the scope of work that they perform. The job of a Cluster is to design and deliver an integrated part or element of the building, and so designers, subcontractors and materials or components suppliers work together within the Cluster. According to the Building Down Barriers way of thinking, all of these are simply “suppliers.” Within the Cluster, they collaborate to deliver best value in the Cluster Product to the client, rather than focus on their traditional fragmented part of the overall process.

The decision as to what should constitute a Cluster, and how many there should be, will be project specific and made with reference to the criteria used to select suppliers. A decision is then taken to allocate the responsibility for the work of each Cluster to one of the suppliers in that Cluster - the Cluster Leader. Cluster Leaders are always strategic long-term supply partners, although it is quite possible to have strategic long-term partners working within a Cluster and responsible to the Cluster Leader (rather than the Prime Contractor) for their work within a project. Generally, the Cluster Leaders will be appointed to their roles because they will have the greatest

opportunity to influence favourably the effective execution of the work of the Cluster.

Cluster Leaders are appointed to a project in its earliest stages so that they can work with the Prime Contractor, any design or cost consultants who may be appointed by the Prime Contractor (notably the architect) and the client in bringing their expertise to bear (through the use of Value Management and Value Engineering) in producing a concept design which:

- optimises functionality
- optimises buildability to keep capital cost down
- optimises through-life costs through good specification of materials and equipment.

The goal is to resolve key cross-cluster interface design issues at an early stage, leaving each Cluster with the maximum scope and autonomy to optimise the area of design it is responsible for. Inevitably, some cross-cluster issues will still need revisiting at a later stage, but the design process can be made significantly more efficient by keeping this to a minimum.

Once the design is complete, the Cluster Leaders are responsible for putting together the price for the completion of the work of their Cluster which will be agreed, after any negotiation thought necessary by the Prime Contractor, and form part of the final price of the whole job to the client. This entails the Cluster Leaders in agreeing prices with each of their Cluster Members, and doing so in a structured and methodical way to reflect the requirement of the Building Down Barriers Process that all the participants are committed to driving out unnecessary cost, ensuring that quality is never jeopardised and that all parties should

make a fair and predictable profit. In keeping with the first underlying principle, the object of these negotiations is not to “squeeze” the profit and overhead element of the Cluster Members below what is reasonable. Rather it is to see where underlying costs can be reduced, for example through removing duplications in prelims and managing the site more efficiently. Tool K contains more detailed guidance on the conduct of such negotiations.

4. Make “value” explicit: design to meet a functional requirement for a through-life cost

The Building Down Barriers approach makes a deliberate break with the single main criterion used to assess most construction products in the UK - the capital cost. Most clients and contractors prioritise this measure of a building’s value to the detriment of all else - particularly whether the building really meets the needs of its users and whether it represents good value for money in terms of how much it costs to run and maintain. Typically, buildings procured through a design and build route, for example, are constructed using the cheapest possible components and materials and have undesirably high maintenance costs. They may also be inefficient in terms of energy costs and “downtime” required for maintenance.

The Building Down Barriers process makes the standard for gauging the value of what is being delivered more rigorous in two ways. It makes the functional requirements explicit, and involves a more sophisticated way of measuring the cost of providing them. Together, these two

make up a meaningful way of assessing “value”.

First, a Building Down Barriers project starts from a statement of the client’s need in functional or output terms, rather than design or engineering terms. The statement of requirements says what the building is there to do or contain - house x number of people engaged on activities a , b and c ; provide facilities for training y number of people in activities p , q , and r . It does not need to say how big the building should be, what shape it should be, or how heavy a load the floor should be able to bear. Such design and engineering issues are best judged by a combination of members of the supply chain, each one having some specialist knowledge which the client does not normally possess, in collaborative discussion with the client’s key representatives. The statement of requirements can also say in what way aesthetic or environmental requirements are important to the building’s or facility’s function. If aesthetic requirements are not important, this can be explicitly stated.

As a design is being developed, it can then be judged against the functional specification – does the building really do what the client wants? This emphasis on functional performance in principle minimises the all too common danger that a design, as it develops from an outline “brief”, couched in design terms, becomes something that simply does not work for the client once it is built.

Second, the Building Down Barriers approach uses the through-life cost (TLC) of a building or facility as the most meaningful measure of its cost, rather than capital cost alone. The client is again involved in making the decisions necessary to balance the capital and operational costs of the building. The

TLC is the combination of these two elements, expressed as a Net Present Value (NPV). Tool K describes in detail how to calculate the NPV of the TLC for a design, using a cost model where predicted future operating costs for a designated design-life (say 35 years) are discounted to make up the NPV, together with the capital cost.

The Building Down Barriers procurement process is predicated on the theory that it is possible to deliver buildings with through-life costs showing significant savings on the through-life costs of buildings procured through traditional routes. Those savings will arise through the selection of materials, electrical and mechanical equipment, finishes, and construction methods, which are appropriate to the design life of the building. There will be a tendency for these materials and processes to be more expensive than might be used on a traditionally procured building, but any such increased cost should be more than off-set by the savings in construction costs that will result from the application of the Building Down Barriers principles to drive out waste of materials and labour.

Through-life costing demands the further discipline of understanding - and standing by - the performance and maintenance requirements of all the constituent parts of the building. Hitherto, this has rarely been done and so presents a challenge to all parts of the construction industry.

5. Involve the supply chain in design and cost development – using target costing, value management and risk management

With the two fundamental aspects of value now defined in a useful way, the Building Down Barriers process focuses on bringing together the knowledge and skills located in various parts of the supply chain in order to develop a design solution that optimises value. The knowledge and skills to be brought together include the specialist knowledge of key suppliers - designers, specialist sub-contractors and materials suppliers - the client's knowledge of their requirements, and of course the Prime Contractor's own knowledge of how to integrate the entire picture. The basic principle is to involve anyone from any point in the supply chain if they have knowledge and skills relevant to a particular decision.

The basis for optimising value is a rigorous approach to managing costs during design development - to avoid the traditional practice of developing designs that then prove to be too expensive for the client, so that profit margins have to be attacked and build quality neglected. This approach is called Target Costing, and has been used to great effect in many areas of manufacturing.

In its essence, Target Costing is a simple idea: the supplier works backwards from the client's functional requirements and the maximum market price for the item. The supplier sets out to design a product that both matches the required level of quality and functionality and provides a viable level of profit at that target price. Costs are to be managed before they are

incurred. Suppliers identify the impact of any design option on both the level of functionality and the cost. Design options are generated and evaluated until a combination of options is found that meets the functionality and cost requirements.

This involves looking very broadly at the ramifications and possibilities of a design option, including how cost savings can be achieved by simplifying it or the way that it is manufactured and installed. This amounts to what is known in manufacturing as "concurrent engineering" of product and processes so that problems can be solved earlier and costs "designed out". This of course requires early involvement of the supply chain.

While the logic of target costing is simple, it has formidable implications in practice, especially for the construction industry where a version of the contrasting "cost plus" approach prevails. The cost plus approach starts by estimating the costs of production, adds a profit margin and then derives a market price. If the client is unwilling to pay the price then "cost reduction" activities are put in place. The variant used in the construction industry, which we might call "target pricing", usually follows the same pattern as the "cost plus" approach, save for starting to cut costs before the bid is submitted. This is usually achieved by lowering specifications, reducing quality, and trimming profit. This undercuts any motivation on the part of suppliers to lower the total cost. They experience cost reduction activity as "squeezing the subbies", with "open book costing" perceived as a crude attempt by main contractors to lift the veil masking the way that price quotes have been built up.

Table 1, below, summarises the differences between the two approaches.

Target Costing is supported by two other fundamental techniques - Value Management and Risk Management. Value Management enables a client to collaborate with the Prime Contractor and

the client of the out-turn cost of the building, and also greater certainty to the members of the supply chain (and the Prime Contractor) that they will make the profit that they intend from the project.

Table 1: Traditional Construction Costing and Target Costing compared

"TRADITIONAL CONSTRUCTION COSTING"	"TARGET COSTING"
Costs determine price	Price determines costs
Performance, quality and profit (and more rarely waste and inefficiency) are the focus of cost reduction	Design is key to cost reduction, with costs managed out before they are incurred.
Cost reduction is not customer driven, nor project/design team driven. It is driven by separate "commercial" people.	Customer input guides identification of cost reduction areas
Quantity surveyors are responsible for cost reductions	Cross functional teams manage costs.
Suppliers involved late in design process	Early involvement of suppliers

the supply chain in defining what value is attached to different aspects of the performance specification, and then offers a structured way for pooling information on the cost and functionality impact of design options, so that collective decisions can be made. It allows everyone involved in the project - and especially the client - to achieve optimal functionality while being fully aware of the cost implications. Its use ensures that the client is brought into the design process so that no-one has to interpret his or her wishes. The design can be agreed by all the parties who will be involved in its construction and use, and the possibility of changes being imposed after construction has started can be all but eliminated.

Risk Management, on the other hand, is a mechanism which is intended to reduce overall cost, to give greater certainty to

Again, as with Value Management, the client is involved in the process of ensuring that, as design decisions are made, all risks are identified, their potential costs established, and responsibility for their management allocated to the organisation best able to fulfil the role.

6. Develop Continuous Improvement within the supply chain

So far we have been looking at how to improve value significantly through better design and costing approaches. We now turn to the central role of continuous improvement in delivering processes, to achieve an even lower price for the current project and ever lower prices for future projects.

Continuous Improvement (CI) is the vehicle for achieving long-term performance improvement - both in terms of what is delivered to the client and profitability of the whole supply chain. The Building Down Barriers procurement process stipulates that potential prime Prime Contractors must demonstrate in their bids that they not only have a commitment to the principles of Continuous Improvement, but that they have in place mechanisms by which CI will be delivered.

While the concept - and, indeed, the practice - of CI is well established in the manufacturing sector, it is unfamiliar to the construction industry. CI is not just related to making sure that each project is executed as effectively as possible, vital though that is. Rather, it can be defined as the theme that underpins the philosophy of Total Quality Management. This philosophy can be summarised as:

“a company-wide, management-led style of running an enterprise in which everyone is involved in ensuring that all actions and processes are done right first time, thus ensuring the elimination of waste in materials and labour”.

Two things illustrate the management style of a company that implements Total

Quality Management philosophies: preventing things from going wrong rather than identifying subsequently that they were not done properly to begin with; and a determination to utilise the contributions of everyone in the business continually to seek better ways of doing things.

In terms of what this means in practice, a key element is paying far greater attention to planning how to do things in advance, and seeing how problems can be anticipated and avoided. This contrasts with normal practice in much of UK construction, where contractors and clients set themselves ambitious delivery programmes without very clear ideas of how exactly the work will be done. The emphasis on CI is on planning in the sense of mapping out the work processes or methods, and then seeing what sort of programme is viable once the processes have been improved. This amounts to a far more rigorous sense of “planning” than is to be found in most of UK construction.

The continual seeking of better ways of doing things - Continuous Improvement - must inevitably involve the principal companies that work together in the design and execution of a project. As we have observed, up to 90% of the cost of a construction project will come from professional advisers, suppliers of materials, machinery, or labour - the supply chain. For a Prime Contractor to demonstrate a commitment to CI - the objective of which is to continuously drive down costs while also driving up quality - it is necessary to show how the Prime Contractor will harness the efforts of the principal contributors of that 90% of project cost in bringing about CI in their own businesses - and passing on the benefits to the end customer as well as improving their own profitability.

However, CI cannot be achieved over the life of one project - it has to be achieved over a period of time. For that to happen it will be necessary for the Prime Contractor to capitalise on long-term relationships with key providers of professional services and advice, materials, equipment, and labour. CI cannot take place without the existence of some form of agreed long-term relationship between Prime Contractor and supplier. This may well mean that the Prime Contractor has to help suppliers of both materials and labour - particularly the smaller ones - with their improvement plans. That help may take the form of investment in problem solving training for the supplier's staff, or making his own experts and expertise available to sub-contractors.

The experience of CI activities in the manufacturing sector is that this kind of investment by the principal manufacturer becomes the norm, further cementing the long-term relationships that support the process. It also encourages the principal manufacturer to become much more discerning in their choice of suppliers in the first place, particularly since they will - or should be - looking for benefits from the suppliers other than just doing everything better. The principal manufacturer should, for example, be seeking opportunities to exploit new technologies or new working methods that the suppliers develop as part of their own efforts to improve their competitiveness through greater innovation.

We expect that a similar pattern will emerge in the construction sector, with the demise of suppliers not prepared to invest in the future, as has happened in manufacturing. At the same time, the companies, which do invest in the future,

will be actively informing the Prime Contractor of the benefits, which can be made available to the client as a result of their CI activities.

The use of CI as an intrinsic element of the Building Down Barriers approach is yet another factor which differentiates it from both simple partnering - which can lack any drivers for consistent and determined action to continually drive down costs and drive up quality (although this should be a feature of enlightened partnerships) - and from Design and Build where, sadly, the long-term relationships which have to sustain Continuous Improvement may be lacking altogether.

7. Promote collaboration through leadership, facilitation, training and incentives.

Developing long-term supply relations and carrying out individual projects using the Building Down Barriers process is an extremely challenging undertaking for anyone in UK construction. Adopting the first six principles above means breaking with much of what most firms operating in construction have seen as important in recent years. A handful of players have already set off down the road of implementing something similar to these principles, but they are generally the first to admit that the journey is a difficult one, requiring a great deal of commitment in order to make real progress and achieve real results.

Prime Contractors who set out on the new road need to be aware that they will be managing a comprehensive programme of organisational change within their own company, based on the idea of collaborating with key suppliers and clients rather than fighting with them.

Their staff will need to learn new ways of thinking and acting, and this involves “unlearning” old ones. It is a cliché, but painfully true, that such programmes of change are utterly dependent on leadership from the top. Senior managers must routinely demonstrate, in everything they do, that they believe in the new processes and the changes that need to happen.

They need to demonstrate this not only to their own staff, but also to their supply partners. Whilst Prime Contractors will be relieved to find some key suppliers who are ready and waiting to embark on long-term relationships and who thoroughly understand what continuous improvement and value management are all about, there will be others who are just starting, as most Prime Contractors are. Such suppliers will be all too ready to lapse back into suspicious ways of relating, and it is up to the Prime Contractor to keep asserting the value of setting up long-term collaboration.

Three mechanisms are central to promoting change within Prime Contractor organisations and the wider supply chain. First, Prime Contractors will need to offer facilitation to project teams and CI problem-solving teams. People will need help in understanding new processes and making them their own. Facilitators are people who work with groups to help them understand and customise new processes, without having managerial responsibility for the team or group concerned. Separating the roles of introducing the new process (the role of the facilitator) and being responsible for making it deliver (the role of the project manager or team leader) generally makes it easier for the people concerned to accept and learn a new way of working. The Prime Contractor needs to make

trained facilitators available to its project teams, and to help its key suppliers identify and fill their own facilitation needs. One of the issues here is overcoming the notion that employing a “non-productive” facilitator is “just adding unnecessary overhead”. The benefits of facilitation are well established in many leading sectors of manufacturing.

Second, Prime Contractors need to take providing training very seriously, since many of the principles we have described involve new skills. Training is a necessary investment for getting the Building Down Barriers to work, but it needs to be targeted on where the needs of a particular project team are.

Finally, setting up and sustaining a collaborative approach to supply chain management requires economic incentives. One fundamental incentive is that improved supply chain performance offers everyone involved real security of future business. However, in reality, and particularly at the outset, there need to be incentives to encourage collaborative problem solving and cost savings at project level.