SECTION II.4

IMPLEMENTING CONTINUOUS IMPROVEMENT

1. BACKGROUND

The application of Continuous Improvement is also central to the Building Down Barriers approach. Its application is twofold. The first aims to driving out waste and inefficiency from the construction process. All the companies working on construction are involved in identifying which activities should be improved and then in applying well-established problem-solving tools to find better ways of doing them. Companies work with one another doing this, so that all the necessary talents and experience can be brought to bear in the analysis of each activity - or process. The people from each company that make up the problem-solving teams are the people who really understand where improvement can be made and what can be done to achieve it. They will include site foremen and site-operatives from the various specialist construction trades. Later in this section we give some examples of Continuous Improvement in action to optimise programme and eliminate waste.

That is Continuous Improvement at the individual project level. But it is clear that the same approach can be applied within each company so that internal processes can be improved leading to the elimination of waste and inefficiency. So, secondly, Continuous Improvement operates not just within the project but is also an activity that goes on all the time in each company in the supply chain with some or all of the savings it generates passed on in lower prices to the client. This is one of the key features of collaborative supply chain management - suppliers retain their preferred supplier status on the basis that they continually deliver cost savings.

The Prime Contractor and all the members of the supply chain contractors must not only have a commitment to the principles of Continuous Improvement, but also have in place mechanisms by which Continuous Improvement will be delivered.

2. HOW CONTINUOUS IMPROVEMENT IS DELIVERED.

There are many tools by which Continuous Improvement is delivered. These tools are described in books on Total Quality Management and most notably in the well-known book "Kaizen" by Masaaki Imai. However, the tools are of no use unless the company:

- recognises from the top that Continuous Improvement is fundamental to the future success of the company
- accepts that every employee can contribute to making things work better and will respond positively to being consulted in improvement activities
- recognises that people can contribute effectively only if they are trained in problem solving
- ensures that good ideas are implemented
- acts on facts when taking decisions to reduce costs and when establishing the strengths and weaknesses of the company

- focuses all improvement activities on clear, consistent, measurable and time-related objectives aimed at giving customers a better deal and cutting operating costs.

Prime Contractors have to work with suppliers to operate in accordance with these principles - while abiding by them themselves.

3. DEMONSTRATING CONTINUOUS IMPROVEMENT.

This cannot be done until present levels of performance have been established - or measured - by some means. There are many ways in which this could be achieved.

The first would be to develop a unique measurement system to be used in the Building Down Barriers pilot projects. A second would be to use one of the many models which have been developed by other industries to measure their suppliers' adherence to improvement targets, incorporating any modifications necessary to make the model relevant to the construction industry's unique difficulties.

The Building Down Barriers CI research team which was set the task of incorporating Continuous Improvement within the Pilot projects favoured a third - the adoption of a widely-used and universally applicable model which has been derived by the British Quality Foundation from the European Foundation for Quality Management - the Business Excellence model. The use of this model enables comparisons of performance with other industry sectors to be made (and hence Benchmarking encouraged) and it is also applicable to small and medium sized organisations - an important consideration in the construction sector.

The proposal is that this Business Excellence model should be used to establish the base scores of performance for suppliers and the contractors themselves, so that improvements in overall performance and performance in those specific areas that are identified as needing particular improvement can be measured at agreed intervals - probably annually.

4. THE BUSINESS EXCELLENCE MODEL.

The Business Excellence Model, developed by the British Quality Foundation, enables organisations to carry out a self-assessment of their performance against a set of criteria that link the way in which the company is managed in terms of:

- leadership
- people
- policy and strategy
- resources and partnerships, and
- processes

with the results that it achieves in terms of:

- people
- customers
- society and, ultimately
- Key Performance Results

The self-assessment system, when subject to external scrutiny, can form the basis of a company's application for the UK Quality Award for Business Excellence.

The model is based on the premise that **Customer results**, **People** (employee) **results** and **Society results** are achieved through **Leadership** which drives **Policy and Strategy**, **People**, **Resources and Partnerships**. This leads ultimately to excellence in **Key Performance Results**. The relationship between the factors is shown below:

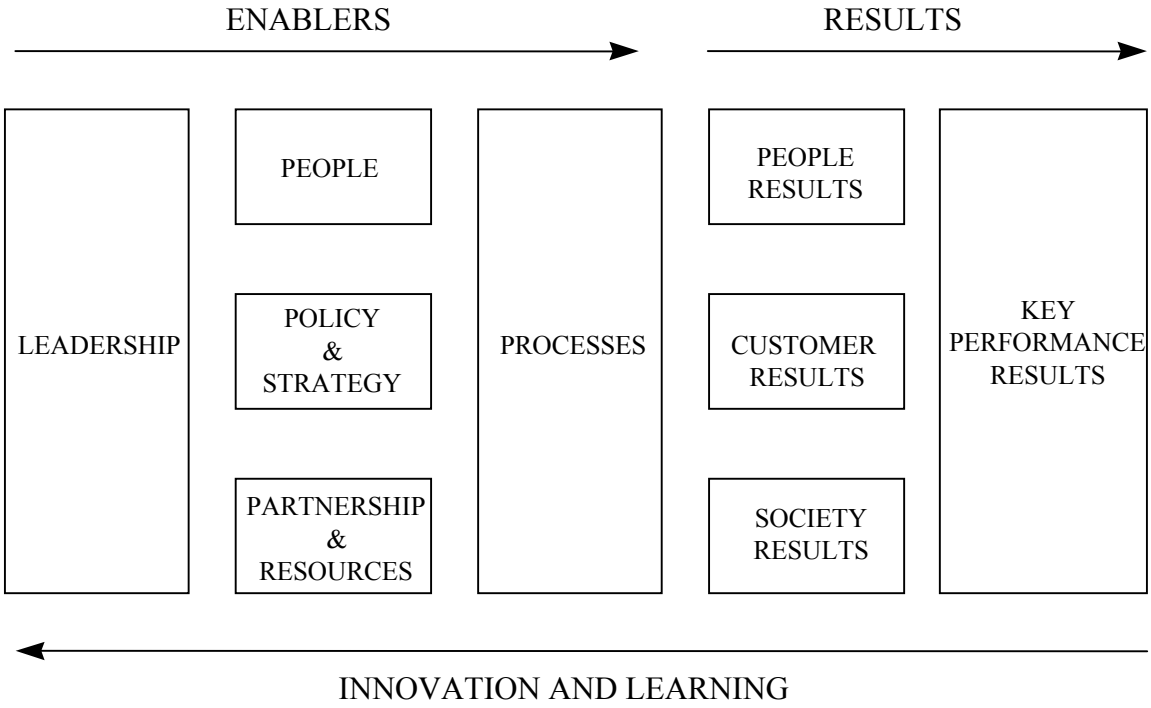

Figure 1 ® 1999 EFQM. The model is a registered trademark of EFQM.

The self-assessed score for each of these factors is subject to weightings which have been defined by the European industrialists who first developed the approach as part of their drive in the mid-eighties to improve the competitiveness of European industry in the face of loss of global market share to the Japanese - themselves the originators of the philosophies which underpin Continuous Improvement. The application of these weightings allows inter-industry comparisons of business excellence to be made - a powerful aid to exploiting the benefits of Benchmarking.

5. GETTING STARTED IN CONSTRUCTION

The Business Excellence model, while well established now in the manufacturing and service sectors, requires commitment to a way of doing business which is still relatively unusual in construction. It may be some considerable time before the business philosophies enshrined in the Business Excellence model become widespread within construction but the Building Down Barriers approach requires that its underpinning foundation of Continuous Improvement is implemented **now** by all parties wanting to take part in projects managed in this way.

A tool was therefore devised which sets out the way in which contractors adopting the Building Down Barriers approach can drive forward the application of Continuous Improvement. It does not require that they have to wait for the top management of their own organisations to sign up to the full ramifications and requirements of the Business Excellence model. Those companies which **have** signed up to Business Excellence will already be doing what we now describe.

STAGE 1:- PROJECT-BASED CONTINUOUS IMPROVEMENT

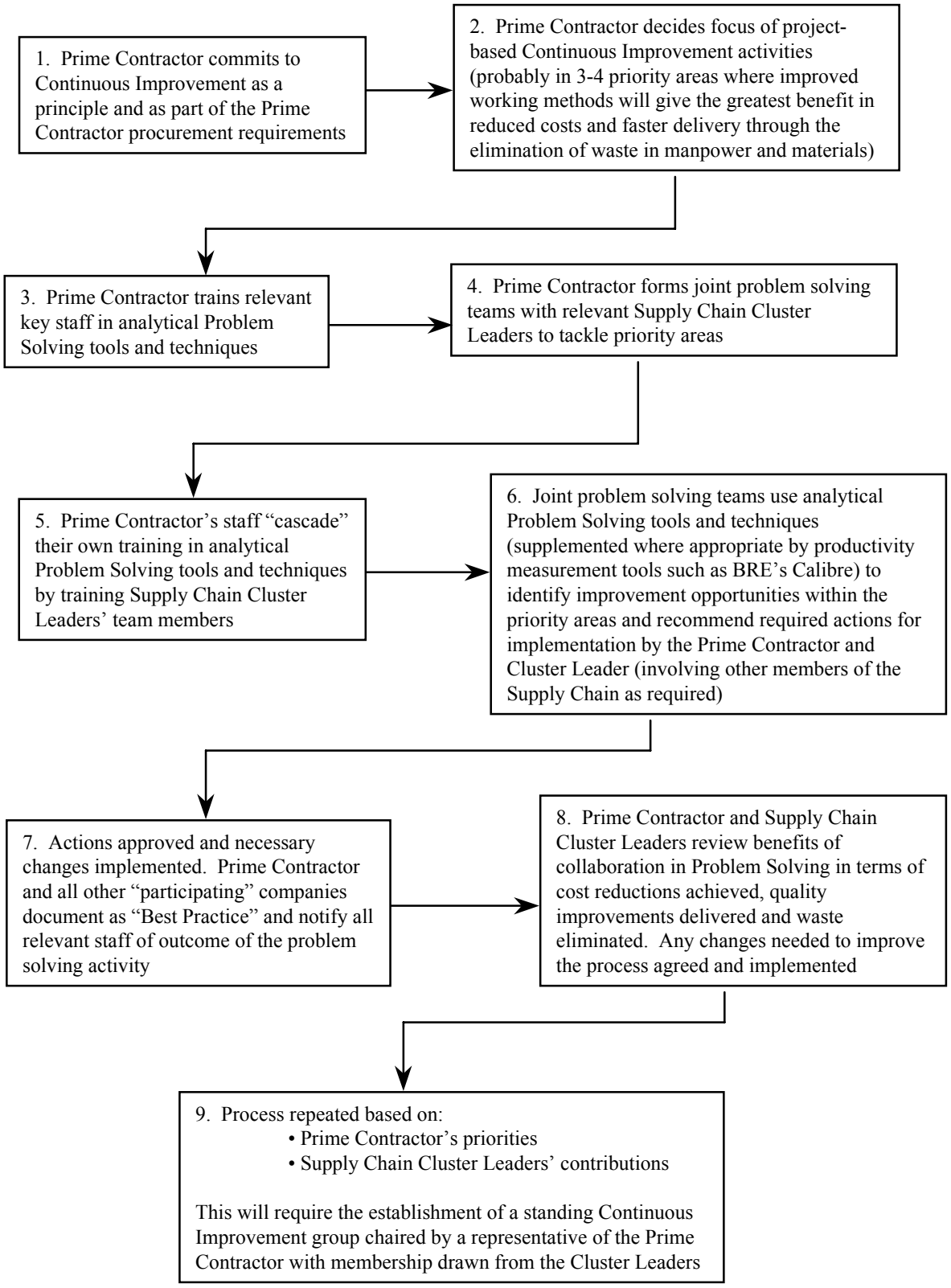

Figure 2

This tool is in two parts which are shown as Stages 1 and 2 on the flowcharts overleaf (Figure 2 and figure 3 respectively). Stage 1 describes how Continuos Improvement can be implemented at the project level while Stage 2 shows how it can be embedded within the supply chain.

Stage 1 recognises that the adoption of Continuous Improvement is a radically new step for most main contractors, and even more so, perhaps, for their suppliers. The responsibility for getting the process moving forward is therefore placed with the Prime Contractor at the project level. Once that has been established, Continuous Improvement can start to be embedded amongst the companies and firms which form the Prime Contractor's long-term supply chain. That is Stage 2. Its application is fundamental to the continual driving down of cost from project to project.- and the retention by the Prime Contractor's key suppliers of their preferred supplier status

The processes described in the tools are self-explanatory, but some points are particularly important and should be carefully noted. These are described below and will serve as an introduction to the practicalities of CI. Nevertheless, CI is one of several areas of the Building Down Barriers approach which are sufficiently challenging to the construction industry to make the use of an external specialist facilitator advisable. A suitably qualified and experienced facilitator can help not just with the training in the tools of problem solving but also in overcoming any resistance to thinking things through rather than taking immediate action based on incomplete facts - a standard response in many industries but particularly so in construction.

STAGE 1.

Continuous Improvement is a fundamental part of the Building Down Barriers process but contractors should not think of it as a willful imposition. Rather, they should see it as an opportunity to be grasped to make a start on continually improving their ability to deliver ever better value for money and control over project profitability. That is what is required to get to Box 1 in the flowchart!

Box 3 refers to analytical Problem Solving tools. The emphasis is on "analytical" and a list of the most commonly used ones are :

Process charts
Pareto Analysis
Ishikawa Diagrams
Histogram and Measles Charts
Run Diagrams and Correlations
Process Control Charts
Check Sheets

These analytical tools are described in detail (together with other notes on quality procedures) in "The Quality 50 - A guide to Gurus, Tools, Wastes, Techniques and Systems." published by PICSIE Books, Telephone/Fax (01280) 815 023.

In Box 4, there is reference to Supply Chain Cluster Leaders. The selection of these organisations is described in Tool C.1 of this handbook, but their very selection is part of the Prime Contractor's own Continuous Improvement process since he should be constantly monitoring the performance of these suppliers and helping them to improve their own performance - and if they can't, reviewing the effectiveness of the procedures used for selecting supply chain members in the first place!

Box 5 contains one of the most fundamental features of Continuous Improvement - the cascade training in which the Prime Contractor's staff train members of the supply chain. Its importance is not just in helping the trainers to understand the tools better themselves but particularly in demonstrating the commitment of the Prime Contractor to Continuous Improvement.

Box 7 refers to documenting the changes brought about by the Continuous Improvement process. This is essential if the benefits of the exercise are not to be lost - it is not an optional extra. It must be done, and everyone involved must be notified of the new working methods and be seen to be using them.

In devising this approach to making a start on Continuous Improvement, we have been careful to ensure that the stages are compatible with the fundamentals of the Business Excellence Model, which companies may want to implement in the future. So use of the proposed "interim" process will support the transition to the Business Excellence Model at any stage in the future.

STAGE 2.

This is when Continuous Improvement starts to be embedded in the management processes of all the members of the supply chain and the Prime Contractor's own organisation. Again, we have assumed that it will be necessary for the Prime Contractor to initiate - and monitor - the process.

The process will be made relatively easy through the establishment of the standing Continuous Improvement group referred to in Box 9 of Stage 1. Easy or not, this process is an on-going requirement of Building Down Barriers.

STAGE 2:- EMBEDDING CONTINUOUS IMPROVEMENT IN THE SUPPLY CHAIN

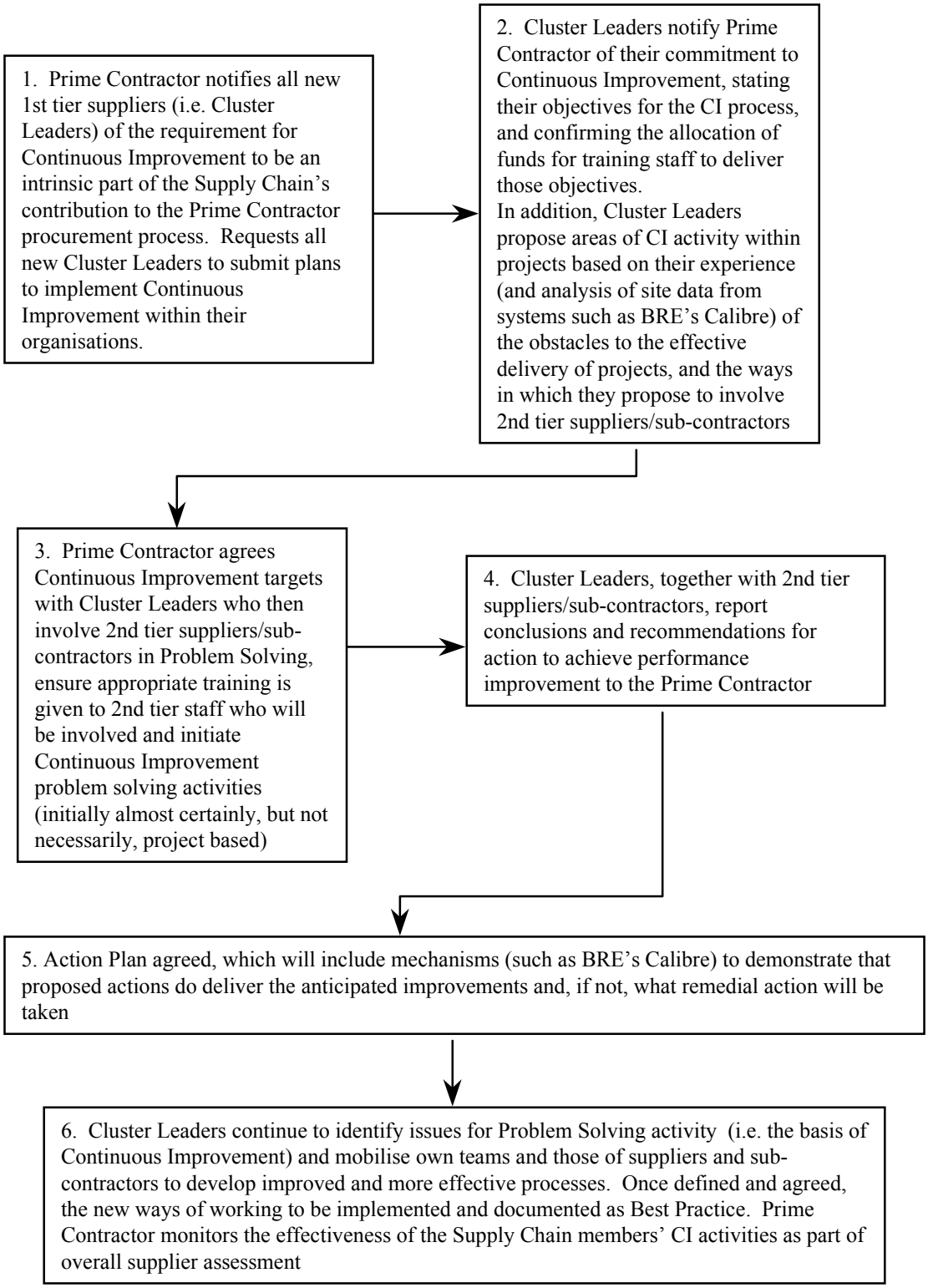

Figure 3

6. CRITICAL SUCCESS FACTORS

Continuous Improvement demands that people act on facts. So we have to have facts at our disposal to confirm that we really are implementing CI fully and not just paying lip service to. the idea in order to claim that it is in place. When we say in Box 1 of the Stage 1 process "Prime Contractor commits to Continuous Improvement...", what evidence must be in place to show that this is in fact the case?

To demonstrate that the actions required within each of the boxes really are being undertaken fully and properly, we have devised a set of **Critical Success Factors (CSFs)** which, if achieved**,** confirm that CI is really in place. These are for Stage 1 but these proposed CSFs will form a model for the derivation of similar CSFs for Stage 2.

Box 1 CSFs

(a) A clear statement from on high - preferably the MD but certainly a member of the board - that the company understands the value of CI to delivering better value-for-money for the client and improved profitability for the company which will therefore adopt the principles and practices of CI

(b) Real investment of suitably qualified resource into the project to advise, train, facilitate, and monitor the implementation of the changes in business processes necessary to support CI within the Prime Contracted project.

Box 2 CSF

(a) Be able to demonstrate that the priority CI activities have been set by analytical means. This could be through the use of the Enabler factors of the Business Excellence Model (as was done on the Pilot projects for Building Down Barriers) or through the use, for example, of properly structured and facilitated workshops.

Box 3 CSF

(a) Records exist to demonstrate that training in the problem solving techniques have been delivered to the people who will become members of site CI teams.

Box 4 CSF

(a) All parties make sure that appropriately experienced people are available to take part in the Problem Solving teams to tackle the issues identified in Box 2.

Box 5 CSF

(a) Ensure that training is completed by all the people who need to be trained.

Box 6 CSF

(a) Ensure that recommended actions are based on valid use of analytical problem solving tools - not on anecdotal evidence.

Box 7 CSF

(a) Ensure that there is evidence that processes are in place by which all data and recommendations put forward by Problem Solving teams is captured and disseminated.

Box 8 CSF

(a) Ensure that there is a process in place to check that, once the new process is implemented, it really does deliver the benefits that were envisaged. If not, action needs to be taken to find out what has gone wrong and take action accordingly.

Box 9 CSF

(a) Prime Contractor ensures that the group running the CI activities continues to drive the process forward, continually looking for new opportunities for doing things better.

As we have said, similar CSFs to these should be devised by the Prime Contractor to ensure that the implementation of Stage 2 CI activities is really taking place and that real results are being demonstrated. This is a vital task in which the key members of the supply chain will want to collaborate, since they know that their preferred supplier status depends on their continual delivery of cost savings to the Prime Contractor.

Vignette 1.

Many of the individual benefits that come about through CI activities at site level will be quite small. It is the accumulation of these small benefits which can make a significant difference to cost overall. An example of this is illustrated by the outcomes of one of the CI themes pursued on one of the Building Down Barriers projects.

The Prime Contractor and Cluster Leaders had all felt during their careers that waste occurred on site because so many trades used the same items of plant and even materials but always supplied their own. On the face of it, therefore, savings should be possible if these things could, in some way, be shared. They decided to put this to the test in a methodical way.

Various opportunities immediately suggested themselves. The two most obvious were the use of just one diesel bowser throughout the entire project and the elimination of duplication of craneage on site. Finding the best way to achieve these sensible objectives was more challenging but a way was found in each case using CI tools. The first didn't require much work but the second one did. All the site team decided that they wanted to do it – the problem lay in the conditions of hire of lifting equipment which, at first sight, made sharing impossible. However, determination to find a way led to ways of working on site which meant that only one crane was ever needed. The team had to be very innovative in their thinking but now they have done it once, they can do it again – and again and again.

The savings from these two examples were, in themselves, small. But they showed that it was possible to share things and so other opportunities were identified – such as the

bricklayer sharing his mortar with the groundworker who, in turn, shared some of his materials with the bricklayer.

And so it all added up to cash benefit for all and, as importantly, consolidated the view that the project was a team effort in which it was actually easy for one trade to help another as a matter of course.

Collaborating for the Built Environment (Be) – www.beonline.co.uk
Be is an independent body formed from a merger of the Reading Construction Forum and the Design Build Foundation in 2002. Its 100 member organisations come from the demand and supply chains of the 'industry formerly known as construction', ranging from public sector and private sector clients and developers to contractors, designers, consultants, specialists and suppliers. It leads research and implementation activities in support of a vision of delivering integrated built environment solutions through collaborative working.

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Collaborative Working Centre – www.collaborativeworking.co.uk
The Collaborative Working Centre of Be is a not-for-profit organisation set up from members of the team that facilitated *Building Down Barriers* to provide consultancy, training and other continuous improvement services to support the development and implementation of collaborative working.

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