

# **Messages and actions from Accelerating Change – for engineering consultants (small and medium)**

Sebastian Macmillan, Eclipse Research Consultants, final version, 1 July 2004

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## Accelerating Change – what does it mean for you?

### Setting an agenda for change

When the Strategic Forum was established in 2001 to bring together a number of rethinking construction initiatives it set out in *Accelerating Change* a new vision for the production of the built environment:

Our vision is for the UK construction industry to realise maximum value for all clients, end users and stakeholders and exceed their expectations through the consistent delivery of world class products and services. In order to achieve this the UK construction industry must:

- add value for its customers, whether occasional or experienced, large or small;
- exploit the economic and social value of good design to improve both the functionality and enjoyment for its end users of the environments it creates (for example, hospitals where patients recover more quickly, schools and work places which are more productive and more enjoyable to work in, and housing which raises the spirits and enhances the sense of self worth).

*Accelerating Change* endorsed the earlier report of the Construction Task Force *Rethinking Construction*, including its series of recommendations captured in the widely-publicised 5-4-7 diagram (figure 1). The diagram summarises the radical changes in the processes through which the industry delivers its projects that were called for in *Rethinking Construction*. The report drew inspiration from developments in other sectors, particularly the automotive industry, where innovation had driven up quality and reduced production costs. It also drew on international comparisons. It identified that the industry as a whole was underachieving, that it invests too little in capital, research & development, and training, and that it was leaving too many of its clients dissatisfied with its overall performance. *Rethinking Construction* recommended the creation of an integrated project process for the industry linking greater use of standard components and pre-assembly with improved project management and closer long-term relationships within the supply side. The five drivers for change included better leadership, greater focus on customers’ needs and the delivery of quality by all members of the team, together with committed leadership and greater respect for all those responsible for creating value in the construction process. Finally, target setting and regular measurement were identified as means to drive up standards of performance, efficiency, and safety.

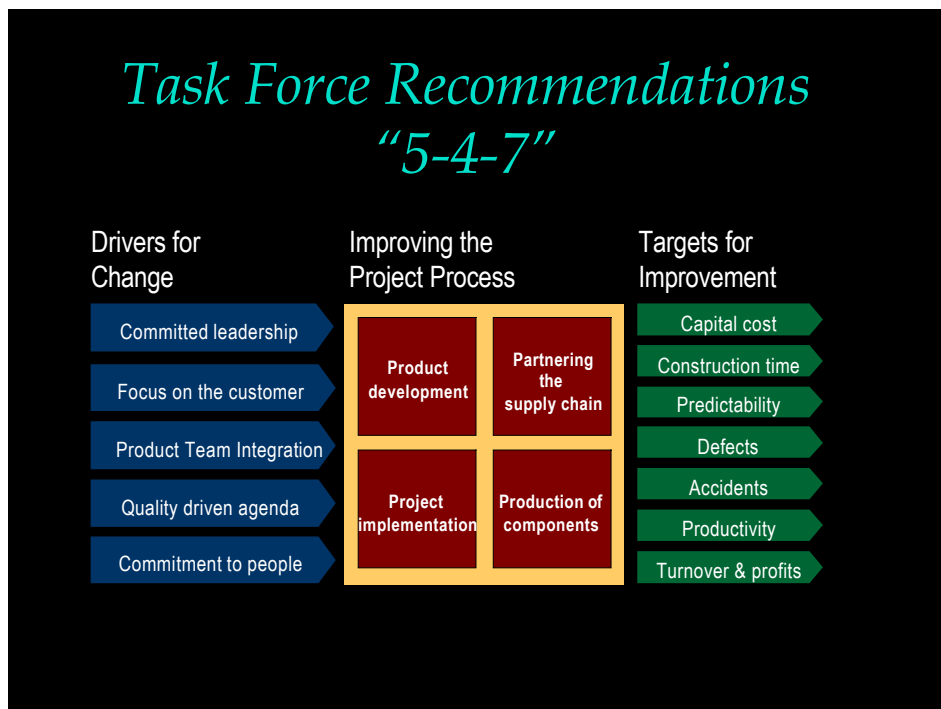


Figure 1 The 5-4-7 diagram from Rethinking Construction

*Accelerating Change* calls for radical improvements in the construction industry and proposes a series of headline targets to help the industry improve its performance. It calls on all those who work within the industry to provide a better service and better delivered projects.

### ***Adopting the new ways of working: improving training, competence and reputation***

Construction is changing. By initiating a wide variety of improvement initiatives that affect everyone in the industry, it is becoming increasingly professional, adopting new ways of working and improving its image. Engineering consultants, just as much as other players, can benefit from participating in the change process. Through your selection procedures and working practices, you can encourage take up of new improvement initiatives and help to industry move towards a culture of continuous improvement based on regular performance measurement. You can contribute by helping to build integrated teams made up of those who honour recognized working rule agreements, who have excellent health and safety records, and who train their workforce.

*The Strategic Forum's third, fourth and fifth headline targets relate to training and competence:*

- *By 2006, 300,000 qualified people recruited and retained in the industry.*
- *By 2007, a 50% increase in applications to built environment higher and further education courses.*
- *By 2010, a fully trained, qualified and competent workforce on all projects.*

The Construction Industry Training Board CITB's Positive Image Campaign is helping construction to meet these targets. And ACBEE (Accelerating Change in Built Environment Education) has been established to ensure the industry attracts, recruits and retains sufficient graduates. ACBEE is encouraging better partnerships between the universities, the community, the industry and the professional institutions. It is helping to ensure these bodies communicate effectively with one another; that higher education courses are relevant, exciting and motivating to course applicants; and that students gain experience of multidisciplinary teamwork.

### ***Understanding the client's business needs and translating them into a brief***

Decisions taken at the outset of a project create a high proportion of the value. For a successful outcome, it is vital that all those involved in the process start with a clear understanding of business needs and the functionality required from the finished product. This is true whatever the building type. Without clarity at the outset there are likely to be changes throughout the delivery process resulting in waste, duplication, poor design and dissatisfaction for everyone involved. Designers should help clients to understand what value means for them, and the creation of value should be a focused objective of integrated teams. As a minimum designers should ensure that the project delivers client requirements.

If clients lack the requisite knowledge or skills to complete all the steps required for the successful identification and delivery of a business solution, you should help them to seek independent, expert advice on any or all of the tasks they do not feel confident to undertake themselves. They may need help for the entire process or at specific stages; for the identification of available options; or for reviews at critical points. Independent advice means that obtained from one or more client mentors who have a non-executive role and are free from vested interests in the solution proposed so avoiding conflicts of interest. Independent client advisers should be experienced professionals with substantial business and/or technical expertise in construction, property, procurement or other relevant fields.

If the review of your client's needs concludes that a construction project is the best solution, you should advise about the full range of available options for procurement, since there are many ways to procure a building each of which has advantages and disadvantages in terms of design, delivery and how risk is allocated. The costs and benefits of a building are in its occupation, and you should provide the client with evidence about environmental performance, operating costs and whole life

value rather than merely capital cost information. In 2003 CABC published a detailed client's guide to briefing called *Creating Excellent Buildings* which is available on their website: [www.cabe.org.uk](http://www.cabe.org.uk). The Constructing Excellence Resource Centre contains a fact sheet on briefing: [www.constructingexcellence.org.uk/pdf/Briefing\\_Team.pdf](http://www.constructingexcellence.org.uk/pdf/Briefing_Team.pdf).

The Strategic Forum has prepared a 'process map' (figure 1) illustrating for clients the key stages through which a project is carried out, together with a set of key steps for clients to consider when faced with a business need (figure 2). You may wish to bring these to the attention of your clients, particularly those who build only occasionally, to act as a map of the process.

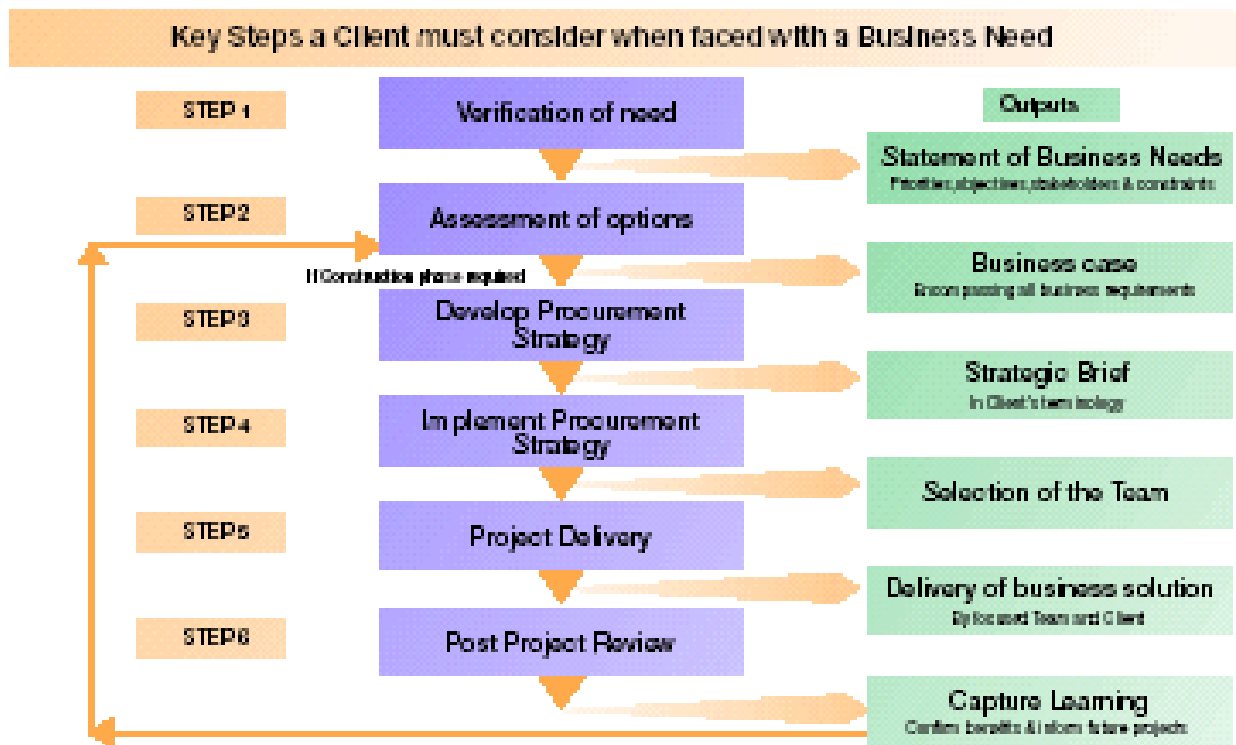


Figure 1

### **Step 1 - Verification of need**

1. Accurately identify and articulate the need.
2. Identify the key objectives and outcomes that the business wants to achieve.
3. Prioritise the objectives.
4. Identify the stakeholders.
5. Identify business attitude to risk.
6. Identify and prioritise significant constraints e.g. financial, legal, time, technology, and business change.
7. Identify internal project structure and ownership.

#### **Outcome:**

Clear statement of the business needs embracing priorities, objectives, stakeholders and constraints.

### **Step 2 - Assessment of options**

1. Develop and appraise all the options.
2. Research the learning from past experience (both your own and others experience).
3. Review the preferred option with the business stakeholders and confirm that it will deliver the business needs and objectives, is realistic and meets the requirements in relation to risk and constraints.

#### **Outcome:**

A robust business case that meets all the business requirements. If the preferred option requires a construction phase:

### **Step 3 - Develop Procurement strategy**

1. Research the options for procuring the project and determine the strategy.
2. Research the learning from past experience (both your own and others experience).
3. Confirm project performance criteria.
4. Review business plan, financial requirements and risks, and controls.
5. Confirm stakeholder commitment.
6. Confirm that the procurement approach will support and encourage good client/supplier relations.

#### **Outcome:**

Strategic Brief articulating, in the client's terminology, the project objectives, needs, priorities, constraints, budget, programme, decision making framework, measures of success and method of selection for the most appropriate delivery of the required business solution.

### **Step 4 - Implement Procurement strategy**

Implement the procurement strategy and select the team best placed to deliver the required business solution. (Throughout this process the Client, by his actions, will set the tone by which he expects the project to be delivered.)

### **Step 5 - Project delivery**

1. Validate and improve the Strategic Brief.
2. Brief the team regarding all aspects of the project (Needs, objectives, risks, constraints and stakeholders.)
3. Implement appropriate and agreed performance measurements.
4. Ensure new members brought into the team are inducted with regard to the business needs, objectives and method of delivery.
5. Make appropriate and timely decisions always referring back to and validating the project objectives.
6. Advise the business on steps to be taken for regarding the implementation and operation of the new asset.

#### **Outcome:**

Project team fully focused on delivering the most appropriate solution to meet the client's business needs within the agreed parameters and a business prepared to embrace the new asset within its operations.

### **Step 6 - Post Project Review**

1. Undertake assessment of new asset
2. Measure final delivery performance against the targets set.
3. Review project history.

#### **Outcome:**

Capture project learning to confirm benefits and to inform future projects.

Figure 2

## ***Working in accordance with the principles of the Clients' Charter***

The Clients' Charter was developed by a group of leading clients of the industry, and it sets out a series of general principles whose adoption can assist both clients and the supply side to work effectively together.

At their simplest, these principles call for clients to:

- Be clear about what is wanted from a project.
- Understand the connection between cost and quality.
- Recognise and define risk.
- Commit to eliminating waste.
- Promote co-operation and non-adversarial attitudes including early involvement of the whole supply chain where appropriate.
- Select team members on the basis of their competence and measured performance, and who will ensure fair treatment of members of the supply chain.

In return, clients may expect the supply side to:

- Inform them of the options for meeting their needs.
- Shorten and competently manage the design and construction supply chain.
- Keep them informed of project progress, including delays and cost over-runs.
- Design projects that can be built on time and to a quality that meets the client's needs.
- Help to find solutions to problems that are fair to all parties.
- Solve interface problems in the supply side.

***The Strategic Forum's second Headline Target is for 20% of construction projects by value to be procured by clients who embrace the principles of the Clients' Charter by the end of 2004, rising to 50% by 2007.***

Details of the Clients' Charter may be obtained from Achilles Information Ltd, telephone 01235 820813, website: [www.clientsuccess.org](http://www.clientsuccess.org).

## ***Planning, designing and specifying to ensure quality and value in the finished product***

*Accelerating Change* calls for the industry to deliver projects that exploit the economic and social value of good design to improve both the functionality and enjoyment of the built environment – for example, attractive work places which promote staff well-being, reduce absenteeism and raise productivity, and that contribute to corporate identity or encourage customer loyalty. In order to bring clarity and focus to the goal of better designed buildings, the Design Quality Indicator is a recently introduced web-based assessment tool that has been developed by the Construction Industry Council and others, and endorsed by the Strategic Forum. It is intended to be used by all stakeholders in a project, to help them negotiate and clarify design priorities at key stages in the process – from initial briefing and outline design, right through to occupation of the completed project.

'The DQI is a welcome innovation as it takes the guess work out of the whole design process. It focuses the team on the needs of the end user, involves all the stakeholders throughout the process and helps develop a more sustainable building. The overall result is an improved product and importantly we can learn from the process because the DQI allows us to measure how the improvements are made.' Peter Rogers, Chairman, Strategic Forum for Construction

***The Strategic Forum's sixth Headline Target is for Design Quality Indicators to be used by:***

- ***500 projects by the end of 2004***
- ***60% of all publicly funded/PFI projects (having a value in excess of £1m) by the end of 2007***
- ***20% of all projects (having a value in excess of £1m) by the end of 2007.***

Details of the Design Quality Indicator tool can be found at [www.dqi.org.uk](http://www.dqi.org.uk).

### ***Participating in integrated delivery teams***

*Accelerating Change* recommends that all those involved in the delivery process – in asset development, designing, manufacturing, assembling and constructing, and operating and maintaining – unite together as a team focusing on common objectives and the creation of maximum value based around the client's vision for the project. Integrated teams are characterised by mutual trust and openness between members of the client organisation and those of the supply team. Working in this integrated way offers a series of benefits for all parties including improved quality, better predictability of project times, reduced cost and the minimisation of risk.

*Partnering* is the process of working together as a team to improve performance through agreeing mutual objectives, devising a way to resolve any disputes, collaborating to achieve continuous improvement, and sharing risks and rewards equitably. *Strategic partnering* involves the integrated supply team and the client organisation working together on a series of construction projects in which knowledge and expertise can be transferred from one project to the next. *Project partnering* on one-off projects can still offer many of the benefits. The key principles for engineers are to:

- ensure key members of the project team are involved early on
- make engineering choices on the basis of value not lowest price
- adopt common processes such as information systems and a common IT platform
- measure performance and seek continuous improvement
- use project participants who have long-term supply chain relationships, and
- adopt a modern commercial arrangement based on target cost or target price with all parties being incentivised by sharing in efficiency gains.

Integrated teams need to devise means for managing risks and sharing rewards in ways which are equitable to all parties. Payment practices should facilitate and enhance collaborative working. Lengthy payment periods and delays in payments severely damage construction businesses, especially small and medium sized firms. In a relationship of collective responsibility, responsible behaviour and mutual interest – as characterised by integrated teams – there should be no need for payment delays or the use of financial retentions by clients.

***The Strategic Forum's first headline target is that by 2004, 20% of projects are undertaken by integrated teams, increasing to 50% by 2007.***

The Strategic Forum's Integration Toolkit contains workbooks for both Integrated Project Teams and Integrated Supply Chains, each containing practical step by step advice to help achieve integration. It is available from [www.strategicforum.org.uk/sfctoolkit2/home/home.html](http://www.strategicforum.org.uk/sfctoolkit2/home/home.html). Constructing Excellence has published a guide to Effective Teamwork which is available at [www.constructingexcellence.org.uk/resourcecentre/themes/themedetails.jsp?id=4007&track=Teamworking](http://www.constructingexcellence.org.uk/resourcecentre/themes/themedetails.jsp?id=4007&track=Teamworking). And the Institution of Structural Engineers has published a Rethinking Construction Toolkit available at [www.istructe.org.uk/news/files/RethinkingToolkit.pdf](http://www.istructe.org.uk/news/files/RethinkingToolkit.pdf).

### ***Involving the supply chain early on***

*Accelerating Change* calls for competitive tendering to be replaced with long term relationships based on clear measurement of performance, and continuous improvements in quality and efficiency. As well as participating fully in an integrated team, you should help the team to harness the potential of team members' suppliers. You should ensure that key manufacturers are part of the integrated team, and that only those who work closely with their suppliers are appointed, since the expertise of suppliers will be drawn upon in offering solutions. The integrated supply chain should reach right through to manufacturers who would not otherwise be part of the team. Integrated teams made up of established supply chains which stay together from one project to the next take experience and a culture of continuous improvement with them.

“Designers must involve the contractors, specialist sub-contractors and key manufacturers as soon as possible. In order to interpret and develop a functional brief it is essential that designers (including specialist subcontractors and key manufacturers) are able to get close to clients. Many contractors do not allow this to happen and this needs to change. Once the project is designed the advantages that can be offered by these specialists are missed.”

Institution of Civil Engineers, quoted in *Accelerating Change*

Teams made up of established supply chains which stay together from one project to the next offer a number of demonstrable business, efficiency and safety benefits. You should take the opportunity to work with the other members of the team to drive out waste at all stages; to raise productivity and to reduce project times; to reduce costs by ‘getting it right first time’; and to provide added value through working within a process protocol, not least so that health and safety risks are ‘designed out’ at source. Working with the other members of the team, you will contribute to the minimisation of risk to health and safety of all those who construct, maintain, operate and refurbish the construction product.

The principles of supply chain management are explained in the *Prime Contracting Handbook of Supply Chain Management*, parts of which are available on the web at [www.mod.uk/linked\\_files/sc-handbook.pdf](http://www.mod.uk/linked_files/sc-handbook.pdf). The full book is published by CIRIA under the title *Building Down Barriers: The Handbook of Supply Chain Management*.

### **Encouraging the team to use standard solutions**

*Accelerating Change* recommends the team to take every opportunity to benefit from the expertise of product manufacturers, suppliers and specialists, all of whom can develop solutions that involve less site processing, that reduce health and safety risks, that improve quality and reliability, and that increase standardisation, pre-assembly and pre-fabrication,. Manufacturers, suppliers and specialists can also advise on the availability of new products, and of innovative solutions which - when linked closely to design and installation - can bring real benefits. You should unlock their research and development expertise so it is deployed to deliver value and enhance the finished product.

### **Exploiting information technology by getting wired up**

E-business and virtual prototyping requires the industry to transform its traditional methods of working and its business relationships. Exploiting information technology effectively to collaborate with all the members of the integrated team can offer a number of significant benefits for engineering consultants:

- improved communication including speed of information delivery and reductions in errors and omissions
- improved business relationships from less repetitive processing of information
- raised efficiencies and skills development from knowledge management
- improved visualisation of alternative options
- economy and speed of construction
- reductions in the costs of transactions between the parties.

There are several levels at which information technology can be exploited in increasing degrees of sophistication. They include:

1. exchanging paper for electronic data exchange to increase speed of information delivery and reduce data re-keying
2. integrating electronic data within existing systems enabling you to omit redundant work activities
3. more comprehensively, re-engineering business processes around electronic document management.

The level at which you should participate will depend on the nature of the project, the capabilities of the parties, and an assessment of the scale of the resulting benefits. Ideally, an IT strategy for a project will be negotiated by the integrated team at the beginning of each project to establish agreed protocols

for exchanging information electronically. Wide-ranging advice on IT in construction is available from the IT Construction Best Practice programme website: [www.itcbp.org.uk](http://www.itcbp.org.uk).

### ***Designing sustainable projects***

According to *Accelerating Change*, sustainable construction requires a step change in the culture of the industry, characterised by clients procuring - and integrated teams delivering - sustainable construction projects, products and services. Designers need to help clients to meet their environmental and social responsibilities in relation to safety, environmental performance and sustainability. Designers should use life cycle costing methods to assess long term performance, and provide clients with information about whole life value as well as initial costs.

The ability of an integrated team to pre-plan a project through from start to finish is a prerequisite to designing in sustainability. Sustainable processes and products should not be added on to the end; they are achievable only if well integrated from the very beginning - projects must be pre-planned for ease of construction, make maximum use of standard components and processes, minimise waste, conserve scarce resources, and protect wildlife habitat and bio-diversity. The completed building should meet best practice levels of energy and water consumption targets, helping to reduce environmental pollution and tackling climate change. These actions will ensure each project enhances the built environment in a sustainable way and improves the quality of life. Pre-planning, designing and specifying projects around the goals of sustainable construction will help to ensure they achieve the triple bottom line of sustainable development by maximising economic and social value and minimising environmental impacts.

The Constructing Excellence website contains a wide variety of material about sustainable construction including a introductory briefing guide for designers at: [www.constructingexcellence.org.uk/pdf/sus\\_designers.pdf](http://www.constructingexcellence.org.uk/pdf/sus_designers.pdf).

### ***Co-ordination of the supply side, waste minimisation and the use of logistics***

At every stage, you should collaborate with the other members of the delivery team and their supply chains to analyse every aspect of the supply chain process – acquisition, delivery and transport, storage, and the flow of materials and components to their point of use. Careful planning of these activities by every member of the team will help to minimise waste, reduce the likelihood of products and components being lost in transit or damaged on site, and prevent defective work.

### ***Promoting the ‘Respect for People’ agenda***

All too often the construction industry is perceived as offering a low-skilled, unsafe working environment and in consequence has failed to attract the best people. The Strategic Forum is determined to reverse a long-term decline in the industry’s ability to recruit and retain a quality workforce. Here too, you can contribute to the new agenda. Most engineering consultants compete to recruit and retain good quality people so the issue will be familiar. And businesses of all kinds are increasingly recognising their corporate social responsibility, including the value to their business of proper attention to all the people who work for them.

*Rethinking Construction* identified ‘respect for people’ as one of its five drivers for change. A follow up report *Respect for People – a framework for action* puts forward a strong business case for action, and recommends that construction firms of all kinds and sizes should commit to achieving the standard of Investors in People. Respect for People Toolkits focus on equality and diversity in the workplace, quality of working environment, career development, lifelong learning and worker satisfaction. They are available via the Resource Centre of the Constructing Excellence website ([www.constructingexcellence.org.uk/resourcecentre](http://www.constructingexcellence.org.uk/resourcecentre)). A guide to encourage ‘respect for people’ in procurement, contract and management practices in the industry is under development by the Strategic Forum. Your support for this initiative will help construction become an industry whose workforce is appropriately skilled and qualified, benefits from a systematic programme of continuing personal and professional development, and is properly valued in the workplace.

### ***Planning, designing and specifying to protect health and safety***

*Accelerating Change* reminds all those associated with construction that the high levels of accidents and fatalities identified with the industry is no longer acceptable. A National Audit Office report by the Health and Safety Executive *Improving health and safety in the construction industry*, published in May 2004, found that many designers lack knowledge of their legal responsibilities, while others erroneously believe that they do not have any duties to the health and safety of construction workers. The full report is available at [www.nao.org.uk/pn/03-04/0304531.htm](http://www.nao.org.uk/pn/03-04/0304531.htm).

In planning, designing and specifying a construction project, you should make the health and safety of all stakeholders a business priority at the forefront of your agenda. You should establish the requirements for healthy, safe working, and ensure that your designs deliver excellence in health and safety performance. At every stage you and the rest of the team should certify that you have - as a team - considered all foreseeable health and safety risks in order to ensure that the facilities currently developed will be safe to build and safe to maintain and operate. Delivering excellence in health and safety performance will enhance your corporate reputation, and that of other stakeholders.

The Health and Safety Executive has produced a series of design guides tackling specific safety issues – such as working at height, steelwork erection and hazardous materials - which can be accessed at [www.safetyindesign.org/](http://www.safetyindesign.org/).

### ***Learning from successful projects***

Engineering consultants rarely spend enough time debriefing at the conclusion of a project. Yet post project reviews are a valuable learning opportunity for individual participants and for their organisations. Ideally, you and the rest of the project team should carry out a systematic review of the team's effectiveness, to learn from feedback and improve performance on subsequent projects, as part of a culture of continuous improvement. Examining what happened and why it happened will help your organisation to be better informed about the strengths and weaknesses of the approaches taken, the procedures followed, and the project out-turns. The examination might include the procurement route adopted, the briefing process, the appointment of team members, the conduct of the project, and positive and negative aspects of the outcome. Post-project reviews of your own past projects are also helpful to ensure you make the most of your own organisation's experience.