Modernising Construction

REPORT BY THE COMPTROLLER AND AUDITOR GENERAL
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executive summary

In this chapter

1 This report is about how the procurement and delivery of construction projects in the United Kingdom can be modernised, with benefits for all - the Construction Industry as well as clients. The construction business is worth £65 billion a year, of which direct expenditure by government departments and their agencies accounts for £7.5 billion. Government spending on construction will increase substantially following the spending Review 2000 which has doubled net public investment on infrastructure over the next three years to £19 billion to deliver improved transport, schools and hospitals. This higher level of spending on capital projects increases the urgency of the need for improvements in public sector procurement and management of new construction, refurbishment and repair and maintenance.

2 A succession of major studies **(Figure 1)** have highlighted the inefficiencies of traditional methods of procuring and managing major projects - in particular the fallacy of awarding contracts solely on the basis of the lowest price bid only to see the final price for the work increase significantly through contract variations with buildings often completed late **(Figure 2 overleaf)**. Experience has shown that acceptance of the lowest price bid does not provide value for money in either the final cost of construction or the through life and operational costs. Relations between the construction industry and government departments have also often been typically characterised by conflict and distrust which have contributed to poor performance.

1 Key Reviews of UK Construction

Constructing the Team - Sir Michael Latham (1994)

Recommended more standardised construction contracts, better guidance on best practice and legislative changes to simplify dispute resolution. Many of the legislative changes were made through the Housing Grants, Construction and Regeneration Act 1996. The report considered that efficiency savings of 30 per cent in construction costs over five years were achievable.

Levene Efficiency Scrutiny (1995)

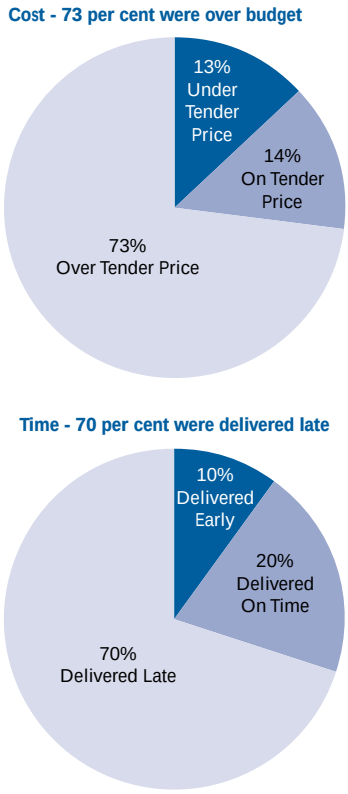
Recommended that departments should:

- communicate better with contractors to reduce conflict and disputes;
- increase the training which their staff received in procurement and risk management; and
- establish a single contact point for the construction industry to resolve problems common to a number of departments.

Rethinking Construction - Sir John Egan (1998)

Identified five "drivers" which needed to be in place to secure improvement in construction; four processes that had to be significantly enhanced; and set seven quantified improvement targets, including annual reductions in construction costs and delivery times of
10 per cent and reductions in building defects of
20 per cent a year.

2 **Performance of departments' and agencies' construction projects**



Source: Benchmarking the Government Client Stage Two Study December 1999

3 Estimates of the cost of these inefficient practices are inevitably broad brush. But studies have identified the potential for major savings - 30 per cent in the cost of construction. Specifically by industry and its clients adopting a more collaborative approach strongly founded on a competitive process with appropriate risk sharing in which value for money is obtained for all parties through a clear understanding of the project's requirements, transparency as to costs and profits, underpinned by clearly understood rights and obligations, and appropriate incentives. More attention to design and early involvement of the whole construction team could also improve the operational efficiency of completed buildings resulting in potentially greater savings over the whole life of the building.

Responsibilities:

- The Department of the Environment, Transport and the Regions has central responsibility for securing improvements within the industry and its clients.
- The Office of Government Commerce leads the promotion of improvements in the performance of departments and agencies as purchasers of construction services.

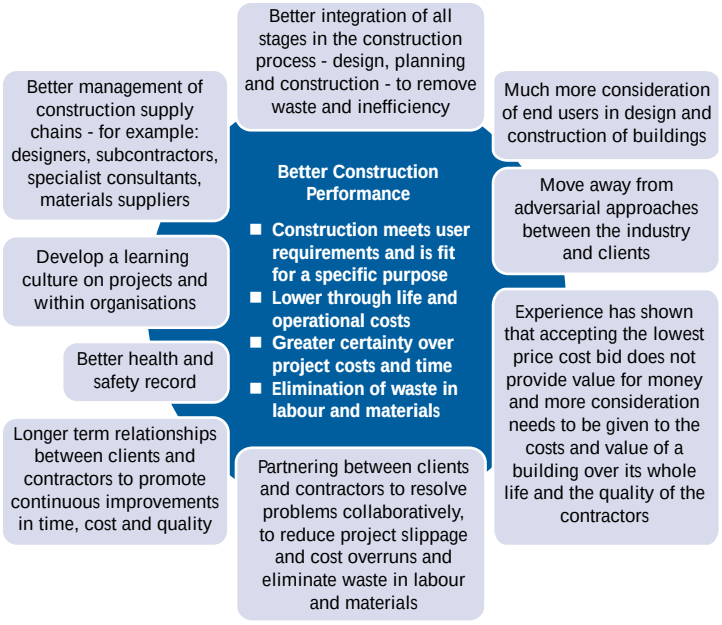
4 This report is forward looking and highlights good practice being adopted by departments and industry which if applied more widely could achieve sustainable improvements in construction performance achieving better value for money for taxpayers. We show that, through changing their approach to the procurement and management of construction, the larger spending departments and agencies estimate that they will achieve efficiency gains of over £600 million annually and improve the quality of the construction. For industry, we show that the application of best practice has the potential to lead to improved profitability compared with the current industry average of one per cent of turnover.

The challenge - Improving construction performance

5 Many reasons are given as to why construction projects are often completed late and significantly over budget - **Figure 3** summarises aspects of the management of construction requiring improvement. But all the more recent reviews agree that a significant contributory factor is the tendency for an adversarial relationship to exist between construction firms, consultants and their clients and between contractors, sub-contractors and suppliers. This is attributed in part to clients placing too much emphasis on lowest price in awarding contracts. As a result some firms have priced work unrealistically low and then sought to recoup their profit margins through contract cost variations arising from, for example design changes, and other claims leading to disputes and litigation.

6 There needs to be a greater concentration on achieving a better construction which meets the needs of the end user at lower through life costs. The entire supply chain including clients, professional advisers, contractors, sub-contractors and suppliers of materials must be integrated to manage risk and apply value management and engineering techniques to improve buildability and drive waste out of the process. This process should reduce through life and operational costs, lead to greater certainty of project time and budgeted costs, fewer accidents and more sustainable construction.

3 **Better construction performance - What is needed?**



Source: National Audit Office analysis of Latham, Levene and Egan Reports

Improving the performance of departments and contractors

(i) Departments

7 The Department of the Environment, Transport and the Regions and the Treasury (from April 2000 the Office of Government Commerce) have taken a number of initiatives to improve construction performance. These include most notably:

- The **Movement for Innovation** and the Housing Forum to promote innovation in the construction industry principally through demonstration projects selected as examples of innovation in construction practice. At 31 July 2000 there were 171 demonstration projects, the lessons from which are being disseminated through conferences, seminars and electronically on the Web.

- **Achieving Excellence Programme** to improve the performance of departments as purchasers of construction services. Key elements include the targets set for departments, agencies and non-departmental public bodies for management, standard practices, integration of supply chains and performance measurement; procurement guidance; and a series of workshops to disseminate the message that departments need to improve their construction procurement and to draw up action plans to do so. All targets must be met by March 2002.

  There are also many other organisations and networks - some privately and some publicly funded whose aim is to promote good practice suggesting some duplication. These have succeeded in raising awareness among the different parts of the industry - clients, contractors, consultants, and specialist suppliers - but there is now a need for more co-ordination and better direction of their activities.

8 As well as these initiatives, the Office of Government Commerce, departments and agencies are working to improve their performance as clients of the construction industry in four key areas: different forms of contracting; partnering; the introduction of the gateway process; and performance measurement. The Office of Government Commerce has issued useful guidance on many of these issues and others including sustainability.

4 The three main procurement approaches for central government departments' construction projects

Public Private Partnerships, particularly Private Finance Initiative projects - A supplier is contracted not only to construct a facility such as a road or prison but principally to deliver the services which the facility is intended to provide. Risks associated with providing the service are transferred to those best able to manage them. The outputs which the service is intended to deliver must be clearly defined.

Design and build - A single supplier is responsible for both the design and construction of the facility.

Prime Contracting - Whilst Design and Build makes a single supplier responsible for the design and build of a facility, prime contracting extends this basic concept very substantially. The Prime Contractor will be expected to have a well-established supply chain of reliable suppliers of quality products so encouraging the increased quality and value for money that results from an element of consistency and standardisation. As well as integrating that supply chain into the design process with contributions from key suppliers, the Prime Contractor co-ordinates and project manages all activities throughout the design and construction period to provide a facility which is fit for the specified purpose and which meets predicted through-life costs.

Different forms of contracting

- Traditional forms of contracting - tendering for each key stage in a construction project such as design, selecting the main contractor, appointing subcontractors, and awarding contracts on the basis of lowest price bid does not provide value for money in the longer term. This is because selecting the lowest price contract may result in a building or road that is more expensive to operate unless careful consideration is given to the design and likely quality of the proposed building, the methods which the contractor proposes to use to construct it, and the potential to be innovative to improve value for money. In recognition of this the Office of Government Commerce advises departments to undertake construction projects using one of three routes (**Figure 4**).

- The different forms of contracting are designed to transfer risk to those best able to manage it; to promote integration and management of all those involved in the construction process and to incentivise them to reduce costs and deliver on time; and to make departments minimise design changes and focus much more on the outputs they expect from the contract in terms of construction which better meets end user requirements. The Office of Government Commerce advises that the traditional procurement route - tendering for the design and construction separately - should be used only if a department can demonstrate that it will provide better value for money than any of the other three types of procurement.

Partnering

- Private sector clients are increasingly establishing long term collaborative relationships or partnering with construction firms for the benefit of both parties - client and supplier. The benefits include client and contractor working together to improve building design, minimise the need for costly design changes, identify ways of driving out inefficiency in the construction process, replicate good practice learned on earlier projects and minimise the risk of costly disputes. In the private sector different forms of partnering have delivered savings of between two per cent (project based partnering) and 30 per cent where strategic partnering is used in the cost of constructing buildings and the cost of partnering - setting it up and monitoring - is assessed as relatively low, adding usually less than one per cent to project costs.

- As emphasised in the research paper, which we commissioned from Professor Norman Fisher and Dr Stuart Green of Reading University (Appendix 4), partnering offers good potential to improve the performance of government departments' construction projects. We found examples of different forms of partnering being used by departments and agencies. For example, project based partnering was used in constructing the Dudley Southern Bypass[2], longer term relationships with contractors are being developed by the Highways Agency[3], and the Ministry of Defence, represented by the Defence Estates Agency[4], are using partnering to improve the management of all contractors involved in their construction supply chain.

- Partnering does not mean that departments have a cosy relationship with contractors - thus increasing the risk of less value for money and possibly fraud and impropriety. If established reliably, partnering can provide departments with greater assurance that value for money is being achieved. For example, partners should still be appointed competitively, and clear improvement targets should be set. There should be a commitment by both parties to continuous improvement and open book accounting - with departments having access to contractors' records - is key so that departments can have assurance about contractors' costs and efficiency improvements.

2 More detail is provided in Appendix 12
3 More detail is provided in Appendix 7
4 More detail is provided in Appendix 6

Gateway process

- Independent reviews at critical points (known as gates) in the procurement process are a major component of private sector best practice. In June 2000 the Office of Government Commerce introduced on a pilot basis "the Gateway process" requiring major procurements including construction to be subject to review at certain key stages, such as agreeing the business need for a project, and before a contract is awarded, by a team sufficiently independent of the project. The purpose is to ensure that the project is justified and that the proposed procurement approach is likely to achieve value for money. The process will be introduced across government in early 2001.

Performance Measurement

- Measuring construction projects' performance is essential for ensuring that planned improvements in cost, time and quality are achieved, comparing achieved performance with that of similar projects, identifying potential for doing things better, and for assessing how contractors compare with other potential suppliers. The Department of the Environment, Transport and the Regions in collaboration with the construction industry has developed a range of Key Performance Indicators covering, for example, the time it takes to complete projects, their costs and quality, client satisfaction and health and safety. The Government Construction Clients Panel and the Office of Government Commerce have developed a series of key performance indicators to measure performance during the life of a project. The system will be introduced across government early in 2001.

9 We assessed the impact which the initiatives to improve construction were having on the performance of four organisations - NHS Estates, Defence Estates, the Highways Agency and the Environment Agency - which collectively are responsible for a spend of over £5 billion a year on construction and represent the majority of new works by central government. We found that each were implementing a programme of reforms to improve their procurement and management of construction. As yet, however, it is too early to quantify the benefits being achieved and little information is available but all four organisations predict significant savings in construction costs and improvements in quality (**Figure 5**).

Contract strategies which incentivise construction firms to perform better; which require departments to consider the individual risk involved with any construction project carefully and place the risk with the party who is best able to manage it; and different forms of partnering between departments and contractors committed to continuous improvement all have considerable potential to improve the quality and cost effective delivery of central government departments' construction. To be successful, however, reliable performance measurement is needed to ensure that planned benefits are achieved and remedial action is taken quickly when performance is less than satisfactory.

5 **Estimated improvements achievable in construction performance**

Organisation	Estimate
NHS Estates	Ten per cent reduction in construction costs for the NHS as a whole and should release £300 million each year.
Defence Estates	Thirty per cent (approximately £250-300 million improvement in value for money) on the cost of constructing and running buildings annually by 2005.
The Highways Agency	At present little quantifiable information is available other than at individual project level. The Agency envisages, however, that its new strategy will deliver improvements in time, cost and quality. It is currently quantifying the benefits.
The Environment Agency	Thirty per cent (approximately £35 million) in construction costs by 2008-2009.

Source: National Audit Office analysis

(ii) The construction industry

10 The Department of the Environment, Transport and the Regions, working with the construction industry, has encouraged a number of initiatives to promote improvements in the performance of construction firms. For example, in response to a challenge from the Department of Environment, Transport and the Regions' Ministers, the Construction Client's Forum (now the Confederation of Construction Clients) has developed the Clients Charter. Clients who sign the Charter commit to three to five year programmes for improving their performance, and to measure both their own performance and that of the projects for which they are client. The Construction Industry Board, representing all sections of the industry, clients as well as suppliers, also develops policies aimed at improving construction performance such as enhancing the quality and skills of the construction workforce.

11 We asked 11 large construction firms and 17 specialist contractors and consultants (**Figure 6**) to identify the initiatives they were taking to improve the services which they provided to their customers.

6 **Large construction firms, specialist contractors and consultants consulted**

Construction firms

- Balfour Beatty PLC
- Jackson Building Ltd
- John Laing
- Kvaerner Construction Ltd
- Alfred McAlpine
- AMEC Plc
- Coulson Group Ltd
- MANSELL plc
- Morrison
- John Doyle Ltd
- Tendring Construction Ltd

Specialist contractors and consultants

- Allford Hall Monaghan Morris
- Amey Plc
- Atelier Ten
- Bennetts Associates Ltd
- Building Design Partnership
- Drake and Scull Engineering
- Edward Cullinan
- Gardiner and Theobald
- Gibb
- Halcrow
- Mace
- Property Tectonics
- Stannah Lifts Ltd
- Terrapin Ltd
- Thorburn Colquhoun
- The Cook and Butler Partnership
- WS Atkins

Specific examples included establishing longer term relationships and partnering arrangements (Balfour Beatty PLC); providing more value to customers with greater consideration of their needs (Alfred McAlpine and Halcrow); better supply management (Terrapin Ltd), learning from promoting good practice (MANSELL plc) and investing in research and development to

identify better ways of reducing the whole life cost such as maintenance of buildings (WS Atkins). There are however a number of factors which could limit improvements in construction performance.

- **Skills of the construction workforce**. Between 1994 and 1998 applications for construction related courses run by Universities for professional staff fell by 26 per cent and both contractors and consultants expressed concern that the industry is becoming increasingly reliant on a less skilled work force. There is also concern that departments' staff are not sufficiently well trained to be intelligent construction clients.
- **Information technology**. There is considerable potential to achieve efficiency improvements by improving the cost effectiveness of construction and by making much greater use of information technology to assist in the design of buildings and streamlining the management of the construction process. Our survey of how the UK compared with construction good practice overseas (Appendix 3) found that the UK was generally behind other countries in the use of information technology in construction.
- **Research and Development**. Investment in research and development in the construction industry is low. In 1999/2000, in an industry with a turnover of £65 billion, £270 million was spent on construction research and development, of this £47 million was funded by central government departments; £147 million by industry; and the remainder by other organisations (Research Councils, Higher Education Funding Council, European Union for example). However, the majority of the industry research is commissioned by the construction materials, components and systems suppliers. The industry's ability to improve and to be innovative could be impeded if it does not invest more in research and development. In Japan the top five construction companies invest one per cent of their turnover in research and development.

Procuring and Managing Construction

12 Our examination of construction projects found general recognition by departments and agencies of the importance of procuring and managing construction better and a commitment to improve. The extent to which good practice is being applied was, however, variable and was generally, better understood by those departments and agencies such as NHS Estates, Defence Estates and the Highways Agency which have large on-going construction programmes and dedicated centres of construction management expertise. Smaller Government organisations undertake a construction project only once every few years and as a result many have less experience of current good practice. Our examination identified six essential requirements for all construction projects, once the need for such a project has been established, if value for money is to be achieved (**Figure 7**).

7 Key requirements of procuring and managing construction including maintenance and refurbishment

Requirement

1. **Contractors should be selected on the basis of achieving long term sustainable value for money and not just lowest price.**

   The lowest tender price alone will not guarantee value for money over the full life of the building. Consideration also needs to be given to the quality of the design, the proposed method of construction and the likely implications for the costs of operating the completed construction over its whole life and meeting health and safety performance needs.

Illustrated by

HIGHWAYS AGENCY

Balancing quality and price

In awarding Design and Build contracts, the Highways Agency evaluates tenders on quality and price. The key elements of which are:

- The Agency gives different weightings to quality and price depending on the complexity of the project, for example, for innovative projects the split is 40 per cent on quality and 60 per cent on price (although on some contracts such as framework arrangements a weighting as high as 80 per cent was applied to quality) whereas for repeat projects or where a standard design can be used, the split is 20 per cent on quality and 80 per cent on price.
- For each project, the Highways Agency determines the key quality aspects to be assessed, for example, innovative approaches to solving issues such as embankments on motorways, and promoting health and safety.
- Tenderers have to submit the quality and price elements of their bids in separate envelopes. The quality tenders must be at or above a pre-determined threshold, before the price tender is considered.
- Only contractors who have demonstrated that they can construct roads of the right quality and within budget will be selected.

BENEFITS SECURED

The Highways Agency is able to give greater consideration to the quality of the final construction. It also means that contractors have more incentive to put forward innovative designs and cover longer term aspects such as the whole life costs of roads and environmental impact because they are aware that price will not be the only criterion by which their tender will be judged (further detail is provided in Appendix 7).

Requirement

2. **Construction design should not be a separate process but be integrated with the whole construction process so that the design team can take more responsibility for the implications of their design including cost, quality, buildability and the health and safety of those required to construct, maintain and demolish the building.**

   It is at the design stage that most can be done to optimise the value of a building to its end users. This means consulting the end users of the building in developing the design and involving the main contractor and specialist suppliers at an early enough stage to advise on the likely impact of the design on the cost and feasibility of construction and to agree realistic timetables.

Illustrated by

DEFENCE ESTATES
Delivering Estate Solutions to Defence Needs

LAING

amec

Integrating the design team - Building Down Barriers

Normal construction practice is for an architect to develop the initial building design in isolation. This can sometimes lead to problems of "buildability" - aspects of the design may be difficult to build or may not be cost effective or there may be better solutions. In Building Down Barriers, Defence Estates and their Prime Contractors - Laing and AMEC adopted a different approach to the design of two physical and recreation centres by organising their project on the basis of "supply clusters" centred around aspects of the work such as mechanical and electrical services. All those involved in a "supply cluster" participated in the design development and there was also extensive consultation with end users.

BENEFITS SECURED

The users are very satisfied with the physical and recreation centres which fully meet their specific needs. The involvement of suppliers and specialist contractors in the design also aided buildability with both projects completed early and have resulted in buildings which have lower predicted through life costs than similar buildings which are conventionally built (further detail is provided in Appendix 13).

Requirement

3. **Sufficient time should be given to planning before starting construction. Good planning involves:**
   - **Getting the construction sequence right** so as to minimise delays from key building materials not being supplied on time or one part of the construction being completed late or out of sequence.
   - **Risk assessment and management** - identifying, assessing and managing project risk from the outset for example, ensuring that key resources are supplied on time, construction is completed on time and health and safety risks to people are effectively controlled.
   - **Value management** (assessing the contribution or "value" of each part of the construction process and considering how it can be improved) to drive out waste, inefficiency and unnecessary losses from construction.

Illustrated by

DUDLEY SOUTHERN BYPASS

Benefits of planning - Dudley Southern Bypass

Considerable effort went into planning this project and no works were carried out until the team was satisfied that it knew the site conditions, the likely risks to the project and had adequate plans in place.

BENEFITS SECURED

The project was completed five months ahead of schedule and within the target cost and the budget agreed with Department of the Environment, Transport and the Regions. There are no outstanding claims on the project and the final account was in July 2000. These results were achieved despite a major enhancement to the scheme with the decision, taken after the start of the project, to construct a new Metro line parallel to a section of the road. The team altered its plans to take account of this in constructing the road. This work is estimated to have saved over £3 million on the cost of the Metro line (further detail is provided in Appendix 12).

Requirement

4. **Reliable project management needs to be in place. The characteristics of good project management are:**
   - **Comprehensive understanding** of the key stages in construction critical to its success.
   - **Detailed knowledge of risks** associated with the project and reliable contingency arrangements to manage them.
   - **Regular monitoring** of key milestones.
   - **Effective communication** and co-ordinaton of all those involved in the construction supply chain.

Illustrated by

Kingston Hospital

Good project management

Kingston Hospital and its contractor Terrapin relied upon good project management to ensure the successful completion of a sugical block within twenty weeks. This required: meticulous planning and co-ordination of the key stages of construction to ensure there were no delays to the timetable; quick and efficient information flows around all team members so that all parties had access to the information needed to carry out their tasks and decisions could be made quickly; clear allocation of responsibilities, but with joint problem solving where necessary; and daily site meetings to monitor progress and identify problems.

BENEFITS SECURED

Good project management meant that the project team was able to cope with unexpected problems, such as the discovery that site information was not accurate with previously unidentified underground services passing underneath the site. Whilst this caused a two week delay initially, the project was completed within the required timescale of twenty weeks (further detail is provided in Appendix 10).

Requirement

5. **The performance of construction projects should be measured to assess whether cost, time and quality requirements are being met and to learn and disseminate lessons for future projects.**

Illustrated by

DEFENCE ESTATES
Delivering Estate Solutions to Defence Needs

Measuring performance

Defence Estates is measuring construction performance in two ways:

- **External Benchmarking**

  Defence Estates assess the performance of the Ministry of Defence against other major purchasers of construction through participation in a number of benchmarking initiatives - the Government Clients Construction Panel, the European Construction Institute, the Business Excellence Model and the Major Contractors Group.

- **A framework for performance measurement**

  Including **core** performance measures which compare Defence projects' performance with that of the construction industry as a whole covering time to complete projects, average cost, number of defects, accident frequency, and customer satisfaction; **secondary** measures which compare different Defence Estates' projects covering the number of changes to project requirements, final cost against initial estimate, and end user satisfaction; and **tertiary** measures which are project specific and cover the achievement of targets to improve the performance of the project for example building cost reductions, and lower maintenance and operating costs, (further detail is provided in Appendix 6).

Requirement

6. **Contractors should be remunerated in a way that incentivises them to deliver good quality construction on time and to budget.**

   How contractors are remunerated will influence their performance. Careful judgement is needed to ensure that contractors have sufficient financial incentives to perform well while departments need to be confident that value for money is being achieved.

Illustrated by

ENVIRONMENT AGENCY

Agreeing a target price - The Environment Agency Beach Management Project

The Environment Agency has contracted with three major dredging companies to provide all its beach defence works on the south and east coasts for five years. Instead of setting a fixed price for the work, the Environment Agency, after detailed negotiations on costs, agreed a target price for each package of work incorporating year on year improvements. The contractor is incentivised to perform better than the target price by receiving an equitable share of any savings or by paying part of any costs over the target price.

BENEFITS SECURED

The five year contract is not yet complete but the Agency has seen substantial cost improvements on historic benchmark costs and is on target to make the planned savings of 15 per cent within the five years (further detail is provided in Appendix 8).

Recommendations

13 We make the following recommendations to four key groups: the Department of the Environment, Transport and the Regions, the Office of Government Commerce, line departments commissioning construction projects and the Construction Industry itself:

The Department of the Environment, Transport and the Regions

- **Provide more co-ordinated direction to initiatives to promote better performance by the construction industry**. The Department has promoted several initiatives, including disseminating good practice, which have been successful in winning the support of the construction industry to change their working practices to improve their performance. There is, however, evidence of some duplication in these initiatives and those of the many industry bodies promoting improvements. It may be that it is necessary to communicate with such a large, diverse industry in many ways but some members of the construction industry reported to us a sense of confusion about the best source of assistance and where to devote their time to facilitate the most improvement in their company or organisation. It is essential that all the sectors of industry know what they need to do to improve and how and where to get advice to do so. The Construction Industry Board now has responsibility for providing strategic leadership to the improvement programme as part of its expanded remit and in working with the Department it should as a priority give more co-ordinated direction to the industry improvement programme.

- **Uses it's influence as a member of the Movement for Innovation Board to ensure that demonstration projects are truly innovative**. Demonstration projects as part of the Movement for Innovation programme have been an efficient way of alerting the construction industry to good practice and innovation. To promote widespread interest the Movement for Innovation team initially accepted all suggestions for demonstration projects put forward by the industry. Not all projects however were truly innovative. The Movement for Innovation Board is tightening the criteria but in the future should ensure that not only are the projects truly innovative but that they can also measure their performance.

- **Develop more sophisticated performance measures**. The Department working with the construction industry has developed and promoted key performance indicators to measure construction performance. These measures have been generally successful in raising firms' awareness of the need to assess their performance in delivering construction services to clients and to benchmark their performance against other suppliers. These measures are an important first step but now require further development. For example, indicators are needed to measure:

  - **the operational - through life - running costs of completed buildings** to determine whether efficiency improvements which the original design was intended to deliver were achieved and to learn lessons for the future;

  - **the cost effectiveness of the construction process** such as labour productivity on site, extent of wasted materials, and the amount of construction work that has to be redone;

  - **quality of the completed construction** and whether it is truly fit for the purpose designed and if not what are the lessons for the future; and

  - **health and safety indicators** that are measures of success rather than just failure.

The Office of Government Commerce

- **Disseminate good practice more widely**. The large purchasers of construction such as NHS Estates, the Ministry of Defence and the Highways Agency accept the need to improve their procurement and management of construction and have action underway. Other departments and agencies may only have a construction project every few years but most will have an on-going repair and maintenance programme. Many departments also fund building projects indirectly through grants, for example, the Department for Culture, Media and Sport covers a number of bodies which distribute funds for capital projects such as the Sports Council and Arts Council. The extent to which these smaller organisations and those receiving funding indirectly understand and apply good construction practice is variable. It is important that the Office of Government Commerce's initiatives to promote good practice reach these bodies.

Line Departments

- **Actively measure improvements in construction performance**. Successive independent reviews have emphasised the considerable potential to improve the quality of construction and to reduce costs. Sir John Egan's Report Rethinking Construction estimated that a reduction of 10 per cent per year in construction costs was achievable. Based on departments and agencies' expenditure on construction in 1999-2000 this is some £750 million. These are, however, only construction cost savings - the savings in the cost of running a building over its whole life are likely to be greater if designs placed more emphasis on improving the operational efficiency of completed constructions.

- Improvements will be achieved only if **(i)** the good practice initiatives promoted by the Department of the Environment, Transport and the Regions and the Office of Government Commerce are actively and widely implemented by departments; **(ii)** departments have reliable systems for monitoring and measuring the achievement of these benefits and in particular costs savings. In the Annex to this executive summary we have set out some key questions which departments need to consider in order to quantify improvements in construction performance; and **(iii)** departments and agencies also have a role to play in ensuring that good practice initiatives are disseminated internally and implemented.

- **Train more staff to be effective construction clients**. Procuring and managing construction requires expert and specialist skills as reflected in the Treasury's Procurement Guidance number 1 which sets out the role and skills requirements of project sponsors. The Office of Government Commerce has developed a training programme for project sponsors - those who represent the department as client in all relations with contractors. By January 2000, 100 out of approximately 950 project sponsors had attended the training. Departments should ensure that all staff involved in procuring and managing construction attend appropriate training.

The Construction Industry

- **Make greater use of innovation to improve public sector construction**. The construction industry including consultant architects, engineers, quality surveyors and project managers, has much to gain from the initiatives underway to improve how departments procure and manage construction. Remuneration on the basis of a target price with opportunities to share in efficiency gains; greater responsibility for building design; longer term relationships; and partnering with a commitment to continuous improvement if implemented widely by government departments will provide contractors with opportunities to earn a reasonable return from government construction projects and should make it easier for them to estimate final costs. The construction industry for its part should continue to support and promote initiatives to improve its performance. And in particular make greater use of innovation drawing on their private sector experience to improve the quality and cost effectiveness of public sector buildings.

Annex

Key questions for line departments and agencies to consider in quantifying improvements in construction performance

1 A number of independent reviews have emphasised the considerable potential to improve the performance of government departments' construction projects and to reduce construction costs by 10 per cent. For this to be achieved departments need to consider cost savings and quality improvements at a very early stage in a construction project and to monitor and measure their achievement. To do so departments need to consider the following questions:

In assessing the need for construction

- Is there a need for the project at all?
- How should the need be fulfilled, for example a new construction, refurbishment of an existing structure or renting?
- How does the cost of the proposed building compare with the cost of other buildings constructed for a similar purpose?
- If the cost of the proposal is more, how is this justified?

In assessing the procurement strategy

- Has the most appropriate procurement strategy been chosen - public private partnership, design and build, prime contracting or traditional?

In assessing the likely operational running costs of the proposed construction

- What are the likely - whole life - running, maintenance and other support costs of operating the proposed building including disposal costs (a quantified estimate should be prepared)?
- How do the proposed running costs compare with costs for existing buildings and other comparable constructions. If costs are higher how are they justified?
- Has the whole design and construction team been assembled before the design is well developed?
- Is supply chain integration being achieved from the outset of the design process?
- Has the design given sufficient consideration to optimising the operational efficiency and effectiveness of the completed construction and have these improvements been quantified?

In assessing the contract strategy

- Have efficiency and cost improvement targets been agreed with the contractor and quantified?
- Have incentives been included in the contract to encourage contractors to perform well?
- Have the benefits to be delivered been quantified before incentive payments will be paid?

In assessing the proposed method of construction

- Have appropriate techniques been used such as value management and value engineering[5] to determine whether the potential for waste and inefficiency has been minimised in the method of construction?
- Have efficiency improvements, to be delivered by the construction process, been quantified?

A baseline is needed against which to measure achieved performance

2 In demonstrating the achievement of improvements in construction, performance at baseline cost should be set for the following:

- Total investment required to complete construction - fit for purpose.
- Cost of the construction - the building process.
- Whole life running costs of the completed building.

Baseline costs should be validated through comparisons with external benchmarks

3 Building costs should be justified, through benchmarking with some external comparator on historic data on existing building costs and performance, to demonstrate the value for money which the new project will deliver.

Achievement of improvements should be carefully monitored, measured and publicised

4 Having set cost reduction, efficiency and quality improvement targets, these need to be monitored regularly. If progress in meeting these targets is not as planned remedial action should be taken. Performance in achieving the targets should be quantified and reported to senior management.

Summary

Baseline costs	Action needed to validate them	When to measure
Total investment required to complete the building fit for purpose.	Benchmarking with existing and comparable buildings.	Baseline cost should be set when the need for construction is agreed and revised once a firm contract is in place. Final cost should be compared with baseline.
The cost of the construction process.	Assurance that techniques such as value engineering have been used to drive out waste and inefficiency.	Baseline should be agreed before construction begins, monitored and final cost compared with baseline and reported to senior management.
Whole life running cost of the completed building.	Comparisons with performance of existing buildings and industry norms.	Baseline should be set in agreeing the building design and monitored once the building is operational to ensure the improvements are realised.

5 *Value management or engineering - The assessment of the contribution or 'value' of each part of the construction process and considering how it can be improved to drive out waste and inefficiency from construction.*