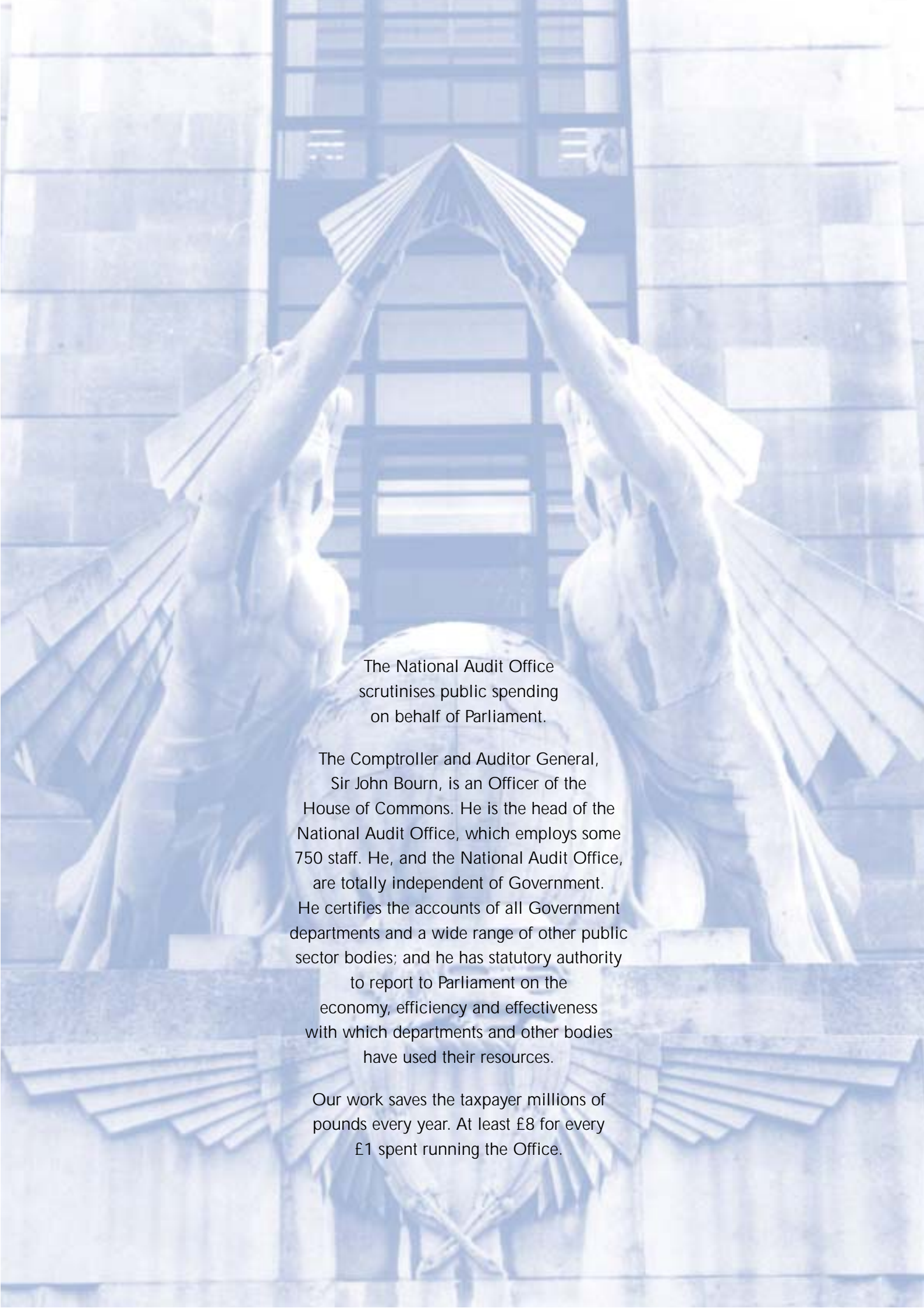


# PFI: Construction Performance

REPORT BY THE COMPTROLLER AND AUDITOR GENERAL  
HC 371 Session 2002-2003: 5 February 2003





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# PFI: Construction Performance



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This report has been prepared under Section 6 of the National Audit Act 1983 for presentation to the House of Commons in accordance with Section 9 of the Act.

*John Bourn*

Comptroller and Auditor General

National Audit Office

31 January 2003

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# Summary

- 1 The Private Finance Initiative (PFI) is being used to procure many projects involving construction of assets which are needed to deliver public services. Up to December 2002 PFI contracts had been let for 25 major hospital schemes, seven prisons, nine roads and a number of other projects such as departmental office accommodation and training facilities. The Office of Government Commerce (OGC) has central responsibility for promoting good practice in public sector construction projects. It is also responsible for the central development of PFI policy. These two areas overlap in those projects where a service procured under the PFI requires the construction of an asset, such as a road or building.
- 2 This report examines the construction performance achieved in PFI projects so far. It focuses on three key areas of construction: price certainty for departments; timing of construction delivery; and the quality of design and construction. To gather evidence on experience to date we carried out a census of all English PFI construction projects let by central government,<sup>1</sup> which were due to have been completed by Summer 2002. The methodology we adopted for this study is set out in Appendix 1. In summary:
  - we tested the hypothesis that PFI will deliver price certainty for departments and timely delivery of good quality assets;
  - our census of projects generally supported the hypothesis, though it is not possible to judge whether these projects could have achieved these results using a different procurement route.



## The hypothesis is that PFI will deliver price certainty for departments and timely delivery of good quality assets

- 3 Under a PFI contract the same private sector party, usually a consortium of companies, is responsible for delivering the required service over the whole life of the contract. In PFI accommodation projects, such as hospitals or prisons, the construction element typically represents around 25 to 30 per cent of the total value of the contract. But other project costs, such as maintenance, will be influenced by the quality of the construction work. In theory, PFI incentivises the consortium to:
  - estimate the full cost of constructing and maintaining built assets when pricing the contract, as the consortium will not be able to recover unforeseen increases later by claiming them back from the department;
  - complete the construction element as soon as possible because the consortium does not begin to receive payments until the asset is ready for use and the service is being delivered;

<sup>1</sup> This includes all completed NHS hospitals for which contracts are let locally by NHS Trusts, but not schools contracts, which are let through local authorities.

- achieve good quality construction as the consortium is obliged to maintain the building to agreed standards throughout the life of the contract, and failure to do so can result in payment deductions or financial damages. This incentive encourages a 'whole life' approach to construction as longer term costs can be reduced by building to higher standards. This differs from traditionally procured assets, where the companies responsible for construction have no interests in the long term performance of the assets.
- 4 We spoke to a number of major PFI contractors, construction industry bodies and academics. They confirmed that these are the incentives which, in theory, are provided by the PFI approach and considered that they are generally working in practice. The incentives were leading to improvements in built assets through the better integration of design, construction and maintenance, leading to the better management of construction cost risks.

## The census of projects generally supported the hypothesis

### Price certainty

- 5 Our census showed that most PFI projects were delivering price certainty to departments with 29 out of the 37 projects surveyed reporting no construction related price increase after contract award. Where there had been a price increase it had been due to changes led not by the contractor but by the department or other parties. The price changes mainly related to further work, which had not been part of the original specification, on additional or improved facilities or changes to the function of a building. But construction cost increases had been mainly borne by the consortium with no increase to the department's payments. This, together with the fact that there has been publicity of some construction companies incurring losses on certain PFI work, is evidence of risk transfer working. Construction companies say that risk transfer is also working in that it places pressure on them to manage risks more effectively.
- 6 The census results compare well with historical experience of construction contracts in the public sector. In our 2001 report 'Modernising Construction' (HC87, Session 2000-01) we reported that some 73 per cent of departments' and agencies' construction projects had run over budget for the public sector. In our PFI census only 22 per cent of those surveyed had overrun (see Figure 1). These price increases were generally relatively small and not due to the consortia charging more for the work originally specified.

**1 Improved project delivery under the PFI**

	Previous experience (1999 Government survey)	PFI experience (2002 NAO census)
Construction projects where cost to the public sector exceeds price agreed at contract	73%	22% <sup>1</sup>
Construction projects delivered late to public sector	70%	24% <sup>2</sup>

**NOTES**

- None of the increases in PFI price after contract award were due to changes led by the consortium alone. For example, in some cases the department changed some of the specifications from those for which the consortium had bid, so the price increased to reflect the changes. Some of these specification changes arose due to new factors affecting the department's needs after contract award. These changes would also have led to price increases under traditional procurement.
- In only eight per cent of PFI projects surveyed was the delay more than two months. No comparative data for this statistic are available for traditionally procured projects. Previous studies of traditional projects had referred to the percentage of time overruns rather than the number of months.<sup>2</sup>

Source: National Audit Office

- Where prices had increased, we found that departments had carried out benchmarking in less than half the cases to satisfy themselves that the price increase was reasonable. This is important as such changes take place without competitive pressure. Further, as PFI building contracts are often for 25 or more years, departments may find they need to change or add to the built asset during the contract period. Where they do so it is important that they have procedures in place to demonstrate that the pricing of the change is value for money.
- This report has focused on the delivery of PFI construction projects to the public sector. As noted above, the private sector experience is that risk transfer is working. But the available information on the level of rewards to construction companies from PFI work is limited and rather mixed. Whilst these issues have not been the focus of this report we hope to return to them in future reports.



<sup>2</sup> The 2002 Mott MacDonald report found that traditionally procured standard building projects examined had taken between one and four per cent longer to complete than expected at business case stage, before contract award. Standard buildings are those not requiring special design considerations. Non-standard buildings examined had taken between two and 39 per cent longer. Non-standard buildings involve special design considerations and may include specialist hospitals, innovative prisons, high technology facilities, other unique buildings or refurbishment projects. The 1999 report, Benchmarking the Government Client found that construction programmes overrun by an average of 13 per cent compared to the tender stage.



## Timing of delivery

- 9** We found that 28 out of the 37 PFI projects surveyed were delivered on time or earlier than specified in the contract. Only two construction projects that were due to be completed were unfinished at the time of our survey (Summer 2002), and the construction of one of those has since been completed. Of the nine that were not delivered on time, six were delayed by two months or less (Figure 1). Where PFI buildings have been delivered late, departments have been able to defer payments, make payment deductions or seek damages.
- 10** This result is also an improvement over previous public sector construction experience. In our 2001 'Modernising Construction' report we found that some 70 per cent of central government's construction projects were delivered late. Some of the improvement under PFI may be because specifications are often worked out in greater detail and cost and time targets are set later in the procurement process than under traditional procurement. This reduces uncertainty in the process.

## Quality of design and construction

- 11** Most public sector project managers surveyed were satisfied with the design and construction of their PFI buildings. They were also mostly satisfied with the performance of the building. However, it was more difficult to obtain a view of user satisfaction. Formal user surveys had been undertaken by departments in only four of the projects surveyed, although in around half of the projects the departments had gathered informal feedback from users. Where formal user surveys had been undertaken the feedback from users was generally favourable.



- 12 Interviewees said they felt that procuring departments were putting more emphasis on design quality and aesthetics in more recent PFI projects than had been the case in earlier projects. They felt it was important for departments to make the importance of design quality clear to bidders to emphasise that the department was not simply looking for the lowest cost bid. The OGC has worked with the Commission for Architecture and the Built Environment (CABE) to develop recommendations to ensure design best practice in all large government capital programmes.<sup>3</sup>

It is not possible to judge whether these projects could have achieved these results using a different procurement route

- 13 There have been a number of changes and initiatives in the construction industry in recent years which aim to improve construction results regardless of the form of procurement. These include encouraging closer working between clients and consortia, and setting targets for improvements in construction performance. There is also the Achieving Excellence Programme, which aims to improve departments' performance as procurers of construction. Finally, there are different procurement routes, other than PFI, such as design and build and prime contracting, which also aim to improve value for money in construction.

- 14 This report, and our census, focused on post-contract construction experience in the PFI projects considered. We did not set out to examine the value for money of the deals. This has been covered by many of our previous PFI reports. Nor did we try to judge how well the construction element would have been performed had the contracts been let using other procurement methods. The positive results of our census do, however, generally compare favourably with the results of other studies which have considered the historical experience of other public sector construction projects. For example, 'Modernising Construction' (HC87, Session 2000-01), Mott MacDonald: 'Review of Large Public Procurement in the UK', July 2002, Agile Construction: 'Benchmarking the Government Client', 1999.



<sup>3</sup> *Improving Standards of Design in the Procurement of Public Buildings* (published 2002).

# Recommendations

- 15 This report has shown that there is strong evidence that the PFI approach is bringing significant benefits to central government in terms of delivering built assets on time and for the price expected by the public sector. In future projects departments need to weigh the prospect of such benefits in the balance with the other advantages and disadvantages of using the PFI or alternative forms of procurement.
- 16 As a result of this examination we make the following additional recommendations:
- A The OGC should prepare updates of the statistics which have been presented in this report on the extent to which PFI projects are being delivered on time and to the cost expected by the public sector. These are important measures of the private sector's performance in PFI projects. The data are relatively easy to collect and provide a valuable insight into how well projects are being delivered under the PFI.
  - B Departments should assess the extent to which it is possible to use the lessons of the PFI approach to improve the delivery of projects using other forms of procurement. PFI construction companies are incentivised to perform because the consortium they belong to will not be paid until the required service is being delivered, but there are also other positive features of the PFI approach which could be applied to conventional construction projects. These include clearer statements of requirements before setting timescales and budgets.
  - C As part of their ongoing relationship aimed at improving the built environment, the OGC and CABE should publicise good examples of design and construction in PFI projects, in conjunction with departments and the private sector. Making examples of good practice available within both the public and private sectors will help to stimulate further innovation in future PFI projects.
  - D Departments should carry out user surveys as part of their post-contract evaluation of PFI projects. User surveys are a valuable way for a department to gather information about how well a built asset is operating. A user survey may identify problems and issues which the department needs to discuss with the consortium. Users' experiences can also be used to inform the development of future projects involving similar assets. In particular, users can make valuable input to the design stage.

# Part 1

## The hypothesis is that PFI will deliver price certainty for departments and timely delivery of good quality assets

1.1 This part of the report sets out the hypothesis that we tested in our census of PFI projects. PFI procurement is intended to incentivise consortia to deliver the built asset on time and at no additional cost to the procuring department. PFI also aims to deliver high quality built assets in order to reduce longer term costs to the consortium. Expert opinion supports the conclusion that the incentives are working.

### PFI incentivises a consortium to take a longer term approach to design and construction

#### The consortium is responsible for assets and services over a long period

- 1.2 The contractor to a PFI contract involving construction of a built asset is nearly always a company specially established to carry out the contract, referred to as a special purpose vehicle. The shareholders of the consortium will usually comprise several companies, often including a construction company, and a facilities management provider. The consortium may also employ the services of a design company.
- 1.3 This arrangement means that the same partners are potentially involved in a long term relationship over the whole contract life. If they are shareholders in the project they have a long term financial interest in the project. This differs from traditionally procured assets, where construction companies usually have no interests in the long term performance of the assets.<sup>4</sup>

#### The PFI aims to encourage better integration between design and construction

- 1.4 The construction and design companies in a PFI consortium have an incentive to work together at an early stage of the bidding process to decide the best way to deliver the required service over the contract life.

Historically under traditional procurement, the design and construction elements tended to be undertaken separately. This often led to problems in implementing the design during the construction phase, which meant that the design had to be revisited, leading to many variations to the asset design. There were often increased costs and delays as the different companies attempted to resolve the problems.

- 1.5 By integrating the design and construction elements, bidders are encouraged to take a longer term view of the design of the asset. For example, by designing and building the asset to a standard that will reduce maintenance costs throughout the contract period the consortium can reduce its long term costs while ensuring that it meets the department's service requirements.
- 1.6 Consortium members know they are in a long term relationship with each other. This relationship encourages the consortium members to work together as failures by any consortium member would have to be dealt with to avoid any reduction in the rate of return for the consortium as a whole. As a result, there tends to be greater co-operation between the design and construction companies than has sometimes historically been the case under traditional procurement.

### PFI incentivises the consortium to deliver the built asset to budget and on time

#### Payments are fixed in the contract, which encourages accurate assessment of costs and risks

- 1.7 The level of payments for the specified service is set out in the PFI contract. Payments may only then change in limited circumstances. Payments may change where they are linked to an inflation index or may be varied where the department requires a change in the service

<sup>4</sup> By traditional procurement we mean the practice of tendering for each key stage of a construction project such as design, construction and the subsequent facilities management. In traditional procurement contracts were often awarded on the basis of the lowest priced bids rather than on the basis of all aspects which might affect value for money.

previously agreed in the contract. However, they cannot be increased as a result of an unforeseen increase in construction costs for which the consortium bears the risk, for example, increased costs for larger foundations due to poorer ground conditions than expected.

- 1.8 The consortium is therefore incentivised to estimate the full costs of construction, including allowances for risks when pricing the contract as it will not be able to recover unforeseen cost increases later by claiming them back from the department.

### Paying for services when delivered under most PFI contracts encourages timely delivery of the asset

- 1.9 Payments do not usually start until the asset has been built and passed for use and the consortium is delivering the required service. For some projects a part payment may be made for other services being provided before the building is complete.

- 1.10 In theory, the payment mechanism incentivises the consortium to complete the construction element as soon as possible in order to receive payments. Because the consortium's funders have money which is at risk in the project they too will be concerned that the consortium should progress the project promptly so that the consortium starts to receive income from the project. The funders will also scrutinise the consortium's plans for the project very carefully before finalising the financing arrangements. The funders will wish to be satisfied that the consortium has identified, and can manage efficiently, all likely project risks. This pre-contract scrutiny of PFI projects by the external funders is an important factor which increases the likelihood of PFI projects being delivered on time and to the cost expected by departments.

- 1.11 Because of these incentives construction work in PFI projects may sometimes be completed ahead of schedule. While there may be occasions where it is in a department's interest to receive a built asset early if the construction work is ahead of schedule the OGC guidance on standard contract terms<sup>5</sup> notes that:

- Departments should only accept early service commencement and payment of any relevant bonus if it offers value for money. Early service commencement may clearly prove good value for money if there is critical demand for the service or if it would benefit the department financially;

- The contract must specify what happens if the contractor is able to provide the service earlier than the planned service commencement date. The department should not be obliged to make any payment before the planned service commencement date unless it has agreed in the contract to accept earlier service commencement.

## The whole life cost approach under PFI encourages good quality design and construction

The consortium is responsible for maintaining the built asset, which incentivises it to build the asset to good quality

- 1.12 Under PFI, the consortium is obliged to maintain the building to agreed standards throughout the life of the contract, and failure to do so can result in payment deductions. This incentivises the consortium to integrate input from its design and facilities management elements into the construction process.

- 1.13 The consortium considers the whole life cost of the asset, which can lead to higher construction standards in order to reduce the need for longer term maintenance throughout the contract. Higher standards may initially cost the consortium more to construct the building, but will reduce the maintenance costs over the life of the contract. This also reduces the risk of payment deductions due to unsatisfactory service through maintenance failures.

## Expert opinion and experience support the conclusion that these incentives are working

Industry experts believe that there is better integration between design and construction and risk transfer is being achieved

- 1.14 We discussed recent construction experience with a number of major construction companies, construction industry bodies and academics. They confirmed that in their views PFI consortia are taking a long term view of contracts. In their experience, the design, construction and maintenance companies of PFI consortia are working closer together to protect their long term interests.

1.15 In line with the hypothesis outlined above, interviewees told us that PFI financial incentives were indeed very important in encouraging on time delivery of good quality projects, with no price increases to the department. The main driver behind finishing the construction on time is that payments do not commence until the service is being delivered. Construction companies told us that the risk transfer in PFI contracts encouraged them to manage construction risks effectively. There had, however, certainly been cases where they had borne cost overruns, for example due to unforeseen ground conditions or failures to accurately cost aspects of the construction work. Although the construction company, in pricing the contract, would have assumed an element of contingency for such overruns, in some cases these had been exceeded. In most cases, the overruns had not resulted in any price increase to the department.

1.16 Construction companies told us that two main factors had contributed to the greater cost certainty to the public sector achieved under the PFI. First, the terms of a PFI contract do not generally allow for any post-contract price increase for the services specified in the contract. Second, in order to raise private finance for a long term PFI contract, there has to be clarity for the funders over the nature of the work to be undertaken. Construction companies considered this had imposed a discipline on departments to think through the scope of the projects and to develop clearer output based specifications. The improved specifications reduced the need for post-contract variations to the work required which had contributed to price increases in previous public sector construction projects.

1.17 In some cases, there had been early problems with the built asset, leading to a failure to deliver the agreed service. However, the construction companies told us that the financial incentive of service payment deductions had generally resulted in the problems being

rectified quickly and at no additional cost to the department. Construction companies, and other industry experts we spoke to, considered PFI contracts were, therefore, achieving risk transfer and delivering price certainty to departments.

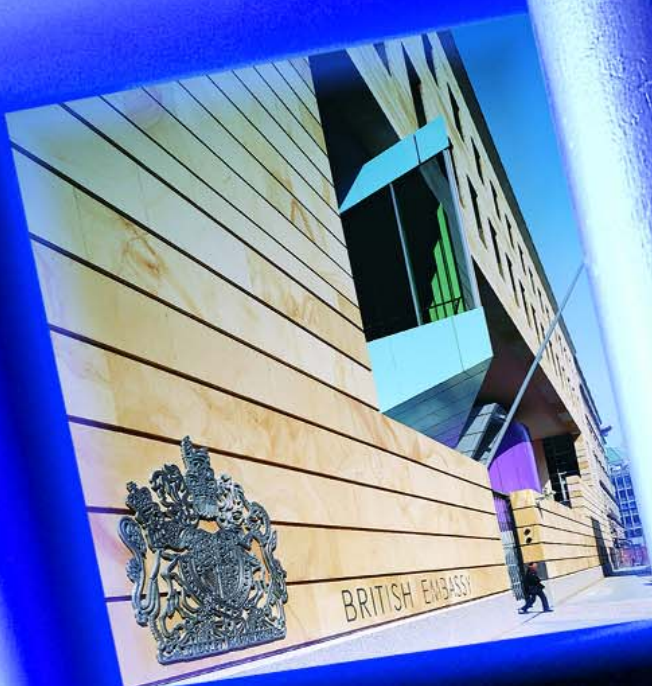
## The industry experts consider that PFI is starting to deliver good quality buildings

1.18 Industry experts felt that the PFI process encouraged a whole life costing approach. They were aware that consortia were investing in good design and construction at the start of the contract. This allowed them to achieve better quality building and to save on maintenance costs and reduce the risk of payment deductions later in the contract, while maintaining the asset to the standards agreed in the contract.

1.19 Interviewees also said they felt that procuring departments were placing greater weight in their bid evaluations on the aesthetic aspect of design in more recent PFI projects than had been the case in earlier projects, while recognising there is often a trade-off between this aspect and construction costs. They felt that it was important that departments made clear to bidders the importance of design quality to emphasise that the department was not simply looking for the lowest cost bid. Additionally, bodies such as CABE are now involved in the design aspects of bidding competitions.<sup>6</sup>

1.20 Contractors had previously told us that in most cases they are given fair scope to innovate in PFI contracts. They noted, however, certain constraints which are inherent in particular types of project. For example, road contractors felt constrained by orders and commitments made at public enquiries. Hospital and prison contractors noted the building regulations they are required to follow. Road contractors also considered innovation was restricted at the tender stage by the desire to have all bidders competing on exactly the same terms.<sup>7</sup>

<sup>6</sup> For further information on best practice promoted by CABE see Part 2.  
<sup>7</sup> *Managing the Relationship to Secure a Successful Partnership in PFI Projects (HC375, Session 2001-02).*



# Part 2

## Our census of projects generally supported the hypothesis

2.1 The results of our census demonstrate that the majority of English PFI central government projects involving construction have been delivered on time and at the agreed price to the public sector. This is better than has been achieved in the past by traditionally procured projects. Most public sector project managers were satisfied with the resulting design and build quality. However, it is not possible to judge whether these projects could have achieved these results using a different procurement route.

PFI projects surveyed delivered price certainty to the department, an improvement over historical experience

Most projects reported no change in the price after contract award

2.2 Departments need to know that the price they contract to pay for a construction related project will be the price that they actually pay. Price certainty enables departments to plan procurements effectively and to maintain the value for money they expect to achieve when letting contracts. The results of our census showed that departments were obtaining a high level of price certainty under PFI contracts, and there was little change in the payments as a result of construction related changes (Figure 2).

The census results show an improvement over historical construction experience

2.3 The 2001 NAO report 'Modernising Construction' referred to the findings of a 1999 study of central government's construction projects.<sup>8</sup> This study found that in 73 per cent of central government's construction projects the price to the public sector had exceeded the contractors' tender price and the project ran over budget

### 2 Price certainty experience in PFI projects involving construction

The Figure shows that the public sector has experienced a high degree of price certainty in PFI construction projects.

	Number of projects	Percentage of projects surveyed
No price increase after contract letting for any reason	26	70
No price increase after contract letting for any reason related to construction	29	78
No construction related price increase of over £10,000 to the annual unitary payments	31	84

#### NOTE

None of the increases in PFI price after contract award were due to changes led by the consortium alone. They mainly related to further work which had not been part of the original specification at contract award (see Figure 3). These changes would also have led to price increases under traditional procurement.

Source: National Audit Office.

to the public sector. A further report in 2002 by Mott MacDonald,<sup>9</sup> commissioned by the Treasury, found that outturn costs of the projects examined were between two and 24 per cent higher than the estimated costs in the business case for standard buildings. The range of cost overruns was between four and 51 per cent for non-standard buildings. The results of our census of PFI projects demonstrate greater price certainty for the public sector than had historically been achieved with traditionally procured construction projects. In only 22 per cent of the PFI projects surveyed had the cost to the public sector increased as a result of construction related increases and most of these cost increases were relatively small. In only six of the projects surveyed had there been an increase in the annual payments of more than £10,000.

<sup>8</sup> Benchmarking the Government Client Stage Two Study, December 1999.

<sup>9</sup> Review of Large Public Procurement in the UK, July 2002.



2.4 We have previously reported on a number of traditional public sector construction projects. These have included the following reports on unusual large projects which ran into serious difficulties involving large cost overruns and time delays: Cost overruns, funding problems and delays on Guy's Hospital Phase III Development (HC 761, Session 1997-98), Progress in completing the New British Library (HC 362, Session 1995-96), and Construction of the Southampton Oceanography Centre (HC494, Session 1997-98). We have also reported on other more conventional projects where there were problems with the quality of the built asset: Construction of Quarry House (HC333, Session 1995-96).

The PFI price increases mainly resulted from changes required by the department but these were not always benchmarked

2.5 Where there had been a construction related price increase it was mainly due to changes initiated by departments or other parties, rather than the consortium alone. For example, an alteration in the function of a building, an expansion of the building size or a change in legislation. Some of these specification changes were due to new factors affecting the department's needs, which arose after contract award. The eight projects where there had been a construction related price increase reported a total of 17 price increases. Departments were involved in initiating over half of the changes and none of the changes were led by the consortium alone (Figure 3).

2.6 Once a preferred bidder has been appointed then any price variation, whether before or after contract letting, will occur without competitive pressure. Given that PFI contracts are often for 25 years or more, departments may need to vary the contracts to take account of changing needs. This might involve commissioning additional buildings on a site or changing the use of existing buildings. Variations could result in price increases which are not value for money. In our previous report on managing PFI relationships, some public sector project teams which had experienced a decline in value for money after contract letting stated that the decline was due to high charges for additional services.<sup>10</sup>

2.7 OGC PFI guidance<sup>11</sup> deals with issues departments need to keep in mind to deal with change during the life of a PFI project. These include :

- Low price contracts may give departments little flexibility as the consortium may have little scope within the terms of the contract to absorb unforeseen changes;

### 3 Price increases after contract award?

*The Figure shows that no price increases were led by the consortium alone. Departments were involved in initiating over half of the changes. The price changes mainly related to further work, which had not been part of the original specification, on additional or improved facilities or changes to the function of the buildings.*

Price increase led by:	Number of price increases
Department	10
Consortium and/or other parties (such as local authorities)	6
Consortium and department	1
Consortium alone	0
<b>Total changes</b>	<b>17</b>
<b>Reasons for price increase</b>	
New Facilities	5
Extensions or enhancements to facilities	5
Change in function of prisons' role to take different categories of prisoners	3
Work on buildings which had not been expected to be retained	2
Refurbishment work	1
Design change	1
<b>Total</b>	<b>17</b>

*Source: National Audit Office.*

- To preserve flexibility departments should think carefully about mechanisms which will maintain value for money. These include agreed prices for defined options for additional work, agreed rates or profit margins for unspecified further work, the rights to benchmark the pricing of additional work and open book accounting;

- Changes during the construction or development phase should be kept to a minimum unless a long period of time is scheduled to elapse before the service commences.

2.8 By benchmarking the price for a proposed change against available building cost data for similar work, departments will be able to assess the reasonableness of proposed construction price increases. But in only three of the eight projects we surveyed where there had been a construction related price increase had the departments benchmarked the price increases. In the absence of benchmarking it may be difficult for departments to demonstrate that price increases are value for money.

<sup>10</sup> *Managing the Relationship to Secure a Successful Partnership in PFI Projects (HC375, Session 2001-02) paragraph 3.39.*

<sup>11</sup> *OGC revised standardisation of PFI contracts (July 2002).*

## Construction cost increases were borne mainly by the construction companies

- 2.9 Six of the 27 public sector project teams that commented on construction cost increases were aware that construction costs to the construction company had increased above those estimated when bidding for the contract. In practice, the incidence of construction costs exceeding construction companies' initial budgets may be higher than was reported to us. Unless there are open book accounting arrangements in place, departments may not be aware of increases in construction costs. If these are incurred in fulfilling the original specification, they will not affect the level of payments made by departments. The construction companies we spoke to had all experienced cost overruns on some of their PFI projects.
- 2.10 Only three public sector project managers were aware of the scale of increases in the construction company's construction costs. Two reported cost overruns of between 11 and 25 per cent, and one reported an increase of less than 10 per cent.
- 2.11 Reasons for construction cost increases included weather conditions, unforeseen ground conditions, labour problems, and changing building regulations. These are common reasons for increased costs under traditional procurement that historically have been wholly or partly borne by departments. Under the PFI these cost increases have been generally borne by the construction companies. Where there have been price variations in respect of construction cost increases these have mainly related to changes initiated by departments or other parties (paragraph 2.5).
- 2.12 There have also been media reports stating that some PFI building contractors have suffered financially from the costs of bidding for PFI contracts or from losses incurred on particular PFI building projects. In particular, Laing Construction was sold in 2001 following large losses. The Chairman's statement in Laing's 2001 Interim Report stated that the National Physical Laboratory redevelopment PFI project was a major contributor to these losses (see paragraph 2.24).
- 2.13 The evidence from our census that construction cost increases were borne mainly by the private sector, and the publicised cases of building contractors suffering financial losses in certain PFI work, is evidence of risk transfer working. Construction companies also told us that, although they had indeed borne cost overruns in some projects, the risk transfer to them inherent in PFI projects was generally leading them to manage risks more effectively. They saw this as further evidence of risk transfer working, in a way which was beneficial to the projects in which they were engaged.
- 2.14 Where construction companies are able to manage risks and complete PFI projects in line with their initial expectations, they may earn greater profits on PFI construction work than traditional construction work. The Chairman of the Major Contractors Group told the Committee of Public Accounts (PAC) in 2001 that his construction company, the Kier Group, had made returns of 2.5 per cent of turnover on PFI projects compared with one per cent on other contracts.<sup>12</sup> But he stressed that the risks were greater in PFI projects as his company had to invest several million pounds before a PFI contract could be signed and there was always the risk that the money would be lost if the deal was aborted. Similarly, Carillion plc told the PAC in 2000 that it expected higher construction profits on PFI work and had been achieving a profit margin of 2.7 per cent against turnover.<sup>13</sup>
- 2.15 Construction companies attribute the possibility of better profit margins on PFI construction work to the reward for managing the greater construction risks which are transferred to the private sector in PFI contracts. As we noted in our report on Modernising Construction<sup>14</sup>, 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. Previous experience has shown that if the price for construction work is too low contractors are likely to seek every opportunity to increase costs through claims often leading to lengthy litigation. In addition to being remunerated for construction services, construction companies may also earn returns on any funds they invest in PFI project companies as part of the financing of the project companies.<sup>15</sup> Their overall returns will also be affected by the costs they incur in making bids for PFI contracts.
- 2.16 This report has focused on the delivery of PFI construction projects to the public sector. On cost issues, the report has concentrated on whether the public sector has been paying the cost it expected to in these projects. The issues of the relationship between the rewards the private sector are earning, and the risks they are bearing, in PFI projects has not been the focus of this report. At present the available information is limited and rather mixed. But these are matters we hope to return to in future reports.

<sup>12</sup> *The PAC's report on Managing the Relationship to Secure a Successful Partnership in PFI Projects (HC460, Session 2001-02) Minutes of Evidence paragraphs 148-153.*

<sup>13</sup> *The PAC's report on the Refinancing of the Fazakerley PFI Prison Contract (HC995-I, Session 1999-2000) Minutes of Evidence paragraph 64. This information was based on Carillion's published accounts at that time. Since then, following changes in its method of reporting results, Carillion has not published comparable data.*

<sup>14</sup> *Modernising Construction (HC 87, Session 2000-01) paragraph 3.22.*

<sup>15</sup> *The OGC states that such investments should be considered as a separate arms length use of construction company funds and the returns generated should be considered alongside other sources of equity funding and not coupled with the profits on construction activities.*

Most PFI building projects were delivered by the time specified in the contract - a further improvement compared with previous procurement experience

Seventy six per cent of the projects surveyed were completed and available for use by the time specified in the contract

2.17 It is important for the delivery of public services that construction work is completed on time and built assets are ready for use by the time agreed. In PFI projects there are two phases after contract letting: the construction of the asset and then usually a short period of time during which the built asset is made ready for use. For example, a new hospital will need to be equipped before it becomes operational. Sometimes an early delivery can lead to increased costs to the department. In our report on the A74(M)/M74 Motorway in Scotland we found that the road was likely to be delivered early, resulting in a likely cost increase of £7 million. In that case the department estimated that benefits would also increase (HC356, Session 1998-99).

2.18 In 29 of the 37 projects surveyed (78 per cent) construction was completed by the time specified in the contract, and 28 (76 per cent) were ready to use by the contractual deadline. Twelve of these 28 were ready for use slightly early. In all these cases no bonus was paid for early delivery, though early payments were made as the departments were ready to use the asset at the earlier date (Figure 4).

The census results are a considerable improvement over historical experience in traditional building procurement

2.19 The NAO 2001 'Modernising Construction' (HC 87, Session 2000-01) report noted that some 70 per cent of departments' and agencies' projects were delivered late. In our census, only nine of the 37 PFI projects surveyed had been delivered later than expected at contract award, and only three of those (eight per cent of the total surveyed) had overrun by more than two months.<sup>16</sup> Some of the improvement under PFI may be because specifications are often worked out in greater detail and cost and time targets are set later in the procurement process than under traditional procurement. So departments will have assessed their requirements to a greater extent, which reduces uncertainty in the process.

#### 4 PFI project delivery experience

The Figure shows that 76 per cent of projects surveyed were ready to use on time or early. Only three projects (eight per cent) were delayed by more than two months (paragraphs 2.23-2.25)

	Construction completed	Ready for use
Early	10	12
On time	19	16
<b>Delivered on time or early</b>	<b>29 (78%)</b>	<b>28 (76%)</b>
Delayed by 2 months or less	4	6
<b>Delivered within 2 months of date specified</b>	<b>33 (89%)</b>	<b>34(92%)</b>
Delayed by more than 2 months	4	3
<b>Delayed in total</b>	<b>8 (22%)</b>	<b>9 (24%)</b>
<b>Total</b>	<b>37 (100%)</b>	<b>37 (100%)</b>

Source: National Audit Office.

2.20 Data received from the Department of Health support increasing improvement under the PFI. Of 61 traditionally procured hospital projects 75 per cent were completed later than the date expected at contract award.<sup>17</sup> Forty seven per cent were completed over two months later than expected. However, this has improved recently. Of the 19 traditionally procured hospitals delivered since March 2000, 13 were late but only four were more than two months late. In contrast, nine of the 11 PFI hospital projects in our census were delivered early or on time. The remaining two projects were delivered within two months after the expected date. The Department of Health is also introducing a new approach to PFI hospital procurement. In some cases it proposes to seek competitive tenders for a batch of new hospitals. It hopes that this approach may reduce bidding costs, improve the speed of delivering projects and achieve economies of scale in the pricing of the contracts.

2.21 Six of the seven roads projects that responded were all delivered early with no construction related increase to the annual unitary charge.

2.22 Concerning prisons, the Prison Service has also experienced good results from the PFI. All seven PFI prisons were ready to use at or before the date required by the contract. No prisons have been procured by a non-PFI route in the last ten years so there is no recent comparative data.

<sup>16</sup> No comparative data for this statistic are available for traditionally procured projects. The 2002 Mott MacDonald report found that traditionally procured standard building projects examined had taken between one and four per cent longer to complete than expected at business case stage, before contract award. Standard buildings are those not requiring special design considerations. Non-standard buildings examined had taken between two and 39 per cent longer. Non-standard buildings involve special design considerations and may include specialist hospitals, innovative prisons, high technology facilities, other unique buildings or refurbishment projects. The 1999 report, Benchmarking the Government Client found that construction programmes overrun by an average of 13 per cent compared to the tender stage.

<sup>17</sup> These 61 are varied in size and include major and minor projects. The NAO data are derived from mainly large construction projects.

## 5 Case Study

### Construction delivery on time

#### Department of Health - South Manchester NHS Trust Hospital

The construction phase of the South Manchester NHS Trust Hospital PFI was completed in 2001. It provided a new Acute Unit (319 beds) and Mental Health Unit (77 beds) and was completed slightly ahead of time and within 0.5% of its budget (based on the cost plan agreed at financial close).

The South Manchester NHS Trust Hospital PFI project director has stated that the emphasis was placed on making the output specification for the works comprehensive, detailed and robust. He believes that this level of clarity increased certainty and reduced the risk of change following financial close. There was also close consultation with clinicians with weekly meetings addressing key capital development issues and promoting information flows.

In addition, the Trust's project director notes that considerable time was spent in 'front-end planning' establishing processes and procedures. He considers that determining early a major element of the 'what to do and how to do it' issues resulted in certainty and speed of execution later. He considers that effective collaboration between the Trust and the private sector teams also enabled prompt resolution of design and construction issues.

Only three of the PFI building projects surveyed had not been completed within two months of the date specified in the contract

2.23 Nine projects were not ready to use when originally expected, but six were only delayed by two months or less. Therefore, 34 of the 37 projects surveyed (92 per cent), were ready to use within two months of the date specified in the contract.

2.24 At the time of the census, only two of the projects due to be completed were still unfinished. These are the Army Foundation College and the redevelopment of the National Physical Laboratory. The Army Foundation College was due to be completed in May 2002. The construction of the project was fully completed in November 2002. Reasons for the delays include project management and construction problems within a tight site (see case study opposite). The redevelopment of the National Physical Laboratory has been delayed whilst the PFI Contractor and the Design and Build contractor tackle the technical aspects of meeting the contractual output specifications. There have been extensive negotiations between the department (the Department of Trade and Industry), the PFI Contractor (Laser) and the builder (John Laing Construction). The building is modular and is being delivered and occupied in phases. The early phases of the project were 12 months late.

The Department estimates that final completion, which was due to have been in August 2002, is likely to be 24 months late. As this is a PFI project the Department is currently paying only where a service is capable of being provided, that is for those modules of the building which are certified complete and capable of occupation. Had this been a traditional procurement it is likely that the Department would have paid for the construction work undertaken to date regardless of whether the modules were complete and capable of being occupied.

2.25 Where PFI buildings have been delivered late, departments have been able to defer payments or seek financial damages. For example, it became apparent that construction of the British Embassy in Berlin<sup>18</sup> would not be complete by the date agreed in the contract mainly due to the need to strengthen part of the curtain walling because of regulatory changes. The Foreign and Commonwealth Office (FCO) then negotiated a new deadline and increased damages if the consortium failed to meet it. Additionally, the consortium agreed to undertake a series of minor changes collectively worth an estimated £1 million with no additional charge to the FCO. In the event, the consortium failed to meet the new deadline so the FCO sought damages under the revised arrangements. The building was completed in June 2000 compared with the original requirement of February 2000 and the revised deadline of May 2000.

## 6 Case Study

### Construction delays

#### The MOD's Army Foundation College

The Army Foundation College suffered from delays during its construction. The project was due to have been completed and all buildings occupied by MOD by May 2002, but at the time of our census (Summer 2002) some building was still incomplete, even though the majority of buildings had already been occupied by the College. The construction of the project was completed in November 2002.

Asbestos on site has played the greatest role in these delays. This problem was discovered just before contract signature and the PFI contractor considered that it would not be able to obtain funding for the project if it accepted asbestos risk. Therefore the department retained the risk and has taken full responsibility for related cost increases and programme delays. Negotiations continue on the price of the additional work attributable to the asbestos remedial work.

However, the Ministry of Defence's project manager is aware that the PFI contractor has experienced delays and cost increases for a number of additional problems on site. These have been mainly project management and construction difficulties, including the management of subcontractors.

18 See National Audit Office report 'The New British Embassy in Berlin' (HC 585, Session 1999-2000).

## Most project managers were satisfied with the design and construction

2.26 Good quality design is important to achieving high quality public buildings. Design development costs are likely to be small in relation to the whole life operating costs of a building project but the design process can have a large impact on the total project costs. PFI incentivises the consortium to invest in good quality design and construction as this can reduce whole life costs. Departments are placing more weight on the aesthetic aspect of design, while realising there is often a trade-off between this aspect and construction costs. The Treasury places importance on good design in public buildings and commissioned a review by the Commission for Architecture and the Built Environment (CABE) and the Office of Government Commerce. This review resulted in a report published in October 2002 'Improving Standards of Design in the Procurement of Public Buildings'. The report includes recommendations to assist the development of good design in public buildings.

2.27 We asked the PFI project managers we surveyed to report the assessment by the project team and the department of both the design and build quality in their projects (Figure 7 and Figure 8).

2.28 In over half the projects, the department and project managers rated design and build quality as good or very good. An example is described in Figure 9. In our census, the project director for the building development at South Buckinghamshire NHS Trust stated that the project team rated the design quality as adequate with some design features considered poor by the individual hospital departments. This was because there had been certain design issues which have been unpopular with patients and visitors (see case study, Figure 10). Therefore the design could not be considered adequate in all respects. But overall the Trust is in general very satisfied with the new developments and the majority of views of the staff and patients using the wards and departments were positive.

2.29 Feedback from users can be a valuable indicator of whether a built asset is satisfactory. Only four projects we surveyed, however, had undertaken a detailed user satisfaction survey, which were generally favourable. Of the rest just over half told us they had some means of obtaining user feedback, ranging from letters from users to anecdotal comments.

### 7 Rating of design quality

The Figure shows that all respondents rated the design and construction quality adequate or better.



#### NOTE

The project team at South Buckinghamshire hospital rated the design quality as adequate with some design features considered poor by the individual hospital departments

Source: National Audit Office

### 8 Rating of build quality

The Figure shows that all respondents considered the build quality to be adequate or better.



Source: National Audit Office

## 9 Case Study

### Good design and construction

#### Prison Service: HMP Altcourse (Fazakerley)

The construction company, Tarmac (now Carillion) introduced new design and construction features into the procurement of prisons which enabled the prison to open five months ahead of schedule. The innovation (in the UK) was in pre-casting off-site modular houseblocks, which could then be transported by lorry and quickly assembled on site to provide the basic structure.

The Prison Service considers that the houseblocks are well-lit, spacious and provide good sight lines. The resultant synergy between the design and operations at the prison is demonstrated by the level of staff deployment that takes advantage of the sight lines. The achievements made at this procurement set the standard for bidders at subsequent privately financed prison competitions.

## 10 Case Study

### Hospital department concerns over design and construction

#### Department of Health: South Buckinghamshire Hospital (two sites at High Wycombe and Amersham)

The Trust stated that the South Buckinghamshire developments are aesthetically very pleasing, but some of the architectural design features have brought with them certain tensions in the day-to-day operation.

One of the features was to provide a non-institutional ambience, without traditional long hospital corridors, by use of combining general and departmental circulation spaces. The desegregation of general and ward areas has not been popular with people walking through departments to get to their destination. This has led to concerns from staff to restrict access through departments to improve security. Some doors have been locked with restricted access. This has led to patient and staff traffic being diverted.

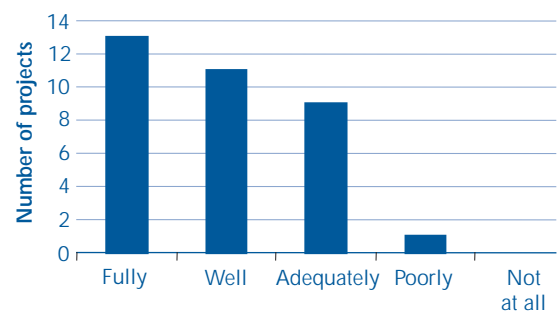
Both sites are built on a slope and have an unusual design feature that each floor can be accessed at ground level at particular points along the slope. There is very good disabled accessibility. There are more entrances than would usually be the case, with the resultant concerns over security and restricting access at nights and weekends. Also availability of adjacent parking has been an issue.

Some visitors have commented that they find access confusing and achieving clear signage is complex, with no obvious main entrance to which visitors are guided clearly.

These operational issues have become evident since bringing both new buildings into use.

2.30 The majority of those surveyed expressed satisfaction with the performance of the building. Thirty three of the 37 projects were reported as performing adequately or better (Figure 11).<sup>19</sup>

## 11 Extent to which the asset is performing to contract specifications



Source: National Audit Office

It is not possible to judge whether these projects could have achieved these results using a different procurement route

2.31 There are a number of changes and initiatives in the construction industry, which may also improve results using procurement routes other than the PFI. This report has not tried to judge whether the PFI was the best procurement route for the projects in our census, but just to examine the construction performance of these specific projects.

A number of key reports aimed at improving construction have been published

2.32 A number of key reports into improving construction procurement and performance have been undertaken in recent years:

- 'Constructing the Team', by Sir Michael Latham (1994);
- 'The Levene Efficiency Scrutiny into Construction Procurement by Government' (1995);
- 'Rethinking Construction' by Sir John Egan (1998);
- 'Accelerating Change' by the Strategic Forum for Construction (2002); and,
- 'Improving Standards of Design in the Procurement of Public Buildings' by OGC and CABE (2002).

2.33 These reports made recommendations for improving the performance of construction projects. The Egan report also set targets for improvement. Additionally, there are a number of other initiatives in the construction industry, which are outlined in the NAO 2001 report 'Modernising Construction' (HC87, Session 2000-01).

<sup>19</sup> Three did not respond to this question. Only one was reported to be performing poorly.

2.34 These recommendations and initiatives were made for the construction industry in general. They are expected to deliver improvements across the construction industry, for example, by encouraging closer working between clients and contractors, and more appropriate allocation of risk between parties.

### Different procurement routes aim to improve value for money in construction

2.35 PFI is one of the three recommended methods for government construction procurement. The other two are Design and Build, and Prime Contracting. Under Design and Build a single supplier is responsible for both the design and construction of the asset. Prime Contracting extends this approach so that the single supplier - the Prime Contractor - co-ordinates and manages all activities through the design and construction period to ensure the asset is fit for its purpose and meets predicted whole life costs.

2.36 These procurement methods aim to transfer risk to those best able to manage it, and to improve integration between contracting parties in construction projects. If followed properly where appropriate, these approaches and the PFI will help to improve value for money for these projects.

### The census did not try to judge whether PFI was the best procurement route for these projects

2.37 Our census focused on the post-contract construction experience of departments' and agencies' PFI projects involving the construction of a built asset, which was complete or due to be complete by summer 2002. In this report we have not set out to examine the value for money of the original deals for these projects. In particular, we have not examined the price which departments have paid to secure the risk transfer which has generally been achieved in the PFI construction projects surveyed. We have examined these wider aspects of value for money in previous reports on individual PFI building projects or groups of projects (Figure 12).

### 12 PFI deals including built assets previously reported on by the National Audit Office

Report title	Number	Report Title	Number
The Skye Bridge	HC5, Session 1997-98	DSS, Newcastle Estate	HC16, Session 1999-00
Bridgend and Fazakerley Prisons	HC253, Session 1997-98	The First Four DBFO Roads	HC476, Session 1997-98
A74(M)/M74 DBFO Road	HC356, Session 1998-99	Dartford and Gravesham Hospital	HC423, Session 1998-99
Royal Armouries Museum in Leeds	HC103, Session 2000-01	The Berlin Embassy	HC585, Session 1999-00
Redevelopment of MOD Main Building	HC748 Session 2001-2002	MOD: The Joint Services Command & Staff College	HC537 Session 2001-2002
The PFI contract for the redevelopment of West Middlesex University Hospital	HC 49, Session 2002-03		

2.38 In addition, we have not sought to judge how well the construction element would have been performed had these contracts been let using the other procurement methods outlined above, drawing on the initiatives and improvements which have been generally adopted in the construction industry in recent years. However, the generally positive results of the projects in our census compare favourably with the historical experience of public sector procurement of other construction projects.

# Appendix 1

## NAO Methodology

### Scope

- 1 The National Audit Office examined the construction performance of English PFI contracts procured by central government which involved the construction of an asset to deliver the required service. We looked at PFI projects for which the construction element was either complete, or was due to be complete by summer 2002, according to the contract.
- 2 We used an issue analysis approach to design the scope and nature of the evidence required to complete this examination. That is, we set a series of high-level audit questions that we considered it would be necessary to answer in order to assess the success or otherwise of the procurement, and collected evidence accordingly. For each of the top-level questions, we identified a subsidiary group of questions, linked logically to the main questions, to direct our detailed work and analysis. Our general report 'Examining the value for money of deals under the Private Finance Initiative' (HC 739, Session 1998-99) provides an outline of this general methodology which acts as a starting point for all of our PFI examinations. We also drew on relevant issues covered in our other reports, particularly our report 'Modernising Construction' (HC87, Session 2000-01), and those dealing with accommodation projects or the financing of large PFI deals.
- 3 The top-level questions we set were:
  - Has there been price certainty during construction?
  - Was the project completed on time?
  - Is it a good quality project?
- 4 Our study has been based on a census of the 38 PFI construction projects which were complete or due to be completed according to the original timetables by the time the census was distributed in Summer 2002. We received responses from 37 public sector project managers whose projects fell within this criterion. These included eleven hospitals, seven prisons, seven roads, five buildings for the MOD, three secure training centres, two office buildings, one laboratory and one magistrates' court. We did not receive a response for the A417/A419 Swindon to Gloucester road.<sup>20</sup>
- 5 We collected and analysed the information from project managers on these PFI construction projects through questionnaires to assess whether these particular projects were delivered on time, within budget and the extent to which design issues were considered.
- 6 In addition we discussed these issues with external experts. We spoke to the Major Contractors' Group (the representative body for leading construction companies) and a number of individual leading construction companies to gain their perceptions of PFI construction and PFI incentives. We also asked them to assess current and past approaches to design and quality in PFI. These companies included Balfour Beatty, Carillion, Laing, Skanska, Sir Robert McAlpine, and Amec. We also sought views from academia and spoke to Professor Roger Flanagan, Professor of Construction Management in the School of Construction Management and Engineering at the University of Reading and Dr Mark Hall, Research Fellow at the Agile Construction Initiative, School of Management, University of Bath. The Commission for Architecture and the Built Environment (CABE) also provided insight and information into design issues for the public sector. Additionally, we consulted the Construction Industry Council.

<sup>20</sup> The Highways Agency has confirmed that the progress on this project has been satisfactory. Construction was completed ahead of schedule and the project cost is in line with the Agency's expectations at contract letting.



# Appendix 2

## Census of Public Sector Project Managers

### The census

The subjects covered by the census include:

### Price certainty

Changes to the unitary charge and net present value before and after contract let

Were these changes benchmarked?

What were the reasons for these changes and who led them?

Were there any increases in cost?

If so, why and who bore the cost increase?

### Time of delivery

Was the asset completed within the time-frame anticipated at contract let, and was it ready for use within this time-frame?

What was the reason for any delays?

Did you receive compensation for delays?

### Quality

How did project teams and departments rate design and build quality?

Did they conduct user satisfaction surveys?

Was the asset performing within contract specifications?

Full details of the census can be found on the website: [www.nao.gov.uk](http://www.nao.gov.uk)

# Glossary of terms

<b>Benchmarking</b>	The process of comparing the method, time or cost of an operation, service or product against those of other organisations, preferably thought to be the best in the field.
<b>DBFO</b>	Design, Build, Finance and Operate contracts. A contract let under the principles of the private finance initiative whereby the same supplier undertakes the design and construction of an asset and thereafter maintains it for an extended period, often 25 or 30 years.
<b>Design and Build</b>	A contract where a single supplier is responsible for designing and constructing a built asset.
<b>Discounting</b>	A method used to convert future costs and benefits to present values using a discount rate.
<b>Discount Rate</b>	The annual percentage rate at which the present value of a future pound is assumed to fall away through time.
<b>Facilities management</b>	Management of services relating to the operation of a building. Includes such activities as maintenance, security, catering and external and internal cleaning.
<b>Net present value</b>	The discounted value of a series of future costs, benefits or payments.
<b>Open book accounting</b>	A description of arrangements whereby part or all of a contractor's financial records for a project can be seen by the authority.
<b>Output specification</b>	The specification of the Department's requirements in terms of the desired outputs rather than inputs.
<b>Preferred bidder</b>	A bidder selected from the shortlist to carry out exclusive negotiations with the Department.
<b>Prime Contracting</b>	A contract involving a main supplier, the Prime Contractor, which has a well established supply chain of reliable suppliers of quality products to encourage increased quality and value for money resulting from an element of consistency and standardisation.
<b>Private Finance Initiative (PFI)</b>	A policy introduced by the Government in 1992 to harness private sector management and expertise in the delivery of public services, while reducing the impact of public borrowing.
<b>Refinancing</b>	The process by which the terms of the funding put in place at the outset of a PFI contract, are later changed during the life of the contract, usually with the aim of creating refinancing benefits for the contractor.
<b>Risk transfer</b>	The passing of risk under the contract from the public sector to the private finance provider.
<b>Special Purpose Vehicle (SPV)</b>	A company specially established to carry out the contract. Shareholders will nearly always comprise several companies often including a construction company and facilities management provider.
<b>Unitary payment</b>	The periodic payment, usually monthly, that the public sector agrees to pay for the provision of services by the PFI contractor.
<b>Value For Money</b>	The optimum combination of whole life cost and quality to meet a customer's requirements.
<b>Whole Life Approach</b>	Taking a view of the construction, operation and maintenance of the asset over the whole life of the project.