JASPERS Horizontal Task Outputs –

Working Paper

Combining EU Grant Funding with PPP for Infrastructure:

Guidelines for the use of DBO to procure Infrastructure projects using EU Structural Funds

Report prepared on the basis of a Consultancy Contract with PricewaterhouseCoopers

December 2010

Foreword

Several JASPERS beneficiary countries have requested JASPERS support in the area of integrating EU funding under projects planned for procurement via a Public Private Partnership (PPP) approach – in particular Romania, Bulgaria, Slovenia, Cyprus, Latvia and Malta. JASPERS has responded by providing support in two ways: (1) addressing key horizontal structuring issues for such projects; and (2) providing support to specific projects planned for EU funding under a PPP approach.

This Working Paper addresses the horizontal issues surrounding the application of Design-Build-Operate procurement in the context of EU grant funding for infrastructure. JASPERS has decided to disseminate this report because it provides methodological support in a complex area of EU funding and because it will prove of interest to a wide range of public authorities and the private sector in several countries. This report is part of a series of JASPERS outputs from "horizontal" tasks aimed at addressing generic issues which impact the development of projects anticipated for EU-funding during 2007-2013.

In developing this paper, JASPERS has drawn on consultancy support from PricewaterhouseCoopers under a Framework Contract with a consortium led by Jacobs. This report contains the full version of the report prepared under this consulting assignment. We would like to thank the principle authors of the report, Greg Haddock, James Green, Velia Leone, Francesco Gargani and Fabio D'Aversa from the PricewaterhouseCoopers consultant team, as well as Gerry Muscat and Joachim Schneider, JASPERS Task Managers. We would also like to thank experts from EPEC (the European PPP Expertese Centre) for their review and input, as well as specialists consulted within the national administrations, especially from Romania, Poland, Portugal and Greece.

Following the preparation of this report, EPEC has been tasked with a workstream oriented to developing further the methodologies for the blending of grant and PPP funding. JASPERS is contributing to this work, and will also continue to be available to beneficiaries to address project-specific issues relating to grant-PPP blending under projects planned for EU co-financing, where requested via JASPERS annual Action Plans.

Luxembourg, December 2010

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JASPERS HORIZONTAL TASK:

Combining EU Grant Funding with PPP for Infrastructure Projects

GUIDELINES FOR THE USE OF DBO TO PROCURE INFRASTRUCTURE PROJECTS USING EU STRUCTURAL FUNDS

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1 Purpose

The purpose of this document "GUIDELINES FOR THE USE OF DESIGN-BUILD-OPERATE ("DBO") TO PROCURE INFRASTRUCTURE PROJECTS USING EU STRUCTURAL FUNDS" is to provide public authorities with an accessible introduction to DBOs and how they may be structured, and an understanding of important points of difference from perhaps better-known Design & Build ("D&B") and Design-Build-Finance-Operate ("DBFO") structures. It is part of a wider JASPERS study to clarify the legal and methodological issues in combining EU funds with Public Private Partnerships (PPPs).

DBO projects are one form of public-private partnership. In a DBO project, a tendering authority contracts with a private sector company (or consortium) to design, build and then – differently from a D&B contract - operate an infrastructure asset for a designated period of time. Funding for the procurement comes mainly from the public sector (including, potentially, EU grants), which is the main point of difference from a DBFO structure.

The DBO method of procurement has been used in a number of sectors and countries. This Note aims to provide readers with an overview of what a DBO project is, where it is suitable for use, key questions to be addressed during procurement and the role EU funding can play. We have used a number of case study examples to illustrate some of the benefits and potential risks involved in DBO projects.

The International Federation of Consulting Engineers ("FIDIC") published in September 2008 a draft contract for DBO projects (known as the "Golden Book"). Many readers may be familiar with FIDIC's "Yellow Book" (D&B contract), and in section 4 we draw out the differences between these standard conditions.

It has not been our intention to provide a detailed "how-to" guide on the structuring of DBOs. Rather we have aimed to provide readers with some insight into principle issues which a contracting authority should consider when contemplating procuring a project as a DBO. All authorities should engage experienced legal, financial and technical advisers at an early stage, to guide them through the processes of options appraisal and risk identification and mitigation which need to be executed thoroughly and carefully and with reference to the specific circumstances of the project.

Our key messages are:

- DBO is a viable, straightforward alternative to D&B, which can bring significant benefits to both contracting authorities and end users;
- DBO is a structure into which public funding, including EU grant funding, can be integrated;
- Valuable experience has been built up in many sectors in structuring DBFO projects, and the lessons of this experience can be incorporated into DBO structures.

2 Introduction

This Note is split into a number of sections in order to provide an overview of the nature and purpose of DBO projects. These sections include:

- Rationale for Choosing DBO – This section provides an overview of what a DBO project is and the differences with D&B and DBFO models. It looks at the relative benefits that a DBO structure can offer and in what type of situations it has been used.

- The DBO Process – This section examines critical questions that a contracting authority should ask at each stage of a DBO procurement.

- Risk Analysis in a DBO Project – This section presents a sample risk matrix drawn from a road project.

- Implications for EU Grant Co-Financing – This section outlines the potential implications for EU grant co-financing when using a DBO project. It shows that, with careful preparation, DBO projects are able to use EU co-financing in the same way as for D&B procurements, and that using grant financing within a DBO can help to facilitate the procurement of higher quality capital expenditure, with consequent benefits for operating and maintenance costs.

- Case Studies – A number of case studies are provided that give examples of DBO projects, highlighting how they can be used and where they are appropriate.

3 Rationale for Choosing DBO

Aim of this Section

The aim of this section is to give a clear understanding of the similarities and differences between the DBO contractual structure and D&B and DBFO approaches. It also aims to highlight the benefits of using DBOs compared to these methods, and to show in which situations a DBO may be appropriate.

What is a DBO project?

In a DBO project a single concessionaire (likely to include a construction contractor who will build the asset, and an infrastructure operator, responsible for the long-term maintenance and operation of the facility and answerable to the contracting authority through a contract which specifies performance standards) is contracted to design, build and then operate an infrastructure asset or group of assets for a designated period of time. Unlike a contractor in a D&B scenario, the concessionaire takes both construction and operation risk through fixed pricing for both elements. The concessionaire is therefore focused not only on the construction of the asset, but also on ensuring its efficient operation for an extended period. The winning bidder in a DBO tender will be the one who has optimised the relationship between **up-front** and **through-life costs**, taking into account the budgetary constraints of the contracting authority. Funding for the **whole-life cost** of the project comes from the public sector (EU grants being one potential source of funding for the up-front cost components of projects within the European Union). Public sector funding is used to finance the construction, and then finances payments to the contractor to operate the facilities. Arguably, because the contractor will be responsible for operating the project, he will be incentivised not to deliver poor quality design or to cut costs during construction. And the payments made by the contracting authority during the facility's operation can also be structured to incentivise the operator to perform: DBO contracts typically incorporate performance- and availability-related standards which the operator must maintain, and penalties for non-achievement. This represents a significant impetus towards rigour in the use of public funds in comparison with D&B structures.

"Whole-life cost" is a core concept in DBO and DBFO projects. It can be defined as *"the cost of acquiring, operating and maintaining an asset over its whole life through to disposal"*. DBO and DBFO structures give contracting authorities the ability to contract for the true cost of a project over the full term of the contract - namely "whole-life costing".

"Whole-life costs" include both "up-front costs" (construction) and "through-life" costs (operating and maintenance costs through to contract end).

Because it transfers risk to the private sector for not only the building of an asset but also its operation, DBO provides greater risk transfer than a D&B project and brings private sector skills into the long-term operation of the asset. However, as financing is still provided by the public sector, less risk is transferred than in the case of a DBFO, where in addition to construction and operation risk, financing risk is also transferred.

Further discussion of the differences between D&B, DBO and DBFO projects follows:

Structural differences between DBO and D&B

The main difference is the inclusion of a period of operation and maintenance of the facility by the private sector concessionaire as part of the services contracted for at the outset. This provides the public sector with the opportunity to optimise whole-life costing of the project. Procurement of an asset under a single D&B contract can be a more efficient and cost-effective way of procuring assets than under a series of discrete design and construction elements. However this and any other variant on the D&B form of asset

procurement form effectively means that the authority is incentivised to procure, and the contractor is incentivised to deliver, a project at the lowest possible cost, which may turn out to be expensive to operate and maintain. Whole-life costing can incentivise both parties to procure an asset which is not only well-designed and constructed, but also well operated and handed back to the public sector in a good condition.

Similarly to a D&B, the public sector pays for the project's construction and can apply for EU co-financing in the same way as in a D&B project. However, whereas in a D&B contract the contracting authority takes over operation of the asset and pays the costs associated directly from its budget, in a DBO the concessionaire operates the project and receives periodic payments – usually monthly - from the contracting authority for doing so. Typically the level of these payments is established at the outset of the project by way of a financial model agreed between the parties, which calculates the amount the operator will need to receive in order to cover operating and lifecycle maintenance costs, manage risk and generate a profit. In some sectors, the operator may take part of his revenue directly from the end-user – for example, a toll road – and may accept some degree of market risk on this income (although this mechanism should not be confused with concession contracts, where commercial risk is transferred entirely to the private sector). A "payment mechanism", agreed at the commencement of the project as part of the contractual structure, sets out the basis on which payments are to be made, and specifies the **performance** and **availability indicators**[1] the concessionaire is expected to achieve. If the concessionaire fails to maintain availability of the project or specified levels of performance, he will suffer deductions from his payment which will reduce his profit.

For example, in a road project the concessionaire would be required to maintain specified levels of lighting, repair and resurfacing (performance) and to keep the road open (availability).

DBO contracts also require the public authority to take on a more consistent and long-lasting operational monitoring role than for D&B projects: the public authority has to put mechanisms in place to ensure that the operator fulfils his contractual obligations and act if he does not. Furthermore, the fact that the monthly fee paid by the public sector to the operator is calculated using indicators based on the operator's performance, incentivises the public authority to fulfil this monitoring role (see section 4 below for more detail on this role). Of course, in theory there is no reason why a public authority would not monitor its own performance in operating a publicly-run project with the same level of diligence, and in many cases this does happen. But in many cases it does not, and DBO structures can provide a useful impetus towards financial rigour and consistent levels of service and ongoing maintenance of an asset which will tend to create **value for money** in the long term.

"Value for money": a DBO project provides "value for money" if it can be demonstrated that it delivers services of a higher quality at a cost which is reduced or comparable to the cost at which the public sector would deliver the same services.

Structural differences between DBO and DBFO

DBOs differ from DBFOs in the use of private finance. In a DBFO the private sector partner raises commercial financing and invests equity to fund construction of the asset. Unlike a DBO, therefore, the contracting authority makes no payment during construction of the asset.

Once construction has been completed, similarly to a DBO, payments are then made by the contracting authority to cover operating and maintenance costs and financing costs, namely servicing of the debt and a return on shareholders' equity. A DBFO provides the same whole-life costing benefit as a DBO,

[1] DBO contracts should not be confused with "Availability Payment" contracts, in which a private sector operator enters into a contract to take over an already-built asset and is only paid if the asset is fully available.

although the risk transfer and incentives are clearly different: in all of the case studies we have included in this document, the contracting authorities have had to deal with the question of how to incentivise concessionaires in a DBO - who are not placing their own equity at risk - to a similar level to concessionaires in a DBFO - whose equity **is** exposed. The case studies suggest a number of innovative ways which have been found to address this question.

The differences between the Three Forms of Procurement summarised

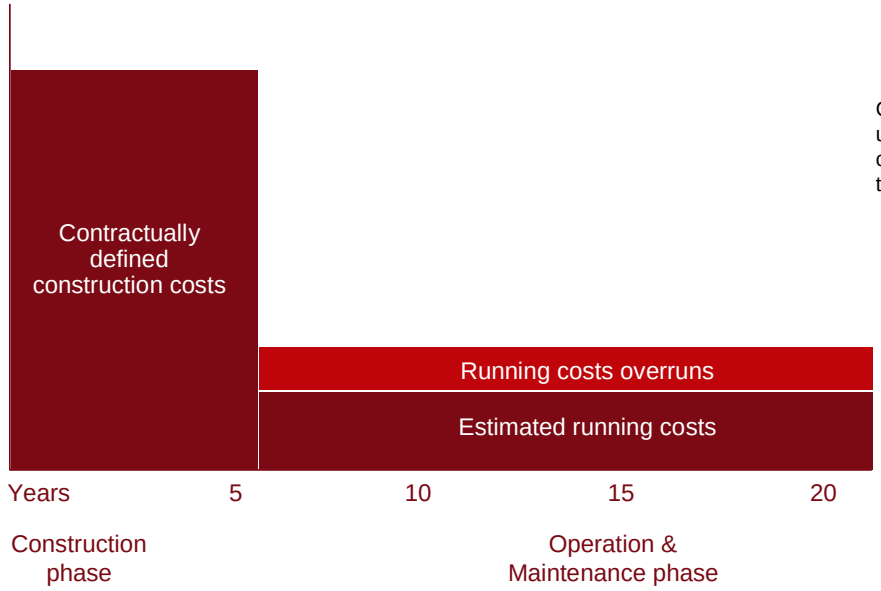
The table below provides a summary of the key similarities and differences between D&B, DBO and DBFO structures.

Issue	Design & Build (D&B)	Design-Build-Operate (DBO)	Design-Build-Finance-Operate (DBFO)
Who designs and builds the asset?	Private sector	Private Sector	Private Sector
Who operates the asset?	Public Sector	Private Sector	Private Sector
Who finances the project?	Public Sector	Public Sector	Private Sector
Can EU Grant funding be used to fund capital expenditure?	Yes	Yes	Yes, but financial structuring may be more complex than in the case of a DBO
Are payments made to the private sector during construction?	Yes	Yes	No, the concessionaire finances construction
Are payments made to the private sector during operation?	No, the public sector operates the asset	Yes	Yes
Who takes on risk during the construction phase?	Private Sector	Private Sector	Private Sector
Who takes on risk during the operational phase?	Public Sector	Private Sector	Private Sector
Who monitors the concessionaire during the operational phase?	N/A	Public Sector	Public Sector

Another way of understanding the differences between D&B, DBO and DBFO projects is provided by the following diagrams:

Design & Build

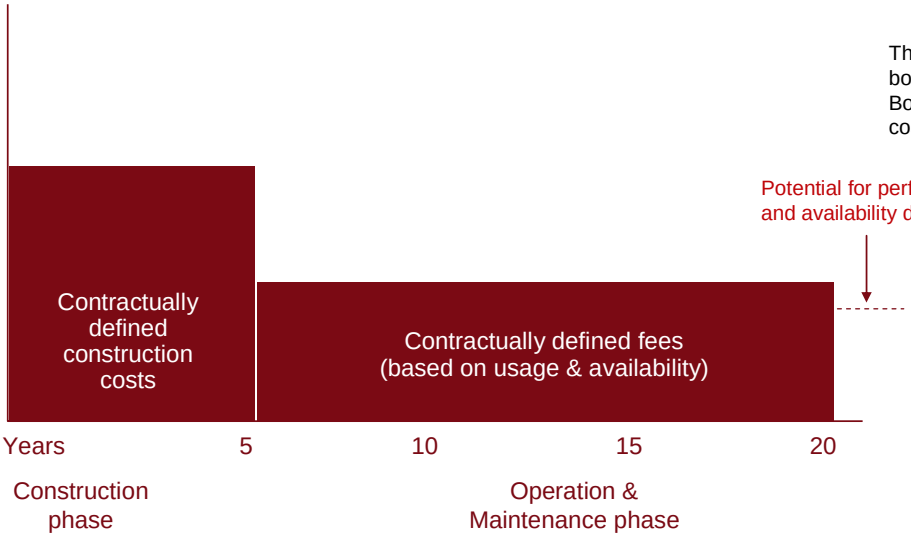
Payment profile for the contracting authority



Construction costs can be fixed under a D&B contract, but the contracting authority is exposed to operating cost risk.

Design – Build - Operate

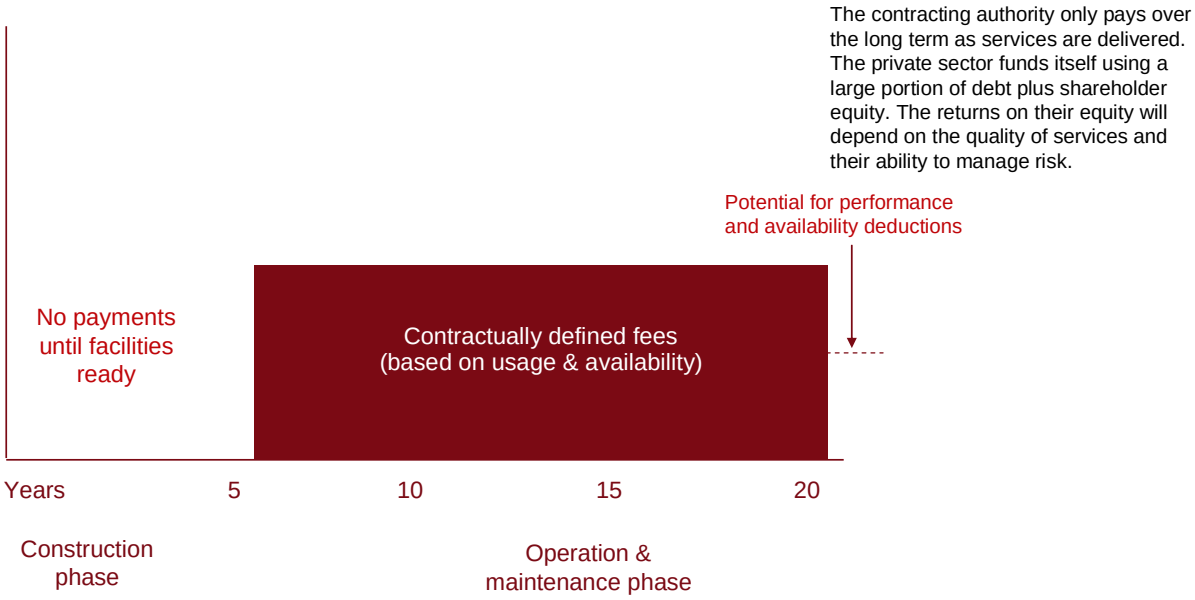
Payment profile for the contracting authority



The contracting authority funds both construction and operation. Both construction and operating costs can be fixed.

Design – Build – Finance - Operate

Payment profile for the contracting authority



Comparative Risk Allocation between different contractual forms

In addition to understanding the structural differences between D&B, DBO and DBFO approaches, it is also important for a public authority to consider differences in risk allocation. In a DBO project the contracting authority is in effect entering into contractual arrangements with a consortium or "concessionaire" comprising a construction contractor, who has relatively short-term obligations, and an operator, whose obligations are long-term. This therefore entails detailed understanding of the way in which the concessionaire has been structured, the risks to the authority and to the project at each stage and how they will be mitigated through the contractual structure. The following table is an example of a comparison which a public authority went through while considering how to structure a project to construct a waste-to-energy plant. In this comparison they identified which party – the government or the private sector concessionaire – would bear the different project risks under each structure.

We stress that the following matrix does not constitute any kind of template or recommendation as to the "correct" allocation of risks between parties; different solutions will be optimal for different cases and a decision as to the optimal solution is likely to depend on a range of financial, legal and political considerations which will differ from case to case; our aim is rather to illustrate the type of analysis involved in compiling a risk matrix and discussing and agreeing the optimal allocation of the risks identified.

Risk	D&B	DBO	DBFO
Scope / specification risks			
Scope / specification risk	Government	Government	Government
Site and approval risks			
Site availability and access risk	Government	Government	Government
Site condition risk	Government	Government	Private
Land acquisition risks	Government	Government	Shared
Environmental approvals risks	Government	Government	Shared
Planning approvals risks	Government	Government	Shared
Design, construction and commissioning risks			
Design risks	Private	Private	Private
Construction risks	Private	Private	Private
Construction cost escalation risk	Private	Private	Private
Supplier risk	Private	Private	Private
Protest / strike risk (planning and construction phases)	Government	Government	Shared
Operating risks			
Demand risk	Government	Government	Partially or entirely Private
Operating performance risks	Government	Private	Private
Power price risks	Government	Government	Government
Power consumption risks	Government	Private	Private
Power supply risks	Government	Government	Government
Pre-treatment risks	Government	Private	Private
Operating cost escalation risks	Government	Private	Private
Change in specification risks	Government	Government	Government
Obsolescence risk	Government	Private	Private
Competition risk	Government	Government	Government

Risk	D&B	DBO	DBFO
Financing risk			
Risk of non-availability of funding to finance construction	Government	Government	Private (although some structures may incorporate an element of public financing)
Risk of non-availability of funding during operation	Government	Government (periodic fees) / private (working capital and any demand-related revenue)	Government (periodic fees) / private (working capital and any demand-related revenue)
Other risks			
Interface risks (i.e. interface with other projects and/or services)	Government	Shared	Shared
Change in legislation risks	Government	Government	Shared
Industrial relations risks	Government	Private	Private

No one form is inherently preferable to another in terms of risk allocation –understanding how risks will be allocated under each structure should form part of a contracting authority's decision-making process.

Benefits (and potential disadvantages) of DBOs in comparison with other forms of procurement

Nevertheless, it is our view that DBO structures do present a number of benefits in comparison to other forms of procurement (although a number of useful lessons can be learned from experience in the structuring of DBFOs), as shown in the following comparison:

Benefits of DBO structures in comparison with D&B

Because D&B projects require definition and tendering of the construction of an asset only, they require less input by the contracting authority up-front in the tendering of a project than a DBO or DBFO. It could be argued that the benefits to be gained by including the operating phase in a DBO structure and the ability to conduct whole-life costing and transfer operating risk outweigh the additional up-front cost to the contracting authority.

Net Present Value: this calculation provides the present value of a series of cashflows by discounting the cashflows at a given discount rate. To compare bids received for a DBO project, contracting authorities would compare the Net Present Value of each bidder's construction costs plus the fees they would charge during the operating period.

The ability of the concessionaire to optimise the balance between up-front construction costs and through-life operation and maintenance is a key benefit. A concessionaire whose bid depends on getting this right is incentivised to minimise the **Net Present Value** of his bid. However, if the authority places budgetary constraints on the up-front costs, it risks losing the benefits of this optimisation and may force the concessionaire into a higher whole-life cost solution not materially different from the authority's own approach.

A second key benefit is the commitment of both

concessionaire and authority to a known cost through the life of the project. The inherent risk with projects built under a D&B contract is that maintenance budgets can be diverted to fund other areas of public expenditure, with the consequence that backlogs of maintenance build up. A DBO contract requires the assets to be maintained consistently to a known and defined standard, and this commitment protects the budget. It is helpful if the contract does not contain too many provisions to allow for changes to maintenance or operating costs, as this can reduce the commitment by both parties. However, if the operating cost is difficult to predict, this may be necessary. This is not to say that DBO cannot be used in projects where long-term operating costs cannot easily be predicted, but the capacity of authorities to transfer this risk will be reduced.

Transferring the long-term operation risks to the private partner also reduces the exposure of the public authority to the additional costs that can result from poor design and/or construction: since the concessionaire knows that he will have to operate the asset long-term, he is incentivised to optimise the whole-life cost, i.e. maximise the quality of both the construction and operation. However, in order to gain the benefits of the stability and quality of maintenance under a DBO, the public authority must be ready at the contract stage to make a long-term commitment to fund the operating payment component of the DBO contract.

Contracting authorities undertaking D&B projects have benefited from the existence of standard forms of contract, namely FIDIC's "Yellow" and "Red" books (*"Conditions of Contract for Plant and Design-Build"* and *"Conditions of contract for Construction for building and engineering works designed by the employer"* respectively. In September 2008, FIDIC published *"Conditions of contract for Design, Build and Operate Projects (1st edition)"*, giving authorities a standard form of contract for DBOs with an operating period of up to 20 years. We comment more fully on this standard contract in the next section.

Benefits of DBO in comparison with DBFO (and some lessons from DBFO structures)

The principal distinction between DBO and DBFO lies in the source of long-term financing for the capital expenditure of the project and in the timing of payments. Under a DBO, public money is used to fund construction costs; in a DBFO, private finance (commercial debt and equity) is used to fund these costs (although many DBFOs are partly public-financed). In a DBO, commercial lenders and investors whose capital is at risk are not present. This can imply a number of relative advantages and disadvantages in comparison with a DBFO.

Tender processes for DBOs have the potential to be shorter than for DBFOs. This is because the need to include commercial lenders and investors in a project structure can extend the process as a result of the analysis they will conduct. Contracts may also be more complex and take longer to negotiate and close. A DBO may therefore be particularly useful where a public authority wishes to procure a project quickly while still taking advantage of whole-life costing.

Once a project is under construction or in operation, the agreement of change or variation to the contract in a DBO is potentially easier, since there is no need to agree changes with commercial lenders/investors.

By using public sources of finance – such as EU grants – a contracting authority will be accessing funds which potentially represent a lower cost to the project. Contracting authorities should be careful in their options analysis to evaluate the "real" cost of public sources of finance – for example, what will be the impact of a DBO project on an authority's future ability to borrow or access grant funding? What are the opportunity costs of using public funds for a DBO, as opposed to seeking private funds through a DBFO structure? Will it have an adverse impact on the authority's ability to finance other socially necessary projects? The availability and relative costs of private finance should always be explored.

There is no doubt that the current financial crisis has had a significant impact on the ability of the private sector to raise commercial finance for DBFOs. Current market conditions have impacted on the availability, cost and term of finance. This will tend to increase the relative attractiveness of DBO structures.

However, DBFO structures, which have been widely used and developed over the last two decades, have led to improvements in procurement practice which have great relevance for DBO approaches. Three examples follow:

- Risk allocation: the development of DBFO as a procurement methodology has increased focus on the analysis of project risks and on their optimal allocation, the knowledge that funders will scrutinise draft contracts having led to increased rigour from the outset. Even in publicly-funded procurements, the practice of developing a comprehensive risk matrix – of the kind presented in section 5 below – has become widespread in countries with a track record of DBFO projects, and has helped authorities to gain a clear understanding of the risks they are taking and how they can be mitigated.

- "Due diligence": in a DBFO, the commercial lenders will appoint their own legal and technical advisers to review designs, construction programmes and operating plans. They are motivated to do this in order to minimise their potential for loss if the project defaults. From the point of view of the contracting authority, the benefit is that the project contracts are subject to a second layer of scrutiny. Evidence compiled by the National Audit Office of the United Kingdom has demonstrated that projects structured as DBFOs demonstrate significantly lower rates of cost increase and delay than projects procured and operated directly by the public sector.

- Financial exposure of investors: a DBFO structure exposes the owners of the operating company to risk on their equity. This arguably increases their incentive to deliver the project to cost and specification throughout its life relative to a DBO. Contracting authorities contemplating tendering a project on a DBO basis should be in no doubt as to the potential risk of a concessionaire constructing a sub-standard facility which later causes problems in operation and from which the concessionaire walks away. Authorities will protect themselves from this risk through a tender process based on evaluation criteria which will identify the most capable - not necessarily the cheapest - contractor (see section 6(iv) below for more detail on evaluation criteria) and by finding ways in the DBO contractual structure to effectively replicate the incentivisation which is brought to bear on a concessionaire in a DBFO structure by having his capital placed at risk.

We explore the lessons of DBFOs for DBOs in more detail in section 4 below, The DBO Process.

Comparison of Benefits of BDO in relation to D&B and DBFO

The following table summarises the benefits that a DBO project has compared to D&B and DBFO methods:

Issue	Design Build (D&B)	Design-Build-Operate (DBO)	Design-Build-Finance-Operate (DBFO)
Ability to control construction cost and inputs	Yes	Yes	Yes
Ability to carry out whole-life costing	Yes, but no contractual imperative to do so	Yes	Yes

Issue	Design Build (D&B)	Design-Build-Operate (DBO)	Design-Build-Finance-Operate (DBFO)
Assists in providing budget certainty for the government in the long-term	No	Yes	Yes
Ability to easily use EU grant co-financing (see section 6 below)	Yes	Yes	Yes, but financial structuring may be more complex than in the case of a DBO
Ability to raise finance from commercial banks and reduce use of public sector funds?	No	No	Yes
Risks over the life of the asset are assessed and evaluated	No	Yes	Yes – level of scrutiny is arguably higher (see next section)
Who takes operating risk?	Public sector	Private sector	Private sector
Maximises "value for money"	No	Yes	Yes
How much flexibility does the public authority have over the operational profile of the project?	Flexible	Less flexible	Less flexible
If a project is terminated, who is most fully protected?	Public sector	Public sector	Commercial lenders

International experience of DBOs

Worldwide experience of DBO projects appears to be disparate. In certain countries, DBO structures have been used in a consistent manner in certain sectors: for example, waste water projects in Ireland (of which we provide one example as a case study in section 7), in Spain, Hungary, Australia and several Middle Eastern countries. Other countries, notably the United Kingdom, have gained experience with DBO structures in sectors including housing, government accommodation, schools and power generation. To our knowledge, DBO structures have been used only rarely in central and eastern Europe. **The potential exists for DBO structures to be implemented more widely, particularly given the impact of the current financial climate on the availability and cost of private sector sources of funding.**

Some international examples of DBOs in the waste water sector:

Csepel Wastewater, Hungary

This is a project involving construction and operation of a waste water treatment plant which aims to improve the quality of water released into the Danube, significantly improving environmental conditions in the Budapest area. The project was awarded to a consortium formed by Degrémont (Suez Group), OTV (Veolia Water Solutions and Technologies Group), Hídépíto (Vinci Group) and Alterra (Colas Group) and involves the construction of the facility (due to complete in 2010) and its operation for 4 years. Total capital cost is €250m, financed by grant-funding from the European Cohesion Fund, with financing also provided by the Hungarian Government, Budapest City Council and the European Investment Bank. Operational costs for the project will be in the order of €10m per annum. This case shows how EU grant co-financing can be used to part-finance DBO projects. A key benefit of the project is that it gives the city council the ability to predict and budget for the future operational costs of the project.

Ref: http://www.veoliawater.com/press/press-releases/press-2006/20060130,1148.htm

Bega Valley Sewerage Programme, Australia

This project (tendered in 2004) provided for the construction of five new sewerage treatment plants and the upgrade of five existing plants to service communities in coastal New South Wales. The project was procured under a DBO contract between the local council and a private sector concessionaire TESIB. The concessionaire will operate the plants for 10 years. Capital costs amounted to $63m (Australian). Of this, $23m was obtained from a state grant with rest of the funding coming from the local council through increased rates levied on consumers. The DBO arrangement facilitated the acquisition of private sector skills and technology and the provision of services to disparate communities.

Refs: http://www.bvsp.com.au/

http://www.begavalley.nsw.gov.au/Your_Council/Policies/procedures/1-3-4(g).pdf

Hutt Valley Water Services, New Zealand

This project provided for the design, construction and operation of a wastewater treatment plant and pipeline to Hutt City and Upper Hutt City in New Zealand's North Island. The project included the delivery of a new waste water treatment plant and collection system, including 20 pump stations, serving a population of 160,000. The concessionaire is Hutt Valley Water Services (HVWS), a subsidiary of OMI Beca and New Zealand Water Services. Total contract period is 20 years. Construction of the facilities was completed in 2002. The project's capital cost was NZ$55m, financed by the local authority from tariff revenues. Competitive tendering enabled the authority to procure the project for substantially less than its original NZ$63m estimate. A DBO structure provided a competitive capital works solution, as well as optimising risk transfer to the private sector and reducing long-term operational costs.

Refs:
http://www.australianwaterservices.com.au/index.php?page=hutt_valley_waste_water_treatment_plant

http://www.huttcity.govt.nz/upload/documents/annual_plan/2000/04_staff.pdf

Some example DBOs from the UK:

Example: Carbon capture project, UK

This project is the first of its kind, and is therefore not commercially viable at this time because of the new technology being used. By using a DBO structure the government can ensure the project goes ahead, which is in the public interest, while taking advantage of private sector skills and a whole-life costing approach to the project (to the extent that this is feasible in a project involving untested technology).

Example: UK Immigration Detention Centres

The UK government wanted to procure new facilities to house immigrants from outside the EU while their asylum cases were heard. Speed was a priority, but the government wanted to keep the benefit of whole-life costing and risk transfer. The result was a DBO with the private sector to design, build and operate the centres which succeeded in reaching contract signature within 3 months. This shows that DBO has the potential to be a relatively quick process.

As the case studies presented in section 7 below (and to which we refer throughout this document) demonstrate, there is in theory no limitation on sectors in which DBO structures can be used. DBO may be a particularly useful structure in projects employing new and untested technology, in which a DBFO solution is not commercially viable but the public authority wants to take advantage of private sector innovation and expertise and to benefit from whole-life costing. The experience of recent years in the structuring of DBFO projects means that the learning points from these projects can, to a large extent, be incorporated into DBO. We cover this in more detail in the next section.

4 The DBO Process

The purpose of this section is to discuss key issues which a contracting authority needs to be aware of and take into account in the planning and structuring of a DBO project in whatever sector. Illustrative examples drawn from case studies are included where appropriate.

Key Issues are discussed under:

- Section 1 - Planning
- Section 2 - Structuring of contracts to cover construction and operation
- Section 3 - Payment mechanism
- Section 4 - Financing.

We have also included a section (Section 5) on **project management during the operational phase** of a DBO, which looks at the implications for a public authority in terms of ongoing contract management and performance monitoring.

Section 1 - Planning

Arguably the initial stages of a project cycle are the most important: thorough preparation at this first stage can help to avoid difficulties and consequent cost and delay during the tender process.

Early preparation means:

- Getting a team in place;
- Undertaking an options appraisal;
- Decision on procurement procedure;
- Undertaking a prequalification exercise;
- Preparing tender documentation.

The above steps are not unique to a DBO project. However we have aimed in our discussion below to focus on issues which may be particularly relevant to a contracting authority contemplating a DBO.

1. Getting a team in place:

A Senior Responsible Officer should be appointed by the contracting authority to have clear ownership of the project. A project manager is also needed, with time available to fulfil the necessary functions and with adequate support.

In a DBO project, a key role for the project manager will be leading the contracting authority's application for EU grants or other sources of public finance.

A contracting authority should employ the following resources to work with the project manager and his team:

- a legal adviser to draft the contractual structure under which the project will be contracted (even if the FIDIC DBO standard contract is used, legal advice will be required on possible variations);
- a technical adviser (in-house or external) capable of drafting the technical requirements of the project, both in terms of construction and long-term operation;
- commercial resources (possibly an external financial adviser).

Authorities may wish to consider seeking support from resources experienced in DBFO projects. As will become clear through the following sections, we consider that the same contractual mechanisms which commercial banks and equity investors have developed to protect their long-term financial interests in DBFO projects can be replicated by contracting authorities to protect public money invested into DBOs and enhance the capacity of public funds to generate value for money.

2. Undertaking an options analysis:

A thorough options analysis will enable the contracting authority to make a decision about the relative merits of a D&B, DBO and DBFO project structure on a robust and transparent basis. It will give the contracting authority confidence that the structure it has chosen will be accepted in the market, will be within its budgetary constraints and represent value for money, will meet any time constraints and will provide satisfactory service to end users.

In section 3 we showed a matrix comparing the distribution of risks in D&B, DBO and DBFO projects. A major advantage of DBO projects over D&B projects is that they encourage the contractor to optimise whole-life costs and also place operating risk with the contractor (however, if whole-life cost risk is too great for the contractor to manage cost-effectively, then a D&B contract may be preferable and this option should not therefore be ruled out of an options analysis). All of these considerations are also true of DBFO projects. However, the allocation of financing risk between public and private sector is entirely different in a DBO and DBFO, and the implications and relative benefits and disadvantages need to be understood and evaluated. We cover the question of how finance risk can be dealt with in a DBO in more detail later in this section.

The options appraisal should consider the following:

- Risk identification and evaluation: each project presents different risks. There is no generic risk matrix: contracting authorities should therefore carry out, at an early stage, a risk identification workshop, involving legal, technical and financial advisers, which will result in a preliminary risk matrix identifying all of the specific risks of the project and clarifying how they would be mitigated under each potential contractual structure. From this early exercise will develop a project-specific risk matrix which will represent a definition by the contracting authority of how it wishes to see risks allocated. This risk matrix should be presented to bidders as part of the tender documentation, and will become a tool for monitoring risk allocation and mitigation throughout the project's development.

  In section 5 we have included an example risk matrix drawn from a DBO case study in the waste sector.

- Market Interest: by this we mean the extent to which each procurement option succeeds in maximising interest amongst the appropriate players with the relevant skills, expertise and capacity to deliver the Project.

- A good financial adviser will help the contracting authority to identify potential bidders and facilitate discussions which will help the authority to evaluate the relative advantages and disadvantages of each option. Critical considerations will be the capacity of each option to generate sufficient interest among bidders to ensure competitive tension.

  Conversations with bidders are likely to be iterative: initial meetings will assess the interest of bidders and their position on the different structures under consideration. Following these initial meetings, the contracting authority and its advisers will undertake some early project structuring, and return to potential bidders to seek their views. The benefits of holding early discussions with bidders and reflecting their views in tender documentation is that there are no surprises for either party once the tender is issued and the chances of a successful tender are maximised.

  In undertaking options studies for waste projects in Australia, authorities routinely undertake market sounding exercises which assess the extent to which each procurement option (D&B, DBO or DBFO) assists in maximising market interest and therefore competition amongst the appropriate players with the relevant skills, expertise and capacity.

  Key elements to be considered in such an exercise include:

  - Market capacity relative to project size
  - Precedent procurement models
  - Players' perceptions regarding the process and likely outcome
  - Capacity in the market to evaluate and manage project risks under each model cost-effectively
  - Extent to which each model increases the level of competitive tension between potential bidders.

- Value for Money: the extent to which each procurement option helps the contracting authority to maximise the value for money achieved from the use of public funds. Value for money can be assessed by a financial model, which compares the differential financing costs of a DBFO and the different degrees of risk transfer under the alternative strategies, but it also depends on a number of qualitative factors such as market capacity to take and manage risk and degree of competition.

  The financial advisers to a contracting authority in the UK which was contemplating undertaking a project involving new and untested technology ran a market-sounding exercise. By doing this they were able to understand the potential costs of commercial delivery of the project, the degree to which the project was not commercially viable and hence the likely level of public funding which would be required. Financial and commercial analysis demonstrated that, given the risk profile of the project, a DBO structure would represent better value for money than a DBFO.

- Budget considerations: the affordability of each procurement option is a factor to be considered.

  A potential advantage of both DBOs and DBFOs over a D&B structure is that the whole-life costs of the project, i.e. the payments which the contracting authority will have to make to the project company during the life of the project, are fixed in advance. However, both D&B and DBO require the authority to be able to afford the up-front payment for the asset. Also, while budget certainty may be seen as an advantage, against this must be set, and evaluated, the recognition that the authority is potentially relinquishing a degree of future budgeting flexibility.

- Time to deliver project: the extent to which each procurement option facilitates the achievement by the contracting authority of its aspirations for having the facility built and in operation within a certain timeframe. (Please note that projects part-financed with EU grant funding will have to comply with "n+2" / "n+3" conditions on the timing of disbursements, and disbursements will have to be completed before 31st December 2015 – please see section 6 below for further details).

The above are some of the criteria which might be used to structure an options analysis exercise and help the contracting authority to come up with a robust and balanced way of identifying the optimal contracting structure.

The Immigration Detention Centre case study in the United Kingdom is an example of how a decision to undertake a project on a DBO basis was made explicitly in the interests of time: options evaluation demonstrated that it would be quicker to tender the project as a DBO than a DBFO since financing from the public sector could be marshalled more rapidly than private sector finance. This will not be true in every case. Critical questions for the contracting authority to ask in assessing this element are:

- How familiar are private sector sources of finance with this type of projects and the risks it presents?
- What is the depth of the private sector market available? Is communication with potential funders straightforward?

3. Decision on procurement procedure:

A number of routes exist under EU legislation for the procurement of assets.

A decision as to the procurement procedure should be taken in parallel with the options analysis, although a decision to undertake a project as a DBO will not necessarily be the determining factor in deciding which procurement procedure to adopt.

Contracting authorities should take legal advice on this decision and on what it means for the practicalities of the consequent tender process. In general terms, four procedures are available for infrastructure projects within the European Union:

- Restricted procedure: a restricted procedure provides defined processes and timescales for the invitation of expressions of interest, selection of a shortlist of bidders, invitation to submit a full tender, evaluation of tenders and contract award; however, the procedure provides no scope for negotiation of bids, and is therefore relevant only in cases where the contracting authority is able to fully define up-front a technical scope which will meet its requirements, and to specify the legal and financial structure of the project.
- Open procedure: in contrast to the restricted procedure, this is a one-tier procedure with no prequalification stage. For most DBO projects, where it is desirable for bidders to gain a detailed understanding of the technical requirements of a project before submitting a bid, this is unlikely to be an applicable procedure.
- Competitive dialogue: this procedure, permitted under the revised Procurement Directive of 2004[2], is intended to be used in the award of complex projects, where there is a need for the contracting authority to hold detailed discussions with bidders on technical, legal and/or financial aspects of the proposed contract. A competitive dialogue procedure would be

[2] **DIRECTIVE 2004/18/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL** of 31st March 2004 on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts.

appropriate in a tender involving new and/or complex processes or technology. It could also be appropriate for projects involving the blending of EU grant financing with other sources of funding. Such dialogue would not be possible under the restricted or open procedures. The competitive dialogue procedure permits dialogue to take place at successive defined stages between the contracting authority and bidders, so that solutions can be progressively identified and refined and risk allocation discussed and understood.

- Negotiated procedure: the effect of article 30 of EU Directive 2004/18 is to replace the negotiated procedure with the competitive dialogue procedure for most projects. Projects in the utilities sector are the exception to this, and the negotiated procedure can be used by contracting authorities without the need for legal justification.

4. Undertaking a prequalification exercise:

A prequalification exercise is one of the most important stages of any procurement. It is an opportunity for a contracting authority to make an early evaluation of the financial strength of potential concessionaires and of their technical experience. Once a decision to undertake a project as a DBO has been made, the contracting authority can define what "financial and technical strength" mean in the context of the project and design its prequalification evaluation criteria accordingly.

Unlike a DBFO, a DBO structure does not require a concessionaire to inject equity into a project. Nevertheless, a concessionaire will need to possess the ability to provide a level of working capital in order to fulfil the contract, both during construction and operation. Furthermore, if the concessionaire fails to meet performance and/or availability requirements (see below), his fee may be subject to deductions, and he will need to have the ability to withstand this in the worst case scenario. Although scenarios will not be fully defined at this early stage, the contracting authority should be able to make a reasonable projection of the likely financial obligations of a future concessionaire and thus be able to make a preliminary evaluation of the ability of bidders to meet these obligations.

5. Structuring the tender documentation and evaluation criteria:

The objective of a contracting authority in the structuring of tender documentation should be to avoid future situations in which decisions on commercial issues have to be made after a preferred bidder has been appointed.

Tender documentation which includes a technical specification of expected outputs and draft construction and operating contracts and payment mechanism, will have the advantage of giving the contracting authority confidence that its commercial position will be protected.

Two key questions for a contracting authority to consider when assembling tender documentation for a DBO project are discussed below:

How to incentivise the concessionaire both to provide innovative design, and get a solution which meets your requirements?

A DBO approach should achieve a technical solution which harnesses all of the innovative capacity which the private sector is able to offer for both the construction and long-term operation of the project, while meeting the requirements of the contracting authority.

Experience has demonstrated that this can be achieved by:

- Clear definition of technical output specifications by the contracting authority – achieved through the market-testing exercise outlined above, through bidder conferences and, if a

competitive dialogue procedure is chosen, through permitted dialogue sessions;

- A draft contract which expresses how risk is to be allocated – this is discussed in more detail below;

- Development of evaluation criteria which will reward innovation (if appropriate).

How to evaluate the tenders?

Paragraph 46 of Directive 2004/18/EC[3] permits the award of tenders on two possible bases: "**lowest price**" or "**economically most advantageous tender (EMAT)**", i.e. the optimum combination of whole-life costs and benefits assessed against pre-determined evaluation award criteria which will normally be detailed to bidders in the Invitation to Tender. We would suggest that, most DBO projects being long-term contracts for the delivery of socially important services, EMAT is the most appropriate basis of award (indeed EMAT is the only possible basis of award in the case of tenders conducted under the competitive dialogue procedure). EMAT requires contracting authorities to carefully balance both quantitative and qualitative evaluation criteria: the solution which best delivers the outputs the authority aspires to, which best mitigates the risk of unforeseen maintenance costs, obsolescence and/or cost overrun during operation and in which the concessionaire meets evaluation criteria regarding, for example, environmental sustainability, approach to customer service and quality assurance and previous experience, will not necessarily be the cheapest. Solutions which appear less expensive than other options may expose the contracting authority to hidden costs in the future, arising from unforeseen maintenance costs or the need to update a facility in order to adapt to future technological changes; and may expose end-users to an unresponsive, inflexible operator delivering poor quality of service.

The development of evaluation criteria is thus a critical part of the development of tender documentation, and one which should be subject to options analysis involving modelling the potential outcomes of different combinations of criteria and weightings.

Since a DBO contract offers a "whole-life" solution, i.e. it covers both construction and operating phases; the price element of the evaluation should be made on the basis of the **Net Present Value** (see definition on page 11) of all costs, namely the construction costs and the fee which will be paid by the contracting authority during the operating period. In a DBO project, since the financing for the project will be provided by the contracting authority from public sources of funds, financing costs will be equal between all bidders.

Section 2 - Structuring of contracts to cover construction and operation:

To authorities accustomed to tendering projects on a D&B basis, a DBO structure will be a departure from previous experience. Authorities can take comfort from the following:

1. Construction:

Contracting authorities should be reassured that a decision to undertake a project as a DBO will not present any significant differences in terms of the structuring of a construction contract from procuring a project as a D&B. **Common protections with which authorities may be familiar through previous D&B experiences** are equally available under DBO contractual structures.

[3] **DIRECTIVE 2004/18/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL** of 31st March 2004 on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts.

Protections which the contracting authority can seek include:

- **Performance bonds:** a performance bond provided by a surety company will protect the contracting authority in respect of any breaches of the construction contract by the contractor. The contracting authority can also require the contractor to seek performance bonds from any subcontractors;
- **Liquidated damages:** these are payable to the contracting authority by the contractor if he is late in meeting a programmed completion date for an asset. Damages should be sufficient to cover any losses sustained by the contracting authority as a result of completion of construction being delayed;
- **Replacement of sub-contractors:** failure of subcontractors to fulfil their obligations can impact on the ability of the contractor to complete a project to time and/or to budget. Responsibility for replacing subcontractors and for indemnifying the contracting authority against any losses occasioned by their failure should lie with the construction contractor through the construction contract. For additional protection, a contracting authority may wish to consider seeking the ability to instruct the contractor to replace a subcontractor.

2. Operation:

The existence of a long-term operating contract with a private sector concessionaire is a key difference between DBOs and D&B structures.

The operating contract governs the relationship between the contracting authority and the operator during the operational phase of the project. It will set out *inter alia* how changes to the project scope, e.g. as a result of technological advances, are to be priced, agreed and paid for; how performance and availability are to be monitored; how disputes are resolved.

The DBOs described in the case studies included in section 7 have contracts which have adapted contractual mechanisms originally developed for DBFO contractual structures. These contracts, developed to protect the interests of both commercial lenders and contracting authorities, typically:

- grant “step-in rights” to authorities which give them the right to “step-into” the shoes of the concessionaire in the event of concessionaire failure and ensure continuity of service delivery by entering into a parallel contract with relevant subcontractors on substantially the same terms as the original subcontract;
- provide protection to all parties in the event of project termination by defining compensation amounts payable under a range of scenarios (e.g. compensation to the concessionaire on default of the contracting authority; compensation on voluntary termination by the contracting authority; compensation on concessionaire default; compensation in the event of *force majeure*);
- define the required condition of the project assets when they are “handed back” to the contracting authority at the end of the project term.

The benefit for a contracting authority of structuring a DBO contract in line with these principles is that the authority gains a very clear and well-tested means of risk mitigation over the whole life of the project.

3. Conditions of Contract for Design, Build and Operate Projects by the International Federation of Consulting Engineers (FIDIC):

Many authorities will have had the experience of structuring D&B contracts on the basis of Conditions of Contract, i.e. standardised guidelines, published by the International Federation of Consulting Engineers (FIDIC). FIDIC publishes two sets of guidelines:

- "Conditions of Contract for Construction – for Building and Engineering Works Designed by the Employer" (commonly known as the "Red Book"); and
- "Conditions of Contract for Construction – for Electrical and Mechanical Plant and for Building and Engineering Works Designed by the Contractor" (commonly known as the "Yellow Book").

In September 2008, in response to increasing interest in DBO structures, the International Federation of Consulting Engineers (FIDIC) published its "Conditions of Contract for Design, Build and Operate Projects" (see www.fidic.org), commonly known as the "Gold Book".

Given that these guidelines have been published so recently, we have provided a brief commentary below on the principal areas of difference between the "Gold Book" and the "Red" and "Yellow Books":

(i) The "Gold Book" has a wider scope than its predecessors, as the operational phase of a project is covered and it has been developed for, and its use is suggested in cases "*where one entity takes total responsibility for an engineering project which incorporates the design, manufacture, delivery and installation of a facility, and the long-term operation and maintenance of that facility on behalf of the Employer*"[4] i.e. the awarding authority;

(ii) The "Gold Book" - as well as the "Red" and "Yellow Books" - is based on the assumption that its contractual objectives will be best achieved through international competition: this suggestion is perfectly in line with EU public procurement rules. In fact, the tender documentation encompassed in the Gold Book could appropriately be used as the basis for launching a public procurement competition in compliance with EU Directives;

(iii) A significant difference is that, bearing in mind all of the different activities the concessionaire has to execute in a DBO structure, i.e. design, build and operate the asset for a period of 20 years before returning it to the public sector for its continued operation, the "Gold Book" suggests that the concessionaire should be organised as a consortium formed by several operators. It is suggested that joint and several liability provisions should be properly incorporated into the contract to be signed;

(iv) The "Gold Book" is based on the assumption that 20 years is the ideal contract tenor for a DBO contract. (FIDIC comments that longer-term contracts require, in its opinion, a fundamentally different contractual structure which will be analysed in a future version of "Conditions of Contract"). This tenor facilitates the financing or part-financing of DBO projects with EU grant funds.

We have included in Appendix 1 a comparison of the clauses of the "Gold Book" with those of the corresponding Conditions of Contract of the "Red" and "Yellow Books".

[4] See Introduction to the Particular Conditions Part B - Special Provision

The EU recommends use of FIDIC's "Gold Book" as a reference going forward for authorities considering tendering projects on a DBO basis.

Section 3 - Payment mechanism:

The payment mechanism of a DBO project sets out how the concessionaire will be paid by the contracting authority for the operation and maintenance of the project. It gives authorities the ability to plan and commit to these costs in a way which is not available under a D&B structure. Payment mechanisms have long been a feature of DBO projects, and valuable lessons can be learned from the way in which they have been structured.

The concessionaire may be paid by way of:

- A periodic fee, often known as a "unitary charge", paid by the contracting authority to the concessionaire and sufficient to compensate him for operating the asset at required levels of availability and performance;
- Charges received from end-users and collected directly by the concessionaire (e.g. water/waste water charges); this revenue source may be partially guaranteed or supplemented by the contracting authority;
- A combination of the above.

A well-structured contract will subject the concessionaire to deductions on his fee if defined performance and availability criteria are not met. This is the same for a DBO and DBFO contract.

Section 4 - Financing:

In structuring the financing of a DBO, the contracting authority will need to access long-term public sector sources of funding. This is no different from a D&B – in a D&B the contracting authority will have to pay for the construction of the asset and will then bear the cost of its operation. The qualitative difference lies in the fact that a DBO will commit an authority to a long-term payment stream to which it is contractually obligated. This should incentivise it to plan and structure its costs over the long-term and monitor the way in which the concessionaire operates the project. In this, the authority has the opportunity to learn from DBFO projects.

The following are areas we see as being key learning points from DBFO projects:

1. Equity:

Unlike a DBFO structure, a DBO structure will not include an equity injection from the concessionaire. This means that the mechanism of incentivising the concessionaire via risk to his return on equity and/or to his equity stake itself, which is available to contracting authorities in a DBFO structure, is not available under a DBO. This needs to be fully understood and taken account of in the options appraisal process.

The Immigration Detention Centres project in the United Kingdom used the innovation of requiring a joint and several guarantee from both the construction contractor and the operator, applicable during the entire term of the project, to act as a substitute for the equity of a DBFO project. The guarantee placed the contractor and operator at risk without requiring them to invest equity. While having a beneficial impact on the project's risk allocation, such a mechanism did entail a cost, which was taken into account in the project's value for money assessment.

The potential benefits of such a structure are:

- A long-term operating contract can be achieved without the need to require the contractor to invest equity; in current financial conditions this may help to make projects feasible;
- The contractor's capital is nevertheless put at risk, which incentivises the contractor to maintain the facilities and to consistently achieve performance standards.

The innovation referred to above, of committing the concessionaire or his parent company to a guarantee for performance during the life of the contract has, we believe, the potential to achieve similar levels of long-term commitment to projects as have been achieved through equity investment in DBFO structures.

2. Effective monitoring:

The presence of commercial lenders and shareholders in a DBFO provides incentives on the concessionaire to perform which do not exist in a DBO: since a DBFO project has been financed using commercial debt and equity raised by the concessionaire, he is responsible for servicing the debt and for providing his shareholders with a return on their investment. Deductions will put at risk his ability to pay lenders and shareholders. In turn, this incentivises commercial lenders and shareholders to maintain close scrutiny of the project.

We have spoken above about how guarantees from the concessionaire can play the role which equity plays in DBFO projects by exerting pressure on the concessionaire to perform and to stay with the project should difficulties arise. Key ways in which lenders and investors monitor the health of a project in a DBFO, and which can be imported to a DBO, include:

Maintenance of reserve accounts

The concessionaire is required to maintain reserve accounts at a certain level, in order to cover both projected and unforeseen costs.

The benefit of reserve accounts is that they minimise the risk of disruptions to service as a result of short-term lack of availability of cash.

In one UK DBO project, the contractor is required to maintain the following reserve accounts:

- A working capital account, sufficient to meet day-to-day operating costs;
- Change in law Reserve Account: an account maintained at a minimum level and intended to cover the costs of unforeseen changes in law;
- Lifecycle Reserve Account: an account which ensures that the contractor has sufficient funds available to cover projected lifecycle maintenance costs.

Monitoring Authority

When a contracting authority enters into a DBO, it will have to monitor the

fulfilment of contractual obligations by the concessionaire over the term of the contract. This means that sufficient resources must be dedicated to this task and they must be incentivised to perform.

Appointment of a technical adviser:

> In the Comhairle nan Eilean Siar DBO schools project in Scotland, effective monitoring and management of the contract will be assured through the creation by the council of a "Special Purpose Vehicle". This will be a stand-alone public company with dedicated resource and a focused objective, namely to monitor the contract and in particular the payment mechanism.

A technical adviser will be appointed by the banks to provide periodic (typically six-monthly) reports on the progress of construction and of operation.

3. Timing of drawdowns:

In a DBFO project, the concessionaire will bring a financing structure, negotiated with equity investors and commercial lenders, as part of his tender. Since the concessionaire is responsible for structuring the financing, drawdowns will be timed to occur in line with the construction programme. The benefits of this are that funding is available when needed, but not fully paid for until it is used.

Under a DBO structure, financing is provided by the contracting authority from public sources, e.g. taxation revenues, EU grants, local or national grants. This can potentially mean that financing will be made available in accordance with the regulations of the source of finance, not the specific timing of the construction programme, i.e. the availability of cash will not necessarily match the cost profile. Contracting authorities need to understand the potential risks that this raises in terms of both funding availability and budgetary control and ensure that they are managed. For example, it will need to be understood how milestone payments are to be met if grant funding is not available until the later stages of a project's construction. If milestone payments are to be met by the contracting authority pending disbursement of a grant, payments should be made in accordance with principles akin to those which would be required by a commercial lender. Thus amounts set out in the milestone payment schedule should be subject to an independent certifier confirming that relevant works have been completed satisfactorily.

4. Tenor:

Whereas DBFOs generally need to be long-term in order to deliver value for money given the cost of commercial finance and equity investment (and the commercial funding markets followed and satisfied this requirements, with terms of up to 30 years available), DBO projects are not necessarily subject to the same requirement. However, long contract terms will bring benefits in terms of the ability to achieve whole-life costing. Authorities will need to balance length of contract term against the flexibility to bring an asset back into public control.

5. Contingency:

A typical financing structure in a DBFO project will include provision for contingencies, e.g. a loan agreement may include an overdraft or standby facility which can be drawn down in the event of cost overrun. Typically the concessionaire would be obliged to part-fund cost overruns with additional equity injections in tandem with drawdowns on the standby facility. The advantages of such a mechanism are that:

- Minor cost overruns can be addressed without occasioning delay to the construction programme;
- The concessionaire is placed at risk (through the higher financing costs which standby facilities typically incur and through the obligation to increase his equity stake if the standby facility is used) and is thus incentivised to avoid cost overruns.

Options for providing contingency available in a DBO scenario include:

- encompassing contingency within the overall price (as in a D&B);
- the authority ensuring that the construction contractor can cope with a cost overrun beyond contingency (to be evaluated at prequalification stage);
- the authority securing a performance guarantee from the construction contractor to mitigate the risk of the contractor walking away;
- the authority holding some contingency financing.

Some of the key ways in which contracting authorities can learn from DBFOs in the structuring of DBO contracts are summarised in the following table:

DBFO lesson	DBO innovation
Equity investment incentivises performance and commitment	Performance guarantees from the construction contractor
Lenders and investors are incentivised to monitor the project to mitigate their risk	Contracting authority to put in place and maintain effective monitoring mechanisms, e.g. stand-alone monitoring authority
Drawdowns linked to milestone payments	Public financing to be structured in line with the requirements of the project
The presence of private finance encourages longer contract terms, the benefit of which is the opportunity to maximise whole-life costing	Use public funding to achieve optimal balance between flexibility over contract term and whole-life costing
Lenders and investors require funding for contingency to be in place	Build contingency into the contracts

Section 5 - Project management during the operational phase by the Public Authority:

Public authorities need to be aware that, by entering into a DBO contract, they are in entering into a long-term obligation to monitor the performance of the concessionaire and manage the contractual relationship. This entails a different range of skills than would be required to manage a facility built under a D&B contract and then taken over to be directly operated by the public sector. In a D&B project the public authority will need to monitor construction. In a DBO, this monitoring capacity will need to extend through the operating period.

To enter into more detail regarding project monitoring requirements, these will entail:

- Correctly paying the concessionaire in accordance with the provisions of the operating contract and payment mechanism; typically the concessionaire would be paid monthly in arrears. In addition to the straightforward administrative task of paying the concessionaire, the authority will need to have in place staff with the necessary skills and resources to receive information on the performance of the concessionaire and the availability of the facilities. For example, in the case of a waste water treatment plant, the concessionaire will be obliged to provide information on the results of water quality tests and the functional availability of the facilities; the authority will need to have staff with the technical capability to interpret the data and to calculate any deductions due;

- Ensuring that obligations with regards to lifecycle maintenance costs are observed. A long-term contract will require the operator to undertake periodic maintenance of the facilities; the authority will need to have staff in place capable of liaising with the operator to ensure that lifecycle maintenance is adequately undertaken. Key questions which will need to be addressed include:

  - How is the concessionaire planning for the lifecycle maintenance? What work will be required? Is the work envisaged adequate to maintain the facilities at the level of performance required under the contract at least until the next lifecycle maintenance period?
  - How is the work being costed? Who will carry it out? Is the concessionaire ensuring that any external contracts are being tendered such that the optimum balance between cost and quality is being achieved?
  - What risks does the lifecycle maintenance work pose to delivery of services during the maintenance period? How is the concessionaire proposing to mitigate these risks? Are their proposals adequate?

- Ensuring that the concessionaire is managing relations with its customers correctly. In the case of many DBO projects, customers of what was previously a publicly-provided service will become customers of the new concessionaire; the contract will contain clauses on issues such as, for example, response times to incidents (e.g. water outage in the case of a water project) and how customer complaints are dealt with. The concessionaire will be obliged to submit data to the authority on customer service performance metrics. The authority may wish to undertake periodic feedback exercises with customers of the concessionaire to ensure that levels of customer satisfaction are being correctly reported;

- Maintaining an ongoing, continuous and consistent relationship with the concessionaire. This requires resources with the skills and experience necessary to maintain interlinked long-term relationships with the technical, administrative, financial and service delivery elements of the concessionaire. The authority's contract management team will therefore need to have:

  - The technical experience and commercial experience and maturity to be able to manage the relationship in a positive, insightful, constructive and consistent manner;
  - The ability to foresee and mitigate potential problems and manage them effectively if they do arise;
  - The resources to maintain the relationship efficiently and thoroughly at the administrative level.

The above may entail different skill sets from those required to directly manage and operate a facility. An authority should not therefore assume that it can staff a DBO contract management team from the pre-existing team which previously delivered and managed a similar facility without asking itself whether the individuals have the appropriate skills and supporting them to acquire them where they are lacking.

5 Risk Analysis in a DBO project

Aim of this Section

This section contains a simplified risk matrix drawn from a DBO project in the roads sector. Our intention is to give an example of what a risk matrix might look like – although a real example, developed across potentially numerous risk workshops and discussions, would be considerably more complex.

There is no such thing as a generic risk analysis. Risks will vary depending on sector, technical scope and social and legal context. In the previous section we stated that one of the earliest actions of a contracting authority should be to draw up a risk matrix, identifying project risks and setting out how they may be mitigated. Identifying risks may also help the contracting authority to identify benefits: for example, if responsibility for hiring staff is to be transferred to the private sector, the public sector will not need to concern itself with the attendant risks. This may provide particular benefit in a project where staff costs may be an important part of operating the asset (e.g. a water plant) compared to a low-staffed project, such as a road.

There is no substitute for a risk identification workshop for any and every project, at which the contracting authority and its advisers work through all of the potential risks presented by the project in hand and evaluate options for their mitigation.

An example risk matrix from a transport (roads) project

Under a transport DBO scheme, the main construction and operational risks can be transferred successfully to the private sector while the public authority may retain some risks related to the external context which are beyond the control of the concessionaire (for instance, the discovery of previously undetected archaeological artefacts).

The following risk matrix shows the types of risks involved in a typical roads project, and represents experience from a UK DBO roads project. It is not exhaustive and is used here to illustrate, at a high level, the type of analysis required. Again we stress that the following matrix does not constitute any kind of template or recommendation as to the “correct” allocation of risks between parties. Each project will demand a specific allocation of each risk identified.

Risk	Comment	Allocation		
		Government	Shared	Private Sector
Scope / specification risks				
Scope / specification risk	Responsibility for ensuring scope is properly defined	✓		
Misunderstanding of scope	Misinterpretation of the output specification that requires changes later on			✓
Site and approval risks				
Site availability and access risk	Current availability and access to the site		✓	
Site condition risk	Assessment of the current condition of site			✓
Land acquisition risks	Acquisition for new developments		✓	
Environmental approvals risks	Approval for project based on wildlife, archaeological risks etc		✓	
Planning approvals risks	That planning will not be granted for the new road	✓		
Design, construction and commissioning risks				
Design risks	Risk that design is not appropriate or cost-effective and therefore not deliverable			✓
Construction risks	Risk of cost overruns or delays after contract award			✓
Construction cost escalation risk	Risk that costs increase because they were not estimated correctly			✓
Supplier risk	Risk of suppliers not delivering what is required for construction			✓
Protest / strike risk (planning and construction phases)	Risk of environmental or other form of protest and/or strike action by employees		✓	

Risk	Comment	Allocation		
		Government	Shared	Private Sector
Operating risks				
Demand risk (if not using a toll system)	Risk that road usage will be less/more than expected	✓		
Demand Risk (if using a toll system where the private sector has flexibility to set price)	Risk that road usage will be less/more than expected			✓
Demand Risk (if using a toll system where the private sector does not have flexibility to set price)	Risk that road usage will be less/more than expected		✓	
Output quality risks	Output does not meet contractual terms (e.g. quality of road surfacing)			✓
Operating performance risks	Operation of road does not meet contract (e.g. availability)			✓
Maintenance risks	Risk that maintenance requirements have not been estimated correctly, leading to extra costs or delays			✓
Operating cost escalation risks	Risk that operating costs rise unexpectedly and are therefore above those set out in the contract			✓
Change in specification risks (from public authority)	Public Authority asks for changes in specification that results in increased cost/delay	✓		
Change in specification risks (from private sector)	Private partner asks for changes in specification that results in increased costs/delay			✓
Competition risk	Public authority allows competition to enter the market which was not present at the outset	✓		

Risk	Comment	Allocation		
		Government	Shared	Private Sector
Finance Risks				
Raising Finance	Who is required to raise the finance to pay the annual fee to the Project Company for the term of the contract?	✓		
Obtaining EU Co-financing	Risk that EU (or other) co-financing will not be obtained	✓		
Income Supplements	Risk from attempts (if contractually permitted) to raise additional income e.g. from roadside advertising			✓
Other risks				
Change in legislation affecting standards that are specific to transport (e.g. environmental issues)	Legislation changes that lead to changes required in performance and/or availability standards	✓		
Changes in legislation affecting concessionaire (e.g. health and safety)	Legislation changes that are generic to all companies			✓
Industrial relations risks	Risk of strike or dispute			✓
Changes in taxation	Changes in taxation which are generic to all companies			✓

6 Implications for EU Grant Co-Financing

European Union grant funding is, in principle, available for DBO projects in sectors eligible for infrastructure financing. The European Union encourages contracting authorities to consider the relative benefits of structuring projects as DBOs using EU grant financing when they undertake an options study of all of the different potential contracting structures open to them. EU grant financing is a straightforward and transparent form of funding, which can help to make projects feasible. It is eminently suitable for DBO projects.

While section 4 highlighted issues to be taken into consideration by contracting authorities in the structuring of a DBO, this section looks at key issues authorities need to bear in mind when considering applying for EU grant funding. The section does not purport to give detailed instructions on the application process - we recommend that contracting authorities refer to EU and national guidelines in order to understand in detail how to apply for grants.

Key considerations

Contracting authorities should be aware of the following considerations and take them into account in their planning:

1. Preparation of grant application:

The contracting authority will be responsible for preparing the grant application and will therefore need to plan for the time required in its resourcing of its tender procedures.

2. Combining of EU grants with other forms of public financing:

EU grants can be combined with other forms of public financing, e.g. national or local funds which might be available to finance infrastructure or public service projects. Financial modelling and options appraisal will be required to evaluate the different options available and to help the contracting authority to make a decision as to the best route.

3. EU grants can only be used to finance capital expenditure:

EU grant funding can be used only to fund capital expenditure ("capex") and not operating expenditure ("opex")[5].

This has two important implications:

- The contracting authority may be able to afford higher quality capex than might be the case if it were using funding from local/national grant sources. This may increase the scope for the concessionaire to optimise whole-life costs without being constrained by a low construction budget. In turn this could have the effect of reducing operating and lifecycle maintenance costs and hence reduce the level of the annual fee payable by the contracting authority. The size of this benefit can be ascertained through detailed options appraisal and financial modelling to compare the relative costs of different capital expenditure options and their impact on operating costs.

[5] Reference: Regulation (EC) n. 1080/2006, art. 7.

Example: Dublin Region Waste Water Scheme

In the Dublin Region Waste Water Scheme (see case studies) EU grant co-financing was used to fund 50% of the capital expenditure of the project. This allowed the contractor to spend a larger amount of capex on the project, providing a higher quality asset that would require lower operational costs over its lifetime. EU grant co-financing therefore helped to increase the quality of the project and reduce the cost over the length of the project.

Ref:

http://www.pppcentrum.cz/res/data/001/000228.pdf

- Tender documentation must require bidders to differentiate clearly between capital expenditure and operating expenditure.

  Below is example wording from tender documentation for a DBO project in the United Kingdom. The example shows how bidders were given clear instructions on the presentation of:

Capex:

- Design and Construction Costs;
- Fittings, Fixtures and Equipment Costs;

  Bidders were also required to provide a “Milestone Payment Schedule”, setting out the timing of costs.

Opex:

- Maintenance Costs;
- Lifecycle Costs;
- Service Delivery Costs.

It was stated to bidders that the costs provided in their bids would become part of the future Project Agreement.

Wording from tender documentation of a UK DBO project:

Capex:

The bidder shall provide detailed cost bids in the formats included within [Appendix x] of this document and which will form part of the Schedules within the Project Agreement, as follows:

- **Design and Construction Costs** – this element shall include a separate sheet for each building proposed from the bidder's proposed schedule of accommodation together with the cost of roads, car parks, other ancillary works and advisory fees not covered by the schedule of accommodation. This cost detail shall form a part of the Project Agreement as [Schedule x] and shall also represent partial detail build up to the figures included within the Milestone Payment Schedule;

- **Fittings, Fixtures and Equipment Costs** – this cost detail shall form a part of the Project Agreement as [Schedule x] and shall also represent partial detail build up to the figures included within the Milestone Payment Schedule;

- All costs shall be provided as at the basis of indexing for construction, maintenance and service provision indicated by the Authority;

The bidder shall also provide the following information which shall be included within schedule E of the Contract, as executed:

- Milestone Payment Schedule in the format included in this tender documentation. Bidders shall note that the total included within the Milestone Payment Schedule shall equate to the total of the pricing documents in the sections above.

Opex:

The bidder shall provide detailed cost bids in the formats included within this tender documentation and which will form part of the Schedules within the Project Agreement, as follows:

- **Maintenance costs** – detailed rates to encompass all of the maintenance services required by the Authority as detailed in [Schedule X]. This cost detail shall form a part of the Project Agreement.

- **Lifecycle costs** – to be quoted as an indicative [20] year spend profile on new build. Assumptions as to the phasing of expenditure should be clearly shown;

- **Service delivery costs** – this element shall include a summary detailing annual running costs and advisory fees. This cost detail shall form a part of the Project Agreement.

4. Selection of evaluation criteria:

In section 4 we stated that "Economically Most Advantageous Tender" would be the most appropriate paradigm for the structuring of evaluation criteria for most DBOs. For reference, "Economically Most Advantageous Tender" means that a project is awarded to the bidder who offers "the optimum combination of whole-life costs and benefits assessed against pre-determined evaluation award criteria".

The definition of evaluation criteria will be project-specific. As an example, the following are the evaluation criteria used in the case of the UK DBO project referred to above

- Quantitative: NPV of capex and opex (this calculation effectively expresses the "whole-life cost of the project; please note that, although EU grant funding will only finance capex, the EU supports the use of NPV covering both capex and opex as an evaluation criterion);
- Qualitative: bidders were evaluated on a range of criteria which included:
  - The detail and quality of their design and construction programme, including plans for works, obtaining statutory approvals, commencing and completing different elements of the project;
  - Their approach towards selection of subcontractors;
  - The thoroughness and robustness of their approach to the management and mitigation of risks to the project being built to cost and time and operated efficiently;
  - Their degree of acceptance of the contractual terms proposed by the authority;
  - Their proposals for achieving a way of working collaboratively with the contracting authority in the construction and operation of the project;
  - Their strategic vision for the long-term management of the project;
  - The quality of their plans for operational management of the facility, including organisational structure and information management systems, financial management, supply chain management, performance management, human resources management;
  - Their plans for monitoring their performance against contractual performance and availability obligations and reporting the same to the authority;
  - The depth and quality of their training programme for staff ;
  - The thoroughness of their health and safety proposals;
  - Their approach to environmental issues, e.g. use of sustainable resources, recycling, pollution reduction, energy conservation.

5. Who is the beneficiary of an EU grant?

EU regulations[6] define a grant beneficiary as an *"operator, body or firm, whether public or private, responsible for initiating or initiating and implementing operations"*. Under a DBO scheme, the grant beneficiary is the contracting authority (e.g. a Ministry, public agency, municipality or municipal utility company with a statutory responsibility for service delivery), who will use the grant to provide a service or to construct infrastructure. The definition does not include an operator to whom the design, construction and operation of an asset is awarded through a tendering procedure. Such operator is not the beneficiary of a grant but is rather, a concessionaire who is paid for the provision of defined services.

6. Timing of a grant application and DBO procurement process:

A grant application will need to be made on the basis of cost projections which are as advanced as possible, and a contractual structure which is reasonably mature. While understanding that changes to project structure can change during negotiation with a preferred bidder, the possibility

[6] Reference: Reg (EC) n.1083/2006, art. 2(4).

for such changes should be minimised. Contracting authorities can achieve this level of development by investing in the project preparation phase as detailed in section 4 above.

Provided that the EU can be satisfied that a project's costs and structure have reached a reasonable level of maturity, there is no limitation as to the timing of a grant application. Applications for grant funding can be submitted prior to a tender being launched, in parallel with a tender process or after a preferred bidder has been selected.

7. Disbursement of an EU grant:

Usually the grant is disbursed to the competent regional or national authority, which then makes it available to the contracting authority to pay instalments to the construction contractor during construction. The grant is disbursed only insofar as it matches actual costs.

Authorities should be mindful of article 93 of the EU Funds Regulations, which states that:

> 1. The Commission shall automatically decommit any part of a budget commitment in an operational programme that has not been used for payment of the pre-financing or interim payments or for which an application for payment has not been sent in conformity with Article 86 by 31 December of the second year following the year of budget commitment under the programme, with the exception mentioned in paragraph 2 (the "n+2 rule").
> 2. For Member States whose GDP from 2001 to 2003 was below 85 % of the EU-25 average in the same period…the deadline referred to in paragraph 1 shall be 31 December of the third year following the year of the annual budget commitment from 2007 to 2010 under their operational programmes (the "n+3 rule").
>
> This deadline shall also apply to the annual budget commitment from 2007 to 2010 in an operational programme falling under the European territorial cooperation objective if at least one of the participants is a Member State referred to in the first subparagraph.
> 3. That part of commitments still open on 31 December 2015 shall be automatically decommitted if the Commission has not received an acceptable application for payment for it by 31 March 2017.

8. Monitoring of expenditure:

Monitoring of progress during construction will be the responsibility of the contracting authority.

The EU will require progress reports and the contracting authority should plan for the provision of these reports.

Please also note comments made in section 4 about the need for the contracting authority to put in place adequate resources for the monitoring of the contract following construction completion and into operation.

Comparison of D&B, DBO and DBFO projects

We have focused above on implications of EU grant funding for DBO projects. In the following table, we make a brief comparison of how EU grant funding can be applied between D&B, DBO and DBFO projects:

Issue	D&B	DBO	DBFO
Who is responsible for preparation of grant application?	Contracting authority	Contracting authority	Contracting authority
Can EU grants be combined with other sources of finance	Yes, can be combined with other public sources of finance	Yes, can be combined with other public sources of finance	Co-funding with private finance is possible but more complex than in a D&B or DBO
Choice of quantitative evaluation criteria	Capital cost	NPV of capital and operating costs preferred	Precedent varies: could be lowest unitary charge, lowest grant requirement, minimum contract duration, level of capital investment beyond minimum requirement
Does the contractual form enable the authority to evaluate tenders on an "Economically Most Advantageous Tender" basis?	Structure pushes authorities towards evaluation on basis of capital cost only	Yes	Yes
Contracting authority is the beneficiary of the EU grant?	Yes	Yes	Yes
Timing of grant application vs. contract procurement	No special requirements	No special requirements	Very careful planning of interfaces between grant timing and PPP procurement timing is required. Decision as to whether to submit grant application before or after commercial close will be key.
Time required for procurement	Moderate (0.5 – 1 year typical)	Moderate (0.5 – 1 year typical)	Long (more than 1 year typical)
Authority will be required to submit monitoring reports to EU	Yes	Yes	Yes

7 Case Studies

Dublin Region Waste Water Scheme, Ireland (in operation since 2004)

Ref: http://www.pppcentrum.cz/res/data/001/000228.pdf

Case study/Country	Dublin Region Waste Water Scheme (Treatment Plant) – Ireland.
Rationale/PPP Objectives	Attracting the best technology and expertise available in the market, increasing economic and environmental efficiency, better protection of capital investment.
Financial structure	Investment financed by public money (Irish Government and EU grant); assets publicly owned.
EU Support	Cohesion Fund financed 50% of the investment costs.
Contract agreement between parties	DBO contract.
Risk allocation	Risk principally allocated to private operators: they cover maintenance and operating costs.
Tariff setting	Municipality set tariffs to cover both capital and operating costs.
Strong points	Project attracted latest technology; project agreement was structured to incentivise the operator to protect the capital investment and ensure project sustainability.
Weak points	Project dependent on government funds to finance the gap between operating costs and tariff revenue.

This case study illustrates how a DBO structure can be used to attract innovative technology and expertise in order to increase economic and environmental efficiency.

Background

The Government of the Republic of Ireland has encouraged private sector involvement in the upgrade of its public utilities and infrastructure through DBO and DBFO structures.

The Dublin Bay Waste Water Treatment Plant is an example of a DBO project in the sector which was partly funded by the EU Cohesion Fund. Other sources of funding included the Department of the Environment, Heritage & Local Government and Dublin City Council.

The treatment plant is responsible for treating wastewater arising from consumers, both domestic and commercial, in the Greater Dublin Area, which includes Dublin City, Fingal, South Dublin and Dún Laoghaire-Rathdown. The plant uses modern technologies for secondary and tertiary wastewater and sludge treatment. The wastewater treatment uses Sequencing Batch Reactors, in a 2-story configuration, with UV disinfection of the final effluent to protect bathing water standards in Dublin Bay. Waste sludge generated by the process is further treated by a combination of thermal hydrolysis, anaerobic digestion and thermal drying. The dried sludge by-product of the process is turned into pellets to be used as fertiliser for farming. The Ringsend plant is the only facility in the world to use this combination of treatments.

Biogas produced by the sludge processing is used to generate up to 60% of the electrical energy requirements of the plant.

The design was chosen as it requires a relatively small area and its construction was possible on the site of an existing facility.

Contract features

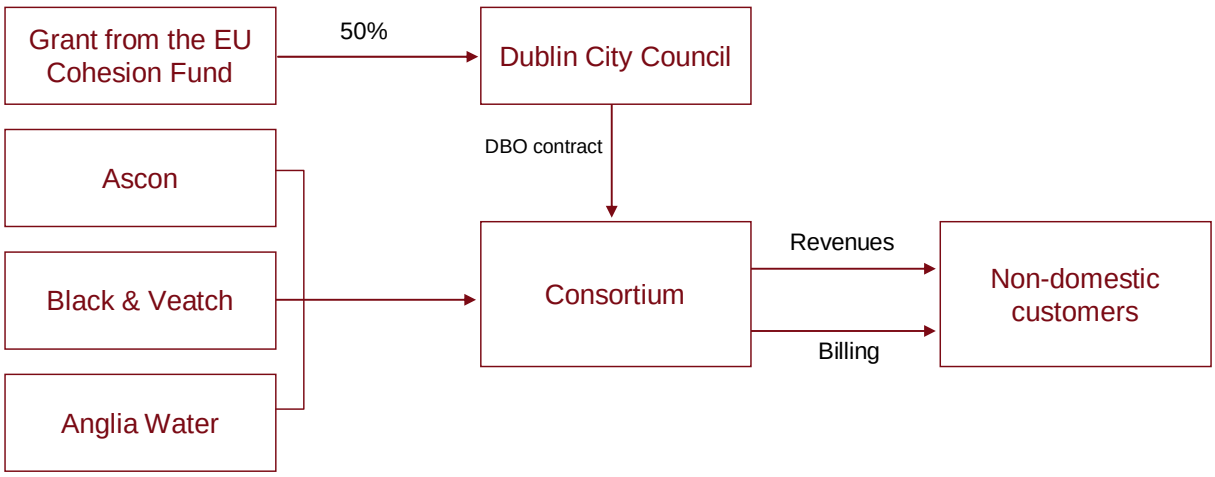
The Dublin Region Waste Water Scheme is a DBO project. The main objectives of the project were to enhance the quality and efficiency of services to the public by attracting the best technology and expertise available in the market.

The contract was awarded through a public tender to an international consortium of Ascon (Ireland), Black & Veach (UK) and Anglia Water (UK). The operational phase of the contract for the treatment plant was awarded for 20 years. It requires the operators to operate and manage the performance of the treatment works, complying with the relevant provisions of the Urban Waste Water Treatment Directive as regards effluent and sludge quality standards.

The concessionaire is paid for the operation of the plant from tariff revenue, which it collects from non-domestic consumers only (domestic consumers do not pay for water treatment in Ireland). Tariffs are set by the Municipality, at a level sufficient to cover both capital and operating costs. The contract does not provide for profit-sharing and the assets remain publicly-owned. The private operators have a contractual obligation to operate and maintain the treatment plant.

EU Support (Cohesion Fund)

The EU Cohesion Fund supported this project, considering it a good example of sustainable regional development using innovative technology which allowed Dublin to meet the requirements of the Urban Wastewater Treatment Directive. The overall cost of the project amounted to €265 million, of which €133 million was provided under the Cohesion Fund as a grant. The remainder was financed by the Irish Government.



Lessons learned

- The combination of a requirement to build the project on a restricted site and to use technology adequate to meet the EU Urban Waste Water Treatment Directive meant that the most up-to-date technology available was required. EU grant financing made it possible to acquire this technology and expertise.

- Capital and operation costs are recovered through a combination of tariff revenue and additional payments made to the operator. This amounts to an indirect subsidy of domestic customers, who do not pay tariffs for waste water treatment.

- A DBO structure enabled the public authority to achieve its objectives for the operating standards for the plant, to bring in private sector operational expertise, to procure the project on the basis of whole-life costing, to contractually oblige the operator to maintain the plant and to protect domestic consumers.

DBO contractual structures have been used to successfully produce over 200 water and waste water schemes, often serving small and remote communities, throughout the Irish Republic.

Carbon Capture Project, UK

Case study/Country	Carbon capture project, UK (under procurement).
Rationale/PPP Objectives	This is a landmark project using pioneering new technology, and therefore requires significant government funding in order to make it viable. Private sector skills are crucial to the success of the project because of the technology involved and therefore a DBO offers the best way to combine public finance and private sector expertise.
Financial structure	Carbon capture-specific investment to be financed by public money.
Contract agreement between parties	DBO contract (not completed).
Risk allocation	Risk principally allocated to private sector concessionaire. They cover construction delivery, maintenance and operating costs.
Payment method	Payment mechanism is likely to involve a mix of milestone payments, availability payments and delivery-related payments.
Strong points	Private sector skills used to ensure efficient design, construction and operation of the facilities. Project will use new technology for the first time.
Weak points	As project may not have external lenders or investors, the contracting authority will not have the benefit of external due diligence.

This case study illustrates how a DBO structure can be used to harness innovative technology and private sector expertise to create a project which is in the public interest but which would not attract fully commercial financing.

Background

This project is the first of its kind in technological terms and has the potential to set precedents and generate experience which will be of great social and economic benefit, both to the UK and internationally. The project involves technology that is both untested and currently expensive to develop and run and is therefore not commercially viable at this time. A DBO method of procurement has therefore been chosen, to marry public sector funding with private sector expertise, with an agreed risk allocation between private and public sectors.

Lessons learned

- The DBO approach will allow the public authority to promote and demonstrate technology that will benefit the public, while being able to transfer construction and operation risk to the private sector.
- Using a DBO method will allow the public authority to incentivise the private partner through a number of means, such as availability and usage payments, to ensure that service delivery during operation matches what is set out in the contract, i.e. relevant methodologies are being adapted and transferred from DBFO experience.
- Structuring a DBO will not entail significant complications compared to a DBFO. Some of the same standard provisions can be included in the DBO structure, and others can be adapted.

Training Project, UK

Case study/Country	Training, UK.
Rationale/PPP Objectives	To use private sector skills to provide the best training facilities possible at the most efficient cost. To take advantage of whole-life costing, while still using public finance.
Financial structure	Investment financed by public money (UK government).
Contract agreement between parties	DBO-style contract.
Risk allocation	Risk principally allocated to private operators. They are required to provide training and achieve minimum pass rates, to construct new facilities and refurbish existing buildings, and to operate training facilities, all for a fixed price.
Payment method	Milestone payments during construction, unitary charge during operation.
Strong points	Private sector skills used to ensure efficient design, construction and operation of the facilities.
Weak points	Project dependent on government funds to finance the project. Initially it was thought private finance would be used, and therefore significant changes had to be made.

This case study illustrates how private sector skills and expertise can be harnessed across a range of services (training and accommodation) and whole-life costing achieved within a DBO structure.

Background

This project comprised the provision of training and accommodation over a 30 year period under a DBO contract. The contractor is required to:

- design and construct new-build accommodation;
- design and execute refurbishment of existing facilities;
- administer training, provide instructors, manage scheduling;
- undertake hard and soft facilities management and lifecycle maintenance.

The rationale behind the project was to improve the facilities and training that were in place by introducing private sector skills. The benefit of using a DBO was that it would not only provide the refurbishment of the current site and construction of new buildings, but would also ensure that they were maintained over the life of the project. This would remove the possibility of a maintenance backlog building up and also ensure that they would be in good condition when they were handed back to the public sector at the end of the contract.

A detailed options analysis was undertaken at the beginning of the project which identified DBO as the optimal structure for the project. Market testing enabled the relative costs of public and private sector finance to be robustly compared. The operating contract was modelled however on DBFO contracts and employs many of the monitoring mechanisms typical in DBFO structures.

Lessons learned

- The value of an early, thorough options analysis.
- Although coming from the public sector, financing was structured similarly to commercial debt with drawdowns tailored to the construction programme and contingencies available. This ensured that financing was managed in the most efficient way possible.
- Incentives on the concessionaire through the payment mechanism are modelled on a DBFO payment mechanism.

Comhairle nan Eilean Sair Schools Project, UK

Case study/Country	Comhairle Nan Eilean Sair Schools Project, UK.
Rationale/PPP Objectives	To use private sector skills to provide schools facilities, but in an area in which private sector concessionaires may not want to invest their own money due to the size of the project. To take advantage of whole-life costing, while using solely public finance.
Financial structure	Investment financed by loan from the Public Works Loan Board (Government Funded).
Contract agreement between parties	DBO contract (in procurement).
Risk allocation	Construction and operation risk to be allocated to private sector operator.
Payment method	Milestone payments during construction, unitary charge during operation.
Strong points	Private sector skills used to ensure efficient design, construction and operation of the facilities. SPV structure ensures close monitoring of the private concessionaire over the life of the contract.
Weak points	Project dependent on government funds to finance the project in the form of a loan, which must be repaid initially. Due diligence is more difficult without private sector finance involved.

This case study illustrates how a DBO structure can be used by the public sector to transfer risk to the private sector and obtain whole-life cost benefits while using public finance, in a geographically remote area.

Background

This project involves the replacement and refurbishment of a number of schools in the Western Isles, a series of islands located off the north-west coast of Scotland, followed by their operation (in terms of facilities management, and lifecycle changes). The capital cost of the project is estimated to be around £60m (in nominal terms) with ongoing maintenance and operational costs of c.£50m (in real terms) over the life of the project.

The initial approach taken was to use a standard DBFO contract which would see a private partner appointed to design, construct, finance and operate the schools. However, market testing showed that there was limited market appetite from the private sector to deliver this proposal due to a combination of the remote location and the existence of a pipeline of transactions based in the mainland of Scotland, in particular the urban central belt.

Instead, analysis was carried out to determine what other structures could be used to procure the project. Whilst a D&B could have been adopted for the initial construction and refurbishment of the educational estate, such an approach would not take account of the operations phase of the project and would not therefore deliver longer term benefits which could be achieved by planning the whole-life cost of the project. To this end, the following structure has been developed:

- Comhairle nan Eilean Sair (the public authority, or the “Comhairle”) will contract with an SPV which they will own 100%, but will be arms length from the public authority and therefore to all intents and purposes a separate body.

- This body will contract with a series of subcontractors to provide construction and facilities management and will oversee performance and delivery during operations.

- A Private Sector Partner has been appointed to assist the SPV to manage the procurement process through to delivery and operations.

- Finance will be provided by the public authority, who will obtain this through a loan from the Public Works Loan Board ("PWLB"), which can be used for the construction cost of the assets. Payments will then be made to the SPV from the Comhairle for operating costs, lifecycle maintenance and FM services and working capital facilities, beginning on completion of the first school. The funding of these payments will come from sources such as existing education budgets, efficiency savings and revenue support grants from the Scottish Government.

The advantage of this structure is that it provides all the benefits of a DBFO – in terms of whole-life costing and transferring risk for operations to the private sector - while continuing to use public sector finance. The other option would have been to return to a D&B model and the public sector taking over operations. However this would not have achieved the desired level of risk transfer.

The structure also allows the Comhairle to create a risk reserve fund from the differential between the cost of borrowing from the PWLB and what it would have cost to borrow private sector funds. This fund will be used to manage any residual risks which, had a DBFO structure been chosen, would have lain with the private sector.

The project is currently under procurement, with market testing showing that the above structure is more attractive to the private sector than a DBFO. Therefore the public authority will soon tender for the contracts to design, construct and operate the schools, taking advantage of PPP benefits.

Lessons learned

- A potential challenge for contracting authorities contemplating a DBO lies in the long-term monitoring of the contract. A commitment is required to devote resources to do this job properly, and to incentivise the individuals involved. The structure agreed upon by Comhairle allows effective monitoring to take place through the creation of an SPV that is solely focused on the project. This SPV is created to manage the project. Therefore the SPV is incentivised to closely monitor the concessionaires to ensure good and consistent performance. Creating an SPV with its own resources also allows the public sector to ensure there are the necessary resources and skills available to ensure close monitoring takes place.

- Geographically remote areas can therefore still benefit from private sector skills and long-term planning of operations requirements. While D&B, followed by public sector management of the asset, could also be used, this would remove the benefits of planning long-term operational requirements. This planning will ensure that a high quality asset is designed, built, operated and handed back to the public sector at the end of the contract.

Immigration Detention Centres, UK

Case study/Country	Immigration Detention Centres, UK.
Rationale/PPP Objectives	To provide accommodation for immigrants to the UK seeking asylum. To procure that accommodation within as short a timescale as possible, while taking advantage of private sector skills and whole-life costing.
Financial structure	Investment financed by UK Government.
Contract agreement between parties	DBO contract.
Risk allocation	Construction and operation risk allocated to private sector operator.
Payment method	Milestone payments during construction, unitary charge during operation.
Strong points	Private sector skills used to ensure efficient design, construction and operation of the facilities. Contracts procured more rapidly than would have been possible under a DBFO structure (demonstrated through options analysis). DBFO experience used in contractual structure. Contracts could be shorter than typical DBFO contracts (10 years), because no need to spread debt repayments over an extended period. Use of joint and several guarantee by construction concessionaire and operator.
Weak points	Due diligence on contracts typically performed by private sector financiers not undertaken. Question whether guarantee referred to above will engender same level of commitment, e.g. to complying with lifecycle maintenance requirements, as an equity stake.

In a DBFO, the concessionaire is also an equity investor in the project. This provides an additional incentive on the concessionaire to perform relative to a DBO structure. This project demonstrates how innovative structuring of a DBO can replicate this incentive on the concessionaire.

Background

The project involves construction and operation of a number of accommodation centres built to house immigrants to the UK seeking asylum while their cases are being processed.

Options analysis undertaken by the UK government demonstrated that DBO would be the most appropriate structure to procure the project within an acceptable timescale. Speed was further facilitated by a detailed outputs specification in the project scope. The contracting authority also assumed responsibility for gaining outline planning approval for the centres.

The contract for the project is based on DBFO precedents (for example, monitoring is achieved through acceptance tests and the employment of a technical adviser by the authority; the concessionaire is subject to performance and availability deductions on their unitary charge). The contractual structure also brought in two innovations:

- Milestone payments during construction: a percentage of the payments was held over by the authority for one year post completion of the milestone. This enabled the authority to evaluate

performance of the assets before paying in full;

- Joint and several guarantee by the construction contractor and operator. This effectively replaces equity in the structure, by incentivising the concessionaire to remain in the transaction should problems arise.

Furthermore, it was decided to structure the contracts with ten year terms. The fact that the project was financed from public sector sources gave the contracting authority a level of flexibility over the contract term which would have been constrained in a DBFO structure, given the requirement to repay high levels of commercial bank debt.

Lessons learned

The principle lesson of this project lies in the innovative use of milestone payments and guarantees to achieve a comparable level of "bite" on the concessionaire as would be achieved through the investment of the concessionaire's own capital in a DBFO structure.

DBO Projects in Spain

DBO has been widely and successfully used as a contractual structure in Spain. The examples which follow are from the municipal waste and desalination sectors.

Municipal waste:

Example 1: Municipal waste plant DBO project, Vega Baja district, Alicante province, Comunidad de Valencia:

This project involves the design, build and operation of a municipal waste plan in Alicante, Spain. The contract was awarded to Cespa in 2008 and will operate in the Vega Baja district of Alicante province, which includes 27 municipalities, serving a population of 750,000 inhabitants. The project will run over 22 years, with Cespa therefore incentivised to design and build the most efficient asset, which will in turn incentivise efficient management of operation and lifecycle maintenance costs over the life of the contract. €98.8 million will be invested in the project over the 22-year contract, which includes a 2-year transition phase prior to bringing the newly-built facilities into service.

The contract covers the construction and operation of a municipal waste treatment and reuse plant (327,000 tonnes/year), a bulky waste sorting and treatment plant (7,300 tonnes/year), the construction of 25 citizens' recycling centres and a plant for handling construction and domestic rubble (57,000 tonnes/year), as well as the construction of a controlled landfill for final disposal of non-reusable waste.

The advantages of a DBO are clear in this project, with the concessionaire incentivised to reduce waste output as much as possible, reducing cost but also improving environmental performance. The entire project aims to recover close to 18% of the total waste by volume (including paper, cardboard, plastic and metal) and produce approximately 45,000 tonnes of compost per year which can be used in agriculture, while at the same time avoiding landfill disposal of about 160,000 tonnes. It thus provides benefits to both the concessionaire and the authority.

Ref:

https://www.ferrovial.com/en/index.asp?MP=18&MS=338&MN=2&IDR=&TR=&accion=&titulo=&fechadesde=&fechahasta=&pag=50&id=1240

Desalination:

In 2005 the Spanish Government established Acuamed, a government-owned entity under the Ministry of the Environment charged with realising a programme for the construction of 26 desalination plants, to achieve total production of 1,370,000m^3/day of clean water for Spain's eastern coast, using desalination as an alternative to river diversion projects. A number of these plants have been tendered during the second half of this decade, using DBO contractual structures. The projects will be financed by combinations of European Union grant funding, contributions from central and local Spanish authorities, and user tariffs. The DBO contractual structure has enabled the Spanish Government and the EU together to achieve a programme of projects in a relatively short space of time, using advanced technology and serving populations which are both dispersed and, given the influence of tourism, seasonally fluctuating, presenting risks which would have complicated the raising of private sector finance. The project below is one example:

Example 2: Desalination DBO project, Campobello and Mutxamel, Comunidad de Valencia:

This project was awarded to a consortium of Degrémont, Drago Sub SA, Rover Alcisa SA and Acsa Obras e Infraestructuras SA in 2007. It involves design, construction and operation of a reverse osmosis seawater desalination plant which will supply drinking water to the towns of Campbello and Mutxamel in the Alicante region.

Construction costs amount to €55 million, to be financed by funds from the European Union and Spanish public sector.

The plant will be based in Mutxamel and will have a capacity of 50,000 m^3/day. It will be operational in mid-2009 and will provide drinking water supply to all the inhabitants of the Marina Baja region in the province of Alicante. With its flexible technology, it will have a production capacity of up to 80,000 m^3/day which will enable it to adjust to the needs of a greater population in the summer months. A DBO structure meant that the concessionaire was incentivised to consider a period of operation in their design and price, which would not have been the case in a D&B structure.

Ref.

www.archives-suez.com/document/?f=presse/en/CP%20Mutxamel%2028062007%20VA.pdf

Appendix: Comparison of FIDIC Conditions of Contract for DBO ("Gold Book") and D&B ("Red" and "Yellow Books") projects

Key: X = clause included

	GOLD BOOK (G)	RED BOOK (R)	YELLOW BOOK (Y)
GENERAL PROVISIONS	**Chapter 1**	**Chapter 1**	**Chapter 1**
Definitions	X	X	X
Interpretation	X (more developed than R and Y)	X	X
Communications	X (more developed than R and Y)	X	X
Law and Language	X	X	X
Priority of Documents	X	X	X
Contract Agreement	X		
Operating Licence	X	-	-
Assignment	X	X	X
Care and Supply of Documents	X	X	X
Errors in the Employer's Requirements	X	-	X
Delayed drawing instructions	-	X	-
Employer's Use of Contractor's Documents	X (more developed than R and Y)	X	X
Contractor's Use of Employer's Documents	X	X	X
Confidential Details	X (more developed than R and Y)	X	X
Compliance with Laws	X (more developed than R and Y)	X	X
Joint and Several Liability	X	X	X

	GOLD BOOK (G)	RED BOOK (R)	YELLOW BOOK (Y)
THE EMPLOYER	**Chapter 2**	**Chapter 2**	**Chapter 2**
Right of Access to the Site	X	X	X
Permits, Licences or Approvals	X	X	X
Employer's Personnel	X	X	X
Employer's Financial Arrangements	X (different from R and Y)	X	X
Employer's Claims	-	X	X
THE EMPLOYER'S REPRESENTATIVE/ THE ENGINEER (R and Y)	**Chapter 3**	**Chapter 3**	**Chapter 3**
Engineer's Duties and Authority	-	X	X
Employer's Representative's Duties and Authority	X (refers to operation)	-	-
Delegation by the Engineer	-	X	X
Delegation by the Employer's Representative	X (refers to operation)	-	-
Instructions of the Engineer	-	X	X
Instructions of the Employer's Representative	X (slightly different)	-	-
Replacement of the Engineer	-	X	X
Replacement of the Employer's Representative	X (slightly different)	-	-
Determinations	X	X	X
THE CONTRACTOR	**Chapter 4**	**Chapter 4**	**Chapter 4**
Contractor's General Obligations	X (includes operation)	X (more detailed)	X
Performance Security	X (provision of a retention period)	X	X
Contractor's Representative	X	X	X
Subcontractors	X (not allowed for operation, unless otherwise agreed)	X	X
Nominated Subcontractors	X	-	X
Assignment of benefit of subcontract	-	X	-

	GOLD BOOK (G)	RED BOOK (R)	YELLOW BOOK (Y)
Co-operation	X	X (slightly different)	X
Setting Out	X	X	X
Safety Procedures	X	X	X
Quality Assurance	X (slightly different)	X	X
Site Data	X	X	X
Sufficiency of the Accepted Contract Amount	X (includes operation)	X	X (includes design)
Unforeseeable Physical Conditions	X	X	X
Rights of Way and Facilities	X	X	X
Avoidance of Interference	X	X	X
Access Route	X	X	X
Transport of Goods	X	X	X
Contractor's Equipment	X	X	X
Protection of the Environment	X	X	X
Electricity, Water and Gas	X (slightly different)	X	X
Employers Equipment and Free-Issue Material	X	X	X
Progress Reports	X (operation reports not regulated)	X	X
Security of the Site	X	X	X
Contractor's Operations on Site	X	X (slightly more developed)	X (slightly more developed)
Fossils	X	X	X
Changes in the contractor's financial situation	X	-	-
DESIGN	**Chapter 5**	**-**	**Chapter 5**
General Design Obligations	X	-	X
Contractor's Documents	X	-	X
Contractor's Undertaking	X	-	X
Technical Standards and Regulations	X	-	X
Training	-	-	X (of Employer's personnel in the

	GOLD BOOK (G)	RED BOOK (R)	YELLOW BOOK (Y)
			O&M)
As-Built Documents	X	-	X
Operation and Maintenance Manuals	X	-	X
Design Error	X	-	X
NOMINATED SUBCONTRACTORS	**-**	**Chapter 5**	**-**
Definition of "nominated subcontractor"	-	X	-
Objection to nomination	-	X	-
Payments to nominated subcontractors	-	X	-
Evidence of payments	-	X	-
STAFF AND LABOUR	**Chapter 6**	**Chapter 6**	**Chapter 6**
Engagement of Staff and Labour	X	X	X
Rates of Wages and Conditions of Labour	X	X	X
Persons in the Service of Employer	X	X	X
Labour Laws	X	X	X
Working Hours	X	X	X
Facilities for Staff and Labour	X	X	X
Health and Safety	X	X	X
Contractor's Superintendence	X	X	X
Contractor's Personnel	X	X	X
Records of Contractor's Personnel and Equipment	X (provision on operation added)	X	X
Disorderly Conduct	X	X	X
PLANT, MATERIALS AND WORKMANSHIP	**Chapter 7**	**Chapter 7**	**Chapter 7**
Manner of Execution	X	X	X
Samples	X	X	X
Inspection	X (more developed)	X	X
Testing	X	X	X
Rejection	X	X	X

	GOLD BOOK (G)	RED BOOK (R)	YELLOW BOOK (Y)
Remedial Work	X	X	X
Ownership of Plant and Materials	X (more developed)	X	X
Royalties	X	X	X
COMMENCEMENT DATE, COMPLETION AND PROGRAMME/ COMMENCEMENT, DELAYS AND SUSPENSION (R and Y)	**Chapter 8**	**Chapter 8**	**Chapter 8**
Commencement date of Works	X (includes design)	X	X (includes design)
Time for Completion	X (different from R and Y)	X	X
Programme	X (includes operation and slightly different)	X	X
Advance Warning	X	-	-
Extension of Time for Completion	-	X	X
Delays Caused by Authorities	-	X	X
Rate of Progress	-	X	X
Delay Damages	X (includes operation. It is not limited)	X	X
Suspension of Work	-	X	X
Consequences of Suspension	-	X	X
Payment for Plant and Materials in Event of Suspension	-	X	X
Prolonged Suspension	-	X	X
Resumption of Work	-	X	X
Contract Competition Certificate	X (both Design-build and Operation)	-	-
Handback Requirements	X	-	-
Unfulfilled Obligations	X	-	-

	GOLD BOOK (G)	RED BOOK (R)	YELLOW BOOK (Y)
DESIGN – BUILD	**Chapter 9**	**-**	**-**
Commencement of Design - Build	X (see previous section for R and Y)	-	-
Time for completion of Design - Build	X (see previous section for R and Y)	-	-
Extension of time for completion of Design - Build	X (see previous section for R and Y)	-	-
Delays Caused by Authorities	X (see previous section for R and Y)	-	-
Rate of Progress	X (see previous section for R and Y)	-	-
Delay Damages relating to Design - Build	X (see previous section for R and Y)	-	-
Suspension of Work	X (see previous section for R and Y)	-	-
Consequences of Suspension	X (see previous section for R and Y)	-	-
Payment for Plant and Materials in Event of Suspension	X (see previous section for R and Y)	-	-
Prolonged suspension	X (see previous section for R and Y)	-	-
Resumption of Work	X (see previous section for R and Y)	-	-
Completion of Design - Build	X	-	-
Failure to Complete	X	-	-

	GOLD BOOK (G)	RED BOOK (R)	YELLOW BOOK (Y)
OPERATION SERVICE	**Chapter 10**	**-**	**-**
General Requirements	X	-	-
Commencement of Operation Service	X	-	-
Independent Compliance Audit	X	-	-
Delivery of Raw Materials	X	-	-
Training	X	-	-
Delays and interruptions during the Operation Service	X	-	-
Failure to Reach Production Outputs	X	-	-
Completion of Operation Service	X	-	-
Ownership of Output and Revenue	X	-	-
TESTING/TESTS ON COMPLETION (R and Y)	**Chapter 11**	**Chapter 9**	**Chapter 9**
Testing of the Works/Contractor's obligations (R and Y)	X	X (much simpler than G and Y)	X
Delayed Tests on Completion of Design - Build	X	X (no design)	X
Retesting of the Works	X	X	X
Failure to pass Tests on Completion	X (no taking over, different from R and Y)	X	X
Completion of the Works and Sections	X	-	-
Commissioning Certificate	X	-	-
Joint Inspection Prior to Contract Completion	X	-	-
Procedure for Tests Prior to Contract Completion	X	-	-
Delayed tests prior to Contract Completion	X	-	-
Failure to pass tests prior to Contract Completion	X	-	-
Retesting Prior to Contract Completion	X	-	-

	GOLD BOOK (G)	RED BOOK (R)	YELLOW BOOK (Y)
EMPLOYER'S TAKING OVER	**-**	**Chapter 10**	**Chapter 10**
Taking Over of the Works and Sections	-	X	X
Taking Over of Parts of the Works	-	X	X
Interference with Tests on Completion	-	X	X
Surfaces Requiring Reinstatement	-	X	X
DEFECTS/DEFECTS LIABILITY (R and Y)	**Chapter 12**	**Chapter 11**	**Chapter 11**
Completion of Outstanding Work and Remedying Defects	X	X	X
Costs of Remedying Defects	X	X (more complex)	X (more complex)
Extension of Defects notification period	-	X	X
Failure to Remedy Defects	X (slightly different)	X	X
Further Tests	X	X	X
Removal of Defective Work	X	X	X
Right of access	-	X	X
Contractor to Search	X	X	X
Performance Certificate	- but see Chapter 8	X	X
Unfulfilled obligations	- but see Chapter 8	X	X
Clearance of Site	-	X	X
MEASUREMENTS AND EVALUATION	**-**	**Chapter 12**	**-**
Works to be measured	-	X	-
Method of Measurement	-	X	-
Evaluation	-	X	-
Omissions	-	X	-
TESTS AFTER COMPLETION	**-**	**-**	**Chapter 12**
Procedure for tests after Completion	-	-	X
Delayed Tests	-	-	X
Retesting	-	-	X

	GOLD BOOK (G)	RED BOOK (R)	YELLOW BOOK (Y)
Failure to pass tests after Completion	-	-	X
VARIATIONS AND ADJUSTMENTS	**Chapter 13**	**Chapter 13**	**Chapter 13**
Right to Vary	X (different from R and Y)	X	X (simpler than G and R)
Value Engineering	X (different from R and Y)	X	X (simpler than G and R)
Variation Procedure	X (different from R and Y)	X	X
Payment in Applicable Currencies	X	X	X
Provisional Sums	X	X	X
Daywork	-	X	X
Adjustments for Changes in Legislation	X	X	X
Adjustments for Changes in Technology	X	-	-
Adjustments for Changes in Cost	X (much simpler than R and Y)	X	X
CONTRACT PRICE AND PAYMENT	**Chapter 14**	**Chapter 14**	**Chapter 14**
The Contract Price	X (much simpler than R and Y)	X	X
Advance Payment	X (slightly different)	X	X
Application for (Advance and) Interim Payment Certificates	X (includes application for advance payment)	X	X
Schedule of Payments	X	X	X
Asset Replacement Schedule	X	-	-
(Payment for) Plant and Materials Intended for the Works	X	X	X
Issue of (Advance and) Interim Payment Certificates	X (includes advance payment certificate – more complex)	X	X
Payment	X (differences relate to the advance payment)	X	X
Delayed Payment	X	X	X

	GOLD BOOK (G)	RED BOOK (R)	YELLOW BOOK (Y)
Payment of Retention Money	X (includes commissioning instead of taking over certificate)	X	X
Statement at completion	-	X	X
Application for Final Payment Certificate (Design Build)	X (different time-limits (28 instead of 56 days))	X	X
Discharge	-	X	X
Issue of Final Payment Certificate (Design Build)	X	X	X
Application for Final Payment Certificate Operation Service	X	-	-
Discharge	X (after final statement operation service)	-	-
Application for Final Payment Certificate (Operation service)	X	-	-
Issue of Final Payment Certificate Operation Service	X	-	-
Cessation of Employer's Liability	X (more complex than R and Y)	X	X
Currencies of Payment	X	X	X
Asset Replacement Fund	X	-	-
Maintenance Retention Fund	X	-	-
TERMINATION BY EMPLOYER	**Chapter 15**	**Chapter 15**	**Chapter 15**
Notice to Correct	X (slightly different wording)	X	X
Termination for Contractor's Default/by Employer (R and Y)	X (slightly different wording)	X	X
Valuation at Date of Termination for Contractor's Default	X	X	X
Payment after Termination for Contractor's Default	X	X	X
Termination for Employer's Convenience/Employer's entitlement to Termination	X (slightly different wording)	X	X

	GOLD BOOK (G)	RED BOOK (R)	YELLOW BOOK (Y)
SUSPENSION AND TERMINATION BY CONTRACTOR	**Chapter 16**	**Chapter 16**	**Chapter 16**
Contractor's Entitlement to Suspend Work	X	X	X
Termination by Contractor	X	X	X
Cessation of Work and Removal of Contractor's Equipment	X	X	X
Payment to Termination	X	X	X
RISK ALLOCATION/RISK AND RESPONSIBILITY (R and Y)	**Chapter 17**	**Chapter 17**	**Chapter 17**
The Employer's Risks during the Design-Build Period	X	-	-
Employer's risks	-	X	X
The Contractor's Risks during the Design-Build Period	X	-	-
The Employer's Risks during the Operation Service Period	X	-	-
The Contractor's Risks during the Operation Service Period	X	-	-
Responsibility for Care of the Works	X (different wording, covers operation period as well)	X	X
Consequences of the Employer's Risk of Damage	X (different wording and scope)	X	X
Consequences of the Contractor's Risks resulting in Damage	X	-	-
Limitation of Liability	X	X	X
Indemnities by the Contractor	X	X (one provision for Employer and Contractor)	X (one provision for Employer and Contractor)
Indemnities by the Employer	X	X (one provision for Employer and Contractor)	X (one provision for Employer and Contractor)
Shared Indemnities	X	-	-
(Risk of infringement of) Intellectual ad Industrial Property Rights	X	X	X

	GOLD BOOK (G)	RED BOOK (R)	YELLOW BOOK (Y)
EXCEPTIONAL RISKS (see Chapter 19 in R and Y)	**Chapter 18**	**-**	**-**
Exceptional Risks	X	-	-
Notice of an Exceptional Event	X	-	-
Duty to minimise Delay	X	-	-
Consequences of an Exceptional Event	X	-	-
Optional Termination, Payments and Release	X	-	-
Release from Performance under the Law	X	-	-
INSURANCE	**Chapter 19**	**Chapter 18**	**Chapter 18**
General requirements for Insurances	X (very different)	X	X
Insurances to be provided by the Contractor during the Design-Build Period	X (insurance types are grouped)	-	-
Insurances to be provided by the contractor during the Operation Service Period	X	-	-
Insurance for Works and the Contractor's equipment	-	X	X
Insurance against injury to persons and damage to property	-	X	X
Insurance for Contractor's personnel	-	X	X
FORCE MAJEURE (See Exceptional Risks in G)	**-**	**Chapter 19**	**Chapter 19**
Definition of *Force Majeure*	- very similar to Chapter 18	X	X
Notice of *Force Majeure*	- very similar to Chapter 18	X	X
Duty to Minimise Delay	- very similar to Chapter 18	X	X
Consequences of *Force Majeure*	- very similar to Chapter 18	X	X
Force Majeure Affecting Subcontractor	-	X	X
Optional Termination, Payment and Release	- very similar to Chapter 18	X	X

	GOLD BOOK (G)	RED BOOK (R)	YELLOW BOOK (Y)
Release from Performance under the Law	- very similar to Chapter 18	X	X
CLAIMS, DISPUTES AND ARBITRATION	**Chapter 20**	**Chapter 20**	**Chapter 20**
Contractor's Claims	X (different, more comprehensive wording)	X	X
Employer's Claims	X	-	-
Appointment of the Dispute Adjudication Board	X (different wording. Termination upon commissioning certificate)	X (termination upon discharge)	X (termination upon discharge)
Failure to Agree Dispute Adjudication Board	X	X	X
Avoidance of Disputes	X	-	-
Obtaining Dispute Adjudication Board's Decision	X	X	X
Amicable Settlement	X (different time-limit (28, instead of 56 days))	X	X
Arbitration	X	X	X
Failure to Comply with Dispute Adjudication Board's Decision	X (different wording)	X	X
Disputes Arising during the operation Service Period	X	-	-
Expiry of Dispute Adjudication Board's Appointment	X	X	X