

# **Programme Procurement in Construction**

*JMM – For Jenny, Charlie Elvis and Ruben Tate*  
*SG – In memory of my late mother, Mrs Vicky Gruneberg*

# **Programme Procurement in Construction**

## Learning from London 2012

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Principal Programme Supply Chain Manager for the delivery of Crossrail

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# Forewords

Rarely, if ever, has the British construction industry delivered a major construction programme on the scale of the London 2012 Olympics, with so much success in terms of timeliness and quality while remaining within budget and without any of the acrimony that is so often associated with major construction projects. The London 2012 construction programme and its outcome have already proved to be a source of pride and achievement not only for the construction client, the workers who built it, the firms involved and the UK construction industry in general but also for the UK as a whole. So much so that politicians from all parties have praised the delivery and construction of the games infrastructure and have been keen to promote the methods used to build the Olympic Park and the other venues in order to repeat the success of the construction process and promote the methods throughout the construction industry.

Naturally, many factors came together to build that success but one of the key foundation blocks to the delivery of London 2012 was the way in which the buildings, stadia and infrastructure of the Olympic Park were procured. In my report, *London 2012 – a global showcase for UK plc*, I make the recommendation that, ‘Government should adopt the principles of the procurement and programme management approach used by the ODA, [the Olympic Delivery Authority], for all public sector projects valued at over £10m’.

This book gives an account of the actual methods that were used in the programme procurement. The techniques described in this book were combined in such a way that those who led the procurement team named their approach Purchase and Supplier Engineering (PSE), an approach that could only have been developed because the complexity of the programme was recognised by the ODA, who recognised the need to allow a highly gifted and professional team to devise the most appropriate procurement methods.

This book describes the procedures, techniques and methods that were used to such great effect. It can only be hoped that the success of the London 2012 programme will be used to encourage others to adopt or adapt the same or very similar strategies, not only in the UK but

around the world, wherever major construction programmes require the management and co-ordination skills and understanding that procured and delivered the London Olympics. Indeed this has already begun to happen as PSE has been adopted on the Crossrail programme, also discussed in this book. The London 2012 programme was a success; I hope this book will help future programmes to enjoy similar success.

Sir John Armitt CBE, Chairman, Olympic Delivery Authority

\* \* \*

The delivery of the London Olympic Park and venues has won wide acclaim as a showcase for UK plc. However, at the start of this epic journey in 2006 the horizon was very different, as demonstrated by an almost total lack of interest from industry in participating.

This is not surprising as the problems of Wembley were unfolding at the time and industry enjoyed a boom of activity. Why would anyone wish to participate in such a high profile enterprise with a fixed and very public end date and an international history of delays, cost overruns and lost reputations?

Into this arena stepped the Olympic Delivery Authority as the Government agency charged with delivery. If national objectives were to be met then industry resources would have to be mobilised on a massive scale. To achieve this, the ODA would have to gain in months what many client organisations pursue for years – their establishment as a recognised client of choice.

The first stage in this process was to carefully listen to industry and its aspirations and to convert these into well defined and communicated commitments as to how the ODA, as client, would behave and how industry was expected to reciprocate. Of course, talking and doing can be very different. However, early engagement in the procurement process demonstrated that commitments would be met and built with a solid foundation on which to go forward.

Industries do not create markets; that is for clients to do and they usually get what they deserve. In the case of London 2012 the ODA received the total support and commitment of UK plc which over time developed into a matter of national pride with all participants giving of their best and no one prepared to let the side down.

It is said that those who ignore history are destined to relive it. However, the success of London 2012 does not have to be a one time

achievement but rather a beacon of how things can be. This book charts how all this was achieved and for those who take note of the many lessons learned and apply them appropriately the potential for a successful outcome is vastly increased.

Howard Shiplee CBE, Executive Director, Laing O'Rourke and previously Director of Construction, Olympic Delivery Authority

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The construction industry has always been a contradiction whereby those that have the vision for how our built environment should develop are trained artistically (as creative people) and those who create that environment are trained as technicians (adapters). Creative people have vision, whereas adapters solve practical problems. There is a gap. The technocrats do not fill the gap; they just help define its edges.

This book describes a methodology that fills the gap, that takes the vision of the creatives and provides a sound and tested base on which the adapters can work. Purchase and Supplier Engineering (PSE) was brought together from best practice applications across industry, the catalyst being the London 2012 Olympic Games. The need for Usain Bolt to tie up his running shoe laces at a given moment, on a specific day five years in the future, galvanised thought since 2006. The degree of national embarrassment as a result of a late Olympics was unimaginable. The result was the creation of a hugely successful methodology of procurement and supplier management that was made up of parts that in themselves were nothing particularly new, rather a great recipe made up of sound ingredients.

Crossrail is one of the largest and most significant transport projects ever undertaken in the Western hemisphere. It has little of the kudos of an Olympic Games but at an engineering level it is astonishing. To bore twin tunnels to take a full size railway under the quite ancient city of London and beyond is the stuff of HG Wells and science fiction. Crossrail has been a programme that has not played the 'not invented here' card but has instead embraced best practice. The PSE approach to procurement has been fully adopted by Crossrail Limited and has been used to procure the entirety of the portfolio of construction and engineering contracts, roughly twice the size of the Olympic Delivery Authority's programme, albeit not nearly as diverse or unique.

At the time of writing this, I cannot imagine that Crossrail will have quite the Topping Out ceremony that The London 2012 Olympics build enjoyed. However, what it does prove is that the construction legacy of the Olympics is alive and well and thriving.

Martin Rowark, Procurement Director, Crossrail

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PODIUM, the Further and Higher Education Unit for the 2012 Games, was established in 2007 to maximise the engagement of universities and colleges across the United Kingdom in London 2012 and to use the Games to promote and showcase the contributions made by UK universities and colleges nationally and globally. These contributions to the legacy of London 2012 include the timely critical appraisal of all the dimensions of the Olympic and Paralympic Games, drawing lessons for the development and management of future 'mega' events. *Programme Procurement in Construction: Learning from London 2012* by my colleague Stephen Gruneberg and his co-author John Mead is one of the first tangible academic contributions to the legacy of the Games.

The scale and complexity of the construction programme was immense; its delivery was inspiring and a global showcase for UK plc. The leader of the ODA, Sir John Armitt, has suggested that lessons should be translated to other major public sector projects. The procurement processes were at the heart of the success story. This book provides an appraisal of those processes and highlights the lessons to be learned. It will become an important element of the London 2012 legacy.

Professor Geoffrey E. Petts, Chair, PODIUM, and Vice Chancellor,  
The University of Westminster

# Preface

The construction of the venues and necessary infrastructure to stage the London 2012 Olympics was such a resounding success that it boosted not only the reputation of the UK construction industry, but also the confidence of the UK population in the country's ability to organise, build and run a major international event. Just as the US man-on-the-moon rocket programme challenged the competence of the whole industrial and technological base of the United States, the 2012 Olympic programme demonstrated the ability of the UK construction industry to provide a built environment to the highest standards of quality, on time, without a single fatal construction accident, in spite of its immense scale and engineering and logistical complexity.

Many factors contributed to this achievement and one of those, in particular, was the method used to mobilise the construction industry to respond to the requirements of the construction programme in the first place. Many issues needed to be resolved. How does one buy the stage for an Olympic Games? How does one engage with the construction industry that will be charged with the delivery? How does one manage the details of thousands of contracts and the many firms of contractors, subcontractors and material suppliers and ensure that no one organisation adversely affects any other, to the detriment of the programme? How does one judge quality at the tender stage? Or monitor progress? Or, for that matter, how does one measure programme exposure, or manage performance? How does one maximise competition during procurement without stepping on a legal minefield of obligations? How does one measure capacity and the ability of firms to cope with the work and the risks involved? These and many more questions and issues are dealt with in this book.

The careful and painstaking preparation of the procurement processes is discussed, ranging from understanding and developing the appetite of contractors and encouraging them to engage with the procurement process, to monitoring performance based on the contractors' own performance claims as set out in their tender submissions. The emphasis of the approach described is based on a close attention to detail to avoid surprises, while keeping a focus on the total programme. By not doing

anything radically innovative or indeed difficult, but by doing simple things thoroughly in a coordinated and strategic way, a big picture is produced that is relatively easy to manage and control, with fewer Rumsfeldian unknowns.

Taken together, the methods and processes described here define an approach the authors and originators have termed Purchase and Supplier Engineering (PSE). Although similar to Supply Chain Management in many ways, PSE is a particular strategic approach to procurement that takes into account the state of the construction market at the inception of the procurement process and the early engagement of possible contractors. PSE provides an overview of the interest of firms in participating and the resulting capacity and workloads of all suppliers, including the main contractors and the critical subcontractors and materials suppliers. Having established the strategic approach for programme procurement and having organised the tendering process and awarded the contracts, PSE follows through by monitoring progress and risk throughout the construction phase and for all critical suppliers in the supply chain.

In a recent article, Hunter (2012) refers to new legislation in the UK: the Public Services (Social Value) Act, which from 2013 requires public-service contracting authorities to take into account economic, social and environmental impacts, balancing price, quality and social value in their procurement strategies. He also talks about engaging with the market before commissioning work, but he does not say how these issues may actually be dealt with in practical terms. This book describes how these and many more objectives were addressed in two major programmes: namely, the London 2012 Olympics construction programme and the Crossrail programme. The former bore the title of the largest construction programme in Europe, only to be beaten by the latter, with a combined total budget well in excess of £20bn.

The concepts and techniques used in the programme were not one-off techniques developed for the London Olympics alone, delivering success for just the ODA. Since the completion of London 2012 they have been further developed by its originators and either wholly or partially adopted on numerous other major construction programmes including the £14.8bn Crossrail rail programme, which involves tunnelling 21 km of twin-bore tunnels under the heart of London and includes eight new sub-surface railway stations.

It takes a client with great vision and foresight to commit to investing in this PSE strategic approach to procurement and supply chain management, but the approach has demonstrated its ability to deliver a high

degree of predictability and give clients what they set out to achieve not only in terms of the financial and economic objectives of budgets and schedules, but also in terms of the client's social and environmental objectives. The approach has also shown its ability to avoid the costs associated with supply chain insolvency, while achieving savings in common components and commodities.

We realise that these are extraordinary claims and that many factors contributed to the success of London 2012. However, in the euphoria of the Games and in the aftermath of the events, there has been very little criticism – if any – of the way the construction programme was conducted. Indeed, since the use of PSE by the ODA, elements are now being used to a greater or lesser extent on all manner of construction programmes, including those in the energy-generation, transport and utilities sectors across both public- and private-sector procurement.

For these reasons this book is aimed at public- and private-sector clients, developers, senior management and those professionals involved in undertaking the procurement, supply chain management and delivery of complex major construction programmes or those organisations, such as major tier 1 contractors, that manage large and diverse portfolios of projects across multiple client bases. The concepts described can be applied in part or in whole to portfolios of projects on a smaller or larger scale than that of an Olympic or Crossrail programme. However, to demonstrate the usefulness of the PSE model, these two particular programmes are used throughout as examples.

The specific management processes that were used in developing the PSE approach to procurement for the Olympic programme for London 2012 are described in this book. No attempt has been made to make a critical evaluation of the processes. Possibly, over time, a critique of the methods used to procure the built infrastructure of the Games may emerge. In the meantime, the authors have endeavoured to give an account of each element in the procurement process to provide the rationale behind the methods used.

Success and failure are often the result of a number of different factors. Attributing success to one particular aspect of a large and complex programme such as the Olympics can be misleading. All those involved in the many aspects of the programme were very aware of the great debt owed to the many thousands of people who contributed their diverse skills and expertise to the success of the overall project. They were also aware that numerous voices were raised in criticism of the Games, and doubts were raised about the ability of the ODA to complete their task. However, once the actual sporting events commenced, it became clear

that the UK construction industry had delivered on its promises and given the London Organising Committee for the Olympic Games (LOCOG) its internationally recognised venues and infrastructure. How these promises were achieved is described in the chapters of this book, in the hope that the lessons learned from this experience can be transferred to other construction programmes and portfolios of projects both in the UK and around the world.

The book is divided into three main sections. The first part is concerned with engaging the supply market. The second part deals with the organisational aspects of programme procurement, including the appointment of contractors and the approach used to decide on the contractual arrangements used. The third part describes the management and monitoring of the performance of the critical supply chain organisations during the construction phase. The first chapter introduces the concept of Purchase and Supplier Engineering, (PSE), which was developed in response to the complexity of the programme's many procurements as their associated processes emerged. Chapter 1 discusses the structure of the organisation of the programme procurement, showing how the delivery partner was engaged as a specialist procurer on behalf of the ODA. One of the key themes of this chapter is the role of the delivery team in interpreting the goals of the client in terms of what the construction contractors were required to deliver. Delivering the vision of the client was central to the purpose of the delivery partner. The chapter concludes by introducing the distinction between projects and programmes.

Chapter 2 provides an overview of the basic economics theory that underpins PSE. That involves a clear perception of the construction market and the wider market forces facing the purchasers and suppliers. The engagement of firms is directly related to the theoretical perspective described. This approach prepares the strategy adopted in PSE for delivering procurement on large construction programmes, a strategy that creates a competitive environment amongst suppliers at all levels in the programme with the purpose of delivering value.

Chapter 3 describes the aims of the client in terms of their values, priorities and critical success factors. In particular, the needs of a client may extend beyond the provision of a physical structure, as major building programmes such as London 2012 tend to impact on local and even national economies, with wider social, environmental and political implications. The client's priorities can then be translated into the requirements to be met in the form of built structures, how they are