LEAN CONSTRUCTION – A CONTRACTORS PERSPECTIVE

1.0  Context

The concept of lean construction is concerned with the application of lean thinking to the construction industry. It is about improved delivery of the finished construction project to meet client needs. Its principles were suggested as part of the Latham and Egan Reports, and featured in the National Audit Office’s document ‘Modernising Construction (2001)’.

Despite the fact that construction operations and supply chains have inherent differences to those deployed within manufacturing, the principles of Lean can equally be applied. It must however be noted that Lean is as much a philosophy and culture as a set of principles or approaches. Regardless of whether one takes the perspective of the client/developer, the contractor of the supplier, the end-to-end supply chain must be engaged. The contractor is in a unique position to be able to co-ordinate downstream activities within the supply chain.

2.0  Principles of Lean

The CIPS Position on Practice on Lean and Agile Purchasing and Supply Management states five principles to lean thinking.

- Specify what creates value as seen from the customer’s perspective
- Identifying all steps across the value stream
- Making those actions that create value flow
- Only making what is pulled by the customer just in time
- Striving only for perfection by continually removing successive layers of waste

In lean construction, owner, designers, general and speciality contractors, and suppliers work together to produce a value-adding, constructible, usable and maintainable facility. Constructing Excellence define Lean Construction as ‘a production management-based approach to project delivery – a new way to design and build capital facilities. Lean production management has caused a revolution in manufacturing design, supply and assembly. Applied to construction, Lean changes the way work is done throughout the delivery process. Lean Construction extends from the objectives of a lean production system (and the five principles stated above), and applies them in a new project delivery process.’

In essence, Lean is about designing and building a solution that meets client needs and getting it right first time. Improvement of processes and elimination of waste is fundamental. To achieve this it is essential that we work closely with the client in order to deliver a product that meets their needs. Lean needs to focus on delivering value by addressing the lowest total cost as opposed to being driven by price. To do this it is necessary to focus on process that can be improved and remove all those elements that do not add value. Design is paramount and can be helped by engaging expertise that will deliver a build able solution. It is essential that a clear strategy and policy are defined and understood by all elements of the supply chain.
Critical success factors include:

- Designing it right
- Understand the cost and whole life costing, and not be driven by price.
- Utilise knowledge and expertise
- Integrate the team, by working with end-to-end supply chain in an integrated manner.
- Understand the end-to-end process.
- Measure performance, to include 360 degrees reporting on your own input
- Training
- Off site prefabrication and multiskilling
- Benchmarking performance
- Supplier development.

It has been stated earlier in this document that ‘lean’ is as much a philosophy and culture as about processes and systems. Key to this philosophy is the relationship between the contractor and suppliers. The key principles require the fostering of much closer relationships with suppliers than that that has been typical of the industry norms. I.e. arms length, often-adversarial relationships. It must be remembered that every part of the supply chain has a part to play in the delivery of a project. Therefore successful relationship management by the contractor/developer is essential. Often referred to as partnering, it really is about good supply chain management and the development of appropriate relationships including supplier and product development. The possibilities for enhanced customer value are endless, but there must be continuous communication between the contractor and the client, and the contractor and the supplier.

Lean is a tool that will help deliver successful management of the supply chain. Equally, a managed supply chain is required to implement lean. For some organisations, rationalisation of the supplier base is fundamental, and a small manageable and meaningful list of suppliers capable and willing to deliver your needs is essential. Probably one of the most effective ways to apply lean thinking is to engage with something like the Construction Lean Improvement Programme.

3.0 Lean Construction in Practice

The Strategic Forum has identified integrated Teams and Integrated Supply Chains for Construction, chaired by Sir John Egan, as crucial to delivering the continuous performance improvements targeted in Rethinking Construction. Improved time, cost and performance are the main drivers for this procurement process.

The two previous industry reports have created a long overdue climate of change in the construction industry. The two reports are quite different in approach and recommendations but both are founded in the belief that integrated supply chains, often using the term partnering, are an essential part of improving the performance of the construction industry and delivering better client satisfaction. Accelerating Change goes further by insisting that the integration of teams and supply chains is one of the three main drivers to accelerate change in our industry. The report of the Strategic Forum, highlights the need for both integrated teams and integrated supply chains. An effective integrated supply chain must ensure close and early collaboration between subcontractors, designer/consultants and product suppliers allowing the lead organisation to be fully effective in the integrated team.
The Jobcentre Plus Case Study

The Department for Work and Pensions Jobcentre Plus project, launched in October 2002, is one of the largest government construction programmes undertaken in the UK, in recent years. The aim of this ambitious £750 million programme was to redesign, rebrand and refurbish more than 1000 former Jobcentre and Social Security offices in Great Britain and make the job-seeking and benefit claiming experience less sterile and more like that encountered in the banking and retail sector.

DWP placed an emphasis on adopting an open, non-hierarchical culture throughout the supply chain.

At peak, over 80 projects were on site concurrently, with the supply chain providing resources and products to complete projects at the rate of more than one office each working day.

This intense level of activity demanded not only one of the most challenging delivery strategies, but also a robust supply chain willing to work as a team, with a high degree of flexibility and cooperation.

The Challenge

Bovis recognised the importance of the message in Latham’s Constructing the Team, Egan’s Rethinking Construction and Central Governments Achieving Excellence Initiative and the benefits of Lean Construction as a philosophy and technique and focused on formulating new ways of working to create an ‘Integrated Team Approach’ that was more than just a statement of intent.

The challenge was to develop closer, cross business working relationships and work as an integrated team to deliver best value to the Jobcentre Plus.

The supply chain was tasked to evolve from the traditional system of hierarchical relationships, to a more communicative culture that shared experience, knowledge and best practice, with a single team commitment, where all parties, including second and third tier members are deemed to be equal partners.

The project objectives were based on these principles:

- Provide DWP with better value by combining lower price with better quality.
- Improve the value of what the supply chain delivers over time, not just on one project.
- Aggregate expenditure and opportunity to maximise JCP purchasing power.
- Create a cycle in which the supply chain gains an increased share and repeated work opportunities, with more predictable profits.
- Improve time and cost predictability.
Selecting the Right People

The key to success was the selection of a management team with the vision and experience to produce a significant step-change in the way construction projects operate and set new standards in relationship development and knowledge sharing.

Many organisations continue to rely on the competitive tender route, with the emphasis on lowest quoted price as the preferred way to select and appoint the supply chain. The selection of the JCP supply chain focused on combining the right skills with the right price. Analysis of the tenders was based on a 40 percent quantitative and 60 per cent qualitative basis—placing emphasis on track records of health and safety performance, partnering, collaborative working and experience of similar projects.

Crucially, DWP viewed the appointment of the supply chain as the start of the procurement process, in working to bring about the changes required for success.

Changing the Culture

The Bovis procurement consultants were tasked to develop a strategy to deliver closer cross business working relationships with the Client, consultants and the supply chain and work as an integrated team with a single team commitment, where all parties including 2nd and 3rd tier members are deemed to be an equal partner and their contribution valued.

To reinforce the partnering culture and project chemistry, considerable emphasis and investment was placed on team building, communication and training, through national and regional workshops and conferences, to create the ‘virtual company’ ethos and single project delivery philosophy.

This, in turn, led to an increased level of trust, crucial to the successful operation of the supply chain. The result was a gathering and harnessing of the diverse range of supply chain knowledge, skills and experience, to achieve substantial cost, quality and performance benefits. Companies that would normally be market competitors have worked together as a team to deliver innovative solutions and save costs.

Staff training and the use of project tools, such as value engineering, were encouraged to maximise value gains. The emphasis on ‘One-Team’, introduced at the start, focused on equal sharing and partnering, with incentives based on project performance.

This culture was embedded, from management through operation and into delivery. It was recognised that a problem will only become an issue if a team is disjointed. By working collaboratively, with like-minded people in a team environment, DWP has created a trusting and sharing culture, which has contributed to the success of this project.
**Strategic Procurement**

The procurement strategy placed high emphasis on early involvement, mutual trust, effective communication and long-term commitment to add value along the design, procurement and construction process.

The cornerstone to support the cultural change was the move away from traditional Forms of Contract with the introduction of PPC 2000, a contract that embraces the project partnering process. To support this approach a range commercial initiatives introduced including:

- True Open book, target cost pricing
- Payment of ‘actual costs’ to Contractors
- Incentivisation through cost saving & performance targets
- No penalty clauses, retentions or liquidated and ascertained damages

The project team acted as a catalyst, working closely with the primary and secondary supply chains, to drive the ongoing value engineering and continuous improvement programme.

From the start, the team sought to maximise the supply chain expertise during the design process, providing an opportunity to:

- Inject creativity into the supply chain team
- Encourage teamwork and knowledge sharing
- Provide improvements to product and methodology
- Improve quality and functionality
- Reduce overall cost.

The results of the value engineering exercises have been impressive and have provided DWP with significant added value, in terms of product quality and life cycle performance and substantial cost savings.

**Achievements and benefits**

The supply chain has fostered a spirit of partnership, which has contributed to the project meeting extremely demanding ministerial targets.

The results have been impressive: -

- 12% saving on construction costs against target cost (estimated total £80 million)
- Reduced component prices by 25% on average (estimated total £40 million)
- 89% of all projects achieved target costs
- 86% projects completed on Programme
- Accident statistics 10 times better than HSE published construction statistics
- Supply chain performance improvement – average 5% quarter on quarter
- No contractual disputes:

**Lessons learnt**

The Jobcentre Plus Project set out on a path to challenge the status quo and deliver change and innovation based on the background of lean construction techniques, partnering and teamwork across the supply chain, in order to deliver overall best value for money.

The procurement strategy and initiatives introduced by Bovis on behalf of DWP are viewed as a model of success in team working and delivering best value. Many of the companies in the supply chain have adopted the processes and procedures employed on the Jobcentre Plus project. The project has produced a significant step-change in the way construction projects operate and is at
the forefront in setting new standards in relationship development, knowledge sharing and a commitment to work as an integrated team in an environment of trust and co-operation.

4.0 Benefits of Lean

The following benefits have been reported from the successful application of lean. Consistent savings of up to 30% have been delivered against a traditional approach.

- Shorter order fulfilment lead times
- Less project down time
- More innovation
- True cost reduction.

5.0 The future of Lean Construction

The extent to which the Japanese model of lean production is applicable in Western contexts is subject to some debate. With issues of supply chain vulnerability, good practice now advocates iteration from lean, to consider agile supply chains. CIPS believe that lean thinking and agility can exist side by side in organisations, and deliver sustainable competitive advantage to organisations.