

Case study showing value engineering exercise brought about through partnering using the PPC 2000 form of contract.

Introduction

Overview

This paper explores the importance of value engineering through a live case study. The value engineering process highlighted within this paper was conducted under the PPC 2000 form of contract. The importance of the two-stage structure of the PPC contract allows for early contractor procurement and involvement. These processes will be explored in more detail further in the paper.

Project Brief

This case study example is based upon the complete external repair and improvement works to 30 residential blocks over two phases, located on the Woodberry Down Estate in Hackney, London. The specific project aim was to provide a schedule of works that represent value for money against the current lifespan of blocks (10 - 15 years) and seek to arrest deterioration and provide weatherproof dwellings ahead of demolition. The first phase consisted of 19 Blocks being complete within a very tight programme of 30 weeks (*Please refer to 'Woodberry Down project Layout'*). The scope of works included roof repairs, window replacement, brickwork and concrete repairs. These works required high levels of scaffold and hoist activity through a tight and congested site and this focused the team on coming up with a solution to reduce all elements of risk.

The project was carried out under PPC 2000, which was based upon a two-stage process. Firstly, a joint design review and development process took place in which the constructor and client would assess the project objectives and put forward comments in relation to buildability and affordability of the scheme. The second stage would then involve the supply chain in the tender process, which would then allow the team to tap into expertise in the supply chain's particular fields. Clause 10.8 of PPC emphasises the need and importance to get maximum output from the specialist supply chain members. This integrated approach helped Mulalley establish and complete the value engineering exercise described in the next section.

David Mosey summarises how the PPC 2000 form of contract enhances opportunities for value engineering:

*“ It provides a way to get contractor's ideas about the scope of the project and its supply chain, and there is still plenty of thinking time before the contractor is authorised to start work on site”.*¹

Clause 1.3 of the PPC highlighted the main principle which is pivotal in the contract:

'Partnering team members shall work together and individually in the spirit of trust, fairness and mutual co-operation for the benefit of the project'.

The collaboration of the project team in achieving the successful deliver is explored further within the case study.

¹ David Mosey Article titled 'How to be good when times are bad: early contractor involvement' Building magazine dated 13.03.09.

Value Engineering Process

Through the framework agreement Mulalley have been involved in collaborative design and process development at the earliest stage of the project. Also, through the early selection of specialists and supply chain members Mulalley have had time to enhance opportunities to value engineer certain items and present to the client.

Our initial proposal included a stand-alone hoist and generator for every block of flats, except in some cases where we had larger blocks; two hoists per block were then required (*Please see 'original hoist layout (proposed)' drawing*). Mulalley did explore the idea of alternative power supplies for the hoist in lieu of high volumes of generators on site. Mulalley got their electrical specialists to look into alternative methods but unfortunately Mulalley could not obtain three phase power supplies from the blocks, so generators were the only viable way forward. We also briefly looked into wind turbines as an eco system but soon realised that using these would carry a high risk, as we would not be able to guarantee stable levels of generated power, which would then impact upon the efficiency of the hoist and could lead to delays to the programme. However, we continued to explore alternatives to the normal process and there were a few key factors, which led to the value engineering exercise:

- Confined Site space (*Please See 'Photograph No. 1'*). 19 Blocks in close proximity, which had a programme running all 19 blocks in tandem.
- Resident Disruption through the entire estate.
- Environmental Impact.

Once these risks were highlighted, Mulalley then began to set up collaboration workshops which involved constructor, client and supply chain to find ways to deliver best value for money. Under Clause 18.1 in the PPC, it explores the importance of highlighting the risks at an early stage to ensure that these are then reduced in the most effective way. Value engineering would be a topic that would always feature in our team meeting agenda. Mulalley began by meeting the supply chain specialist (scaffolding) and an independent hoist supplier on site to walk through the original scope of works and the practicalities of what they were being asked to do.

It became clear from the site visit that although having separate hoisting facilities on all blocks would be the most convenient working method, it was going to take up valuable space for the surrounding residents and cause endless disturbance. Car Park spaces were limited throughout the estate to begin with so Mulalley did not want to disable more than what we needed to. Off the back of this concern, the first design I came up with was to have a narrow base lift on all scaffolds. This way, available car park spaces were kept to a maximum to avoid disruption to the residents.

Once I had come up with an approved design we then began to look at the hoisting facilities in more detail. Mulalley again set up workshops to discuss any ways we could value engineer these facilities. Again, exploring the potential of resident disruption through noise and pollution, we liaised with the team to come up with a way forward to minimise this. My idea was to use a shared hoist facility between two neighbouring blocks wherever possible. This worked by erecting link scaffold at every floor level to the hoist from both neighbouring blocks (*See 'Shared Hoist Design Sketch' Attached*). This design also meant that we could share a generator and fuel tank, which in turn would offer considerable savings.

Once Mulalley had a preliminary design, we had to discuss with all supply chain members, involved to see whether in practical terms, this was achievable. All supply chain members were appointed very early on in the process through our framework agreement on Hackney.

Firstly, we had to ensure that programme was not compromised as the budget for the project had to be spent within the financial year. Due to the tight programme and busy congested site with all trades, we had to ensure that having a single hoist would still allow all trades to transport their goods and materials without impacting on their programme obligations and to ensure that safety was not compromised to the operatives (*Clause 7.4 of PPC 2000*). Although it would take more careful and stringent management on site, all supply chain members were happy with the new proposal (*Please see 'shared hoist layout' drawing and photograph No. 2*). Final designs were collated and were ready to be submitted to the client (*Clause 8.1 of PPC 2000*).

The next stage was to then submit a cost exercise and submit to the client for approval under a scope change request. This required breaking down all elements effected and producing an 'add and omit' exercise. The results of this exceeded our expectations. Reductions were seen in the following areas: Carriage and dismantle costs for the hoist, hoist hire charges, hoist enclosure tower reduction, hire and transport of both the generators and fuel tank and of course the fuel was notably reduced. The final cost saving against the original AMP saw a staggering 50% saving on hoist and generator items alone (*Please see attached 'new hoist proposal cost saving exercise 26.01.10'*). Once this was tabled, the client issued a change order to allow Mulalley to proceed on the basis of the shared hoist concept (*Clause 17.3 of PPC 2000*).

The client Project Manager Gideon Taylor gave a positive response to the exercise by saying:

*'Good Stuff. Can you include this approach in all AMP's that have not yet been signed off by the client'*².

Before we commenced on the scheme Mulalley provided hoist training to at least one operative for every trade on site to ensure that there were multiple persons on site who could operative the hoists in a safe manner.

Benefits to the Project

The agreed scope change carried multiple benefits to the project team as a whole. Environmental benefits are paramount on the project. Before commencement on site, all operatives have a mandatory induction, which is carried out by the constructor. From the offset, environmental awareness is discussed. For example, operatives are reminded to turn off generators and power to the hoists when these are not being used. This helps minimise noise disruption to residents but also reduces the carbon footprint on site and contributes towards reducing energy consumption on site.

In reducing the number of generators on site as well, this again helps reduce carbon emissions. For example, each 140kva generator could use in the region of 25-30 litres an hour, which would equate to 1250-1500 litres a week. So, for every generator omitted, the carbon emissions were heavily reduced.

Another environmental impact is the generation of noise pollution. The noise pollution to residents via the generator and hoist when in use can cause great resident disruption. As the generators and hoists were located next to the blocks, noise could easily travel through to

² Gideon Taylor Email dated 12.01.10.

resident's homes. Live sites can be noisy at the best of times, without the addition of mechanical machinery involved and these generators would be running for the entire working day.

Also the reduction in air pollution reduces resident disruption and enhances their safety and well-being. The generators when firing up and running will give off fumes and smoke, so the only way to reduce this is to scale down the volume of generators on site and to closely monitor the usage of these to make sure they are only being used when absolutely necessary. .

Car park spaces for residents had to be carefully monitored to ensure that Mulalley were acting as considerate neighbours to the residents. As the scaffolding would inevitably take up a proportion of resident parking bays, we were mindful of reducing them further, as hoist locations, in most cases had to be placed within a parking zone. Therefore, in reducing the volume of generators and hoists, we avoided taking up further parking bays. Mulalley saved up to 3 parking bays for every hoist we omitted. (*See 'Photograph No.2' as an example*).

The obvious benefit was the substantial cost saving to the project. We looked into the detail and realised that minimising generators and hoists would still possess the same functional requirement but at the same time eliminates unnecessary costs to the client. It also released some funds, which Mulalley then received an instruction at a later date to roll out a front door programme to the blocks. This provided tangible additional works for the residents instead of the money being lost on items such as hoists and scaffold, which the residents would not have seen physical benefits to them and the estate. The PPC contract explores incentives under clause 13.2 in which this change of approach gave shared savings and added value to the project. Financially, Mulalley did not receive any additional benefits, as a reduction in AMP value would in fact reduce our overhead and profit margin for this phase.

A final concept that PPC 2000 sets out is the objective of providing sustainability (Clause 4.2). This approach to shared hoist facility was sustained through the entire duration of the project and can easily be replicated across future projects of similar nature and future phases of Woodberry Down. This will see a broader demographic reap the benefits in relation to the added value in which this design concept brought to our project.

Conclusion

The changed approach to the hoist facilities turned out to be a success. Clause 4.1 of the PPC 2000, illustrates some of the key partnering objectives that were achieved in this case study. To obtain the success achieved we had to have effective co-operation throughout the whole partnering team to work towards the same goal. We finalised designs and costs in a timely fashion in order to continue to meet programme requirements. We innovated a new approach that can be used on similar projects through the partnering agreement. And above all Mulalley maintained the programme without compromising quality of the final project. Mulalley delivered all 19 blocks to the satisfaction of the client and have now been awarded phase 2 which involves a further 11 blocks. The positive impacts of this innovation also helped Mulalley obtain a silver award from the considerate constructors scheme.