Construction Clients' Group
CONSTRUCTING EXCELLENCE

Pathfinder project

The Hopkirk Research Institute accommodates one of the largest animal health research centres in the Southern Hemisphere.

Hopkirk Research Institute

Client: JV between Massey University and Ag Research
Contractor: McMillan & Lockwood (PN) Limited
Architect: S2F, Melbourne, Australia
Publication Date: September 2008
Region: Palmerston North
Sector: Commercial, Technical Research Laboratory, Offices
Total Project Value: $17.45m Total
Project Construction Timescale: July 2005 to Dec 2006
Defects Period: 12 months
Form of Contract: NZIA SCC1, 2nd Edition 2000

The Hopkirk Project started its life under a traditional framework, but due to a potential budget and time blowout in the design stage, a new Client Project Director (CPD) lead the team towards a collaborative method of working in order to bring the project back on track.

Background

This project is an excellent example of what can be achieved by adopting best practice Collaborative Working Principles even within the confines of a traditional contract.

This is a subject which often arises in the Construction Clients Group meetings – i.e. that a team cannot work collaboratively under today's traditional contract forms. This project shows how this is simply not the case.

Whilst the traditional contracts were maintained, the CPD, the consultants and the contractor created an informal charter. Together, they formed a Project Control Group (PCG) and shifted the procedures and processes to a more inclusive way of working. There was a collective motivation to find ways to reduce the cost and construction time to ensure the project's success.

The outcome was a 'fast-track' construction, (based on a preliminary assessment of costs (PAC) and a P&G plus Contractor's margin) that was delivered under budget. In addition, despite changes, the majority of the project was completed on time. This case study examines how this was achieved.

Successful Outcomes

As in all construction projects, key performance measures focused on cost, time and quality. In addition, other key aspects were treated with equal importance – for example, health and safety and the culture of the team were recognised as playing significant roles in the success of the project.

Collaborative culture working under a traditional contract

The PCG was able to develop a healthy culture that enabled them to work towards a shared goal. This was achieved even though they continued to work under the Traditional contracts and in separate offices.

What significantly brought them to a shared alignment was the informal charter that they developed after the tender price in April 2005. This charter created an 'open book' policy that was supported by the client. In addition, the client established a single project website that included progress reports, up to date documentation, audit reports and photos. This was accessible to all the members of the PCG. It even included the contingency sum for the project, an unusual move for a Client.

Typically, under the Traditional process, the Architect would have design authority and act on behalf of the client when making decisions. In this case, all design and processes were signed off by the PCG. This meant that all decisions were shared amongst the PCG. The result of this was agreed cooperation, as the team realised that decisions were being resolved in an open, fair and timely manner and that the decisions were ultimately best for the project.

Collaborative culture working under a traditional contract (Continued)

The team members were willing to admit any mistakes to each other, although still bound by Traditional Contracts. A general feeling of trust had been established that they all worked towards a collective outcome.

When interviewed, the project architect described *"The CPD was crucial to the success of this project. By forming the PCG he created a forum where issues could be talked about freely and openly. This built trust amongst the team and took away the adversarial issue. It is important to have an experienced client, as he was able to bring people on board and in doing so, was able to get a better result."*

The contractor explained *"All jobs should be run like this! It makes sense to work this way, it's a logical choice as it builds trust in the relationships which creates a team that works together to find solutions."*

The Project Team

On Time

Due to a strong emphasis on the programme, the project was able to meet all but one of its milestones. By the 22 December 2006, the project was 95% complete. The only sacrifice to programme was the Physical Containment Level (PCL) 3 laboratories which required a very high level of finish and subsequently took longer than the PCG anticipated to gain compliance. These laboratories demanded the highest standard of quality to reach the PCL3 Standard required and the approval of MAF and ERMA. It was decided amongst the PCG to take this final 5% of the work into a separate stage of works, which was awarded Practical Completion on 16 March 2007.

It is interesting to note that Liquated damages were stipulated in the initial formulation of the contract. Prior to construction the Client removed anything that referred to penalties and/or Liquidated Damages, preferring to trust and work with the Contractor as they realised that you cannot have a collaborative relationship where penalties are involved. The provision for extensions of time remained in the contract, but the Contractor chose not to take this path and no extension of time was applied for.

Inside the laboratory

Quality

Achieving a high quality of finish was important to the team and resulted in the vast majority of the work being completed to the required level of quality. The one key area that was not initially completed to the required standard was that comprising the PCL3 laboratory. These Laboratories demanded a very high quality of finish as the project architect explained *"This was the Contractor's first PCL3 laboratory. In our experience it is very rare for the Contractor to get the level of quality required for the Laboratories right the first time. It is difficult to fully understand the rigour that is involved to get it right*".

Prior to construction, the Architect recommended a site visit with the Client and Contractor to similar Australian Facilities which proved to be a very useful exercise providing examples of the high quality of finish that was required to meet the standards.

To further help achieve this level of quality, the architect and the contractor worked together to prepare a snag list about a month prior to Practical Completion to ensure minimal defects at the handover of the building. This highlights a key change in attitude whereby Contractor and Architect work together at reducing defects. This was able to happen as they had each developed such a good working relationship during the project.

Key principles for repetition

- For the Client to gain knowledge and employ experienced senior staff who can help direct and lead the project
- Single point of contact to the client, particularly important when the client is multi-headed, to enable decisions to be made in a clear and timely manner
- Select the whole team on their experience, skills and quality of work rather than on price alone
- Organise a culture workshop that includes key team members up front to define how they will work together and create a Project Charter
- Bring the key members of the team into a Project Control Group (PCG) which makes essential decisions together in a 'best for project' manner.
- Run an Open book policy
- A client driven shared Project Web Site
- A combined Risk Register managed via an inclusive website
- Becoming an official Site Safe site

Cost

A key successful outcome for the team was completing the project 3.4% below the PAC. This was possible due to the careful collaborative planning and formal risk management procedures carried out by the PCG.

The formation of the PCG enabled innovative decisions during the re-design and construction, as members were able to contribute beyond their domain of knowledge and work together to achieve the best solutions.

One example of this can be found in the building structure which was initially designed to be reinforced concrete, but due to a material shortage and subsequent rise in costs a redesign was achieved using a structural steel frame solution that was cost competitive and made significant savings.

A further example involved replacing traditional bored piles by using steel screw piles. This sped up the project in addition to saving on costs of around $350K. Both examples were achieved without affecting the integrity of the overall design.

Risk Management

Risks were actively and collaboratively managed. The Risk Register was easily accessible on the project website and was addressed each month at the PCG meetings and at a quarterly risk review. All risks had a risk profile and were associated with all sections of the work, the procurement of materials and labour, the standard of each of the trades and the time and costs potentially associated with the work. This was supported by the Project Architect, who stated that *"the risk management was run really well. The Risk Register was consistently revisited throughout the project"*.

Audit

The JVA required a 6 monthly audit which was initially seen as restrictive but in fact created a positive outcome as it had the benefit of managing and communicating the costs of the project. The JVA included specific delegation of each level of variation processing. This meant that there had to be a real justification to use the contingency component. And resulted in the variations only making up 1.6% of the contract value, where typically variations are around 5% or more.

Health and Safety

An area that the PCG are particularly proud of is their Health and Safety Record, which resulted in zero Lost Time Incidents (LTIs). This is an excellent achievement on such a significant and complex project.

As an official Site Safe site, all individuals who entered the site had to have a Site Safe Card or be escorted by a Site Safe approved member. The CPD set an example, by himself completing the Site Safe course. The CPD noted the Site Safe culture gave rise to unforseen added benefits towards creating a team, *"as a lot of the sub-contractors were on the course together and this had a positive effect to how the project succeeded*".

The Completed Project in use in May 2007

The Project at 25th January 2006

Summary of Benefits

In review, this Pathfinder Project clearly demonstrates the benefit of forming a more collaborative team, whose relationships are progressively built on trust. By being able to achieve this, it enabled the project to be fast-tracked and therefore built within the time period predicted and under budget. An additional key benefit was an exemplary Health and Safety Record.

A further benefit that is often overlooked, but nonetheless one that is invaluable is that the Client and all other key team members working on this project were all satisfied with the finished product and would welcome the opportunity to work with each other again.

What this project clearly highlights is the changes anyone can make within the industry towards changing the behaviour of the team from an adversarial, non-trusting one, towards collaboration. The more projects like this one that show the advantages of working this way will ultimately lead a groundswell towards a more holistic approach. A sensible question needs to be asked – why wait until the tender process to find out that the budget has been blown – wouldn't it make more sense to integrate design and construction early on and save time, money and potentially make it a more enjoyable process.

Lessons learned

As in all projects, there are always aspects which can be improved and which the team can take on board for future projects. Key lessons to take forward from this project have been identified as:

- **Achieving Quality Standards:** the Contractor has taken on board the experience gained from their first experience of providing such a high standard of quality in the Research Laboratories and planned how they might adopt a different approach.
- **Combined PCG:** Working as a combined PCG was a new experience for the team. After this project, the majority of them saw the advantage of working this way.
- **Post Practical Completion:** A general comment was that it is important to retain key members of the Project team after Practical Completion to ensure on-going relationships and continuity of work. The importance of the Defect Period is an area that is often overlooked, but is of key significance to ensure that repair work is done efficiently, safely and to a high level of quality. If defects take awhile to get resolved, bad feelings can occur, which influence how the client feels about the overall project even if work has been outstanding until that point.
- **Achieving Quality Standards:** Projects of this size and duration often find that those at the start of the project do not always finish the project. This can happen to the Client, Design and Construction teams. The key lesson here is to be aware that if this happens the expectations between the parties may be different. This highlights why it is important to maintain a Client Brief that clearly states the key objectives, values and vision of the project.

Possible improvements

- More collaborative relationships onsite training and workshops to help manage the culture shift. Inclusive in this, would be on-going coaching and mentoring.
- The Contractor being able to select the subcontractors more carefully, particularly when such a high quality of work is required.
- Invite the whole team including subcontractors to review and discuss how to mitigate the defects issue and how to improve the management of the subcontractors in future
- As this client is a 'diamond' repeat client, consider setting up a preferred supply chain. In this way, the Contractor can train the supply chain and develop their skills for similar projects.
- Make sure that any final defects are cleared immediately, otherwise the favourable impression left by the overall project can be easily lost and could impact future work prospects.

Key Client Actions

This project demonstrates a number of areas where the client directly and positively affected the outcome of the project **for all**, by adopting specific Collaborative Working practices. These included:

- **Team Selection:** Key team members were selected through an invited tender process and were chosen specifically for their skills, experience and historical relationships with the Client and not on price alone.
- **Single point of Client Contact:** At the Tender stage the JV Client made a crucial decision and brought one of their experienced Client Project Directors (CPD) to manage the process and overcome the time delay factor and cost blowout. The CPD was the single point of contact for the JV Client. The CPD was able to closely monitor variations, costs and ensure that decisions were made in a clear, transparent and timely manner.
- **Front End Planning:** To ensure the project's success the CPD placed a lot of emphasis on front end planning, the programme, risk management, variation control and health and safety.
- **Team Culture:** The CPD was able to achieve this by instigating an agreed **informal charter** that moved procedures to an all inclusive Project Control Group (PCG) operation, an **'Open Book'** policy, **Integrated redesign and construction**, creating **formal risk management** procedures, very **stringent variation control management**, and establishing and monitoring an exemplary **Site Safe site**.
- **External Audit:** To meet the formal Joint Venture agreement (JVA) between Massey University and Ag Research, an independent external audit (by Audit NZ) of the project was required every 6 months.
- **'On the Ground' Client:** The client along with user representatives were part of the PCG and were included in all key decision making

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