University of Southern Queensland
Faculty of Engineering and Surveying

Benefit of Partnering in the Hong Kong Construction Industry

A dissertation submitted by

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Courses ENG4111 and 4112 Research Project

towards the degree of

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Abstract

This Research Project describes an investigation into the application of partnering in the Hong Kong construction industry in order to examine if partnering should bring benefit to employers, engineers and contractors.

Literature review was undertaken to review the contract formation and management process, the fundamentals of project partnering, the contract management process using traditional and partnering approaches and the benefits, costs and issues associated with delivering civil engineering projects using partnering as compared with traditional forms of contract.

After completion of the literature review a research methodology in terms of questionnaire was developed, to collect data and information from practitioners, to research the benefits, drawbacks and problems of partnering, as well as the situation suitable for partnering.

Case studies were also carried out to describe the real case happened in the Hong Kong construction industry. It comprises three partnering projects and three non-partnering projects, to compare and contrast the process and outcome of two categories of project delivery. It reveals that partnering improves performance, reduces disputes and improves relationship.

Based on the findings of data analysis a process was developed for improved project delivery system. This is a straightforward approach and was then tested with principals, superintendents and contractors in the Hong Kong construction industry. Finally, evaluate the use of process developed in the award and management of a particular construction contract. All these supports that successful implementation of partnering could be able to improve the current problems in the contract delivery process.

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I further certify that the work is original and has not been previously submitted for assessment in any other course or institution, except where specifically stated.

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Signature

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Date

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Glossary of Terms

Construction Industry Review Committee In 2000, the Chief Executive of Hong Kong Special Administrative Region appointed the Construction Industry Review Committee to comprehensively review the current state of the construction industry and to recommend improvement measures to uplift its quality and performance.

Hong Kong Housing Authority a government organisation established under the Housing Ordinance, and is a statutory body responsible for co-ordinating all aspects of public housing.

Hong Kong Housing Society it is a non-government organisation aiming to serve the needs of the Hong Kong community in housing and related services.

Remeasurement Contract type of contract will be used where the work cannot be accurately measured before tendering takes place. The basis of this type of contract envisages a total remeasurement of the work undertaken which will then be priced at the relevant prices contained in the tender document. Example of this form is FIDIC (the International Federation of Consulting Engineers) form of conditions of contract.

Target cost contract under this approach, the contractor agrees to carry out the work on the basis that he is paid the prime or actual cost of labour, plant and materials. In addition, he receives an agreed fee to cover management, overheads and profit. The fee fluctuates in relation to the success of the project. If the cost is higher than originally anticipated, then the fee is reduced; if the cost is less, then the fee is increased.

Chapter 1 Introduction

The majority of Hong Kong construction projects comprise various parties like employer, architect and/or engineers, contractor and subcontractors. In this traditional arrangement system, employer/ architect/ engineers and contractor often operate in an environment with limited trust and cooperation. As a result of this mistrust, time may be delayed due to the strict application of contract terms and money may be spent as a result of dispute resolution.

Partnering is a management approach to get the maximum achievement and effectiveness from good relationship/ co-operation between two or more parties.

Partnering is also being viewed as a means of restoring focus on the project as a whole, and for all parties' interest and breaking the destructive cycle of confrontational practices.

1.1 Aim.

The aim of this project is to evaluate whether the implementation of partnering should bring benefits to employers, engineers and contractors in the Hong Kong construction industry.

1.2 Background.

The construction industry in Hong Kong is one of the main pillars of Hong Kong's economy. As reported by Uebergang et al. (2004, p.9), the gross value of construction work in Hong Kong amounted to 4.8% of total GDP (equal to about US$25.2 billion) in 2001.

The activities of Hong Kong construction industry can be grouped into three broad categories: building construction, structures and facilities construction and non-site activities (decoration, maintenance and repair).

As described by the Construction Industry Review Committee (CIRC) (2001, p.1), local construction activities are labour-intensive, dangerous and polluting. Built products are seldom defect-free. Construction costs are comparatively high. There is a tendency to award contracts to the lowest bidders and delivery programmes are often unrealistically compressed.

The construction industry is characterised by a high degree of fragmentation, with numerous individual participants each pursuing his singular interests on a project-by-project basis. Co-operation on an industry wide basis is very limited. Under the conventional approach to project delivery, which is still the most widely used approach in local construction, the various processes from design to commissioning proceed in sequence with little interaction with one another.

It is further observed by CIRC that the multiple parties involved in the construction supply chain often adopt an adversarial approach in dealing with one another. The absence of a teamwork culture in the industry and the lack of a common purpose among stakeholders have inhibited concerted efforts in driving for better overall performance of the industry as a whole.

1.3 Objectives.

The specific objectives of this project are:

- Conduct literature review.

- Review the use of traditional contracting and partnering in Hong Kong.

- Develop a research methodology for assessing the benefits, costs and issues associated with partnering in the Hong Kong construction industry.

- Conduct a study on construction projects in Hong Kong, six total, three of which are to be delivered through partnering, to gather data on the contract delivery processes and research the advantages and disadvantages of implementation of partnering in the view of parties involved in a contract.

- Analyse the results of this study to assess the hypothesis “The implementation of partnering should bring benefit to employers, engineers and contractors in the Hong Kong construction industry”.

- Develop a process for improved project delivery in the Hong Kong construction industry.

- If time permits, test the recommendations developed, with principals, superintendents and contractors in the Hong Kong construction industry; and

- Evaluate the use of the process developed in the award and management of at least one particular construction contract.

Chapter 2 Literature Review
Traditional Contracting and Partnering

The study book for the Faculty of Engineering and Surveying (FOES) of the University of Southern Queensland course 70708 (which is now ENG3003): Engineering Management (2001 p.2.1) defines a contract as an agreement between two or more parties which those parties intend to be legally enforceable and which the law recognises as being binding. In this chapter, the literature review comprises the principles of contract delivery process involved projects procured in traditional ways and projects incorporated the adoption of partnering.

2.1 The Traditional Contract Formation and Management Process

As described by Walker and Hampson (2003, p.14), the traditional, or conventional, approach to procuring projects involves discrete design development, tender, contract award and construction delivery phases. Each phase is, in theory, separate and distinct. The process begins with a client approaching the principal design consultant. This is generally the architect for building projects or a design engineer for engineering projects.

Tenders are called after design completion and the construction cost is then assumed to be ‘fixed’. The final end cost of a project, however, also includes the costs of design changes and other claims made for consequential delays. Thus, the traditional procurement method often ends up delivering the tendered lowest price for a project and subsequent claims for additional works mean that many clients feel at the mercy of contractors seeking opportunities to create profit and additional revenue.

The main criticism of the traditional lump sum approach has been that it invites a confrontational approach over disputes arising out of contract variations and what might be a fair price for these.

There are other types of construction contracts such as Design and Construct Contracts and Management Contracts. FOES (2001, p.3.2) stated that in the Design and construct form of contract the performance required of the product is specified and the methods by which the performance will be assessed are detailed. The design is left to the contractor.

Atkinson (1992, p.27) introduced that in a management contract the contractor joins the promoter's/engineer's team at the design stage of a contract to assist in the planning and design by providing the team with the benefit of his practical experience and construction expertise. Once the project gets under way, he manages the contract but does not carry out any of the construction, leaving that to be carried out by various sub-contractors.

2.2 The Fundamentals of Project Partnering.

The Reading Construction Forum in the UK (Bennett & Jayes 1995, p.2) defines partnering as:

> "*Partnering is a management approach used by two or more organisations for the purposes of achieving specific business objectives by maximising the effectiveness of each participant resources. The approach is based on mutual objectives, an agreed method of problem resolution and an active search for continuous measurable improvements.*"

As cited from the Construction Industry Institute Australia (CIIA 1996, p.11), the New South Wales Government defines partnering with respect to construction projects as:

> "*A management process employed to overcome the traditional adversarial and litigious nature of the construction industry. Partnering uses structured procedures involving all project participants to: define mutual goals, improve communication and develop formal problem solving and dispute avoidance strategies.*"

Different categories of partnering relationships exists, Cartlidge (2004, p.193) described that partnering as a process whereby the parties to a traditional risk transfer form of contract, commit to work together with enhanced communications, in a sprit of mutual trust and respect towards the achievement of shared objectives. There were two approaches, strategic and project partnering. Strategic partnering is concerned with a range of work, often unspecified at the time that the contract is made, over a period of time. The motivations are to achieve consistency and predictability of workload, to take out waste and to achieve continuous improvement through experience and learning. Project partnering is much more focused on a single project. Samuelsson-Brown (2002, p.5) further explained that an occasional or new customer would benefit from the project specific approach whilst a regular construction

customer would realise the full benefit of partnering when the lessons learned on projects are transferred to future projects, as in strategic partnering, where year-on-year or project versus project comparisons can be made.

The essential features of Partnering were described by the Construction Industry Board, UK (CIB 1997, p.3): Partnering is only appropriate between organisations whose top management share the fundamental belief that people are honest, want to do things which are valued, and are motivated by challenge. Such organisations trust their people and seek ways to enable them to add value to their business.

Partnering is a structured methodology for organisations to set up mutually advantageous commercial arrangements, which help their people work together more effectively. It has three essential components:

- establishment of agreed and understood mutual objectives
- methodology for quick and cooperative problem resolution
- culture of continuous, measured improvement.

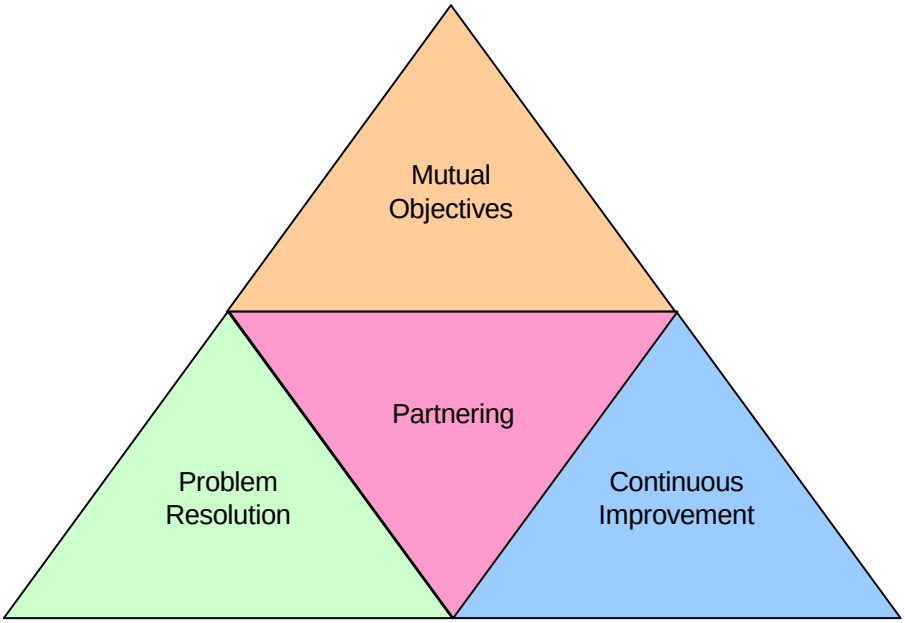


Figure 2-1: The three essential features of partnering

Source: Bennett and Jayes (1995)

Bennett & Jayes (1995, pp.5–9) explained in details for the three features, the following is the summary:

- **Mutual Objectives**

The most fundamental requirement of partnering is an agreement on mutual objectives. The aim is to find objectives that firmly establish for everyone involved that their own best interests will be served by concentrating on the overall success of the project. Partnering enables everyone to win more than they could get by adopting traditional adversarial attitudes.

- **Problem Resolution**

Any activity as complex as a modern construction project inevitably gives rise to situations where there are conflicting interests and so problems arise. Well devised mutual objectives serve to minimise these but partnering would remain a hollow, idealistic idea without a good problem resolution process. The aim of the process should be to resolve problems at the lowest possible level within the organisation as quickly as possible.

The overall aim should be to resolve disputes without needing to use mediation or any harder legal processes.

- **Continuous Improvement**

Partnering that provided mutual objectives and an effective problem resolution process and nothing more would rapidly drift into a cosy and inefficient way of working. It is essential if partnering is to deliver its potential benefits that explicit attention is given to ensuring that performance continually improves.

2.2.1 Circumstances suitable for partnering

The Construction Industry Board (1997, p.4) explained that partnering is not an appropriate procurement strategy for all construction projects. When considering partnering arrangement, parties should seek by discussion to identify sources of risk and then to establish who can best assess and manage the quantum of risk. Partnering succeeds best where the client's procurement strategy accepts that the project is high value and high risk, and the contractors' interest is fuelled by the prospect of a high value/ high attractiveness account core to their business.

Scott (2001, p.20) summarised the circumstances suitable for the alliancing approach (the difference between alliancing and partnering will be discussed later in this chapter):

- the owner wants to achieve better than historical cost and/or schedule performance
- the project represents a significant capital investment
- the project is technically or organisationally complex
- the project involves high levels of uncertainty
- there are relatively few suppliers able to deliver the specific service required.

2.3 Project and Contract Management Process

2.3.1 Project and contract management process using traditional approach

In the traditional contract, the owner has a direct contractual relationship with the main contractor and the consultant. There is no contractual relationship between the consultant and the main contractor or between the owner and the sub-contractor(s). The consultant carries out all the design work in the first instance, prepares the contract documents, and assists the owner in selection of the main contractor. Thereafter, the construction part of the project gets underway and the supervision of the main contractor's work is usually the responsibility of the consultant (the architect or the engineer, the one who design the works). (Tang et al. 2003, p.28)

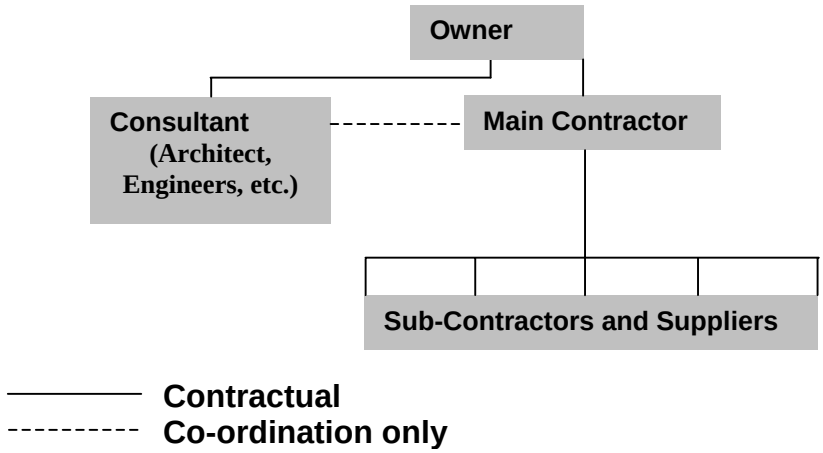


Figure 2-2: Traditional contractual arrangement

Source: Tang et al. (2003)

Construction on-site involves even more people in the project process. A contractor will be appointed who will employ many domestic subcontractors, plus other subcontractors named or nominated by the client to carry out the construction works. Once the facility is complete, the client has to organize and manage to take-over and start-up of the facility. (Rowlinson and Walker 1995, p.62)

2.3.2 Project and contract management process using partnering

Bennett and Jayes (1995, pp.29–36) described the project partnering process. It has three essential stages:

- The decision to use partnering
- Holding a partnering workshop to develop mutual objectives and an agreed issue resolution process,
- Undertaking construction work and focusing on continuously improving performance through follow up workshops.

2.3.2.1 The decision to use partnering

Project partnering arrangements can be initiated by clients, consultants or contractors. The commitment of the main parties is essential for effective partnering arrangements to be used. It is important to check that the main parties are likely to adopt partnering attitudes.

There are no requirements of project partnering that prevent clients from using their normal tendering procedures in selecting consultants or contractors. The only change is that the selected firm is offered the opportunity of entering into a partnering arrangement. When there is agreement that a partnering arrangement should be set up, the next step is to hold a partnering workshop. At this stage all the participants are bound together by normal forms of engagement and conditions of contract. All that is different from other projects is that they have agreed to use project partnering.

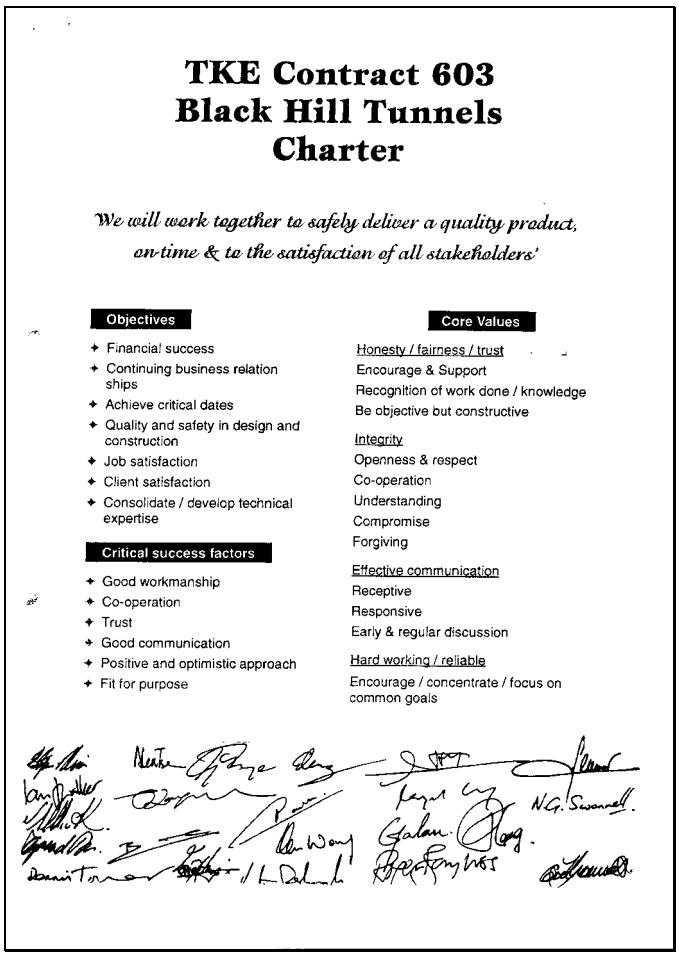
Hellard (1995, p.37) explains that the contract establishes the legal relationships, the partnering process attempts to establish working relationships among the stakeholders through a mutually developed, formal strategy of commitment and communication. Masterman (2002, p.137) further explains that the use of partnering is a voluntary arrangement made between all of the project participants, has no legal standing and imposes no contractual obligations upon any of the parties.

2.3.2.2 Partnering Workshops

Mak (2001, p.220) described that partnering is normally established through a facilitated process consisting of organized workshops attended by key participants from both parties to the contract. An outside facilitator is usually hired to lead the workshop that normally lasts two or three days. As suggested by Bennett and Jayes (1995, p.31), a partnering workshop should be held within one month of the contract awarded. The purpose of the first workshop is to establish how the partnering firms will work together. A set of mutual objectives and a problem resolution process will be produced; these are then embodied in a partnering charter.

2.3.2.3 Partnering charter

The partnering charter should be signed by everyone present at the workshop. The final action at the workshop is to agree arrangements for follow up workshops. Follow up workshops need not be scheduled on a regular basis but held when the project team feel there are major partnering problems to resolve. They provide opportunities to evaluate progress towards the mutual objectives recorded in the partnering charter. They also provide an opportunity for the project team to address any problems that have arisen concerning partnering The figure shown below is a typical partnering charter used in a construction project.



TKE Contract 603
Black Hill Tunnels
Charter

We will work together to safely deliver a quality product, on-time & to the satisfaction of all stakeholders'

Objectives

- Financial success
- Continuing business relation ships
- Achieve critical dates
- Quality and safety in design and construction
- Job satisfaction
- Client satisfaction
- Consolidate / develop technical expertise

Critical success factors

- Good workmanship
- Co-operation
- Trust
- Good communication
- Positive and optimistic approach
- Fit for purpose

Core Values

Honesty / fairness / trust
Encourage & Support
Recognition of work done / knowledge
Be objective but constructive

Integrity
Openness & respect
Co-operation
Understanding
Compromise
Forgiving

Effective communication
Receptive
Responsive
Early & regular discussion

Hard working / reliable
Encourage / concentrate / focus on common goals

Figure 2-3: Partnering charter

Source: MTR Corporation Limited

2.3.2.4 Final workshops

A final project workshop should be held to review project performance. This creates the opportunity for lessons learnt during the project to be applied on future projects. It also serves to celebrate successes.

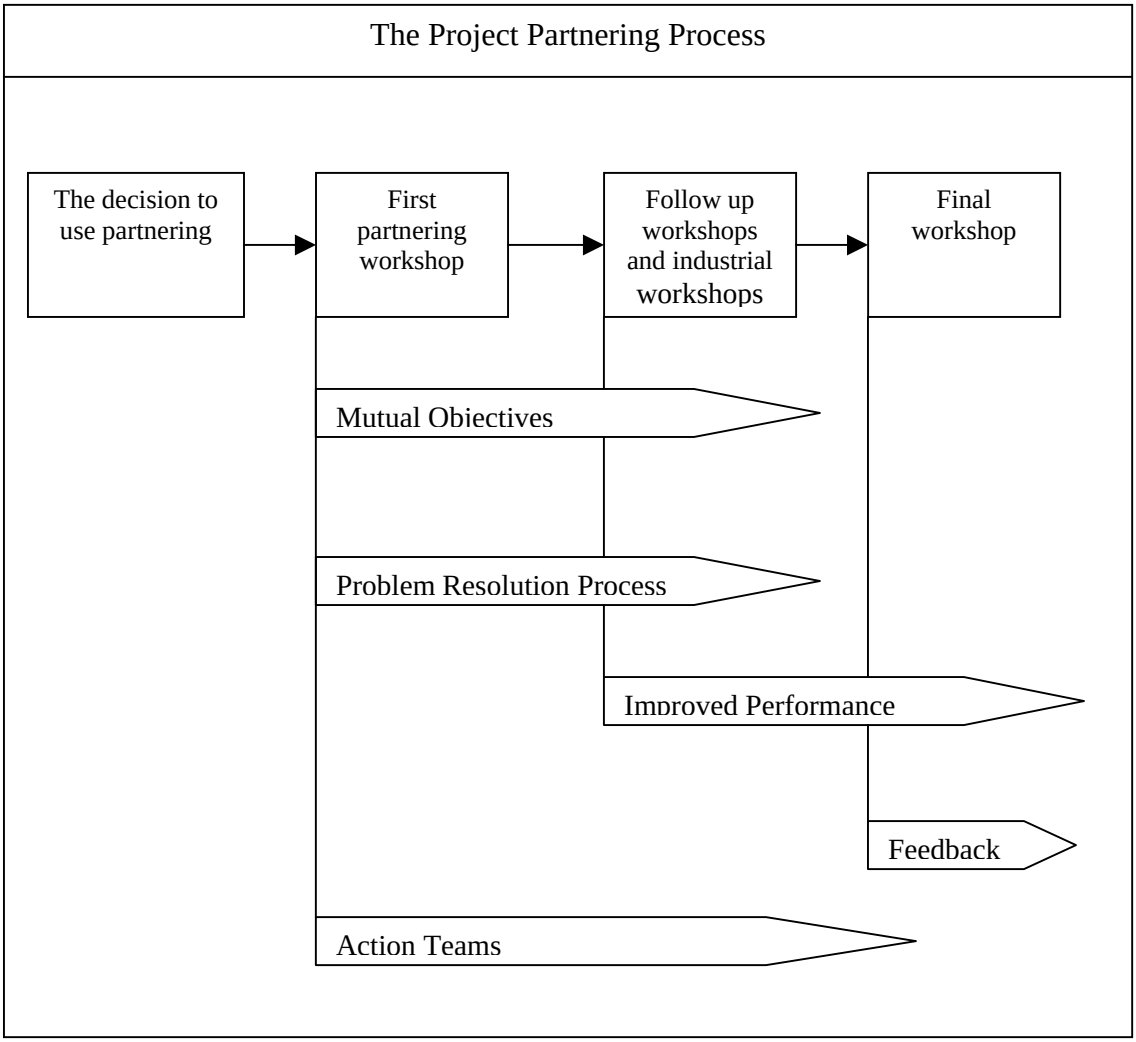


Figure 2-4: The project partnering process

Source: Bennett and Jayes (1995, p.29)

2.3.3 Requirements for success in partnering

For long-term partnering to be successful, there must be a continuance of and relationships built on: Open and effective communications, trust, compatibility of individual companies' visions and strategic plans and profitability.

Increasing or improving profits is the ultimate goal of long-term partnering, be it through lower production costs, improved product quality resulting in greater market share, or reduced dependence on adversarial contracts and legal assistance (Kubal 1994, p.131).

Schultzel and Unruh (1996, p.104) also considered that the facilitator often has to lead the partnering team to find and incorporate breakthroughs that greatly enhance the outcome in line with partnering goals.

2.3.4 Difference between Partnering and Alliancing

The contract management process using partnering is also similar to alliancing. Alliancing is more detailed and considerably more formal than other partnering arrangements. It involves profit-sharing and often risk-sharing schemes whereby sanctions apply for failure to achieve key performance indicators and targets. The distinctive feature of an alliance is an incentivised contract which is central to the relationship. Hence the participants have the opportunity to derive quantifiable benefits from the explicit incentive arrangements as opposed to the more indirect incentives in partnering arrangements arising from the potential for improved cash flow and the opportunity for future work. (Roe & Jenkins 2003, p.8)

Walker and Hampson (2003, p.53) described that the important distinction between partnering and alliancing is that with partnering, aims and goals are agreed upon and dispute resolution and escalation plans are established, but partners still retain independence and may individually suffer or gain from the relationship. With alliancing parties form a cohesive entity, that jointly shares risks and rewards to an

agreed formula. Thus if the project fails to meet agreed project key performance indicators then all partners jointly share the agreed penalty.

This Research Project investigates research in respect of partnering, as I find no published cases on alliancing in Hong Kong.

2.4 Benefits and Problems of Partnering

2.4.1 Benefits

Many benefits can be achieved through implementation of a partnering relationship. These include improved relations among people, greater efficiency and cost effectiveness, increased opportunity for innovation, continuous improvement of quality services, reduced delivery time and speed to market, increased safety and the reduction of disputes (Roe & Jenkins 2003, p.11). Practical benefits described by Roe & Jenkins also include:

- Supervision by those qualified: Organisational structures tend to be flatter with decision making delegated to less senior levels of management. The result is said to be a quicker response to problems and opportunities.

- Free exchange of information: free exchange not only of financial but also of technical and programming information. The parties should also consider any appropriate measures to preserve confidentiality.

- Snagging and re-work: the parties co-operate to identify defects, to programme remedial works to agree work methods, including acceptable alternatives. Rework is sometimes carried out on a cost reimbursable basis, without profits.

- Reduction of the need for audit and inspection: some partnering arrangements reduce to a minimum audit and inspection by the employer. However, such arrangements are unlikely to be acceptable in the public sector. Alternatively, audit and inspection may be carried out jointly or by independent consultants whose costs are shared.

- Reduction in costs associated with disputes: such costs are said to include not only those of outside consultants but also the internal costs associated with adversarial contract administration which requires a detailed paper trail to be prepared to position the parties for the defence of pursuit of claims.

Matthews (1999, p.256) provided a comprehensive literature review to identify those theorists and practitioners who had discussed the benefits and problems in-depth. The most prevalent benefits and problems are summarized as follows:

Table 2-1: Benefits of partnering

Stakeholders	Benefits
Common for owner, main contractor, consultants, subcontractor and suppliers	• Reduced exposure to litigation through open communication and issue-resolution strategies. • Lower risk of cost overruns and delays because of better time and cost control over projects • Open communication and unaltered information allow more efficient resolution of problems
For main contractor	• Better time and cost control over project • Increased opportunity for financially successful project because of non-adversarial win-win attitude
For consultants	• Enhanced role in decision-making, as an active team member in providing interpretation of design intent and solutions to problems • Increased opportunity for financially successful project because of non-adversarial win-win attitude
For subcontractor and suppliers	• Improved decision-making avoids costly claims and saves time and money • Increased opportunity for financially successful project because of non-adversarial win-win attitude

2.4.2 Drawbacks

Bennett and Jayes (1995, pp.22–24) described some drawbacks. The following are the main points.

- Corruption

The main argument in favour of one-off relationships based on competitive tendering is that they reduce the possibility and opportunities for corruption. The habit of working with another person and trusting them can lead to a relaxation of normal safeguards and checks.

- Additional Costs

Partnering comprises the direct costs of partnering workshops as well as employing facilitator, and the early involvement of senior management in establishing the approach.

- Career prospects

Staff involved in a partnering arrangement often has doubts about how it will affect their career prospects. Critchlow (1998, p.20) also stated that employees might regard themselves as sidelined into a static part of their organization, isolated from the main commercial impetus of the business.

- Loss of Confidentiality

Difficulties arise in some partnering arrangements over confidentiality as partnering is based on open book arrangements or joint project offices, an unusually wide range of confidential information may be available.

- Reduction of competition

Critchlow (1998, p.19) considered that, if a contractor finds that exposure to competition is reduced as a result of the partnering arrangement is long established, there is a tendency to seek an increase in margins, which is exacerbated in a difficult marketplace where the contractor is facing losses on other contracts.

- Small sized stakeholders driven out of the markets

Wai (2004, p.3) has studied a potential drawback in UK that partnering has led several clients to enter into strategic long-term arrangements. Such a procurement strategy tends to favour bigger contractors and suppliers. As a result, small and medium sized contractors and suppliers have alleged that they have been slowly driven out of the markets.

2.4.3 Cost of partnering

The principal direct costs of partnering are in running workshops. Workshops provide the main means by which the essential features of partnering are established and new attitudes are developed. According to Bennett and Jayes (1995, p.22) in UK, a good partnering facilitator will cost from £2,000 to £4,000 (at 1995 price) for a two-day workshop. Other costs include the accommodation and meals for the participants. The total can amount to about 1% of the project costs, but are often less depending on accommodation costs.

According to the research by Thompson (1996, p.144) in USA: The costs associated with partnering appear to be minimal compared to the results that can be achieved through its implementation. The cost of partnering implementation was less than 0.25% of total project cost. None of his surveys indicated that partnering costs are more than 2.0%

2.4.4 The balance of benefits and costs

Bennett and Jayes (1995, p.25) opine that the balance of benefits and costs depends on individual circumstances and also on the attitudes and culture of potential partners. The growing popularity of partnering suggests that there are many situations where, if a suitable partner can be found, significant net benefits are available.

A reported case by Lam (2002, p.14) in Hong Kong indicated that it involved running cost of about 0.1% - 1% of the project cost but the potential savings would be 2 – 10% of the project value which means a rate of return of 100 to 10,000 times.

Chapter 3 Traditional Contracting and Partnering Practice in Hong Kong

Hong Kong has developed into a major commercial centre of Southeast Asia – the world's fastest growing economic region. However, the construction systems are still very conservative (Tam 2000, p.1). Construction contracts are commonly awarded to the lowest bidders throughout the construction value chain. Cut-throat competition has sometimes led to unrealistically low bids which fail to make adequate provisions for meeting all the statutory and tender requirements. (CIRC 2001, p.26)

3.1 Procurement systems in Hong Kong

As studied by Tam (2000, p.1), the procurement method used in Hong Kong is still very traditional. Traditional procurement methods typically involve employment of an architect or engineer to produce a design, followed by the appointment of a contractor and overseeing the administration of the project.

Tender drawings and forms of tender that are prepared by the architect or engineer are sent to selected contractors. The contractors estimate the costs of the operations involved in the project and submit tenders for the work. (Chan & Yung 2001, p.7).

Examples of recently completed large-scale infrastructure projects adopting traditional contract system are West Rail and Airport Core Programme (a new airport built on an island and linked to the business core in Central by roads & rail and other interconnected infrastructures). Two airport related projects will be described in Chapter 6.

3.2 Use of Partnering in Hong Kong

3.2.1 Partnering in 1990s

Project partnering has gained popularity in the Hong Kong construction industry since its adoption on the North District Hospital project in 1994. An increasing trend in building and construction has been observed in the public, private and infrastructure sectors over the past decade, with a proven track record of success. (Chan et al. 2004, p.66)

Figure 3-1: North District Hospital

More recently, Mass Transit Railway Corporation (MTRC) (renamed: MTR Corporation Limited since 2000) adopted a partnering approach to their major infrastructure projects of Tsueng Kwan O Extension. MTRC owns and operates a railway network currently comprised of 48 stations, 80.4 kilometres of route length and carries 2.5 million passengers per normal weekday. Construction of these network commenced in 1975. Construction and such maintenance work had consistently been procured through traditional competitive tendering methods with multiple contracts up until the award of Tseung Kwan O Extension contracts in 1998 (Black 2004, p.84).

The Partnering plan was designed to cover the civil engineering contracts and overlay a non-contractual partnering campaign onto MTRC's traditional contract procurement – post-contract award on a voluntary basis with the agreement and support of the contractors. A similar approach would be applied to the next stage involving the electrical and mechanical contracts, building on experience and lessons learnt from the change programme of the civil engineering contracts. (MTRC 2003, p.26).

Figure 3-2: The Tseung Kwan O Extension Map

(Source: Lam 2002)

The background and other relevant information relating to this project will be further discussed in Chapter 6 – Case studies.

With respect to the private development, in late 1997, Hongkong Land Limited made the decision to proceed with the development of Chater House, at a time of serious economic concerns in both Hong Kong and Asia. To achieve the vision of Chater House prime commercial office and luxury retail redevelopment that addressed the ever increasing needs of their international tenant base, the developer decided that the best way forward was to first select a consultant team that known to be of the highest standard in their respective fields and to create a constructive and innovative working environment around them which would achieve their vision and objectives. As a result, a full partnering process has been implemented along with a strong emphasis on adopting innovative construction methodologies, sustainable architectural and engineering details and no sub/sub-contracting arrangements. (Robinson 2004, p.7)

3.2.2 Partnering since 2000

Throughout the late 1990's, there were numerous scandals with regards to public housing production, including many incidences of sub-standard piling works, which undermined public confidence in the Housing Authority of Hong Kong (HKHA). HKHA intensified their efforts to enhance the quality of the public housing it produces, and published a Consultative Document in early 2000, titled "Quality Housing – Partnering for Change". The Document (p.12) promotes the view that the key driver for change has to be through Partnering.

The Construction Industry Review Committee (CIRC) (2001, p.6) advocated the wider adoption of a partnering arrangement in local construction so that all project participants would work as a team to achieve shared project objectives rather than in competition with one another. For partnering to work, the interests, needs, expectations, achieve better project outcomes, CIRC further proposed that clients should motivate their consultants and contractors to provide better value by aligning the latter's financial objectives with the project objectives.

Project Partnering has been popular in the local construction industry after it was advocated by CIRC in 2001 with the aim to improving the quality standards in the industry. The Director of Hong Kong Housing Society, Francis Law (2004, p.21) confirmed that the Society has adopted Project Partnering in its development projects since advocated by CIRC. So far the Society has implemented partnering in five of their projects.

The Housing Authority decided in 2001 to widen the application of project partnering to all new works projects. In the same year, the same arrangement was also extended to the Authority's maintenance and improvement projects for existing buildings. (Fung 2004, p.13)

The Environment, Transport and Works Bureau of Hong Kong Government has been actively promoting the adoption of partnering in public works contracts in recent years, and introduced partnering on a non-contractual basis in public works contracts

in early 2001. Since the recommendation by CIRC, non-contractual partnering has been used in more than 30 public works contract for building, civil engineering, electrical and mechanical works (Wai 2004, p.3). One project under the Bureau will be discussed in Chapter 6.

The Project Director of MTR Corporation Limited, Russell Black (2004, p.84) anticipated that in future it expected to utilize a balance of traditional contracts with partnering and benefit sharing, and target cost contracts for difficult works.

3.3 Benefits and Problems of Partnering in Hong Kong

3.3.1 Benefits

The Director of Hong Kong Housing Society, Francis Law (2004, p.23) gave a comprehensive summary on benefits of partnering in Hong Kong.

1. Team work enabling better communication and decision making: Since each member is committed not only to perform his or her part but also assist the others, improvement to progress and quality of works can be achieved.

2. Increasing productivity and innovation: Project team members are more dedicated to contribute to the common goals of the team. Working in a harmonious environment, productivity and innovation can be promoted.

3. Confrontation being replaced with cooperation: Confrontation is generally replaced with cooperation, and chances of claims and disputes can be reduced.

4. Project planning being enhanced with clear objectives: It sets out lines of effective communication and ways to efficiently handle potential problems. Early and good project planning can be therefore enhanced.

3.3.2 Problems in implementing partnering in Hong Kong

Cheung and Kan (2004, p.33) gave their observations to the problems in implementing partnering for government drainage projects in Hong Kong. The following is the summary:

1. The current standard form of contract for public works is incompatible with partnering as it provides no financial incentives for fostering a true partnering approach.

2. Most of the professional and technical staff involved in management of contracts have been working under an adversarial system for a very long time. They lack the skills and confidence to make the best out of partnering and they are concerned about accusations of impropriety by public sector watchdogs.

3. The rules and regulations governing the administration of public works contract do not lend themselves to partnering.

4. Public sector watchdogs and regulators need to be more informed about the construction industry and they need to be convinced that it is in the long term interest of the community to move away from the traditional adversarial approach.

Chapter 4 Research Design and Methodology

This chapter describes the methodology used in this research project. Qualitative and quantitative techniques were used to analyse data. They are described as follows:

4.1 Literature Review

General background information on traditional contracting, the contract formation and management process, the fundamentals of project partnering, its benefits, costs associated with delivering construction projects, and revision of the use of traditional contracting and partnering in Hong Kong, were obtained from the perusal of numerous textbooks, papers published in construction related journals, internet web sites, as well as conference proceedings. This information was supplemented by the reading of previous research on partnering.

4.2 Questionnaire Survey

After the review of literature, a questionnaire was to be developed, to see whether the literatures have said, could really apply to the Hong Kong construction industry. A questionnaire was then developed containing predominantly closed ("tick the box") questions. Naoum (1998, p.71) considers that closed questions are easy to ask and answer, they require no writing by either respondent, and their analysis is straightforward. The design of the questionnaire was in line with the recommendations made by Naoum (1998, pp.84–86), that is, the questionnaire was short and comprehensive. Directions must be clear and complete. Questions must be objective without offering leading questions.

This draft questionnaire was then tested on two professional colleagues, in order to check the clarity and effectiveness of the questions within. The questionnaire was structured into four sections. Assurance was given that all data would be treated as strictly confidence, and would not be disclosed to other parties.

The finalised questionnaire, condensed to three pages, was sent to a considerable number of construction professionals, together with a covering e-mail explaining the purpose of the survey.

The questionnaire was structured into four distinct sections and was mainly for two purposes. The first was to gather data on the partnering projects in respect of benefits and problems of partnering. The second was to gather opinions in order to develop a process for improved project delivery in the Hong Kong construction industry.

Detailed methodology in respect of questionnaire survey will be further discussed in Chapter 5 – Questionnaire Results and Analysis.

4.3 Case Studies

Following the general opinions obtained from questionnaire survey, the next step was to compare whether or not the results apply to a real case. The case study method was carried out to collect actual information in industry. Case studies on six construction projects, of which three are to be delivered using partnering, were used to investigate into the implementation of projects in the Hong Kong construction industry. The types of projects were private and public projects, including both building and civil engineering projects.

The information for projects was obtained from web sites of Hong Kong Government, the Hong Kong Demonstration Projects Committee and a partnering facilitator consultant: John Carlisle Partnership. In addition, other than information obtained from public, data were also gathered from some local professionals working with individual projects. However, as requested by these professionals the information in respect of project titles and identity of these professionals will not be disclosed. The outline of the project and performance data were discussed in the case studies.

The reported case contains information on project description, background, contract delivery system and performance such as time, cost, claim occurrence, etc. In addition, benefits and problems of implementing partnering for some case studies will also be addressed, subject to availability of the related information.

4.4 Benefits, Drawbacks and Problems during Implementation of Partnering

The data for benefits, drawbacks and problems during implementation of partnering were obtained from questionnaire surveys. These items were set out in three distinct questions with a number of sub-questions following review of literatures. The respondents were requested to choose one from five-scale point ranging from strongly agree to strongly disagree. Naoum (1998, p.76) considered when this rating scale format is used, each respondent has the choice to express his or her degree of agreement or disagreement on a particular scale, it reflects the intensity of the particular judgement involved.

The question also identified the type of stakeholder in partnering. So data could be obtained from various parties such as Employers, consultants (architect, engineer or project manager) and contractors who might have different views on the benefits, drawbacks and issues in partnering.

4.5 Development of a Process for Improved Project Delivery

After the review of literature, the analysis of information from questionnaire and actual case studies, the next stage was to develop a project delivery system and to attempt to improve the traditional project delivery mechanism.

4.5.1 The Improvement model

The first area of concern was the development of a project delivery model, providing a framework for developing the process, in order to improve the current traditional project delivery mechanism which leads to the confrontation practices in the construction industry to avoid problems in performance of construction projects arising out of these practices.

In the past years literature review indicated that partnering was able to improve project performance such as time, cost and quality. The question is: if partnering is so powerful, why not all projects apply partnering? Literature also has answers: not all projects are suitable for partnering, there are still some unsuccessful partnering stories, hence affect project performance.

A model is required to be developed for improving project delivery by using partnering. The following sections describe the outline of the improvement model.

4.5.2 The Circumstances favour use of partnering

Following the literature review in Chapter two. Not all projects are suitable for partnering. The criteria for using partnering are:

- High contract value of project
- High risk exposure
- Strong intention to complete the project on time
- Project is technically or organizationally complex
- To enhance better relationship
- Intention to improve quality of the project
- Intention to establish long-term relationship among parties
- There are relatively few contractors or suppliers able to deliver the specific service required.

4.5.3 How to implement

Following identification of situations favour the use of partnering, the next step is the implementation. In order to make sure that the partnering will be implemented successfully, a number of factors should be included. These are the critical successful factors.

- Mutual trust among project stakeholders
- Adequate resources
- Support from top management
- Long term commitment
- Effective communication
- Monitoring and controlling mechanism
- Fair allocation of risks among parties
- Early implementation of partnering process
- Willing to share resources among parties
- Partnering integration process
- Opportunity for innovation
- Improved project delivery costs
- Improved project delivery time
- Improved quality
- Improved environmental outcomes

4.5.4 Outcome

Following the circumstances favour partnering, the critical success factors for implementing partnering, the final outcome will be produced. The project performance could be measured in terms of cost or budget, construction time, quality, safety issues, environmental, improvement in relationship among parties and improvement of communication among parties.

The whole development process is straightforward and could be presented in the following model:

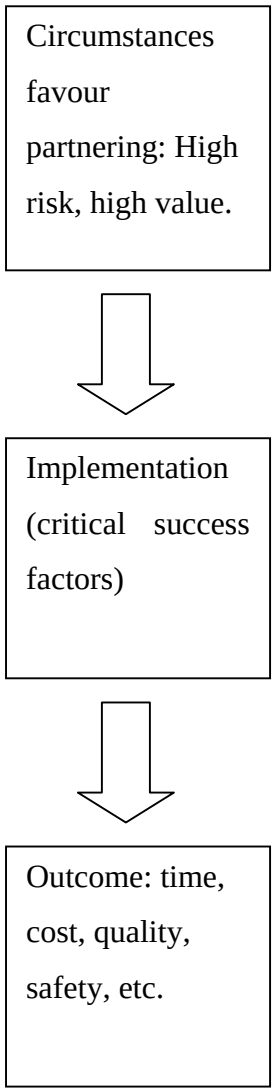


Figure 4-1: Project Delivery Improvement Model

4.5.5 Verification of process

All the above elements have been incorporated into the questionnaire in order to obtain the views from the respondents. Question C1 was for the circumstances preferring the adoption of partnering. Question C5 is a list of critical success factors and Section D was the performance of partnering project compared to traditional procured project. The results will be discussed in the next Chapter.

Chapter 5 Questionnaire Results and Analysis

In this chapter, the selection of questionnaire respondents, the structure of the questionnaire and the returned questionnaire and its analysis will be discussed.

5.1 Selection of Questionnaire Respondents

The target respondents were selected from those construction professionals known to have some partnering exposure in Hong Kong, as well as others who have been in the same organisation(s) of the author. The target respondents come from different projects including infrastructures, commercial development, public housing works and engineering facilities. They have been working in various types of organisations such as private & infrastructure developers, consulting engineer firms, government departments, contractors and subcontractors. The working levels include engineering technologist, professional and managerial.

To expedite the circulation process and to encourage effective response, all questionnaires were sent out by e-mail, together with the covering letter. The target respondents comprised the following sources:

- Speakers from Construction Industry Institute Hong Kong Conference 2004 on Construction Partnering
- Professionals working with the Hong Kong Government
- Staff from MTR Corporation Limited
- Current colleagues of the authors in a consulting engineer's firm
- Members in Engineer's Australia Hong Kong Chapters

- Other local construction professionals

5.2 Structures of the Questionnaire

The questionnaire was structured into four distinct sections.

- Section A: the respondent's background information in the construction industry,

- Section B: the information relating to individual partnering project which the respondent is currently or has been involved,

- Section C: the respondent's experience and opinions on partnering,

- Section D: the respondent's degree of satisfaction for partnering project performance.

To minimise the pages of the questionnaire, the first section contains only two questions: length of construction experience and number of partnering projects the respondent has been involved.

The second section contains questions about the respondent's partnering project information and his/her role in this particular partnering project. This includes the respondent's employment background, project information, partnering arrangement and performance of this project.

The third section contains questions about the respondent's opinions on implementing partnering, such as under what circumstances the respondent would prefer applying partnering, benefits & drawbacks of partnering, problems in implementing partnering and the critical success factors for a partnering project.
A five-point scale is used, where: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree.

The fourth section contains questions about the respondent's opinions on the degree of satisfaction of partnering projects performance compared to traditional projects in respect of time, cost, quality, etc.

Details of questionnaire results are attached in Appendix B.

5.3 Response to Questionnaire

114 electronic mailings were sent out to employers, consultants and contractors in early June 2005, with a deadline for returns set for 30 June 2005, a reminder mailing was made later that month. Up to mid July 2005, total of 58 questionnaires received but 7 questionnaires were considered invalid, due to either the questionnaires were incomplete or the respondents' partnering information was for projects outside Hong Kong. The details are as follows:

Table 5-1: Number of questionnaires sent and returned

Questionnaires	Number of respondents
Total no. sent	114
Total no. returned	58
Response rate	50.9%
No. of valid return	51

This overall response rate is about 51%, which is considered acceptable compared to similar partnering research conducted in Hong Kong. For instance, (Wong and Cheung 2004) received a 54% response rate to their questionnaires whilst (Wong, Chan & Wong 2003) received a response rate of 32%.

5.4 Analysis of Questionnaire Reply

The information filled in the returned questionnaires was collated and summarised in a spreadsheet file (Microsoft Excel) for data analysis activities.

5.4.1 Section A – Respondents' background

Section A of the questionnaire is to collect background information of the respondent in respect of respondent's construction working experience and number of partnering projects in which the respondent has been involved. To minimise the number of pages of the questionnaire, only two questions were asked in this section. The majority of the respondents have substantial working experience, and over 70% of respondents have over 15 years working experience. No respondent's experience is less than five years. So the respondents' opinions in respect of partnering are highly acceptable. The following table shows the statistics.

Table 5-2: Respondents construction working experience

Respondents' working experience	Number of respondents
6 – 10 years	7 (14%)
11 – 15 years	8 (16%)
Over 15 years	36 (70%)
Total	51 (100%)

As partnering has only short history in Hong Kong (first project in 1994 and rare in 1990s), the respondents should also have experience in traditional or other types of contract. So they are able to compare partnering to traditional contracting.

With respect to the number of partnering projects the respondents have been involved, about 51% of respondents only involved in one partnering project but there were still 16% respondents have worked for more than three partnering projects. It indicates that partnering is still very fresh in the Hong Kong construction industry. The following table shows the result.

Table 5-3: Number of partnering projects the respondents have been involved

Number of partnering projects respondents have been involved	Number of respondents
One	26 (51%)
Two	11 (21%)
Three	6 (12%)
More than 3	8 (16%)
Total	51 (100%)

5.4.2 Section B – Partnering project data

This section describes the data for each respondent's involvement in his/her most recently involved partnering project. The first part collects general project data, such as the client type, nature of project, size of project, company role, position in his company, etc. The second part collects data that the respondent considered the performance of his respective partnering project such as time, cost and claim occurrence.

Question B1: Type of Client:

This question is to get information on the type of clients. There are private, public (i.e. the Government) and quasi-public (two railway corporations with majority owned by the Government).

Table 5-4: Type of clients the respondents have been involved

Respondents involved in partnering whose client is	Number of respondents
Private company	4 (8%)
Public (Government)	19 (37%)
Government owned corporations	28 (55%)
Total	51 (100%)

As the Hong Kong Government and the MTR Corporation Limited highly encourage partnering so respondents worked for private partnering project only cover 8%.

Question B2: Project nature:

This question is to get the information on the type of partnering projects in Hong Kong. 80% of respondents have been involved in civil engineering partnering projects. The reason may be that the questionnaires were sent to more civil engineers than to other kinds of professionals.

Table 5-5: Nature of partnering project the respondents have been involved

Nature of project the respondents have been involved	Number of respondents
Civil Engineering	41 (80%)
Building	8 (16%)
Electrical and Mechanical Engineering	2 (4%)
Total	51 (100%)

Question B3: Contract sum of this project:

This question is to get the information about the size of the partnering projects in Hong Kong. About half of the respondents have worked for partnering projects of size over HK$1 billion (US$128M).

Table 5-6: Size of partnering project the respondents have been involved

Contract sum of partnering projects	Number of respondents
Less than HK$100M	3 (6%)
100M to 500M	16 (31%)
501M to 1000M	7 (14%)
Over one billion	25 (49%)
Total	51 (100%)

Question B4: Company role:

This question is to get the information about the type of stakeholders involved in partnering projects in which the respondents have worked for. Over 50% have worked for client's company so the overall opinions may be on the side of the clients.

Table 5-7: Type of stakeholders the respondents have been involved

Stakeholders type	Number of respondents
Client/ Employer	26 (51%)
Consultant	11 (22%)
Contractor/ subcontractor	14 (27%)
Total	51 (100%)

Question B5: The respondent's position in the partnering projects.

This is to get the information on the seniority of the respondents. The following table summarise the positions of each type of organisation:

Table 5-8: Classification of positions of respondents

Type of Company	Position
Client	Senior manager, manager, chief engineer, senior engineer/ surveyor, engineer/surveyor/architect, assistant engineer, senior inspector of works, etc.
Consultant	Director, associate, chief engineer, senior engineer, engineer, assistant engineer/ surveyor, senior inspector of works, etc.
Contractor	General manager, project manager, manager, senior engineer, assistant engineer, etc.

The above positions can be broadly grouped into five grades, namely: senior managerial, managerial, senior professional, professional and technical. The following chart shows the demarcation, over 75% respondents are either professional or managerial grade:

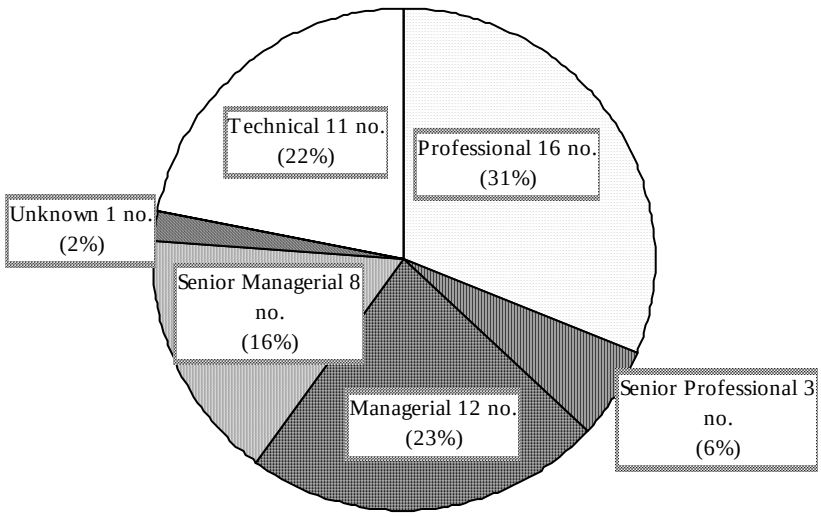


Figure 5-1: Position type for survey respondents

Question B6: Contract period:

This question is to gather the information on the contract period. Majority of the respondents worked for project period more than two years. Usually longer project period indicates high value of works.

Table 5-9: Contract period for respondents' partnering projects

Contract period	Number of respondents
1 to 2 years	6 (12%)
2.1 to 3 years	24(47%)
More than 3 years	21(41%)
Total	51 (100%)

Question B7: Partnering stakeholders:

This question is to gather information on the partnering stakeholders involved in the respondents' partnering project. The most widely adopted stakeholders are client-consultant-contractor (39%). Client-consultant-contractor-subcontractor arrangement also has 18% in this result. The least used arrangement was contractor-subcontractor partnering arrangement. In terms of organisation, 98% contractor is one of the stakeholders in the partnering arrangement, 96% client, 57% consultant and 28% subcontractor are one of the parties in partnering arrangement. That is, almost all partnering arrangement involves the client and contractor organisations. About half of partnering arrangement involves consultant whilst only one quarter of partnering arrangement involves subcontractor.

Table 5-10: partnering stakeholders involved in the respondents' project

Stakeholders	Number of respondents
Client-consultant-contractor	20 (39%)
Client-contractor	17(33%)
Client-contractor-subcontractor	3(6%)
Client-consultant- contractor-subcontractor	9 (18%)
Contractor-subcontractor	1(2%)
Subcontractor (one respondent has put one stakeholder only)	1(2%)
Total	51 (100%)

Question B8: Contract type:

This question is to gather data on the contract type adopted by the partnering project. Over 57% of the partnering projects adopted re-measurement (refer to Glossary) type contract – most civil engineering contracts in Hong Kong are in this type. No respondent has been involved in cost-plus partnering project.

Table 5-11: Contract type adopted in the respondents' partnering projects

Contract type	Number of respondents
Lump Sum	15 (29%)
Re-measurement (see Glossary)	29(57%)
Target cost (see Glossary)	7(14%)
Total	51 (100%)

The following three questions relate to the performance of the partnering projects the respondents have come across. These are time, cost and claim occurrence. It indicates that most partnering projects are on time, within budget and less claims.

With regard to time performance, 52% respondents considered that their projects were on schedule, 24% respondents considered that their projects were ahead schedule and the same proportion of respondents also considered that their projects were delay. This equates 76% respondents considered that their partnering projects were in good progress.

Table 5-12: Respondents' comment on time performance for partnering projects

Time Performance	Number of Respondents
On Schedule	27 (52%)
Ahead up to 5%	4 (8%)
Ahead 6 – 10%	7 (14%)
Ahead more than 10%	1 (2%)
Delay up to 5%	6 (12%)
Delay 6 – 10%	2 (4%)
Delay more than 10%	4 (8%)
Number of respondents	51 (100%)

With reference to the following table, the majority of each stakeholder considered that their companies were either on budget or some saving for their respective partnering project. It amounts to about 85% of total respondents, only 15% respondents considered that they overrun their budget in partnering. On the client side, 46% of respondents considered their projects were on budget and 42% had saving. On the engineer (consultant) side, 64% were on budget and 18% were saving. On the contractor side, 36% were on budget and 43% were saving. Although about half of the client and contractor had saving, there were 21% contractor's budget overrun more than 10%. Hence the contractor might not be considered very success in respect of cost performance in partnering.

Table 5-13: Cost performance for each stakeholders in partnering project

Organisation	Client	Engineer	Contractor	All respondents
On budget	12 (46%)	7 (64%)	5 (36%)	24 (47%)
Saving up to 5%	6 (23%)		2 (14%)	8 (16%)
Saving 6 – 10%	2 (7%)	2 (18%)	4 (29%)	8 (16%)
Saving more than 10%	3 (12%)			3 (6%)
Overrun up to 5%	1 (4%)			1 (2%)
Overrun 6 – 10%	1 (4%)	1 (9%)		2 (4%)
Overrun more than 10%	1 (4%)	1 (9%)	3 (21%)	5 (9%)
	26 (100%)	11 (100%)	14 (100%)	51 (100%)

Question B11 Claim occurrence:

The respondents were requested to fill the claim occurrence information in their respective partnering project. 63% respondent considered that the claim occurrence in their project was below traditional procured project. Only 8% respondent considered their project claim occurrence was higher than that of traditional procured projects.

Table 5-14: Claim occurrence for partnering projects

Claim occurrence	Number of Respondents
Indifferent to traditional procured project	15 (29%)
Below traditional project up to 5%	20 (39%)
Below traditional project up to 6 – 10%	3 (6%)
Below traditional project more than 10%	9 (18%)
Above traditional project up to 5%	2 (4%)
Above traditional project up to 6 – 10%	1 (2%)
Above traditional project more than 10%	1 (2%)
Total	51 (100%)

The majority of the respondent's projects have good performance: except for 24% of respondents reported delay, 15% of respondents reported overrun and 8% of respondents reported more claim occurrence in their respective partnering contracts. Hence, the overall performance of partnering projects in Hong Kong is considered satisfactory.

5.4.3 Section C – Experience and opinions in partnering

This section is related to the respondent's experience and opinions in partnering. The questions designed were based on those obtained after review of literature. Respondents have given rating for the questions. Five-point scale is used to calculate the mean score for each question. The mean score for each question was computed by the following formula:

$$\text{Mean score} = \frac{\Sigma\,(f \times s)}{N}$$

Where:

s = score to each question by the respondents ranging from 1=strongly disagree to 5=strongly agree

f = frequency of response to each rating

N = total number of responds on this question

The average score is 3. Over this value means that the majority of respondents agree to the questions asked.

Question C1: The respondents gave their ratings for the circumstances preferring delivering projects by using partnering. The following is the result:

Table 5-15: Circumstances the respondents prefer partnering

No.	Question	Client	Consultant	Contractor	Overall
1.	High contract value of project	3.92	4.18	3.86	3.96
2.	High risk exposure	3.92	4.36	4.00	4.04
3.	Strong intention to complete the project on time	4.08	4.36	3.71	4.04
4.	Project is technically or organisationally complex	3.77	4.45	3.57	3.86
5.	Enhance better relationship	4.19	4.27	4.07	4.18
6.	Intention to improve quality of the project	3.31	4.00	3.21	3.43
7.	Intention to establish long term relationship among parties	4.04	4.45	3.93	4.10
8.	Few contractors/suppliers able to deliver the specific service required	3.31	3.73	3.21	3.37

The results give strong figure. Average scores for questions no. 5, 7, 3 and 2 are above 4. It indicates that when a future project is a high risk-value type, with definite timeline and complex in nature, and the parties would like to improve better relationship, partnering is more favourable. Average scores for all questions (except question 8) given by consultants are at least 4.00. As for contractors only questions 6 and 8 with average scores less than 3.5. Basically consultants gave higher scores, clients gave less higher and the contractors gave the lowest. As such consultants would like to implement partnering compare with other parties under the above circumstances.

Question C2: The respondents gave their ratings for the benefits for partnering project compared with traditional procured project. The following is the mean scores results given by the project parties:

Table 5-16: Benefits for the partnering project

No.	Question	Client	Consultant	Contractor	Overall
1.	Better team relationship	4.15	4.27	3.57	4.02
2.	Efficient problem solving	4.08	4.09	3.36	3.88
3.	Save time for the projects	3.77	3.82	3.21	3.63
4.	Save cost for the project	3.54	3.27	3.14	3.37
5.	Better quality in design	3.23	3.27	3.00	3.18
6.	Better quality in works	3.19	3.64	3.00	3.24
7.	Better safety performance	3.58	3.73	2.93	3.43
8.	Better productivity	3.69	4.09	3.21	3.65
9.	Reduce claims, dispute and litigation	4.08	3.64	3.07	3.71
10.	Improved communication among stakeholders	4.15	4.36	3.86	4.12
11.	Lower administration costs	3.62	3.18	2.57	3.24
12.	Promote product innovation	3.27	3.45	2.71	3.16
13.	Continuous improvement	3.62	3.73	2.93	3.45

Generally clients and consultants considered to agree more benefits than contractors did, as four items have average score of above 4 (strong figure) whilst no average scores has achieved 4 from contractors. As for scores between 3.5 and 4, clients have 6 items, consultants have 5 items and contractors have none. Both clients and consultants agreed to these 13 benefits but the items for better safety performance, lower administration costs, promote product innovation and continuous improvement may not be considered as benefits from the contractors' point of view, as the mean scores for these items are below 3 (3 = "neither agree nor disagree"), even though the overall mean scores taken by all parties are above 3. This might indicates that partnering is more beneficial to clients and consultants compared to contractors.

The order of benefits rated by all parties is: 1st for "Improved communication among stakeholders" (clients: 4.15; consultants: 4.36; contractor: 3.86); 2nd for "Better team relationship" (clients: 4.15; consultants: 4.27; contractor: 3.57) and 3rd for "Efficient problem solving" (clients: 4.08; consultants: 4.09; contractor: 3.36). "Reduce claims, dispute and litigation" is the 4th, its average score is 4.08 given by clients.

Question C3: The respondents gave their ratings for the drawbacks for the partnering projects. The following is the result:

Table 5-17: Drawbacks for the partnering project

No.	Question	Client	Consultant	Contractor	Overall
1.	Potential for corruption induced by closer relationship	3.35	2.36	2.43	2.88
2.	Reduction in career prospect for project staff	3.00	2.27	2.57	2.73
3.	Increase in project costs for partnering expenses (facilitator, workshops, etc.)	3.38	2.73	3.29	3.22
4.	Loss of confidentiality among stakeholders	3.04	2.82	3.00	2.98
5.	Reduction of competition for procuring projects	3.08	2.64	2.71	2.88
6.	The long term strategic relationship between client and large size contractor results in small sized contractors and suppliers to be driven out of the markets	3.42	2.64	3.14	3.18

In the Client's side respondents agree to all the above six drawbacks. However, consultants do not agree to these six drawbacks. This indicates clients worry about the harmful effects of partnering than the other parties but this seems not affect the consultants' business. Contractors only agree to items 3, 4 and 6 as the drawbacks for partnering. The average scores for all questions given by all parties did not exceed 3.5, indicating there is not strong support enough for the partnering drawbacks.

Question C4: The respondents gave their ratings for the problems during implementing partnering project. The following is the result:

Table 5-18: Problems during implementing partnering project

No.	Question	Client	Consultant	Contractor	Overall
1.	Misunderstand the concept of partnering	3.50	3.82	3.00	3.43
2.	Lack of flexibility in large bureaucratic organisation	3.35	4.18	3.79	3.65
3.	Inadequate partnering training	3.42	3.45	3.29	3.39
4.	Not involving other key parties	3.31	3.55	2.93	3.25
5.	Parties failed to share information	3.00	3.27	3.14	3.10
6.	Continuity of open & honest communication not achieved	3.42	3.45	3.14	3.35
7.	Relationship problems – adversarial relationship, distrust, failure of sharing risk etc	3.23	3.27	3.00	3.18
8.	Parties had little experience in partnering	3.65	3.73	3.43	3.61
9.	Contract conditions confine risk sharing	3.35	3.73	3.71	3.53

Client and Consultants agree to all the above problems during implementing partnering project. Contractors only disagree “Not involving other parties” as problem and agree to other items as problems. The average scores given by the parties are range from 3.10 to 3.65, thus the problems seems not strong enough. The highest three ranks for these questions are question 2: “Lack of flexibility in large bureaucratic organisation”, “Little experience” and “contract confines risk sharing”.

Question C5: The respondents gave their ratings for the Critical Success Factors for partnering project. The following is the result:

Table 5-19: Critical Success Factors for partnering project

No.	Question	Client	Consultant	Contractor	Mean Score
1.	Mutual trust among project stakeholders	4.35	4.73	4.00	4.33
2.	Adequate resources	4.00	4.18	3.50	3.90
3.	Support from top management	4.62	5.00	4.21	4.59
4.	Long term commitment	3.96	4.55	3.79	4.04
5.	Effective communication	4.31	4.64	4.21	4.35
6.	Monitoring and controlling mechanism	3.88	3.82	3.71	3.82
7.	Fair allocation of risks among parties	4.04	4.09	3.93	4.02
8.	Early implementation of partnering process	4.12	4.55	3.86	4.14
9.	Willing to share resources among parties	3.77	3.91	3.57	3.75
10.	Partnering integration process (workshop)	3.85	4.09	3.71	3.86
11.	Opportunity for innovation	3.23	4.00	3.29	3.41
12.	Improved project delivery costs	3.65	3.91	3.64	3.71
13.	Improved project delivery time	3.88	4.09	3.64	3.86
14.	Improved quality	3.27	3.73	3.29	3.37
15.	Improved environmental outcomes	3.23	3.82	3.29	3.37

Mean scores for the three parties: Clients, Consultants and Contractors are above 3, i.e. three parties agree to all the above 15 items for Critical Success Factors. The results for the critical success factors showed very strong figures. For instance, “Support from top management” was given the highest scores, scores exceeded 4 were given by all parties and consultants rated “5” meant 100% strongly agree. Other items have scores above “4” given by all parties are item 1: “mutual trust among stakeholders” and item 5: “effective communication”. Although not all parties rated average score “4” for the following items, those still got a strong figures: item 2: “adequate resources”, item 7: “fair allocation of risks” and item 8: “early implementation of partnering process”.

5.4.4 Section D – Degree of satisfaction for partnering project performance

This section contains only one question and this question is to ask the respondent to give rating for the degree of satisfaction for partnering project performance compared with traditional procured project. The following is the result:

Table 5-20: Degree of satisfaction for partnering project performance

No.	Question	Client	Consultant	Contractor	Mean Score
1.	Cost	3.73	3.55	3.21	3.55
2.	Time	3.85	4.09	3.50	3.80
3.	Quality	3.15	3.45	3.29	3.25
4.	Safety	3.31	3.64	3.14	3.33
5.	Environmental	3.27	3.64	3.29	3.35
6.	Relationship among parties	3.96	4.45	3.93	4.06
7.	Communication among parties	4.08	4.27	3.79	4.04

Mean scores for the three parties: Clients, Consultants and Contractors are above 3, i.e. three parties agree to all the above 7 items have better degree of satisfaction in respect of partnering project performance compared to traditional procured projects. However, the “soft” performance such as communication and improved relationship seems better compared to the “hard” performance such as time, cost, quality, safety and environmental as the former got average scores above “4” whilst the later got between 3.25 and 3.80.

5.5 Summary of Questionnaire Analysis

The majority of respondents come from the civil engineering industry so the result may favour partnering for civil engineering works. However, this sample is acceptable for analysis as they involved different classes of practitioners who processed sufficient working experience in the construction industry.

Respondents involved in partnering projects usually have high value and long construction period. However, the contract delivery process involved in partnering is still traditional. The types of contract are usually lump sum or re-measurement procured by competitive tendering. As partnering is still fresh for some participants, they might intend to use traditional contract plus partnering as a starting point.

Regarding performance for partnering projects, projects always were on schedule or ahead schedule. Stakeholders were either on budget or have some saving. Only minority of stakeholders still have overrun budget. Claim occurrence in partnering projects is lower than that for non-partnering projects.

High-risk projects favour adoption of partnering. Benefits listed in the above table were agreed by clients and consultants, but contractors might consider partnering cannot produce better performance in respect of safety, administration costs, innovation, etc.

The results of drawbacks opined by the parties are quite different among the parties. Clients agreed the list of drawbacks but consultants did the opposite way. Contractor considered that increase in project costs, loss of confidentiality etc. were the drawbacks. Most parties agreed to all the items listed for problems and critical success factors. In conclusion, all parties agreed that, they are more satisfied with the performance of partnering projects, than those of traditional procured projects.

Chapter 6 Case Studies

6.1 Case No. 1 - Chater House (Partnering)

6.1.1 Description of Project

The project comprised the demolition of an existing building and construction of a 29-level, 74,000 m² (gross) commercial building located at Central, Hong Kong, consisting of a 3-storey basement, a 3-storey podium and a 23-storey tower.

Figure 6-1: Chater House

(Source: Hongkong Land Limited)

6.1.2 Background

Design development and construction began in 1996 and was completed in mid-2002. The developer was Hongkong Land Limited, the main contractor was Gammon Skanska Limited. A number of other local and international contractors were also involved in the design, demolition and construction phases.

It was expected that during the construction stage there were late changes in design to accommodate principal tenant requirements, which, under normal circumstances, would have caused significant problems and delays and hence claims. However, these issues were resolved in a timely and effective manner as a result of the management and decision-making methodologies adopted. One of them is the adoption of partnering.

6.1.3 Contract delivery process

Hongkong Land adopted Guaranteed Maximum Price as procurement method. It was a hybrid contract based on the standard negotiated form but with a capped price and fixed completion date. Price could be adjusted in the event of unforeseen changes that occurred as a part of the construction work.

The client and main contractor engaged a professional project facilitator to facilitate the building of the Partnering Charter and ensure that it was effective. The facilitator's role was to provide a forum for the partners to develop the Charter together and to create mechanisms for reaching agreement throughout the process without losing momentum.

6.1.4 Partnering performances

The following partnering performances were summarised from the report by Uebergang et al. (2004):

- Cost performance: the budgeted project redevelopment costs for Chater House were some HK$1.78 billion; however, savings resulting from time and efficiency initiatives reduced the costs of the project by about HK$0.27 billion.

- Construction period: Reduced construction period by over 8 months. The client and the main contractor worked closely to incorporate timesaving innovations and overlap construction activities in order to achieve an earlier completion date.

- Safety Measures: Government Labour Department figures for 2001 show that the overall accident rate on Hong Kong sites was 115 per 1000 people. By contrast, Chater House's overall accident rate was 16 per 1000 people. The project also won the industry-wide health and safety Gold Award for 2002 in the Government Occupational Safety & Heath Awards.

- Claims occurrence: There were zero contractual claims between the client and the contractors.

- Enhanced reputation of all partners and team members: the main contractor and sub-contractors believe that the subsequent new contracts they have been awarded since completion of this project are a result of the reputation gained through this Chater House project.

6.1.5 Benefits, difficulties and critical success factors

The following benefits, problems and success factors were summarised from the study by Chan et al (2004, pp.42–43):

Seven common benefits were perceived among the client, the main contractor, the consultant and the subcontractor, including completing the project on time and within budget, achieving high quality, improvement of efficiency, better communication, establishment of good relationship, and efficiency of problem solving.

With respect to the major difficulties in implementing partnering, the client believed that partnering only worked well if all the parties pulled together. The main contractor stated that commitment and understanding of partnering concepts by the subcontractors were insufficient. There was also insufficient time to implement partnering thoroughly and the client was unaware of the partnering objectives.

The identified partnering critical success factors were consistent among the parties, and included senior management support and commitment from all participants, especially the client and the main contractor.

6.1.6 Discussion

This was a high value project. The properties are premium grade commercial properties in terms of quality, facilities and building management. A lot of changes were expected during the execution of works. Traditional contracting might not be satisfactory to achieve the final products. Success implementation of partnering is leading to better performance of project. Eight months reduction in construction period is beneficial to all partnering stakeholders.

6.2 Case No. 2 - Tseung Kwan O Extension (TKE) (Partnering)

6.2.1 Description of project

The project comprised 13 Civil Engineering and Building works contracts and 21 Electrical and Mechanical works contracts, most of which had interfaces with one another and with several Government departments and many other external organisations and agencies.

Tseung Kwan O Extension (TKE) extends the existing MTR Corporation Limited (MTRC) coverage at the eastern Kowloon peninsula eastward to the Tseung Kwan O

new town by adding five new stations. The procurement of the whole project was packaged into major civil and E&M contracts which together with the design fee, land cost and the client's management cost amounted to the outturn capital cost estimate of HK$30.5 billion (US$3.9bn) in 1997. (Lam 2002, p.10).

6.2.2 Background

Notwithstanding the previous project: the Airport Railway was finished on time and within budget, the overall project delivery was characterized by excessively adversarial contractual relationships and excessive claims activities amidst the overheated airport core programme-related construction market of the time. After a thorough study and careful consideration, MTRC decided to embark on the partnering approach by overlaying it onto its traditional project management framework to manage the TKE. (Lam 2002, p.11)

6.2.3 Contract delivery process

Civil contracts were mostly Engineer's design; Rail systems and M&E contracts were Design and Build. Partnering was non-contractual and did not form part of the pre-qualification or tendering activities. The works were supervised by the MTRC in house project management team.

6.2.4 Partnering Results

The following is abstracted from the report by Lam (Project Manager, MTR Corporation), 2002, p.12:

- Overall cost saving. The original budget was HK$30.5 billion. Latest figure below HK$16 billion, with savings of some HK$1 billion attributed directly to partnering.

- Improved claim activities. Compared to the previous project: the Airport Railway, some 5,000 claims registered at seven months prior to its opening, while TKE recorded only less than 500 claims at the same point in time.

- Early conclusion of Final Account – the final accounts for foundation contracts and few civil contracts were concluded as soon as the site works were complete.

- Programme Certainty: The interfacing contractors were more willing to communicate openly with one another. There were many occasions that the main contractor allows the follow-on contractors to access the site ahead of the programmed date without incurring any additional cost. The overall completion of the TKE was able to be brought forward by 10 weeks.

- Knowledge sharing: Some experience sharing sessions have been organised to pull the contractors and MTRC staff working of a similar job nature together.

6.2.5 Benefits, difficulties and critical success factors

As reported by Lam (2002, p.11), the positive outcomes of partnering could be generally named as overall cost saving through increased productivity and reduced waste, programme certainty, improved quality, higher consumer satisfaction, better communication and less disputes. The client and the contractor share a common result that both of them can finish off the project with certain benefits.

With regard to the difficulties, MTRC Project Manager Roger Bayliss (2002, p.4) reported that a number of challenges had to be dealt with during the development of the partnering initiative. Firstly, partnering was only introduced post-contract. There was a potential contradiction in that the client was attempting to partner and yet had not adopted partnering principles during the contractor selection process. The

introduction of partnering was set against a background of low tender prices due to the very competitive construction market when construction of TKE started. It was a challenge to keep people focussed on the fact that partnering does not replace the contract and is not about soft options. There have also been a number of challenges associated with the buy-in any commitment from the parties involved, both within the client and amongst the contractors. Some middle management and front line staff take the view that partnering is going soft on the contractor, as people with many years of exposure to the traditional confrontational relationships have difficulty in understanding the message.

However, Bayliss (2002, p.3) further explained the success factors for this project: a clear understanding of the strategic objectives, a common desire to partner and a willingness to trust each other and commitment.

6.2.6 Discussion

The whole TKE were divided into 13 major civil engineering contracts. Other than this, more system-wide contracts were also included leading to potential interface problems. This sophisticated nature of project caused heavy burden to the project management team. With the implementation of partnering, the whole project was completed successfully.

6.3 Case No. 3 – Route 8 - Sha Tin Heights Tunnel & Approaches (Partnering)

6.3.1 Description of project

The project is for the construction of a section of trunk road. It comprises 1 km long, dual three-lane tunnels under Sha Tin Heights, a 0.6 km long dual two-lane reinforced concrete tunnel approach road, two slip road viaducts, with an

approximate total length of 1 km, associated noise barriers and noise enclosures, drainage, slope works and landscape works.

6.3.2 Background

The tendered sum on contract award at 15 November 2002 was HK$1,073 million (about US$138M) and completion is programmed for early 2007.

As stated in Chapter 3, the Hong Kong Government has been working towards the wider adoption of partnering for public works contracts since 2001. Two contracts were then selected in 2002 to adopt a structured, non-binding post-award project partnering approach. This project is one of the two contracts awarded.

Major challenges faced by the partners included difficult temporary access for construction and police request for realignment of one of the temporary access points, and high safety risk to construct a bored pile wall when many other works would be in progress in the same area.

6.3.3 Contract delivery process

The tendered sum on contract award at 15 November 2002 was HK$1,073 million (about US$138M) and completion is programmed for early 2007. This is a re-measurable contract with provision for price fluctuation, let on the basis of an Engineer’s design.

After award of the contract, the Government sought the agreement of the contractor to adopt post-award non-binding partnering. Partnering process included start up workshop, partnering charter, meetings with partners’ senior staff, etc.

6.3.4 Partnering Performance

The following is abstracted from the web site of John Carlisle South East Asia (facilitator for this project) regarding the partnering performance of this project:

- Fewer Claims when compared with other contracts of similar nature and dealt with more quickly – 33 claims with 12 resolved already, a similar contract might have generated 100 claims at the same stage.

- Cost savings resulting from conclusion of three supplemental agreements for contractors' alternative design.

- Early completion (at least one month anticipated).

- Joint resolution of blasting constraints and difficult piling at a particular location.

6.3.5 Benefits, difficulties and critical success factors

The following is also abstracted from the web site of John Carlisle South East Asia regarding the benefits and difficulties of partnering:

- Acceptance of contractor's value engineering proposals with sharing of consequential savings.

- An amicable working environment for all stakeholders through team building and trust rather than by confrontation.

- Speedier decision making with defined issue resolution strategies.

- Meeting the mutual objectives as agreed in the partnering Charter by cooperation.

- Developing a cooperative culture.

- Reduce unnecessary paperwork.

- Maintaining good public relations resulting in very few substantiated public complaints.

However, one difficulty faced in the early stages of the project was that both client and contractor tended to treat each other as contracting parties in a conventional arrangement, even though both had signed the charter. As a result, it was difficult to recognize many benefits in the early stages and the progress of identifying and solving problems together was initially slow. Another difficulty faced was that sometimes, other government departments, who play a key role in reviewing and accepting value engineering proposals might not show the same degree of enthusiasm as the partnering entities.

Regarding success factors for this project, experience on this project shows that building trust between the two contracting parties is essential to the success of Partnering. More importantly, in order for the benefits to materialize earlier, this must be achieved quickly, and if possible, involve all stakeholders including the maintenance authorities and other interested parties.

6.3.6 Discussion

This project is a section of a trunk road linking to the future Disneyland. Works schedule is tight although not necessary to finish before the opening of the theme park. At the time of writing the works are still in progress. However, the performance so far has been considered good.

6.4 Case No. 4 - Airport Railway Project (Non-partnering)

6.4.1 Description of project

The project consists a station, tunnels, an elevated road and perimeter roads around the station. The station has a plan area of 60,000m² over a site area of 14 hectares. The station incorporates two underground levels providing vertically separated platform for a domestic line and an airport express line, and three above ground levels with intermediate levels for retail development. The station is also linked with the future phased construction of the property development around and above the station structure.

Tunnels were cut and cover tunnels connected to both ends of the station. Total length is approximately 450m. The elevated road is approximately 18m wide, 500m long and two lanes in each direction.

6.4.2 Background

The project was a part of Airport Core Programme works: a new airport built on a man-made island and linked to the business core in Central Hong Kong by related infrastructure works such as roads and rail. The Contract commenced in November 1994 with completion in June 1998. The original contract sum was HK$2.62 billion (about US$335 million).

Within this railway project itself, construction of the station interfaced with other 16 number system-wide contractors including track laying, communications, power supply, etc., requiring major efforts not only for physical coordination but also in the integrated programming and planning of all activities including testing and commissioning.

The structural engineer provided good solutions to design problems but he left things to the last moment and this had caused the Employer contractual problems. The

contractor did not take up his coordination responsibilities so the supervisor spent hours in detailed coordination meeting discussing issues that really should have been sorted out by the contractor. Other problems included difficult ground conditions such as extensive presence of boulders and marine clay that affected the progress of piling works.

6.4.3 Contract delivery process

The contract was a traditional re-measurement contract. The works were designed by the Employer's designer with the exception of architectural elements which were "design and construct" package. Supervision was by Employer's in house project team (defined as "the Engineer" under the contract). This project did not adopt partnering arrangement.

6.4.4 Performance for this project

The following is summary of the performance of this project:

- The works were certified as substantially completed in June 1998. This date includes an extension of time of less than two months from the original date for completion. The overall progress of the works was satisfactory and the various sections were completed on time.

- The contractor notified over 800 extension of time claims and 700 cost claims and in addition submitted over 2300 variation requests.

- Supplemental agreements settled all extension of time claims and cost claims. The amount was about HK$302 million, equivalent to 11% of the original contract sum.

- The labour, plant and material resources (human resources as well) were considered inadequate at the early stage. However, the overall quality of work is satisfactory.

- Some designs were fundamentally flawed and the designer needed to finalise these flawed designs and then integrate them post-award so that changes continued throughout the construction period.

- Deteriorating relationships and confrontation at all levels of the supervisor/ contractor personnel, as a result of the scale of information and change flow that occurred.

6.4.5 Discussion

The project information was collected from the principal's construction engineer but as per his request the information regarding his employer and project title should not be disclosed. I used to work in the Client's organisation in a contract interfaced with this case study so that some information was collected by me as well.

This project was not a partnering project. It involved complicated interface and huge volume of works and hence high value. Management of design and construction required enormous efforts. Substantial changes in design and confrontational approach among the parties caused the project spent more not only for claims but also for instructed acceleration to recover the delay.

6.5 Case No. 5 - Reclamation Project (Non-partnering)

6.5.1 Description of project

The project is for the provision of land comprised the reclamation of about 20 hectares of land. Other works included the reprovisioning of six ferry piers, advanced road and tunnel works, drainage, sewage, utilities, electrical and mechanical services, demolition of piers, permanent sea walls, cooling water pumping stations, immersed tube tunnel unit, electrical main plant buildings and other related ancillary works.

6.5.2 Background

The project was also part of Airport Core Programme works. The contract commenced in September 1993 with completion in September 1997.

The contractor had to accommodate various physical obstructions including utilities by either changes in methods of construction or by the designer modifying the design to suit the site conditions.

The original contract sum was HK$1.72 billion (about US$220 million). The contractor was generally co-operative throughout the works. However, the Superintendent considered that his supervision was not always well organised and much Superintendent's effort was required to ensure satisfactory control and supervision of the works.

Other than the Superintendent's officially issued variation orders, the contractor still contented over 1400 changes (and hence requested valuation) and gave about 480 notices of delay.

6.5.3 Contract delivery process

The contract was a traditional style Lump Sum contract with Engineer's design. The Conditions of Contract was based on Government's Conditions of Contract for the Airport Core Programme with special provisions for re-measurement. This project did not adopt partnering arrangement.

6.5.4 Performance for this project

The following is the summary of performance of this project:

- With the problems arose during the construction of this project, some sections were delayed about 100 days due to reasons beyond the control of the contractor. However, the overall progress of the works was satisfactory and the various sections were completed on time.

- Supplemental agreements settled all extension of time claims and cost claims. The amount was about US$3.5 million.

- The labour, plant and material resources were considered to be satisfactory throughout the construction period to suit the extremely tight programme of works. The quality of the works met the required standards.

6.5.5 Discussion

The project information was collected from a contractor staff who was responsible for the cost management of this contract but again the information regarding his employer and project title are not be disclosed here.

This project was not a partnering project. As discussed in the previous section, Airport Core Programme involved huge volume of works and hence high value. Majority of works were marine or underground works and hence high risk. However, the project was complete with satisfaction of the project parties. Substantial changes in design caused large amount of claims and hence settled amount.

6.6 Case No. 6 - Vehicle Access Project (Non-partnering)

6.6.1 Description of project

The project comprises the construction of a ramped vehicular access to a newly built school. It is a 5m wide two-way single carriageway linking an existing road to the school, including a 60m long at-grade road, a 70m long elevated bridge constructed on 3 piers on and above an existing slope with mini bored pile foundations. This project also includes slope improvement works and landscaping works.

6.6.2 Background

The works commenced in January 1999 and was complete in February 2000 after an extension of time of 4 days was granted. The original contract sum at award was HK$35 million (about US$4.5 million).

Some parts in the design were considered too conservative for achieving cost effectiveness. The Contractor tried to maximize their profit by subcontracting the entire works to the subcontractor and deploying staff on site as minimum as possible, to carry out the supervision.

6.6.3 Contract delivery process

The contract was a traditional lump sum contract with re-measurement items for underground works. The works were managed and supervised by a project manager. The project manager employed a design consultant to design the works. This project did not adopt partnering arrangement.

6.6.4 Performance for this project

The following is summary of the performance of this project:

- The overall progress of the works was satisfactory and the various parts were completed on time.

- Total 11 Nos. of claims notifications were received. 4 days extension of time was granted for valid claims.

- The final cost of the vehicular access was approximate by 2% above the actual contract sum, including all the additional costs associated with claims.

- Inadequate resources in respect of quality assurance were provided for this contract. However, the quality of the Works was satisfactory with no non-conforming products.

- The overview of the Contractor's performance on safety matters was good and the specified safety standard was achieved.

6.6.5 Discussions

The project information was collected from a contractor's site engineer who was responsible for the planning of this contract and he requested not to disclose the information regarding his employer and project title.

This was a relatively simple project, short period and not high value. Site area is small and involved little interface work. As such, implementation of partnering is not required. The project also achieved good results without implementing partnering.

6.7 Revision to Case Studies

Following review of the above six case studies, the outcome and performance are basically matched with the studies from previous chapters. That is, High risk or high value projects favour the use of partnering. Partnering improves project performance, reduce claims, improved relationship among project stakeholders, etc. Stakeholders received benefits from partnering, such as increase in efficiency, productivity, save time and cost, improved communication and reduction of claims. However, parties faced problems during implementation such as the misunderstanding the partnering concept, inadequate training and contract delivery or conditions confine rights. Success implementation relied on a set of success factors including mutual commitment, effective communication, early partnering implementation and top management support. These are basically matched with what we have obtained from the questionnaire survey.

Chapter 7 Process for Improved Project Delivery

This chapter discusses the process for improved project delivery. The process has been introduced in Chapter 4 and the data have been obtained and presented in Chapter 5.

7.1 Introduction

The selection of project delivery system would affect the performance of the project and produce win-lose situation among project parties. Collaborative strategies such as partnering may improve this situation. However, the decision to use partnering should not be abused. The criteria to adopt partnering have been discussed in Chapter 4 and 5. Apart from the situation discussed in these chapters, traditional contracting is still the most viable strategy. The following is the discussion.

7.2 The Improvement Process Model

As explained in Chapter 4, the model developed for project improvement is simple and straightforward. It involves three stages: The first stage is the identification of project characteristics in order to apply project partnering or traditional contracting. If partnering is selected, the second stage involves deploying a set of measures to ensure the success of implementation of partnering and overcome the problems in implementing partnering. The last stage is the evaluation of outcome. This is a simple task, as project performance in terms of time, cost, quality, environment, etc. can be easily measured.

7.3 Process 1 – Decision whether Adopt Partnering

The results obtained in Chapter 5 in respect of the circumstances preferring delivering projects by using partnering. Based on the average scores obtained, the priority of these circumstances is as follows:

- The intention to enhance better and long term relationship among parties,
- Project has high-risk exposure,
- Strong intention to complete the project on time,
- High contract value of project,
- Project is technically or organisationally complex,
- Intention to improve the quality of the project,
- Few contractors or suppliers are able to deliver specific services.

If a proposed project has the above characters, it is advisable to adopt partnering arrangement in order to improve the performance of project.

7.4 Process 2 – How to Implement

Implementation of partnering follows the fundamentals for partnering (as discussed in Chapter 2): Mutual Objectives, Problem Resolution and Continuous Improvement. These are dependent on some factors of success. Based on the average scores obtained in Chapter 5, the priority of these factors is as follows:

- Support from top management,

- Effective communication and mutual trust among parties,
- Early implementation of partnering process,
- Long term commitment among parties,
- Fair allocation of risks among parties,
- Adequate resources including knowledge, technology, information, etc.,
- Partnering integration process such as charter and workshops and improved project delivery time,
- Monitoring and controlling mechanism such as key performance indicators,
- Willing to share resources among parties,
- Improved project delivery costs,
- Opportunity for innovation and
- Improved quality and environmental outcomes.

In view of the above success factors it is easily recognised that partnering is not easy to be success. The most important factors are support from top management within all project stakeholders and effective communication among the parties.

7.5 Process 3 – Outcome

With the success implementation of partnering, the outcome performance would be better than that of project procured in traditional method if the situation favours partnering. Based on the average scores obtained in Chapter 5, the following items are considered have better performance, and are listed in descending order:

- Relationship among parties are better than that of traditional project,
- Communication among parties are better,
- Time performance is better,
- Cost performance is better,
- Environmental performance is better,
- Safety performance is better,
- Quality performance is better,

7.6 Summary

A simple process was developed to improve the current problems appear in the traditional project delivery system. The process could be briefly described as follows:

If situation not favour partnering, (e.g. simple project with long duration), use traditional delivery system,

If situations favour partnering such as high risk and strong intention to complete project on time, then adopt partnering,

Implementation of partnering complies with the fundamentals of partnering. As for success factors during implementation, the most important are support from top management and effective communication among parties.

7.7 Test of Process

Following the development of the whole process, test should be carried out by seeking the views of participants in the Hong Kong construction industry. E-mails were sent out in early October 2005 to the respondents who replied to my questionnaire in July 2005. Few replies have been received up to the time of writing; these are described as follows:

7.7.1 Views from Principal

One respondent, who is a professional in contracts management, comments that this process provides a logical and conceptual frameworks and guideline for the management level in deciding whether to implement the partnering process and how to implement partnering in a successful manner. This process also facilitates the partnering performance evaluation for continuous improvement. With respect to the practicality, the listed variables for both the decision to adopt partnering and the critical success factors for implementing partnering could reflect the real situation which construction professionals face in daily operation and decision.

However, as strategic partnering is not popular in Hong Kong, mutual trust and long term commitment, which are paramount for partnering, are difficult to be established by simple process through one-off project. Variable measurement should be quantified and benchmarked to make it more practical and useful. In addition, the

critical success factors should be reviewed from time to time during different stages of construction processes, such continuous review process, is to ensure the implementation more efficient and effective.

Another respondent, who was an engineer in the Superintendent organisation in a partnering project, does not have any comments on this process because he believes that it is the result of questionnaire analysis. From his past experience in one partnering project, it has a better performance in respect of time, cost and quality, compared to his involved past projects, but he is not sure whether it comes out from partnering.

7.7.2 Views from Superintendent

One engineering technologist, who have substantial experience in site supervision in partnering projects, comments that there are some other essential and salient factors governing the success of partnering which my process developed does not include, such as involvement and devotion of individuals to partnering, openness as well as individual personal character will also affect the outcome.

7.7.3 Views from Contractor

One response was received from a Senior Project Manager in a subcontractor organisation. He had two major comments, the first is that it is very difficult to compare the time and quality factors for a project with or without partnering, as no projects are identical. Another comment is that based on his experience only projects with high progress concern will do partnering and cost will usually beneficial to main contractor and subcontractor.

7.8 Application of the Process

This section takes a further step by selecting an actual project and evaluating how well the process developed could have been applied to the award and management of the main contract for delivering that project. The case described in Section 6.4 (railway project) is used again.

7.8.1 Process 1 – Decision whether adopt partnering

As described in Section 6.4, this project involved complicated interface and huge volume of works, the following is the checklist:

- Strong intention to complete the project on time? Yes!

As this is a part of Airport Core Programme, the project should be completed on time to catch up the overall completion and operation of the new airport in 1998.

- Project has high-risk exposure? Project is complex? Yes!

It had interface problems – other 16 number system-wide contractors located on the same site and in some instances working at the same time.

- Intention to enhance better relationship among parties? Yes!

I believe under most circumstances the parties should like to enhance better relationship among various parties. The actual happening was that the relationship among the parties was adversarial.

- Intention to establish long term relationship among parties?

I have no idea on this although extensions of railway project in Hong Kong is increasing, there is no indication on the development of long term relationship among the client, consultants and contractors.

- Intention to improve the quality of the project? Yes!

The project involves high quality commercial area and future high class residential development so quality is important.

- Few contractors and suppliers are able to deliver specific services? No!

This project opened for international contractors as well as suppliers I do not see any difficulties in finding suitable contractors and suppliers.

In view of the above this project is suitable for the partnering, the Principal, Superintendent and Contractor might decide to use partnering and any party could initiate the use of partnering.

7.8.2 Process 2 – How to implement

The implementation of partnering follows the fundamentals of partnering (discussed in Chapter 2), these are dependent on some factors of success, the following is the review of problems encountered during the operation of the project and see how critical success factors could be used to overcome the problems.

Construction of the station included interfacing with other 16 number system-wide contractors, it required major efforts spent for overcoming physical coordination, programming and planning of all activities covering testing and commissioning. Late issues in design changes caused contractual problems. Coordination by the Contractor was weak and ground conditions affected the progress of works. Regarding the project delivery mechanism, this was a traditional type of contract requiring the successful contractor to get the job with lowest bid.

Interface problems could be overcome by effective communication and mutual trust among parties. Performance could be improved by better coordination and planning of activities.

Late issue in design changes could be improved by effective communication, adequate resources and willing to share resources among the parties.

Ground conditions affected the progress of works could be improved by the fair allocation of risks among parties and improved project delivery costs.

Other than the above-mentioned measures, implementation of partnering required other factors such as support from top management, early implementation of partnering process and effective control mechanism.

7.8.3 Process 3 – Outcome

The expected outcome would be as follows:

As relationship and communication would be better, so there would not be over 1,500 claims raised, instead it would have been less claims. Time and cost performance would be better as the Principal would not spent money to recover the delay which due to his reasons of delay such as late changes in design.

As relationship improved confrontation at all levels would be reduced to avoid the any further adversarial actions taken by the parties.

Chapter 8 Conclusions

The opening chapter of this dissertation outlined problems facing the Hong Kong construction industry in respect of project delivery system. In the past decade there were huge value spent in the construction industry especially for large-scale infrastructure projects. As Hong Kong has been continuing to develop, construction values are expected to share a substantial proportion in the Hong Kong economy. There should be suitable measures to deal with the problems arose from the execution of traditional project delivery. The aim of this Research Project is to evaluate whether the implementation of partnering should bring benefits to parties in the Hong Kong construction industry.

8.1 Findings from Questionnaire Results

Literature has said that Partnering contributes successful elements to construction projects. In order to verify whether it works in the Hong Kong construction industry, a questionnaire was developed to gather data on the actual partnering practices in Hong Kong. Data include project performance of partnering projects and other opinions such as benefits and problems of partnering and situation to apply partnering. Questionnaire response is quite satisfactory. All respondents must have partnering experience in Hong Kong.

As checked from the project performance data, 52% and 24% respondents considered that their projects were on time and ahead schedule respectively. 47% and 38% respondents considered that their projects were on budget and saving respectively. 29% and 63% respondents considered that their projects have same and less claim occurrence than before respectively. This shows that majority of respondent's partnering performance is satisfactory in respect of time, cost and claim occurrence. This fulfills the basic achievements for each stakeholder needs through implementation of partnering.

The respondents also gave definite answers to the situation for adopting partnering, the majority of respondents agree to the circumstances such as high value, high risk and enhance better relationship. Respondents also gave high scores for partnering benefits such as better team relationship and communication, efficient problem solving and reduction of claims and disputes. With respect to drawbacks, the results show not strong figures obtained. Respondents might consider increase in project costs and long term relationship among parties results in small sized stakeholders driven out of the markets; however, the result obtained did not have high scores which indicated that drawbacks might not be happened in some particular project.

High scores have also been obtained for critical success factors of partnering implementation including mutual trust, top management support, effective communication and fair allocation of risks among parties. These factors are used to overcome the problems in implementing partnering.

The overall degrees of satisfaction in respect of time, cost, quality, safety, environmental and relationship are considered better from the respondents' point of view.

8.2 Findings from Case Studies

Following the questionnaire analysis case studies were carried out to see what actually happened in the construction industry. Three partnering projects include one commercial development, one railway project and one highway project; all these are classified as projects suitable for apply partnering. With respect to other three non-partnering projects, two high value infrastructure projects and one further simple project were described. This revealed the criteria for selection of appropriate project delivery mechanism: high value and high risk project favours the use of partnering, low value and simple project applying traditional procurement would be better.

The three partnering projects described have better performance in respect of time, cost, claims and relationship among the parties, as compared to the similar sized projects but procured in traditional contracting. Each party also gave his opinions on the benefits and problems of partnering in his respective project. This basically matches the findings from the Questionnaire Survey.

8.3 Process for Improved Project Delivery

To get the maximum benefits of implementing partnering to overcome the current problems of project delivery in Hong Kong, an improvement model was developed to modify the current project procurement system. It involves the decision of adopt partnering, the successful implementation process and the expected results. This model was then tested by local professionals who have also the respondents of the questionnaire previously developed. Respondents from the Principal, Superintendent and Contractor have given their opinions.

In general their feelings are positive but they considered that it is relatively simple as partnering involved other elements such as consideration of strategic partnering, the method of contract management such as lump sum contract or target cost contract, these factors do not fully detailed in my model developed. In general the process developed is viable but it needs further refinement.

This process is further used to evaluate a real case (one of the non-partnering project described in the case studies). This process demonstrates that if partnering process had been adopted, the performance could have been improved and relationship problem could also have been enhanced. The evaluation concludes that the developed process by using partnering could be used to improve the current problems for the current traditional project delivery system.

8.4 Review of the Project Objectives

The objectives of this project include the review of current literatures and the current partnering practice in the Hong Kong construction industry. This was followed by detailed research through collection of questionnaire data and the real cases happened, to gather the actual data for traditional and partnering projects. Hence a partnering process model for improved project delivery was developed. The developed process was further tested with principals, superintendents and contractors in the Hong Kong construction industry.

Correct decision on the use of partnering enhances better project performance and improves relationship among all parties. Each party can obtain benefits arising from these improvements.

In conclusion the successful implementation of Partnering would be able to bring benefits to the principals, superintendents and contractors in the Hong Kong construction industry.

8.5 Further Work

The following list outlines further work that could be conducted in the study of partnering in the Hong Kong construction industry:

- Wider inclusion of other stakeholders and investigate the advantages of including subcontractor, supplier and all personnel in a project,

- Review the use of other project delivery system such as target cost contract in the establishment of partnering process,

- Possibility of future development of strategic partnering in the Hong Kong construction industry, and

- Refinement, practical application and review of the process for improved project delivery model.

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Appendix A Project Specification

University of Southern Queensland

FACULTY OF ENGINEERING AND SURVEYING

ENG 4111/4112 Research Project

PROJECT SPECIFICATION

FOR: MAK CHI KEUNG

TOPIC: BENEFIT OF PARTNERING IN THE HONG KONG CONSTRUCTION INDUSTRY

SUPERVISORS: Dr. David Thorpe

ENROLMENT: ENG 4111 – S1, D, 2005
ENG 4112 – S2, D, 2005

PROJECT AIM: This project seeks to investigate whether or not Partnering is benefit to the Hong Kong Construction Industry

PROGRAMME: Issue B, 29 March 2005

1. Undertake a literature review on traditional contracting and partnering, including:
   - the contract formation and management process
   - the fundamentals of project partnering
   - the project and contract management process using traditional and partnering approaches
   - the benefits, costs and issues associated with delivering civil engineering projects using partnering as compared with traditional forms of contract.

2. Review the use of traditional contracting and partnering in Hong Kong.

3. Develop a research methodology for assessing the benefits, costs and issues associated with partnering in the Hong Kong construction industry.

4. Using this research methodology, conduct a study on at least six (6) construction projects in Hong Kong, of which three (3) are to be delivered using partnering, to:
   - gather data on the contract delivery processes used in the Hong Kong construction industry
   - research the advantages and disadvantages of implementation of Partnering in the view of parties involved in a contract.

5. Analyse the results of this study to assess the hypothesis "The implementation of partnering should bring benefit to employers, engineers and contractors in the Hong Kong construction industry."

6. Use the findings of the analysis to develop a process for improved project delivery in the Hong Kong construction industry,

7. Report findings to peer group via oral presentations and in the required written format

As time permits:

8. Test the recommendations developed in Step 6, with principals, superintendents and contractors in the Hong Kong construction industry.

9. Evaluate the use of the process developed in the award and management of at least one particular construction contract.

AGREED: _____(Student) _____

(Supervisor)

Date: _____ Date: _____

Appendix B Statistical Results of the Questionnaire Survey

SECTION A : RESPONDENT'S BACKGROUND

A1 Working experience in construction industry

Working experience	Respondent
Less than 6 years	0
6 to 10 years	7
11 to 15 years	8
More than 15 years	36
Total	51

A2 What is the number of partnering projects you have been (are) involved?

Number of partnering projects	Respondent
0	0
1	26
2	11
3	6
Over 3	8
Total	51

N.B. respondents answered with "0" were considered invalid response

SECTION B: PROJECT INFORMATION OF CURRENT OR RECENTLY COMPLETED PARTNERING PROJECT

B1 Type of Client

Type of Client	Respondent
Private Company	4
Public (Government)	19
Government owned corporations	28
Total	51

B2 Project Nature

Project Nature	Respondent
Building	8
Civil Engineering	41
Electrical & Mechanical	2
Total	51

B3 Contract sum of this project (HK$)

Contract sum	Respondent
Less than 100 million	3
100M to 500M	16
501M to 1000M	7
More than 1 billion	25
Total	51

B4 Your company's principal business:

Company's business	Respondent
Client	26
Contractor	14
Consultant	11
Total	51

B5 Your position:

Stakeholder / Your Position	Respondent		
	Client	Consultant	Contractor
Managing Director		1	
Associate Director		1	
General Manager			2
Senior Manager	3		1
Manger	3		6
Chief Engineer		3	
Senior Engineer/ Surveyor	2		1
Engineer/ Architect/ Surveyor	12	1	3
Assistant Engineer	5	1	1
Senior Inspector/ Technician	1	3	
Unknown		1	
Total	26	11	14

B6 Contract Period

Contract Period	Respondent
1 to 2 years	6
2.1 to 3 years	24
More than 3 years	21
Total	51

B7 Partnering stakeholders involved in your project

Stakeholders	Respondent
Client-consultant-contractor	20
Client-contractor	17
Client-contractor-subcontractor	3
Client-consultant-contractor-subcontractor	9
Contractor-subcontractor	1
Subcontractor	1
Total	51

B8 Contract Type

Contract type	Respondent
Lump Sum	15
Re-measurement	29
Target Cost	7
Cost plus	0
Total	51

B9 Time performance of this partnering project

Time performance	Respondent
On schedule	27
Ahead schedule up to 5%	4
Ahead schedule 6 – 10%	7
Ahead schedule more than 10%	1
Behind schedule up to 5%	6
Behind schedule 6 – 10%	2
Behind schedule more than 10%	4
Total	51

B10 Cost performance of this partnering project

Time performance	Client	Consultant	Contractor	Total
On budget	12	7	5	24
Saving budget up to 5%	6		2	8
Saving budget 6 – 10%	2	2	4	8
Saving budget more than 10%	3			3
Overrun budget up to 5%	1			1
Overrun budget 6 – 10%	1	1		2
Overrun budget more than 10%	1	1	3	5
Total	26	11	14	51

B11 Claims occurrence

Claims occurrence	Respondent
Indifferent to traditional procured project	15
Below traditional procured project up to 5%	20
Below traditional procured project 6 – 10%	3
Below traditional procured project more than 10%	9
Above traditional procured project up to 5%	2
Above traditional procured project 6 – 10%	1
Above traditional procured project more than 10%	1
Total	51

SECTION C: YOUR EXPERIENCE/ OPINIONS IN PARTNERING PROJECT

Score to each question by the respondents 1=strongly disagree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree

C1 Please give your rating for the following circumstances you would prefer delivering projects by using partnering

Question C1.1	Scores given					
High contract value of project (e.g. over HK$500M)	1	2	3	4	5	Average
Clients	0	1	8	9	8	3.92
Consultants	0	0	1	7	3	4.18
Contractors	0	1	3	7	3	3.86
Overall	0	2	12	23	14	3.96

Question C1.2	Scores given					
High risk exposure (e.g. ground problem)	1	2	3	4	5	Average
Clients	0	1	7	11	7	3.92
Consultants	0	0	1	5	5	4.36
Contractors	0	1	2	7	4	4.00
Overall	0	2	10	23	16	4.04

Question C1.3	Scores given					
Strong intention to complete the project on time	1	2	3	4	5	Average
Clients	0	1	1	19	5	4.08
Consultants	0	0	1	5	5	4.36
Contractors	0	3	1	7	3	3.71
Overall	0	4	3	31	13	4.04

Question C1.4	Scores given					
Project is technically or organisationally complex (e.g. hospital)	1	2	3	4	5	Average
Clients	0	2	6	14	4	3.77
Consultants	0	0	1	4	6	4.45
Contractors	0	1	5	7	1	3.57
Overall	0	3	12	25	11	3.86

Question C1.5	Scores given					
Enhance better relationship	1	2	3	4	5	Average
Clients	0	0	4	13	9	4.19
Consultants	0	0	0	8	3	4.27
Contractors	0	1	1	8	4	4.07
Overall	0	1	5	29	16	4.18

Question C1.6	Scores given					
Intention to improve quality of the project	1	2	3	4	5	Average
Clients	0	5	10	9	2	3.31
Consultants	0	0	2	7	2	4.00
Contractors	0	3	6	4	1	3.21
Overall	0	8	18	20	5	3.43

Question C1.7	Scores given					
Intention to establish long term relationship among parties (e.g. Strategic Partnering)	1	2	3	4	5	Average
Clients	0	0	7	11	8	4.04
Consultants	0	0	0	6	5	4.45
Contractors	0	1	2	8	3	3.93
Overall	0	1	9	25	16	4.10

Question C1.8	Scores given					
There are relatively few contractors/ suppliers able to deliver the specific service required.	1	2	3	4	5	Average
Clients	0	4	12	8	2	3.31
Consultants	0	2	2	4	3	3.73
Contractors	0	3	6	4	1	3.21
Overall	0	9	20	16	6	3.37

C2 Please give your rating for the following benefits for the partnering project that you have been involved in general: (compare with traditional projects)

Question C2.1	Scores given					
Better team relationship	1	2	3	4	5	Average
Clients	0	1	3	13	9	4.15
Consultants	0	0	2	4	5	4.27
Contractors	0	1	6	5	2	3.57
Overall	0	2	11	22	16	4.02

Question C2.2	Scores given					
Better problem solving	1	2	3	4	5	Average
Clients	0	0	2	20	4	4.08
Consultants	0	0	2	6	3	4.09
Contractors	0	3	4	6	1	3.36
Overall	0	3	8	32	8	3.88

Question C2.3	Scores given					
Save time for the project(s)	1	2	3	4	5	Average
Clients	0	1	7	15	3	3.77
Consultants	0	0	3	7	1	3.82
Contractors	0	5	2	6	1	3.21
Overall	0	6	12	28	5	3.63

Question C2.4	Scores given					
Save cost for the project(s)	1	2	3	4	5	Average
Clients	0	2	10	12	2	3.54
Consultants	0	1	7	2	1	3.27
Contractors	0	4	5	4	1	3.14
Overall	0	7	22	18	4	3.37

Question C2.5	Scores given					
Better quality in design	1	2	3	4	5	Average
Clients	0	3	14	9	0	3.23
Consultants	0	1	6	4	0	3.27
Contractors	1	3	5	5	0	3.00
Overall	1	7	25	18	0	3.18

Question C2.6	Scores given					
Better quality in works	1	2	3	4	5	Average
Clients	0	4	13	9	0	3.19
Consultants	0	0	4	7	0	3.64
Contractors	0	3	8	3	0	3.00
Overall	0	7	25	19	0	3.24

Question C2.7	Scores given					
Better safety performance	1	2	3	4	5	Average
Clients	0	0	12	13	1	3.58
Consultants	0	0	3	8	0	3.73
Contractors	0	3	9	2	0	2.93
Overall	0	3	24	23	1	3.43

Question C2.8	Scores given					
Better productivity	1	2	3	4	5	Average
Clients	1	0	6	18	1	3.69
Consultants	0	0	1	8	2	4.09
Contractors	0	3	5	6	0	3.21
Overall	1	3	12	32	3	3.65

Question C2.9	Scores given					
Reduce claims, dispute and litigation	1	2	3	4	5	Average
Clients	0	0	3	18	5	4.08
Consultants	0	1	4	4	2	3.64
Contractors	1	2	6	5	0	3.07
Overall	1	3	13	27	7	3.71

Question C2.10	Scores given					
Improved communication among stakeholders	1	2	3	4	5	Average
Clients	0	0	1	20	5	4.15
Consultants	0	0	1	5	5	4.36
Contractors	0	0	2	12	0	3.86
Overall	0	0	4	37	10	4.12

Question C2.11	Scores given					
Lower administrative costs	1	2	3	4	5	Average
Clients	0	2	10	10	4	3.62
Consultants	0	2	6	2	1	3.18
Contractors	1	7	3	3	0	2.57
Overall	1	11	19	15	5	3.24

Question C2.12	Scores given					
Promote product innovation	1	2	3	4	5	Average
Clients	0	3	13	10	0	3.27
Consultants	0	0	7	3	1	3.45
Contractors	1	5	5	3	0	2.71
Overall	1	8	25	16	1	3.16

Question C2.13	Scores given					
Continuous improvement	1	2	3	4	5	Average
Clients	0	0	11	14	1	3.62
Consultants	0	1	3	5	2	3.73
Contractors	1	3	6	4	0	2.93
Overall	1	4	20	23	3	3.45

C3 Please give your rating for the following drawbacks for the partnering project that you have been involved in general: (compare with traditional projects)

Question C3.1	Scores given					
Potential for corruption induced by closer relationship	1	2	3	4	5	Average
Clients	1	4	9	9	3	3.35
Consultants	2	5	2	2	0	2.36
Contractors	3	4	5	2	0	2.43
Overall	6	13	16	13	3	2.88

Question C3.2	Scores given					
Reduction in career prospect for project staff	1	2	3	4	5	Average
Clients	1	9	6	9	1	3.00
Consultants	1	7	2	1	0	2.27
Contractors	2	4	6	2	0	2.57
Overall	4	20	14	12	1	2.73

Question C3.3	Scores given					
Increase in project costs for partnering expenses (facilitator, workshops, etc)	1	2	3	4	5	Average
Clients	0	6	6	12	2	3.38
Consultants	1	3	5	2	0	2.73
Contractors	0	4	4	4	2	3.29
Overall	1	13	15	18	4	3.22

Question C3.4	Scores given					
Loss of confidentiality among stakeholders	1	2	3	4	5	Average
Clients	0	7	12	6	1	3.04
Consultants	0	4	5	2	0	2.82
Contractors	1	4	3	6	0	3.00
Overall	1	15	20	14	1	2.98

Question C3.5	Scores given					
Reduction of competition for procuring projects	1	2	3	4	5	Average
Clients	0	8	8	10	0	3.08
Consultants	0	5	5	1	0	2.64
Contractors	1	6	4	2	1	2.71
Overall	1	19	17	13	1	2.88

Question C3.6	Scores given					
The long term strategic relationship between client and large size contractor results in small sized contractors and suppliers to be driven out of the markets	1	2	3	4	5	Average
Clients	0	4	10	9	3	3.42
Consultants	0	6	3	2	0	2.64
Contractors	1	3	4	5	1	3.14
Overall	1	13	17	16	4	3.18

C4 Please give your rating for the following problems during implementing partnering project that you have been involved

Question C4.1	Scores given					
Misunderstand the concept of partnering	1	2	3	4	5	Average
Clients	0	4	6	15	1	3.50
Consultants	0	1	1	8	1	3.82
Contractors	1	4	4	4	1	3.00
Overall	1	9	11	27	3	3.43

Question C4.2	Scores given					
Lack of flexibility in large bureaucratic organisation	1	2	3	4	5	Average
Clients	0	7	4	14	1	3.35
Consultants	0	0	1	7	3	4.18
Contractors	1	1	3	4	5	3.79
Overall	1	8	8	25	9	3.65

Question C4.3	Scores given					
Inadequate partnering training	1	2	3	4	5	Average
Clients	0	3	9	14	0	3.42
Consultants	0	1	4	6	0	3.45
Contractors	1	2	4	6	1	3.29
Overall	1	6	17	26	1	3.39

Question C4.4	Scores given					
Not involving other key parties (such as key subcontractors, design consultants and suppliers)	1	2	3	4	5	Average
Clients	0	4	10	12	0	3.31
Consultants	0	1	3	7	0	3.55
Contractors	0	6	3	5	0	2.93
Overall	0	11	16	24	0	3.25

Question C4.5	Scores given					
Parties failed to share information	1	2	3	4	5	Average
Clients	0	8	11	6	1	3.00
Consultants	0	1	7	2	1	3.27
Contractors	0	3	6	5	0	3.14
Overall	0	12	24	13	2	3.10

Question C4.6	Scores given					
Continuity of open and honest communication was not achieved	1	2	3	4	5	Average
Clients	0	3	9	14	0	3.42
Consultants	0	2	4	3	2	3.45
Contractors	1	4	2	6	1	3.14
Overall	1	9	15	23	3	3.35

Question C4.7	Scores given					
Relationship problems – adversarial relationship, distrust, failure of sharing risks etc	1	2	3	4	5	Average
Clients	1	4	10	10	1	3.23
Consultants	0	3	3	4	1	3.27
Contractors	1	5	2	5	1	3.00
Overall	2	12	15	19	3	3.18

Question C4.8	Scores given					
Parties had little experience in partnering	1	2	3	4	5	Average
Clients	0	2	6	17	1	3.65
Consultants	0	1	2	7	1	3.73
Contractors	0	2	4	8	0	3.43
Overall	0	5	12	32	2	3.61

Question C4.9	Scores given					
Contract conditions confine risk sharing (e.g. underground risks undertaken by contractor)	1	2	3	4	5	Average
Clients	0	5	9	10	2	3.35
Consultants	0	1	3	5	2	3.73
Contractors	0	1	5	5	3	3.71
Overall	0	7	17	20	7	3.53

C5 Please give your rating for the following Critical Success Factors for partnering project

Question C5.1	Scores given					
Mutual trust among project stakeholders	1	2	3	4	5	Average
Clients	0	0	2	13	11	4.35
Consultants	0	0	0	3	8	4.73
Contractors	0	0	2	10	2	4.00
Overall	0	0	4	26	21	4.33

Question C5.2	Scores given					
Adequate resources	1	2	3	4	5	Average
Clients	0	1	4	15	6	4.00
Consultants	0	0	2	5	4	4.18
Contractors	0	2	4	7	1	3.50
Overall	0	3	10	27	11	3.90

Question C5.3	Scores given					
Support from top management	1	2	3	4	5	Average
Clients	0	0	2	6	18	4.62
Consultants	0	0	0	0	11	5.00
Contractors	0	0	1	9	4	4.21
Overall	0	0	3	15	33	4.59

Question C5.4	Scores given					
Long term commitment	1	2	3	4	5	Average
Clients	0	0	6	15	5	3.96
Consultants	0	0	0	5	6	4.55
Contractors	0	0	4	9	1	3.79
Overall	0	0	10	29	12	4.04

Question C5.5	Scores given					
Effective communication	1	2	3	4	5	Average
Clients	0	0	2	14	10	4.31
Consultants	0	0	0	4	7	4.64
Contractors	0	0	0	11	3	4.21
Overall	0	0	2	29	20	4.35

Question C5.6	Scores given					
Monitoring and controlling mechanism	1	2	3	4	5	Average
Clients	0	1	5	16	4	3.88
Consultants	0	0	3	7	1	3.82
Contractors	0	0	4	10	0	3.71
Overall	0	1	12	33	5	3.82

Question C5.7	Scores given					
Fair allocation of risks among parties	1	2	3	4	5	Average
Clients	0	0	5	15	6	4.04
Consultants	0	0	2	6	3	4.09
Contractors	0	0	4	7	3	3.93
Overall	0	0	11	28	12	4.02

Question C5.8	Scores given					
Early implementation of partnering process	1	2	3	4	5	Average
Clients	0	1	3	14	8	4.12
Consultants	0	0	0	5	6	4.55
Contractors	0	0	5	6	3	3.86
Overall	0	1	8	25	17	4.14

Question C5.9	Scores given					
Willing to share resources among parties	1	2	3	4	5	Average
Clients	0	0	9	14	3	3.77
Consultants	0	0	4	4	3	3.91
Contractors	0	1	5	7	1	3.57
Overall	0	1	18	25	7	3.75

Question C5.10	Scores given					
Partnering integration process (such as workshop, charter, review meetings, incentives, etc)	1	2	3	4	5	Average
Clients	0	0	6	18	2	3.85
Consultants	0	0	0	10	1	4.09
Contractors	0	0	4	10	0	3.71
Overall	0	0	10	38	3	3.86

Question C5.11	Scores given					
Opportunity for innovation	1	2	3	4	5	Average
Clients	0	2	17	6	1	3.23
Consultants	0	0	2	7	2	4.00
Contractors	0	2	6	6	0	3.29
Overall	0	4	25	19	3	3.41

Question C5.12	Scores given					
Improved project delivery costs	1	2	3	4	5	Average
Clients	0	2	7	15	2	3.65
Consultants	0	0	2	8	1	3.91
Contractors	0	0	5	9	0	3.64
Overall	0	2	14	32	3	3.71

Question C5.13	Scores given					
Improved project delivery time	1	2	3	4	5	Average
Clients	0	1	4	18	3	3.88
Consultants	0	0	2	6	3	4.09
Contractors	0	1	3	10	0	3.64
Overall	0	2	9	34	6	3.86

Question C5.14	Scores given					
Improved quality	1	2	3	4	5	Average
Clients	1	1	15	8	1	3.27
Consultants	0	0	3	8	0	3.73
Contractors	1	1	5	7	0	3.29
Overall	2	2	23	23	1	3.37

Question C5.15	Scores given					
Improved environmental outcomes	1	2	3	4	5	Average
Clients	1	0	18	6	1	3.23
Consultants	0	0	3	7	1	3.82
Contractors	1	0	8	4	1	3.29
Overall	2	0	29	17	3	3.37

SECTION D: DEGREE OF SATISFACTION

Score to each question by the respondents 1=much worse, 2=worse, 3=same, 4=better and 5=much better

D1 Please give rating for the degree of satisfaction for partnering project performance (compared with traditional procured project)

Question D1.1	Scores given					
Cost	1	2	3	4	5	Average
Clients	0	0	9	15	2	3.73
Consultants	0	1	4	5	1	3.55
Contractors	0	1	9	4	0	3.21
Overall	0	2	22	24	3	3.55

Question D1.2	Scores given					
Time	1	2	3	4	5	Average
Clients	0	0	7	16	3	3.85
Consultants	0	0	2	6	3	4.09
Contractors	0	1	5	8	0	3.50
Overall	0	1	14	30	6	3.80

Question D1.3	Scores given					
Quality	1	2	3	4	5	Average
Clients	0	3	16	7	0	3.15
Consultants	0	0	6	5	0	3.45
Contractors	0	0	10	4	0	3.29
Overall	0	3	32	16	0	3.25

Question D1.4	Scores given					
Safety	1	2	3	4	5	Average
Clients	0	1	16	9	0	3.31
Consultants	0	0	5	5	1	3.64
Contractors	0	0	12	2	0	3.14
Overall	0	1	33	16	1	3.33

Question D1.5	Scores given					
Environmental	1	2	3	4	5	Average
Clients	0	1	17	8	0	3.27
Consultants	0	0	6	3	2	3.64
Contractors	0	0	10	4	0	3.29
Overall	0	1	33	15	2	3.35

Question D1.6	Scores given					
Relationship among parties	1	2	3	4	5	Average
Clients	0	1	2	20	3	3.96
Consultants	0	0	1	4	6	4.45
Contractors	0	0	4	7	3	3.93
Overall	0	1	7	31	12	4.06

Question D1.7	Scores given					
Communication among parties	1	2	3	4	5	Average
Clients	0	0	2	20	4	4.08
Consultants	0	0	1	6	4	4.27
Contractors	0	1	4	6	3	3.79
Overall	0	1	7	32	11	4.04

Appendix C Cover Letter for the Questionnaire

8 June 2005

Dear Sirs,

Questionnaire Survey on the Benefit of Partnering in the Hong Kong Construction Industry

I am a final year external student of Bachelor of Engineering at the University of Southern Queensland, Australia. I am now conducting my final year research project. The topic is “the Benefit of Partnering in the Hong Kong Construction Industry”.

The aim of this questionnaire is to gather data on the contract delivery processes using partnering in the Hong Kong construction industry and research the advantages and disadvantages of implementation of partnering in the views of parties involved in a contract.

I would be most grateful if you could complete the attached questionnaire and return to me by e-mail (mak.chikeung@gmail.com) or fax (2637 8539) on or before 30 June 2005. The information provided will be treated with strict confidence and is for data analysis purpose only.

Should you have any queries, please do not hesitate to contact me on 9302 2779. Thank you for your participation. Your support would be much appreciated.

Yours faithfully,

Mak Chi Keung

Encl.