POTENTIAL CONFLICTS OF INTEREST IN DESIGN EXTENDED SERVICES CONSTRUCTION MANAGEMENT

by

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ABSTRACT

The construction management (CM) project delivery system is a unique contracting alternative to traditional general contracting and contemporary design-build contracting. It has slowly acquired identity and definition since its spontaneous and controversial start some twenty years ago. It has been provided under several unique contractual configurations requiring different combinations of design, construction and contracting services.

This thesis in the first instance, attempts to define the different forms and variations of CM that are presently in use. It then outlines six specific potential conflicts of interest issues that design companies which also provide CM services on projects where they are also engaged as designers. Strategies used by these companies to manage or resolve these issues are also presented.

Finally, this thesis attempts to resolve the conflicts of interest issues that are inherent in the Extended Services Construction Management (XCM) form. It places great emphasis on the project team approach to resolve conflicts pertaining to Design Review and Inspection Services. It also provides the project team with a framework for identifying conflict issues, and isolating the elements that may contribute to such issues early in the design process. Guidelines for systematically addressing the problem are outlined.
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Chapter 1

INTRODUCTION

1.1. Introduction to Construction Management

The term "construction manager" is one of the most misunderstood titles of modern day construction and defies an accurate definition that is acceptable to everyone. Each of the major professional and technical organizations seems to agree in principle on the concept that the construction manager should be organizationally separate from the architect/engineer firm that designs the project, and the general contracting firm that constructs it (Fisk 1988).

Although there is not one single definition of "construction management," there is some consensus. Foxhall defines the construction manager as a firm that applies knowledge of construction techniques, conditions, and costs to the three phases of decision, design and delivery of a project (Foxhall 1976). Lammers describes the construction manager as a professional consultant who offers his/her services for a predetermined fee. He/she can be contrasted to a general contractor who makes an entrepreneurial profit on the project he handles (1971). Several similar definitions exist in the literature (Barrie and Paulson 1977; Cushman et al. 1983; Gorman 1976; Haltenhoff 1987; Pisarcik 1980; Riggs 1988).
Construction management service is a team effort. Its purpose is to control time, cost, quality, and safety of the constructed project. A *Harvard Business Review* article on professional construction management by Davis and White defined it as follows:

Although this approach has several different variations, the essence of the concept centers around the introduction of a construction manager as the owner's agent and manager of the entire building process. The position is similar to that of the "master builder" of ancient times, whose responsibilities spanned both the design and construction phases of the building process.

Today, however, "he" is more commonly a group, a company, or a partnership with two paramount characteristics: construction know-how and management ability. The construction manager assists the owner in arranging for the contractors and the architects who will actually do the work, seeing to it that their efforts are coordinated right from the very start of the design process to the final delivery of the completed facility. (1973)

Not surprisingly, this approach, involving the combined and coordinated efforts of the construction manager, architect, and contractor is sometimes referred to as the "team approach." With it, the architect is assured of having resources available which determine the cost and time consequences of design decisions. At the same time, the owner is made more aware of the aesthetic-cost trade-offs.
The consistent theme of literature defining construction management through the middle of the 1970's and 1980's focused on professional construction management. Here, the construction manager is an agent of the owner, with a fiduciary duty to act in the owner's best interest and apply construction expertise during all phases of the construction process for the benefit of the owner for a fee.

Under the professional construction management arrangement (also referred to as Agency Construction Management), the construction manager has overall management responsibility; there is no prime or general contractor on the project. Each segment of construction is contracted separately with the owner, not the construction manager, with the advisement of the construction manager.

The Contractor Construction Management approach, on the other hand, allows the construction manager to have greater control over the project, in some cases performing portions of the work with his own forces, or subcontracting work. Under this arrangement, the construction manager may be in a position to offer a guarantee maximum price to the owner. A principal benefit of the construction management approach is that it lends itself to "fast track" or phased construction, which can result in major time savings.
1.2. **Background**

During the past decade, public and private owners have increasingly utilized the construction management delivery system. In 1979, nearly one-third of the construction companies on *Engineering News Record*’s top 400 list obtained significant revenues from construction management, compared with less than one-fourth in 1978. Also during that year, the top fifty United States general contractors acting as construction managers obtained construction management fees in excess of $869.7 million; the top fifty consulting architectural and engineering firms acting as construction managers obtained revenues in excess of $432.3 million (April 17, 1980, pp. 77-78). In 1988, the Top 500 Design Firms billed their clients about $3 billion for construction management services performed on a fee basis, slightly less than the year before. Construction management billings accounted for about 14% of all billings by the Top 500 Design Firms in 1988 (Hannan, June 15, 1989, pp. 30 - 32).

Despite its growth in popularity, current prevalent use and the substantial increase in billings, the concept of construction management is still relatively new. The service assignment options within construction management are many and as a result, a variety of contract configurations are used. This flexibility has captured the imagination of the industry and contributed significantly to the popularity of the system. Its versatility
facilitates its use on any project by allowing owners to customize the form and variation to suit their specific needs (Hannan, June 15, 1989).

1.2.1. The Construction Manager's Relationship with the Owner

The relationship between an architect or a professional construction manager and the client is, in essence, a fiduciary relationship existing between an agent and a disclosed principal. As defined in Black's Law Dictionary (1979), a fiduciary is "a person having a duty, created by his undertaking, to act primarily for another's benefit in matters connected with such undertaking." Such a relationship is founded on trust or confidence reposed by one person in the integrity and fidelity of another. It exists where there is a special confidence reposed in one who in equity and good conscience is bound to act in good faith and with due regard to interests of one reposing the confidence.

A fiduciary relationship may exist as a matter of common law. For example, a specific charge may be found in architectural and engineering licensing laws or regulations to serve the client's interest. This special relationship may also arise as a matter of contract. For example, both of the Associated General Contractors (AGC) Construction Management Agreement forms state that "the construction manager accepts the relationship of trust and confidence established between him and the owner under this agreement" (AGC Document 8, April 1980 and AGC Document
8a, June 1977). They continue with language to the effect that the construction manager promises the owner to furnish his/her best skill and judgement in furthering the interest of the owner.

The American Institute of Architects (AIA) Document A201/CM (June 1980) specifies the general conditions that apply to construction management projects. In Article 2 of the general conditions, the responsibilities of the CM are spelled out in 23 numbered paragraphs. The conditions make the CM the owner's "representative" during work and defines many of the CM's precise responsibilities. Likewise, AIA Document B801 (June 1980), the Owner-CM form agreement, confers broad authority upon the CM "to further the interests" of the owner by providing "skill and judgement."

The Construction Management Association of America (CMAA) standard form of contract document applicable to the agent-CM relationship, CMAA Document A-1 (1988), expressly makes the CM the owner's agent, requiring the CM to function "with due care in accordance with the generally accepted standards of good construction management practice." This language leaves little doubt as to the status of the CM under the contractual scheme.

Since the fiduciary relationship is one in which the principal has placed a measure of trust and reliance in the agent, it demands in return, the
utmost good faith, honesty and loyalty on the part of the agent. In some
cases, the agent is bound to act in a manner that best serves the principal
and must avoid taking any financial advantage; in other words, the agent is
permitted to act in any number of ways to serve his or her own ends, so long
as the interests of the principal are not prejudiced.

1.2.2. Multiple Responsibilities of the Construction Manager

It has already been established that Construction Managers are
legally characterized as agents engaged as consultants, rather than
independent contractors hired to perform a specific, physically measurable
task. This generally holds true until the Construction Manager's contracted
responsibilities extend beyond those normally assigned to an agent. This
occurs in all forms and variations of the construction management system
with the exception of the agency form.

When construction and contracting responsibilities are assigned to
the construction manager, a dual role of agent and independent contractor is
created. The construction manager retains an agent's status during the pre-
construction phase but essentially abdicates that status when executing
construction or undertaking contracting responsibilities after the design
phase has been completed. The dual agent-independent contractor status
generates a potential for conflict of interest that may be a detriment to the
owner by mitigating the effectiveness of the checks and balances
conjunctively installed between agent and independent contractor in the construction management project delivery system (Haltenhoff 1986).

A different yet similar situation develops when the project's design professional accepts the additional responsibility of the project's construction manager. Although both involvements comply with agent and consultant criteria, when the distinctly separate disciplines are performed by the same party, the effectiveness of the checks and balances purposely installed to extract maximum constructability from the design and construction functions is reduced. A potential for conflict of interest that may be a detriment to the owner is established.

Many contractors have expressed fears that the "new kid" in Construction Management, the Architect/Engineer (the Design Professional,) uses his initial contact with the owner to get an "inside track" on being selected as a Construction Manager (Reed, June 1980). In addition there are no set procedures for bidding on Construction Management jobs. In 1978, the Office of Federal Procurement Policy, decided that regulations were needed to define what types of conflict of interest situations should not be permitted in Construction Management projects. However, they did not prohibit architects from serving as Construction Managers on projects they have designed (Reed, June 1980).
There are fifty-three design firms on ENR's list of the Top 100 Construction Managers, with professional fees of $632 million, and twenty-one general contractors with $304 million in CM billings. The seven pure Construction Management firms (companies with 100% of their revenues from CM fees) earned $193 million. It should be noted that the above mentioned firms, did not contract directly with prime contractors or subcontractors, and assumed none of the contractual responsibilities of a general contractor (ENR, June 15, 1989).

1.3. Problem Statement

Combined assignments may be viewed as an economic advantage or an efficiency by an owner or the party providing the services. However, the disadvantages resulting from the elimination of checks and balances heavily outweigh the perceived savings in time and cost of services. Such dual assignments significantly increase the potential of conflict of interest inherent in the Construction Management project delivery system.

Even as various forms of construction management continue to grow in popularity, however, some consideration must be given to the following issues:
• How have construction managers, in their various roles, been able to successfully satisfy the owner’s interests, and at the same time avoid conflicts of interest?

• What procedures do practicing construction managers use for controlling these conflicts?

1.3.1. Problem Significance

A persistent problem that owners have with construction management is the lack of knowledge of how the several forms and variations of construction management function within the system (Haltenhoff 1987, Sears 1985, and Hannan 1989). Preconceived ideas, and an unwitting comparison with general contracting procedures precludes a constructive understanding of the system. As a result, owners often have an inability to reconcile the services they receive with those they expected.

Dual services are vested in a single organization in all but one of the forms of construction management (Agency CM). Consequently a potential for conflict of interest is an accepted part of the construction management system. Failure to recognize this inherent aspect of construction management by an uninformed owner, or by the party providing construction management services, may result in an adversarial relationship. Often this is due to the lack of a common understanding of each party's
responsible. This in turn may eliminate any beneficial effects of the process which might normally accrue in performance of a project (Haltenhoff 1987). By defining the "real" conflicts of interest situations facing construction managers and owners, the synergistic relationship or team commitment, will be preserved.

1.3.2. Scope

This research is limited specifically to the extended services form of construction management. The varied responsibilities of construction managers in the design and construction process will be discussed. The main focus of the research, however, will be narrowed down to the responsibilities of design review and construction inspection. Since the construction industry is so diverse, the construction manager’s role may vary considerably from one project to another. Consequently, the sample of companies to be surveyed will be limited to design firms that also provide construction management services.

1.4. Objectives

This thesis will expose and discuss any potential for conflict of interest generated by the assignment of dual responsibilities to the construction manager. It will evaluate the trade-offs made by the owner as a result of dual responsibilities. The findings will provide users with the necessary
guidelines to deal with situations contractually and procedurally during the execution of any construction project.

The central theme of this thesis is to create an awareness in owners of the potentially debilitating effects of assigning dual responsibilities to construction managers, despite the fact that such assignments may yield efficiency and economic advantages. It will also provide owners with procedures that will hopefully offset such effects. Consequently, the primary objectives of this research are as follows:

1. To identify the different types of CM contracts that are presently in use;

2. To detail the various potential conflicts of interests that may arise in the CM process, and the possible implications of same;

3. To highlight and compare how some construction managers have avoided and dealt with such conflicts;

4. To define guidelines that owners and construction managers (who are assigned dual responsibilities) can follow in an effort to prevent compromised situations. These guidelines will be limited to the CM's responsibility for design review and construction inspection.
1.5. **Methodology**

The planned methodology includes the following steps:

1. Conduct a comprehensive literature search. This would include a review of the standard industry construction management contract documents. The intent here is to ascertain the full range of services provided by construction managers and the different forms and variations of construction management services.

2. Interview five design firms offering Construction Management services in order to determine:
   
i) The type of construction management contract form(s) used by the company;
   
ii) The scope of services they offer;
   
iii) A full range of conflict areas;
   
iv) Specific conflict issues that they have dealt with;
   
v) The scope/context of the problem;
   
vi) How the conflict was resolved;
   
vii) The best solution for dealing with such situations.

The results of the survey will be closely compared to the findings of the literature search. The selection of the firms is based on their ability to qualify for ratings in ENR's Top 100 Construction Managers.
3. Interview five owners who have utilized the Construction Management approach. The intent here is to determine the following:
   i) CM variation used;
   ii) Form of contract and agreement adopted;
   iii) Level of detail embodied in the agreement;
   iv) Duties and responsibilities of the Owner and Construction Manager;
   v) Specific conflict areas that were encountered;
   iv) Procedures used to address the problem.

4. Guidelines for coping with two specific areas will be developed, based on dialogue with the design firms and owners/clients. The areas are:
   i) Design Review.
   ii) Construction Inspection;

   All data collected will be analyzed on the basis of simple correlations.
   A detailed list of areas of potential conflicts of interest will be prepared.
   Some of the more serious and common conflict areas will be highlighted and discussed. Procedures for dealing with two specific areas will be detailed.
1.6. Expected Results

It is expected that the results of this investigation will provide:

1. A full array of construction management services being offered in industry, and the various contractual configurations.

2. An identification of several areas of potential conflicts of interests in the construction management process, with specific reference to situations where the construction manager carries out dual responsibilities.

3. Guidelines or procedures to follow, in order to avoid, or minimize conflicts of interests.

1.7. Thesis Outline

This chapter has covered an introduction to the study. It provided background on the need for owners and construction managers to be cognizant of the potential conflict of interest situations that may arise when the project designer also performs CM services. Chapter 2 presents an overview of literature relating to construction management and its different forms and variations. It also provides information on the various standard industry construction management forms.
Chapter 3 discusses the prominent conflict of interest issues facing design firms providing Design Extended Services Construction Management. It also presents the methods used by these companies to minimize and resolve such conflicts. Chapter 4 defines guidelines for coping with two specific issues, namely design review and construction inspection.

Chapter 5 presents a summary of the study. It provides the conclusion concerning what impact the guidelines (presented in chapter 3) will have on the Design Extended Services Construction Management delivery system, as well as suggestions for further research.
Chapter 2

TYPES OF CONSTRUCTION MANAGEMENT SERVICES

Today construction management is a unique alternative system of contracting that competes with general contracting and design-build contracting systems as a means of delivering projects. This chapter presents the different formats and respective variations into which construction management can be decomposed. It also discusses the inherent characteristics of each form and variation.

2.1. The Traditional (Linear) Construction Approach

The traditional or linear approach to construction in both the private and public sector refers to the procedure of design, bidding or negotiation, and construction, following each other in single file order (Clough 1986; Fisk 1988). The owner first identifies his needs, estimates the cost of construction to meet those needs, assesses available financing, and then decides whether to undertake a building project (Nash 1977). Next, the owner hires an architect in order to obtain a design for the project. Then, the architect produces a set of construction drawings and specifications that is sufficiently definitive to permit a solicitation of bids for construction of the entire project (Nash 1977).
The architect will generally use his/her best efforts to design a project that will be bid within the owner's budget. However, by the end of the design phase, even with the architect's cost estimate, neither the owner nor the architect has any assurance that a general contractor will submit a bid for the entire project even close the owner's budget. Thus, in the traditional approach two entire steps often take place without the advantage of professional advice as to the design cost of construction materials, methods, and labor.

After bids are solicited and opened, the public owner must accept the lowest bid, provided that it is responsive to the solicitation (Fisk 1988). The private owner has greater flexibility since he/she is not required to select the lowest bidder. Traditionally a fixed-priced contract is then executed with a general contractor, who proceeds to negotiate his/her final subcontract prices with subcontractors. These will perform a majority of the physical construction work on the project. See Figure 2.1.

The persuasive arguments for this traditional process are management simplicity and cost security. Getting the design worked out, the working drawings and specifications completed, and all the decisions made before construction starts will simplify the client's and the design professional's management duties. Awarding the bid to one contractor, who
Figure 2.1. The Traditional (Linear) Construction Approach – General Contracting
(Source: The Committee on Construction Management, 1987)
agrees to deliver the project according to plans and specifications for a fixed bonded price will secure costs (Thomsen 1982).

During the late 1960's and 1970's factors began affecting the construction industry's linear approach to construction. First, the economy became less predictable and the United States was confronted with surging inflation rates. Second, as with other industries, the technology of construction systems (building systems and products) rapidly advanced and became increasingly specialized (Cushman et al. 1983).

2.2. Disadvantages of the Traditional (Linear) Construction Approach

There are three principal disadvantages to the traditional, sequential approach to construction. First, in most cases, the owner's decision to build a project of a certain scope to meet his/her needs within budget was made without any input from the contractors who are most knowledgeable with regard to cost of construction materials, methods and labor.

The second disadvantage is the delay (extra time) inherent in the traditional approach. The design effort does not start until the owner's decision to build is complete. Delivery or construction does not start until a comprehensive set of construction drawings and specifications is completed and bid upon (Nash 1977).
The third principal disadvantage of the traditional approach is its effect on the construction process and the relationship between the owner and the architect, on one hand, and the general contractor and its subcontractors on the other hand. In order to compete successfully in the bidding market, a general contractor must submit the lowest bid. General contractors frequently subcontract most of the contract work, and invariably share the subcontract pool of bids with other general contractors bidding on the same project. The general contractor therefore only has three variables within which to meet the low bid: the cost of his/her portion of the work, the cost of his/her management (Foxhall 1976), and his/her ability to bargain with subcontractors for the lowest subcontract prices. Since the general contractor's cost of doing his/her own work is relatively fixed with regard to material and labor, he/she is forced to cut costs. This is done by seeking lower subcontract prices, or by applying stringent management practices (Foxhall 1976).

Fourthly, it was extremely difficult to make design changes expeditiously under this arrangement. These factors, in one form or another, have all contributed to the need for the construction management approach.
2.3. **Construction Management (CM)**

A careful analysis of evolving requirements of the four traditional parties in the construction industry – owner, architect, general contractor and subcontractor – reveals a central, common need for a professional with expertise and knowledge of the construction cost of materials, methods and labor. This should also be combined with expertise in scheduling, coordination, and supervision to act as an agent of the owner. He should also be able to apply his professional expertise during the decision, design and delivery phases of construction, working closely with the owner, the architect and trade contractors (Brady et al. 1974; Stukhart 1987).

A prototype CM organization does not currently exist. A CM firm can be any organization that has the unique combined resources necessary to proficiently execute the form and variation of CM best suited for or selected by the owner. All organizations that call themselves Construction Managers are not equally equipped to provide the needed services (see Appendix A for a list of CM's service responsibilities). Additionally, unlike the practice of engineering and architecture, CM services are not universally governed by law. CM standards of practice are in the formative stages, and the professional status of the CM and the persons it employs remains for the future to determine (Committee on Construction Management 1987).
There are numerous forms and variations of CM services from which owners may choose on a project by project basis. These are presented in Table 2.1, and discussed below. Each form and variation has inherent characteristics that accommodate unique owner requirements and needs.

2.3.1. Agency Construction Management (ACM)

In its purest form, the construction manager is solely the agent of the owner, working for a fee for its professional service as opposed to possessing any entrepreneurial risk and consequent profit (Cushman et al. 1983; Haltenhoff 1986). In this form, the construction manager does not become engaged in other project delivery functions, such as design services, contracting, or doing construction work with his own forces. All contracts for design services, construction, and construction support services are directly with the owner. See Figure 2.2.

2.3.2. Guaranteed Maximum Price Construction Management (GMPCM)

The guaranteed maximum price construction management is referred to in a broad sense as "contractor" construction management. This is so, because at a late point in design the construction manager's agency agreement with the owner is amended to provide a guaranteed maximum price for the total cost of construction. The CM firm becomes involved in a
|----------------------------------|--------------------------------------|----------------------------------|-----------------------------------------------|-------------------------------------------|-----------------------------------------------|-----------------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|-----------------------------|-----------------------------|----------------------|
Figure 2.2. Agency Construction Management (ACM)
(Source: The Committee on Construction Management, 1987)
dual role as construction manager and general contractor once the guaranteed maximum price is given (Committee on Construction Management 1987).

The guaranteed maximum price aspect virtually converted the agency arrangement to an independent contractor arrangement, even though the CM's ACM responsibilities continue. The guaranteed maximum price form is appropriate when it is necessary for the owner to contract project cost prior to the completion of contract documents (Haltenhoff 1986). The basic form of GMPCM is shown in Figure 2.3. Other variations of GMPCM are presented in Figures 2.4 to 2.6, these are Constructor GMP/XCM, Contractor GMP/XCM and Contractor/Constructor GMP/XCM respectively.

2.3.3. Owner Construction Management (OCM)

The CM system was originally owner inspired; consequently OCM is assumed to be the oldest form of construction management in the system (Haltenhoff 1986). OCM places the owner in the performance position of the CM. The owner absorbs the CM responsibilities according to his in-house capabilities. If the total requirement exceeds his capabilities, he strengthens them by adding appropriate staff for the project or hires specific services from a CM firm. Figure 2.7 illustrates the basic form of OCM.
Figure 2.3. The Basic Form of Guaranteed Maximum Price Construction Management (GMPCM)
(Source: The Committee on Construction Management, 1987)
LEGEND:
- A contract exists between the parties connected.
- An administrative tie exists between the parties as a contract requirement.
- An independent contract is in force between the parties.
- An agency relationship is in force between the parties.

Figure 2.4. Constructor GMP/XCM
(Source: The Committee on Construction Management, 1987)
Figure 2.5. Contractor GMP/XCM
(Source: The Committee on Construction Management, 1987)
Figure 2.6. Contractor/Constructor GMP/XCM
(Source: The Committee on Construction Management, 1987)
Figure 2.7. The Basic Form of Owner Construction Management (OCM)
(Source: The Committee on Construction Management, 1987)
Another variation of OCM is shown in Figure 2.8, referred to as Owner Design/Manage. This version is very popular with large manufacturing firms when reorganizing and updating production lines (Haltenhoff 1986).

2.3.4. Extended Services Construction Management (XCM)

Extended Services Construction Management permits the Construction Manager to perform multiple roles as either an Architect Engineer/Construction Manager (AE/CM) or as a Construction Manager/Contractor and (or) Constructor. XCM is used as the descriptive because, in each variation, the initially contracted services are extended to include one or more additional services, creating a compound role for the Construction Manager (Committee on Construction Management 1987). In the case of an AE/CM combination, referred to as Design XCM, the combining of design services and CM services, can only be accomplished by the Architect/Engineer firm providing design services for the project. In essence the Architect/Engineer extends his design service agreement to include CM services or enters into a separate second contract with the owner to provide them. See Figure 2.9.

The Constructor XCM (Figure 2.10.) and Contracting XCM (Figure 2.11.) are variations that can only be provided by CM organizations that have the capability to construct with their own forces, or the capacity to enter
Figure 2.8. Owner Design/Manage, an OCM Variation
(Source: The Committee on Construction Management, 1987)
Figure 2.9. Design Extended Services Construction Management (XCM)  
(Source: The Committee on Construction Management, 1987)
Figure 2.10. Constructor XCM
(Source: The Committee on Construction Management, 1987)
Figure 2.11. Contractor XCM
(Source: The Committee on Construction Management, 1987)
into contracts for construction, respectively. In these variations the Construction Manager extends his contract to include one or the other of the required services. The ultimate variation of XCM combines the contracting, construction and construction management responsibilities into one contract for services. This variation is descriptively labeled Contractor/Constructor XCM. See Figure 2.12.

2.4. Standard Industry Construction Management Forms

In the mid-seventies, The American Institute of Architects (AIA), The National Society of Professional Engineers (NSPE), and The Associated General Contractors of America (AGC) were all confronted with the phenomenon of Construction Management, and responded in various ways to the needs of their members for information and guidance. All three of the organizations developed CM contract forms reflecting the particular perspective of that organization, if not a recommended approach to CM (Cushman et al. 1983).

In 1978 the AIA and AGC originally attempted to develop a single owner-construction manager agreement form that could be endorsed by both organizations (Cushman et al. 1983). However, different policy approaches eventually led to the creation of separate agreement forms, both of which are now in their second editions. The NSPE form (Publication No. 1910-15, 1977) was developed in conjunction with the American Consulting
LEGEND:

- A contract exists between the parties connected.
- An administrative tie exists between the parties as a contract requirement.
- An independent contract is in force between the parties.
- An agency relationship is in force between the parties.

Figure 2.12. Contractor/Constructor XCM
(Source: The Committee on Construction Management, 1987)
Engineer Council (ACEC), independent of the AIA (Document B801, 1980) and AGC (Document 8d, 1979) forms.

The Construction Management Association of America (CMAA), a national organization representing construction management, was formed in 1981. Its purpose was to promote the growth and development of construction management as a professional service and to enhance the quality of the practice. In 1988, this organization presented its own standard form of construction management agreement.

These agencies have all developed standard forms of contract for CM work. The following forms will be referred to as the AIA, AGC, NSPE/ACEC and CMAA forms, respectively:


- AGC Document 8, Standard Form of Agreement between Owner and Construction Manager (Guaranteed Maximum Price Option), 1979.


In addition to the above forms, the AIA, AGC and CMAA have issued complementary contract documents to cover the relationships among other parties in the construction process. These are presented in Tables 2.2 to 2.4.

2.4.1. Conceptual Differences in the Standard Industry Forms

There are three well-defined conceptual approaches to construction management, each of which is represented by one of the standard industry documents. In one approach, represented by the AIA documents, the Construction Manager is an independent professional providing management services to the owner. He has no contractual or organizational relationship to either the architect or engineer responsible for design of the project, nor any relationship to the multiple, separate prime contractors used to construct the project. This approach is referred to as professional construction management. The entire AIA family of construction management documents is based on this approach. Because the construction manager coordinates rather than controls the performance of
Table 2.2: The AIA Family of Construction Management Documents

<table>
<thead>
<tr>
<th>AIA Family of Construction Management Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document A101/CM</td>
</tr>
<tr>
<td>Document A201/CM</td>
</tr>
<tr>
<td>Document B311/CM</td>
</tr>
<tr>
<td>Document B141/CM</td>
</tr>
<tr>
<td>Document B801</td>
</tr>
<tr>
<td>Document G701/CM</td>
</tr>
<tr>
<td>Document G722</td>
</tr>
<tr>
<td>Document G723</td>
</tr>
</tbody>
</table>

Source: Cushman et al. 1983
Table 2.3: The AGC Family of Construction Management Documents

<table>
<thead>
<tr>
<th>AGC Family of Construction Management Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document 8</td>
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<tr>
<td>Document 8a</td>
</tr>
<tr>
<td>Document 8b</td>
</tr>
<tr>
<td>Document 8d</td>
</tr>
<tr>
<td>Document 8f</td>
</tr>
</tbody>
</table>

Source: Brady et al. 1974; Pisarcik 1980; Cushman et al. 1983
Table 2.4: The CMAA Family of Construction Management Documents

<table>
<thead>
<tr>
<th>CMAA family of Construction Management Documents</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Document No. A-1</td>
<td>Standard Form of Agreement Between Owner and Construction Manager</td>
</tr>
<tr>
<td>Document No. A-2</td>
<td>Standard Form of Contract Between Owner and Contractor</td>
</tr>
<tr>
<td>Document No. A-3</td>
<td>General Conditions of the Construction Contract; Owner - Contractor Contract</td>
</tr>
<tr>
<td>Document No. GMP-1</td>
<td>Standard Form of Agreement Between Owner and Construction Manager</td>
</tr>
<tr>
<td>Document No. GMP-2</td>
<td>Standard Form of Contract Between Construction Manager and Contractor</td>
</tr>
<tr>
<td>Document No. GMP-3</td>
<td>General Conditions of the Construction Contract; Construction Manager - Contractor Contract</td>
</tr>
</tbody>
</table>

Source: CMAA 1988
the prime contractors in the various trades, he/she does not undertake to guarantee their work, nor guarantees the cost of the project to the owner.

Another conceptual approach is reflected in the AGC documents. The construction manager will perform similar services, but will also be given a greater amount of control over the work. In some cases, he will perform portions of the construction work with his own forces, or letting out work to subcontractors as a general contractor. Under this approach, the construction manager may be in a position to offer a guarantee maximum price for the project and to provide some guarantee of performance. This approach currently appears to be most popular, because of the appeal to the owner of single point responsibility for construction (Cushman et al. 1983). Because of the similarity of this approach to the use of the traditional general contractor, it is referred to as contractor construction management.

The third approach is the converse of the second, and is illustrated by the NSPE/ACEC project management agreement. Essentially, the design professional (architect or engineer) will perform construction management services in addition to traditional design and construction administration. Under this approach, which may be called architectural construction management, the owner is again spared the necessity of having to deal with yet another party. The construction phase responsibilities undertaken by the design professional acting as construction manager are limited and are similar to those of the independent professional construction manager.
It would not be unfair to say that the AGC forms promote an approach to CM designed to preserve a position of the general contractor and that the NSPE/ACEC project management agreement attempts to preserve or promote a strong role of the design professional during construction. The AIA form does not side with either the design professional or the contractor; neither does the CMAA form, but this neutral approach is at the cost of adding another party to the construction team. See Table 2.5 for a comparison of the different approaches.

2.4.2. Exceptions to the use of Standard Construction Management Forms of Agreement

There are situations where none of the standard forms of agreement comes close to the type of agreement which the owner desires to have with the Construction Manager. Sometimes, this will be a matter of the level of detail embodied in the agreement, rather than of any desire to deviate from the basic relationships described in one or another of the standard industry documents. In other cases, despite general agreement with the relationships envisaged by the industry forms, the terms of the agreement will not be seen by either the owner or the Construction Manager as providing sufficient protections to its interests. There may also be instances
<table>
<thead>
<tr>
<th>Professional Organizations</th>
<th>Conceptual Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIA Documents</td>
<td>Professional Construction Management approach. CM is an independent third party.</td>
</tr>
<tr>
<td>AGC Documents</td>
<td>Contractor Construction Management approach. CM offers a guaranteed maximum price for the project.</td>
</tr>
<tr>
<td>NSPE/ACEC Documents</td>
<td>Architectural Construction Management approach. The architect/engineer in addition to carrying out his/her design responsibilities, also performs CM responsibilities during the design and construction phases.</td>
</tr>
<tr>
<td>CMAA Documents</td>
<td>Professional Construction Management approach.</td>
</tr>
</tbody>
</table>
where the owner does not wish to enter into a relationship anything like those outlined in the standard forms. Some agencies that have developed their own construction management form of agreement are: General Services Administration; New York Transit Authority; New Jersey Transit Authority; Ellerbe Becket Inc.; and CRS Sirrine.

A decision not to use the industry forms should be based on knowledge of what protection those forms provide for the owner, what relationships they describe and enough knowledge of the CM market to know whether alternative approaches are realistic and available. An owner should be satisfied that its project is sufficiently unique that the need for a departure from the standard forms justifies the additional uncertainties which will emerge. He then needs to protect himself against those uncertainties accordingly.

2.5. Chapter Summary

This chapter presented an overview of construction management. It presented, in brief, the circumstances that led to its evolution, and the many forms and variations to which it can be decomposed. It discussed the responses of the industry's professional organizations to the CM concept. Also highlighted was the XCM form which is the principal focus of this study.
Chapter 3

POTENTIAL CONFLICTS OF INTEREST IN THE EXTENDED SERVICES
CONSTRUCTION MANAGEMENT PROCESS

This chapter discusses the major areas of potential for conflicts of interests as seen through the eyes of those who practice construction management, and the literature. It also presents strategies that are used by Design/Construction Management Companies to successfully handle such situations.

3.1. Defining the Roles of the Service Entities

Proprietary business entities within the construction industry can be loosely classified as either independent contractors or agents (Committee on Construction Management 1987). Construction contractors, with their risk-taking involvements on projects involving a lump sum contract, are good examples of an entrepreneurial business entity operating as an independent contractor. Architects and engineers, when engaged by owners to provide design and contract administration for the bidding and construction of a project, are good examples of a service business operating essentially as an agent. While it can be argued that both are taking risks and are providing services, there is sufficient distinction between the involvements to support the "potential for conflict of interest factor."
3.1.1. The Construction Contractor

The construction contractor is termed an independent contractor as a result of the terms of the agreement entered into with the owner. An independent contractor is a party who contracts to do a specified task for another party and functions free from the influence, guidance, and control of the other party while performing the task. He/she is also responsible to the other party for the end result.

The lump sum contractor derives his/her profit from the difference between the contracted amount and the money that must spent to meet the requirements of the contract. In performing the work, the contractor has the opportunity to use his/her methods to produce profit. However he/she is also in a position to "regulate" or cut quality and effort during the performance of his/her obligations (Committee on Construction Management 1987). The completed project can then be measured against the plans and specifications to determine contractual performance. Any successful "regulation" of quality or effort by the contractor may or may not be evident. While this is a sensitive area for discussion, it is a universally recognized contracting problem that exists in the construction industry.
3.1.2. The Architect/Engineer

The performance of the architect or engineer cannot be measured as definitively as the construction contractor's. Standards of practice and professional performance equal to that of his peers provide the criteria by which design services are ultimately judged. Unless the design professional is providing services under a percentage-of-construction-cost fee structure, or cost plus/reimbursable contract, there is little opportunity to substantially enhance his financial position. There is no financial incentive for him/her to use questionable practices in either the quality of design, or the performance of his services. The "cutting of corners" in either design or the provision of services will ultimately be harmful to the design professional, because they will be obvious sooner or later.

The design professional performs essentially as an agent of the owner (at least to the extent specified in the terms of the agreement) (Cushman et al. 1983; Committee on Construction Management 1987). Agency requires the highest duty of care and loyalty on the part of the agent to the owner. In providing services, an agent is subject to the influence, guidance and control of the one he/she serves (Holton 1983). The law recognizes agency as a fiduciary relationship, one held in trust or confidence by both parties.
3.1.3. The Construction Manager

The owner/construction relationship is primarily a creature of contract, and because of the lack of any substantial body of case law and acceptable standards pertaining to construction management, the courts can be expected to give weight to the explicit language of the contract (Holton 1983). One of the cases that suggests that the construction manager will be regarded as a professional by the courts is Mongiovi vs. Doerner, 546 P.2d 1110 (Or. App. 1976). In this case, the court, in constructing the Oregon statutes for building and construction on public building projects, examined the functions of a construction manager and concluded that the contract with the construction manager was a personal service contract whereby a county was purchasing professional services involving peculiar skills, knowledge and experience. The court went on to conclude that the construction manager relationship amounted to a professional service contract.

The function of a construction manager is most closely akin to the professional role of an architect/engineer on a typical construction project. It is expected that the courts will apply the same standard of care for the construction manager as has been well developed in the case law involving architects and engineers, that is,

The construction manager probably will be required to exercise the requisite skill and judgement of a similarly situated reasonable
professional and will be held to a standard of ordinary care in that exercise. (Sneed 1981, p. 321)

Construction managers by virtue of the several contractual forms of the CM system, have opportunities to function as independent contractors or agents, or, in some forms of CM, simultaneously as agent and independent contractor (Haltenhof 1987). The latter case gives rise to situations where the construction manager may be exposed to potential conflict of interest situations. It is very important to understand that the degree of the potential for conflicts of interest changes with the form and variation of construction management used.

3.2. Conflicts of Interest

Generally, conflicts of interest fall into two categories:

i) Those that can be cured by disclosure;

ii) Those that are incurable.

Incurable conflicts are condemned because the existence of conflicting loyalty, no matter how slight, is inconsistent with the degree of trust placed in the agent by the principal. Conflicts of interest will arise in the construction management process when one party has been entrusted with the responsibility for making judgements, and then stands a chance to
receive a tangible benefit, directly or indirectly, as a result of such decisions (Cushman et al. 1983).

The test for a conflict of interest in a fiduciary relationship is not whether the client is being placed at a disadvantage. The test is whether the construction manager has a financial interest in the outcome of a decision he/she has to make on behalf of the client or some third party. The conflict exists because his/her obligation is to serve the client faithfully as agent and to advance the client's interests where possible, not simply to avoid cheating the client.

3.3. Design/Construction Management Company Survey

The sections below briefly discuss the design of the survey questionnaire that was used by the writer to determine what are the major conflicts of interest issues facing Design XCM practitioners.

3.3.1. Questionnaire Design

The questions developed for the interviews were structured to determine the following:

i) The calibre of the company;
ii) The methods used by the company to acquire design/CM jobs;

iii) The companies’ perception of the major areas where there are potential for conflicts of interest in XCM;

iv) The process used to minimize or resolve these conflicts; and

v) The methods used to control two specific areas, namely design review and construction inspection.

3.3.2. Company Selection

Five major design firms that also offer construction management services were selected for participation in the survey. Each have been ranked by the Engineering News Record as being both top design and construction management firms. Each has been in operation for over 40 years, with an excellent reputation both in the United States of America and internationally. Each firm is well established, and has sufficient experience in the industry to have encountered some of the key conflicts of interest issues in the XCM process.

It was hoped that each company would have recommended an owner organization with whom they have worked on a successful project. However, of the five firms interviewed, two felt that such information was
proprietary, while two others recommended public agencies that were reluctant to be interviewed. The research was therefore deficient in the valuable contributions of owners, since only one such organization participated in the survey. The questions and responses of each firm are located in Appendix B.

3.3.3. Interview Technique

All of the interviews were conducted personally. The intent was to have interviewees comment freely on each of the questions. Every effort was made to interview at least two persons in each company. The reason for this approach was to confirm the accuracy of the information and procedures. However, it was only possible to use this method with two companies. None-the-less, all the interviewees were senior personnel in their respective organizations, and their replies were assumed satisfactory.

3.4. Conflicts of Interest Issues Identified by the Survey

Figure 3.1 shows a list of the companies that participated in the survey along with a breakdown of the type of services they provide. Figure 3.2 lists the type of construction management services that are provided by the five design/CM firms. Finally, Figure 3.3 presents a list of the more important conflict of interest issues the these companies encountered in performing their services. These issues are discussed below.
<table>
<thead>
<tr>
<th>SERVICES PROVIDED</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td></td>
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<tr>
<td>Contracting</td>
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<td></td>
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<tr>
<td>Management</td>
<td></td>
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</tr>
<tr>
<td>Architect/Engineer</td>
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<td></td>
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</tbody>
</table>

Figure 3.1: List of Companies That Participated in the Survey
<table>
<thead>
<tr>
<th>NAME OF COMPANY</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSTRUCTABILITY REVIEW</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>CONTRACT ADMINISTRATION</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SUPERVISION AND INSPECTION</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PERFORM CONSTRUCTION</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Figure 3.2: Scope of Construction Management Services Provided by the Design/CM Companies
### Potential Conflicts of Interest Identified by Companies

<table>
<thead>
<tr>
<th>Areas of Potential Conflicts of Interest</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM Acting as a Contractor (Section 3.3.6)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Decision on Disputes (Section 3.3.5)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Supervision and Administration (Section 3.3.4)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Review of Design (Section 3.3.3)</td>
<td></td>
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</tr>
<tr>
<td>Cost Plus/Reimbursable Contracts (Section 3.3.2)</td>
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<td></td>
</tr>
<tr>
<td>Percentage Fee (Section 3.3.1)</td>
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</tbody>
</table>

**Note:** The shaded area will be focused on in Chapter 4.
3.4.1. Percentage Fees (Based on the Cost of Construction) and Cost Saving Incentives

One of the longest standing potential conflicts of interest for the architect, the contractor, and more recently for the construction manager is found in the percentage fees system. Here, the fee is based on a percentage of the cost of construction. This fee arrangement however satisfies the test of conflict of interest, since it is widely accepted in other professions, and has seldom been strongly criticized as a conflict of interest.

Four of the six firms interviewed consider this as a conflict of interest issue. Of interest is the fact that two of the four perform construction work. These two companies (C and D) felt that some owners may consider this as a conflict of interest on the part of the construction manager, especially if he/she is expected to perform some construction. A percentage fee has only an indirect relationship to the amount of work required; it assumes that a more expensive project requires more services than a less expensive one. The percentage fee provides a windfall, if the cost of the project escalates. Less likely, but also occurring on occasions, is a fee penalty where the project costs come in below expectations.

The construction manager working on a percentage fee basis will be in a position to secure extra compensation on account of his/her design,
constructability, and construction decisions. Efforts to economize are rewarded by a reduced fee, and conversely there will be an increased fee if construction costs are high. However, because the percentage fee arrangement is a historical one, its benefits and pitfalls are well known and easily perceived.

3.4.2. Cost-Plus/Reimbursable Contracts

Two of the six companies pinpointed a second area of conflict in the cost portion of any cost-plus/reimbursable contract. For many professionals, including construction managers, there may be some benefit to having a larger volume of work, even if the fee portion of the contract is fixed. The construction manager who is in a cost-plus contract arrangement with a client also has, to some extent, a fiduciary obligation to the client. It is therefore incumbent upon the construction manager not to needlessly or deliberately run up costs. He/she should especially not take advantage of this contract arrangement to keep otherwise idle forces busy.

Some cost-plus contracts between the architect engineer/construction manager are written so that they will be subject to an upper limit cost, sometimes referred to as a GMP or guaranteed maximum price. Although the GMP may set an upper limit on the cost to be paid by the client, this price will most likely be higher than what might be obtained from competitive bids.
What incentive, if any, does the construction manager have to keep costs significantly under the maximum limit provided in the contract?

Some contracts attempt to control costs within the upper limit by establishing strict definitions of what items are to be reimbursed as cost items. Any costs (normally overhead items) incurred by the construction manager outside the allowable costs must be absorbed in the fee portion of the compensation. Such descriptions of allowable costs can be found in the forms of agreement published by the AIA (Document B801, Article 6 and 16, June 1980) and AGC (Document 8d, Article 7, June 1979). Allowable costs should specifically exclude costs arising out of the negligence of the construction manager, in order to ensure some fiscal responsibility. Incentive clauses allowing the construction manager to share in any savings if costs are kept below a certain dollar level can create conflicts, and their potential benefit must be viewed in the light of those conflicts.

A cost-plus contract can provide other opportunities for conflicts of interests. Although the construction manager will have a duty to use the most efficient means and to protect the the interest of the client as if they were his/her own, he may be faced with conflicting allegiances. For example, is a cost-plus construction manager properly serving the best interests of his/her client by subcontracting work out on a cost-plus basis when it could obtain fixed prices? A construction manager who has a relationship with a particular subcontractor or supplier on more than one
project is in a position to reward that subcontractor or supplier on the cost-plus project, at the owner's expense, in exchange for favorable prices on another project where the construction manager is providing a fixed price.

3.4.3. Review of Design Documents

A third conflict of interest in XCM arises when the review of the architect or engineer's drawings for completeness, economy, and constructability is done by the architect engineer/construction manager. All six companies are in agreement on this issue. The consensus is that, the architect/engineer when acting as the construction manager, will not be likely to identify errors. Additionally he/she will be less inclined to require changes in the design if doing so would cost any time or money, or would expose any negligence on their part. This conflict prevents the architect-construction manager from serving the best interests of the client.

This issue is based on the premise that the construction manager is undertaking a review of the design drawings as if it were an independent, third-party construction manager. Obviously, an independent review is not a discrete service that a construction manager who is also the architect or engineer will be providing or should be expected to provide. The client has selected an architect/engineer who is also providing construction management services; the architect has an obligation to design the project in a way which will be efficient and economical to construct, and presumably
has the ability to do so. If the client desires to have an independent check of
the design documents, that service must be obtained from an independent
party.

Construction management involves a number of different skills,
capabilities, and services. The suggestion that an architect/engineer has a
conflict of interest when acting as a construction manager assumes that the
construction manager necessarily will be undertaking an independent
review of the architect/engineer's design documents. One cannot be
expected to give totally independent evaluation of one's own work in the first
instance; thus, there is no conflict of interest unless the client considers one
to exist.

3.4.4. Supervision and Inspection Services

This primary responsibility of the construction manager was also
pinpointed by all the interviewees as an area where there is a potential for
conflicts of interest in design XCM. The magnitude of the problem is based
on the level of detail of the construction manager's responsibility for
supervision and inspection. The most important issue under consideration
here is the nature of the project, and the extent of the company's liability for
the end product. All of the design/CM firms are of the opinion that what is of
greatest concern to owners is whether these firms can be depended on to
judge the adequacy of its own product.
In at least one case, First National Bank of Akron vs. Cann, 503 F. Supp. 419 (N.D. Ohio 1980), the architect and construction manager were held jointly liable to the owner for failing to detect and remedy improper construction practices by the contractor. On this project, the architect was an employee of the construction manager, who also performed construction services. The architect was found guilty of breach of contract for failing to conduct inspections so as to uncover defective conditions. The construction manager was guilty of substantial and unapproved deviations from drawings and specifications, which constituted a breach of contract. Although no mention was ever made in this case to a conflicts of interest, they were definitely evident. This matter will be further developed in section 3.4.6.

3.4.5. Decision on Disputes

A more persuasive argument for the existence of a conflict of interest can be made in a situation common to both the traditional construction and the construction management delivery system. This involves the circumstance where the designer (acting also in the capacity as a construction manager) is called upon to decide a claim based on an alleged error, omission, or inconsistency in its own drawings and specifications. Four of the six companies agreed that there is a potential for conflict of interest for the architect engineer/construction manager in deciding on
disputes. The remaining two, provide limited construction management services and therefore do not have to contend with this issue.

The conflict, however, is clear: if an impartial, objective judgement were to sustain the contractor's claim, it would also tend to set the blame on the designer, who might be liable to the client for any extra cost awarded to the contractor. Various commentators have long maintained that an architect/engineer cannot be impartial when judging claims which will call its own work into question (Cushman et al. 1983; Holton 1983).

Normally the construction manager will have the primary responsibility for estimating, scheduling, coordinating, and inspecting construction. He/she may also have the responsibility for processing payment applications from contractors and either approving them for payment or recommending approval for payment to the architect (which in this instance is a part of his/her organization). Additionally, the construction manager will normally have some responsibility for reviewing claims for additional cost, request for change orders, etc. Such a firm (architectural engineering / construction manager) can find itself in a very uncomfortable position in situations where it has to decide on claims or change order requests, that are primarily due to negligence on their behalf.

Two scenarios presented by company D were:
1. A contractor on the project makes a claim for delay damages that is based on an alleged failure by the construction manager to schedule or coordinate the work properly.

2. There is an error or omission in the construction documents. During construction the architect/engineer discovers the omission and issues a correction to change the drawings. The contractor demands a change order reflecting the additional costs and costs for delay.

In both situations described, the construction manager / architect engineer is faced with a potential conflict between an obligation to render an impartial decision and his/her own pecuniary interests. After making an investigation and a thorough evaluation of the situation, he/she has the following choices:

i) Approve the extra and face a claim from the project owner;

ii) Reject a meritorious claim and risk being overturned in a subsequent arbitration, after an even greater expense to the owner;

iii) Attempt to resolve the claim by accepting lower quality work or otherwise waiving contract requirements.
The best course of action for the construction manager is to admit his/her fallibility, give the contractor what is due, and either hope for the project owner's understanding or be prepared to face the consequences. It is important for the project owner to understand that the construction manager, like the architect/engineer, is providing services on behalf of the client which involve a high degree of informed judgement. Their decisions will not always turn out to be correct, and some may cost the client additional money. If the construction manager and architect/engineer were expected to bear the financial risk for every act, judgement, decision, error, or omission they made, they would not be agents of the owner working for a fee. They would be in an entrepreneurial position which would require much higher rewards for success, for example as a design-build contractor.

3.4.6. Construction Manager Acting as Contractor

The most significant conflict of interest in construction management is found where the construction manager, in addition to providing design services, undertakes to perform some aspects of the construction work with his/her own labor and materials. This arrangement is somewhat similar to the "Turnkey" contract, which may go beyond design and construction and may include other functions, such as financing, operations and maintenance, and staff training. Of the six companies interviewed, four identified this as another key conflict issue. There is a growing trend toward the use of this type of arrangement. Companies C and D perform this type of
service. They claim that more owners are using this arrangement, since it provides them with the opportunity of dealing with one agency as a single source of responsibility. The potential for conflicts are however clear and classic.

Consider a situation where the construction manager whose normal mode of operation is to "broker" all the construction work on the project. The construction manager negotiates prices for all the subcontracted work and gives the project owner a guaranteed maximum price for the project based on these negotiated subcontract prices. The guarantee maximum price is subject to any number of exceptions, essentially, whenever one of the subcontractors is awarded an extra, the GMP is increased by a similar amount. Some of the subcontract items are handled under separate, direct contracts between the owner and the subcontractors (acting as prime contractors) whose work is being coordinated by the construction manager. These subcontract items may even be assigned back to the construction manager by the project owner.

The following questions are therefore pertinent:

i) Should the construction manager have the discretion to determine what work is handled under one of the multiple prime contracts with the owner, and what construction work, if any, will be performed by
the construction manager or under contract to the construction manager?

ii) Should the construction manager be entitled to perform any portion of the work it desires, so long as the cost does not exceed the price quoted by the lowest bona fide bidder?

iii) If a subcontractor defaults, should the construction manager be required to complete the work within the original GMP?

iv) What should the role of the construction manager be in reviewing and approving payments to subcontractors, and who, if anyone, will review and approve payments to the construction manager for the construction work it performs and for the work performed by the construction manager's subcontractors?

Presumably, the construction manager will only be undertaking work it knows can be performed for less than the price quoted by the outside contractor. How can the owner be assured that the construction manager has gotten the best price for the owner from the outside contractor? In addition to having a vastly better knowledge of the project, the construction manager also has the ability to manipulate project costs to ensure that the portion it undertakes will be profitable. The construction manager's management decisions on behalf of the owner will directly affect his/her
profit or loss, since he/she has the opportunity to steer profitable construction work to the company, should they choose to do so.

Then there are questions pertaining to inspection of the work. Is the owner confident that the construction manager will perform his/her own work (or the work that he/she has subcontracted out on his/her own account) satisfactorily? Can the construction manager be expected to apply the same standards in inspecting his/her own work as he/she does when inspecting the work of others?

One of the construction manager's responsibilities is to review payment requests. He or she will therefore collect payment applications from the separate prime contractors and from his/her own subcontractors, as well as prepare his/her own firm's payment requests. However, can the construction manager truly be expected to approve, on behalf of the owner, his/her own payments and those for his/her subcontractors?

Can the construction manager who also performs some of the work be expected to fairly decide disputes between his/her own subcontractors and the separate prime contractors working directly for the owner? If the construction manager has given the owner a GMP but has the opportunity to control quality of the work, will the construction manager allow quality to suffer in order to keep from exceeding the GMP?
It may be to the owner's advantage to limit the extent of work which the construction manager may do itself. If the construction manager also does business as a general contractor, the owner might prohibit him/her from taking on any work except "general conditions" items normally performed by a general contractor's own forces.

3.5. Strategies to Avoid or Limit the Potential For Conflicts of Interest

It is important to understand that the potential for conflict of interest changes with the form and variation of construction management used. It is equally important to understand that the potential cannot be avoided, but the conflict can. The owner's requirement is to understand the nature of the potential and the extent to which it exists, and deal with it contractually and procedurally as a means of protection through mitigation (Committee on Construction Management 1987).

Reference is again made to the results of the survey to determine procedures used by major companies to minimize any areas of potential for conflict of interests. All of the companies that participated in the survey emphasized that all construction management contracts are acquired by answering advertisements for request for proposals. There are no exceptions even if the company was contracted to provide design services. Secondly, the construction management division of each company is totally separated from the design division, operating as a different profit center and
separated from the design division, operating as a different profit center and serviced by totally different personnel. Some of the strategies used by the companies to minimize conflicts of interest situations are discussed below:

- **Cost Reimbursable Contracts:** This type of conflict can be minimized if the owner requires the construction manager (who performs construction work) to disclose whether any subcontractors or suppliers on the project are also working for him/her at the same time. The construction manager should also disclose whether or not he/she has any unsettled claims from or indebtedness to any subcontractor or supplier to be used on the project. Another solution is to require the construction manager to obtain competitive sub-bids for portions of the work, with final award of subcontractors subject to the client's approval.

Although the owner is inviting conflicts of interest if he/she engages a construction manager to perform construction work on a cost-plus basis, the architect/engineer and the professional construction manager acting strictly as an agent can be faced with similar (but less severe) conflicts when working on a cost-plus basis. They generally are expected to take no more time than is necessary on the project, consistent with their normal professional approach to their assignments.

- **Review of Design Documents:** The general consensus among the representatives of the companies that participated in the survey, was that
the design team. All the major issues pertaining to this particular responsibility are typically discussed with the client prior to commencement of their involvement in the project. The review is done professionally and honestly. If any errors, omissions, or discrepancies (for example, the failure to adhere to stipulated code requirements) are discovered, these are invariably brought to the owner's attention.

- **Construction Manager Also Performing Construction:** Two of the five companies sometimes perform construction services on projects where their involvement has been as both designer and construction manager. One of them has admitted however, to using subcontractors occasionally.

  In their opinion, where the construction manager is expected to perform construction work, the project owner is well advised to consider the use of a traditional cost-plus contract to protect its interests. The owner may also consider it desirable to have another entity providing oversight (inspection and testing) of the work done by the construction manager. Although this may appear to be self-defeating or a duplication of effort, it serves the best interests of the owner, especially on projects where strict adherence to specifications must be maintained.

- **Construction Supervision and Inspection Services:** All six companies agree that this issue revolves around the concept of trust. If the owner is convinced that the construction manager can be trusted to manage
owner is convinced that the construction manager can be trusted to manage
the project, then he/she can be conscientious enough to perform some
measure of supervision and inspection services. Each of the five design/CM
companies admitted to having a manual, defining in detail, all inspection
procedures that their company provides. This is used as a basis to convey
to owners and their own personnel how such procedures are carried out.

Company F noted that it is very important that the construction
manager's responsibility for this function be clearly defined and that a
program for construction surveillance and inspection be submitted to the
owner. This program is compared with the specific objectives of the project.
Under such a program, the construction manager must provide resident
project representatives and appropriate field staff at the construction site.
The owner also provides their own site representative to monitor the
construction manager's work.

- **Decision on Disputes:** All the participants seem to agree on the
subject of keeping disputes to a minimum and most of all putting the owner's
interests first. In the event there is an inconsistency in project documents
that may warrant changes (major or otherwise) to the project, and the sole
responsibility lies with the designer/ construction manager, their company is
quite prepared to honor all necessary costs to rectify the situation. If the
adequacy of the designer (or construction manager) services is called into
question by the owner, the issue is promptly addressed and resolved. This
is done with the primary objective of not placing the owner under any
disadvantage.

3.6. Chapter Summary

This chapter highlighted the prominent conflicts of interest issues
facing design firms providing design XCM services. Data was gathered from
organizations that have both utilized and provided the service. Six key
areas were discussed and the methods used to minimize and resolve such
conflicts were presented.

It is quite evident that there is a potential for conflicts of interest in
every independent contract. The potential is independent of the servicing
party's technical capabilities. The assertion of professional or business
ethics provides no guarantees that conflicts will not occur. Those presented
in this chapter are specific to XCM, and they are serious enough to highlight
the need for definite measures to manage them.
Chapter 4

GUIDELINES FOR DESIGN REVIEW AND CONSTRUCTION INSPECTION

This chapter will focus on procedures for coping with two key responsibilities of construction managers who also perform design services, namely design review and construction inspection. Both areas of responsibility contribute immensely to the quality of the project. Both areas also present construction managers with potential for conflicts of interest in Design Extended Services Construction Management. The proposed guidelines presented in Figure 4.1, are discussed in detail in the following sections.

4.1. Select the Project Team

The complexity of the engineering systems and the demand for better building environments makes it necessary for architects, engineers, construction managers, and other personnel to form a project team. Invariably, the team consists of:

- The owner's representative, project manager, and/or resident engineer;
Figure 4.1. Guidelines for Design Review and Construction Inspection
- The design professional's team leader, and/or principal in charge and appropriate support staff;

- The construction manager and appropriate support staff (Wheeler 1978).

It is imperative that on projects where both design and construction management services are provided by the same firm, the owner should ensure that the personnel assigned to the design team, are not also assigned to provide construction management services. This allows for a more objective approach to their respective responsibilities. Similarly, when a construction manager also functions as a constructor on the same project, personnel providing field supervision of workers should not be responsible for owner related construction decisions. These operational representatives must be specifically designated and defined.

Responsibilities must be well documented and transmitted to each team member. Projects of this nature inherently include a considerable number of construction interfaces that are generally difficult for the owner, and other team members. These must be must be identified at an early stage, and discussed openly. In selecting this project team, there are five important activities that must given consideration. These are explained below.
4.1.1. Develop a System of Checks and Balances

As mentioned earlier, the peer relationship between the owner, architect/engineer, and construction manager allows for a synergistic or team approach to all decisions. The project team is structured to act in concert when making decisions and determining the course of project delivery. The segregation of the required services facilitates checks and balances, and precludes any conflict of interest from the decision making process (Haltemhoff 1988).

This arrangement prevents any single team member from attaining total control of the decision making process. In effect, the construction manager's contracted-for expertise in planning, contracting, and construction is constantly observed (and tested when necessary) by the design professional's experience and secondary knowledge of those areas. Similarly, the design professional's contracted-for experience in design is open to the construction manager's constructability experience and knowledge of the design process.

Many commentators are of the opinion that the elimination or relaxing of these conditions lessens the perceived benefits of the construction management system (Haltemhoff 1986; Thomsen 1982; Reed 1980; and
Cushman et al. 1983). To establish the team concept and preserve checks and balances throughout the project delivery process, the owner must either:

1) Separate services contractually; or

2) Contractually require that procedures be instituted which effectively offset the debilitating effects of assigned dual responsibilities.

In any case, a team structure must be designed and installed that will foster the process of checks and balances.

It is assumed that each team member, has a unique ability in their field of expertise. Also assumed is the fact that each has something of value to contribute to the other's performance, based on their individual construction industry experience. As peers on the team, it is expected that each will appropriately assist the other in the generation of owner oriented solutions to design and construction issues as the project delivery process develops. In such situations, there is a need for the consideration of objective trade-offs, and the development of alternative strategies to ensure that the owner's interests are not compromised.
4.1.2. Use Separate Service Contracts

A more positive approach to the separation of assigned personnel is the separation of service responsibilities into individual contracts. Instead of extending a professional design services contract to include construction management services (or vice versa), owners should enter into a standard contract for design services, and a separate companion contract with the same firm for construction management services.

This concept of contract separation is often used in the more traditional design-build contracting system. Here a contract covering design precedes a second contract for a lump sum for the construction of the project. Contract separation permits each document to speak for itself with regard to the technically unrelated services, permitting the use of their independent provisions to prevent crossover personnel assignments.

4.1.3. Encourage Proper Communication Between Team Members

The expectation for open communication and the exchange of complete information may be the most difficult to fulfill, but it contributes toward the development of teamwork and project objectives. Ideally, the overall design process should go smoothly and all project team members should agree at all times. In reality this global harmony never occurs because there are strong pressures on the project, because the objectives of
the team representatives often conflict with each other. This may often be due to a lack of awareness by one discipline team of the reasons why the other discipline team proposes a specific issue.

Communication and coordination among team members are critical in such situations. Therefore, expedience is necessary: (1) To facilitate the functional constraints of the owner's ongoing operation; and (2) To minimize the impact of decisions on the construction momentum of the contractors involved. Many interface problems can generate adverse cause-effect situations. The project team must maintain interface problems and decisions in an integrated rather than an isolated perspective (Haltenhoff 1987).

4.1.4. Display Ethics, Integrity, and Moral Obligation

The effort of the project team must be based on mutual trust and understanding among all the parties. This is only achieved when all actions on the part of team members are ethical, and integrity prevails. On a quality-oriented project team, each team member endeavors to fulfill their respective obligations, while cooperating with other team members. The relations among members must be supportive, and not divisive or self-serving. The mutual goal should be a successful project that adheres to the owner's requirements, with each member diligently contributing towards its achievement (ASCE, 1988).
Proper business ethics must prevail in all dealings and relationships among team members. Team members must adhere to the adopted codes of ethics of their respective professional associations. Honesty and open communications must be cultivated, as this will determine the extent of the project's success (Wheeler 1978, and ASCE 1988). This is extremely important when the construction manager performs his/her design review and construction inspection responsibilities. All errors and omissions made by the architect engineer must be underscored, and discussed openly at the project team level.

4.1.5. Install a Decision-Making Process

The decision making process should function as a controller that pinpoints the transition between the different phases of design and construction. Throughout the entire process, each team member has their own individual concerns. The design team is concerned with the quality of decisions and their effect on design coordination.

The construction manager focuses on the effects of each problem, and its subsequent solution, on the cost and progress of the project. Delay in the decision-making process may cause a delay in the project schedule. If additional work is required of contractors, increased costs may be generated.
The owner has a major concern for the effects of interface decisions on his/her continuing operations. Construction operations must be necessarily coordinated and scheduled around the on-going operation of the facility. In most instances owners have integrated their operation, and space requirements into the construction schedule, and are committed on a relatively inflexible long term and short term basis. To change operational commitments because of a construction problem, or in response to the resolution of the problem requires careful operational replanning to avert additional problems and added expense. The owner's input to construction interface problems reflects knowledge that only he/she possesses. He/she therefore commands a unique and mandatory position in decision making.

The process highlighted in Figure 4.2, illustrates the recommended the decision making procedure. It has been adopted from a model developed by Vanegas Pabon (1987). It begins with the respective team members examining proposals by the design team and/or the construction management team. These proposals are analyzed and reviewed by all members of the project team. All comments are evaluated, then a decision point appears. If the proposal is complete at this stage, the project team accepts it, incorporates it in the project, and signs off. If not, the project team identifies the issues that require completion and determines who is responsible for their completion. Depending on the assignment of
Figure 4.2. The Decision-Making Process
Source: Developed from (Vanegas Pabon 1987)
responsibilities, the process returns for design or construction management input or both.

Decisions involving construction interfaces benefit from the team's synergism. Each team member contributes to the solution from his unique perspective, yet all have a common goal. If the team is properly constituted, all representatives at all decision making levels will have the authority and capability to handle a problem expeditiously and properly.

4.2. Define the Owner's Objectives

A comprehensive list of the owner's objectives for a particular project must be prepared. These objectives must be detailed and refer to specific aspects of a project, such as function, operation, schedule, technical matters, quality, esthetics, and administrative, fiscal, or management requirements. The construction manager and design professional's ability to assist the owner in establishing these objectives depends on how early in the planning and execution process they are involved in the project.

Table 4.1. shows the appropriate design and construction management implications and conflicts of interest for given objectives. Column one presents the owners' objectives and performance requirements for the project. Each of these requirements presents differing implications for the design and construction management teams, these are outlined in
### Table 4.1: Project Objectives Implications

Source: Adapted from (Tatum 1987)

<table>
<thead>
<tr>
<th>Project Objectives</th>
<th>Design Implications</th>
<th>CM Implications</th>
<th>Potential Conflict of Interest</th>
</tr>
</thead>
</table>
| Minimizing Capital Cost of the Facility | • Efficient designs and use of materials  
• Use of standard practices and materials | • Least cost delivery system  
• Schedule analysis (optimization)  
• Most efficient construction method | • Design review  
• Construction inspection |
| Minimizing Life Cycle Cost of the Facility | • Design for efficient operation  
• Increased emphasis on quality and reliability | • Greater construction scope  
• Higher quality standards  
• High quality construction | • Design review  
• Construction inspection |
| Maximizing Reliability, Functionality, Leasability or Aesthetics | • Evaluation and more alternatives  
• Increased detail in requirements | • Greater construction scope;  
• Higher quality standards | • Design review  
• Construction inspection |
| Minimizing the Project Schedule | • Conservative design assumptions  
• Increased coordination of concurrent design activities | • Phased construction  
• Increased planning and coordination  
• Higher peak workforce  
• Perform construction | • Design review  
• Construction inspection  
• Construction performance |
| Compliance with Externally Imposed Requirements | • Supplementary design criteria  
• External design review | • Constraints on construction operations  
• Monitoring compliance. | • Design review  
• Construction inspection |
| Highly Demanding Technical or Performance Requirements | • Research and development  
• More sophisticated analysis  
• Less use of standard designs  
• Increased attention to construction | • Detailed analysis and planning  
• Innovative construction methods  
• Greater integration with design | • Design review  
• Construction inspection  
• Fee arrangement  
- Percentage of cost  
- Cost-Plus/Reimbursable |

columns two and three. Based on the identified implications, the potential conflict of interest issues can be determined as is indicated in column four. The project team now has an early indication of what the major conflicts are, and can therefore implement measures to minimize or avoid the resultant effects.

The design professional's role in assisting the owner to establish such objectives should be in areas where the designer has particular expertise. Typically these should include the functional, technical, schedule, and quality-compliance areas. The construction manager's role in helping to establish the owner's objectives will be seriously restricted if he/she is brought on board late in the process. If, however, he/she is involved at an early stage, his/her contributions on constructability reviews, schedule, costs, value engineering, quality control, and other procedures related to the owner's objectives will be invaluable.

4.3. Define the Required Project Delivery Services

Every project requires six definitive delivery services (Haltenhoff 1988). They are:

1) Design;

2) Project Management;
3) Contracting/Purchasing;

4) Construction;

5) Construction Coordination;

6) Contract Administration.

In the construction management system, the design professional provides three of the six services, namely design, project management and contract administration. However some responsibilities, such as project management and contract administration are shared with construction manager. Design responsibilities are not shared. The owner contracts with guidance from the construction manager and technical input from the design professional, while the construction manager provides the construction coordination of contractors. Since there may be an overlapping of responsibilities, it is very important that the construction manager’s responsibilities be clearly defined.

4.4. Develop a Quality Assurance Program

The construction manager's approach to excellence can be achieved by consistently fulfilling the obligations of his/her contracts. That can be
considered as a form of conformance to requirements. However, the construction management definition of quality must go beyond satisfaction of a minimum standard. As a professional, the construction manager must be able to judge when to innovate, when to aim for spectacular performance, or when to expand a client's view of what is attainable.

Quality is obtained by the conscientious application of a thoroughly planned quality assurance program implemented through quality control procedures. The key characteristics of such a program are:

A) **Achieving the requirements of the owner with regards to:**
   i) Functional adequacy;
   ii) Completion within the time schedule and budget;
   iii) Life-cycle costs; and
   iv) Operation and maintenance.

B) **Achieving the requirements of the design professional and construction manager by providing:**
   i) A well defined scope of work;
   ii) A budget to assemble and use a qualified, and experienced staff;
   iii) A budget to obtain adequate field information prior to design;
   iv) Provisions for timely decisions by the owner, construction manager and design professional; and
v) A contract to perform necessary work at a fair fee with adequate time allowance.

C) Achieving the requirements of the constructor by providing:
   i) Adequate contract plans, specifications, and other documents prepared in sufficient detail to permit the constructor to prepare a priced proposal or competitive bid;
   ii) Timely decisions by the owner, construction manager and design professional on authorizations and processing of change orders;
   iii) Fair and timely interpretation of contract requirements from field design and inspection staff; and
   iv) A contract for performance of work on a reasonable schedule which permits a reasonable profit.

D) Achieving the requirements of regulatory agencies with regards to:
   i) Public safety and health;
   ii) Environmental considerations;
   iii) Protection of public property including utilities; and
   iv) Conformance with applicable laws, regulations, codes and policies (ASCE 1988).
4.5. Perform Design Review

Reviewing design drawings and other construction documents is an ongoing responsibility of the construction manager throughout the design phase of the project. His/her reviews are critical to the success of the project. They are based on functional adequacy of the design and materials used, conformance with applicable codes and regulations, conformance with budget requirements, and adequacy of construction.

The construction manager must therefore endeavor to develop his/her own checklist of important technical matters and criteria by which design drawings and other project documents can be appraised. A completed list cannot be included here because of the vast number of types of constructed projects and disciplines that could be considered. Included below are some of the items identified by the American Society of Civil Engineers (1988), that would apply to the final documents:

- Have standard details been modified to fit the site conditions, as required by changing codes, or to meet other special requirements of this project?

- Have the drawings been coordinated among disciplines or offices? Has a conflict check been performed?
• Were the specifications coordinated between trades for conflicting requirements involving jurisdictions, sequencing, materials, approvals, coordination and location of components, construction site usage, storage, site utilities, or temporary construction?

• Are testing, and acceptance criteria clearly defined and adequate? Are payment provisions for testing clear?

• Are requirements for submittals well defined? Are provisions clear pertaining to where submittals are not wanted? Are specifications clear pertaining to where submittals are not wanted?

• Are specifications clear on the allowable procedures for requesting substitutions?

• Are services during construction adequately coordinated between design and field personnel?

4.6. Develop a Conflict Resolution Process

Conflicts may occur during the life of a project. In situations where the construction manager is involved in multiple roles (i.e. if the CM's service includes design and possibly construction), it is highly unlikely that the conditions of agency will prevail. Hence there is dire need for a process by
which potential conflict situations can be resolved. Specific reference is made here to the functions of design review and construction inspection.

The process of resolving the key areas where conflicts may exist, which is illustrated in Figure 4.3, is based on the work of Tatum (1987). The procedure begins with the project team considering a proposal by either the construction management team and or the design team. This is reviewed, analyzed, and scrutinized by the owner's team and other operational representatives on the project team. All comments and proposed alternatives are evaluated by the entire project team as indicated by the process, and then a decision point occurs. If there is no conflict, or if the conflict is cured by disclosure, the project team accepts the comments and the proposed alternative, incorporates them in the project, and signs off.

If the conflict still prevails, all reasons for existing concerns are determined. These are reviewed by the construction management team with two possible outcomes:

1) If a different alternative is feasible, the construction management team proposes another solution and returns the alternative for another review;

2) If there is no alternative solution, the construction management team reviews the cost and schedule advantages and technical
Figure 4.3. The Conflict Resolution Process
Source: Adapted from (Tatum 1987)
reasons for their proposal directly with the owner's team, who may accept or reject the proposal.

This loop may be repeated indefinitely until the matter is resolved by the owner. The important issue is to try to understand the conflict and be receptive to the other team's reasons and concerns.

4.7. **Define Construction Inspection Responsibilities and Procedures**

The project's technical and quality requirements stated in the contract documents define the levels of performance and acceptance criteria for the project. One of the first tasks in planning for construction is to determine whether these standards are clear. If not, the construction manager should insist on adequate clarification. This is essential since the responsibility for testing and inspection are dependent on these standards. Additionally, plans for managing construction operations depend largely on the standards of quality required on the project.

Next, the construction manager should be provided with construction procedures by the contractors whenever new standards of work and/or acceptance criteria apply. These would describe the means, methods, techniques, and sequences necessary to complete construction operations.
They are not needed for standard operations and standard acceptance criteria. Ideally these should be prepared by the contractor's field personnel.

Quality assurance and quality control procedures will then be prepared by the construction manager. These will define how the quality methods, such as inspection, testing, tracking and documenting, will be used to meet the design requirements. Generally these are outlined in the company's engineering and construction manual. They provide the guidelines and instructions for the design personnel, inspectors, and technicians who perform quality control tasks. They will highlight requirements from technical specifications and summarize inspection requirements, frequency, method, acceptance criteria, means of documentation, and responsibility.

Adequate representation from the various discipline teams with regards to construction inspection responsibilities and procedures, is important for both quality and the efficiency of construction. Depending on the size and complexity of the project, and taking into consideration peculiarities of XCM, the following representatives with their respective responsibilities are recommended:

- **Owner's representative** – to manage and coordinate the owner's quality assurance activities; to give prompt direction if unanticipated
conditions are encountered; to coordinate with regulatory agencies; and to approve changes.

- **Design Professional's representative** – to identify critical technical requirements and quality risks; to observe the construction operations and monitor compliance with design requirements; to update plans and specifications changes during construction; to observe and approve testing and acceptance of equipment and systems.

- **Construction Manager's representative** – to inspect and review work performed; to verify that tests and start-up procedures are accomplished; to receive requests for information the constructor and to communicate such requests to the home office; to maintain at the site orderly files on all job records, inspection and test reports, work directive changes, etc.

- **Representative from an independent testing and inspection organization** – to examine and test various materials, procedures and equipment.

### 4.8. Chapter Summary

The two responsibilities that were considered, namely, design review and construction inspection, are key contributors to quality on the
construction project. They have both been identified as potential areas of conflicts of interest in the design XCM delivery system. To effectively cope with these conflicts, they must first be identified very early, and resolved within the framework of the project team. The primary objective therefore is to preserve the team approach.

All members of a quality oriented construction team should have a serious interest in team performance. However, it is the construction manager's responsibility, as the knowledgeable party, to install guidelines that establish and maintain the level and quality of the checks and balances required for the system's effective operation. To do this, the construction manager must not only recognize his/her responsibility under the contract, but must also implement strategies unique to the form and variation of the construction management system being used.
Chapter 5

SUMMARY AND CONCLUSIONS

5.1. Thesis Summary

This thesis addressed the issue of potential conflicts of interests in the design XCM approach. An overview of the different forms and variations of construction management systems that are presently being used by the construction industry was first presented. The major forms of construction management identified were: Agency Construction Management; Owner Construction Management; Guaranteed Maximum Price Construction Management; and Extended Services Construction Management.

Next, a survey was conducted with design/CM firms that provide extended services construction management, and owners that have utilized this type of service. The purpose of the survey was to define the major conflicts of interest. To some extent the survey was restricted due to the participation of only one owner's organization. Also presented were some of the strategies used by these agencies to resolve or minimize these conflicts. A list of the conflict of interest issues are:

1) Percentage fees based on the cost of construction;
2) Cost-plus/Reimbursable contracts;

3) Design review;

4) Construction inspection;

5) Decision on disputes;

6) Construction manager performs construction services.

Finally, guidelines were developed for coping with what the writer felt was the two most important conflicts, namely, design review and construction inspection. These guidelines were based on input from CM practitioners and existing literature. The key elements were:

1) Implement a project team, with emphasis being placed on maintaining a system of checks and balances;

2) Define the owner's objectives and the required project delivery services, and identify the resultant conflicts of interest issues;

3) Implement a quality assurance program, and define construction inspection responsibilities and procedures;
4) Review the final construction documents;

5) Develop a conflict resolution process;

6) Define construction inspection responsibilities and procedures.

5.2. Observations

All of the companies refer to the practice of being candid in discussing these conflict of interest issues as a major factor in maintaining a strong and positive relationship with the owner. Each contended that the process would be better served if the said conflicts can be isolated at an early stage in the design phase. Other observations are highlighted in the sections below.

5.2.1. The Importance of the Owner's Involvement in the Project Team

The increased involvement of owners in the process of delivering projects requires a higher level of understanding by owners of the factors that can contribute to potential conflict of interests on the part of the construction manager. The importance of understanding the nature of the potential and the extent to which it exists cannot be over emphasized. It was recommended that owners anticipating the use of XCM, should become
aware of its motivations and details before entering an agreement for construction management services. Similarly those providing construction management services should be certain that the owner is sufficiently informed of the process to beneficially proceed with it.

5.2.2. The Need for Definition of the Expected Functions of the Discipline Teams

To a certain extent, this study cannot be definitive in describing the relationships that should be established among team members. Since the project team is defined by the contractual arrangement among its members, many contractual variances and interpretations are possible. In addition to the variation of XCM used, the capabilities, experience, and the expertise of the various types of owners significantly influence the organizational structure of the team. For example, a private owner with no technical staff requires a different organizational arrangement for its project than an experienced owner such as an airport or a transit authority in a large metropolitan area.

How the team is determined depends on the contractual arrangement among the parties. It is important that all members of the contractual arrangement recognize the expertise of other team members and that the scope, tasks, and responsibilities are properly assigned. Each should be
aware of their role in each of the six project delivery services earlier defined in chapter 4.

5.2.3. The Need for a System to Resolve Conflicts

Regardless of the competence of the project team, the level of coordination, and the application of the procedures defined earlier, some areas of conflict may not be satisfactorily resolved. The following suggestions can significantly contribute to a solution:

- Address the problem expeditiously.

- Isolate the key issues. Address each issue one at a time, based on the order of priority.

- Discuss all relevant facts and feelings on the issue before attempting to resolve it. Gather all the data.

- Identify the project objective that is the focus of the disagreement, or determine the heading under which the specific problem falls.

- Develop several alternatives for resolution.
• If possible, arrive at a team consensus on the possible solution. If a consensus cannot be reached, the owner, after consulting with other team members, should select the preferred alternative (Quaranta 1990; Lincicome 1989; Wiide 1989; ASCE, 1988).

Insufficient coordination and communication have heavily contributed to project failures and the dissatisfaction of team members. The Design Professionals Insurance Company (D.I.P.C.) in 1976 reported that owners tend to resort to legal action, not so much because of the imperfections in a project, but rather because of the unexpected events, surprises, mounting frustrations over problems not addressed, or not being informed about problems. The frequency of lawsuits has been highest from clients with whom communications are limited and those with limited construction experience. This information therefore underscores the importance of the project team working as a closely knit unit, and maintaining a team structure that preserves the checks and balances process throughout the project delivery period.

5.3 Conclusions

Construction management services are provided by construction managers using different practitioner formats. In essence construction management services comprise a menu from which a form and its variation are selected. Owners should therefore be extremely careful, when engaging
the services of a construction manager, when determining the combination of services that best suit their requirements. The determination of the appropriate form and variation to be used is the initial and most consequential decision to be made.

Discussions with construction management practitioners conclusively revealed that companies which have pinpointed potential conflicts and openly discussed these with owners are usually able to avoid or minimize the effects of such conflicts. They are at least able to take steps to reform a situation. The need to preserve the checks and balances system within the team concept must be reiterated. Whether the construction manager functions as an agent or as an independent contractor, his/her responsibility must be carried out using his/her best skills and judgement.

Individually, none of the concepts presented in this research are new. However, collectively they provide a new approach to the project team, especially owners who may be still influenced by the traditional construction approach. Most importantly these concepts provide a structured mechanism for integrating the project team, and dealing with conflict of interest issues in design XCM services.
5.4. **Contributions of the Study**

All the objectives outlined in chapter one were met. The different forms and variations of construction management formats were identified. The study also provides a description of some of the conflict of interest issues that design/construction management companies are confronted with when performing XCM services. As an extension of the conflicts of interest, this investigation also identified methods used by these companies to tactfully avoid or resolve the issues.

The research also provided procedures for dealing with two responsibilities of the construction manager that relate to quality on the construction project, namely design review and construction inspection. The decision making and conflict resolution processes establish joint responsibility and balance between the owner, design, and construction management teams. They also provide mechanisms to monitor and expedite the design and construction process.

5.5. **Areas for Future Research**

The practice of construction management is still in its formative stages. The nature of services provided the construction manager, and the responsibilities assumed by him/her as a project participant, support recognition of the construction management practitioner as a professional in
his/her own right. Current statutes and public regulations are not consistent on either the practice of construction management as a project delivery system or on who is qualified to provide construction management services (Phillips 1986). Such a climate provides an excellent opportunity for further research in the following areas:

- **Extended testing of the procedures to resolve design review and construction inspection conflicts:** The proposed procedures were based on interviews with six companies and a literature research. Some of the steps have been tried and tested. However, a much larger sample of companies (owners and construction managers) must be examined to see if the procedures are cogent.

- **A determination of the areas of potential conflicts of interest in other forms and variations of construction management:** This will assist in refining the construction management process and facilitate the implementation of procedures to minimize any negative effects that would otherwise arise.

- **The extent of the construction manager's liability for safety and quality control:** These are two very important issues that came to the fore throughout this research. The scope of this research would encompass both the construction manager's responsibility during design and his/her on-site function. It would assist in determining the extent of his/her safety and
quality control responsibilities under the various forms of construction management.
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APPENDIX A

CONTRACTUAL RESPONSIBILITIES OF THE CONSTRUCTION MANAGER

This appendix presents an in depth look at the contractual responsibilities of the construction manager. These responsibilities are not limited to XCM system. They are based on an extensive literature search. The first section focuses briefly on the need for owners to choose the project delivery method based on their needs objectives.

A.1. Choice of Delivery Method

Once an owner conceptualizes a project, he/she must organize teams of professionals to provide assistance in making the critical decision of whether to proceed to the design and delivery phases. Traditionally, during the decision phase an owner consulted primarily with the design professional with respect to the project concept and the construction cost of materials, methods and labor. As mentioned in Chapter 2, the need for construction management arose, in part, as a result of owners' need for more accurate, cost-tested expertise during the decision phase. On complex projects it is now common for the owner to consult with both its architect and its construction manager during the decision phase. Indeed, a construction manager's input during the decision phase can be most helpful to an owner with respect to the development of the initial concept and design, and the
development of budgets for utilization by other professional members of the owner's team.

An important question for an owner to resolve is whether to retain the its construction manager during the decision phase. Next the owner will have to determine the form and variation of construction management that is best suited for the project under consideration. It is extremely important that the owner carefully review all the options that are available, and ensure that his/her final selection conforms to the project objectives. The process for selecting a Construction Manager has a format closely resembling that of selecting a design professional. The entire process is detailed by The Committee on Construction Management (1987).

The owner must now determine the extent of the authority, responsibility, and accountability each member of the project team will undertake during the decision, design and delivery phases. It is critical for the owner, the architect and construction manager to resolve their respective authority, responsibility and accountability for the project during the negotiating of their contracts. In effect these contract negotiations serve as the parties' collective allocation of duties and risks relating to their project involvement.
A.2. Contract Provisions Pertaining to the Construction Manager's Services

The generic activities of the Construction Manager consist of the following:

1. The development of the project budget from information provided by the owner and architect/engineer.
2. The design of the management plan and strategy based on the owner's parameters of the project.
3. The scheduling of project delivery from design through construction.
4. The application of value management, including direction in constructability and contractibility decisions.
5. The formation of contract conditions to facilitate the use of the construction management project delivery system, format, and variation.
6. Review the contract documents prior to issuance to bidders for proposals.
7. The determination of divisions of work to facilitate the multiple bidding process.
8. The prequalification of contractors and the identification of owner direct purchase items.
9. A survey and analysis of the labor pool and contracting practices in the area of the project.
10. Team leadership at the time that the expertise of the construction manager is germane.
11. The development of bidding competition to generate the most favorable pricing conditions.
12. Communicate with bidding contractors to clarify conditions and resolve discrepancies in bidding documents.
13. Assistance to the owner during the bidding process to ensure that the receipt of proposals is properly conducted.
14. Review proposals to determine if those being considered are complete and in the owner's best interests.
15. Leadership in negotiations with contractors on behalf of the owner.
16. Administrative assistance in the signing of contracts and the accumulation of required information.
17. The organization and chairing of preconstruction meetings with contractors.
18. The development and implementation of the on-site construction schedule.
19. The coordination of contractors at the site on a full time basis.
20. The chairing of periodic project and progress meetings with contractors.
21. The organization and administration of a contractor system for expediting material and equipment.
22. The establishment and administration of a project reporting system.
23. The institution and coordination of the progress payment procedure for contractors.
24. The procurement and control of construction support requirements for the project.
25. Assistance to the owner and contractors with respect to any labor relations efforts connected with the project.
26. The design and implementation of the project's quality management program.
27. The administration of contract changes and the project's change order procedure.
28. Cost tracking, and the administration of the owner's cost accounting program.
29. Assistance in the resolution of disputes arising from the performance of the contracts (Committee on Construction Management 1987).

The CMAA (1988) has divided the responsibilities of the Construction Manager into four basic functions, namely:

- Project Management
- Time Management
- Cost Management
- Project / Contract Administration
These functions are not mutually exclusive, but are related and integral components of the construction management delivery process. In their Construction Manager’s Manual each of the above functions is presented in the following phases:

- Pre-Design
- Design
- Bid and Award
- Construction
- Post Construction

A.3. Design Services

Prior to the advent of the construction management concept, architects were the principal parties participating with the owner in the development of the project concepts and design. Now the construction manager can provide tested expertise in construction cost of materials, methods and labor during the decision, and particularly the design phases. Consequently, the owner-construction manager contract should contain specific provisions setting forth the extent of the construction manager’s responsibilities, with specific reference to the review of the project concept and design.
The construction manager should thoroughly familiarize himself/herself with evolving architectural and structural drawings and specifications for the project. During the delivery stage this familiarization should extend to shop drawing and submittal review. If the construction manager is on board early enough, he/she can make a thorough review of the project site and provide the following:

- Information on site use;
- Advice about anticipated cost factors related to site selection and the project site placement;
- An analysis of the construction labor market in the project locale;
- Potential labor problems during the expected project delivery time;

The construction manager should also be able to provide advice with respect to the actual design of the building, in particular, the cost of alternative designs. Architects frequently will not be knowledgeable about the actual construction cost and performance of various major subsystems and possible alternatives. Thus, current standard construction management contracts provide for the construction manager to make recommendations on the construction cost of alternative project subsystem components, in order that the owner and architect may consider various options.
The construction manager should also be able to offer sound advice on the sequencing of construction. As he/she reviews evolving architectural and structural plans and specifications, recommendations pertaining to the development of construction sequencing, and the definition of clear and discrete work scopes are invaluable (Vanegas Pabon 1987). For example, some designs may result in the overlapping of the work scope of various prime contractors. Some designs may result in a sequence of construction that requires too many trades in one area at the same time. Many architects lack this type of construction experience.

Finally, but perhaps most importantly, the construction manager ought to review the design for apparent defects. While the architect and consulting engineers must bear the primary responsibility and liability for design defects, the owner should be able to rely on the construction manager for a general review of the design and identification of apparent defects. Additionally, he/she should provide the owner and architect with recommendations on any ambiguities in the design documents, which may lead to substantial change orders or disputes during project delivery.

Generally, the construction manager will be required to exercise requisite skill and judgement in performing his/her professional duties. In addition to this the construction manager will also be held accountable to the same professional standards which are exercised in other professions (for example architecture and engineering). To the extent a construction
managers' advice results in design changes which prove defective, he/she may be liable in contract for breaching his/her contract with those with whom he/she has contracted. Similarly, he/she may be liable in tort to the same parties for the negligent performance of his/her contract. To those with whom he/she has not contracted, the construction manager will be liable in tort for negligent performance of his/her professional services (Lee 1983).

A.4. Constructability

Constructability recommendations include contract packaging, construction sequencing, access to work, safety, construction methods, materials, minimization of construction interferences, work rule and jurisdictional effects, as well as design and detail improvements. These recommendations should be available in the early phases of design, when site layouts, schematics, and specification criteria are being considered (Stukhart 1987). Such recommendations shall be advisory to the owner. The construction manager should play a major role in the preparation of project specifications involving field coordination and control, work simplification, quality management, and labor provision.

In the review of plans and drawings, the construction manager is expected to assist the owner by identifying patent errors, ambiguities, and omissions. The construction manager is not responsible for checking design calculations or the technical content of of specifications (Stukhart 1987).
At no time should the construction manager preempt the responsibility of the architect or engineer for the facility's design integrity. The construction manager's advisory role is that of making construction recommendations, and presenting suitable design alternatives when appropriate. Alternate solutions are particularly appropriate whenever design details affect construction feasibility, costs, or schedules.

A.5. Long-Lead Procurement Items

The owner-construction management contract should require the construction manager to review the design for the purpose of identifying long-lead procurement items. These may include special subsystems, machinery, equipment, unusual materials or supplies, and even labor which must be procured in advance for efficient, timely project completion. Although somewhat analogous to the construction manager's design responsibilities, identification of and recommendations about long-lead procurement items can avoid numerous problems on construction projects.

A.6. Estimates, Cost Accounting, and Preparation of Budgets

The owner-construction manager contract should require the construction manager to evaluate the project concept and design during the decision and design phases for the ultimate cost of delivery. During the
delivery phase, the construction manager should evaluate the ongoing construction at periodic intervals to assess the extent to which the project is being constructed in accordance with the budget. To the extent the project costs exceed the budget, the construction manager should analyze why and should make recommendations on how the budget can be achieved.

It is prudent for the owner to carefully explore with the architect and construction manager the precise nature and extent of the cost estimate services the construction manager intends to perform. Next, there should be some agreement on the phases at which such information should be supplied. The form of industry documents used, and the contractual stipulations with regards to cost, will determine the extent of the cost estimates, cost accounting and budget preparation services the construction manager will provide. The CMAA standards defines a full range of responsibilities for the construction manager with specific reference to cost management (1988). The are as follows:

i) Pre-Design Phase
   • Preliminary Cost Investigation
   • Project and Construction Budget
   • Cost Analysis

ii) Design Phase
   • Schematic Design Estimate
• Preliminary Design Estimate
• In-Progress and Final Design Estimates
• Value Analysis Studies
• Cost Monitoring and Reporting
• Schedule of Values

iii) Bid and Award Phase
• Estimates for Addenda
• Bid Analysis and Negotiation

iv) Construction Phase
• Change Order Control
• Trade-Off Studies
• Claims for Cost
• Cash Flow Reports
• Project Cost Reports

v) Post Construction Phase
• Final Cost Report

The AIA and CMAA owner-construction manager contracts provide only for the construction manager to estimate costs. These contracts do not provide for warranties, guaranties, or fixed-costs limits. This highlights a critical point about contractual risk allocation with regard to cost estimates.
Traditionally, the general contractor took the ultimate project cost estimate risk since he/she submitted bids in the form of a lump sum fixed-price contract. If his/her price was too low, his/her liability was lost on the project. However, if the bid was accurately estimated, he/she would make a reasonable entrepreneurial profit. Under the professional CM concept, the construction manager offers his/her expertise as a professional service for a fixed fee as the owner's agent and does not guarantee the cost, timeliness, or quality of construction.

Thus in utilizing the professional construction management concept, the owner must realize that the construction manager is relinquishing its right to make an entrepreneurial profit on the project. Consequently, for a fixed fee, the construction manager may not want to take the contractual risk of guaranteeing or warranting the project cost or the timeliness or quality of construction.

A.7. Construction Document Assistance

The owner-construction manager contract should require the construction manager to review evolving architectural and structural drawings and specifications. It should also stipulate that he/she makes recommendations to the owner and architect with respect to the development and delineation of discrete bid packages. His/her input on work scope divisions in the following areas will be invaluable:
• Traditional work scope divisions within the industry, particularly as they affect potential labor jurisdictional disputes;
• Project costs;
• Construction sequencing;
• Potential work interfacing problems;
• Potential trade interference problems;
• Unusual labor or material requirements;
• Compliance of bid packages with government regulations.

Once the owner, architect, and construction manager agree on the precise scope of separate bid packages, the construction manager should be required to review the basic form of contract documents, and make recommendations on specific provisions in the general conditions. Regardless of whether the prime contracts are to be bid or to be negotiated, the construction manager should remain involved with each development in the process.

On a complex construction project there will be numerous bulletins as the architectural and structural plans and specifications evolve, and during negotiations, work scope may be altered significantly as prices are received from different contractors with suggestions for project economies. As the bidding and negotiations proceed, it is imperative that the construction
manager ensure that all project work is included in the prime contracts, with particular attention being given to the factors outlined above.

A.8. Bid, Negotiations, and Contract Award Assistance

The owner-construction manager contract should require the construction manager to provide the owner with substantial assistance with the bidding, negotiating, and awarding of multiple prime contracts (Cushman et al. 1983). During the decision and design phases, the construction manager will be required to analyze the construction market and the project locale to determine potential prime contractors in critical construction areas. He/she will appraise their competence, and their ability to adequately complete the prospective project.

At the same time, the construction manager should develop prospective bidder interest in the project. The successful development of bidder interest in the project usually accrues to the benefit of the owner. The greater number of prime contractors bidding with respect to discrete bid packages tends to result in more competitive prices and the generation of design alternatives.

During the design and delivery phases, as discrete bid packages are finalized and issued to prospective prequalified bidders, the construction manager should be required to monitor all aspects of the issuance of
bulletins, clarifications, and interpretations of bid documents. Once bids are received, the construction manager should assist the owner and architect in analyzing the responsiveness of the bids, alternative designs, and overall costs. He/she will also organize and chair bid and pre-award conferences. During these conferences the construction manager will fully familiarize the bidders with critical aspects of the project, for example, scheduling mechanisms and coordination duties.

After the choice of prime contractors have been made, he/she will monitor the final execution of contract documents and ensure that the work scope included within the contracts are those to which the parties agreed. As multiple prime contracts are executed, the construction manager should be required to issue relevant notices to proceed (Cushman et al. 1983).

The construction manager will have the primary responsibility for the allocation of duties and risks for bidding, negotiation, and award assistance. In order to ascertain the extent of those duties, it is important for the owner and construction manager to specify as clearly as possible, what is expected of the construction manager in the owner-construction manager contract.

A.9. General Contract Administration Services

The owner-construction manager contract will require the construction manager to provide contract administration in accordance with his/her duties
set forth in the general conditions to the multiple prime contracts. The AIA CM contract (B801, 1980) provides for example:

"Unless otherwise provided in this Agreement and incorporated in the Contract Documents, the Construction Manager in cooperation with the Architect shall provide administration of the Contracts for Construction as set forth below and in the 1980 Edition of AIA Document A201/CM, General Conditions of the Contract for Construction, Construction Management Edition."

In the general conditions for separate multiple prime contracts, it is particularly important that the scope of the construction manager's responsibilities as agent for the owner be clearly defined in contrast to that of the architect. On complex construction projects utilizing phased construction and multiple prime contracts, it is common to have literally hundreds of change orders. Depending upon the negotiating strengths of various prime contractors, the method for arriving at the price of change orders or extra work orders may be different. The general conditions must make clear to what extent the construction manager and architect, respectively, have authority to commit the owner to prices for various change orders and extra work orders (Cushman et al. 1983).

The construction manager will also be required to establish a format for and run weekly job progress meetings. He/she will be required to
develop with the owner and architect a general agenda for each such meeting, which should include:

- A review of the minutes of the prior week's meeting;

- A review with each active prime contractor of his/her general work progress and any work problems;

- A careful review of the scheduling status of the project, to determine whether any of the prime contractors are behind schedule or interfering with other prime contractors' work, and whether any of these contractors are asserting acceleration or delay claims as a result of the conduct of any other prime contractor, the owner, the construction manager, or the architect;

- A comprehensive listing for each prime contractor of any and all extension requests, change orders, and extra work orders;

- A careful description by each prime contractor of his/her intended work schedule, work areas, and personnel requirements for the upcoming week (Stukhart 1987; Cushman et al. 1983; Kluenker 1986).
The construction manager should also type and distribute minutes of weekly job progress meetings.

A.10. Scheduling and Coordination Services

When a project is substantially delayed by actions of either the owner or one or more of the multiple prime contractors, the strategy of the delayed prime contractors often is to sue the owner, asserting that the owner had the duty to schedule and to coordinate all of the prime contractors. In the event one of the multiple prime contractors delays the project, the other prime contractors will allege that the owner had the duty either to force the offending contractor to maintain the project schedule or to terminate it and hire another prime contractor (Cushman et al. 1983). Thus, in negotiating their contract, the owner and construction manager must decide which party will take primary responsibility and the consequent risk for project scheduling and coordination.

When a construction manager is used on a complex project, one of his primary obligations to the owner will be to coordinate the work of the project architect and multiple prime contractors, often using Critical Path Method (CPM) scheduling analysis for this purpose. To the extent that he/she has provided overall project scheduling services, the construction manager may be thought to have assumed an element of the traditional general contractor's usual function. If there is then a delay in project
completion because of the construction manager's faulty scheduling, the contractor may be able to shift liability for delay to the construction manager or the owner for whom the construction manager is acting as an agent (Lambert 1983).

The construction manager should be required to provide general project coordination. In addition to scheduling, such coordination services would include a review of all interfacing, interference, and potential labor disputes among multiple prime contractors. Since he/she offers the owner expertise in the area of scheduling and coordination, the construction manager's liability is most likely to be a function of the extent to which an owner delegates that duty and provides the power to enforce it.

Under the AIA CM contract where the construction manager acts in a professional capacity, it assumes the duty of advising the owner on scheduling and coordination, leaving the ultimate responsibility for scheduling and coordination with the owner. When the construction manager guarantees a maximum price, however, the construction manager frequently retains the requisite authority to enforce its scheduling and coordinating duties and, presumably incurs liability for breaches of those duties (Cushman et al. 1983; Brady et al. 1974).
A.11. Supervision and Inspection Services

Unless the owner has competent personnel to conduct supervision and inspection responsibilities, he/she needs either an architect or a construction manager to supervise and inspect the multiple prime contractors' work. Under prior versions of the AIA owner-architect and owner-general contractor agreements where the architect had the duty to supervise construction, and had the power to stop project work, architects were found liable to, among others, general contractors for failure to perform their supervision responsibilities. In reaching such decisions, courts relied upon the architects' duties set forth in their agreement with owners and owners' agreements with general contractors. In response to their expanding liability, architects through the AIA have altered standard AIA contract documents to mitigate the effect of court decisions (Clough 1986; Cushman et al. 1983).

The owner and the construction manager should negotiate specifically the extent of the construction manager's supervisory and inspection duties with particular attention to the meaning of such terms as "supervision," "observation," and "inspection." The AIA CM contract merely requires general supervision and inspection responsibilities from the construction manager (AIA Document B801, 1980, arts. 1.2.7 and 1.2.7.1.) In addition, the AIA construction management edition of the General Conditions of the Contract for Construction, the owner, as opposed to the
construction manager, retains the right to stop the project (AIA Document A201/CM, 1980, art. 3.3.1.).

The owner, however, may well desire that its construction manager assume more than simple on-site observation for its supervision and inspection services. If so, he/she should give the construction manager greater powers, for example the right to stop the project work and the right to reject work performed by the multiple prime contractors.

Where multiple prime contractors are under direct contract to the owner, each will presumably retain his/her customary obligation for operations. But the construction manager will usually be required to exercise overall supervisory responsibility. Such responsibility may exceed that of the architect, who will ordinarily not be required to make exhaustive or continuous on-site inspections to check the quantity or quality of the work. If the construction manager retains ultimate control to approve or reject all work done by contractors, he/she may be deemed also to see that contractors perform their work properly. Failure to do so may result in imposition of liability of the construction manager by the owner, the contractors, and even third parties (Lambert 1983).
A.12. **Review and Certification of Progress Payments**

The construction manager may be directly or indirectly responsible for progress payments to contractors and the issuance of payment certificates. The AIA CM contract provides that the construction manager is responsible to develop and implement procedures for reviewing and processing payment requisitions by multiple contractors. He/she is required to make recommendations with respect to payment and certification to the owner and its architect (AIA Document B801, 1980, art. 1.2.16.).

The owner and the construction manager must carefully negotiate this issue and the precise language of the provisions requiring the construction manager to review and certify payment requisitions. From the owner's point of view, of all the parties in the construction process, the construction manager probably has the most expertise and is in the best position to make such a certification. The owner may well desire the construction manager to assume greater responsibility for its review and certification of payment requisitions than it would expect of the architect in a traditional construction project.

A.13. **Change Order Assistance**

On any complex construction project where phased construction and multiple prime contracts are utilized, hundreds of changes occur. For each
change that occurs there are four significant ramifications: First, a time factor; second, a cost factor; third, an interfacement factor; and fourth, the interference factor. Most of the CM contracts require the construction manager to identify and recommend to the owner and its architect desirable changes to the multiple prime contracts, and to review and evaluate requests for change orders from multiple contractors. In addition, these contracts require the construction manager to assist the owner in the negotiation of the time and cost factors of such change orders (AGC Document No. 8, 1980, art. 2.1.9; AIA Document B801, 1980, art. 1.2.3.3.; CMAA Document No. A-1, 1988, art. 3.5.1.5)

In negotiating provisions of the owner-construction manager contract relating to change order assistance, it is critical that the owner realize in advance that identification and recommendation of a particular change to a multiple prime contract is only one small portion of the kind of assistance the owner needs. Once the necessity of the change has been identified, the owner needs prompt and competent advice on the impact of each such change on project time, cost, interfacement, and interference factors.

Indeed, as a result of such issues, other prime contractors may assert substantial acceleration or delay claims against the offending prime contractor, the construction manager, and the owner. Hence, the construction manager should be required to advise all possibly affected
prime contractors of each impending change and seek from them an advance evaluation of the change impact on their work.

A.14. Substantial and Final Completion Services

The construction manager should be required to summarize each multiple prime contractor's work and to prepare a punch list indicating incomplete or unsatisfactory items. After the preparation of the initial punch list, the construction manager should monitor each multiple prime contractor's completion of the punch list. He/she should obtain from the multiple contractors all the requisite affidavits, mechanic's lien releases, general releases, operating manuals, guarantees, required extra or spare parts, and, most importantly, as-built drawings in the possession of these contractors (Cushman et al. 1983).

As multiple prime contractors request final inspection of their work, the construction manager should establish inspection dates and conduct inspections along with the owner and its architect. In the event multiple prime contracts require the said contractors to train the owner's personnel in the operation and maintenance of particular equipment, the construction manager should ensure that the owner's personnel have received competent training and are prepared to continue the operation and maintenance of the equipment. Finally, he/she should be required to evaluate each contractor's final payment requisition, negotiate all remaining
change orders and extra work orders, and arrange for the owner to make final payment.

A.15. Coordination of Owner-Purchased Materials, Systems, and Equipment

Frequently, the owner will be purchasing specialized materials, systems, and equipment for installation in the project. Unless the owner intends to administer the procurement, delivery, storage, and installation coordination of such items, the owner should require the construction manager to assume those duties. He/she can also be involved in the identification and purchasing of these long-lead procurement items. Additionally, the construction manager should be required to monitor the fabrication of such specialty, owner-purchased items, to ensure compliance with the project schedule.

A.16. Safety Services

The owner must decide which party is going to be responsible for the identification, evaluation, review, and monitoring of multiple contractors' safety programs on the project. Prior to the emergence of the construction manager, architects were responsible for safety. Architects were traditionally subject to suit only by those with whom they contracted. Perhaps the single, most significant legal development with respect to architects' liability on
construction projects was the abolition of the privity defense to suits by injured third parties (Harvard Law Review, 1979, vol. 92, pp. 1081).

The architects' privity defense initially was eroded in decisions resulting from cases brought by injured third-party plaintiffs alleging architects' failures to maintain safe construction sites. Federal regulations, principally the Occupational Safety and Health Act (29 U.S.C. 651) and the Consumer Product Safety Act (15 U.S.C., sec. 2051), have imposed complicated requirements affecting the construction industry. As with duties relating to supervision and inspection, and certification of payment requisitions, once architects found themselves increasingly liable for safety-related duties, they have through the AIA attempted to withdraw from those duties and consequent liability.

The various industry CM contracts places the entire responsibility for safety on the construction manager (AIA Document B801, 1980, art. 1.2.4; AGC Document No. 8, 1980, art. 2.1.13.1; CMAA Document No. A-1, 1988, art. 3.5.4.7). Therefore, unless the owner intends to assume safety duties, he/she should require the construction manager all safety duties pertaining to the project. The owner and the construction manager should recognize, however, that such allocation of duties and risks places liability squarely on the construction manager.
The majority of reported decisions construing a construction manager's liability in any respect in the construction context involve the construction manager's liability for injuries to persons at the project site. From these decisions it is now clear that a construction manager is subject to OSHA as administrator and coordinator of all phases of construction including the safety program even though none of its employees is engaged in actual, physical construction work. The construction manager may also be liable for personal injuries sustained at the project site, depending upon his/her duty to the injured person, negligent performance of that duty, and the proximate cause of the injuries. His/her liability will be determined by the terms of the contract and his/her conduct at the project site.

A.17. Summary

This appendix focused primarily on the service activities of construction managers in industry today. This list is by no means exhaustive or comprehensive, but it draws attention to the more important responsibilities of the construction manager. It is very evident however that the construction manager's service activities to some extent overlap those traditionally performed by the architect and the contractor.
APPENDIX B

SURVEY QUESTIONNAIRES AND RESULTS

B.1 Questionnaire for Design/CM Firms

Name of firm:
Address:

Telephone No.:
Name & Designation/Title of Interviewee:
Date:

1. How many years has your firm been in business under the name stated above?

2. What is your definition of construction management?

3. How many years has your firm provided construction management services?

4. What range of services does your firm provide under the name stated above?
5. How many of your employees are assigned to CM services?

6. List in-house personnel in the following categories?
   - Field managers or superintendents
   - Project administrators or managers
   - Inspectors/Quality managers
   - Resource personnel
   - Support or administrative persons

7. Designate the technical level of all in-house personnel by category?
   - Engineers, civil
   - Engineers, mechanical
   - Engineers, electrical
   - Architects
   - Value Engineers
   - Planners
   - Attorneys
   - Business Administration
   - Computer Science/Data Entry
   - Estimators
   - Specification Writer
   - Others

8. Is the firm associated in any way with professional and trade associations?
   - If yes, what are they?
   - If no, why not?

9. What are the main procedures your firm use to acquire contracts?
10. What form and variation of CM services do you provide?

11. How is the form and variation of CM system determined?

12. What contract form(s) does your firm utilize, and reason(s) for your choice?
   (AIA, AGC, NSPE/ACEC, CMAA, etc., Custom)
   If its a custom form of contract, may I have a copy?

13. When performing CM services, do you hire out any particular portion(s) of the work?

14. List your specific experience as a construction manager in the following project categories.
   
<table>
<thead>
<tr>
<th>PROJECTS</th>
<th>No. of Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td></td>
</tr>
<tr>
<td>Industrial, Processing Plants</td>
<td></td>
</tr>
<tr>
<td>Health care</td>
<td></td>
</tr>
<tr>
<td>Educational</td>
<td></td>
</tr>
<tr>
<td>Correctional</td>
<td></td>
</tr>
<tr>
<td>Hotels</td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td></td>
</tr>
<tr>
<td>Civil Works</td>
<td></td>
</tr>
</tbody>
</table>
Renovations

Others

15. Does your firm have a preference of contract type for any of the particular project categories above?

16. Has the firm been involved in any sort of litigation / arbitration over issues pertaining to potential conflicts of interests?
   If yes, what percentage?
   What was the major problem?

17. What were the circumstances that led to the development of the problem?

18. Do see a particular reason why these contract problems developed? Are they dependent on the project type, or may be the owners, etc.?.

19. What in your opinion are the major areas of potential conflict of interest in the form of CM services that you offer?

20. What do you think are the variables that contribute to these conflict issues?

21. What strategies does your firm employ to deal with these issues?
22. Has any particular conflict caused your firm to alter its policies and procedures with regard to future work?
   If yes, which specific conflict?
   What policy changes were made?

23. What direction do you envisage CM will take in the future and why?
   In your opinion, what are its attributes and drawbacks? Give reasons.

24. What do you think it will take to make CM acceptable to the construction industry as a whole?

25. Outline the procedures used by your company to care for the responsibilities of design review and construction inspection on a typical project where you are both designer and construction manager?

26. Could you give an example of a good job and a bad job that your company worked on in the past?
   Why do you consider this as being good and the other bad?
   What were the major issues in the bad job?

27. How have owners been coping/handling such a situation?
B.2 Results of Design/CM Firm Survey

Name of firm: Company A
Address: New York, NY
Name & Designation/Title of Interviewee:
   Mr. Tom Li, Snr. Structural Engineer & Head of CM Dept.
Date: February 3, 1990.

Questions 1-8:
- Company has been in operation since 1947.
- Views the construction manager as the owner's agent.
- Company has been providing CM services for the past 8 years.
- Company also provides architectural and engineering design services, both locally and internationally.
- The CM department has a total of seventy-five personnel, in the following categories: Construction engineers, resident engineers, office engineers, senior inspectors, inspectors and surveyors. The technical level of all in-house personnel ranges from engineers (civil, structural, highway, mechanical, electrical, and HVAC), structural designers, estimators, architects, computer managers and specification writers. They are affiliated to the AWS, ASCE, ACI and IBTA.
9. Responding to request for proposals.
10. Design Extended Construction Management.
11. It is based primarily on the needs of the client.
12. Most of the projects they are involved in are for public clients, they use the contract of the respective public agency.
13. No, the responsibility of selecting contractors is done by the client. The extent of their responsibility includes supervision and inspection.
14. The following is a list of projects on which the company have acted as CM:

<table>
<thead>
<tr>
<th>Commercial</th>
<th>Bridges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational</td>
<td>Transit Authority</td>
</tr>
<tr>
<td>Correctional</td>
<td>Renovations</td>
</tr>
<tr>
<td>Tunnels</td>
<td>Research</td>
</tr>
<tr>
<td>Highway</td>
<td>Airports</td>
</tr>
</tbody>
</table>

Figures pertaining to the number of projects, were not available
15. No.
17. and 18. Not applicable
20. The fact that they are responsible for providing constructibility and design reviews during the design phases and subsequently perform inspection services during the construction phase, its generally felt that they may tend to overlook any errors or oversights on the part of project team.
21. Maintain regular communication with the client, keeping him/her informed with all problems and changes. Keeping the design and construction team separate.

22. No. However the company has from time to time introduced new policies that aids them to more efficiently carry out their responsibilities. One example of this is the preparation and signing of a daily inspection form.

23. and 24. It would appear that the future is bright for CM. This company has been doing a large amount of renovation projects as designer/CM, and the New York area has a great potential for such projects. Additionally, the scale of projects has been increasing immensely over the past years, and there is need for someone with the skills of the CM to provide coordination, along with adequate budget and schedule control.

25. • The company has a Manual on procedures to check quality. This is outlined to the client from the outset of the project.
  • Regular liaison with the design team and owner’s representative.
  • All reviews are recorded and submitted to the client.
  • Develop quality assurance program for project. The project team contributes towards this development. A copy of this program is committed to site personnel who ensures that all project work conforms to required standards.
  • The owner’s organization is promptly informed if the work done by contractors does not conform to specified standards.
26. and 27. • The Triboro Bridge and Tunnel Authority Toll Plaza was considered to be the best job done by the company, primarily because of the smooth running of the project and the good relationship with the owner that was maintained throughout the entire project. All contractors performed their assigned tasks excellently.

• There were no bad projects.

Most of the owners the company have dealt with are Public Agencies (many of which are repeat clients, with knowledgeable and well informed representatives), they have been trying their best to resolve any conflicts or problems as quickly as possible using a step-by-step process outlined in the company's manual of procedures.
Name of firm: Company B

Address: New York, NY

Name & Designation/Title of Interviewee:

Mr. Thomas Quaranta, Area Manager

Date: February 9, 1990.

Questions 1.-8.:

- The company has been in business for over 100 year, whilst the CM division has been in operation for about 25 years. The CM group is approximately 230 strong and falls under the umbrella of the company’s construction services division. The support staff of this division includes professional construction managers; resident engineers; architectural, mechanical, electrical, and civil inspectors; office engineers, construction attorneys, office managers, etc. Thirty percent of their staff are registered architects and professional engineers. The company is also a corporate member of CMAA.

9. Primarily request for proposals. The company also perform a large amount of public sector work.

10. Agency, and design extended services CM.

11. Invariably on the client’s needs. On occasions suggestions will be made to owners if they are unsure about what their needs are.

12. Contracts range from the AIA form to those used by public companies. The company is making a special effort to promote the use of the CMAA contract form.
13. No.
14. The company has immense experience on a wide range of projects viz.: Commercial, Industrial, Tunnels and Bridges, Highways, Landmarks, Maintenance Facilities for Transit Systems, Educational, Correctional, and Health Care facilities.
15. No
16. No.
17. and 18. Not applicable.
19. • Inspection of construction work on projects designed by the company;
   • Design review;
   • Situations where the company is a joint venture with another company on projects for the same owner;
   • Situations where there may be a dispute;
   • Instances where the CM also perform construction.
20. In each instance the company appears to have divided interests.
21. • The company has a step by step procedure to aid clients to visualize the magnitude of the project before the scope or extent of the company’s involvement is determined;
   • There is department policy that stipulates that a representative of the CM division must be present to ensure that the scope of work is well defined;
   • Separate contracts;
   • All potential conflicts are highlighted to the owner from the outset;
• All proposed changes are discussed with the owner or his/her representative.

• The company has a commitment to a quality project and the owner's interests precedes everything.

22. The company has made some adjustments in their policies, but not because of a specific conflict issue. The CM division will perform constructibility reviews on all projects whether the client pays for it or not. A more indepth review will be carried out on projects if the client requests it and pays for it. The company also modifies its procedure depending on the experience and previous dealings with clients.

23. and 24. As long as the construction industry remains fragmented and complex projects abound there will be a need for CM. In the New York area more and more Public Agencies are requiring separate service contracts design and CM.

25. The company has a manual of standards that outlines detailed procedures on both responsibilities.

26. and 27. Good project: The South Street Sea Port Water Development project for the City of New York, a $350 m project.

• All of the project participants were cooperative, and had a common goal;

• There was strict schedule control;

• The use of innovative materials.

Bad project: The interviewee was reluctant to name the project, however the client was the City of New York.
• The client did not have a clear direction;
• There was very poor schedule control;
• Contractors were unreliable.

Owners that are properly staffed and have a clear project direction are much better equipped to cope with conflict situations.
Name of firm: Company C
Address: Washington, DC
Name & Designation/Title of Interviewee:
   Rick A. Lincicom, Vice President
   Jeff Shram, Manager of Contract Administration
Date: December 21, 1989

Questions 1.-8.:
This company is a diversified services firm offering planning, design,
construction and post occupancy services. The design subsidiary
offers the following services: Architectural, engineering, interior
design, and landscape architecture. The construction services
subsidiary of the company, provides construction administration,
project management, cost estimating, scheduling, construction
management and design build services. The CM group is comprised
of six persons. Support services is provided by the construction
administration and project management group.

9. Contracts are acquired primarily on the basis of requests for
proposals.
10. Agency CM, Design XCM, and Design Build.
11. The owner's needs.
12. AIA-201/CM and AIA-B801a. The company also has their own
contract type which is used occasionally.
13. No.
14. These figures were not available, however the company successfully completed commercial, medical, health care and educational projects.

15. The company has expertise for medical facilities, however there is no preference for a specific contract type.

16. No.

17. and 18. Not applicable.

19. • Fee arrangement: the percentage fee and cost savings contract, and the cost reimbursable contract;
• Construction supervision and inspection;
• Design review;
• Disputes;
• Providing construction services.

20. Everything hinges on the fact that the company is "wearing two hats."

21. • All conflicts are resolved "in-house," with the design team and CM team ironing out thorny issues before involving the owner;
• Keeping the owner or his/her representative informed;
• Keeping the design and CM departments separate;
• To highlight and discuss all possible conflicts and key issues with the owner up-front;
• Maintaining a high level of trust with the owner, and always placing the owner's interests first.

22. No.
23.- 24. There is much more scope for CM in the construction industry. The fragmented nature of the industry lends itself for this service. More and more owners whose organizations are not sophisticated enough are looking to CMs to provide the much needed management and coordination skills. It is expected that many owners will look to traditional design firms to also provide CM services, since many owners prefer to deal with one entity rather than two.

25. • Keeping the design and CM departments separate;
• Each team will make an independent review of the construction documents, and all discrepancies will be discussed in-house;
• Firm commitment to providing the owner with a quality project.

26.-27. The Holy Cross Hospital project. The company worked very closely with the owner using the team approach. All decisions was reached on a team basis, and all problems was resolved expeditiously. The company never really had a bad job.
Name of firm: Company D
Address: Washington, DC
Name & Designation/Title of Interviewee:
   Ed Wilde, Project Controls Manager (Eastern Region Commercial Group)
Date: December 22, 1989

Questions 1. to 8.:
This group, which has been in operation for over 80 years, is a Design/Construct company providing comprehensive services in architecture, engineering, construction and program management, and project financing. In 1984 and 1985, it was ranked the largest architecture/engineering design and construction management firm in the United States, according to Engineering News-Record. With 3,000 employees representing a broad spectrum of disciplines in Planning, Facilities Programming Analysis, Project Management, Architectural and Engineering Design, Construction Management, and Project Financing. Services provided by the CM division includes, Contractor prequalification, scheduling, project accounting, contract management/administration, value engineering, cost management, purchasing/expediting, construction strategy planning, construction supervision, project certification/validation, and start-up supervision. 9. By means of requests for proposals.
10. Agency CM, Design extended services CM, GMPCM, and also some Design Build work.
11. Primarily on the needs of the client.
12. AIA A201/CM, the company also uses their own version which is based on the AIA A20i/CM format. I was however unable to obtain a copy.
13. Yes, this is done occasionally.
14. The company has completed a wide range of projects, but the figures on project breakdown are not available.
15. No.
16. None whatsoever.
17. and 18. Not applicable.
19. • Design Review, the possibility of the CM team overlooking or down playing errors, omissions, and poor design by the design team;
• Inspection services, the CM inspecting work done its own forces;
• CM also performing construction services;
• Change order negotiation by the CM for its own work;
• Disputes and claims resolution;
• Fee arrangement, cost reimbursable contracts and percentage fee and cost savings incentive.
20. It boils down to the fact that the CM is wearing two hats.
21. • Design and CM responsibilities are done by separate divisions, and different personnel;
• The design and CM functions are governed by separate contracts;
• Applicable conflict issues are discussed with the client prior to the signing of the contract;
• All differences between the design and CM teams are resolved in-house;
• Always applying honesty and integrity, and most of all placing the owner's interests first.

22. No.

23. and 24. There seem to be a bright future ahead for CM. More owners are utilizing the CM arrangement, primarily because of the flexibility it offers to them.

25. The project teams work closely in carrying out the design review responsibility. Each project has a qualified inspection team that ensures that work confirms to specified standards.

26. and 27. The company never really had a bad CM job. However the interviewee was very reluctant to divulge specific details about any good projects.
Name of firm: Company E

Address: Washington, DC

Name & Designation/Title of Interviewee:

   Goodluck Tembunkiart, Project Manager
   George Schwartz, Contract Administrator

Date: December 20, 1989

Questions 1.-8.:
Founded in 1946, this company is one of the leading design firms in the United States. Over the past ten years the company has been providing a small measure of CM services. It has a specific group (studio) that provides technical support services including construction documentation and administration. This group works closely with the design group on all projects. Project teams work closely with clients to achieve optimum levels of economy and design.

10. Design extended services CM.
11. The needs of the client.
12. Primarily the AIA format.
13. No.
15. Not really.
16. No.
17. and 18. Not applicable.

19. Design review and inspection services.

20. It boils down to the fact that the company is "wearing two hats."

21. • The company makes a special effort to keep the design and CM teams separate.
• The company limits its CM involvement to administrative responsibilities and will occasionally perform inspection services.
• Working closely with the owner in each project phase, thus ensuring that he/she is aware of all project decisions.

22. No.

23. and 24. There seem to be a great future for CM ahead. More and more owners are demanding better management systems, efficient schedule coordination, and higher quality standards on their projects. CM is an effective way of providing these services. Additionally, the very scope of some projects today warrants the use of CM approach. The question however is, should these services be provided by the the same company that designs the project? An increasing amount of projects are being done this way. If owners are comfortable with the system, and are willing to work closely with the design/Cm firm, then there is the likelihood that more owners will be using this arrangement.

25. • The company prepares for each client, a tailored project manual which sets forth administrative and documented management procedures to be used in administering the particular project;
• Employing a step by step process, each topic is thoroughly explained both narratively and graphically.
26. and 27. Most of the projects done by this firm has been successful, however the interviewee did not want to give specific information on any particular project, since he considered this to be proprietary information.
B.3 Questionnaire for Owner's Organization

1. What procedures does your firm use to acquire CM services?

2. What form and variation of CM services does your company utilize?

3. How is the form and variation of CM system determined?

4. What contract form(s) does your firm utilize, and reason(s) for your choice?
   (AIA, AGC, NSPE/ACEC, CMAA, etc..., Custom)
   If it's a custom form of contract, may I have a copy?

5. Has the firm been involved in any sort of litigation / arbitration over issues pertaining to potential conflicts of interests?
   If yes, what percentage?
   What was the major problem?

6. What were the circumstances that led to the development of the problem?

7. Do see a particular reason why these contract problems developed?
   Are they dependent on the project type, or may be the Designer/CM, etc.?
8. What in your opinion are the major areas of potential conflict of interest in situations where design firms also perform CM services?

9. What do you think are the variables that contribute to these conflict issues?

10. What strategies does your company employ to deal with these issues?

11. Has any particular conflict caused your organization to alter its policies and procedures with regard to future work?
    If yes, which specific conflict?
    What policy changes were made?

12. What direction do you envisage CM will take in the future and why?
    In your opinion, what are its attributes and drawbacks? Give reasons.

13. What do you think it will take to make CM acceptable to the construction industry as a whole?
14. Outline the measures your organization would take on a typical project where the Design/CM firm cares for the responsibilities of design review and construction inspection?
B.4 Results of Survey of Owner’s Organization

Name of firm: Company F
Address: Baltimore, MD
Name & Designation/Title of Interviewee:
    Dave Albright, Area Manager
Date: March 9, 1990

Background: This corporation is a developer for for a large corporate group.
1. The company uses the established concept of advertising for proposals.
2. Various forms, namely agency CM, design extended services CM, construct extended services CM, and guaranteed maximum price CM.
3. The CM form is based on our needs, and how critical the project duration is.
4. Both the AIA and AGC CM version.
5. No.
6. and 7. Not applicable.
8. We have only used this approach once, and in my opinion the major conflict issues are:
   • Fee arrangement, where the it is based on a percentage format and includes a cost savings incentive;
• Design review, the possibility of the CM not revealing errors and poor design by the designer;
• Inspection services;
• Decision on disputes;
• Instances where the CM also performs construction tasks.

9. With one company is performing two functions the owner is robbed of another perspective on the project, and there is always the possibility of the owner's interests being compromised.

10. • Utilization of separate contracts for design and CM services;
• Working closely with the project team, especially during the design phases;
• Maintaining a representative on site.

11. No.

12. There is great scope for CM in the future primarily because of the unique services being offered by CMs. Construction managers offer owners the expertise of budget and time control, these are both key considerations on construction projects today. The complexity of projects also necessitates the skill of a specialist to coordinate construction activities.

13. There is a definite need to educate owners on the advantages of the concept, and the many forms and variations being offered by CMs presently.

14. • To work closely with the project team, and being involved in the decision making process;
all inspection procedures and actual inspections.

- Have the organization's representative work closely with the CM on
  team as to how each aspect of the project will be undertaken:

- To ensure there is a definite procedure on the part of design/CM