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**Michigan
Society of
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Monthly Bulletin

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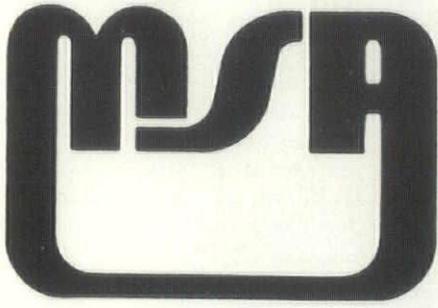
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The Architect and Construction Management



*Peter C. Darin, Jr. E.E.
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The process of design and construction of major projects is going to be managed; the only question is "who will do the managing?" The architect, or the architect/engineer is a logical candidate for the role of the Construction Manager because of his understanding of how to provide professional services for a fee. Construction Management calls for the same client/professional relationship, uncompromised by divided self-interests.

A serious misunderstanding of what Construction Management is, and what a Construction Manager does, has led a large number of unqualified people---professional, technical, and managerial---to self-appoint themselves as practitioners of an art they have not mastered. And unless the construction Manager is prepared to learn or assemble a number of skills not normally within any one profession's competence, he is not going to be able to act as a Construction Manager for a sophisticated client. The function of Construction Management goes far beyond changing a letterhead to include those two words.

What has brought about this surge of interest in Construction Management? Essentially, it arose because the building client has become dissatisfied with the ability of architects and the allied construction industry to provide a quality facility, and at the same time, to control the time it takes to design and construct it, as well as the total cost of the facility. In a time of rapidly escalating costs of both labor and materials, the client feels that the most effective weapon he has against building cost inflation is better management of the processes. Most architects, engineers, and contractors will admit that design and construction *have not* been managed nearly as efficiently as most business and manufacturing operations.

The logic by which the best modern management operates is that you must Plan, Organize, Implement, and then Control the process of whatever you mean to accomplish. In this case, to design and construct a physical facility.

While it seems obvious that the Construction Manager is expected to control both construction cost and the time required for designing and building the project, most owners are adding another criteria: the ability to understand and manage financial planning and cash flow requirements.

The architect cannot count completely on a demonstrated record of successfully managing the design process, although obviously, that is a first requirement. Even if his firm has mastered perfectly the management of his traditional phase of the project, it is only a part of a greater whole. The Construction Manager must be as familiar with all of the construction processes as a true general contractor; he must be as skilled in the area of cost control as a talented comptroller; as knowledgeable of scheduling control as a plant manager; and as financially savvy as an investment banker.

Now there is no intention to suggest that all of these talents must be centered in some Superman, some Renaissance man to end all Renaissance men. But what we have learned at SH&G through a series of successful Construction Management projects (and one spectacularly unsuccessful one) is that all of these skills must be represented on the Construction Manager's staff, immediately available to him.

As a result of our firm's experience, we believe that the following talents must be available within any firm offering Construction Management services:

1) *Design process experts.* They are completely familiar with the managers of the design process in all of the significant disciplines (planning, architectural, mechanical, structural, electrical and civil).

2) *Business managers.* These must not only be trained in, but experienced in, managing a business or process. But to fully understand the design and construction process, they must have a background in the estimating, negotiating and supervision of field projects, as well as a working knowledge of the design process either as an architect or as one of the engineering disciplines.

3) *Cost controllers.* In addition to knowing how to estimate the costs of the various systems in a building, these people must also understand the cost implications of all decisions made by the design disciplines. Value engineering, life-cycle costing, and owners' cost implications are part of this repertoire. As decisions are made and the design progresses, these cost controllers must be able to quickly and accurately estimate the cost of various design alternatives.

4) *Schedule controllers.* This skill involves an understanding of the contractors' time requirements in all of the trades, as well as the time needed by the designers, whose work is interdependent on one another (for example, the structural engineer must know the weight of the rooftop mechanical equipment before he can size his structure). Also, these people must be aware of the implications of all special knowledge they have of the construction labor and/or materials conditions in the project area. If one kind of specialized labor, like steamfitters, is in short supply in the project area, this information must be programmed into the decisions of the mechanical engineer on the selection of the HVAC system. And if the structural designer is choosing between concrete and steel, both the cost and the availability of these materials in the job area must be available to him.

5) *Financial expertise.* The Construction Manager must have on hand people who understand what the cash flow requirements of various projects will have on the owners. While the embarrassment of not having cash ready for payment of work put in place is obvious,

it is equally important that large amounts of money not be borrowed, nor bonds issued, too long in advance of when the funds are needed. It could mean extra interest paid, or borrowing at a disadvantageous time. This need to know how much and when money will be needed is equally important to the industrial or business client, a hospital board, or a school board, and poor advice can be costly. Any such extra cost of a facility adds nothing to its quality or its function. The Construction Manager must know the financial relationships of design decisions and the market for the project space. For example, a known rent structure will set certain size and cost parameters that can be exceeded only by risking the project's financial soundness. This is especially true in rental apartments and speculative office space.

The very breadth of the services required in Construction Management indicate that they will almost never be found in a single individual, and that a team of experts will have to be assembled. Since these should be top men in their fields, it means that they will be expensive, and it appears that only the larger organizations will be able to offer all these services under one roof, and will be able to secure the volume of projects that will make these services economically viable. However, it is perfectly possible for the smaller firm to assemble as a joint venture the kind of expertise demanded.

The general contractor, who may have top-quality civil, architectural and structural construction people, has a different problem in that he will have to add the mechanical and electrical construction people, plus the architectural and engineering design management and the financial expertise. Another entry is the management expert, who also owns but one leg of the stool, and will have to find both design and construction management people.

While Construction Management is important on the traditional lineal scheduling process of Program, Design, Bid, and Construct, it is absolutely vital to the success of any accelerated and overlapped process, such as Phased Construction, Fast-Track, or UTAP, or whatever. Under such systems, design decisions can be implemented as they are made without having to wait until the entire design process is completed and documents prepared for bidding.

But this can be successful only if the Construction Manager has given the designers all of the information they need to make those original decisions. For example, on one extremely successful project, SH&G was able to pour footings and order structural steel almost immediately because the client had accepted the criteria that the bay size would be 40' x 50', the buildings would be one-story and truss-roofed, and the HVAC would be roof-mounted. Obviously, this ruled out any later change to a high-rise structure, except at a predictable cost in time and money. While the designer might think of this as a constriction on his options, the design process always consists of a series of decisions building on the ones that went before. The traditional system makes the same irrevocable (because of cost) decisions, but they are not acted upon until the last one is made.

It will be the Construction Manager's ability to lay out a realistic construction schedule that will permit him to

identify the proper sequence and detailing of all the design and construction operations in order to make the most effective use of the time, money, and people resources at his command. Decisions on quality criteria remain the province of the owner and his architect, but the Construction Manager is responsible for recommendations on the time duration of design and construction, and the cost of construction. Unless it conflicts with an owner/architect aesthetic or quality standard, he will also be able to utilize performance criteria in the specifications.

During the implementation of these people, time and money resources, the Construction Manager must constantly monitor and forecast the progress, with special emphasis on the identification of variances and/or problems that threaten the Owner's objectives. He must take prompt and effective action to control those problems.

In an early stage of one of SH&G's projects, the Construction Manager visited a supplier's factory, and became convinced that there was no way that the deadline for some critical electrical equipment could be met, and that this failure would set back the project several months. Since on-time delivery was the Owner's prime objective, another manufacturer was located who could meet the delivery date, and the contract was transferred to him. On a traditional project, no action would have been taken until the manufacturer actually failed to deliver, and then the contractor would attempt to find a substitute. In this case, the early recognition of the problem and the prompt action eliminated any delay in the project.

Although the construction schedule gives sub-contractors specific dates for the beginning and the end of their work, one or another trade often falls behind, threatening the schedule of every trade that follows. In this case, the experienced Construction Manager will insist that the sub go on overtime, or add more workmen, to make up the time and progress he has lost. As an aside, we have learned that prompt payment of sub-contractors for work put in place insures that men will not be pulled off your job because some other job is more reliable in payment. Many of these contractors operate on a close margin, and quick inspection, certification, and payment, will give your job a high priority with these small businessmen.

The process of Construction Management is one of orchestrated teamwork, with the Construction Manager as the conductor (but not dictator) of the activities of Owner, Architect/Engineer, and Contractors. One of the surest ways for a project to fail to meet its objectives is to allow the Owner to avoid or postpone the decisions he must make, at the time he must make them. As the Owner, he has the right not to make them, but the Construction Manager must make crystal clear the cost in time and money of such a delay, so that the Owner's decision (or non-decision) is an informed one.

How do you assure this kind of decisiveness? One successful tactic is that of regularly scheduled meetings, with a pre-published agenda of all problems that require decisions, and the stipulation that every item on the agenda **MUST** be resolved before the meeting is adjourned. Under such a stricture, it is amazing how many tough decisions get made quickly!

While many architects and architectural firms will not be interested in providing this CM service, and will prefer playing the traditional role of design architect, working closely with the other design disciplines, one fact has to be faced: projects are going to be managed by somebody.

This does not imply any diminution of the role or responsibility of the design professional. In fact, there are some important advantages to be gained. The designer will get a crash course in how to manage his own design process that should make him more efficient and more profitable. He should be able to eliminate the false starts and re-starts in design that come from getting facts too late to prevent errors or false premises. And he will get an education in how the other parts of the process function that should improve his own skills, as well.

To summarize, any professional or firm interested in doing Construction Management must broaden the skills available to include all those we have named. The architectural firm with a sound background of managing all of the other design disciplines starts with the same excellent potential as the A/E.

Construction projects are going to be managed, and this responsibility is going to be given to those who know how to manage the processes from beginning to end. Some of these managers will be architects or architect/engineers, some will come from the ranks of the general contractors, and some may even come out of management consultant firms. The field is wide open, may the best manager win.



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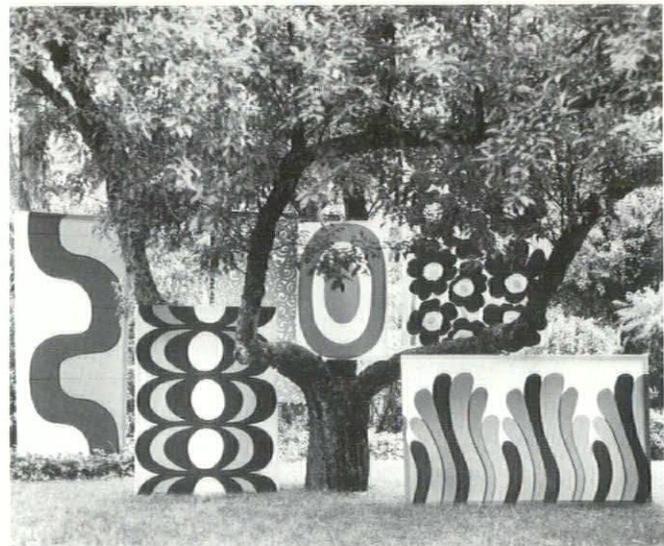
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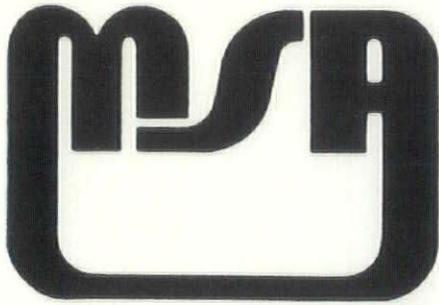
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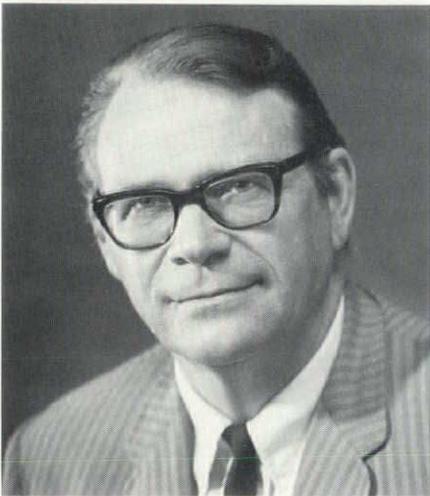
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THIRD PARTY, CONSTRUCTION BASED CM



C. E. Haltenhoff is president of Elzinga & Volkers, Inc. of Holland, Michigan. A graduate of LeHigh University with a Bachelors Degree in Civil Engineering, Haltenhoff joined the firm in 1965 after eleven years in the Upper Peninsula, where he served as Project Engineer for Merritt, Chapman and Scott Corp. on the construction of the foundations for the Mackinac Bridge. He later served the Mackinac Bridge Authority as

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CM IS NOW

It is apparent that the credibility of construction management as a mode of contracting has been established. From our position as Construction Managers, we can substantiate its validity on both public and private work in the one to fifteen million dollar range. It is certainly safe to say that CM has arrived and is maturing at a varying pace in all parts of these United States. Briefly, this is a status report on construction management as we view it in Michigan.

Our records indicate that during the past four years, projects that utilized third party CM techniques demonstrated economies and efficiencies unavailable to projects not using CM techniques. The record also shows an ever-increasing number of CM projects as owners and architects are rapidly accepting the concept by becoming aware of its advantages in saving both time and money. The rapid rate of construction escalation coupled with the acute shortages of certain materials, has assisted the advocates of CM in their effort to convince those interested in the status quo.

MATURATION

The future looks bright for construction management and as a result the entire construction industry has gained credibility at a time when it needed it most. This

is not to imply that all is running smoothly and that controversy does not exist. On the contrary, CM must still endure its remaining maturation with all of the inherent problems of growing up in a somewhat puzzling environment. CM is faced with the impressive

task of converting the remaining disbelievers. Progress in this area will be slow, for as with any new philosophy, the initial acceptance is by the progressives who are susceptible to change. Those who resist change, always require an unproportionate time span before accepting something new.

As far as the environment is concerned, it is most difficult for those of us who live with CM on a daily basis to understand the attitudes and fears that some professionals have, concerning the presence of CM in our midst. A truly objective study of what CM does and how it does it, will most certainly establish its credibility and validity to any willing listener. Our experience has indicated that many professionals have preconceived ideas about CM that tend to eliminate any further desire or ability to become adequately knowledgeable. This lack of inquisitiveness, for whatever reason, precludes a value judgement and maintains a negative evaluation in an unnatural way. Because CM cannot fully mature until the professional environment is clear, leads one to suggest that those with deaf ears are

purposely adamant in their reluctance to become exposed to the real facts about construction management.

GROWING PAINS

One of the major growing pains of the maturation process is the self controlled entry of new firms into the CM field. Many firms enter the field full speed without fully understanding the ultimate responsibilities of providing construction management services. They develop their program as an on-the-job training exercise, so to speak. Proper construction management cannot be provided under these conditions and disillusionment and dissatisfaction soon become obvious to the architect and the owner. These situations have most certainly generated many pre-conceived ideas and have undoubtedly damaged the credibility of construction management to a considerable degree. These experiences must be eliminated if CM is to move toward unqualified acceptance in our industry.

On the other hand, some firms enter the construction management field with no real intention of providing the full scope of services that are required to effect the maximum efficiencies and economies inherent to a total CM program. An experience with a firm having this philosophy leaves an owner somewhat impressed, but wondering if he really got his money's worth out of the results of the abbreviated CM effort. The nature of CM precludes satisfactory results from less than a total effort. In order to be effective the CM involvement must be comprehensive and expert in every way.

SOURCES OF CM

We have categorized CM firms as contractor based, design based, design/build based and independently based. Each category has its own inherent features and they differ considerably one from another. Regardless of the varying backgrounds and resources, each firm should be equipped to provide nothing less than total CM services to their clients. Understanding the fact that CM services extend from the very beginning of planning and continue through occupancy and the project warranty period, it becomes clearly evident that the design/build firm which has talent, resources and experience in every facet of the construction process is best suited to provide CM services. What's more, as an everyday participant in both the design and construction fields the design/build based CM remains current in his knowledge and accurate in his participation as a member of the building team.

This doesn't say that CM firms with lesser backgrounds cannot compete with the design/build CM in the accountability of services provided, but it is an indicator of where the weak areas will appear in their programs. It is reasonable to assume that a contractor based firm will not have professional design practitioners on his permanent staff. This represents a resource deficiency that must be overcome in order to provide CM services.

However, the contractor based CM probably has the least serious staffing situation to correct because his design function as a CM is secondary to the architect/engineer team member. The CM's design resource contributes mainly to the review of specifications and bidding process conformation, however, some CM overview of the design is required. Also familiarity with design parameters for various types of facilities is mandatory to insure a complete understanding of project goals. Although the contractor based CM can solve the design deficiency by employing architectural or engineering talent, the resource situation is not the best because the day to day involvement in the design profession as a practitioner is missing. The obvious alternative to in-house availability is of course contracting for services from an outside source. This is second best, but certainly acceptable.

In contrast to the contractor based CM, the problem facing the CM that is design based is where to obtain knowledgeable and current construction input. After all the name of the game is construction management and solid construction input is what the client deserves. The owner already has a competent architectural or design team member and is in need of construction expertise to properly support the function of the team. Regardless of how much construction oriented talent the design based CM employs, its effectiveness will fall short unless there is active involvement in construction, as a contractor, on a day to day basis. Architects are not contractors so in order to obtain current and useful construction input, sufficient to fulfill the CM obligation, the design based CM must seek outside help from a functioning contracting source. Unlike the contractor based CM, where the utilization of outside design resources was second best, in-house contracting resources rate as second best to the design based CM.

We have commented on all categories except the CM that operated independently, and is not a part of either a design firm or construction firm. However, a conclusion with regard to the probable effectiveness of an independent CM firm can readily be drawn from the two previous discussions. There is no operating resource from either design or construction disciplines. In-house personnel are not practitioners in their areas of expertise and contracted services never seem to reach the level of involvement that the owner deserves. Although independently based CM's have both options available to provide CM resources to the team, neither option is totally adequate to satisfy the obligation of a CM involvement.

THIRD PARTY CM

Regardless of the construction manager's origin, in order to be totally effective the CM must have a third party position on the team. The catalytic effect of the CM, on the traditional owner-architect relationship is in itself a major asset of the CM concept. To deny an owner the benefits of third party input is to deny him a

fair share of the reason for the success of construction management to date. Our experience as well as the experiences of others, clearly shows that the three person team concept provides a new and effective vitality to the planning and design stage of the project. Owners consistently express their appreciation for the second opinion that is available on third party CM projects. Architects and engineers acquire a new level of confidence with respect to budgeting, scheduling and contracting procedures with the assistance of the new construction oriented team members.

CREDIBILITY

There should be no controversy over the opinion that the effectiveness of construction management is overwhelmingly dependent upon the ability of the CM to provide accurate, dependable and timely construction oriented input to the project. One obvious factor that was totally absent from the general contracting mode was construction oriented input during planning and design. CM organizations that are integral part of an active and reputable construction firm are certainly in the best position to provide valid and creditable input to the CM team effort. What better budgeting can you get than from an active, practicing construction estimator, that puts his pricing ability to constant test in the general contracting, competitive bidding arena. Who is better aware of labor conditions, material availability, effective bidding procedures, contracting methods or construction scheduling than an active contracting practitioner. Complete knowledge, derived from daily involvement in contracting procedures provides credibility to the construction based CM.

MANAGEMENT

To make the building team effective the CM must have a defined and tested management control system. Without the means to motivate and monitor the activity of the team and coordinate progress, construction management contracting would be virtually useless. Whereas the management control system is vital to the coordination of the construction phase, much of the efficiency and economy of CM centers around the utilization of the management control system during planning and design. Throughout this period efficient cooperation of all team members is generated and maintained at an exceptionally high level. Owners are obliged to render decisions and take scheduled actions. The commitments of the architect and engineer are expedited. CM input is regulated to respond to the pace of the schedule.

COMPUTERIZATION

It is difficult to visualize a construction manager operating without computerization of his management control system. It is almost as difficult to visualize a CM that did not develop the system he uses. The

effectiveness of the control system depends upon timely and proper implementation and is maintained by timely and efficient updating as the project moves ahead. Because both projects and teams differ substantially, it is most desirable to be able to adjust the management control system to fit the varying circumstances. Complete familiarization with the components of the system, plus available talent to implement the appropriate components to fit the project, are both very necessary CM resources. The ultimate in management control system convenience is an onsite computer and an in-house staff to make it function.

NO HALF WAY CM

We have tried to present what we consider to be essential elements of potentially effective construction management organizations. We have purposely avoided detail, because it is our opinion that without the broad resources, the probability of providing a satisfactory end result is zero. Our target in all of our CM involvements is total and complete immersion in the process, for here is where the maximum benefits of CM contracting lie. There is no room for compromise in our program for as soon as less than all is committed, the efficiencies and economies that are inherent to the program are compromised also. This does not mean that we are unbending or severe in our team relationships. On the contrary, we are pliable and flexible and perhaps overly conscious of the other team members' constrictions because our program is sufficiently developed to afford the luxury of this concern and allow for concessions without sacrificing effectiveness.

We have incorporated into our program every possible method and procedure that will provide maximum economies and efficiencies to construction projects. We approach each involvement with the intention of doing it all. If and when we pull back from any aspect, it is strictly because it can't be done and not because we can't do it. If there is any dogma in our E&V/CM program, it lies in our determination to provide complete CM involvement.

CM EFFICIENCIES

The potential efficiencies of CM are obvious and for the most part easily explained and understood. They revolve around the project time element and the intervals of design, delivery and construction. Time saved at any point in the project is beneficial to the owner. For all practical purposes, time saved during the project is beneficial to everyone including the architect, engineer, CM and the contractors. In our present-day construction market, time saved by productively utilizing the long delivery periods of scarce material, has effectively reduced the impact of material shortages on project time spans. These procedures, commonly referred to as fast tracking and phased construction are popular and effective CM tools. When properly instituted and controlled, fast tracking and phased construction have a

substantial accordion effect on the total project duration.

Other efficiencies derived from increased contractor input to the bidding process, better control over product utilization, exposure of the construction process, more effective contact with the project, more equitable price negotiations and improved field coordination all add up to a more confident and knowledgeable involvement for both owner and architect. Third party, construction based CM has the proper position and necessary resources to effect these efficiencies.

PROGRAM SCHEDULE

Third party, construction based CM brings to each project a time monitoring program of planning and design that will fit the overall project need. The considerations are based on construction input and reflect progress potential, seasonal factors, structure types, long-range items and the overall construction outlook. To be objective this input must originate from a third party and be based primarily on the obvious contracting and construction possibilities. At times the recommendations of the CM put pressure on the owner or the team design member, however, the recommendations are based objectively on project value and on parameters subscribed to by all team members through agreement. At the outset of the project a schedule is established with positive goals in mind, the CM, through his management control system, monitors the schedule and guides the various decisions and actions to fruition. E&V/CM refers to this process as the Program Schedule and has achieved excellent success in conveniently bringing greater time efficiencies to the planning, design and phased construction period of the projects we have been associated with.

CM ECONOMIES

The potential economies of CM are by far the most difficult CM benefits to explain to owners and architects. The basic reason for the difficulty lies in the fact that the major savings are derived from contracting procedures and neither the owner nor architect are in that business. To a contractor the savings are obvious and represent a substantial dollar amount. Basically they are effected through comprehensive competition and the elimination of profit on profit. Both of these items, uncontrollable in the G.C. mode, are very controllable under the CM mode.

When general contractors assemble their proposals prior to the submittal of bids, they markup their subcontractors' proposals as part of their overall profit. The subs already have included their own profit in their submitted figures. Thus the term profit on profit. Under E&V/CM and most other contractor based programs the work is separated into many divisions, each one somewhat similar to the subcontracts under the G.C. mode. Individual bids are received by the owner for each division of work. As a result, only the "subcontractor" profit is included. E&V/CM uses as

many as 50 separate and distinct bid divisions in achieving this economy.

MULTIPLE BIDDING

Individual proposals for each bid division are received in a highly competitive situation. This does not occur under the G.C. mode where sub bids are mostly received over the telephone and are only as firm and as competitive as verbal communication permits. Most subcontract "awards" under the G.C. mode occur long after the G.C. bid date and are "negotiated" based on the financial situation that exists with respect to the G.C. figure for the project.

E&V/CM basically establishes a one time — one bid situation that extracts the best proposal from each bidder, makes it firm and competitive and leaves no room for negotiations that result in savings for anyone but the owner. When you consider the fact that usually ninety and sometimes one hundred percent of the G.C. bid is subcontract in nature, multiple bidding becomes the substantial economy of CM contracting. It can be easily seen that the finer the breakdown the greater the savings to the owner. The CM that lumps the work into a dozen or so major divisions is not providing the maximum financial advantage to his client.

It should be apparent that the establishment and administration of a proper multiple contract procedure requires a construction manager with total contracting involvement. Besides the knowledge and ability required to separate the divisions of work into acceptably bidable segments, the CM must also be confident that the interfaces between each bid division is logical and understood. Of course, the administration of thirty or forty contracts requires its own expertise as well as the ability to properly and efficiently coordinate the work of the contractors in the field. The E&V/CM format provides for these seemingly complex conditions and makes them common to all projects. Contractor based CM firms can accomplish this procedure because familiarization with contracting methods at the subcontract level is inherent to a construction organization. Design based firms on the other hand must resort to the lumping process because they do not have the necessary construction involvement to do otherwise.

VALUE ENGINEERING

Perhaps the major concern of the design profession and probably the one that has generated the most preconceived ideas against CM, is the term value engineering. For some reason V.E. has been erroneously pictured as telling the architect or engineer how to design and what to detail. If this completely false impression could be removed, many of the hold-outs would quickly become CM advocates. Value engineering is not a subjective exercise in our E&V/CM program and we doubt if it is in any other contractor based program. In direct contrast however, a design based CM can hardly avoid a subjective involvement in the design

function especially if the CM firm is affiliated with the architect on the project.

Value engineering is essentially a process of exposure. It depends upon open minds, objective input and logical decisions by the team. It encompasses budget reviews, scheduling, alternatives, procedures and methods. The intended result is complete review of all possibilities where owner dollars are involved. In our experience it has resulted in both increased and decreased square footage, product changes, phased and un-phased construction, alternate proposals and even increased budget amounts before projects went into the design development stage. V.E. is not forced to any team member under our particular program.

Our experience places the savings produced through value engineering about midway down the list. Depending upon many project factors, the savings could be significant or somewhat less than that. You can be assured however, that some savings will result from V.E. on every E&V/CM project. Our third party situation and our inherent contracting and construction knowledge assure this.

Much of our CM activity has been school related and many of the design professionals we have worked with are exceptionally expert in this field. There is seldom any design oriented V.E. that we can provide in these involvements due to the fact that their expertise inherently includes economical design features and details. However, we find many opportunities to effectively apply V.E. to other aspects of the project where our construction and contracting expertise takes precedence.

GUARANTEED MAXIMUM CM

One of the less popular forms of construction management in the 1 to 15 million dollar project range is maximum price CM, where at some point in the process the CM obligates himself to a guaranteed maximum cost figure for the project. In effect he converts himself from a team member to a general contractor in the full sense of the word except that he does not participate in the savings below the maximum cost. All are returned to the owner. An added CM fee is charged to provide this feature which in itself is usually larger than the basic CM fee. The total fee extracted by the CM is unproportional to the project volume and a good portion of it is only earned by virtue of the guarantee provided.

Maximum price CM tends to drive budgets up in order to avoid a costly overrun that will erode the CM fee and drive quality down in order to similarly protect the CM if the initial insurance effort falls short. Value engineering definitely becomes subjective in the process and the team concept is replaced by the traditional adversary relationship once the guaranteed maximum situation begins. Guaranteed maximum CM certainly has a place in present day contracting, however, broad sweeping changes must be made in the procedures and

requirements before it will provide the generous economies of pure construction management.

PUTTING IT ALL TOGETHER

In all that preceded we have expressed a vocational point of view. CM is far too advanced to be discussed academically. It has been natural for us to expound upon E&V/CM, because it represents all of the principles, techniques and procedures that we believe construction management requires if it is to fulfill its promise.

Construction management can stand on its own merit in spite of the fact that it is still maturing. In all cases of E&V/CM involvement our fee was less than the extracted economies. Yet this should not be the measure for justification as it so often is. Construction input to a project, as it is required and when it is required, should in itself justify the CM fee providing the input is accurate and vocations.

The most potent use of construction management has to come from a third party situation where the CM has no other interests than to serve the team as the construction expert. This precludes involvement in any actual construction. The most effective use of construction management will be derived from a CM that is directly affiliated with a construction firm and has a secondary relationship with a design firm. All else being equal, the above situations provide the obvious advantage to a construction management experience.

FINAL THOUGHTS

Our role as a team member with at least ten Michigan architects has been gratifying with no exceptions. This should not be misconstrued to mean that every experience has been without ripples. We have had our differences of opinions and our periods of conflict within the team structure. We have found for the most part that our problems originated from a lack of early understanding of each other's roles and responsibilities. Because of the first experience situation, some misunderstanding was to be expected and we had compensated for this as best we could by over-communicating at the outset of the involvement. Apparently, even this extra effort was not sufficient to solve all misunderstood or pre-conceived impressions that surfaced during the course of a project. However, without exception, the team managed to function and, in spite of the ripples, the desired end results were collectively achieved and the owner well served.

We are certain that as CM becomes more familiar and the language more articulate, the ripples will disappear and the CM team concept will be a totally productive process carried out in an efficiently cooperative atmosphere. Our own prognosis for CM is go.



Architects Active in Social Change

Begun as a national project in 1967 by the AIA, the local CDC effort is one of 70 programs in the country. AIA adopted CDC projects as a priority so architects would be involved in efforts to effect social change and improve conditions for the poor, says David Byrd, AIA, President of the Huron Valley Chapter, AIA.

Recently through the CDC a revolving fund was established to help students pay tuition to Washtenaw Community College (WCC) until

they received reimbursement from the federal government. The fund has already received a \$300 donation from Delta Sigma Theta sorority and a \$600 contribution from the Washtenaw Contractors Association.

When the WCC students repay the loan to the revolving fund, it enables other students to borrow from the fund.

A number of buildings projects in the community have been done under the auspices of the CDC. Byrd says the center is currently

cooperating with a group of families in the Forest Hills subdivision in an effort to have a parcel of nearby public land declared a public park. The land, which is now barren of trees and plants, would be landscaped with money provided by a fund held by the city.

The center developed plans for converting the old Arnet tombstone factory at 218 Chapin St. into a church. Members of New Hope Baptist Church and men in the CDC building trades training program have worked for 1½ years on the project, according to Byrd. The youth of the church are learning carpentry skills while helping on the building project, he says. In projects such as the New Hope Baptist Church local architects donate their design talents.

Byrd, who teaches architectural technology at WCC, says through the CDC black contractors are getting contracts they can hire minority persons who are learning the construction trades.

Construction trainees from WCC have built a multi-media teaching center for WCC and remodeled an old stable to create an office for Byrd. Because he is chairman of the CDC projects committee, the office also serves as headquarters for CDC.

Trainees are converting an old brewery at 724 N. Fifth Avenue into five apartments under an Ann Arbor Code Enforcement Project. About 8 to 10 men are working on the project.

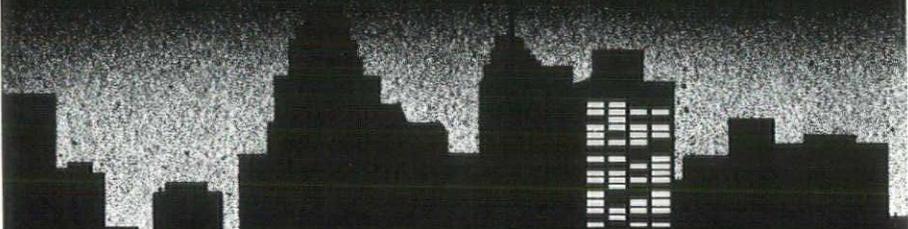
Trainees also have been involved in renovating the Alpha XI Delta sorority house, 904 Lincoln, the chapel at First United Methodist Church and a house at 625 Fountain.

Under a black contractor who hires minority persons, students from WCC are building a new home on Base Lake. The students attend school part time and are paid for their work on the project.

Byrd says the men ranging in age from 18 to 50 participating in the work-study program at WCC earn between \$5.50 and \$12.50 an hour on the projects in which CDC is involved.

About 40 students at WCC are involved in the building trades

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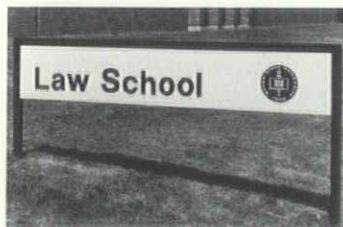
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program. Of those, about one-third are black according to Byrd.

Members of the CDC committee are Dr. James Chaffers, Professor of architecture at U-M; Rosemary Papp, who has a masters degree in architecture and works with Byrd; Vernon Williams and Arthur Symes, doctoral candidates in architecture at the U-M and teachers at WCC.

(Reprinted from an article in the Ann Arbor News by Mary Jo Frank, about the Community Development Center of the Huron Valley Chapter, AIA.)

Inaccurate Cost Estimate is Breach of Contract

The Supreme Court of Michigan has upheld a lower court's decision that an architect's gross underestimation of probable construction costs constituted a breach of contract that could cost the architect his fee and make him liable for the damages of the owner.

An architect and an owner entered into a standard architectural contract for the design of a building that required the architect to submit a statement of probable construction cost based on area, volume and unit costs.

Based on the architect's estimate that the building would cost approximately \$40,000, the owner, who was also the general contractor, went ahead with the project. Four years later and after more than \$60,000 had been spent, the building was only partially completed and an additional \$20,000 would be required to finish the job.

The owner brought a suit against the architect to recover damages for the architect's malpractice, claiming that the architect's error had breached a contract that required an accurate estimate of probable construction costs.

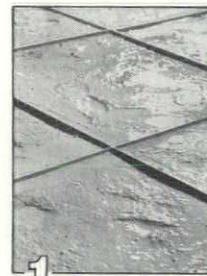
The architect countered that the estimate was not prepared as a guaranteed or firm figure, rather it was merely an opinion. He cited the contract that provided "The architect cannot and does not guarantee that bids will not vary from any statement of probable construction cost or other cost estimate prepared by him."

Harper Hospital in the Detroit Medical Center... Terrazzo



Harper Hospital's Webber Memorial Building has 22 operating rooms, a large surgical recovery room, and extensive X-ray and laboratory facilities. In the operating area, conductive floors were imperative, cleanliness and ease of maintenance were critical — TERRAZZO, a natural!

Architect: *Smith Hinchman & Grylls Associates, Inc.*



1 TERRAZZO subbed divided by plastic strips.



2 Placing and compacting TERRAZZO topping.

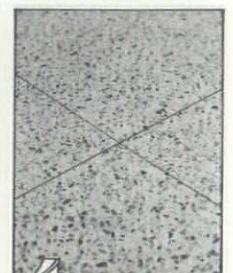


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A lower court had rejected the architect's arguments and found that he had breached the contract and was liable for the damages sustained by the owner. The question before the Supreme Court was whether sufficient evidence had been submitted to warrant the lower court's decision.

In its review, the Supreme Court noted that the lower court had ruled on the spirit and purpose of the agreement rather than the specific language. And it had stated, "The fact that the costs exceeded the estimate substantially was sufficient to prove a breach of the architect's contractual duty to render a reasonably accurate statement of probable costs."

In regard to the damages, the court went on to say, "Any architect who substantially underestimates the cost of a proposed structure . . . may not only forfeit his right to compensation but may also be liable for damages."

After hearing all the evidence, the Supreme Court concluded that the case had been properly presented and sustained the lower court's decision that the contract had been breached.

*Edited by Mr. Michael S. Simon
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* Kostohryz V. McGuire, 212 N.W.
2d 850 (1973)

J. Gardner Martin Retires From GLF&E



J. Gardner Martin, P. E., has announced his retirement as Executive Vice President of the Great

Lakes Fabricators and Erectors Association.

Martin had been associated since 1964 with the organization which maintains offices in Detroit.

Long prominent in Michigan construction circles, Martin will continue activities as a structural consultant and organizational and public relation advisor.

Prior to affiliation with the Great Lakes Fabricators & Erectors Association he served from 1948 to 1964 as Michigan District Engineer for the Portland Cement Association with headquarters in Lansing.

Martin has been active in many professional and civic organizations, serving as former board member and state vice president of the Michigan Society of Professional Engineers of what he is a charter member and as past president of the Michigan Good Roads Association.

He is a fellow in the American Society of Civil Engineers, a fellow and charter member of the Engineering Society of Detroit, and a charter member of the Michigan Association of the Professions. He is affiliated with the American Welding Society, American Institute of Steel Construction, and Society of

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Military Engineers. He is a former member of the American Concrete Institute, Michigan Engineering Society, American Road Builders Association, and Michigan State Chamber of Commerce.

Giffels & Volvo in Virginia

Volvo broke ground in Chesapeake, Virginia for the first foreign car manufacturing plant in the United States. The initial segment of the plant will total 750,000sf and by phased construction will ultimately reach 2 million sf. Engineering services for the overall project are being performed by Giffels Associates, Inc.

The project represents Volvo's largest single investment, not only in the United States, but in the world, with a total investment for the project approximating \$150 million.

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The description of the State Legislative process in the May issue of the Monthly Bulletin contained an error in step #4. The article should have indicated that if the chamber of origin accepts the changes made by the second chamber, the final version is considered enrolled and is sent to the Governor. A bill is sent to a conference committee only when one chamber has not agreed to changes proposed by the other.

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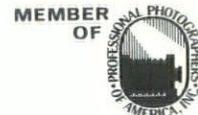
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Mt. Pleasant Kmart Uses Stage Construction for Lot

Stage construction, used many times in the past for K Mart shopping centers, was also utilized this past year for their new location in Mt. Pleasant.

A hot mix asphalt base of 4½" in the parking area and 5" in the service drive area was put down early in the year and used for clean, mud-free storage space and as parking space for the various sub-contractors.

When construction of the building was completed The Hicks Company finished the paving job with a wearing course of asphalt and the center was open for business.

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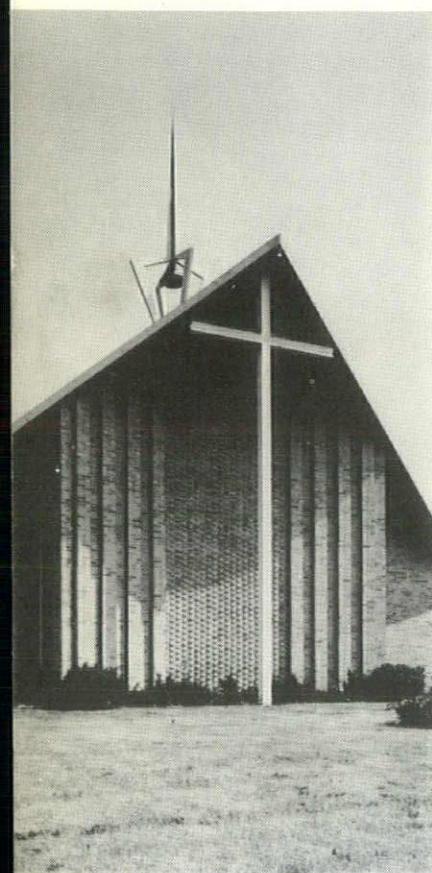
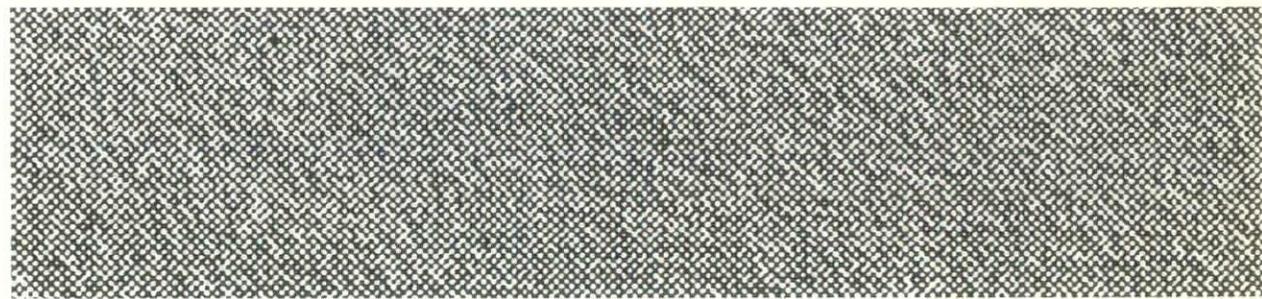
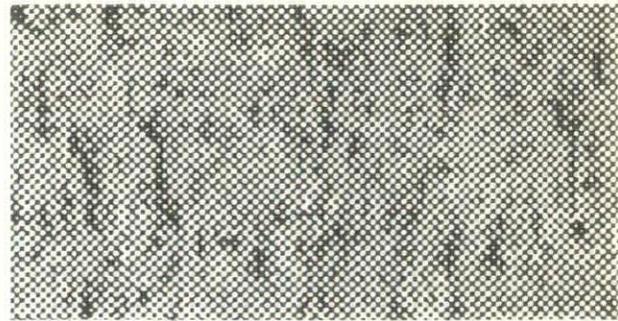
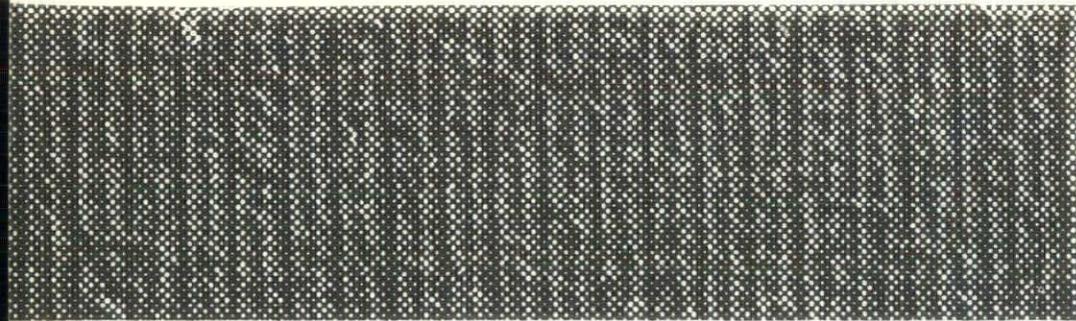


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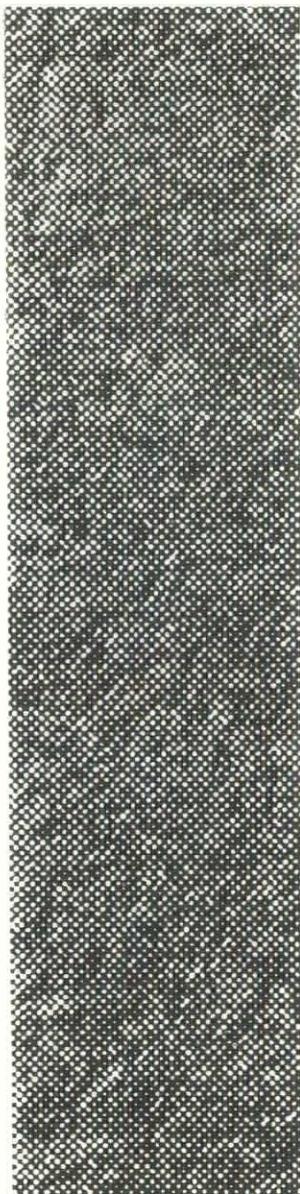
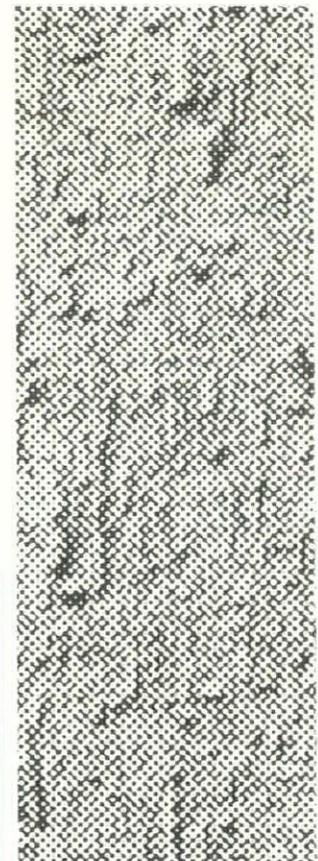
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