A Dozen Ways a Construction Owner Can Save Money
Of the Construction of a Building Project

By Michael Carringer, FCPE
Executive Vice-President
Foxcor, Inc.

To The SRAPPA Convention in New Orleans, Louisiana
November 2, 2004

The original title of this paper was “A Dozen Ways (and Counting) Owners Waste Money on Construction Projects.” It was probably not the most politically correct way of describing the topic but it expressed my feelings at the end of a long day of project struggles.

During the last decade my company has worked on hundreds of projects ranging in size from five million dollars to one billion dollars. Our involvement has been at times from the beginning, at times during the middle, and at times at the end of the construction process. We have reviewed thousands of change orders (over 7,500 on one project alone), numerous design proposals, hundreds of contracts, and thousands of construction drawings at various levels of completion (26,000 on one project alone.)

Given this mountain of recent experience we have had occasion to reflect upon project success and lack thereof and to attempt to identify the common elements that lead to one or the other.

When projects are not successful there is of course plenty of blame to go around. The construction team, the designer and the owner all share to varying degrees depending upon the particular set of circumstances. And indeed much of the literature, lawsuits, etc., seek to apportion blame. What we have found in many instances is that owners are not fully aware of how their actions influence the final project results.

Our experience with less than successful projects has led to an investigation of the elements of the projects which owners influence and which not properly done may lead to project problems and wasted owner’s money. This paper will discuss a number of those elements and recommend ways to correct them if they exist.

Construction Program

There must be an idea and a need before anything happens. It may originate on the back of the proverbial cocktail napkin or be a multiyear master program, parts of which get moved up in the queue on a regular basis.

But it is the translation of the idea into a space program where problems often begin to develop. As a rule, the more detailed the program the more opportunity to carefully think needs through. The more detailed the program, the more sets of owner eyes can view it, and the less mistakes made. A laboratory building, for example, will require the input of the scientists who use the space, the administrative staff, the custodial staff for custodial staff space requirements and the building facilities staff for mechanical and electrical spaces. If there is food service, the food service staff will need to be consulted. Oftentimes one or more of these user groups are left out of the programming phase. We are not as yet discussing spatial relationships but pure spaces needed. Prior to engaging a design team, the owner should have as clear a view as is possible of its space needs in as much detail as the owner can generate.

In addition, during this period the owner can begin to conceive of the type of facility it would like from an appearance standpoint. What type of facility conveys the owner's understanding of the project, is it a Mayo Clinic or a neighborhood clinic? Is it stately or utilitarian?

This preparation work serves a number of useful purposes, the most useful of which is the owner developing a thorough understanding of its needs. To the degree that the owner does not have a thorough understanding of its needs is to the degree that it may build more of a facility that in the end it does not want.

Program Budgeting

Budgeting at the program level should be a parallel effort with programming. It is not usually sufficient to say that the owner has a 100,000 square foot facility which will cost $150/square foot. Each of the various types of spaces in a facility has its own unique cost within the overall and budgeting each space properly will result in a more accurate overall budget. In the lab example, the lab space may be $300/square foot in the aggregate while the administrative space may be $150/square foot and the custodial/mechanical/electrical space $90/square foot. A typical program estimate produced by this writer is included in appendix one.

We divide program estimates into four general categories, three of which are widespread in the construction industry. They are "core and shell, "interior fit out," "equipment," and "FF&E." There are differing definitions of these categories of cost between our different clients and the terminology must be clearly understood in each case. For the purposes of this discussion the following descriptions will be used.

Core and shell includes building foundations, structure, exterior closure, mechanical and electrical systems, hoisting, and interior unfinished partitions. Interior fit out includes the finishes for the walls, floors and ceilings of the spaces provided in the core and shell budget and the millwork for those spaces. Equipment is the fixed equipment required for the space. In the lab example, the laboratory spaces would have lab equipment, the kitchens would have food service equipment, the laundry (if in the program) would have laundry equipment, etc. It should be noted that in this definition the mechanical and electrical equipment required to make the building function are included in the core and shell values. FF&E is described as moveable furniture, fixtures, or equipment. In the lab example, office furniture, artwork, window coverings and such items are included in FF&E.

The values for each of the program spaces for each of the categories above may be given by experience or by analysis, or more likely, both. The experienced estimator knows what costs have been from past projects or can analyze the elements of each category and develop costs per square foot.

The advantages of such an approach are in some ways analogous to the approach described in the programming section above. The budget will be more accurate and the owner will understand its various elements better and so gain more confidence in it.

Every program budget should contain a line item for contingency. In most cases we recommend a contingency which depends on the depth of program analysis. There are two principle types – a program contingency measured as a percentage of the total program area and a budget contingency based on the dollar value of the budget. Program contingencies should be based on the owner's past experience of program growth in projects and program contingency should be based on the level of confidence the owner's team have in the budget. Ten percent in each category is not uncommon.

Designer Selection

Only after the owner has accomplished the steps described above should it initiate the process of selecting a design team. This is not to say that the owner should not engage the services of design and cost professionals (these should be separate and independent firms so as to maintain the maximum level of objectivity and arms length) to assist in program development and program budgeting, but those professionals should be engaged for specific functions in each area and not granted expanded roles related to design and costing.

When the owner is satisfied with its program and budget, it should issue a formal Request for Proposals for design. The design RFP should be detailed as to program, budget, the owner's vision for the project and the requirements for selection. These requirements should include the design deliverables for the project (a recommended list is included as appendix two), a graphic representation the design each of the proposers would recommend, the owner's schedule for design by major deliverable date, the fees for design, the team proposed by the lead design firm, and the qualifications of each of the proposed team members and the individuals proposed by each team member (along with their qualifications) for the project. The RFP should include the form of contract the owner proposes to use for design of the project. So doing will allow the proposers to review and comment on the proposed contract during the RFP process, therefore speeding up the design process when the successful proposer is chosen by the owner. The owner should develop a scoring or evaluation matrix for the proposals received with the appropriate weights for each category being evaluated. The process may include a prequalification phase during which the potential proposers can demonstrate their qualifications so that the list of proposers can be narrowed to only the most qualified firms, thus saving the owner and the proposer time and money.

In recent years there has been a tendency for owners to focus largely on the fees proposed by design teams. Overemphasis on design fees to the detriment of qualifications and design deliverable requirements often leads to increased costs of construction. Paying an unqualified design team one percent less in design fees (as a percentage of the project cost) may lead to a ten percent added cost of construction because of poor design documents. A less than complete list of design deliverables leads to misunderstanding the status of design both with respect to payment of fees and to design document completeness.

The owner should, after receipt of the design proposals, conduct thorough interviews with each of the proposers. The interviews should be of sufficient length to allow the owner to develop its own comfort level with the design team's understanding of the project and a comfort level with the individuals who will be working on the project. The overriding purpose of the RFP process is for the owner to select the best qualified design team with a reasonable fee and with whom the owner feels it can most successfully interact.

As a gesture of good faith and to assist the design teams in defraying costs of submittal the owner should consider compensating each proposing team to some level for its efforts.

Designer Contracting

As stated above the owner should include its proposed form of contract with the RFP. The contract should contain all the elements of the RFP, design schedule, fees, insurance provisions and deliverables. It should contain provisions for the owner's remedy if the design team does not produce the correct level of documents in the correct schedule and in many cases language which obligates the design team to design to the owner's budget or redesign for no added fee.

Design Estimating

It is critical that the owner engage the services of a competent cost consultant to monitor the progress of the design as compared to the budget. It is our firm recommendation that this consultant be contracted directly with the owner and independent of the design team. This allows another set of eyes and often a more competent one than is possible if the design team has this responsibility. The owner should issue an RFP for these cost consultant services as well; setting out the schedule, deliverables, level of detail and format of the estimates, along with regularly scheduled meetings between the consultant and design team at all stages of design with in depth review sessions between the owner, design team, and cost consultant at each of the major deliverable dates. These major design and cost milestones should include at a minimum an estimate at the end of conceptual design, schematic design, design development and construction documents.

The cost consultant chosen should demonstrate its experience and ability to estimate the type of project contemplated, the appropriate estimating system to be used, the ability of the cost consulting team to estimate all construction disciplines at all levels of detail and its ability and experience in value engineering studies, system critique, and ability to communicate its findings on an ongoing basis. We have included a sample conceptual estimate as appendix three.

The cost consulting area is another in which the owner should not be principally concerned with fees but with results and value received. Is has been our experience that using a competent cost professional will result in the owner saving many multiples of the fees paid in the design and construction process.

Contracting Methods and Contractor Selection

There are a number of methods available to an owner to contract for construction services. These include lump sum bidding, cost of the work with a fee, cost of the work with a fee and a guaranteed maximum price, agency construction management, multiple prime contracts, etc. Many public owners are mandated by law to use lump sum bidding and to accept bids from any firm who meets certain criteria and can produce a bid bond and a payment and performance bond.

All of these methods have their pros and cons. Lump sum bidding to essentially all comers has the traditional advantage of engendering the maximum amount of competition, which supposedly results in the lowest price. This view in recent years has come under substantial scrutiny because the initial bid is oftentimes not the final price when the owner adds in the cost of change orders. The existence of and pricing for change orders will be discussed further below but it has been a topic of heated debate between owners and construction team members for some time. In addition to the change order issue, lump sum bidding leaves the owner very little flexibility in choosing the best construction team for the project. Some of the factors which may affect lump sum bids are the number of bids received, the amount of subcontractor and material supplier competition, the ability of the bidders to perform in a timely and cost efficient way, the personnel with which the project is staffed by the construction team, etc. In short, the owner contracts on the base of price alone, which is often not the best practice. If the owner uses multiple lump sum prime contractors on the same project the problem is likely to be compounded.

It has been our experience that the preferred method for contracting for construction services is one of the several types of negotiated contract methods, the best being the cost of the work plus a fee with a guaranteed maximum price provision. Some of these types of contracts also include shared savings clauses which specify that the contractor and owner spilt any savings under the

guaranteed maximum price according to some percentage formula. We no not recommend these types of clauses for two principle reasons. The first is that the construction team chosen should be professional enough to not require extra incentive for performing and the second is that the shared savings incentive oftentimes becomes an inducement to attempt to make the guaranteed maximum price higher than it should be so that there will be shared savings and extra fee for the construction team.

Absent the shared savings clause, the advantages of this type of contract, properly managed by the owner, are many. The owner may prequalify firms to propose on its project in the same way as discussed above with regard to design firms. It may ask for information about a firm's operational and financial ability to perform the project in the time frame the owner wishes. It may require references from other owners for whom the contractor has provided similar construction services. It may allow the owner to prequalify not only general contractors but also subcontractors and material suppliers, so that at the end of the process the owner has satisfied itself that it has a large enough construction pool to engender competition and that the competitors are all capable of performing the work.

The method also allows the owner to issue a request for proposal rather than a request for bid. This enables the owner to ask the proposers to provide substantially more information with the proposal than would otherwise be possible. Such information includes the contractor's proposed staff, overhead pricing, detailed estimate for the cost of the work, fee, proposed subcontractors and vendors with their detailed pricing information and staffing proposals, a proposed construction schedule, and any assumptions and clarifications it has to its proposal. The proposals should be submitted and opened in private, allowing the owner sufficient time to examine them in detail so as to understand them clearly. It also allows the owner to conduct in depth interviews with each proposing team including its major subcontractors, to not only satisfy itself that the proposal is fair and complete but also to gain an impression of the working relationship which is likely to develop between the owner, designer, and construction teams. We recommend the owner staff, designer, and cost consultant be included in these interviews as they will be required to interface with the construction team as well.

It has been our experience that this process leads the owner team to choose the best construction team for the project, to provide itself with voluminous information about the proposals and to develop consensus among the team members as to the right choice. It also affords the owner team an opportunity to clarify uncertain areas and to negotiate changes to the construction team's proposal if necessary.

Change Order Review

As was noted above, the issue of change orders has been a contentious one for many years and with valid reason. Owners believe there are too many change order requests for their projects and that the pricing for them is inflated. While even in the best of design documents there are valid reasons for change requests, for example if the owner for good business reasons decides to modify its program or change the function of a space or use a different material in a given location, the fact is that construction documents are produced by fallible human beings who make mistakes. For these reasons change orders are to a certain extent to be expected. However, a voluminous number of change orders points either to the fact that the owner did not program its facility adequately or accurately or that it chose the design team for the wrong reasons and the design team did not perform satisfactorily.

With respect to the pricing of change order requests it has been our experience that the owner's concerns are well grounded. In our review of thousands of change orders on hundreds of projects we have found that properly evaluated the vast majority of change order requests are overpriced.

On individual projects we have witnessed the asking price be reduced from twenty to forty five percent in the aggregate of all change orders reviewed. In the former case the total value of the change order requests was about $100 million, with a resultant $20 million savings, which is not insignificant. This same project was the aforementioned 7,500 change order requests, which might lead one to conclude that the other mentioned issues above existed.

We must stress that this process of review is a comprehensive task of the owner's staff or cost consultant independently defining the scope of the change, quantifying it, and estimating the change in the same level of detail as would have been performed on the estimate of the 100% construction documents. A comparison of the owner's detailed estimate for a change with the contractor's detailed estimate is the best way to evaluate the rational value of a change, since it has the effect of two sets of eyes looking at the same change and rather quickly informs the construction team that change order review will be a meticulous process. Any construction contract of any type must include language that all change order requests be accompanied by a sufficiently detailed estimate that such a comparison can be made.

Schedule Review

The owner should have the capability, or procure it from a schedule consultant, to periodically review the construction team's schedule in detail. The owner should independently form its own opinion about whether the project is on schedule or not, and whether the remaining work to be done on a project can be done in the time allotted. While many owners feel this is the work of the contractor, to the extent that the contractor fails to prosecute the schedule in a rational and orderly fashion is to the extent that the owner may be involved in a request for change order and subjected to the risk of financial loss. If a project has not been managed properly and the completion date is approaching there may be a need to add manpower, increasing costs and decreasing efficiency. Should this occur and not be anticipated the construction will seek to be compensated for these types of costs and often this results in claims and large legal expenses. If the owner is not intimately aware of schedule status it may be rudely surprised when the claim comes and be ill prepared to deal with it.

As an aside about what we call change order requests gone bad, it should be noted that claims in our experience are noteworthy as much for the cost to adjudicate them as for the amount sought without legal fees. It is not uncommon for the legal fees and associated costs to be a significant portion, if not the majority, of the final settlement amount. This fact points out that the best policy is to settle such matters before they reach the claim stage.

Owner Staffing

Many owners seriously underestimate the staff required to represent their interests fully during the construction process. While the size of the owner's staff varies according to the size and complexity of the project, the staff must be both adequately sized and of professional experience to fully represent the owner's interest on a daily and hourly basis. Issues which arise daily affect the outcome of the project and the owner cannot assume the construction team will represent the owner's best interest. The reality of the construction market is that the construction team's highest goals are to minimize its risk and maximize its fee. For an owner to fail to appreciate this fact and be able to competently and professionally respond to construction issues as they arise is potentially the largest way in which an owner may waste money on a construction project.

Closeout Procedures

Another area in which the owner may save money (not waste it) is in having a very clear set of closeout procedures. These should include a detailed list of the owner's requirements both in general terms and work category by work category. The requirements should be tied to the construction schedule and should have monetary consequences if not met in the appropriate time frame with the appropriate level of documentation. It is the owner's obligation and in the owner's best interest if the requirements are detailed, straight forward and issued in a timely fashion. It should be noted that one of the responsibilities of the owner's staff is to monitor the process, review the submittals for timeliness and completeness, and work with the construction team to complete the process in a timely way.

Record Documents

Owner requirements for record documents are almost universal and to a great degree standard from project to project. As built drawings, specifications, submittals and operation and maintenance manuals are basic requirements. The accumulation of these documents, their cataloguing and storage are responsibilities of the owner's staff. In many cases, however, the tasks associated with record documents are not performed in a timely nor complete fashion with the result that facility staff does not have all the data needed to manage the facility for the long run. In the case of record documents the design profession has developed good requirements in great detail. The problems typically arise when the owner does not manage the process of timely receipt of the record documents as well as timely storage.

Conclusion

We began this paper by noting that the alternate title related to ways owners waste money on construction projects. We hope that the discussion above has reinforced our conclusion that for the construction owner to minimize its exposure to wasted construction dollars it must be committed to doing an excellent, professional job in all the areas noted. In so doing it will minimize the amount of money it wastes. Which brings us full circle – construction dollars not wasted equal construction dollars saved.