

A Case Study of Project Delivery Systems: Implementing Construction Management-Agency at Auburn University

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Auburn University has recently changed from the traditional design-bid-build delivery system to construction management for some of its projects, providing an example of why a public institution would want to adopt an alternative method. The focus of our study will address such issues as to why Auburn University changed delivery systems and whether the new approach is used on all projects, the benefits of using construction management, how the fee is derived, and how construction management affects the public good. The authors of this paper performed a literature review and conducted interviews with Greg Parsons, Director of Design Services, and Bill Jay, Director of Construction Services, both working in the Facilities Division at Auburn University. By interviewing these two individuals, who are directly involved with construction management, we gained a unique perspective on Auburn University's decision to change project delivery systems.

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Introduction

Traditionally, construction management was used on projects in the private sector where funding was not strictly regulated. However, public institutions are now beginning to realize how construction management services can help the public good in terms of both time and money. Auburn is an example of a public entity that has recently adopted construction management as a viable project delivery system for its projects. Title 39 of the Code of Alabama, as amended effective April 22, 1997, now recognizes program management, project management and *construction management* as services, which can be employed by an awarding authority in the renovation, repair, maintenance, and construction of public works. Persons performing such services are prohibited from performing work on the project with their own or subcontracted forces. The main objectives for allowing construction management in the state of Alabama include maximizing the value of the return on the owner's investment by enhancing the quality of the projects, controlling construction costs and time, and reducing long-term operating costs.

Auburn University has recently changed from the traditional design-bid-build delivery system to *construction management-agency* for some of its projects, providing an example of why a public institution would want to adopt an alternative method. The focus of our study will address such issues as to why Auburn University changed delivery systems and whether the new approach is used on all projects, the benefits of using construction management, how the fee is derived, and how construction management affects the public good. The authors of this paper performed a literature review and conducted interviews with Greg Parsons, Director of Design Services, and Bill Jay, Director of Construction Services, both working in the Facilities Division at Auburn University. By interviewing these two individuals, who are directly involved with construction management, we gained a unique perspective on Auburn University's decision to change project delivery systems.

Construction management agreements take a number of different forms (Dorsey, 1997), including:

Agency Construction Management - Often referred to as "pure" or "professional" construction management, because the construction manager acts as the owner's agent in a fiduciary role throughout the project. Contracts for design and construction are direct with the owner. Professionally, the construction manager performs a management role throughout the design and construction phases, managing the construction contracts in the interests of the owner. The CM does not guarantee the contract prices or provide a warranty for the work.

Contractor/Construction Management - May also be referred to as "independent contractor" or "guaranteed maximum price" construction manager. During the design phase, the contractor/construction manager performs similarly to the agent construction manager. However, during the design phase the construction manager may provide the owner with a guaranteed maximum price for the construction of the project and during the construction phase may provide some or all of the construction. The construction contracts may be held by either the construction manager or the owner. The CM may warranty the work of all contractors, and there may be a division of savings clause or other cost savings incentives.

Auburn University Design Services Department

Design & Development is the University's "in-house" source for comprehensive design, project management, archival management and design services. This department is directed by Greg Parsons, Director of Design & Development. Design & Development coordinates design and cost estimates for all major renovations and new facilities, contracts and supervises design services by "outside" consultants, and designs most campus interiors. Architects, engineers, and interior designers hold professional licensures and maintain their professional licenses through participation in mandatory continuing education programs.

All work done by the department of Design & Development is governed by the principle of "appropriate" design. The buildings/interiors must fit the context of the University, serve the University's academic mission, and be as economical as possible to construct and maintain. The range of work involving Design & Development is diverse, as indicated by Haley Center's Foreign Language Lab renovation, Tichenor Hall's computer lab, and the development of the Terrell Shopping Mall in the Hill residence area, which was a collaborative project with Auxiliary Services and Project Construction. One of the more recent Design & Development projects was a new computer lab in Ralph Draughon Library, a joint effort with Project Construction and Maintenance and Operations' shops, which provided two handicapped work stations and built-in storage cubicles.

Auburn University Construction Services Department

Construction Services handles all major campus construction and renovations and is divided into the two areas: Project Construction and Project Management. This department is directed by

Bill Jay, Director of Construction Services. Project Construction is an in-house construction group, which accomplishes small to medium size construction projects on the Auburn University campus. It specializes in dealing with projects on short notice and sensitive time schedules. They work very closely with the University customer to keep interference with normal Department and University functions to an absolute minimum. Typical projects include renovation of classrooms, auditoriums, suites, offices, or laboratories. Project Construction performs plumbing, electrical, mechanical, carpentry, concrete and many other types of construction work.

Project Management is comprised of a staff of experienced construction project managers who administer all construction projects on the University campus. Project managers are involved with large construction projects from design through completion of construction. Each construction project on campus, including those performed by the Project Construction group, is assigned to one of these project managers who are responsible for the quality inspections, payment authorization, and communications between Auburn University and the contractors.

Historical Delivery Methods used at Auburn University

Auburn University is a public institution in the state of Alabama and follows the guidelines of the Alabama Building Commission in terms of utilizing architects and general contractors. The traditional process used on past projects was design-bid-build where the building was designed and then the design was turned into bid documents. A series of prequalified general contractors would then be allowed to bid on the project. The project was awarded to the general contractor with the lowest, responsive bid and would enter into a construction contract with Auburn University limiting the cost of construction to the “lump sum” that was proposed. Increased costs beyond that lump sum were allowed only through formal change orders agreed upon by Auburn University and the contractor. The single general contractor would perform the work and the architect, university inspectors and others would observe the project during construction. After a period of time, the project would be completed and then closed out.

The design-bid-build lump sum project delivery system is traditional, relatively simple, and widely understood. With this approach, owners have a good idea of the final cost of the project prior to beginning construction, the lowest bid provides a reliable market price for the project, it avoids favoritism and allows all qualified contractors to compete on an equal basis, and finally, the owner has a relatively clear idea of the finished product (Gordon, 1994). The disadvantages of lump sum contracting include the greater amount of time that the design-bid-build sequence may require, the inability to handle the increasing complexity of building construction, the risk of awarding an incompetent contractor the job, and the development of adversarial relationships due to the different goals of the parties (Konchar, 1998).

In 1997, the Alabama Public Works Law was changed to where they recognized construction prequalification of general contractors. Auburn University has been doing this before the legislation was even put into place. Greg Parsons, Director of Design Services at Auburn University, stated the following concerning prequalification:

We think it has raised the quality of our construction work and helped alleviate problems with general contractors who got in over their head. Before prequalification, I would estimate that 1 out of 4 general contractors were trying to stretch themselves to get a project. The quality of the work, the ability to deliver it on time, and other things just went bad. We had lots of bad projects. I'd say one in four, or one in five. Since prequalification, we don't think we've had a bad job. Since 1994-95, we haven't had a bad job, one that couldn't get finished. We haven't had a general contractor get in over his head, so we've been very fortunate (Parsons, 2003).

When using prequalification for public jobs, the owner has to be cautious and follow specific steps. Prequalification in the public sector is more procedural than in the private sector. Because of the concept of equal access to public business, all qualified contractors must be allowed to bid for work on taxpayer funded projects. Thus, in public projects, prequalification must be based on clearly defined, defensible criteria, such as experience in jobs of similar complexity, current work load, and demonstrated financial stability (Dorsey, 1997). These are the criteria that Auburn University puts on questionnaires when prequalifying general contractors and then evaluated when narrowing the list.

Auburn University has recently changed to construction management-agency for some of their projects. The construction manager is now doing the screening and helping Auburn prequalify not only the general contractor, but also the subcontractors, which will be a distinct advantage in raising the level of quality. Receiving bids from only those mechanical subs, electrical subs, and brick masons that can handle the work decreases the chances of a subcontractor defaulting during the project. Greg Parsons states:

We're still getting a competitive price and we're still following the Public Works Law and the Alabama Building Commission guidelines. We think it is to our advantage to have top tier trade contractors. Instead of prequalifying only one, we are prequalifying 20-25 trade contractors for a project and we believe that it will improve the quality, which is our main focus (Parsons, 2003).

The Change to Construction Management

Construction management (CM) is the application of professional management practices to a construction project. The fundamental premise of CM is the fostering of a cooperative team effort to attain common goals established by the owner (Strang, 2002). Auburn University saw CM as a viable and beneficial delivery system that would improve their projects. In discussing why Auburn University changed to CM, Greg Parsons states:

The strongest and most compelling reason to change is that the industry has changed. If we stayed in the traditional design-bid-build arena, our projects would have suffered. The role and relationship of the design entity with the contractor is different from the relationship with the construction manager. We believe that the construction management delivery method allows us to bring in

construction professionals early in the projects where they can share their expertise on cost control, constructability, schedule management, value engineering and life cycle costing. We have heard both positives and negatives from those who have been using it in the state of Alabama. It is my opinion that the negatives won't happen if you involve yourself with top tier construction management firms. They are going to perform their best, they are professionals, they are going to do their best to uphold their reputations and have repeat business with us (Parsons, 2003).

For many years, Auburn University did a scaled down, modified version of construction management. In addition to having an architect performing cost estimates that was in their contract, they would hire a separate estimator from a general contractor to put together cost estimates. They knew that there was an important role for someone to play like a construction manager. Auburn started construction management in February 2002 when the Board of Trustees expressed an interest in pursuing the alternative delivery method. The Board asked the Facilities Division to work with them in creating a process in which to engage construction management services, and to define the criteria of when to use construction managers and when not to. The University worked with that for four or five months, and then in mid 2002, started using it on the Sciences and Labs Center, the Forestry and Wildlife Sciences Building, the Pharmacy Building, the Transportation Technology Center, Samford Hall, Auburn University Medical Clinic and the Student Village.

Consideration of Other Delivery Systems

According to the 1997 Alabama Public Works Law, construction managers are considered professionals, as are architects, engineers and land surveyors. The goal of incorporating construction management in the public sector is to receive a higher quality project at a competitive price. Design-bid-build is the traditional method used to get the lowest price, but lawmakers believe construction management offers many more advantages. As far as the law is concerned, construction management is still design-bid-build. The owner is getting a design, putting out documents, advertising the project in newspapers, and those who want the work bid on it. The main difference is that instead of receiving one bid, you are receiving fifteen bid packages and the coordination of all those contracts is not being done by the general contractor, but rather a construction manager.

Members from the Facilities Division visited the University of Missouri who has started using design-build on some of their projects. They hire a design service to come up with schematic designs and design criteria for a project, and then put it out to bid as a design-build engagement. If they were building a parking deck, they would spell out that they want 500 parking spaces and give any other important design criteria. Then, whoever wants to do the work teams up as a design-build entity and bids on the job. On bid day, they turn in their proposal saying that they can build 500 spaces for a specified amount of money. The University of Missouri has pre-determined criteria that help them decide which is the best proposal. The decision is made with cost being 50% of the value and quality, number of parking spaces, and design being the other 50%. Representatives from Auburn also attended a seminar where it said that the design-build

method could be used on academic buildings. After doing the research, visiting other universities and experimenting with design-build, Greg Parsons explains their conclusions:

We are a little hesitant to go that route. Our experience with the Hotel and Dixon Conference Center, which was a design-build project, was very, very negative. The motivation of the particular trade contractors involved was financial only. There were not enough checks and balances in the system to, for instance, design the mechanical system on paper that met the current codes. We had many situations where there was a problem like this. The mechanical contractor was the mechanical engineer and had many competing forces in his mind. He wants to make the most money he can on the project, and just wants the mechanical system to work at the required level so he can make it through the warranty period. The contractor went out of business soon after the project was completed, and so there is no entity to take legal action against in order to get some relief. The mechanical system has serious problems due to the fact that the mechanical contractor was not motivated by professionalism and a code of ethics that a mechanical engineer would normally follow. Design professionals are charged with protecting public health, welfare, and safety as they help us deliver a project. If there is a way to design a system that is below code standards and still make money, then your motivations are different. We are not big on design-build at all. We do not think we would be well served in the long run (Parsons, 2003).

After identifying a need for change and researching possible delivery systems, Auburn University believed construction management was the best option. They believe that construction management will help them get a project of higher quality, completed more quickly and with fewer change orders.

Factors Dictating the Use of CM

Although Auburn University incorporated CM in their work, they still use design-bid-build on some projects. The criterion recommended to the Board was that it should be decided by the design and construction professionals of the Facilities Division in concert with Administration and the Board. Collectively, they would look at the project and see if its complexity, dollar value, and unusual site issues warrant the use of construction management services. Bill Jay, Director of Construction Services, explains:

We have only changed some of our projects. We still bid out a lot of contracts using lump sum, but on some of the more complex projects we have used construction management to see what results we get. Over the last several years, the workload has increased dramatically, in the neighborhood of \$400 million in construction. We probably have 150 projects going on right now of various sizes. In order to help us save time, we have decided to use construction management at the request of the Board of Trustees at Auburn University. On some of the projects, the traditional method is still used where the building is designed, then it is bid on, and then constructed. Construction management is still in its infancy.

We don't know what lies ahead, so we'll just have to wait and see how it works, and then decide whether to keep it or modify it. On complex projects, construction management is beneficial because during design the construction manager works very closely with the architect so we will have fewer change orders during construction (Jay, 2003).

Selection of the Construction Manager

In the public sector, openness and objectivity of selection are required. Public knowledge is mandated when a unit of government is planning a major piece of construction. Construction management as a project delivery system has contributed mightily to the image of construction as a service, and those firms, which exhibit a strong service attitude, tend to get the jobs.

Auburn University starts the process by sending out a questionnaire to those who are interested in bidding the work. The questionnaire asks for information such as average construction volume, financial history, current financial status, company history, background of similar work, and years of experience in construction management. They often follow up with interviews with clients that they have worked for. Ten to fifteen interested companies return the questionnaires. The Facilities Division then sits down with the construction management selection committee which is made up of three members from facilities, some of them from Design Services and some from the assistant provost for construction services office; one member from the business office at assistant vice president level or above; two from the Building Committee, normally the chairman and department head; and a faculty member with whom the Board of Trustees is associated with. The committee convenes and goes through the questionnaires that have been submitted by the firms and tries to narrow down that list to 3, 4 or 5 to interview. From that list, the committee sends 2 or 3 unranked names to the president's office. The committee has instructions to submit the basic data and information about the firms to the president in order to help him when he's looking at the 3 firms submitted. Once the list is narrowed down to 2 or 3 firms, the committee gives a scenario to assume during the pre-construction and construction services. From that scenario, the firms tell them how many hours, personnel, and what kind of resources they are going to use on the project. These factors then translate into a bottom line including the total fees and expenses that they would expect to get paid for their services. According to Greg Parsons, "what those fees and expenses have yielded is competitive; there has not been a large disparity from one firm to another. So far it has been very common. We've also had some dialogue with other institutions to find out what they are paying for construction management services to make sure we're in the ballpark" (Parsons, 2003).

The committee uses professional qualifications to narrow down the list to three, and from there, they ask for financial information. Although they may not necessarily pick the lowest dollar value or the lowest cost, they want them to be competitive and in line before they make it available to the president. The president makes a selection and recommends one firm to the Board of Trustees. Then at the upcoming board meeting, whenever that occurs, they verify that selection.

Fee Structure

Fees are essentially a transfer of value for value. The construction manager adds value to a project through leadership, knowledge, skill, coordination, and administration of the work. The fee is paid in order to obtain a completed building as smoothly as possible and with minimal anxiety. Compensation structures for construction management services vary according to risks and responsibilities, and are allocated between the pre-construction and construction phases. There is a common perception that the owners are paying two professionals, the architect and the construction manager, for performing the same tasks. Greg Parsons explains how the additional fee for a construction manager is beneficial:

We do consider the construction manager as a professional fee, but we feel their value and expertise is different than the design entity. It helps balance the equation where the owner, architect and construction manager are working towards the same goal, and we set up our contracts to make it clear that we are on the same page. I personally don't see it as an additional fee for which we have not found a way to compensate. I am convinced that we will get a better building and get what we paid for (Parsons, 2003).

At Auburn University, the fee is negotiated up front. There is a specific process that the university goes through in order to arrive at the price. Once they have chosen the three best firms, they tell the construction manager to assume an 18 month pre-construction phase and a 30 month construction period. The potential construction managers then send their proposals in terms of the people who will be put on the job, and the total hours for each phase. When the university receives that, they compare those three proposals and present them to the president so he can make a decision.

Since Auburn University is a public institution, incentives and additional awards are not used in order to protect the public good. Greg Parsons explains:

If we add to the scope of the project or if there is a natural catastrophe, which causes the project to take longer, then perhaps there is an avenue to relieve them by paying an extra fee for their services for a longer period of time. They pretty much get the same fee no matter how long the work takes, so their incentive is to get it done early and get it done on time. We have heard stories that some institutions are giving a financial incentive for savings below a certain agreed upon threshold. They basically split the savings with the construction manager. We don't think that's a good idea at this time because our thoughts are that we want the construction manager to develop the initial budget and decide what that threshold is. If they know that there is a financial incentive, they will set a high number so they can come below it and split the savings with the owner. There will always be a fight with them from the start for that high number, and we do not think that is to our advantage. We want to have an open and forthright discussion with them about what the budget and projections will be, and not play any games with them over the matter (Parsons, 2003).

CM Services During the Project

Construction management is the process of professional management applied to a project from conception to completion for the purpose of controlling time, cost and quality. The implicit objective of construction management is maximizing the value of the return on the owner's investment by coordinating the efforts of the designer, owner and subcontractors during each phase of the project.

Pre-Design

During pre-design, Auburn University would expect the CM to work with them in writing the program. The program is like a recipe, it tells the design team what the owner is looking for in the design. Auburn informs the architect how many offices, classrooms, auditoriums and any other important criteria needed in the building. The CM plays an important role during this part of the process by giving their expertise on specific items. Auburn University expects the construction manager to work with them early on in the program to develop a budget and time schedule. As the architect begins to work in earnest on the design, they want the construction manager to maintain and monitor the control of the cost. Various things are communicated to the construction manager and architect. The university has standards, guidelines, master plans and several other items that they want them to understand upfront, so they are aware of the things desired at the end of the project. Greg Parsons explains:

We want a balanced project; we don't want a Cadillac level on one thing and a Yugo level on another. We don't want to have a rotunda or spiral staircase at the expense of not having enough money to do a good mechanical system. We want a building that is well balanced, where the value is spread evenly throughout the project and we don't build more than we can afford. We want to build at a high level of quality and maintain a high level of quality so that we can provide good services to the university. We expect to build for a hundred year lifetime and expect to remodel a couple of times during that hundred year life expectancy. We want our new buildings to last as well as the buildings that were built in the early part of the century. The buildings built in the 1920's, 30's, and 40's have held up very well, but many of the buildings built in the 60's, 70's and 80's have not held up very well. We want to build buildings at a higher level and not build buildings that have to be overhauled on an occasional basis (Parsons, 2003).

Design

During the design phase, the construction manager helps Auburn University by looking at the drawings and giving constructability reviews. The architect is responsible for coordinating all of the documents, but it is still good to have another set of eyes to look over them. Greg Parsons explains what services they desire during the design phase:

We want the construction manager to oversee it and make sure that our comments are incorporated in it. If we tell the architect that we want a specific brick or a specific floor finish or if we want a particular aspect of the design to be modified, we expect the construction manager to help us monitor it, to look at it and let us

know how it affects the time and budget. If we have given instructions that will suddenly delay the completion of the design, we want to know that and want him to keep an eye on it and tell us how it affects the cost and schedule (Parsons, 2003).

The construction managers that Auburn University deals with have been in the construction industry for a long time and understand that if you don't have a good set of construction documents, you are vulnerable to change orders, claims, errors and problems that you will have to solve in the field during construction. They know that the cost of solving problems in the field is more expensive than solving them during design. The CM helps Auburn look for potential loopholes in the documents, which in turn, minimizes the problems in the field.

Bidding/Negotiation

During the bidding and negotiation phase, the construction manager helps Auburn University with prequalification of potential bidders and helps wrap up interest in terms of trade contractors. The CM might have contacts with various subcontractors and can help get them excited and lined up to bid on the project. They also develop an overall project schedule, so when the subs come to bid on the project, they know what the expectations are and if there is a particular aspect of the work that has to be completed in a specified amount of time. After looking at the project schedule, they know if they can complete the work in that amount of time, and if they can't, they do not bid on the project. On the other hand, some might say that it fits perfectly in their schedule and can bid on it. Greg Parsons states, "Early on, the overall project schedule is an important aspect allowing the subcontractors to know what is expected of them on bid day. The construction manager also makes sure that they are qualified, have the financial strength, experience in that type of work, have the bonding capacity and many other things" (Parsons, 2003).

Construction

Overseeing the Work

During the construction phase, the construction manager helps Auburn University by being another set of eyes and presence on the jobsite with the owner's interests in mind. It is to the owner's advantage to have more participation from the construction manager in looking after their interests, making sure that the operations are being done correctly, and if a question comes up, getting it resolved in a reasonable and timely manner. These were the traditional roles of the architect during the construction phase, but now have transferred to the CM. The CMAA (Construction Management Association of America) Owner-Architect agreement has the architect assisting the CM in the final inspection of the work. What may be troubling is that the architect, nor other design professionals, will be able to see work that has been covered-up, thereby relying on the CM's ability to know for sure that the covered-up work conforms to the contract agreements (Berman, 2002).

Managing Contractors

Under CM-Agency, the contracts for construction are direct between Auburn University and the contractors such as the mechanical sub, mason sub, etc. Former subcontractors are now *prime contractors* to the Owner. To some people, more risk is involved with this type of contracting. Instead of having one construction contract, one bonding company, and one general contractor, Auburn can have 25 prime contractors, 25 bonding companies, and 25 insurance companies involved with each of their projects. The prime contracts are awarded on the basis of qualifications and lowest bid, in order to receive the best price for construction.

Construction managers vary greatly in how they perform when compared to general contractors and architects. Theoretically, they perform much like a general contractor. They have a project manager, assistant project manager, and a superintendent on site working with the subcontractors to make sure that the quality of work is to the plans and specifications. They also create a schedule to coordinate the various subcontractors on the project. In performing their services for the owner, the construction manager makes sure that the project is on schedule by working with the subcontractors. Bill Jay explains:

At Auburn, we are planning to incorporate into the contract language stating that we will not pay contractors extra if the project lasts past a certain period of time so they have incentive to get the project done on time. So we attempt to have the construction manager put the pressure on the contractors to be on schedule. We are constantly acting in the same way with the construction managers so that they stay on schedule as well (Jay, 2003).

Who Holds The Risk During Construction?

Risk allocation depends primarily on who holds the contracts and whether the construction manager is acting as a constructor during the construction phase (Dorsey, 1997). For projects at Auburn University using CM-Agency, the owner holds the risk during construction because they hold the contracts with contractors. If there is any dispute, the owner will have to resolve it. Auburn University has written documents stating that *the construction manager is not at risk in the state of Alabama*. The construction manager can not do any of the work: they cannot lift a hammer, they cannot pour concrete, etc. They can use people with management skills, paper, and computers, but they can not use any heavy equipment and actually do the work. Since they can not perform any work, *construction managers do not take on the risk of guaranteeing the work*. In some instances, there are contracts where they might do that. Greg Parsons describes the risk involved on CM projects; “We think that we are following the guidelines of the Alabama Building Commission, where the construction manager is an advisor or consultant. The only risk that we have seen is if they do not manage the project well. If it takes 24 months to build instead of 18, we do not pay them any more fee, unless there are extenuating circumstances” (Parsons, 2003).

Cost Control

A principle of construction management is that the construction manager provides leadership and administration for all aspects of the project. One area where this can be seen is cost control throughout the project. Cost control, especially on public projects, is mandatory in order to stay within the specified budget and not spend extra money. Auburn University handles this by using a system of checks at the end of each phase of the project. The construction manager is the key element in making this process as smooth and efficient as possible.

At the end of each phase of design, the Facilities Division gets an updated estimate from the construction manager and the project can not move ahead until the budget is reconciled. They have an established budget that the board has authorized and they stay within that budget unless there is a compelling reason to go back to the board and request that they be allowed to spend extra money. This is normally done only when more money can be obtained either through funding or receiving private dollars. Ninety percent of the time the project remains within the board approved budget and they do not have to go back to the board for the authorization to spend more money. Greg Parsons describes the cost control process; “We feel that the construction manager can help us keep that in line from start to finish. You cannot move ahead in the project, from one phase to another, without incremental checks along the way where you review the construction manager’s estimate and determine whether to go ahead or not based on the budget” (Parsons, 2003). Auburn has a go/no-go signal ready for the construction manager when they send the reports, and if something should arise between the phases, the construction manager is obligated to inform them. For example, the construction manager would inform Auburn if deep foundations are required instead of shallow spread footings where it will add \$500,000 to the project. Then Auburn would need to stop, regroup, and decide where they will recover that \$500,000. Perhaps the money can be recovered in some other part of the project such as floor finishes because having a good foundation takes precedence over aesthetics. In this way, they can stay within the specified budget and not spend extra money.

The Use of Contingencies

Contingencies are found in all types of construction management projects. In the budgeting process, the owner, designer, and construction manager forecast probable costs, adding one or more contingencies for unknown elements. The contingencies identify topics for further exploration and may be carried in budgets into the construction phase, where they become identified as contingency amounts and become part of the agreement between the owner and construction manager. In agency construction management, contingencies are largely for budget purposes (Dorsey, 1997).

Auburn University has traditionally held a 10% overall project contingency during most of the design phase. After the bids have been received, and depending on the type of project, the contingency can be reduced. If it is a “messy” renovation where they are more likely to find unknowns when they open up the building, they tend to hold the full 10% contingency to get them through construction. If it is a clean, new building it might go as low as 5%. Greg Parsons explains how construction management influences the contingency amount, “With construction

management, we might lower the contingency earlier because we have construction professionals managing the cost and the chances of cost overruns are reduced. We are hoping that our contingencies can be reduced upfront and lowered as we go through the project” (Parsons, 2003). They typically lower the contingency as the project evolves and nears completion because there is less chance of having a surprise come up. Contingencies are not extra money to spend because they want to add something new to the project. They try to define the project at the start and like to hold the contingencies in a sacred category, saving it for the undiscovered or gap in the project.

CM and the Public Good

Construction management in the public sector involves closer scrutiny because the projects are being funded by the taxpayers’ money. The general public wants to make certain that they are not spending unnecessary dollars on methods that do not improve the cost or time of a project. They need the assurance that their money is being well spent. On public projects, the cost of construction management services might be a little more when compared to the lump sum approach. The public might see this as unnecessary money being spent when the traditional method yielded the lowest costs. In his response to justifying the cost of hiring a CM, Greg Parsons explained:

This is just my opinion, because we don’t have a completed project yet. When a project is broken into multiple, separate packages, it in many ways eliminates one overall markup on all those trades. The general contractor in the traditional design-bid-build method would receive all of the prices from the separate subcontractors, and in computing his estimate, would have his markup on that including overhead, profit and bonding. We think that by not having that single overall markup from a general contractor helps to balance the cost. My personal opinion is that we probably will pay a little more in total cost for the same exact package. Simply because of the fact that in the traditional design-bid-build, the single general contractor might be tempted to take prices from subcontractors who are not necessarily qualified to do the work. We are hearing that by using pre-qualification and getting those subcontractors who truly understand what is expected of them, the possibility of claims and change orders is reduced. They know that they are dealing with construction professionals who know how to look at change orders and help the owner and architect from frivolous claims that we have to argue and debate away. There is considerable discussion about the fact that having a construction manager will help minimize those claims and lower the costs at the end of the project. Using the traditional method, on bid day we might have got the lower price, but by change orders and then using contingency money we probably end up spending the same amount (Parsons, 2003).

Bill Jay, in justifying the cost of hiring a CM for a public project, states:

On some projects it is very clear that it will have positive results, then again on some projects, it is not as clear. We are in the process of determining which projects it works for and those that it doesn’t. The more complicated the project

is, the greater the benefit of using a construction manager. We feel that the biggest advantage is that they work very closely with the architect to make sure that the construction documents are very clear, concise and correct. The problems that arise during construction are more costly with change orders and claims. We are in a learning process here ourselves. We have talked to various people all over the U.S. and we have received a wide variety of opinions. Some have had serious problems with construction management and some have enjoyed working with it (Jay, 2003).

Public Viewpoint

With Auburn University being a public institution, their projects have a profound impact on the general public and local businesses. For some of the local contractors, work at Auburn University comprises a substantial portion of their construction volume. Since most are small contractors who rely on competitive bidding, the switch to construction management has affected them. When asked about the perceptions from the public regarding construction management, Greg Parsons replied:

With regards to the public viewpoint, we have had subcontractors tell us that they are in favor of this method, but we've had some local general contractors tell us that they are not in favor of this because they think that it is taking away the potential projects that they can bid on. There is a little bit of truth in both of these, but there is also room for discussion. In a way, we are actually expanding the contracts for the local general contractors. Our pre-qualification criteria says that to bid on work as a general contractor, your average annual volume for the past five years must be twice the value of the project you are bidding on. If the value of the project is \$10 million, your average annual volume over the past five years must be \$20 million. There aren't many local general contractors who have an annual volume that could allow them to bid on a \$40 million project, in fact, there are none. So we are not convinced that we will be hurting the local general contractors, in fact, lots of times what we are hearing is that it opens it up by dividing it into smaller packages. It works on big projects, but I think it would be a negative on small projects such as \$5 million projects (Parsons, 2003).

Conclusion

The main objective for Auburn University implementing construction management was to maximize the value of the return on its investment by enhancing the quality of the project, controlling construction costs and time, and reducing long-term operating costs. Auburn plans to experiment with construction management on some of their more complex projects and see what the results are. Thus far, Auburn's experience with construction management on their current projects has been very good. Auburn will evaluate the completed projects in terms of achieving higher quality work and saving time and money. Then, they will determine if they want to continue using construction management on their more complex projects, or if they want to explore other alternative delivery systems.

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