

Construction Management: Understanding and Leading an Ethical Project Team

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To my grandmother, Margie Ruth Freund (Cosgrove), who instilled in me from the moment I was born that the most prestigious values to hold in life have absolutely nothing to do with material wealth. Through her daily example, I learned that the most important qualities a person can possess are quite simply honesty, integrity, and respect for others. From her I learned that fairness and honesty may not always pave the easiest path or allow me to come out on top, but they are nevertheless the cornerstones to leading a revered and meaningful life. She taught me that the easiest way to keep people from discovering something for which you are ashamed is to avoid doing things for which you should be ashamed in the first place.

Contents

Preface.....ix
Authorxiii

MODULE 1

Chapter 1 Subcontractors 3
 The Subcontractor’s Perspective 5
 Chapter 1 Questions 43

Chapter 2 General Contractors..... 47
 The General Contractor’s Perspective 47
 Chapter 2 Questions 66

Chapter 3 Field Crews 69
 The Field Crew’s Perspective 70
 Chapter 3 Questions 77

MODULE 2

Chapter 4 Architects 81
 The Architect’s Perspective 83
 Chapter 4 Questions 114

Chapter 5 Sub-consultants 117
 The Sub-Consultant’s Perspective 118
 Chapter 5 Questions 130

MODULE 3

Chapter 6 Project Owners	133
The Project Owner's Perspective.....	133
Chapter 6 Questions	156
Chapter 7 Construction Managers.....	159
The Construction Manager's Perspective.....	160
Conclusion.....	169
Chapter 7 Questions	173
Index	175

Preface

The construction industry is well regarded throughout the world for being full of good, down-to-earth, honest people. Conversely, the construction industry also bears a reputation for unethical contractual dealings and adversarial relationships among the various project team members. The vast contradiction in these traits has puzzled me ever since entering the industry as a young project engineer. Over my career I have found that there are many sources for the unethical dealings and personal antagonism inherent with our industry, but I have also found that there are many ways to combat these futile and destructive characteristics. In this book we will examine the origins of these traits and discuss management methods that will control and minimize their detrimental impacts.

Team atmospheres and collaborative working environments benefit every person and every company involved with a construction project. One of my primary focuses as a project leader has always been fostering honest and collaborative relationships among all of the various project team members. I strive to promote and extend this collaborative spirit across the entire spectrum of a project team, from the owner to the laborers in the field. By building a collaborative team atmosphere we optimize the efficiency, productivity, and overall enjoyment of all those involved with our projects.

When I was a child, like most children, I constantly wanted my own way and needed to learn how to share and be friends with the other children. When I began to stray out of line there were two rhetorical questions my grandmother routinely asked me. First, when I said or did something mean to another child she would ask “how do you think that makes them feel?” Secondly, when I acted selfishly toward the other children she would ask “how would you feel if they treated you that way?” As an adult I have learned to ask these self-reflective questions of myself and to treat others as I would like to be treated. This is not merely a lesson for children on a playground or a lesson that solely applies to personal relationships. This important lesson is relevant to all aspects of life, including our professional relationships. In the construction industry these lessons are applicable to contract negotiations, preparation of change order requests, schedule expectations, quality standards, and all other aspects of the business. Regardless of our individual roles and

responsibilities, as project team members we are compelled to treat each other fairly and reasonably. In return we should expect to be treated fairly and reasonably by our teammates.

The construction industry is extremely complex, such that no one person could ever learn everything there is to know about this business within a single lifetime. Actually, I do not believe any one person could learn even 5% of the intricacies of this industry in their lifetime. This is why a construction project consists of so many highly skilled experts, such as the architect, various engineers, general contractor, multitude of subcontractors, and countless manufacturers. Each and every one of these parties is an expert in their respective profession, but at the same time have only a general knowledge of other fields. One of the most prevalent causes of animosity among project team members is that we do not fully understand the roles of other parties. As a result, we do not fully appreciate the unique experience, skill, hard work, and dedication that each of our teammates bring to a project. This under-appreciation of each other must be combated. In this book we will discuss the roles of each project team member, as well as their individual perspectives, needs, and expectations. From this we will gain a greater respect and admiration for each other, which will in turn aid in reducing the animosity plaguing our industry.

Another important life lesson my grandmother emblazoned in me is that the decisions we make are our own and can never be blamed on others when something goes wrong. This is a lesson all children are taught and as adults we generally apply well to our personal lives. However, for some mysterious reason there is a general belief that this philosophy is not applicable to business decisions. The truth is that we are in fact personally accountable for each and every decision we make regardless of the circumstances for which they are made. Through the discussions in this book we will examine and dispel the general belief that business decisions entail little or no personal accountability.

For instance, when asked the simple question as to whether or not they believe stealing money is a moral act no one in the world would reply yes. However, for financial decisions in which we are able to place the label of a business decision this morality has a tendency to fall by the wayside. When the label of a business decision is used, we seem to feel far less personal accountability. The following examples will illustrate this statement:

- a. Consider the scenario in which a general contractor's project manager (GCPM) and subcontractor's project manager (SPM)

meet to negotiate three change order requests. The first change order request amounts to \$5,000 and is the general contractor's financial responsibility. The second and third change order requests are the financial responsibility of the owner and amount to \$10,000 and \$12,000 respectively.

As a business decision, the GCPM asks the SPM to increase each of their second and third change order requests by \$2,500. This raises the total value requested from the owner by \$5,000. In exchange, the \$5,000 change order request for which the general contractor is responsible will be voided. In this case the total value requested by the subcontractor remains constant, but the source of the funds has changed.

The SPM may agree to this revision because he is not concerned with where the money comes from, only with the total amount he receives. In this example, the GCPM has effectively stolen \$5,000 from the owner, but because he was able to place the label of a business decision on this accounting manipulation he may feel little or no personal accountability for his actions. In fact, the GCPM is fully and personally accountable for his decisions and the unethical results. Further, by knowingly agreeing to alter their change order requests, the SPM has become an accomplice to this theft.

- b. As a second example, consider a GCPM who is in charge of two projects, both of which are negotiated contracts with traditional guaranteed maximum price agreements¹. The first project is going quite well and is expected to reach completion significantly under budget. The second project has encountered many problems and is expected to finish well over budget, thus creating a considerable financial loss for the general contractor. In an effort to minimize this expected loss the GCPM has decided to charge costs for management time, field labor, and supplies expended on the second project to the first project. The first project has a sufficient budget for these expenditures, so some may consider this a prudent business decision made by the GCPM in an effort to mitigate his company's losses. By performing this accounting manipulation the savings returned

¹ A guaranteed maximum price (GMP) agreement means the general contractor has guaranteed the project will not exceed a certain value. In this example of a traditional GMP, the general contractor is compensated at cost plus a fee percentage and all savings under the GMP are returned to the owner.

to the owner of the first project are reduced. This diminished return equates to a theft from the first owner. Because the GCPM was able to place the label of a business decision on his actions he may feel little or no personal accountability. Once again, this is an ill-conceived feeling of contentment. It is an unwavering truth that we are all fully and personally accountable for the decisions we make, regardless of the circumstances for which the decisions are made.

People never like to make mistakes, but we all do. It can be extremely difficult to admit our mistakes and own up to the consequences, especially when the consequences will result in great embarrassment or a tremendous financial loss. An instinct for many is to immediately look for an excuse or someone else to blame when something goes wrong, but manipulating facts and making false accusations has never and will never be considered an acceptable practice. Just as we flourish in our own accomplishments, we must maintain responsibility for our own mistakes, no matter how difficult it may be.

The easiest way to keep people from discovering something for which you are ashamed is to avoid doing things for which you should be ashamed in the first place.

Chapter 1

Subcontractors

Subcontractors are the foremost experts in their respective trades. In light of this unique and valuable expertise, they are frequently sought for advice from architects, engineers, and general contractors during the design and planning stages of a project. Although subcontractors are well versed in their own trade, they are not experts in the work of other trades. This leads us to the fundamental purpose of the general contractor's leadership role on a project. The general contractor's staff may not comprise experts from any of the subcontracted trades, but as a team they do boast a good working knowledge of all trades performing work on a project. This global knowledge is utilized during the bidding phase to ensure every component of a project is covered by one party (i.e., no scope gaps), while at the same time no component is covered by more than one party (i.e., no double coverage). As a project enters its construction phase this working knowledge is utilized to plan the work, schedule the subcontractors, coordinate the myriad of building systems, and orchestrate the construction operation in the most efficient manner possible.

The riskiest financial aspect of a project is the cost of field labor. Materials and equipment can usually be estimated to a high degree of accuracy, but field labor is highly dependent on how efficiently a project is conducted. The work of a subcontractor characteristically entails a tremendous amount of field labor, which bears an equally tremendous risk. Unfortunately, the efficiency of the construction operation is largely out of any individual subcontractor's control. Because the general contractor orchestrates the construction operation, subcontractors are heavily dependent on the general contractor's management skills to control their labor cost. This is a significant concern for many subcontractors. As a result, subcontractors will only submit bids to general contractors they believe will manage an efficient project. This is a responsibility general contractors should never take lightly.

It is the general contractor's responsibility to allocate each and every component of a project such that all work is covered by one party, but that no work is covered by more than one party. This is an immense and difficult management task. The general contractor will initially convey these divisions of work via their instructions to bidders manual and eventually incorporate these terms into each individual subcontract agreement. Subcontracts traditionally have a special scope of work section that is dedicated to this purpose.

Because subcontractors are a lower contractual tier than the general contractor there is a widespread misconception that they are subservient to the general contractor. This could not be further from the truth. Subcontractors and general contractors are truly partners on a project and this is the spirit for which subcontracts are written.

*sub-con-tract*¹ (*sub kon trakt*) 1) (noun) a secondary contract in which the person or company originally hired in turn hires somebody else to do all or part of the work, 2) (intransitive verb) to work on contract **with*** a person or company who is a contractor to somebody else

* Note that the term "with a person or company," not "for a person or company," is correctly used in this definition. A subcontractor is a partner *with* the general contractor. They do not work *for* the general contractor.

When a particular scope of work is allocated to a subcontractor they bear all risks and benefit from all rewards associated with that scope of work. A subcontract is not an agreement made solely with the general contractor, which is another widely held misconception. Subcontracts are a delegated portion of the prime contract agreement and are bound to all of its provisions. A subcontract agreement has two important distinctions in this regard:

- a. First, a subcontract agreement allocates a certain portion of the project work to the subcontractor. For example, an electrical subcontractor will be issued a subcontract to perform all electrical work on a project, which is essentially an allocation of the electrical piece-of-the-pie. Very importantly, the subcontract agreement also ties them to the terms of the prime contract. A subcontract agreement is quite thick, and this reference to

¹ From Encarta Dictionary: English (North America).

the prime contract may only be a single sentence, but it is a key sentence. By signing a subcontract agreement the subcontractor is effectively signing the prime contract as well. Though the prime contract may not be physically attached, it is contractually linked. This connection to the prime contract is no different than the connection a subcontract agreement makes to the drawings, specifications, or other documents.

- b. The subcontract agreement typically includes more requirements and places further restrictions on the subcontractor's scope of work than those described by a prime contract. The requirements and restrictions identified in a subcontract will not supersede those of the prime contract, they will only add to them. Examples may include mandatory attendance at weekly coordination meetings, instructing a painter to include a specified quantity of touch-up work near project completion, or requiring that the electrician provide temporary lighting throughout the building. When a conflict is discovered between the terms of the prime contract and a subcontract the more stringent provision will always prevail.

Although the general contractor is each subcontractor's liaison to the design team and owner, they are not the subcontractor's superior. This relationship is a partnership in its truest form.

THE SUBCONTRACTOR'S PERSPECTIVE

1. On a project for which the prime contract is a negotiated guaranteed maximum price² (GMP) type, the general contractor will attain bids from the subcontractors, thoroughly review the bid proposals, and perform negotiations as necessary. They will then include each low bid as an individual line item in their estimate that tabulates the prime contract value.

An unfortunate habit in the industry occurs after execution of the prime contract. Namely, a general contractor might attempt to negotiate subcontract values that are lower than those used to establish the GMP prime contract amount. Subcontracts are

² A guaranteed maximum price (GMP) agreement means the general contractor has guaranteed the project costs will not exceed a certain value. Generally, any savings on an under-budget project are returned to the owner.

never issued until the prime contract has been executed, which provides the general contractor an opportunity to negotiate lower subcontract values and keep the savings for themselves. This is commonly termed “making a buy.”

For example, consider a painting bid in the amount of \$250,000. The general contractor will include this amount in their GMP estimate and enter into a prime contract based on this value. Subsequently, the general contractor may coerce the painting low bidder into reducing their bid amount by 1%, which in this case amounts to \$2,500. This \$2,500 is then held by the general contractor, which effectively increases their contingency.

As another example, consider a \$50,000,000³ prime contract value for which \$45,000,000 of the work is subcontracted. We will assume the owner has agreed to allow the general contractor a 3% contingency, which amounts to \$1,500,000⁴. If each subcontractor agrees to provide the general contractor a 1% “buy” on the project it will amount to an additional \$450,000. This raises the general contractor’s contingency value from \$1,500,000 to \$1,950,000, which is a 30% increase.

Normally, a general contractor will not expressly state that subcontractors agreeing to provide arbitrary bid reductions are going to be afforded preferential treatment. Nor will they verbally state that subcontractors refusing these reductions are going to be given last considerations. However, by nature of a request such as this it is undoubtedly implied. Subcontractors may view these reductions as the lesser of two evils. They could either concede a portion of their base bid value or they could stand to lose even more by being treated unfairly with scheduling constraints, change order negotiations, and other considerations through the course of the project. This is not a fair position to place a subcontractor in.

There are two repercussions frequently realized after a general contractor has made a buy, both of which become the eventual financial burden of the owner. First, and obviously, the owner will be overpaying for the subcontract values. Secondly, the subcontractors are likely to submit inflated change order requests in an attempt to recover their forfeited money. Since the

³ Rounded calculations are used in this example for simplicity.

⁴ For a total GMP value of \$51,500,000.

owner is the recipient of most change order requests, they will bear a significant financial burden from this inflated pricing.

By performing this act without the owner's knowledge the general contractor is violating the trust that the owner has instilled in them. When a general contractor is awarded a project in a negotiated manner they have both a contractual and moral obligation to perform their duties in the best interest of the owner. Further, as the owner's duly appointed representative, the construction manager has an essential duty to oversee the estimating and bidding processes to ensure the general contractor does not attempt the unethical practice of making buys.

One proactive management method that aids in controlling this issue is a requirement that the general contractor provide copies of all executed subcontracts to the construction manager. When this request is posed to a general contractor, there are two vastly different responses that could be expected. A general contractor who performs their work to the highest degree of ethics will welcome this sharing of information, as they pride themselves on this trait and appreciate the opportunity to prove it. General contractors such as this welcome audits of any kind, as the result of a successful audit is an impressed owner who will in turn become a spectacular reference for them in the future. The second reaction that could be expected is a general contractor who is very defensive and secretive of these documents. Defensiveness is a sign that they have something to hide.

The best way to keep people from finding out about something we are ashamed of is to avoid doing things for which we should be ashamed in the first place.

Requesting copies of all fully executed subcontract agreements may appear reactive, as opposed to proactive, but the truth is that we are not trying to catch the general contractor after they have performed an unethical act. Actually, we are letting the general contractor know at the onset of a project that fully executed subcontracts will be requested in an effort to create a deterrent. When they are notified that the construction manager will be reviewing the subcontract agreements, they will not attempt to make buys, in fear of being caught. Thus, by simply informing the general contractor of this requirement

prior to the onset of the bidding phase we will deter this unethical act from occurring.

2. Subcontracted work is almost always competitively bid. Because the bidders are in direct competition with each other for a project that is to be awarded solely upon the lowest cost, they will all provide the absolute lowest bids for which they are comfortable. When project bids come in over budget there might be a temptation to pressure the subcontractors into lowering their bid amounts. But, when subcontractors have already furnished the lowest price for which they feel comfortable, this is in fact an attempt to take money from the fair value of their proposals and in turn providing an unfair gain to the owner of the project. Subcontractors, like all of us, are in business to make money. They work hard for this money and deserve fair compensation for their efforts.

A well known, though unethical, practice is sharing the low bid value with the second lowest bidder and asking them to beat that price. General contractors might use this tactic in an effort to lower their lump-sum competitive bid or to help a subcontractor who is a personal friend win a project. This act is commonly termed bid shopping, and is widely discouraged throughout the industry. Sharing a bidder's quotation with their competitor in an attempt to persuade the competitor to lower their price is not an ethical negotiating tactic.

When a general contractor earns a reputation for bid shopping it spreads rapidly through the local construction community. Subcontractors will not put forth the costly and time consuming effort of bidding a project if they believe the general contractor will deny them a fair opportunity for success. As a result, general contractors who have earned a reputation for bid shopping have great difficulty persuading subcontractors to provide them bids. General contractors rely on good, low, competitive bids from the subcontractors in order to win projects. Therefore, when a general contractor has trouble getting bids it can drive them out of business.

3. The cost of providing design documents⁵ to all of the project bidders can be considerable. Because of this, owners, architects, and general contractors regularly require bidders to purchase their

⁵ Design documents are the collection of drawings, specifications, and various supplemental documents.

own documents in order to bid a project. In fact, there is a general consensus that this is simply a cost of doing business as a subcontractor in the construction industry. From the subcontractor's point of view, the cost of purchasing design documents for every project they bid can be a significant financial burden. This cost is so burdensome that subcontractors are selective when accepting bidding opportunities because they cannot afford to purchase the documents for every project on the market.

Although the printing cost associated with distributing design documents to all of the bidders is considerable, it is often found to be financially beneficial because this approach will actually increase the number of bidders on a project. One of the primary reasons subcontractors pass on bidding opportunities is to control the amount of money they spend on design documents, therefore they are much more likely to bid a project for which the drawings are provided free of charge. If just one of the bidders who would otherwise have passed on the opportunity is actually found to be the low bidder; the difference between their bid and the bid of the next lowest bidder is likely to be greater than the amount incurred for printing costs. Thus, a net gain will be realized.

Performing value analyses such as this is in the owner's best financial interest, and protecting the owner's best interest is the construction manager's ultimate responsibility. Of course not all bidders need to be provided full sets of design documents. For example, ceramic tile bidders would only be furnished their respective specification section and the necessary architectural sheets. Likewise, landscaping bidders would not be provided documents such as the electrical or plumbing drawings.

4. Change orders are seemingly inevitable on construction projects. In preparation for change orders it is crucial to establish each subcontractor's change order labor rates and markup percentages prior to awarding their subcontract. When feasible, these quoted rates should also be a factor in determining the low bidder. If labor rates and markup percentages are not established prior to subcontract award, they may not become known until the first change order request is submitted. These rates have a reputation for being higher than if the subcontractor had provided them during the competitive bidding phase. This is especially true when the subcontractor's recognize their award of the project is contingent on them.

The most efficient and effective method of gathering labor rate information from the hundreds of bidders is to create a standardized bid form with blank spaces for each bidder to easily fill in their various labor rates. Disappointingly, even though bidders are routinely directed to use these standard forms and specifically instructed to fill in all of the blanks, experience has shown that subcontractors regularly submit bid forms with many empty blanks. Sometimes they do not even use the standard form at all. Because we never want to disqualify a low bidder due to a simple formality such as their bid format, these bids are customarily still accepted by general contractors. However, except when prohibited by public bidding laws, the general contractor should never divulge the bid results until this cost information is attained.

As the ultimate project authority and protector of the owner, a construction manager must take steps to ensure the bidders use the standard bid forms and, of course, fill in all of the blanks. Getting 100% of the bidders to provide bids per these project formalities is not a feasible task. However, we must put forth our best effort to maximize bid compliance. The best way to do this is with advertising, such as using large and bolded print on the first page of the design documents, bid instructions, and any addenda or other directives issued to the bidders. Sending a written notification to all bidders two or three days prior to bid day for the sole purpose of reinforcing this requirement is another effective management technique.

On privately funded projects we have the luxury of acquiring this information after bids are received, but before a low bidder is identified. However, on publicly funded projects the strict bidding laws prohibit using information received after bids are submitted as a factor in determining the subcontract award. Obviously, it is even more critical to clearly convey this requirement to the bidders of a publicly funded project.

Historically, bidders are consistently informed that change order labor rates and markup percentages will be a factor in determining who is awarded a project. In practice, this method of bid evaluation is very rarely imposed. Subcontractors have recognized this trend and as a result many actually provide high labor rates on the bid forms because they do not believe these rates will truly be a factor in the project award. To combat this

problem it is advisable for the construction manager to institute a set formula prior to bidding the project such that X quantity of labor hours and Y value of materials with the respective markup percentages will be added to each bid for analysis purposes. The result of this analysis will then be used to determine the low bidder (Figure 1.1). Of course, the actual subcontracts will be issued for the base bid value, not this tabulated value. This tabulated value should only be used for the analytical purpose of determining the winning bidder.

Through the course of our careers there will be countless occasions in which labor rates are provided after the subcontractors have been awarded a project. It should be recognized that calculating labor rates is not as simple and straightforward as it may appear. Labor rates comprise a number of individual costs, including the base wage, payroll taxes, workers compensation insurance, small tools⁶, expendables⁷, work trucks⁸, and of course profit. In this event we must request an itemized accounting of their hourly rates. This cost breakdown provides the necessary information to perform a thorough and fact-based examination of the rates. Base wages, payroll taxes, and workers compensation insurance are typically found to match the union or government mandated rates, thus they are rarely a cause for concern. However, the following examples illustrate unnecessary costs often discovered in a labor rate calculation.

- a. First and foremost, we must verify the profit percentage is reasonable.
- b. We must ensure reasonable rates are utilized for small tools, expendables, and work trucks. Estimating the cost of these items is quite speculative and as a result can spur a contentious debate. To avoid debates associated with these cost items, it is a good management practice to dictate acceptable formulas in the design documents. The general

⁶ Costs for small hand held tools, such as drills and circular saws, are generally accounted for within the labor rates. This is a common and generally accepted practice.

⁷ Like small tools, expendable costs are generally accounted for within hourly labor rates. Expendables include such items as drinking water cups, drill bits, and saw blades.

⁸ Costs for company trucks, including fuel and maintenance, are also generally accounted for as part of the hourly labor rates.

Bid Analysis

Item	Subcontractor A	Subcontractor B	Subcontractor C
Base Bid Amount	\$ 490,000.00	\$ 485,000.00	\$ 510,000.00
280 Hours at Submitted Labor Rate	\$ 16,800.00	\$ 23,800.00	\$ 19,600.00
\$10,000 in Materials Plus Submitted Markup Percentage	\$ 11,000.00	\$ 11,800.00	\$ 11,500.00
Adjusted Bid Value	\$ 517,800.00	\$ 520,600.00	\$ 541,100.00

Subcontractor A submitted a labor rate of \$60 per hour and a markup percentage of 10%
 Subcontractor B submitted a labor rate of \$85 per hour and a markup percentage of 18%
 Subcontractor C submitted a labor rate of \$70 per hour and a markup percentage of 15%

Although Subcontractor B provided the lowest base bid, after this analysis it has been determined that Subcontractor A actually provided the best overall value. Therefore, Subcontractor A should be awarded the project.

FIGURE 1.1 Utilizing change order labor rates and markup percentages to determine which bidder will provide the overall best value for a project is good management practice.

contractor and all subcontractors will then be forced to use these preset formulas for all labor costs associated with change order work. For instance, if a subcontractor is not restricted to a set formula they may simply plug \$20 per hour for a work truck. However, if a formula was provided that takes purchase price, fuel, maintenance, insurance, and reasonable profit into account the actual cost of this same work truck might calculate to only \$5 per hour. In this hypothetical example, this approach prevents a subcontractor from earning an undeserved profit of \$15 per hour from their truck.

- c. A labor rate breakdown may include contributions to the employees 401k. This is an actual cost and as such is a reasonable inclusion in the hourly rate. However, craft workers are unlikely to be eligible for a 401k contribution program from their companies. If this is included as a line item we must verify that the employee is in fact offered a 401k contribution as part of their compensation package. Some companies have been known to add fraudulent line items such as this in an effort to increase their profits. Other examples include vacation and sick pay line items for employees who

Chapter 2

General Contractors

The individual successes of each project team member are heavily dependent on the success of the project team as a whole. Each individual project team member relies on their teammates to perform their respective roles in a timely and competent manner. For instance, the general contractor is relied upon to attain accurate bids, employ reputable subcontractors, and orchestrate an efficient construction operation. In turn, the architect is relied upon to provide design documents suitable for bidding and construction purposes, the construction manager is relied upon for fair treatment in all financial matters, and subcontractors are relied upon to meet their schedule and quality expectations.

The overall success of a construction project is defined by the final cost, completion date, and quality of the craftsmanship. Codependent relationships are vital to this measurement of success. The nature of codependency demands that we instill a great deal of trust in our fellow project team members, but it is naturally difficult to trust another company for our financial wellbeing and individual successes. This trust centers on and around our construction team leader, the general contractor, throughout the construction phase. The general contractor has both a contractual and moral obligation to orchestrate a project in the most economical fashion possible, while progressing quickly and providing the highest degree of quality. The entire project team benefits when the general contractor takes this to heart.

THE GENERAL CONTRACTOR'S PERSPECTIVE

1. People have a tendency to view money differently when it is their own than they do when it belongs to someone else, such as their company, a project owner, or a subcontractor. Of course, this tendency is evident in all businesses and is not by any means unique to the construction industry. However, this

trait of human nature is of particular concern in our industry because the costs and risks inherent with a construction project are considerably higher than other business types.

A major contributor to this trait is the fact that we never actually see any physical money through the course of our daily duties. All dollar values are simply represented as line items on various cost reports, change order requests, billings, and other administrative documents. Over time, people have a tendency to develop numbness to these documents and resultantly tend to forget that those numbers represent actual money that is coming out of someone's pocket. In fact, I firmly believe that people would view money much differently if we exchanged piles of cash for all financial transactions rather than ordinary pieces of paper. Of course, trading piles of cash is not practical for obvious reasons and is not recommended, but the point is that we must always view documents symbolizing money as the actual cash those documents represent. Every member of a project team needs to remain cognizant that the decisions we make have a significant financial impact and even though we may not personally benefit from any savings or hold any personal liability for any losses, someone we know is. This person may be the owner of our company, the owner of the project, the owner of the subcontractor's company, or, in the case of a public project, the taxpayers.

For example, consider a superintendent who reviews the project estimate to verify how much money has been budgeted for each work activity immediately before they begin the respective work. He might pay special attention to items of work that have a respectively small budget and complete that work in the most economical fashion possible. Conversely, this same superintendent might pay little or no attention to work activities which he is certain can be constructed under budget. This lack of attention may result in slow work performance by the field crews or inefficient methods. It is reasonable to assume that if the money spent was coming from the superintendent's own pocket, he would in fact complete all work activities in the most economical fashion possible, regardless of their budgetary values.

A budget is a management tool used to monitor the progress and financial status of a project. A budget should never govern how aggressively a work activity is performed. Work

activities should always be planned in the most expedient and economical fashion possible, without regard to their individual budgetary values. If a superintendent anticipates that an activity will be completed well under budget it is their duty to keep that work as far under budget as possible.

Realistically, some work activities will be completed under budget, while others will be over budget. In the end, these over-runs and under-runs should be expected to balance with each other. So, if a superintendent does not concern himself with coming in as far under budget as possible for activities that under-run the budget, the project team may realize in the end that not enough savings were generated to balance with the over-run activities.

A related source of concern is raised when a superintendent anticipates the budget for a particular work activity is insufficient. In this case they may have an urge to produce substandard or incomplete work in an effort to remain under budget. Because a diligent construction manager will identify substandard and incomplete work with their quality control program, this deceptive approach often results in a greater loss than would have been incurred if the work had been constructed correctly in the first place. When deficiencies are discovered the general contractor is directed to perform remedial work to correct them. In the end, the cost of this remedial work is likely to exceed what it would have cost the general contractor to perform the work correctly in the first place. Again, we must always complete work activities properly and in the most economical fashion possible, without regard to their respective budgets.

2. Design problems are commonplace and a natural part of the construction process. These problems are frequently the product of conflicting information within the design documents or information that is missing from the design documents. Construction projects are tremendous in both size and complexity, which equates to a very high degree of difficulty. Consequently, it is not a reasonable expectation for a design team to issue a flawless set of design documents. The excessive amount of time it would take to review, analyze, coordinate, and perfect the design documents is cost-prohibitive in the grand scheme of a project. Given, the design documents must be of good quality, but perfection is not a reasonable expectation.

When a design problem is discovered the general contractor customarily issues a request for information (RFI) to the design team. It is then the design team's contractual responsibility to resolve the problem and issue direction to the contractor. Contractual terms aside, the general contractor's expertise in the means and methods of construction¹ is a valuable asset to the development of creative solutions. Though it is the design team's contractual responsibility to provide RFI responses, the general contractor does at the very least have an implied obligation to assist the design team in devising creative and optimal solutions. In fact, this obligation is not always simply implied and is often written into the prime contract agreement as a specific responsibility of the general contractor. This contractual term is commonplace on privately financed projects.

Just as conflicts and problems are a natural aspect of the design process, construction errors are a natural and expected part of the construction process. Experience has shown that when a general contractor refuses to assist the design team in devising solutions to complicated and costly design problems, the design team becomes reluctant to assist the general contractor with design solutions for errors made in the field. A collaborative environment in which the contractor assists the design team with design problems and the design team assists the contractor with construction errors is critical to the ultimate success of a project.

All construction projects are unique, so everything we build is essentially a prototype. Problems and mistakes are inherent with prototypes of any sort, including automobiles, computers, textbooks, home appliances, lawn mowers, furniture, and even buildings. The difference in our industry is that we are selling our prototypes to the owners, whereas prototypes for mass-manufactured products are either kept in storage at the manufacturing facility or simply thrown away with the trash. We are never provided second chances to get things right. This exemplifies the importance of a collaborative team atmosphere among the project team.

¹ An expertise in the means and methods of construction is commonly referred to as an expertise in constructability.

3. A widespread misunderstanding held by subcontractors is that a general contractor's signature on a time and materials ticket (also termed a T&M or field ticket) is always a confirmation that the task at hand is in fact extra work and not part of their contractual duties. This is not the purpose of a field ticket. However, a general contractor's signature on a field ticket absolutely is verification that the number of hours and quantity of materials represented on the field ticket are accurate. The authorized signer of field tickets, usually the project superintendent, must understand their responsibility in this important financial matter. This is not a responsibility that should be taken lightly.

Reviewing, analyzing, and confirming contractual responsibility can be an arduous task, so much so that performing this verification prior to signing a field ticket is time-prohibitive. Field tickets are traditionally signed by the general contractor's on-site superintendent, who cannot be reasonably expected to verify contractual responsibility on the spot. Notably, field tickets presented by subcontractors routinely include preprinted language stating that a general contractor's signature represents an acknowledgement that the work in question is outside the realm of their contractual obligations. In practice, this exculpatory language is generally found to be unenforceable.

Unfortunately, monitoring the specific number of workers and hours spent on all of the time and materials work performed on a project demands a tremendous supervisory effort. Further, because the effort spent monitoring T&M work is a time consuming distraction from other important project duties, many project superintendents do not pay it proper attention. A disappointing reality is that field tickets are often signed by busy superintendents without any review or confirmation that the time and materials represented on the field ticket are in fact accurate. When subcontractors recognize that a superintendent carelessly signs any field tickets placed in front of him while he is pressed for time, they use this knowledge to their advantage. Specifically, the subcontractors may attempt to gain approval of field tickets with inflated time and materials values.

Subcontractors learning to watch the superintendent and only hand him field tickets when they see he is hurried is a relatively common occurrence. Unfortunately, these inflated quantities are not often recognized by anyone after the signature is

provided and these unethical subcontractors are subsequently overpaid for the respective change order work.

Consider the owner's perspective on this issue. If they are told that the project superintendent is signing field tickets blindly, they will assuredly reject the respective change order requests and probably have the superintendent removed from the project.

The majority of work tracked with field tickets is the ultimate financial responsibility of the owner, not the general contractor who is actually signing them. Although the general contractor is not usually financially responsible for the succeeding change order requests, they do have an obligation to understand what it is that they are signing. The signature on a field ticket is not a simple formality. It is a personal verification that what is written on the ticket is accurate. Signing a document of any sort without reading, understanding, and agreeing to it is a reckless practice.

Projects with greater than average problems may have a dozen or more different time and materials activities in progress simultaneously. The project superintendent and assistant superintendents may not be able to monitor this excessive T&M work while still coordinating and orchestrating the project efficiently and effectively. This is a frequently encountered dilemma and it is not uncommon for a superintendent to utter the disheartening phrase "I don't have time to monitor all of the T&M work going on." When this occurs the construction manager must take immediate action to ensure change order work is properly supervised and field tickets are not signed arbitrarily. In this situation a prudent approach might be to add an additional staff member who is delegated the sole task of monitoring T&M work. With this approach the subcontractors will be instructed to inform this person when their T&M work begins, where it will occur, and when it ends. This person will oversee these work activities and sign the representative field tickets at the completion of each work day. The construction manager may even wish to monitor these costs personally by employing this person directly, rather than relying on the general contractor.

A project for which there is a great deal of time and materials work being performed often goes hand in hand with a project that is significantly over budget. When a project is anticipated

to finish well over budget it is never easy to endure the cost of another staff member added to the project. The cost of this additional person must be weighed against the expected savings he will provide in successfully combating inflated labor hours and material quantities, as well as the projected benefit of the superintendent's time that is diverted from field ticket management to project operations. If the expected benefit is greater than the estimated cost, employing an additional staff member for this task is a sensible management decision.

4. The labor rates general contractors utilize for their salaried employees are derived from a formula that includes projected sick days and vacation time. Special cost codes that allocate these salary costs to a home office overhead budget are then used when employees are out sick or on vacation. This is in contrast to cost codes that are billed to the project budget. This is a routine and generally accepted practice throughout the industry.

When the prime contract agreement is a single lump-sum value it is of no concern to the construction manager or owner how the general contractor accounts for their employees time. However, if the prime contract agreement is a guaranteed maximum price, or similar form, for which management time is billed on an hourly basis and reimbursed by the owner; the salaried employee time must be monitored by the construction manager (CM). The CM has an important duty to ensure time spent on nonproject-related activities is not billed to the project. The owner should never be held responsible for extracurricular activities² performed by the project staff.

Though general contractors regularly utilize home office overhead cost codes for sick and vacation time, they do not always use special cost codes for time employees spend in training, working on upcoming bids, or attending company functions. Like sick and vacation time, extracurricular activities detract from the time employees spend managing their projects. Therefore, the time spent on extracurricular activities should not be billed to the project owner. Owners regularly understand and agree to their responsibility for vacation and sick time, as they are part of the basic employee compensation package. However, the distinguishing characteristic is that sick and vacation time

² Activities unrelated to the project.

are nonproductive, whereas extracurricular activities are productive. In the case of extracurricular activities the employee is actually performing a service for their company. Therefore, their company should bear the respective costs.

As integral members of the project team, construction managers have a good knowledge of who is or is not in the office on any given day. In fact, the construction manager typically works so closely with the general contractor's staff that they know where each person is when they are not on site. Keeping a daily attendance record is not a cost-efficient task, as a CM has much more important things to focus their time on. However, in the first couple months of a project the CM should make a few observations of when employees are off site performing activities that are unrelated to the project and make a note of them. When the monthly billing is presented these random samplings should be checked against the time billed to ensure the general contractor did not bill their extracurricular activities to the project owner. If the CM discovers that this time has been billed to the owner it is their duty to request a correction from the general contractor and emphasize to them that this practice will not be allowed. Periodic random reviews of this nature are highly effective in preventing these acts.

After this initial test the CM will use their discretion to determine if further monitoring is necessary and, if so, how frequently it needs to be performed. Notably, once a general contractor realizes the construction manager is periodically monitoring the staff attendance they will be deterred from errantly coding their timecards in the future. Provision of a deterrent is a very effective and proactive management technique.

5. A common contractual arrangement for negotiated projects is a guaranteed maximum price (GMP) with a stipulated lump sum for general conditions. Basically, the general contractor will be reimbursed for all direct³ project costs plus a fee percentage. But, they will receive a lump-sum amount for all indirect⁴ costs, commonly referred to as the general conditions costs. The terms

³ Direct costs are defined as anything that is a part of the completed project, such as field labor and building materials.

⁴ Indirect costs are defined as anything that is not a part of the completed project, such as management time, temporary toilets, office trailers, printing, and office supplies.

of this agreement normally state that all savings under the GMP be returned to the owner.

With this arrangement a clear delineation between what items are included in the lump-sum value for general conditions and what items are reimbursable under the GMP must be established. This division of work will vary slightly among projects, but variation is perfectly acceptable as long as all parties understand and agree to the specific division of work on a given project. Temporary toilets, site fencing, general clean up labor, utility bills, dumpsters, and temporary power are just a few examples of items that have been known to fall on either side of this dividing line.

A clear division of these costs is crucial to ensure the owner does not pay for anything twice. For instance, a general contractor may include temporary toilets and dumpster service in their lump sum for general conditions. Subsequently, their project manager may allocate the invoices for these items to reimbursable cost codes, which means they are billed as reimbursable costs. Thus, after already having paid for these items via the lump-sum value for general conditions, the owner will pay for them a second time as reimbursable costs under the GMP.

It is the construction manager's responsibility to understand the terms of the prime contract and monitor the project billings to ensure the owner does not provide duplicate payments to the general contractor. The most efficient method of managing this issue is to require that the general contractor provide a cost report with each billing. This report will list all invoices paid during the billing period, the name of the company that was paid, which cost code the invoice was allocated to, and the amount. Customized cost reports can be generated very easily with most accounting programs, therefore provision of this document should be a relatively simple task. This is an excellent management tool that will provide the construction manager all of the necessary information to ensure the general contractor has not misallocated any invoices.

This might appear to be a reactive management technique, but in practice it is actually proactive. The goal is not to catch the general contractor in the act of misallocating invoices, which would be reactive. The goal is to let the general contractor know we are monitoring their cost reports. This provides a proactive

message that any misallocations will be discovered. This deters them from attempting any unethical accounting practices.

The best way to solve a problem is to prevent the problem from occurring.

6. Many general contractors prefer the contractual structure of a guaranteed maximum price (GMP) with a separate lump sum for general conditions. This is because general contractors hope to run an efficient project and in the end derive an additional profit from savings within their general conditions budget. Many owners also prefer this contractual arrangement because it ensures the general contractor does not take advantage of the project budget for unnecessary or frivolous items when a project is under budget. For instance, if all general conditions costs are reimbursable (not segregated as an independent lump-sum value) the general contractor might have a compulsion to make extravagant purchases near the end of an under-budget project. Extravagances may include buying lunch for the staff two or three times a week; purchasing expensive jobsite furniture; buying high-end electronic equipment; and generally paying little attention to the costs spent on indirect items for which they will personally benefit. They may even bring on additional, yet unnecessary, staff members to make their lives a little easier. Needless expenditures such as this do not benefit the project, but will reduce the savings that is eventually returned to the owner.

The downside to this contractual arrangement is that the general contractor may attempt to cut their general conditions expenses to the point that the project suffers. For example, general contractors have been known to reduce staff in order to save money, which is commonly referred to as “running a lean project.” The key distinction of a lean project is that the general contractor might provide sufficient staff to keep up with their day to day duties, but just barely. They may not provide sufficient staff to look into the future and effectively plan the project. When a general contractor is falling behind on their planning responsibilities it is not nearly as obvious as when they fall behind on their daily tasks. As a result, construction managers do not always recognize this deficiency until it is too