

IMPROVING THE CONSTRUCTION PROCESS THROUGH STANDARDIZING
DAILY LOGS

By

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The construction industry is constantly under pressure to provide the most accurate information in the form of a budget to prospective owners to be awarded a project. With this goal in mind, estimating departments have been working hard to store the most up-to-date information in the company's database in order to provide the most accurate job estimate. Despite the precautions the estimating departments take, errors will never be eliminated from the estimating process. Efforts can be made to continually update and improve the estimating and overall construction processes by improving the information gathered in the field. Through investigation of current methods of tracking job progress and the current implementations of daily logs, this study will introduce an improved method for tracking job progress.

Starting with research on the current methods for tracking job progress and continuing this research to a more narrow scope including the use of daily logs will

provide insight on the current methods of construction. This insight will then be used in the creation of a standardized format for daily logs to be used on every job. A standardized format will provide more reliable and accurate information to all facets of construction.

The ultimate goal of every construction company is to complete a project successfully in order to make a profit. A new method for tracking progress through daily logs will promote greater success in all areas of construction including estimating, managing and job tracking. If each aspect of construction can be improved, the end result will be greater success on the project level, which amounts to enhanced profit margins.

CHAPTER 1 INTRODUCTION

The construction industry as a whole is currently at a point where the competition forces all companies to strive to elevate themselves above rival firms in order to promote their ability to get work. Whether participating in a hard bid or negotiated work, every company has a unique method of budgeting future projects. There will always be disparity between firms and how they carry out the estimating process; however, the introduction of standardized forms would promote a more organized approach through the pre-construction and construction processes. The use of daily logs is currently universal in the construction industry, but every company has a unique format for these logs which causes confusion. A standard format for these logs would promote reliability for individual contractors and the industry as a whole.

Statement of the Problem

When dealing with productivity in construction, the most obvious aspect to be addressed was the limitation of waste. Whether it was wasted time or materials, both played significant roles in the amount of work produced on a job. In order to conquer this problem, more accurate methods of identifying waste and tracking job progress were needed in the future.

Objective of Study

Every minute of time was precious through the construction process; therefore, wasted time resulted in a loss of potential profit. One way to avoid loss was to keep a precise record of the work produced. Accurate recoding of jobsite data would promote a

better comparison between the estimated and actual work. If there was variance between these two, an immediate adjustment could be made to prevent future problems. If this method were in use today, the estimating process would be much more accurate. This method was not in use because many companies depended on the experience of their employees; rather than what was occurring in the field. This was a major flaw that had to be addressed.

The tracking of actual job progress played an important role in keeping all projects current with the schedule. Tracking job progress was crucial to the progress of construction; in the same way, it was also important to all pre-construction activities.

Every construction company used daily logs as a means of tracking job progress and making records in case of any dispute. Most companies also used the same concept with the daily logs. It would be logical to create a standard format for these logs that both described the state of the job for that day and benefited the process of estimating. The main problem was gathering the right information that all companies needed on the daily log.

First hand insight on how corporations used daily logs and tracked production was obtained by gathering information through interviews of various estimators from Central-Florida-based construction companies. This insight enabled a comparison of the different methods used by each company. These comparisons were then compiled to create one standard format of daily logs to be used by all companies. Recording job progress was a

concept used every day on all construction projects. There was neither a right nor a wrong way of recording data as long as the important information about the job got passed on to the right people in the proper manner. The problem was keeping these logs practical so that they did not require an insubordinate amount of time to fill out.

Hypothesis Statements

The following Hypotheses were tested in this study:

H1: The combination of different formats of daily logs gathered from construction companies of different size and type will enable the creation of a standard format that can be used by all firms and thus improve the current process of recording daily job activities.

H2: The accurate recording of jobsite information should refer to daily delays, and other job related conflicts that can be used to prevent these problems in the future.

Overview

The purpose of this research was to grasp the different approaches to tracking job progress and the methods used in the construction industry. Through a research of the available literature and contractor input, a solution was developed that all contractors were able to use regardless of size or type. Finding this solution was a challenge because all companies operate in different ways. However, personal input from contractors gave better insight on how a standard set of logs would work in the industry.

Prior to contractor involvement, research was carried out to fully understand the issues and ideas that were in existence in the construction industry. This was carried out through the literature review which analyzed various works all relating to productivity in the construction industry.

The following chapter takes a detailed look into the literature reviewed to promote a better understanding for the methods of tracking job progress. Beginning with current methods and closing with technological efforts to promote greater success in the industry. This investigation allowed a complete understanding for the basic path this paper took.

CHAPTER 2 LITERATURE REVIEW

Introduction

As the competitiveness of the construction industry continues to increase, and separation from the rest becomes more difficult, it is important to ensure the accuracy of the estimates. Keeping prices competitive requires all information in an estimate to be precise in order to protect the company. While this relates well to the performance levels in construction, this concept must be narrowed to only involving the improvement of job production.

The first step was to look at current methods of documenting information about the job. There are a number of ways this is carried out from a contractor's point of view (Fisk, 2000). Next, a theory of production aimed directly at the construction industry and more importantly, the reason why construction is so unique that it needs its own theory of production will be discussed (Koskela, 1999).

Next, Key Performance Indicators (KPIs) (Cox et al. 1997) were investigated to determine the activities that management uses to indicate the performance levels of construction crews. Both KPIs and production theories will give an idea of current principles that are used in construction, but the future will involve more technology in everyday work and therefore must also be discussed. Finally, the work of Treffinger (2005) and El-Mashaleh (1997) both looked at the existing use of technology in business and the direction this movement might take, are discussed.

Current Methods of Recording Progress

When it comes to recording data on activities taking place on a jobsite, there are many different forms a contractor can use: daily logs, concrete logs, equipment logs, weekly report and weekly time cards just to name a few. Each of these forms plays important roles in documenting the work that occurs on a job. The use of each of these forms is up to the discretion of the contractor or the owner; they are not required by law (Fisk, 2000). Although documentation is not required by law, most companies do keep track of the progress through these forms, especially the daily log. This log or report is viewed as crucial to the construction process because it keeps an accurate record of the daily progress carried out on a job (Fisk, 2000). If this report is not used or filled out properly it could prove costly in the end; often used as a reference if conflict arises, daily logs are highly regarded for what they can prevent. If the records are not complete, the project manager has no way to back up any claims.

Prior to the adaptation of daily logs, project superintendents were asked to fill out a construction diary. This diary was a hard bound book full of standard forms that provided room for detail in the description of what occurred on the project that day. This book was used for the same purpose the daily logs are today: maintain an "unimpeachable legal record" (Fisk, 2000). In a way, this book acted as a standardized format for the daily logs. All diaries had the same forms that asked the same questions. This way, if legal action was taken against the company, this official record could be presented in court as a source for the contractor to recall activities that had taken place on the day in question.

The process has remained almost unchanged. The only difference is every company's format for the daily log differs slightly. The idea behind this is to eliminate inconsistency in order to produce more reliable results. A contractor would be able to

understand their own log, but a second party would have a difficult time determining what type of information this form presented. When the dairy used was the same between companies, confusion was kept at a minimum. Everyone understood what the questions were asking and what information needed to be provided in these logs. The current format of logs is not consistent between firms, which creates difficulty in filling them out and interpreting the information available.

The argument is not that standardized documentation will solve all of the problems in the construction industry. However, it will make it easier for contractors and outside parties to interpret what happened on the jobsite on any given day. This is crucial in legal cases when a dispute arises and the solutions to the problems are in question. Speed and accuracy have always been important concepts in the construction industry. By introducing these concepts back into the process of recording daily logs, the construction process will improve greatly.

Keeping up with daily logs and tracking job progress is a timely but crucial aspect in every construction project. The next step to fully understanding the job progress dilemma is to investigate what needs to be recorded and tracked on a daily basis to improve the construction process.

Production Theories

Due to the unique conditions the construction industry goes through to conduct every day business compared to other industries, it needs to be viewed differently when discussing actual production. Unlike most industries, a construction project is not usually mobile, it has size limitations and also must adapt to the surrounding environmental conditions. These three factors play crucial roles in determining the amount of

productivity that is carried out. Koskela (1999) wrote about an alternate theory of production that should be created for the construction industry.

Koskela (1999) defined such a theory in this sense as providing an "explanation of observed behavior, and contributes thus to understanding." Understanding what occurs on a jobsite and how to plan for it is exactly the purpose of this paper. It is possible for a company to be able to discover more about the problems associated with a job and ultimately create a method to plan around these problems simply by observing the surroundings. Koskela (1999) also described the theory as giving direction and providing an ultimate benchmark for practice. Processing, inspecting, waiting and moving are all parts of construction that represent waste. Unfortunately these concepts will never be eliminated. Tracking the waste and learning about possible activities that can be carried out at the same time the wasted time could be converted into production. Reducing waste means making money, this ultimately leads to the success of the project.

There are two theories of production discussed by Koskela: the transformation view and the flow view. Transformation is defined as the work that needs to be completed, whereas flow is an attempt to eliminate waste (Koskela, 1999). Koskela's goal is to create a new theory that uses both of these ideas in order to promote more reliability in construction. The reason behind this is that construction is unlike any other industry. There is a comparison between the construction and auto industry because both are similar in the sense that many small pieces are put together by different groups of people to ultimately create one final product. The difference between these two industries is that a car moves along an assembly line, whereas construction workers move around the building. Also, the car makers are in a controlled environment. Construction workers are

exposed to the outside elements, which affects the amount of work completed each day.

"Due to the one-of-a-kind nature and temporary organization, drawings and production instructions are the most frequent cause of construction defects" (Koskela, 1999).

Planning against potential delays proves difficult because of the nature and environment the construction industry exists.

If the goal of a construction production theory is to plan for potential problem areas to avoid them and not necessarily eliminate waste, there may be some success. The theory must allow the workers to follow a set of guidelines and observe what is happening in the surroundings, understand any potential conflicts and work around other workers so as to not be slowed down (Koskela, 1999). This is defined as the elimination of conflict by understanding the surroundings, which would lead to greater productivity.

Another example of how a theory of production would give a sense of direction is through observation of the past to overcome future problems. Koskela discussed passing information on to novices so inexperienced workers are able to participate in activities only experts were able to in the past. This simple task of condensing knowledge or information enables this new process to be carried out (Koskela, 1999). Similar to this approach is transferring situational knowledge to others in different circumstances. The same way prior knowledge is condensed and passed on to younger workers or novices to give direction, past situations can be adapted to a different situation to retrieve the same or similar results (Koskela, 1999). The main goal in creating a production theory is to reach success at all levels and all situations. If workers learn before making mistakes, the chances of increasing production rates will increase.

Koskela stated that a theory of production is important to all industries because it ultimately leads toward the design, control and improvement of production in the workplace (Koskela, 1999). That is exactly what the construction industry should attempt to do: improve the way production is viewed so that it can be adapted to introduce greater success on the project levels.

Scope management is defining work that needs to be carried out on a job by breaking down every aspect. This is important to construction because it enables workers to be informed so the greatest amount of work will be carried out. It prevents unnecessary work from being attempted, and the work that is completed helps deliver the purpose laid forth in the construction documents (Koskela, 1999). This idea of scope management is based on the transformation view, which depends on certainty. Koskela describes this as the main view used throughout the construction industry. The problem is that certainty is lacking in construction. Every project is different and any situation can change in an instance (Koskela, 1999). This is why Koskela attempts to come up with a new theory of construction that would be based not on consistency or certainty, but on past experiences and how they can contribute to the future projects.

Key Performance Indicators in Construction

In contrast to Koskela's idea of a perfect theory of production for construction, Cox et al. (1997) suggest using Key Performance Indicators (KPIs) in construction with the help of upper management to assess performance carried out in the field. Unlike the idea of a standard production theory, KPIs vary between situations and people. Cox et al. (1997) defined KPIs as a compilation of data used to measure the performance of any operation, but this does not mean that it is consistent in all projects. A KPI is anything that helps a job manager understand the crew performance levels better. Cox et al. (1997)

used a historical baseline to determine what KPIs actually are and how they should be used. Looking at past activities to understand problems that have occurred and the end result of these problems will enable a manager to comprehend how to avoid these conflicts in the future.

Cox et al. (1997) explored a quantitative approach which looked into factors of progress that can be measured. For example, the most common method is the units per man hour which explores how many units can be constructed in one hour of work (Cox, et al. 1997). Estimating uses historical data to determine these numbers and then applies the answer to the construction schedule. The problem with this approach is that delays need to be taken into consideration. It simply looks at an average production rate that was recorded. If the unit per man hour calculation is a pure average, any delays would already be factored in, thus making the estimate accurate. This all depends on the purity of the information gathered and how it is transferred to the estimating department.

If estimators have access to pure and accurate information, the estimate will prove to be accurate itself; a clear agenda for the construction process will then be followed. In this case all possible delays will be planned and accounted for and the surprises in the construction process would be limited. Unfortunately, every construction project has surprises that will eventually arise. Estimators must find a way to plan for these changes from the norm and give the project managers the best opportunity to produce a profit.

The Use of Technology in Construction

To keep production at its highest level better methods need to be adapted to limit waste and use historical information to promote accurate estimating. El-Mashaleh (2003) discussed many aspects of construction and production. The section best assisting the problem at hand is the impact IT (Information Technology) has on work performance.

Companies from every industry of varying in size and type are using e-Business to organize communications and thus improve the success of their company (Treffinger, 2005). El-Mashaleh addressed a number of propositions for how IT is an excellent source of improving productivity in construction. Three of these proposals fit well with the issue at hand: facilitating coordination and responsiveness, increasing speed and accuracy and increasing coordinating efficiencies (El-Mashaleh, 2003).

The introduction of technology to authoritative workers onsite (project managers and superintendents) will help reduce confusion with documentation, which leads to delays. The introduction of hand held internet technologies to jobsite activities will promote a greater understanding for the requirements of the job. Questions can be sent from one person to the next and answers can be retrieved with the push of a button. Using PDAs, workers will be able to send e-mail and pictures through a network to ensure questions are quickly answered making the process of question and answer more efficient (El-Mashaleh, 2003).

In addition to problem of sending questions and answers is sending documentation. Paper documentation is the current standard in the construction industry. When drawings are sent out subcontractors expect to receive them in hard copy form. These construction documents (drawings and specifications) are expensive and range from a few pages to a few hundred pages. More applicable to the business aspect of construction is the cost of these documents, which the general contractor is usually expected to pick up.

Equally as important as keeping the work force informed about the job is keeping the owner of the project updated on all activities. Owners are becoming increasingly

more demanding and want information about their projects available at all times. This can be made possible by making jobsites IT friendly (Treffinger, 2005).

Business to business sharing connects customers, suppliers and partner applications as well as all business processes across the internet (Treffinger, 2005). IT will be used to implement speed in the process of sending drawings to multiple groups reducing cost and time restraints.

Most drawings for construction are created through CAD programs, which are Computer Aided Design programs. The files created can easily be sent electronically to any contractor because they are created in an electronic format (EI-Mashaleh, 2003). These concepts will reduce the cost of printing drawings, the cost of transferring documents and the time it takes to send them. In the quest to improve production, the electronic transfer of drawings and other documents is a logical step to introducing speed to a time consuming process. The speed at which RFIs are answered will be revolutionary. Processes that used to take days or weeks should now take only a few hours.

In addition to hand held technologies, most business have adapted to the age of technology in the main office. The office will generally have a network that keeps all the computers in the office connected. This benefits the field workers because information can be stored on the network from any computer or portable device so anyone on the network can see this information. If executive management in the office needs to check the progress of a job, the only requirement would be to look in the job specific folders on the network and see a daily post of what is happening on the site. This concept relies on how the workers submit daily information. While the project manager is ultimately in

control of the project, a person of authority in the office is able to read about the progress and demand greater production on certain aspects. This idea will ensure that the forms are being filled out properly and on a regular basis. This observation through the network will not be exclusive to company executives; anyone involved in the project will be able to look at the projected schedule and observe how close construction is following the schedule (El-Mashaleh, 2003). Not only will the onsite workers be observing the schedule to ensure the job is on track, but office management will also be able to see and react to how the job is progressing.

Construction as an industry is continually changing to improve itself. With the availability of new ideas to track work and promote better production, there is no reason to pass up these opportunities. IT, production theories and KPIs are only a few concepts that have progressive ideas about improving the state of construction. The case studies below will give a better understanding for exactly what is occurring in the industry in Florida and some ideas to change current methods to improve the way construction tracks progression.

The next chapter will continue the research process by discussing in greater detail how the first hand research will be collected. Titled “Research Methodology,” this chapter will explain the interview process and the expected results in order to create a standard format for the daily logs that will satisfy all contractors.

CHAPTER 3 RESEARCH METHODOLOGY

Accurate tracking of field production should play an important role in the estimating process just as it does for managing the construction phase. The best method to determine how contractors are tracking field production is to conduct interviews with different companies to determine the concepts of their daily reports. Improving estimating is important to this research. Thus, an estimator from each company should also be interviewed. At the same time, the activities going on in the field would best be interpreted by a project manager or a superintendent. Depending on the type of company and availability of the employees, these interviews should be directed toward estimators and project managers.

No two contractors carry out business operations in the same manner. All companies use daily logs but, not necessarily for the same purposes. Data gathered from different companies will allow for combination of the existing processes to develop a standard format for daily logs and tracking job progress.

The process of selecting which contractors to interview was based primarily on them having a functioning office based in Orlando. The next criterion that had to be investigated was the size of the company. Some of the contractors selected were national companies and others will strictly be local contractors that work only in the Orlando area. Finally, the focus was on commercial construction managers, general contractors and some of the subcontractors working for these companies.

Due to their conflicting interests construction managers, general contractors and sub-contractors will all have different points of view when dealing with tracking job progress. Subcontractors are usually concerned only with their own crews and their direct responsibilities to the job. The only time a subcontractor would need to know the progress of another company would be if delays began to arise on the job. On the other hand, a general contractor is concerned with the project as a whole and not necessarily each individual activity. If any percentage of the work is self performed by the subcontractor, concerns will be raised with regard to the progress of these activities. The subcontractors would not be tracked on this same level of precision. As long as the job as a whole is on schedule, the general contractor will not be concerned with how the subcontractors are working. Finally, a construction manager is most concerned with the project being completed on time. If there is a delay, the construction manager will determine the problem through the general contractor or the subcontractor causing the delay. Otherwise, tracking job progress would not be a major aspect of the construction manager's daily activities.

Once the interview pool was selected, personal interviews were used to allow the contractors to answer specific questions about the process of tracking job progress. The contractor was expected to explain the current processes, how these methods benefit the company and any ideas for change. Finally, the contractor was asked about a standard format for daily logs and how this would benefit the process of recording field information to promote more accurate estimating.

At the completion of the interviews, the information was gathered and recorded to review all methods of tracking job progress and possible methods of improvement. The information about the daily logs was organized and interpreted to determine which aspects gathered the most accurate information. From the interpretations a new format was created to address the specific needs laid forth by the individuals interviewed.

Once the standard format for the daily logs was created, it then had to be validated through a test stage of constructive criticism. The log was sent back to the contractors that were interviewed for their opinions on whether or not the new log would be used and if it would provide greater benefits than the existing method.

The final step was to gather all the critiques from the contractors and organize them in a way that allowed a final draft of the new daily log format. In organizing the criticism of the contractors, priority was given in addressing the concepts and ideas that proved to be conflicting. The first draft was a rough compilation of what job parameters the contractors had collected in their daily logs and what the contractors wanted on a daily log. The second draft was an edited form of the first draft, based on criticism given by the individuals interviewed.

The process of interviewing contractors, creating a new daily log, receiving constructive criticism, and the creation of a final draft will promote the concept of improving the current utilitarian value of daily logs. Every company uses these logs for different reasons, which means every company may have a different opinion about the new format created. However, the goal of this research is not to create the perfect form, but one that will promote more accurate recording of all daily activities.

Now that the research process has been explained, the next step is to actually carry out the case studies. This chapter will explore in great detail the exact methods each company current uses, and the changes that need to be made in order to create a more productive process.

CHAPTER 4 CASE STUDIES

Phase One Interviews

Introduction

The goal of this investigation on tracking job progress was to create a well rounded understanding of how construction companies are expected to operate; the next step was to determine how real companies track progress. By investigating four different companies and the methods they used to keep track of the daily progress that occurs on the jobs, a more complete understanding of production tracking was developed. The information for this study was gathered through phone interviews with individuals from estimating departments of different builders in the state of Florida.

CCS Mechanical

CCS Mechanical is a Florida based specialty contractor with focus on mechanical systems for institutional and commercial construction projects. The phone interview with CCS Mechanical took place on March 23, 2006 at 4pm with Rob Boyer who is the Director of Field Operations.

According to Boyer, the best and only way to track production in terms of keeping all areas of the company informed (field, project management and estimating) is to keep the process as simple and straight forward as possible. If the process is not easy to follow, confusion will occur and conflict will result.

In order to get a complete understanding of tracking field progress the estimating process must first be comprehended. The estimating department uses standards set forth

by the SMACNA (Sheet Metal and Air Conditioning Contractors National Association) and MCAA (Mechanical Contractors Association of America) as a baseline for projecting field production. If the job presents more difficulty than the average job at first glance, the estimating department is responsible for making changes to these numbers so they more accurately fit to what will actually be produced in the field. The estimate should also be broken up into areas of installation. Every area in a building requires different installation types and processes. The installation of equipment in the penthouse will require much more time and equipment than a basic office room would. This must be factored in to how much time is budgeted for each activity.

Moving away from the estimating process, the workers in the field are expected to fill out weekly budget sheets which describe in detail the work carried out that week and how much time and money was spent. These weekly budget sheets are simple excel spreadsheets, which are really a combination of time cards and material logs that track what each worker did in a given week. A comparison is then made between what was actually completed versus what was expected to be completed. After each worker displays where the job status is for the given week, the reports are then flipped to summarize the progress of the job as a whole. These time cards are combined with those of previous weeks to determine the total hours that have been worked on a job and the quantities of materials used. This allows the project manager of the job to monitor the man hours and money spent on a continual basis.

This process allows each job to be tracked by the job aspects; it also helps in making accurate projections of durations in the future. Once the job is completed, the information is gathered and used as historical data to update future estimates. If there

was a problem in terms of the estimate, the estimating department is able to go back and see the problem to adjust for future projects.

This process has proven successful for CCS Mechanical because it continually keeps the estimating department and the rest of the project team updated on what is expected. This method works for this company, but not necessarily for all construction firms. Every company has different goals in terms of what needs to be completed on each job they are working on.

The Beck Group

The Beck Group has been in the construction business for almost a century and has moved away from general contracting to construction management. Skipper Vaughn is currently the Director of Pre-Construction and has a complete understanding of the way the estimating department operated when the company used to provide general contracting services. His expertise gave an insight on how things used to be run in hopes of making adjustments for the future. This phone interview took place on March 23, 2006 at 3:30pm.

Prior to becoming a construction management business, Beck tracked job production through a system of cost reports. This was done by breaking down the job estimate into work items and even further into sub-items. For example, concrete was broken down into subcategories: column forms, place and finish, drop beam bottoms, etc. These subcategories were then given quantities. When the job was being carried out, the superintendent could refer back to the estimate and determine what the projected quantities were for each subcategory.

While the role of the superintendent is to monitor the job to insure the work is continuing according to schedule, this is only part of the job. Checking quantities being

used on the job is also an important part of the superintendent's job. If there is any inconsistency between the estimate and what is actually being constructed it should be recorded and immediately investigated to determine what went wrong.

If all detail is recorded properly, a source of historical data is created that can be used in the future pricing of similar projects. Beck used records from one job and compared them to similar projects to create a learning curve to be followed. Comparing different numbers from different projects would produce an average, which was used towards future estimating needs.

Beck placed importance on the superintendent's role to record quantities used to prepare a comparison to the estimate, but an order of magnitude was also crucial. The different sizes of the jobs meant that there would be a difference in the time and cost required to complete the project. There are many activities that are carried out in a given day on a construction site and all must be recorded in order to keep track of the progress throughout the project

All work carried out should be noted in what is referred to as the daily logs. No information should be left out of these logs because the slightest adjustment of detail from reality can affect the appearance of a phase or even the entire project on paper. In addition to these daily logs, Beck required weekly reports so that all work completed in one week could be recorded on a single spreadsheet to avoid confusion. Management was able to look at the reports and to understand how much work could be completed in a week.

Regardless of the design of these forms, they needed to be kept as simple as possible. There were many different things a superintendent was required to keep track of and to record in a given week and removing complications from the forms would reduce the amount of work necessary to fulfill these tasks.

KHS&S Contractors

KHS&S Contractors is an interior/exterior subcontractor with offices in Orlando, Tampa and a number of other cities across the western United States. Erik Santiago is the Vice President of the Tampa office and is familiar with the procedures used in the estimating department. This phone interview took place on March 28, 2006 at 11:00am.

KHS&S used historical data almost exclusively to create an estimate for a job proposal. Standard take off was carried out to find quantities and the information was put into the Timberline estimating software where an appropriate price was attached to these quantities. Prior to sending out any bid, the final numbers were checked to determine the appropriateness of the prices. This check was an opportunity for the estimating department to factor in the degree of difficulty of the project which would alter the price of the job.

When the review of the prices for the proposed job was carried out prior to submitting the bid it was being viewed in the job cost format. This job cost format was a breakdown of the entire job, which spelled out each aspect of construction, how much it would cost and how long it would take to complete. These job cost codes were also used as the production codes. Both are a break down from the Construction Specification Institute's (CSI) (ref!!!!) division level down to the actual process: layout, framing, installation, wire mesh, scratch coat, plaster, etc.

Once the estimating department agreed on the proposed prices, the bid was sent off to the general contractor in hopes of receiving permission to build the job. If the job was granted to KHS&S the estimators and the rest of the project team would meet and began the transition from estimating stage to the construction stage. The superintendents would learn at this meeting what was expected of their own construction crews in terms of what was estimated. At this point, the superintendent is able to question or respond to the expectations set forth. In most cases, the superintendent already had an idea of what the job would require before this meeting.

After construction began, time cards were used to track worker progress and productivity. Each time card used the same cost codes developed by the estimators for the activity carried out. The only difference was that these codes were simplified to reduce the amount of work required by the superintendent. If the cost codes were exactly the same as the estimating codes, the superintendent would be spending too much time tracking and recording what each worker was doing. This would ultimately limit the time available to the superintendent to ensure the job was going according to plan.

KHS&S used a weekly time card system, which enabled a weekly check on the total amount of money and time being spent. These weekly costs would show the progress of the job and a weekly estimation of the work completed.

At the completion of the job, the project manager, superintendent, operations manager and estimating department would all meet again to check the cost code data and to compare it to the job budget. This was a learning opportunity; therefore clarifications were asked for. These clarifications allowed for corrections to be made to improve for the future.

Post completion is not the only time KHS&S attempts to rectify problems. During the project the operations manager was constantly checking for conflicts and immediately worked to solve any dilemma that arose to prevent any loss in profits. This was checked by the project manager filling out the weekly cost reports to check the job progress and come up with an accurate estimate of the percent complete.

Perry Construction

Established in 1968, Perry Construction has become a strong working force as a general contractor in the state of Florida for over 38 years. Greg Knicely is the Vice President of Pre-Construction at Perry Construction and has comprehensive knowledge of all concepts of tracking production in terms of relating that back to the estimating department.

According to Knicely, there was not a great deal of effort that goes into tracking the progress of individual activities. A superintendent did not usually have a lot of time to track job progress; time spent tracking progress was a wasted opportunity to carry out actual work. Job progress tracking adversely affected the company because money was made from actual production, not from tracking production. Keeping track of job progress helped the company understand what was occurring on the job, but it also hindered the superintendent's ability to be productive. Perry Construction believed it was necessary to gather information from the superintendents and the project managers; however, spending crucial time to gather this information was a dilemma.

The amount of detail that went into creating an estimate for a job was more detailed than the work that occurs in the field. The Perry Construction estimators spent valuable time looking at every aspect of a job to understand the job in its entirety. Field operations were more about the construction of a project and not about planning for the future.

When information was tracked in the form of reports for historical data, the superintendents did not use cost codes like those used in estimating. Field recording was simplified so the superintendent was able to record the hours and number of workers that went into completing an activity.

Small jobs were equally as important to Perry Construction as large jobs; however, large jobs required more tracking techniques as a result of the amount of detail that went into the job. If there were any problems, they had to be detected immediately so they could be fixed. On a small job, a problem would be noticed very quickly, and thus could be fixed quickly. However, a problem on a larger job could go unnoticed because of all the activities going on. This could prove disastrous to the job.

Perry Construction is a general contractor that is more concerned with job milestones to determine how the job is progressing than they are with looking at each crew's progress. This is different from small contractors or subcontractors whose job is to track every detail to ensure they are staying close to the schedule in order to make the expected profit.

Conclusion

Every contractor has some way of understanding the way their workers perform in the field. Whether it is through filling out logs or updating historical data, all companies know the abilities of their employees. The introduction of a standardized form to the industry might benefit all companies in their ability to track job progress and update their estimating databases. To get a better understanding of how this process would work a number of companies were selected to be interviewed. These interviews would clearly define the uses of daily logs in the industry and how useful a standardized log would be to the project and estimating teams.

Phase Two Interview Questions

Introduction

At the completion of the phone interviews, a deeper understanding was developed for tracking productivity on the job. A further analysis would be required once the topic had been narrowed down to investigating the use of daily logs and their importance to all facets of construction. This investigation would be carried out through personal interviews with additional contractors.

Interview Questions

A base set of questions was established that all interviewees would be asked, to get descriptive expression of the methods of tracking production that were used by each company. These uniform questions would give structure to the interviews promoting greater success. The point was to go into each interview with the same intent so getting the proper information and feedback was possible.

The interviewee would first be asked how their respective company used the daily logs. It was assumed that every company had some method of maintaining daily logs set up, but not every company used these logs for the same purposes. Some had very descriptive daily logs that required a lot of time and effort to fill out properly. Other companies had basic forms that were not used for any set purposes. It was important to determine how these logs were being used to determine whether or not a new format would even be used by the company.

Each interview also addressed the topic of tracking job progress. Just like in the case studies, it was determined that all companies tracked job progress in their own unique ways. Since the goal was to suggest a log to the industry that would improve the process of tracking job progress, current methods should continue to be explored.

Finally, it is crucial to determine if the company is interested in making adjustments to the current methods in order to improve estimating and the construction processes. All construction companies are in business to make a profit. If a new method is introduced that will improve the monitoring of construction process by all companies, it will in turn provide opportunities to increase profits and become increasingly attractive to all companies.

List of Interviewees

Brasfield & Gorrie, LLC.

- Terry Butler, Chief Estimator
- Ren Tilden, Senior Project Manager

Hensel Phelps Construction Co.

- Bryan L. Butcher, Chief Estimator
- Jim Pappas, Operations Manager

KHS&S Contractors (Orlando)

- Josh Johnson, Estimator
- Ken Cook, Project Manager

R.A. Rogers Construction Company

- Rob Johnston, Vice President of Pre-Construction Services

Clancy & Theys Construction Co.

- Pete Pace, Vice President/CEO Florida Division

J. Raymond Construction Corp.

- Dan Cramer, Senior Project Manager

Tilt-Con Corp.

- Matt Trail, Estimator

Data Collection

The interviews described below were conducted with individuals representing various companies with the goal of gathering information to understand the different

methods of tracking job progress and address the possibility of changing these methods. Below is a thorough description of each interview, the concepts each contractor used to track progress and some suggestions to improve future estimating.

Brasfield & Gorrie, LLC.

Estimators do not get much exposure to construction in the field, but all people involved in construction understand that the daily logs were an important part of construction. Terry Butler, Chief Estimator described the detail that superintendents at Brasfield & Gorrie were required to put into every daily log to prevent any confusion when reviewing the logs at a later date. These logs were not just put in a notebook, never to be looked at again. In fact, three copies of the log were made: one stayed on the job site, one was sent to the company headquarters in Birmingham and a final copy was submitted to the company network electronically. This way, if there was ever a question; the information could easily be located.

Tracking actual job progress is the responsibility of the project manager in charge of the job. Each month, the project manager would complete a projection report, which described exactly where the project stood and what to expect for the future. This allowed a comparative analysis between what was actually spent and what was budgeted by the estimate. Once the project manager had this information, changes were made to keep the project on schedule and under budget. The information used to get these projection reports was from the weekly time cards. The largest problem that occurs here though was the inaccurate recording of data. If the information from the field was not being recorded correctly, it would cause problems with the projection reports, the status of the job and the way the estimating department handled a subsequent job.

Project managers had to create a monthly projection report describing what had occurred on the job during the preceding month despite inaccuracies found in the available information. At the completion of the job, a final job report was created by the project manager that showed the gains and losses for each aspect of the job. This labor report, just like the projection report was a product of the weekly time cards.

Brasfield & Gorrie valued the process of filling out daily logs to keep track of all activities that occur on the job. This created complete records for the company in case they ever needed to prove what happened on a specific day on a job. In the event of legal action, the project manager or superintendent would be able to look back at the daily logs and to show exactly what happened on that day provided the log was filled out properly. This was the only purpose for filling out the daily logs. The logs are undoubtedly important, but the contemporary information recorded would not help in the estimating process. There were too many forms to go through to determine exactly what was happening throughout the job process. However, if a method could be adopted to introduce ease and structure to the daily logs that would provide help to the estimating department, Brasfield & Gorrie would be interested in learning more.

The interview with Ren Tilden, Senior Project Manager, was a reinforcement of the discussion with Terry Butler. Daily logs were only used to protect the company in the situation of legal disputes. While the logs were treated as an important aspect of the job, it was not for any reason outside of protecting the company in the future. Brasfield & Gorrie also used a number of other logs to keep track of important information: RFI, Change Order and Submittal Logs.

As far as tracking job progress goes, Brasfield & Gorrie used software developed by a construction software solutions company CGC (Computer Guidance Corporation) to compile labor numbers, job costs, billings to the owner and all charges associated with the project that the accounting department handles. This program as described by Terry Butler also produced the projection reports and the final job report. The data in the program was constantly being updated by the project managers in order to keep the information about the project up-to-date. If there were any discrepancies, the project manager would be able to detect the problem before it got out of control.

Ren Tilden viewed the concept of adapting a new method for daily logs to benefit the estimating process as a difficult one to conquer. The reason was too much information would need to be recorded on a daily basis for the logs to have any meaning. The logs could be altered to gather more information, but this would only complicate the job of the superintendent. According to Tilden, when the job of the superintendent gets more complicated, the project begins to have problems.

Hensel Phelps Construction Co.

Bryan Butcher is the Chief Estimator for Hensel Phelps, a large general contractor in Orlando, Florida, and works mainly on two types of projects based on project delivery system: Design Build and Negotiated work. The type of contract for the job would delegate the process that goes into estimating the job. Both were thorough and accurate, but because one was usually repeat business with a customer, the company took a bit of a different approach. This was because in most cases, the repeat work would be on a building similar to one that was previously constructed.

Regardless of the type of contract, all conceptual estimates were recorded in simple MS Excel spreadsheets showing all the detail of the proposed building, quantities and

costs to each aspect. Once the job started, a cost control and labor recap sheet was given to the project manager that described every aspect of the job and what was estimated in terms of quantities and costs. This is the method of job cost accounting and control that the project manager was required to track closely. The project manager would constantly be filling out these sheets in order to build a production comparison between what was estimated and what was actually performed.

It is crucial to the overall life of the project that each project manager keeps a close tab on all activities going on throughout the process of the job. If the activities were not properly recorded, problems would arise. While the project manager was keeping tabs on the job through the cost reporting process, the estimator would be getting these forms and double checking to make sure everything was going according to plan. If there was any deviation from the estimate, both parties would be responsible for calling a meeting to figure out the problem and how it would be fixed.

Most of the time problems were caught early as a result of the accurate method of recording and checking job progress. To ensure the project's success, all parties involved in the construction of the project met at what Hensel Phelps referred to as, the 1/3rd point. This was the point on the job when first 1/3rd of all construction activities had been completed. It was a time for all management and estimating members to discuss the current state of the job. It was also the last opportunity for the numbers to be adjusted. If the job progressed past this point and things need to be changed, the company would be running the risk of losing money on the project.

At the end of the 1/3rd point meeting, the responsibility of the estimating department was removed from the project so the project management team is able to

focus on completing the job. The estimators were still able to keep track of the project and watch it progress, but they were no longer required to attend job meetings. There was a second meeting at the 2/3rd point on the job, but this is mostly the project management team gathering to discuss the completion of the job and make sure it is on time and under budget. The numbers could be changed at this point because the job was too far along. However, if adjustments needed to be made, it was the responsibility of the management team to figure out the problem and how it would be handled.

The estimating department at Hensel Phelps played a crucial role throughout the construction process. Most companies had a hand off meeting where the estimating department gives all of the job information to the project management team. Unless there was an error in the estimate and the project manager needed an estimator's help, this was usually the last time the estimator sees the job. Hensel Phelps operated differently in that the estimating team observed the project up to the 1/3rd point and sometimes further to ensure that the project is following the proper path. This system of checks and balances between the two departments kept up communications and increased the success rate of all projects.

All job tracking by the project management team for their use and the use of the estimating team was through the cost accounting system and production comparison. Like most companies, Hensel Phelps had daily logs that were filled out by the superintendents on a daily basis, but they were not used for estimating purposes. These logs were used to protect themselves against legal action. It is important to note that the estimating department was always trying to update the estimating process with new

productivity numbers so that the future projects were accurate to the way the company was working and progress was made on projects.

Hensel Phelps as a company was most concerned with the number of man hours spent on the job as opposed to actual dollar amounts. This was a common misconception because in most cases, the estimators were strictly concerned with the cost of an activity or the entire project. However, the dollar value of each activity often fluctuated with the change in the market. The amount of man hours it took to complete a project should stay consistent regardless of any change in the costs.

Since the main concern of Hensel Phelps was the number of man hours put into a certain activity, the creation of a standard daily log would benefit estimating. By keeping track of each crew, how many men were on the job and when activities were complete, the daily logs could provide an excellent source of data that would help keep the estimate current. Even if the logs were secondary to the labor recap sheets, the daily logs could be used to back up this data.

Jim Pappas is an Operations Manager for Hensel Phelps Orlando and he reinforced the ideas Bryan Butcher expressed in the previous interview. The most important production tracking resource used is the labor recap sheet that project managers fill out regularly to break down every aspect of the job. This labor recap sheet was compared with the job estimate to ensure activities were being completed in the manner that was set forth in the estimate. These labor reports showed how many hours were going into each activity, giving an accurate idea of production rates in regards to all jobsite activities.

The largest problem that could occur here was the recording of inaccurate data. In most cases the superintendent filled out the data necessary for the project manager to

create the labor recap sheets. If the superintendent did not give accurate information, the labor recap sheets would not be accurate. There were many times when the superintendent would see the amount of work being carried out in one area and would see that it was over budget; instead of making the proper records the data would be recorded in another category of work to fit it into the budget. This makes the estimate look perfect, but in reality it hurts the company because this disables the feedback mechanism which displayed any errors in the estimate and allowed future corrections to be made.

For this reason daily logs should be adapted into the estimating processes to check for errors in the records. The superintendents at Hensel Phelps were required to fill out the logs on a daily basis to keep accurate records of what was occurring on the job. Even if the detail was lacking on the log, the superintendent was putting in time to at least make a head count, record what occurred on the job and describe any errors. This information alone would be a benefit to the estimating department. By implementing a quicker and more accurate method of recording daily progress, the estimating department could view this progress and use it to create a more accurate estimate improving the state of every job Hensel Phelps performed.

KHS&S Contractors

KHS&S Contractors is an interior/exterior subcontractor with one office located in Orlando, Florida. Joshua Johnson has only spent a few years in the estimating departments, both in the Tampa and Orlando offices, yet he plays an active role in estimating most jobs that come through the Orlando office.

From a subcontractor's point of view, the actual production that occurred on a job was more important to the company than the actual price. The reason was prices were always changing, but productivity should remain constant. It was the responsibility of

both the project manager and the superintendent to keep track of production so future jobs could be estimated in the same manner that the work was carried out.

Construction projects often encountered problems, which had to be addressed and recorded. Whether the problem was with the estimate or something unforeseen, the problem needed to be recorded. If changes were made to prevent major damage, these would also need to be recorded. This way, the company would learn from these events and plan around them in the future.

Most companies had the concept of comparing the job estimate to what actually occurred on the job. This was difficult for KHS&S because the estimate was very different from the way it was recorded in the field. In many cases, the superintendents did not make proper records of what happened on the job. They believed that keeping consistent with the estimate was best for the company; however, the contrary is true. The estimating department needed the superintendents to fill out the progress reports exactly how things occurred so the estimators could later determine errors and how to prevent them in the future.

Unfortunately, there was not a direct link existing between the estimators and the project managers who worked on the job. KHS&S estimators were based in the office and rarely got out to the field for interaction. Project managers on the other hand, were always running from job to job and were not concerned with matters that went on in the estimating department. The chief estimator was the only member of the estimating team that had direct contact with the project team.

If the estimating department was more involved in the construction process, they would be able to gain knowledge and experience in terms of estimating what the field

would need or use in the future. Experience was crucial to all aspects of business; if estimators had some work experience in the field, the job estimates produced would be more accurate. The estimators were so busy with new work that they never had an opportunity to completely understand the past jobs and obtain any knowledge.

The final problem that the estimating department would run into was reviewing old work to fix errors. The process of estimating was so intense that the estimators had time only to work on the projects at hand and then move to the next. There was not time to look at previous projects and make corrections. In order to produce accurate estimates, a better method needed to be introduced to allow estimators to look at the past and learn from the mistakes made in the past.

The current format of estimating at KHS&S only allowed the chief estimator to understand the activities that occurred in the field. If a format of logs was developed to deliver jobsite data directly to the estimators, all jobs would become more productive. In this sense, the estimators would have a more complete understanding of what would need to be estimated to help out the workers in the field. More important would be the demand on the chief estimator would also be reduced.

R.A. Rogers

Rob Johnston is the Vice President of Pre-Construction Services at R.A. Rogers, a Central Florida based general contractor, and is informed on all issues that deal with estimating for this company. As far as keeping track of daily progress goes, this was the responsibility of the superintendents on each job. Daily logs were filled out in the jobsite trailer using software called Pro-log and was subsequently transferred electronically into a corporate database. The log was then submitted online to the project manager of the job. The details of these logs included the number of workers on site, the materials

delivered and the progress of each subcontractor along with any other comments the field superintendent felt was important to the daily description of the job.

R.A. Rogers is a general contractor but they operate much like a construction manager because they do not self perform any work. Tracking job progress therefore, was only important to the company in terms of finding out where the job stood currently. The descriptions the subcontractors provided in their own daily reports were used by R.A. Rogers to get a more complete understanding of what work was carried out on a given day and to determine that both companies agreed to this work completed. Every contractor used the daily logs in different manners which made this aspect of the job very complicated. Certain subcontractors would put more effort into tracking job costs and progress than others. Those who put in more effort to tracking activities on the job were more attractive clients to R.A. Rogers because these companies were more concerned with the success of the project.

R.A. Rogers used their own computer programs to keep the estimates in working order. There was no set method used to periodically update the estimating process by changes that occurred in the field. The only adjustments made to the future estimating process were through word of mouth from project managers to the estimating department. These adjustments occurred post mortem, not during the progress of the job.

Since R.A. Rogers operated much like a construction manager, they were not concerned with production rates like a subcontractor would. Nonetheless, these numbers could be useful to this company. The use of production averages over all projects to check bids and current work carried out would help in the process of dealing with

subcontractors. The use of a standard daily log that would enable a production comparison would prove beneficial to a company like R.A. Rogers.

Clancy & Theys Construction Company

Clancy & Theys Construction Company is a general contractor/ construction manager focusing on commercial, industrial and institutional buildings primarily in the Southeastern United States. Pete Pace is the Vice President of Clancy & Theys and the CEO of the Florida division. He got his start working in the field and moved his way up through the company to where he is now. Pete's experience in both the office and the field, have created valuable opportunities for insight into the way Clancy & Theys tracks job productivity and the importance of their daily logs.

The job of every project manager was to make sure a job was completed properly and to ensure the company was making the greatest profit. The only way a company would survive was to make money. An estimate was thus set up as a guide through the process of construction and helped the project manager reach the goals of making money. This did not mean the estimated costs were the exact amounts the project managers had to spend on the job. The estimate showed how much was in the contract; but, if the project manager spent less money than expected in certain areas, the company would benefit from the additional profits.

The process of tracking all activities that occurred on the job began with the technology available to the project managers in the jobsite trailer. Every project manager was equipped with a laptop computer to constantly communicate with the office. When information was recorded on the job through the cost codes set up by the estimating department, the project manager put this information into the computer and uploaded it to the company network. This way, the project manager would keep track of the progress

through the cost codes, and the estimating department would be able look into the feedback from the field. This system was set up in case the estimators needed to double check on how work was actually carried out on the job.

The information to improve estimating was available. The problem was it needed to be in the proper format to improve the database and adjust for future problems. The process Clancy & Theys was currently using was not accurate because the cost codes that the estimating department used were extremely detailed and the field codes were not. These codes were so detailed that the superintendents recording the activities were being asked to put too much time into determining how each activity would be coded. The point needed to be to save time and make the process more accurate. Unfortunately, accuracy was not occurring because the process was taking too much time and effort. Simplicity was the key to successful data recording; this was a concept that had not yet been established.

At Clancy & Theys, every superintendent went through the process of recording the events of the day onto a daily log used to protect the company in the case of legal action. These logs required a minimal amount of time out of the day and kept a good record of the events that took place in that day. Tracking the important information on the job and providing defense against legal action in the future were reasons a standard format of daily logs was necessary. This new format would include the names of the subcontractors on site, the equipment and whether or not it was being used, material delivered and the names of all visitors to the site. In addition, the log would prove beneficial if it included space where photographs of problems on the site could be added so all people involved could get a visual idea of the problem. This would not address the

issue of cost code conflicts, but if the foundation was laid to build a working log, then the next step could be to introduce cost codes to this log.

The introduction of a more progressive method to keep open communication between the field and the estimating department would help Clancy & Theys operate smoothly and eliminate problems before they occurred. In construction, the superintendent was the most crucial individual to getting the project completed. These employees saw every aspect of the job day in and day out. The introduction of new methods to promote better communication between the superintendents and the rest of the company would promote greater success on all projects.

J. Raymond Construction Corporation

J. Raymond Construction Corporation is a small general contractor based in Central Florida. Dan Cramer is a Senior Project Manager with J. Raymond and has experience on many projects of different size and value.

The project managers at J. Raymond, unlike most project managers were crucial in running a project from its inception to completion. The role of the project manager began in the estimating phase when the drawings from the owner arrived at the office. J. Raymond worked with 80 to 90% negotiated contracts and mostly with repeat customers. In these cases the project managers had the best relationships with the owners and handled the project from its preliminary planning stages through the construction and on to the completion of the project.

The project management team was so involved in the process of estimating, that the estimating department at J. Raymond only consisted of a chief estimator, an assistant estimator and an administrative assistant. There was no reason to employ many other people in this department because only 10 to 20% of the work went through estimating.

Regardless of the size of the estimating department, information was still needed to help whomever was doing the estimating understand what needed to go into the project. Project managers had spent a lot of time in the field to understand what it would take to put a project together. In this sense project managers were good at estimating a job. There was always a need to find information that would support the estimating process.

J. Raymond was more of a construction manager than a general contractor because they did not self perform any work. In the estimating process, the project manager was most concerned with getting adequate scope coverage and pricing from the subcontractors. For this reason, tracking job progress in the field was not crucial to the success of the company. When the project was in motion and work was being carried out in the field, the superintendents were in charge of making sure each subcontractor was doing what their contract specified. Records were made on a regular basis to explain where each subcontractor was in regard to their scope of work. This helped the project manager understand the state of the project. At the end of the job, this information was gathered and the project manager went through a check list explaining how each scope of work was carried out. The superintendent filled out a report card for each subcontractor, which provided a project rating on their overall performance for the job.

The superintendent was required to fully understand every aspect of the jobs and keep track of what each subcontractor was doing; therefore, the daily logs were usually not filled out with any detail and accuracy. J. Raymond used these logs on a daily basis, but the information and detail put into these forms could never be used to benefit the process of estimating. If a method were introduced that would allow the superintendent to make notes while walking through the jobsite, it might be developed into a useful tool

to benefit future estimates. The only use J. Raymond had for these logs in the current state was to provide legal documentation for the actual progress of the job.

Tilt-Con Corporation

Tilt-Con Corporation is a tilt-up concrete contractor providing service throughout the state of Florida. Matt Trail is the estimator at Tilt-Con Corporation and budgets every job that comes into the office. Tilt-Con is not like a general contractor or construction manager, because they use daily production numbers to keep the business productive.

There needed to be a method to determine the amount of work each crew had produced in a given day in order to keep up the competitive nature of Tilt-Con. Daily logs and time cards were important to assisting the estimator in understanding what actually took place in the field.

Man hour reports were created from the weekly time sheets filled out by the superintendent in the field and were submitted electronically to the company network. From there, the reports went directly into Timberline which was the software Tilt-Con used for estimating. Once submitted, the software automatically updated the man hour reports which kept the software up-to-date with the current production rates of the work crews. This way, the estimating department had the most up-to-date estimating data available.

The field logs told exactly what was used on the job and allowed a comparison between the estimated and the actual. The daily logs tracked the number of workers in a specific crew, what work was performed and if there were any problems or delays. There were multiple formats of the daily logs Tilt-Con used; there was one for the carpenters, one for the concrete crew and a separate log for the equipment. This provided information about what was on site, what work it performed and its idle time. These are

useful to the estimator because equipment accumulates major costs to the project. If there was a way to limit idle time, the company would be able to initiate more opportunities for saving. There were the weekly time cards for each employee and each crew which proved to be the most beneficial to the estimator because they explained exactly how much time was charged to each task. As with all companies, saving time means saving money. If Tilt-Con accurately estimated a time of completion for each task, they would be able to limit the risk of losing money due to inaccurately estimating future work.

As far as improving the current method of daily logs, the best option for Tilt-Con was to merge the current formats of the daily log, weekly time card and equipment logs all into one. This way the superintendent would not have to repeat information on different forms, it would be combined into one, thus making it easier for estimating and any other department to read the log and understand what took place in actually completing the work on the job.

Conclusion

The interviews reinforced the concepts that were introduced earlier in the case studies that all companies: had a unique method for tracking job progress, used daily logs even if it is only for protection in disputes and each company was looking for a way to make more money. Although every company explained a different method of tracking progress, there were not any that specifically said they would not entertain the idea of change to produce greater profits.

The positive idea taken from this was if a new method were developed different from what already exists in the industry, all of the companies would be interested in it. The new format must assist in legal defense and help in the estimating process. Despite

the confidence all of these companies had in their current methods, they would all be willing to try a new idea if it would help their company make more money.

As can be seen in table 4-1, every contractor had different uses for the daily logs. In addition to the current uses, each contractor had different opinions as to how a new format should be adjusted in order to meet the current needs of the individual company and the industry as a whole. The complicated part came in merging all of these concepts into one daily log.

To comprehend how these companies would react to a new type a daily log, one must be created. Through the combination of information gathered in the interview process, a preliminary standard format for the daily logs must be created. The completion of this log required an investigation from each contractor interviewed to understand the reactions to this format. This phase included constructive criticism from each interviewee in order to develop a log that would be feasible to implement in the construction industry and would address the each company's specific needs. This constructive criticism phase can be more thoroughly understood in table 4-2. This table describes in detail the opinions the contractors gave on whether or not the new format was feasible and also what changes needed to be made to the standard format to reach the ultimate goal of improving the process of tracking job progress for all construction firms.

Table 4-1: Research Results

Name	CM	GC	Sub	Log Purpose			Changes For Estimating				
				Defense	Daily Records	Track Progress	Combine Current	Link Est & PM	Simple	Electronic	No opinion
Brasfield & Gorrie		√		√	√		√		√		
Hensel Phelps		√		√							√
KHS&S			√	√	√			√			
R.A. Rogers	√			√	√					√	
Clancy & Theys	√			√	√			√		√	
J.Raymond	√			√					√	√	
Tilt-Con			√	√	√	√	√			√	

Table 4-2: Contractor Feedback

Name	CM	GC	Sub	Feasibility			Key Changes			
				Yes	No	Maybe	Content	Elect.	Sub	Size
Brasfield & Gorrie		√		√			√			
Hensel Phelps		√				√	√			√
KHS&S			√			√	√		√	
R.A. Rogers	√				√		√	√		
Clancy & Theys	√			√			√	√		
J.Raymond	√				√		√	√		√
Tilt-Con			√		√		√	√	√	

CHAPTER 5 DATA ANALYSIS AND OBSERVATIONS

Introduction

At the conclusion of the interviews, the data was collected and used to create a preliminary standard format for the daily log. All nine interviews in person and the four over the phone gave different perspectives regarding the methods of tracking job progress. In general, subcontractors were most concerned with keeping track of the performance of the field workers to keep the estimating process updated. In contrast, most general contractors and construction managers were concerned with checking the projects along milestones not how the daily production levels were rated. Regardless of the perspective of each company, the goal was to combine the input to create one format to satisfy all companies.

The following section was a discussion of the preliminary daily log that was created and some detailed responses on how this form would fit into each company's daily routine. The point of the preliminary log was to construct a basic form and receive constructive criticism on its format and potential use. This analysis would ultimately give a more precise idea of what the contractors were looking for and enable the creation of a final draft to satisfy the needs of all contractors interviewed.

Description and Criticism of the Preliminary Daily Log

The log created from the interviewing process was a starting point that would be used to eventually create a final draft of a log that could be used as the industry standard. For this to happen, the log needed to satisfy the requirements of all contractors. The log

needed to first have space to list the name of the project, the project number, the log number and the date. This was all basic information, but very important to the make up of the log. Following these entries were two spaces to fill in the names of the project manager and the superintendent.

The opinions of the Identification section were generally positive. The only major idea introduced was to have a number of full lines available to include the names of visitors to the job. Pete Pace of Clancy & Theys noted that a visitors list can be the most influential aspect as far as what happened on the job. Depending on who was on the job can determine how much work was completed. The contractor wanted to know the exact time and day an inspector, owner or architect showed up on the job. Other than this addition, there was no feedback on the first section of the log.

The next step was to investigate the condition of the jobsite in terms of the weather and how it had affected the workers. There was an area to record the high and low temperatures of the day, whether or not there was precipitation that day and how much, plus a section titled: "Adverse Weather Affects." An additional answer section would provide space for the superintendent to explain what happened on the job as a result of the weather. Many times rain or lightning delays work or even shuts down a job for an entire day. If this happened, the superintendent would record this information. This record would help in the planning of rain days in the future. Also, the weather could have caused damage to some part of the building that was already under construction. Any such damage would be recorded so that the delayed start of the project is documented.

There was no feedback about the Weather section of the log. There was not a lot of detail that could have gone into the weather and the goal was to limit the information on the log to aspects crucial to explaining what happened on the job.

Construction sites can be dangerous atmospheres and occasionally accidents occur. Once an accident has occurred, it should be recorded in the daily log to provide information on what happened. The information included: the type of accident, who was involved, if any time was lost and if the accident was an emergency or not. Pete Pace's comments on this section included listing the accident report number which should be attached to the back of the daily log. This way the information would be available briefly on the daily log and if more information were needed, the page could be flipped to see the actual accident report. Terry Butler of Brasfield & Gorrie adjusted the title of the section from "Accidents" to "Safety/Incidents/Warnings/Accidents." This way all areas of safety were included in the subheading. If the log was to be changed to this, there would have to be a box to specify the type of safety problem being recorded. Ken Cook of KHS&S Contractors also was looking for more detail in this section, specifically dealing with inspection and violation descriptions.

Materials ordered and delivered everyday on a job needed to be recorded on the daily log to prevent confusion. There were two separate sections: one for the materials ordered and one for materials delivered to the site. Both had space for 6 materials to be listed. In addition to what the material was, there was space to include the quantity, unit of measure, cost per unit and the total cost. The only difference between the ordered and delivered sections was the delivered section had a space to specify the condition of the material delivered.

Ren Tilden of Brasfield & Gorrie said this section would be good for smaller jobs, but difficult to track the materials delivered and ordered daily for large jobs because of the high numbers. Ren stated that getting an idea of when the materials were delivered in comparison to when they were ordered could be used in scheduling for the future. Terry Butler suggested adding space to list the subcontractor's name (for whom the material was supplied) and the name of the supplier who delivered the material. There should also be a space to write about back-orders, items not delivered and items that needed to be returned. Pete Pace took this suggestion one step further and included the supplier's contact name and phone number in the case a conflict arose later. An extra line should be added to list the delivery ticket number.

After the Materials section was an area to detail the equipment on the job site and all important information related to these machines. Space was available to write the type of equipment, the name of the operator, the hours the equipment was in use and idle and any problems the equipment had that day. Most equipment used by subcontractors was rented; therefore, Pete Pace suggested including space for the rental company name and contact information along with the date the equipment was delivered to the site the date it was (or will be) returned.

Dumpster activity was something that might not seem relevant compared to the other activities being tracked, but they were a critical aspect of everyday work. When a dumpster caused a problem on the job, delays followed. The only concept addressed in this section were the name of the waste removal company and three check boxes specifying whether the dumpster is full, empty or pulled that day. The only feedback was

from Pete Pace regarding a space for the number of containers delivered or pulled that day.

The schedule was one of the most important aspects of the construction process. If one company was not working according to schedule, the result would be a delayed job. Three questions were asked with yes or no responses and space to include additional comments. These questions included: 1) all crews in compliance with the job schedule; 2) were there any major milestones reached on the job today; and 3) were there any new future directives that should be addressed. Ken Cook of KHS&S was looking for a basic response. The space to fill in extra information works, but specifically asking if there was any deviation from the schedule would be helpful.

After the discussion of the schedule was the area to list the subcontractors on the site. Included in this section were spaces to include: the subcontractor name, employee count, conflicts and future instructions given to the subcontractor. Terry Butler suggested a fifth column to include work completed; this would allow the general contractor to know where each subcontractor stood in terms of their responsibilities. Pete Pace suggested, instead of the future instructions category, it be named “description of work activity.” This way it was not pointing at something that would happen; rather, it is asking what the subcontractor was currently working on. Ren Tilden suggested adding areas that included housekeeping for subs, which would describe areas left unclean and possibly set up for a back charge. Also, safety checks for the subcontractor which would include violations and warnings. Finally, subcontractor delays or other problems that led to the delay of the project should be added. These delays could lead to problems with

other subcontractors or ultimately the general contractor and result in not hiring them to do work in the future.

This section created conflict for the subcontractors. It was at this point they began to believe the intended use for this log is to help general contractors. Ken Cook suggested changing the section to an area to record employee's names and locations on the job. Instead of focusing on the general contractors needs to track the subcontractors, it would give the option of filling out crew names or the names of individual employees. The choice should be up to the type of contractor making the records. Matt Trail of Tilt-Con Corporation confirmed this opinion by saying this section makes the log too universal. As a subcontractor, Tilt-Con needed space to record information that was directly related to the work their company was performing. There were not any subcontractors that were genuinely concerned with the performance of other subcontractors.

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The final section in the preliminary daily log was entitled "Additional Information," and asked general questions dealing with the state of the job and how it is progressing. The questions were as follows: what areas of work began today; what areas of work were completed today; were there any questions raised; and any additional comments not specified above. Pete Pace suggested the question topic be changed to "Issues Pending". The logic behind this change was that, questions were raised about everything. In order to limit the amount of irrelevant information, the concept of issues that had not been cleared up should go in the area titled "Issues Pending"..

Terry Butler was looking for an area that included daily clean-up activities, safety meetings and who attended and whether or not there were inspections held on that day.

Rob Johnston of R.A. Rogers was looking for questions regarding anything being back charged and whether or not there were any issues causing delays. Rob and Pete Pace were both interested in having a section where pictures taken on the job that day could be attached to better explain issues that were written about in the log.

Overall, the general contractors and construction management firms were satisfied with the preliminary results. There were still some changes and additions that needed to be made to create a working log, but it was on the right track. The subcontractors on the other hand expressed that the log appeared to be directed strictly towards a general contractors responsibilities. To make this log more useful to a subcontractor, there must be sufficient space to record data that was relevant to their own activities. In the interview, Matt Trail had suggested a more technological approach. An electronic format with drop down menus listing activity names, cost codes and descriptions of progress would be the best and most progressive method for a change.

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Conclusion

The creation of this preliminary daily log was just the start of introducing a standard format that could be used by all companies. The feedback painted a clearer picture of what was needed in order to fulfill the many different needs in the construction industry. One thing that was clear, all companies want a straightforward and simplistic approach to make these records. Everyone also wanted a log that had enough information on it to be relevant. More information needed to be added in the Material sections, the Equipment section and the Additional Information section; this information included: subcontractor and supplier information and any problems in the process of ordering and delivering these materials. Once these corrections were made, a daily log would be created that would satisfy most of the needs of all contractors.

CHAPTER 6 SUMMARY AND CONCLUSION

Conclusion

The issue of production in the construction industry was proven to be important, but only in regard to certain types of contractors. At one point it was assumed that all contractors had concern for the productivity carried out on a construction project. Regardless of the interest a contractor had in jobsite productivity, every contractor was concerned with the way daily activities were carried out and subsequently recorded. If for no other reason than to keep track of activities to prevent legal dispute in the future, all contractors had some way of recording everything that occurred on a job in a given day. While every company had a different method of carrying this out, it had been shown that with the motivation of making larger profits on their jobs contractors were willing to explore new methods for tracking job progress.

The preliminary phone interviews demonstrated that every company was different in terms of what types of information they tracked on the job. In fact, one of the companies claimed to not even be concerned with tracking job production because it was a form of wasting productivity in itself. The concept that came from these interviews was that every company used daily logs to keep track of the activities occurring on the job. This finding ultimately led to the idea that daily logs could be used for multiple purposes. Not only should they be used to prevent legal conflict by providing information about the job, but they also could provide information valuable to the estimating department.

Once this idea was developed, personal interviews were conducted with ten individuals who worked for contractors in the Central Florida area. The goal was to interview companies with different backgrounds so the research would apply across the board. This variation created an inflow of ideas from a range of contractors differing in type and size. The general consensus was that daily logs were not used as a means to track job progress because the present forms were not suitable for this application. If a standard form was created that was simple, provided a sufficient amount of information and helped the company make money; the new daily log concept might be adopted.

The end result was that while creating a standard daily log for the construction industry was possible, it was difficult to produce one which every type of contractor would be pleased. The problem was that every contractor currently used the logs for different reasons. Converting all construction firms to one use of these logs would be nearly impossible. Perhaps a better goal would have been to create a standard daily log that everyone in the industry could use to keep track of daily activities. When the concept of using the log for estimating purposes was introduced, the contractors began to get nervous. No one wanted to have their method of creating a job estimate changed. This is what kept the company in business, and in most cases, the contractors were confident in the way they operated.

Limitations of Study

In the process of investigating the use of daily logs and how progress was tracked on a regular basis, a few approaches were used. The phone interviews and personal interviews provided insight on the specific methods of operation different companies partook. However, there were a few factors that restricted this research.

Primarily, the number of contractors interviewed was limited because of time restraints. It has already been noted a number of times that every construction company had their own unique way of carrying out day to day operations. The method each company used depended on the size of the company, the type of company and the significance each placed on making their company better. Due to the ways each company operated, it would have been impossible to interview every construction company and completely understand how each operated their business.

Instead, taking a small sample of contractors that represented different type of firms that exist allowed for an interpretation on what methods were in existence. The point was not to interview every company and determine the perfect method for tracking job progress. On the contrary, it was to create an improved method of tracking job progress that could be adapted and used by all companies. Despite the time and resource restraints, this goal was accomplished.

Need for Further Research

A common theme that arose throughout all the interviews was the need to introduce more technology into everyday activities in the construction process. With so many opportunities to promote greater success, technology should not be overlooked. Speed and efficiency were concepts mentioned by every company. With the use of technology in everyday construction, these ideas would be accomplished.

The use of hand held devices including PDAs and cellular phones have continued to increase throughout all industries including construction. If a program was developed to implement a daily log such as the one created through this research to be used with PDAs and cellular phones, the construction industry would see enormous benefits. This

way, superintendents who filled out daily logs would not wait to get back to the job trailer to fill out the forms. Instead, the superintendent would be able to fill the form out continually throughout the day.

This was only one suggestion, but it seemed to be the most positive concept in terms of what would be useful to contractors of all types and sizes. Every company was attempting to find a better way to find success on each project. The implementation of information technologies on the jobsites would greatly increase the chances of success on a day to day basis.

APPENDIX A
PRELIMINARY STANDARD DAILY LOG

Standard Daily Log

Project Name:
Log Number:

Project Number:
Date:

Superintendent:
Project Manager:

Weather

Temperature	
High	<input style="width: 95%;" type="text"/>
Low	<input style="width: 95%;" type="text"/>

Precipitation		
Yes	<input style="width: 95%;" type="text"/>	INCHES
No	<input style="width: 95%;" type="text"/>	"
Time Lost?	<input style="width: 95%;" type="text"/>	:

Adverse Weather Affects:	

Accidents:					
Type:	<input style="width: 95%;" type="text"/>		<input style="width: 95%;" type="text"/>		
Name:	<input style="width: 95%;" type="text"/>		<input style="width: 95%;" type="text"/>		
Lost Time:	<input style="width: 95%;" type="text"/>		<input style="width: 95%;" type="text"/>		
Emergency?	<input style="width: 95%;" type="text"/>		<input style="width: 95%;" type="text"/>		

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Figure A-1: Preliminary Standard Log

Materials								
Ordered			1	2	3	4	5	6
Description								
Quantity								
U/M								
\$/Unit								
Total \$								

Delivered								
			1	2	3	4	5	6
Description								
Condition								
Quantity								
U/M								
\$/Unit								
Total \$								

Equipment On Site					
No.	Type of Equipment:	Operator:	Hrs. In Use	Hrs. Idle	Problems:
1					
2					
3					
4					
5					
6					
7					
8					

Figure A-1: Preliminary Standard Log

Dumpster Activity	
Company Name	
Full	
Empty	
Pull	

Schedule Questions				
			Yes	No
Are All Crews In Compliance With The Job Schedule?				
Explain:				

			Yes	No
Were There Any Major Milestones Reached On The Job Today?				
Explain:				

			Yes	No
Are There Any New Future Directives That Should Be Addressed?				
Explain:				

Figure A-1: Preliminary Standard Log

Subcontractors On Site				
No.	Subcontractor Name	Employee Count	Conflicts	Future Instructions Given
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

Figure A-1: Preliminary Standard Log

Additional Information	
What Areas Of Work That Began Today?	
What Areas Of Work Were Completed Today?	
Were There Any Questions Raised? Answers?	
Any Additional Comments Not Specified Above?	

Figure A-1: Preliminary Standard Log

APPENDIX B
CURRENT DAILY LOGS



SUPERINTENDENT'S DAILY REPORT

No. _____

Project: _____
 Superintendent: _____

Job No.: _____
 Date: _____

TODAY'S WEATHER CONDITIONS AND TEMPERATURE			
High: _____ °	Low: _____ °	Comments: _____	
Rainfall: _____ "			

BRASFIELD & GORRIE EMPLOYEES ON SITE			
LABORER _____	SUPERINTENDENT _____		
CARPENTER _____	ASSISTANT SUPERINTENDENT _____		
CONCRETE FINISHER _____	CLERK _____		
OPERATOR _____	FOREMAN _____		
IRONWORKER _____	FIELD ENGINEER _____		
PIPELAYER _____	RODMAN _____		
MILLWRIGHT _____			
TOTAL BRASFIELD & GORRIE EMPLOYEES		[]	

SUBCONTRACTOR & SUB-SUBCONTRACTOR EMPLOYEES ON SITE			
Company Name	No.	Company Name	No.
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

TOTAL SUBCONTRACTOR EMPLOYEES []

TOTAL ALL PERSONNEL ON SITE []

LIST ACCIDENTS:

EXTRA WORK ORDERS:

MATERIAL RECEIVED	FROM	CONDITION	INSPECTED BY

Figure B-2: Brasfield & Gorrie Daily Report

KEENAN, HOPKINS, SCHMIDT & STOWELL
CONTRACTORS, INC.

DAILY JOB LOG

JOB # 14550-2

DATE: 3/2/06
W TH F S S M T
(Circle One)

CONDITIONS: Clear 66°

CHANGE ORDERS OR DOCUMENTS RECEIVED: RFI Response WT# 247

JOB MEETINGS, PROBLEMS OR REMARKS: _____

Work Completed:

-BIB Rear Dumpster Enclosure

Work In Progress:

-B4 Light Con EIFS Repair - 2 Men

Needs:

-B1A Exterior Facade Demo Finished (3 Wire Locations)

-B1A Tower: Cast and CMU Completion

-B1A & B1B Roof Completion

-B6A & B6B Steel Completion

Observations:

-No steel section or deck at Building 6A

-2 Hour HVAC Enclosure damaged during Build at 1st Level Demolition.

Supervisor's Signature _____

Figure B-4: KHS&S Daily Job Log

Report Date: Monday, May 8, 2006	Weather: Partly Cloudy
Project No: 65393	Temperatures: High: 88 Low: 68
Project Name:	Work Condition: Good
Superintendent:	Site Condition: Good

Ref.	Company Personnel	No.	Company Progress/Areas Worked
1	Supervision	2	
2			
3			
4			
5			
6			
7			
8			
	Employee Total	2	

Ref.	Subcontractors	No.	Sub Trade	Subcontractor Progress/Areas Worked
1	Cicero Masonry, Inc	6	Bricklayers	
2				
3	Magruder	6	Labors	Fine grading base material and compacting.
4	Lundquist Excavating,	8	Operators	Grade work on base material on building slab area.
5	Tharp Plumbing	1	Plumbers	Repairing broken pipe.
6	Quinco Electrical, Inc.	3	Electricans	working on bilding rough-in
7	Field Welding	4	Ironworkers	Misc. welding on building structure
8	Cellucrete Corp	12	Cement Masons	Installing lite wt. concrete deck and insulation
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
	Subcontract Total	40		

Delivery Time	Suppliers Name	Material Description (Note Any Damage Or Shortages)

Figure B-5: R.A. Rogers Daily Field Report

Phone/Con Person	Time	Company	Phone/Con Description:

Visitors Name	Time	Company	Visitation Remarks

Were you required to do T&M work or extra work beyond the requirements of the contract? Was it authorized and by whom?
 Yes
 No

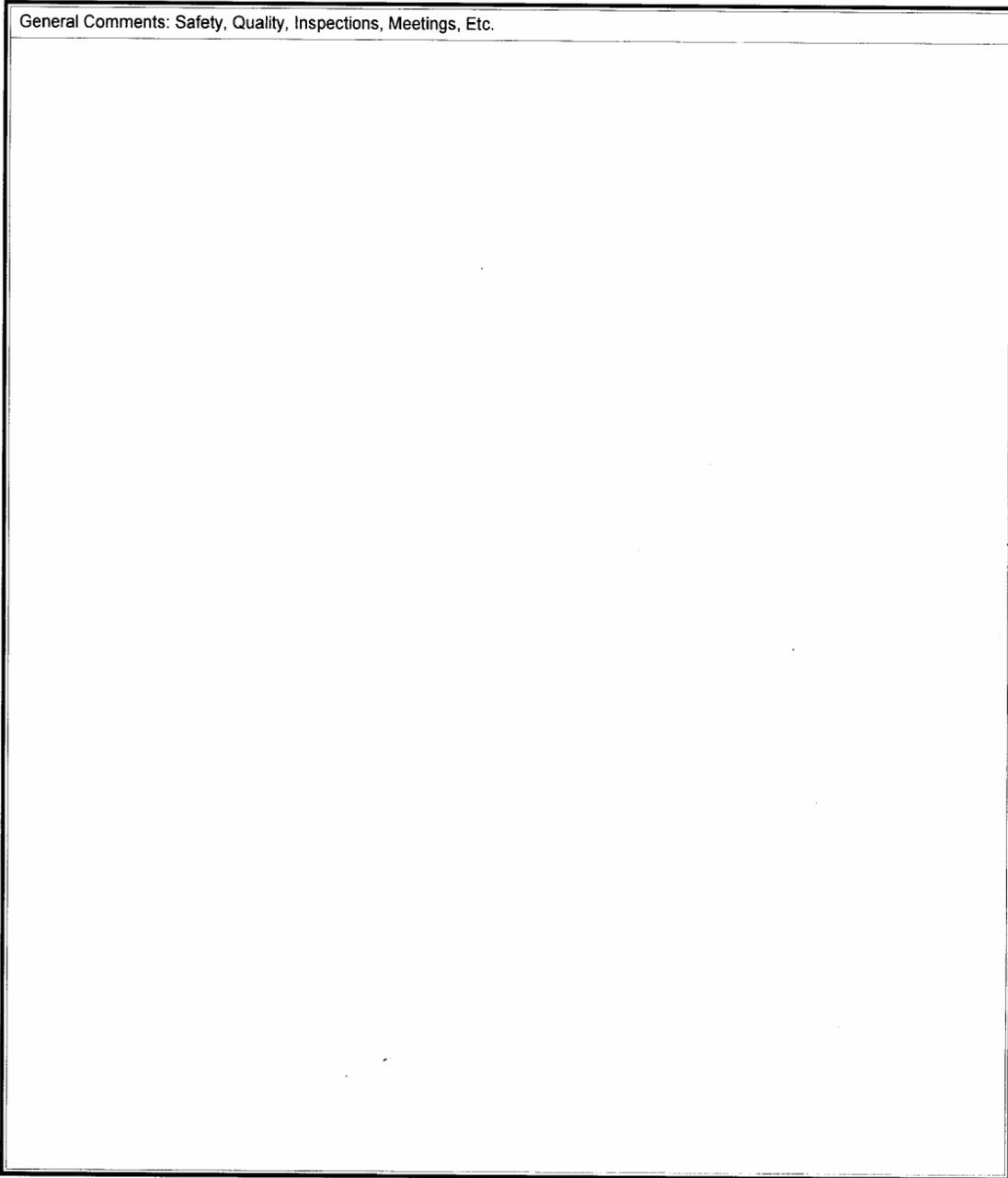
Did you perform work for a subcontractor or material supplier that should be backcharged? Indicate the Field Work Order No.
 Yes
 No

Were any operations delayed or suspended by action of the owner, architect, subcontractors, suppliers, or other circumstances?
 Yes
 No

Equipment Item	Qty	Worked Performed with Equipment

Figure B-5: R.A. Rogers Daily Field Report

General Comments: Safety, Quality, Inspections, Meetings, Etc.



Certified by:

Signed: _____ Date: _____

Figure B-5: R.A. Rogers Daily Field Report



Daily Construction Report

Detailed, Grouped by Date

Pompano Citi Centre **Project # 05-043** **J. Raymond Construction Corp**
 One Pompano Square Tel: 407-506-7146 Fax: (407) 712-6868
 Pompano Beach, FL 33062

~~██████████~~ **Friday 5/12/2006**

Number	Temp @ N/A	Temp @ N/A	Temp @ N/A	Precip	Cumul Precip	Wind Velocity
083				0	2	

Partly Cloudy

Notes:

- > Inspector looked at roof installation in progress.
- > Conducted Sub coordination and Owner/Arch. weekly meetings.

Visitors:

- Peter Delgado
- Tom Lowell
- Joe Faith
- Dan Cramer
- Peter Fimiani w/ Howard Miller

Company	Crew	Event Type	Qty	Cumulative Qty	Units	Description
	N/A					

~~██████████~~ **Allstate Fireproofing, Inc.***

No Crew Assigned

- > Mobilized equipment and material to begin fireproofing at Ross interior tomorrow.
- > Began mineral wool and caulking of 4 hr rated joints adjacent to Macy's.
- > Installed protection plastic to control overspray.

Manpower Trade	CLASSIFICATION	Quantity	UOM
Thermal and Moisture Protection	Apprentice	3	Mandays
Waterproofing	Technician	1	Mandays

Crew Total Today: 4 **Crew Total to Date: 0**

EQUIPMENT	Quantity	UOM

Total:

Task Unique ID	Name	WBS	Notes

Company Total: 4 **Company Total To Date: 5**

Figure B-6: J. Raymond Daily Construction Report



Daily Construction Report
Detailed, Grouped by Date

Plate Steel Construction

No Crew Assigned

- > Continued metal deck installation at L/T and OD.
- > Repaired six RTU curb opening supports that were too large for JAG Air.

Manpower Trade	CLASSIFICATION	Quantity	UOM
Metals	Iron Worker	4	Mandays
Crew Total Today: 4		Crew Total to Date: 0	

EQUIPMENT	Quantity	UOM
Fork Lift	1	
Total:	1	

Task Unique ID	Name	WBS	Notes
----------------	------	-----	-------

Company Total: 4 **Company Total To Date: 127**

Intite Roofing & Sheet Metal Co., Inc.

No Crew Assigned

- > Completed roof membrane at Ross area roof.

Manpower Trade	CLASSIFICATION	Quantity	UOM
Rofer	Journeyman	19	Mandays
Crew Total Today: 19		Crew Total to Date: 0	

EQUIPMENT	Quantity	UOM
Tar Kettle	1	
Total:	1	

Task Unique ID	Name	WBS	Notes
----------------	------	-----	-------

Company Total: 19 **Company Total To Date: 107**

Figure B-6: J. Raymond Daily Construction Report



Daily Construction Report
Detailed, Grouped by Date

~~Penn Air Mechanical "DPA" Jag Air Mechanical, Inc.~~

No Crew Assigned

- > Installed duct hangers at rear of Ross.
- > Set curbs at L/T after repairs by iron workers.
- > Install visqueen over EF curbs for protection from rain.

Manpower Trade	CLASSIFICATION	Quantity	UOM
Mechanical - HVAC	Journeyman	3	Mandays
Mechanical - HVAC	Supervisor	1	Mandays
Crew Total Today: 4		Crew Total to Date: 0	

EQUIPMENT	Quantity	UOM
Scissor Lift	1	
Total:	1	

Task Unique ID	Name	WBS	Notes
----------------	------	-----	-------

Company Total: 4 **Company Total To Date: 14**

~~Plumbing - Meckel Florida, Inc.~~

No Crew Assigned

- > Ground rough drains at stairwell 1 & 3. Inspection called for tomorrow.

Manpower Trade	CLASSIFICATION	Quantity	UOM
Mechanical - HVAC	Equipment Operator	1	Mandays
Mechanical - Plumbing	Foreman	1	Mandays
Crew Total Today: 2		Crew Total to Date: 0	

EQUIPMENT	Quantity	UOM
Excavator	1	
Total:	1	

Task Unique ID	Name	WBS	Notes
----------------	------	-----	-------

Company Total: 2 **Company Total To Date: 13**

Figure B-6: J. Raymond Daily Construction Report



Daily Construction Report
Detailed, Grouped by Date

~~Two Generation~~

No Crew Assigned

- > Poured Off. Depot truck well retaining walls.
- > Compacted Stair 1 & 3 slab subgrade.
- > Formed pedestals for exterior columns framing support at Ross canopy.
- > Grouted columns.
- > Grind & patch rear elevation wall panels.

Manpower Trade	CLASSIFICATION	Quantity	UOM
Concrete	Finisher	2	Mandays
Concrete	Journeyman	5	Mandays
Crew Total Today: 7		Crew Total to Date: 0	

EQUIPMENT	Quantity	UOM
Snorkel Lift	1	
Total:	1	

Task Unique ID	Name	WBS	Notes
----------------	------	-----	-------

Company Total: 7 **Company Total To Date: 839**

Manpower: Today: 40 **To Date: 1,190**

Figure B-6c: J. Raymond Daily Construction Report



Daily Details

Detailed, Grouped by Date

Pompano Citi Centre	Project # 05-043	J. Raymond Construction Corp
One Pompano Square	Tel: 407-506-7146	Fax: (407) 712-6868
Pompano Beach, FL 33062		

Date: Friday 11/11/2005

Number	Temp @ N/A	Temp @ N/A	Temp @ N/A	Precip	Cumul Precip	Wind Velocity
001				0.00	0.00	

Conditions: Clear, Windy

Reported By Company

The Scott Partnership Architecture, Inc.

Reported By

Amy Victor

Notes:

- American committed to the following;
- > Complete bldg. pad and certification by Monday 11/14 for JRCC access to stake bldg. Tues. a.m.
- > Sewer manhole removed and backfilled also by Monday.
- > Grading and balance of area outside and directly behind Bldg. B pad.
- > Will stabilize equipment access ways from paved area to bldg. pad using stockpiled base rock.
- > Water @ new hydrants to be available in 3 to 4 weeks.

Visitors:

- Art Roth - Faison
- Dario Herrero - American

Art Roth to handle demolition of piling adjacent to Macy's that conflicts with our foundation.

Date: Monday 11/14/2005

Number	Temp @ N/A	Temp @ N/A	Temp @ N/A	Precip	Cumul Precip	Wind Velocity
002				0.00	0.00	

Conditions: Overcast, Windy, Light Rain

Reported By Company

J. Raymond Construction Corp

Reported By

Kermit Wenkstern

Notes:

- > Floyd Kelley the P. Bch. structural inspector said O.K. to earthen forms for foundation const. as long as the ground was stable and the specified footing dimensions are maintained.
- > Site contractor re-excavated to three different depths at Col. line B and Universal performed density tests at each. All surpassed required min. 98% compaction.
- > David and Gerchar layed out bldg. corners. Will return tomorrow to verify subgrade elevation.

Visitors:

Date: Tuesday 11/15/2005

Figure B-7: J. Raymond Daily Details



Daily Work

Detailed, Grouped by Company

Pompano Citi Centre One Pompano Square Pompano Beach, FL 33062	Project # 05-043 Tel: 407-506-7146 Fax: (407) 712-6868	J. Raymond Construction Corp
---	--	-------------------------------------

Date	Crew	Daily Work Description
All dates fireproofing joints		
12/29/2005	N/A	> Apply elevator pit wall waterproofing.
3/29/2006	N/A	> Mobilized equipment and material to begin fireproofing at Ross interior tomorrow. > Began mineral wool and caulking of 4 hr rated joints adjacent to Macy's. > Installed protection plastic to control overspray.
3/30/2006	N/A	> Began and completed approx. 3200 sf of fireproofing at Ross interior. > Continued mineral wool and caulking of 4 hr rated joints adjacent to Macy's.
3/31/2006	N/A	> Continued spray fireproofing at Ross interior. > Continued mineral wool and caulking of 4 hr rated joints adjacent to JC Penney's.
4/3/2006	N/A	> Continued spray fireproofing at Ross interior. At start of shift they had completed approx. 8,000 s.f. > Continued mineral wool and caulking of 4 hr rated joints adjacent to JC Penney's. > Received and unloaded additional materials.
4/4/2006	N/A	> Approx. 50% complete at Ross. > Water proofer not on site. Gary Kelly said he would return tomorrow. > Cleaned overspray from rear bay of Ross to allow access by other trades.
4/5/2006	N/A	> Continued spray at Ross interior. > Waterproofer returned and worked on 4 hr panel joints at Macy's side.
4/6/2006	N/A	> Continued spray at Ross interior. > Waterproofer completed 4 hr panel joints at Macy's side including above roof deck. > The need to do a better job of cleaning floor when moving to a new area.
4/7/2006	N/A	> Continued spray at Ross interior. Approx. 85% complete with that area. > Waterproofer continued caulking panel joints. > Sent notice comply re: cleanup. Dumpster has been full for two days and they apparently cannot get service.
4/8/2006	N/A	> Continued spray at Ross interior. Approx. 85% complete with that area. > Waterproofer continued caulking panel joints. > Dumpster remains full and unserviced. Began just hauling material out of bldg. and piling it next to container.
4/10/2006	N/A	> Continued spray at Ross interior. Approx. 90% complete with that area. > Waterproofer continued caulking panel joints. > Dumpster remains full and unserviced. Began just hauling material out of bldg. and piling it next to container.
4/11/2006	N/A	> Continued spray at Ross interior. Approx. 95% complete with that area. > Waterproofer continued caulking panel joints. > Dumpster finally serviced.
4/12/2006	N/A	> Continued spray at Ross interior to 100% complete with that area. > Waterproofer continued caulking panel joints. > Began removal of protective plastic and cleanup of Ross.
4/13/2006	N/A	> Continued panel caulk joints. > Spray complete at Ross. Clean and removal of overspray and plastic.
4/14/2006	N/A	> Continued panel caulk joints. > Spray crew not on-site. Will resume at L/T on Monday 4/17.
4/17/2006	N/A	> Relocate equipment to west rear of bldg. in preparation to begin spray on at Linens & Off. Depot. > Hang protective visqueen in Linens space.

Figure B-8: J. Raymond Daily Work



TILT-CON
CORPORATION

DAILY LOG

JOB NAME: _____ JOB NO: _____

SUPERINTENDENT: _____ DATE: _____

Work Performed Today

Weather _____
 Temp _____ am _____ pm

Work Force	No.
Superintendent	_____
Foreman	_____
Laborers	_____
Carpenter	_____
Finishers	_____
Pump Op	_____
Laser Scd Op	_____
Equipment Op	_____

Subcontractors on Job (Sub name & # of employees)

Total	Mach. #/Hrs
Tilt-Con Equipment	
(F)orklift	(D)ozer
(B)ackhoe	(S)kidsteer

Subcontractor Progress:

Problems/Delays

Material Deliveries

Concrete: _____ CY
 _____ PSI
 Ticket # _____

Estimated: _____ CY
 _____ PSI
 Ticket # _____

Lumber _____ LF/EA
 Ticket # _____

Rebar _____ LBS
 Ticket # _____

Misc _____

Extra Work/Changes Authorized By Time Spent (man hrs)

Equipment On Rent/Off Rent Rented From

Copies: Office-White Superintendent-Yellow General Contractor-Pink

Figure B-9: Tilt-Con Daily Log



PLACE & FINISH DAILY LOG

TILT-CON
CORPORATION

JOB NAME: _____ JOB NO: _____

CONCRETE SUPER: _____ DATE: _____
SITE SUPERINTENDENT: _____

Work Performed Today (incl. Quantities i.e. slab SF, # of Panels, etc.)

Weather _____
Temp _____ am _____ pm

	Work Force	No.
_____	Superintendent	_____
_____	Laborers	_____
_____	Finishers	_____
_____	Pump Op	_____
_____	Laser Screed Op	_____
_____	Total	_____

Subcontractors on Job (pump co./P&F sub, etc.):

Concrete Deliveries
Actual Quantity: _____
CY
PSI

Delivery Times:
First batch on job: _____ (am) (pm)
Last batch on job: _____ (am) (pm)

Ticket # _____
Estimated Quantity: _____
CY
PSI
Ticket # _____

Work Prep Problems/Delays and or Service/ Concrete Mix Problems/Delays:
(Note any quality issues with either concrete mix or vendor service below.
Be specific about problems that may have occurred, and time impact.)

Equipment On Rent/Off Rent	Rented From
_____	_____
_____	_____
_____	_____

Extra Work/Changes	Authorized By	Time Spent (manhrs)
_____	_____	_____
_____	_____	_____

Copies: Office-White Site Superintendent-Yellow Concrete Superintendent-Pink

Figure B-10: Tilt-Con Place and Finish Daily Log

Date Called In	Date Delivered	Called In By	Job #	Job Name	Product ID	Product Description	Qty	Used For	Ticket #
12/28/05	12/20/05	Juan Moreno	05-0030	Windy Ridge		4000 PSI	126	Panels	31524166
12/28/05	12/21/05	Juan Moreno	05-0030	Windy Ridge		4000 PSI	220	Panels	31524223
12/28/05	12/21/05	Juan Moreno	05-0030	Windy Ridge		4000 PSI	208	Main Slab	31524228
12/28/05	12/22/05	Juan Moreno	05-0030	Windy Ridge		4000 PSI	208	Panels	37101299
12/28/05	12/27/05	Juan Moreno	05-0030	Windy Ridge		4000 PSI	167	Panels	37502291
12/29/05	12/27/05	Juan Moreno	05-0030	Windy Ridge		3000 PSI	25	Casting Slab	31524271
12/29/05	12/29/05	Fidel Analco	05-0030	Windy Ridge		4000 PSI	207	Panels	31524337
12/28/05	12/28/05	Fidel Analco	05-0024	Miramar		4000 PSI	20	Columns	530263
12/29/05	12/29/05	Ed Bartell	05-0034	Sarasota II		4000 PSI	40	Main Slab	60404961
12/29/05	12/29/05	Steve Knapp	05-0004	FAU - Harbor	257	2500 PSI	128	Casting Slab	1237865
12/29/05	12/29/05	Fidel Analco	05-0024	Miramar		4000 PSI	20	Split	14-Shearwall 6-Columns
12/30/05	12/30/05	Matt Lebright	05-0041	Indian Ridge / CEP	30955	3000 PSI	165	Split	100-Inl Figs
12/30/05	12/30/05	Steve Knapp	05-0004	FAU - Harbor	257	2500 PSI	175	Casting Slab	65-Ext Figs
12/30/05	12/30/05	Fidel Analco	05-0024	Miramar		4000 PSI	80	Panels	1718658
12/30/05	12/30/05	Fidel Analco	05-0024	Miramar		4000 PSI	23	Split	14-Shearwall
01/03/06	01/03/06	Ed Bartell	05-0034	Sarasota II		4000 PSI	410	Main Slab	9-Columns
01/04/06	01/04/06	Mike Decker	04-0032	USF	3000LWT	3000 PSI	80	Mezzanine	60604716
01/05/06	01/05/06	Randall	05-0031	Falcon Tire		grout	1,506	beams	60604742
01/09/06	01/09/06	Mike Decker	04-0032	USF		grout mix 151524	5	Panels	1718-500
01/09/06	01/09/06	Ray	05-0002	S.Reg Library	439	2500 PSI	439	Mezzanine	60801820
01/11/06	01/11/06	Maximo	05-0008	Homestead Hosp		3000 PSI	5	Mezzanine	530514
01/11/06	01/11/06	Matt Lebright	05-0041	Indian Ridge / CEP		3000 PSI	70	Casting Slab	1654393
01/12/06	01/12/06	Ray	05-0002	S.Reg Library	409	3000 PSI	120	Inl footings	1443363
01/12/06	01/12/06	Ray	05-0002	S.Reg Library	439	3000 PSI	3	Panels	530641
01/16/06	01/16/06	Jim	05-0037	One Charter Place		4000 PSI	9	new wall mezz	530639
01/17/06	01/17/06	Juan Moreno	05-0032	Oakshire		4000 PSI	116	panels	641256
01/25/06	01/25/06	STEVE KNAPP	05-0004	FAU - Harbor		3500 psi	200	slab	31225668
01/25/06	01/26/06	MELVIN	05-0014	HARLEY SUNRISE	N/A	4000 PSI	370	MAIN SLAB	1326414
01/26/06	01/26/06	MELVIN	05-0014	HARLEY SUNRISE		4000 PSI	8	DIAM	530975
01/26/06	01/26/06	RANDALL	05-0031	Falcon Tire		8.5 GROUT	10	Panels	530980
01/19/06	01/19/06	RANDALL	05-0031	Falcon Tire		3000 PSI	10	WALKS	1718780
01/19/06	01/19/06	Randall	05-0031	Falcon Tire		3000 PSI	5	WALKS	1718780
01/25/06	01/25/06	Randall	05-0031	Falcon Tire		GROUT	20	DUMPSTERS	1718791
01/26/06	01/26/06	Randall	05-0031	Falcon Tire		3000 PSI	16	EXT SLAB	1665517
01/19/06	01/19/06	JIM	05-0037	One Charter Place		4000 PSI	18	EXT SLAB	1718845
01/17/06	01/17/06	MELVIN	05-0014	HARLEY SUNRISE		GROUT	78	PANELS	641540
01/18/06	01/18/06	JIM	05-0037	One Charter Place		4000 PSI	1	Panels	530590
01/22/06	01/22/06	Matt Lebright	05-0041	Indian Ridge / CEP		4000 PSI	93	PANELS	641360
01/20/06	01/20/06	Mike Decker	04-0032	USF		3000 PSI	120	EXT FOOT	1443617
01/20/06	01/20/06	JIM	05-0037	One Charter Place		4000 PSI	130	PANELS	60605350
01/16/06	01/16/06	Jim	05-0024	Miramar		4000 PSI	107	PANELS	641417
01/23/06	01/23/06	RAY	05-0002	S.Reg Library	409	2500PSU	93	Panels	641360
01/23/06	01/23/06	RAY	05-0024	S.Reg Library	439	4000PSU	25	STUBS	429501
01/24/06	01/24/06	Ed Bartell	05-0034	Sarasota II		4000 PSI	6	COLUMNS	60702065
01/20/06	01/20/06	954-658-3138	05-0024	Miramar	409	4000PSI	289	Columns	
01/20/06	01/20/06	954-658-3138	05-0024	Miramar		4000PSI	15	Columns	
01/13/06	01/13/06	954-658-3138	05-0024	Miramar		4000PSI	40	Columns	
01/11/06	01/11/06	954-658-3138	05-0024	Miramar		4000P	410	Mezzanine	
01/23/06	01/23/06	Mike Decker	04-0032	USF	151027	30000P	80	Panels	
01/23/06	01/23/06	Mike Decker	04-0032	USF		30000P	18	DIAMONDS	60605401

Figure B-11: Tilt-Con Job Cost Summary

TILT-CON SHORT INTERVAL PLAN

JOB NU: _____ JOB SUPT NAME: _____ PERIOD: from _____ to _____
 JOB NAME: _____ DATE: _____

To be completed and sent in on Friday with your other paperwork

Activities and Cost Codes	Unit	Qty	% Cmp	This Week							Week After							Subcontractors/Equipment/Materials	What do you need?	
				Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun			
1. Interior Foundations:																				
a. Building layout	010300	SF																		
b. Excavate int foundations	030010	LF																		
c. Reinforcing/Welded wire	030010	SF7 Tons																		
e. Set anchor bolts	1030010	EA																		
d. Pour interior foundations	030010	LF7 CY																		
2. Exterior Foundations:																				
a. Building layout	C 010300	SF																		
b. Excavate ext foundations	030010	LF																		
c. Reinforcing/Welded wire	030010	SF7 Tons																		
e. Set anchor bolts	030010	EA																		
d. Pour exterior foundations	030010	LF7 CY																		
3. Main Slab:																				
a. Fine grade	030030	SF																		
b. Form	030030	LF																		
c. Reinforc/Poly/Weld wire	030030	SF7 Tons																		
d. Pour - Place & Finish	030030	CY																		
e. Finalize	030030	SF																		
4. Casting Slab:																				
a. Fine grade	030030	SF																		
b. Form	030030	LF																		
c. Reinforc/Poly/Weld wire	030030	SF7 Tons																		
d. Pour - Place & Finish	030030	CY																		
e. Strip forms	030030	LF																		
f. Remove casting slabs	010300	LF																		
5. Panels:																				
a. Layout	030050	EA																		
b. Form	030050	LF																		
c. Reinforcing	030050	Tons																		
d. Install embeds	030050	EA																		
e. Pour	030050	EA7 CY																		
f. Grouting	30050	LF																		
g. Strip Forms	030050	LF																		
h. Erect	030050	EA																		
i. Finalize	030050	EA7 SF																		

1 of _____

Figure B-12: Tilt-Con Short Interval Plan

JOB NUMBER: _____ TILT-CON SHORT INTERVAL PLAN JOB SUPT NAME: _____
 JOB NAME: _____ DATE: _____ PERIOD: from _____ to _____

To be completed and sent in on Friday with your other paperwork

What are you trying to accomplish?		This Week							Week After							What do you need?		
Activities and Cost Codes	Unit	Qty.	% Cmp.	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Subcontractors/Equipment/Materials
6. Perimeter:																		
a. Form	030040	LF																
b. Backfill and compact	030040	SF/ CY																
c. Reinforc/Poly/Weld wire	030040	SF																
d. Install pipe bollards	030040	EA																
e. Pour	030040	SF/ CY																
f. Finalize	030040	LF																
7. Masonry:																		
a. Sub labor	no cost	Mhrs																
b. Tie beams	030120	LF/ CY																
c. Columns	030110	EA/ CY																
d. Fill cells	no cost	EA/ CY																
e. Drill and epoxy dowels	030090	EA																
8. Exterior:																		
a. Truck aprons	030140	SF/ CY																
b. C.I.P. wall/columns	030100	CY																
c. Sidewalks	030070	SF/ CY																
d. Stairs	030130	EA/ CY																
b. Reinforcing	030090	Tons																
c. Pour	030090	SF/ CY																
d. Strip forms	030090	LF																
9. Paving:																		
a. Fine grade	030060	SF																
b. Form	030060	LF																
c. Reinforc/Poly/Weld wire	030060	SF/ CY																
d. Pour - Place & Finish	030060	SF/ CY																
e. Finalize	030060	SF																
10. Closeout:																		
a. General job cleanup	010300	Mhrs																
b. Punchlist	010300	Mhrs																
c. General job closeout	010300	Mhrs																

Figure B-12: Tilt-Con Short Interval Plan

I HEREBY ACKNOWLEDGE THAT, DURING THE PAY PERIOD COVERED BY THIS TIMECARD, ALL WORK TIME REFLECTED BY THIS CARD IS ACCURATE AND, DURING SUCH PERIOD, I (employee must initial one) _____ WAS NOT INJURED ON THE JOB.



EMPLOYEE SIGNATURE: _____

JOB NUMBER	LAST NAME		EMPLOYEE #		WEEK ENDING DATE		
	SUN	MON	TUE	WED	THU	FRI	SAT
	PLAC	PLAC	PLAC	PLAC	PLAC	PLAC	PLAC
	EFIN	EFIN	EFIN	EFIN	EFIN	EFIN	EFIN
General Conditions	010.300						
Demolition/Hauling	020.110						
Travel Time	010.300						
Interior footings	030.010						
Exterior Footings	030.020						
Main Slab	030.030						
Perimeter Slab	030.040						
Panels	030.050						
Panels Erect	030.050						
Concrete Paving	030.060						
Misc. Exterior Slabs	030.065						
Concrete Walks	030.070						
Mezzanines	030.080						
Susp. Beams/Slabs	030.090						
Cast in Place Walls	030.100						
Columns	030.110						
Beams	030.120						
Cast in Place Stairs	030.130						
Pits/Misc	030.140						
Casting Slabs	030.900						
Rework/Repairs	030.990						
TOTALS							
OVER							
GRAND TOTAL ALL TIMECARDS							

HR-1

Figure B-13: Tilt-Con Place Weekly Timecard

EXPENSE REPORT								
	SUN	MON	TUES	WED	THURS	FRI	SAT	TOTALS
Meals								
Gas								
Tolls								
Supplies								
Miscellaneous								
Attach receipts to Timecard								
						DUE EMPLOYEE		
						DEDUCT FROM EMPLOYEE		
Supervisor's Signature: _____								

EMPLOYEE NAME _____

EMPLOYEE RECORD CHANGES

New Address: _____
 Mailing Address _____ City _____ State _____ Zip _____

New Phone: (_____) _____

LEAVE OF ABSENCE

Authorized a leave of absence beginning _____ to return to work _____
 Date _____ Date _____

State reason for leave: _____

Note: Failure to return to work on the date specified above, or failure to request an extension by phoning Human Resources at 1-800-1 GO-TILT could result in the termination of your employment. Please keep us advised of your situation.

 Employee Signature and Date

 Supervisor's Approval

EMPLOYEE RELEASE

Effective Date: _____

Reason:

- Unsatisfactory work performance during 90 day probationary period.
- Voluntary Quit (**State reason in remarks section**)
- Quit – JOB ABANDONMENT (no phone calls and did not show up for 3 consecutive work days)
- Lay Off (**Temporary**)
- Lay Off (**Permanent**)
- Discharge due to misconduct or sustained poor performance (**explain in remarks**)

REMARKS (Note dates of any verbal warnings and attach any related documents. Continue remarks on separate sheet, if necessary.)

This individual is is not recommended for rehire.

 Supervisor

Supervisor's Notes: _____ _____ _____ _____
--

Figure B-13: Tilt-Con Place Weekly Timecard

Mileage at end of Week _____



TILT-CON
CORPORATION

**EQUIP
OPERATORS**

I HEREBY ACKNOWLEDGE THAT DURING THE PAY PERIOD COVERED BY THIS TIMECARD, ALL WORK TIME REFLECTED BY THIS CARD IS ACCURATE AND, DURING SUCH PERIOD, I (employee must initial one) _____ WAS NOT INJURED ON THE JOB.

EMPLOYEE SIGNATURE: _____

WEEK ENDING DATE _____

EMPLOYEE # _____

LAST NAME _____

(PRINT) FIRST NAME
SUPERINTENDENT: _____

JOB NUMBER _____

	SUN		MON		TUE		WED		THU		FRI		SAT	
	LAB HR	EQ HR	LAB HR	EQ HR	LAB HR	EQ HR	LAB HR	EQ HR	LAB HR	EQ HR	LAB HR	EQ HR	LAB HR	EQ HR
Travel	010.400													
Cartage/Fuel	010.500													
General Cleanup	010.700													
Maint-Non Routine														
Interior footings	030.010													
Exterior Footings	030.020													
Main Slab	030.030													
Perimeter Slab	030.040													
Panels	030.050													
Panels Erect	030.050													
Concrete Paving	030.060													
Misc. Exterior Slabs	030.065													
Concrete Walks	030.070													
Mezzanines	030.080													
Susp. Beams/Slabs	030.090													
Cast in Place Walls	030.100													
Columns	030.110													
Beams	030.120													
Cast in Place Stairs	030.130													
Pis/Misc	030.140													
Casting Slabs	030.900													
Rework/Repairs	030.980													
TOTALS														
OVER														

GRAND TOTAL ALL TIMECARDS

PUMPS=300 SCREEDS=350 BACKHOES/DOZER=023 LULLS/FORKLIFT=001

(EQ CODES)

Figure B-14: Tilt-Con Place and Finish Daily Log

EXPENSE REPORT								
	SUN	MON	TUES	WED	THURS	FRI	SAT	TOTALS
Meals								
Gas								
Tolls								
Supplies								
Miscellaneous								
Attach receipts to Timecard								
						DUE EMPLOYEE		
						DEDUCT FROM EMPLOYEE		
Supervisor's signature: _____								

EMPLOYEE NAME _____
EMPLOYEE RECORD CHANGES

New Address: _____
Mailing address City State Zip

New Phone: () _____

LEAVE OF ABSENCE

Authorized a leave of absence beginning _____ to return to work _____
Date Date

State reason for leave: _____

Note: Failure to return to work on the date specified above, or failure to request an extension by phoning Human Resources at 1-800- I GO – TILT could result in the termination of your employment. Please keep us advised of your situation.

Employee Signature and Date Supervisor's Approval

EMPLOYEE RELEASE

Effective Date: _____

Reason:

- Unsatisfactory work performance during 90 day probationary period.
- Voluntary Quit (**State reason in remarks section**)
- Quit – JOB ABANDONMENT (no phone calls and did not show up for work for 3 consecutive work days)
- Lay Off (**Temporary**)
- Lay Off (**Permanent**)
- Discharge due to misconduct or sustained poor performance (**explain in remarks**)

REMARKS (Note dates of any verbal warnings and attach any related documents. Continue remarks on separate sheet, if necessary.)

This individual is is not recommended for rehire.

Supervisor

Supervisor Notes: _____ _____ _____ _____ _____
--

Figure B-14: Tilt-Con Place and Finish Daily Log



TILT-CON
CORPORATION

**CONCRETE
CREW ONLY**

I HEREBY ACKNOWLEDGE THAT, DURING THE PAY PERIOD COVERED BY THIS TIMECARD, ALL WORK TIME REFLECTED BY THIS CARD IS ACCURATE AND, DURING SUCH PERIOD, I (employee must initial one) _____ WAS NOT INJURED ON THE JOB.

EMPLOYEE SIGNATURE: _____

(PRINT) FIRST NAME _____ LAST NAME _____ WEEK ENDING DATE _____
SUPERINTENDENT: _____ EMPLOYEE # _____

JOB NUMBER	SUN		MON		TUE		WED		THU		FRI		SAT	
	PLACE/FIN	SACK/PAT												
Travel Time		010.300												
Demolition/Hauling		020.110												
Interior footings		030.010												
Exterior Footings		030.020												
Main Slab		030.030												
Perimeter Slab		030.040												
Panels		030.050												
Panels Erect		030.050												
Concrete Paving		030.060												
Misc. Exterior Slabs		030.065												
Concrete Walks		030.070												
Mezzanines		030.080												
Susp. Beams/Slabs		030.090												
Cast in Place Walls		030.100												
Columns		030.110												
Beams		030.120												
Cast in Place Stairs		030.130												
Pits/Misc		030.140												
Casting Slabs		030.900												
Rework/Repairs		030.990												
TOTALS														
OVER														

GRAND TOTAL ALL TIMECARDS

Figure B-15: Tilt-Con Concrete Timecards

EXPENSE REPORT								
	SUN	MON	TUES	WED	THURS	FRI	SAT	TOTALS
Meals								
Gas								
Tolls								
Supplies								
Miscellaneous								
Attach receipts to Timecard						DUE EMPLOYEE		
						DEDUCT FROM EMPLOYEE		
Supervisor's signature: _____								

EMPLOYEE NAME _____

EMPLOYEE RECORD CHANGES

New Address: _____
 Mailing address City State Zip

New Phone: () _____

LEAVE OF ABSENCE

Authorized a leave of absence beginning _____ to return to work _____
 Date Date

State reason for leave: _____

Note: Failure to return to work on the date specified above, or failure to request an extension by phoning Human Resources at 1-800- I GO – TILT could result in the termination of your employment. Please keep us advised of your situation.

Employee Signature and Date _____ Supervisor's Approval _____

EMPLOYEE RELEASE

Effective Date: _____

Reason:

- Unsatisfactory work performance during 90 day probationary period.
 - Voluntary Quit (**State reason in remarks section**)
 - Quit – JOB ABANDONMENT (no phone calls and did not show up for work for 3 consecutive work days)
 - Lay Off (**Temporary**)
 - Lay Off (**Permanent**)
 - Discharge due to misconduct or sustained poor performance (**explain in remarks**)
- REMARKS (Note dates of any verbal warnings and attach any related documents. Continue remarks on separate sheet, if necessary.)
- _____
- _____
- _____

This individual is is not recommended for rehire.

 Supervisor

Supervisor Notes: _____ _____ _____ _____

Figure B-15: Tilt-Con Concrete Timecards

APPENDIX C
ANALYSIS MATRIX

Table C-3: Analysis Matrix Daily Log Format

Analysis Matrix - Daily Log Format

Company Name	Who Fills Out The Logs	Why Are They Important	What Changes Need To Be Made	Are The Logs Currently Used For Their Intended Purpose?
<u>Brasfield & Gorrie</u>		Document Daily	If for Estimating:	Logs are a very important part of the superintendent's job and they are filled out daily with great detail and precision
		Activities onsite	track labor/job cost	
	Project		constantly update	
	Superintendent	Acts as a defense	PM about job	
		mechanism in disputes	problems	
<u>Hensel Phelps</u>		Brief explanation	Need to be more	The only intended
		of what happened on	user friendly	purpose is to provide
	Superintendent	the job		defense in legal
		Explain problems on	The current info is	disputes
		the job site	not relevant to	
<u>KHS&S</u>		legal support	the estimators	
		Only used to	N/A	No, the purpose of
	Crew	document activities	The only estimator	the logs are limited
	Superintendent	from the day for	involved in production	and they are not
		future reference	is the Chief Est. and	usually filled out
		he is present on the	properly	
	legal support	job, no log needed		

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Table C-3: Analysis Matrix Daily Log Format

<u>R.A. Rogers</u>		Keep track of	Greater simplicity	Yes, they are filled
	Superintendent	activities in general	Consistent through	out and submitted
	submits log to the	terms that take	different companies	electronically and
	Project Manager	place on the job	Include photos	at
	who fills it out in	that day	electronic format	any time if
Pro-log			necessary	
		legal support		
<u>Clancy & Theys</u>		Provides general	Equip/Material log	Yes, Pro-log is
	Field Superintendent	information about	for daily deliveries	used to submit the
	submits to the	the activities	Have an area to	documents
	Project Manager	of the day on that	include job photos	to the database
	jobsite			
<u>J. Raymond</u>			Electronic	No, this company
		Briefly details the	Simplify the content	is a CM and not
	Superintendent	work on the job	make questions more	concerned with
			relevant to activities	production
		legal support		

Table C-3: Analysis Matrix Daily Log Format

<u>Tilt-Con</u>		All logs give the estimating dept. production information	Combine all logs into 1	Yes, these logs are crucial
	Superintendent	which keeps the company in business	electronic format	to updating the estimating software
			would introduce accuracy	
		Track Job Progress In Crucial Areas of The Job	Simplify the log	
	N/A	Update Estimate	Combine Current Formats	N/A
		Provide a Source of Documentation in the Case of a Dispute	Include the Max Information with the greatest ease to fill out	
<u>Standard Log - Michael Chandler</u>				

APPENDIX D
FINAL STANDARD DAILY LOG

Standard Daily Log

Project Name: **Log Number:**

Project Number: **Date:**

Superintendent: **Project Manager:**

Site Visitors:	<input style="width: 95%; height: 25px;" type="text"/>
	<input style="width: 95%; height: 25px;" type="text"/>
	<input style="width: 95%; height: 25px;" type="text"/>
	<input style="width: 95%; height: 25px;" type="text"/>

Weather

95

Temperature	
High	<input style="width: 85%; height: 25px;" type="text"/>
Low	<input style="width: 85%; height: 25px;" type="text"/>

Precipitation		
Yes	<input style="width: 85%; height: 25px;" type="text"/>	INCHES
No	<input style="width: 85%; height: 25px;" type="text"/>	:_____"
Time Lost?	<input style="width: 85%; height: 25px;" type="text"/>	:_____

Adverse Weather Affects:	<input style="width: 85%; height: 25px;" type="text"/>
	<input style="width: 85%; height: 25px;" type="text"/>
	<input style="width: 85%; height: 25px;" type="text"/>
	<input style="width: 85%; height: 25px;" type="text"/>
	<input style="width: 85%; height: 25px;" type="text"/>
	<input style="width: 85%; height: 25px;" type="text"/>

Figure D-16: Final Standard Daily Log

Safety Incidents						
Type:						
Name:						
Lost Time:						
Report No.						
Safety Meeting Held?	Attendees:					
Yes		Name				
No		Company				
		Issues Raised				

Materials						
Ordered						
	1	2	3	4	5	6
Description						
Quantity						
U/M						
\$/Unit						
Total \$						
Contact Name						
Contact Phone #						
Delivered						
	1	2	3	4	5	6
Description						
Condition/Problem						
Quantity						
U/M						
\$/Unit						
Total \$						
Contact Name						
Contact Phone #						

Figure D-16: Final Standard Daily Log

Equipment On Site						
No.	Type of Equipment:	Company Name	Operator:	Hrs. In Use	Hrs. Idle	Problems:
1						
2						
3						
4						
5						
6						
7						
8						

Dumpster Activity			
Company Name		Dumpster Identification	
Full		Container Number	
Empty			
Pull			

Schedule Questions			
		Yes	No
Are All Crews In Compliance With The Job Schedule?			
Explain:			

Figure D-16: Final Standard Daily Log

		Yes	No		
Were There Any Major Milestones Reached On The Job Today?					
Explain:					
		Yes	No		
Are There Any New Future Directives That Should Be Addressed?					
Explain:					
		Yes	No		
Were there any Inspections Held Today?					
Pass/Fail/Explain:					

Figure D-16: Final Standard Daily Log

Subcontractors On Site					
No.	Employee/Sub Name	Location	Employee Count	Conflicts	Work Completed
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					

Clean - Up			
No.	Employee / Company Name	Area	Problems
1			
2			
3			
4			
5			
6			
7			
8			
9			

Figure D-16: Final Standard Daily Log

Additional Information	
What Areas Of Work That Began Today?	
What Areas Of Work Were Completed Today?	
Were There Any Questions Raised? Answers?	
Any Additional Comments Not Specified Above?	

Figure D-16: Final Standard Daily Log

LIST OF REFERENCES

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2. El-Mashjaleh, Mohammad Suleiman, Firm Performance and Information Technology Utilization in the Construction Industry: An Empirical Study, Gainesville, FL 2003.
3. Fisk, Edward R., Construction Project Administration, Upper Saddle River, NJ, 2000.
4. Koskela, Lauri, Management of Production in Construction: A Theoretical View, VTT, Finland, 1999
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BIOGRAPHICAL SKETCH

Michael P. Chandler is seeking a degree of Master of Science in Building Construction from the University of Florida and the M.E. Rinker, Sr. School of Building Construction. He began his graduate work in the fall of 2004, shortly after achieving his lifelong goal of receiving a degree from the University of Notre Dame. At Notre Dame, Michael studied both history and computer applications in order to expand his intellectual capabilities. Prior to his acceptance at the University of Notre Dame, Michael spent two years at Holy Cross College in South Bend, Indiana, where he prepared himself to meet the challenges of a major university. While attending both Holy Cross College and the University of Notre Dame, Michael worked summers in Florida as a laborer on multiple construction crews. This infield experience is what ultimately pushed Michael to pursue a graduate degree in the field of construction. Through the guidance of Dr. R. Raymond Issa, Dr. Robert F. Cox and Dr. Robert C. Stroh, Sr. Michael has worked to complete a thesis that will benefit the future of construction. With a master's degree from the University of Florida, Michael P. Chandler hopes to continue his education from the classroom and field experience to better the construction industry.