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Construction Research Series

THE BANK OF WESTMINSTER AND
HYLAND PARK CONSTRUCTION CONTRACTS
AS ENGINEERING STUDENT CLASSROOM PROJECTS;
CONSTRUCTION PHASE

By
Robert J. Bossa

SELECTED
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THE BANK OF WESTMINSTER AND
HYLAND PARK CONSTRUCTION CONTRACTS
AS ENGINEERING STUDENT CLASSROOM PROJECTS;
CONSTRUCTION PHASE

By
Robert J. Bossa

Presented to:

The Department of Civil, Environmental,
and Architectural Engineering
The University of Colorado at Boulder
In Partial Fulfillment of the Requirements
for a Masters of Science Degree

The University of Colorado at Boulder

Boulder, Colorado


December 13, 1984

SELECTED
FEB 27 1986
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This Report for the Master of Science Degree by
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Bossa, Robert J. (M.S., Civil Engineering)

The Bank of Westminster and Hyland Office Park Construction Contracts as Engineering Student Classroom Projects: Construction Phase.

Employers often find that the recently hired engineering school graduate has difficulty in correlating the methodology and the technology learned in the classroom to actual construction projects. The following report attempts to help in tying together classroom work and an actual construction project.

Information for the report was provided by Walters Construction Management, Inc. The report describes an actual office building presently under construction. Portions of the report are intended to be used as narrative type lessons, other parts are to be used as laboratory problems.

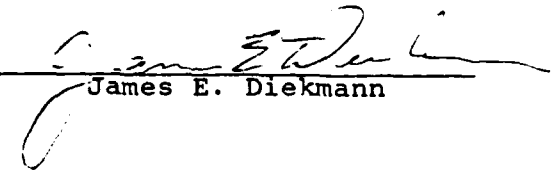
The report focuses on the organizational structure of the construction firm and the contractual requirements of the construction firm. The text then analyzes selected portions of the project in order to explain why certain construction related procedures have been made.

Photographs of the construction phase of the project are presented. The photographs are intended to provide a pictorial history of the construction project.

Past reports on this project will be used along with this report to develop a complete, total construction project for classroom application.

This abstract is approved as to form and content.

Signed


James E. Diekmann

ACKNOWLEDGEMENTS

I would first like to thank the Bill Walters Company, specifically Mr. John Fox and Mr. David Metcalf of Walters Construction Management, Inc., who provided this construction contract to be used as a classroom project. The amount of time and costs expended by them and the firm is truly appreciated.

I would also like to thank Professor James Diekmann for his help and advice throughout this project.

INTRODUCTION

Within the scope of the undergraduate and graduate Civil and Architectural engineering programs is the need to relate information from textbooks and classrooms to the actual construction industry. This report will attempt to bridge the gap between real world situations and the world of academics.

Walters Construction Management has agreed to let their organization and one of their current projects serve as a model for this report. The Bank of Westminster is under construction at the corner of 92nd Avenue and Sheridan Blvd. The bank project along with the organizational structure of Walters Construction Management will be studied and analyzed and results will give a realistic approach to future student assignments.

The objectives of this report are to study the construction phase of the Bank of Westminster and to tie it to specific graduate and undergraduate courses offered in the Construction Management field in the Department of Civil and Architectural Engineering. This report will study the development of the B.L. Walters company from the original corporate entity of Walters Construction Management and why this cooperation came into existence.

The actual organization of Walters Construction Management will be used as a reference for study in the Construction Management (CE 525) class. This will give the class a successful and working organization to compare with the different organizational structures referred to in the classroom. Students will be able to discuss the advantages and disadvantages of this particular organization and compare their thoughts with the thoughts of members in the organization of Walters Construction Management. The class will be given the organizational structure and then discuss the formal and informal links of each department. Afterwards they can again compare their assumptions or results with those of the actual formal and informal links within Walters Construction Management.

By following one of the numerous subcontractors on this job students will experience the actual paper flow and contract related problems encountered during this project. This will be very effective in the Construction Contracts (CE 524) class when discussing effects of backcharging or how backcharging or changes in the plans will affect the subcontractor and his contract.

The use of time lapse photography will be used in the Construction Engineering I & II (CE 528 & CE 529) classes. Time lapse photography will show actual repetitive construction methods used on this project. The class will be able to analyze these methods and decide on

possible alternative solutions to these specific construction practices.

Each classroom application will have packaged slides specifically for that module which will give a visual recording of the project at specific construction phases and will assist students in visualizing the project phase being discussed. The slides will encompass the project from the clearing of the site through the complete building.

PART I - PROJECT REPORT

THE ORGANIZATION STRUCTURE AND THE CREATION OF WALTERS CONSTRUCTION MANAGEMENT

The B.L. Walters Corporation was formed approximately three years ago, in 1981, to the corporate level from the Walters Construction Management organization which was formed in 1974. The primary motivation for forming a full service development company from the traditional construction management firm was the desire of the Chief Executive Officer to have control over what was being developed and how that development was to be accomplished. Because of the objective to have complete control, Walters Construction Management expanded and became the Bill L. Walters Company.

This Corporation is comprised of numerous companies that handle the acquisition of the land, the development of the raw land, the management of the construction, the maintenance and management of the constructed building, the leasing of completed buildings, and a Chief Financial Officer to maintain all the accounting records of the B.L. Walters Company. The overall corporate structure is shown in Figure 1.

ORGANIZATIONAL STRUCTURE

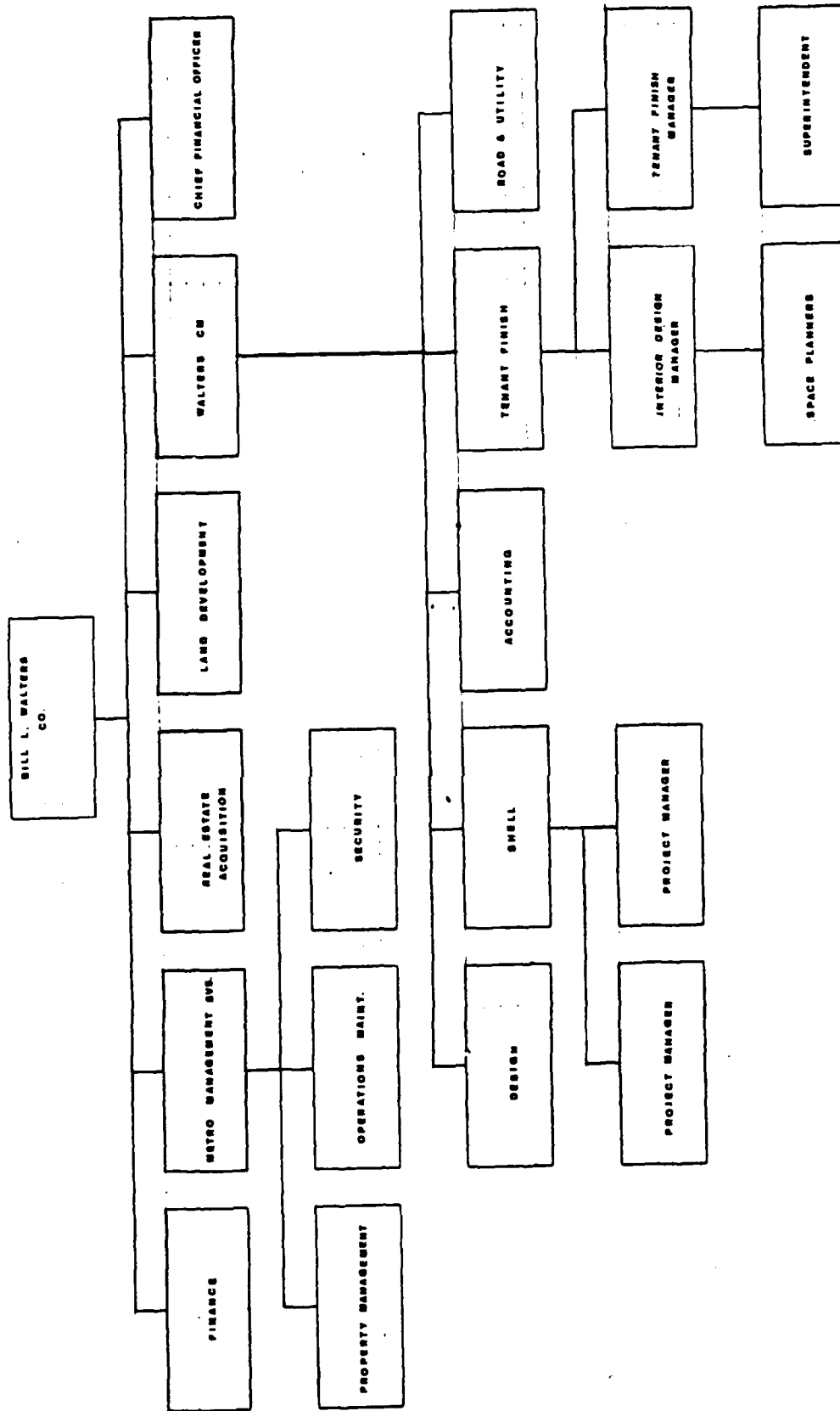


FIG. 1

This report will deal strictly with the construction management portion of the entire organization and will also touch upon the management/maintenance of a project once a project has been completed. The construction management part of B.L. Walters Company, hereafter referred to as Walters Construction Management, is a wholly owned subsidiary, and is divided into five areas. These areas are Architectural and Design, Shell Construction, Tenant Finish, Roads and Utilities, and Accounting.

Each of these separate areas operate on an arm's-length, semi-formal basis with the B.L. Walters Company. At the head of Walters Construction Management is the Vice President and General Manager who reports directly to the President of B.L. Walters Company. The manager of Shell Projects and the Manager of Tenant Finish, along with the Manager of Road and Utilities, the Senior Architect and the Senior Accountant report directly to the Vice President.

The structure of Walters Construction management makes it very clear that as the general contractor, Walters Construction Management will subcontract a great deal of the work. As an organization they do not maintain the personnel to do the majority of work that a General Contractor can. By maintaining their own Project Managers and Field Supervisors, Walters Construction Management maintains control of these projects. In the architectural area the design drawings may be produced

either by Walters or by outside designers. In the event that an outside designer is used, Walters Construction Management maintains control over the actual design, the design costs, and the design period.

During the design phase both the Shell Construction Department and the Tenant Finish Department are deeply involved in the design phase. All agreements between the various departments are at arms-length and there are written contracts between the various departments.

Tenant finish is one of the new areas created at Walters Construction Management because of the increased need for specialists to deal with tenants and getting them moved into their building. It is seen as one of the most important areas within the Walters Construction Management organization. At Walters Construction Management they recognized the need for this specialty and reorganized, creating Tenant Finish. The improvement of and a more receptive attitude toward tenant finish was seen as a bona fide plus in the renting of completed buildings and development of good customer relations. The Tenant Finish Department has become one of the biggest departments of Walters Construction Management. The Tenant Finish department is considered the income stream for Walters Construction Management. Working with the tenants and insuring their satisfaction is one of the biggest reasons for the success of Walters Construction

Management. To enhance the organization's credibility and to utilize the "one stop shopping" principal, a good Tenant Finish Department is essential to a successful company.

The goals of Tenant Finish are to give the customer complete satisfaction in their final spaces. Tenant Finish works very closely with the Design area and the Shell Construction area in the very beginning to alleviate problems with the customer's requests. The Tenant Finish Department is structured so that under the Manager of Tenant Finish there is an Interior Design Manager who, with the space planners assigned to him, will do the interior design for the tenant based on proven interior designs. The Interior Design Manager will incorporate into his designed spaces other options or additions that the customer may desire. Walters Construction Management builds typical office buildings thereby creating a quick, concise decisionmaking process of what will work in a specific building and what will not.

When the building is erected and weatherproof, the Project Managers for Tenant Finish, who with their own Field Supervisors, complete the interior portion of the building. The Project Manager for the Tenant Finish will maintain clear, concise records of what is being done to the interior of the building. With the typical building having more than one tenant, he will keep

records of what spaces are for what tenants and keep his field supervisors apprised of any changes in design or schedule. The Tenant Finish Department will also do some work for organizations other than Walters Construction Management. The amount of this work is minimal and only comes to approximately ten percent of the actual tenant finish work accomplished.

The Shell Construction part of the Walters Construction Management organization is very similar to the Tenant Finish Department. Under the Manager of Shell Projects there are various Project Managers and in turn, under the Project Managers are various Field Supervisors.

The Project Manager would be involved with the project from the very first design meeting through the tenant occupation of the building. During the initial design meeting the Project Manager will be there with the Architects and Designers so that when any questions arise about the design in conjunction with the actual construction, it can be answered quickly. The Project Manager also communicates with the various Consulting Engineers hired by the Design Department to help answer any questions that may come up about the Mechanical, Electrical, or Structural systems. The Project Manager would report directly to the Manager of Shell Projects with any problems that he could not solve informally with his counterpart in the Design area, Tenant Finish area, Accounting area, or Road and Utility area. The basic

philosophy of the entire organization is to solve any problem that may arise at the lowest possible level.

If the Project Manager can't solve a problem informally, he would move up his chain of command to the Manager of Shell Projects who will try to solve the problem at his level. If this is not possible then the Vice President and General Manager of Walters Construction Management will make the decision. Because of the informality and the close proximity of these various Managers and Project Managers it is infrequent that a problem can not be solved among the people involved.

In conclusion, the Walters Construction Management organization is a main part of a Design-Build organization that also incorporates the management/maintenance of the structure. The Walters Construction Management organization goes one step further than the Professional Construction Manager organization and not only designs and builds, but also leases, manages, and maintains the structures they erect. This keeps Walters a step ahead of their competition. Walters Construction Management controls the design, the design cost, and the design period but also maintains their credibility and their positive public image by catering to their customers not only in the construction phase, but afterwards in the moving in and leasing phase.

**OBJECTIVES OF WALTERS CONSTRUCTION MANAGEMENT
AS COMPARED TO THEORETICAL ORGANIZATIONS**

In comparison with normal project delivery systems, Walters Construction Management is a combination of the Owner-Builder organization and the Professional Construction Management organization.

Theoretically, a Professional Construction Management organization combines three parties into a team consisting of the owner, designer, and construction manager in a non-adversary relationship. The construction manager works closely with the owner and the designer from the beginning to the completion of the project. The construction manager does not normally perform construction work with his own forces or guarantee the overall cost of the work. Once the budget is approved the construction manager monitors developments in schedules, quality requirements, and spending in order to maintain the objectives established in the beginning of the project. The construction manager advises and coordinates the procurement of any long lead materials or equipment. He will monitor the payments to subcontractors, the changes in contracts or any claims. In general, the construction manager monitors actual cost, schedules, and quality control.

Walters Construction Management does all of this, but is different in one very important aspect of the typical model. Walters Construction Management does not go out and bid on projects to manage; their projects are established down through the hierarchy of their chain of command. The Chief Executive Officer who is an architect by training, may want to develop land in accordance with members of an organization that he has an interest in, thereby creating the projects.

Walters' desire to maintain absolute control over their project is in line with the aims of the Owner-Builder organization. In theory, the owner is responsible for the design and construction of the project. The owner has the option of using his own work forces or to subcontract part or all of the work.

The Walters Construction Management organization is a Line and Staff Task Force. As shown in Figure 1 there is a distinct hierarchy and a designated chain of command. The hierarchy is designated only for those decisions that can't be resolved at lower levels in the organization. A strength of Walters Construction Management is the project orientation of the entire project team. One of the weaknesses, in theory, in a line and staff organization is that individuals may be troubled by the dual accountability to both a project and a functional boss.

Walters Construction Management is also structured somewhat as a Matrix Organization. The informal lines of the structure opens lines of communication at all levels and gives people the ability to talk with counterparts and maintain a knowledgeable and productive environment. Therefore, Walters construction Management is most definitely a Line and Staff Task Force, but with a little of the Matrix Organization added to help alleviate any communication problems.

In conclusion, the main objective of Walters Construction Management is to maintain absolute control over the project and to produce a product that is a marketable commodity.

**DIFFERENCES BETWEEN WALTERS CONSTRUCTION MANAGEMENT
AND OTHER CONSTRUCTION MANAGERS**

A major difference between Walters Construction Management and other developers is the "one stop shopping" approach. Not only will Walters Construction Management design the building, they will manage the interior finish, and will maintain the upkeep of the building and surrounding grounds. This is a major difference since most developers utilize a fragmented approach to the development of buildings.

A construction Manager who utilizes the fragmented approach will have someone come in who owns the land and wants it developed. This manager may or may not help find a designer that can design what the owner wants on the land. Once the design is approved by all interested parties, it is then turned over to the construction manager. The construction manager in turn requests bids based on these designs from various general contractors who in turn receive bids from various subcontractors.

Once the construction manager picks his general contractor he will manage the job as per plans and specifications and keep track of any changes in the project. He will be the owner's representative on the job. The construction manager, in most instances, will carry

professional liability insurance for this specific project and also on any other project he may be managing at the time.

Under Walters Construction management, a major difference is that Walters Construction Management is covered under an umbrella policy from the B.L. Walters Company for professional liability. When Walters Construction Management gets a project to be managed, it usually has been first brainstormed at the Chief Executive Officer's level of the B.L. Walters Company. The land has been acquired under the Land Acquisition Department of B.L. Walters Company, and the developers in Land Development may have specific plans for this tract of land.

Walters Construction Management, like other construction managers, would go out looking for bids for the various parts of construction, but would act as their own general contractor. The differences are quite unique in that Walters Construction Management has control over the design of the project, control of the construction management of the project, control over changes in the design of the project, and once the project is complete, control over the management of the building.

A developer or construction manager who utilizes the fragmented approach can run into many difficulties during the project's construction. There could be quite a bit of money spent in litigation determining who is

responsible and who will pay for corrections to any faulty design or construction applications. If once a tenant has occupied the building and there are maintenance problems, the developer must get in touch with the people who do their maintenance to correct it. In the B.L. Walters company, they would handle their own maintenance problems and there would be no doubt as to what the priority is.

In the fragmented approach, the "finger pointing" and litigation could go on for quite awhile. Finding out who is responsible and then making sure the responsible party adheres to their end of the agreement could be costly not only in dollars, but also in time. While in the full service development company such as Walters Construction Management, a decision could be made and action to fix the problem could be imposed.

The Walters Construction Management organization allows decisions to be made faster in the pre-construction phase and the construction phase than in the fragmented approach. This is because in the fragmented approach, the construction manager or developer is trying to touch base with numerous people involved in the project at various locations. The start up cycle in decisionmaking at Walters Construction Management is quite short compared to a fragmented approach of construction management. At Walters Construction Management the process of decisionmaking is known and has been

utilized over and over again. The members of the organization know who is in charge and where to go for certain decisions. In a fragmented approach, the construction manager must first establish the lines of communication and the chain of command. This alone is very time consuming.

A significant difference is that the Chief Executive Officer of B.L. Walters Company has absolute control over the Walters Construction Management organization as well as Land Acquisition, Land Development, Maintenance/Management, etc. which ensures a quick decisionmaking process. Because of this control, the Walters Construction Management organization can be more positive and make absolute commitments to cities, municipalities, and/or other public service areas for not only the construction of a project but its overall development. This greatly enhances the credibility of the organization as well as maintaining the flexibility to propose or accept alternatives to the design quickly and effectively.

In conclusion, the significant difference between Walters Construction Management and the fragmented approach is that the decisionmaking process in both the pre-construction and construction phase is quicker and much more efficient in an organization such as Walters Construction Management. Having all the participants for a certain project under one roof makes the life of the

project from conception to completion significantly shorter and improves the quality of the finished project to the tenant or owner.

ADVANTAGES AND DISADVANTAGES OF WALTERS CONSTRUCTION MANAGEMENT

In interviews and conversations with several members of the organizational structure of Walters Construction Management, some distinct advantages and disadvantages of the organization appeared.

A distinct advantage that appeared frequently was that there was a more positive attitude towards the customer and that commitments would be made and adhered to. The majority of people felt that this was a great advantage in enhancing Walters Construction Management's credibility and was in conjunction with the B.L. Walters Company policy of insuring the customer's satisfaction. At times this could be a disadvantage. Because of the organization's feeling of responsibility, they could be abused by trying to make the customer happy at all costs. Having to maintain the warranty can sometimes create the feeling of jumping through hoops.

During good construction periods, the desire to control the project in its entirety could be an advantage because you have a varied selection of customers to choose from. A disadvantage to maintaining complete control is that a number of contractors don't want to give up control to Walters Construction Management, so they don't work for them. This is found more often

during good construction periods. This could put a damper on the marketplace for Walters Construction Management, creating a loss of consultants and a loss of a certain part of the market. During slow times in the construction field, this desire for control is not an advantage, but it is not a big disadvantage.

One disadvantage is that it costs more to do business. The continuity of the organization creates a need for more supervisors to be kept on the payroll when times are slow. In other organizations they would release some supervisors, but at Walters Construction Management they are retained.

Having changes dealt with at a lower level in the organization is a valuable advantage. If there is a policy change affecting a project, because of the informal chain of command within Walters Construction Management, it can be dealt with quickly and at the level the change is having the most effect. The most distinctive advantage observed was that there was more teamwork in the organization at Walters Construction Management. The adversary relationship was minimal and it was observed that any adversities between certain departments could be resolved. The goal of Walters Construction Management is known by everybody and the teamwork needed to achieve that goal is there. It is respected that when it comes down to "passing the buck" or if adverse designs or adverse construction occur, it is all kept within the

B.L. Walters Company organization. This enhances the ability for problems to be solved expeditiously and favorably to all parties involved.

In conclusion, based on my interviews and personal observations, it was found that the advantages of the Walters Construction Management organization outweighed the disadvantages. Various members of the organization felt that the teamwork was favorable for a successful project and that having a self-contained organization where any number of problems from accounting to design could be solved quickly and effectively, was mandatory for a successful project.

PART II - LEGAL AND CONTRACTUAL REQUIREMENTS

Walters Construction Management subcontracts a major portion of their work and with this comes the responsibility to insure that they receive their specified requirements.

This section will address the requirements of a Construction Management firm as regards the bidding process, contracts, job progress management, job cost management, planning and scheduling, modifications, and commercial issues. It will then address the practical application of the aforementioned procedures. These procedures will be documented with actual paperwork used on the Bank of Westminster project.

THEORETICAL APPLICATION

At the beginning of a project plans and specifications must be developed and approved for construction. This requires that the engineering departments and the designer be able to formally agree on a specific set of plans that will fulfill the requirements of the owner. In conjunction with the plans, the various departments will specify any restrictions or constraints that must be included in the specifications.

Once the plans and specifications are approved the Construction Management firm will enter the bidding process. A letter of inquiry is sent out to various subcontractors to determine what contractors are interested in bidding on the project. It will describe when the bids are to be invited, the general nature of the project, what kind of bid is required, and when bids are due.¹ Before the Construction Management firm or owner solicits bids from any contractor he will perform extensive background research on these contractors checking their previous projects, their financial stability, and other general information. Once the background research is complete, the owner will send out invitations to bid. The package will contain the plans and specifications, the type of contract that will be used, the bid form, and

the general conditions of the bid invitation. The subcontractor is then required to assemble his bid.

Once the subcontractor assembles his bid, the owner and architect have 30 to 60 days to award the job. At this time the owner and architect will discuss modifications or changes with the two lowest bidders. In these discussions a clear understanding of the agreements must be reached. Once an agreement is reached the Notice of Award is sent to the subcontractor. This authorizes the subcontractor to start ordering long lead time items and to start shop drawings. In the Notice of Award it is stated that a formal contract will be forthcoming.

In the construction contract received by the subcontractor the description of work, the description of terms, a completion statement insuring the subcontractor is going to provide the labor, material and equipment, and any other general provisions deemed necessary by the owner or his representative. This contract will also stipulate how the subcontractor will be compensated for the work, and have a project title and project number. This form requires signatures, the subcontractor's license number, his Workmen's Compensation Insurance Company, and his Personal Liability Insurance Company with policy numbers and expiration dates.

Once the project is underway it must be insured that the subcontractor does what was specified. Utilizing job progress management is one of the many factors

the owner's representative on the project site must be aware of.² In a job progress report the subcontractor will have his job broken into manageable activities and easily understood schedules. A bar chart is easily understood and has activity start and completion dates. This is a widely used tool in understanding a project's progress. The subcontractor, when placing his bid, can set up his progress report based on the time constraints set by the owner. To make this progress report work, meetings must be established on a routine basis so the owner is informed of the subcontractor's schedule. Daily reports filed by the field supervisor will give an account of what the subcontractor accomplished and if he is on schedule. This owner's daily report can be compared with the subcontractor's daily report for any discrepancies. In the daily reports it will show who did what, with how many crew members, and with what equipment and material.

Along with the progress of the job, the project can be managed with the daily, weekly, or monthly costs of the job. The subcontractor and owner have agreed on the subcontractor's costs and monitoring his costs will help insure the owner and subcontractor know what is being spent and for what. The project job cost sheet should break down costs into material, equipment, labor, and any other category the subcontractor or owner deems necessary. This will simplify the subcontractor's requi-

sition for payment. A change that has increased the scope of the contract or a mistake in labor requirements will eventually show up in the cost management forms.

The subcontractor can be awarded the job under several different kinds of construction contracts. The various contracts can be lump sum, cost-plus-fixed-fee or percentage-fee, and guaranteed-maximum-plus-fixed-fee.³ Once the job has been awarded the subcontractor must take steps to contact his material suppliers and contract for the purchase of the material needed.⁴ A requirement by the owner is a list of the material suppliers utilized by the subcontractor and notification immediately if the list changes.

To keep abreast of the construction costs the owner and the subcontractor maintain a day to day record of material costs and labor. The owner's representative on the job can keep track of labor by daily or weekly time cards submitted for approval. Copies of all material requisitions that have been delivered should also be brought through the owner's field supervisor for submittal to the accounting department. Along with the time cards the field supervisor will fill out daily logs of what occurred on the project, what work was accomplished, crew size, equipment used, and any other valuable information. In the mechanical work it is extremely important for the plumbing subcontractor to keep records of the various pipe sizes that are used, valves and

fittings, and the roughing for fixtures as well as the finished fixtures. This will give the subcontractor an idea of the progress of his job by the amount of material in place and also keep check on any pilfering that can occur.⁵

In the beginning of the project the subcontractor should be advised as to the proper format for requisitioning payment. The owner or architect must clearly state what vouchers, payrolls, bills of lading, or other material he should have; the legal requirements that must be met; when the requisition must be ready; who must approve it; and when to expect his money.⁶

Most contracts will stipulate that monthly requisitions be submitted. This helps the accounting department maintain an active account of the cost for the project. It also gives the owner some leverage if he is not pleased with the progress and insures that inspections will be done at timely intervals, on the project by his field supervisor before payment is authorized. When a requisition is submitted a certain percent is retained as a retainage fee. The sole purpose for this retainage is to make sure the owner does not pay the full value until all work is complete.⁷ This will act as an incentive for the subcontractor to complete work that may be in dispute.

During the course of a project change orders occur. There are numerous reasons for change orders and

usually can be no trouble if they are handled expeditiously and properly. Some of the more frequent reasons for change orders are changes due to additional work, changes caused by errors in planning, changes in codes creating extras, and extra compensation because of job conditions.⁸

Changes due to additional work are caused by the owner or architect wanting to change the type of work, upgrade the quality of certain material, or make an addition. Changes due to errors in planning might be errors in dimensions or omitting an essential piece of equipment. The subcontractor is responsible for knowing the codes of his trade and should be aware of any changes in the codes. Change of job conditions can be created by the owner or architect being indecisive, the owner may have financial trouble and slow the job down, or an incompetent subcontractor can not accomplish what he originally agreed on.

Whatever the reason for changes a procedure must be established for processing these changes. Since the changes or modifications will reflect what is happening on the project site, the information must come from the project site itself.⁹ A change order can occur at any point of the total construction operation and should include any specific information concerning the exact area where this change originated and who initiated it.¹⁰ Prompt notice should be given to the Contractor, the

Owner, and the Architect of any proposed changes. This will give all the personnel involved the earliest notice of any impending changes.

The authority to authorize changes or modifications will be with the owner or the architect or their designated representatives. Therefore complete and proper procedures for recording proposed changes or modifications by the field supervisor are extremely important. There must be complete information obtained from the field supervisor covering every step from the initial suggestion of the change, to the estimation of material and labor required for the change, the new agreement between the owner and subcontractor, and the cancellation of the change or the incorporation of the change.¹¹ Because of the various reasons for changes and modifications a high priority should be to have a member of the contracting organization examine the bidding documents from a contractual standpoint and determine where changes may be adviseable.¹²

In conclusion, the object of any contracts administrator is to see that problems are addressed before they reach the construction site. Clear, concise procedures for the contractors to follow when bidding for a project and explicit guidelines on how to address any problems once the project is started should be established. Once the guidelines and rules are established and understood by all parties concerned then a well organized and properly run project can be expected.

PRACTICAL APPLICATION

The practical application of legal and contractual requirements will be discussed utilizing one of the subcontractors for the Bank of Westminster project.

Walters C.M. started their preliminary meetings with the various engineering departments, architects, and project manager for the Bank of Westminster as early as March 1984. In these meetings preliminary designs were examined and reviewed to alleviate any future construction or management problems. The past experiences of the engineers and the project manager could help identify problems in the design that will effect the construction of the project.

When the plans and specifications were finalized Walters C.M. sent out invitations for bids. Having dealt with contractors or subcontractors in the past Walters C.M. has a list of acceptable contractors and will notify them of possible projects. During the preliminary design meetings Walters C.M. had already been in touch with various contractors and subcontractors explaining the project and getting responses from interested contractors. Walters C.M. is a private organization and therefore does not have to pick the lowest bidder or accept the lowest bid. Having sent out a letter of inquiry

Walters C.M. will receive a Bid Form from the various contractors stating they have reviewed the plans, specifications, and addenda prepared by the design firm hired by Walters C.M.. It will give the name of the project, the bid amount, and what they will accomplish. The bid form will state the contractor will formalize the work with the signing of a written contract within ten days of receiving a written "Notice of Award". See Appendix A, Fig. 1.

Before Walters C.M. sends a "Notice of Award" they will review the contractor's bid form to insure he received all of the addenda and review any exceptions or changes the contractor made to what is specified. The contractor and Walters C.M. will insure there is a clear understanding of the agreements before a "Notice of Award" is sent. These agreements can be made over the phone or in person, but proper documentation must be required. See Appendix A, Figure 2 for copies of phone bids that the plumbing subcontractor made deleting certain items, revised prices and what was not included on the original bid.

The "Notice of Award" is then sent to the contractor, referencing the project by title and location, for him to proceed based upon his proposal of the dated bid form. The "Notice of Award" will give the contractor authorization to start shop drawings and to order long lead time items. Within the "Notice of Award"

is a commitment that a formal contract is forthcoming. See Appendix A, Fig. 3.

Walters C.M. requires that once the contractor receives his "Notice of Award", a list of the material suppliers that the contractor will be utilizing is submitted and if any changes to the list occur they will be notified immediately. See Appendix A, Fig. 4.

Within 30 to 60 days Walters C.M. will send out a standard Subcontract Form for the subcontractor to review. Their form is very similar to the American Institute of Architects Document A101. It will contain the date of agreement, who the agreement is made between, the project name, the architect's name, and the provisions of the contract. This form will stipulate the work to be accomplished and will provide standard provisions on the back. Additional provisions may be added and noted for the subcontractor's verification and approval. As discussed in the Theoretical Application a Workmen's Compensation Insurance Policy and a Personal Liability Insurance Policy with policy numbers and expiration dates appears on the bottom of the Standard Subcontract Form. See Appendix A, Fig. 6 and 7.

One of the additional provisions Walters C.M. added was provision 43 which addresses labor disputes on the project. This provision requires that work be continued on the project without delay. It was discussed with the Project Manager on how access to the project

would be handled in case of a picket or dispute. Two entrances to the project would be authorized, one for the picket lines and one for the subcontractors not in dispute.

Up to this point Walters C.M. practices the theoretical applications previously mentioned, but on this project there is a definite lack in formal job progress management. The Field Supervisor monitors what is accomplished on a daily basis, but the lack of an activity listing and a logic diagram creates difficulties in accurately keeping track of the project's progress. The bar chart is one tool that is being used, but the extensive nature of construction and construction management stipulates that more should be done. This bar chart was created by Walters C.M. and does not have any input from the subcontractor. To tell the subcontractor he is behind or ahead of schedule is strictly Walters C.M.'s interpretation.

Another tool monitoring the job progress of the Bank of Westminster is the 'daily logs submitted by the Field Supervisor. See Appendix B. These logs give a day by day account of what occurred on the project and what the subcontractors accomplished. It gives updates of any specific problems with weather, concrete received on the job, and other general problems. The logs will tell what equipment was used, for how long, and why. This not only

helps in monitoring the progress of the job, but is useable documentation for backcharging a subcontractor.

Walters C.M. has the capability to monitor the project progress and utilizes the computer on other projects. On the Bank of Westminster it must be assumed that the smallness of the project plus the release of certain employees created a void.

Walters C.M. has the capabilities of inputting activity listings and having a logic diagram created. They also have the capabilities with this logic diagram to establish resource leveling, scheduling, and cost control. They utilize the PMS-II project management system which is one of the most extensive project management systems for a personal computer. See Appendix C.

In the area of job cost control Walters C.M. again has extensive capabilities in this area. They utilize the Estimax software which can give them 3 levels of cost for any project. Each level will have a breakdown of cost code, description, labor cost, material cost, subcontractors, totals, and dollar per square foot. As the levels get more explicit a breakdown for quantities and units is also used. See Appendix A, Fig. 8. But Walters C.M. doesn't utilize these tools on the Bank of Westminster project.

During the Bank of Westminster project problems of a subcontractor not being able to accomplish part of the work originally contracted for surfaced. This in

turn created a modification to the original agreement. Walters C.M.'s field supervisor was keeping track of the subcontractor's progress and found he was getting behind schedule. The project manager was notified and he in turn got in touch with the subcontractor. The project manager then offered to do a certain part of the work for the subcontractor with Walters C.M. personnel. During the conversation it was agreed what Walters C.M. would do and the maximum amount it would cost the subcontractor. This conversation was referenced by the project manager when he sent a formal letter explaining what Walters C.M. was going to do, how much it would cost the subcontractor, and that a formal Change Order to the contract or a backcharge would be executed. See Appendix A, Fig. 9.

The notification of backcharge was the choice made by Walters C.M. in dealing with this specific subcontractor. In the notification for backcharge is the date, the project name, the subcontractor number which is a key to what subcontractor it is and what kind of work, the cost code, and a description of what exactly Walters C.M. is charging the subcontractor for. See Appendix A, Fig. 10.

After all the work agreed on is done by Walters C.M. a Subcontract Backcharge form is filled out. See Appendix D. The form will have the project name, the subcontract number, the date it was finalized, the cost code, and the notification date. It will describe what

was done by Walters C.M. and the maximum backcharge total agreed on referencing Appendix A, Fig. 9. Attached to the Subcontract Backcharge would be Walters C.M.'s cost distribution summaries, material/equipment invoices, and payroll distribution sheets to substantiate the backcharge. At the bottom is a summary of what money was spent on labor and material. This was then subtracted from the maximum allowable backcharge authorized. As you can see by Appendix D Walters C.M. lost money on this backcharge. An error in the estimate for the maximum cost of this backcharge cost Walters C.M. \$3,089.28.

In conclusion, Walters C.M. utilizes a number of the theoretical approaches to construction management and project control. But in the important areas of progress management and cost management they are not utilizing the tools available within their own organization. Again this could be because of the release of certain people and a lack of manpower to use these tools and also because of the small scope of the Bank of Westminster project as compared to other projects.

NOTES

¹Laurence E. Reiner, Handbook for Construction Management (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1972), p. 33.

²Ibid., p. 73.

³Ibid., p. 40.

⁴Ibid., p. 89.

⁵Ibid., p. 93.

⁶Ibid., p. 94.

⁷Ibid., p. 95.

⁸Ibid., p. 98.

⁹Clarence J. Douglas and Elmer L. Munger, Construction Management (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1969), p. 146.

¹⁰Ibid., p. 148.

¹¹Ibid.

¹²Samuel P. Oppenheimer, Directing Construction for a Profit (New York, N.Y.: McGraw Hill Book Co., 1971), p. 204.

PART III

CONCLUSIONS

The original projected start date for the Bank of Westminster project was to be in April 1984. However the start date was slipped to July, 1984 due to design related and owner induced delays.

The impact of the delay in starting did not cause the anticipated negative effect from the weather. It was originally thought that not having the building enclosed by December, harsh weather conditions would be a detrimental factor. But the weather has cooperated to date and the enclosure of the building should be completed by the end of 1984.

The organizational structure was found to be very effective and maintained a well defined hierarchy. This organizational structure encouraged lateral communication among the various departments within the organization. The close proximity of the various departments was very beneficial to the decision making process. This close proximity also favored a positive and effective team atmosphere. Changes in the plans or specifications or errors in the plans and specifications could be worked out expeditiously. The closeness encouraged a relaxed atmosphere when dealing with peers or superiors and

created effective group meetings for the day to day problem solving.

The field management of the project was very good and was the main reason for the project's progress. The lack of practical construction management practices, (i.e. logic diagrams, schedules, cost management) hindered the management of this project. The ability of the field management to keep the daily logs accurately was a substantial reason for the home office not being misinformed or the project being mis-managed. During a problem with a subcontractor not being able to accomplish the agreed work that he was contracted for, the accuracy of the records kept in the field and forwarded to the home office helped alleviate a more substantial loss of money than was incurred.

Time schedules and deadlines that contractors were held to were established from the barchart created by management. The contractor can not be legally held to these time constraints if he did not participate in their creation. Establishing a logic diagram with the computer capabilities available at the home office would have maintained a tighter schedule and created substantial documentation for contractor backcharges or change orders. On the Bank of Westminster project the computer capabilities available were not utilized to their potential and caused managerial difficulties. These difficulties were only overcome by the abilities of the field

management and project management assigned to the project.

During the evaluation of the pre-cast erection timelapse film it was found that the crew size for the project was efficient and appropriate. The amount of idle time during the pre-cast erection was minimal and the supervision of the crew was adequate. The handling of the precast pieces at times was redundant and could have been more efficient, but the overall process was good.

The brick veneer erection timelapse was also evaluated and the crew size was sufficient. During one established cycle the amount of idle time was so minimal it didn't account for any time on the crew balance analysis figure.

The evaluation of the activity listing, logic diagram, scheduling, and resource availability and utilization was hindered. The inability of management to utilize the computer software capabilities available created a gap in this report's analysis. A more concise and clear understanding of how actual "real world" management coincides with classroom management theory would have been very helpful in the grasp of theoretical techniques for students. The ability to study a project step by step in theory and then to compare it with reality would have helped close the gap between academia and the real world of construction management.

The usefulness of this report to students will help differentiate between the theoretical application taught in the classroom and what happens on an actual job site. The students will understand that a project can be planned and scrutinized theoretically but that intangibles such as human factors in management, changes in project priorities, or changes in personnel can not always be accounted for in theory. The ability for management to be flexible and to keep clear, concise records is very important, but also management must be able to deal with those intangibles in a practical and professional manner. This report shows how the theoretical and practical application of construction management coexisted on the Bank of Westminster project and what the deficiencies were.

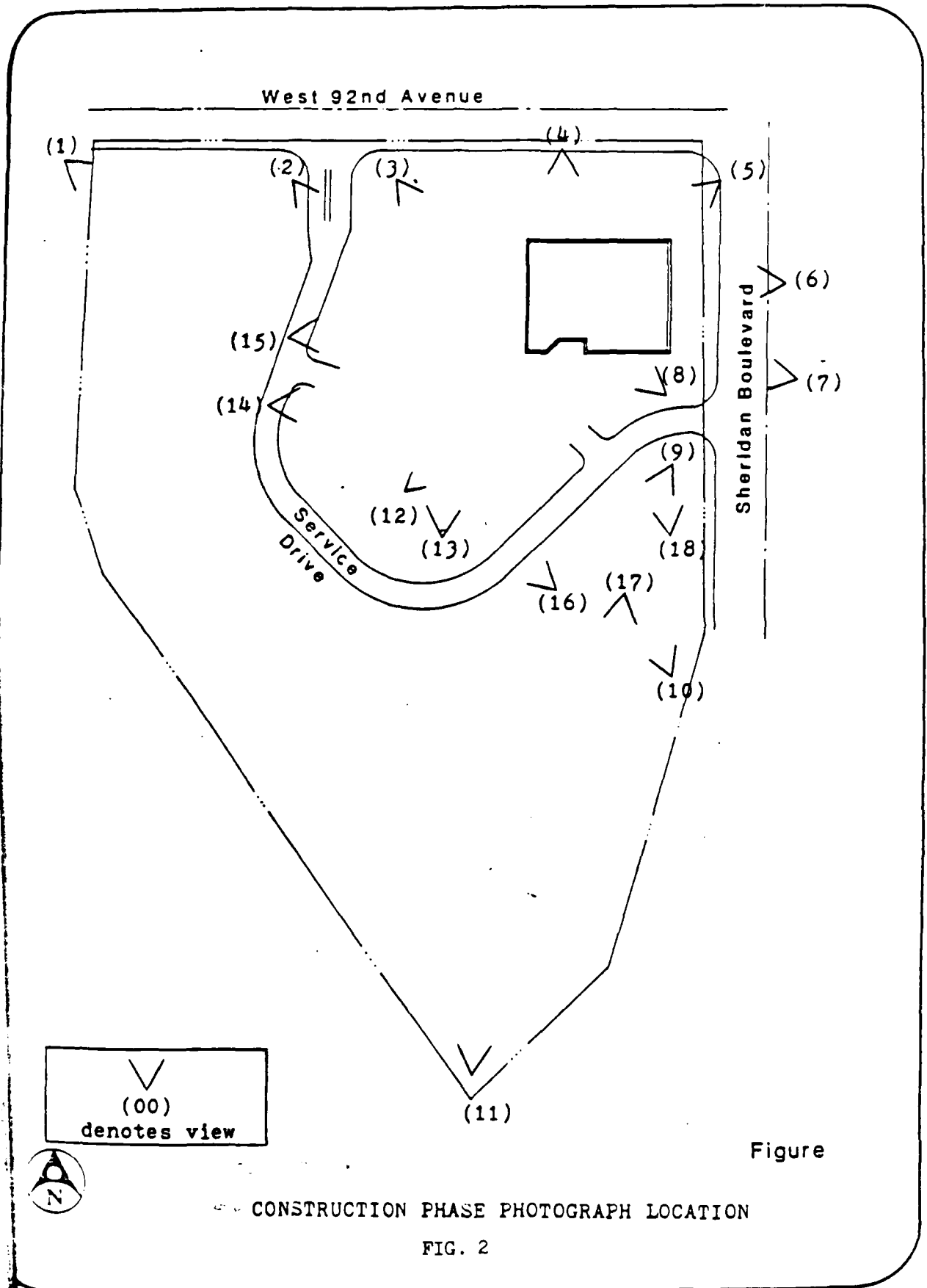
In general the starting date slippage and the loss of some key personnel within the Walters C.M. organization created a severe time factor in the completion of this report. The inability to follow this construction project to its finish reduced the information available for classroom study.

PART IV PHOTOGRAPHS

In conjunction with this project, construction photographs have been taken. The exact location from which they were taken is shown on Figure 2 and description of each view is given.

POSITION	DESCRIPTION
1	View from far North-West property line.
2	View from West side of 92nd Avenue service drive cut out.
3	View from East. Side of 92nd Avenue service drive cut out.
4	View of proposed North elevation.
5	View from far North-West property line (intersection of 92nd Avenue and Sheridan Boulevard).
6	View of proposed East elevation from the far side of Sheridan Boulevard.
7	View from North side of Sheridan Boulevard cut out.
8	View of the proposed South elevation of the Bank.
9	View of existing temporary bank from North side of Sheridan Boulevard cut out.

- 10 View of existing temporary bank from fence line at Sheridan Boulevard.
- 11 View of the site from far Southern Corner.
- 12 View from center of service drive of 5 + 00.
- 13 View of parking log from South edge.
- 14 View from center of service drive at 3 + 00.
- 15 View from center of entry cutout to bank from service drive at 2 + 85.
- 16 View of the proposed South elevation of the bank.



Figure

CONSTRUCTION PHASE PHOTOGRAPH LOCATION

FIG. 2

APPENDIX A
BID DOCUMENTS AND CONTRACT

RECEIVED JUNE 29 1984

BID FORM

TO: Walters Construction Management, Inc.
7951 East Maplewood Avenue, Suite 200
Englewood, Colorado 80111

Date: June 29, 1984

Having examined the plans and specifications (and addenda) prepared by:

Merrick and Company
10855 East Bethany Drive
Denver, Colorado 80222

Road

and having familiarized ourselves with the site and job conditions, the
Undersigned does hereby submit the following bid for [Furnishing and
Installing] ~~[Furnishing Only]~~ ~~[Installing Only]~~ for the following
classifications of work listed in the Invitation to Bid:

Piped Utilities

For Private Road Improvements, Hyland Office Park, Westminster, Colorado.

Our firm price bid is in the amount of:

Twenty Seven Thousand Two Hundred Thirty Eight dollars (\$ 27,238.00)

Upon receipt of "NOTICE OF AWARD" the Undersigned agrees to execute a formal
contract for the work within ten (10) days after receipt of such notice.

The Undersigned acknowledges receipt of Addenda: 1, 2, & 3.

The Undersigned has carefully checked all the above figures and understands
the responsibility for any errors or omissions in making this proposal.

The Undersigned accepts the conditions that any and all bids may be rejected.

The Undersigned further agrees that this proposal shall not be withdrawn for a period of thirty (30) calendar days after the closing time for receipt of bids.

Respectfully submitted:

Plumbing Co.
Name

Pres
By Title

Address

Dated this 29th day of June, 1984.

SEAL (if Bidder is a Corporation)

PHONE BID

PROJECT Bank of Westminster

Rec'd By JLD

COMPANY _____

Date 7-16-84

BY _____

Time _____

PHONE _____

Per Plans and Specs. Yes No

Taxes Included - State Yes No

Including Addenda - No. _____

Local Yes No

Freight Allowed Yes No

Including Alternates Yes No

Installed Yes No

DESCRIPTION	AMOUNT
Wet Taps - No City Tap Fees Included	
Tap Fees 4" Sewer	
12" x 12" Wet Tap @ Intake	
Cost of Night Work - O.T. not included	
Barricades & Flagmen - No	
Asphalt Patching - No	
Structure - Form & Pour <u>or Precast</u>	
Concrete	
Backfill	
Pipe Utilities - Trenching OK	
- Slope OK	
- Kick Blocks OK	
Size of Crew (s) One or Two	

PHONE BID

PROJECT Bank of Weston
 COMPANY Plumbing
 BY _____
 PHONE _____

Rec'd By [Signature]
 Date 7-11-94
 Time _____

Per Plans and Specs. Yes No
 Including Addenda - No. _____
 Including Alternates Yes No

Taxes Included - State Yes No
 Local Yes No
 Freight Allowed Yes No
 Installed Yes No

DESCRIPTION	AMOUNT
Debit ~ 395 1/2" x 15" #12,000 Debit 4" Ch & 1 Munkide	
➔ Revised Price	\$11,702
Schedule on Sun Jewell Pointe Rd	

PHONE BID

PROJECT Bank of Washington
COMPANY Plumbing
BY _____
PHONE _____

Rec'd By Q/K
Date _____
Time _____

Per Plans and Specs. Yes No
Including Addenda - No. _____
Including Alternates Yes No

Taxes Included - State Yes No
Local Yes No
Freight Allowed Yes No
Installed Yes No

DESCRIPTION	AMOUNT
1) Des. Material OK	
2) O.T. for Street Cu- 8 hrs	\$1,300
3)	

July 17, 1984

Mr.
PLUMBING COMPANY

Re: Bank of Westminster
9191 Sheridan Blvd.
WCM Project #3700

Gentlemen:

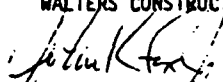
Please let this letter serve as a Letter of Intent and Notice to Proceed based upon your proposal of June 29, 1984 for Road Utilities in the amount of \$97,298 for the above referenced project.

A contract will be mailed to you in the near future for your signature. Please proceed with the ordering of any long lead items, etc. as may be required. Also please proceed with shop drawings as necessary. Please forward Certificates of Insurance to our office when you return your signed contract.

Should you have questions please contact the undersigned.

Very truly yours,

WALTERS CONSTRUCTION MANAGEMENT, INC.


John K. Fox, Jr.
Project Manager

JKF/jpl



WaltersCM

A BIL L. Walters
Company

7961 East Maplewood Avenue, Suite 200, Englewood, Colorado 80111, (303) 770-4300

FIG. 3

A-6



WaltersCM A Bill L. Walters
Company

7851 East Maplewood Avenue, Suite 200, Englewood, Colorado 80111, (303) 770-4300

MATERIAL SUPPLIERS

PROJECT: Bank of Westminster

CODE NO: 3710-2505

SUBCONTRACTOR: Plumbing Company

DATE: 8-28-84

(Per Provision No. 35 of Subcontract)

If not applicable, please indicate: _____

NAME OF MATERIAL SUPPLIER	ADDRESS	PHONE NO.
Waterworks Sales Co.	600 W. 48th Ave Denver 80216	292-6206
Carder Concrete Product	8311 W. Carder Ct. Littleton 80125	794-6303
Mobile Premix Concrete	P.O. Box 5183 TA Denver 80217	534-3165

Immediate notification in writing shall be made to the General Contractor if any of the above suppliers are changed.

May 1 Signature



STANDARD SUBCONTRACT FORM

Project No. 3710 Code No. 2505

THIS AGREEMENT, made and entered into this 28th day of August, 1984, by and between Plumbing Company doing business as same

with principal office at _____ hereinafter called the subcontractor, and Bill L. Walters Construction Management Inc., hereinafter called the contractor

WITNESSETH: That the subcontractor and the contractor in consideration of the mutual covenants herein contained hereby agree as follows:

SECTION 1. The subcontractor agrees to furnish all labor, materials, equipment, scaffolding, services and supplies for all work hereinafter described in accordance with the general conditions, plans and specifications prepared by Herrick & Company hereinafter known as the architect and as described in Section 3 hereof for Private Road Improvements at Hyland Office Park for French Walters Assoc. hereinafter called the owner at 7951 East Maplewood Avenue #300, Englewood, Colorado 80111 in accordance with all conditions of the contract between the owner and the contractor.

SECTION 2. The provisions set forth upon the reverse side hereof, are hereby incorporated into and made a part of this subcontract.
SECTION 3. The subcontractor and the contractor agree that the materials to be furnished and the work to be done by the subcontractor are in accordance with the current contract documents, applicable plans, specifications, divisions and section numbers dated XXXXXXXXXXXXXXXXXXXXXXXXXXXX in Article 16 of the Standard Form of Agreement Between Owner and Contractor dated August 1, 1984 as follows:

1. Provide all necessary labor, materials and equipment required to perform the work which includes but not necessarily limited to the following:
 - a. Approximately 1,005 LF of 12" D.I.P. water main including all valves, bends, tees, thrust blocks, rodding, etc. as noted on the documents, including the relocation/adjustment of two (2) existing fire hydrants and the installation of one (1) new fire hydrant all set properly to finish grade and one (1) 12" check valve. Twelve (12") inch wet tap is included.
 - b. Approximately 1,492 LF of 8" PVC permanent sanitary sewer and approximately 93 LF of 4" PVC temporary sanitary sewer including all bends, wyes, etc., seven (7) precast manholes with poured concrete bases, one (1) 8" sewer tap.
 - c. Approximately 865 LF of 15" RCP storm sewer and approximately 30 LF of 18" storm sewer including four (4) precast manholes with poured bases, three (3) Type R 10 foot inlets, two (2) Type R 5 foot inlets, the removal and re-use of existing materials.
 - d. All excavation and backfill for the above work shall be by subcontractor and shall be performed to the Soils Engineer's requirements.
 - e. All City, State, Federal and RTD taxes are included.
 - f. All work shall be performed as approved by the City of Westminster.
 - g. The cost of all overtime work for making the 12" water tap in Sheridan Blvd. during a weekend night is included, in the amount of \$1,300.00
 - h. The following shall be excluded from the work:
 1. Development fees for sewer or water.
 2. Payment and Performance bonds.

SECTION 4. The subcontractor agrees: To keep himself thoroughly informed as to the progress of the job; To begin work within seven days after notification by the contractor; To prosecute the work continuously and uninterrupted with all possible speed; And, to complete the entire work covered by this subcontract as scheduled and agreed upon by subcontractor and contractor. The subcontractor, however, shall not be held responsible for any delays caused by the neglect, delay or default of the general contractor, the owner or any other subcontractor.

SECTION 5. IN CONSIDERATION WHEREOF, the contractor agrees to pay the subcontractor, for the full and faithful performance of his work, the sum of NINETY EIGHT THOUSAND FIVE HUNDRED NINETY EIGHT AND NO/100 dollars (\$ 98,598.00)

in current funds, subject to additions and deductions for changes as they are agreed upon, provided that no payments are to be made unless the subcontractor's rate of progress, work done and material furnished are satisfactory to the contractor, owner and/or the owner's authorized representative and as herein agreed upon. Payments to be made as follows: 80% monthly on work satisfactorily performed the previous month and the balance 80 days after completion, acceptance and payment by the owner of all work under this contract.

IN WITNESS WHEREOF, the parties hereto have executed this agreement for themselves, their heirs, executors, successors, administrators, and assigns, on the day and year first above written.

ATTEST:

BILL L. WALTERS CONSTRUCTION MANAGEMENT, INC.

Assistant Secretary

[Signature]
John K. Fox, Jr. Title Project Manager

Subcontractor's License No.

State Farm Ins. Co. 7-1-85
W.C. Insurance Co. Pol. No. Expires

PLUMBING COMPANY,
Subcontractor

Continental Ins. Co. 9-1-85
P.L. Insurance Co. Pol. No. Expires

[Signature]
Title

WCM-011 10/82

7 NATIONAL PROVISIONS OF SUBCONTRACT

THE SUBCONTRACTOR AND THE CONTRACTOR AGREE THAT THE FOLLOWING PROVISIONS SHALL BE A PART OF THEIR CONTRACT

1. The phrase "General Contract" (a copy of which is on file at the office of the contractor and is available for inspection at all times) shall be deemed to mean the contract between the contractor and the owner with reference to the work described in Section 1 of this subcontract, together with all the provisions, general conditions, plans, drawings, specifications and estimates which are made a part thereof or referred to therein.
2. The subcontractor agrees to furnish all material and to perform all work required by this subcontract strictly in accordance with the general contract.
3. Insofar as the provisions of the general contract do not conflict with specific provisions herein contained, they and each of them are hereby incorporated into this subcontract as fully as if completely rewritten herein. The subcontractor agrees that he will so perform this agreement as not to violate any term, covenant or condition of said general contract. The relationship of the subcontractor hereunder towards the contractor shall be the same as that of the contractor towards the owner under said general contract and the relationship of the contractor hereunder to the subcontractor shall be the same as that of the owner towards the contractor under said general contract.
4. The subcontractor shall submit to the contractor's office on or before the Twenty Fifth (25th) day of each month, requisition for payment covering the value of the work completed to the satisfaction of the owner during that month. If said requisitions are not delivered by the subcontractor as above noted, payment may be withheld for 30 days additional. This contract is payable at the office of the contractor in Englewood, Colorado. Request for final payment must be accompanied by written acceptance of the architect, if requested. Legal right of action shall be in Jefferson County, Colorado.
5. The subcontractor shall furnish the contractor with such partial releases and waivers of lien and claims from his material men and creditors as the contractor may request from time to time on labor and/or material and/or other claims, and final releases and waivers of lien and release of all claims at the time of final payment on this subcontract.
6. The subcontractor shall furnish, if requested by the contractor, sworn affidavits from time to time, which shall state amounts due or to become due, amounts paid, and any other information clearly to indicate the financial condition of the subcontractor, insofar as it relates to labor and material furnished, and to be furnished under this subcontract, and the contractor may take such steps as he may deem necessary to protect himself against any claims. If at any time the contractor shall determine that the subcontractor's financial condition has become, in his opinion, unsatisfactory the subcontractor shall furnish satisfactory security to the contractor within three days after written notice to his last known address and in default of furnishing said security, the contractor shall have the option to cancel this contract. In case of such cancellation the rights of the contractor shall be the same as if the subcontractor had failed to perform this contract in whole or in part.
7. The terms of payment provided herein shall not make it incumbent on the contractor to make payments in an amount that would not leave a sufficient balance to cover the retained percentage together with an amount sufficient to satisfy all obligations of the subcontractor for labor, materials, etc. furnished or to be furnished by him under this subcontract.
8. The subcontractor agrees that monies received for the performance of this contract shall be held in trust and used first for labor and materials entering into this work, and said monies shall not be diverted to satisfy obligations of the subcontractor on other contracts.
9. The subcontractor agrees to protect the owner and contractor against all costs or claims for transportation, freight and express, on men, materials and equipment to and/or from the job, and for all other incidental expenses in connection with his work, and to prepay the transportation charges on all materials, etc. shipped.
10. The subcontractor agrees to the scale of wages prescribed in the general contract or the scale prescribed by law in case the general contract provides no such scale. If the subcontractor shall for any respect to perform the covenants contained in this paragraph, the contractor shall have the option to cancel this subcontract forthwith. All penalties stated in the general contract shall be applicable hereunder as between the subcontractor and contractor, except as otherwise expressly provided herein. In no event shall the subcontractor pay any wage in excess of that authorized under federal wage or salary regulations.
11. The right is reserved by the contractor to require changes in, deviations from, additions to, and omissions from, the work herein contracted, and the subcontract price shall be adjusted accordingly. Before proceeding with any change, deviation, addition or omission, the subcontractor will first obtain written authorization from the contractor, which authorization will state the amount by which the subcontract will be adjusted, if any. The subcontractor shall have no dealings with the owner or his authorized representatives in regard to changes, extras or omissions in connection with this work, but must deal only with the contractor.
12. Subcontractor agrees to furnish acceptable bond to contractor if so required, and further agrees to carry and pay for workmen's compensation and public liability insurance, with satisfactory limits and in acceptable companies. He shall also carry property damage insurance. The subcontractor shall furnish the contractor with certificates showing names of the carriers, numbers of the policies and expiration dates.
13. The subcontractor agrees to and does hereby accept full and exclusive liability for the payment of any and all contributions or taxes for unemployment insurance and/or old age retirement benefit, pensions or annuities, now or hereafter imposed by the government of the United States, and/or by the government of any state or territory of the United States, which are measured by the wages, salaries or other remunerations paid to persons employed by the subcontractor on any work performed under the terms of this subcontract.
14. The subcontractor shall route all equipment and materials to be used in the execution of this contract as designated by the contractor, providing the transportation costs are not increased by so doing. It is expressly agreed that the carrier so designated shall be the agent of the subcontractor and not the agent of the contractor.
15. This subcontract takes precedence over any and all proposals, correspondence, and oral agreements made prior to the date hereof.
16. This subcontract includes all changes, addenda, etc., to date.
17. The subcontractor shall not sub-let or assign any portion of this subcontract without the written consent of the contractor first had and obtained.
18. Subcontractor shall not assign, or attempt to assign in any manner at any time any funds accrued or to accrue under this contract without written consent of contractor, and no such assignment shall be binding on contractor unless and until accepted in writing by contractor.
19. The subcontractor agrees to prosecute his work, and the several parts thereof at such times and in such order as the contractor considers necessary to keep the same sufficiently in advance of the other parts of the building and to avoid any delay in the completion of the construction as a whole. The subcontractor shall reimburse the contractor for any loss, damage or extra expense paid or incurred by the contractor which is due to subcontractor's failure to deliver any and all materials as required, or to properly perform any and all work in keeping with the progress of the general construction work, or to properly perform any term, covenant or condition contained in this subcontract, or which is due to the breach of any of the provisions of this subcontract, and it is further agreed that if the subcontractor fails or refuses to proceed with his work as directed by the contractor, or fails to perform said work in accordance herewith, in whole or in part, or fails to perform any term, covenant or condition contained in this subcontract, the contractor may upon two (2) days written notice to the subcontractor's last known address, take any steps he deems advisable to secure necessary labor or materials by contract or otherwise, and may take over all of the subcontractor's equipment, materials, etc., and may prosecute the work to completion. In case the contractor deems this procedure necessary for proper conduct of the work, all monies expended therefore shall be deducted from the contract price herein stated, and if such expenditures exceed the amount otherwise due to the subcontractor hereunder the subcontractor agrees to pay to the contractor on demand the full amount of such excess, together with interest thereon at the rate of six per cent per annum, until paid.
20. The subcontractor shall promptly amend and make good any defective materials and/or workmanship to the entire approval and acceptance of the owner and/or architect or their authorized representatives. Should the subcontractor refuse or neglect to proceed at once with the correction of rejected or defective materials and/or workmanship after receiving notice to do so, it is agreed that the contractor shall have the right and power to have the defects remedied or changes made at the expense of the subcontractor. And the subcontractor agrees to pay to the contractor on demand any and all loss and/or expense paid or incurred by the contractor in remedying such defects and/or making such changes, together with interest thereon at the rate of six per cent per annum, until paid.
21. The subcontractor shall effectively secure and protect his materials and work, and shall bear and be liable for all loss and/or damage of any kind in connection therewith at any time prior to the final completion and acceptance thereof, unless said loss or damage is caused by direct negligence of the contractor and subject to the provisions of Section 25 hereof, as they may apply. The subcontractor shall reimburse the contractor on demand for any breakage or other damage to other work or materials occasioned by the subcontractor in the execution of this subcontract.
22. If the subcontractor deems that surface or work to which his work is to be applied or affixed is unsatisfactory or unsuitable, written notification of said condition shall be given to the contractor, otherwise no consideration will be given to claims for extra compensation or non-responsibility in connection therewith.
23. The subcontractor shall provide at his own expense, whatever storage sheds, work shops and offices are necessary for the performance of this subcontract, and shall remove same and thoroughly clean the premises at the completion of the work.
24. The subcontractor shall clean up and remove from the site as directed by the contractor, all rubbish and debris resulting from his work. Also he shall clean up to the satisfaction of the inspectors, all dirt, grease, marks, etc., from walls, ceilings, floors, fixtures, etc., deposited or placed thereon as a result of the execution of this subcontract. If the subcontractor refuses or fails to perform this cleaning as directed by the contractor, the contractor shall have the right and power to proceed with said cleaning, and the subcontractor will on demand repay to the contractor the actual cost of said labor plus percentage of such cost to cover supervision, insurance, overhead, etc. It is also agreed and understood the subcontractor is to do all cutting and patching that comes in connection with his work.
25. It is understood and agreed it has been the practice of the general contractor to carry builders' risk fire insurance in the amount of his estimate or full insurance to insurable value, including substructure, to the extent that such insurance is carried by the general contractor on the general contract, the subcontractor will have an interest in the insurance policy; however, the provisions of this section do not make it mandatory upon the general contractor to carry any insurance whatsoever for the benefit of the subcontractor. Subcontractor agrees he will assume the responsibility to determine whether builders' risk insurance is in force.
- In the event the general contractor should elect to carry builders' risk insurance, and only in such event, the subcontractor agrees to submit immediately, for the purpose of determining values under the insurance coverage, a complete breakdown of this contract price showing materials, labor, expendable tools, supplies or any other thing or article of value, the cost of which is included in the contract price stated in this agreement.
26. The subcontractor shall furnish promptly all samples, tests, drawings, cuts, schedules, etc., required in connection with his work, but approval of same does not relieve him of his responsibility of complying with the requirements of the drawings and specifications. All transportation costs on samples and drawings furnished by the subcontractor shall be paid by him.
27. The subcontractor shall furnish all guarantees, bonds, operating instructions, etc., as required by the specifications.
28. If the subcontractor makes use of the contractor's hoist, mixer or any other equipment, or ice water, gas, electricity, water, etc., an agreed price in writing must be made with contractor's superintendent or better strictly by contractor's charge.
29. If at any time any controversy shall arise between the contractor and the subcontractor with regard to any matter or thing involved in this subcontract, and which the parties hereto do not promptly adjust and determine, or which the owner or his authorized representative cannot decide to the satisfaction of both parties hereto, then the written orders of the contractor shall be followed and said controversy shall be decided by arbitration at the end of the work, and before final settlement is made between the contractor and the subcontractor. The Rules of the American Arbitration Association, then in effect shall govern.
30. The subcontractor shall hold and save the contractor and owner harmless from any liability including attorney's fees, costs and expenses, for or on account of any patented or unpatented invention, article or appliance manufactured or used in the performance of this subcontract, including their use by the owner.

FIG. 5

A-9



31. The subcontractor shall not place on the work any equipment of which he is not sole owner unless he obtains written permission from the contractor.
32. When labor only is furnished by the subcontractor, subcontractor agrees to use Contractor's material without waste and agrees to pay for any material ruined or damaged on account of negligence or carelessness. Unless otherwise stated, when material is furnished by contractor, same shall be delivered to the curb line of the building which shall constitute delivery. Quantities of material used daily shall be reported to contractor's superintendent, and empty sacks banded and placed in contractor's warehouse.
33. The subcontractor agrees to cooperate to the fullest extent with contractor's superintendent in charge and further agrees to remove any workmen immediately that are not satisfactory to contractor or architect.
34. If the project is government or government aid, it is agreed that all requirements with regard to labor priority, maximum hours of labor, scales of wages to all skilled, semi-skilled and unskilled workmen, and the method of payment or any other provision, will be fulfilled. Everything required of the contractor in this connection is applicable to this subcontract. Any and all certificates of compliance required by the government will be furnished on demand.
35. Each subcontractor must submit on a form provided by the contractor, a list of all subcontractor's suppliers of labor and materials whose quotations he has used in the preparation of his bid and whose services he proposes to use in construction of the project.
36. The subcontractor is an independent contractor under the terms of this contract, notwithstanding the fact that the contractor reserves the right to supervise the work and to make suggestions relative to the satisfactory completion thereof.
37. Time is of the essence of this contract.
38. The subcontractor hereby represents to the contractor that he is, and will comply, to the course of this contract with all federal law, state law and applicable county ordinances relating to workmen's compensation insurance, safety and health, wage and hour laws, state sales and use taxes, federal excise and transportation taxes, local building and zoning codes and federal and state withholding taxes, and any fine or penalty assessed against the contractor caused by violation done by the subcontractor shall be paid by the subcontractor.
39. Subcontractor hereby agrees to defend at its own cost and to indemnify and hold harmless the contractor, its agents and employees from any and all liability, damages, losses, claims and expenses, howsoever caused, resulting directly or indirectly from or connected with the performance of this agreement, irrespective of whether such liability, damages, losses, claims and/or expenses were actually or allegedly caused through the negligence of contractor or any of its agents, employees or other subcontractors, excepting only such liability, damages, losses, claims and expenses as shall have been occasioned by the sole negligence of the contractor, its agents and employees.
40. Although drawn by the contractor, this agreement shall, in the event of any disputes over its meaning or application, be interpreted fairly and reasonably and neither more strongly for or against either party.
41. Notwithstanding all other provisions of this subcontract, Subcontractor agrees to submit partial payment requests in such form and copy as Contractor may require, and to deliver same to Contractor's general office by the twenty-fifth (25th) day of the month. Subcontractor agrees that his monthly partial payment request will include only work and materials in place or delivered to the site or stored off-site under conditions satisfactory to the Contractor prior to the last day of the month. Monthly partial payments are due not later than thirty (30) days after due date for partial payment requests and shall be made within five (5) days of receipt of payment from the Owner. When final payment is due, Subcontractor shall submit invoice for final payment, clearly marked "Final Payment".
42. Subcontractor shall be responsible for clean-up of rubbish and debris resulting from his work on a daily basis, all as verbally directed by the general contractor.
43. Subcontractor agrees that, in the event of any picket or other form of labor dispute at the construction site, whether that dispute or picket is in connection with the Contractor, Subcontractor, or any other contractor or subcontractor on this construction site, Subcontractor will continue to perform the work required herein without interruption or delay. In the event Subcontractor fails to continue the performance of the work included herein, without interruption or delay, because of such picket or other form of labor dispute, the rights accorded the Contractor by Provision #19 elsewhere herein shall apply.



ACORD CERTIFICATE OF INSURANCE

7/23/84

PRODUCER
 The Linden Company
 10 Lakeside Lane, #109
 Denver, Colorado 80212

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

RECEIVED
 JUL 26 1984

COMPANIES AFFORDING COVERAGE

- COMPANY LETTER **A** Transportation Insurance Co.
- COMPANY LETTER **B** Ranger Insurance Company
- COMPANY LETTER **C**
- COMPANY LETTER **D**
- COMPANY LETTER **E**

INSURED
 John Plumbing Company

COVERAGES

THIS IS TO CERTIFY THAT POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH POLICIES.

CO-17A	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIABILITY LIMITS IN THOUSANDS		
					EACH OCCURRENCE	AGGREGATE	
A	GENERAL LIABILITY	TBP042093546	9/1/83	9/1/84	BODILY INJURY	\$ 500	\$ 500
	<input checked="" type="checkbox"/> COMPREHENSIVE FORM				PROPERTY DAMAGE	\$ 250	\$ 250
	<input checked="" type="checkbox"/> PREMISES OPERATIONS				BI & PD COMBINED	\$	\$
	<input checked="" type="checkbox"/> UNDERGROUND EXPLOSION & COLLAPSE HAZARD				PERSONAL INJURY	\$	\$ 500
	<input checked="" type="checkbox"/> PRODUCTS/COMPLETED OPERATIONS						
	<input checked="" type="checkbox"/> CONTRACTUAL						
	<input checked="" type="checkbox"/> INDEPENDENT CONTRACTORS						
A	AUTOMOBILE LIABILITY	BUA042093577	9/1/83	9/1/84	BODILY INJURY PER PERSON	\$ 250	
	<input checked="" type="checkbox"/> ANY AUTO				BODILY INJURY PER ACCIDENT	\$ 500	
	<input checked="" type="checkbox"/> ALL OWNED AUTOS (PRIV. PASS.)				PROPERTY DAMAGE	\$ 500	
	<input checked="" type="checkbox"/> ALL OWNED AUTOS (OTHER THAN PRIV. PASS.)				BI & PD COMBINED	\$	
	<input checked="" type="checkbox"/> HIRED AUTOS						
<input checked="" type="checkbox"/> NON-OWNED AUTOS							
<input checked="" type="checkbox"/> GARAGE LIABILITY							
B	EXCESS LIABILITY	To Be Determined	7/1/84	7/1/85	BI & PD COMBINED	\$ 1000	\$ 1000
	<input checked="" type="checkbox"/> UMBRELLA FORM						
	<input type="checkbox"/> OTHER THAN UMBRELLA FORM						
	WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY				STATUTORY	\$	(EACH ACCIDENT)
						\$	(DISEASE-POLICY LIMIT)
						\$	(DISEASE-EACH EMPLOYEE)
	OTHER						

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS

Bank of Westminster

CERTIFICATE HOLDER

Walters C.M.
 7951 East Maplewood Ave., Suite 200
 Englewood, Colorado 80111

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL -30-DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

Reddy Ann Stunkel

ACORD 25 (2/84)

IR/ACORD CORPORATION 1984



CERTIFICATE OF INSURANCE
 issued by the
 STATE COMPENSATION INSURANCE FUND
 95J BROADWAY
 DENVER, COLORADO 80203
 DENVER PHONE: (303) 866-2658



TO WHOM IT MAY CONCERN:

This is to certify that this department has issued a Standard Workmen's Compensation and Employer's Liability Policy as described below covering the liability imposed upon subject employers by the Workmen's Compensation Act of Colorado, said policy being in good standing as of this date.

POLICY NUMBER: 055 -0 AUGUST 23, 1984

POLICY PERIOD: JULY 1, 1984 to JULY 1, 1985

INSURED: PLUMBING CO

DATE OF ORIGINAL ISSUE: AUGUST 9, 1968

QUARTERLY ADJUSTMENT

** FOR ADDITIONAL COPIES, THIS CERTIFICATE MAY BE REPRODUCED. **

All policies are subject to the following provision of the Workmen's Compensation Act with respect to cancellation:

Section 8-54-114. If any employer shall be in arrears for more than twenty days in any payment required to be made by him to the State Compensation Insurance Fund as provided by this Act, he shall by virtue of such arrangement be in default of such payment and any policy issued to him by said Fund shall thereupon be cancelled without notice as of the effective date or renewal date of said policy.

STATE COMPENSATION INSURANCE FUND

Joyce Meyers
 JOYCE MEYERS, ADMINISTRATIVE CLERK

JM

01041P1 FORM #0267 07-19-34

Walters CM
A Bill L. Walters Company
7951 E. Maplewood Av., #200
Englewood, Colorado 80111

BUDGET COST ESTIMATE
CitiCorp Diners Club
Denver, Colorado
By: JRM 9/28/84

Proj # 844-0000
SQ FT 250,000
09/24/84
Level 1 Report

Code	Description	Labor	Material	Subs/oth	Total	\$/SF
.1	ARCHITECTURAL/STRUCTURAL			7692728	7,692,728	30.77
.2	MECHANICAL SYSTEMS			3498150	3,498,150	13.99
.3	ELECTRICAL SYSTEMS			2972900	2,972,900	11.89
.4	SPECIAL SYSTEMS					
.5	SPECIAL EQUIPMENT					
.6	SPECIAL FINISHES					
.7	SITWORK/UTILITIES			1372340	1,372,340	5.49
.8	GENERAL CONDITIONS			805269	805,269	3.22
.9	DESIGN OVERHEAD			1360000	1,360,000	5.44
1.0	PERFORMANCE BOND			78057	78,057	.31
1.1	DESIGN/BUILD FEE			450000	450,000	1.80
Project Total				18229444	18,229,444	72.92

Walters CM
 A Bill L. Walters Company
 7951 E. Maplewood Av., #200
 Englewood, Colorado 80111

BUDGET COST ESTIMATE
 CitiCorp Diners Club
 Denver, Colorado
 By: JRM 9/28/84

Proj # B44-0000
 SQ FT 250,000
 09/24/84
 Level 2 Report

Code	Description	Labor	Material	Subs/oth	Total	\$/SF
.1 ARCHITECTURAL/STRUCTURAL						
.101	Clear at Building			305852	305,852	1.22
.102	Foundation System			342764	342,764	1.37
.103	Structural System			2274730	2,274,730	9.10
.104	Slab-On-Ground			247034	247,034	.99
.105	Roofing System			296367	296,367	1.19
.106	Exterior Walls			1589940	1,589,940	6.36
.107	Vertical Circulation			236500	236,500	.95
.108	Interior Walls			625669	625,669	2.50
.109	Floor Finishes			1160818	1,160,818	4.64
.110	Ceiling Finishes			298240	298,240	1.19
.111	Wall & Column Finishes			185844	185,844	.74
.112	Specialty Items			128970	128,970	.52
TOTAL				7692728	7,692,728	30.77
.2 MECHANICAL SYSTEMS						
.201	Heating, Vent & A.C.			2921050	2,921,050	11.68
.202	Plumbing System			350200	350,200	1.40
.203	Fire Protection System			226900	226,900	.91
.204	Control System					
.205	Special Mechanical					
.206	Temporary Heating					
TOTAL				3498150	3,498,150	13.99
.3 ELECTRICAL SYSTEMS						
.301	Fixtures & Lamps					
.302	Circuits & Devices					
.303	Main Feeders & Secondary					
.304	Switchgear & Transformer					
.305	Special Electrical					
.306	Temporary Electrical					
.307	Electrical Complete			2972900	2,972,900	11.89
TOTAL				2972900	2,972,900	11.89

Walters CM
 A Bill L. Walters Company
 7951 E. Maplewood Av., #200
 Englewood, Colorado 80111

BUDGET COST ESTIMATE
 CitiCorp Diners Club
 Denver, Colorado
 By: JRM 9/28/84

Proj # B44-0000
 SD FT 250,000
 09/24/84
 Level 3 Report

AC	Description	Quan.	UN	Labor	Material	Subs/oth	Total
.101 Clear at Building							
	Clear&Grub @ Bldg.	2000.00	CY			.50	1,000
	Mass Bldg. Excav.	26000.00	CY			2.50	65,000
	Grade Beam Excav.	2100.00	CY			4.00	8,400
	Elev. Pit Excav.	60.00	CY			8.00	480
	Column Cap Excav.		CY				
	Backfill & Compact	11394.00	CY			8.50	96,849
	4Ft. Struct. Fill	15852.00	CY			6.00	95,112
	Soil Investigation						
	Compaction Tests	20.00	EA			150.00	3,000
	Perimeter Drainage	2000.00	LF			16.00	32,000
	Under Floor Drain		LF				
	Clean Walks/Street	1.00	LS			1200.00	1,200
	Cooling Tower Sump	192.00	CY			8.00	1,536
	Reces'd. Chiller Rm	510.00	CY			2.50	1,275
	TOTAL					305852	305,852
.102 Foundation System							
	18" Drilled Piers	16.00	EA			700.00	11,200
	30" Drilled Piers	158.00	EA			1050.00	165,900
	36" Drilled Piers		EA				
	Pilasters @ Wall	58.00	EA			300.00	17,400
	Pier Caps		EA				
	Equip. Curbs	3500.00	Sf			5.00	17,500
	Grade Beams	7200.00	SF			11.50	82,800
	Sumo Pits	1.00	EA			500.00	500
	Cooling Tower Sump	600.00	SF			11.50	6,900
	Elevator Pits	467.00	SF			11.50	5,371
	Waterproofing	20200.00	SF			.60	12,120
	Perim. Insulation	1260.00	SF			.80	1,008
	Winter Protection	1.00	LS			12000.00	12,000
	Cool Tower Fndn.	130.00	SF			11.50	1,495
	Generator Pad	1200.00	SF			3.75	4,500
	Transformer Pad	72.00	SF			3.75	270
	Concrete Testing	1.00	LS			2000.00	2,000
	Pier Inspection	3.00	WK			600.00	1,800
	TOTAL					342764	342,764
.103 Structural System							
	Structural Steel	1000.00	TN			1050.00	1,050,000

- 1 -

FIG. 8

A-15

August 15, 1984

Mr. Plumbing Company

Re: Private Road Improvements
Hyland Office Park

Dear Tom:

This is to confirm our telephone conversations regarding Walters CM personnel performing work on the storm inlets (5 each) and the storm drain RCP.

As per our discussion of August 10, 1984 Walters CM shall construct the 10 ft. and 5 ft. inlets. The manhole rings, ladder rungs and grates will be provided by and installed by Walters CM. Excavation and backfill shall be by . The amount charged to for this work shall be cost of the work plus 7% and shall in no case exceed \$2,016.00 per each.

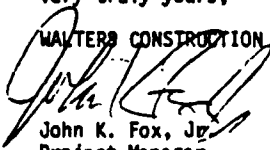
The storm drain line RCP shall be installed with our laborers at an hourly rate of \$11.70, \$12.35, and \$13.33 which includes all payroll taxes, etc. All equipment and material for this portion of the work shall be provided by Plumbing.

Upon Completion of the work, a Change Order to your contract or a Backcharge will be executed to finalize this agreement.

Should you have questions, please contact the undersigned.

Very truly yours,

WALTERS CONSTRUCTION MANAGEMENT, INC.


John K. Fox, Jr.
Project Manager

JKF/jpl

cc: 3700-3710



WaltersCM

A Bill L. Walters
Company

7861 East Maplewood Avenue, Suite 300, Englewood, Colorado 80111, (303) 770-4300

FIG. 9

A-16



WaltersCM

Bill L. Walters
Company

761 East Maplewood Avenue, Suite 200, Englewood, Colorado 80111, (303) 770-4200

NOTIFICATION OF BACKCHARGE

SUBCONTRACTOR: <u>Plumbing Company</u> <hr/> <hr/> <hr/>	Date <u>8-27-84</u> Project <u>Private Road Improvement 9 Hyland Office Park</u> Subcontract Date <u>8-27-84</u> Subcontract # <u>3710-2505</u> Backcharge Cost Code <u>19000</u> Cost Code Description <u>Utilities</u> <hr/>
--	---

Gentlemen:

Under the terms of the above referenced subcontract agreement, Paragraphs 19, 21, & 24, Walters CM is exercising its right and proceeding with the following work:

Per mutual agreement of both parties - Barnekow Construction will provide P & H tracked
backhoe for the purpose of excavating the water and sewer lines for Plumbing.
The cost of \$60 per hour standard rate shall be deducted from the Contract for all
tickets signed by Walters CM and Plumbing.

The above work is being completed on a time & material basis. Upon completion, a formal backcharge to your subcontract will be issued. The backcharge will be supported with documented costs.

Bill L. Walters, Construction Management, Inc.

By [Signature]
John K. Fox, Jr./Project Manager

JKF/jpl

White - Subcontractor • Yellow - Project Manager • Pink - Accounting

WCM-020 (8/22/84)

APPENDIX B

DAILY LOGS



DAILY LOG

PROJECT ~~Hyatt~~ BANK Bank of Westminster DATE 7-23-84

WEATHER CONDITIONS SIGNATURE Boyer 2.0 Mal
 Temperature: High 95 Low _____
 Precipitation: Inches _____ Rain _____ Snow _____
 Condition: Clear X Partly Cloudy _____ Overcast _____

SAFETY
 Accidents: Personal _____ Equipment _____ Public Liability _____ Property Damage _____
 Explain: _____

MATERIALS		SUBCONTRACTORS	
Cost Code	Ticket No.	Company	No Men
		1 SURVEY CROW	- 2
		2 WCM	- 5
		3	
		4	
		5	
		6	
		7	
		8	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS
BACKHOE LOADER RENT	7/23	7/23	POWER RENTAL	REMOVE FENCE

- 1) Removed SPLIT RAIL & STOCKADE FENCE. - fence to corner; Rail to yard
 - 2) Removed 5 SIGNS
 - 3) Removed VALVE Boxes, CHECK VALVES, SPRINKLER HEADS
 - 4) 11:00 Tom O'DONNELL MEETING ON SITE WORK. Schedule 7/30/84
 - 5) SURVEYORS SET STATIONS; CUT & FILL ON PERMANENT ROAD.
 - 6) BLUE STAKES CABLE, PHONE, GAS, ELECTRIC SHOWED UP. Locations OK
 - 7) CALLED REPTERS LANDSCAPE. DIDN'T SHOW UP TODAY.
 - 8) TALKED TO MURPHY EXCAVATION. CONFIRM WEDNESDAY START
 - 9) WCM YARD - USED 2 TRUCKS @ HRS FROM HEATER FOR FENCE removal - Hauled fence to corner.
 - 10) WORKED CROW 8 HRS.
 - 11) Removed 1 flagpole - To yard
 - 12) Removed 4 curb wheel stops - Haul to yard
- JR/BOY PAUL/BOY KEVIN/BOY BRIAN/BOY ED/BOY



416

DAILY LOG

PROJECT WESTMINSTER BANK DATE 7-30-84

WEATHER CONDITIONS SIGNATURE Raymond O'Neal
 Temperature: High 95 Low 62
 Precipitation: Inches — Rain — Snow —
 Condition: Clear X Partly Cloudy X Overcast —

SAFETY
 Accidents: Personal — Equipment — Public Liability — Property Damage —
 Explain: —

MATERIALS		SUBCONTRACTORS	
Cost Code	Ticket No.	Company	No. Men
		1. WCM-2	ODONNELL - 1 - 4MAS
		2. SWEVEY - 2 HALF DAY	1 - LAB
		3. MURPHY - BLADE/OPER	1 - BAKER
		4. 613 /OPER	
		5.	
		6. 966 LOADER/OPER	
		7. SHEEPSFOOT 1/2 DAY	
		8. 980 LOADER 1/4 DAY	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS
—				
—				
—				

- 1) WASSANAAR SHOWED UP FOR COMPACTION TESTS.
- 2) O'DONNELL SHOWED UP. JUST MOVED PIPE IN. REMOVED 30' LF OF EXISTING 18" RCP @ 92 & SHERIDAN BROUGHT OUT LITTLE JD HOE. THEY ARE BRINGING OUT A TRACK HOE.
- 3) TALKED TO AL WASSANAAR ON USING SCORPE IN A CONFINED TRENCH FOR UTILITY WORK. NO PROBLEM AS LONG AS IT DOESN'T DRAIN INTO THE BUILDING.
- 4) FRED MURPHY HAS 8 HRS EXTRA ON 166 BLADE FOR BRINGING IN EXTRA FILL IN ROAD DUE TO SURVEY PROBLEMS ON GRADE.
- 5) EXISTING DETENTION POND ON CORNER NEEDS TO BE MUCKED OUT, USING BARNEKOW BACKHOE. CHEAPER THAN MURPHY. MURPHY WANTED \$105/HOUR; \$210 MOBILIZATION. BARNEKOW \$60/HR.
- 6) AL WASSANAAR APPROVED USING ASPHALT IN FILL @ DETENTION POND.
- 7) STARTED TO DETOUR TRAFFIC ON TEMPORARY ROAD AND TEAR UP BLDG. SITE. ON SCHEDULE FOR CAISSONS ON MONDAY.
- 8) WE HAVE RECEIVED RAIN EVERY NIGHT FOR PAST WEEK. REAL PROBLEM WITH EXISTING DETENTION POND. BUILDING CORNER RIGHT OVER POND.

WCM-015

WHITE - Project Manager CANARY - Superintendent



DAILY LOG

PROJECT WESTMINSTER BANK DATE 8/6/84 MONDAY

WEATHER CONDITIONS SIGNATURE Ray L. O'Neil

Temperature: High 90 Low 60
Precipitation: Inches 1/2" Rain X Snow _____
Condition: Clear _____ Partly Cloudy YES Overcast _____

SAFETY
Accidents: Personal _____ Equipment _____ Public Liability _____ Property Damage _____
Explain: _____

MATERIALS		SUBCONTRACTORS	
Cost Code	Ticket No.	Company	No. Men
		1. MEREDITH - RIG/2 OPER	
		2. WCM - 6	
		3. SURVEY - 2	
		4. DENVER REEL - 3	
		5. O'DONNELL - 1-4 MAN	
		6. 3-LAB	
		7. 1-OPER/HOR	
		8.	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS
NONE				

1) STARTED CAISSONS.	DIAMETER	LOCATION	DRILLING LENGTH	CONCRETE
MEREDITH.	36"	3-B-G	30'	7.51
	36"	5-G	30'	7.51
	36"	8-G	32 1/2'	8.16
	36"	10-G	32 1/2'	8.16
	30"	10-D	31 1/2'	5.09
	30"	10-C	32'	5.18
	TOTAL		188 1/2 LF	41.61 CY

- 2) POURED 44 CY. 5% WASH SAND.
- 3) DENVER REEL 3/4 DONE WITH CAISSON CAGES.
- 4) TALKED TO MURPHY ON GETTING LOADER OUT HERE. PROBLEM. THURSDAY IS BEST. NEAR WEDNESDAY.
- 5) O'DONNELL ON 8" SANITARY UP TO MANHOLE #5.

WCM-015 WHITE - Project Manager CANARY - Superintendent



DAILY LOG

PROJECT WESTMINSTER BANK DATE 8/13/84

WEATHER CONDITIONS SIGNATURE Ray O'Neil
 Temperature: High 95 Low 60
 Precipitation: Inches — Rain — Snow —
 Condition: Clear Yes Partly Cloudy — Overcast —

SAFETY
 Accidents: Personal — Equipment — Public Liability — Property Damage —
 Explain: —

MATERIALS		SUBCONTRACTORS	
Cost Code	Ticket No.	Company	No. Men
		1. WCM-6	Denver Reel - 3
		2. SUEVY - 2	
		3. O'DONNELL - 1-9MAN	
		4. 3-CAB	
		5. 1-OPER/MOR	
		6. MEREDITH - 1-9MAN	
		7. 1-RIG/OPER	
		8. 1-OILER	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

	DIA	LOCATION	DRILL LENGTH	EST. CONCRETE
1) HELD SAFETY MEETING.				
2) MEREDITH ON 5TH DAY OF DRILLING - DIN THE 4-MAN BACK ON JOB.	36"	1-E	27'	7.21
	36"	1-F	27'	7.08
3) O'DONNELL ON 12" WATER, UP TO STATION 42240, DISCUSSED STARTING 15" RCP	24"	PLAZA	17'	2.50
	24"	PLAZA	18'	2.70
STORM ON WEDNESDAY, NO MANPOWER SO WORKING OUT A DEAL WITH OUR LABORS DOING WORK.	24"	PLAZA	17'	2.60
	24"	2-E	16'	1.90
	42"	4-D	30'	13.60
4) TALKED TO SUBURAN ON CONCRETE CONSISTENCY, SLUMP & AIR CHANGE.	36"	3-D	33'	8.70
Need to CLEAN MIXER DRUMS, YIELDS PER TRUCK RUNNING SHORT.	TOTALS →			46.29
5) ORDERED FOR PIPES FOR INLETS FROM CONRESSO, DELIVERY A.M. ON 8/26/84.				



Walters CM

A Bill L. Walters
Company

7861 East Maplewood Avenue, Suite 200, Englewood, Colorado 80111, (303) 770-4300

DAILY LOG

PROJECT Westminster Canal DATE August 28, 1989

WEATHER CONDITIONS

Temperature: High 90 Low 60
Precipitation: Inches — Rain — Snow —
Condition: Clear YES Partly Cloudy — Overcast —

SIGNATURE [Signature]

SAFETY

Accidents: Personal — Equipment — Public Liability — Property Damage —
Explain: —

MATERIALS		SUBCONTRACTORS	
Cost Code	Ticket No.	Company	No. Men
		1. O'DONNELL - 1-9 MAN	
		2. 1-CAB	
		3. 2-HOP/OPER	
		4. WCM - 8	
		5. FORMBUILDERS - 4	
		6. D&D - 8	
		7.	
		8.	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) D&D STARTED CURB & GUTTER, POURED 400 CF
- 2) STARTED BACKFILL ON TIE BEAMS.
- 3) POURED 52 CY ON TIE BEAMS @ TOWER 1 + ELEVATION.
- 4) Reviewed schedule with Murphy. Says no problem but will have to go. HARD TO NAIL MURPHY TO A SCHEDULE. TRY USING SPEED MEMOS.
- 5) O'Donnell tying in check valve & fire hydrant. No problems yet. Should be installed up & topped in by Wednesday.
- 6) Scheduled VAULT STEEL FOR DELIVERY ON 8/29 @ 7:00.
- 7) O'DONNELL IS USING OUR LABEL FOR BACKFILL AROUND THE INLETS.

WCM-015

WHITE - Project Manager CANARY - Superintendent



WaltersCM

A Bill L. Walters
Company

7951 East Maplewood Avenue, Suite 200, Englewood, Colorado 80111, (303) 770-4300

DAILY LOG

PROJECT WESTMINSTER BANK DATE 9/4/84

WEATHER CONDITIONS SIGNATURE Page 2 of 2
Temperature: High 85 Low 50
Precipitation: Inches — Rain — Snow —
Condition: Clear YES Partly Cloudy — Overcast —

SAFETY
Accidents: Personal — Equipment — Public Liability — Property Damage —
Explain: —

MATERIALS	Ticket No.

SUBCONTRACTORS	Company	No. Men
1. WCM	- 8	Denver Reel - 2
2. O'DONNELL	- 1 - 4 MAN	
3.	2 - OPER/HAC	
4.	2 - LAB	
5. DTD	- 4	
6. MURPHY	- 1 - OPER/BLADE	
7.	1 - LORDER / OPER 1/2 DAY	
8.	FORM BUILDERS - 4	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) Started 12" water @ 92nd & Sheridan at 8:30. Half done. just road base we will have Wednesday. found abandoned phone cable & unmarked electric utilities.
- 2) Murphy ditch drawn up with blade & loader on Northminster started work. Worked 8 HRS. Murphy showed up with blade @ 10:00. Loader @ 10:30. Loader broke down @ 12:30. No loader the rest of the day.
- 3) O'Donnell electric materials in load
- 4) Schedule grade beam pour on two half of pillars for Thursday @ 12:00
- 5) Ralph Barr, inspector showed up to recheck wall @ 1 & 2 behind back wall. No answer yet as to procedure. Talking about pillars.
- 6) Backfilled grade beams & tie beams.
- 7)

WCM-015

WHITE - Project Manager CANARY - Superintendent



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Company

7951 East Maplewood Avenue, Suite 200, Englewood, Colorado 80111. (303) 770-4300

942

DAILY LOG

PROJECT WESTMINSTER BANK DATE 9/10/87

WEATHER CONDITIONS SIGNATURE Raymond O'Neil
Temperature: High 85 Low 60
Precipitation: Inches — Rain — Snow —
Condition: Clear YES Partly Cloudy — Overcast —

SAFETY
Accidents: Personal — Equipment — Public Liability — Property Damage —
Explain: —

MATERIALS		SUBCONTRACTORS	
Cost Code	Ticket No.	Company	No. Men
		1. WCM-8	RIVIERA-1
		2. O'DONNELL - 1-MAN	
		3. 1-LAB	
		4. 2-HAUL/OPER	
		5. STRESSCON - 4	
		6. MURPHY - 1-LOADER/OPER	
		7. FORM BUILDERS - 4	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) CORING COMPANY SHOWED UP @ 8:30. JOHN CARLSON ALSO. FINISH DRILLING HOLES @ TIE BEAMS FOR STRESSCON.
- 2) STRESSCON STARTED. TRUCK & CRANE READY @ 8:00.
- 3) MURPHY - 2 TRUCKS TO HAUL EXCESS DET, LOADER.
- 4) SHIFTED TRAFFIC ON PERMANENT ROAD.
- 5) TALKED TO HOA + PWA (COUNCIL). SCHEDULE FOR 9/17. NEED SHOP DWGS APPROVED.
- 6) SCHEDULED FOR BANK VAULT FLOOR POUR ON TUESDAY.
- 7) POSSIBLE LOW CONCRETE BREAKS @ TIE BEAM FOR ELEVATOR & STAIR #1. POSSIBLY BREAK & TEAR OUT. WILL KNOW ON TUESDAY.
- 8) STRESSCON SET 8 PIECES.
- 9) REBAR FOR STRUCTURAL PLAZA SHOWED UP. WCM UNLOADED.
- 10) POURED WALLS FOR TYPE R 10' INLET ON SHERIDAN.
- 11) TALKED TO MURPHY ABOUT SMALL BACKHOE LOADER FOR JOB, SAID ONE WASN'T AVAILABLE.
- 12) MEL HELPED O'DONNELL FINISH MANHOLES.
- 13) DETAIL FOR STARTED @ 3:00 TIEING VAULT STEEL.

WCM-015 WHITE - Project Manager CANARY - Superintendent



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A Bill L Walters Company

7851 East Maplewood Avenue, Suite 200, Englewood, Colorado 80111, (303) 770-4300

9/14

DAILY LOG

PROJECT WESTMINSTER BANK DATE 9-14-84

WEATHER CONDITIONS SIGNATURE Page 20 read

Temperature: High Low
Precipitation: Inches Rain Snow
Condition: Clear Partly Cloudy Yes Overcast Yes

SAFETY
Accidents: Personal Equipment Public Liability Property Damage
Explain:

MATERIALS		SUBCONTRACTORS	
Cost Code	Ticket No.	Company	No. Men
		1. WCM - 8	
		2. Denver Reel - 3 - 2 HRS	
		3. MURPHY - 1 - Loader/oper	
		4. <u> </u>	
		5. <u> </u> 2-TANDEMS	
		6. RIVIERA - 1	
		7. STRESSCON - 4	
		8. FORM BUILDERS - 3	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) DENVER REEL STARTED TIEING VAULT WALL STEEL. POUR VAULT ON 9/18.
- 2) FORM & POUR TOPPING SLAB @ CORNERS ON 1ST FLOOR TO BE ABLE TO START BRICK WORK.
- 3) 8427448 Case Number (Westminster Police). POLICE STOPPED BY AND SAID ARRESTED 2 PEOPLE ON PICKING UP WCM CONES AND BARRICADES.
- 4) ZIG ZAG DID 4 - 4"X10" CORES @ TIE BEAMS. 9:30-12:00 (WASSNAAR WILL PICK THEM UP. WASSNAAR PICKED UP CYLINDERS @ 12:30.
- 5) MEL GRANTING DOWELS & HOLES IN TIE BEAM FOR STRESSCON.
- 6) NORTHWESTERN DOING BACKFILL FOR O'DONNELL ON STORM EAST SIDE.
- 7) CALLED NORTHSTAR, O'DONNELL, RIVIERA, HELM, HEAT & POWER, ON SCHEDULE FOR BLDG TOPPING SLABS START 10/1, ROOF ON BLDG 10-15.
- 8) TALKED TO Dave Reeder on setting alarm in parking lot. Schedule for 9-17.
- 9) SCHEDULED TO POUR LIGHT POLE BASES ON 9-21.
- 10) RIVIERA SET TEMPORARY POWER TO BLDG. 220 3 PHASE.
- 11) WEATHER COLD, LIKE WINTER.
- 12) POUR 2-4'X4'3 PLASTERS @ STRUCTURAL PLAZA.

WCM-015

WHITE - Project Manager

CANARY - Superintendent



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A Bill L. Walters
Company

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HLZ

DAILY LOG

PROJECT WESTMINSTER BANK DATE SEPTEMBER 20, 1989

WEATHER CONDITIONS SIGNATURE Raymond

Temperature: High _____ Low _____
Precipitation: Inches _____ Rain _____ Snow _____
Condition: Clear _____ Partly Cloudy _____ Overcast _____

SAFETY
Accidents: Personal _____ Equipment _____ Public Liability _____ Property Damage _____
Explain: _____

MATERIALS		SUBCONTRACTORS	
Cost Code	Ticket No.	Company	No. Men
_____	_____	1 WCM-8	MURPHY - 1 - Hoer/oper
_____	_____	2 D&D-5	1 - Conner/oper
_____	_____	3 BERICH-2	1 - Dozer/oper
_____	_____	4 STRESSCON-4	
_____	_____	5 HEAT/POWER-2	
_____	_____	6.	
_____	_____	7.	
_____	_____	8.	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) D&D DOING CURB & GUTTER & CROSSPANS FROM STATION 6+00 TO 9+00. AHW HAS A BUST PROBLEM IN THE CURB & GUTTER. HAD A BUST TO BE CUT OUT. D&D STARTED @ 8:00 WORKING BACK TO 6+00.
- 2) BURED DRILLED 7 LIGHT POLE BASES. DRILLED FROM 9:00 TO 10:30. CONCRETE CAME @ 11:00. SCY. ELECTRICIANS SET CONDUIT & BOLT PATTERNS AND AHW SURVEY (GREGG) SITUATED BOLTS SO LIGHTS FACE THE RIGHT WAY.
- 3) MURPHY STILL BEHIND ON MOVING DIRT. BLADE SCHEDULED TO COME IN ON 9-24 MONDAY. BACKFILLED STRUCTURAL PLAZA.
- 4) BERICH MASONRY SETTING UP SCAFFOLD ON 10 LINE. HAVING PROBLEM WITH THEIR DELIVERY ON THEIR MORTAR COLOR. ~~1~~ 1 DAY BEHIND.
- 5) STRESSCON WAS SUPPOSE TO BE TO 2 LINE ON NORTH SIDE TODAY. WON'T BE UNTIL TOMORROW. THEY ARE 1 BAY BEHIND. 2 DAYS.
- 6) DENVER REEL IS TIEING UP VAULT ROOF STEEL. THEN THEY WILL MOVE OVER TO STRUCTURAL PLAZA.
- 7) TALKED TO HELM (BILL MARTIN) ON SCHEDULE. MECH. CURBS IN 10-6 WILL BE MEETING WITH THEM ON 9-24.
- 8) MET WITH AHW SURVEYING ON #898 BACKCHARGE. EVERYTHING WORKED OUT ON HANDLING BACKCHARGES. NO BACKCHARGE.

WHITE - Project Manager CANARY - Superintendent
WCM-015



DAILY LOG

PROJECT WESTMINSTER BANK DATE 10-3-84

WEATHER CONDITIONS SIGNATURE Reginald
 Temperature: High 75 Low 30
 Precipitation: Inches — Rain — Snow —
 Condition: Clear — Partly Cloudy YES Overcast —

SAFETY
 Accidents: Personal — Equipment — Public Liability — Property Damage —
 Explain: —

Cost Code	MATERIALS	Ticket No.	SUBCONTRACTORS	
			Company	No. Men
			1. BETCH-9	MURPHY-1-Loader/oper
			2. WCM-11	1-Blade/oper
			3. O'DONNELL-3	
			4. HEAT/Power-1	D&D-3
			5. STRESSCON-4	HELM-3
			6.	
			7.	
			8.	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) PUT IN SCUPPER FOR ROOF ON 10 LINE. 2 BRICKS HIGH & 2 BRICKS LONG, 9" OFF OF TWIN TEE IN CENTER OF WALL.
- 2) KEVIN, BARRY, MCL WORKING IN PARKING LOT.
- 3) REST OF CREW GETTING 1ST FLOOR READY FOR A POUR.
- 4) 2 PEOPLE FROM CHASE MANHATTAN BANK VISITED THE JOB SITE. SHOWED THEM AROUND COMMENTED HOW CLEAN JOB WOULD BE.
- 5) D&D SHOULD HAVE CURB & GUTTER IN PHASE 1 PARKING DONE.
- 6) HEAT/POWER HAS 4 GUYS SCHEDULED FOR THURSDAY.
- 7) TALKED TO ART WOOD OF SUBURBAN ON CONCRETE DESIGN FOR FLOOR TAPPINGS. WE ARE GOING TO A 5/2 SACK MIX WITH A POZZOLITH ACCELERATOR.
- 8) JOHN WAS OUT THIS MORNING SAYING CHANGES TO BE MADE. NO LONGER WITH WALTERS. DAVE MCCALL PROJECT MANAGER.
- 9) TALKED TO BRANNON ON PAVING. START TODAY & WORK SATURDAY ALSO.
- 10) MAY HAVE TO WORK LATE TO GET READY FOR 1ST FLOOR POUR. NO OVERTIME.
- 11) 3:30 STARTED TO RAIN. CHECK. MAY HAVE TO CANCEL PAVING.

PARKING LOT & 1ST FLOOR POUR.
 WCM-015 WHITE - Project Manager CANARY - Superintendent



WaltersCM

A Bill L. Walters
Company

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DAILY LOG

PROJECT WESTMINSTER BANK DATE OCTOBER 8, 1984

WEATHER CONDITIONS SIGNATURE Boyd O'Hara
Temperature: High 65 Low 35
Precipitation: Inches _____ Rain _____ Snow _____
Condition: Clear _____ Partly Cloudy 70 Overcast _____

SAFETY
Accidents: Personal _____ Equipment _____ Public Liability _____ Property Damage _____
Explain: _____

MATERIALS		SUBCONTRACTORS	
Cost Code	Ticket No.	Company	No Men
_____	_____	1. WCM-11	MURPHY-0
_____	_____	2. O'DONNELL-2	HEAT/POWER-2
_____	_____	3. RIVIERA-2	ANDERSON-2
_____	_____	4. DAD-22	
_____	_____	5. BENCH-10	
_____	_____	6. _____	
_____	_____	7. STRESSCON-4	
_____	_____	8. _____	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) SET UP FOR 1ST FLOOR POUR. PUMPER HERE @ 6:00. READY TO POUR. SUBURBAN HAD PROBLEMS WITH THE BATCH PLANT. CONCRETE DIDN'T SHOW UP UNTIL 8:15. SLUMP WAS BAD & CONCRETE TEMPERATURE WAS 65°. BACKCHARGE SUBURBAN. I TALKED TO MIKE.
- 2) FINISHED PUMPING @ 11:30. POURED 1ST FLOOR & STAIR TOWER & LANDINGS. 132 CY.
- 3) PUSHED BRANNOX BACK UNTIL WEDNESDAY. SUBGRADE STILL TO WET.
- 4) PUBLIC SERVICE SHOWED UP TO HOOK UP PERMANENT POWER THROUGH PARKING LOT.
- 5) PRECAST FINISHED UP - ON THE BUILDING. THEY SHOULD BE COMPLETELY DONE ON WEDNESDAY.
- 6) DAD POURED ALL CURB & ENTRY FOR PHASE 1 PARKING. 8 CY

WHITE - Project Manager CANARY - Superintendent

WCM-015



DAILY LOG

PROJECT Walters CM DATE October 23, 1984

WEATHER CONDITIONS SIGNATURE Doyle J. O'Neil
 Temperature: High 90° Low 25°
 Precipitation: Inches _____ Rain _____ Snow _____
 Condition: Clear _____ Partly Cloudy YES Overcast _____

SAFETY
 Accidents: Personal _____ Equipment _____ Public Liability _____ Property Damage _____
 Explain: _____

MATERIALS		SUBCONTRACTORS	
Cost Code	Ticket No.	Company	No. Men
_____	_____	1. WCM - 4	
_____	_____	2. HELM - 1	
_____	_____	3. RIVIERA - 1	
_____	_____	5. O'DONNELL - 2	
_____	_____	6. BERKH - 4 HALF/DAY	
_____	_____	7. _____	
_____	_____	8. _____	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) Weather wasn't bad. I was nice all day.
- 2) CARPENTERS CONTINUE WEATHER ENCLOSURES
- 3) BERKH WORKED HALF A DAY MOVING SCAFFOLD. THE GROUND IS TO WET YET.
- 4) STILL HAVEN'T DONE ANY SITE WORK.
- 5) KEVIN GRADED THE ROOF PISTS.

WCM-015 WHITE - Project Manager CANARY - Superintendent



DAILY LOG

PROJECT Westminster Board DATE October 29, 1984

WEATHER CONDITIONS SIGNATURE Raymond
 Temperature: High 60 Low 35
 Precipitation: Inches _____ Rain _____ Snow _____
 Condition: Clear PT Partly Cloudy _____ Overcast _____

SAFETY
 Accidents: Personal _____ Equipment _____ Public Liability _____ Property Damage _____
 Explain: _____

MATERIALS		SUBCONTRACTORS	
Cost Code	Ticket No.	Company	No. Men
		1. WCM - 7	D & D - 20
		2. O'DONNELL - 3	Heat/Pump - 1
		3. RIVIERA - 2	BRUNDAGE - 1
		4. HELM - 4	AHW - 2 Half Day
		5. BERICH - 7	MORTSTAR - 2
		6. CBC - 6	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) O'DONNELL TAPPED ROOF DRAINS INTO STAIR ON EAST SIDE OF BLDG.
- 2) Helm finishing duct supports on the roof.
- 3) Riving during rough in on floors.
- 4) Nails up on 3rd floor & 1st floor on rough ins.
- 5) Borich on west side of the building and on the columns on the south side.
- 6) D & D paved all of 2ND Floor, LAST SECTION of 3RD Floor, South canopy drive, Stair tower, 1 landing, Elevator pit floor. Total Pumping @ 7:00, finished @ 1:30. Total 176 CF total for day.
- 7) Kevin was sick today.
- 8) AHW sheetmetal parking lot & the roof.
- 9) CBC finished 2/3 of roof.
- 10) Called maddox on return credit for full 100 lb propane bottles.
- 11) Talked to Dennis Heater on picking up vital items.

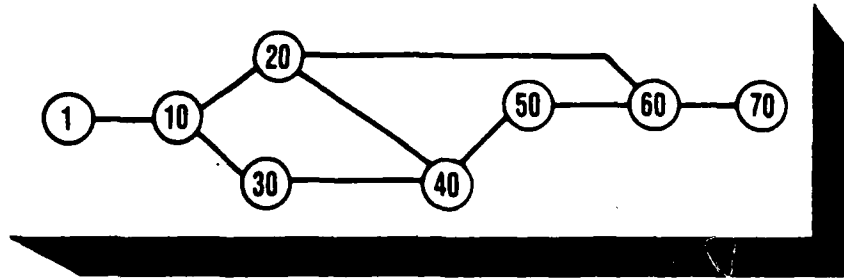
WCM-015 WHITE - Project Manager CANARY - Superintendent

APPENDIX C

PROJECT MANAGEMENT SOFTWARE UTILIZED

PMS-II

THE MOST COMPLETE
PROJECT MANAGEMENT
SYSTEM . . .



NORTH AMERICA MICA, INC.

MICA

11772 Sorrento Valley Rd., Suite 100 • San Diego, CA 92121 • (619) 481-6998/Telex #701257 NAMICA UD

PMS-II — A Mainframe Critical Path Project Management System on a Microcomputer

THE PROBLEM:

What do you do when . . . ?

The president of your company just assigned you the responsibility of managing the development of a new product that requires:

- Market verification
- Design feasibility
- Reliability certification
- Production facility design
- Pilot production run
- Conceptual design
- Prototype development
- Test marketing
- Facility construction

And you are expected to present a plan from beginning to end at the Board of Directors meeting in two weeks. Your plan must identify what resources will be needed and when, how much the project will cost, and when each of the major accomplishments will be ready for review. You are to use the available resources that are controlled by ten different department managers, and this project is to be scheduled around the current workload of the various departments. And, by the way, your bonus and next year's salary are dependent upon how quickly and inexpensively you can accomplish this assignment.

How are you going to approach this seemingly impossible task?

THE SOLUTION:

You need a systematic method for assembling your project into a dynamic network of interrelated activities. This network should be able to handle the complexities of your project, yet be simple to change. It should be able to present you with the current status of each activity in your project, and it should be able to tell you how each is doing against budget.

This systematic method should enable you to prepare the reports that the president wants, and it should allow you to identify what activities will be affected by a slip or a gain in another activity. Your project needs to be under the control of a Project Management System.

Maximum project control on a micro budget! Check these features . . .

PMS-II is a complete critical path network analyzer that will calculate the early start/finish and late start/finish dates, float time, and critical paths for project networks with up to 2700 activities.

You'll find PMS-II as easy to operate as it is profitable to use. The 100+ page user manual comes complete with a tutorial section to guide the first time user through the operation of the system. In just a few minutes you can have PMS-II solving your project problems.

FEATURES:

- U.S. and international date formats supported.
- Schedule based on a 3, 4, 5, 6, or 7 day work week.
- Scheduling around up to 100 holiday or non-work periods of up to 99 days in length.
- Three project management disciplines: 1) actual start/finish, 2) days remaining, and 3) percent complete. Since PMS-II maintains the data required for all three methods, you can switch from one mode to the other on the same project as conditions dictate.
- Optional desired finish date causes PMS-II also to process your project from desired finish to earliest start calculating "True Float" for all activities.
- All mandatory and optional government contract reporting requirements as defined in the Corps of Engineers Project Management specifications ER-1-1-11 and DOD 7000-2, a real plus for those engaged in government contract work!
- Designed by experts in the field of user oriented software, PMS-II is extremely easy to operate. It is a 'menu-driven' system with extensive editing and error checking features. PMS-II's calculation program even checks your network for logic errors and identifies broken activity chains.
- Speed — performing all calculations on a project network of 1000 activities in under 10 minutes. This rapid turn-around time affords you the luxury of playing out various 'what if' scenarios until all dates and durations are fully optimized.
- Easily interfaced to your job cost system or dBASE II (tm) and other programming languages.

SUPPORT:

North America Mica provides each user with one year of free software and manual updates (PMS-II is now in its eighth enhanced release) as well as free phone-in consulting service on any PMS-II related question.

CAPACITY:

PMS-II determines the maximum number of activities per network by looking at the amount of free memory available. With 64K under the CP/M operating system, PMS-II will handle over 1250 activities. Under MP/M in a 48K user partition, PMS-II will allow about 700 activities, and under CP/M-86 or PC/MS DOS up to 2700 activities can be processed in 128K, with a hard disk or XT system.

PMS-II will manage 'n' number of projects or sub-projects depending on disk capacity. Sub-projects can be automatically linked to provide for an unlimited project size.

HARDWARE REQUIREMENTS:

- Any microcomputer system with at least 64K of memory, and
- 80 character by 24 line video display with addressable cursor, and erase to end-of-line, and
- A 132 column printer; character or dot-matrix (10 CPI on 14" paper, 16.7 CPI with 8" paper), and
- 600K of disk storage in 2 drives or a hard disk.

SOFTWARE REQUIREMENTS:

- CP/M (tm) (Ver. 2.2 or later), MP/M (tm), CP/M-86 (tm), MSDOS (tm), or PC DOS (tm) operating systems.

dBASE II IS A TRADEMARK OF ASHTON-TATE. CP/M & MP/M ARE TRADEMARKS OF DIGITAL RESEARCH.

Turn Projects Into Profits . . .

With The Most Complete Set of Project

ACTIVITY-ON-ARC DIAGRAM —

- A graphic presentation of the logic of the activity network.
- Displays node numbers, description, and duration of each activity.
- Optionally prints the early start/finish or late start/finish dates.
- Highlights the Critical Path(s), In-Process, and completed activities.

ACTIVITY-ON-ARC DIAGRAM	ACTIVITY-ON-ARC DIAGRAM	ACTIVITY-ON-ARC DIAGRAM	ACTIVITY-ON-ARC DIAGRAM	ACTIVITY-ON-ARC DIAGRAM
1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50
51	52	53	54	55
56	57	58	59	60
61	62	63	64	65
66	67	68	69	70
71	72	73	74	75
76	77	78	79	80
81	82	83	84	85
86	87	88	89	90
91	92	93	94	95
96	97	98	99	100

ACTIVITY REPORT — keystone of the system's reporting capabilities:

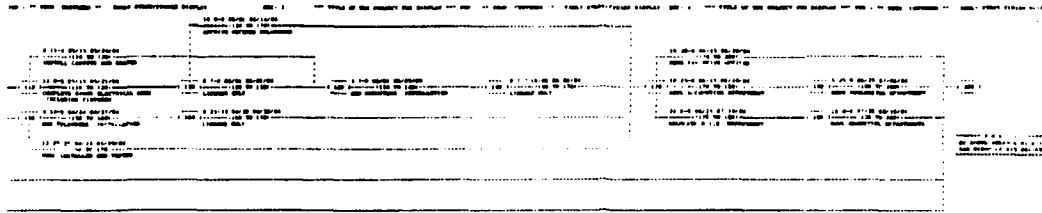
- Allows you to select primary, secondary, and/or tertiary sort from early start, early finish, late start, late finish, responsibility, aux1, aux2, float, job cost fields, or end node.
- You can select a range of values or a single value on any or all of the data fields to extract any subset of activities from your project.
- The report provides page breaks and cost subtotal on the major sort field at your option.
- You can optionally suppress the printing of the budgeted and actual dollar amounts.
- The activity status as of the report date (Can Start, Must Start, Late, Critical, Active, Complete, or Planned) is displayed for each activity.
- All of your planning parameters (i.e., burden rate, workdays per week, etc.), holidays, and sort/select choices are recapped at the end of the report.
- A 'Schedule Only' Report can be displayed on the screen.

ACTIVITY REPORT FOR *** TITLE OF THE PROJECT FOR DISPLAY ***										PAGE 1
NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
ACTIVITY	DESCRIPTION	START	FINISH	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	STATUS
1	20	05	2000	0000	0000	0000	0000	0000	0000	COMPLETED
000-1-1	SELECT BELIEVER FROM OPTION	11/07/83	11/07/83	11/07/83	100	6814	1761	PLA		
000-1-2		11/07/83	11/07/83	11/07/83	324	6825	1813	ACT		
000-1-3		11/07/83	11/07/83	11/07/83	724	700	434	WED		
000-1-4	TOTAL/PAGE FLAT = 0 / 0									
20	30	05	2000	0000	0000	0000	0000	0000	0000	COMPLETED
000-2-1	APPROVE OPTION CONTRACTS	11/08/83	12/16/83	11/08/83	624	6425	5187	PLA		
000-2-2		11/08/83	12/16/83	11/08/83	434	6425	4161	ACT		
000-2-3		11/08/83	12/16/83	11/08/83	0	0	0	WED		
000-2-4	TOTAL/PAGE FLAT = 0 / 0									
30	40	05	2000	0000	0000	0000	0000	0000	0000	COMPLETED
000-3-1	DEAP FLOR PLUM TO BLAKE	12/16/83	12/31/83	12/16/83	120	2350	1003	PLA		
000-3-2		12/16/83	12/31/83	12/16/83	120	2350	1242	ACT		
000-3-3		12/16/83	12/31/83	12/16/83	0	0	0	WED		
000-3-4	TOTAL/PAGE FLAT = 0 / 0									
40	50	05	2000	0000	0000	0000	0000	0000	0000	ACTIVE AND PENDING
000-4-1	FINISH REVIEW OF FLOR PLUM	12/20/83	01/11/84	12/20/83	240	15000	6100	PLA		
000-4-2		12/20/83	01/11/84	12/20/83	0	0	0	ACT		
000-4-3		12/20/83	01/11/84	12/20/83	240	15000	6100	WED		
000-4-4	TOTAL/PAGE FLAT = 0 / 0									
50	60	05	2000	0000	0000	0000	0000	0000	0000	DEEP PENDING AND PENDING
000-5-1	DEBAPT FLOR PLUM	01/15/84	03/15/84	01/15/84	1120	1700	540	PLA		
000-5-2		01/15/84	03/15/84	01/15/84	1120	1700	0	ACT		
000-5-3		01/15/84	03/15/84	01/15/84	1120	1700	990	WED		
000-5-4	TOTAL/PAGE FLAT = 0 / 0									
60	70	05	2000	0000	0000	0000	0000	0000	0000	CRITICAL
000-6-1	FINALISE FLOR PLUM REVIEW	03/20/84	04/02/84	03/20/84	100	3620	1903	PLA		
000-6-2		03/20/84	04/02/84	03/20/84	0	0	0	ACT		
000-6-3		03/20/84	04/02/84	03/20/84	200	3620	1903	WED		
000-6-4	TOTAL/PAGE FLAT = 0 / 0									

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Management Reports Ever Offered



GANTT OR BAR CHART —

- Shows in graphic form the start and stop date, float time, and percent complete status for each activity.
- Shows the critical path(s).
- Gives you the same data sorting and selection options as the Activity Report.
- Allows you to define the symbols you want for Critical Path, Activity Time, Float Time, Late, and Percent Complete.
- Prints a vertical scribe line under the report date which shows you what should be complete and what is still ahead.
- The holidays, non-work periods, and weekends are highlighted.
- You can select either a daily or weekly print format (weekly shown).

02/07/04 SECTION 1 *** TITLE OF THE PROJECT FOR DISPLAY *** WEEKLY SUMMARY
 ** YOUR NAME DISPLAYED HERE **
 EARLY START---EARLY FINISH DISPLAY

DESCRIPTION	EN	EF
SELECT BUILDING FROM OFFICES	1	10
DETERMINE FLOOR REQUIREMENTS	10	20
APPROVE OUTSIDE CONTRACTS	10	60
DRAW FLOOR PLANS TO SCALE	30	30
FIRST REVIEW OF FLOOR PLAN	30	40
REWORK FLOOR PLANS	40	50
FINALISE FLOOR PLAN REVIEW	50	50
REMOVE OLD ROOF TEST FOR LEASE	60	70
PAINT EXTERIOR OF BUILDING	60	60
RESURFACE THE PARKING LOT	60	90
INSTALL SIGN ON OUTSIDE WALL	90	200
LANDSCAPE AND CURB PATIO	90	200
INTERIOR WALL INSTALLATION	100	110
ALL MAJOR ELEC INSTALLATION	100	150
COMPLETE RING ELECTRICAL WORK INCLUDING FIXTURES	110	130
INSTALL CARPETS AND DRAPES	110	130
ARCHIVE RECORDS RELOCATED	120	170
NEW FURNITURE INSTALLATION	130	160
NEW TELEPHONE INSTALLATION	150	160
HWAC INSTALLED AND TESTED	150	170
RELOCATE R.I.S. DEPARTMENT	170	190
MOVE ACCOUNTING DEPARTMENT	170	190
MOVE EXECUTIVE OFFICES	170	200
MOVE MARKETING DEPARTMENT	190	200
MOVE PURCHASING DEPARTMENT	190	200

PRG-11 BY NORTH AMERICA RECA INC. SAN DIEGO CA. 1=COMPLETE **FLOAT **ACTIVITIES **LATE **CRITICAL 0=COMPLETE #=NEEDS 0=HIGHLIGHT

Earned Value Analysis

- For defense contractors working to DOD reg 7000-2.
- Shows value of work budget vs. accomplished vs. actual cost for each activity.
- Calculates earned value based upon percent complete or days remaining.
- An outstanding management tool that is applicable to any project control situation.
- Report generated in three sections:

02/07/84 ACTIVITY EARNED VALUE ANALYSIS PAGE 1

*** TITLE OF THE PROJECT FOR DISPLAY ***
 ** YOUR NAME DISPLAYED HERE **
 EARLY START--EARLY FINISH ON MATERIAL LABOR BURDEN

SN	EM	DESCRIPTION	BCWS	BC	BCWP	ACWP	START	FINISH
1	20	SELECT BUILDING FROM OPTIONS	20,861	100%	20,861	9,662	10/03/83	11/07/83
10	20	DETERMINE FLOOR REQUIREMENTS	15,232	100%	15,232	15,232	11/08/83	12/16/83
10	60	ADVERTISE OUTSIDE CONTRACTS	21,759	100%	21,759	11,240	11/08/83	12/22/83
20	30	DRAW FLOOR PLANS TO SCALE	3,621	100%	3,621	3,621	12/18/83	12/27/83
30	40	FIRST REVIEW OF FLOOR PLAN	23,340	0%	0	0		
40	50	REMARK FLOOR PLANS	16,569	0%	0	0		
60	70	REPAIR OLD ROOF TEST FOR LEAKS	36,349	0%	0	0		
60	80	PAINT EXTERIOR OF BUILDING	17,685	0%	0	0		
60	90	RESURFACE THE PARKING LOT	17,685	38%	5,241	8,785	12/27/83	
00	000	INSTALL SIGN ON OUTSIDE WALL	2,229	0%	0	0		
TOTAL			199,290		56,716	48,540		
LESS PROGRESS BILLINGS TO DATE						0		
					56,716	48,540		

SCHEDULE VARIANCE = -162,576
 COST VARIANCE = 8,176

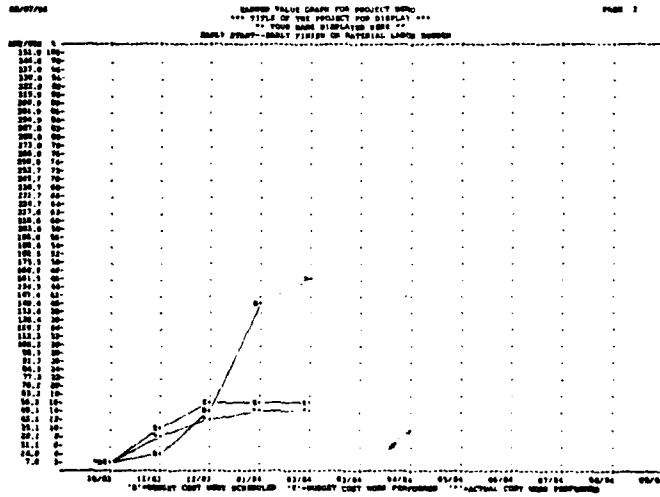
1. Value of work accomplished by activity as a function of budgeted amounts, percent complete, and actual.

02/07/84 EARNED VALUE OF ACTIVITIES BY MONTH PAGE 2

*** TITLE OF THE PROJECT FOR DISPLAY ***
 ** YOUR NAME DISPLAYED HERE **
 EARLY START--EARLY FINISH ON MATERIAL LABOR BURDEN

MONTH	BCWS			BCWP			ACWP		
	AMOUNT	ACUM	BTOTAL	AMOUNT	ACUM	BTOTAL	AMOUNT	ACUM	BTOTAL
10/83	2,061	2,061	8,730	8,749	8,749	2,499	2,782	2,782	2,782
11/83	11,793	14,254	8,066	22,216	20,993	9,021	16,607	24,390	6,95
12/83	38,657	60,911	12,719	31,117	32,082	34,084	16,197	40,777	11,62
01/84	82,290	127,161	33,87	5,778	33,061	15,93	6,133	47,110	13,62
02/84	22,129	199,290	49,38	853	56,716	16,16	1,438	48,540	13,83

2. Budgeted, earned, and actual amount by month for all activities.



3. A graphic presentation of the earned value, the budget, and the actual amounts.

Funding Schedule

- Shows in tabular and graphic form the total costs by month in 4 ways: 1) early finish basis, 2) late finish basis, 3) average of 1 and 2 (per Corps of Engineers specification ER 1-1-11 reporting requirements), and 4) actual cost at actual start/finish.
- For activities that span more than one month, PMS-II can put all the activity's dollars in the ending month or spread them over the duration of the activity.

02/07/84

VALUE/COST OF ACTIVITIES BY MONTH
 *** TITLE OF THE PROJECT FOR DISPLAY ***
 ** YOUR NAME DISPLAYED HERE **
 ALLOCATION METHOD = SPREAD ON MATERIAL LABOR BURDEN

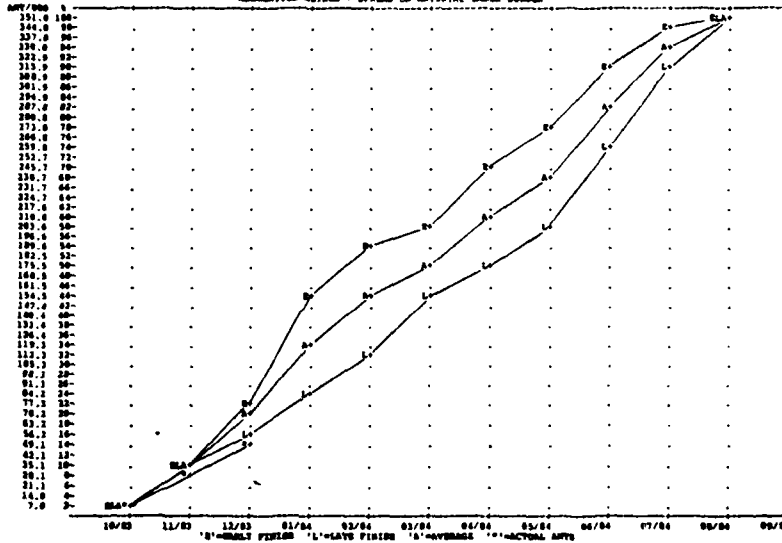
PAGE 1

MONTH	EARLY FINISH			LATE FINISH			AVERAGE			ACTUAL		
	AMOUNT	ACCUM	TOTAL	AMOUNT	ACCUM	TOTAL	AMOUNT	ACCUM	TOTAL	AMOUNT	ACCUM	TOTAL
10/83	8749	8749	2.49	8749	8749	2.49	8749	8749	2.49	7783	7783	2.22
11/83	22216	30965	8.82	22216	30965	8.82	22216	30965	8.82	16607	24390	6.95
12/83	43444	74409	21.20	26732	57697	16.44	35088	66053	18.82	24250	48540	13.83
01/84	76136	150545	42.89	25214	82911	23.62	50674	116727	33.25	0	48540	13.83
02/84	36446	186990	53.27	30367	113278	32.27	33406	150133	42.77	0	48540	13.83
03/84	14666	201657	57.45	38363	151640	43.20	26514	176647	50.32	0	48540	13.83
04/84	39082	240739	68.58	19785	171425	48.84	29433	206080	58.71	0	48540	13.83
05/84	31205	271944	77.47	32275	203700	58.03	31739	237819	67.75	0	48540	13.83
06/84	45391	317335	90.40	54505	258205	71.56	49948	287767	81.98	0	48540	13.83
07/84	25597	342932	97.69	58988	317192	90.36	42292	330059	94.03	0	48540	13.83
08/84	7381	350313	99.77	32603	349796	99.63	19952	350011	99.71	0	48540	13.83

02/07/84

*** TITLE OF THE PROJECT FOR DISPLAY ***
 FUNDING SCHEDULE GRAPH FOR PROJECT DEMO
 ** YOUR NAME DISPLAYED HERE **
 ALLOCATION METHOD = SPREAD ON MATERIAL LABOR BURDEN

PAGE 2



Now, Do You Have the Resources to Accomplish the Schedule . . . ?

RMS-II

A Resource Management System For Use With PMS-II

THE PROBLEM:

Your company has successfully used PMS-II to schedule and control many concurrent projects, but your project managers are experiencing unexpected delays and confusion because more than one of them has planned to utilize the same resource at the same time.

Often, critical activities within your project are discussed in detail with the department managers that will be providing the resource(s) required. They may assure you that your project will be "taken care of" only to find out when it is too late that they don't have enough resources to meet the schedule because the resource plans that were submitted for budget approval were in error! They're very sorry, but your project will now be delayed. All remaining activities will need to be renegotiated with all of the other departments and you can expect more of the unexpected.

THE SOLUTION:

Your company needs to use a systematic method for controlling the allocation of finite resources against the requirements of many competing projects. Your company needs RMS-II, the Resource Management System for PMS-II.

Put An End To Resource Conflicts . . .

RMS-II is a completely integrated resource management system that allows a project manager to define up to 96 separate resource centers — people, departments, machine tools, test centers, etc. — each with a unique capacity in hours, an hourly cost, and a burden rate. These resources can then be allocated to the activities in your PMS-II projects. Reports can be generated showing these allocations on either a project or a resource center basis.

RMS-II is ideal for contractors who have their own crews, for engineering or manufacturing firms using a matrix type of organization, or in any project situation where conflicts over scarce resources can arise. It makes capacity planning and load leveling easy by providing the resource managers with quick visibility of the demands on the resource centers under their control. RMS-II provides:

- Optional selection of either the resource center's burden rate or the burden rate associated with the project (fixed burden contracts).
- Video display of all allocations against a resource center that potentially conflict with the activity that is being allocated.
- Allocations automatically update the activity's budget for labor and burden.
- Allocations are made in hours per day and can be budgeted in either total hours or total dollars.

. . . And Unproductive Excess Resource Capacity

Allocation Report For A Project

RESOURCE ACTIVITY REPORT - *** TITLE OF THE PROJECT FOR DISPLAY *** PAGE 1

** YOUR NAME DISPLAYED HERE **

WBS CODE	WBS	ACT	ACTIVITY	START	FINISH	MATERIAL	LABOR	NUMBER	STATUS		
30	00	10	04	DEPT. - DPT	FIRST REVIEW OF FLOOD PLAN		200	15000	0100 PLS	ACTIVE AND CRITICAL	
				AUT-1-1	EARLY - 12/28/83	01/11/84	0	0	0 ACT		
				AUT-1-2	LATE - 12/28/83	01/11/84	0	0	0 ACT		
				JOBCH- A104	ACTUAL - 12/28/83	01/11/84	200	15000	0100 YAW		
					TOTAL/FREE FLOAT - 0 / 0						
				RCV DESCRIPTION	FROM	TO	EMBAT	BOB	LABOR	BOB	
				OR 1	ELECTRICAL SECUR	12/23/83	01/11/84	30	10	1500	0010
				OR 2	MECHANICAL SECUR	12/23/83	01/11/84	30	10	1500	0010
00	50	47	04	DEPT. - DPT	SECONDARY FLOOD PLANS		1120	17036	0100 PLS	ROBT STARY AND CRITICAL	
				AUT-1-1	EARLY - 01/11/84	01/11/84	0	0	0 ACT		
				AUT-1-2	LATE - 01/11/84	01/11/84	0	0	0 ACT		
				JOBCH- 0195	ACTUAL - 01/11/84	01/11/84	1120	17036	0100 YAW		
					TOTAL/FREE FLOAT - 0 / 0						
00	70	00	06	DEPT. - PE	REPAIR OLD ROOF VENT FOR LEAKS		000	20000	10000 PLS	ROBT STARY	
				AUT-1-1	EARLY - 12/23/83	02/17/84	0	0	0 ACT		
				AUT-1-2	LATE - 02/04/84	04/02/84	0	0	0 ACT		
				JOBCH- A107	ACTUAL - 12/23/83	02/17/84	000	20000	10000 YAW		
					TOTAL/FREE FLOAT - 0 / 0						
				RCV DESCRIPTION	FROM	TO	EMBAT	BOB	LABOR	BOB	
				OR 1	ELECTRICAL SECUR	12/23/83	02/17/84	10	60	10000	5000
				OR 2	MECHANICAL SECUR	12/23/83	02/17/84	20	60	20000	10000
00	00	10	04	DEPT. - PE	PAINT REPAIR OF BUILDING		300	11250	0075 PLS	POSSIBLE	
				AUT-1-1	EARLY - 12/23/83	02/17/84	0	0	0 ACT		
				AUT-1-2	LATE - 01/16/84	04/02/84	0	0	0 ACT		
				JOBCH- A100	ACTUAL - 12/23/83	02/17/84	300	11250	0075 YAW		
					TOTAL/FREE FLOAT - 142 / 0						
				RCV DESCRIPTION	FROM	TO	EMBAT	BOB	LABOR	BOB	
				OR 1	ELECTRICAL SECUR	01/05/84	01/25/84	20	15	7500	0050
				OR 2	MECHANICAL SECUR	01/05/84	01/25/84	10	15	3750	0025
00	00	30	100	DEPT. - PE	REPAIR THE PAINTING JOB		720	10076	5073 PLS	ACTIVE	
				AUT-1-1	EARLY - 12/27/83	01/07/84	0	0	0 ACT		
				AUT-1-2	LATE - 06/07/84	07/17/84	0	0	0 ACT		
				JOBCH- A100	ACTUAL - 12/27/83	07/17/84	720	10076	5073 YAW		
					TOTAL/FREE FLOAT - 112 / 0						
00	200	5	06	DEPT. - PE	INSTALL ROOF ON OPPOSITE WALL		120	1361	740 PLS	POSSIBLE	
				AUT-1-1	EARLY - 01/16/84	01/20/84	0	0	0 ACT		
				AUT-1-2	LATE - 06/06/84	06/10/84	0	0	0 ACT		
				JOBCH- A110	ACTUAL - 12/23/83	01/20/84	120	1361	740 YAW		
					TOTAL/FREE FLOAT - 142 / 0						
				FINAL TOTAL			3570	85221	46263		
							360	9420	2007		
							3160	86601	41270		

*** TITLE OF THE PROJECT FOR DISPLAY ***

CALCULATIONS BASED ON USUAL ACTUAL START/FINISH DATE PROJECT START/END

TOTAL ACTUAL COST =	0705
TOTAL PAYMENTS =	0
OVER / UNDER =	-0705

START/END DATES - 10/01/83 PROJECT REC - ** YOUR PRT'S NAME **

CUSTOMER - ** YOUR CUSTOMER ** LAST PAYMENT DATE -

DATE PER WEEK - 5

POST PARAMETERS - / / 84

SELECTION OF PARAMETERS

2 - EARLY STARY 122203 020704

STARTS	ENDS	DESCRIPTION
10/01/83	1	COLUMBIA DAY
11/20/83	1	FRANKIE WTRC
12/23/83	1	FRANKIE WTRC
01/02/84	1	ROBT STARY DAY
02/20/84	1	ROBT STARY DAY
05/20/84	1	ROBT STARY DAY
07/02/84	1	JULY HOLIDAY

02/07/84 RESOURCE UTILIZATION SUMMARY FOR PROJECT #100704

RCV	DESCRIPTION	EARLY/END	LATE/F	W-ALLO	TOT. W	LABOR	BOB/PS
1	ELECTRICAL SECUR	12/23/83	01/11/84	1	1000	21000	12000
2	MECHANICAL SECUR	12/23/83	01/11/84	1	1700	31700	14875
						46700	26875

ALLOCATION REPORT -

- Shows all allocations to a given activity within a project from any resource center.
- Indicates whether each allocation to an activity is within that activity's current scheduled time period.
- Offers all the Sort and Select features from PMS-II Activity Report.

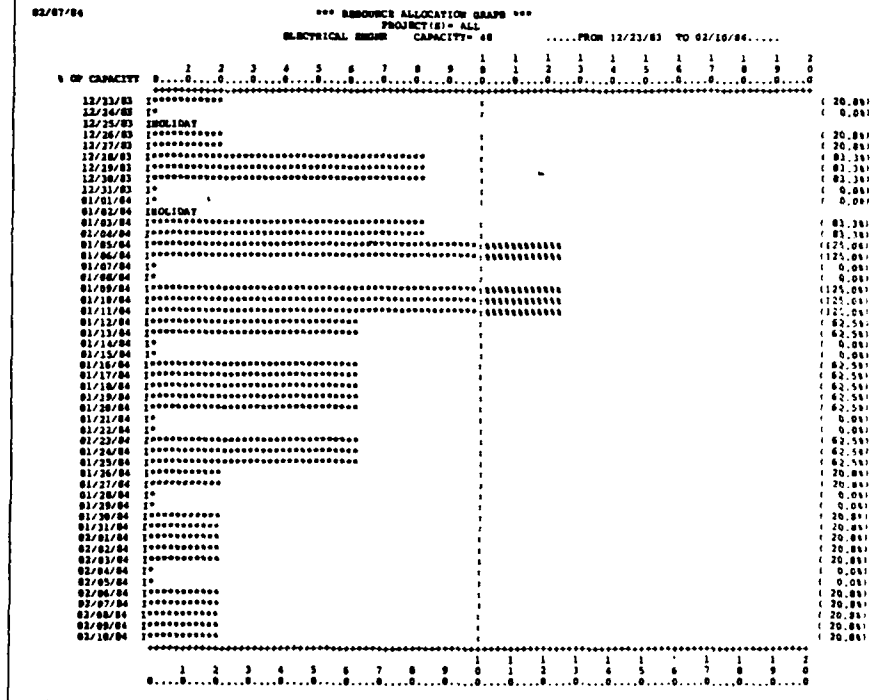


Resource Allocation Report/Graph

02/07/04 1 ELECTRICAL ENGINE CAPACITY= 48 25.00 PER HOUR BOMBER-1054 PAGE 1
.....FROM 12/23/83 TO 02/10/84.....

PROJECT	RES/HR	SHOES	SHOES	SHOES	SCAP	D-DAYS	TOTRES	FROM	TO	LABOR	BURDEN
DEMO	3	60	70	10	21	40	400	12/23/83	02/17/84	10,000	5,400
DEMO	3	30	40	10	43	18	100	12/28/83	01/11/84	7,500	4,050
DEMO	3	60	80	20	42	15	300	01/05/84	01/25/84	7,500	4,050
								1000		25,000	13,500

END OF RESOURCE ALLOCATION REPORT -- PROJECT(S) = ALL



- Shows sum of all allocations of a given resource center as a percent of capacity over time.
- Graph shows allocations by date and highlights allocations in excess of 100% of capacity.
- Date selectable and single project selectable for partial print.



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AO-R164 810

THE BANK OF WESTMINSTER AND HYLAND PARK CONSTRUCTION
CONTRACTS AS ENGINEER. (U) COLORADO UNIV AT BOULDER DEPT
OF CIVIL ENVIRONMENTAL AND ARCH. R J BOSSA 13 DEC 84
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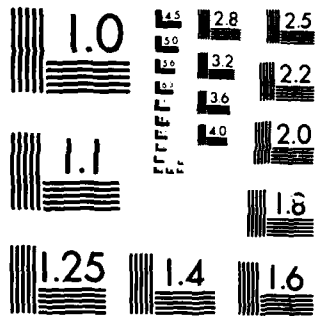
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Consolidated Allocation Report/Graph

02/07/84 *** CONSOLIDATED ALLOCATION REPORT *** PAGE 1
CAPACITY= 60 21.00 PER HOUR BURDEN=105%

.....FROM 12/23/83 TO 02/16/84.....

PROJECT	RES/HR	AMOUNT	DAYS	SRS/DAY	SCAP	H-DAYS	TOTYRS	FROM	TO	LABOR	BURDEN
DEMO	1	60	76	10	31	40	600	12/23/83	02/17/84	10,000	1,400
DEMO	1	20	40	30	62	10	200	12/20/83	01/11/84	7,500	4,050
DEMO	1	60	80	30	62	15	300	01/05/84	01/25/84	7,500	4,050
							1000			25,000	17,500

END OF RESOURCE ALLOCATION REPORT

02/07/84 *** CONSOLIDATED ALLOCATION REPORT *** PAGE 1
CAPACITY= 30 23.00 PER HOUR BURDEN=105%

.....FROM 12/23/83 TO 02/16/84.....

PROJECT	RES/HR	AMOUNT	DAYS	SRS/DAY	SCAP	H-DAYS	TOTYRS	FROM	TO	LABOR	BURDEN
DEMO	1	60	76	30	37	60	600	12/23/83	02/17/84	20,000	10,800
DEMO	1	10	40	30	56	10	100	12/20/83	01/11/84	7,500	4,050
DEMO	1	60	80	10	19	15	150	01/05/84	01/25/84	3,750	2,025
							1250			31,250	16,875

END OF RESOURCE ALLOCATION REPORT

GRAND TOTAL ALL RESOURCES 2250 56,250 30,375
RESOURCE CENTER INCLUDED - 1 2

02/07/84 *** CONSOLIDATED ALLOCATION GRAPH ***
CONSOLIDATED CAPACITY= 102FROM 12/23/83 TO 02/16/84.....

DATE	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20	C21	C22	C23	C24	C25	C26	C27	C28	C29	C30	C31	C32	C33	C34	C35	C36	C37	C38	C39	C40	C41	C42	C43	C44	C45	C46	C47	C48	C49	C50	C51	C52	C53	C54	C55	C56	C57	C58	C59	C60	C61	C62	C63	C64	C65	C66	C67	C68	C69	C70	C71	C72	C73	C74	C75	C76	C77	C78	C79	C80	C81	C82	C83	C84	C85	C86	C87	C88	C89	C90	C91	C92	C93	C94	C95	C96	C97	C98	C99	C100
12/23/83																																		1																																					1																													
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01/31/84																																		1																																					1																													
02/01/84																																		1																																					1																													
02/02/84																																		1																																					1																													
02/03/84																																		1																																					1																													
02/04/84																																		1																																					1																													
02/05/84																																		1																																					1																													
02/06/84																																		1																																					1																													
02/07/84																																		1																																					1																													
02/08/84																																		1																																					1																													
02/09/84																																		1																																					1																													
02/10/84																																		1																																					1																													

- Provides allocation to capacity data over time for any combination of 2 to 96 resource centers.
- Allows resource manager to define individuals as resource centers and still extract summary allocation data for the entire group or department.

And you can manage your project's material commitments as well...

MMS-II

THE PROBLEM:

MEMO

To: PROJECT MANAGER

re: GM TOWER

- Will the materials arrive in time for each activity?
- Can money be saved by bulk purchases across projects?
- The project schedule has changed — what orders need attention?
- What are the details of the large material expenditures for the main steel structure?
- Will material orders allow concrete pouring to be moved back two weeks?
- The vendor is asking for payment — did we receive line 12 of P.O. 142-3434A?
- What materials have been allocated for the major electrical work?
- I'd like to see details of how you are minimizing construction loan cash draw.

Call me tomorrow morning.
From: A.J.T., Vice President

P.S.: "Genius is not 'knowing' the answer to every question. It is knowing 'where to find' the answer." (Albert Einstein)

THE SOLUTION:

MMS-II is a materials management system that gives a project manager control of all major bid items. As many as 1000 purchase orders can be entered into MMS-II's purchase order data base for as many as 500 different vendors. Up to 32,000 line items of material can be allocated to 'n' activities in 'n' PMS-II projects.

MMS-II works hand-in-hand with PMS-II. Entries to MMS-II automatically update material budget and actual values in PMS-II and are shown on the ACTIVITY REPORT, FUNDING SCHEDULE, and EARNED VALUE ANALYSIS. Schedule changes in PMS-II are matched with scheduled delivery dates of material orders, and late or excessively early scheduled deliveries are highlighted.

MMS-II has the same easy-to-use techniques for entering and updating information as PMS-II. Only necessary information is requested, and clear editing and error checking messages help you get your data entered correctly the first time.

02/07/84 ACTIVITY REPORT WITH MATERIAL ALLOCATIONS FOR BEND 1 *** MOVE TO A NEW BUILDING *** PAGE 1

WBS#	LINE	QTY	UNIT	START	FINISH	MATERIAL	LABOR	EQUIP	STATUS
1	10	30	1000	RESP - ENC	SELECT BUILDING FROM OPTIONS				ACTIVE AND CRITICAL
				ADD-1= 1	EARLY - 10/01/83	11/07/83	300	6963	7796 PLN
				ADD-2= 1	LATE - 10/01/83	11/07/83	326	000	1000 ACT
				ADD-3= 1	ACTUAL - 10/01/83	11/07/83	-24	6163	6796 VAB
				JOBCD= A100	TOTAL/FREE PLANT =	0 / 0			

VENDOR	P. O. #	LINE	ITEM	DESCRIPTION	UN	DATE	QTY	COST	DATE	QTY	COST
33	1203	1	E-2001	E SIZE GRAPH PAPER	PC	09/22/83	2	60	09/30/83	2	60
33	1203	2	PS-123	DRAPT PEN SET-FULL	EA	09/22/83	1	30	09/30/83	1	30
33	130-401021	34	PRINTS	BLUE PRINTS AS SPEC	EA	09/22/83	16	24	10/01/83	16	48
100	3712	7	SERVICES	DRAFTING	HR	09/22/83	7	100	10/01/83	7	100
							300			324	

VENDOR	P. O. #	LINE	ITEM	DESCRIPTION	UN	DATE	QTY	COST	DATE	QTY	COST
60	00	30	200	RESP - PL	RESURFACE THE PARKING LOT						
				ADD-1= 1	EARLY - 12/27/83	03/07/84	5200	400	210	PLN	CRITICAL
				ADD-2= 2	LATE - 06/05/84	07/17/84	0	0	0	ACT	
				ADD-3= A100	ACTUAL - 12/27/83		0	0	0	VAB	
				JOBCD= A100	TOTAL/FREE PLANT =	110 / 0					

VENDOR	P. O. #	LINE	ITEM	DESCRIPTION	UN	DATE	QTY	COST	DATE	QTY	COST
33	1204	2	ASPH-001	PREPR/APPLD ASPHALT	YD	01/17/84	30	3600			
33	1204	4	PRINT-10	YELLOW/BLACK MARKING	QL	02/08/84	12	96			
33	1202	10	SERVICES	APPLY ASPHALT SURFC	EA	01/17/84	1	1200			
33	1202	13	SERVICES	PAINT PARKING LINES	EA	02/08/84	1	400			
							5200			0	

ACTIVITY REPORT WITH MATERIAL ALLOCATIONS —

- Provides the details of all material allocations for each activity, showing delivery schedule and status.
- Highlights situations where materials are due to arrive outside of currently scheduled activity time periods.
- Keeps track of thousands of line items of material orders as the project moves from activity to activity, making timely delivery of critical materials practical even with frequent schedule changes.
- Highlights areas where delaying or expediting deliveries could improve project profitability and progress.
- Includes the same sort and select capabilities as PMS-II and RMS-II.

A Materials Management System for use with PMS-II

MATERIAL ORDERS												PAGE 1			
P.O. #	DATE	LINE	PROJECT	QUANTITY	ORDER	ITEM	DESCRIPTION	UN	DATE	QTY	COST	DATE	QTY	COST	STATUS
1303	09/01/83		FLOOR PLANNING MATERIALS												CLOSED
		1		1	10	0-2001	E SIZE GRAPH PAPER	PE	09/23/83	2	60	09/20/83	2	60	CLOSED
		2		1	10	09-123	ORAPT PEN SET-FULL	EA	09/23/83	1	36	09/20/83	1	36	CLOSED
1204	09/23/83		PARKING LOT TO BE SURFACED OFF BY 6 AM												OPEN
		1		60	00	09PH-001	PREP/APPLD ASPHALT	TD	01/17/84	10	3600				OPEN
		4		60	00	PAINT-55	YELLOW/ROAD MARKING	GA	02/09/84	12	36				OPEN
12A-001021	09/01/83		ACTUAL BLUEPRINTS OF SITES 1 THRU 4												CLOSED
		1A		1	10	PRINTS	BLUE PRINTS AS SPEC	EA	09/23/83	16	24	10/01/83	16	48	CLOSED
1302	09/23/83		PARKING LOT RESURFACING												OPEN
		12		60	00	SERVICES APPLY ASPHALT SURFC	EA	01/17/84	1	1200					OPEN
		13		60	00	SERVICES PAINT PARKING LINES	EA	02/09/84	1	600					OPEN
1303	10/01/83		MAJOR ELECTRICAL FOR NEW BUILDING												OPEN
		1A		100	100	CONDUIT-02	C52 CONDUIT	FT	02/26/84	400	900				OPEN
		1B		100	100	CONDUIT-12	C36 FIREHALL CONDUIT	FT	02/26/84	80	120				OPEN
		1C		100	100	PLUG-010	4 PLUG FLOOR RECEPT	EA	02/26/84	30	225				OPEN
		1D		100	100	WIRE-012	120V FLEX POWER CAB	RL	02/26/84	4	600				OPEN
		1E		100	100	PLUG-010	RECEPT MOUNTING BASE	EA	02/26/84	30	75				OPEN
		1F		100	100	FIT-006	4 PLUG FLOOR RECEPT	EA	02/26/84	12	260				OPEN
		1G		100	100	SERVICES	ELECTRICAL INSTALLTN	HR	02/26/84	100	4200				OPEN
															6472

MATERIAL ORDERS DETAIL REPORT —

- Shows the detail of each purchase order in the data base, including quantities received against orders.
- P.O.s can be selectively reported based on a range of P.O. numbers, status of purchase order, order date, and vendor.

MATERIALS RECEIVED - AUDIT AND CONTROL												PAGE 01		
P.O. #	DATE	LINE	VENDOR	ITEM	DESCRIPTION	UN	DATE	QTY	COST	DATE	QTY	COST	PROJECT	PRJ
1303		1	13	0-2001	E SIZE GRAPH PAPER	PE	09/23/83	2	60	09/20/83	2	60		
1302		2	33	09-123	ORAPT PEN SET-FULL	EA	09/23/83	1	36	09/20/83	1	36		
12A-001021		1A	13	PRINTS	BLUE PRINTS AS SPEC	EA	09/23/83	16	24	10/01/83	16	48		
2713		7	13	SERVICES	ORAPPING	HR	09/23/83	1	100	10/01/83	1	100		

MATERIALS RECEIVED — AUDIT AND CONTROL —

- Provides for a continuous audit trail of the quantities and costs of materials received as well as a convenient means of controlling the authorization of material expenditures.

VENDOR MASTER LISTING												PAGE 1		
P.O. #	DATE	LINE	VENDOR	ITEM	DESCRIPTION	UN	ORDERS		COST		RECEIVED		PROJECT	PRJ
							NUMBER	QTY	ACTUAL	PARTIAL	LATE	NUMBER			QTY	COST
22			HALLEY TITLE INSURANCE INC.		242 BRADWAY SUITE 1002		2	04	254	0	0	0	0	
			SAN DIEGO, CA 92101							00	00	00	00	
12A-001			J.C. ASPHALT SUPPLY		10022 PRIARI ROAD		10	020	00400	0	14000	4	120	14000
			SAN DIEGO, CA 90023							00	150	250	150	150
33			ARCHITECTURAL SERVICES & SUPP		10710 LUTHERSON HWY		2	0	200	0	100	0	0	
			LA JOLLA, CA 92037							00	000	00	00	00
74			INDUSTRIAL ELECTRICIANS GROUP		10022 PRIARI ROAD		1	124	12000	0	0	0	0	
			SAN DIEGO, CA 90022							00	00	00	00	00

VENDOR REFERENCE AND ANALYSIS LISTING —

- Acts as a control list of acceptable vendors and as an aid to tracking each vendor's performance.

And when you get tired of running PMS-II yourself . . .

BPS-II

THE PROBLEM:

When you first get your PMS-II, and are running three or four projects, sitting at the computer and generating each of the reports you needed is not much of a chore — in fact, it is actually a lot of fun. But after you have several projects on your system, and the novelty of watching the programs go through their paces has worn off, tending the machine while it generates the many weekly reports you require can become an expensive and tiresome task.

THE SOLUTION:

BPS-II is a batch processing system, which allows you to:

- 1) define the projects you are currently managing,
- 2) calculate and generate activity reports, GANTT charts, and edit listings, and
- 3) select options for these calculations and reports.

Then, with a single command from you, **BPS-II** will calculate and report against any number of projects with as many different options as your current PMS-II system, all from your pre-defined files, completely unattended by you.

If you will find yourself running the same reports against the same projects day after day or week after week, **BPS-II** can result in a considerable savings in time, money, boredom, and aggravation.

BPS-II has been designed to provide you with the greatest flexibility possible by allowing you to set up multiple independent files for:

- 1) projects to be processed,
- 2) reports to be generated, and
- 3) the sort, select, and format options to be used with the reports.

Then, any set of projects can be run against any set of reports using any set of options!

. . . let BPS-II do it for you.

Maximum Project Control on a Micro Budget

Pricing:	Full System	Demo	Upgraded Demo
1) PMS-II	\$1295.00	\$50.00	\$1245.00
2) RMS-II	\$ 995.00	\$50.00	\$ 945.00
3) MMS-II	\$ 995.00	\$50.00	\$ 945.00
4) BPS-II	\$ 495.00		

(California residents please add 6% Sales Tax.)

Discount Policy:
30% educational discount for recognized institutions. Demo system price applied toward full system price.

Payment Terms:
Prepay or C.O.D. Next day air available via UPS Red Label (add \$20.00 per PMS-II system).

Delivery:
All systems shipped within 24 hours ARO, UPS Blue Label (second day air).

Freight:
N/C in U.S.A.

About the Demo Systems

The demo systems come with full user documentation including tutorial and ALL the features of the full system except those which allow you to create or add to a project network. With the DEMO network that is included on your disk, you can explore every feature of PMS-II, RMS-II, or MMS-II, on your own machine, at your leisure. When you decide to purchase a full system, just return your demo disk(s) for an upgrade(s), and you will receive \$50 credit for each upgraded demo.

ORDER FORM

- Please send one PMS-II demonstration system and user manual (\$50.00 — applicable towards the price of the full system)
- Please send one RMS-II demonstration system and user manual (\$50.00 — applicable towards the price of the full system) (requires PMS-II)
- Please send one MMS-II demonstration system and user manual (\$50.00 — applicable towards the price of the full system) (requires PMS-II)
- Please send full PMS-II system (\$1295.00)
- Please send full RMS-II system (\$995.00) (requires PMS-II)
- Please send full MMS-II system (\$995.00) (requires PMS-II)
- Please send full BPS-II system (\$495.00) (requires PMS-II)

Ordered by (print): _____

Title: _____ Date: _____

Company: _____

Address: _____

Phone: () _____ Ext. () _____

Disk Format: CP/M CP/M 86 PC DOS MSDOS

Disk Size: 8" 5 1/4"

Computer: _____ Make _____ Model _____

SHIPPING INSTRUCTIONS/DEALER STAMP

**DEMAND
CONSTRUCTION SERVICES, INC.**

7430 E. Caley Ave. Building 1, Suite 350
ENGLEWOOD, COLORADO 80111
(303) 740-8647

11772 Sorrento Valley Rd., Suite 100
San Diego, California 92121

NORTH AMERICA MICA, INC.

(619) 481-6988
Telex #701257 NAMICA UD

**Keeping you on
The Critical Path . . .**



11772 Sorrento Valley Rd., Suite 100 • San Diego, CA 92121 • (619) 481-6998/Telex #701257 NAMICA UD

APPENDIX D
SUBCONTRACT BACKCHARGE

SUBCONTRACT BACKCHARGE

SUBCONTRACTOR: _____ Date 11-1-84 Project Hyland Office Park
 _____ Company _____ Subcontract # 3710-2505
 _____ Backcharge Cost Code 3710-2510
 _____ Notification Date 8-15-84

Under the terms of the subcontract agreement, referenced above, Walter CM has exercised its right and completed the following work:

Construction of three (3) 10-ft. Type R inlets and two (2) 5-ft. Type R inlets in the Private Road, excluding manhole rings, ladder rungs and grates supplied by Subcontractor, by mutual agreement. Per WCM letter dated 8-15-84, maximum backcharge total of 5 x \$2,016.00 = \$10,080.00 is applicable, as actual costs exceeded that maximum. (WCM Cost Distribution summaries, material/equipment invoices, and Payroll Distribution sheets are attached hereto.)

Per Paragraphs 19, 21, & 24 of the agreement, your next subcontract payment will be credited the following amount for reimbursement of our costs.

<u>Vendor</u>	<u>Invoice No./WCM Labor</u>	<u>Cost</u>
WCM labor (see attached)	8/19, 8/26, 9/2, 9/9, 9/16	\$10,446.69
Misc. vendors (see attached)	Materials & equipment	2,722.59
ACTUAL COSTS SUBTOTAL		\$13,169.28
Minimum Allowed minus Actual Costs = \$10,080.00 - \$13,169.28		(3,089.28)
Subtotal		\$10,080.00
Overhead (<u>0</u> %)		-0-
TOTAL		\$10,080.00

Bill L. Walters Construction Management, Inc.
 By David M. Metcalf
 David M. Metcalf/Project Manager

White - Subcontractor • Yellow - Project Manager • Pink - Accounting

WCM-01 8/28/84

WALTERS CONY. MANAGEMENT -09-

PRICE 2

8/31/64

PROJECT CODE PI TYPE DENOM / CLIENT INV. NO. / INCOME COST BURET GEN. /LEIS
 NO. NO. NO. NO. NAME G/L TRNGS. AMOUNT AMOUNT NO. ACCT. NO.

3710 WYLAND OFFICE PARK

(CONTINUED)

PROJECT NO.	CODE NO.	PI NO.	TYPE NO.	DENOM / CLIENT NAME	INV. NO. / G/L TRNGS.	INCOME AMOUNT	COST AMOUNT	BURET NO.	GEN. /LEIS ACCT. NO.
	2310	01	01	*****	LAB. 001904	0134.68		PR03-0171	300001P
	2310	01	01	*****	CO. 2001904	046.00		PR03-0172	301001P
	2310	01	01	*****	LAB. 002404	01939.99		PR04-0173	300001P
	2310	01	01	*****	CO. 2002404	9501.99		PR04-0174	301001P
	2310	02	02	CONCRECO, INC.	23312	0699.30		PJ05-0239	302001P
	2310	02	02	SUNSHINE REINFC BIZ CO.	STBT	0244.74		PJ05-0352	302001P
	2310	02	02	SUNSHINE REINFC BIZ CO.	STBT	0149.30		PJ05-0354	302001P
TOTAL FOR CODE - 2310 -						63016.66			
	2315	03	03	AND ENGINEERING, INC	1032	0014.00		PJ05-0327	303001P
	2315	03	03	AND ENGINEERING, INC	1064	01210.00		PJ05-0329	303001P
TOTAL FOR CODE - 2315 -						02032.00			
	1900	03	03	BRONKHEN CONST & SUPPLY	STBT	010100.00		PJ05-0331	303001P
	1900	03	03	O'DONNELL PLUMBING CO	STBT	010100.00-		PJ05-0334	303001P
TOTAL FOR CODE - 1900 -									
	20210	06	06	*****	JE 29	022.71-		GL01-0012	303001P
TOTAL FOR CODE - 20210 -						022.71-			
TOTAL FOR PROJECT - 3710 -						012460.90			

CODE EMP NO.	CODE EMPLOYEE NAME	CRAFT DESC.	HOURS		COMPENSATION			BURDEN		
			REGULAR OVERTIME	TOTAL	REGULAR OVERTIME	TAXABLE NON-TAXABLE	TOTAL	COMPANY PROJECT	CRAFT TOTAL	TOTAL LABOR AND BURDEN
1050	23952 COLQUITT KEVIN ROBER	LABORER	6.50		85.40			25.64		
TOTAL FOR CODE	1050		6.50	6.50	85.40		85.40	25.64	25.64	111.12
				6.50			85.40		25.64	111.12
2505	77300 COLLECCHIO, JAMES R	LABORER	32.00		200.00			86.40		
	88400 8800 EDWARD STERNANT	LABORER	16.00		132.00			45.60		
TOTAL FOR CODE	2505		48.00	48.00	440.00		440.00	132.00	132.00	572.00
				48.00			440.00		132.00	572.00
2510	19450 BROWN PHILIP JOHN	CARPENTERS-MEN	8.00		134.60			46.40		
TOTAL FOR CODE	2510		8.00	8.00	134.60		134.60	46.40	46.40	201.00
TOTAL FOR PROJECT	3710		62.50	62.50	600.16		600.16	204.04	204.04	884.20
				62.50			600.16		204.04	884.20

COST CASE EMP NO.	EMPLOYEE NAME	CRAFT DESC.	HOURS		COMPENSATION		BURDEN		TOTAL LABOR AND BURDEN
			REGULAR OVERTIME	TOTAL*	REGULAR OVERTIME	TAXABLE NON-TAXABLE	TOTAL*	COMPANY PROJECT		CRAFT TOTAL*
1000									
23932	COLQUHITT NEVIN BARRY	LABORER	8.00		105.20			31.36	
				8.00		105.20		31.36	136.76
TOTAL FOR CASE 1000			8.00		105.20			31.36	136.76
				8.00		105.20		31.36	136.76
1470									
23968	CORRENO WELCHER B	LABORER	4.00		66.00			19.00	
				4.00	66.00			19.00	85.00
77500	SULLECCHIO, JAMES B	LABORER	2.00		18.00			13.30	
				2.00	27.00			13.30	30.30
09225	YOUNG ROBERT E	LABORER	4.00		41.00			12.30	
				4.00	41.00			12.30	53.30
TOTAL FOR CASE 1470			6.00		59.00			45.60	104.60
				12.00	95.00			45.60	140.60
2220									
23932	COLQUHITT NEVIN BARRY	LABORER	16.00		210.40			63.12	
				16.00	210.40			63.12	273.52
TOTAL FOR CASE 2220			16.00		210.40			63.12	273.52
				16.00	210.40			63.12	273.52
2300									
23968	CORRENO WELCHER B	LABORER	8.00		80.00			25.40	
				8.00	80.00			25.40	105.40
77500	SULLECCHIO, JAMES B	LABORER	30.00		270.00			81.00	
				30.00	270.00			81.00	351.00
08440	WOOD EDWARD STEPHEN	LABORER	4.00		30.00			11.40	
				4.00	30.00			11.40	41.40
09225	YOUNG ROBERT E	LABORER	44.00		431.00			123.30	
				44.00	431.00			123.30	554.30
TOTAL FOR CASE 2300			86.00		847.00			234.10	1,081.10
				86.00	847.00			234.10	1,115.10
2310									
18325	ALEXAN JORDANO	COMPENSATED-NEE	24.00		434.04			130.21	
				24.00	434.04			130.21	564.25
19480	BRINN PHILIP JOHN	COMPENSATED-NEE	32.00		618.72			185.62	
				32.00	618.72			185.62	804.34
23968	CORRENO WELCHER B	LABORER	16.00		176.00			62.70	
				16.00	176.00			62.70	241.70
73040	SEDLITON JOHN S	COMPENSATED-NEE	37.50		670.19			203.46	
				37.50	670.19			203.46	873.65
TOTAL FOR CASE 2310			109.50		1,908.95			581.99	2,490.94
				111.50	1,938.95			581.99	2,520.94



A member of the Conesco Co.
 Mailing Address: PO Box 17287 • Denver, Colo. 80217
 Office and Plant: 130 South Santa Fe Drive • Denver, Colo. 80223
 (303) 777-3983

DATE ORDERED	DATE DELIVERED	INVOICE NO.
08/22/84	08/22/84	023312
CUSTOMER ORDER NUMBER		

INVOICE

SOLD TO: WALTERS CONST NGMT INC
 7931 E MAPLEWOOD AVE
 SUITE 200
 ENGLEWOOD CO 80111

SHIP TO: BANK OF WESTMINSTER
 BANK OF WESTMINSTER
 9191 SHERIDAN BLVD
 WESTMINSTER CO

S.E. NO.	INVOICE DATE	WRITTEN BY	ENTERED BY	CASH	TERMS	ALL CHARGES ARE PAYABLE ON OR BEFORE THE 15TH OF MONTH FOLLOWING PURCHASE UNLESS OTHERWISE SPECIFIED. PAYMENT FOR SHORTAGE ON DAMAGE MUST BE MADE IMMEDIATELY.
31	08/22/84	SMP	SMP	X	NET 30	
SPECIAL INSTRUCTIONS: 8832 BS						

ORDERED	UNIT	ITEM NO / DESCRIPTION	QUANTITY	PRICE	AMOUNT
1	LOT	MS529 CURB INLETS EXTRA TO CONTRACT	1	675.00	675.00

RECEIVED

AUG 21 1984

YOU MAY DEDUCT \$6.75 IF PAID BY 9/10/84

SUB TOTAL	CREDIT ON	WEIGHT	DELIVERY	SALES TAX	MISC	DEPOSIT
675.00	0	0	24.30	0.00	0.00	0.00
						699.30

THANK YOU

PAY THIS AMOUNT

Plant
Brighton
11755 Brighton Rd.
Ct. Order

Plant
Suburban
8400 Fenton
Ct. Order

Plant
Brighton
11755 Brighton Rd.
Ct. Order

Plant
Brighton
11755 Brighton Rd.
Ct. Order

1/4 No. 59
Curb (sq. Yards) 4 1/2
Date 8-20-88

1/4 No. 59
Curb (sq. Yards) 4 1/2
Date 8-20-88

1/4 No. 59
Curb (sq. Yards) 4 1/2
Date 8-20-88

1/4 No. 59
Curb (sq. Yards) 4 1/2
Date 8-20-88

Concrete
3710
3710
3710

Concrete
3710
3710
3710

Concrete
3710
3710
3710

Concrete
3710
3710
3710

AIR ENTRAINMENT
POZZOLITH 322 344 EARLY
CALCIUM CHLORIDE
USE CURB, GUTTER, PAVING, PLATWORK, FLOOR
MAX SLUMP
PUMP MIX

AIR ENTRAINMENT
POZZOLITH 322 344 EARLY
CALCIUM CHLORIDE
USE CURB, GUTTER, PAVING, PLATWORK, FLOOR
MAX SLUMP
PUMP MIX

AIR ENTRAINMENT
POZZOLITH 322 344 EARLY
CALCIUM CHLORIDE
USE CURB, GUTTER, PAVING, PLATWORK, FLOOR
MAX SLUMP
PUMP MIX

AIR ENTRAINMENT
POZZOLITH 322 344 EARLY
CALCIUM CHLORIDE
USE CURB, GUTTER, PAVING, PLATWORK, FLOOR
MAX SLUMP
PUMP MIX

PRICE
AMOUNT

PRICE
AMOUNT

PRICE
AMOUNT

PRICE
AMOUNT

STATE TAX
CITY TAX
RTD TAX
COUNTY TAX
SUB TOTAL
WAITING TIME
TOTAL CHARGE

STATE TAX
CITY TAX
RTD TAX
COUNTY TAX
SUB TOTAL
WAITING TIME
TOTAL CHARGE

STATE TAX
CITY TAX
RTD TAX
COUNTY TAX
SUB TOTAL
WAITING TIME
TOTAL CHARGE

STATE TAX
CITY TAX
RTD TAX
COUNTY TAX
SUB TOTAL
WAITING TIME
TOTAL CHARGE

Left Plant
Planned Job
Finished Unloading
Gals
3
310

Left Plant
Planned Job
Finished Unloading
Gals
3
310

Left Plant
Planned Job
Finished Unloading
Gals
3
310

Left Plant
Planned Job
Finished Unloading
Gals
3
310

Plant
 5400 Fenton
 Suburban Reddi Mix Co.
 Mail 1300 Westmore Ave., Cals. 90003
 Brighton
 11755 Brighton Rd.
 Phone 421-0720

Plant
 5400 Fenton
 Suburban Reddi Mix Co.
 Mail 1300 Westmore Ave., Cals. 90003
 Brighton
 11755 Brighton Rd.
 Phone 421-0720

Order No. 3710-251
 Date 8-24-88
 City Orange

Order No. 3710
 Date 8-24-88
 City Orange

Customer's Name
 J. L. ...
 Address
 92 ...
 City Orange

Customer's Name
 J. L. ...
 Address
 92 ...
 City Orange

QTY	CONCRETE	PRICE	AMOUNT
24	6050 S&B TYPE 2 1/4 IN. EARLY	52.50	1260
	AIR ENTRAINMENT		
	POZZOLITH 322 3/4 EARLY		
	CALCIUM CHLORIDE		
	USE CURB GUTTER PAVING FOOTINGS WALLS		
	FLATWORK FLOOR		
	MAX SLUMP 3 INCH		
	PUMP MIX		
	FOR LOADS ORDERED LESS THAN 4 CU YDS		
	WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$39.00 PER HOUR (85¢ PER MIN) OR ANY PART THEREOF FOR UNLOADING TIME OVER FREE TIME WRITTEN AT LEFT		20
	WATER ADDED TO THE MIX		
	ADDED ON JOB		
	PLANT		
	Arrived Job		
	Finished Unloading		
	Suburban Reddi Mix Co. Assumes No Responsibility for Damages Beyond the Curb or Property Line if You Designate Driver to Do Curb or Property Line You Will be Responsible for Any Damage That May Occur		
	FINANCE CHARGE AT THE RATE OF 2% PER MONTH (APR 24%) WILL BE ON ACCOUNTS NOT PAID WITHIN 30 DAYS FROM DATE OF PURCHASE		
	Customer's Signature		
	6722		

QTY	CONCRETE	PRICE	AMOUNT
24	6050 S&B TYPE 2 1/4 IN. EARLY	52.50	1260
	AIR ENTRAINMENT		
	POZZOLITH 322 3/4 EARLY		
	CALCIUM CHLORIDE		
	USE CURB GUTTER PAVING FOOTINGS WALLS		
	FLATWORK FLOOR		
	MAX SLUMP 3 INCH		
	PUMP MIX		
	FOR LOADS ORDERED LESS THAN 4 CU YDS		
	WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$39.00 PER HOUR (85¢ PER MIN) OR ANY PART THEREOF FOR UNLOADING TIME OVER FREE TIME WRITTEN AT LEFT		20
	WATER ADDED TO THE MIX		
	ADDED ON JOB		
	PLANT		
	Arrived Job		
	Finished Unloading		
	Suburban Reddi Mix Co. Assumes No Responsibility for Damages Beyond the Curb or Property Line if You Designate Driver to Do Curb or Property Line You Will be Responsible for Any Damage That May Occur		
	FINANCE CHARGE AT THE RATE OF 2% PER MONTH (APR 24%) WILL BE ON ACCOUNTS NOT PAID WITHIN 30 DAYS FROM DATE OF PURCHASE		
	Customer's Signature		
	6722		

NOTE: Freshly placed concrete, mortar, concrete, or grout may cause skin injury. Avoid contact with skin where wet and fresh concrete sets. Wash promptly with water. Any concrete material get into eyes, rinse immediately and repeatedly with water and get prompt medical attention. KEEP OUT OF REACH OF CHILDREN.

NOTE: Freshly placed cement, mortar, concrete, or grout may cause skin injury. Avoid contact with skin where wet and fresh concrete sets. Wash promptly with water. Any concrete material get into eyes, rinse immediately and repeatedly with water and get prompt medical attention. KEEP OUT OF REACH OF CHILDREN.

.....

PROJECT NO.	CODE NO.	FE NO.	TYPE NO.	OWNER / CLIENT NAME	EST. NO. / C/L. NUMBER	ENGINE	COST	UNIT	GEN. LEAD
NO.	NO.	NO.	NO.					NO.	OCT. NO.

.....

3710 INLAND OFFICE PARK

CONTINUED

1320	01	.....	LAB. 070004	032.23	FE00-0107	300001P
1330	01	.....	CE. 2072004	00.60	FE00-0108	301001P

TOTAL FOR CODE - 1320 - 0194.60

1470	01	.....	LAB. 070004	0277.30	FE00-0137	300001P
1470	01	.....	CE. 2072004	007.71	FE00-0138	301001P

TOTAL FOR CODE - 1470 - 0385.39

1900	02	S. S. ENGINEERS, INC.	08610	073.00	FE00-0145	300001P
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TOTAL FOR CODE - 1900 - 073.00

2215	01	LAB. 070004	0164.00	FE01-0130	300001P
2215	01	CE. 2072004	040.20	FE01-0136	301001P

TOTAL FOR CODE - 2215 - 0213.20

2220	01	.....	LAB. 070004	0290.20	FE00-0137	300001P
2220	01	.....	CE. 2072004	0119.06	FE00-0140	301001P
2220	01	.....	LAB. 072304	0020.00	FE00-0167	300001P
2220	01	.....	CE. 2072304	004.00	FE00-0168	301001P

TOTAL FOR CODE - 2220 - 0804.66

2300	01	.....	LAB. 070004	0401.23	FE01-0137	300001P
2300	01	.....	CE. 2072004	0120.30	FE01-0130	301001P
2300	01	.....	LAB. 009904	0764.00	FE00-0141	300001P
2300	01	.....	CE. 2072004	0227.34	FE00-0142	301001P
2300	01	.....	LAB. 071604	0300.00	FE00-0173	300001P
2300	01	.....	CE. 2071004	0113.76	FE00-0174	301001P
2300	02	O'BRIEN PLANNING CO	STRT	070000.00	FE01-0001	300001P
2300	02	O'BRIEN PLANNING CO	STRT	004070.00	FE00-0077	300001P

TOTAL FOR CODE - 2300 - 010040.07

2310	01	.....	LAB. 070004	02472.42	FE01-0130	300001P
2310	01	.....	CE. 2072004	0701.73	FE01-0160	301001P
2310	01	.....	LAB. 070004	01600.31	FE00-0143	300001P
2310	01	.....	CE. 2072004	0007.49	FE00-0144	301001P
2310	01	.....	LAB. 071604	01770.30	FE00-0175	300001P
2310	01	.....	CE. 2071004	0021.17	FE00-0176	301001P
2310	02	.....	JE 000	0779.13	01.01-0015	300001P
2310	02	CEB SUPPLY	30101	007.36	FE00-0040	300001P
2310	02	CEB SUPPLY	30100	007.04	FE00-0000	300001P

.....
 PROJECT CODE PT TYPE NUMBER / CLIENT JOB NO. / INCOME COST SHEET GEN. / LINES
 NO. NO. NO. NO. NAME G/L NUMBER AMOUNT AMOUNT NO. ACCT. NO.

2710 INLAND OFFICE PARK CONTINUED

2310	02	SUNSHINE HEINE ELEC. CO.	STRT	0130.00	P300-0121	302001P
2310	02	SUNSHINE HEINE ELEC. CO.	STRT	0112.96	P300-0123	302001P
2310	02	SUNSHINE HEINE ELEC. CO.	STRT	0217.86	P300-0133	302001P
2310	02	SUNSHINE HEINE ELEC. CO.	STRT	0174.77	P300-0135	302001P
2310	02	SUNSHINE HEINE ELEC. CO.	STRT	0136.83	P300-0140	302001P
2310	02	TONL & BRIDGE SUPPLY INC.	7436	043.01	P304-0144	302001P
2310	04	CCS SUPPLY	30990	010.34	P304-0046	304001P
2310	04	CCS SUPPLY	30980	012.96	P304-0047	304001P

CANNOT LOCATE COPY OF STATEMENT

TOTAL PER CODE - 2310 - 0916.74 → \$9,124.44

2310	02	AND ENGINEERING, INC.	1092	0047.00	P300-0247	303001P
2310	02	AND ENGINEERING, INC.	1092	0204.00	P300-0248	303001P

TOTAL PER CODE - 2310 - 0091.00

2600	02	BRADMAN SAND & GRAVEL CO	1	010122.00	P304-0040	303001P
2600	02	ZIS ZAG CONCRETE WORKS C	10010	090.00	P304-0172	303001P

TOTAL PER CODE - 2600 - 010212.00

2620	02	ZIS ZAG CONCRETE WORKS C	10110	090.00	P304-0174	303001P
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TOTAL PER CODE - 2620 - 090.00

2620	02	ZIS ZAG CONCRETE WORKS C	10000	0160.00	P304-0171	303001P
2620	02	ZIS ZAG CONCRETE WORKS C	10042	0000.00	P304-0173	303001P

TOTAL PER CODE - 2620 - 01491.00

2720	01	.....	LAB. 090904	0210.00	P002-0140	300001P
2720	01	.....	CG. 2099904	062.12	P002-0146	301001P
2720	02	AND ENGINEERING, INC.	1092	0900.00	P300-0246	303001P

TOTAL PER CODE - 2720 - 01279.32

2730	01	.....	LAB. 093004	0107.00	P000-0109	300001P
2730	01	.....	CG. 2093004	022.10	P000-0110	301001P

2730	02	SUNSHINE HEINE ELEC. CO.	STRT	01200.91	P300-0124	302001P
2730	02	SUNSHINE HEINE ELEC. CO.	STRT	0331.73	P300-0120	302001P
2730	02	SUNSHINE HEINE ELEC. CO.	STRT	0401.97	P300-0134	302001P
2730	02	SUNSHINE HEINE ELEC. CO.	STRT	01067.73	P300-0136	302001P
2730	02	SUNSHINE HEINE ELEC. CO.	STRT	0047.12	P300-0141	302001P
2730	02	SUNSHINE HEINE ELEC. CO.	STRT	01331.32	P300-0142	302001P
2730	02	SUNSHINE HEINE ELEC. CO.	STRT	01030.00	P300-0144	302001P

TOTAL PER CODE - 2730 - 06070.13

COST CODE EMP NO. EMPLOYEE NAME	CRAFT DESC.	HOURS		COMPENSATION			BURDEN		TOTAL LABOR AND BURDEN
		REGULAR OVERTIME	=TOTAL*	REGULAR OVERTIME	TAXABLE NON-TAXABLE	=TOTAL*	COMPANY PROJECT	CRAFT =TOTAL*	
1000									
23932 COLQUHETT KEVIN ROBER	LABORER	16.00		210.00			63.12		
			16.00			210.00		63.12	273.52
TOTAL FOR CODE 1000		16.00	16.00	210.00		210.00	63.12	63.12	273.52
2215									
23940 CONKENS WELCHON B	LABORER	8.00		88.00			26.00		
			8.00			88.00		26.00	114.00
80640 BOSS EDWARD STEWART	LABORER	8.00		76.00			22.00		
			8.00			76.00		22.00	98.00
TOTAL FOR CODE 2215		16.00	16.00	164.00		164.00	49.20	49.20	213.20
2305									
23940 CONKENS WELCHON B	LABORER	8.00		88.00			26.00		
			8.00			88.00		26.00	114.00
77300 SOLLECCHIO, JAMES B	LABORER	8.00		72.00			21.60		
			8.00			72.00		21.60	93.60
80640 BOSS EDWARD STEWART	LABORER	8.00		76.00			22.00		
			8.00			76.00		22.00	98.00
89225 YOUNG ROBERT K	LABORER	21.00		215.25			64.50		
			21.00			215.25		64.50	279.63
TOTAL FOR CODE 2305		45.00	45.00	431.25		431.25	133.30	133.30	386.63
2310									
83225 BLEMAN JONAS	CARPENTERS-MEN	40.00		723.40			217.02		
			40.00			723.40		217.02	940.42
9450 BROWN PHILIP JOHN	CARPENTERS-MEN	32.00		610.72			185.62		
			32.00			610.72		185.62	804.34
23932 COLQUHETT KEVIN ROBER	LABORER	16.00		210.00			63.12		
			16.00			210.00		63.12	273.52
23940 CONKENS WELCHON B	LABORER	16.00		176.00			52.00		
			16.00			176.00		52.00	228.00
73040 SINGLETON JOHN S	CARPENTERS-MEN	40.00		723.40			217.02		
			40.00			723.40		217.02	940.42
89225 YOUNG ROBERT K	LABORER	2.00		20.50			6.15		
			2.00			20.50		6.15	26.65
TOTAL FOR CODE 2310		146.00	146.00	2,472.42		2,472.42	741.73	741.73	3,214.15
TOTAL FOR PROJECT 3710		223.00	223.00	3,290.67		3,290.67	909.43	909.43	4,200.10

COST CODE EMP NO.	EMPLOYEE NAME	CRAFT DESC.	---HOURS---		---COMPENSATION---			---BURDEN---		TOTAL LABOR AND BURDEN
			REGULAR OVERTIME	*TOTAL*	REGULAR OVERTIME	TAXABLE NON-TAXABLE	*TOTAL*	COMPANY PROJECT	CRAFT *TOTAL*	
09223	YOUNG ROBERT H	LABORER	.50	.50	5.13		5.13	1.94		6.67
TOTAL FOR CODE 2505			53.00	54.00	737.92		764.40	229.33	229.33	993.63
2510	10323 ALEDAN JONASO	CARPENTERS-MEN	24.00	24.00	434.04		434.04	130.21	130.21	564.25
19450	BROWN PHILIP JOHN	CARPENTERS-MEN	16.00	16.00	309.36		309.36	92.81	92.81	402.17
23952	CALQUETT KEVIN ROBER	LABORER	16.00	16.00	210.40		210.40	63.12	63.12	273.52
23960	CORRENS NELSON S	LABORER	8.00	8.00	88.00		88.00	26.40	26.40	114.40
73040	SINGLETON JOHN S	CARPENTERS-MEN	29.50	29.50	533.51		533.51	160.05	160.05	693.56
09223	YOUNG ROBERT H	LABORER	12.00	12.00	123.00		123.00	36.90	36.90	159.90
TOTAL FOR CODE 2510			103.50	105.50	1,698.31		1,698.31	509.49	509.49	2,207.80
2725	23952 CALQUETT KEVIN ROBER	LABORER	16.00	16.00	210.40		210.40	63.12	63.12	273.52
TOTAL FOR CODE 2725			16.00	16.00	210.40		210.40	63.12	63.12	273.52
TOTAL FOR PROJECT 3710			247.00	248.00	3,396.21		3,422.77	1,026.83	1,026.83	4,449.60

PROJECT 2710 BYLAND OFFICE PARK
 BUILDING CONTRACT -87-

PAYROLL DISTRIBUTION
 PAGE 32

PERIOD
 9/16/84

COST CODE EMP NO.	EMPLOYEE NAME	CRAFT SECT.	HOURS		COMPENSATION			BURDEN		TOTAL LABOR AND BURDEN
			REGULAR OVERTIME	TOTAL*	REGULAR OVERTIME	TOTAL*	COMPANY PROJECT	CRAFT TOTAL*		
1000										
23982	COLQUITT KEVIN ROBER	LAWNER	16.00		210.40			63.12		
				16.00		210.40		63.12	63.12	273.32
TOTAL FOR CODE 1000			16.00	16.00	210.40	210.40	63.12	63.12	273.32	
1300										
36600	McKELLIPS LARRY LIND	LAWNER	0.00		05.00			23.00		
				0.00		05.00		23.00	23.00	111.00
TOTAL FOR CODE 1300			0.00	0.00	05.00	05.00	23.00	23.00	111.00	
2300										
23940	CORRENS MELCHOR B	LAWNER	8.00		80.00			25.00		
				8.00		80.00		25.00	25.00	114.00
77000	BELLECKER, JAMES B	LAWNER	14.30		130.30			39.15		
				14.30		130.30		39.15	39.15	169.65
00600	NUSS ERNARD STEWART	LAWNER	16.00		152.00			45.60		
				16.00		152.00		45.60	45.60	197.60
09220	YOUNG ROBERT K	LAWNER						4.61		
				1.00	13.30		13.30	4.61	4.61	19.99
TOTAL FOR CODE 2300				39.30	370.30	370.30	113.76	113.76	501.64	
2310										
10320	ALDRAN JORDAN	CARPENTER-HEB	33.00		396.01			179.04		
				33.00		396.01		179.04	179.04	775.05
19400	BRUNN PHELIP JOHN	CARPENTER-HEB	24.00		464.04			147.74		
				23.00	28.43	492.47		147.74	147.74	640.21
73000	SCHEULTON JOHN S	CARPENTER-HEB	32.00		370.72			101.30		
				33.00	26.55	400.27		101.30	101.30	706.05
00600	NUSS ERNARD STEWART	LAWNER	0.00		76.00			22.00		
				0.00		76.00		22.00	22.00	98.00
TOTAL FOR CODE 2310				99.00	1,713.37	1,770.30	331.16	331.16	2,301.71	
3700										
36600	McKELLIPS LARRY LIND	LAWNER	4.00		43.00			12.90		
				4.00		43.00		12.90	12.90	38.90
TOTAL FOR CODE 3700			4.00	4.00	43.00	43.00	12.90	12.90	38.90	
TOTAL FOR PROJECT 2710			163.30	166.30	2,423.47	2,493.63	708.74	708.74	3,204.57	



DELIVERY ADDRESS

THE BROOMFIELD LUMBER CO., Inc.

LUMBER, HARDWARE, PAINT, GLASS, STEEL
7805 W. 120th • P.O. BOX 305 • Phone 488-2387
BROOMFIELD, COLO. 80020

7711

Date 8-14-84

Walter CM

OUR CREDIT POLICY: Terms are 2% 10th, Net 30th. Discounts are not allowed on saw sharpening, mill expense, mill permits or bid items or unless otherwise noted. Accounts are billed at the end of each month and are payable as noted above. A Service Charge of 2% per month on any unpaid balance as of the 28th of the month following billing will be assessed. Additionally, account privileges will be suspended until the unpaid balance is cleared up. If this account is assigned for collection, customer agrees to pay reasonable attorney's fees.

Job No.	Quantity	Description	Total Quantity	Price	TOTAL
17105	2	Handlans	2	6.15	12.30
	1	Heats	1	2.20	2.20
	1	Conk	1	8.45	8.45
	2	Winn Boards	2	1.25	2.50
	16	4x8 3/4 AC	16	20.75	332.00
	24	2x4x12	24	3.36	80.64
	6	1x4x12 #3	6	1.36	8.16
	4	1x12x12 #3	4	6.84	27.36
	16	2x4x16	16	4.59	73.44
					517.66
Received By	<i>[Signature]</i>		SALES TAX	36.11	
			TOTAL	583.77	

TERMS: Net 20th

9/31/84
JOURNAL ENTRY TO
WCM #3710-2510 - JET 28

Plant
 Arrived 6400 Fort Jay
 Suburban Reddi Mix Co. Plant Brighton X
 Mail: 5300 Wadsworth Arrvado, Colo. 80002 11755 Brighton Rd.
 Phone 421-0720
 Driver Drury Tr. No. 55 Cdn. Vg. Order 2 1/2 = 2 1/2 CY Ordered
 Customer Order No. 3710 Date 8 22 84
 Name Walter

Job Address 22nd / Sheridan

QTY.	CONCRETE	PRICE	AMOUNT
<u>1/2</u>	<u>1857</u> <u>2</u> <u>3/4</u> <u>PK</u> <u>52.50</u>		<u>131.25</u>

AIR ENTRAINMENT
 POZZOLITH 322 344 EARLY
 CALCIUM CHLORIDE _____ %
 USE CURB, GUTTER PAVING, FOOTINGS WALLS.
 FLATWORK FLOOR
 MAX SLUMP 3 INCH
 PUMP MIX drulate

SERVICE CHARGE: FOR LOADS DEP LESS THAN 4 CUB YDS. 131.25

Free Time To Unload This Load: 18 MIN. WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$39.00 PER HOUR (85c PER MIN) OR ANY PART THEREOF FOR UNLOADING TIME OVER FREE TIME WRITTEN AT LEFT.

ANY WATER ADDED TO THE MIX ON THE JOB WILL BE THE PURCHASER'S RESPONSIBILITY	WATER ADDED ON JOB <u>0</u> Gals.	STATE TAX <u>131.25</u>
Left Plant: <u>1:40</u>	Arrived Job: <u>2:10</u>	CITY TAX <u>3.94</u>
	Finished Unloading: <u>2:30</u>	RTD TAX <u>79</u>
SUBURBAN REDDI MIX CO ASSUMES NO RESPONSIBILITY FOR DAMAGES BEYOND THE CURB OR PROPERTY LINE IF YOU DESIGNATE DRIVER TO GO BEYOND CURB OR PROPERTY LINE YOU WILL BE RESPONSIBLE FOR ANY DAMAGE THAT MAY OCCUR		COUNTY TAX <u>-</u>

FINANCE CHARGE AT THE RATE OF 2% PER MONTH (APR 24%) WILL BE ON ALL ACCOUNTS NOT PAID WITHIN 30 DAYS FROM DATE OF PURCHASE

Z 7046 Customer's Signature

WAITING TIME
 TOTAL CHARGE 135.98

CANTON: Freshly mixed cement, sand, or grout may cause skin injury. Avoid contact with skin. Wash immediately with plenty of water. If any cement mixture gets into eyes, rinse immediately and repeatedly with large amounts of water. Keep out of reach of children.

8/31/84
JOURNAL ENTRY TO
ACCOUNT 3710-250 — JE# 28



SUPPLY, INC.

5150 FOX STREET
DENVER, COLORADO 80216
(303) 296-0150

INVOICE No 58101

RECEIVED
SEP 10 1984

DATE 8/20/84

TO ORDER

Walters CM
7951 E maplewood, Ave.
Suite 200
Englewood, CO 80111

SHIP TO

9191 Sheridan

OUR ORDER NO.	CUSTOMER ORDER NO.	SALESMAN	TERMS	SHIPPED VIA	Paid. or Coll.
26227	17108	2	NET 30	WC	
QUANTITY	DESCRIPTION	PRICE	AMOUNT		
200 ea	8' LE Cones	27.00/c	54.00		
		State	1.62		
		City	1.62		
		RTD	.32		
			57.56		

NO MERCHANDISE RETURNED WITHOUT OUR WRITTEN PERMISSION - MAKE NO DEDUCTIONS FROM THIS INVOICE - IF INCORRECT RETURN AT ONCE.





SUPPLY, INC.
 5150 FOX STREET
 DENVER, COLORADO 80216
 (303) 286-0160

INVOICE No 58188

RECEIVED

SEP 10 1984

DATE 8-21-84

BILL WALTERS

SOLD TO

Walters C.M. Construction
 5975 S. Syracuse #107
 Englewood, Co 80111

SHIP TO

Westminster bank 400

OUR ORDER NO	CUSTOMER ORDER NO	SALESMAN	TERMS	SHIPPED VIA	Ppd or Coll
C26278	17110	2	NET 30	WC	
QUANTITY	DESCRIPTION			PRICE	AMOUNT
200 ea.	8" SE Cone snapties			23.00c	46.00
				State	1.38
				City	1.38
				RTD	.28
					49.04

NO MERCHANDISE RETURNED WITHOUT OUR WRITTEN PERMISSION - MAKE NO DEDUCTIONS FROM THIS INVOICE - IF INCORRECT RETURN AT ONCE



cmt copy

Plant
Ananda
5400 Fenton
Brighton
11755 Brighton Rd.
Phone 421-0728

Driver DALE T. NO 67 Cyclic Yeg. Drivem
Customer's Order No. 18-18 CY Ordered 1884
Date 9-12 in 84

Name WALTER C. M.
Address 92 rd & Soudan

QTY.	CONCRETE	PRICE	AMOUNT
2	CY 6x TYPE 1 BAX TYPE 2 3/4 IN. <u>1000</u>		
	AIR ENTRAINMENT YES NO		
	POZZOLITH 32% 34% EARLY		
	CALCIUM CHLORIDE %		
	USE CURB GUTTER, PAVING, FOOTINGS, WALLS.		
	REINFORCED FLOOR		
	MAX. PUMP INCH		
	PUMP MIX		

SERVICE CHARGE: FOR LOADS ORDERED LESS THAN 4 CU YDS.

Free Time to Unload This Load 14 WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$39.00 PER HOUR (85¢ PER MIN) FOR ANY PART THEREOF FOR UNLOADING TIME OVER FREE TIME WRITTEN AT LEFT.

ANY WATER ADDED TO THE MIX ON THE JOB WILL BE THE PURCHASER'S RESPONSIBILITY ON JOB

Left Plant 2:45 Arrived Job 3:15 Finished Unloading 6 Gals. 3.35

Suburban Ready Mix Co. 3:35 MAKES NO RESPONSIBILITY FOR DAMAGES BEYOND THE CURB OR PROPERTY LINE IF YOU DESIGNATE DRIVER TO GO BEYOND CURB OR PROPERTY LINE YOU WILL BE RESPONSIBLE FOR ANY DAMAGE THAT MAY OCCUR.

FINANCE CHARGE AT THE RATE OF 2% PER MONTH (APR 84) WILL BE ON ALL ACCOUNTS NOT PAID WITHIN 30 DAYS FROM DATE OF PURCHASE.

Z 8832 Customer's Signature [Signature] TOTAL CHARGE 1225.64

CAUTION: Freshly mixed cement, mortar, concrete, or grout may cause skin injury. Avoid contact with skin where possible and wash exposed skin areas promptly with water. If any cement mixtures get into eyes, rinse immediately with water for 15 MINUTES.

SEE'S COPY

Suburban Ready Mix Co.
11755 Brighton Rd.
Brighton, Mo. 64622
Phone 421-0728

Driver 18-18 Cyclic Yeg. Drivem
Customer's Order No. 18-18 CY Ordered 1884
Date 9-12 in 84

Name WALTER C. M.
Address 92 rd & Soudan

QTY.	CONCRETE	PRICE	AMOUNT
2	CY 6x TYPE 1 BAX TYPE 2 3/4 IN. <u>1100</u>		
	AIR ENTRAINMENT YES NO		
	POZZOLITH 32% 34% EARLY		
	CALCIUM CHLORIDE %		
	USE CURB GUTTER, PAVING, FOOTINGS, WALLS.		
	REINFORCED FLOOR		
	MAX. PUMP INCH		
	PUMP MIX		

SERVICE CHARGE: FOR LOADS ORDERED LESS THAN 4 CU YDS.

Free Time to Unload This Load 14 WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$39.00 PER HOUR (85¢ PER MIN) FOR ANY PART THEREOF FOR UNLOADING TIME OVER FREE TIME WRITTEN AT LEFT.

ANY WATER ADDED TO THE MIX ON THE JOB WILL BE THE PURCHASER'S RESPONSIBILITY ON JOB

Left Plant 2:45 Arrived Job 3:15 Finished Unloading 6 Gals. 3.35

Suburban Ready Mix Co. 3:35 MAKES NO RESPONSIBILITY FOR DAMAGES BEYOND THE CURB OR PROPERTY LINE IF YOU DESIGNATE DRIVER TO GO BEYOND CURB OR PROPERTY LINE YOU WILL BE RESPONSIBLE FOR ANY DAMAGE THAT MAY OCCUR.

FINANCE CHARGE AT THE RATE OF 2% PER MONTH (APR 84) WILL BE ON ALL ACCOUNTS NOT PAID WITHIN 30 DAYS FROM DATE OF PURCHASE.

Z 8832 Customer's Signature [Signature] TOTAL CHARGE 1225.64

CAUTION: Freshly mixed cement, mortar, concrete, or grout may cause skin injury. Avoid contact with skin where possible and wash exposed skin areas promptly with water. If any cement mixtures get into eyes, rinse immediately with water for 15 MINUTES.

CUSTOMER'S COPY

Suburban Reddli Mix Co. Plant Brighton 11755 Brighton Rd. Phone 421-0720

Driver Alan To No 58 Concrete Volume Ordered 4 cu yd
Customer's Order No 3710-2510 Date 9-10 1984
Name Walter C M
Job Address 52nd & Shady

CITY	CONCRETE	PRICE	AMOUNT
4	CONCRETE BAY TYPE 2 1/2 MK	53.50	310.00
	AIR ENTRAINMENT YES		
	POZZOLITH 322 344 EARLY		
	CALCIUM CHLORIDE		
	USE CURB, GUTTER, PAVING, FOOTINGS, WALLS, PLATWORK, FLOOR		
	MAX SLUMP 4 INCH		
	PUMP MIX		
	FOR LOADS ORDERED LESS THAN 4 CU YDS		
	WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$30.00 PER HOUR (85¢ PER MIN) OR ANY PART THEREOF FOR UNLOADING TIME OVER FREE TIME WRITTEN AT LEFT		
	ANY WATER ADDED TO THE MIX ON THE JOB WILL BE THE PURCHASER'S RESPONSIBILITY		
	Left Plant		
	Arrived Job		
	Finished Unloading		
	Suburban Reddli Mix Co. has no responsibility for damages beyond the curb on property line if you designate driver to go beyond curb on property line you will be responsible for any damage that may occur.		
	FINANCE CHARGE AT THE RATE OF 2% PER MONTH (APR 24%) WILL BE ON ALL ACCOUNTS NOT PAID WITHIN 30 DAYS FROM DATE OF PURCHASE		
	Customer's Signature <i>Alan To</i>		
	7946		
	WAITING TIME		
	TOTAL CHARGE		

CAUTION: Freshly mixed cement, mortar, concrete, or grout may cause skin injury. Avoid contact with skin where possible and wash exposed skin areas promptly with water. If any cement splatters get into eyes, rinse immediately and repeatedly with water and get prompt medical attention. KEEP OUT OF REACH OF CHILDREN

STATEMENT COPY

Suburban Reddli Mix Co. Plant Brighton 11755 Brighton Rd. Phone 421-0720

Driver Alan To No 58 Concrete Volume Ordered 4 cu yd
Customer's Order No 2011 Date 9-10 1984
Name Walter C M
Job Address 52nd & Shady

CITY	CONCRETE	PRICE	AMOUNT
4	CONCRETE BAY TYPE 2 1/2 MK	53.50	310.00
	AIR ENTRAINMENT YES		
	POZZOLITH 322 344 EARLY		
	CALCIUM CHLORIDE		
	USE CURB, GUTTER, PAVING, FOOTINGS, WALLS, PLATWORK, FLOOR		
	MAX SLUMP 4 INCH		
	PUMP MIX		
	FOR LOADS ORDERED LESS THAN 4 CU YDS		
	WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$30.00 PER HOUR (85¢ PER MIN) OR ANY PART THEREOF FOR UNLOADING TIME OVER FREE TIME WRITTEN AT LEFT		
	ANY WATER ADDED TO THE MIX ON THE JOB WILL BE THE PURCHASER'S RESPONSIBILITY		
	Left Plant		
	Arrived Job		
	Finished Unloading		
	Suburban Reddli Mix Co. has no responsibility for damages beyond the curb on property line if you designate driver to go beyond curb on property line you will be responsible for any damage that may occur.		
	FINANCE CHARGE AT THE RATE OF 2% PER MONTH (APR 24%) WILL BE ON ALL ACCOUNTS NOT PAID WITHIN 30 DAYS FROM DATE OF PURCHASE		
	Customer's Signature <i>Alan To</i>		
	7946		
	WAITING TIME		
	TOTAL CHARGE		

CAUTION: Freshly mixed cement, mortar, concrete, or grout may cause skin injury. Avoid contact with skin where possible and wash exposed skin areas promptly with water. If any cement splatters get into eyes, rinse immediately and repeatedly with water and get prompt medical attention. KEEP OUT OF REACH OF CHILDREN

STATEMENT COPY

Suburban Reddli Mix Co.
 Plant Brighton
 11755 Brighton Rd.
 Phone 421-0720

Plant Address 5400 Eglon
 Order No. 47
 Date 8-30-84
 Customer's Name: Walters Con
 Order No. 243

QTY	PRICE	AMOUNT
34	5.00	170.00
AIR ENTRAINMENT POZZOLITH 32: 344 EARLY CALCIUM CHLORIDE USE CURB GUTTER PAVING FLATWORK FLOOR MAX SLUMP 3 PUMP MIX		

RECEIVED
 SEP 27 1984
 BILL WALTERS
 CONCRETE MANAGEMENT, INC.

Free Time to Unload This Load: 23
 SERVICE CHARGE: LESS THAN 4 CU YDS.
 WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$19.00 PER HOUR (85¢ PER MIN) FOR ANY PART THEREOF FOR UNLOADING TIME OVER FREE TIME WRITTEN AT LEFT.
 WATER ADDED TO THE PURCHASER'S RESPONSIBILITY ON JOB: 4
 Arrived Job: 3:15
 Finished Unloading: 4:40
 STATE TAX: 1.2
 CITY TAX: 1.2
 RTO TAX: 1.2
 COUNTY TAX: 1.2
 SUB TOTAL: 176.77
 WAITING TIME: 176.77
 TOTAL CHARGE: 176.77

CAUTION: Freshly mixed cement, mortar, concrete, or grout may cause skin injury. Avoid contact with skin where possible and wash exposed skin areas promptly with water. If any contaminants get into eyes, rinse immediately and repeatedly with water and get prompt medical attention. KEEP OUT OF REACH OF CHILDREN.

CUSTOMER'S COPY

Suburban Reddli Mix Co.
 Plant Brighton
 11755 Brighton Rd.
 Phone 421-0720

Plant Address 5400 Eglon
 Order No. 47
 Date 8-30-84
 Customer's Name: Walters Con
 Order No. 243

QTY	PRICE	AMOUNT
34	5.00	170.00
AIR ENTRAINMENT POZZOLITH 32: 344 EARLY CALCIUM CHLORIDE USE CURB GUTTER PAVING FLATWORK FLOOR MAX SLUMP 3 PUMP MIX		

RECEIVED
 SEP 27 1984
 BILL WALTERS
 CONCRETE MANAGEMENT, INC.

Free Time to Unload This Load: 23
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 WATER ADDED TO THE PURCHASER'S RESPONSIBILITY ON JOB: 4
 Arrived Job: 3:15
 Finished Unloading: 4:40
 STATE TAX: 1.2
 CITY TAX: 1.2
 RTO TAX: 1.2
 COUNTY TAX: 1.2
 SUB TOTAL: 176.77
 WAITING TIME: 176.77
 TOTAL CHARGE: 176.77

CAUTION: Freshly mixed cement, mortar, concrete, or grout may cause skin injury. Avoid contact with skin where possible and wash exposed skin areas promptly with water. If any contaminants get into eyes, rinse immediately and repeatedly with water and get prompt medical attention. KEEP OUT OF REACH OF CHILDREN.

TOOL & ANCHOR SUPPLY INC.

'The Construction Supply Professionals'
 P.O. Box 904 • Aurora, Colorado 80040

RECEIVED INVOICE

7436

AUG 29 1984

(303) 320-4573

TO *Walter Am*
 7951 E. Maplewood #200
 Englewood, Colo 80111

INVOICE DATE 8-27-84	SALESPERSON <i>[Signature]</i>
BILL L. WALTERS CONSTRUCTION MATERIALS	
<i>7191 Skene Blvd.</i>	

3710-2510

QTY. ORDERED	QTY. SHIPPED	DESCRIPTION	UNIT PRICE	TOTAL
1	1	1 1/4" N/Cs. Die	34.95	34.95
1	1	can rapid stop cutting fluid	6.75	6.75
				41.70
				1.26
				43.41

Ray D. Neal

A finance charge of 2% per month, equal to 21% APR, will be charged on all past due amounts.
 Please pay directly from this invoice.
 No statement will be sent unless requested.

State Tax
 City Tax
 RTD Tax
 Shipping Charges
 TOTAL

Thank You



ECS SUPPLY, INC.
 5150 FOX STREET
 DENVER, COLORADO 80216
 (303) 296-0150

RECEIVED

SEP 10 1984

BILL L. WALTERS
 CONSTRUCTION MANAGEMENT, INC.

INVOICE R 30990

DATE 8-21-84

ORDER TO

Walters C.M. Construction

SHIP TO

9191 N. Sheridan

OUR ORDER NO.	CUSTOMER ORDER NO.	SALESMAN	TERMS	SHIPPED VIA	Ppd. or Coll.
R1306	17112	2	NET 30		
QUANTITY	DESCRIPTION	PRICE	AMOUNT		
	Rental Equipment per attached	.10 each	10.00		
		State	.30		
		RTD	.06		
			10.36		

NO MERCHANDISE RETURNED WITHOUT OUR WRITTEN PERMISSION - MAKE NO DEDUCTIONS FROM THIS INVOICE - IF INCORRECT RETURN AT ONCE.



CCS SUPPLY CO.
 DISTRIBUTORS OF CONSTRUCTION MATERIALS
 3150 FOX
 DENVER, COLORADO 80216
 TELEPHONE 303-428-9120

RENTAL INVOICE

Job 3700-2510 R70

W. J. C. M.

JOB LOCATION
 9191 N. Sheridan

SOLD TO

DATE SHIPPED	CUSTOMER ORDER NUMBER	TERMS	INVOICE DATE	INVOICE NUMBER
	17112	15 TO DAYS-NET 30 DAYS	E-22-84	
QUANTITY	DESCRIPTION			AMOUNT
100 ea	Steel Wedges			.10 ea / mo
<p>All Equipment shall be returned in same condition as received. Any Damage or Cleaning will be at lessee expense. Please check equipment before accepting.</p>				
				SIGNATURE

RENTAL PERIOD	DATE	TIME OUT	TO	DATE	TIME IN	TOTAL
RENTAL RATE - DAY		WEEK		MONTH		
PURCHASE OPTION	YES <input type="checkbox"/>	NO <input type="checkbox"/>	PRICE \$			
SUBJECT TO THE TERMS AND CONDITIONS ON THE REVERSE HEREOF, WHICH ARE MADE A PART HEREOF AS IF FULLY SET FORTH HEREIN ABOVE.						SALES TAX
I HAVE READ THE TERMS AND CONDITIONS OF THIS LEASE AGREEMENT AND AGREE THERETO:						TRANSPORTATION OUT
BY _____ NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL LESSEE						TRANSPORTATION IN
TITLE DATE						TOTAL

ALL INSURANCE TO BE PROVIDED AT LESSEE EXPENSE



WaltersCM A Bill L. Walters
Company

7861 East Maplewood Avenue, Suite 300, Englewood, Colorado 80111, (303) 770-4300

PURCHASE ORDER

Job & Cost Code 3700-2510 Bldg. Permit No. _____ Date 2/20/94 19 94
Excludes City Sales Tax on Purchases
 To C.C.S. SUPPLY For INLET FORMS
 Address 5150 FLY ST. Date Required 5/1/94
 Ship To WALTERS CM How Ship WICMA Pickup
 Address 9191 SHERIDAN BLVD. WESTMINSTER CO. Terms _____

QUANTITY ORDERED	RECEIVED	PLEASE SUPPLY ITEMS LISTED BELOW	UNIT	PRICE
100		WEDGES	RENTAL	

IMPORTANT
 OUR ORDER NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, ETC.
 PLEASE NOTIFY US IMMEDIATELY IF YOU ARE UNABLE TO SHIP COMPLETE
 ORDER BY DATE SPECIFIED.

 Purchasing Agent

White—Supplier • Green—File • Canary—Accounting • Pink—Field • Gold—Numeric Copy

WCM-008



SUPPLY, INC.
 5150 FOX STREET
 DENVER, COLORADO 80216
 (303) 296-0150

RECEIVED

INVOICE R 30988

SEP 10 1984

DATE 8/20/84

BILL L. WALTERS
 CONSTRUCTION MANAGEMENT, INC.

SOLD TO

Walters CM

SHIP TO

9191 Sheridan

OUR ORDER NO	CUSTOMER ORDER NO	SALESMAN	TERMS	SHIPPED VIA	Ppd. or Coll.
1303	17108	2	NET 30	OT	
QUANTITY	DESCRIPTION	PRICE	AMOUNT		
	RENTAL EQUIPMENT PER ATTACHED		12.50		
		State	.38		
		RTD	.08		
			12.96		

NO MERCHANDISE RETURNED WITHOUT OUR WRITTEN PERMISSION - MAKE NO DEDUCTIONS FROM THIS INVOICE - IF INCORRECT RETURN AT ONCE.



CCS SUPPLY CO.
 DISTRIBUTORS OF CONSTRUCTION MATERIALS
 5130 FOX
 DENVER, COLORADO 80216
 TELEPHONE 393-429129

RENTAL INVOICE

Job 3710-2510

R70

SOLD TO: *Walters CM*
Job = 3700

JOB LOCATION

9191 Sheridan Blvd

DATE SHIPPED	CUSTOMER ORDER NUMBER	TERMS 1% 10 DAYS-NET 30 DAYS	INVOICE DATE	INVOICE NUMBER
	<i>17108</i>		<i>8-26-84</i>	
QUANTITY	DESCRIPTION			AMOUNT
<i>12 Pcs</i>	<i>Steel Wedges</i>			<i>.10 ea / mo</i>
<small>All Equipment shall be returned in same condition as received. Any Damage or Cleaning will be at lessee expense. Please check equipment before accepting.</small>				SIGNATURE

RENTAL PERIOD	DATE	TIME OUT	TO	DATE	TIME IN	TOTAL
RENTAL RATE - DAY		WEEK		MONTH		
PURCHASE OPTION	YES <input type="checkbox"/>	NO <input type="checkbox"/>	PRICE \$			
<small>SUBJECT TO THE TERMS AND CONDITIONS ON THE REVERSE HEREOF, WHICH ARE MADE A PART HEREOF AS IF FULLY SET FORTH HEREIN ABOVE.</small>						SALES TAX
<small>I HAVE READ THE TERMS AND CONDITIONS OF THIS LEASE AGREEMENT AND AGREE THERETO:</small>						TRANSPORTATION OUT
<small>NAME OF CORPORATION, PARTNERSHIP OR INDIVIDUAL LESSEE</small> <i>Kevin Calvert</i>						TRANSPORTATION IN
BY		TITLE		DATE		TOTAL

ALL INSURANCE TO BE PROVIDED AT LESSEE EXPENSE

PROJECT NO.	CODE NO.	PI NO.	TYPE NO.	VENOR / CLIENT NAME	INV. NO. / C/L TRANS.	INCOME AMOUNT	COST AMOUNT	SUBIT NO.	GEN./LEDC ACCT. NO.
-------------	----------	--------	----------	---------------------	-----------------------	---------------	-------------	-----------	---------------------

3710 HVLAND OFFICE PARK

1130		01		LAB. 101004		9148.64		PR02-0103	500001P
1130		01		CO. X101004		942.19		PR02-0106	501001P
1130		00		JE 13		9201.00		GL 01-0618	505001P
1130		00		COUNTY LINE LANDFILL	5005239	874.00		PJ03-0106	505001P

TOTAL FOR CODE - 1130 - 9438.23

1160		02		HVLACH SUPPLY CO	3220	678.74		PJ04-0043	502001P
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TOTAL FOR CODE - 1160 - 678.74

1330		02		AIR PRODUCTS AND CHEMICAL	562 79051	917.82		PJ04-0034	502001P
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TOTAL FOR CODE - 1330 - 917.82

1330		01		LAB. 100704		918.75		PR01-0177	500001P
1330		01		CO. X100704		83.23		PR01-0178	501001P
1330		01		LAB. 101004		926.00		PR02-0107	500001P
1330		01		CO. X101004		98.06		PR02-0108	501001P
1330		01		LAB. 102004		938.76		PR04-0101	500001P
1330		01		CO. X102004		99.23		PR04-0102	501001P
1330		02		WESTERN FASTENERS	001277	983.76		PJ04-0046	502001P

TOTAL FOR CODE - 1330 - 9172.67

2205		03		SHOPY CONSTRUCTION CO.	3789	94346.00		PJ05-0270	503001P
------	--	----	--	------------------------	------	----------	--	-----------	---------

TOTAL FOR CODE - 2205 - 94346.00

2215		03		NORTHWESTERN CONST	2002	91045.00		PJ05-0000	503001P
------	--	----	--	--------------------	------	----------	--	-----------	---------

TOTAL FOR CODE - 2215 - 91045.00

2220		01		LAB. 100704		9187.00		PR01-0179	500001P
2220		01		CO. X100704		932.18		PR01-0180	501001P
2220		02		HOST LUMBER CO	47637	9306.00		PJ04-0042	502001P

TOTAL FOR CODE - 2220 - 9525.98

2310		02		HOST LUMBER CO	47053	914.79		PJ04-0020	502001P
2310		04		CCS SUPPLY	31160	919.36		PJ04-0020	504001P
2310		04		GANNETT MARR	3521	937.12		PJ04-0022	504001P
2310		04		POWER RENTAL EQUIPMENT IN	27483.01	9176.27		PJ05-0003	504001P

TOTAL FOR CODE - 2310 - 9238.54

HAST LUMBER COMPANY

TELEPHONE 282-1218
4801 EAST 80TH AVENUE
P.O. BOX 98

COMMERCE CITY, COLORADO 80037

47853

QUANTITY SERVICE
HAST LUMBER

"Hast has it"

DATE Aug 27 1984

TERMS: NET 30 DAYS. ALL SERVICES BILLED DESTROY HEREIN. DESTROY BY EMPLOYEES AND ADDRESS BY ADDRESSEE. THIS COMPANY'S SERVICES ARE PAID BY 10% OF NET. POLICE OFFICERS, OTHERS AS COUNTY SHALL BE RESPONSIBLE FOR PAYING AND DESTROY SHALL PAY A FINANCE CHARGE OF 1% PER MONTH. PERMITS AND DELIVERY ACCOUNTS MUST BE PAID (THE ABOVE FINANCE CHARGE SHALL BE THE RESPONSIBILITY OF THE DELIVERANT ACCOUNTS). ALL DELIVERANT ACCOUNTS MUST BE PAID.

Method	Cash	C.O.D.	Chg.	Total Order No.
				11001

SOLD TO: WALTERS CONST. MGR. C.M.
7951 EAST MAPLEWOOD
SUITE 200
ENGLEWOOD, CO. 80111

ADD: Westminster Bank #3710
9191 Sheridan Blvd
Westminster

QTY	DESCRIPTION	QUANTITY	PRICE	AMOUNT
6	2x4-12' Std Btr		238	1428

RECEIVED

OCT 21 1984

NOTICE: ALL MATERIALS RETURNED SUBJECT TO 20% HANDLING CHARGE. BILL WALTERS
MATERIALS AND/OR LABOR RECEIVED PER INVOICE TERMS. CONSTRUCTION MANAGEMENT, INC.

MOORE TOTAL	1428
STATE & RTD TAX	51
ADAMS COUNTY TAX	
COMMERCE CITY TAX	
DEWEER CITY TAX	
FRT LABOR	
GRAND TOTAL	1479

DELIVERED BY: Dampier DATE: 8/28
BY: X [Signature] RECEIVED BY: [Signature]
Thank You



SUPPLY. INC.
 5150 FOX STREET
 DENVER, COLORADO 80216
 (303) 295-0168

RECEIVED

OCT 11 1984

INVOICE R 31168

DATE 9/30/84

BILL L. WALTERS
 CONSTRUCTION MANAGEMENT, INC.

D F O S
T O

Walters CM
 7951 E Maplewood ave
 Suite 200
 Englewood, CO 80111

S H I P
T O

9191 N Sheridan

OUR ORDER NO.	CUSTOMER ORDER NO.	SALESMAN	TERMS	SHIPPED VIA	Paid or Coll
1306	PO #17112	2	NET 30	OT	
QUANTITY	DESCRIPTION	PRICE	AMOUNT		
	RENTAL EQUIPMENT PER ATTACHED		10.00		
		State	.30		
		RTD	.06		
			10.36		

NO MERCHANDISE RETURNED WITHOUT OUR WRITTEN PERMISSION - MAKE NO DEDUCTIONS FROM THIS INVOICE - IF INCORRECT RETURN AT ONCE.



WE REPAIR EVERYTHING
Handy Nabors Rentals
 5185 W. 80th Ave. - Westminster, Colo. 80039
 Just East of Sheridan Blvd. on 80th Ave.

EXPIRATION DATE _____
 PREVIOUS DRIVERS LICENSE NO. _____
 BIRTHDAY _____

RENTAL CONTRACT
No. 03521
 PHONE NO. 770 4300
 CAR LICENSE NO. _____
 IN Sept 4-84
 OUT Sept 4 11:30
 DATE RENT IN Sept 5-84

To C. M. ...
 St. 7951 East Maplewood
 City West 700

EQUIPMENT IS LEASED FOR USE AT _____
 LESSEE JOB NO. _____ P.O. NO. 19491

ITEM RENTED	RATE MINIMUM	1 DAY	1 WEEK	CHARGES
<u>1. 2" (Catalin Pump) Hydraulic Hose</u>	<u>30.00</u>	<u>24h</u>		
<u>1 Length 2" Discharge Hose</u>	<u>42.00</u>	<u>24h</u>		

Bank of West

NOTE SPECIAL CONTRACT TERMS AS APPLIES TO CONTRACTOR AND/OR POWER EQUIPMENT RENTALS. What constitutes a day's rental: 1. From 7:30 a.m. to 7:30 p.m. - 1 day rental. 2. Out after 7:30 a.m. following day 2. Out after 7:30 a.m. - 1 day rental expires 24 hours from time out. 3. Overtime charges 1/3 of day's rate per hour. A day's rental on non-powered equipment 24 hours.

RENTAL ONLY NOT FOR SALE
 BILL ACCOUNT PAY ON RETURN

CUSTOMER IS RESPONSIBLE FOR ALL DAMAGES TO TIRES

1% PER MO. SERVICE CHARGE WILL BE MADE ON ALL AMOUNTS UNPAID AFTER 30 DAYS FROM DUE DATE. RESULTING IN AN ANNUAL PERCENTAGE RATE OF 18%. IN EVENT OF DEFAULT, PURCHASER AGREES THAT COLLECTION COST INCLUDING REASONABLE ATTORNEY FEES, MAY BE RECOVERED.

COLORADO LAW CONCERNING THEFT OF LABOR, SERVICES, OR THE USE OF PROPERTY, AND PROVIDING PENALTIES THEREFOR. C.R.S. 72, § 18-4-402, as amended by HB 1203 (1978); 18-4-402 IS MADE PART OF THIS CONTRACT.

PROVISIONS ON THE BACK OF THIS LEASE ARE PART OF THIS CONTRACT
 CUSTOMER IS RESPONSIBLE FOR THEFT OF RENTAL EQUIPMENT WHILE IN HIS CUSTODY.

RENT	34.50
MOSE	
DELIVERY & PICK UP	
SUBTOTAL	
TAX	2.62
DEPOSIT	
GASOLINE	
TOTAL CHARGES	37.12

SIGN HERE → BY X *[Signature]*
 LESSOR
 YOUR PROMPT RETURN WILL SAVE YOU MONEY

Call 427-9175 For Hours
 WE CHARGE 7 DAYS A WEEK WE CHARGE FOR TIME OUT NOT TIME USED
 RENTAL RATES QUOTED COVER 48 HOUR WEEK, OR 8 HOUR DAY.

Power RENTAL

RENTAL INVOICE NUMBER 021483-01 PAGE 1

POWER RENTAL EQUIPMENT INC. 725 N. 39TH AVE. DENVER CO. 80216 303/480-0973

LESSEE
WALTERS CONSTRUCTION MGMT
7951 EAST MAPLEWOOD AVENUE
SUITE 200
ENGLEWOOD CO 80111

FOR USE AT SITE
92ND & SHERIDAN BLVD.
RECEIVED
SEP 9 1984

ORIGIN DATE 8/24/84 TERMS NET EDM CUSTOMER REFERENCE P.O.# 18892 INVOICE DATE 9/25/84 MONTHLY BILLING

ITEM NUMBER	CATALOG DESCRIPTION	U/M	USAGE	UNIT PRICE	RENT FROM	TO	RENT
1780	POWER DRIVE 1/2 HP E	1.0		8/24 15	8/25 15		108.00
1781	RAM TAMPER 1000B	1.0		8/27 07	8/28 14		370.00 F
	PICKUP/DEL. ZONE B EA	1.0		7.29	8/24 15		7.29 F
	BUMPER PINTLE ADAPTE EA	1.0		15.00	8/24 15		15.00 F

ADDITIONAL COSTS
CREDIT MEMO TO BE
ISSUED 11/22/84 PER
KRAL @ POWER RENTAL

NET / DELIVERY OUT OF TAX AREA NUMBER
DAMAGE WAIVER 8.40 TAXABLE
PER MONTH OR 18.0 % NON-TAX
IS ASSESSED ON
OVER 30 DAYS

5.58 TOTAL 176.27

CHARGES OVER 30 DAYS

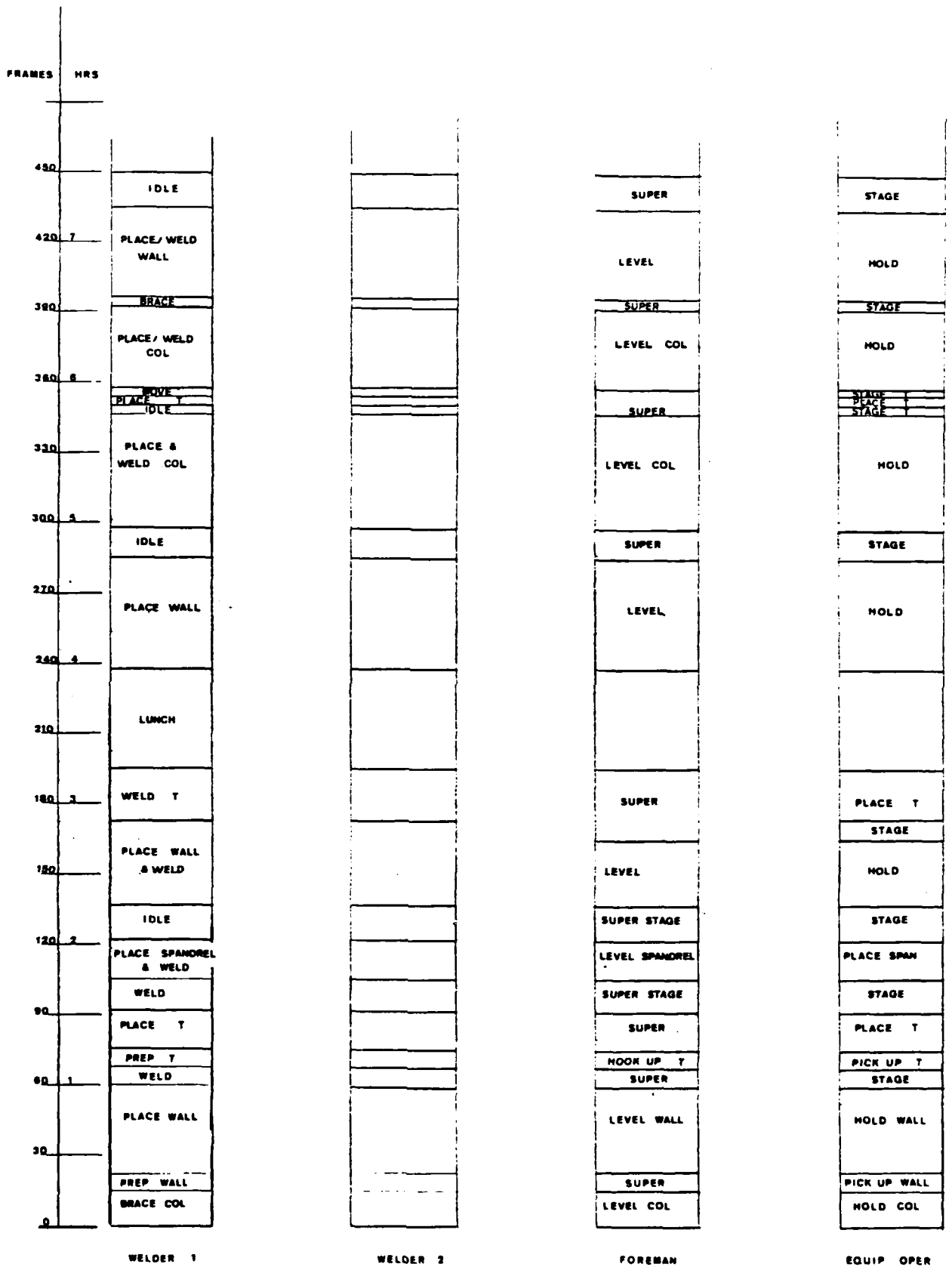
APPENDIX E
PROBLEMS AND SOLUTIONS

ASSIGNMENT 1

Analyze and suggest ways to improve the erection process of the precast structure of the Bank of Westminster from the given timelapse film. Set up a crew balance chart for analysis and comparison as shown in Methods Improvement for Construction Managers by Henry W. Parker and Clarkson H. Ogelsby, McGraw Hill Book Co., 1972.

- Given:
- 1) Welder 1 is dressed in dark pants and dark shirt.
 - 2) Welder 2 is dressed in dark pants and white shirt.
 - 3) Foreman is dressed in dark pants, white shirt, and red hard hat.
 - 4) Equipment Operator is dressed in dark pants, dark shirt, and dark ball cap.
(NOTE: Operator does not leave cab of crane.)
 - 5) Each frame was taken every 60 seconds, therefore 1 frame is equal to 1 minute.
 - 6) The 60 second interval starts at the start of film.
 - 7) The second half of the film was taken at 15 second intervals, therefore 4 frames equals 1 minute.

FRAMES	HRS.	WELDER 1	WELDER 2 (SEE WELDER 1)	FOREMAN	EQUIP. OPER
580	2.2	IDLE			IDLE
525		PLACE & WELD "T"			HOLD "T"
480		IDLE			PICK UP "T"
435		PLACE & WELD "T"		SUPERVISION	MOVE "T"
390		IDLE		HOOK UP "T"	HOLD "T"
345		WELD "T"			PICK UP "T"
300		PLACE "T"		SUPERVISION	HOLD "T"
255		POSITION "T"		POSITION "T"	PLACE "T"
210		IDLE		HOOK UP "T"	PICK UP "T"
165		WELD "T"		IDLE	HOLD "T"
120		IDLE		HOOK UP "T"	PLACE "T"
75		WELD		SUPERVISION	HOLD
30		PLACE WEST CURTAIN WALL		SET TRANSIT	POSITION WEST WALL
0				LEVEL WEST WALL	



ASSIGNMENT 2

Analyze and suggest ways to improve the erection process of the brick veneer of the Bank of Westminster from the given timelapse as shown in Methods Improvement for Construction Managers by Henry W. Parker and Clarkson H. Ogelsby, McGraw Hill Book Co., 1972.

- Given:
- 1) Foreman is heavy set with white hard hat dressed in tank jacket and dark pants.
 - 2) Two bricklayers both dressed in maroon shirts and dark pants with white hard hats.
 - 3) Laborer dressed in gray jacket, dark pants, and red hard hat.
 - 4) Laborer dressed in gray jacket with blue shoulders, dark pants, and white hard hat.
 - 5) Film was at 1 second intervals, therefore 60 frames equals 1 minute.

Frames | Minutes

1660+

1565 | 26

1540+

1420+

1300+

1080+

960+

840+

720+

600+

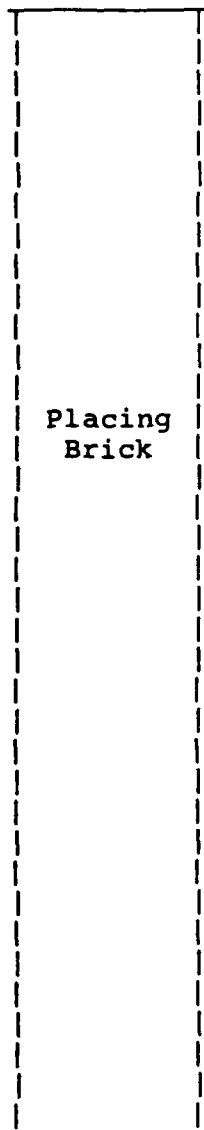
480+

360+

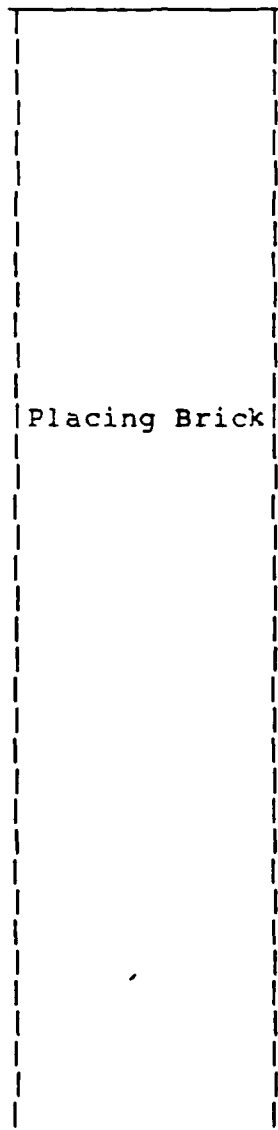
240+

120+

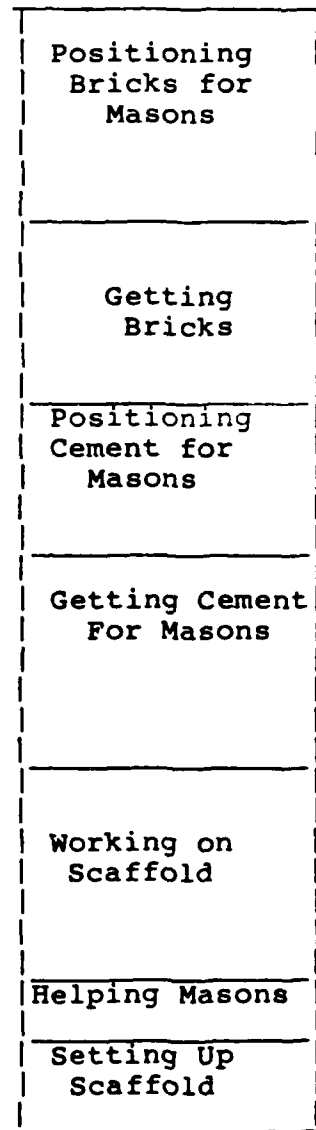
0



Mason 1



Mason 2



Laborer

APPENDIX F
BIBLIOGRAPHY

BIBLIOGRAPHY

- Barrie, Donald S. Directions in Managing Construction. New York, N.Y.: John Wiley and Sons, 1981.
- Culbertson, Alan N. and Kenney, Donald E. Contract Administration Manual for the Design Professional. New York, N.Y.: McGraw Hill Book Company, 1983.
- Douglas, Clarence J. and Munger, Elmer L. Construction Management Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1969.
- Oppenheimer, Samuel P. Directing Construction for a Profit. New York, N.Y.: McGraw Hill Book Co., 1971.
- Parker, Henry W. and Oglesby, Clarkson H. Methods Improvement for Construction Managers. New York, N.Y.: McGraw Hill Book Company, 1972.
- Reiner, Laurence E. Handbook of Construction Management. Englewood Cliffs, N.J.: Prentice-Hall Inc., 1972.
- Rubey, Henry and Milner, Walker W. Construction and Professional Management. Oklahoma: The Macmillan Company, 1966.

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