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Construction Research Series

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

By
Robert J. Bossa

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Construction Engineering and Management Program

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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

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This Report for the Master of Science Degree by
Robert J. Bossa
has been approved for the
Department of
Civil, Environmental, and Architectural Engineering
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.

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

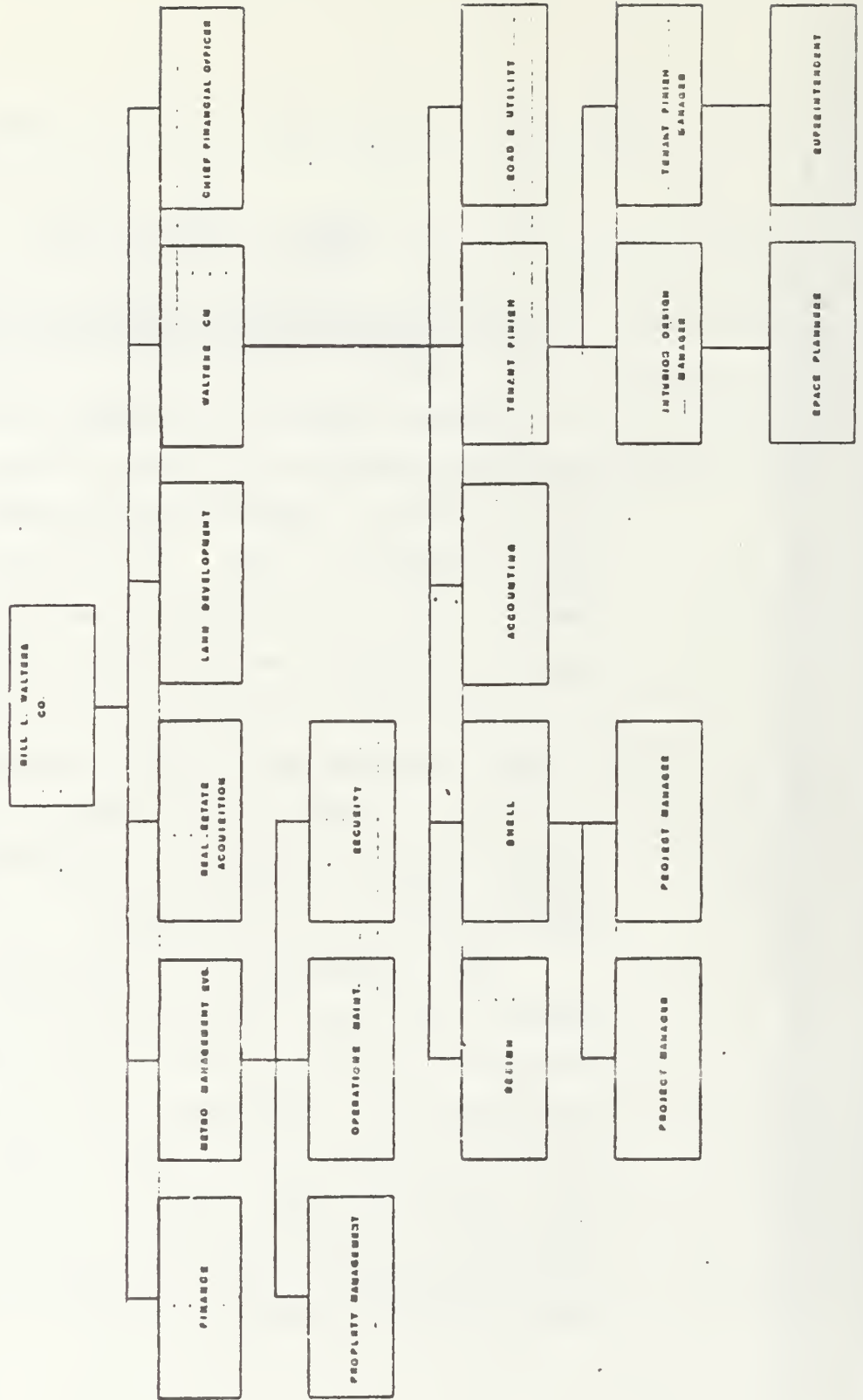


FIG. 1

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 arms-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.

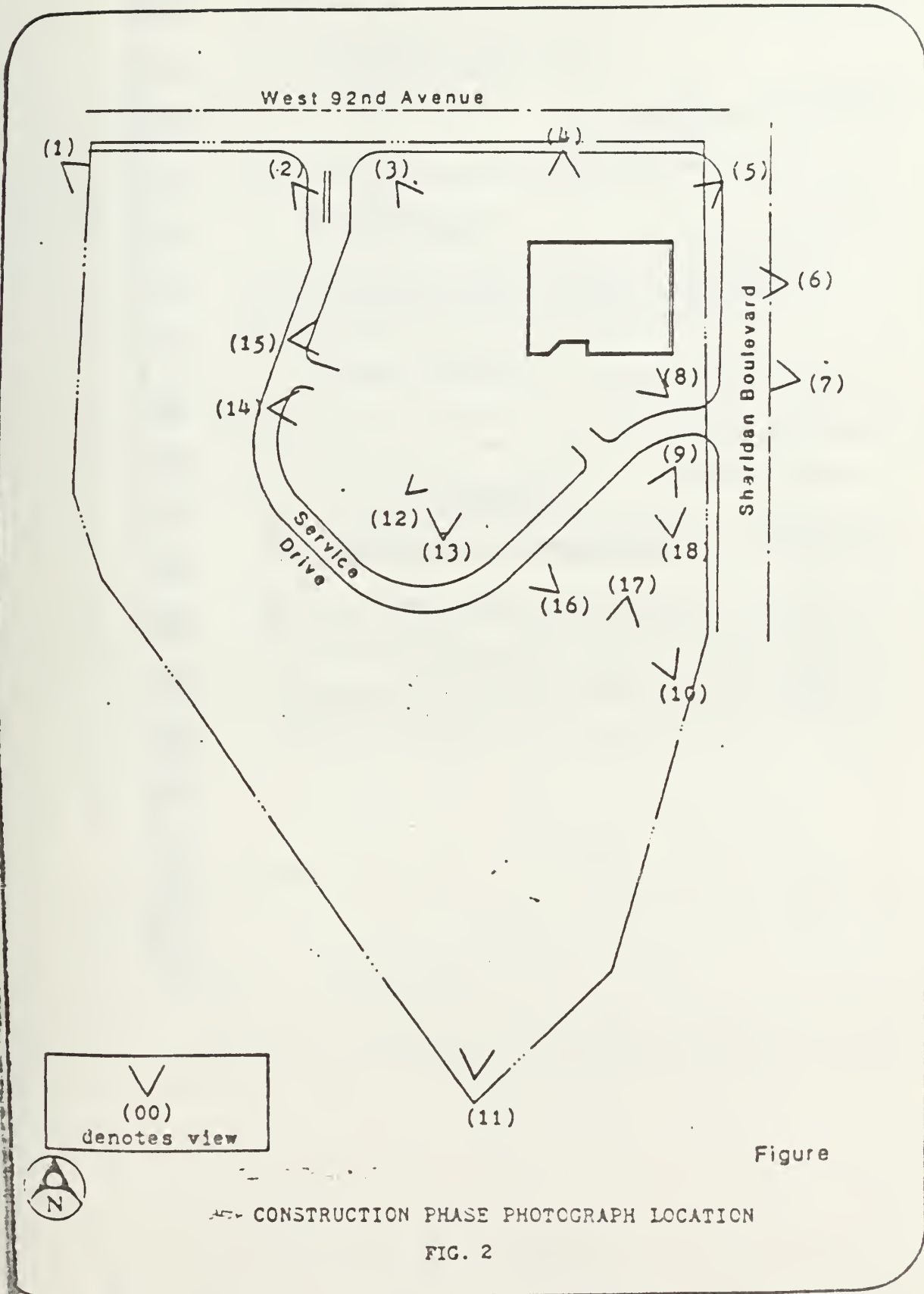
In general the starting date slippage and the loss of some key personnel within the Walters C.M. organization created a severe time factor in the completion of this report. The inability to follow this construction project to its' finish reduced the information available for classroom study.

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.



APPENDIX A

BID DOCUMENTS AND CONTRACT

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:

Phenbery Co.
Name

Pres
By Title

Address

Dated this 19th day of June, 1984.

SEAL (if Bidder is a Corporation)

371

Bid Form - 2

FIG. 1

A-2

PROJECT Bank of Washington
COMPANY Phobis
BY _____
PHONE _____

Rec'd By JKR
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) <u>Dist. Material OK</u>	
2) <u>O.T. for</u> <u>\$1,300</u> <u>Street Cu-</u> <u>8 hrs</u>	
3)	

July 17, 1984

Mr.

PLUMBING COMPANY

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

Gentlemen:

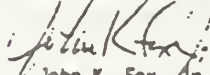
Please let this letter serve as a Letter of Intent and Notice to Proceed based upon your proposal of June 29, 1984 for Road Utilities in the amount of \$97,298 for the above referenced project.

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



Walters CM

A Bill L. Walters
Company

7901 East Maplewood Avenue, Suite 200, Englewood, Colorado 80111, (303) 778-4888

FIG. 3

A-6



Walters CM A BIL Walters
Company

7891 East Greenwood 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: _____

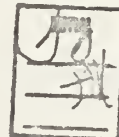
NAME OF MATERIAL SUPPLIER	ADDRESS	PHONE NO.
Waterworks Sales Co.	600 W. 48th Ave Denver 80216	292-6206
Carder Concrete Products	8311 W. Carder Ct. Littleton 80125	794-6303
Mobile Premix Concrete	P.O. Box 5183 TA Denver 80217	534-3165

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

Mary J _____
Signature

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

1. The phrase "General Contract" (except of which is on file at the office of the contractor and a provision for inspection at all times) shall be deemed to mean the contract between the contractor and owner with reference to the work described in Section 1 of the subcontract, together with all the provisions, general conditions, plans, drawings, specifications and address 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 the subcontract strictly in accordance with the general contract.
3. Inasmuch as the provisions of the general contract do not conflict with specific provisions herein contained, it is agreed that the provisions herein shall be deemed to be a part of the general contract. The subcontractor agrees that he will perform the agreement as not to violate any law, covenant or condition of the general contract. The subcontractor's responsibility towards the contractor shall be the same as that of the contractor towards the owner under the general contract and the subcontractor shall be the same as that of the owner towards the contractor under the general contract.
4. The subcontractor shall submit to the contractor's office on or before the Twenty Fifth (25th) day of each month, a request for payment covering 75% value of the work completed to the satisfaction of the owner during that month. If said remuneration is not approved by the subcontractor as above stated, payment may be withheld for 30 days additional. This contract is payable at the office of the contractor in Jefferson County, Colorado. Payment shall 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 orders, material orders and other claims, and final releases and waivers of lien and release of all claims at the time of final payment on the subcontract.
6. The subcontractor shall furnish, if requested by the contractor, such affidavits from time to time which shall state amounts due or to become due, amounts paid, and any other information which is necessary to the informed decision of the subcontractor master or to a release to labor and material furnished and to be furnished under the 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 that effect in writing and in default of furnishing said security the contractor shall have the right to cancel the contract in case of such cancellation the rights of the contractor shall be the same as if the subcontractor had failed to perform the contract in whole or in part.
7. The timing 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, material, etc., furnished or to be furnished by him under the subcontract.
8. The subcontractor agrees that claims arising from the performance of the contract shall be held in trust and used first for labor and material entering into the 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 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 furnish wages as prescribed in the general contract, or the scale prescribed by law in case the general contract provides no such scale. If the subcontractor shall fail to comply to perform the conditions contained in the paragraph, the contractor shall have the right to cancel the subcontract forthwith. All parties shall be bound by the general contract as between the subcontractor and the contractor, and the contractor shall have the right to cancel the subcontract at any time in case of such cancellation the rights of the contractor shall be the same as if the subcontractor had failed to perform the contract in whole or in part.
11. The right is reserved by the contractor to require changes in, additions to, deletions from, and omissions from, the work, and the subcontractor agrees that he will comply with such changes, additions or omissions, and the subcontractor shall be deemed to have agreed to such changes, additions or omissions, and the subcontractor shall have no claim against the contractor in respect to such changes, additions or omissions in connection with the work, but must deal only with the contractor.
12. Subcontractor agrees to furnish accurate bond to contractor if so required, and further agrees to carry and pay for workmen's compensation and other liability insurance, with satisfactory financial and acceptable companies. He shall also carry property damage insurance. The subcontractor shall furnish the contractor with addresses showing names of the company, number of the policy and expiration date.
13. The subcontractor agrees to and does hereby assume full and exclusive liability for the payment of any and all contributions or taxes for unemployment insurance and/or retirement benefit, pension or annuity, 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, when as measured by the wages, salaries or other remunerations paid to persons employed by the subcontractor on work performed under the terms of this subcontract.
14. The subcontractor shall own all equipment and materials to be used in the execution of the contract as designated by the contractor providing the transportation costs are not increased by its doing. It is expressly agreed that the owner to designated shall be the agent of the subcontractor and not the agent of the contractor.
15. The subcontractor takes precedence over any and all proposals, correspondence, and oral agreements made prior to the date hereof.
16. The subcontractor makes all changes, omissions, etc., in due.
17. The subcontractor shall not exhibit or assign any portion of the 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 the 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 (owner) may require 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, expense or delay caused 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 work, omission or omission contained in the subcontract, or which delays the progress of any of the provisions of the 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 task, omission or condition contained in the subcontract, the contractor may upon two (2) days written notice to the subcontractor's last known address, stop any work he deems advisable to secure necessary labor or material by contract or otherwise, and may take over all of the subcontractor's equipment, materials, etc., and may prosecute the work as completed. In case the contractor deems the procedure necessary for greater conduct of the work, all claims expended therefore shall be deducted from the contract price herein stated, and if such expenditures exceed the amount contained due to the subcontractor hereunder the subcontractor agrees to pay to the contractor on demand the full amount of such claims, together with interest thereon at the rate of ten per cent per annum, until paid.
20. The subcontractor shall promptly attend and make good any defective materials and workmanship to the entire satisfaction 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 defective materials and/or workmanship after written notice as set forth herein, it is agreed that the contractor shall have the right and power to have the defects corrected 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 ten per cent per annum, until paid.
21. The subcontractor shall attend to and make good 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 such loss or damage is caused by direct negligence of the contractor and subject to the provisions of Section 22 hereof, being payable only. The subcontractor shall reimburse the contractor on demand for any loss and/or damage to other work or materials occasioned by the subcontractor in the execution of the subcontract.
22. If the subcontractor demonstrates methods or work to which he work is to be applied or offered is unsatisfactory or unsuitable, written notification of said condition shall be given to the contractor. Obvious no compensation will be given to claim for extra compensation or non-responsibility in connection therewith.
23. The subcontractor shall provide his own equipment, whatever storage sheds, work sheds and offices are necessary for the performance of the 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 of the work all materials and debris resulting from his work. And he shall clean up to the satisfaction of the inspector, of dirt, grease, mortar, etc., from walls, ceilings, floors, fixtures, etc., deposited or placed thereon as a result of the execution of the 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 and cleaning, and the subcontractor will be deemed to have agreed to pay to the contractor the actual cost of such labor plus percentage of such cost as for supervision, insurance, overhead, etc. It is also agreed and understood that 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 a builder's risk fire insurance in the amount of his contract or bid insurance to insurable value, including subcontractors, 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 builder's risk insurance is in force.
26. In the event the general contractor should elect to carry builder's risk insurance, and only in such event, the subcontractor agrees to submit immediately, for the purpose of determining value under the insurance coverage, a complete breakdown of the contract price showing materials, labor, equipment, tools, supplies and any other thing or article of value, the cost of which is included in the contract price stated in this agreement.
27. The subcontractor shall furnish promptly all estimates, lists, 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.
28. The subcontractor shall furnish all guarantees, bonds, operating instructions, etc., as required by the specifications.
29. If the subcontractor makes use of the contractor's hoist, derrick or any other equipment, or air, water, gas, electricity, water, etc., an agreed price in writing shall be made with contractor's representative or other strictly by contractor's charge.
30. If at any time any controversy shall arise between the contractor and the subcontractor with respect to any matter or thing involved in the subcontract, and which cannot be settled by the parties by mutual consent, or which the owner or the authorized representative cannot settle to the satisfaction of both parties hereto, then the written orders of the contractor shall be followed and such controversy shall be decided by arbitration in the city of Denver, Colorado, and before that settlement is made between the contractor and the subcontractor. The name of the American Arbitration Association, filed in effect shall govern.
31. The subcontractor shall not take the contractor and owner's business from any industry including attorney's fees, costs and expenses, for or on account of any payment or unpaid amount, direct or indirect manufactured or used in the performance of the subcontract, including their use by the owner.



31. The subcontractor shall not place on the work any equipment of which he is not the 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 handled 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 singly listed, quantified and placed in contractor's addresses.
33. The subcontractor agrees to cooperate to the fullest extent with contractor's superintendents in charge, and further agrees to remove any workman 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 be paid, work-rest, and vacation provisions, and the method of payment or any other provision will be limited. 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 customers of labor and materials whose cylinders 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 the contract.
38. The subcontractor hereby warrants to the contractor that he is, and will comply, to the course of the contract, with all Federal, State and applicable County ordinances relating to workmen's compensation insurance, safety and health laws and fire laws, state laws and use laws, Federal sector and transportation laws, local building and zoning codes and federal and state outstanding laws, and any fine or penalty assessed against the contractor caused by violation same 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, however 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 are actually or allegedly caused through the negligence of contractor or any of its agents, employees or other subcontractors, including any such liability, damages, losses, claims and expenses as shall have been established by the due 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.



COPIED CERTIFICATE OF INSURANCE

7/23/84

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

RECEIVED
 JUL 26 1984

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

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
 James 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 LN	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRES DATE (MM/DD/YY)	LIABILITY LIMITS IN THOUSANDS		
					EACH OCCURRENCE	AGGREGATE	
A	GENERAL LIABILITY	TBP042093546	9/1/83	9/1/84	SOBLY INJURY	\$ 500	\$ 500
	<input checked="" type="checkbox"/> COMPREHENSIVE FORM				PROPERTY DAMAGE	\$ 250	\$ 250
	<input checked="" type="checkbox"/> PREMISES OPERATIONS				BI & PD COVERED	\$	\$
	<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	SOBLY INJURY (PA FIRST)	\$ 250	
	<input checked="" type="checkbox"/> ANY AUTO				SOBLY INJURY (PA OTHER)	\$ 500	
	<input checked="" type="checkbox"/> ALL OWNED AUTOS (FROM FRAG.)				PROPERTY DAMAGE	\$ 500	
	<input checked="" type="checkbox"/> ALL OWNED AUTOS (OTHER THAN FROM FRAG.)				BI & PD COVERED	\$	
	<input checked="" type="checkbox"/> HIRED AUTOS						
	<input checked="" type="checkbox"/> NON-OWNED AUTOS						
B	EXCESS LIABILITY	To Be Determined	7/1/84	7/1/85	BI & PD COVERED	\$ 1000	\$ 1000
	<input checked="" type="checkbox"/> UMBRELLA FORM						
	WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY				STATUTORY \$ EACH ACCIDENT \$ DISEASE-POLICY LIMIT \$ DISEASE EACH EMPLOYEE		
	OTHER						

DESCRIPTION OF OPERATION/LOCATION/SUBJECT/SPECIAL ITEMS
 Bank of Westminster

AGENT/INSURER
 Walters C.M.
 7951 East Wapleswood 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 TO THE CERTIFICATE HOLDER NOTICE TO THE CERTIFICATE HOLDER BEING PLACED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL CONSTITUTE NO CANCELLATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.
 AUTHORIZED REPRESENTATIVE: *Adrian Ann Stankel*

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	SITework/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 # 844-0000
 SQ 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	3300.00	Sf			5.00	17,500
	Grade Beams	7200.00	SF			11.50	82,800
	Sump 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.

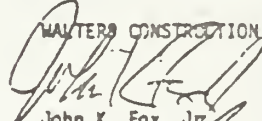
The storm drain line RCP shall be installed with our laborers at an hourly rate of \$11.70, \$12.35, and \$13.33 which includes all payroll taxes, etc. All equipment and material for this portion of the work shall be provided by Plumbing.

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

7961 East Maplewood Avenue, Suite 300, Englewood, Colorado 80111, (303) 779-4300

FIG. 9

A-16

NOTIFICATION OF BACKCHARGE

SUBCONTRACTOR: <u>Plumbing Company</u>	Date <u>8-27-84</u> Project <u>Private Road Improvement 2 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>
---	--

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 - Barmekow 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 John K. Fox, Jr.
 John K. Fox, Jr./Project Manager

JKF/jpi

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

WCM-88 8/23/88

APPENDIX B
DAILY LOGS



DAILY LOG

PROJECT ~~Hudson Bank~~ Bank of Westminster DATE 7-23-84

WEATHER CONDITIONS SIGNATURE [Signature]
Temperature: High 95 Low
Precipitation: Inches Rain Snow
Condition: Clear X Partly Cloudy Overcast

SAFETY
Accidents: Personal Equipment Public Liability Property Damage
Explain:

Table with columns: MATERIALS (Cost Code, Ticket No.), SUBCONTRACTORS (Company, No Men). Includes entries for SURVEY CREW and WCM.

Table with columns: EQUIPMENT RENTAL, DATE IN, DATE OUT, SUPPLIER, REMARKS. Includes entry for BACKHOE LOADER RENT from POWER RENTAL.

- 1) Removed SPLIT RAIL & STOCKADE FENCE. - fence to center; load 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 REPTON LANDSCAPE. DIDN'T SHOW UP TODAY.
8) TALKED TO MURPHY EXCAVATION. CONFIRM WEDNESDAY START.
9) WCM YARD - USED 2 TRUCKS 8 HRS FROM HAZARD FOR FENCE removal - Hauled fence to center.
10) WORKED CREW 8 HRS.
11) Removed 1 sign - to yard
12) Removed 4 curb wheel stops - Haul to yard
JR/BR PAUL/BR KEVIN/BR BRIAN/BR ED/BR



411

DAILY LOG

PROJECT WILKINSTER BANK DATE 7-30-84

WEATHER CONDITIONS
Temperature: High 95 Low 62 SIGNATURE Ray A. Neal
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 - 4MAN
		2. SUEVY - 2 HALF DAY	1 - LAB
		3. MURPHY - BLADE/OPER	1 - BACKHOE
		4. _____	
		5. 613 OPER	
		6. 946 LEADER/OPER	
		7. SHOOTER 1/2 DAY	
		8. 780 LEADER 1/4 DAY	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS
—				
—				

- 1) WASSANNAE SHOWED UP FOR COMPLETION TEST.
- 2) O'DONNELL SHOWED UP. JUST MOVED PIPE IN. REMOVED 30' LF OF EXISTING 18" RCP @ 92 & SHERIDAN BRANCH OUT LITTLE JD HOE, THEY ARE BRINGING OUT A TRACK HOE.
- 3) TALKED TO AL WASSANNAE ON USING SOURCE IN A CONFINED TRENCH FOR UTILITY WORK. NO PROBLEM AS LONG AS IT DOESN'T RAIN INTO THE BUILDING.
- 4) FRED MURPHY HAS 8 H2S EXTRA ON 166 BLADE FOR BRINGS IN EXTRA FILL IN ROAD DUE TO SURVEY PROBLEMS ON GRADE.
- 5) EXISTING DETENTION POND ON CORNER NEEDS TO BE MUCKED OUT. USING BARNIKOW BACKHOE. CHEAPER THAN MURPHY. MURPHY WANTED \$105/HOUR; \$210 MONTH. TOM BARNIKOW \$60/HR.
- 6) AL WASSANNAE APPEARS 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 EXPLORED PATH EVERY NIGHT FOR TEST WORK. REAL PROBLEM WITH EXISTING DETENTION POND. BUILDING CORNER RIGHT OVER POND.

WCM - Project Manager CANARY - Superintendent

WCM-018

DAILY LOG

PROJECT WESTMINSTER BANK DATE 8/6/84 MONDAY

WEATHER CONDITIONS SIGNATURE Ray L. O'Toole
 Temperature: High 90 Low 60
 Precipitation: Inches 0.2" 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 - 2IG/2 OPER	
_____	_____	2. WCM - 6	
_____	_____	3. SWEVEY - 2	
_____	_____	4. DENVER REEL - 3	
_____	_____	5. O'DONNELL - 1-4MAN	
_____	_____	6. _____	
_____	_____	7. _____	
_____	_____	8. _____	
_____	_____	3-LAB	
_____	_____	1-OPER/HO	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS
<u>NONE</u>				

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

- 2) POURED 44' CY. 5% W/TS ON.
- 3) DENVER REEL 3/4 DIA WITH CAISSON CASES.
- 4) TALKED TO MURPHY ON GETTING LOADS OUT HERE. PROBLEMS THURSDAY IS BEST. NEED WEDNESDAY.
- 5) O'DONNELL ON 8" SANITARY UP TO MANHOLE #5.

WCM-018

WHITE - Project Manager CANARY - Superintendent



DAILY LOG

PROJECT WESTMINSTER BANK DATE 8/13/89

WEATHER CONDITIONS SIGNATURE Page O'Neil
 Temperature: High 95 Low 60
 Precipitation: Inches — Rain — Snow —
 Condition: Clear 95 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. SHERM - 2	
		3. O'DINNEL - 1-9MAN	
		4. 3-CAS	
		5. 1-OPER/MAN	
		6. MCFREITH - 1-9MAN	
		7. 1-216/OPER	
		8. 1-OILER	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

	DIA	LOCATION	DEPTH	EST. CONCRETE
1) HELD SAFETY MEETING.				
2) MCFREITH ON 5TH DAY OF DRILLING.	36"	1-E	27 1/2'	7.21
DUE THRU 4-MAN BACK ON JOB.	36"	1-F	27'	7.08
3) O'DINNEL ON 12" WATER UP TO STATION	24"	PLAZA	17'	2.50
4'240. DISCUSSED STARTING 15" RCP	24"	PLAZA	18'	2.70
STORM ON WEDNESDAY NO HANDWORK SO	24"	PLAZA	17 1/2'	2.60
WORKING OUT A DEAL WITH OUR	24"	2-E	16'	1.90
LADDER IS DOING WORK.	42"	4-D	30'	13.60
4) TALKED TO SUBURAN ON CONCRETE	34"	3-D	33'	8.70
CONSISTENCY, SLUMP & AIR CHANGE.	TOTALS →		194'	46.29
NEED A CLEAN MIXED DRUMS. YIELD				
PER TRUCK RUNNING SHORT.				
5) ORDERED FOR PIPES FOR INLETS FROM				
CONCRETE. DELIVERY A.M. ON 8/26/89.				

EMTE - Project Manager P'VAL'RY - Superintendent

WCM-018



WaltersCM

A Bill L Walters Company

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

1166

DAILY LOG

PROJECT Westridge Park DATE August 28, 1981

WEATHER CONDITIONS

Temperature: High 90 Low 69
Precipitation: Inches 0 Rain 0 Snow 0
Condition: Clear Yes Partly Cloudy No Overcast No

SIGNATURE [Signature]

SAFETY

Accidents: Personal 0 Equipment 0 Public Liability 0 Property Damage 0
Explain: 0

MATERIALS

Cost Code	Ticket No.

SUBCONTRACTORS

Company	No. Men
1 O'DONNELL - 1-4 MAN	
2 1-CAB	
3 2-Hop/loper	
4 WCM - 8	
5 FORM BUILDERS - 4	
6 D & D - 8	
7	
8	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) DID STARTED CURB & GUTTER. POURED 400 LF
- 2) STARTED BACKFILL ON TIE BEAMS.
- 3) POURED ST CY ON TIE BEAMS @ TOWER 1 & ELEVATION.
- 4) Revised schedule with Murphy. Some no problem but will have to be. HARD TO HAIL MURPHY TO A SCHEDULE. TRY USING SPEED MEMPHIS
- 5) O'Donnell trying in check valve & pipe highest. No problem yet. Should be started up & tested in by Wednesday
- 6) Scheduled VAULT Steel For DELIVERY ON 8/29 @ 7:00.
- 7) O'Donnell IS USING OUR LABELS FOR BACKFILL AROUND THE INLETS.

WHITE - Project Manager CAMARY - Superintendent

WCM-015



DAILY LOG

PROJECT WESTMUSZER BANK DATE 9/4/84

WEATHER CONDITIONS
Temperature: High 85 Low 50
Precipitation: Inches Rain - Snow -
Condition: Clear YES Partly Cloudy - Overcast -

SIGNATURE Ray D. [unclear]

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

MATERIALS		SUBCONTRACTORS	
Cost Code	Ticket No.	Company	No. Men
		1. WCM - 8	Denver Rec - 2
		2. O'DONNELL - 1 - 4 MAN	
		3. 2 - OPER/HOR	
		4. 2 - LAB	
		5. DTD - 4	
		6. MURPHY - 1 - OPER/CLERK	
		7. 1 - LEADER / OPER 1/2 DAY	
		8. FORM BUILDERS - 4	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) Started 12" work @ 9:00 & finished at 8:30. Half done just now but we will have Wednesday found abnormal flow cold & unmixed electric utilities.
- 2) Rough dirt down to soil. Dredge & back on north side of stream. Worked B.H.S. Rough stream up with dredge @ 10:00. Dredge @ 10:30. Dredge back down @ 12:30. No work the rest of the day.
- 3) O'Donnell abiding. Manholes in road.
- 4) Schedule back down again on two half of building for Thursday @ 12:00.
- 5) Ridge bar inspector showed up to recheck wall @ 1 & 2 behind back wall. No answer yet as to procedure. Talking about grades.
- 6) Excavated grade down & tie down.
- 7)

WCM-018 WHITE - Project Manager CANARY - Superintendent



Walters CM

A Bill Walters Company

781 East Highland Avenue, Suite 200, Englewood, Colorado 80111, (303) 770-0300

9/12

DAILY LOG

PROJECT WESTMINSTER BANK DATE 9/10/87

WEATHER CONDITIONS
Temperature: High 85 Low 60 SIGNATURE Edgar D. O'Neil
Precipitation: Inches — Rain — Snow —
Condition: Clear (CS) Partly Cloudy — Overcast —

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

Cost Code	MATERIALS	Ticket No.	SUBCONTRACTORS	
			Company	No. Men
			1. WCM-B	RIVERA-1
			2. O'DONNELL-1-1 MAN	
			3. 1-LAB	
			4. 2-HA/OPT	
			5. STRESSCON-4	
			6. MURPHY-1-Loader/opr	
			7. 2-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 HAZARD (CONV). 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 PLATE SHOWED UP. WCM UNLOADED.
- 10) POWER 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 HOPPER O'DONNELL FINISH' MANHOLES.
- 13) DAVE FOR STRESSCON @ 3:00 BRING VAULT STEEL.

WCM-016

WHITE - Project Manager CANARY - Superintendent



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DAILY LOG

PROJECT WESTMINSTER BANK DATE 9-14-84

WEATHER CONDITIONS SIGNATURE Page 2 of 2

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. DEMVA RENT - 3 - 2 HRS	
		3. MURPHY - 1 - Loader/opr	
		4. ? - 2 Tandems	
		5. RIVIERA-1	
		6. STRESSCON - 4	
		8. FORM BUILDERS - 3	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) DEMVA RENT STARTED TIEING VAULT WALL STEEL FOUR VAULT ON 9/13.
- 2) FORM 4 BAY TOPPING SLAB @ CORNERS ON 1ST FLOOR TO BE ABLE TO START BRICK WORK.
- 3) 2927448 Car Number (Westminster Police). POLICE STOPPED BY AND SAID ARRESTED 2 PEOPLE ON PICKING UP WCM CONES AND BARRIERS.
- 4) ZIG ZAG DID 4 - 4"X10" CORES @ TIE BEAMS. 9:30-12:00 WASSenaar WILL PICK THEM UP. WASSenaar PICKED UP CYLINDERS @ 12:30.
- 5) MEL GRANTING DOWELS & HOLES IN TIE BEAM FOR STRESSCON.
- 6) NORTHWESTERN DOING BACKFILL FOR O'DONNELL ON STORAGE EAST SIDE.
- 7) CALLED NORTASTAR, O'DONNELL, RIVIERA, HELM, HEAT POWER, ON SCHEDULE FOR BLDG TOPPING SLABS START 10/1, ROOF ON BLDG 10-15.
- 8) TALKED TO Dave Ruder on setting alarm in parking lot. Schedule for 9-17.
- 9) SCHEDULED TO POUR LIGHT TIE BARS ON 9-21.
- 10) RIVIERA SET TEMPORARY POWER TO BLDG 220 3 PHASE.
- 11) WEATHER COLD, LIKE WINTER.
- 12) POUR 2 - 4'X4'3 DIAPHRAGMS @ STRUCTURAL PLAZA.

WCM-876

W-475 - Project Manager CANARY - Superintendent



HLZ

DAILY LOG

PROJECT WYSEMUNSTER 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	
		1 WCM-8	MURPHY - 1 - Hor / opp
		2 D&D-5	1 - Labor / opp
		3 Berman-2	1 - Cozer / opp
		4 STREXON-4	
		5 HEAT/POWER-2	
		6	
		7	
		8	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) D&D DRIVING CURB & GUTTER & CROSSPANS FROM STATION 6+00 TO 9+00. AHW HAS A BUSY PROBLEM IN THE CURB & GUTTER. HAD A BUSY TO BE CUT OUT. D&D STARTED @ 8:00 WORKING BACK TO 6+00.
- 2) BUREAU DRILLED 7 LIGHT POLE BASES. DRILLED FROM 9:00 TO 10:30. CONCRETE CAME @ 11:00. SCY. ELECTRICIANS SET CONDUIT & BOLT PATTERNS AND AHW SQUAY (CREEK) SITUATED BOLT SO LIGHTS FACE THE RIGHT WAY.
- 3) MURPHY STILL BEHIND ON FINISHING DIRT. BLADE SCHEDULED TO COME IN ON 9-24 MANDAY. BACKLASH STRUCTURAL PLAZA.
- 4) BRICK MASONS SETTING UP SCAFFOLD ON 10 LINE. HAVING PROBLEM WITH THEIR DELIVERY ON THEIR MORTAR COLOR. ~~1 DAY~~ 1 DAY BEHIND.
- 5) STRESSON WAS SUPPOSE TO BE TO 2 LINE ON NORTH SIDE TODAY. WON'T BE UNTIL TOMORROW. THEY ARE 1 BAY BEHIND. 2 DAYS.
- 6) DODGE REEL IS TIEING UP VAULT ROOF STEEL THEN THEY WILL MOVE OVER TO STRUCTURAL PLAZA.
- 7) TRUED TO HOLD (ALL MARCO) ON SCHEDULE. MICH. CURBS IN 10-1 WILL BE MEETING WITH THEM ON 9-29.
- 8) MET WITH AHW SURVEYING ON '898 BACKCHARGE. EVERYTHING WORKED OUT ON HANDLING BACKCHARGES. NO BACKCHARGE.



Walters CM

A Bill L Walters Company

781 5th International Avenue, Suite 202, Englewood, Colorado 80111 (303) 770-0300

DAILY LOG

PROJECT WESTMINSTER BANK DATE 10-3-84

WEATHER CONDITIONS SIGNATURE Raymond
Temperature High 75 Low 30
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 BENCH-9	MURPHY-1- Leads/oper
_____	_____	2 WCM-11	1- Blade/oper
_____	_____	40' DANIEL-3	
_____	_____	5 HEAT/Power-1	DID-3
_____	_____	6 STRESSCAN-4	HELM-3

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) PUT IN SCUPPER FOR ROOF ON 10 LINE. 2 BRKS HIGH & 2 BRKS LONG 9" OFF OF TWIN TR IN CENTER OF WALL.
- 2) KOLB, BARRY M.P.L WORKING IN PARKING LOT.
- 3) REST OF CREW GETTING 1ST FLOOR READY FOR A POUR.
- 4) 2 POURS FROM CHASE MANHATTAN BANK VISITED THE JOB SITE. SKIPPED THEM AROUND COMMENCED HOW CLEAN JOB WOULD.
- 5) DID SHARP 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 TAPPING. WE ARE GOING TO A 5/2 SACK MIX WITH A FIBERGLASS ACCELERATOR.
- 8) JOHN WAS OUT THIS MORNING SAYING CHANGES TO BE MADE. NO LEMBER WITH WALTERS. DAVE MCFARLAND PROJECT MANAGER.
- 9) TALKED TO BRANNON ON PAVING START TIME & 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.
SMITH - Project Manager CANARY - Superintendent



DAILY LOG

PROJECT WESTMINSTER BANK DATE OCTOBER 8, 1984

WEATHER CONDITIONS SIGNATURE Raymond [Signature]
 Temperature: High 65 Low 35
 Precipitation: Inches _____ Rain _____ Snow _____
 Condition: Clear _____ Partly Cloudy (x) 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/AWOL-2
_____	_____	3. RUIVIERA-2	ANDERSON-2
_____	_____	5. DAD-22	
_____	_____	7. BENCH-10	
_____	_____	8. STRESSCON-4	

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. PAURED 1ST FLOOR & STAIR TOWER & LANDINGS. 132 CY.
- 3) PURSED BRANNON BACK UNTIL WEDNESDAY. SUBGRADE STILL TO WRT.
- 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 PAURED A ALL CURB & GUTTER FOR PHASE 1 PARKING. 8CY

WCM-015

OWITE - Project Manager CANARY - Superintendent



DAILY LOG

PROJECT Waterbury Church DATE October 23, 1984

WEATHER CONDITIONS
Temperature: High 40° Low 25° SIGNATURE Don J. [unclear]
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. _____	
_____	_____	4. RIVERA - 1	
_____	_____	5. O'DONNELL - 2	
_____	_____	6. BERK - + HALF/DAY	
_____	_____	7. _____	
_____	_____	8. _____	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) Weather would not allow work on roof all day.
- 2) CARPENTERS CONTINUE WEATHER ENCLOSURES.
- 3) BERK WORKED HALF A DAY MOVING SCAFFOLD. THE GROUND IS TOO WET YET.
- 4) STILL HAVEN'T DONE ANY SITE WORK.
- 5) KEVIN GRADED THE ROOF PITS.

WCM-015 WHITE - Project Manager CANNARY - Superintendent



DAILY LOG

PROJECT Wabtrinter Bond DATE October 29, 1984

WEATHER CONDITIONS

Temperature: High 60 : Low 35
Precipitation: Inches _____ Rain _____ Snow _____
Condition: Clear (P) Partly Cloudy _____ Overcast _____SIGNATURE Raymond

SAFETY

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

MATERIALS

Cost Code	Ticket No.

SUBCONTRACTORS

Company	No. Men
1. WCM - 7	D & D - 20
2. O'DANNIEL - 3	Heat/Power - 1
3. RIVIERA - 2	BRUNDAGE - 1
4. HELM - 4	AHW - 2 Half Day
5. DERICH - 7	NOBINSTAR - 2
6. CBC - 6	

EQUIPMENT RENTAL	DATE IN	DATE OUT	SUPPLIER	REMARKS

- 1) O'DANNIEL TAPPED ROOF DRAINS INTO STORM ON EAST SIDE OF BLDG.
- 2) Helm finished duct supports on the roof.
- 3) Riviera doing rough ins on floors.
- 4) No. 12's up on 3rd floor & 1st floor on rough ins.
- 5) Boonin on west side of the building and on the columns on the south side.
- 6) D & D framed 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 178 CF total for day.
- 7) Kevin was sick today.
- 8) AHW started packing out & the roof.
- 9) CBC finished 2/3 of roof.
- 10) Called Muller on return credit for full 100 lb square lathe.
- 11) Called to Kevin Hester on picking up vital items.

WCM-218

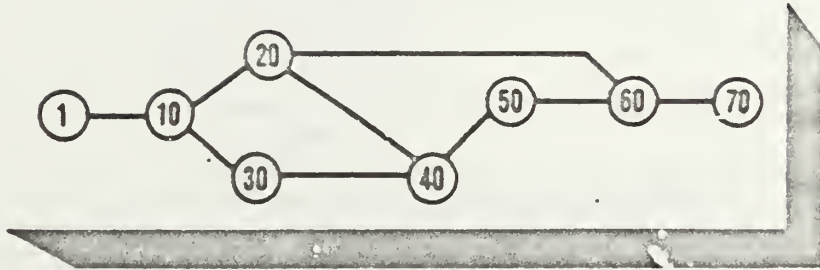
WHITE - Project Manager

CANNON - 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) 481-6996/Telex #791237 NAMICA GD

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 2, 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 "Tree 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 "mouse-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 40K 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), CPM-86 (tm), MSDOS (tm), or PC/DOS (tm) operating systems.

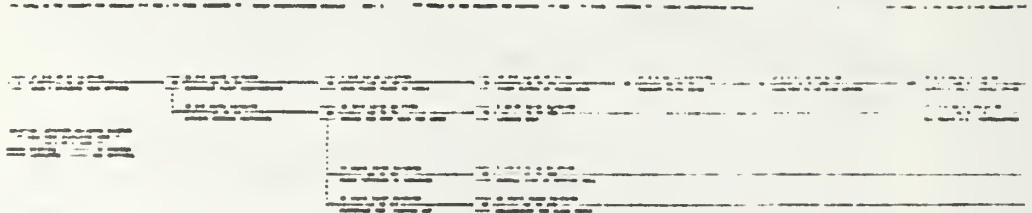
dBASE II IS A TRADEMARK OF Ashton-Tate. CPM & MP/M ARE TRADEMARKS OF DIGITAL RESEARCH.

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.



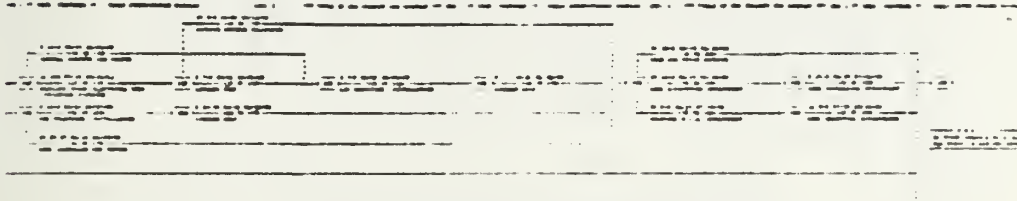
ACTIVITY REPORT — keystone of the system's reporting capabilities:

- Allows you to select primary, secondary, and/or tertiary sort from early start, early finish, late start, late finish, responsibility, cost 1, cost 2, 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 subtotals 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 customized choices are summarized at the end of the report.
- A Schedule Only Report can be displayed on the screen.

ACTIVITY	START	FINISH	DURATION	STATUS	CRITICAL	ACTUAL COST	BUDGETED COST
1	01-01-80	01-15-80	14	Completed		1000	1000
2	01-15-80	02-01-80	17	Completed		1500	1500
3	01-15-80	02-15-80	31	Completed		2000	2000
4	02-01-80	02-15-80	14	Completed		1000	1000
5	02-15-80	03-01-80	16	Completed		1200	1200
6	02-15-80	03-15-80	30	Completed		1800	1800
7	03-01-80	03-15-80	14	Completed		1000	1000
8	03-15-80	04-01-80	17	Completed		1500	1500
9	03-15-80	04-15-80	31	Completed		2000	2000
10	04-01-80	04-15-80	14	Completed		1000	1000
11	04-15-80	05-01-80	16	Completed		1200	1200
12	04-15-80	05-15-80	30	Completed		1800	1800
13	05-01-80	05-15-80	14	Completed		1000	1000
14	05-15-80	06-01-80	17	Completed		1500	1500
15	05-15-80	06-15-80	31	Completed		2000	2000

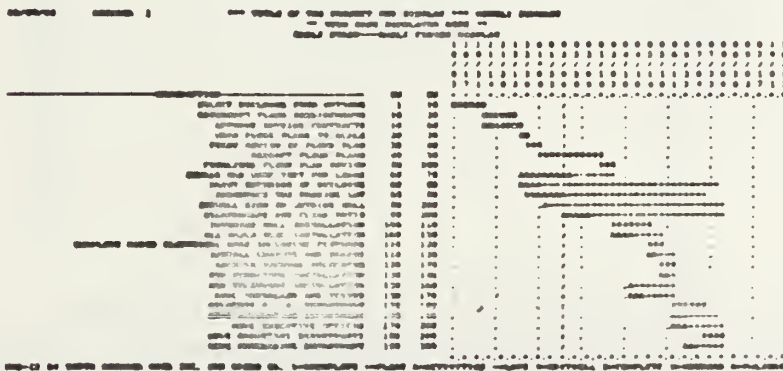
Reproduced from
best available copy.

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 control 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).



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:

ACTIVITY VALUE OF WORK

1. VALUE OF THE BUDGET (100% COMPLETE) VS ACTUAL COST

ACTIVITY	BUDGET	ACTUAL	PERCENT COMPLETE	DATE
1000	10,000	10,000	100%	12/31/80
2000	20,000	15,000	75%	12/31/80
3000	30,000	25,000	83%	12/31/80
4000	40,000	35,000	88%	12/31/80
5000	50,000	45,000	90%	12/31/80
6000	60,000	55,000	92%	12/31/80
7000	70,000	65,000	93%	12/31/80
8000	80,000	75,000	94%	12/31/80
9000	90,000	85,000	94%	12/31/80
TOTAL	400,000	370,000		

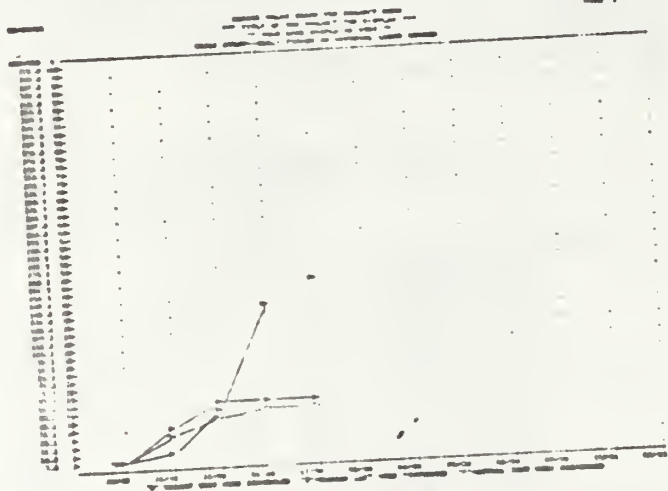
1. Value of work accomplished by activity as a function of budgeted amounts, percent complete, and actual.

ACTIVITY VALUE OF WORK

2. BUDGETED, EARNED, AND ACTUAL AMOUNT BY MONTH FOR ALL ACTIVITIES

ACTIVITY	BUDGET	EARNED	ACTUAL	PERCENT COMPLETE	DATE
1000	10,000	10,000	10,000	100%	12/31/80
2000	20,000	15,000	15,000	75%	12/31/80
3000	30,000	25,000	25,000	83%	12/31/80
4000	40,000	35,000	35,000	88%	12/31/80
5000	50,000	45,000	45,000	90%	12/31/80
6000	60,000	55,000	55,000	92%	12/31/80
7000	70,000	65,000	65,000	93%	12/31/80
8000	80,000	75,000	75,000	94%	12/31/80
9000	90,000	85,000	85,000	94%	12/31/80
TOTAL	400,000	370,000	370,000		

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.



- 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 1111 reporting requirements), and 4) actual cost at actual start/finish.
- For activities that span more than one month, PMS-8 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

PAGE 1

*** TITLE OF THE PROJECT FOR DISPLAY ***
 ** FOUR BARS DISPLAYED BELOW **
 ALLOCATION METHOD - SPREAD OR MATERIAL LABOR DOLLARS

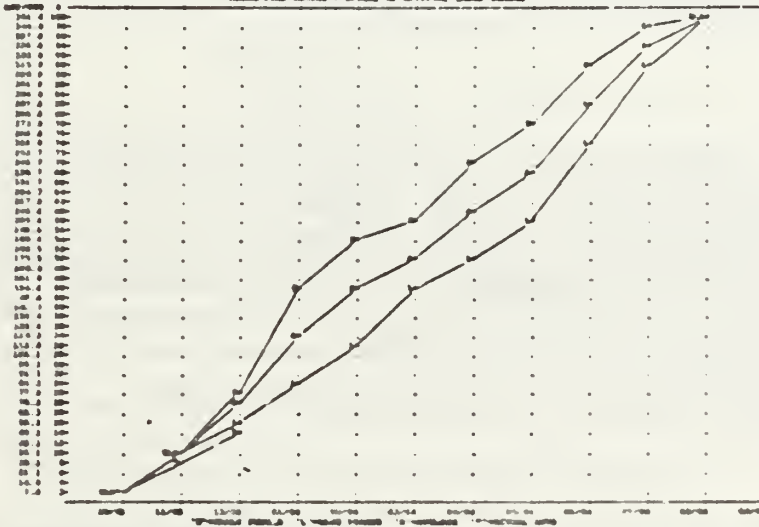
MONTH	EARLY FINISH			LATE FINISH			AVERAGE			ACTUAL		
	AMOUNT	ACCUM	TOTAL	AMOUNT	ACCUM	TOTAL	AMOUNT	ACCUM	TOTAL	AMOUNT	ACCUM	TOTAL
10/83	87.00	87.00	2.00	87.00	87.00	2.00	87.00	87.00	2.00	77.83	77.83	1.33
11/83	222.16	309.16	8.02	222.16	309.16	8.01	222.16	309.16	8.02	144.87	224.80	6.95
12/83	43.04	749.60	31.30	267.32	576.97	16.44	130.00	649.12	18.81	241.50	465.00	11.83
01/84	70.10	1309.60	81.00	252.14	829.11	32.83	508.74	1107.77	32.35	0	465.00	12.83
02/84	34.46	1654.06	91.27	262.67	1122.70	32.27	11.00	1301.11	41.77	0	465.00	13.81
03/84	140.00	1814.06	97.05	263.63	1386.33	61.20	2031.0	1704.47	50.32	0	465.00	13.43
04/84	300.00	2114.06	60.50	197.95	1714.28	60.84	2042.11	2000.00	50.71	0	465.00	11.81
05/84	212.00	2326.06	77.47	222.75	2037.00	54.83	2117.9	2270.0	61.75	0	465.00	12.81
06/84	453.00	2779.06	88.40	145.05	2382.05	73.54	490.40	1876.07	81.90	0	465.00	11.83
07/84	250.00	3029.06	97.44	100.00	2482.00	88.34	422.00	2300.00	84.81	0	465.00	13.83
08/84	7.00	3036.06	88.77	136.00	2618.00	95.05	190.11	2500.11	98.71	0	465.00	13.83

02/07/84

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

PAGE 2

 ** FOUR BARS DISPLAYED BELOW **
 ALLOCATION METHOD - SPREAD OR MATERIAL LABOR DOLLARS



Now, Do You Have The Resources To Accomplish The Schedule.

RMS II The Resource Management System For Big-Unit W/S's

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:

- Optimal 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 Approving Beyond National Capacity

Consolidated Allocation Report/Graph

01/07/84 *** CONSOLIDATED ALLOCATION REPORT *** PAGE 1
 CAPACITY 10 15.00 PER HOUR RESOURCE 1001
 FROM 12/11/83 TO 02/18/84

PROJECT	RES/HR	DATE	RESOURCE	RES/HR	SCAP	0-8-85	TOTALS	FROM	TO	LABOR	COSTS
DEMO	0	00	70	10	21	40	100	12/21/83	02/17/84	10,000	2,000
DEMO	0	20	00	30	42	10	300	12/18/83	01/11/84	1,500	3,050
DEMO	1	00	00	30	02	15	300	01/05/84	01/25/84	2,500	4,950
							1000			15,000	11,200

END OF RESOURCE ALLOCATION REPORT

01/07/84 *** CONSOLIDATED ALLOCATION REPORT *** PAGE 1
 CAPACITY 14 15.00 PER HOUR RESOURCE 1011
 FROM 12/11/83 TO 02/18/84

PROJECT	RES/HR	DATE	RESOURCE	RES/HR	SCAP	0-8-85	TOTALS	FROM	TO	LABOR	COSTS
DEMO	0	00	70	30	37	40	600	12/22/83	02/17/84	20,000	10,000
DEMO	1	20	00	30	30	10	300	12/18/83	01/11/84	1,500	3,050
DEMO	1	00	00	10	10	15	150	01/05/84	01/25/84	1,750	2,825
							1150			11,250	14,875

END OF RESOURCE ALLOCATION REPORT

GRAND TOTAL ALL RESOURCES 1250 56,250 10,375

RESOURCES CENTER INCLUDED : 1 1

RESOURCES *** CONSOLIDATED ALLOCATION GRAPH ***
 CONSOLIDATED CAPACITY 102 FROM 12/11/83 TO 02/18/84

DATE	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	TOTAL
12/11/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/12/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/13/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/14/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/15/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/16/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/17/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/18/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/19/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/20/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/21/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/22/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/23/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/24/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/25/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/26/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/27/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/28/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/29/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/30/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/31/83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/01/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/02/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/03/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/04/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/05/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/06/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/07/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/08/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/09/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/10/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/11/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/12/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/13/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/14/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/15/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/16/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/17/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/18/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/19/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/20/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/21/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/22/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/23/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/24/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/25/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/26/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/27/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/28/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/29/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/30/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/31/84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
02/01/84	0	0	0	0																											

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 GENE 1 *** MOVE TO A NEW DIVISION ***										PAGE 1	
LINE	QTY	UNIT	DESCRIPTION	UNIT	DATE	QTY	COST	DATE	QTY	COST	STATUS		
1	10	30	1000	DESP = CTK	SELECT BUILDING FROM OPTIONS						ACTIVE AND CRITICAL		
				ORD-10 1	EARLY = 10/03/83	11/07/83	300	000	7700	PLD			
				ORD-20 2	LATE = 10/03/83	11/07/83	220	070	1000	ACT			
				ORD-30 3	ACTUAL = 10/03/83	11/07/83	-20	610	0700	VAR			
				ORD-400	TOTAL/PMS PLANT = 0 / 0								
VENDOR P. O. #													
33	1300		1 0-300*	0 SIZE GRAPH PAPER	PE 06/12/83	3	00	00/00/83	7	00	CLOSED		
33	1301		0 PM-123	WRAP PAPER 941-PULL	EA 09/12/83	1	30	00/00/83	7	30	CLOSED		
13	12-000000		54	PRINTS	ONE PRINTS AS SPEC	EA 06/12/83	10	10	10/01/83	10	CLOSED		
102	2712		7	SERVICES	SLIPTING	WB 06/12/83	7	100	10/01/83	7	CLOSED		
TOTAL/PMS PLANT = 113 / 0													
VENDOR P. O. #													
60	00	30	200	DESP = PE	REPLACE THE PAVING LOT						CRITICAL		
				ORD-10 1	EARLY = 12/27/83	02/07/84	0100	000	710	PLD			
				ORD-20 0	LATE = 00/11/80	07/17/84	0	0	0	ACT			
				ORD-400	ACTUAL = 12/27/83		0	0	0	VAR			
				ORD-400	TOTAL/PMS PLANT = 113 / 0								
VENDOR P. O. #													
33	1304		2	ADPH-001	ADPH/APP 1	APPHAL	70	01/17/84	10	3000	PAST DUE	12	
33	1304		0	ADPH-10	PELLOROP AD	ADPHAL	00	02/00/84	10	00	ADPH-10	10	
21	1100		12	SERVICES	ADPH 1	ADPHAL	00	01/17/84	1	1000	PAST DUE	12	
22	1302		12	SERVICES	ADPH 1	ADPHAL	00	01/17/84	1	000	ADPH-10	10	
TOTAL/PMS PLANT = 113 / 0													

ACTIVITY REPORT WITH MATERIAL ALLOCATIONS —

- Provides the details of all material allocations for each activity, showing delivery schedule and status.
- Highlights allocations 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.

And when you get tired of running PMS-II yourself

BPS-II

THE PROBLEM:

When you first get your FMS-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 Road, Suite 100
San Diego, California 92121

NATIONAL MICRO-TEK, INC.

(619) 481-5938
Telex: 8701257 NAMIC-11



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

NORTH AMERICA MICA, INC
MICA

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 rings 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.

Vendor	Invoice No./WCM Labor	Cost
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 Walters Construction Management, Inc.
 By David M. Metcalf
 David M. Metcalf/Project Manager

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

WCM-21 (8/83)

PROJECT CODE PI TYPE FUND / CLIENT EST. NO. / DISBURSE COST DEBIT GEN. LEDG
 NO. NO. NO. NO. NAME C/L TRANS. REPORT REPORT NO. ACCT. NO.

2710 WIND OFFICE FTR

(CONTINUED)

2710	01	01	LAB. 001704	0134.68	F202-0171	300001P
2710	01	01	CS. 1001504	046.00	F202-0172	301001P
2710	01	01	LAB. 002104	01329.95	F204-0173	300001P
2710	01	01	CS. 1002104	1001.99	F204-0174	301001P
2710	02	02	CONCRETE, INC.	23512	PJ02-0229	302001P
2710	02	02	SUPERIOR REFRIG. ICE CO.	0204.76	PJ02-0232	302001P
2710	02	02	SUPERIOR REFRIG. ICE CO.	0149.50	PJ02-0234	302001P
TOTAL FOR CODE - 2710 -				52816.64		
2713	03	03	ONE ENGINEERING, INC	0014.00	PJ02-0227	303001P
2713	03	03	ONE ENGINEERING, INC	01210.00	PJ02-0229	303001P
TOTAL FOR CODE - 2713 -				02024.00		
1900	03	03	INDUSTRIAL CONST & SUPPLY	010100.00	PJ02-0221	303001P
1900	03	03	F'DONNELL PLUMBING CO.	010100.00-	PJ02-0236	303001P
TOTAL FOR CODE - 1900 -						
2030	00	00	..... JI 29	022.71-	CL01-0012	303001P
TOTAL FOR CODE - 2030 -				022.71-		
TOTAL FOR PROJECT - 2710 -				012040.90		

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	GOVT TOTAL	
1000										
23932	COLGRETTE KEVIN ROBER	LABORER	6.00		83.40			23.64		
				6.00		83.40		23.64	23.64	111.12
TOTAL FOR CODE	1000		6.00	6.00	83.40		83.40	23.64	23.64	111.12
2500										
77500	SOLLECKEY, JAMES R	LABORER	32.00		208.00			86.40		
				32.00		208.00		86.40	86.40	374.40
88400	BOOB (ERRICK) STEWART	LABORER	16.00		132.00			43.68		
				16.00		132.00		43.68	43.68	197.68
TOTAL FOR CODE	2500		48.00	48.00	440.00		440.00	132.00	132.00	572.00
2510										
19450	BROWN PHILIP JOHN	COMPONENTS-REC	8.00		154.68			46.40		
				8.00		154.68		46.40	46.40	201.08
TOTAL FOR CODE	2510		8.00	8.00	154.68		154.68	46.40	46.40	201.08
TOTAL FOR PROJECT	3710		62.00	62.00	680.16		680.16	204.04	204.04	884.20

JOB CODE	EMP NO.	EMPLOYEE NAME	CRAFT CODE	— J O B S —		— C O M P E N S A T I O N —		— S U B J E C T —		TOTAL LABOR COST RESP.
				REGULAR OPERATIVE	*TOTAL*	REGULAR OPERATIVE	TRAVEL NON-TRAVEL	*TOTAL*	COMPANY PROJECT		CRAFT *TOTAL*
1009										
	23762	CALCOTT HEVIN BAKER LADNER		8.00		185.20		31.56		
					8.00		185.20	31.56	31.56	136.76
TOTAL FOR CODE 1009				8.00		185.20		31.56	31.56	136.76
					8.00		185.20	31.56	31.56	136.76
1479										
	23766	CHICKEN WELCHER S LADNER		4.00	4.00	66.00		19.00		
	77588	BELLECHER, JAMES S LADNER		2.00		19.00		12.50		
				2.00	4.00	27.00		45.50	13.50	58.50
	87223	YONG ROBERT S LADNER		4.00		41.00		12.50		
					4.00	41.00		41.00	12.50	53.50
TOTAL FOR CODE 1479				6.00		55.00		45.50	45.50	197.60
				4.00	12.00	55.00		45.50	45.50	197.60
2229										
	23762	CALCOTT HEVIN BAKER LADNER		16.00		219.40		63.12		
					16.00	219.40		63.12	63.12	273.52
TOTAL FOR CODE 2229				16.00		219.40		63.12	63.12	273.52
					16.00	219.40		63.12	63.12	273.52
2389										
	23766	CHICKEN WELCHER S LADNER		8.00		82.00		25.50		
					8.00	82.00		25.50	25.50	114.00
	77588	BELLECHER, JAMES S LADNER		38.00		278.00		81.00		
					38.00	278.00		81.00	81.00	391.00
	88448	BOYD EDWARD STEWART LADNER		4.00		35.00		11.40		
					4.00	35.00		38.00	11.40	49.00
	87223	YONG ROBERT S LADNER		44.00		451.00		133.50		
					44.00	451.00		451.00	133.50	584.50
TOTAL FOR CODE 2389				54.00		847.00		254.10	254.10	1,101.10
					54.00	847.00		254.10	254.10	1,101.10
2319										
	18323	BLAZER JOHNSON	COMPONENTS-RES	24.00		434.04		128.21		
					24.00	434.04		434.04	128.21	562.25
	19468	BEHR FELIP JOHN	COMPONENTS-RES	22.00		618.72		188.62		
					22.00	618.72		618.72	188.62	807.34
	23766	CHICKEN WELCHER S LADNER		16.00		176.00		62.79		
				2.00	18.00	23.00		289.00	62.79	271.79
	75878	SCHLETER JOHN S	COMPONENTS-RES	27.50		672.19		203.46		
					27.50	672.19		673.19	203.46	876.65
TOTAL FOR CODE 2319				107.50		1,785.95		561.99	561.99	2,347.94
				2.00	111.50	1,785.95		561.99	561.99	2,347.94



COMESCO INC.

A Division of The Quanta Co.
Marketing Address: P.O. Box 17227 • Denver, Colo. 80217
Office and Plant: 120 South Bascom Rd. Dring • Davis, Ca. 95622
Tel: (303) 777-3083

SOLD TO: WALTERS CONST MGMT INC
7951 E MAPLEWOOD AVE
SUITE 200
ENGLEWOOD CO 80111

INVOICE

DATE ORDERED	DATE DELIVERED	INVOICE NO
08/22/84	08/22/84	023512
CUSTOMER ORDER NUMBER		

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

FILE NO.	INVOICE DATE	WRITTEN BY	ENTERED BY	CASH	SHIP	OTHER
31	08/22/84	SRP	SRP	X		

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

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

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

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

QUANTITY	UNIT	ITEM NO. / DESCRIPTION	SHIPPED	BACK ORDERED	PRICE	UNIT	AMOUNT
1	LOT	MS529 TURB IMLEIS EXTRA TO CONTRACT	1		675.00	LOT	675.00

RECEIVED

AUG 24 1984

CUSTOMER SERVICE

YOU MAY DEDUCT \$6.75 IF PAID BY 9/10/84			
SUB TOTAL	CREDIT OR MONTH	DELIVERY	ON POST
675.00	0	0.00	0.00
TOTAL		675.00	0.00
PAY THIS AMOUNT		675.00	

THANK YOU

W Mix Co.
 Plant Brighton
 11755 Brighton Rd.
 Brighton, Mich. 48116
 Date 4/8/82

3710 - 2510
 42 CY
 2510

QTY	CONCRETE	PRICE	AMOUNT
42	BAR CY TYPE D BOX TYPE 2	52.50	2362.50
	AIR ENTRAINMENT		
	POZZOLITH 322 344 EARLY		
	CALCIUM CHLORIDE		
	USE CURB GUTTER PAVING PLATWORK FLOOR		
	MAX BUMP PUMP MIX		
	SERVICE CHARGE: FOR LOADS ORDERED LESS THAN 4 CU YDS		
	Waiting Time To Unload This Load		
	Rate of \$39.00 per hour (85¢ per min) for any part thereof for unloading time over 11 P.M. 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		
	STATE TAX		
	CITY TAX		
	RTD TAX		
	COUNTY TAX		
	SUB TOTAL		
	WAITING TIME		
	TOTAL CHARGE		

CAUTION: Freshly mixed concrete contains of ground glass which may cause skin injury and is highly caustic. Do not breathe dust or fumes. Do not get concrete on your face, eyes, or clothing. If you get concrete on your face, eyes, or clothing, wash immediately with water and get prompt medical attention. KEEP OUT OF REACH OF CHILDREN.

Suburban
 Plant Brighton
 11755 Brighton Rd.
 Brighton, Mich. 48116
 Date 4/8/82

3710 - 2510
 42 CY
 2510

QTY	CONCRETE	PRICE	AMOUNT
42	BAR CY TYPE D BOX TYPE 2	52.50	2362.50
	AIR ENTRAINMENT		
	POZZOLITH 322 344 EARLY		
	CALCIUM CHLORIDE		
	USE CURB GUTTER PAVING PLATWORK FLOOR		
	MAX BUMP PUMP MIX		
	SERVICE CHARGE: FOR LOADS ORDERED LESS THAN 4 CU YDS		
	Waiting Time To Unload This Load		
	Rate of \$39.00 per hour (85¢ per min) for any part thereof for unloading time over 11 P.M. 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		
	STATE TAX		
	CITY TAX		
	RTD TAX		
	COUNTY TAX		
	SUB TOTAL		
	WAITING TIME		
	TOTAL CHARGE		

CAUTION: Freshly mixed concrete contains of ground glass which may cause skin injury and is highly caustic. Do not breathe dust or fumes. Do not get concrete on your face, eyes, or clothing. If you get concrete on your face, eyes, or clothing, wash immediately with water and get prompt medical attention. KEEP OUT OF REACH OF CHILDREN.

Plant
Brighton
11755 Brighton Rd.
Phone 421-0720

Plant
Brighton
11755 Brighton Rd.
Phone 421-0720

Order No. 3710-251
Date 8-24-87

Customer's Name
J. C. Walters

Job Address
92nd & Spaulding

QTY	CONCRETE	PRICE	AMOUNT
2 1/4	CONCRETE BAX TYPE 2	52.50	124.38

CONCRETE
BAX TYPE 2

CONCRETE
BAX TYPE 2

CONCRETE
BAX TYPE 2

CONCRETE
BAX TYPE 2

CONCRETE
BAX TYPE 2

Plant
Brighton
11755 Brighton Rd.
Phone 421-0720

Plant
Brighton
11755 Brighton Rd.
Phone 421-0720

Order No. 3710
Date 8-24-87

Customer's Name
J. C. Walters

Job Address
92nd & Spaulding

QTY	CONCRETE	PRICE	AMOUNT
2 1/4	CONCRETE BAX TYPE 2	52.50	124.38

CONCRETE
BAX TYPE 2

CONCRETE
BAX TYPE 2

CONCRETE
BAX TYPE 2

CONCRETE
BAX TYPE 2

CONCRETE
BAX TYPE 2

BALANCE SHEET - 1964

PAGE 2

9/21/64

PROJECT CASE FE TYPE NUMBER / CLIENT EST. NO. / ---BUDGET--- ---COST--- ---BUDGET--- ---COST--- ---BUDGET--- ---COST---
 NO. NO. NO. NO. NAME C/A PHONE AMOUNT AMOUNT

2710 27100 OFFICE PARK

1230 01 LBS. 079204 622.23 F202-01 07 200001 P
 1230 01 CS. 2092004 99.68 F202-01 08 201001 P
 TOTAL FOR CASE - 1230 - 721.91

1470 01 LBS. 079704 627.38 F202-01 17 200001 P
 1470 01 CS. 2097004 99.71 F202-01 18 201001 P
 TOTAL FOR CASE - 1470 - 727.09

1900 03 A. C. ROBERTSON, INC. 4818 673.00 F300-01 03 200001 P
 TOTAL FOR CASE - 1900 - 673.00

2210 01 LBS. 079204 616.00 F204-01 03 200001 P
 2210 01 CS. 2092004 69.28 F204-01 06 201001 P
 TOTAL FOR CASE - 2210 - 685.28

2220 01 LBS. 079704 626.23 F202-01 19 200001 P
 2220 01 CS. 2097004 619.46 F202-01 20 201001 P
 2220 01 LBS. 079204 628.00 F204-01 07 200001 P
 2220 01 CS. 2092004 604.60 F204-01 08 201001 P
 TOTAL FOR CASE - 2220 - 688.66

2200 01 LBS. 079204 642.23 F201-01 17 200001 P
 2200 01 CS. 2092004 612.38 F201-01 18 201001 P
 2200 01 LBS. 079704 674.48 F202-01 01 200001 P
 2200 01 CS. 2097004 623.24 F202-01 02 201001 P
 2200 01 LBS. 0791004 638.00 F202-01 73 200001 P
 2200 01 CS. 2091004 613.76 F202-01 74 201001 P
 2200 03 O'NEILL PLUMBING CO 8787 67000.00 F301-01 01 072001 P
 2200 03 O'NEILL PLUMBING CO 8787 62598.00 F301-01 07 200001 P
 TOTAL FOR CASE - 2200 - 61860.99

2300 01 LBS. 079204 6272.42 F201-01 19 200001 P
 2300 01 CS. 2092004 6741.73 F201-01 20 201001 P
 2300 01 LBS. 079704 61688.31 F202-01 03 200001 P
 2300 01 CS. 2097004 6009.49 F202-01 04 201001 P
 2300 01 LBS. 0791004 61778.20 F202-01 73 200001 P
 2300 01 CS. 2091004 6021.17 F202-01 76 201001 P
 2300 02 JE 803 6719.13 CLM-01 03 200001 P
 2300 02 CS SUPPLY 20101 637.24 F204-01 03 200001 P
 2300 02 CS SUPPLY 20101 607.04 F204-01 08 200001 P

PROJECT CASE PT TYPE ORDER / CLIENT NO. IN. / INVOICE COST BUDGET GEN. / LINE
 NO. NO. NO. NO. NAME C/L TRANS. REPORT BUDGET ID. ID. ACCY. NO.

1710 WPLAND OFFICE PARK

CONTINUED

2310	02	SHAWNEE BEHE EEE CO.	STRT	6139.99	2300-0121	302001P
2310	02	SHAWNEE BEHE EEE CO.	STRT	6113.26	P300-0123	302001P
2310	02	SHAWNEE BEHE EEE CO.	STRT	6217.26	P300-0123	302001P
2310	02	SHAWNEE BEHE EEE CO.	STRT	6176.77	P300-0123	302001P
2310	02	SHAWNEE BEHE EEE CO.	STRT	6426.23	P300-0126	302001P
2310	02	YOE & SICKM SUPPLY INC.	7106	943.91	P300-0146	302001P
2310	04	CCS SUPPLY	30990	616.36	P300-0046	304001P
2310	04	CCS SUPPLY	30990	612.00	P300-0047	304001P

CANNOT LOCATE COPY OF STATEMENT

TOTAL FOR CASE - 2310 -

59916.74 → 7,124.4

2310	02	SHAWNEE BEHE EEE CO.	1992	6647.00	P300-0217	302001P
2310	02	SHAWNEE BEHE EEE CO.	1992	6294.00	P300-0218	302001P

TOTAL FOR CASE - 2310 -

12941.00

2460	02	SHAWNEE BEHE EEE CO.	1	61612.00	P300-0048	302001P
2460	02	ZIC ZAG CONCRETE SERVICES C	10010	693.00	P300-0172	302001P

TOTAL FOR CASE - 2460 -

618212.00

2620	02	ZIC ZAG CONCRETE SERVICES C	10010	690.00	P300-0174	302001P
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TOTAL FOR CASE - 2620 -

690.00

2620	02	SHAWNEE BEHE EEE CO.	1992	6421.00	P300-0219	302001P
2620	02	ZIC ZAG CONCRETE SERVICES C	10000	6160.00	P300-0171	302001P
2620	02	ZIC ZAG CONCRETE SERVICES C	10000	6030.00	P300-0173	302001P

TOTAL FOR CASE - 2620 -

61491.00

2720	04	.....	LIN. 000004	6216.40	P300-0145	300001P
2720	04	.....	CS. 100004	663.12	P300-0146	301001P
2720	02	SHAWNEE BEHE EEE CO.	1992	6986.00	P300-0216	302001P

TOTAL FOR CASE - 2720 -

61279.52

2730	04	.....	LIN. 000004	6167.00	P300-0149	300001P
2730	04	.....	CS. 100004	622.10	P300-0150	301001P
2730	02	SHAWNEE BEHE EEE CO.	STRT	61298.91	P300-0124	302001P
2730	02	SHAWNEE BEHE EEE CO.	STRT	6301.73	P300-0129	302001P
2730	02	SHAWNEE BEHE EEE CO.	STRT	6401.97	P300-0134	302001P
2730	02	SHAWNEE BEHE EEE CO.	STRT	61667.73	P300-0136	302001P
2730	02	SHAWNEE BEHE EEE CO.	STRT	6047.12	P300-0141	302001P
2730	02	SHAWNEE BEHE EEE CO.	STRT	61337.32	P300-0142	302001P
2730	02	SHAWNEE BEHE EEE CO.	STRT	61639.00	P300-0144	302001P

TOTAL FOR CASE - 2730 -

66675.13

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									
23952	COLQUHITT KEVIN ROBER	LABORER	16.00		210.00			63.12	
				16.00		210.00		63.12	273.32
TOTAL FOR CODE 1000			16.00	16.00	210.00		63.12	63.12	273.32
				16.00		210.00		63.12	273.32
2215									
23948	CORCHIN BELCHER S	LABORER	8.00		88.00			26.40	
				8.00		88.00		26.40	114.40
88600	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		49.20	49.20	213.20
				16.00		164.00		49.20	213.20
2303									
23948	CORCHIN BELCHER S	LABORER	8.00		88.00			26.40	
				8.00		88.00		26.40	114.40
77000	SULLIVANTS, JAMES S	LABORER	8.00		72.00			21.60	
				8.00		72.00		21.60	93.60
88600	BOSS EDWARD STEWART	LABORER	8.00		76.00			22.00	
				8.00		76.00		22.00	98.00
87225	YOUNG ROBERT E	LABORER	21.00		215.25			64.50	
				21.00		215.25		64.50	279.75
TOTAL FOR CODE 2303			45.00	45.00	491.25		133.20	133.20	306.63
				45.00		491.25		133.20	306.63
2318									
6325	BLONDE JONAS	CARPENTER-HEI	40.00		723.40			217.02	
				40.00		723.40		217.02	940.42
9450	BRINE PHELIP JOHN	CARPENTER-HEI	32.00		618.72			185.62	
				32.00		618.72		185.62	804.34
23952	COLQUHITT KEVIN ROBER	LABORER	16.00		210.00			63.12	
				16.00		210.00		63.12	273.32
23948	CORCHIN BELCHER S	LABORER	16.00		176.00			52.00	
				16.00		176.00		52.00	228.00
73000	SCHELETER JOHN S	CARPENTER-HEI	40.00		723.40			217.02	
				40.00		723.40		217.02	940.42
87225	YOUNG ROBERT E	LABORER	2.00		20.50			6.15	
				2.00		20.50		6.15	26.65
TOTAL FOR CODE 2318			146.00	146.00	2,472.42		741.73	741.73	3,214.15
TOTAL FOR PROJECT 3718			223.00	223.00	3,290.67		909.43	909.43	4,200.10
				223.00		3,290.67		909.43	4,200.10

COST CODE EMP NO.	EMPLOYEE NAME	CRAFT DESC.	---BURD---		---COMPENSATION---			---BURDEN---		TOTAL LABOR AND BURDEN
			REGULAR OVERTIME	*TOTAL*	REGULAR OVERTIME	TAXABLE NON-TAXABLE	*TOTAL*	COMPANY PROJECT	CRAFT *TOTAL*	
89225	YOUNG ROBERT E	LABORER	.50		5.13			1.54		
TOTAL FOR CODE 2745			53.00	50	737.92		9.13	229.33		6.67
			1.00	54.00	26.56		764.40	229.33		973.83
2510										
13325	ALLEN JONAS	CARPENTERS-RES	24.00		434.04			130.21		
TOTAL FOR CODE 2510			24.00	24.00	434.04		434.04	130.21		564.25
19458	BURKH PHILIP JOHN	CARPENTERS-RES	16.00		309.36			92.81		
TOTAL FOR CODE 2510			16.00	16.00	309.36		309.36	92.81		402.17
23952	CALDWELL KEVIN ROGER	LABORER	16.00		210.40			63.12		
TOTAL FOR CODE 2510			16.00	16.00	210.40		210.40	63.12		273.52
23940	CORRIGAN BELCOUR B	LABORER	9.00		80.00			26.40		
TOTAL FOR CODE 2510			9.00	9.00	80.00		80.00	26.40		114.40
75040	SENGLETON JOHN S	CARPENTERS-RES	29.50		533.31			160.05		
TOTAL FOR CODE 2510			29.50	29.50	533.31		533.31	160.05		693.56
89225	YOUNG ROBERT E	LABORER	12.00		123.00			36.90		
TOTAL FOR CODE 2510			103.50	103.50	1,690.31		1,690.31	509.49		2,207.80
2725										
23952	CALDWELL KEVIN ROGER	LABORER	16.00		210.40			63.12		
TOTAL FOR CODE 2725			16.00	16.00	210.40		210.40	63.12		273.52
TOTAL FOR PROJECT 3710			247.90	15.00	3,796.21		210.40	63.12		273.52
			1.00	248.90	26.56		3,422.77	1,826.63		4,449.60

COST CODE F/P NO. EMPLOYEE NAME	CRAFT DESC.	HOURS		COMPENSATION		BUDGET		TOTAL LABOR AND BURDEN
		REGULAR OVERTIME	TOTAL*	REGULAR NON-TAXABLE	TOTAL*	CRAFT PROJECT	CRAFT TOTAL*	
1030								
23928 OILBETT KEVIN ROSE LAMMER		14.00		210.00		63.12		
TOTAL FOR CASE 1030		14.00	16.00	210.00	210.00	63.12	63.12	273.32
			16.00		210.00		63.12	273.32
1230								
36400 BICKELT'S LARRY LEO LAMMER		0.00		05.00		23.00		
TOTAL FOR CASE 1230		0.00	0.00	05.00	05.00	23.00	23.00	111.00
			0.00	05.00	05.00		23.00	111.00
2300								
23940 CHURCH WELCH S LAMMER		0.00		08.00		26.00		
77300 CALLECCIA, JAMES B LAMMER		14.30		130.30		39.13		
00400 BIRD EDWARD STEWART LAMMER		16.00		132.00		43.60		
09223 YOUNG ROBERT E LAMMER						4.61		
TOTAL FOR CASE 2300			1.00	13.30	13.30	4.61	4.61	19.99
		26.30		370.30		113.76		
		26.30	39.30	13.30	330.00	113.76	113.76	501.64
2510								
14323 BLISS JENNIS COMPENSATION			33.00	396.01		179.04		
19400 BRINER PHILIP JOHN COMPENSATION			23.00	444.04		147.74		
73000 BRIDGEMAN JOHN S COMPENSATION			23.00	23.43		492.47		
00400 BIRD EDWARD STEWART LAMMER			22.00	570.72		181.30		
00400 BIRD EDWARD STEWART LAMMER			2.00	28.33		600.27		
TOTAL FOR CASE 2510			80.00	1,719.57		531.16		
		2.00	99.00	54.26	1,770.33	531.16	531.16	2,301.71
3700								
36400 BICKELT'S LARRY LEO LAMMER		4.00		43.00		12.90		
TOTAL FOR CASE 3700		4.00	4.00	43.00	43.00	12.90	12.90	55.90
			4.00		43.00		12.90	55.90
TOTAL FOR PROJECT 2710		163.30	164.30	2,423.47	2,493.33	748.74	748.74	3,244.57
		2.00		70.26				



DELIVERY ADDRESS

THE BROOMFIELD LUMBER CO., Inc.

LUMBER, HARDWARE, PAINT, GLASS, STEEL

7975 W. 120th

P.O. BOX 308

Phone 485-2387

BROOMFIELD, COLO. 80020

7711

Date 8-14-84

Watters CM

OUR CREDIT POLICY: Terms are 2% 10th, Net 30th. Discounts are not allowed on new shipments, full expense, full terms, 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 25th of the month following billing will be assessed. Additionally, account charges and privileges will be suspended until the unpaid balance is cleared up. If this account is charged for collection, the customer agrees to pay reasonable attorney's fees.

Quantity	Description	Unit Price	Total
2	handles	26.15	52.30
1	plate	2.21	2.21
1	count down		8.45
2	Winn Baulawa	21.25	42.50
16	4x8 3/4 AC	20.75	332.00
24	2x4x12	3.36	80.64
6	1x4x12 #3	1.26	7.56
4	1x12x12 #3	6.84	27.36
16	2x4x16	4.54	72.64
			517.06

Received by *[Signature]*

SALES TAX	36.17
TOTAL	583.47

TERMS: Net 30th

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



Plant **Suburban Reddi Mix Co.** Plant **Brighton**
 Address **3400 Fontana** Mail **1388 Woodworth Avenue, Colo. 80022** Brighton **X**
6400 Fontana Phone **421-0720** 11755 Brighton Rd.

Order No. **3710** Date **8-22-84**
 Driver **Walter** City **Colorado**

Job **Handy Sheridan**
 Address

QTY.	CONCRETE	PRICE	AMOUNT
$\frac{1}{2}$ CY	1857 ^{EX} TYPE 1 SAX TYPE 2 3/4" ϕ	52.59	131.25

AIR ENTRAINMENT (YES)
 POZZUOLI 322 344 18 EARLY
 CALCIUM CHLORIDE %
 USE: CURB, GUTTER, PAVING, FOOTINGS WALLS, FLATWORK FLOOR
 MAX SLUMP 3 INCH
 SLUMP YR

SERVICE CHARGE: FOR LOADS LESS THAN 4 CY

Free Time To Unload This Load **18** MIN
 WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$39.00 PER HOUR (65¢ 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 GAL

Left Peak: 1:40	Arrived Job: 2:10	Finished Unloading: 2:30	STATE TAX	131.25
			CITY TAX	39.4
			RTD TAX	79
			COUNTY TAX	
			SUB TOTAL	135.98

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

CAUTION: Freshly mixed cement may cause skin injury. Avoid contact with eyes. If contact occurs, get into eyes immediately and wash eyes with water. If contact occurs, get into eyes immediately and wash eyes with water. If contact occurs, get into eyes immediately and wash eyes with water.

4/3/84
SUBURBAN REDDI MIX CO. ENTRY TO
WCH# 370-250 — JEA 28



CCS SUPPLY, INC.
 5150 FOX STREET
 DENVER, COLORADO 80218
 (303) 294-0150

INVOICE No 58101

RECEIVED
 SEP 10 1984

DATE 8/20/84

S
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T
O

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

S
H
I
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T
O

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.





CCS SUPPLY, INC.
 5150 FOX STREET
 DENVER, COLORADO 80218
 (303) 295-0150

INVOICE No 58188

RECEIVED

SEP 10 1984

DATE 9-21-84

BILL WALTERS
 2701 W. ...

S
O
L
D
T
O

Walter C.A. Construction
 5975 S. Syracuse #107
 Englewood, Co 80111

S
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Westminster bank

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



1-NT COPY

Plant
Alameda
8400 Fenlon

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

Driver
Duke To No 67
Cubic Yds. Ordered
18.18

Customer's
Order No.
Date
9-12-54

Walter C. M.
92 rd of Shandon

QTY	CONCRETE	PRICE	AMOUNT
2	CY 6" TYPE 1 SLX TYPE 2 7/8" M. V. USE CURB, GUTTER, PAVING, FOOTINGS, WALLS. MAX PUMP 4 INCH PUMP M.S. 1000	55.00	110.00
	AIR ENTRAINMENT YES		
	POZZOLITH 322 344 EARLY M		
	CALCIUM CHLORIDE USE CURB, GUTTER, PAVING, FOOTINGS, WALLS. 100% FULFILLED		
	MAX PUMP 4 INCH		
	PUMP M.S.		

SERVICE CHARGE: FOR LOADS ORDERED LESS THAN 4 CU YDS

First Time To Unload This Load: 14

WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$30.00 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

Left Plant: 2:42

Arrived Job: 3:05

Quits: 5:44

FINISHED UNLOADING: 3:35

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.

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

STATE TAX: 99.00
CITY TAX: 29.70
RFD TAX: 5.94
COUNTY TAX: 125.64
SUB TOTAL: 140.64
WAITING TIME: 14
TOTAL CHARGE: 154.64

Customer's Signature: *Walter C. M.*

8832

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 residues get into eyes, rinse immediately with water.

EA'S COPY
Reddi Mix Co.
11755 Brighton Rd.
Brighton, Calif. 94620
Phone 421-0720

9/12/84

3710-2510
INLET CONCRETE
2CY

0822

2 @ 55.00 = 110.00
3.6% = 3.96
WALL
\$113.96

QTY	CONCRETE	PRICE	AMOUNT
2	CY 6" TYPE 1 SLX TYPE 2 7/8" M. V. USE CURB, GUTTER, PAVING, FOOTINGS, WALLS. MAX PUMP 4 INCH PUMP M.S. 1000	55.00	110.00
	AIR ENTRAINMENT YES		
	POZZOLITH 322 344 EARLY M		
	CALCIUM CHLORIDE USE CURB, GUTTER, PAVING, FOOTINGS, WALLS. 100% FULFILLED		
	MAX PUMP 4 INCH		
	PUMP M.S.		

SERVICE CHARGE: FOR LOADS ORDERED LESS THAN 4 CU YDS

First Time To Unload This Load: 14

WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$30.00 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

Left Plant: 2:42

Arrived Job: 3:05

Quits: 5:44

FINISHED UNLOADING: 3:35

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.

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STATE TAX: 99.00
CITY TAX: 29.70
RFD TAX: 5.94
COUNTY TAX: 125.64
SUB TOTAL: 140.64
WAITING TIME: 14
TOTAL CHARGE: 154.64

Customer's Signature: *Walter C. M.*

8832

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 residues get into eyes, rinse immediately with water.

CUSTOMER'S COPY

Plant
Brighton
11755 Brighton Rd.
Armeds, Cal. 94042
Phone 421-0720

Order No. 3710-2510 Date 9-10 1958
City Orland

Name Walter S. ...
Job Address ...

QTY.	CONCRETE	PRICE	AMOUNT
4	MAX 2 BAX TYPE 2	53.50	214.00
	AIR ENTRAINMENT		
	POZZOLITH 32, 344 EARLY		
	CALCIUM CHLORIDE		
	USE CURB, GUTTER, PAVING, FOOTINGS, WALLS, FLOORWORK, FLOOR		
	MAX SLUMP		
	PUMP MIX		
	SERVICE CHARGE: FOR LOADS ORDERED LESS THAN 4 CU YDS		
	WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$39.00 PER HOUR 185¢ PER MIN FOR ANY PART THEREOF FOR UNLOADING TIME OVER FREE TIME WRITTEN AT LEFT		
	WATER ADDED TO THE MIX ON THE JOB WILL BE THE PURCHASER'S RESPONSIBILITY		
	STATE TAX		
	CITY TAX		
	ATO TAX		
	COUNTY TAX		
	BUS TOTAL		
	WAITING TIME		
	TOTAL CHARGE		

Suburban Ready Mix Co. assumes no responsibility for damages to the curb or property line if you designate driver to go on curb or property line. YOU WILL BE RESPONSIBLE FOR ANY DAMAGE THAT MAY OCCUR.

FINANCE CHARGE AT THE RATE OF 2% PER MONTH (APR 1958) WILL BE ON ALL ACCOUNTS NOT PAID WITHIN 30 DAYS FROM DATE OF PURCHASE.

Z 7946 Customer's Signature *Walter S. ...*

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

CUSTOMER'S COPY

Plant
Brighton
11755 Brighton Rd.
Armeds, Cal. 94042
Phone 421-0720

Order No. 3710 Date 9-10 1958
City Orland

Name Walter S. ...
Job Address ...

QTY.	CONCRETE	PRICE	AMOUNT
4	MAX 2 BAX TYPE 2	53.50	214.00
	AIR ENTRAINMENT		
	POZZOLITH 32, 344 EARLY		
	CALCIUM CHLORIDE		
	USE CURB, GUTTER, PAVING, FOOTINGS, WALLS, FLOORWORK, FLOOR		
	MAX SLUMP		
	PUMP MIX		
	SERVICE CHARGE: FOR LOADS ORDERED LESS THAN 4 CU YDS		
	WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$39.00 PER HOUR 185¢ PER MIN FOR ANY PART THEREOF FOR UNLOADING TIME OVER FREE TIME WRITTEN AT LEFT		
	WATER ADDED TO THE MIX ON THE JOB WILL BE THE PURCHASER'S RESPONSIBILITY		
	STATE TAX		
	CITY TAX		
	ATO TAX		
	COUNTY TAX		
	BUS TOTAL		
	WAITING TIME		
	TOTAL CHARGE		

Suburban Ready Mix Co. assumes no responsibility for damages to the curb or property line if you designate driver to go on curb or property line. YOU WILL BE RESPONSIBLE FOR ANY DAMAGE THAT MAY OCCUR.

FINANCE CHARGE AT THE RATE OF 2% PER MONTH (APR 1958) WILL BE ON ALL ACCOUNTS NOT PAID WITHIN 30 DAYS FROM DATE OF PURCHASE.

Z 7946 Customer's Signature *Walter S. ...*

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

CUSTOMER'S COPY

Suburban Redili Mix Co.
 Plant Brighton
 11765 Brighton Rd.
 Phone 421-0720

Order No. 47 Date 8-30
 Customer's Name Walter Con
 Order No. 8-30

QTY.	CONCRETE	PRICE	AMOUNT
34	1157 BAR TYPE 2 34	52.50	1785.00
AIR ENTRAINMENT POZZOLITH 322 344 EARLY CALCIUM CHLORIDE USE CURB OUTTER PAVING FLATWORK FLOOR MAX SLUMP 2 INCH PUMP MIX			
SERVICE CHARGE: FOR LOADS ORDERED LESS THAN 4 CU YDS WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$30.00 PER HOUR (\$55 PER MIN) OR ANY PART THEREOF FOR UNLOADING TIME OVER FREE TIME WRITTEN AT LEFT 23			
WATER ADDED ON JOB Job No. <u>15</u> Finished Unloading: <u>4</u> Gals 1140			
STATE TAX CITY TAX FTD TAX COUNTY TAX SUB TOTAL WAITING TIME TOTAL CHARGE			
TOTAL CHARGE <u>1767.77</u>			

Customer's Signature Walter Con
 7 7242
 CAUTION: Freshly mixed cement, mortar, concrete, or grout may cause skin injury. Avoid contact with skin. Wash thoroughly with soap and water immediately. If any cement materials get into eyes, rinse immediately and repeatedly with water and get prompt medical attention. KEEP OUT OF REACH OF CHILDREN.

STATEMENT COPY

Suburban Redili Mix Co.
 Plant Brighton
 11765 Brighton Rd.
 Phone 421-0720

Order No. 47 Date 8-30
 Customer's Name Walter Con
 Order No. 8-30

QTY.	CONCRETE	PRICE	AMOUNT
34	1157 BAR TYPE 2 34	52.50	1785.00
AIR ENTRAINMENT POZZOLITH 322 344 EARLY CALCIUM CHLORIDE USE CURB OUTTER PAVING FLATWORK FLOOR MAX SLUMP 2 INCH PUMP MIX			
SERVICE CHARGE: FOR LOADS ORDERED LESS THAN 4 CU YDS WAITING TIME WILL BE CHARGED FOR AT THE RATE OF \$30.00 PER HOUR (\$55 PER MIN) OR ANY PART THEREOF FOR UNLOADING TIME OVER FREE TIME WRITTEN AT LEFT 23			
WATER ADDED ON JOB Job No. <u>15</u> Finished Unloading: <u>4</u> Gals 1140			
STATE TAX CITY TAX FTD TAX COUNTY TAX SUB TOTAL WAITING TIME TOTAL CHARGE			
TOTAL CHARGE <u>1767.77</u>			

Customer's Signature Walter Con
 7 7242
 CAUTION: Freshly mixed cement, mortar, concrete, or grout may cause skin injury. Avoid contact with skin. Wash thoroughly with soap and water immediately. If any cement materials 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 1994

(303) 320-4573

INVOICE DATE BILL L. WALTERS - 27-89	SALES PERSON 7216
CONSTRUCTION MATERIALS 7191 Sheridan Blvd.	

TO Walters Co
 7951 E. Meplwood #200
 Englewood, Colo 80111

3710-2510

QTY. ORDERED	QTY. SHIPPED	DESCRIPTION	UNIT PRICE	TOTAL
1	1	1 1/4" N/Cs. Air	34.95	34.95
1	1	Can Rapidlap cutting fluid	6.75	6.75
				41.70
				1.26
				.25
				43.41

Roy D. Neal

A finance charge of 2% per month, equal to 24% 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



RECEIVED

INVOICE # 30990

SUPPLY, INC. 8150 FOX STREET DENVER, COLORADO 80216 (303) 233-0150
BILL L. WALTERS CONSTRUCTION MANAGEMENT, INC.

SEP 10 1984

DATE 8-21-84

SOLD TO

Walters C.M. Construction

SHIP TO

9191 N. Sheridan

OUR ORDER NO.	CUSTOMER ORDER NO.	SALESMAN	TERMS	SHIPPED VIA	Paid or Coll.
R1306	17112	2	NET 30		
QUANTITY	DESCRIPTION	PRICE	AMOUNT		
	Rental Equipment per attached	.10 @ amo	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
 5150 FOX
 DENVER, COLORADO 80214
 TELEPHONE 303-628-9120

RENTAL INVOICE

SOLD TO

Welding CM

Job 3700-2510 Q70

JOB LOCATION
 9191 W. Sheridan

DATE SHIPPED	CUSTOMER ORDER NUMBER	TERMS	INVOICE DATE	INVOICE NUMBER
	17112	15 TO DAYS-NET 30 DAYS	5-22-84	
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	TO	DATE	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



FCS SUPPLY, INC.
 5150 FOX STREET
 DENVER, COLORADO 80216
 (303) 236-0150

RECEIVED

INVOICE # 30938

SEP 10 1984

DATE 8/20/84

BILL WALTERS
 CONSTRUCTION MANAGEMENT, INC

S
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Walters CM

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O

9191 Sheridan

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

NO RETURNS ACCEPTED WITHOUT OUR WRITTEN PERMISSION - MAKE NO DEDUCTIONS FROM THIS INVOICE - IF RECEIVED RETURN AT ONCE.



CCS SUPPLY CO.
 DISTRIBUTORS OF CONSTRUCTION MATERIALS
 5130 FOX
 DENVER, COLORADO 80214
 TELEPHONE 303-420-9120

RENTAL INVOICE

job 3710-2510
Q20

SOLD TO: *Walters C M*
Job = 3700

JOB LOCATION
9191 Swinden Blvd

DATE SHIPPED	CUSTOMER ORDER NUMBER	TERMS	INVOICE DATE	INVOICE NUMBER
	<i>17108</i>	15 15 DAYS-NET 30 DAYS	<i>8-26-54</i>	
QUANTITY	DESCRIPTION			AMOUNT
<i>12 ea.</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	TO	DATE	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>Walters C M</i>				TRANSPORTATION IN
BY	TITLE	DATE	TOTAL	

ALL INSURANCE TO BE PROVIDED AT LESSEE EXPENSE

WALTERS CONST. EQUIPMENT -19-

PAGE 1

10/31/64

PROJECT CODE PZ TYPE VENDOR / CLIENT INV. NO. / ---INCOME--- ---COST--- BURET GEN./LISC
 NO. NO. NO. NO. NAME G/L TRAPR. ---AMOUNT--- ---AMOUNT--- NO. ACCT. NO.

PROJECT NO.	CODE NO.	PZ NO.	TYPE NO.	VENDOR / CLIENT NAME	INV. NO. / G/L TRAPR.	INCOME AMOUNT	COST AMOUNT	BURET NO.	GEN./LISC ACCT. NO.
3710 OFFICE FURN.									
1130		01		.....	L&S. 101404	9140.64		PR02-0103	500001P
1130		01		.....	CS. 2101404	942.19		PR02-0104	501001P
1130		00		.....	JE 13	9201.00		CL01-0410	500001P
1130		00		COUNTY LINE LAMSWELL	5045237	974.40		PJ03-0104	500001P
TOTAL FOR CODE - 1130 -						9438.23			
1160		02		OFFICE SUPPLY CO	3220	678.74		PJ04-0043	502001P
TOTAL FOR CODE - 1160 -						678.74			
1330		02		ALL PRODUCTS AND CHEMICAL	362 79051	917.82		PJ04-0034	502001P
TOTAL FOR CODE - 1330 -						917.82			
1330		01		.....	L&S. 100704	918.75		PR01-0177	500001P
1330		01		.....	CS. 2100704	63.23		PR01-0178	501001P
1330		01		.....	L&S. 101404	925.00		PR02-0100	500001P
1330		01		.....	CS. 2101404	88.06		PR02-0100	501001P
1330		01		.....	L&S. 102304	939.76		PR04-0101	500001P
1330		01		.....	CS. 2102304	99.23		PR04-0102	501001P
1330		02		WESTERN FASTENERS	604277	983.76		PJ04-0046	502001P
TOTAL FOR CODE - 1330 -						6172.67			
2200		03		EMERY CONSTRUCTION CO.	3709	94346.00		PJ05-0070	503001P
TOTAL FOR CODE - 2200 -						94346.00			
2210		03		NORTHWESTERN CONST	2902	61045.00		PJ05-0008	503001P
TOTAL FOR CODE - 2210 -						61045.00			
2220		04		.....	L&S. 100704	9187.00		PR01-0179	500001P
2220		04		.....	CS. 2100704	632.10		PR01-0180	501001P
2220		02		BEST LUMBER CO	47057	9396.00		PJ04-0042	502001P
TOTAL FOR CODE - 2220 -						9223.90			
2310		02		BEST LUMBER CO	47053	914.79		PJ04-0020	502001P
2310		04		CCS SUPPLY	31160	919.36		PJ04-0020	504001P
2310		04		EMERY TISSOT	3521	937.12		PJ04-0032	504001P
2310		04		PAPER GENERAL SUPPLY CO	7,483.01	9176.27		PJ05-0005	504001P
TOTAL FOR CODE - 2310 -						9223.90			



SUPPLY, INC.

8150 FOX STREET
DENVER, COLORADO 80218
(303) 295-0169

RECEIVED

OCT 11 1984

BILL L. WALTERS
CONSTRUCTION MANAGEMENT, INC.

INVOICE

31169

DA 10/84

SOLE
TO

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

SHIP
TO

9191 N Sheridan

OLR ORDER NO.	CUSTOMER ORDER NO.	SALESMAN	TERMS	SHIPPED VIA	Pay or Cash
1306	PO #17112	2	NET 30	OT	
QUANTITY	DESCRIPTION	PRICE	AMOUNT		
	RENTAL EQUIPMENT PER ATTACHED		10.00		
		State	.30		
		RTD	.05		
			10.36		

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



Power RENTAL

RENTAL INVOICE

NUMBER 027483.01

PAGE 1

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

LESSOR: POWER RENTAL EQUIPMENT INC. 725 W. 39TH AVE. DENVER CO. 80216
303/400-0973 FAX 303/400-1335

FOR USE AT SITE
92ND & SHERIDAN BLVD.
020335
RECEIVED
SEP 17 1984

ORIGIN DATE: 8/24/84 NET EOH: 9/25/84
CUSTOMER REFERENCE: P.O.# 18092
INVOICE TYPE: MONTHLY BILLING

ITEM NUMBER	CATALOG DESCRIPTION U/M	USAGE UNIT PRICE	RENT FROM 1 TO 2	RENT
1000	POWER DRIVE 1/2 HP E	1.0	8/24 15	15.00
1101	RAM TAMPER 1000B	1.0	8/27 07	7.29
	PICKUP/DEL. ZONE B EA	1.0	8/24 15	15.00
	BUMPER PINTLE ADAPTE EA	1.0	8/24 15	15.00

ADDITIONAL COST
CREDIT MEMO TO BE
ISSUED 8/23/84 PER
KAL @ POWER RENTAL

DELIVERY OUT OF TAX AREA NUMBER 135.00 TAX 3.600 %
TAXABLE NON-TAX 7.29 ADD'L TAX
DELIVERY WAIVER 8.40
MONTHLY RENT 19.00 %
RIS ASSESSED ON
OVER 30 DAYS

5.58 TOTAL 176.27

CHARGES OVER 30 DAYS

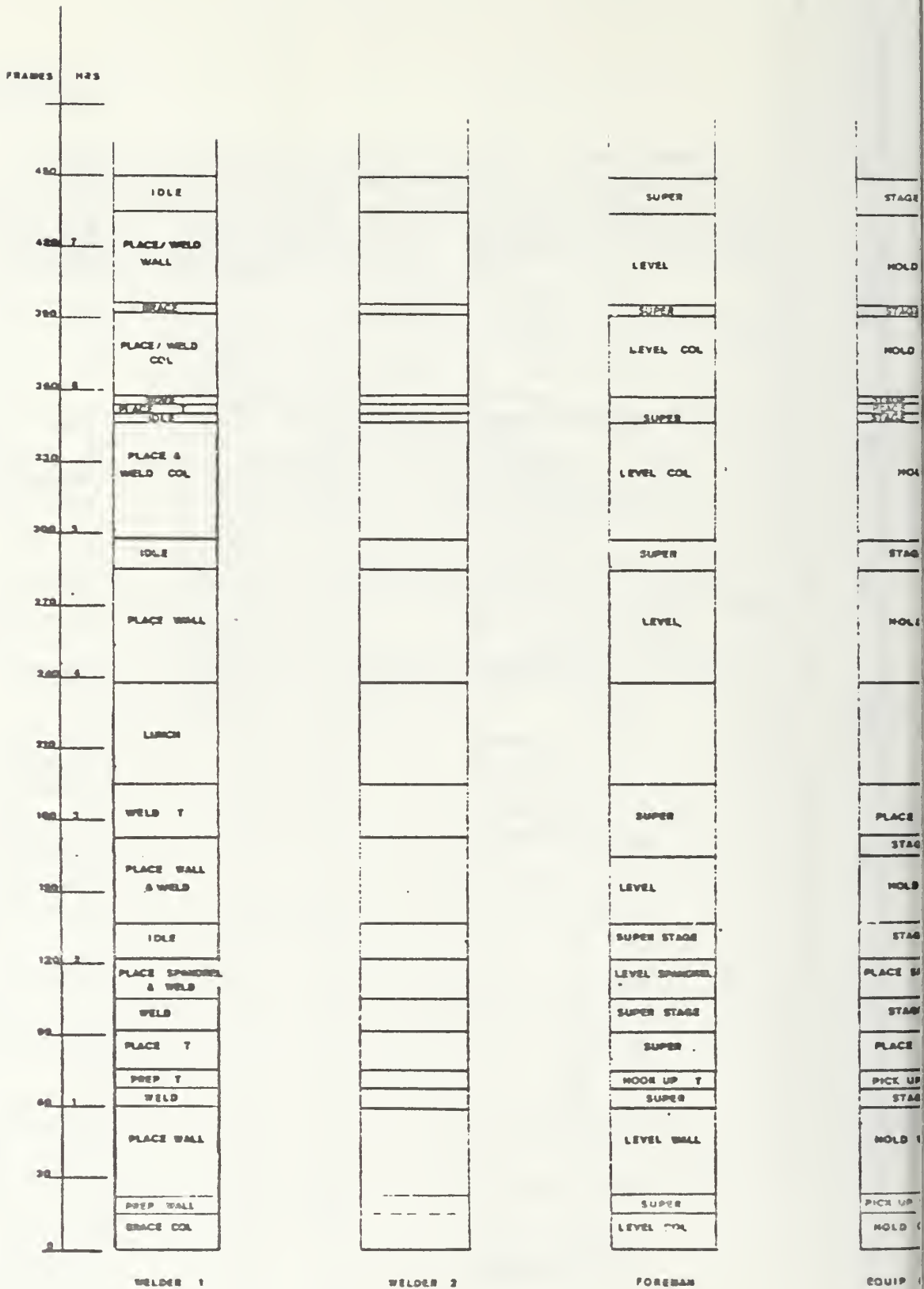
APPENDIX E
PROBLEMS AND SOLUTIONS

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
480	2.2	IDLE			IDLE
420		PLACE & WELD "Y"			HOLD "Y"
400		IDLE			PICK UP "Y"
360		PLACE & WELD "Y"		SUPERVISION	MOVE "Y"
340		IDLE		HOOK UP "Y"	HOLD "Y"
320		WELD "Y"			PICK UP "Y"
300		PLACE "Y"		SUPERVISION	HOLD "Y"
280		POSITION "Y"		POSITION "Y"	PLACE "Y"
260		IDLE		HOOK UP "Y"	PICK UP "Y"
240		WELD "Y"		IDLE	HOLD "Y"
220		IDLE		HOOK UP "Y"	PLACE "Y"
200				SUPERVISION	
180					
160					
140					
120		WELD		SET TRANSIT	HOLD
100					
80					
60		PLACE WEST CURTAIN WALL		LEVEL WEST WALL	POSITION WEST WALL
0					



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

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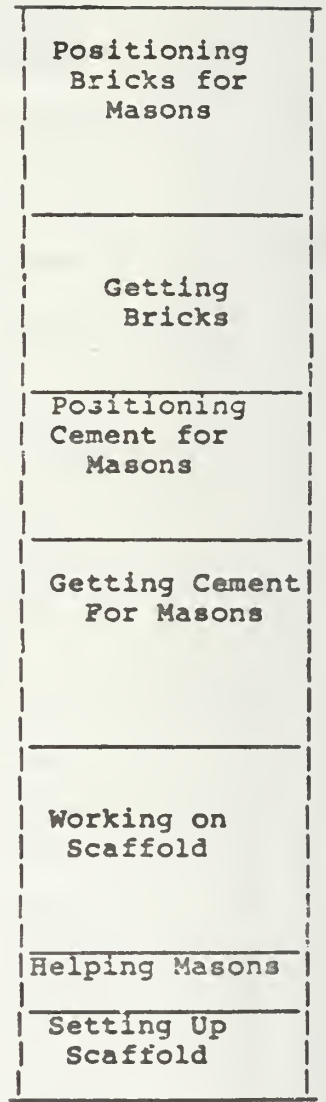
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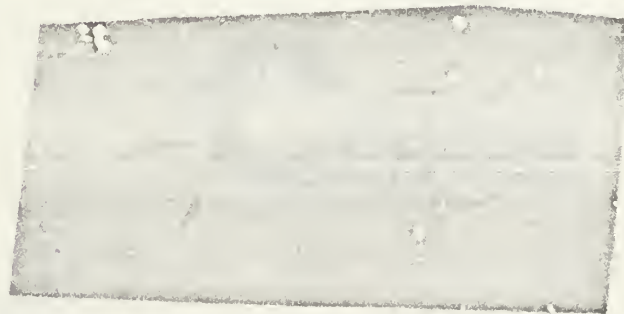
APPENDIX F
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