CHARLES PANKOW, INC.
AND
SUBSIDIARIES

1983 ANNUAL MEETING
SEPTEMBER 8 - 11, 1983

HUNTINGTON-SHERATON HOTEL
PASADENA, CALIFORNIA
CHARLES PANKOW, INC.
1983 ANNUAL MEETING

ATTENDANCE LIST

ALTADENA OFFICE

Steve Beuby
Jim Body
Andy Curd
Jon Eicholtz
Stuart Feldman
Mark Hereford
Tim Hernandez
Bob Law
Kevin Nuckels
Kim Petersen
Russ Osterman
Charles Pankow
Dean Stephan
Bob Telles
David Van Zile
Tom Verti
Joe Wilford

HONOLULU OFFICE

Dick Ackerson
Jim Allyn
Bill Beard
Hugh Brown
Scott Church
Lou Gedeon
George Hutton
Mark Johnson
Don Kimball
Mike Kodama
Joe Limasa
Don McKibben
Dennis Nakamoto
Doug Schell
Clarence Taba
Jose Tablada
John Twomey

SAN FRANCISCO OFFICE

Bill Broders
Dean Browning
Brad Inman
Rik Kunnath
Jeff Smith
Mike Townsend
Steve Vaughn
Robert Zochert
Wayne Ambrose  
Bruce Blakely  
Bill Bramschreiber  
Curt Burks  
Al Fink  
Brett Hill  
Steve Kennedy  
Kim Lum  
Charles Rodgers

Harvey Chang  
Neal Fukumoto  
Red Metcalf  
Joel Pitto  
Tim Royco  
Butchie Schmidt  
Raymond Yee  
Richard Yamashina

Jason Arakawa  
Bob Crawford  
Barney Ikehara  
Jay Kuhre  
Jack Parker  
Elvin Quiocio  
Walter Zukermura

Jim Faull  
Tom Metcalf  
Jim Thain

Tony Giron  
Tracy Scissons  
Jeffrey Smith  
Brad Wall

Ed Dickson  
Jack Griege  
Billy Reed  
Dave Seagren  
Dave Schmidt  
Carl Wesely

Kris Reiswig

Mike Liddiard  
Mike Matson  
Richard Smith  
Jim Waters
MILWAUKEE, WISCONSIN
411 Wisconsin Building

Larry Brammer
Kirk Clagstone
Tom Krajewski
Alan Murk
Joe Sanders
Kevin Smith
Dick Walterhouse

PASADENA, CALIFORNIA
Walnut Center

Claud Davis
Ernie Delgado
Rudolfo Flores
David Gilliland
Sylvester Henriquez
Fernando Hernandez
Stan Hildebrandt
Bill Hughes
Norm Husk
Mark Josten
Frank Neimeyer
James Smith
Robert Stanley
Elvester Strong
Fritz Tegatz
Bill Tornrose
Samuel Tome
Peter Zuro
GUESTS

Grant Burton
Oxmoor Center
Louisville, Kentucky

Jack Hoffman
Main Hurdman
San Francisco, California

Ed Galus
Main Hurdman
San Jose, California

John F. McLaughlin
Purdue University
Lafayette, Indiana

George McClellan
Federal Insurance Co.
Short Hills, New Jersey

Paul Fleming
Federal Insurance Co.
Short Hills, New Jersey

GUEST SPEAKERS

Robert Englekirk
Robert Englekirk Consulting
Structural Engineers, Inc.
Los Angeles, California

Donn E. Hancher
Purdue University
Lafayette, Indiana

Leon Martel
Author, Lecturer,
Scientist, Researcher

Howard Westphall
(Retired USMC)
Westphall & Associates
Laguna Niguel, California
1983 PANKOW SERVICE PINS

FIVE YEARS OF SERVICE
Harvey Chang
Marciano Cho
Kirk Clagstone
Jon Eicholtz
James Faull
Steven Kennedy
Helen Lanford
Kevin Smith

TEN YEARS OF SERVICE
Al Corceiro
Brad Inman
Charley Rogers
Butchie Schmidt
Jim Thain
Nancy Walker

FIFTEEN YEARS OF SERVICE
Barney Ikehara
Don Reside

TWENTY YEARS OF SERVICE
Tony Giron
Jack Greiger
George Hutton
Alan Murk
Russ Osterman
Charles Pankow
SPEAKER BIOGRAPHIES
Dr. Robert Englekirk

Dr. Robert Englekirk is a licensed structural engineer in 19 states. His firm, Robert Englekirk Consulting Structural Engineers, Inc., has designed over 4 billion dollars worth of construction since 1969 in practically every region of the United States.

While experienced with all structural building materials, Dr. Englekirk has particular expertise in the areas of concrete framed buildings and seismic analysis.

Dr. Englekirk's philosophy toward structural design is that imagination and ingenuity have their place in every project. This attitude has been responsible for many contributions to the innovative use of all engineering materials.
Howard A. Westphall, Colonel, USMC (Retired)

Howie Westphall is an articulate proponent of the human potential movement and has spent over 38 years in the business of educating and training people. Prior to embarking on his dynamic version of "retirement", he was in charge of training and professional education for the U.S. Marine Corps. During his 28 years of service, some of his tours included The Pentagon, Okinawa, Korea, Vietnam and three years as the Assistant Naval Attache at the American Embassy in London, England. He retired in 1971 to join The PACE Organization. In his twelve years with PACE, Howie has been actively involved with the research and development of PACE programs as well as serving as Instructor, Consultant and Marketing Coordinator. With the acquisition of PACE by Wilson Learning Corporation in August, 1982, Howie was selected to be the Vice President, General Manager of the PACE Organization and directed the personally conducted PACE programs.

On May 1, 1983, Howie and his wife, Nannette, formed their own company and are the sole licensee conducting PACE Program.

Academic work at Emory and Duke Universities led to his BS degree from the University of Maryland.

Born in Sharon, Wisconsin, Howard and his wife reside in San Juan Capistrano, California. His recreational interests are many and varied -- tennis, jogging, golf, raquetball, squash and gardening are his favorites.
Donn E. Hancher

Professor Hancher has been associated with Purdue University and the West Lafayette, Indiana community, where he makes his home, since 1961 as a student, grad-student and presently as Associate Professor.

He has been presented with awards for his outstanding achievements in counseling and his work as a young engineer.

He has been actively involved with the American Society of Civil Engineers, Tau Beta Pi, Transportation Research Board and Building Research Advisory Board.

He is currently consulting with companies as a construction manager as well as his many duties at Purdue, especially in the area of counseling and teaching students in construction engineering.
Dr. Leon C. Martel

Dr. Leon C. Martel is a political scientist and futurist, specializing in economic, political, social and resource issues. He is the author of *Lend-Lease, Loans and the Coming of the Cold War*, and co-author of *The Next 200 Years*. His current book, in process, is *Future Change: A Guide to What's to Come in Industries, Jobs and Investments*. He is also a captain in the US Naval Reserve with extensive experience in the fields of political and military intelligence.

Dr. Martel is a former member of the professional staff of the prestigious "think tank," the Hudson Institute, and served as its Executive Vice President from 1977-80. There, he was project leader for studies for the Executive Office of the President of the United States, and offices of the Vice President and Secretary of Defense. He coordinated the Institute's "Prospects for Mankind" study and contributed to the Corporate Environment Program.

Prior to coming to Hudson, he was a tenured member of the Hofstra University faculty. Earlier, on military active duty, he was in charge of the Russian and East European desk in the Navy's European Intelligence Center and later served as an intelligence research analyst in the National Security Agency.

Dr. Martel holds a BA from Dartmouth College, and an MA, PhD and Certificate of the Russian Institute from Columbia University. He writes extensively for scholarly journals and popular periodicals.
<table>
<thead>
<tr>
<th>Time</th>
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| 12:00 - 1:30 PM | Stockholders’ Luncheon  
“San Marino Room” |
| 1:30 - 3:30 PM  | Stockholders’ Meeting  
“Mirror Room” |
| 6:00 PM       | Depart for Cocktails and Dinner at Pankow Residence |
1983 ANNUAL MEETING SCHEDULE
FRIDAY MORNING
SEPTEMBER 9

8:00 AM  Breakfast -- "Wentworth Room"

9:00 AM  Meeting and Opening Remarks
          "Georgian Room"

9:05 AM  Forum: Claims & Problems
          San Jose & AT&T
          10560 Wilshire & Walnut
          Center
          Waikiki International Plaza
          The Esplanade
          Don Kimball with
          Dean Browning
          Carl Wesely
          Don Mckibben

10:00 AM Importance of Quality Control
         In the Field
         Bob Englekirk

10:30 AM Coffee Break

10:45 AM Forum: Claims Avoidance
         Don Kimball with
         Dean Stephan
         Brad Inman

12:00 Noon Luncheon -- "Viennese Room"
         Guest Speaker
         Howard Westphall
CLAIMS AND PROBLEMS
San Jose Plaza Structural Upgrade
by
Dean Browning

Introduction
San Jose Plaza Parking Structure, owned by the City of San Jose, is adjacent to the Plaza office buildings and was built in 1972. CPI contracted for the structural engineering. The structure is a 6 story, moment frame design with 4-1/2" P/T decks on P/S-P/T girders at 18 ft. on center. The structure was built on concrete piles. There were no shear walls anywhere in the building. The exterior finish was precast window panels with approximately 50% openings on three sides. In 1982 the City of San Jose hired Cygna Engineering to review the building structure and report on a few cosmetic problems. During the review they discovered what they considered 17 items of design deficiency. As a result of the report, the City closed the structure on October 5, 1982.

Investigating the Report
From the discovery until approximately December 1st, all efforts were concentrated towards investigating the report allegations with structural engineers, Len Robinson of Robinson, Meier, Juilly and Boris Bressler and Sig Freeman of Wiss, Jenny, Elstner. Three other structural engineering firms were asked for advice and suggestions. Of the 17 points brought out in Cygna's report, 14 were defendable. The three areas that could not be defended all had to do with seismic stability of the structure. In the short direction, the earthquake forces were resisted by the 12 beam/column moment frames. This required the connections at the precast concrete column and beams to be moment resistant instead of allowing them to rotate as we commonly do in a shear wall design. This was accomplished with rebar and P/T strands through the column into a void in the end of the beam filled with deck concrete. In the long direction, poured in place beams spaned from column to column at the center of the building creating a moment frame. All of the frames were satisfactory with only seismic loads. But, when dead, live, seismic and torsion loads per 1970 UBC were calculated, it failed. In both directions, the drift required to bring the strand and rebar to full force exceeded any satisfactory limits and exceeded the ductility requirements. It could not be determined how NAM Engineering had addressed these questions since the original design calculations could not be found. During this review it was decided to not only consider the moment frames to resist the loads but to also take into consideration the slabs, ramps, precast columns, stairwells, etc. that could add strength. None of these helped that much, but took a long time to consider and eliminate.

Solving the Design Problem
From December 1st, 1982 until the settlement with the City in April, 1983, the two engineering firms, Robinson, Meier, Juilly and Wiss, Jenny, Elstner reviewed many possible solutions. Many attempts were
made in trying to add strength to the beam/column connections but all failed. Adding standard 10" shear walls didn't work since it required adding piles. The question here was how do you add unloaded piles to the loaded ones and expect them to act in the same manner. During this time, the City of San Jose hired another structural engineering firm to review our solutions, H.J. Degenkolb & Assoc. Any solution CPI proposed had to be acceptable to them. In fact, the final solution contains a few items our engineers consider unnecessary but were a compromise. Another restriction that hindered design efforts was the open requirement for the parking structure to prevent the need for ventilation. Any addition to the exterior walls had to have openings of sufficient size.

Solution

During the entire 7 month investigation from closing until completion of construction, the time drain on the San Francisco staff was tremendous. It was a constant struggle to allow the structural engineers enough freedom to be creative and thorough but make sure they stayed on track. Many trees gave up their all for the computer printouts. Finally, a solution took form. The compromise with the City was that the structure would be designed to meet the 1973 UBC for seismic requirements only, not for any other requirement. This required shear walls. They had to be thin and long to spread the loads over as many piles as possible. The pile driving logs proved there was some residual strength in the piles that were used. The gunite walls were added to the building on each end, the back solid wall and along each side of the ramp at the center of the building. The asphalt on the ground floor at each end bay was removed and a SOG was added to further tie the walls to more pile caps. The wall was attached to the existing precast exterior panels and columns with three types of inserts. The areas where the existing walls were thick enough, #5 bars were epoxied into holes. At the columns the gunite walls were attached with #4 bars, 9" long in epoxied holes close together creating a doweling effect. The remainder of the gunite wall was attached with 60 penny nails dipped in epoxy and driven into 1/4" diameter holes 3" deep. The walls had #5 rebar at 12" on-center plus many added trim bars. The end bays had arched openings that were slightly smaller than the original arched openings, and the rebar around the openings was congested and difficult to place.

Construction

The first of May construction started by removing screens, sprinklers, etc. that were in the way of future walls. The asphalt on each end for the 1st bay was removed and a structural SOG was added. Gunite walls varying from 5" to 8" thick were added to each end of the building, the center ramp bays on each side and the back wall full height of the building. The gunite walls were secured to the existing concrete walls with 6000 epoxy inserts and sandblasting the existing walls. Construction was completed and accepted by the City the middle of August including a few cosmetic items. The new construction blended into the existing building so well that it would be difficult for anyone that didn't see the building before to know anything was done.
CLAIMS AND PROBLEMS
AT&T Office Building Exterior Discoloration

by

Dean Browning

Introduction

AT&T Office Building in San Francisco was structured from November, 1976 until May, 1977. The exterior was built with precast wall panels 12' x 18' by 2' thick. The final coat of Burks Clear Proof Heavy Duty sealer was placed on the building just prior to final acceptance. Within two weeks, signs of efflorescence started appearing over the entire building. After another two weeks, virtually every panel had some signs and a few panels seemed to be all white. The building was sandblasted to remove the efflorescence and that seemed to have cleared the problem.

Precast Panel

The precast panels were made in Milpitas and trucked to the jobsite. The panels contained color additive, Yosemite Light, added to mix at the plant. The slump was between 2-4" for the 6.75 SK lightweight, 4000 psi mix with Felton sand. The panels were removed from the mold and left face down for three days. They were stood up, sandblasted and sealed with a sprayer within 4-7 days after casting. The first coat didn't seem to cause the problem. After the panels were erected on the building they acted as forms for the poured-in-place concrete columns and beams. The glass was secured and the exterior joints were caulked.

Investigating the Problem

The final coat of sealer was then placed on the building within 9 months after the first coat and the building started showing signs of efflorescence within two weeks after the final coat. James Shilstone from Texas, a precast expert, was hired to review the problem. After testing he didn't find any reason why the problem occurred. The general consensus of the people studying the problem, suppliers and consultants, was that the final coat of sealer prevented the building from breathing. Therefore, the impurities could not dissipate as they worked their way to the surface and became trapped. Other items may have contributed such as the drought that year. The water could have had a higher level of impurities than usual or the sand may not have been washed as much as usual. Another item is the time span from casting to sealing. Precast goes through drastic water content changes during that time. It may be possible to seal the panels too soon.
Solving the Problem

The building had to be sandblasted anyway to remove the efflorescence. Therefore, removing the impurities also removed the last coat of sealer allowing the building a chance to breathe. This seems to have corrected the problem. The building was not resealed at the suggestion of the experts. Many precasters today refuse to seal precast due to their experiences.
CLAIMS AND PROBLEMS
Exterior Wall Panels at 10560 Wilshire
by
Carl Wesely

I. Introduction

The exterior wall panels on the 10560 Wilshire Condominium were designed to be prefabricated, light weight, easy to install and very attractive. These panels were also designed to withstand the forces of nature such as wind, sun, rain and minor movements. The first four design criteria were met and exceeded. However, the panels failed to withstand any one of the forces of nature. This is a story of not seeing the trees for the forest and a good lesson has been learned.

II. History of Design and Construction

The initial design of the building called for the use of light-weight Dryvit System building panels which have been used throughout the country with very good results as far as meeting the main design criteria as stated earlier. The City of Los Angeles, however, had no experience with the Dryvit System, nor were they ever going to approve the use of this panel system in the City because of the foam insulation. Since the City would not approve the Dryvit System, it was modified to meet the City requirements and still be functional and good looking. Lightweight peralite plaster was substituted for the Dryvit Foam. A plastic reglet was substituted for an aluminum extrusion and the Dryvit finisher material was used to provide the weather protection and attractive finish.

III. Water Problems Started to Develop

During the first rainstorm in November, watermarks appeared at the lower corners of about 80% of the windows. Immediately, we thought that we had bad caulking at the window sills. The window installer was summoned to the project. Drywall was removed at the lower corners of a few sample windows and we proved to the glazer that all of the windows needed to be recaulked.

During a major storm in January, more watermarks appeared and there were many areas where there was severe water damage. After a detailed investigation of the building exterior showed no obvious cause for the intrusion of water, it was decided that drywall was to be removed from some selected exterior walls. Upon the removal of the drywall, it was obvious that there were many serious defects in both the design and construction of the panels. Water was running down the backside of the exterior plaster, along the steel studs and into the rooms.
How could this happen to panels which received more attention during design, fabrication, transportation and erection than any 20 single items combined? The answer is that no time did anyone ever question the very basics, "Were the materials being used for the desired results?".

IV. Causes of Problems

It appears that the main problems stem from the use of the Dryvit Finisher as a weather proofing material, the use of the plastic reglet as an architectural feature strip and finally the use of a peralite lightweight plaster.

It is now recognized that the Dryvit Finisher does not provide a water tight coating, nor does it even provide a weather proof coating. It appears that water will penetrate the Dryvit finish at almost any location.

The plastic reveal strip which was chosen for its flexibility seems never to stop being flexible. As the material sits in the sun, it is constantly moving and cracking and inviting any and all water to enter between the plastic and plaster.

Finally, the lightweight peralite plaster has shrunk many times more than the normal sand and cement plaster, creating cracks up to 1/16" in width. There are many other factors contributing to the overall problem, but it has been established that these three items contribute to about 95% of all the leakage.

V. Proposed Solutions

The following items have been proposed as possible solutions to the panel leakage:

a. Add an angle or elastomeric bandaide to the lower leg of the plastic reglet.

b. Add an elastomeric bandaide to the milcore caulk joints and plaster around all panels.

c. Drill weep holes to drain any water trapped behind the plaster.

d. Caulk all cracks and cover with Dryvit.

VI. Conclusion

Many of us have learned from this project that it is not enough to check that all materials are being installed as per the design and specifications, but that we must ask questions of material compatibility and suitability. We are definitely not designers, however, we suffer whether the problem was caused by design or workmanship.
CLAIMS AND PROBLEMS

Columns at Walnut Center

by

Carl Wesely

I. Introduction

The first of the 72-foot columns were cast for construction of the parking structure at Walnut Center as per the plans and specifications. When the concrete reached the proper strength, the columns were to be raised and set into position. On the first pick, it was obvious that something was wrong because the column bent, as it was being raised. The column had not been designed to be cast horizontally then lifted at one point and set into position. This was another case where it was not enough to just build as per plan and specifications, but the designer needed to be questioned to insure that he had considered all pertinent criteria.

II. Solutions

- To save the existing columns, holes were cored through the column to accommodate a two point lift.

- Steel was added to all future columns to accommodate a one point lift.
CLAIMS AND PROBLEMS
Waikiki International Plaza

by
Don McKibben

The Project

Scope - 3-Story Reinforced Concrete Shopping Center
Gross Area: 159,000 s.f.
Contract Value: 6.2 million dollars
Construction Start: May 1978
Construction Duration: 13 months

The Problem

During construction, neighbors reported that our construction was causing damages to adjacent buildings. As it turned out, the problems were allegedly caused by our pile driving operation between May 15 and June 19, 1978. About 250 piles were driven - the longest being 175 feet. The piles were driven through a thin, medium-dense crust seven to nine feet thick and then encountered a deep layer of loose, sandy material. The piles virtually slid through the latter. The bearing piles met design specifications when encountering a dense coral shelf.

Due to these complaints, a meeting was held on June 14, 1978 with the manager of the Waikiki International Marketplace (Larry Clapp), CPA staff, and our insurance adjuster – subsequently, some such repairs were made at CPA expense.

During the summer of 1978, the Waikiki International Marketplace submitted a contractor's proposal to repair their facilities at a cost of about $360,000. Our estimate was inside $10,000. Attempts were made at negotiations but Larry Clapp refused to reduce his claim.

The Suit

In June of 1979, the Miramar Hotel and the Waikiki International Marketplace filed suit for damages against the developer, CPA and our insurance carrier. In the complaint, the Plaintiffs sought relief for damages caused by differential settlement as a result of our pile driving operation, excavations adjacent to their properties, and de-watering operations. Through the next several years (1979 to 1983), attempts again were made to negotiate a settlement. After a review of our pre-construction photo survey, the Miramar withdrew from the suit - at no cost. Our insurance company made several offers to Larry Clapp, the largest being $100,000 in attempts to settle this "nuisance case". Larry Clapp's demand remained in the neighborhood of $300,000.
Next came two surprises. A month before the trial we were informed that a more junior attorney would defend us at the trial. Then, two days before the trial, we were told that the Plaintiff had demanded financial statements of all Defendants for 1981 and 1982. This was due to the fact that punitive damages were sought by the Plaintiff and could be assessed directly against any one of the Defendants. (In formal correspondence of July 1981, CPA noted to our insurance company that it was our understanding that all elements of this matter were completely insurable - no reply was ever received from our insurance carrier nor their attorneys.) Due to this demand for financial records by the Plaintiffs attorney's, we sought final and complete settlement by our insurance company - unsuccessfully.

The Trial

The trial commenced on June 7, 1983 and lasted for three weeks. At the onset of the trial, the Plaintiff dropped their claim for damages caused by excavations and de-watering operations. Their quantified their damages as follows:

1. $420,000 in compensatory damages to their buildings,
2. $500,000 against CPA for punitive damages, and
3. $250,000 in punitive damages against the developer.

A significant portion of the financial relief sought was to level the floors which had an imperceptible slope to them.

During the trial, our expert witness testified that it was hard to imagine that we caused as much as $60,000 in damages; that any differential settlement that may have been caused by the pile driving would have eventually occurred in time and we may have, at worst, hurried this cycle along a bit; and that the Waikiki International Marketplace was constructed entirely on spread footings with no piles since there had been no soils investigation during the design effort.

The Plaintiff sought to prove that severe damages had occurred to his building and that he relied upon promises made to make such repairs. Further, his architect testified as an expert witness, stating that a soils investigation was not necessary and, since he "knew Waikiki", he could calculate the loadings.

The Verdict

On the morning of Friday, June 24, 1983, the judge instructed the jury. They adjourned for the week-end and reached a verdict late Monday morning, June 27, 1983. The jury assessed $150,000 in strict liability against Charles Pankow Associates and $175,000 in punitive damages for promissory estoppel against Charles Pankow Associates. Subsequent to the verdict, the judge allowed interest on the strict liability verdict in the amount of $62,000. THE BOTTOM LINE JUDGEMENT: $387,000 AGAINST CPA.
The Status

Many states prohibit the insurability of punitive damages. There is no such statute in Hawaii; however, there has been a recent lower court ruling disallowing an insurance company's payment of punitive damages - it is understood that in this case punitive damages were specifically excluded from the policy. There is no such exclusion in CPI's policies. A few days after the jury's verdict, we again demanded complete and final settlement, including the punitive damage portion by the insurance company. In early August it was learned that an offer had been made by our insurance company which had been accepted by Larry Clapp in the amount of $275,000.
CLAIMS AND PROBLEMS
The Esplanade
by
Don McKibben

The Project

Scope - 209 luxury condominium units with parking structure and related recreational facilities.
Gross Area: 500,000 s.f.
Contract Value: 9.5 million dollars
Construction Start: November 1971
Construction Duration: 20 months

The Problems

Water infiltration is the source of all the problems occurring at the Esplanade Condominium. Water leaks occurred in the following areas:

1. Through the recreation deck to garage levels below causing damage to cars. Primary cause of water infiltration - contract documents did not call for waterproof membrane nor waterproof expansion/control joints at the recreation deck. Allegations have been made that CPA represented that the recreation deck could be made waterproof through the use of post-tensioning systems. Some discussions did occur during the planning stages for the project regarding the use of a two-way post-tension recreation deck and referenced CPI's first project, the Oakland Parking Structure at Broadway and McArthur which had no waterproofing membrane on the top parking deck (utilized two-way post-tension system). Allegations by the owner have also been made that poor construction methods and poor products used by CPA in building the garage caused the water leaks. The architect recommended to the owner the installation of a membrane prior to placing the topping slab. This recommendation was disregarded. Many repairs were undertaken soon after the project completion by the developer. The garage leaks were directed away from parking stalls but continued to some extent.

2. Through flat roofs of the penthouses which utilized Hydro-Ban, a composite single-ply membrane product. Roofing failure was caused by inordinate shrinkage of the Hydro-Ban roofing material - seams ruptured and material pulled away from the perimeter cant strips. The Hydro-Ban appears to be a basically faulty product. Initial shrinkage factors of 5-10% were encountered. There were continuing repairs and complaints until 1977 when Honolulu Roofing, the subcontractor, gave a two-year guarantee which expired in 1979. No further work has been performed by the subcontractor although the Association claims that there have been some leaks since then.
3. Through the sloping roofs over penthouses roofed with corrugated metal roofing. Due to discontinuation of the product, the installation in several areas was done in a manner to conserve materials to insure completing the project. Water leaks on the Decra-rib sloping roofs were either caused or aggravated by foot traffic of the owner's representatives and occupants of the condominium. The architect provided no access to mechanical equipment located on the roof other than across the Decra-rib surfaces. Further, the roofs provided an obvious and unbarricaded play place for children. Again, Honolulu Roofing gave an extended two-year guarantee which expired in 1979 and no further work has been performed since then by the subcontractor.

4. Through the walls of the penthouses which were pre-assembled CMU panels utilizing a threadline epoxy system on horizontal joints and solid grouted reinforced vertical cells. Water infiltrated through exterior block walls at hairline cracks in the exterior plaster finish along block joints, panel joints, and openings in reentry corners at random locations. There was no elastomeric waterproofing called for in the contract documents. It is understood that the wall leaks were ultimately corrected when the owner applied such a coating.

The Litigation

Sales of the project were slower than anticipated by the developer and many were made by agreement of sale. The continuing deteriorating market conditions and corresponding erosion of real estate values resulted in defaults and foreclosures by the developers. The ensuing litigation involved counter-claims against Oceanic by individual apartment buyers and the Association of Apartment Owners based upon water leaks and uninhabitability. Eventually the construction team composed of CPA and its subcontractors, the supplier and manufacturer of the roofing material, Hydro-Ban, and the design team including the architect, the structural engineer and the landscape architect, were brought into the suit.

Two years ago Oceanic Properties settled with the Association of Apartment Owners and received an assignment of their claims by paying the owners $350,000. The developer claims this assignment to be worth $1,000,000 based upon complete replacement of the roofs and extensive repairs to the garage. The suits involving the individual penthouse units were settled with the respective owners and their claims also were assigned to Oceanic.

After settling with the Association and individual owners, the developer proceeded with its lawsuit against the construction and design teams. The developer's contract documents allow arbitration with their architect and contractor (which includes subcontractors). These documents do not include the architect's consultants and the
contractor's/subcontractors' suppliers and manufacturers. CPA filed a motion to stay the Oceanic suit pending arbitration, and prevailed. The court, however, allowed discovery to continue.

At this time the developer's attorneys are deposing representatives of the design and construction teams. It is anticipated that over 60 days will be required for such depositions. Additional depositions required by the defendants' attorneys are also expected. Further, document review is ongoing by all parties. No date has been set for arbitration although the arbitrators have been selected. Should this case go through the complete arbitration and litigative process (with the consultants, suppliers, and manufacturers), it is estimated that the attorneys' fees for the nine parties involved would considerably exceed $1,000,000.

The claims of Oceanic Properties include the $350,000 to $1,000,000 assignment from the Homeowners Association; approximately $750,000 for loss of profits and additional financing costs; approximately $150,000 for repairs paid by Oceanic Properties; approximately $100,000 for claims in the penthouse units; and other claims.

The Status

Settlement negotiations have been attempted - during the Spring of 1983 the defendants' insurance companies offered Oceanic about $250,000 to settle out of court. This offer was rejected, and Oceanic has indicated a willingness to settle for about $800,000. The defendants' insurance companies at the present time are considering an increase to their offer.

Questions of insurability also exist in this case. Resultant or consequential damages to occupants' belongings, furnishings, etc. are obviously insurable. Work product deficiencies, i.e. concrete slabs, block walls and roofing products are uninsurable. The remaining issues are being reviewed.

A settlement in the near future certainly is in the best interests of all the defendants, including their insurance companies. The only parties who stand to gain through a continuation of this case are the attorneys!
QUALITY CONTROL CONSIDERATIONS
IN THE 1980'S
AS THEY RELATE TO THE
CONSTRUCTION INDUSTRY

by

Robert Englekirk

THE MARKET PLACE

A. Consumer Attitudes
   - Influence of space age achievements on the consumer

B. Consumer Needs
   - Post war period over

C. Impact on Commercial Development
   - A floor on new products
   - Efficient and exciting spacial requirements
   - Still a buyer's market - keeps prices down
   - Responsibility for the performance of components of the
     product is spread over the whole development team

D. Buyer Beware No Longer the Answer

E. What is Your Real Responsibility

F. One More Thorn - Fast Track

ATTAINING QUALITY CONTROL

A. The Team

B. The Goals as they Relate to the Structure
   - Safety
   - Serviceability
   - Economy

C. Timing
   - Conceptual Phase
   - Schematic Design Phase
   - Design Development
   - Plan Completion
   - Shop Drawing Room
   - Construction
CLAIMS AVOIDANCE

by

Brad Inman

1. INTRODUCTION

In this discussion CLAIMS is not being used in reference to legitimate Change Orders but instead refers to DISPUTES, whether with the owner or with subcontractors or design professionals. Claims such as this are uniformly counter productive - they take a tremendous amount of supervisory and management time, create hard feelings amongst all parties, and invariably cost everyone money. You hardly ever can recover all your costs, even if you are right and can prove it.

2. SO HOW DO WE AVOID CLAIMS DISPUTES?

There are actually two steps: first, doing all that we can to prevent the chance of a claim arising; second, once one seems inevitable, investigate and resolve it as soon as possible.

A. ELIMINATE THE POSSIBILITY OF A CLAIM

There are many things we do already and more we can do to avoid the possibility of a dispute or claim against us or between us and the owner. We've talked about many of these at previous Annual Meetings but to refresh our thinking, consider the following items:

1) Who are we doing business with? We're smart to carefully select the owners we work for, the design professionals whose work we coordinate and often take contractual responsibility for, and particularly the subcontractors who work for us but whom we are also contractually responsible for. This is a people business, and our most successful projects are those in which we have a constructive, mutually respected relationship with all parties. Governmental agencies have generally proven difficult to work constructively with and seem to be prone to creating claims problems.

2. What do the contracts actually say? The more care in reviewing - in great detail - the mutual obligations and responsibilities - up front - the better the chance of avoiding a misunderstanding later which could lead to claim.

3) Put it in writing - confirm, confirm and reconfirm - Diaries, transmittals, memos confirming telephone calls, minutes of meetings, etc., are all critical to ensure open and concise communication. Job records created, maintained and saved are a godsend not only to avoiding a claim but in expeditiously resolving a dispute if one comes up.
4) Don't ignore a problem - it rarely will go away of its own accord.

5) Do it right the first time - make sure the sub does too. Right, its easy to say and a lot tougher to do but through Quality Assurance, Jobsite Inspection and careful planning we must strive for absolute conformance to plans, specs and contract commitments.

6) Employ outside experts to review typically troublesome areas such as window systems, key elements of the structural design, mechanical systems, caulking and sealers, compatibility of different materials requiring a bonded assembly.

7) Limit our liability - we do not want to give extended warranties for our construction work. Our design contracts with owners now limit our liability for errors and omissions of design to a fixed dollar amount and for a fixed time. Conversely our design agreements with our Architects and Engineers require they have E&O Insurance and that the owner shall make claims directly to them rather than thru us.

8) Much of our work is Design/Build and as such we assume a much broader responsibility for the final design product. We must "inspect" the plans and the specs, particularly details, just as we do the actual work in the field. The more accurate the drawings are, the better the chance of avoiding a claim during and after construction.

B. WE'RE STUCK!

In spite of doing all the above we nevertheless get into a dispute, a claim is made. Perfection wasn't quite enough. Now what do we do?

1) Investigate immediately!

2) Treat as a potentially serious problem - a seemingly small item may in fact be very serious.

3) Open all lines of communication and keep them open. Put it in writing!

4) Don't panic but do contact those who may be involved - Architect, Engineer, Subs. Have them investigate also.

5) Contact our insurance broker and if appropriate have insurance companies put on notice. Just because we have insurance to cover certain areas (resultant damage from a defect, or design error) we cannot assume the insurance company will take care of the problem. We must investigate and resolve with them. We are not insured for defects in workmanship or materials.
6) Keep it constructive - hard as it is at times it almost always pays to avoid getting emotional or angry - even when you're dealing with a turkey!

3. **WE'VE COVERED AVOIDANCE AND EXPEDITIOUSLY RESOLVING CLAIMS.**

Here at the meeting I'll discuss actual examples of claims or potential claims made against us, including the process by which we faced and resolved the major problem at the San Jose Parking Structure. This job was covered earlier in this session with regard to the technical aspects of the investigation and modification work and my discussion will be on the business and legal aspects.

4. **SUMMARY**

   A. Avoid claims by doing everything right the first time, and put it in writing.

   B. Treat a claim quickly, aggressively, constructively and keep communicating with all parties.

   C. Resolve it as soon as possible. It will save time, money and prevent ulcers and we can get on to productive activities. We are builders - not lawyers.
CLAIMS AVOIDANCE
Design Review
by
Dean Stephan

In response to our desire to avoid problems and resulting claims by recognizing and correcting them before the fact, we have instituted a design review for the major disciplines on our design/build projects. These design reviews are conducted by independent professionals not associated with the design/build team. They are selected based upon the project's geographical location and the particular expertise desired. The engineering reviews to date have been conducted by practicing consulting engineers. There is discussion currently underway as to whether the reviewers should be practicing consultants or consultants specializing in catastrophic review. The pros of the practicing consultant is his currency with standard practice, local code interpretation and alternate solutions. The advantage of industry experts is that they have firsthand knowledge of potential problem areas and improper detailing. The design/build structural engineers have strongly preferred the peer review because of their perception of the experts not being very current or skilled at the complex structural analysis techniques being used today.

The reviews are for:

a) Safety
b) Serviceability
c) Economy

Safety generally is a major part of the structural review. The reviewer is asked to look at the critical areas of the building, usually the lateral bracing and vertical loading for gross errors or improper assumptions on technique or loadings. In addition, rapid calculations are done for critical loading areas. If they don't approximate the design, then a detail analysis is conducted.

Serviceability deals with the adequacy for the intended use. The major areas explored are:

Structural:

a) Vibration
b) Deflections
c) Drift
d) Details and Connections
Electrical:
   a) Capacities
   b) Faulting Loads
   c) Flexibility
   d) Energy Conservation

Mechanical:
   a) Tonnage
   b) Air Flows
   c) Noise
   d) Design Criteria
   e) Energy Conservation
   f) System Type and Proposed Equipment
   g) Controls and Zoning

Watertightness:
   a) Flashing
   b) Membranes
   c) Glass and Glazing

Economy involves the suggesting of alternatives, different systems or identifying overly conservative design assumptions or design.

Generally the review process follows the following steps:

   a) Initial review of design development drawings with written comments and questions by reviewer.
   b) Written response from the designers.
   c) In person meeting to resolve outstanding issues.
   d) Review of working drawings following the same procedure as above.

No two engineers will agree on everything; thus the in-person meeting usually involves a few residue issues in which there is no right or wrong. This requires CPI to make the choice.

PBSI has performed several glass reviews for the mainland projects. The process has been much the same except for the in-person meeting. This review generally involves subcontractor shop drawings and the initial subcontractor selection in addition to the contract documents.

The review process has had significant beneficial impact in the areas of serviceability and economy. It does expose us to a cost liability on our precommitted contracts by the possibility of change orders due
to judgement calls or upgrading of initial contract requirements. To date it has significantly improved design coordination and has resulted in serviceability improvements and cost savings.

The review process provides the company with a measure of protection against catastrophic failure and the problems associated with watertightness, thus "loss control". It also gives the client a comfort level with the design/build process and offers tangible proof of our efforts to produce our stated desire to produce a high quality product at a predetermined price.
1983 ANNUAL MEETING SCHEDULE
FRIDAY AFTERNOON
SEPTEMBER 9

2:00 PM  Meeting (continued) "Georgian Room"

2:00 PM  Technical Developments in
          Concrete: Superplasticisers/
          Glass Fiber Reinforced
          Concrete
          Norm Husk
          Dean Browning

2:40 PM  Promotional Film
          "The Art of Building"
          Tom Verti

3:00 PM  Coffee Break

3:15 PM  Development - Vehicle for
          Construction Marketing
          Jon Eicholtz

3:35 PM  Movie

3:55 PM  Subcontracting & Subcontract
          Default
          Dick Ackerson

4:15 PM  Trends in Engineer Education
          as they Relate to
          Construction Industry
          Prof. Donn Hancher

4:40 PM  Free Time

7:00 PM  Cocktail and Dinner Party with
          Invited Guests
          "Viennese Room"
SUPERPLASTICISERS

by

Norm Husk

I. Introduction

II. Pretesting & Selection of Products

III. Precast Concrete
   A. Precast/Pretensioned Beams and Girders.
   B. Precast Column Cladding and Spandrel Cladding.

IV. Poured in Place Concrete
   A. PIP Shear Walls.
   B. PIP Columns.

V. Advantages/Disadvantages

VI. Quality Control

VII. Film
Fiber-Reinforced Concrete

by

Dean Browning

I. Introduction

Concrete is fundamentally weak in tension and has comparatively low ductility and little resistance to impact loading. In order to overcome these disadvantages, many researchers have been conducting experiments to use various types of short-cut fibers in the concrete for reinforcement. The most frequently-used materials are metal fibers and glass fibers.

The short random-placed fibers act as crack arrestors by producing "pinching" forces which tend to close a crack. As the tension-weak concrete produces cracks, the random fibers across the path of the crack prevent it from opening.

II. Steel Fibers

The primary applications to date for steel fibers are traffic paving, either structure deck or as a topping, and concrete pipe manufacturing. The cost of the steel material and placing problems make it less desirable than other materials. The steel-fiber concrete is placed in the conventional manner without usual reinforcement. The fibers have a tendency to ball up, especially on thinner sections. Since the concrete cover for rebar is not necessary, most panels are thin. The thin parking slabs were found to have a much greater resistance to cracking with more deformation before failure occurred.

III. Glass Fibers

For years, the use of glass fiber was limited due to the alkaline material in hydrated cement. In recent years, an alkaline-resistant glass fiber has renewed interest in glass-fiber reinforced concrete, GFRC. Its primary applications are building claddings, non-removable forms and underground utility boxes. The United Kingdom has been using the GFRC extensively for many applications and the brand name "Cem-Fill" is patented by Pilkington Brothers, Limited. In this country, Owens-Corning Fiberglass Corp. has done extensive research and discovered an alkaline-resistant glass fiber from an additive called "Zirconia." They refer to their final product as Fiber Reinforced Concrete, FRC.

The process of making wall panels is similar to that of fiberglass-mold making. The cement and fiber is sprayed onto a mold and the matrix compressed into shape by hand-rolling the mix to approximately 3/8" thick. The panels are stiffened by ribs as required. The bolted connection to the structure is a loop cast into the product by adding more material. Steel studs can be added in the factory with electrical wiring completed and ready for drywall once in place.
IV. Advantages to FRC

The main advantage of FRC is the light weight of the completed product. Not that the density of FRC is less, 115 to 140 pcf, but that the cross-section of the product is thinner. A typical window wall panel may be many inches thick to cover reinforcing steel. A typical wall panel from FRC with the same exterior dimensions has 3/8" thick walls with a hollow interior core. The FRC panels generally weigh about ten percent as much as a concrete panel. Since the panels are hollow, mechanical and electrical lines can be incorporated into the wall.

The panels can have unusual and difficult shapes that may be unreasonable for concrete panels. As in concrete, faces that are formed at different angles will produce different surface appearances.

V. Disadvantages of FRC

The primary concern for using FRC is the loss of strength after a period of time. The material’s ultimate strength is greatest shortly after manufacturing. This can be an advantage considering the usually-high stresses experienced while handling prior to erection. However, the time loss in strength dictates that the product not be used as a structural member (load-carrying) until further study.

As discussed earlier, another disadvantage to FRC is the alkaline attack on the fibers which requires either coated fibers or ones made from special glass. This leads to higher material cost. In addition, a lot of production by hand is required. In the past, the product had been too expensive to compete with other materials. As the industry grew and initial costs were deferred, the price is becoming more in line with other finishes.

The disadvantages to appearance are two basic types. First, the ribs in the panel acting as stiffeners and thickened areas for structural connections will read through if not constructed properly. This can be covered by staining the panel. The second appearance problem is checking. This will occur if not handled properly since the panels are thin and flexible. The steel stud frame will help prevent this problem.

VI. Application to Data

To date, GFRP has been used primarily for building cladding in the United States. On the east coast they design deep window box panels with interesting shapes. On the west coast the panels typically are flat cladding, either vertical or horizontal. The only reason for the difference seems to be production and connection requirements for zone Y. In Australia they are using the GFRP panels as a mold for PIP concrete with success. In Europe the applications vary from utility boxes to bridge deck PIP concrete forms. They use the GFRP skin as protection for the PIP concrete. They feel the GFRP has better spalling and weathering resistance.
V. Future

The concerns expressed for years about brittle, long term failure and loss of strength still exists. There is a great reluctance on anyone's part to be the first one to try something new, but during the last few years most applications have been tried and the concern isn't as great anymore. GFRPC will become more and more accepted due to its advantages and the problems will be overcome.
Material description

FRC panels generally weigh about 10 percent as much as pre-cast concrete panels.

The first and major difference between Fiberglas-reinforced and conventional concrete can be seen in Figure 1.

The precast concrete panel, on the left, is a solid mass. It was made by placing concrete into a form or mold until the form was filled. It may also incorporate steel reinforcing bars.

The FRC panel, on the right, also uses a concrete mixture, but here the manufacturing process involves spraying the concrete, along with chopped glass fibers, into the form.

Externally these two parts look exactly alike. But the FRC part, viewed from the back, is concave, following the shape of the face. It is a high-strength “skin” (3/8 in. to 1 in. thick) which serves the same function as the thicker pre-cast concrete panel, but at a fraction of the weight.

FRC panels have the “moldability” of plastics but with all the strength of concrete.

It is partly from the weight savings and partly from the spray-up manufacturing process that FRC derives its other distinguishing features compared to conventional concrete.

Not limited by the weight and rebar requirements of a solid concrete mass, the FRC “skin” can be sprayed into a very broad array of forms.

Considering installed-cost economics—including building structural requirements, panel cost and weight, and erection equipment and procedures—the practical range for FRC forms is broader in several respects than for precast. Panel designs which would require a large volume of concrete, such as those with very deep sections, are particularly good candidates for FRC.

Figure 2 exhibits an FRC application on an office building as a case in point. The light weight deeply recessed panels permitted the windows to be sent back thus providing shading without obstructing the view or the light. Externally they add a design element that distinguishes the building. The “moldability” of FRC provided the solid look of precast as well as the design feature of the structure.
How parts are made with Fiberglas-reinforced concrete

To make a typical Fiberglas-reinforced concrete panel, the manufacturer first builds a form or mold to the designer's specifications (see page 10 for more design data). Into this form the producer sprays a slurry mixture of standard portland cement, sand, water and additives, and a spray of two-inch-long chopped glass fibers. The sprayed-up composite is then "rolled out" (compressed with hand rollers) to remove entrapped air and assure solidity of the mass. The panel is left to set in the covered form and is then stripped and cured under controlled environmental conditions.

During the spraying process, fastening devices and structural design features (such as ribs sprayed over foam blocks) are set into the form and covered with the FRC mixture.

The spray-up process and the homogeneity of Fiberglas reinforcement it produces allow production of relatively delicate detail. Virtually any texture can be reproduced with FRC, including those with exposed aggregate.

Also available for finish technique are pigmentation, applied colorants and various texturing methods.

Owens-Corning and the fabricators of FRC products stand ready to provide the means of implementing your ideas.

Applications

Here is a starter list of architectural or building components which can be made of FRC with the spray-up process. These are all non-load-bearing items because the spray-up process does not produce structural parts.

| Cladding panels | Equipment housings |
| Soffits | Fascia panels |
| Booths | Column covers |
| Cabanas | Coping |
| Street furniture | Kiosks |
| Planters | |
| Interior panels | |

(Top) FRC panels are made by spraying a concrete slurry and chopped glass fibers into an architectural form

(Bottom) The finished panel is stripped from the form and cured under controlled environmental conditions.
The proof of FRC strength

Test results displayed here were determined with equipment and procedures employed by the Owens-Corning Technical Center in Granville, Ohio.

The Technical Center also performs accelerated and real-time exposure tests to determine the properties of aged FRC material. The accompanying chart shows the effects of time on ultimate and PEL (Proportional Elastic Limit) strengths. Note that aging has the effect of gradually increasing PEL strength*—so that it tends toward identity with ultimate strength as time passes and stability is achieved. This is the reason for design of the FRC part to working stress levels which are generated from PEL, rather than ultimate strengths.

Since the highest ultimate strengths are developed in the part during the period immediately following manufacture, these higher strengths are of considerable benefit. For it is during that period of handling, shipping and erection—rather than during architectural use of the product—that it is subjected to the greatest stresses.

* A slight decrease in PEL strength over time has been noted in extremely hot, dry exposures.

Continuous exposure to extremely hot, dry conditions may require special design consideration.

Typical property ranges of FRC spray-up materials
Tested at 28 days, 7-day wet cure, 4 volume percent (5 weight percent), with 2" AR Glass fibers

<table>
<thead>
<tr>
<th>Mix</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Portland cement, Type I</td>
<td>94 lbs.</td>
</tr>
<tr>
<td>Sand</td>
<td>31 lbs.</td>
</tr>
<tr>
<td>Water-reducing agent*</td>
<td>4 oz.</td>
</tr>
<tr>
<td>Water</td>
<td>31 lbs.</td>
</tr>
<tr>
<td>AR Glass fibers (added by chopper during spray-up)</td>
<td>8.2 lbs.</td>
</tr>
</tbody>
</table>

*It may not be necessary to use a water-reducing agent if a high-shear mixer is employed in the mixing process.

Properties
Note: These are typical properties and are not to be used for design purposes. Each manufacturer must test composites produced in its own facility to establish actual physical properties for use as design parameters of their products.

<table>
<thead>
<tr>
<th>Property</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultimate flexural strength, psi</td>
<td>3000-4500</td>
</tr>
<tr>
<td>P.E.L.** flexural strength, psi</td>
<td>1200-1800</td>
</tr>
<tr>
<td>Ultimate tensile strength, psi</td>
<td>1000-1600</td>
</tr>
<tr>
<td>P.E.L.** tensile strength, psi</td>
<td>400-1000</td>
</tr>
<tr>
<td>Compressive strength (edgewise), psi</td>
<td>7000-12000</td>
</tr>
<tr>
<td>Shear strength (interlaminar), psi</td>
<td>500-800</td>
</tr>
<tr>
<td>Impact strength (Charpy), in-lbs/in²</td>
<td>70-140</td>
</tr>
<tr>
<td>Young’s Modulus (sonic), psi x 10⁶</td>
<td>3.1-4.2</td>
</tr>
<tr>
<td>Young’s Modulus (flexural), psi x 10⁶</td>
<td>1.8-3.2</td>
</tr>
<tr>
<td>Density,pcf</td>
<td>115-140</td>
</tr>
<tr>
<td>Coefficient of thermal expansion, in/in/°F x 10⁶</td>
<td>6-9</td>
</tr>
</tbody>
</table>

**P.E.L. = Proportional Elastic Limit

Schematic Representation of Long-Term FRC Strengths—Typical Natural Weathering Behavior of good quality FRC materials.
Promotional Movie
"The Art of Building"
by Thomas D. Verti

One of the most important aspects of acquiring new construction opportunities is to be known and recognized in the marketplace as a reputable, competent and competitive builder. Even though our reputation as an industry leader in innovative and advanced concrete technology is prevalent within the technical and engineering community, by virtue of the numerous publications of construction projects in Engineering News Record, Construction Digest, Construction Methods, Western Construction, etc., our reputation in the Development Community is in its infancy stage.

Since it is the Development Community that provides the source of new work, we are starting to make a concerted effort to describe and advertise our company's philosophy, capabilities and track record via the traditional media such as newspaper and magazine articles and brochures, as well as the media of short motion pictures.

Several years ago a short film, featuring our "state of the art" precasting techniques, was produced for the purpose of educating architects and structural engineers to our experience and capabilities in this specialized area. Although very successful, this movie was technically oriented and did not serve directly as a marketing tool.

The purpose of the movie "The Art of Building", which will be viewed here, is to present, in an illustrative manner, the complex and comprehensive role we undertake as a "Master Builder" in the planning, designing and construction phases of a major building project.
The film making process extended over a period of two years and presents the Crocker Plaza Office Building project in Long Beach, California as a case study of the Design/Build process in evolution.

The following is the "Narrator" text for the movie which attempts to describe (within the 10 minute film) the company, its philosophy, talent, capabilities, experience and proven track record in a straight forward, non-technical style that will be understood and appreciated by our future developer clients.

In this 20th anniversary year, it is our hope that this movie, "The Art of Building", will open the door to many future challenging construction opportunities.
PANKOW FILM NARRATION
"THE ART OF BUILDING"

1. OPENING TITLES: CHARLES PANKOW, INC. presents ... THE ART OF BUILDING

2. PHOTO BLOCKS: UNRELATED BUILDING BLOCKS
   (AN INTRODUCTION TO THE CHALLENGE OF BUILDING)

NARRATOR

The Art of Building is the systematic and timely integration of interlocking systems and materials, ... each component plays a vital role and must be carefully evaluated.

This challenge requires the skill of a Master Builder, a company whose specialists can draw from superior talent and years of knowledge and experience.

Without this skill the construction process can become a labyrinth of confusion. A maze of opportunities for a building to fall short of its intended goals.

The process is complex, easily misunderstood and despite all the preparation ... there is still risk. Risk of structural and financial failure ... ... functional and aesthetic failure ... and the failure to meet vital time commitments.

3. LIVE ACTION: PANKOW PEOPLE AT WORK (AN INTRODUCTION TO THE COMPANY)

NARRATOR

At Charles Pankow, we devote all of our talent and skills to the task of eliminating the risks in building.
Skilled supervisory technicians and an experienced management team, deliver our projects on schedule and within budget.

The Pankow organization was founded in 1963. Our growth as a company is the direct result of our introduction and implementation of creative ideas to both the construction and design process. Our success can be measured by our completed buildings, awards and patents.

Experienced in all facets of development, design and construction, we have met the tough standards of the marketplace ... completing over twenty-five million square feet of building space.

4. PHOTO BLOCKS: THEY TAKE ON MORE ORDER

NARRATOR
Our clients, who operate nationwide, bring demanding criteria to the planning table. Over the years we have proven our ability to respond to these demands.

Early in the planning process our team begins to integrate the many diverse elements within the building program. These initial decisions are the most critical. They require technically advanced construction techniques and the attention of highly qualified professionals ... professionals that can bridge the gap between the theoretical and the practical.

We provide a comprehensive analysis of architectural and engineering design options, including the selection of materials and construction methods. Under the scrutiny of our engineering and management specialists we carefully consider function, quality and scheduling factors.
As the planning and design phase draws to a conclusion, months of preparation, backed by years of experience will now be put to the test ... the construction process is set in motion.

5. LIVE ACTION: THE BUILDING RISES (COST SAVINGS)

NARRATOR
At Charles Pankow, we have pioneered and developed numerous technologies designed to stem the tide of ever-escalating construction costs. Years of experience, coupled with careful planning and imaginative engineering, enable us to incorporate many cost saving techniques in our building process. Often a relatively small change to a single detail can save the owner hundreds of thousands of dollars.

We are leaders in the development of jobsite automation, mechanized construction and advanced concrete technologies.

These include production line slipforming and the on-site/off-site manufacturing of structural and architectural precast concrete components. While others adopt methods we have made obsolete, we continue to provide our clients with innovative solutions to their specific building needs.

6. PHOTO BLOCKS: CLEARER INTEGRATION OF THE BUILDING ELEMENTS (FINANCIAL SAFEGUARDS)

NARRATOR
As the building components come together our skills and planning abilities give form to the emerging structure.
In a marketplace where the cost of money, labor and materials are relatively fixed, real cost savings can only be found through the application of innovative ideas.

To leverage a project into a competitive position the owner must look for a company whose philosophy is tuned to the ever increasing demands of the market.

As a result ... Charles Pankow is able to stand behind their work by offering a bonded lump sum contract.

If asked to operate in a design and build mode, Charles Pankow can furnish these guarantees "up front" based on preliminary plans and specifications, long before major design expenditures are realized.

When a substantial amount of capital is at risk, it is good to know Pankow's bond provides security essential to the owner.

7. LIVE ACTION: SLIPFORMING THE CENTRAL CORE

NARRATOR
An example of Charles Pankow's innovative construction technique can be seen in this office building. All of its internal components such as the elevator shaft, chases, bathrooms, stairs and lobby walls have been incorporated into the central concrete core. This structural and functional core is formed in a process called slipforming.

In slipforming, the concrete is poured into a continuous form. This form moves vertically up the full height of the building as it gives shape to the building core.
The form is systematically raised by means of a hydraulic jacking system in controlled increments. After the last concrete pour has cured, the form and working platform is hydraulically lifted into position, ready for the next level's pour. The form is raised with minimum manpower and maximum mechanization. Installation of the surrounding precast beams, panels and suspended floor slabs follow repetitively and quickly.

The use of a slipform allows the central core to be finished early in the construction schedule so that work can begin on critical elements such as mechanical equipment and elevators ... all of this well in advance of what would be possible with conventional methods.

8. LIVE ACTION: PRECAST ELEMENTS (PRECASTING TECHNIQUE)

NARRATOR
Another important aspect of our approach is the use of innovative precasting techniques.

Precast members including beams, floor planks, columns and wall panels can be cast at the construction site in an efficient, quality controlled, factory like atmosphere using specialized crews trained by experienced supervisors. The precast building parts can be stockpiled on-site until needed, and then erected in sequence, using a building block or erector-set approach.

The panels are designed to be assembled quickly yet maintain precise dimensional control and deliver an attractive and durable finish.
These pre-tensioned beams were fabricated on-site in a portable precast beam bed, one of Pankow's patented systems. The forms and molds used to produce these beams are made of concrete, wood, fiberglass and steel. This cost effective forming system was reused hundreds of times.

The beams are stored on-site until the schedule calls for their installation. During the assembly process they are positioned in blockouts within the slipformed core.

The beams also have built-in notches for supporting the floor slab formwork, thereby eliminating the need for costly scaffolding and manpower requirements.

10. PHOTO BLOCKS: BLOCKS IN BLACK SPACE (RESPONSE TO UNIQUE CHALLENGES)

NARRATOR

Pankow's professionals have the skill to organize the building process. They have proven their ability to recognize and solve unique on-site construction problems.

11. LIVE ACTION: THE FINISHED CROCKER PLAZA

NARRATOR

Charles Pankow is proud of its position in the construction industry, proud of its building product. As an industry leader, the Company has focused on setting a direction for others to follow.

Grounded in a determination to meet our clients' needs, we offer a risk free approach to construction, an approach that guarantees both quality and cost control at the beginning of a project.
NARRATOR
To Charles Pankow building is a skilled arrangement of interlocking decisions delivering a quality building on time and on budget.

After the successful integration of hundreds of professional skills and the application of years of engineering experience, the building is complete ... ready for occupancy.

NARRATOR
We take pride in putting our reputation "on the line" and we invite you to consider our approach as the most effective way to achieve your building needs.

Nothing is more gratifying to our company than a successful building serving the needs of the owner and the community.

The Charles Pankow organization believes that this is the Art of Building.
PRESENTATION
OF
SUBCONTRACT DOCUMENTS

By
R. E. Ackerson

I. DEFAULT (Refer to Section 7. DEFAULT of the Subcontract)
   
   A. What is Default?

   1. Failure to perform work.
   2. Failure to comply with Contractor's Schedule.
   3. Failure to provide proper materials and equipment.
   4. Failure to obtain necessary approval of Architect/Engineer of government agencies.
   5. Failure to comply with prevailing code regulations or laws governing the performance of the Subcontract.
   6. Failure to comply with Union labor agreements.
   7. Failure to make payment for work performed or material purchased.
   8. Failure to perform Change Order work.
   9. Failure to protect work until final completion.
   11. Failure to comply with any provisions of the Subcontract.

   B. Procedures for Placing Subcontractor into Default:

   1. Subcontractor must fail to perform or comply with items listed above.
   2. Contractor must provide written notification to Subcontractor to allow five (5) calendar days to remedy default.
   3. A second notice is not required if the default is a repetition of the same default and a previous written notice was issued.

   C. Contractor Remedies:

   1. Provide any such labor, materials, supervision, tools, equipment or supplies and deduct the cost therefrom from any money then due or thereafter to become due to Subcontractor.
2. Terminate Subcontractor’s rights in part or in their entirety under this Subcontract and take over and complete the performance of this Subcontract or any part of it at the expense of Subcontractor and employ any other person or firm to furnish the work, materials, etc.; and in case of such termination of Subcontractor's rights, Subcontractor shall not be entitled to any further payment until the work shall be completed, in which case Subcontractor shall be entitled to the excess, if any, of the unpaid balance provided for by the contract over the expenses incurred by Contractor in finishing the work at the time provided for final payment herein. However, if such expenses exceed any unpaid balance, Subcontractor shall pay the difference to Contractor at the completion of the work.

3. The Contractor may, at its sole discretion, in addition to or in lieu of the exercise of any other right, enter upon the premises and take possession for the purpose of completing the work, of all materials, equipment, tools, plant and facilities of the Subcontractor and the Contractor, and the Subcontractor hereby assigns and transfers to the Contractor, as directed by the Contractor, all materials, equipment, tools, plant and facilities for which payment has or will be made under this contract and all subcontracts, orders and commitments; and agrees to execute and deliver all such papers and take all such action as a Subcontractor may require to fully invest in the Contractor the rights of the Subcontractor in and to the same and/or to cancel, as directed by the Contractor, subcontracts, orders and commitments and sell at prices approved by the Contractor such materials, equipment, tools, plant and facilities as the Contractor shall direct, the proceeds to be paid or credited to the Contractor as the Contractor shall direct.

4. Reimbursement of all expenses and damages.

D. Examples of Default:

1. Minor (clean-up, negligence).
2. Serious (inability to perform or schedule delays).

II. SUBCONTRACT REVISIONS (See attached documents)

A. Original Subcontract Documents
B. Standard Paragraph A
C. Revised Documents incorporating provisions of Standard Paragraph A.
SUBCONTRACT

JOB NO. .................................................................

SUBCONTRACT NO. ....................................................

THIS AGREEMENT, made this ............... day of ................................................, 19........, by and between

................................................................., hereinafter called the Subcontractor, and

................................................................., hereinafter called the Contractor.

IT IS AGREED AS FOLLOWS:

Section 1. SCOPE OF WORK. (a) The Subcontractor agrees to furnish all supervision, shop and/or field engineering and design work as provided for in the contract documents, labor, tools, equipment, materials and supplies necessary to perform, and to perform all work set forth in subsection (b), including all work required to complete the installation of its work and which may not necessarily be noted in the specifications or detailed in the plans, in connection with the construction of ................................................................., hereinafter called the Owner.

for ................................................................................................................................., in accordance with the terms and provisions of the prime contract, except as otherwise provided herein, between the Owner and the Contractor dated ................................................................., 19........, including the General and Special Conditions, final Drawings and Specifications by ................................................................., Architect, and ................................................................., Structural Engineer, as approved by Owner and other documents forming or by reference made a part of the contract between the Contractor and the Owner, all of which shall be considered part of this Subcontract by reference thereto, and the Subcontractor agrees to be bound to the Contractor and the Owner by the terms and provisions thereof.

Subcontractor acknowledges its opportunity to inspect pertinent articles of Prime Contract, a copy of which is available in Contractor's Home Office. If personal visitation to Contractor's office is not convenient due to distance, Subcontractor acknowledges its rights of inspection of pertinent articles by written communication to be its available option.

(b) Subcontractor agrees to perform all ................................................................. as described in or reasonably inferable from the Plans and in accordance with but not limited to the following sections of the specifications:

See Section 26 for Additional Provisions.

Section 2. BOND. Prior to commencement of its work, the Subcontractor shall furnish a Performance and Payment Bond, each in an amount equal to the full subcontract price. Such bond shall be on Contractor's form or a form satisfactory to Contractor and shall be with a Surety satisfactory to Contractor. Contractor will pay the premium only if the bond is placed through its Broker.

Otherwise, bond premiums shall be paid by Subcontractor.

Section 3. DELIVERY POINT. When the Subcontractor does not install all material furnished under this Subcontract, such material as is not installed is to be delivered F.O.B. job site ................................................................., including all applicable taxes.

Section 4. PAYMENT. (a) The Contractor agrees to pay the Subcontractor for the performance of this Subcontract, as specified herein, the sum of ................................................................. Dollars ($ .................................................................), subject to additions and/or deductions for changes agreed upon or determined as hereinafter provided. Partial payments will be made to the Subcontractor each month in an amount equal to ninety percent (90%) of the value, computed on the basis of the prices set forth above, of the work performed hereunder, less the aggregate of previous payments; but it shall be a condition precedent to such partial payment becoming due to the Subcontractor that ten (10) days have expired after the Contractor receives payment for such work from the Owner. If the Contractor receives payment from the Owner for less than the full value of the work performed or of materials delivered to the site, the amount due to the Subcontractor shall be reduced accordingly. No partial payment to the Subcontractor shall constitute approval or acceptance of work done or materials furnished hereunder. Upon complete performance of this Subcontract by the Subcontractor and final approval and acceptance of Subcontractor's work and materials by the Owner, the Contractor shall make final payment to the Subcontractor if the balance due it under this Subcontract on the express condition precedent that ten (10) days have expired since full payment for such work and materials has been received by the Contractor from the Owner and any applicable lien period has expired without a lien being filed by Subcontractor or anyone claiming under it; or, at the Contractor's option, Subcontractor has submitted a satisfactory lien release or waiver to Contractor. Subcontractor is hereby notified and also agrees that its monthly invoice will be submitted to Contractor at .................................................................

This invoice must be received five (5) days prior to the .......... day of the month. In the event Subcontractor's invoice is not received as stipulated above, it is assumed that Contractor will not have included the costs of said invoice in Contractor's billing to project Owner and payment will not be made until the following pay period.

HOME OFFICE
(b) The Contractor may deduct from any amounts due or to become due to the Subcontractor any sum or sums owed by the Subcontractor to the Contractor; and in the event of a breach by the Subcontractor of any provision or obligation of this Subcontract, or in the event of the assertion by other parties or by the Contractor or the Owner of any claim, lien, or any other right against the Contractor or the premises arising out of the performance of Subcontractor's performance or failure of performance of this Subcontract, the Contractor shall have the right up to the amount of such deduction or expense thereof, until the situation has been remedied or adjusted by the Subcontractor, to the satisfaction of the Contractor.

(c) Upon request, Subcontractor shall provide Contractor with evidence satisfactory to it that Subcontractor has paid for all labor, services and materials included in any progress billing, and that all labor, services and materials included in any progress billing are acceptable to the Owner and/or Architect.

(d) Contractor shall provide a detailed breakdown of its price within five (5) days of the date of this subcontract.

Section 5. CHANGES. The Contractor may at any time by written order, and without notice to the Subcontractor's sureties, make changes in, additions to, and omissions from the work to be performed and materials to be furnished under this subcontract, that shall be mutually agreed upon by and between the Contractor, Subcontractor, and the Subcontractor shall promptly proceed with the performance of this Subcontract as so changed. Contractor may also use discretion with respect to the method of construction other than those indicated on the plans and specifications. If such changes should change the scope of the work of the Subcontractor, then the Subcontractor's price shall be equitably adjusted to the extent such adjustment is provided for in the prime contract, provided the party affected makes written demand herefor within ten (10) days of the date the such change is ordered or any such drawings indicating alternate details or methods of construction have been submitted to the Subcontractor.

Section 6. PROSECUTION OF THE WORK. The Subcontractor shall furnish all labor, supervision, shop and/or field engineering, and design work if called for in the contract documents, tools, equipment, materials and supplies necessary for the performance of the Subcontract in a proper, efficient and workmanlike manner. The Subcontractor shall complete the work undertaken in a prompt and diligent manner whenever such work or any part of it becomes available, or at such other time or times at the discretion of the Contractor, and so as to promote the general progress of the entire construction. Subcontractor shall not, by delay or otherwise, interfere with or hinder the work of the Contractor or any other Subcontractor. Any materials that are to be furnished by the Subcontractor hereunder shall be furnished in sufficient time to enable the Subcontractor to perform and complete its work as required herein.

Section 7. DEFAULT. (a) In the event of any default under this Subcontract by Subcontractor, then Contractor, in addition to any other remedies it may have, either under the terms of this agreement or by law, shall be entitled to the following:

(1) Reimbursement by Subcontractor for any and all liquidated or actual damages that may be assessed against and collected from the Contractor which are attributable to or caused by Subcontractor's delays or failure to furnish the materials or perform the work required by this Subcontract;

(2) Any additional damages, expenses and costs that Contractor may sustain by reason of the default of Subcontractor;

Such costs to include all standby and onsite overhead costs incurred by reason of Subcontractor's delay in completing its work.

(b) If Subcontractor at any time refuses or neglects to supply labor, materials, supervision, tools, equipment or supplies of proper quality, quantity or for the proper performance of this contract or if Subcontractor should fail to pay in any respect to prosecute the work with promptness and diligence, or if Subcontractor fails to comply or becomes disabled from complying with any of the conditions or provisions of this contract, and such neglect, failure or default is not cured within twenty (20) days after written notice by Contractor to Subcontractor to do so (provided, however, a second notice need not be given for a repetition of the same default even though the prior default may have been cured after notice) or if Subcontractor should be adjudicated a bankrupt or make a general assignment of the benefit of its creditors, then Contractor, in addition to any other remedies it may have, either under the terms of this agreement or by law, shall be entitled to do the following:

(1) Provide any such labor, materials, supervision, tools, equipment or supplies and deduct the cost therefrom from any money then due or thereafter to become due to Subcontractor;

(2) Terminate Subcontractor's rights in part or in their entirety under this Subcontract and take over and complete the performance of this Subcontract. The Contractor is hereby given power to employ any person or firm to furnish, perform the work, materials, etc., and in case of such termination of Subcontractor's rights, the Contractor shall not be entitled to any further payment until the work shall be completed, in which case Subcontractor shall be entitled to the excess, if any, of the balance paid for by the Contractor over the expenses incurred by Contractor in finishing the work at the time provided for final payment by the Contractor, provided, however, if such expenses exceed any unpaid balance, Subcontractor shall pay the difference to Contractor at the completion of the work.

(3) The Contractor may, at its sole discretion, in addition to or in lieu of the exercise of any other right, enter upon the premises and take possession for the purpose of completing the work, of all materials, equipment, tools, plant and facilities of the Subcontractor and the Contractor, and Subcontractor hereby assigns and transfers to the Contractor, as directed by the Contractor, all materials, equipment, tools, plant and facilities for which payment has or will be made under this contract and all subcontracts, orders and commitments; and agrees to execute and deliver to and take such action as a Subcontractor may require to fully invest in the Contractor the rights of the Subcontractor in and to the same and/or cancel, as directed by the Contractor, subcontracts, orders and commitments and sell at prices approved by the Contractor such materials, equipment, tools, plant and facilities of the Contractor shall direct, the proceeds to be paid or credited to the Contractor as the Contractor shall direct.

(c) In the event of neglect, failure, or default of the part of Subcontractor by Contractor shall not constitute the waiver of any additional or continued neglect, failure or default by Subcontractor.

(d) If Subcontractor cannot supply materials required by the specifications and cannot get alternatives approved, Contractor may then provide such materials and the installation of them if required by the Subcontract at the expense of the Subcontractor.

Section 8. PERMITS, FEES, SERVICES AND REPORTS. The Subcontractor agrees to pay the cost of all permits, fees, sales taxes, gross income tax, water, sewer, temporary heating and lighting, hoisting, proper protection of his own and existing work of the Owner and others already in place, clean up and removal of his debris as may or may not be directed by the Contractor, furnishing and approval of samples, tests, shop drawings, as-built drawings, guarantees, reports, etc., connected with, called for, or necessary for its work.

Section 9. DELAYS. (a) In the event the Subcontractor's performance of this Subcontract is delayed or interfered with by acts of the Owner, Contractor or other subcontractors, it may request an extension of the time for the performance of same, hereinafter provided, but shall not be entitled to any increase in the Subcontract price or to any claims or additional compensation as a consequence of such delays or interference, except to the extent that the prime contract entitles the Contractor to compensation for such delays, and then only to the extent of any amounts that the Contractor may, on behalf of the Subcontractor, recover from the Owner for such delays. Otherwise, Subcontractor expressly agrees not to make, and hereby waives, any claim for damages on account of any delay, obstruction or hindrance for any reason, including but not limited to, the aforesaid cause, and agrees that its sole right and remedy in the case of any delays, obstruction or hindrance shall be an extension of the time fixed for completion of its work.

(b) No allowance for an extension of time shall be made by the Contractor for any cause whatever, shall be claimed by, or made to, the Subcontractor unless the Subcontractor shall have made written request upon the Contractor for such extension within forty-eight hours after the cause of such extension occurs, or, if the contract between the Owner and Contractor provides for an extension of sufficient time to permit the Contractor to give notice to the Owner within the time allowed by the prime contract for such notice.

(c) No allowance of an extension of time shall, in any event, be made to the Subcontractor for delay by the Subcontractor in preparing drawings or in securing approval of the Architect or Engineer when such drawings are not properly prepared or when the Subcontractor's exercise of reasonable diligence and judgment could have anticipated and avoided the delay.

Section 10. LABOR. The Subcontractor, in connection with the work covered by this Subcontract, shall comply with and be bound by any labor agreements executed by the Contractor or on Contractor's behalf and labor provisions in the prime contract to the extent that the provisions of such agreements apply to subcontractors, and it shall also comply with all labor agreements that may be in effect at the time the Subcontract is signed.
materials or equipment to execute the work defined in this Subcontract, then the Contractor may terminate the Subcontract and proceed in accordance with Section 7 hereof.

Subcontractor shall pay for all fringe benefits applicable to its labor and shall provide and pay for any trust fund bonds whenever such may be required. Subcontractor shall provide Contractor, upon its request, satisfactory evidence of such payments being made.

Section 11. PROGRESS SCHEDULE. The Subcontractor shall confer with the Contractor regarding the schedule on which the various items of work must be completed. In addition, the Subcontractor agrees to complete the several portions and the whole of the work under this Subcontract by the time designated by the progress schedule developed by the Contractor as such progress schedules are modified from time to time by the Contractor. The Subcontractor shall commence the several portions of the work in such order as the Contractor may direct; and shall obtain written notice of performance on receipt of like notice.

The Subcontractor agrees to submit as many as necessary within fifteen (15) days from the date of this contract, and further agrees to order all of its materials with start work on the said project as required and shall prosecute and complete the various portions and all of its work in accordance with the above referred to progress schedule.

Section 12. INSURANCE. Prior to the commencement of its work, the Subcontractor agrees, at its own expense, to procure and maintain during the entire progress of the work, full statutory workmen's compensation, employer's liability insurance, bodily injury liability and property damage liability insurance with a carrier or carriers and on policy forms satisfactory to Contractor.
(e) The Contractor shall not be deemed to have waived its rights to demand arbitration under this Subcontract by filing suit, provided:

1. The Contractor files suit in order to prevent the running of the statute of limitations or in order to obtain the benefit of some provisional remedy, such as an attachment or injunctive relief; and
2. The Contractor stays substantive court proceedings pending arbitration.

(f) Subcontractor consents and agrees that any arbitration under this Agreement may, at the option of Contractor, by consolidation, joinder or otherwise, include other persons involved in or affected by the decision in such arbitration. Nothing herein contained shall be construed to grant to Subcontractor any right to arbitration under any circumstances except to the extent expressly granted to Subcontractor under this Agreement.

Section 15. POSSESSION PRIOR TO COMPLETION. Whenever it may be useful or necessary for the Contractor to do so, the Contractor shall be permitted to store on the site of the work which has been either partially or fully completed by the Subcontractor before final inspection and acceptance thereof by the Owner, but such use or occupation shall not relieve the Subcontractor of its guarantee of said work and materials nor of its obligation to make good at its own expense any defect in materials or workmanship which may occur or develop prior to Contractor's release from responsibility to the Owner. Provided, however, the Subcontractor shall not be responsible for the maintenance of such portion of the work as may be used or occupied by the Contractor, nor for any damage thereto that is due to or caused by the negligence of the Contractor during such period of use or occupancy.

Section 16. OTHER CONTRACTS. (a) It is understood and agreed that the work provided for in this Subcontract constitutes only part of the work being performed for the Owner by the Contractor and other subcontractors. The Subcontractor, therefore, agrees to perform the work called for in this Subcontract in such a manner that it will not injure, damage or delay any other work performed by the Contractor or any of its employees, as permitted to do by the terms of the prime contract, and further agrees to pay the Contractor for any damage or delay that may be caused to such other work by the Subcontractor or its employees;

(b) Subcontractor shall be bound by the terms and provisions of the prime contract, the plans and specifications, and other general contract documents. However, it is mutually agreed that in case of any conflict between any of the terms and conditions of this Subcontract Agreement, and of the prime contract, plans, specifications, and other general contract documents, this Subcontract Agreement shall govern.

Section 17. SHOP AND DESIGN DRAWINGS. (a) If Subcontractor shall make changes in design, including dimensional changes, either through shop drawings or actual field work, it shall accept all responsibility for structural and functional adequacy and acceptance of such changes by Owner or Architect. Any structural or functional inadequacies which may develop because of such changes shall be remedied by the Subcontractor in spite of any approvals given by Owner or Architect unless such change is specifically included in a change order or provided for in Section 5. In addition, the costs of additional work, redoing or repairing work incurred by other trades or Contractor resulting from such changes shall be borne by the Subcontractor.

(b) If Subcontractor is responsible for design drawings, it shall accept all responsibility for structural, functional, and design adequacy of such drawings and acceptance by Owner and Architect of such drawings. Any structural or functional failure or inadequacy result from such design drawings shall be remedied by the Subcontractor. In addition, the Subcontractor shall bear all resultant costs such as work by other trades or Contractor, in addition to the original contract price, and any damages.

(c) If this Subcontract is based on preliminary, outline, or otherwise unfinished Plans and Specifications, the Subcontractor accepts responsibility for cooperating and coordinating with Architect and other trades in developing final Plans and Specifications so as not to impose additional work or cost on other trades or Contractor or to cause an increase in the Subcontract price. If the final Plans and Specifications change the scope of work of this contract then the Subcontract price will be equitably adjusted to the extent such adjustment is provided for in the prime contract.

Section 18. INDEPENDENT CONTRACTOR. The Subcontractor expressly warrants that it is or, prior to the start of work hereunder and during the entire progress of the work hereunder, will be an independent licensed contractor and an employing unit subject as an employer to all applicable unemployment compensation statutes so as to relieve the Contractor of any responsibility or liability to the Subcontractor or any employees as employees of the Contractor for the purpose of keeping records, making reports and payments of unemployment compensation taxes or contributions; and the Subcontractor will keep and hold the Contractor harmless and reinstate it for any expense or liability incurred under said statutes in connection with employees of the Subcontractor, including a sum equal to benefits paid to those who were Subcontractor's employees, where such benefit payments are charged to the Contractor under any Merit Plan or to its individual reserve account pursuant to any state unemployment compensation statute.

Section 19. COMPLIANCE WITH LAW. The Subcontractor further agrees as regards (a) production, purchase and sale, furnishing and delivering, pricing, and use or consumption of materials, supplies and equipment; (b) the hire, tenancy or conditions of employment of employees and their hours of work and rates of and the payment of their wages; (c) the keeping of records, making of reports and the payment, collection or deduction of Federal, State and local taxes and contributions; and (d) the performance of this sub subcontract in all other respects that the Subcontractor will keep and have available all necessary records and make all payments, reports, collections and deductions, and otherwise do any and all things so as to fully comply with all Federal, State and local laws, ordinances, rules and regulations and utility requirements and all applicable safety regulations in regard to any and all said matters insofar as they affect or involve the Subcontractor's performance of this Subcontract, all so as to fully relieve Contractor from and protect it against any and all responsibility or liability herefor or in regard thereto.

Section 20. PROTECTION OF WORK. Except as provided in Section 15, above, the Subcontractor specifically agrees that it is responsible for the protection of its work until final completion and acceptance thereof by the Owner and that within the limits of Contractor's responsibility it will make good or replace, at no expense to the Contractor or the Owner, losses and any damage to its work which occurs prior to said final acceptance.

Section 21. ARCHITECT - ENGINEER. The words "Architect" or "Engineer" as used herein refer to the person appointed by the Owner to supervise the work of the Contractor on behalf of the Owner.

Section 22. ASSIGNMENT. The Subcontractor shall not, in whole or in part, assign or sublet this Subcontract or the proceeds thereof without the written consent of the Contractor.

Section 23. SPECIFIC PROVISIONS INSERTED. The attachment hereto of specific provisions of the Contract between the Contractor and the Owner is for purposes of emphasis or to comply with applicable law or regulations and is not to be construed as an exclusion of other provisions of that contract.

Section 24. PRIOR UNDERSTANDINGS OR REPRESENTATIONS. The Contractor assumes no responsibility for any understandings or representations made by any of its officers or agents prior to the signing of this Subcontract unless such understandings or representations by the Contractor are expressly stated in the Subcontract.

Section 25. CAPTIONS. The captions at the beginning of each Section of this Contract are for convenience only and are to be given no weight in construing the provisions of this Subcontract.

Section 26. ADDITIONAL PROVISIONS. (See Attached Sheets)

IN WITNESS WHEREOF, the parties hereto have executed this Subcontract by their proper officers or duly authorized agents.

By: [Signature] (For Contractor)  By: [Signature] (For Subcontractor)

Subcontractor's License No. [Number]  Subcontractor's Federal Employer Identification No. [Number]  Contractor's State License No. [Number]  [Signature]  [Signature]
1. CONTRACT DOCUMENTS

The Subcontract Documents for the work consist of this Subcontract, the General Conditions, the Revisions to General Conditions, the Plans and Specifications, all addenda issued prior to the execution of this Subcontract, and all modifications issued subsequent to the execution of this Subcontract. If anything in the Plans and Specifications is inconsistent with this Subcontract, this Subcontract will control; provided, however, that it is specifically intended that the rights and obligations of the Subcontractor, as defined in the other Subcontract Documents, are intended to supplement, rather than modify, the rights and obligations of the Subcontractor as described in this Subcontract, and that the other Subcontract Documents shall be interpreted so as to effect this intent. The Subcontractor is presumed to have examined all pertinent sections of the Subcontract Documents, including but not limited to the Plans and Specifications of other trades in order that it may be familiar with any and all provisions and/or requirements affecting its work. Work included in this Subcontract is to be complete in all respects and includes all work identified or inferable from the drawings and Specifications and any other work necessary to satisfy design criteria or provide for a finished facility of quality workmanship.

2. SUPERVISION

a. Concurrently herewith, Subcontractor shall furnish Contractor with a statement containing the names, positions, and business telephone numbers of all of its executives, jobsite superintendent or foreman, and other employees who will be responsible in any way for the management or supervision of the work. These persons will be subject to the approval of Contractor.

b. Subcontractor agrees to have a responsible representative from its firm full time on the project during its work and may agree to be represented by a representative from its firm at weekly subcontractors' meetings at Contractor's field office immediately prior to and during Subcontractor's phase of work.

3. MATERIAL PROCUREMENT

a. Submittals - Subcontractor is to furnish within fifteen (15) days after date of this Subcontract a complete list of all material and/or equipment, all drawings, and all samples that are to be furnished under this Subcontract.

b. Procurement - Within five (5) days after approval of submittals, material shall be ordered by Subcontractor as set forth in Section 11 of this Subcontract, and Subcontractor shall provide Contractor with a procurement list/log of material ordered on Contractor's form which shall include as a minimum, order dates, shipping dates, and delivery dates. For purposes of this paragraph, "ordered by Subcontractor" is defined to mean that purchase order or contract has been sent to the vendors/suppliers who have the material in stock or who are to manufacture the material.

c. Purchase Orders - Copies of purchase orders indicating delivery dates confirmed by Subcontractor's suppliers shall be furnished Contractor if requested.

d. Procurement Log - Updated copies of the procurement log are to be provided to Contractor on the 25th day of each month until such time as all materials have been delivered to the jobsite and is a condition precedent to payment.

e. Material Shortages - In the event of unavailability of any material to be furnished and/or installed under this Subcontract, Subcontractor shall notify Contractor immediately in writing and procure alternate and equal materials satisfactory to Contractor, Architect, and Owner at no additional cost and so as not to delay Contractor's schedule.

f. Expediting & Shipment of Materials - Time is of the essence in this Subcontract and in completion of this project and Subcontractor agrees that it shall take the necessary action to ensure that materials required in the execution of its work are on hand when required so as not to delay Contractor's schedule. Subcontractor agrees to notify Contractor in writing of any potential or actual delays concerning procurement of materials by either Subcontractor or its agents.

g. No approval of submittals, drawings, lists of material or equipment shall release any of Subcontractor's obligations or responsibilities as defined in this Subcontract or the Subcontract Documents. Failure on part of Subcontractor to process submittals or initiate procurement action as set forth above shall in no way relieve Subcontractor of its obligation to furnish the required materials on the jobsite when required to meet Contractor's schedule.

4. PAYMENTS

a. On or before the 25th day of each calendar month, Subcontractor shall prepare, certify as correct and deliver to Contractor an itemized application for payment in a form specified by Contractor. Prior to submitting formal monthly payment requests, Subcontractor shall review payment application with Contractor's superintendent and obtain preliminary agreement as to quantity of work in place.

b. No progress payments will be disbursed until such time as all of the requirements under this Subcontract have been fulfilled, including but not limited to the receipt of Subcontractor's procurement log and schedule of values.

c. Final payment shall not be made until all lien waivers, releases and receipts covering all labor and materials for which a lien could be filed are received by Contractor. In addition, all guarantees, warranties, certificates, operating instructions, manuals, and as-built drawings must be submitted and approved prior to final payment.

d. 4% Hawaii General Excise Tax is included but will be deducted from monthly progress payments and paid on behalf of Subcontractor by Contractor.

5. COORDINATION OF WORK

a. It will be Subcontractor's responsibility to leave its work in proper condition to receive the subsequent application of work of other trades. Assignment/submittal of any of Subcontractor's work, if approved by Contractor in writing, shall not relieve Subcontractor from its responsibility for correct and timely performance and direct coordination of its work.

b. Prior Work - Before starting work Subcontractor shall examine all prior work affecting this Subcontractor and assure itself that all conditions are, at the time it begins work, such as will allow proper execution of the work and the assumption of warranty requirements. Subcontractor shall notify Contractor immediately in writing upon discovery of any improper conditions.
6. CHANGES

The following is added to Section 5 of this Subcontract:

Contractor shall not be obligated to pay for any claim or request for an extra to the Subcontract for work, material, or services provided or performed prior to receipt of a change order executed by Subcontractor.

7. CHANGES IN THE WORK

Should Contractor direct Subcontractor to perform work on this project not included as part of this Subcontract, and Contractor and Subcontractor fail to agree on a price for such work, Contractor may direct Subcontractor to proceed with such work on a cost-plus basis. If the change is to be paid for on a cost-plus basis, the amount to be added to or deducted from the Subcontract amount shall be calculated as follows:

a. Actual cost of materials, equipment rentals and the like;

b. Cost of labor, including wages, payroll taxes, workers compensation premiums, and fringe benefits which are standard in the industry and properly allocable to the change order affecting the work.

c. Taxes directly related to the change order.

d. Additional compensation to Subcontractor equal to ten percent (10%) of the total of the foregoing items a through c. No additional mark-up shall be allowed for Subcontractor's subcontractors.

3. WARRANTY WORK

Subcontractor warrants and guarantees that the work and materials covered by this Subcontract shall be of good quality, free from faults and defects and in conformance with the Plans and Specifications. Subcontractor warrants that all materials and equipment shall be new unless otherwise specified, if requested by Contractor. Subcontractor agrees to make arrangements for performance of warranty work directly with the Owner(s) or its agents. Subcontractor agrees to make good at its own expense all costs, including resultant damages, resulting from or in connection with any defect in materials, workmanship or equipment which may occur or develop prior to Contractor's release from responsibility to the Owner therefor or for which Contractor may be responsible. In no case shall Subcontractor's warranty or guarantee be less than for a one-year period after substantial completion of the work or acceptance of Subcontractor's work, whichever shall be later. A written guarantee on Contractor's form shall be submitted by Subcontractor prior to final payment. Subcontractor specifically agrees that said warranty/guarantee may be assigned by Contractor to Owner or other party.

9. ENVIRONMENT

Unless specifically exempted in Section 26 of this Subcontract, Subcontractor shall without further direction be responsible for full compliance with environmental rules, regulations and standards in effect at the location(s) of Subcontractor's project work. Environment is defined to include air quality, water quality, waste management, appearance, noise control, public convenience, and public relations. Subcontractor shall be responsible for strict compliance and the intent of environmental regulations.

10. DEFAULT - Section 7 of this Subcontract is amended as follows:

a. Section 7(b) (Revised) = "...or if Subcontractor should be adjudicated a bankrupt, or Subcontractor seeks or becomes involved in, voluntarily or involuntarily, any violation of the Bankruptcy Act or any other State or Federal law relating to or affecting the rights of creditors or voluntarily or involuntarily is involved or connected with a general assignment for the benefit of its creditors, then Contractor...."

11. PROMPT PERFORMANCE

If Contractor shall in good faith determine that Subcontractor shall not have made adequate provision for the prompt and faithful performance of this Subcontract, or that Subcontractor has fallen behind in the project so as to prejudice the probability of Contractor being able to finish overall at the time required, it shall be lawful for Contractor (a) to terminate Subcontractor's right to proceed with the project or with such part thereof as to which there has been delay or improper performance, and to proceed to finish the same by contract, by itself or otherwise; or (b) to furnish such labor and material as may be needed, at the expense of Subcontractor, without so terminating this Subcontract. In either event, Contractor shall have the right to enter upon the construction site and take possession of all the materials, tools and equipment belonging to Subcontractor and, for this purpose, this Subcontract shall be construed as an assignment by Subcontractor to Contractor of all such materials, tools and equipment. Contractor, in any such event, also may refrain from making any further payments under this agreement to Subcontractor until the entire project shall be finished fully and accepted by the Owner, at which time, if the unpaid balance of the amount to be paid under this Subcontract shall exceed the expense incurred by Contractor in finishing the project and the damages sustained by Contractor as a result of Subcontractor's default, such excess shall be paid by Contractor to Subcontractor. But if such expenses and damages shall exceed such unpaid balance, Subcontractor promptly shall pay the difference to Contractor. If Contractor does not terminate the right of Subcontractor to proceed, Subcontractor shall continue with the balance of the project. If the Owner is damaged by reason of any breach by Subcontractor of this agreement, then Subcontractor shall, subject to any defenses and offsets to which Subcontractor may be entitled under this Subcontract, pay the Owner such damages.

12. MATERIALS NOT INCORPORATED INTO WORK

Unless otherwise directed by Contractor, Subcontractor agrees to issue instructions to all its vendors to make immediate deliveries of all the required materials, either to the site of the project or to Subcontractor's shop, as the case may be, and, if delivered to the site, to store such materials in a suitable manner at its own expense. Materials shall not be delivered to the site without first obtaining Contractor's permission. Subcontractor shall be fully responsible for the materials so stored, and Contractor shall be under no responsibility therefor. Subcontractor shall not be entitled to any payment
for materials stored on-site or off-site unless (a) payment therefor is received by Contractor from the Owner and then only in amounts not to exceed the amounts received from the Owner as and when received by Contractor from the Owner; (b) Subcontractor has filed with Contractor insurance policies in form satisfactory to Contractor covering the said materials; and (c) Subcontractor has complied with all other requirements of the Owner and Contractor.

13. CORRECT PERFORMANCE

Subcontractor shall be responsible for correct performance of Subcontractor’s own work, including work of Subcontractor’s subcontractors and suppliers, and any errors therein shall be corrected at Subcontractor’s own cost and expense and, in addition thereto, Subcontractor shall indemnify Contractor for any costs or expense attributable to errors in performance by Subcontractor or Subcontractor’s subcontractors or suppliers. In that regard, Subcontractor’s obligation hereunder shall include taking field measurements for all work hereunder and approval of shop drawings by Owner or Contractor shall not relieve Subcontractor from correcting work either reflected in error on Subcontractor’s shop drawings, not conforming to the field requirements or not complying with the terms of this Subcontract. In that regard, it shall not be incumbent upon Contractor to discover any mistakes, errors, omissions, or deviations from the Contract requirements or the quality of kind of materials used by Subcontractor or in in the shop drawings, schedules and reports submitted by Subcontractor, and Contractor’s and/or Owner’s approval of same shall not relieve Subcontractor from responsibility for unauthorized changes, deviations, omissions or for errors of any sort therein. Subcontractor takes full responsibility for compliance with all applicable regulatory agency criteria and building codes for items included in its work whether or not reflected in its shop drawings.

14. TERMINATION

In the event that the Contract between the Owner and Contractor is terminated or work stopped or delayed on the project for any reason permitted in the Contract between Owner and Contractor or by direction of governmental authority, then Contractor shall have the right to terminate this Subcontract without penalty or cause Subcontractor to stop all work pending Contractor’s continuation of the work. In the event of such stoppage or termination and unless otherwise permitted by the Owner, Subcontractor shall be entitled to payment under this Subcontract only for the actual cost of work in place, materials delivered and accepted by the Owner, and confirmed non-cancelable material purchase contracts at the time of work stoppage by Contractor.

15. HOISTING

Contractor’s hoisting facilities, as they exist at the jobsite, will normally be made available to Subcontractor provided such hoisting is scheduled adequately in advance. Contractor’s hoisting facilities, if required during other than normal working hours, shall be made available to Subcontractor at the expense of Subcontractor (Subcontractor shall be responsible for rigging/handling materials).

16. SITE CONDITIONS

It is understood that the jobsite may be in a congested area and that Subcontractor shall be responsible for providing storage and/or employee parking facilities (including payment of any costs) as may be required to perform the work included in this Subcontract.

17. CARGO INSURANCE

Subcontractor agrees to provide cargo insurance for all materials while enroute to project site, the cost of premiums being the responsibility of Subcontractor. Insurance coverage shall be for the full value of materials. Any deductible shall be paid by Subcontractor.

18. ARBITRATION - The following is added to or amends Section 14 of this Subcontract:

(g) Subcontractor agrees to be included as an additional party in any arbitration proceeding between Owner and Contractor arising from the design and construction of the property if either Owner or Contractor considers Subcontractor or its agents to be responsible or liable.

(h) Contractor and Subcontractor agree that this is one of the best of their efforts, that their contract documents will contain similar arbitration provisions as stated herein and that these provisions shall include an agreement to consolidation or joinder to permit disposition of all claims, disputes or other matters relating to the project so that complete relief is accorded in one arbitration proceeding if either party hereto so requests.

(i) Subcontractor agrees that this arbitration Section shall be construed and enforced in accordance with Hawaii Revised Statutes, Chapter 658.

19. Subcontract sum is based on Subcontractor working on all construction days scheduled by Contractor, including all non-General Contractors Association holidays.

20. INSURANCE

Requirement for written notice of cancellation or reduction in coverage under Section 12 herein is amended from ten days to thirty (30) days. Further, Contractor shall be named as an additional named insured under all Subcontractor’s liability policies.
SUBCONTRACT

JOB NO._________________

SUBCONTRACT NO.________

THIS AGREEMENT, made this ___ day of __________, 19___, by and between_______________

(Subcontractor and Address)

__________________________________________, hereinafter called the

Subcontractor, and _________________

(Cocontractor and Address)

__________________________________________, hereinafter called the

Contractor.

IT IS AGREED AS FOLLOWS:

Section 1. SCOPE OF WORK. (a) The Subcontractor agrees to perform all work set forth in
subsection (b), in connection with the construction of

for _________________, hereinafter called the Owner, at

in accordance with the terms and provisions of the prime
contract, except as otherwise provided herein, between the Owner and the Contractor dated

, 19___, including all the General and Special Conditions, Final Drawings and
Specifications by

Engineer, as approved by Owner and other documents forming or by reference made a part of the
contract between the Contractor and the Owner, all of which shall be considered part of this
Subcontract by reference thereto, and the Subcontractor agrees to be bound to the Contractor and the
Owner by the terms and provisions thereof. Subcontractor acknowledges its opportunity to inspect
pertinent articles of Prime Contract, a copy of which is available in Contractor's Home Office. If
personal visitation to Contractor's office is not convenient due to distance, Subcontractor
acknowledges its rights of inspection of pertinent articles by written communication to be its
available option.

(b) Subcontractor agrees to perform all

described in the Plans and in accordance with but not limited to the following sections of the
specifications:

including all work reasonably inferable and necessary to satisfy design criteria so as to provide a
finished, quality, facility.

See Section 26 for Additional Provisions.

(b) Subcontractor agrees to perform all

as described in or reasonably inferable from the Plans and in accordance with but not limited to the
following sections of the specifications:

See Section 26 for Additional Provisions.

Section 2. BOND. Prior to commencement of its work, the Subcontractor shall furnish a
Performance and Payment Bond, each in an amount equal to the full Subcontract price. Such bond
shall be on Contractor's Form and shall be with a Surety satisfactory to Contractor. Contractor
will pay the premium.

Section 3. DELIVERY POINT. When the Subcontractor does not install all material furnished
under this Subcontract, such material as is not installed is to be delivered F.O.B. jobsite

, including all applicable taxes.

Section 4. PAYMENT. (a) Subcontractor shall submit for approval within ten (10) days of
signing of the Contract, a "Schedule of Values". (b) The Contractor agrees to pay the Subcontractor
for the performance of this Subcontract, as specified herein, the sum of

Dollars ($________) subject to additions and/or
deductions for changes agreed upon or determined as hereinafter provided. Four percent (4%) Hawaii
General Excise Tax is included but will be deducted from monthly progress payments and paid on
behalf of Subcontractor by Contractor. Partial payments will be made to the Subcontractor each

8/19/83

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month in an amount equal to ninety percent (90%) of the value, computed on the basis of the prices set forth above, of the work performed hereunder, less the aggregate of previous payments; but it shall be a condition precedent to such partial payment becoming due to the Owner. If the Contractor receives payment from the Owner for less than the full value of the work performed or of materials delivered to the site, the amount due to the Subcontractor shall be reduced accordingly.

No partial payment of the Subcontractor shall constitute approval or acceptance of work done or materials furnished hereunder. Upon complete performance of this Subcontract by the Subcontractor and final approval and acceptance of Subcontractor's work and materials by the Owner. Final payment shall not be made until all lien waivers, releases and receipts covering all labor and materials for which a lien could be filed are received by Contractor. In addition, all guarantees, warranties, certificates, operating instructions, manuals, and as-built drawings must be submitted and approved to the satisfaction of the Owner prior to final payment. On or before the 25th day of each month, Subcontractor shall prepare, certify as correct and deliver to Contractor at

an itemized application for payment in a form specified by Contractor. Prior to submitting formal
monthly payment requests, Subcontractor/Seller shall review payment application with Contractor's superintendent and obtain preliminary agreement as to quantity of work in progress. No progress payments will be disbursed until such time as all of the requirements under the Contract have been fulfilled, including but not limited to the receipt of Subcontractor/Seller's procurement and schedule of values. In the event Subcontractor's invoice is not received as stipulated above, it is assumed that Contractor will not have included the costs of said invoice in Contractor's billing to project Owner and payment will not be made until the following pay period.

(c) The Contractor may deduct from any amounts due or to become due to the Subcontractor any sum or sums owed by the Subcontractor to the Contractor; and in the event of any breach by the Subcontractor of any provision or obligation of this Subcontract, or in the event of the assertion by other parties of any claim or lien against the Contractor or the premises arising out of the Subcontractor's performance or failure of performance of this Subcontract, the Contractor shall have the right to retain out of any payments due or to become due to the Subcontractor any amount sufficient to completely protect the Contractor from any and all loss, damage or expense therefrom, until the situation has been remedied or adjusted by the Subcontractor, to the satisfaction of the Contractor.

(d) Upon request, Subcontractor shall provide Contractor with evidence satisfactory to it that Subcontractor has paid for all labor, services and materials included in any progress billing, and that all labor, services and materials included in any progress billing are acceptable to the Owner and/or Architect.

Section 5. CHANGES. (a) The Contractor may at any time by written order, and without notice to the Subcontractor's sureties, make changes in, additions to, and omissions from the work to be performed and materials to be furnished under this Subcontract, and the Subcontractor shall promptly proceed with the performance of this Subcontract as so changed. Contractor may also use details and methods of construction other than those indicated in the plans and specifications. If such changes should change the scope of work of the Subcontractor, then the Subcontractor price shall be equitably adjusted to the extent such adjustment is provided for in the prime contract, provided the party affected makes written claim therefor within ten (10) days of the time any such change is ordered or any such drawings indicating alternate details or methods of construction have been submitted to the Subcontractor. Contractor shall not be obligated to pay for any claim or request for an extra to the Subcontract for work, material, or services provided or performed prior to receipt of a change order executed by Subcontractor.

(b) Should Contractor direct Subcontractor/Seller to perform work on this project or provide material not included as part of the Contract, and Contractor and Subcontractor/Seller fail to agree on a price for such work, Contractor may direct Subcontractor/Seller to proceed with such work on a cost-plus basis. If the change is to be paid for on a cost-plus basis, the amount to be added to or deducted from the Contract amount shall be calculated as follows:


b. Equipment - Actual cost of rental, not to exceed prevailing rates.

c. Labor - Direct payroll costs, payroll taxes, workers compensation premiums, and fringe benefits which are standard in the industry and properly allocable to the change order affecting the work.

d. Overhead - Six percent (6%) of total of items (a) through (c), including compensation for estimating, purchasing, insurance, etc., and miscellaneous home office costs.

e. Fee - Five percent (5%) of total of items (a) through (c).

f. Sub-Subcontractors - Two percent (2%) compensation to Subcontractor for administration and supervision.
g. Gross Income Tax - Actual cost.

(e) Subcontractor shall not make any modifications to the plans and specifications or existing work of other trades without specific written approval of Contractor. Such approval includes, but is not necessarily limited to the following:

a. Providing any additional holes or blockouts in dry concrete or masonry work other than as shown in the Contract Drawings. Any modifications shown on shop drawings, but not on Contract Drawings, must receive specific written approval for such penetrations, in addition to shop drawing approval.

b. Cutting, benching, heating, moving, adjusting or in any way modifying the concrete reinforcing steel and post-tensioning work.

c. Removal, loosening, or relocating of any falsework, "X" bracing and/or re-shoring, or any of their components.

d. Material or equipment loading on any suspended slab or formwork.

e. Nailing, stapling or otherwise penetrating Contractor's form systems.

Section 6. CONSTRUCTION MODELS. Contractor may request completion of the first typical floor at the earliest possible time to establish such units as construction models. In conjunction therewith, Subcontractor/Seller shall perform all work required for such units, including providing all material, installation, fixtures and other work as directed by Contractor.

Section 7. PROSECUTION OF THE WORK. (a) The Subcontractor shall furnish all labor, supervision, shop and/or field engineering and design work if called for in the contract documents, tools equipment, materials and supplies necessary for the performance of the Subcontract in a proper, efficient and workmanlike manner. The Subcontractor shall prosecute the work undertaken in a prompt and diligent manner whenever such work or any part of it becomes available, or at such other time or times as the Contractor may direct, and so as to promote the general progress of the entire construction. Subcontractor shall not, by delay or otherwise, interfere with or hinder the work of the Contractor or any other Subcontractor. Any materials that are to be furnished by the Subcontractor hereunder shall be furnished in sufficient time to enable the Subcontractor to perform and complete its work as required herein.

(b) Subcontractor shall be required to work on all construction days scheduled by Contractor, including all non-General Contractors Association holidays.

Section 8. PROMPT PERFORMANCE. If Contractor shall in good faith determine that Subcontractor shall not have made adequate provision for the prompt and faithful performance of the Contract, or that Subcontractor has fallen behind in the project so as to prejudice the probability of Contractor being able to finish overall at the time required, it shall be lawful for Contractor (a) to terminate Subcontractor's right to proceed with the project or with such part thereof as to which there has been delay or improper performance, and to proceed to finish the same by contract, by itself or otherwise; or (b) to furnish such labor and material as may be needed, at the expense of Subcontractor, without so terminating the Contract. In either event, Contractor shall have the right to enter upon the construction site and take possession of all the materials, tools and equipment belonging to Subcontractor and, for this purpose, the Contract shall be construed as an assignment by Subcontractor to Contractor of all such materials, tools and equipment. Contractor, in any such event, may refrain from making any further payments under this agreement to Subcontractor until the entire project shall be finished fully and accepted by the Owner, at which time, if the unpaid balance of the amount to be paid under the Contract shall exceed the expenses incurred by Contractor in finishing the project and the damages sustained by Contractor as a result of Subcontractor’s default, such excess shall be paid by Contractor to Subcontractor. But if such expenses and damages shall exceed such unpaid balance, Subcontractor promptly shall pay the difference to Contractor. If Contractor does not terminate the right of Subcontractor to proceed, Subcontractor shall continue with the balance of the project. If the Owner is damaged by reason of any breach by Subcontractor of this agreement, then Subcontractor shall, subject to any defenses and offsets to which Subcontractor may be entitled under the Contract, pay the Owner such damages.

Section 9. MATERIALS NOT INCORPORATED INTO WORK. Unless otherwise directed by Contractor, Subcontractor agrees to issue instructions to all its vendors to make immediate deliveries of all the required materials, either to the site of the project or to Subcontractor's shop, as the case may be, and, if delivered to the site, to store such materials in a suitable manner at its own expense. Materials shall not be delivered to the site without first obtaining Contractor's permission. Subcontractor shall be fully responsible for the materials so stored, and Contractor shall be under no responsibility therefor. Subcontractor shall not be entitled to any payment for materials stored on-site or off-site unless (a) payment therefore is received by Contractor from the Owner and then only in amounts not to exceed the amounts received from the Owner as and when received by Contractor from the Owner; (b) Subcontractor has filed with Contractor insurance
policies in form satisfactory to Contractor covering the said materials; and (c) Subcontractor has
compiled with all other requirements of the Owner and Contractor.

Section 10. CORRECT PERFORMANCE. Subcontractor shall be responsible for correct performance of
its own work, including work of its subcontractors and suppliers, and any errors therein shall be
rectified at its own cost and expense. In addition thereto, Subcontractor shall indemnify
Contractor for any costs or expenses attributable to errors in performance by Subcontractor or its
subcontractors or suppliers. In that regard, Subcontractor's obligation hereunder shall include
taking field measurements for all work hereunder and approval of shop drawings by Owner or
Contractor shall not relieve Subcontractor from correcting work either reflected in error on its
shop drawings, not conforming to the field requirements or not complying with the terms of the
Contract. In that regard, it shall not be incumbent upon Contractor to discover any mistakes,
errors, omissions, or deviations from the Contract requirements in the quality of kind of materials
used by Subcontractor or in the shop drawings, schedules and reports submitted by Subcontractor, and
Contractor's and/or Owner's approval of same shall not relieve Subcontractor from responsibility for
unauthorized changes, deviations, omissions or for errors of any sort therein. Subcontractor takes
full responsibility for compliance with all applicable regulatory agency criteria and building codes
for items included in its work whether or not

Section 11. TERMINATION. In the event that the Contract between the Owner and Contractor is
terminated or work stopped or delayed on the project for any reason permitted in the Contract
between Owner and Contractor or by direction of governmental authority, then Contractor shall have
the right to terminate the Contract without penalty or cause. All work to stop pending Contractor's
continuation of the work. In the event of such stoppage or termination and unless otherwise
permitted by the Owner, Subcontractor shall be entitled to payment under this Contract only for the
actual cost of work in place, materials delivered and accepted by the Owner, and confirmed non-
cancellable material purchase contracts at the time of work stoppage by Contractor.

Section 12. HOISTING. Contractor's hoisting facilities, as they exist at the job site, will
normally be made available to Subcontractor provided such hoisting is scheduled adequately in
advance. Contractor's hoisting facilities, if required during other than normal working hours,
shall be made available to Subcontractor at the expense of Subcontractor (Subcontractor shall be
responsible for rigging/handling materials).

Section 13. SITE CONDITIONS. It is understood that the job site may be in a congested area and
that Subcontractor shall be responsible for providing storage and/or employee parking facilities
(including payment of any costs) as may be required to perform the work included in the Contract.

Section 14. SUPERVISION. (a) Concurrently herewith, furnish Contractor with a statement
containing the names, positions, and business telephone numbers of all of its executives, job site
superintendent or foreman, and other employees who will be responsible in any way for the management
or supervision of the work. These persons will be subject to the approval of Contractor.

Section 15. CONFLICTS. In the event of any conflict between the Subcontract and the provisions
herewith and/or of the other Contract Documents, the provisions of the Subcontract shall control.
In general, Plans and Specifications indicate quality of materials and workmanship and drawings
indicate dimensions, locations, quantities and details of construction. Figured dimensions take
precedence over scaled measurements. Detailed drawings and specifications take precedence over
general drawings and specifications. Supplementary details and instructions, revisions of later
date and addenda, if approved by Contractor, take precedence over original documents, information
and earlier addenda providing they do not increase the Scope of Work or delay execution of the
work.

Section 16. DEFAULT. (a) In the event of any default under this Subcontract by Subcontractor,
then Contractor, in addition to any other remedies it may have, either under the terms of this
agreement or by law, shall be entitled to the following:

(1) Reimbursement by Subcontractor for any and all liquidated or actual damages that may
be assessed against and collected from the Contractor which are attributable to or caused by
Subcontractor's delays or failure to furnish the materials or perform the work required by this
Subcontract;

(2) Any additional damages, expenses and costs that Contractor may sustain by reason of the
default of Subcontractor. Such costs to include all standby and onsite overhead costs incurred
by reason of Subcontractor's delay in completing its work.

(b) If Subcontractor at any time refuses or neglects to supply labor, materials, supervision,
tools, equipment or supplies of quantity and quality for the proper performance of this
contract or if Subcontractor should fail in any respect to prosecute the work with promptness and
diligence, or if Subcontractor fails to comply or becomes disabled from complying with any of the
conditions or provisions of this contract, and such neglect, failure or default is not cured within
five (5) calendar days of written notice by Contractor to Subcontractor to do so (provided, however,
a second notice need not be given for a repetition of the same default even though the prior default may have been cured after notice) or if Subcontractor should be adjudicated a bankrupt or make a general assignment for the benefit of its creditors, then Contractor, in addition to any other remedies it may have, either under the terms of this agreement or by law, shall be entitled to do the following:

(1) Provide any such labor, materials, supervision, tools, equipment or supplies and deduct the cost therefrom from any money then due or thereafter to become due to Subcontractor;

(2) Terminate Subcontractor's rights in part or in their entirely under this Subcontract and take over and complete the performance of this Subcontract or any part of it at the expense of Subcontractor and employ any other person or firm to furnish the work, materials, etc.; and in case of such termination of Subcontractor's rights, Subcontractor shall not be entitled to any further payment until the work shall be completed, in which case Subcontractor shall be entitled to the excess, if any, of the unpaid balance provided for by the contract over the expenses incurred by Contractor in finishing the work at the time provided for final payment herein. However, if such expenses exceed any unpaid balance, Subcontractor shall pay the difference to Contractor at the completion of the work.

(3) The Contractor may, at its sole discretion, in addition to or in lieu of the exercise of any other right, enter upon the premises and take possession for the purpose of completing the work, of all materials, equipment, tools, plant and facilities of the Subcontractor and the Contractor, and the Subcontractor hereby assigns and transfers to the Contractor, as directed by the Contractor, all materials, equipment, tools, plant and facilities for which payment has or will be made under this contract and all subcontract orders and commitments; and agrees to execute and deliver all such papers and take all such action as a Subcontractor may require to fully invest in the Contractor the rights of the Subcontractor in and to the same and/or to cancel, as directed by the Contractor, subcontract orders and commitments and sell at prices approved by the Contractor such materials, equipment, tools, plant and facilities as the Contractor shall direct, the proceeds to be paid or credited to the Contractor as the Contractor shall direct.

(c) The waiver of any neglect, failure, or default on the part of Subcontractor by Contractor shall not constitute the waiver of any additional or continued neglect, failure or default by Subcontractor.

(d) If Subcontractor cannot supply materials required by the specifications and cannot get alternatives approved, Contractor may then provide such materials and the installation of them if required by the Subcontract at the expense of the Subcontractor.

Section 17. COMMENCEMENT OF CONTRACT. Work under the Contract shall not commence until a written Notice to Proceed is by Contractor. If the project fails to proceed, the Contractor has the right to cancel the Contract without penalty or liability. If a Notice to Proceed is not given by May 1, 1983, the Contract shall be deemed cancelled, unless both parties agree to an extension and/or modification.

Section 18. PERMITS, FEES, SERVICES AND REPORTS. The Subcontractor agrees to pay the cost of all permits, fees, sales taxes, gross income tax, water, power, temporary heating and lighting, hoisting, proper protection of his own and existing work of the Owner and others already in place, clean up and removal of his debris as may or may not be directed by the Contractor, furnishing and approval of samples, tests, shop drawings, as-built drawings, guarantees, reports, etc., connected with, called for, or necessary for its work.

Section 19. MATERIAL PROCUREMENT. (a) Submittals - Furnish within fifteen (15) days after date of the Contract a complete list of all material and/or equipment, all drawings, and all samples that are to be furnished under the Contract.

(b) Procurement - Within five (5) days after date of submittals, material shall be ordered by Subcontractor/Seller as set forth in the Contract, and Subcontractor/Seller shall provide Contractor with a procurement list/log of material ordered on Contractor's Form which shall include as a minimum, order dates, shipping dates, and delivery dates. For purposes of this paragraph, "ordered by Subcontractor/Seller" is defined to mean that purchase order or contract has been sent to the vendor/suppliers who have the material in stock or who are to manufacture the material.

(c) Purchase Orders - Copies of purchase orders indicating delivery dates confirmed by Subcontractor/Seller's suppliers shall be furnished Contractor if requested.

(d) Procurement Log - Updated copies of the procurement log are to be provided to Contractor on the 25th day of each month until such time as all materials have been delivered to the jobsite and is a condition precedent to payment.

(e) Material Shortages - In the event of unavailability of any material to be furnished and/or installed under the Contract, Subcontractor/Seller shall notify Contractor immediately in writing.
and procure alternate and equal materials satisfactory to Contractor, Architect, and Owner at no additional cost and so as not to delay Contractor's schedule.

(f) Expediting & Shipment of Materials — Time is of the essence in completion of this project and Subcontractor/Seller agrees that it shall take the necessary action to insure that materials required in the execution of its work are on hand when required so as not to delay Contractor's schedule. Subcontractor/Seller agrees to notify Contractor in writing of any potential or actual delays concerning procurement of materials by either Subcontractor/Seller or its agents.

(g) No approval of submittals, drawings, lists of material or equipment shall waive any of Subcontractor's/Seller's obligations or responsibilities as defined in the Contract or the Contract Documents. Failure on part of Subcontractor/Seller to process submittals or initiate procurement action as set forth above shall in no way relieve Subcontractor/Seller of its obligation to furnish the required materials on the job site when required to meet Contractor's schedule.

Section 20. DELAYS. (a) In the event the Subcontractor's performance of this Subcontract is delayed or interfered with by acts of the Owner, Contractor or other subcontractors, it may request an extension of the time for the performance of same, as hereinafter provided, but shall not be entitled to any increase in the Subcontract price or to damages or additional compensation as a consequence of such delays or interference, except to the extent that the prime contract entitles the Contractor to compensation for such delays, and then only to the extent of any amounts that the Contractor may, on behalf of the Subcontractor, recover from the Owner for such delays. Otherwise Subcontractor expressly agrees not to make, and hereby waives, any claim for damages on account of any delay, obstruction or hindrance for any cause whatever, including but not limited to, the aforesaid cause, and agrees that its sole right and remedy in the case of any delays, obstruction or hindrance shall be an extension of the time fixed for completion of its work.

(b) No allowance for an extension of time, for any cause whatever, shall be claimed by, or made to, the Subcontractor unless the Subcontractor shall have made written request upon the Contractor for such extension with forty-eight hours after the cause of such extension occurs, or, if the contract between the Contractor and Owner provides for a shorter period, within sufficient time to permit the Contractor to give notice to the Owner within the time allowed by the prime contract for such notice.

(c) No allowance of an extension of time shall, in any event, be made to the Subcontractor for delay by the Subcontractor in preparing drawings or in securing approval of the Architect or Engineer when such drawings are not properly prepared or when the Subcontractor by the exercise of reasonable diligence and judgment could have anticipated and avoided the delay.

Section 21. LABOR. The Subcontractor, in connection with all work covered by this Subcontract, shall comply with and be bound by any labor agreements executed by the Contractor or on Contractor's behalf and labor provisions in the prime contract to the extent that the provisions of such agreements apply to subcontractors, and it shall also comply with all labor agreements to which it is signatory. Failure at any time to comply with any of the provisions of such agreements will, at the option of the Contractor, be cause for termination of this Subcontract under the provisions of Section 16. If, by reason of off-site strikes, picketing or disputes of any nature, Subcontractor should be persistently, repeatedly, or for a period of two (2) consecutive days, unable to supply proper materials or equipment to execute the work defined in this Subcontract, then the Contractor may terminate the Subcontract and proceed in accordance with Section 16 hereof.

Subcontractor shall pay for all fringe benefits applicable to its labor and shall provide and pay for any trust fund bonds whenever such may be required. Subcontractor shall provide Contractor, upon its request, satisfactory evidence of such payments having been made.

Section 22. PROGRESS SCHEDULE. The Subcontractor shall confer with the Contractor regarding the schedule on which the various items of work must be completed. In addition, the Subcontractor agrees to complete the several portions and the whole of the work herein sublet by the time or times designated by the progress schedule developed by the Contractor as such progress schedule may be modified from time to time by the Contractor. The Subcontractor shall commence the several parts of the Work at such times and proceed therewith at such places and in such order as the Contractor may direct; and on receipt of written notice from the Contractor, the Subcontractor shall cease performance of the Work or portions thereof to the extent directed and shall resume performance on receipt of like notice.

The Subcontractor agrees to submit drawings, lists, samples, etc., through Contractor for approval as called for in the specifications or other documents within fifteen (15) days from the date of this contract, and further agrees to order all of its materials within five (5) days after approval of said documents or samples and to procure delivery of same at the proper time and to arrange to start work on the said project as required and shall prosecute and complete the various portions and all of its work in accordance with the above referred to progress schedule.

Section 23. INSURANCE. Prior to the commencement of its work, the Subcontractor agrees, at its own expense, to procure and maintain during the entire progress of the work, full statutory

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workmen's compensation, employer's liability insurance, bodily injury liability and property damage liability insurance with a carrier or carriers and on policy forms satisfactory to Contractor.

Such liability insurance shall include the contractual or assumed liability of Subcontractor set forth in the following section. Subcontractor shall provide Contractor with copies of such policies upon request and shall provide Contractor with certificates of said insurance evidencing all of the coverage required herein and providing that such policies shall not be cancelled or reduced in coverage until thirty (30) days after written notice shall have been given to Contractor of such cancellation or reduction in coverage. Further, Contractor shall be named as additional named insured under all Subcontractor liability policies.

Subcontractor's liability insurance shall have the following minimum limits or the limits required by the prime contract, if greater: Personal injury or death, not less than $500,000.00 for one person and $1,000,000.00 for a single accident; property damage, other than automobiles, $500,000.00; and automobile property damage, $100,000.00.

Subcontractor agrees to provide cargo insurance for all materials while enroute to project site, the cost of premiums being the responsibility of Subcontractor. Insurance coverage shall be for the full value of materials. Any deductible shall be paid by Subcontractor.

Section 24. INDENIFICATION, GUARANTY AND WARRANTY. The Subcontractor further specifically obligates itself to the Contractor in the following respects:

(a) To indemnify the Contractor against and save it harmless from any and all claims, suits, expense or damage for any alleged or actual infringement or violation of any patent or patent right, arising in connection with this Subcontract and anything done thereunder;

(b) To indemnify the Contractor against and save it harmless from any and all claims, suits or liability for injuries to property, injuries to persons including death, and from any other claims, suits, or liability on account of any act or omission of the Subcontractor, or any of its officers, agents, employees, or servants;

(c) To indemnify the Contractor and the Owner against and save them and the premises harmless from any and all claims, suits or liens, by others than the Subcontractor, arising in connection with this Subcontract and anything done thereunder;

(d) Subcontractor warrants and guarantees that the work and materials covered by the Contract shall be of good quality, free from faults and defects and in conformance with the Plans and Specifications. Subcontractor warrants that all materials and equipment shall be new unless otherwise specified. If requested by Contractor, Subcontractor/Seller agrees to make arrangements for performance of warranty work directly with the Owner(s) or its agents. Subcontractor agrees to make good at its own expense all costs, including resultant damages, resulting from or in connection with any defect in materials, workmanship or equipment which may occur or develop prior to Contractor's release from responsibility to the Owner therefore or for which Contractor may be responsible. In no case shall Subcontractor's warranty or guarantee be less than for a one-year period after substantial completion of the work or acceptance of Subcontractor's work, whichever shall be later. A written guarantee on Contractor's form shall be submitted by Subcontractor prior to final payment. Subcontractor specifically agrees that said warranty/guarantee may be assigned by Contractor to Owner or other party.

(e) The Subcontractor warrants and guarantees the work and materials covered by this Subcontract and agrees to make good, at its own expense, all costs in connection with any defects in materials or workmanship which may occur or develop prior to the Contractor's release from responsibility to the Owner therefor;

(f) The Subcontractor assumes toward the Contractor all the obligations and responsibilities that the Contractor assumes toward the Owner, as set forth in the prime contract, General and Special Conditions, Drawings, Specifications, and other documents hereinabove referred to, insofar as applicable, generally and specifically, to the materials to be furnished and the work to be performed under this Subcontract;

(g) The Subcontractor, if and when arranging to move men or materials or to do any of its work from scaffolding, platforms, or other temporary structures, runways, man lifts, hoists, etc., whether or not installed by itself, shall examine and test same before beginning work; but in any event, if and while using same, it agrees that it accepted said scaffolding, etc., and assumes all responsibility for accidents, damages, etc., caused directly or indirectly by any of its operations, while said scaffolding, etc., is being used by it. The Subcontractor, if, and when, arranging to do any of its work with tools or equipment whether or not owned by it, shall examine and test same to its satisfaction, but in any event, if, and when using same, it agrees that it has accepted same, and it accepts all responsibility for accidents, damage, etc., caused directly or indirectly by any of its operations while said tools, equipment, etc., are being used by it.
(h) Subcontractor shall indemnify the Contractor and Owner against, and save them harmless from, any and all loss, damage, costs and expenses suffered or incurred on account of any breach of the aforesaid obligations and covenants and any other provision or covenant of this Subcontract.

Section 25. SPECIAL CONDITIONS. (a) Subcontractor agrees to have a responsible representative from its firm full time on the project during its work and agrees to be represented by a responsible representative from its firm at weekly subcontractors' meetings at Contractor's field office immediately prior to and during Subcontractor's phase of work.

(b) Coordination of Work:

(1) It will be Subcontractor's responsibility to leave its work in proper condition to receive the subsequent application of work of other trades. Assignment/subletting of any of Subcontractor's work, if approved by Contractor in writing, shall not relieve Subcontractor from its responsibility for correct and timely performance and direct coordination of its work.

(2) Prior Work - Before starting work Subcontractor shall examine all prior work affecting this Subcontractor and assure itself that all conditions are, at the time it begins work, such as will allow proper execution of the work and the assumption of warranty requirements. Subcontractor shall notify Contractor immediately in writing upon discovery of any improper conditions.

(3) Acceptance of Prior Work - The act of Subcontractor of starting any specific operation will be deemed as evidence of acceptance of related existing conditions as being satisfactory for such work and the required or indicated results that shall be produced.

(c) Environment - Unless specifically exempted in Subcontract, Subcontractor shall without further direction be responsible for full compliance with environmental rules, regulations and standards in effect at the location(s) of Subcontractor's project work. Environment is defined to include air quality, water quality, waste management, appearance, noise control, public convenience, and public relations. Subcontractor shall be responsible for strict compliance and the intent of environmental regulations.

Section 26. ARBITRATION. (a) All controversies, except as otherwise provided in this Section or any other section of this Agreement arising out of or pertaining to the construction of the Work referred to in this Subcontract or regarding the interpretation of this Subcontract, shall be submitted to arbitration in the manner hereinafter provided. In any event, the Subcontractor shall in no case cease to perform expeditiously the Work called for hereunder or the Work directed by the Contractor to be performed pursuant to this Subcontract, the Subcontractor shall diligently proceed with same. If any dispute or controversy arises in connection with any matter involving a direction, order, opinion or ruling of the Owner or any of the Owner's representatives, then the Subcontractor shall be bound by such ruling, direction, opinion or order to the same extent as the Contractor may be bound.

It is further agreed that in the event the Contractor exercises any of the rights granted to it under this Subcontract, the Subcontractor shall have no rights to arbitration, and the right to demand arbitration shall be vested solely in the discretion of the Contractor. If the Subcontractor claims that any of the demands made by the Contractor hereunder are improper, Subcontractor must, nevertheless, fully comply therewith, and its right to arbitration shall exist only in the event if fully complies with the direction of the Contractor and completes all of its Work hereunder. If the Subcontractor refuses to comply with the demands of the Contractor and fails to continue with the performance of the Work hereunder because the Contractor exercises any right granted under this Subcontract, the right to arbitrate any claims arising hereunder shall be exclusively vested in the Contractor; and in the event any claims are made by the Subcontractor and the Contractor demands arbitration, the Subcontractor hereby waives all rights to contend that the right to arbitrate under such circumstances lacks mutuality.

(b) Arbitration shall be had in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, as said rules may be in effect at the time the arbitration is initiated. Should any party refuses or neglect to appear or participate in arbitration proceedings, the arbitrator is empowered to decide the controversy in accordance with whatever evidence may be presented.

(c) All requests for arbitration shall be made in writing within thirty (30) days after occurrence of the events giving rise to the dispute or controversy. In the event Subcontractor fails to make such request in writing within the time stipulated herein, the Subcontractor hereby waives all rights to claim for that dispute or controversy. Acceptance of final payment by the Subcontractor shall constitute Subcontractor's waiver of all claims to arbitration. No arbitration proceedings shall be commenced or maintained unless commenced within one (1) year following substantial completion of the project.

(d) The terms, conditions, decisions, rulings, actions, orders or directions of the Owner's representatives, as used in the various Sections of this Subcontract, shall be deemed to include the
award or decision of any arbitration board authorized by the Contract Documents to determine any controversy between the Owner and the Contractor; provided, however, that the Contractor shall have previously given the Subcontractor written notice of such arbitration. In all such cases, there shall be no right of arbitration as between the Subcontractor and the Contractor, and the award, decision or ruling of the arbitration board shall be final and conclusive upon the Subcontractor, and shall have the same force and effect as if the Subcontractor were a party to the arbitration proceedings from their commencement.

(e) The Contractor shall not be deemed to have waived its rights to demand arbitration under this Subcontract by filing suit, provided:

1. The Contractor files suit in order to prevent the running of the statute of limitations or in order to obtain the benefit of some provisional remedy, such as an attachment or injunctive relief; and

2. The Contractor stays substantive court proceedings pending arbitration.

(f) Subcontractor agrees to be included as an additional party in any arbitration proceeding between Owner and Contractor arising from the design and construction of the property if either Owner or Contractor considers Subcontractor/Seller to be responsible or liable.

(g) Each party hereto expresses consent and agrees that any arbitration arising out of or relating to the Contract or the breach thereof or between Subcontractor and any of its subcontractors, material suppliers or between Owner and Contractor for the project may, at the option of either party, include by consolidation, joinder or in any other manner, other persons involved in or affected by such claim, dispute or other manner. Contractor and Subcontractor agree that to the best of their efforts, that their contract documents will contain similar arbitration provisions as stated herein and that these provisions shall include an agreement to consolidation or joinder to permit disposition of all claims, disputes or other matters relating to the project so that complete relief is accorded in one arbitration proceeding if either party hereto so requests.

(h) Subcontractor consents and agrees that any arbitration under this Agreement may, at the option of Contractor, by consolidation, joinder or otherwise, include other persons involved in or affected by the decision in such arbitration. Nothing herein contained shall be construed to grant to Subcontractor or Contractor any right to arbitration under any circumstances except to the extent expressly granted to Subcontractor under this Agreement.

(i) Subcontractor/Seller agrees that any arbitration proceeding shall be construed and enforced in accordance with Hawaii Revised Statutes, Chapter 658.

Section 27. POSSESSION PRIOR TO COMPLETION. Whenever it may be useful or necessary for the Contractor to do so, the Contractor shall be permitted to occupy or use any portion of the work which has been either partially or fully completed by the Subcontractor before final inspection and acceptance thereof by the Owner, but such use or occupation shall not relieve the Subcontractor of its guarantee of said work and materials nor of its obligation to make good at its own expense any defect in materials or workmanship which may occur or develop prior to Contractor's release from responsibility to the Owner. Provided, however, the Subcontractor shall not be responsible for the maintenance of such portion of the work as may be used or occupied by the Contractor, nor for any damage thereto that is due to or caused by the negligence of the Contractor during such period of use or occupancy.

Section 28. OTHER CONTRACTS. (a) It is understood and agreed that the work provided for in this Subcontract constitutes only a part of the work being performed for the Owner by the Contractor and other subcontractors. The Subcontractor, therefore, agrees to perform the work called for in this Subcontract in such a manner that it will not injure, damage or delay any other work performed by the Contractor or any other subcontractor, and further agrees to pay the Contractor for any damage or delay that may be caused to such other work by the Subcontractor or by its agents or employees;

(b) Subcontractor shall be bound by the terms and provisions of the prime contract, the plans and Specifications, and other general contract documents. However, it is mutually agreed that in case of any conflict between any of the terms and conditions of this Subcontract Agreement, and of the prime contract, plans, specifications, and other general contract documents this Subcontract Agreement shall govern.

Section 29. SHOP AND DESIGN DRAWINGS. (a) If Subcontractor shall make changes in design, including dimensional changes, either through shop drawings or actual field work, it shall accept all responsibility for structural and functional adequacy and acceptance of such changes by Owner or Architect. Any structural or functional inadequacies which may develop because of such changes shall be remedied by the Subcontractor in spite of any approvals given by Owner or Architect unless such change is specifically included in a change order provided for in Section 5. In addition, the costs of additional work, redoing or repairing work incurred by other trades or Contractor resulting from such changes shall be borne by the Subcontractor.
(b) If Subcontractor is responsible for design drawings, it shall accept all responsibility for structural, functional, and design adequacy of such drawings and acceptance by Owner and Architect of such drawings. Any structural or functional failure or inadequacy which may result from such design drawings shall be remedied by the Subcontractor. In addition, the Subcontractor shall bear all resultant costs such as work by other trades or contractor, architectural and engineering changes, lost of rent, and any damages;

(c) If this Subcontract is based on preliminary, outline, or otherwise unfinished Plans and Specifications, the Subcontractor accepts responsibility for cooperating and coordinating with Architect and other trades in developing final Plans and Specifications as to as to impose additional work or cost on any other trades or Contractor or to cause an increase in the Subcontract price. If the final Plans and Specifications change the scope of work of this contract then the Subcontract price will be equitably adjusted to the extent such adjustment is provided for in the prime contract.

Section 30. INDEPENDENT CONTRACTOR. The Subcontractor expressly warrants that it is or, prior to the start of work hereunder and during the entire progress of the work hereunder, will be an independent licensed contractor and an employing unit subject as an employer to all applicable unemployment compensation statutes so as to relieve the Contractor of any responsibility or liability for treating Subcontractor's employees as employees of the Contractor for the purpose of keeping records, making reports and payments of unemployment compensation taxes or contributions; and the Subcontractor agrees to indemnify and hold the Contractor harmless and reimburse it for any expense or liability incurred under said statutes in connection with employees of the Subcontractor, including a sum equal to benefits paid to those who were Subcontractor's employees, where such benefit payments are charged to the Contractor under any Merit Plan or to its individual reserve account pursuant to any state unemployment compensation statute.

Section 31. COMPLIANCE WITH LAW. The Subcontractor further agrees as regards (a) production, purchase and sale, furnishing and delivering, pricing, and use or consumption of materials, supplies and equipment; (b) the hire, tenure or conditions of employment of employees and their hours of work and rates of and the payment of their wages; (c) the keeping of records, making of reports and the payment, collection or deduction of Federal, State and local taxes and contributions; and (d) the performance of this subcontract in all other respects that the Subcontractor will keep and have available all necessary records and make all payments, reports, collections and deductions, and otherwise do any and all things so as to fully comply with all Federal, State and local laws, ordinances, rules and regulations and utility requirements and all applicable safety regulations in regard to any and all said matters insofar as they affect or involve the Subcontractor's performance of this Subcontract, all so as to fully relieve Contractor from and protect it against any and all responsibility or liability therefor or in regard thereto.

Section 32. PROTECTION OF WORK. Except as provided in Section 27, above, the Subcontractor specifically agrees that it is responsible for the protection of its work until final completion and acceptance thereof by the Owner and that within the limits of Contractor's responsibility it will make good or replace, at no expense to the Contractor or the Owner, losses and any damage to its work which occurs prior to said final acceptance.

Section 33. ARCHITECT - ENGINEER. The words "Architect" or "Engineer" as used herein refer to the person appointed by the Owner to supervise the work of the Contract on behalf of the Owner.

Section 34. ASSIGNMENT. The Subcontractor shall not, in whole or in part, assign or sublet this Subcontract or the proceeds thereof without the written consent of the Contractor.

Section 35. SPECIFIC PROVISIONS INSERTED. The attachment hereto of specific provisions of the Contract between the Contractor and the Owner is for purposes of emphasis or to comply with applicable law or regulations and is not to be construed as an exclusion of other provisions of that contract.

Section 36. PRIOR UNDERSTANDINGS OR REPRESENTATIONS. The Contractor assumes no responsibility for any understandings or representations made by any of its officers or agents prior to the signing of this Subcontract unless such understandings or representations by the Contractor are expressly stated in the Subcontract.

Section 37. CAPTIONS. The captions at the beginning of each Section of this Contract are for convenience only and are to be given no weight in construing the provisions of this Subcontract.

Section 38. ADDITIONAL PROVISIONS. (See Attached Sheets)
IN WITNESS WHEREOF, the parties hereto have executed this Subcontract by their proper officers or duly authorized agents.

________________________________________  __________________________________________
By_________________ (For Contractor)  By_________________ (For Subcontractor)

Contractor's State License No.______________  Subcontractor's License No.______________

Subcontractor's Federal Employer Identification No._________________
SPECIAL CONDITIONS

I. TEMPORARY FACILITIES
II. EARTHWORK
III-A. BUILDING CONCRETE
III-B. SITWORK CONCRETE
IV. MASONRY, LAVA ROCK, AND CONCRETE RUBBLE MASONRY (CRM)
V. ASPHALTIC CONCRETE PAVING AND SURFACING
VI. WATERWATER TREATMENT PLANT AND LIFT STATIONS
VII. PIPED UTILITIES
VIII. MISCELLANEOUS SITWORK FACILITIES
IX. OFFSITE ROADWAY CONSTRUCTION
X. CARPENTRY
XI. ROOF SYSTEMS
XII. PAINTING AND WALLCOVERING
XIII. SUPPLY OF STRUCTURAL STEEL AND MISCELLANEOUS METAL
XIV. INSTALLATION OF STRUCTURAL STEEL AND MISCELLANEOUS METAL
XV. HARD TILE
XVI. ACOUSTICAL TREATMENT
XVII. DRYWALL AND METAL FRAMING
XVIII. ELECTRICAL WORK
XIX. RESILIENT FLOORING
XX. TERMITE CONTROL
XXI. ARCHITECTURAL SHEETMETAL
XXII. AIR CONDITIONING AND VENTILATION
XXIII. PLUMBING
XXIV. FIRE PROTECTION
XXV. FINISH HARDWARE
XXVI. TOILET COMPARTMENTS
XXVII. HOLLOW METAL DOORS, SPECIAL DOORS AND HATCHES
SPECIAL CONDITIONS

1. CONTRACT DOCUMENTS: The Contract Documents for the work consist of:


C. Architectural Drawings A10, A11, A25 and A26, identified as "Interior Mall Finish Drawings" by Thorsen & Thorshov and signed by Owner and Contractor;

D. Structural Drawings, S-1 to S-8, by Dunham Associates issued with Bulletin #2, and signed by Owner and Contractor;

E. Electrical Drawings, E-1 to E-17, by Dunham Associates dated February 12, 1982, and signed by Owner and Contractor;

F. Mechanical Drawings, M-1 to M-22, dated February 12, 1982, revised March 23, 1982, issued with Bulletin #2, and signed by Owner and Contractor;

G. Civil Drawings, 1 to 75, by JHK Tanaka, Inc., dated March 13, 1981, and signed by Owner and Contractor;

H. Specifications by Thorsen & Thorshov Associates, and Addendum #1 dated 1/30/81, Bulletin #1 dated 2/12/81, and Bulletin #2 dated 5/3/82, and signed by Owner and Contractor;

I. Owner's Exhibit B, Site Plan, marked-up to show quantities of on site curbs and walks, initialed by Owner and Contractor;

J. Owner's Exhibit C, Provisions for Building E signed by Owner and Contractor and Contractor's clarification letter dated April 13, 1983, describing Building E;

K. Contract Provisions for the Prince Kuhio Plaza dated May 9, 1983;

L. Contractor's Construction Progress Schedule dated March 18, 1983;

and all modifications issued subsequent to the execution of this Contract. If anything in the Plans and Specifications is inconsistent with this Contract and/or Contract Provisions, this Contract and/or Provisions will control. The Subcontractor/Seller is presumed to have examined all the pertinent sections of the Contract Documents, including but not limited to the Plans and Specifications of other trades in order that it may be familiar with any and all provisions and/or requirements affecting its work. Work included in this Contract is to be complete in all respects and includes all work identified or inferable from the drawings and Specifications and any other work necessary to satisfy design criteria or provide for a finished facility of quality workmanship.

2. CHANGES IN THE WORK: Should Contractor direct Subcontractor/Seller to perform work on this project or provide material not included as part of this Contract, and Contractor and Subcontractor/Seller fail to agree on a price for such work, Contractor may direct Subcontractor/Seller to proceed with such work on a cost-plus basis. If the change is to be paid for on a cost-plus basis, the amount to be added to or deducted from this Contract amount shall be calculated as follows:

A. Actual cost of material, equipment rentals and the like;

B. Cost of labor, including wages, payroll taxes, workers compensation premiums, and fringe benefits which are standard in the industry and properly allocable to the change order affecting the work;

C. Taxes directly related to the change order;

D. Additional compensation to Subcontractor/Seller equal to ten percent (10%) of the total of the foregoing items A through C. No additional mark-up shall be allowed for Subcontractor's/Seller's subcontractors.
3. WARRANTY WORK: Subcontractor/Seller warrants and guarantees that the work and materials covered by this Contract shall be of good quality, free from faults and defects and in conformance with the Plans and Specifications. Subcontractor/Seller warrants that all materials and equipment shall be new unless otherwise specified. If requested by Contractor, Subcontractor/Seller agrees to make arrangements for performance of warranty work directly with the Owner(s) or its agents. Subcontractor/Seller agrees to make good at its own expense all costs, including resultant damages, resulting from or in connection with any defect in materials, workmanship or equipment which may occur or develop prior to Contractor’s release from responsibility to the Owner therefor or for which Contractor may be responsible. In no case shall Subcontractor/Seller’s warranty or guarantee be less than for a one-year period after substantial completion of the work or acceptance of Subcontractor/Seller's work, whichever shall be later. A written guarantee on Contractor's form shall be submitted by Subcontractor/Seller prior to final payment. Subcontractor/Seller specifically agrees that said warranty/guarantee may be assigned by Contractor to Owner or other party.

4. SUPERVISION: Concurrently herewith, furnish Contractor with a statement containing the names, positions, and business telephone numbers of all of its executives, jobsite superintendent or Foreman, and other employees who will be responsible in any way for the management or supervision of the work. These persons will be subject to the approval of Contractor.

5. MATERIAL PROCUREMENT:

A. Submittals - Furnish within fifteen (15) days after date of this Contract a complete list of all material and/or equipment, all drawings, and all samples that are to be furnished under this Contract.

B. Procurement - Within five (5) days after approval of submittals, material shall be ordered by Subcontractor/Seller as set forth in this Contract, and Subcontractor/Seller shall provide Contractor with a procurement list/log of material ordered on Contractor's form which shall include as a minimum, order dates, shipping dates, and delivery dates. For purposes of this paragraph, "ordered by Subcontractor/Seller" is defined to mean that purchase order or contract has been sent to the vendors/suppliers who have the material in stock or who are to manufacture the material.

C. Purchase Orders - Copies of purchase orders indicating delivery dates confirmed by Subcontractor/Seller's suppliers shall be furnished Contractor if requested.

D. Procurement Log - Updated copies of the procurement log are to be provided to Contractor on the 25th day of each month until such time as all materials have been delivered to the jobsite and is a condition precedent to payment.

E. Material Shortages - In the event of unavailability of any material to be furnished and/or installed under this Contract, Subcontractor/Seller shall notify Contractor immediately in writing and procure alternate and equal materials satisfactory to Contractor, Architect, and Owner at no additional cost and so as not to delay Contractor's schedule.

F. Expediting & Shipment of Materials - Time is of the essence in completion of this project and Subcontractor/Seller agrees that it shall take the necessary action to insure that materials required in the execution of its work are on hand when required so as not to delay Contractor's schedule. Subcontractor/Seller agrees to notify Contractor in writing of any potential or actual delays concerning procurement of materials by either Subcontractor/Seller or its agents.

G. No approval of submittals, drawings, lists of material or equipment shall waive any of Subcontractor's/Seller's obligations or responsibilities as defined in this Contract or the Contract Documents. Failure on part of Subcontractor/Seller to process submittals or initiate procurement action as set forth above shall in no way relieve Subcontractor/Seller of its obligation to furnish the required materials on the jobsite when required to meet Contractor's schedule.

6. PAYMENTS:

A. Subcontractor/Seller shall submit for approval within ten (10) days of signing of this Contract, a "Schedule of Values".

B. On or before the 25th day of each calendar month, Subcontractor/Seller shall prepare, certify as correct and deliver to Contractor an itemized application for payment in a form specified by Contractor. Prior to submitting formal monthly payment requests, Subcontractor/Seller shall review payment application with Contractor's superintendent and obtain preliminary agreement as to quantity of work in place.
C. No progress payments will be disbursed until such time as all of the requirements under this Contract have been fulfilled, including but not limited to the receipt of Subcontractor/Seller's procurement log and schedule of values.

D. Final payment shall not be made until all lien waivers, releases and receipts covering all labor and materials for which a lien could be filed are received by Contractor. In addition, all guarantees, warranties, certificates, operating instructions, manuals, and as-built drawings must be submitted and approved prior to final payment.

E. (SUBCONTRACTORS ONLY) 4% Hawaii General Excise Tax is included but will be deducted from monthly progress payments and paid on behalf of Subcontractor by Contractor.

7. PROMPT PERFORMANCE: If Contractor shall in good faith determine that Subcontractor/Seller shall not have made adequate provision for the prompt and faithful performance of this Contract, or that Subcontractor/Seller has fallen behind in the project so as to prejudice the probability of Contractor being able to finish overall at the time required, it shall be lawful for Contractor (a) to terminate Subcontractor/Seller's right to proceed with the project or with such part thereof as to which there has been delay or improper performance, and to proceed to finish the same by contract, by itself or otherwise; or (b) to furnish such labor and material as may be needed, at the expense of Subcontractor/Seller, without so terminating this Contract. In either event, Contractor shall have the right to enter upon the construction site and take possession of all the materials, tools and equipment belonging to Subcontractor/Seller and, for this purpose, this Contract shall be construed as an assignment by Subcontractor/Seller to Contractor of all such materials, tools and equipment. Contractor, in any such event, also may refrain from further payments under this agreement to Subcontractor/Seller until the entire project shall be finished fully and accepted by the Owner, at which time, if the unpaid balance of the amount to be paid under this Contract shall exceed the expense incurred by Contractor in finishing the project and the damages sustained by Contractor as a result of Subcontractor/Seller's default, such excess shall be paid by Contractor to Subcontractor/Seller. But if such expenses and damages shall exceed such unpaid balance, Subcontractor/Seller promptly shall pay the difference to Contractor. If Contractor does not terminate the right of Subcontractor/Seller to proceed, Subcontractor/Seller shall continue with the balance of the project. If the Owner is damaged by reason of any breach by Subcontractor/Seller of this agreement, then Subcontractor/Seller shall, subject to any defenses and offsets to which Subcontractor/Seller may be entitled under this Contract, pay the Owner such damages.

8. MATERIALS NOT INCORPORATED INTO WORK: Unless otherwise directed by Contractor, Subcontractor/Seller agrees to issue instructions to all its vendors to make immediate deliveries of all the required materials, either to the site of the project or to Subcontractor/Seller's shop, as the case may be, and, if delivered to the site, to store such materials in a suitable manner at its own expense. Materials shall not be delivered to the site without first obtaining Contractor's permission. Subcontractor/Seller shall be fully responsible for the materials so stored, and Contractor shall be under no responsibility therefor. Subcontractor/Seller shall not be entitled to any payment for materials stored on-site or off-site unless (a) payment therefore is received by Contractor from the Owner and then only in amounts not to exceed the amounts received from the Owner as and when received by Contractor from the Owner; (b) Subcontractor/Seller has filed with Contractor insurance policies in form satisfactory to Contractor covering the said materials; and (c) Subcontractor/Seller has complied with all other requirements of the Owner and Contractor.

9. CORRECT PERFORMANCE: Subcontractor/Seller shall be responsible for correct performance of its own work, including work of its subcontractors and suppliers, and any errors therein shall be corrected at its own cost and expense and, in addition thereto, Subcontractor/Seller shall indemnify Contractor for any costs or expense attributable to errors in performance by Subcontractor/Seller or its subcontractors or suppliers. In that regard, Subcontractor's obligation hereunder shall include taking field measurements for all work hereunder and approval of shop drawings by Owner or Contractor shall not relieve Subcontractor/Seller from correcting work either reflected in error on its shop drawings, not conforming to the field requirements or not complying with the terms of this Contract. In that regard, it shall not be incumbent upon Contractor to discover any mistakes, errors, omissions, or deviations from this Contract requirements in the quality of kind of materials used by Subcontractor/Seller or in the shop drawings, schedules and reports submitted by Subcontractor/Seller, and Contractor's and/or Owner's approval of same shall not relieve Subcontractor/Seller from responsibility for unauthorized changes, deviations, omissions or for errors of any sort therein. Subcontractor/Seller takes full responsibility for compliance with all applicable regulatory agency criteria and building codes for items included in its work whether or not reflected in its shop drawings.
10. **TERMINATION:** In the event that the Contract between the Owner and Contractor is terminated or work stopped or delayed on the project for any reason permitted in the Contract between Owner and Contractor or by direction of governmental authority, then Contractor shall have the right to terminate this Contract without penalty or cause. All work to stop pending Contractor's continuation of the work. In the event of such stoppage or termination and unless otherwise permitted by the Owner, Subcontractor/Seller shall be entitled to payment under this Contract only for the actual cost of work in place, materials delivered and accepted by the Owner, and confirmed non-cancelable material purchase contracts at the time of work stoppage by Contractor.

11. **HOISTING:** Subcontractor shall provide all lifting, hoisting, rigging and handling (labor, materials and equipment) of his materials, as required for installation.

12. **CARGO INSURANCE:** Subcontractor/Seller agrees to provide cargo insurance for all materials while enroute to project site, the cost of premiums being the responsibility of Subcontractor/Seller. Insurance coverage shall be for the full value of materials. Any deductible shall be paid by Subcontractor/Seller.

13. **ARBITRATION:**

A. All controversies, except as otherwise provided in this Section or any other Section of these Specifications arising out of or pertaining to the construction of the work referred to in this Contract or regarding the interpretation of this Contract, shall be submitted to arbitration in the manner hereinafter provided. In any event, the Subcontractor/Seller shall in no case cease to perform expeditiously the work called for hereunder or the work directed by the Contractor to be performed pursuant to this Contract, but the Subcontractor/Seller shall diligently proceed with same. If any dispute or controversy arises in connection with any matter involving a direction, order, opinion or ruling of the Owner or any of the Owner's representatives, then the Subcontractor/Seller shall be bound by said ruling, direction, opinion or order to the same extent as the Contractor may be bound.

B. It is further agreed that in the event the Contractor exercises any of the rights granted to it under this Contract, the Subcontractor/Seller shall have no rights to arbitration, and the right to demand arbitration shall be vested solely in the discretion of the Contractor. If the Subcontractor/Seller claims that any of the demands made by the Contractor hereunder are improper, Subcontractor/Seller must, nevertheless, fully comply therewith, and its rights to arbitration shall exist only in the event it fully complies with the direction of the Contractor and completes all of its work hereunder. If the Subcontractor/Seller refuses to comply with the demands of the Contractor and fails to continue with the performance of the work hereunder because the Contractor exercises any right granted under this Contract, the right to arbitrate any claims arising hereunder shall be exclusively vested in the Contractor; and in the event any claims are made by the Subcontractor/Seller and the Contractor demands arbitration, the Subcontractor/Seller hereby waives all rights to contend that the right to arbitrate under such circumstances lacks mutuality.

C. Arbitration shall be had in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, as said rules may be in effect at the time the arbitration is initiated. Should any party refuse or neglect to appear or participate in arbitration proceedings, the arbitrator is empowered to decide the controversy in accordance with whatever evidence may be presented.

D. All requests for arbitration shall be made in writing within thirty (30) days after the occurrence of the events giving rise to the dispute or controversy. In the event Subcontractor/Seller fails to make such request in writing within the time stipulated herein, the Subcontractor/Seller hereby waives all rights to claim for that dispute or controversy. Acceptance of final payment by the Subcontractor/Seller shall constitute Subcontractor/Seller's waiver of all claims to arbitration. No arbitration proceedings shall be commenced or maintained unless commenced within one (1) year following substantial completion of the project.
E. The terms, conditions, decisions, rulings, actions, orders or directions of the Owner’s representatives, as used in the various Sections of this Contract, shall be deemed to include the award or decision of any arbitration board authorized by the Contract Documents to determine any controversy between the Owner and the Contractor; provided, however, that the Contractor shall have previously given the Subcontractor/Seller written notice of such arbitration. In all such cases, there shall be no right of arbitration as between the Subcontractor/Seller and the Contractor; and the award, decision or ruling of the arbitration board shall be final and conclusive upon the Subcontractor/Seller, and shall have the same force and effect as if the Subcontractor/Seller were a party to the arbitration proceedings from their commencement.

F. The Contractor shall not be deemed to have waived its rights to demand arbitration under this Contract by filing suit, provided:

1. The Contractor files suit in order to prevent the running of the statute of limitations or in order to obtain the benefit of some provisional remedy, such as an attachment or injunctive relief, and

2. The Contractor stays substantive court proceedings pending arbitration.

G. Subcontractor/Seller agrees to be included as an additional party in any arbitration proceeding between Owner and Contractor arising from the design and construction of the property if either Owner or Contractor considers Subcontractor/Seller to be responsible or liable.

H. Each party hereto expresses consent and agrees that any arbitration arising out of or relating to this Contract or the breach thereof or between Subcontractor/Seller and any of its subcontractors, material suppliers or between Owner and Contractor for the project may, at the option of either party, include by consolidation, joinder or in any other manner, other persons involved in or affected by such claim dispute or other manner. Contractor and Subcontractor/Seller agree that to the best of their efforts, their contract documents will contain similar arbitration provisions as stated herein and that these provisions shall include an agreement to consolidation or joinder to permit disposition of all claims, disputes or other matters relating to the project so that complete relief is accorded in one arbitration proceeding if either party hereto so requests.

I. Subcontractor/Seller agrees that any arbitration proceeding shall be construed and enforced in accordance with Hawaii Revised Statutes, Chapter 658.

14. Subcontractor/Seller shall be required to work on all construction days scheduled by Contractor, including all non-General Contractors Association holidays.

15. INSURANCE: Subcontractor/Seller shall, upon signing this Contract, provide evidence of insurance coverages set forth in this Contract with provision for thirty (30) days written notice to Contractor in event of cancellation or reduction in coverage. Further, Contractor shall be named as additional named insured under all Subcontractor/Seller’s liability policies.

16. CONFLICTS: In the event of any conflict between this Contract and the provisions of the other Contract Documents, the provisions of this Contract shall control. In general, Plans and Specifications indicate qualities of materials and workmanship and drawings indicate dimensions, locations, quantities and details of construction. Figured dimensions take precedence over scaled measurements. Detailed drawings and specifications take precedence over general drawings and specifications. Supplementary details and instructions, revisions of later date and addenda, if approved by Contractor, take precedence over original documents, information and earlier addenda providing they do not increase the Scope of Work or delay execution of the work.

17. CLEAN-UP: Subcontractor/Seller shall clean-up all debris generated by its work on a daily basis and shall leave the work area in a broom-swept condition, and dispose of all debris to Contractor’s designated jobsite garbage container.

18. Subcontractor/Seller shall not make any modifications to the plans and specifications or existing work of other trades without specific written approval of Contractor. Such approval includes, but is not necessarily limited to the following:

A. Providing any additional holes or blockouts in dry concrete or masonry work other than as shown in the Contract Drawings. Any modifications shown on shop drawings, but not on Contract Drawings, must receive specific written approval for such penetrations, in addition to shop drawing approval.
B. Cutting, benching, heating, moving, adjusting or in any way modifying the concrete reinforcing steel and post-tensioning work.

C. Removal, loosening, or relocating of any falsework, "X" bracing and/or re-shoring, or any of their components.

D. Material or equipment loading on any suspended slab or formwork.

E. Nailing, stapling or otherwise penetrating Contractor's form systems.

19. SPECIAL CONDITIONS (Subcontractor's Only)

A. Subcontractor agrees to have a responsible representative from its firm full time on the project during its work and and agrees to be represented by a responsible representative from its firm at weekly subcontractors' meetings at Contractor's field office immediately prior to and during Subcontractor's phase of work.

B. Coordination of Work

(1) It will be Subcontractor's responsibility to leave its work in proper condition to receive the subsequent application of work of other trades. Assignment/subletting of any of Subcontractor's work, if approved by Contractor in writing, shall not relieve Subcontractor from its responsibility for correct and timely performance and direct coordination of its work.

(2) Prior Work - Before starting work Subcontractor shall examine all prior work affecting this Subcontractor and assure itself that all conditions are, at the time it begins work, such as will allow proper execution of the work and the assumption of warranty requirements. Subcontractor shall notify Contractor immediately in writing upon discovery of any improper conditions.

(3) Acceptance of Prior Work - The act of Subcontractor of starting any specific operation will be deemed as evidence of acceptance of related existing conditions as being satisfactory for such work and the required or indicated results that shall be produced.

C. Changes

Contractor shall not be obligated to pay for any claim or request for an extra to the Subcontract for work, material, or services provided or performed prior to receipt of a change order executed by Subcontractor.

D. Environment

Unless specifically exempted in Subcontract, Subcontractor shall without further direction be responsible for full compliance with environmental rules, regulations and standards in effect at the location(s) of Subcontractor's project work. Environment is defined to include air quality, water quality, waste management, appearance, noise control, public convenience, and public relations. Subcontractor shall be responsible for strict compliance and the intent of environmental regulations.

E. Equipment

Subcontractor shall provide all scaffolding, lifts and other equipment necessary to perform his work in accordance with Contractor's schedule. Subcontractor shall be totally responsible for ensuring that all equipment is in a safe operating condition and that all safety precautions are strictly observed, and that the method of fastening and locations of safety lines/supports are adequate, and that the parts of the building to which the equipment is attached are adequate to support the equipment.

F. Schedule

Complete all work as required by Contractor's schedule. In the event that Contractor's schedule is revised, the Subcontractor's schedule will be revised accordingly without additional compensation, except as provided for in Subcontract, Section 9.

20. Authorization for sequencing, scheduling and Changes in the work or for specific performance of the work shall be directed by Contractor's management personnel only.

21. All work for Building E shall be included in Subcontractor's and Materials Contractor's scope of work as required. Final working drawings and specifications for Building E shall be a
direct extension of Owner's Exhibit C as clarified by Contractor's letter dated April 13, 1983. Subcontractor and Material Contractor recognizes that revisions of a minor nature will occur as final documents are completed, and acknowledges that such changes shall not be a basis for a change in the lump sum subcontract/material contract.

22. Subcontractor shall, if feasible, utilize the services and/or products of local, Island of Hawaii, labor and suppliers such as the following companies:

A. Yamada Enterprises

B. Hawaii Planing Mill

The specific companies listed above are requested to be considered by the Project Owner, and utilization of the services and/or products of these companies does not represent an endorsement or a release of liability by Contractor, and shall not cause a change in either the contract schedule or specified products.

* * * * * * *
CURRENT TRENDS IN CONSTRUCTION EDUCATION

by

Dr. Donn E. Hancher
Associate Professor of Construction Engineering and Management
Purdue University

Introduction

The construction industry is the largest industry in the United States, with the volume of construction contracts averaging about 10 percent of the Gross National Product for the last several years. Associated with being the largest industry are several problems, such as labor conflicts, intense competition, changing technology, government regulations and the highest frequency of business failures of any other industry. One of the major reasons for the high failure rate is the ease with which one can start a construction company. We jokingly infer that all is needed is a pickup truck and a customer to get started, but actually it is true. Of course this is not the basis for initiating a firm if long term success is an objective.

In addition to being the largest industry, the construction industry is also the most diverse and fragmented one. Very seldom, if ever, is there strong unity amongst the thousands of contractors in business on any issue. There are many factors which separate the industry into many fragmented groups, such as type of work performed, union vs non-union, geographic area of operation, size of firm and special services offered to clients. There is certainly no majority opinion on the best path for a young person to follow for a management career in the industry, especially if trying to specify the best type of formal education to follow, if any. Actually, in my opinion, it is this existing diversity which makes the construction industry a dynamic and interesting one to work in. However, it also creates several headaches for construction educators who are trying to educate young persons for construction careers, not knowing what paths they may choose to follow!!

Construction Education

Prior to the 1960's the formal education route taken by most young persons interested in construction was engineering, primarily Civil Engineering. During the 1960's, the "space race era," engineering programs were revised to higher science pursuits and practice oriented topics such as construction and surveying were reduced or eliminated. This gap was filled by a new wave of engineering technology programs which were expanded from two-year to four-year curriculums; construction was a natural and popular area for such a program. Today the engineering programs have returned to more practice oriented goals, but the large number of engineering technology programs still exist. Many such programs in construction have been initiated in recent years, with most of them dropping the technology title from their program name. Table 1 shows a tabulation of four-year undergraduate
construction programs in existence in 1981 as identified in a study by the Business Roundtable.

TABLE 1

Four-Year Undergraduate Construction Programs
(1981 Business Roundtable Survey)

<table>
<thead>
<tr>
<th>University Subdivision</th>
<th>Number of Schools</th>
<th>Number of Graduates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>54</td>
<td>1182</td>
</tr>
<tr>
<td>Civil Engineering or</td>
<td>40</td>
<td>1140</td>
</tr>
<tr>
<td>Civil Engr (Constr)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>17</td>
<td>214</td>
</tr>
<tr>
<td>Totals</td>
<td>111</td>
<td>2536</td>
</tr>
</tbody>
</table>

Construction education programs fall into three main categories: Engineering, primarily Civil Engineering; Construction Technology or Building Construction; and Other, such as business schools. All offer the student preparation for a construction career; however, the content of the curriculum and the educational goals of the program are usually tailored to the strengths of the faculty and to the market demands of the employers of the graduates. One could never get agreement from the many faculty members as to the best curriculum to follow for construction education, nor should they, since different programs have different goals. However, most programs contain the same basic categories of subject matter, but differ in the percentage mixture of each. The four basic categories are: Technical, Construction Management, Business and General Education. In spite of the efforts of construction educators to mold their students in their own image, each year hundreds of progressive and optimistic young construction students graduate and pursue construction careers.

Purdue Programs

It is my somewhat biased opinion that Purdue University leads the Nation in offering a full range of excellent construction programs. There are three programs in engineering and one in technology specifically designed to prepare young persons for construction careers; and several students from management and other programs in engineering and technology take some courses in construction and seek employment in construction. The major programs are identified below:
<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>DEGREE</th>
<th># STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Engineering (Undergrad Program)</td>
<td>BSCE</td>
<td>100 Majors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 Minors</td>
</tr>
<tr>
<td>Construction Engineering and Management</td>
<td>BSCNE</td>
<td>120</td>
</tr>
<tr>
<td>Civil Engineering (Graduate Programs)</td>
<td>MSCE, MSE,</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>MS, PHD</td>
<td></td>
</tr>
<tr>
<td>Building Construction and Contracting Technology</td>
<td>BS</td>
<td>400</td>
</tr>
<tr>
<td>Other Programs (Undergrad Minors)</td>
<td>MGMT, ENGR,</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>TECH</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>950 TOTAL</td>
</tr>
</tbody>
</table>

I believe it is apparent that Purdue is quite active in teaching construction on a formal basis. In addition we have been active in sponsoring continuing education courses for construction professionals and hope to be more active in the future. A reasonable question to ask at this point is: "Is a college education really needed for a career in construction?" Notice that I said "education" and not "degree," too often we have students who pursue a degree and avoid any strenuous effort towards an education! The answer to the question is obviously "NO" if one refers to all possible careers; however, it is the best path to take if one seeks an eventual management career in construction. Also, it comes in real handy if one decides to change career paths later.

I believe that the sophistication of construction management and operations have increased significantly in recent years, especially in large scale construction. One can still come from the crafts and become a successful manager if his potential is recognized by a supervisor and he is given professional development for management. However, it is much more efficient and practical to develop a young college graduate with construction education. Also, I feel that construction managers need a good technical background to be successful in today's market demands for services such as Design-Build, Conceptual Estimating, Energy Audits and Value Engineering. It is very difficult to develop professional competency in these areas without a formal educational background as a base.

New Topics of Interest

There are several areas of interest that are receiving increased attention by construction educators today, especially in schools of engineering. Most of these are not new topics to construction, but they have not been given as much attention in the past as the traditional topics such as materials, planning, estimating and labor relations. It is not our intention to de-emphasize the traditional
topics, although some may question this claim, but we are trying to improve and expand our educational offerings, especially at the graduate level. Improvement at the graduate level will also improve our offerings at the undergraduate level. I will briefly comment on three topics of new interest and will have additional comments in my presentation.

A. Construction Research

Research is an essential area of construction education, just as in other educational areas, especially in schools of engineering. It seems logical that the largest industry in the Nation would support a large amount of research. However, except for government sponsored research, the construction industry in the United States gives very little support to construction research at educational institutions. There are few progressive companies, such as Charles Pankow, Inc., who support such research activity; but they are rare indeed! The need for construction research remains and is thus conducted by construction faculty and students without outside support.

The National Science Foundation has attempted to increase its support of construction research, but has been limited due to its lack of authority to support applied research projects instead of basic research projects. Most of the research needs in construction involve applications of known theories to solve existing problems and therefore do not qualify for NSF support. NSF did sponsor a workshop in May of 1982 at the University of Michigan on "Research Needs in Construction Engineering," with construction faculty from most of the engineering schools teaching construction attending. Several topics were identified which need further research, the the problem of additional funding for this research remains a dilemma.

B. Human Resource Management

In recent years management in the construction industry has begun to realize the importance of the human resource in the construction process, especially with respect to supervisory and management staff. Human resource management is the new term for what has been traditionally called personnel management. However, in all fairness, there have been significant advancements in this area of management in all industries. Today's employee is certainly more aware of his work environment and is definitely more demanding of satisfactory working conditions. Accordingly there is increased interest in human resource management in construction education programs. The basic functions of human resource management can be classified as:

- Recruitment and Selection
- Assignment and Utilization
- Supervision
- Performance Evaluation
- Performance Review
The primary objective of human resource management is to provide the best person for a given function or task. The practical objective of a company is to motivate employees to be more productive, with the essential goal of maximizing the productivity of the company as a whole. I believe the proper slogan is "work smarter not harder."

For years there has been much activity in the construction industry to evaluate the productivity of the craftsmen, with much research still needed. Recently there has been new interest in evaluating the productivity of supervisory and management employees. One approach to this problem has been to categorize the various areas of possible improvement of employee production into the following categories:

Substitution of Equipment for Human Effort
Improved Methods of Work
Removal of Unproductive Practices
Improved Management of Human Resources

This categorization helps to direct efforts to improve productivity into similar areas of activity. For instance, in the area of unproductive practices, one can evaluate traditional practices self-imposed by a company which may inhibit productivity of employees, such as "too damn many meetings," "interruptions to thought processes," and "information exchange conflicts between departments." Many professional careers can and will be devoted to studying such problems in the future!

C. Computer Utilization

One of the biggest problems confronting educational programs of any type today is the inclusion of computer training and utilization in their respective curriculums. Such involvement is very expensive and very frustrating; no matter what one decides to do, tomorrow will bring a better system at a lower cost than the system bought today!! There are several basic questions to consider when trying to decide about getting in step with the computer revolution:

What Language to Use - Basic, Fortran, CPW, etc....
What Hardware to Buy - Maxi, Mini, or Micro
What Support Equipment - Printers, Remote Terminals, etc...
What Brand to Buy - Radio Shack, IBM, CDC, HP, etc...
What Software Packages to Buy or Develop Internally
Where, When and How to Start Using What You Bought????

Purdue is certainly no exception to the dilemma, but we are making a very positive effort to handle this challenge. In the last three years we have gone from very little on-line user equipment to now having one of the most advanced computer systems in the Nation. This has been due on the most part to our Dean of Engineering, John Hancock, and to the efforts of our Electrical Engineering School. As a matter of fact, I wrote this paper on my own terminal in my office using
one of the three word processing programs available on our Engineering Computer Network.

The computer is definitely here to stay and will continue to become a common tool for all persons in all walks of life in the future. We have now started research on the utilization of personal size computers in construction management. We currently have one Radio Shack TRS-80 Model 4, and have just ordered another one. There are many different personal size computers available and being used throughout the Nation in construction. They are all good, easy to learn to use, and actually quite fun and useful! I encourage you all to jump in and try it, you'll like it!

Construction Education Problems

There are always problems confronting any business, and construction is no exception. Speaking as an engineering educator, we have made tremendous progress in increasing the emphasis on preparing young engineers for professional careers in construction. Of course we still have many improvements to make, but I do want to emphasize that we have come a long way in the last ten years!

One of the major problems in construction education, especially in engineering, is the shortage of qualified persons to be faculty. Every program in the Nation is always on the outlook for candidates for their faculty. Unfortunately, the type of person we are looking for is the same type of person that construction companies are looking for to put in management positions. To be competitive universities need to attract young persons right after their graduate studies to seek teaching as a career. However, most young graduates want to "hit the field where the action is" and certainly do not want more schooling. There are many days when I have the same feeling! There are now more young engineering students pursuing the PhD in Construction Engineering programs; perhaps the faculty problem will improve in the future.

The other major problems in construction education are related to program support, both by their institutions and by the construction industry. Funding problems continue to increase for many schools with more funds needed to support faculty salaries and expenses, and to improve educational facilities and equipment. More funds are also needed to conduct construction research if better faculty and students are to be attracted to construction programs. All this at a time when budget cuts abound in government units and the industry is still suffering for more work! In my opinion one of the biggest problems we have is gaining more support from the construction industry for our programs, our faculty and our students. Construction is a highly practice-oriented profession and only through active interaction with construction professionals will we be able to better prepare our students for construction careers!
The construction industry is a dynamic and exciting place to spend a professional career. Preparing young persons for entry into this highly fragmented and diverse industry, especially at the undergraduate level, is a most challenging task. Although many improvements are still needed, many very good educational programs are now available to young persons pursuing professional careers in construction. These programs range in scope from one-year technician training to PhD programs in engineering. One fact is clear if the construction profession is to attain equal status with other recognized professions, more support is needed by educational institutions from the construction industry and from their alumni. With increased support the future for construction education and the construction profession can be bright indeed!
1983 Annual Meeting Schedule

Saturday Morning

September 10

8:00 AM  Breakfast -- "Wentworth Room"

9:00 AM  Meeting -- "Georgian Room"

9:00 AM  Jobsite Purchasing: Need for Control
          Bob Telles
          Jim Allyn

9:20 AM  Jobsite Purchasing in Action
          (One Approach)
          Al Fink

9:35 AM  Jobsite Purchasing: Execution in the Field
          Alan Murk
          Red Metcalf

10:00 AM Coffee Break

10:15  Safety Statistics
       Don McKibben

10:45  Safety Film

11:10  Jump Forms: Hobron and Milwaukee
       Harvey Chang
       Kirk Clagstone

12:00 Noon Luncheon -- "Viennese Room"
       Service Awards/Guest Speaker
       Dr. Leon Martel
JOBSITE PURCHASING

by

Jim Allyn and Bob Telles

Purchasing is one of the most important and too often the most
neglected function in our business. Jobsite purchasing accounted
for approximately $13,000,000 of $34,000,000 in total work put
in place in Hawaii last year. As you can see, it is a very
important function.

For your future reference, you will find in your meeting booklet
a diagram of the proper procedures that should be followed. The
following describes in detail the proper procedures:

Step 1 - Execute the purchase order in four parts. The purchase
order should be filled out completely, noting especially
quantity ordered, price, description of materials, and
any special terms or conditions agreed to.

Step 2a - Send original (white) copy marked "Vendor's Copy" to
vendor.

2b - Send blue copy marked "Head Office" to main office
Accounting Department.

2c - Hold pink and yellow copies pending receipt of materials
ordered and vendor's invoice.

Step 3a - Confirm that materials received from vendor agree with
what was ordered.

3b - Compare vendor's invoice to purchase order. Pay
special attention to quantities, prices, and discount
terms.

3c - Attach payable voucher to invoice, check footings and
extensions, cost code, and obtain superintendent's
approval.

Step 4a - Submit yellow copy of purchase order marked "Head
Office with Vendor Invoice," attached to original
vendor invoice (from Step 3c above) to Accounting.
These invoices are usually submitted to Accounting
on a weekly basis and in batches.

4b - File duplicate copy of invoice and pink copy of pur-
chase order marked "Field Office" in jobsite alpha-
betic reference file.
Jobsite Purchasing (continued)

Step 5 - Main office Data Processing Department processes submitted batches and produces various reports including checks, purchase journals, disbursement journals, job cost detail reports, etc.

Step 6 - Invoices submitted in Step 4a and checks produced in Step 5 are assembled by Accounting Department and submitted to authorized company officer for final review and signature.

Step 7 - Signed checks are returned to Accounting.
   a) Original of check is remitted to vendor.
   b) Voucher package (Step 4a) and check copy are filed in alphabetic vendor file.
   c) Check copy is filed in numerical check file.

The following DO's and DON'Ts are important to remember:

(1) DO execute a purchase order each time you purchase materials or services.

(2) DO send an executed copy of the purchase order to the vendor. This serves as a written confirmation of the terms and special conditions of the purchase.

(3) DON'T issue the vendor just the purchase order number or your name in lieu of an actual copy of the purchase order.

(4) DON'T release the yellow copy of the purchase order until you have received all the material ordered and are ready to pay the vendor.

(5) DON'T prepare purchase orders "after the fact." This defeats the purpose of the purchase order.

(6) DON'T pay vendors from statements, delivery receipts, or duplicate invoices. Demand original invoices.

(7) DO pay in accordance with the agreed terms and conditions, and take all discounts possible.

(8) DON'T continue to buy from the same vendor time after time because it is convenient. Shop around for prices and service. You may find a new vendor that is better.
JOBSITE PURCHASING

by

Alan Murk

On most projects, the dollars are spent on jobsite purchasing of such items as: small tools, form materials, form hardware and supplies, miscellaneous embedded items, some permanent materials and miscellaneous rental equipment have a significant effect upon the cost of the total project.

Pre-planning is the first step that must be taken in order to know what our needs are and what they will be in the future. The requirements for jobsite purchases vary considerably from project to project. The superintendent, field superintendent and project engineer must first establish the direction and the sequence of operations that are required by the design of the project. The construction sequence that is required by the design, and the schedule that has been established, many times have some effect on the quantities of tools needed, form materials purchases and the falsework needed to move the project. Maximum crew sizes that are possible to produce an even work flow, must be considered.

Labor costs today dictate that we cannot work short on tools and equipment, but these costs must be kept to the minimum in a balance with the maximum expected production. We will probably never be able to eliminate the problem of a rush purchase of "one of these" or "one of those." However, this must be the exception rather than the rule, as we lost any advantage that may exist from quantity purchases.

All projects need some amount of standard type tools and equipment, i.e., saws...drill motors...air compressors and vibrators. Always check to see if any of these items are available from another project, or possibly from the local storage yard. If nothing is available, then a purchase will be required.

A list of tools, both the basic types and any special items, must be compiled. Select a specific made and model number, as well as the quantity needed. Request information regarding availability, parts and repair service warranties. Take your prepared list to several of the local suppliers for a quotation...but ask them to price each item, as this may be helpful in future purchases of additional equipment. Buy what you need, but do not over-buy. Many suppliers may give you a delivery time of 10 days to two weeks, which should tell you that they do not inventory that merchandise. If they cannot afford to carry that inventory, then I don't feel that we can afford to buy any item that we do not have a definite need for, as it becomes an inventory item that we carry. Capital tied up in anything that is not being used, is not productive use of our assets.
When there is a need for special tools or equipment, we have an obligation to search the market place for the tool or equipment that will perform as needed...There is information available that you should review in depth before the decision is made that system A...or Brand X...is the one that best suits your situation. Information, both technical and non-technical is available from records or from personnel within the company...information which has been compiled as a result of awareness of particular needs or problems we have met. Keep this in mind when you hear salesmen or manufacturer's representatives extol the various features of the merchandise they hope to sell. Gather all of the information that is to be had, sift through what you have been told, try to talk to someone in the industry who has used the system or equipment. Review the equipment and the operations with the jobsite supervision...and...if you feel it necessary, with someone at your home office. Be objective and look for possible alternatives. Systems, whether they consist of tools or forming methods, are usually designed to fit many situations, and like so many things that are supposed to be flexible or adaptable, often require considerable modification in order to conform to our needs. We must have a thorough understanding of this portion of the operation and of the system. This understanding is necessary to enable us to evaluate the cost effectiveness of this purchase or rental.

Most rental or leasable systems are costed on a percentage of the replacement costs, usually at a monthly rate. Attention must be given to costs arising from lost or damaged items, and also to possible cleaning costs when the item is returned. This information is not usually included in the quotation, but may be buried in the small print. Ask the questions and document the information in the agreement or letter form. These are costs you must consider along with the monthly rental.

If, after careful evaluation, you decide to go with a particular piece of equipment, you should look at the total cost of rental or lease as opposed to purchase, if that is an option. The purchase is not the last cost when you consider that you must remove them from your jobsite and someone must unload and store the materials. This is particularly true when you are on a remote project where transportation costs are significant. Possible or probable re-use of these items in the near future could be a consideration. Where the cost to purchase is far in excess of the rental agreement, these factors probably would not come into play. Always be aware that your project sponsor may be able to give you some assistance in these matters, as they are aware of the budget of your project, as well as being up to date on developing projects where this material or equipment might be utilized.

The cost of rental items must be monitored constantly, once they are delivered to the jobsite. Delivery and pickup charges should be looked at to determine whether to return an item not needed for a few days. These charges sometimes are in excess of the rental costs for a few non-productive equipment days. Where many pieces are involved
in the rental, i.e., tubular falsework and form hardware, an accurate piece count is required at both delivery and pickup. In most cases, the driver will not sign your count ticket, as they want to make their own count at their shop when they unload. While our count may not be binding upon the supplier, at least we have some basis for comparison with the suppliers list. Should shortages or damaged items be determined, the account should be settled without delay, as the rental on these items continues until the settlement is finalized... A list of rental items posted on the wall, works as a constant reminder to the superintendent and field superintendent of the rental items that are on the project.

Repair to small tools is another area where considerable costs may be expended. As noted before, new tools should have a warranty period, and we should check to see if that coverage is still available. Always request an estimate before authorizing the repair, and have an understanding regarding whether or not there is a dismantle charge, in order to prepare the estimate. The superintendent may make the decision regarding salvage or scrappage of job expended tools and equipment. Refer to section #4 in the Superintendent's Manual, for repairs to Equipco rental items.

A list of major items of equipment to be rented to the project by Equipco, is also found in section #4 of the Manual. Should purchase of additional items of equipment in this category be necessary, the purchase must be authorized by your home office. Quite often jobsite personnel are requested to take quotations on this equipment. These quotations must spell out all of the conditions regarding this purchase. The purchase order is usually written at the home office, but there are times when we have handled the P.O. at the jobsite, after verbal approval has been given for the purchase.

Some construction companies do all of the purchasing from the central office, even down to the purchase of lumber and nails. This probably solves one problem by creating another one of relying upon someone remote from the project, to be responsible for securing materials and supplies in a timely fashion. We have a great deal of freedom in our purchases, and because of that freedom we also take on a responsibility to follow the proper procedures.

Over the past few years, all of us have become aware of the tremendous increases in the cost of labor coupled with a decline in productivity. In order to offset these labor costs, we need to systematize and mechanize as many operations as possible. This leads to the possibility of additional purchasing and the need for strict attention to the control of these expenditures.

We must shop before we buy, we must protect the supplies and materials from damage or theft... One of the responsibilities we have as supervisors is to preserve and protect the assets of the company. Savings in our purchases is probably the easiest way of earning dollars. Some of the things that happen on our projects cannot be prevented or anticipated, but we can...if we only will... control the cost of our jobsite purchasing.
1. **General**

Purchase of materials can be made in the following manner:

(a) Purchase Order
(b) Material Contract
(c) Purchase Agreement

Material Contracts and Purchase Agreements are normally prepared by the estimator prior to the start of the project. If required during construction they should be prepared in a draft form, approved by the Superintendent, and sent to the main office for review, typing and transmittal.

Purchase of materials costing less than $5,000 can normally be done through issuance of a purchase order by the project Superintendent. In certain cases it may be advantageous to use a Material Contract in lieu of a purchase order even if the amount of purchase is small. Such cases would include critical materials which could have a significant delay on the project, and vendors with which it is advisable to have a signed agreement. The issuance of a purchase order does not require the vendor to sign and therefore may be construed by the vendor as a unilateral contract to which he is not bound. Also, a purchase order does not give any protection whatsoever regarding guarantees, warranties, the quality of workmanship, or the insurance requirements which must be complied with under the terms of a material contract or a subcontract. The purchase order does provide an expedient and simple manner for purchasing and, when used properly, normally provides the degree of control required for smaller dollar purchases.

Purchase orders should never be used when labor is to be performed on the job (i.e., in lieu of a subcontract or subcontract change order).

2. **Purchase Orders**

(a) **General**

Despite the fact that some vendors will accept verbal orders, it is imperative that all purchases (other than those noted above) be made by purchase order. If a verbal order has been placed the P.O. should contain the words "CONFIRMATION ONLY." Purchase orders provide for:
(1) Written confirmation of the material that is to be purchased along with the terms and conditions of the purchase and the manner of payment.

(2) Cost control necessary to maintain sophisticated cost accounting records.

(3) Prompt processing of payments.

(4) Assurance that the vendor has understood and taken action on your order.

(b) Procedures

Before making a purchase, the purchaser should select the vendor with the best price quotation, provided that the material meets specifications and schedule and is of a satisfactory quality.

The purchase order must be completed in full on Pankow's Purchase Order form (Exhibit VI-26). A sample completed P.O. is shown in Exhibit VI-27. Each P.O. is to include quantity and description of item(s) purchased, unit prices, applicable taxes, applicable discounts, terms (especially on rentals and lease/purchase items), shipping information (deliver, will call, etc.). Prices should be extended and totalled, including taxes and discounts.

The purchase order number, date, vendor, and description of order are to be recorded in the Purchase Order Log (Exhibit VI-27). The P.O. is to be signed by the job Superintendent, and the four parts distributed as follows:

1st copy (white): Mailed to vendor (daily).

2nd copy (yellow): Held by job until invoice is received, then attached to invoice and receiving slip and sent to main office.

3rd copy (pink): Retained by job and attached to duplicate copy of invoice.

4th copy (blue): Sent to main office upon completion of purchase order. P.O.'s should be in numerical order as much as possible.

(c) Tool or Equipment Repairs

On repair of tools, be specific as to what you want done, and ensure repair company understands that they are to con-
tact you prior to making other repairs for "additional work they
discovered was required." Although difficult, attempt to affix
some sort of estimate on repairs, especially larger items.

3. Receiving of Materials

Materials must be received and checked by a responsible
employee designated by the job Superintendent. Delivery receipts
are turned in to the Office Manager. This should be done as soon
as possible after receiving the material. The Office Manager
attaches the delivery receipt to the second copy of the P.O. and
files alphabetically by vendor.

4. Vendor Invoices

Vendor invoices should be handled in the following
manner:

(a) Should be received in triplicate.

(b) Delivery receipt and second copy (yellow) of
purchase order are removed from file.

(c) Invoice and purchase order (delivery slip attached)
are compared for price and quantity.

(d) Invoice is checked for arithmetical accuracy.

(e) Terms for payment of invoice should be adhered to
as noted on each invoice.

(f) Original and duplicate invoices are attached to the
delivery receipt and second copy (yellow) of the purchase order.

(g) Third copy of the invoice is matched to the third
copy (pink) of the purchase order and stapled together.

(h) Accounts payable ticket (Exhibit VI-29) is attached
to original invoice.

(i) Information on the payables ticket is completed.
Cost code and classification are taken from the purchase order.
The total amount on the payables ticket must equal the total
amount of the invoice.

(j) Original and duplicate of invoice, along with the
second copy (yellow) of the purchase order, if complete, are
stapled together and given to the Superintendent for his appro-
val. Space is provided in the stamped area for his initials.

(k) After Superintendent's approval has been obtained,
accounts payable are batched in groups of 25 invoices of less. A
batch ticket (Exhibit VI-30) is attached showing total dollar amount, number of invoices, and batch number. The calculator tape addition of the total dollar amount per batch should also be attached to each batch ticket.

(1) The approved invoices should be sent to the main office at least once a week.

(m) After invoices are processed weekly, the main office will return a copy of the purchase journal (see Exhibit VI-31) used for paying each job's invoices.

Any discrepancies that occur, either in the purchase order or the vendor's invoices, should be resolved as soon as possible.
CHARLES PANKOW, ASSOC.

DATE ______________________ 19

TO

ADDRESS

SHIP TO:

BILL TO:

DATE REQUIRED | TERMS | HOW SHIP | F.O.B. | SHIP FROM | DESTINATION

| QUANTITY | PLEASE SUPPLY ITEMS LISTED BELOW | PRICE |

Issue Three Copies of Invoice at Time of Purchase or Mail to Above Address.
Prices On This Order Are Not Subject to Increase.
We WILL Only Accept Charges For Merchandise Ordered by Person Whose Signature is Authorized in Writing by the General Office.
All Material Provided Which is to be Incorporated as a Permanent Part of the Work Shall Comply With the Requirements of the Plans and Specifications.
Seller Assumee All Responsibilities for Delays in Delivery of This Order.
Equipment and Materials Furnished Shall Comply with all Federal, State and Local Safety Codes.

CHARGE ______________________

CHARLES PANKOW, ASSOC.

Job No. _______ Job Telephone _______ BY NAME _______ TITLE _______

EXHIBIT VI-26

VENDORS COPY
**PURCHASE ORDER**

CHARLES PANKOW, ASSOC.

**DATE** July 10 1981

**TO** ABC Supply

**ADDRESS** 1234 5th Street, Honolulu, Hawaii 90006

**SHIP TO** Charles Pankow Associates
567 So. King Street, Suite 400
Honolulu, Hawaii 96813

**BILL TO** Same

<table>
<thead>
<tr>
<th>DATE REQUIRED</th>
<th>TERMS</th>
<th>HOW SHIP</th>
<th>F.O.S.</th>
<th>DESTINATION</th>
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</thead>
<tbody>
<tr>
<td>7/15/82</td>
<td>2%/10</td>
<td>Pahu Delivery</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
<th>PRICE</th>
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<tbody>
<tr>
<td>2</td>
<td>Brooms @ $10.00 ea.</td>
<td>20.00</td>
</tr>
<tr>
<td></td>
<td>(Chg 210 STS)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>25' Hose @ $15.00 ea.</td>
<td>15.00</td>
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<tr>
<td></td>
<td>(Chg 230 STS)</td>
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<td></td>
<td>Subtotal</td>
<td>35.00</td>
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<td></td>
<td>4% State Tax</td>
<td>1.40</td>
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<tr>
<td></td>
<td>TOTAL</td>
<td>$36.40</td>
</tr>
</tbody>
</table>

---

**CONFIRMATION ONLY**

---

Issue Three Copies of Invoice at Time of Purchase or Mail to Above Address. Prices On This Order Are Not Subject to Increase.

We Will Only Accept Charges For Merchandise Ordered by Person Whose Signature is Authorized in Writing by the General Office.

All Material Provided Which is to be Incorporated as a Permanent Part of the Work Shall Comply With the Requirements of the Plans and Specifications.

Seller Assumes All Responsibilities for Delays in Delivery of This Order.

Equipment and Materials Furnished Shall Comply with all Federal, State and Local Safety Codes.

**CHARGE** As above

**CHARLES PANKOW, ASSOC.**

<table>
<thead>
<tr>
<th>CPA-3xx</th>
<th>531-2685</th>
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</thead>
<tbody>
<tr>
<td>Job No.</td>
<td>Job Telephone</td>
</tr>
<tr>
<td>XYZ Condo</td>
<td>EXH+</td>
</tr>
<tr>
<td>Job Name</td>
<td>VI-27</td>
</tr>
<tr>
<td>P.O.</td>
<td>Date</td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
</tr>
<tr>
<td>10994</td>
<td>7/10/75</td>
</tr>
<tr>
<td>10995</td>
<td>7/29/75</td>
</tr>
<tr>
<td>10996</td>
<td></td>
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<tr>
<td>10997</td>
<td></td>
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<td>etc.</td>
<td></td>
</tr>
<tr>
<td>VEND INVOICE</td>
<td>VENDOR NO.</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>8875 5211516</td>
<td>HAWN TEL</td>
</tr>
<tr>
<td>9100 08751</td>
<td>IMUA BUILD</td>
</tr>
<tr>
<td>9727 STMT</td>
<td>ISL WIDE TW</td>
</tr>
<tr>
<td>11300 08474</td>
<td>KILGOS</td>
</tr>
<tr>
<td>11300 8475</td>
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</tr>
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<td>14178 888/VK</td>
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<td>15300 FEB STMT</td>
<td>OAHU REFUSE</td>
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<td>16300 STMT</td>
<td>PAC CONT</td>
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<td>VENDOR NAME</td>
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<td>18200 30978</td>
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<td>PJ07-0033</td>
<td>RMT CORP</td>
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<tr>
<td>PJ07-0036</td>
<td>RMT CORP</td>
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<tr>
<td>PJ07-0037</td>
<td>RADIO CALL</td>
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<tr>
<td>PJ07-0039</td>
<td>STATELINE CABINETS</td>
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<tr>
<td>Controls Totals</td>
<td>Job Cost</td>
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<tr>
<td>----------------------</td>
<td>------------</td>
</tr>
<tr>
<td></td>
<td>Equipment</td>
</tr>
<tr>
<td></td>
<td>Material</td>
</tr>
<tr>
<td></td>
<td>Subcontract</td>
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<table>
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<th>Open Payables</th>
<th>4,600.35</th>
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<tr>
<td>Subcontract Retention</td>
<td>0.00</td>
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<td>Subcontract Taxes</td>
<td>0.00</td>
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<tr>
<td>Prepaid Invoices</td>
<td>0.00</td>
</tr>
</tbody>
</table>
SAFETY PRESENTATION - GRAPHS & TABLES

by

Don McKibben

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1. CPI Frequency of Recordable Accidents
2. CPI Frequency of Lost Time Cases
3. CPI Severity Rate - Lost Days
4. CPI Frequency of Recordable Accidents by Craft
5. CPI Frequency of Lost Time Accidents by Craft
6. CPI Severity Rate - Lost Days by Craft
7. Three-Year Comparison, Frequency of Recordable Accidents
8. Three-Year Comparison, Frequency of Lost Time Cases
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10. PBI Safety Program Savings
11. CPA Safety Program Savings
12. Combined CPI Accident/Illness Record by Crafts
13. CPI Combined Accident/Illness Statistics
14. Accident/Illness Statistics by Job:

Executive Centre
Hobron in Waikiki
Mandarin at Waikiki
411 E. Wisconsin Building
Walnut Center
Kaiser Parking Structure - Oakland
Number of Days Lost per 200,000 Man-Hours

Number of Days Lost

CPI Average
US Average
Key to Incidence Rates

CPI Severity Rate - Days Lost by Craft

Carpenters
353.9
192.0

Laborers
198.9

Masons/Finishers
49.6

Engineers
0

Other
2.4

5.4
### COMBINED CPI ACCIDENT/ILLNESS RECORD

**BY CRAFTS**

1 June 1982 - 31 May 1983

<table>
<thead>
<tr>
<th>STATISTICS</th>
<th>HOURS WORKED</th>
<th>RECORDABLE CASES</th>
<th>LOST TIME CASES</th>
<th>DAYS LOST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carpenters</td>
<td>136,749</td>
<td>44</td>
<td>4</td>
<td>242</td>
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<tr>
<td>Laborers</td>
<td>114,602</td>
<td>41</td>
<td>2</td>
<td>114</td>
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<tr>
<td>Masons/Finishers</td>
<td>48,361</td>
<td>5</td>
<td>2</td>
<td>12</td>
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<tr>
<td>Operating Engineers</td>
<td>11,346</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other Confidential</td>
<td>74,383</td>
<td>5</td>
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<tr>
<td><strong>COMPANY TOTAL</strong></td>
<td><strong>385,340</strong></td>
<td><strong>99</strong></td>
<td><strong>9</strong></td>
<td><strong>370</strong></td>
</tr>
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<table>
<thead>
<tr>
<th>INCIDENCE RATE PER 200,000 HOURS (100 MAN-YEARS)</th>
<th>FREQUENCY</th>
<th>SEVERITY</th>
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<tbody>
<tr>
<td></td>
<td>RECORDABLE CASES</td>
<td>LOST TIME CASES</td>
</tr>
<tr>
<td>Carpenters</td>
<td>64.4</td>
<td>5.8</td>
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<tr>
<td>Laborers</td>
<td>71.6</td>
<td>3.5</td>
</tr>
<tr>
<td>Masons/Finishers</td>
<td>20.7</td>
<td>8.3</td>
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<tr>
<td>Operating Engineers</td>
<td>70.5</td>
<td>0</td>
</tr>
<tr>
<td>Other Confidential</td>
<td>13.4</td>
<td>2.7</td>
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<tr>
<td><strong>COMPANY AVERAGE</strong></td>
<td><strong>51.4</strong></td>
<td><strong>4.7</strong></td>
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### Combined Accident/Illness Statistics

**1 June 1982 - 31 May 1983**

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Hours Worked</th>
<th>Recordable Cases</th>
<th>Lost Time Cases</th>
<th>Days Lost</th>
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<tr>
<td>CPA, 1982-83</td>
<td>321,104</td>
<td>87</td>
<td>9</td>
<td>370</td>
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<tr>
<td>CPA, 1981-82</td>
<td>556,351</td>
<td>130</td>
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<td>338</td>
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<tr>
<td>CPA, 1980-81</td>
<td>468,454</td>
<td>140</td>
<td>13</td>
<td>415</td>
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<tr>
<td>PBI, 1982-83</td>
<td>64,236</td>
<td>12</td>
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<td>0</td>
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<td>PBI, 1981-82</td>
<td>189,308</td>
<td>74</td>
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<td>120</td>
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<td>PCC, 1980-81</td>
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<td>794</td>
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<td>CPI, 1982-83 (Total)</td>
<td>385,340</td>
<td>99</td>
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<td>CPI, 1981-83 &quot;</td>
<td>745,659</td>
<td>204</td>
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<td>CPI, 1980-81 &quot;</td>
<td>617,139</td>
<td>213</td>
<td>31</td>
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#### Incidence Rate

**Per 200,000 Hours (100 Man-Years)**

<table>
<thead>
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<th>Statistics</th>
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<th>Lost Time Cases</th>
<th>Severity (No. of Days Lost)</th>
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<tr>
<td>CPA, 1982-83</td>
<td>54.2</td>
<td>5.6</td>
<td>230.5</td>
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<tr>
<td>CPA, 1981-82</td>
<td>46.7</td>
<td>3.9</td>
<td>121.5</td>
</tr>
<tr>
<td>CPA, 1980-81</td>
<td>59.8</td>
<td>5.6</td>
<td>177.2</td>
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<tr>
<td>Hawaii State, 1980</td>
<td>35.0</td>
<td>13.7</td>
<td>260.5</td>
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<tr>
<td>PBI, 1982-83</td>
<td>37.4</td>
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<td>PBI, 1981-82</td>
<td>78.1</td>
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<td>126.7</td>
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<td>PCC, 1980-81</td>
<td>98.2</td>
<td>24.2</td>
<td>1068.0</td>
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<td>Calif. State, 1979</td>
<td>19.9</td>
<td>8.7</td>
<td>106.7</td>
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<td>4.7</td>
<td>192.0</td>
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<tr>
<td>CPI, 1981-82</td>
<td>54.7</td>
<td>7.5</td>
<td>122.8</td>
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<td>CPI, 1980-81</td>
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<td>391.8</td>
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<tr>
<td>National avg., 1980</td>
<td>15.5</td>
<td>6.5</td>
<td>113.0</td>
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### EXECUTIVE CENTRE

CPA 382 - Honolulu, Hawaii

1 June 1982 - 31 May 1983

<table>
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<th>STATISTICS</th>
<th>HOURS WORKED</th>
<th>RECORDABLE CASES</th>
<th>LOST TIME CASES</th>
<th>DAYS LOST</th>
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<td>Carpenters</td>
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<td>242</td>
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<td>Laborers</td>
<td>81,235</td>
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<td>2</td>
<td>114</td>
</tr>
<tr>
<td>Masons/Finishers</td>
<td>41,304</td>
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<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Operating Engineers</td>
<td>8,127</td>
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<tr>
<td>Other</td>
<td>47,360</td>
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<tr>
<td><strong>JOB TOTAL</strong></td>
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<td>66</td>
<td>8</td>
<td>368</td>
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<tr>
<td><strong>COMPANY TOTAL</strong></td>
<td>385,340</td>
<td>99</td>
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<table>
<thead>
<tr>
<th>INCIDENCE RATE PER 200,000 HOURS (100 MAN-YEARS)</th>
<th>FREQUENCY</th>
<th>SEVERITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>Carpenters</td>
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<td>Masons/Finishers</td>
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<tr>
<td>Operating Engineers</td>
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<tr>
<td>Other</td>
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<tr>
<td><strong>JOB TOTAL</strong></td>
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<tr>
<td><strong>COMPANY AVERAGE</strong></td>
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### HOBRON IN WAIKIKI

CPA 374 - Honolulu, Hawaii

1 June 1982 - 31 May 1983

<table>
<thead>
<tr>
<th>STATISTICS</th>
<th>HOURS WORKED</th>
<th>RECORDABLE CASES</th>
<th>LOST TIME CASES</th>
<th>DAYS LOST</th>
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<tr>
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<td><strong>370</strong></td>
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<table>
<thead>
<tr>
<th>INCIDENCE RATE PER 200,000 HOURS (100 MAN-YEARS)</th>
<th>FREQUENCY</th>
<th>SEVERITY</th>
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</thead>
<tbody>
<tr>
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<td>Operating Engineers</td>
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<td>Other</td>
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<td><strong>JOB TOTAL</strong></td>
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<td><strong>COMPANY AVERAGE</strong></td>
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<td><strong>4.7</strong></td>
</tr>
<tr>
<td>STATISTICS</td>
<td>HOURS WORKED</td>
<td>RECORDABLE CASES</td>
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<tr>
<td>-----------------------</td>
<td>--------------</td>
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<tr>
<td>Carpenters</td>
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<td>Laborers</td>
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<td>Other</td>
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<tr>
<td><strong>JOB TOTAL</strong></td>
<td><strong>16,273</strong></td>
<td><strong>3</strong></td>
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<tr>
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</table>

<table>
<thead>
<tr>
<th>INCIDENCE RATE PER 200,000 HOURS (100 MAN-YEARS)</th>
<th>FREQUENCY</th>
<th>SEVERITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
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<tr>
<td>Operating Engineers</td>
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<tr>
<td>Other</td>
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<td><strong>JOB TOTAL</strong></td>
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<td><strong>COMPANY AVERAGE</strong></td>
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## Statistics

<table>
<thead>
<tr>
<th>STATISTICS</th>
<th>HOURS WORKED</th>
<th>RECORDABLE CASES</th>
<th>LOST TIME CASES</th>
<th>DAYS LOST</th>
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</thead>
<tbody>
<tr>
<td>Carpenters</td>
<td>520</td>
<td>0</td>
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<tr>
<td>Laborers</td>
<td>798</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>Masons/Finishers</td>
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<td>0</td>
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<td>Operating Engineers</td>
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<td>Other</td>
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<td><strong>99</strong></td>
<td><strong>9</strong></td>
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## Incidence Rate

<table>
<thead>
<tr>
<th>INCIDENCE RATE PER 200,000 HOURS (100 MAN-YEARS)</th>
<th>FREQUENCY</th>
<th>SEVERITY</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>RECORDABLE CASES</td>
<td>LOST TIME CASES</td>
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<tr>
<td>Carpenters</td>
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<td>0</td>
</tr>
<tr>
<td>Laborers</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Masons/Finishers</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Operating Engineers</td>
<td>0</td>
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<td>Other</td>
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</tr>
<tr>
<td><strong>COMPANY AVERAGE</strong></td>
<td><strong>51.4</strong></td>
<td><strong>4.7</strong></td>
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</tbody>
</table>
# WALNUT CENTER

PBI 538 & 308 - Pasadena, California

1 June 1982 - 31 May 1983

<table>
<thead>
<tr>
<th>STATISTICS</th>
<th>HOURS WORKED</th>
<th>RECORDABLE CASES</th>
<th>LOST TIME CASES</th>
<th>DAYS LOST</th>
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</thead>
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<tr>
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<tr>
<td><strong>COMPANY TOTAL</strong></td>
<td><strong>385,340</strong></td>
<td><strong>99</strong></td>
<td><strong>9</strong></td>
<td><strong>370</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INCIDENCE RATE PER 200,000 HOURS (100 MAN-YEARS)</th>
<th>FREQUENCY</th>
<th>SEVERITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RECORDABLE CASES</td>
<td>LOST TIME CASES</td>
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<tr>
<td>Carpenters</td>
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<tr>
<td>Laborers</td>
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<td>0</td>
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<tr>
<td>Masons/Finishers</td>
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<tr>
<td>Operating Engineers</td>
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<td>Other</td>
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<td><strong>JOB TOTAL</strong></td>
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<tr>
<td><strong>COMPANY AVERAGE</strong></td>
<td><strong>51.4</strong></td>
<td><strong>4.7</strong></td>
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</table>
### Kaiser Parking Structure - Oakland

**PBI 534 - Oakland, California**

1 June 1982 - 31 May 1983

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Hours Worked</th>
<th>Recordable Cases</th>
<th>Lost Time Cases</th>
<th>Days Lost</th>
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<td>Masons/Finishers</td>
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<tr>
<td>Operating Engineers</td>
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<tr>
<td><strong>Company Total</strong></td>
<td><strong>385,340</strong></td>
<td><strong>99</strong></td>
<td><strong>9</strong></td>
<td><strong>370</strong></td>
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<table>
<thead>
<tr>
<th>Incidence Rate Per 200,000 Hours (100 Man-Years)</th>
<th>Frequency</th>
<th>Severity</th>
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<tbody>
<tr>
<td></td>
<td>Recordable Cases</td>
<td>Lost Time Cases</td>
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<td>Carpenters</td>
<td>65.5</td>
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<td>Laborers</td>
<td>42.9</td>
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<td>Masons/Finishers</td>
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<td>Operating Engineers</td>
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<td><strong>Job Total</strong></td>
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<td><strong>Company Average</strong></td>
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SAFETY FILMS

Safety Film #1:  "It Starts at the Top"

This film about high-rise construction shows that safety in the construction industry must begin with top management and demonstrates potential dangers, methods of prevention, and the correct action to take in case of an injury. The film promotes management involvement as a tool to lower job costs and improved efficiency.

Safety Film #2:  "A Time and Place for Everything"

This film, again about high-rise construction, shows how two partners find that accidents, not "bad luck", are the cause of their poor financial status. By visiting several successful firms, the partners learn that poor planning leads to disorganization and, eventually, costly accidents. The partners put good planning and safety principals to use and solve their financial problems.
JUMP FORMS
by
Harvey Chang and Kirk Clagstone

I. BACKGROUND:

1. Previously used on:
   A. Century Center (Lubeca International, Inc.)
   B. Pacific Monarch (Lubeca International, Inc.)

2. Currently in use on:
   A. 411 East Wisconsin (PAFCO Manufacturing Corp.)
   B. Hobron In Waikiki (Meke, Inc.)

II. ADVANTAGES:

1. Permits faster construction cycle.
2. Cheaper concrete placing costs - Forms designed for full liquid head.
3. Minimal dependence on tower crane - Forms are self-elevating.
4. Blockout placement more accurate/faster since can be pre-attached to formwork.
5. Higher quality wall finish: Use high quality materials with high reuse factor/fewer ties required due to heavy framing.
6. Form liners/Architectural finishes can be utilized.
7. Permits levelling and alignment controls.
8. Ease of inspection/quality control.
9. Suitable for cold weather construction - Can utilize insulation/heating equipment.
10. Requires only minimal structural modification due to presence of jacking equipment/structural framework.
11. No rebar template required.

III. DISADVANTAGES:

1. High initial cost: No in-house equipment.
2. Jacking inserts/blockouts, tie holes require patching.
3. Learning curve involved - New techniques.
4. Hydraulics/Electrical motors require maintenance.
IV. PROJECT PLANNING

1. Construction Approach:
   Cast-in-place vs slipform vs jump form vs precast, etc.

2. System Selection:
   Meke/Pafco/Lubeca/Cantilver, Inc./Strickland, etc.

3. Analyze Concrete Structural Elements/Transitions:
   (see attached sketches)

4. Design Formwork:
   (see attached sketches)

5. Details:
   Form Liners, Corner Details, Reinforcing Steel, Blockout Locations, Jacking Locations, etc.

6. Jobsite Conditions:
   A. Systems Controls: Level and Plumbness
   B. Access to Jump Form/Safety:
   C. Clearances at Tower Crane/Concrete Pump:
   D. Precast Stairs:

7. Dismantling: Plan before erected in field
6TH TO 23RD FLOOR CORE PLAN

HOBRON IN WAIKIKI
ELEVATOR CORE WALLS
27th to 43rd Floor Core Plan

Hobron in Waikiki
Elevator Core Walls
HOBRON IN WAIKIKI - ELEVATOR CORE WALLS
ANALYZE CONCRETE STRUCTURAL ELEMENTS
HOBRON IN WAIKIKI
ELEVATOR CORE WALLS
CORNER DETAILS

NOTE WALL THICKNESS VARIATIONS

WALER - FORM ASSY
SUPPORT BEAM ASSY

LIFTING BEAM ASSY.

HOBRON IN WAIKIKI
ELEVATOR CORE WALLS - JUMP FORM DETAILS
V. PLANNING/FABRICATION/SET-UP
411 East Wisconsin

(Refer to enclosed sketches)
VI. PROJECT USAGE

1. 411 East Wisconsin: Jump Form Cycle (see attachment)

2. Hobron In Waikiki: Jump Form Cycle (see attachment)

3. Cost Analysis: (see attachments)
   A. Cost Code Comparison for Estimating
   B. Sample Equipment Lease Agreement
   C. Sample Equipment/Parts Listing
   D. Sample Lumber List
The step-by-step sequence of operation for the elevator/stair shaft-type jump form are as follows, beginning just after the completion of a typical pour:

1. Clean excess spilled concrete from upper and lower working decks.
2. Remove forming ties.
3. Roll external wall form back away from wall. Forms are hung from the upper working deck via overhead rollers. Break interior form loose.
4. Jack form up until elevation required for next pour is reached.
5. Lock jacking ladder supports into just-completed wall pour.
6. Level form by turning the adjustable screw jacks.
7. Align form if required. Utilize bracing, cable ties, weights, etc. as necessary.
8. Clean and oil form surface.
9. Place blockouts.
10. Place steel and electrical conduits.
11. Close form and install all ties, etc.
12. Pour concrete.
13. Return to Step No. 1.
The step-by-step sequence of operation for the elevator/stair shaft-type jump form are as follows, beginning just after the completion of a typical pour:

1. Clean excess spilled concrete from upper and lower working decks.

2. Remove forming ties

3. Roll external wall form back away from wall. Forms are hung from the upper working deck via overhead rollers. Break interior form loose.

4. Spray walls with curing compound.

5. Jack form up via hydraulic rams until elevation required for next pour is reached. This is done after concrete pump placing mast has been raised and before precast stairs are installed.

6. Lock jacking beam supports into just-completed wall pour.

7. Plumb form by turning the adjustable screw jacks located at jacking beam supports.

8. Align form if required. Utilize bracing, cable ties, weights, etc. as necessary.

9. Clean and oil form surface.

10. Check blockout placement (pre-attached to forms).

11. Place steel and electrical conduits.

12. Close form and install all ties, etc.

13. Pour concrete.

COST ANALYSIS

SLIPFORM MASTER CODE

HOBRON ESTIMATE: SLIP

VERTICAL SUPPORT (CY)

HOBRON ESTIMATE: JUMP

VERTICAL SUPPORT (CY)

SLIPFORM (CY)

JUMP FORM (CY)

220.00 VERTICAL SUPPORT (CY)

221.00 SLIPFORM (CY)

.10 Yokes with Pull Rods (EA)

.11 Wall Forms with Walers (SF)

.12 Column Form with Truss (SF)

.13 Working Deck w/Joists (SF)

.14 Walking Deck (SF)

.15 Perimeter Trs/Deck (SF)

.16 Stl Templts/Walkway (LF)

.17 Jacks (LF)

.18 Water/Air Systems (EA)

.19 Finishers Scaffold (LF)

.21 Carp w/Slip (SF)

.22 Alterations (LS)

.23 Work at Slab Line (SF)

.24 Jack Rods (LF)

.31 Concrete (CY)

.41 Fin w/Slip, PTC/Rep (SF)

.42 Rubber Float Fin (SF)

.43 Cure Contact (SF)

.50 Dismantle (SF)

.10 Yokes with Pull Rods (EA)

.11 Wall & Column Forms (SF)

.13 Working Deck w/Joist

.14 Wall & Column Forms (SF)

.15 Working Deck w/Joists (SF)

.16 Stl Templts/Walkway (LF)

.17 Jacks (LF)

.18 Water/Air Systems (EA)

.19 Finishers Scaffold (LF)

.21 Carp w/Slip (SF)

.22 Alterations (LS)

.23 Work at Slab Line (SF)

.24 Jack Rods (LF)

.31 Concrete (CY)

.41 Fin w/Slip, PTC/Rep (SF)

.42 Rubber Float (SF)

.43 Cure Contact (SF)

.50 Dismantle (SF)

Jacks - Rental (SF)

Carp w/Jump (SF)

Alterations (LS)

Work at Slab Line (SF)

Concrete (CY)

Dry Finish (SF)

Cure Contact (SF)

Dismantle (SF)
EQUIPMENT LEASE AGREEMENT

BARE RENTAL

(Specify whether BARE RENTAL or FULLY OPERATED)

THIS AGREEMENT made this 14th day of January, 1983, by and between

MAKE, INC.

(Name)

1434 Kalaniiki Street
Honolulu, HI 95821

(Owner, Show complete address)

and

CHARLES PANTON ASSOCIATES

(Name)

P. O. Box 2538
Honolulu, HI 96804

(Lessee, Show complete address)

WITNESSETH:

In consideration of the mutual covenants herein contained, the parties hereby agree as follows:

(1) The Owner hereby rents to the Lessee the following described machinery and/or equipment, hereinafter called "equipment" at the rates shown below prorated accordingly:

<table>
<thead>
<tr>
<th>Description of Equipment</th>
<th>Rate</th>
<th>LUMP SUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDRAULIC JUMP FORM HARDWARE FOR THE</td>
<td>per</td>
<td></td>
</tr>
<tr>
<td>ELEVATOR CORE WALL FORMING SYSTEM</td>
<td>per</td>
<td></td>
</tr>
<tr>
<td></td>
<td>per</td>
<td></td>
</tr>
<tr>
<td></td>
<td>per</td>
<td></td>
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<td></td>
<td>per</td>
<td></td>
</tr>
<tr>
<td></td>
<td>per</td>
<td></td>
</tr>
</tbody>
</table>

The Owner guarantees that all equipment furnished under this Agreement meets all City, State and other applicable safety requirements and/or codes.

(2) The Owner shall deliver said equipment to Lessee at Jobsite: 343 Hobron Lane,

Honolulu, Hawaii 96815

(City)

(County)

(State)

on or before January 24, 1983

Freight or delivery charges shall be paid by the Owner

(3) The effective date of this lease shall be January 14, 1983

The term of this lease shall be for such time as the equipment is required by the Lessee on the Hobron in Waikiki job. Lessee may terminate this lease on five days notice if Lessee is dissatisfied in any way with Owner's equipment, service, and/or Owner's performance on the jobsite. If the equipment fails to perform as represented in Sections 13 and 14, any loss sustained by the Lessee shall be borne by the Owner.

JOB OFFICE

(OVER)
LESSEE shall pay to the Owner as rental for such equipment the rate set out in Section (1) hereof.

(5) Owner shall furnish with the leased equipment, at no additional cost to the Lessee, such qualified operators satisfactory to the Lessee as may be necessary to operate such equipment for the term of this Lease. The Owner guarantees that the equipment will be kept in first class operating condition and the Owner will furnish, at no extra cost, replacement equipment of equivalent size and capacity should it become necessary because of breakdown or non-availability of the equipment listed in Section (4). Such replacement equipment or repairs shall be furnished promptly so as to cause no unreasonable delay or extra costs to the Lessee, and the Owner shall be responsible for all extra costs sustained by the Lessee as a result of Owner's failure to furnish such repairs or replacement equipment promptly.

(6) Owner shall purchase and maintain Workers' Compensation and Employer's Liability Insurance for the protection of the operators of the leased equipment as required by law of an employer, and Public Liability ($500,000/$1,000,000) and Property Damage ($500,000/$1,000,000) Insurance for the protection of the Owner and Lessee during the term of this Lease. Owner further agrees to indemnify Lessee against and save it harmless from any and all claims, suits, liability, damage or expense for damage to property or injury to persons, including death, in any way arising out of or in connection with the Lessee's use of the leased equipment. The Owner shall also furnish evidence that the equipment is insured by an Equipment Floaters policy or equal, and shall maintain such insurance in full force.

(7) The Lessee shall keep the equipment in good repair and condition and will return the equipment in as good condition as when leased, reasonable wear and tear excepted; and

(8) Lessee shall be liable for any and all damage to any persons or property while said equipment is in its possession unless said damage is the result of the equipment manufacturer's or the Owner's negligence or from an inherent defect in the equipment, in which event Owner shall indemnify and save harmless Lessee from any and all such damage.

(9) Products Liability Insurance shall be furnished by the Owner in the amount of , naming Lessee as additional insured.

(10) Rental shall not be due for time Lessee is prevented from using equipment for reasons beyond his control. During such time, Owner may use or rent the equipment elsewhere but will make the equipment available upon 24 hours notice when Lessee is again able to use the equipment.

(11) All taxes (sales, use, property taxes, etc.) shall be paid by the Owner.

(12) Equipment floater or Products Liability Insurance held by Owner on the rented equipment shall precede any insurance exposures of the Lessee.

(13) Owner guarantees the equipment to perform to manufacturers specifications and agrees to hold Lessee harmless for failure of the equipment to perform accordingly.

(14) If any equipment being furnished under this agreement is highly selective (not easily replaced) and if the job design and construction has been predicated upon the use of this equipment, the Owner shall provide a performance and payment bond on a form and in an amount satisfactory to the Lessee. This bond shall be in the amount of and Owner shall be responsible for all costs incurred by the Lessee as a result of non-availability or non-performance of such selective equipment.

(15) The equipment is and shall at all times remain the sole and exclusive property of the Owner; and the Lessee shall have no right, title, or interest therein or thereto except as expressly set forth in this lease.

(16) In the event of loss or damage of any kind whatsoever to any item of equipment, and if same is determined by Lessee to be lost, stolen, destroyed or damaged beyond repair, this lease will terminate with respect to such item of equipment.

(17) Other Provisions:

See attached.

IN WITNESS WHEREOF, the parties have executed this Agreement on the date first above written.

OWNER

MEKE, INC.

By: ____________________________
Representative

LESSEE

CHARLES PANKOW ASSOCIATES

By: ____________________________
Name: _______________________
Title: _________________________
(17) OTHER PROVISIONS

A. Design, fabricate and furnish hydraulic jump form hardware for the elevator core walls only on the subject project, including but not limited to: hydraulic pumps and rams, steel walers and support brackets, steel gridwork to support working decks, scaffold brackets, plates, bolts, drift pins, form screws, corner brackets, control unit, electrical wiring, and hydraulic oil.

B. Lessee furnished items: plywood, lumber, form ties, blockout materials made of other than metal, ladders and hoisting facilities, electrical service.

C. Design:

1) Form design shall be based on structural drawings by Richard M. Libbey, Inc. Owner shall submit shop drawings for approval no later than 1/24/83.

2) Form design shall incorporate concrete placing boom supported by and jacked by form system.

3) Form design shall be capable of supporting two floors quantity of reinforcing steel, and all necessary tools and accessories utilized in the operation of the form system.

4) Form design shall be capable of allowing full liquid head pressure of concrete.

D. Delivery: All items will be delivered to jobsite for unloading and assembly by Lessee. After use, Owner's equipment shall be dismantled, scraped clean of concrete, bundled and delivered by Lessee to a designated storage site within Honolulu.

E. Supervision: Owner will provide all necessary on-site supervision and assembly instructions to Lessee's designated field personnel, both for initial assembly and until satisfactory and successful operation of this form system is obtained.

F. Payments: Progress payments shall be made as follows:

1) upon delivery.

2) upon completion of assembly.

3) upon completion of third successful jump.

4) Balance upon completion of elevator core walls and use of forms.
## HOBRON IN WAIKIKI

### PRELIMINARY LUMBER LIST

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<thead>
<tr>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>186 pcs 4 x 6 x 8'-0&quot; Construction DF S4S</td>
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<tr>
<td>4 pcs 4 x 4 x 16'-0&quot;</td>
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<tr>
<td>32 pcs 2 x 8 x 16'-0&quot;</td>
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<td>72 pcs 2 x 8 x 14'-0&quot;</td>
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<td>60 pcs 2 x 6 x 14'-0&quot;</td>
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<td>80 pcs 2 x 4 x 12'-0&quot;</td>
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<td>6,928</td>
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72 pcs 3/4" x 4' x 8' Plywood

72 pcs 3/4" x 4' x 8' Plywood (Working Deck) 2,304 SF
The following electrical & hydraulic equipment has been supplied to subject project:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>SUPPLIED</th>
<th>RETURNED</th>
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<tbody>
<tr>
<td>Control Panel 2 x 2 unit Boxes</td>
<td>2</td>
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</tr>
<tr>
<td>Raise/Reset switches on cables</td>
<td>5</td>
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<tr>
<td>50' No. 12 Cord with 20A plugs M/F</td>
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<tr>
<td>30' No. 12 Cord with 20A plugs M/F</td>
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<td>15' No. 12 Cord with 20A plugs M/F</td>
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<tr>
<td>6&quot; x 108&quot; Hydraulic Rams</td>
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<tr>
<td>1/4&quot; x 54&quot; Flexible Hydraulic Hoses</td>
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<tr>
<td>1/4&quot; JIC / 1/2&quot; Pipe Elbows</td>
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<tr>
<td>Hydraulic Reservoirs</td>
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<tr>
<td>Hydraulic Pump, Motor, Reservoir, Control</td>
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<tr>
<td>Hydraulic Oil Gal</td>
<td></td>
<td>16</td>
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<tr>
<td>1/2&quot; Plugs</td>
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<table>
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<tr>
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<th>ITEM</th>
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<tr>
<td>1A</td>
<td>Grid Cross Plates</td>
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<tr>
<td>2A</td>
<td>Clamp Plates</td>
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<tr>
<td>3B</td>
<td>Upper Ram Bkt</td>
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<tr>
<td>4A</td>
<td>Upper Grid/Stud Bkt</td>
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<tr>
<td>5</td>
<td>Upper Stud Bkt</td>
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<td>6C</td>
<td>Steel Studs</td>
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<td>8</td>
<td>Lower Stud Bkt</td>
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<tr>
<td>10C</td>
<td>Lower Support Beams 10&quot; C x 60&quot;</td>
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<td>11</td>
<td>Upper Rail Posts</td>
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<tr>
<td>14A</td>
<td>Rod Mounting Bkt</td>
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<tr>
<td>15</td>
<td>Lower Cylinder Mount Bkt</td>
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<tr>
<td>16</td>
<td>Lifting Beams 12&quot;C</td>
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<tr>
<td>19B</td>
<td>Ext. Scaffold Legs</td>
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<tr>
<td>21A</td>
<td>Scaffold Bkt Foot</td>
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<td>23</td>
<td>Corner Plates M/F</td>
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<td>24A</td>
<td>Form Roller Bkts (Complete)</td>
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<td>25</td>
<td>8-1/2&quot; Form Suspension Bkt</td>
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<td>26</td>
<td>Corner Pins</td>
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<td>28</td>
<td>Small Beam Clamps</td>
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<td>29</td>
<td>End Plate to 10&quot; Beams</td>
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<tr>
<td>31</td>
<td>Corner Edge Strips</td>
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<td>34</td>
<td>Waler Stud Bkt</td>
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<td>35</td>
<td>Waler Washers</td>
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<td>36</td>
<td>Stud Pins 1 3/8&quot;</td>
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<td>41</td>
<td>Walers (See List)</td>
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<td>51</td>
<td>Internal Forms (14-1/2 x 14-1/2)</td>
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<td>57</td>
<td>Corner Tie Bolt</td>
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<td>58</td>
<td>Corner Tie Stop Plates</td>
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<td>59</td>
<td>Corner Tie Washers</td>
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### SKETCH

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<tr>
<td>63</td>
<td>Support Plates</td>
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<td>67</td>
<td>Special Nuts</td>
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<td>81</td>
<td>45 Corner Forms</td>
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<td>82</td>
<td>Stepped Form 4&quot;</td>
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<td>4&quot; Removable Form</td>
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<td>84</td>
<td>Form Support Angle</td>
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<td>Adjustable Support Leg</td>
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<td>86</td>
<td>Special End Plates 10&quot;C</td>
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<td>87</td>
<td>Support Bolt</td>
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<tr>
<td>88</td>
<td>Lifting Plates A &amp; B</td>
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<tr>
<td>89</td>
<td>Support &amp; Lifting Brackets</td>
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<td>90</td>
<td>Lifting Pin</td>
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<td>91</td>
<td>Scaffold Leg Mounting</td>
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### BOLT LIST

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<th>No.</th>
<th>Description</th>
<th>SUPPLIED</th>
<th>RETURNED</th>
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<tr>
<td>8 x 2-1/2&quot;</td>
<td>Drywall Screws</td>
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<td>1/2&quot; x 1-1/2&quot; Bolts &amp; Nuts</td>
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<tr>
<td>1/2&quot; x 3&quot; Bolts</td>
<td>350</td>
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<tr>
<td>1/2&quot; x 3-1/2&quot; Bolts &amp; Nuts</td>
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<tr>
<td>1/2&quot; x 7&quot; Coach Bolts &amp; Nuts</td>
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<tr>
<td>3/8&quot; x 1-1/2&quot; Coach Bolts &amp; Nuts</td>
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<tr>
<td>3/4&quot; x 2&quot; Bolts &amp; Nuts</td>
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<tr>
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<td>1&quot; x 13&quot; HT Bolts</td>
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<td>1&quot; x 7&quot; HT Bolts</td>
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<td>1&quot; x 3&quot; HT Socket Head Bolts</td>
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<tr>
<td>1&quot; Allthread x 36&quot;</td>
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<tr>
<td>1&quot; Nuts</td>
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1983 ANNUAL MEETING SCHEDULE
SATURDAY AFTERNOON
SEPTEMBER 10

2:00 PM  MEETING (CONTINUED) "GEORGIAN ROOM"

2:00 PM  PRIDE IN WORKMANSHIP         JACK PARKER

2:30 PM  PRECAST CONCRETE              TOM VERTI

3:20 PM  COFFEE BREAK

3:35 PM  JOB SLIDE TOURS
         Hobron - Neal Fukumoto
         Walnut Center - Mark Josten
         Executive Center - Curt Burks
         Mandarin - Jason Arakawa
         Milwaukee Office Building - Tom Krajewski
         Oakland Parking Structure - Dick Walterhouse
         Catalina Landing - Carl Wesely
         Hilo Shopping Center - Tom Metcalf
         Oxn Moor Center - Kris Reiswig

4:15 PM  20 YEARS IN REVIEW

4:35 PM  CLOSING REMARKS              CHARLES PANKOW

7:00 PM  COCKTAILS AND DINNER
PRIDE IN WORKMANSHIP

by

Jack Parker

A. Slide review
B. Points of view
   1. Developer
   2. Owner
   3. Contractor
   4. Buyer
C. Reflection of attitudes
D. Small things count
E. Building with substance
F. What does this mean
PRECAST CONCRETE
by
Thomas D. Verti

Slide Presentation Outline

I. Introduction -- Why Precast?

II. Structural Elements
   A. Beams
      1. Portable Beam Bed
      2. Precast - Pretensioning Beams
         a) Casting Yard Fabrication
         b) Jobsite Fabrication
   B. Columns
      1. Jobsite Fabrication
      2. Erection
      3. Finish Product

III. Architectural Elements
   A. Cladding (Column and Spandrel)
      1. Molds and Forms
      2. Sandblasting
      3. Erection
      4. Finish Product
   B. Wall Panels
      1. Molds and Forms
         a) Fiberglass
         b) Concrete/Steel
         c) Casting Slabs
2. Manufacturing Process
   a) Casting Yard Fabrication/Storage
   b) Jobsite Fabrication and Storage
   c) Sandblasting
3. Erection
4. Finish Product
C. Miscellaneous Precast Elements
1983 ANNUAL MEETING SCHEDULE
SUNDAY MORNING
SEPTEMBER 11

8:00 AM
Breakfast Buffet -- "Poolside"

9:00 - 11:00 AM
Walnut Center Job Tour

11:30 AM
Return to Huntington-Sheraton for Airport Departures