Welcome to

Swimming with the SHARKS in Construction

presented by:

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Dennis McEvoy

- MANAGEMENT CONSULTING
- NETWORK MODELING
- CRITICAL PATH METHOD

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ABOUT RALPH J. STEPHENSON, P.E.

Mr. Stephenson is an engineering consultant with a diversified background in land planning, facilities location, building design and construction, critical path method and technical management.

Educated at Lawrence Institute of Technology (Bachelor of Science, Mechanical Engineering) and Michigan State University (Master of Science, Civil Engineering), he has been associated with such firms as Smith, Hinchman & Grylls, Victor Gruen Associates, and the H. F. Campbell Company. With the latter two organizations Mr. Stephenson occupied executive positions as vice president. In 1962 he started his own consulting practice, specializing primarily in operational and management areas for owners, designers and contracting firms.

He is a registered professional engineer in the states of Michigan, Wisconsin, Illinois, Indiana, Ohio, Pennsylvania, West Virginia, Virginia, Florida and Minnesota. He is a member of the Engineering Society of Detroit, the Michigan and National Society of Professional Engineers, Michigan Association of the Professions and the Great Lakes Area Development Council.

Since 1953 Mr. Stephenson has been associated at middle and upper management levels with the planning, programming, design, construction and operation of billions of dollars of industrial, commercial and public facilities in all parts of the United States and Canada. He has taught many technical and management seminars in the United States, Canada and Europe and has authored several magazine articles. He has also co-authored a book on critical path method. His broad experience has given him an understanding and appreciation of the nature of small, medium and large companies and for the need to solve their management problems through creative systematic and knowledgeable approaches.

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ABOUT DENNIS MC EVOY

Dennis is President of Medical Construction Services (MCS), a Quantum Company. MCS is a design/build and construction management firm which specializes in hospitals, medical office buildings, and special procedure rooms.

Dennis was educated at the University of Wisconsin-Madison, where he received a Bachelor of Science degree in Construction Management with a concentration in Real Estate. Since that time, he has been associated with such firms as: Ellerbe-Becket, the third-largest architectural firm in the United States, Universal Medical Buildings, the fifteenth-largest Design/Build firm in the country, and M.A. Mortenson Company, the fiftieth -largest General Contractor in the Country.

Dennis has been involved with the development and construction of numerous medical, commercial, and retail projects in fourteen states, including among them the Roger Maris Cancer Treatment Center. This project was a major addition to and remodeling of a 350 bed hospital in Fargo, North Dakota. Dennis was also involved with the construction of the Civil and Mineral Engineering Building, a $15 Million Classroom, Laboratory, and Research facility located at the University of Minnesota. This project won the Outstanding Civil Engineering Achievement in 1983.

Dennis is the Central Regional Governor of the American Society of Professional Estimators, and has lectured to many business, University and trade associations about construction ethics and bidding.

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Section #1 - Marketing Manages Estimating

I. Objective of section#1 - Marketing Manages Estimating

To explore the relations between estimating and marketing and identify the linkages that make each valuable to the other.

II. Questions to answer

- ***A. What are the action boundaries of the construction industry?***
- ***B. Where is the estimator needed within the construction industry?***
- ***C. What are the matrix sectors in which the estimator can help to market effectively?***
- ***D. What can estimator's talents contribute to a marketing program?***
- ***E. How can the estimator help in the marketing and sales effort?***

III. Topics

A. The macro boundaries of the construction world

1. Line of action (X axis) - steps to completing the project

Cost estimating is an intergral part of each and every step of the construction line of action. To understand the critical nature of estimating during each step and to be fully effective in his or her's career, the professional estimator needs to keep in mind an overview of the steps in a total construction line of action. They are:

- ***Conceive & communicate***

  Here the ultimate facility is born from a recognition of a need that is presently unfilled. During the conceptual period the basic premises are sketched out and bulk estimates made based on anything from experienced guesses to detailed historical cost comparisons.

  These early perceptions of the project are usually accurate mirrors of what the user wants. They are communicated to others who mold them into a program and a graphic statement.

- ***Program & articulate***

  During programming the specific needs of the project are put into a form that can be easily understood by those decision makers who must approve or disapprove. Here the concept is translated into a physical needs statement, is quantified and articulated in graphic form for submission and approval.

- ***Approve***

  This critical point in a project's existence is where the ultimate decision makers (UDM's) say no-go or go. Approval is the key that either aborts the project or moves it into the design stage.

- ***Design***

  During design the products of the early work are used to produce a set of construction contract documents. These include working drawings, specifications and general conditions from which a contractor can build the job within predictable scope, quality, time and cost limits.

- ***Construct***

  Now the facility that has been conceived, communicated, programmed, approved and designed is built. The words, the drawings, the diagrams, the estimates are all translated into three dimensional space containing the materials, equipment and systems that actually make up the final operating environment.

- ***Turn over***

  Once constructed the facility is turned over to the owner, and the user or tenant. This is an important step. A completed building or other facility is a valuable commodity whose ownership must be properly transferred to someone who knows how to use it effectively.

- ***Operate and maintain***
  The facility is brought to operating readiness, turned on, and run in so as to achieve its ultimate use. As operating readiness is achieved, ongoing maintenance is required to prevent failures and to correct operating dysfunctions.

2. ***Activities that need to be done (Y axis)***
   - ***Planning***
     Defining the design and implementation components of architecture, engineering, construction, operation, and maintenance, and assembling them into a program of work.
   - ***Marketing and sales***
     Representing your organization to those who are potential users of your services. Marketing is establishing your capacities, your market, and a strategy of obtaining work within it. Selling is establishing and implementing the strategy of achieving the objectives of the market plan.

     In brief, marketing plans the selling effort. Selling closes the agreement to transfer goods and services from the seller to the buyer.
   - ***Engineering***
     Using mathematical and scientific laws of nature to prepare a technically sound and buildable design within the resource framework desired and required.
   - ***Architecture***
     Using appropriate guidelines of behavior, function, and aesthetics to prepare an effective environmental design by which the purpose of the project can be achieved within the resource framework desired and required.
   - ***Estimating***
     The art and science of predicting what the total cost of a proposed program will be based on measurements and observations from which the unknown elements are given a value.
   - ***Real estate***
     Locating, controlling and acquiring real property on, or within, which the program is to be implemented.
   - ***Financing***
     Acquiring and managing financial resources to pay for the program.
   - ***Legal***
     Maintaining legal observations of the program to insure adherance to contract and regulatory agreements and obligations.
   - ***Construction***
     Procuring labor, materials, equipment and other resources and combining them by and into a managed system so the end result is a facility built to the requirements of the contract documents and the intent of the design.
   - ***Leasing***
     Renting or otherwise arranging to receive a cash flow from the improved property that allows a desired return on the investment. This activity may include construction of tenant improvements within the base building space.
   - ***Property management***
     Exerting management control over improved properties to insure they are successful.
3. ***Those who do the activities (Z axis)***

- ***Conceiver - the boss***
  Those who conceive the idea and provide the wherewithal to bring the environmental program to a successful conclusion. Usually the conceiver is the key party driving the project to completion.
- ***Translator - prepares the documents***
  Those who translate the environmental statements into construction language.
- ***Constructor - builds the project***
  Those who interpret the construction language and convert it to an actual physical environment.
- ***Operator - operates and maintains the facility***
  Those who operate and maintain the completed project.
- ***Regulator - sets and holds construction guidelines***
  Those who review and inspect the project to help insure protection of the health, welfare and safety of the public.

B. Action arenas in which the estimator works

Where marketing and estimating interests intersect varies with the project nature and with the delivery system being used. Almost any planning, design or costruction action being considered requires an estimate of resources needed if a rational no-go or go decision is to be made.

1. ***Where in the macro matrix is the estimator likely to be involved?***
2. ***What happens in these arenas of estimating action?***

C. The pivotal role of the estimator in effective marketing & selling

1. ***The estimator may help decide many matters. Some are:***
   - ***Suitability of the project for the estimator's organization - profiling***
     Profiling is the preparation and use of a selective, flexible and tailored system of screening projects for your participation.
     Profiling the project
     Profiling the client
     Profiling the project team
     Techniques of profiling
       Decision tables
       Weight value systems
       Other
   - ***Validity of the project cost structure***
     What does the pro forma require?
     What level of quality is required?
   - ***Soundness of the project component systems proposed***
     Procurement
     On site work
     Off site work
     Substructure
     Superstructure
     Exterior skin
     Interior rough work
     Interior finish work
     Unit systems work
   - ***Achievement of the project time plan***
     How is the project to be sequenced?
     When is the project supposed to finish?
     When will the project actually be finished?
   - ***Constructability of the project***
     How well does the delivery system suit the owner's needs?
     How well does the delivery system suit the user's needs?

How well do the proposed components match the owner's and user's needs
How well will the project team perform?
Is the cost structure right?

- ***Whether the project should go ahead or not***

What is the timing of a go or no-go decision?
What are the criteria to be used for a go or no-go analysis?

2. ***The estimator is on the front line of the prospect and client contact - why?***
   - ***Can help make an authentic needs assessment***
   - ***Can help make valid value analyses***
   - ***Can objectively recommend a project be built or not***
   - ***Can price proposed programs at an appropriate level of accuracy and commitment***
   - ***Can assist in quickly pricing alternatives***
   - ***Can give knowledgable help on the project plan and schedule***

D. ***How the owner, the user, the planner/programmer and the architect/engineer employ estimating as a marketing tool***

1. ***Owner requires cost and resource estimates to***
   - ***Validate a proposed project***
   - ***Market internally***
   - ***Provide authentic infomation to the UDM***
   - ***Decide on the content of the must, want and wish lists***

The must list
Those items that **must** be included in the scope of work to make the project a go. If any of the items are not able to be included the project is a no-go.

The want list
Those items that are **wanted** and can be included in the scope of work, over and above the must list items, since they provide a definable and acceptable return on their cost investment.

The wish list
Those items that the owner and user **wish** they could include but might not be able to due to budgetary or other reasons. Wish list items are best added, not deleted, as the project moves into construction.

2. ***User or tenant requires cost and resource estimates to***
   - ***Define the costs related to fitting up the space***
   - ***Define the relation of capital cost, rent & maintenance costs***
   - ***Understand the influence of operating costs on the price for occupying the space***
3. ***Planner/programmer requires cost and resource estimates to***
   - ***Visualize the full scope of the proposed project***
   - ***Accurately define the scope of project work (must, want, wish)***
   - ***Convey the relation of target costs vs estimated costs***
   - ***Move larger plans across critical transition points into smaller phased segements***
4. ***Architect/engineer requires cost and resource estimates to***
   - ***Guide, and ultimately control, design decisions related to budget***
   - ***Select optimum project delivery systems***
   - ***Select labor, materials, equipment and systems that fit the program***
   - ***Manage the use of other professional resources within the project team***

E. ***What management must know to use estimating as a marketing tool***

1. ***The allowable project cost***
2. ***The performance characteristics required of the facility***
3. ***The performance characteristics provided by various project delivery systems***

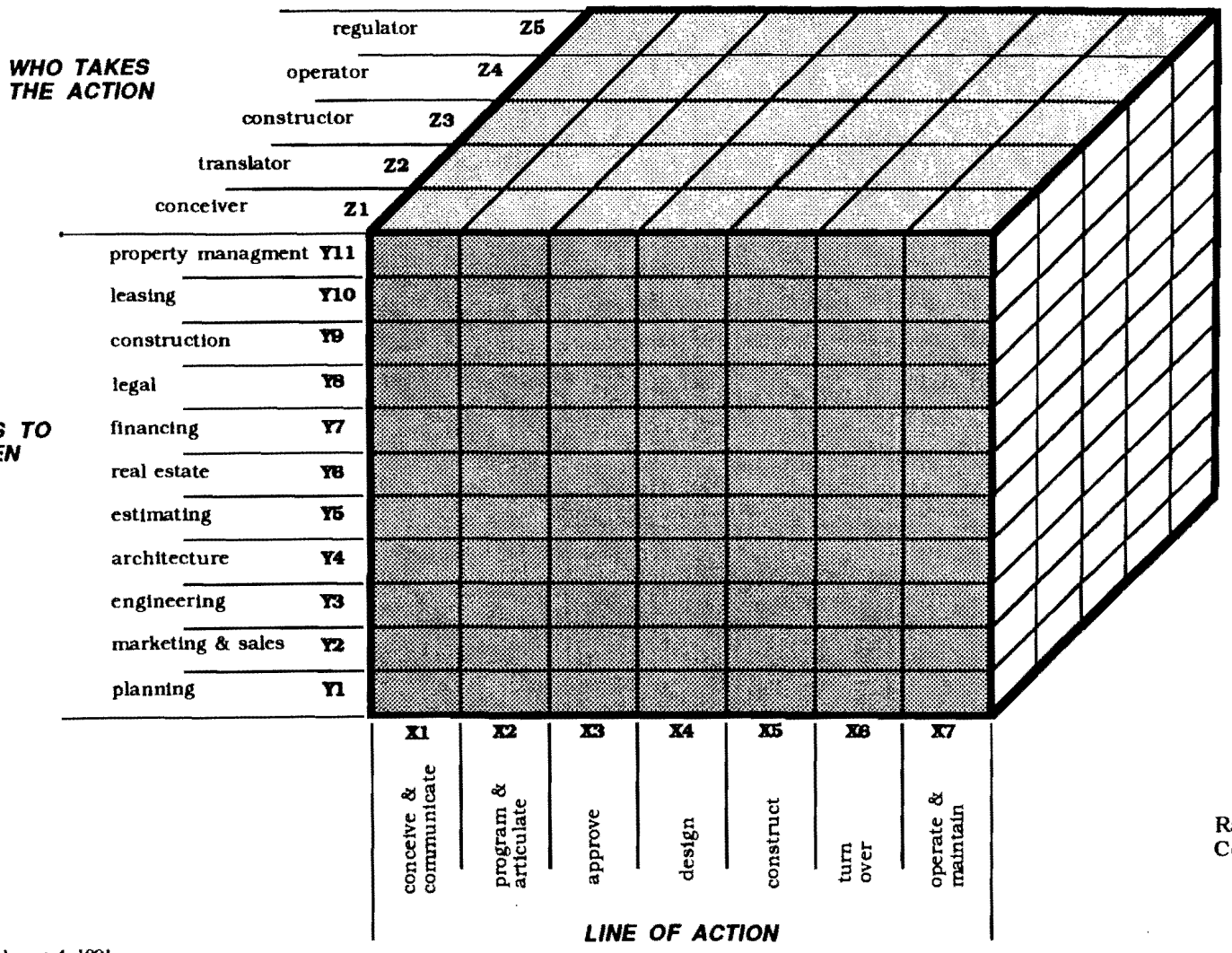
4. *The use and detail level of the estimate to be prepared - this is influenced by several factors*
    - *Point in time at which estimated is to be prepared*
    - *Scale of detail required*
    - *Estimating methodology*
    - *Life span covered by the costing*
    - *Data available*
    - *Ultimate use of the estimate*
    - *Number of elements estimated relative to total*
    - *Competitive situation*
    - *Role of estimate in setting final cost*
    - *Control position occupied*
5. *The importance of a body of authentic cost and performance data from which to work in a probabilistic sense*
6. *The desired content of the must, want and wish list*

F. *Suiting the character of the estimate to the marketing needs of your organization*

There exists a need to adequately bridge the transitions from one type of relation to the next. Often the estimator of costs is the most suited for this work since the estimator's work product is used in many different operations.

1. *Locating & stimulating the prospect's interest in you - clarity and authenticity*
2. *Preparing the presentation - authenticity*
3. *Making the presentation - clarity, authenticity and razzle dazzle*
4. *Negotiating the contract - accuracy, clarity and full scope definition*
5. *Analyzing the project - technical accuracy*
6. *Doing the work - technical accuracy and clarity*

MACRO MATRIX BOUNDARIES OF DESIGN & CONSTRUCTION



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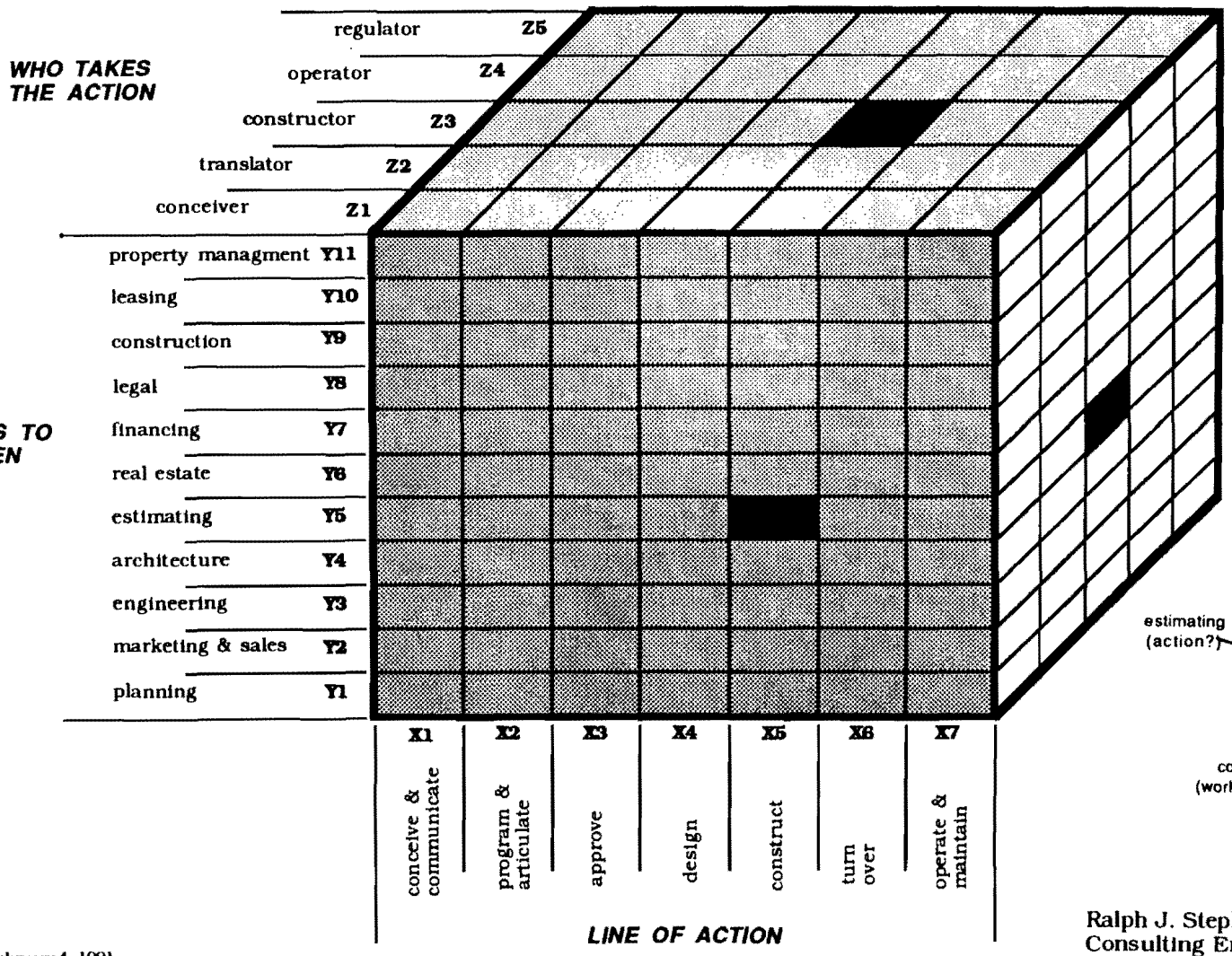
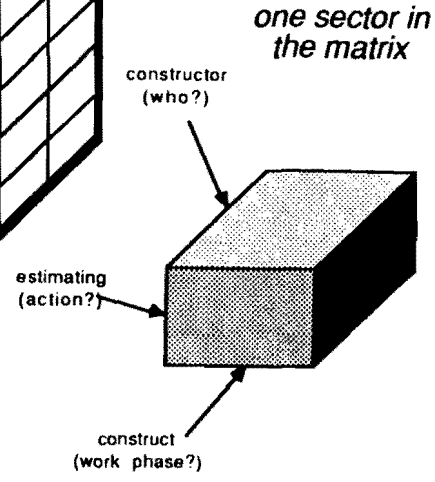
MACRO MATRIX BOUNDARIES OF DESIGN & CONSTRUCTION





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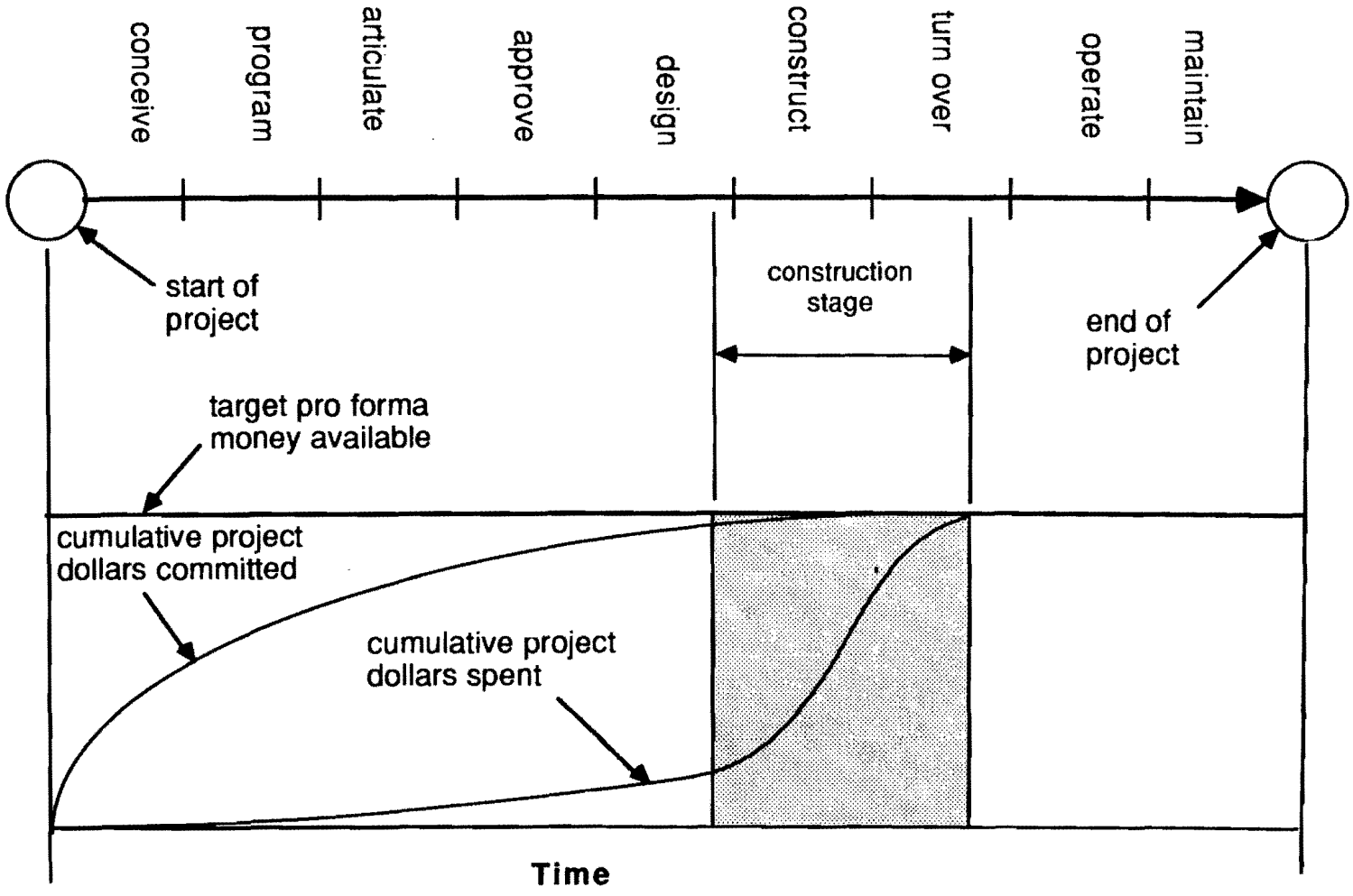

Costs Committed Compared to Money Spent on Construction Projects

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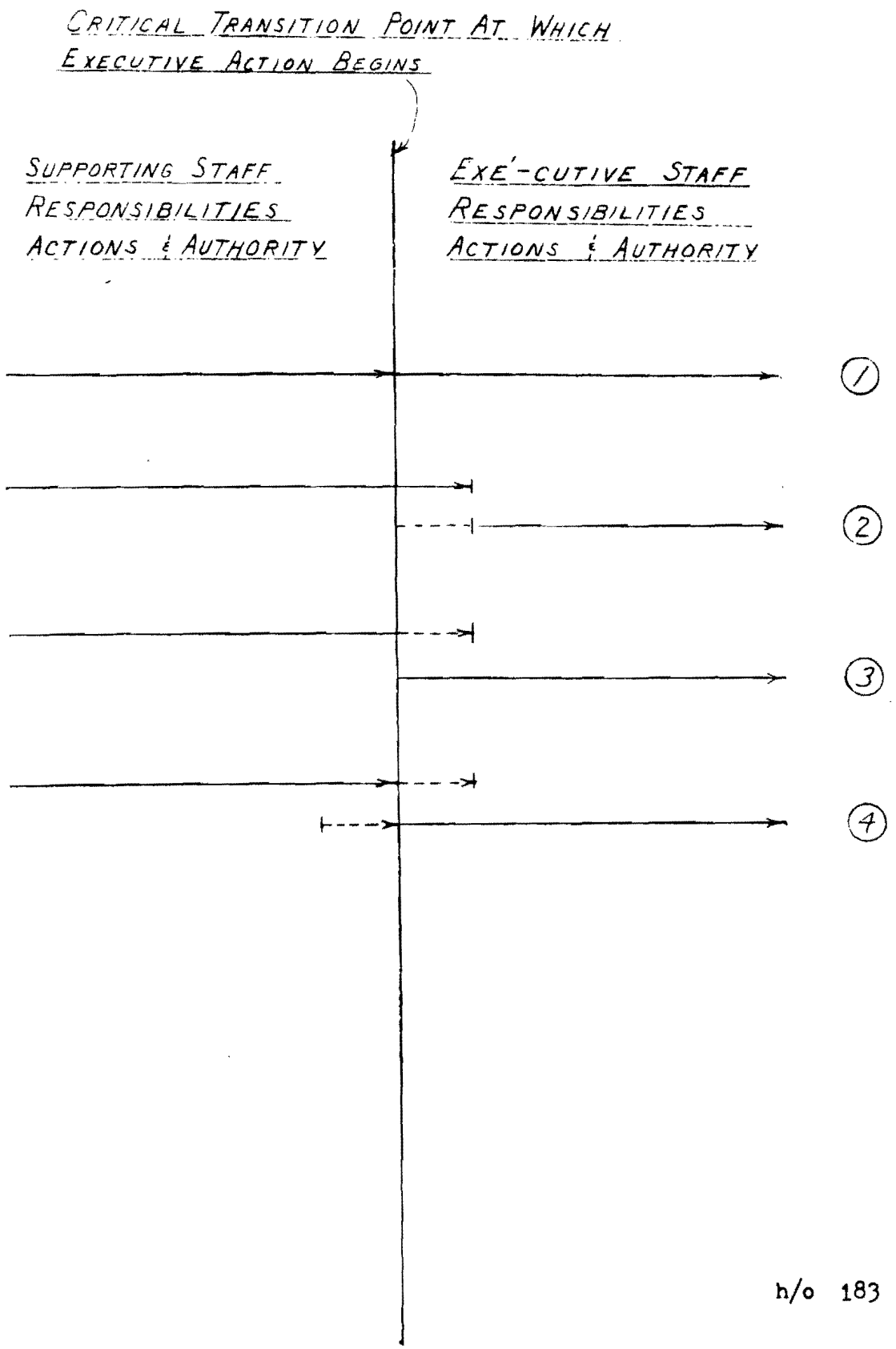

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KINDS OF ESTIMATES

Estimating can be defined as an approximate statement of what would be charged for certain work to be done submitted by one ready to undertake the work. Other definitions have been proposed but they all lead to the conclusion that estimating is fundamentally the art and science of predicting what the total cost actually will be. This estimate classification system takes into account the functional characteristics of the specific estimate to be made. It considers ten elements.

1. Point in time at which estimate is prepared
2. Scale of detail required
3. Estimating methodology
4. Life span covered by costing
5. Data available
6. Ultimate use of estimate
7. Number of elements estimated relative to total
8. Competitive situation
9. Role of estimate in setting final cost
10. Control position occupied

A meaningful classification system results if we assign values or weights to identify the requirements of the specific estimating situation.

1. Point in time at which estimate is prepared

    1) Conceive
    2) Program
    3) Articulate
    4) Approve
    5) Design
    6) Construct
    7) Turnover
    8) Operate
    9) Maintain

2. Scale of detail required

    1) Very rough detail, using general rules of thumb
    2) Generalized combination system in rough detail
    3) Moderate detail by unit or component modified with general historical and current data
    4) Great detail modified with specific historical and detail current data

3. Estimating methodology

    1) Replacement or appraisal technique
    2) Historical unit area or volume figures indexed for current use
    3) Major component costing and assembly indexed for current use
    4) Detailed component costing and assembly indexed for current use

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3. Estimating methodology (Cont.)

5) Detailed time and material estimates of elemental units (individually assembled at time of estimating)

The fundamental difference between component costing and costing from elemental units is that in the first the elemental units are pre-assembled and pre-estimated so that they are not evaluated each time the component is encountered in the project.

4. Life span covered by costing

1) Cost of initial installation only
2) Cost of installation, and short operating and maintenance cycle
3) Cost of installation, and long operation and maintenance cycle
4) Cost of installation, and total operation and maintenance over life of investment

5. Data available

1) Very little
2) Moderately adequate with supplementary research
3) Generally adequate
4) As much as required

6. Ultimate use of estimate

1) Conceptualizing - to gain basic idea of scope - usually very rough figures
2) Comparative evaluation - to measure on an equal basis several elements or combinations, all relative to a common datum
3) Budgeting - to provide a basis for allocating capital funds, maintenance or operating costs or other expenditures on a given program prior to its final design but after its conception
4) Competitive - to give the ultimate decision-maker in an environmental design and construction program comparable, firm values by which he can select all elements of the program to optimize its effectiveness

7. Number of elements estimated relative to total

1) Small part of total
2) Moderate part of total
3) Major part of total
4) Most or all of total

8. Competitive situation

1) No competition
2) Moderate multi value competition
3) Heavy single value competition

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8. Competitive situation (Cont.)

Multi value competition is a relative evaluation based upon several factors such as size, quality of management, experience, present work load and financial strength.

In single value competition, all of these are reduced to a lone evaluation of the ultimate value expressed in the money bid. Such is the case on public projects where the only requirement to be on the bidding list is that an adequate bond be available.

9. Role of estimate in setting final cost

1) To set capital costs only
2) To set financing, operating and maintenance costs only
3) To set all project costs through a specified period of time

10. Control position occupied

1) No control exerted
2) Minor controls possible
3) Major controls possible
4) Total control of program

Much elaboration is possible on control positions. The code suggested is a simplistic approach and in actual use might be modified to reflect to what the control is applied. Control position may extend to labor, material, land, money, design, construction or sub contractors among others.

2. Professional Service Contract Characteristics

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A. Agreement premises

1. Totally negotiated - broad multivalue competition
2. Partially qualified - moderate multivalue competition
3. Totally qualified - narrow multivalue value competition

B. Authority limits

1. As agent
2. As limited agent
3. As contractor

C. Payment methods

1. Fixed total including payroll + overhead + profit + (expenses)
   a. Expenses included
   b. Expenses separate
2. (Payroll costs) x multiplier + fixed fee + expenses
   a. Limit on
   1.) Payroll hours
   2.) Expenses
   b. No limit on
   1.) Payroll hours
   2.) Expenses
3. (Payroll costs) x multiplier for payroll costs & overhead
   a. Expenses included
   b. Expenses separate
4. % of total construction cost
   a. Expenses included
   b. Expenses separate

D. Scope of services

1. Single responsibility
   a. All in house
   b. In house & outside consultants
2. Split responsibility
   a. In house, client & other prime consultants
   b. In house & other prime consultants
   c. In house & client

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3. Construction Contract Characteristics

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A. Agreement premises

1. Totally negotiated - broad multivalue competition
2. Partially qualified - moderate multivalue competition
3. Totally qualified - narrow multi valuevalue competition

B. Authority limits

1. As full agent
2. As limited agent
3. As contractor

C. Payment methods

1. Fixed cost (hard money)
2. Time & material + fixed fee
   a. Limit on
      1.) Time & material (gmp) with no shared savings
      2.) Time & material (gmp) with shared savings
   b. No limit on time & material
3. Time & material + % fee
   a. Limit on
      1.) Time & material (gmp) with no shared savings
      2.) Time & material (gmp) with shared savings
   b. No limit on time & material
5. Conditional payments or penalties
   a. Incentive/disincentive
   b. Liquidated damages

D. Scope of services

1. Single responsibility - in house & subcontractors
   a. All trades
      1.) Provide management
      2.) Provide design
      3.) Provide construction labor
      4.) Provide construction materials
   b. Limited trades
      1.) Provide management
      2.) Provide design
      3.) Provide construction labor
      4.) Provide construction materials
2. Split responsibility - in house, subcontractors & other primes
   a. All trades in contract
      1.) Provide management
      2.) Provide design
      3.) Provide construction labor
      4.) Provide construction materials
   b. Limited trades in contract
      1.) Provide management
      2.) Provide design
      3.) Provide construction labor
      4.) Provide construction materials

Note: If answer to any of the first 3 questions is no, don't propose on design/build basis.

		1	2	3	4	5
Q1	Negotiated or qualified arrangement possible?	Y	Y	Y	Y	Y
Q2	Private project?	Y	Y	Y	Y	Y
Q3	Do we have good a/e &all trade estimating services available	Y	Y	Y	Y	Y
Q4	Do we have time to prepare good d/b proposal?	Y	N	N	N	N
Q5	Do we control land & financing?	-	-	-	-	-
Q6	Is prospect engineering or management oriented?	-	Y	N	N	N
Q7	Have we built successfully for the prospect before?	-	-	Y	-	N
Q8	Have we built similar d/b projects previously?	-	-	Y	N	Y
A1	Propose on d/b delivery system	X	X	X		
A2	Don't propose on d/b delivery system				X	X

To Propose or Not on Design Build Delivery System

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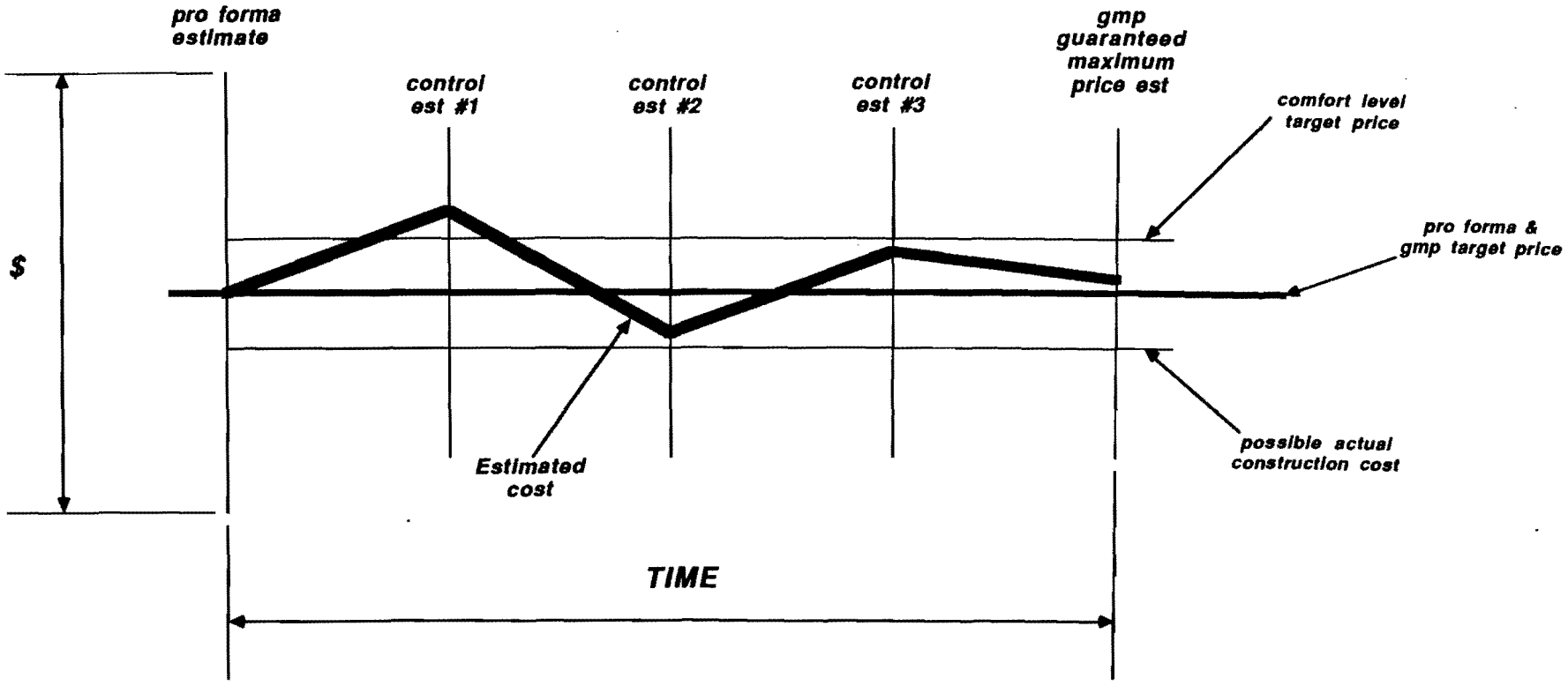

THE ITERATIVE COSTING SEQUENCE

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Sheet #IT1

Section #2 - Steps to Successful Project Management

I. Objective of section #2

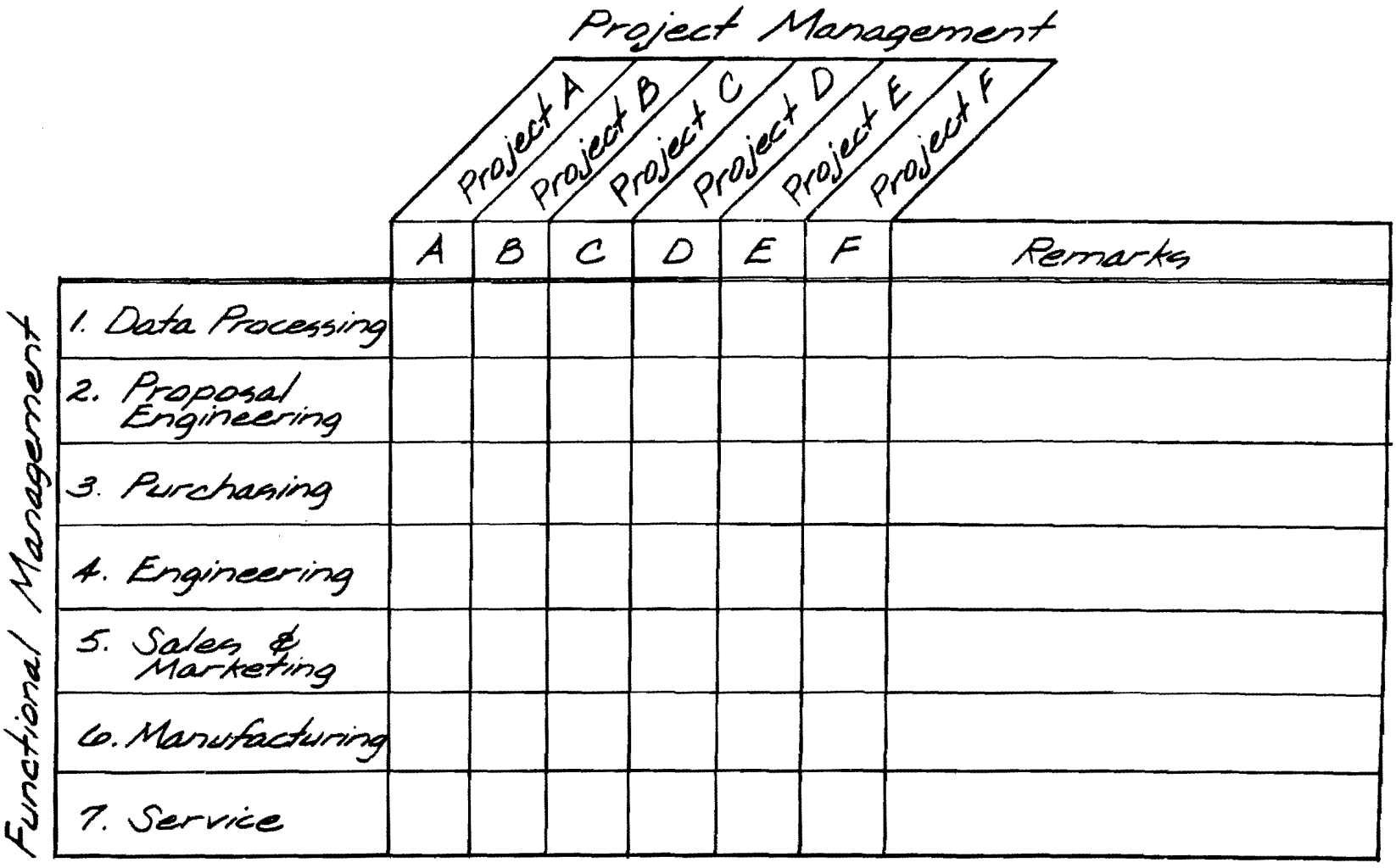
To discuss the elements of effective project management that are that are of concern and are valuable to the good estimator.

II. Questions to answer

- *A. What is a project manager?*
- *B. How is estimating of importance to the project manager?*
- *C. When is an estimator a project manager?*
- *D. What are the matrix sectors in which good planning is necessary?*
- *E. What are some project planning tools that have proven effective?*
- *F. How do you know when you've done a good job of project management?*

III. Topics

- *A. The nine major steps to effective project management*
- *B. Setting project goals and objectives*
- *C. The project manager's role in selecting a project delivery system*
- *D. Elements of effective project management*
- *E. Qualities of a good project manager*
- *F. The balance between responsibility and authority*
- *G. Organizing the project to achieve quality and cost targets*
- *H. The role of the estimate in managing the project*
- *I. Basics of job planning and scheduling*



PROJECT/FUNCTIONAL MANAGEMENT MATRIX

RALPH J. STEPHENSON, P.E., P.C.
CONSULTING ENGINEER

Ralph J. Stephenson PE

DESIGN/BUILD MATRIX

	Actions / Functions	01 Sales	02 Engineering	03 Architecture	04 Estimating	05 Real Estate	06 Finance	07 Legal	08 Graphics	09 Construction	10 Leasing	11 Property Mgmt
I	Maintain											
H	Operate											
G	Turn Over											
F	Construct											
E	Design											
D	Approve											
C	Articulate											
B	Program											
A	Conceive											

Ralph J. Stephenson PE
Consulting Engineer

ELEMENTS OF EFFECTIVE PROJECT MANAGEMENT

1. Technical competence
2. Proper project planning
3. Good project staff morale
4. Clearly defined authority lines
5. Clearly defined responsibility lines
6. Respected leadership
7. Clear understanding of the project mission
8. A sensitive monitoring system
9. Prompt and effective resolution of problems
10. Discerning points of view
11. Effective modes of action
12. A feeling for people
13. A project wide desire for excellence
14. Inquisitive minds
15. A sense of humor
16. Collective patience
17. Collective endurance

Ralph J. Stephenson PE
Consulting Engineer

QUALITIES OF A GOOD PROJECT MANAGER

01. A perceptive ability to move from the micro situation to the macro situation, and back again at will.
02. An ability to work well with people.
03. A desire for excellence.
04. An inquisitive mind.
05. An ability to manage conflict.
06. A sense of humor.
07. Good mental peripheral vision.
08. Education in related fields
09. Training in related fields.
10. Leadership ability.
11. Related technical and professional credentials.
12. An understanding of the true role of profit in our society.
13. A potential for being creative.
14. Good communication ability.
16. Intelligent consistency.
15. Honesty and integrity.

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Consulting Engineer

NINE MAJOR STEPS TO EFFECTIVE PROJECT MANAGEMENT

DEFINITIONS

• PROJECT - A set of work actions having identifiable objectives, and a beginning and an end.

• EFFECTIVE - Of a nature that achieves identifiable goals and objectives in accordance with an action plan, and reaches worthwhile peripheral goals through intermediate accomplishments.

• MANAGEMENT - The identification, assembly and direction of resources to achieve desired results.

QUESTION

• What is different about project organization compared to functional organization?

1. Project organization is usually temporary.

2. Project organization is usually based on a different rationale than is functional organization.

3. Project authority positions tend to be vested first and earned later.

STEPS TO GOOD PROJECT MANAGEMENT

• A good project seems to require 9 major steps, done well, to be successful.

1. Goals and objectives for the project are clearly identified, and starting, intermediate and ending measuring points established early in the project life.

2. A suitable project delivery system is selected as the goals & objectives are defined.

3. An action plan showing desired and necessary courses of action from beginning to end of the project is prepared.

4. The action plan is translated into schedules, and the resources needed are determined and balanced for most profitable performance.

5. A project organization is built under (not over) the resources required to provide resource management quality, continuity, and monitorbility.

6. A method of isolating, identifying and correcting deviations from desired performance standards is designed and put into action.

7. The needed resources are assembled and the project team gets to work.

8. Progress and performance of the project team is measured and evaluated using management by exception.

9. The project is closed out promptly, cleanly, and totally as work draws to a close.

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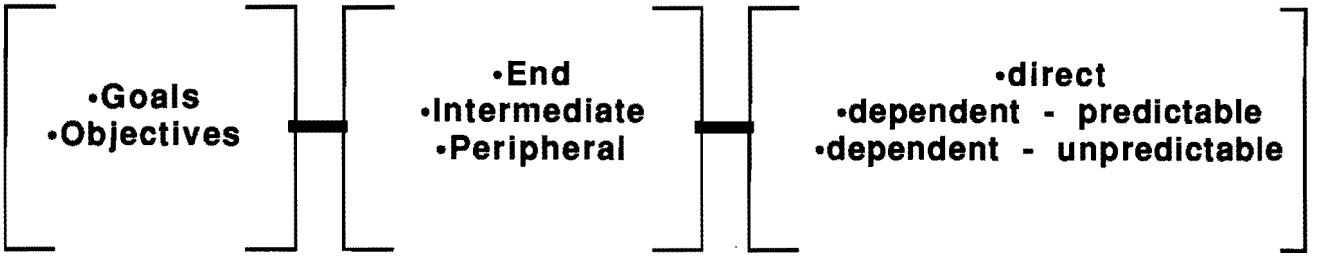
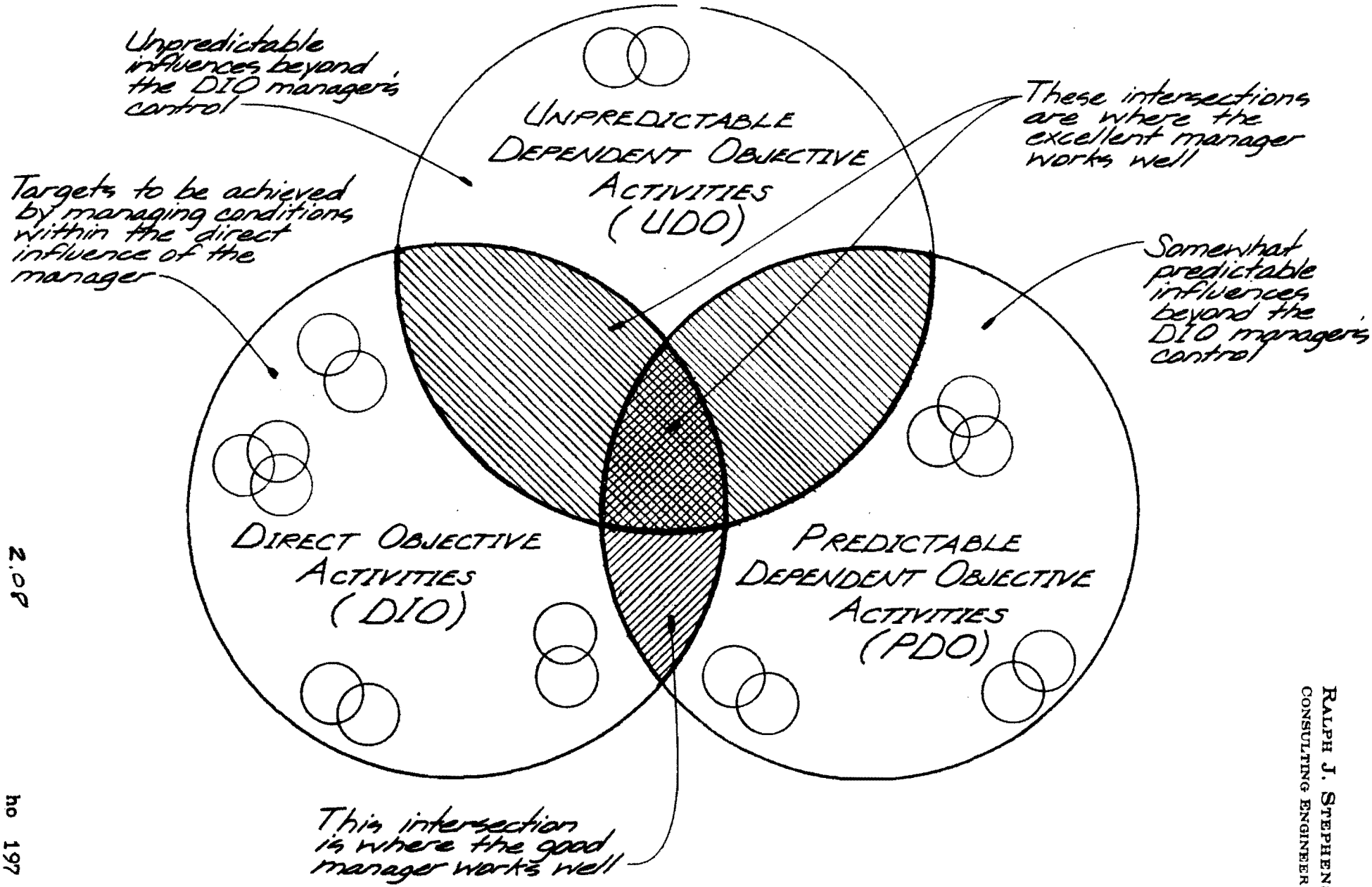
Goals & Objectives Definition



Definitions

- Goals - Unquantified targets to be achieved
- Objectives - Quantified goals to be achieved
- End - Goals & objectives realized upon completion of the project or program
- Intermediate - Goals & objectives achieved at specific points prior to completion of the project or program
- Peripheral - Goals & objectives achieved on an ongoing basis during the project - often are personal, professional, technical, financial or social
- Direct - Goals & objectives to be achieved by internal direct influences
- Dependent - Goals & objectives affecting the project but to be achieved by external influences - usually are predictable or unpredictable

ho 316 July, 88



THE DIO/PDO/UDO INTERSECTION

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

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Consulting Engineer

JOB PLANNING - WHAT IS IT ?

1. PLANNING is to formulate a sequence of actions leading to an end goal.

2. NETWORK PLANNING is to graphically depict this sequence of action.

3. CRITICAL PATH PLANNING is a technique of establishing resource limits on each plan component.

PLAN VISIBLY !

Section #3 - Starting Out Right

I. Objective of section

To identify how the need for an estimate arises, who uses the early estimates and why, and the critical nature of early estimates as baseline documents.

II. Questions to answer

- *A. What is the pro forma and what is its role in setting target costs?*
- *B. What is the estimator's responsibility in setting goals and objectives?*
- *C. How is the estimate used to start a series of actions?*
- *D. How can a network model help the estimator start the job right?*
- *E. Who uses the estimate and how?*
- *F. How is the estimate used as a basic project delivery system tool?*

III. Topics

- *A. The proforma and how it is derived and used to set initial costs.*
- *B. Crossing critical transition points*
  1. *Interest to active proposing*
  2. *Proposing to negotiating*
  3. *Negotiating to contract execution*
  4. *Contract execution to mobilizing and moving on site*
  5. *Contract execution to awarding sub contracts*
  6. *Awarding sub contracts to submittal, approval, fab and delivery action*
- *C. Demands that trigger the need for an estimate*
- *D. Project start up and factors that are of importance*
  1. *Estimating*
  2. *Other*
- *E. The estimate as a base line tool*
- *F. Using the estimate to develop the planning laundry list*
- *G. The role of the estimator in planning & scheduling field work*
- *H. The iterative estimate as an influence in the design of the project*
  1. *Material selections*
  2. *Equipment selections*
- *I. Using the need, want and wish technique in early estimates*
- *J. Use of network models to help the estimator start the job right*
- *K. Defining the scale of the estimate needed*
- *L. Integrating the estimate with the design*
- *M. Designing to the estimate*
- *N. The role of the estimator in planning and scheduling field work*
- *O. The need for good procurement practices*

2 year working day calendar starting on January 2, 1991

Ralph J. Stephenson PE PC - 323 Hiawatha Drive,
Mt. Pleasant, Michigan 48858, ph 517 772 2537

Jan, 1991	13 051	23 102	05 152	16 203
02 001	14 052	24 103	06 153	17 204
03 002	15 053	28 104	07 154	18 205
04 003	18 054	29 105	08 155	21 206
07 004	19 055	30 106	09 156	22 207
08 005	20 056	31 107	12 157	23 208
09 006	21 057	**Jun, 91**	13 158	24 209
10 007	22 058	03 108	14 159	25 210
11 008	25 059	04 109	15 160	28 211
14 009	26 060	05 110	16 161	29 212
15 010	27 061	06 111	19 162	30 213
16 011	28 062	07 112	20 163	31 214
17 012	29 063	10 113	21 164	**Nov, 91**
18 013	**Apr, 91**	11 114	22 165	01 215
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22 015	02 065	13 116	26 167	05 217
23 016	03 066	14 117	27 168	06 218
24 017	04 067	17 118	28 169	07 219
25 018	05 068	18 119	29 170	08 220
28 019	08 069	19 120	30 171	11 221
29 020	09 070	20 121	**Sep, 91**	12 222
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31 022	11 072	24 123	04 173	14 224
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04 024	16 075	27 126	09 176	19 227
05 025	17 076	28 127	10 177	20 228
06 026	18 077	**Jul, 91**	11 178	21 229
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06 046	16 097	30 148	09 198	20 249
07 047	17 098	31 149	10 199	23 250
08 048	20 099	**Aug, 91**	11 200	24 251
11 049	21 100	01 150	14 201	26 252
12 050	22 101	02 151	15 202	27 253
				30 254
				31 255

2 year working day calendar starting on January 2, 1991 -

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37 Elements of importance to success in design and construction - ho 341

By Ralph J. Stephenson PE PC

- **Summary**

In the design and construction industry there exist many factors which influence the degree of success achieved on a project. They deal with project goals, profit types, project sequencing, the nature of the participants and the kinds of problems most likely to be encountered.

If the parties to a planning, design and construction program recognize the nature and importance of these factors, a major step will have been made toward their proper and effective combination and management.

Below are listed 37 basic influences on project delivery systems. Project management concerns how to combine these into a successful job of which all participants are proud.

- **Six major goals to meet for design & construction project success**

The client, owner & user must be assured upon completion of his job that:

1. The facility program and the facility design have met their needs, desires and wishes.

2. The planning, design and construction work on the project has been accomplished within the time and cost structure required and desired.

3. All relationships on the project have been maintained at a high technical and professional level, and have proven rewarding for those involved and affected.

4. The people involved at all levels of work on the job have realized a financial, professional and technical profit for themselves and their associates by being on the project.

5. The project has been closed out with little or no residual potential for major problems of maintenance or operation.

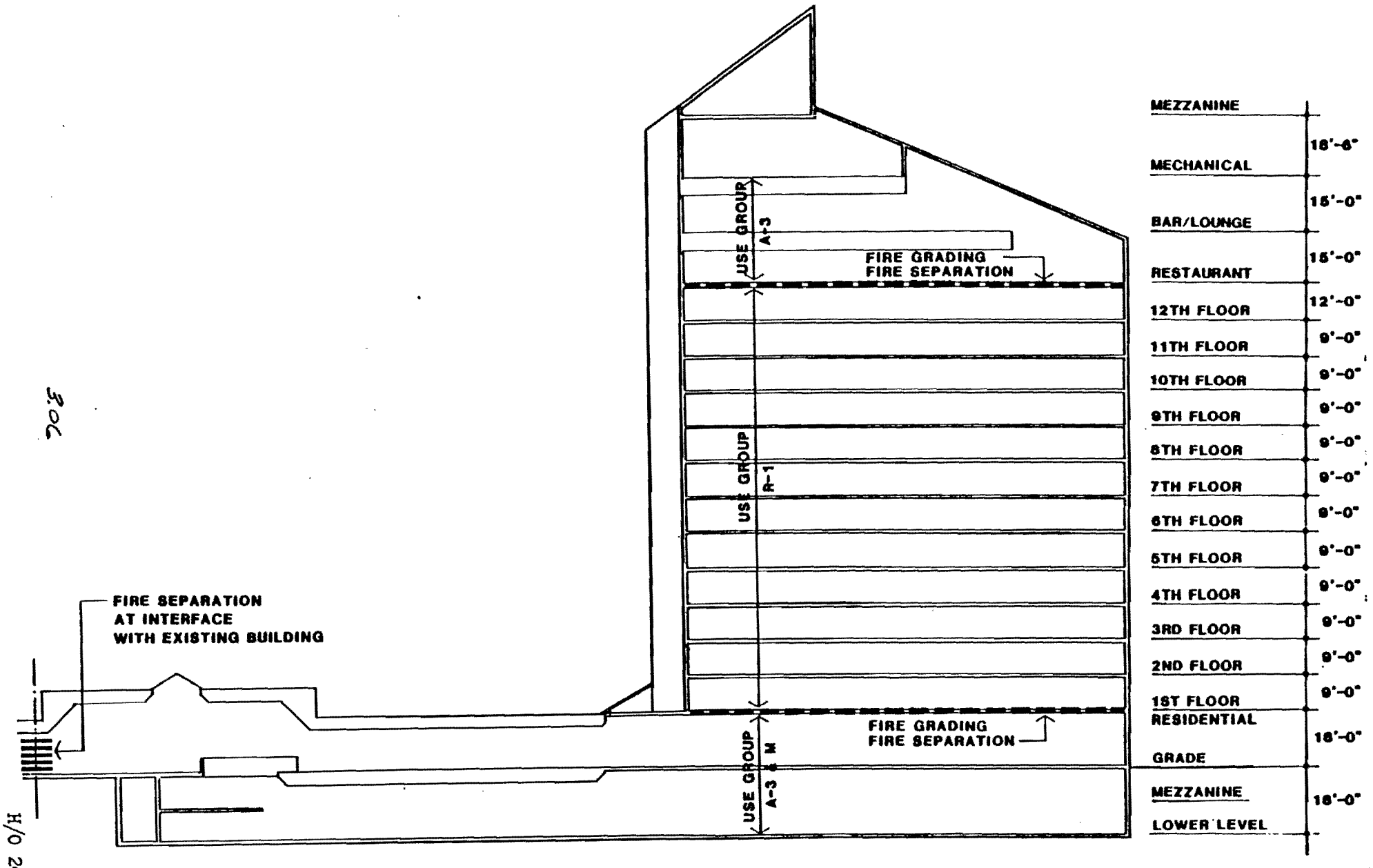
6. The entire process has been free of unresolved contested claims for additional money, additional time, damage payments, and of the potential for future financial demands after the job has been closed out.

- **Seven types of profit**
  1. **Financial** - an improvement in a money position
  2. **Social** - a gratifying experience contributing to society's well being
  3. **Self actualization** - a gain in personal non financial satisfaction by contributive work
  4. **Value system** - reward gained by application of values in which one believes
  5. **Technical** - acquisition of technical skill or technical data of value
  6. **Enjoyment** - personal enjoyment of a situation gained from involvement in it
  7. **Educational** - learning made possible only by efforts exerted in any given situation
- **Nine major elements in the design & construction sequence & how they are done**
  1. **Conceive the basic project**
     Visualize and state the fundamental nature of the proposed project, what purpose it is to serve, and its base characteristics.

2. **Prepare the program**
   Set down the physical characteristics of the total project in written and graphic form so as to be able to translate these characteristics into approval documents from which the full design can proceed.
3. **Articulate the program for approval**
   Merge the concept, and the written and graphic program into written and graphic construction language which can be reviewed and released by the ultimate decision makers for full design.
4. **Approve the basic project**
   Approve the concept, the program, and the merging of the two. This approval by those in authority initiates the full design and construction process
5. **Design the project**
   Prepare full contract documents for construction use.
6. **Construct the project**
   Build the project and make it ready for turnover to the owner or user.
7. **Turn over the project**
   Release the constructed project to the owner or user with full documentation needed to operated and maintain the completed environment.
8. **Operate the project**
   Take over, run in, and make the new environment fully operational.
9. **Maintain the project**
   Keep the new environment in proper operating condition by a well conceived and effectively managed maintenance effort.

- **Five major participants in the design & construction process**
  1. **Conceiver** - The ultimate decision making force behind the entire program
  2. **Translators** - The parties that translate the project concept into construction documents
  3. **Constructors** - Those who build the project
  4. **Operators** - Those who operate the completed project
  5. **Regulators** - Those who help assure project adherence to the cause of public good
- **Ten major types of design & construction problems**
  1. **Constructive acceleration**
     An action by a party to the contract that forces more work to be done with no time extension, or the same amount of work and a shorter period of time in which to do it.
  2. **Constructive change**
     A construction action or inaction by a party to the contract that has the same effect as a written order.
  3. **Defective or deficient contract documents**
     Contract documents which do not adequately portray the true contract scope.
  4. **Delay**
     A situation, beyond the control and not the fault of a contract party, that causes a delay to the project
  5. **Differing site condition**
     A situation in which the actual conditions at the site of a project differs from those represented on the contract documents, or from reasonable expectations of a site in that area.
  6. **Directed change**
     A legitimate change within the contract scope for which the owner is obligated to pay.
  7. **Impossibility of performance**
     A situation in which it is impossible to carry out the work within the contract requirements.

8. **Maladministration**
   The interference of one contract party with another contract party's rights, that prevents the latter party from enjoying the benefits of least cost performance within the contract provisions.
9. **Superior knowledge**
   The withholding of knowledge by one party to a contract from another party to the contract during the precontract period, and that, subsequent to contract execution, adversely affects the second party's construction operations in matters of importance.
10. **Termination**
    Dismissal of a party to the project contract for convenience or default.


MEZZANINE
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RESTAURANT
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USE GROUP A-3 & M
FIRE GRADING FIRE SEPARATION
FIRE GRADING FIRE SEPARATION
FIRE SEPARATION AT INTERFACE WITH EXISTING BUILDING

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H/O 240

CONTRACT DOCUMENT MATRIX SUMMARY
GRAND TRAVERSE RESORT VILLAGE TOWER & LOW RISE
D106 - RALPH J. STEPHENSON PE PC - DATE PRINTED: JAN 12 1988

I	S	ACTIVITY DESC	AL	LB	LL	LR	TW	SI	EB	REC#
A	-	SET HORIZ & VERT CONTROLS	A	-	-	-	-	A	-	4
A	-	MASS EXCAVATE TO 677'4	A	-	-	-	-	A	-	5
A	-	HAUL EXCAVATION TO BORROW AREA	A	-	-	-	-	A	-	6
A	-	CONSTRUCT HAUL ROAD	-	-	-	-	-	A	-	7
A	-	KEEP EXISTING ROADS CLEAN	-	-	-	-	-	A	-	8
A	-	REMOVE ABANDONED UTIL IN EXCAV AREAS	-	-	-	-	-	A	-	9
A	-	STRIP BLDG SITE & STOCKPILE TOPSOIL	A	-	-	-	-	A	-	10
A	-	DEMOLISH EXISTING ROAD IN EXCAV AREAS	-	-	-	-	-	A	-	11
B	-	OBTAIN FOUNDATION PERMIT	B	-	-	-	-	-	-	28
B	-	EXCAVATE FOOTINGS-NOT FOR SLB ON GRD	B	-	-	B	B	-	-	14
B	-	ERECT NECESSARY CONSTRUCTION FENCING	B	-	-	-	-	-	-	12
B		PART BACKFILL AT EXT FOUND WALLS	B	-	B	B	B	-	B	72
B	-	LAY OUT BUILDING	B	-	-	-	-	-	-	13
B	-	BACKFILL INT FOUND TO EL ?	B	-	-	B	B	-	-	19
B	-	LAY DRAIN TILE AT PITS	-	-	-	-	B	-	-	22
B	X	EFRP PIT SOG	-	-	-	-	B	-	-	20
B	X	FRP EXT LOWER LEVEL WALLS	B	-	B	B	B	-	-	15
B	X	EFRP COL FTGS	B	-	-	B	B	-	B	17
B	X	EFRP WALL FOOTINGS	B	-	-	B	B	-	-	18
B	X	DRIVE SHEETING AT EXISTING BLDG	-	-	-	B	-	-	B	23
B	X	PART APPLY EXT WALL WATERPROOFING	B	-	B	B	B	-	-	25
B	X	PART INSTL EXT WALL DRAIN TILE	B	-	B	B	B	-	B	34
B	X	FRPS COLS TO LOBBY LEVEL	-	-	-	B	-	-	-	24
B	X	FRPS COLS TO LL MEZZ	-	-	-	B	B	-	-	26
C	-	BACKFILL & COMPACT AT PITS	-	-	-	-	C	-	-	21
C	-	COMP INSTL DRAIN TILE AT EXT WALLS	C	-	-	-	-	-	-	36
C	X	APPLY PIT WATERPROOFING	-	-	-	-	C	-	-	16
C	X	FRPS ELEV 5 WALLS TO LB	-	-	-	-	C	-	-	27
C	X	INSTALL TRENCH DRAIN COVERS	-	-	C	C	-	-	-	29
C	X	INSTALL STEEL STAIRS & FILL	C	-	-	-	-	-	-	31
C	-	COMPLETE PHASE 2 ECAVATION	-	-	C	C	-	-	C	33
C	X	FRP PIT WALLS	-	-	-	-	C	-	-	189
C	-	BACKFILL EXT BUILDING WALLS	C	-	-	-	-	-	-	38
C	-	BACKFILL EXT RETAINING WALL	-	-	-	-	-	C	-	35
C	X	EFRP RETAINING WALL FOOTING	-	-	-	-	-	C	-	37
C	X	FRPS RETAINING WALL STEM	-	-	-	-	-	C	-	39
C	-	EXCAVATE FOR ALL SLABS ON GRADE	-	-	C	C	C	-	-	49
C	-	POUR OUT SUPPORTED DECKS	C	-	-	C	C	-	-	53
C	-	DEMOLISH EXISTING CANOPY	-	-	-	-	-	-	C	77
C	X	CURE, PART & TOTAL STRIP SUPTD DECKS	C	-	-	C	C	-	-	51
C	X	INSTL ELECT GROUNDING SYSTEM	C	-	-	-	-	-	-	52
C	X	FRPS COLUMNS ABOVE LOBBY LEVEL	C	-	-	-	C	-	-	54
C	X	FRPS COLS ABOVE LL MEZZ	-	-	C	C	C	-	-	43
C	X	CURE, STRIP & RESHORE SUPTD DECKS	C	-	-	C	C	-	-	50
C	X	ERECT MISC MTLS RELATED TO SS CONC WOR	C	-	-	-	-	-	-	190
C	X	CONSTRUCT LB SLABS ON GRADE	-	C	-	-	-	-	C	46
C	X	INSTL MISC IRON SKIN EMBEDS & SUPPORTS	C	-	-	-	C	-	-	56
C	X	COMP APPLY EXTERIOR WALL WATERPROOFING	C	-	-	-	-	-	-	42
C	X	FORM & SET IN FLOOR WORK FOR SUPTD DKS	C	-	-	C	C	-	-	55
C	X	INSTL EXPANSION JOINTS & RELATED EMBED	C	-	-	-	-	-	-	44
C	X	CONSTRUCT LL SLABS ON GRADE	C	-	C	C	C	-	-	57
C	X	INSTL MATERIAL & PERSONNEL HOIST	C	-	-	-	-	-	-	47
C	X	PROVIDE CONTRACT C HOISTING	C	-	-	-	-	-	-	48
C	X	CONSTRUCT TOWER LL MEZZ DECK	-	-	C	-	C	-	-	41

I	S	ACTIVITY DESC	AL	LB	LL	LR	TW	SI	EB	REC#
D	X	FURNISH ELEVATOR EMBEDMENTS	-	-	-	-	D	-	-	192
D	X	INSTALL ELEVATOR RAILS, EQUIP, CAB	-	-	-	-	D	-	-	58
D	X	INSTALL ELEVATOR HYDRAULIC CYLINDER	-	-	-	-	D	-	-	59
E	X	ERECT LR METAL FLOOR & ROOF DECK	-	-	-	E	-	-	E	108
E	X	ERECT, PLUMB & BOLT LR STRUCT STL & JS	-	-	-	E	-	-	E	107
F	X	INSTL EXT SKIN MISC METALS	F	-	-	-	-	-	-	60
F	X	INSTALL SLIDING DOORS	-	-	-	-	F	-	-	79
F	X	INSTALL CURTAIN WALL GLASS	-	-	-	-	F	-	-	82
F	X	ERECT ALUM SIDING	-	-	-	-	F	-	-	75
F	X	ERECT CURTAIN WALL FRAMING	-	-	-	-	F	-	-	81
F	X	INSTALL BALCONY RAILS	-	-	-	-	F	-	-	78
G	X	INSTL PLUMBING FIXTURES	G	-	-	-	-	-	G	145
G	X	INSTL SPRINKLER HEADS	G	-	-	-	-	-	G	169
G	X	INSTL GRILLS & DIFFUSERS	G	-	-	-	-	-	G	139
G	X	INSTL FAN COIL UNITS	-	-	-	-	G	-	-	142
G	X	PROCURE FAN COIL UNITS	G	-	-	-	-	-	-	99
G	X	PROCURE WATER SOFTENER	G	-	-	-	-	-	-	94
G	X	PROCURE CHILLERS	G	-	-	-	-	-	-	101
G	X	PROCURE DOMESTIC WATER TANKS	G	-	-	-	-	-	-	93
G	X	PROCURE BOILER	G	-	-	-	-	-	-	100
G	X	PROCURE COOLING TOWER (OR COND)	G	-	-	-	-	-	-	98
G	X	PROCURE FIRE PUMPS	G	-	-	-	-	-	-	96
G	X	PROCURE HOT WATER TANK	G	-	-	-	-	-	-	91
G	X	PROCURE DOMESTIC WATER PUMPS	G	-	-	-	-	-	-	92
G	X	PROCURE AIR HANDLING UNITS	G	-	-	-	-	-	-	95
G	-	INST AF DOMESTIC MECH PIPING	G	-	-	-	-	-	G	134
G	-	INSTL HARD CEILING SUSP & BLACK IRON	G	-	-	-	-	-	G	167
G	-	INSTL STUDS & IN WALL WORK	G	-	-	-	-	-	G	164
G	X	EIB UG UTIL AT LL SLAB ON GRADE	G	-	G	G	G	-	-	32
G	X	INSTL WATER HEATING SYSTEM	G	-	-	-	-	-	G	159
G	X	INSTL OUTSIDE GREASE TRAP	G	-	-	-	-	-	-	160
G	X	INSTL HOOD DUCTS	G	-	-	G	G	-	-	136
G	X	EIB UG UTIL AT LB LVL SLAB ON GRADE	-	G	-	-	-	-	G	30
G	X	INSTL INSIDE GREASE TRAP	G	-	-	-	-	-	-	161
G	X	INSTL AF SHT MTL DUCTWK	G	-	-	-	-	-	G	133
G	X	INSTL & PIPE FUEL TANK	G	-	-	-	-	G	G	162
G	X	INSTALL ROOF EQUIP CURBS	-	-	-	G	-	-	-	104
G	X	INSTL SIAMESE CONNECTIONS	G	-	-	-	-	-	G	131
G	X	INSTALL ROOF MOUNTED EQUIP	-	-	-	G	-	-	-	105
G	X	INSTL HOSE BIBBS	G	-	-	-	-	-	G	130
G	-	INSTL MECH SLEEVES	G	-	-	-	-	-	G	125
G	X	INSTL ALL MECH EMBEDS IN C CONCRETE	G	-	-	-	-	-	-	45
G	-	TEST & BALANCE MECHANICAL SYSTEMS	G	-	-	-	-	-	G	188
G	X	INSTL SPRINKLER SYSTEM	G	-	-	-	-	-	G	132
G	X	SET & PIPE CHILLER	G	-	-	-	-	-	-	152
G	X	INSTALL WATER HEATING EQUIP	G	-	-	-	-	-	-	106
G	X	SET & HOOK UP JACUZZIS	-	-	-	-	G	-	-	143
G	X	INSTL TOILET ROOM ACCESSORIES	G	-	-	-	-	-	G	149
G	X	INSTL VV BOXES	G	-	-	-	-	-	G	140
H	X	PROCURE MECH CONTROL SYSTEMS	H	-	-	-	-	-	-	88
H	X	INSTL ELECT TRIM ITEMS	H	-	-	-	-	-	H	123
H	X	INSTL LIGHT FIXT	H	-	-	-	-	-	H	120
H	X	PROCURE EMERGENCY GENERATOR	H	-	-	-	-	-	-	87
H	X	PROCURE TRANSFORMERS	H	-	-	-	-	-	-	102

I	S	ACTIVITY DESC	AL	LB	LL	LR	TW	SI	EB	REC#
H	X	PROCURE MOTOR CONTROL CENTERS	H	-	-	-	-	-	-	97
H	X	PROCURE UNIT SUBSTATIONS	H	-	-	-	-	-	-	86
H	X	PROCURE SWITCH GEAR	H	-	-	-	-	-	-	89
H	-	INSTL ABOVE FLOOR ROUGH ELECT WORK	H	-	-	-	-	-	H	170
H	-	INSTL HARD CEILING SUSP & BLACK IRON	H	-	-	-	-	-	H	168
H	-	INSTL EXPOSED RUFF ELECT COND & FEEDER	H	-	-	-	-	-	H	119
H	X	INSTL POWER PANEL BOXES	H	-	-	-	-	-	-	117
H	X	INSTL LIGHT PANEL BOXES	H	-	-	-	-	-	-	118
H	X	INSTL STUDS & IN WALL WORK	H	-	-	-	-	-	H	165
H	-	INSTL TV CONDUIT	H	-	-	-	-	-	H	127
H	-	INSTL EMBEDDED ELECT CONDUIT	H	-	-	-	-	-	-	115
H	-	INSTL ELECT SLEEVES	H	-	-	-	-	-	H	124
H	-	INSTL EMBEDDED ELECT BOXES	H	-	-	-	-	-	-	116
H	X	INSTL TELEPHONE CONDUIT	H	-	-	-	-	-	H	126
H	X	INSTL ALL ELECT EMBEDS IN C CONCRETE	H	-	-	-	-	-	-	40
H	X	INSTL FIRE SAFETY CONDUIT	H	-	-	-	-	-	H	128
H	-	TEST & BALANCE ELECTRICAL SYSTEMS	H	-	-	-	-	-	H	141
H	X	PROCURE ELECT CONTROL SYSTEMS	H	-	-	-	-	-	H	114
H	X	INSTL & HOOK UP ELECT EQUIP	H	-	-	-	-	-	-	129
H	X	INSTL GROUNDING MAT	H	-	-	-	-	-	-	121
H	X	INSTL LIGHTENING ARRESTER SYSTEM	H	-	-	-	-	-	-	122
J	X	FRP EQUIP BASES	J	-	-	-	-	-	J	1
J	X	PROCURE TRASH COMPACTOR	J	-	-	-	-	-	-	90
J	-	INSTL HARD CEILING SUSP & BLACK IRON	J	-	-	-	-	-	J	166
J	X	INSTL STUDS & IN WALL WORK	J	-	-	-	-	-	J	163
J	X	ERECT INTERIOR MASONRY	J	-	J	J	J	-	J	62
J	X	INSTL LINEN CHUTE	-	-	-	-	J	-	-	148
J	X	INSTL TRASH COMPACTOR	J	-	-	-	-	-	-	171
J	X	INSTL TRASH CHUTE	-	-	-	-	J	-	-	147
J	X	INSTALL INT HOLLOW METAL FRAMES	J	-	-	-	-	-	-	103
J	X	INSTALL DOCK LEVELLERS	-	-	J	J	-	-	-	61
J	X	INSTL SHOWER PANS	J	-	-	-	-	-	J	146
J	O	INSTALL INSULATION AT EXPOSED SOFFITS	-	-	-	J	J	-	J	63
J	X	INSTALL PLASTER SOFFITS	-	-	-	J	J	-	J	80
J	-	HANG BOARD	J	-	-	-	-	-	J	174
J	-	TAPE & SAND BOARD	J	-	-	-	-	-	J	175
J	X	INSTL ACOUST CLG SUSP & GRID	J	-	-	-	-	-	J	181
J	X	INSTL SIGNAGE	J	-	-	-	-	-	J	183
J	X	INSTL VANITIES	J	-	-	-	-	-	J	173
J	X	APPLY FP TO HOOD DUCT	J	-	-	J	J	-	-	137
J	X	INSTL APPLIANCES	-	-	-	-	J	-	-	150
J	X	INSTALL PLASTIC LAM DOORS & HARDWARE	J	-	-	-	-	-	-	109
J	X	INSTL RESILIENT FLOORING	J	-	-	-	-	-	J	180
J	X	INSTALL DUMBWAITER	-	-	-	-	J	-	-	2
J	X	INSTL MILLWORK & TRIM	J	-	-	-	-	-	J	172
J	X	INSTL INTERIOR LANDSCAPING	J	-	-	-	-	-	J	185
J	X	INSTL CERAMIC TILE	J	-	-	-	-	-	-	144
J	X	INSTL ACOUST CLG PANELS	J	-	-	-	-	-	J	182
J	X	INSTL QUARRY TILE	J	-	-	-	-	-	J	179
J	X	INSTALL INT WOOD DOORS & HARDWARE	J	-	-	-	-	-	-	111
J	X	INSTALL INT HARDWARE	J	-	-	-	-	-	-	112
J	X	INSTALL INT HOLLOW METAL DOORS	J	-	-	-	-	-	-	110
J	X	LAY CARPETING IN CORR & PUBL SPACES	J	-	-	-	-	-	J	177
J	X	INSTL VINYL WALL COVERING	J	-	-	-	-	-	J	187

I	S	ACTIVITY DESC	AL	LB	LL	LR	TW	SI	EB	REC#
J	X	PAINT REQUIRED SURFACES	J	-	-	-	-	-	J	176
J	X	INSTL CLOSET DOORS	-	-	-	-	J	-	-	184
J	X	INSTL INT DOORS & HARDWARE	J	-	-	-	-	-	J	157
J	X	INSTL TOILET ROOM PARTITIONS	J	-	-	-	-	-	J	151
K	X	INSTL FOOD SERVICE ROUGH IN	K	-	-	-	-	-	-	154
K	-	FIELD MEASURE FOR FOOD SERVICE EQUIP	K	-	-	-	-	-	-	155
K	X	INSTL HOOD FIRE PROTECTION	K	-	-	M	M	-	-	138
K	-	RUN IN FOOD SERVICE EQUIP & TRAIN STAF	K	-	-	-	-	-	-	186
K	X	INSTALL FOOD SERVICE EQUIP	K	-	-	-	-	-	-	113
K	X	INSTL HOODS	K	-	-	M	M	-	-	135
K	X	FAB & DEL FOOD SERVICE EQUIP	K	-	-	-	-	-	-	156
K	X	INSTL FOOD SERVICE EQUIPMENT	K	-	-	-	-	-	-	153
M	X	ERECT TOWER METAL DK	-	-	-	-	M	-	-	195
M	X	ERECT, PLUMB & BOLT TOWER STRUCT STEEL	-	-	-	-	M	-	-	194
N	X	INSTALL EXT LOUVERS	-	-	-	N	N	-	-	76
N	X	INSTALL ROLLING STEEL DOORS	-	-	N	N	-	-	-	69
N	X	INSTALL EXT HOLLOW METAL DOORS	N	N	N	N	N	-	N	70
N	X	INSTALL EXT ENTRY FRAMING	N	N	-	N	N	-	N	84
N	X	INSTALL EXT HARDWARE	N	N	N	N	N	-	N	85
N	X	APPLY BALCONY TOPPINGS	-	-	-	-	N	-	-	83
N	X	ERECT EXTERIOR MASONRY	N	-	-	N	N	-	N	64
N	X	INSTALL EXT HOLLOW METAL FRAMES	N	N	N	N	N	-	N	71
N	X	ERECT STOREFRONT FRAMING	N	N	-	N	N	-	N	67
N	X	INSTALL STOREFRONT GLASS	N	N	-	N	N	-	N	68
N	X	INSTALL LR INSULATION,SHT MTL & RFG	N	-	-	N	-	-	N	73
N	X	INSTALL ENTRY GLASS	N	N	-	N	N	-	N	74
P	X	INSTALL SKYLITE GLASS	-	-	-	P	-	-	-	66
P	X	INSTALL SLOPED GLAZING	-	-	-	-	P	-	-	193
P	X	INSTL BALCONY GLASS	-	-	-	-	P	-	-	191
P	X	INSTALL SKYLITE FRAMING	-	-	-	P	-	-	-	65
P	X	INSTALL WINDOW WASHING EQUIPMENT	-	-	-	-	P	-	-	3
Z	X	LAY CARPET AT GUEST ROOMS	-	-	-	-	Z	-	-	178

I. Trans America Mall Notes - disk 129 - ho 297

A. General information - to be periodically revised & kept current

General information is to be retained in the notes for the project. If a section of the data is no longer valid it will be noted as such and relocated to the superseded data section of the file, or noted with the change and left in place.

1. Name of project - Trans American Mall
2. Those involved
   - Carlsbad Holding - Center owner
     - Frank Rogell - Officer in charge
     - Charles Lugow - Project manager
     - Tom Brotherton - On site representative
     - Lawrence Jones - Mall manager
   - Clemency and Harrigan - Architect/Engineer of record
     - Charles Clemency - Principal in charge
     - Carl Travis - chief designer
     - Lorne MacIntosh - project manager
   - Larkins & Horowitz - Electrical & mechanical engineers
     - Art Larkins - Principal
     - Fred Karlton - Mechanical engineer
     - Ted Horowitz - Electrical engineer
   - Todd & Jones - General contractor
     - Jay Harvey - Project manager
     - Charles McElvey - Field superintendent
     - Harvey Vennalt - General superintendent
   - Lincoln Mechanical - Mechanical contractor
     - Larro Nadian - Project manager and estimator
     - Niles Mechadian - Project superintendent
   - Sunshine Electrical - Electical contractor
     - Stan Sunshine - Principal and project manager
     - Lefty Mallett - Superintendent
3. Responsibility codes
   - 001 - Carlsbad Holding - owner
   - 002 - Clemency & Harrigan - architect/engineer
   - 003 - Larkins & Horowitz - electrical/mechanical engineers
   - 004 - Todd & Jones - General contractor
   - 005 - Lincoln Mechanical - mechanical contractor
   - 006 - Sunshine Electrical - electrical contractor
4. Abbreviations (in alphabetical order)
   - c&h - Clemency & Harrigan
   - cho - Carlsbad Holding
   - cod - contract documents
   - dp1 - design package 1 (other dp abbreviations similar)
   - dpa - development package
   - etr - end time restraint
   - fen - front end work
   - fiw - finish interior work
   - gmp - guaranteed maximum price
   - l&h - Larkins & Horowitz
   - lme - Lincoln Mechanical
   - pro - procurement

riw - rough interior work
sbw - shell building work
sel - Sunshine Electrical
sit - site work
ski - exterior building skin
sub - building substructure work
sus - building superstructure work
sys - building systems work
t&j - Todd & Jones
t&m - Time and material
t/r - time restraint
tim - tenant improvement work

5. Project design package content
   - Design package dp1
     Complete construction documents for 200' x 400' addition to existing tenant building.
   - Design package dp2
     Existing building remodeling from col line 01 to col line 22. Complete interior demolition and construction of new base building space with demising studs erected.
   - Design package dp3
     Extension of north site area including parking and related work for 800 additional cars.
   - Design package dp4
     Renovation of existing mechanical and electrical rooms and replacement of entire electrical distibution system
   - Design package dp5 - to be defined
6. Key dates - as of 3/2/88 (43)
   - Complete prepare & issue design packages (dp)
     - 3/25/88 (60) - Comp prepare & issue dp1
     - 4/11/88 (71) - Comp prepare & issue dp2
     - 4/29/88 (85) - Comp prepare & issue dp3
     - 5/31/88 (106)- Comp prepare & issue dp4
     - To be determined - Comp prepare & issue dp5
   - Submit guaranteed maximum prices (gmp)
     - 3/25/88 (60) - Submit gmp for dp1
     - 4/20/88 (78) - Submit gmp for dp2
     - 5/26/88 (104) - Submit gmp for dp3
     - 5/31/88 (106) - Submit gmp for dp4
   - Start construction work
     - 4/25/88 (81) - Start construction of dp1 base building
     - 6/30/88 (128) - Start renovation under dp4
     - 9/11/89 (432) - Start site work under dp3 contract
     - 9/11/89 (432) - Start remodeling under dp2
   - Complete complete work
     - 6/1/89 (362) - Complete site work under dp3 contract
     - 6/1/89 (362) - Complete const dp1 work to start of tenant improvemnts
     - 7/31/89 (403) - Complete base building work under dp1
     - 8/15/89 (414) - Grand opening of new addition under dp1
     - 3/1/90 (552) - Complete remodeling dp2 base bldg to start of tenant work

4/2/90 (574) - Complete remodeling base building under dp2
4/27/90 (593) - Grand opening of dp2 contract work

7. General characteristics of project
   - Location - Delaton, New Hampshire
     - Faces on 20th Steet, access to Lohngren on west and Mill Run on east
   - Philosophy
     - To constantly maintain an attractive, safe retail environment during const
   - Existing enclosed mall shopping center
     - Built about 1971
     - Gross existing building area = 150,000 sq ft
     - Parking spaces = 1,000
     - Anchors
       - Travelers Merchandise - general department store
         - Strong store
       - Robertson Company - catalogue outlet
     - 25 tenant spaces in addition to anchors
     - Areas presently unoccupied and available for construction use
       - Col lines 22 to 25/A to D
       - Col lines 5 to 6/D to D.5
   - Existing fast food building on outlot belongs to Carlsbad Holding
     - To be maintained in operation at all times
   - Problems to be resolved
     - Variances needed to remodel electrical and mechanical systems
     - Must determine safety condition of existing electrical vaults
   - Laundry lists
     - dp1 - new building close in work
     - dp4 - mechanical and electrical remodeling work
8. Superseded data
   - Randy East - Carlsbad Holding - project manager - relocated 2/1/88 (21)

B. 8:05:08 - July 27, 1988

1. Project meeting #1 - in Carlsbad offices - July 27, 1988
2. By Jay Harvey
3. 01.0 - Those attending meeting
   - Frank Rogell - Carlsbad officer in charge
   - Charles Lugow - Carlsbad project manager
   - Charles Clemency - C & H principal in charge
   - Lorne MacIntosh - C & H project manager
   - Art Larkins - L & H principal in charge
   - Jay Harvey - T & J project manager
4. 02.0 - Agenda
   - 2.01 - Review project characteristics
   - 2.02 - Prep smry netwk model for dp1, 2, 3 & 4 to confirm current key dates
   - 2.03 - Prepare laundry lists for early construction work in dp1
   - 2.04 - Prepare laundry lists for all construction work in dp4
   - 2.05 - Prepare network models for close in work for dp1
   - 2.06 - Prep network models for elect and mech remodelling under dp4
5. 03.0 - Current status of project
   - 03.01 - Design
     - 03.0101 - All intermediate design package production dates being met
     - 03.0102 - Need cost data on alternate roofing details for dp1

03.02 - Construction
03.0201 - T & J currently preparing early estimates leading to GMP
03.03 - Owner working with all to define tenant continuity during const
03.0301 - Having trouble with the Chocolate Poodle
03.0302 - Records Inc and Fran's Dresses move set and agreed to

6. 04.0 - Old business
7. 05.0 - New business
8. 06.0 - Miscellaneous
   06.01 - All parties agreed to current key dates listed above
   06.02 - Carlsbad agreed to review T & J sub prices & release appvl promptly
   06.0201 - Within 2 working days of receipt
   06.03 - Abbreviations generally three letters
   6.0301 - For names 1st letter of 1st name and 1st two letters of last name
   6.0302 - Traditional abbreviation to be maintained
   06.04 - All construction contracts will be with T & J
   06.05 - T & J contract currently on hourly and t & m basis
   06.0501 - Will reduce to gmp by iterative estimates
   06.0602 - gmp to be provided to Carlsbad by package content

C. ho 297 - Feb 88

	wrk cty	action	client	arch/ engr	est	pm	const supt
1	adm	Assign job numbers			x		
2	adm	Determine financial soundness of client			x		
3	adm	Determine scope & nature of labor agreements & discuss with proj team			x		
4	adm	Establish project cost acctg system and account numbers			x		
5	adm	Establish request for payment, approval & payment procedures			x		
6	adm	File bid set of contract documents in safe, protected location			x		
7	adm	Insure that all drawing deposits are returned			x		
8	adm	Obtain bonds, insurance & licenses as required			x		
9	adm	Obtain builder's risk and liability insurance			x		
10	adm	Obtain contractor bonds as required			x		
11	adm	Obtain fire and theft insurance			x		
12	adm	Obtain subcontractor bonds as required			x		
13	adm	Prepare & distribute project directory			x		
14	adm	Prepare and distribute subcontractor list			x		
15	adm	Prepare requests for payment			x		
16	adm	Prepare schedule of values for payment requests			x		
17	adm	Provide owner with insurance certificates as required			x		
18	adm	Review applicable lien laws & convey information to those concerned			x		
19	adm	Review billing procedures with subcontractors			x		
20	adm	Review employee site conduct guidelines with internal staff			x		
21	adm	Set field project filing system			x		
22	adm	Set format for project document files			x		

	wrk cty	action	client	arch/ engr	est	pm	const supt
23	adm	Set up field bank accounts as needed			x		
24	adm	Validate your firm's ability to meet insurance requirements			x		
25	clo	Define job conditions to be met for obtaining certificate of occupancy			x		
26	clo	Define job conditions to be met for substantial completion			x		
27	clo	Establish & publish operating & maint manual (OMM) submittal procedures			x		
28	clo	Establish and publish warranty procedures			x		
29	clo	Follow up on corrective work required during warranty period			x		
30	clo	Follow up project during warranty period			x		
31	clo	Set project close out procedures			x		
32	con	Arrange for & take ongoing construction photos			x		
33	con	Determine location of storage, const roads, stockpile, parking and fab areas			x		
34	con	Inspect job site before move in			x		
35	con	Label & safely store intact bid set of contract documents			x		
36	con	Notify those concerned, particularly field staff re alternates selected			x		
37	con	Prepare & maintain general conditions material analyses			x		
38	con	Prepare & maintain past & current adminstrative labor analyses			x		
39	con	Prepare and maintain past & current field labor analyses			x		
40	con	Prepare project construction network model			x		
41	con	Prepare project construction schedules			x		
42	con	Read construction specifications and contracts			x		
43	cor	Apply for & obtain plan code reviews required			x		
44	cor	Make code searches for document compliance			x		

	wrk cty	action	client	arch/ engr	est	pm	const supt
45	cos	Confirm owner's budget relative to the project delivery system selected			x		
46	cos	Prepare & distribute buy out estimate as required			x		
47	cos	Prepare and distribute code of accounts			x		
48	cos	Prepare field cost, hour, quantity budget targets			x		
49	cos	Prepare list of allowances and review with project staff			x		
50	cos	Prepare master labor & material budgets			x		
51	cos	Provide field with field budgets			x		
52	cos	Tabulate all bid qualifications & review with project staff			x		
53	cot	Prepare & issue subcontract purchase orders			x		
54	cot	Review client contract			x		
55	cot	Review purchase order conditions with subcontractors			x		
56	des	Make full review of construction drawings			x		
57	des	Prepare & submit performance specs for life safety and automation systems			x		
58	des	Retain curtain wall/testing consultant			x		
59	eas	Determine applicable utility easements & confirm clearance to start work			x		
60	eas	Determine maintenance easements and confirm clearance to start work			x		
61	eas	Determine reciprocal easements & confirm clearance to start work			x		
62	eas	Identify easments & restrictions that impact on field work			x		
63	fin	Check all assements and resolve outstanding liability commitments			x		
64	gco	Arrange for project progress photos and video & sound records to be made			x		
65	gco	Establish photo taking responsibilities and procedures on project			x		
66	gco	On time & material jobs, identify all general requirement & condition items			x		

	wrk cty	action	client	arch/ engr	est	pm	const supt
67	mgt	Revalidate your firm's ability to do job			X		
68	mgt	Set project delivery system to be used			x		
69	mgt	Set project mission, goals & objectives			x		
70	p&s	Confirm owner or end user time table for construction & occupancy			x		
71	p&s	Confirm owner or end user time table for design			x		
72	p&s	Determine scope of work for all off site construction required			x		
73	p&s	Establish and tabulate key project dates, and review with project team			x		
74	p&s	Prepare summary & detailed network models of work to be done			x		
75	p&s	Review work plan and schedules with subcontractors			x		
76	per	Obtain all site clearances needed to begin and maintain work			x		
77	prg	Establish scope of off site work required by you and by others			x		
78	pro	Determine mock ups required and make arrangements for their design & const			x		
79	pro	Determine warehousing needs and obtain space			x		
80	pro	Establish & publish submittal procedures			x		
81	pro	Establish & publish submittal processing procedures			x		
82	pro	Establish format and content of procurement logs			x		
83	pro	Establish hoisting needs and procure hoisting equipment			x		
84	pro	Establish plan room procedures for project			x		
85	pro	Establish rental equipment needs and procure equipment			x		
86	pro	Estimate revision costs to work			x		
87	pro	Expedite deliveries			x		
88	pro	Identify all allowance items & distribute list to those concerned			x		

	wrk cty	action	client	arch/ engr	est	pm	const supt
89	pro	Identify all owner furnished equipment items & distribute to those concerned			x		
90	pro	Identify equip & material furnished by others & review with proj staff			x		
91	pro	Identify long lead or hard to procure items and discuss with project staff			x		
92	pro	Identify nature of labor force for project			x		
93	pro	Obtain & distribute approved long lead item color & finish schedules			x		
94	pro	Obtain delivery dates for material & equipment furnished by others			x		
95	pro	Obtain site topographic, boundary & utility surveys			x		
96	pro	Obtain soil borings and analyses			x		
97	pro	Obtain subcontractor information			x		
98	pro	Package const documents for soliciting sub proposals			x		
99	pro	Prep & issue sub contractor construction contracts & po's			x		
100	pro	Prepare bidder's lists			x		
101	pro	Prepare blanket purchase order system			x		
102	pro	Prepare contract award tabulation sheet where appropriate			x		
103	pro	Prepare contract document matrix			x		
104	pro	Prepare list of early submittals needed and assign to project staff for doing			x		
105	pro	Prepare list of vendors providing bidding information			x		
106	pro	Prepare material procurement purchase orders			x		
107	pro	Prepare over/under analysis of proposals and buy out			x		
108	pro	Prepare subcontractor selection criteria			x		
109	pro	Prepare subcontractor selection list			x		
110	pro	Receive and file all executed sub contracts			x		

listed by work category and action alpha sequence

	wrk cty	action	client	arch/ engr	est	pm	const supt
111	pro	Retain engineering survey services required			x		
112	pro	Review all exotic materials to be used with project staff			x		
113	pro	Review and evaluate const sub contract proposals			x		
114	pro	Review testing needs and obtain testing services			x		
115	pro	Set normal, expedited and special submittal turnaround times to be used			x		
116	pro	Set storage & insurance reqmts for material & equip furnished by others			x		
117	pro	Solicit & receive const sub contract proposals			x		
118	reg	Determine restricted load requirements on site access roads			x		
119	reg	Obtain copies of applicable codes and ordinances			x		
120	reg	Provide notice of start of work as required			x		
121	res	Check land ownership to determine if project can be built on site			x		
122	res	Prepare and obtain required easements			x		
123	res	Resolve property use restrictions			x		

Laundry list for pile test

Pueblo Plant
Nebraska Public Power Distribution District
Oaski, Nebraska

Introduction

You are a facilities engineer for the Nebraska Public Power Distribution District. Your boss has assigned you to be project manager for construction of a new Pueblo Plant in Osaki, Nebraska. He has asked you to plan and execute the installation of test piles to help decide the final design characteristics of the power plant foundation.

You have completed selection of the type of test pile to be used and must now write the test specification, select the number of piles and their location, and lay out the piles in the field. There is a possiblility of saving & using the test pile cluster for the total building foundation group. Therefore you plan to retain a test contractor that could also be awarded the full piling installation contract

Plan the entire test pile installation process.

Laundry list - at random unnumbered

- Select test pile locations
- Record test load results
- Load piling
- Order testing equipment
- Decide whether test piles remain as permanent piles
- Select number of test piles
- Deliver test pile materials
- Retain test pile contractor
- Prepare test procedures
- Approve test pile results
- Remove test loads
- Approve test procedures
- Order test pile materials
- Lay out test piles in field
- Deliver testing equipment
- Drive & fill test piles

Laundry list - at random numbered in rough action sequence

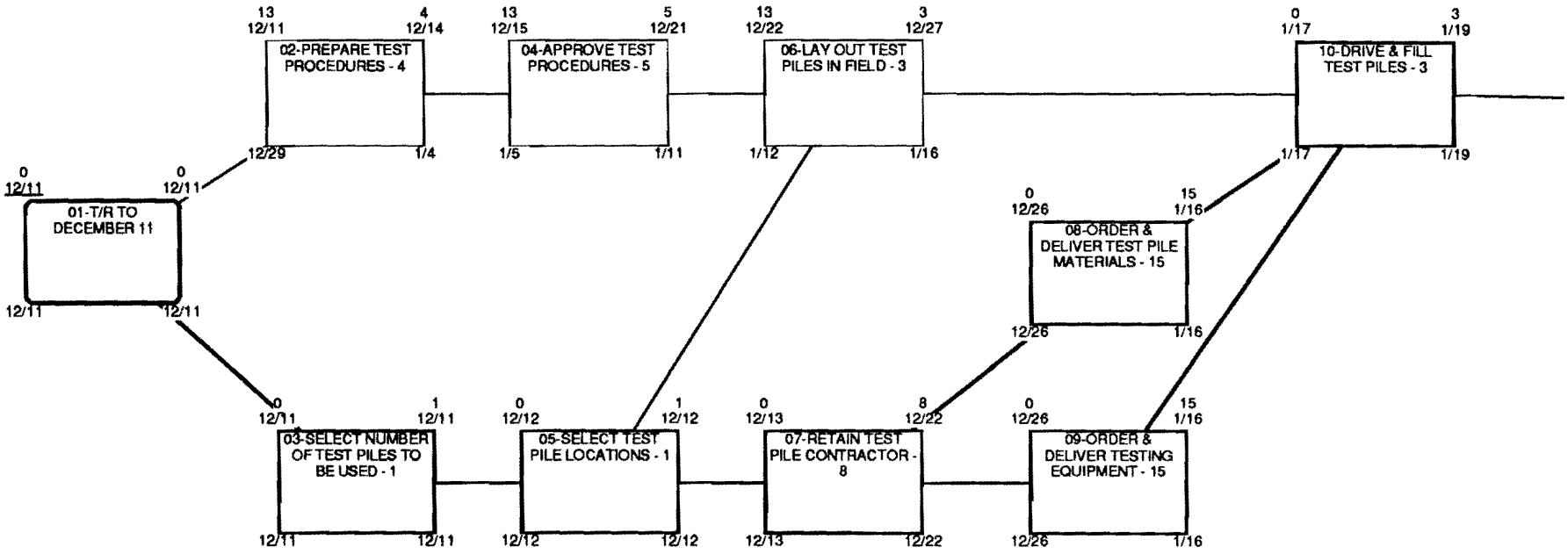
- 002 - Select test pile locations
- 010 - Record test load results
- 008 - Load piling
- 005 - Order testing equipment
- 011 - Decide whether test piles remain as permanent piles
- 001 - Select number of test piles
- 006 - Deliver test pile materials
- 004 - Retain test pile contractor
- 001 - Prepare test procedures
- 011 - Approve test pile results
- 009 - Remove test loads
- 003 - Approve test procedures
- 005 - Order test pile materials
- 004 - Lay out test piles in field
- 006 - Deliver testing equipment

007 - Drive & fill test piles

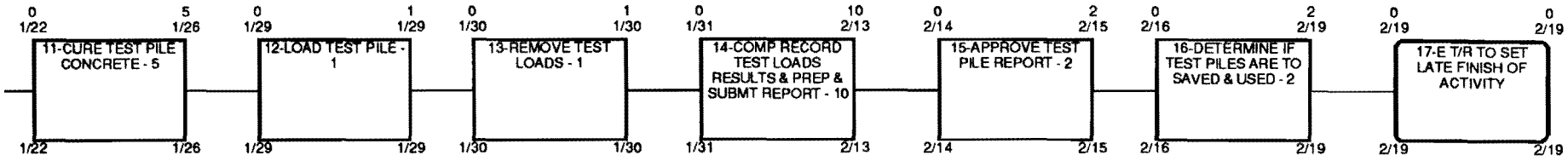
Laundry list - numbered & ordered

001 - Prepare test procedures
001 - Select number of test piles
002 - Select test pile locations
003 - Approve test procedures
004 - Lay out test piles in field
004 - Retain test pile contractor
005 - Order test pile materials
005 - Order testing equipment
006 - Deliver test pile materials
006 - Deliver testing equipment
007 - Drive & fill test piles
008 - Load piling
009 - Remove test loads
010 - Record test load results
011 - Approve test pile results
011 - Decide whether test piles remain as permanent piles

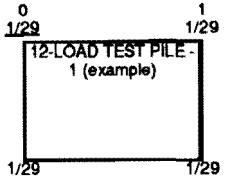
HO 317 Dec 1990


01-T/R TO DECEMBER 11
0 12/11
0 12/11
12/11
12/11
02-PREPARE TEST PROCEDURES - 4
13 12/11
4 12/14
12/29
1/4
03-SELECT NUMBER OF TEST PILES TO BE USED - 1
0 12/11
1 12/11
12/11
12/11
04-APPROVE TEST PROCEDURES - 5
13 12/15
5 12/21
1/5
1/11
05-SELECT TEST PILE LOCATIONS - 1
0 12/12
1 12/12
12/12
12/12
06-LAY OUT TEST PILES IN FIELD - 3
13 12/22
3 12/27
1/12
1/16
07-RETAIN TEST PILE CONTRACTOR - 8
0 12/13
8 12/22
12/13
12/22
08-ORDER & DELIVER TEST PILE MATERIALS - 15
0 12/26
15 1/16
12/26
1/16
09-ORDER & DELIVER TESTING EQUIPMENT - 15
0 12/26
15 1/16
12/26
1/16
10-DRIVE & FILL TEST PILES - 3
0 1/17
3 1/19
1/17
1/19

3.23



Total float time **Duration**
Early start **Early finish**



- **Activity number**
- **Activity description**
- **Activity estimated duration in elapsed working days**

Late start **Late finish**

ACTIVITY DATA KEY

Issue #1 - November 11, 1989
354 tet pl ntwk 318 - disk 203
ho 354 - Nov 89

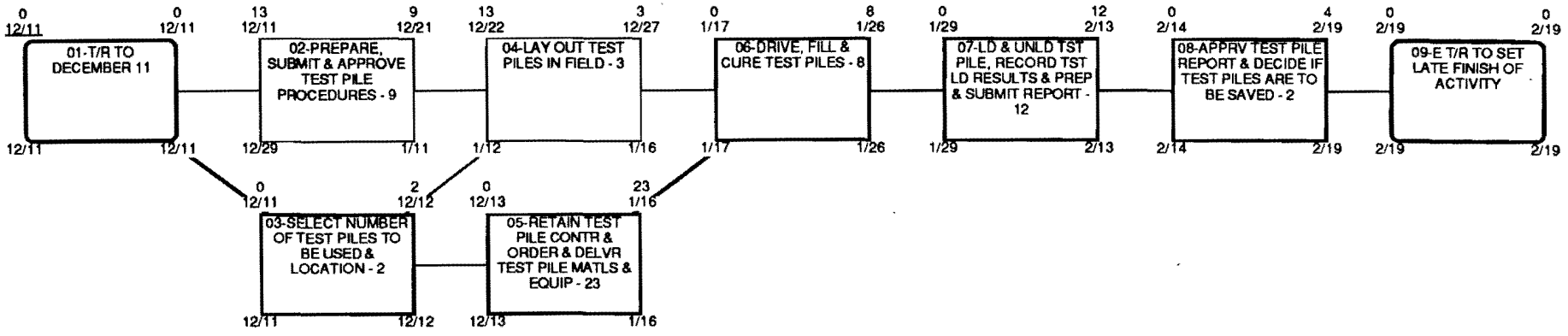
Reserved activity numbers

41	46
42	47
43	48
44	49
45	50

NETWORK MODEL FOR TEST PILE INSTALLATION - NEBRASKA PUBLIC POWER DISTRIBUTION DISTRICT PUEBLO PLANT - OSAKI, NEBRASKA

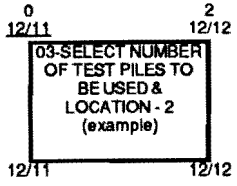
Ralph J. Stephenson PE
Consulting Engineer
323 Hiawatha Drive
Mt. Pleasant, Michigan 48858
ph 518 772 2537

SHEET #1



S-2-5

Total float time **Duration**
Early start **Early finish**



- **Activity number**
- **Activity description**
- **Activity estimated duration in elapsed working days**

Late start **Late finish**

ACTIVITY KEY

SUMMARY NETWORK MODEL FOR TEST PILE INSTALLATION - NEBRASKA PUBLIC POWER DISTRIBUTION DISTRICT PUEBLO PLANT - OSAKI, NEBRASKA

Issue #1 - November 12, 1989
353 tst pl ntwk - disk 203
ho 353 - Nov 89

Reserved activity numbers

41 46
42 47
43 48
44 49
45 50

Ralph J. Stephenson PE
Consulting Engineer
323 Hiawatha Drive
Mt. Pleasant, Michigan 48858
ph 517 772 2537

SHEET SM-1

Date May 10

Project: Lake City Community College

Page 1

Item	Code	Contractor or Vendor	Code	Lead Time Reqd.--wkg. dys.					Earliest		Latest		Best		Actual		Remarks
				Detail	Approve	Fabric	Deliver	Total	DTO	DOJ	DTO	DOJ	DTO	DOJ	DO	DOJ	
Struct Steel	5	Frey Erectors	4	10	4	10	2	26	5/23	6/29	5/23	6/29	5/23	6/29			
Alum sash	11	Bell Bros.	9	9	5	12	2	28	6/17	7/28	6/27	8/5	6/17	7/28			
Excavation	3	Mate Bros.	2	—	—	—	—	2	5/12	5/16	5/12	5/16	5/12	5/16			
Roofing	9	Cicotte Roofing	8	—	—	—	—	15	6/24	7/18	7/21	8/11	6/24	7/18			
Brick	10	Richardson Inc.	6	—	—	—	1	1	5/13	5/16	5/16	5/17	5/13	5/16			Sample wall
Plastering	16	Robert Plastering	15	—	—	—	—	10	7/11	7/25	8/4	8/18	7/14	7/28			

Abbreviations

Fabric = Fabricate

Wkg = Working

Dys = Days

Requird = Required

DTO = Date to order (calendar)

DOJ = Date on job (calendar)

DO = Date ordered (calendar)

Purchasing Schedule Example

3.26

H/O 12

Ralph J. Stephenson

SUBMITTAL TURN AROUND TIMES

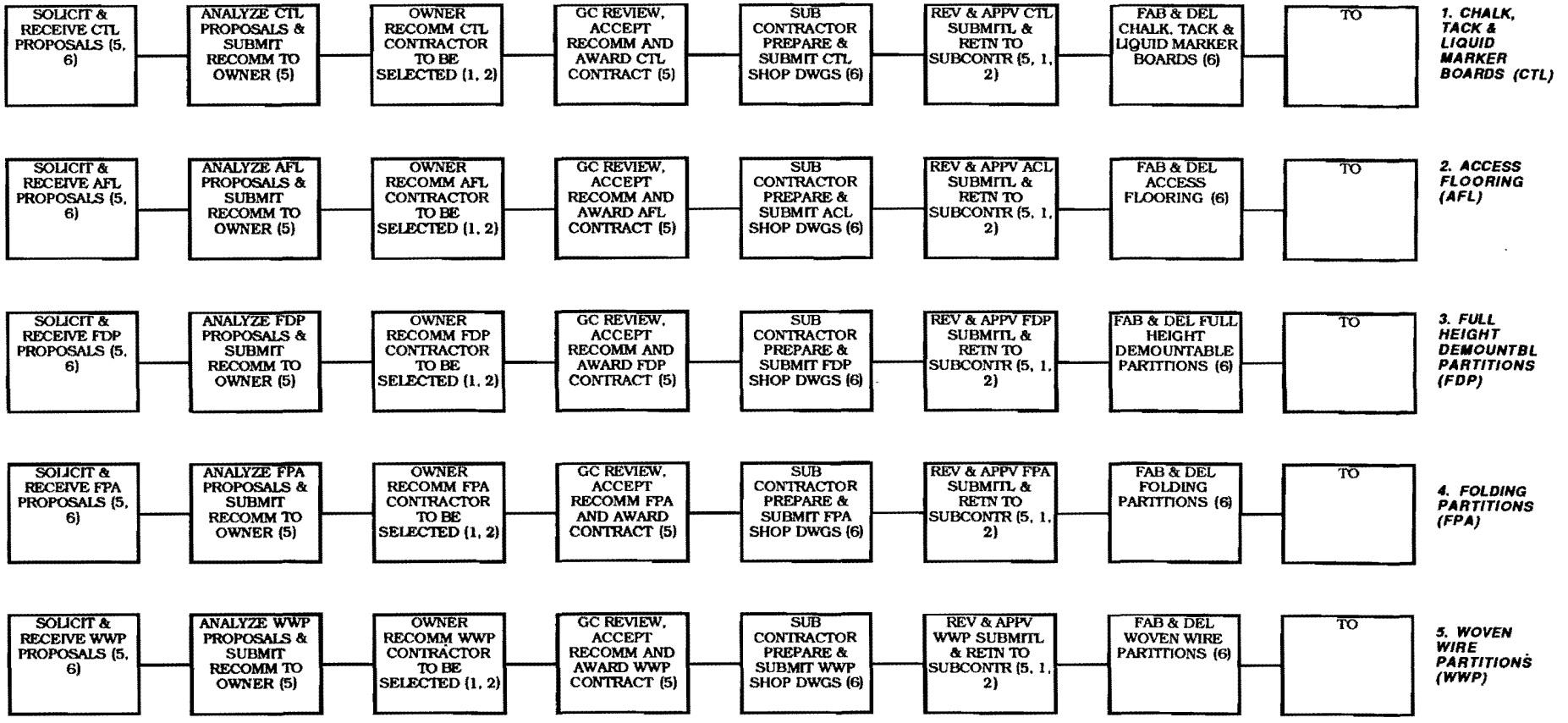
TIME REQUIRED IN WORKING DAYS

	ACTION	NORMAL	EXPEDITED	SUPER EXPEDITED
1	* PRIME CONTRACTOR LOG IN & CHECK	1+2 3	1+1 2	1/2 + 1 1 1/2
2	PRIME CONTRACTOR TRANSMIT TO A/E	3	1	1
3	A/E LOG IN & CHECK	1+15 16	1+10 11	1/2 + 5 5 1/2
4	A/E TRANSMIT TO PRIME CONTRACTOR	3	1	1
5	PRIME CONTRACTOR LOG IN & REVIEW	1+2 3	1+1 2	1/2 + 1/2 1
6	** PRIME CONTRACTOR TRANSMIT TO SUBCONTRACTOR	3	1	1
	TOTALS	31 WKG DAYS	18 WKG DAYS	11 WKG DAYS

* TABULATION TAKEN FROM POINT IN TIME WHERE SUBMITTAL ARRIVES AT PRIME CONTRACTOR'S OFFICE.

** TABULATION ENDS WHEN APPROVED SUBMITTAL ARRIVES AT SUBCONTRACTOR'S OFFICE.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER



S.28

Ralph J. Stephenson PE PC
Consulting Engineer
323 Hiawatha Drive
Mt. Pleasant, Michigan 48588
ph 517 772 2537

DIVISION 10

ITEMS INCLUDED

1. Chalk, tack & liquid marker boards (ctl)
2. Access flooring (afl)
3. Full height demountable partitions (fdp)
4. Folding partitions (fop)
5. Woven wire partitions (wwp)

PROCUREMENT NETWORK MODEL FOR TRINITY LAB & OFFICE BUILDING MARTINLY DNR HEADQUARTERS GENERAL SERVICES ADMINISTRATION MARTINLY, OKLAHOMA

Issue #1 - November 15
i1div10sht1procumt
ho 300 - Dec 90

Section #4-Construction Ethics and How You Can Sleep At Night

I. Objective of section #4 - Construction Ethics and How You Can Sleep At Night

To explore the ethicial values of the construction community, and the attendees of this program.

II. Questions to answer

A. Are the most "Ethical companies most likey to survive the long haul"?

B. The battle of dollars vs: Ethics?

C. How to evaluate if a firm has ethical pratices.

III. Topics

A. Understand the "Shark" you are swimming with.

B. Bid Shopping - Free enterprise or dirty pool.

C. Justifiable reliance

D. Do you have an ethics story

E. Survey Questionaire

F. A review of the ASPE survey

G. How this applies to you?

August 11, 1990

Attention : Mr Dean Nealson
150 Union Street
Lakewood , N.J.
33028

Re: The new office building

Situations are developing which make us very uncomfortable.
Recently we have been contacted by subcontractors complaining about the manner in which their bids to your firm are being handled.

The subcontractors each claim that they were advised previously that their bid was good. later, they were told that , if they accept a lower price, the contract will be awarded to them. We all know what this process is.

The subcontractors are , of course, unhappy with this treatment.
they complain to us because they think that our firm condones this practice in order to save money. **If there is money to be saved, Dean, it should come to our firm.**

These kind of complaints are not good for our reputation in the area. your firm may never work in this area again but we will. We have to.

Please look into this situation and immediately conclude the subcontractor award process. The project specifications are very clear. section 01300.1.3 requires a progress schedule immediately after notice of award. Section 01300.1.4 requires a list of the subcontractors identifying their portions of work within 15 days after notice of award.

Please work with us to make this a successful project for all parties.

Sincerely

Mr Joe Smith
Vice President
The Really Big Insurance Co.

SHEET METAL CONTRACTORS ASSOCIATIONS OF NORTHERN AND CENTRAL/SOUTHERN NEW JERSEY

AIR Side

Volume One, Number One
September, 1989

An informative newsletter from the Sheet Metal Contractors Associations of Northern & Central/Southern New Jersey

BID SHOPPING

Free enterprise or dirty pool? Subcontractors who refuse to play have options, from separate bids to educating competitors

by Diana Granitto

Bid shopping, claim some general contractors, is free enterprise. Subcontractors call it a game, but it's one they don't have to play.

In this game, the low bidder is on the defensive. The general may use the low bid to get the job, then shop around for a better deal. If one sub won't peddle his bid, chances are another will.

Some subs complain when generals shop; then they turn around and shop their sub-subs. Contractors at all levels seek the best prices from suppliers.

To stay in the game, subcontractors may pad their bids so they can negotiate later and still make a profit. Or, they wait till the last minute to bid, causing errors and leaving the general little time to prepare his bid.

When the general plays one bid against another after receiving the award, the savings are not passed on to the owner. Subs are forced to reduce their price or lose the job, even if they were the low bidder. If they cut the price, job quality may suffer. The owner loses again.

One way to get out of the bid shopping game is to use separate contracts to the owner, or even to the general contractor in the case of second-tier subs.

Separate bids save an estimated 7-12% on projects by cutting middleman mark-ups and allowing the owner to choose the best bids of all major contractors. One caution, however: if the bidding is closed, "then you have the owner doing the

continued on page 4

4.02

Welcome to AIR SIDE, a new, informative newsletter for the construction industry from the companies that design, manufacture and construct HVAC air handling systems in the state—the Sheet Metal Contractors Associations of Northern and Central/Southern New Jersey.

We at the Sheet Metal Contractors Associations in New Jersey have developed this newsletter to encourage the business practice of separate or direct contracting with sheet metal contractors, which is common in other states.

In New Jersey, many builders, developers, corporations, engineers, architects, general contractors and construction management companies have traditionally contracted for sheet metal or air handling work with a mechanical or plumbing contractor.

But we in the sheet metal industry, as we will show by objective, newsworthy articles in this newsletter, can achieve significant cost savings, for builders constructing a commercial office building, that contract directly with us.

We can deliver better coordination and control, better quality, value-added engineering to cut down costs, and what's more—we can deliver the job on time and do the work more efficiently.

So please take a moment to read through our newsletter. You may be surprised at what separate contracting can do for your company, especially over the long run. And please feel free to call either one of our SMACNA chapter managers, Mary Kole representing the Northern chapter at 201-890-0890, and Leo Nemeth for the Central/Southern chapter at 201-297-6644, to discuss this further.

Sincerely,

John F. Creegan
President—Northern Chapter

Brian E. Kiker
President—Central/Southern Chapter

Sheet Metal Contractors Associations of Northern and Central/Southern New Jersey

BID SHOPPING *continued*

shopping," said Mac Sullivan, Sullivan Mechanical, Shenandoah, Va.

"An ideal world would be to do all our business directly with the owner," said sheet metal contractor Jim Roth, James E. Roth Inc., Mars, Pa. However, it even helps for a sheet metal contractor to bid to the general instead of the mechanical, he said. The general who has a sub he can count on is less likely to shop.

Instead of selling price, bidding direct allows a sub to sell his reputation, skills and experience, said Roth. Another plus is cash flow. When working directly with owners, Roth sometimes gets paid in two weeks.

As president of Sheet Metal & Air Conditioning Contractors National Ass'n two years ago, Roth launched a campaign promoting separate sheet metal contracts, primarily to the general contractor. A promotional videotape is being updated and a brochure produced, said SMACNA president Butch Welsch.

In his 26 years in business, Welsch said his firm, Welsch Furnace Co., St. Louis, has bid all its work direct except for two jobs: "I lost my shirt on one and my pants on the other!"

SMACNA of Northern New Jersey recently retained a consultant to help market the separate bids concept.

"An ideal world for subs would be to do all our business directly with the owner."

Some general contractors and construction managers were concerned that with direct bidding "some work would fall through the cracks," said chapter manager Mary Kole. So the association prepared suggested bid scopes organizing the HVAC work into four categories: hydronic piping, refrigeration, sheet metal/air handling, and temperature control.

Moving to separate contracts is an uphill battle, especially in areas with a tradition of single bid-single contract. One approach is to push legislation calling for multiple primes on government work, said construction attorney Perry Safran, Safran Law Offices, Raleigh, N.C.

Most states use a single prime on public work, and private work usually follows suit, Safran noted. There are a few exceptions: North Carolina law, for example, requires at least four prime contracts on public projects: general, plumbing, mechanical and electrical.

Another multiple-prime mandate, New York state's oft-challenged Wicks Law, requires separate plumbing, electrical and HVAC contracts on most public projects over $50,000. This protects subcontractors against bid shopping and slow payment, and subs have defeated efforts to repeal the law.

Some agencies are not bound to Wicks, and their jobs often come in "40-50% above what the job is worth," said plumbing contractor Lawrence Roman, executive vice-president of Wachtel, Duklauer & Fein, Mt. Vernon, N.Y. "Subs must add 10-15% to their price because the general contractor shops."

TO BE CONTINUED...

Reprinted from CONTRACTOR, June, 1989

SEPARATION *continued*

was built and financed by real estate developer David Chase of Chase Enterprises, in a joint venture with the SMWIA National Pension Fund.

Instead of the traditional request for proposals on HVAC work from the mechanical contractors, the joint venture partners (developer Chase Enterprises and the SMWIA) asked for separate bids on this project from sheet metal contractors.

Richards Sheet Metal's separate bid proposal (which was accepted) was to install the duct work ***and*** the HVAC (heating, ventilating and air conditioning) equipment, which consisted of individual air-handling units on each floor of the office building.

In addition to avoiding the traditional mark-up from the mechanical contractor, Domanico emphasizes that by contracting directly to the sheet metal contractor, the owner and developer benefited from substantial cost savings due to ***value-added engineering***.

Many commercial office buildings are typically over-engineered for new construction of HVAC systems, explains Domanico, Richards Sheet Metal draftsmen were able to go in and scale down the original engineering designs for the Old City Hall Building project in New Haven. Equipment installation and ductwork specifications were re-designed to provide an ***efficient*** HVAC system operation.

With improved coordination and direct control over the air-handling HVAC work made possible by builders and developers that ask their general contractors or construction managers to award contracts separately and directly to sheet metal contractors —similar cost savings, quality, and value-added engineering seem sure to follow.

4.03

HOLMAN ERECTION COMPANY, Appellant,

v.

ORVILLE E. MADSEN & SONS, INC., Respondent.

No. C2-82-926.

Supreme Court of Minnesota.

March 4, 1983.

Subcontractor who had been listed on general contractor's winning bid for construction of public wastewater treatment project brought breach of contract action against general contractor for using different subcontractor on actual project. The District Court, Clay County, Paul G. Hoffman, J., granted summary judgment in favor of general contractor, and subcontractor appealed. The Supreme Court, Yetka, J., held that mere fact that general contractor listed subcontractor in its winning bid did not form binding contract between the two, and general contractor was free to use different subcontractor in effort to meet minority business requirement.

Affirmed.

1. **Contracts ⇐22(1)**

To constitute acceptance of subcontract bid, acts of general contractor must be deemed manifestation of assent when evaluated under objective standard; form of assent, whether it be written, oral, or by conduct, is not relevant as long as objective standards are applied and essential finding of mutual assent is made.

2. **Contracts ⇐16**

Mere fact that general contractor who was awarded prime contract on public wastewater treatment project listed particular subcontractor to do steel erection work in its winning bid did not, of itself, form binding contract between general contractor and subcontractor, and general contractor was free to subsequently use different subcontractor at slightly higher cost in order to meet minority business requirement. M.S.A. § 336.2-206.

Syllabus by the Court

Summary judgment was properly granted in favor of the general contractor in a contract action brought by a subcontractor to recover damages for alleged breach of contract. No contract was formed by the mere act of listing the subcontractor as a proposed subcontractor in the general contractor's prime bid on a public construction project.

Dosland, Dosland & Nordhougen, Moorhead, for appellant.

Briggs & Morgan, Steven Halverson, St. Paul, for respondent.

Considered and decided by the court en banc without oral argument.

YETKA, Justice.

Plaintiff-appellant Holman Erection Company (Holman) commenced an action against Orville Madsen & Sons, Inc., (Madsen), alleging that Madsen had breached a construction contract. Holman claims that Madsen accepted Holman's bid on a subcontract, and thereby formed a contract, by listing Holman as a proposed subcontractor in a general contract bid Madsen submitted to the City of Moorhead. Holman sought the profits it argued it had lost when Madsen awarded the subcontract to a different construction company.

The Clay County District Court granted Madsen's motion for summary judgment. Holman appeals from the order and judgment dismissing Holman's claim. We affirm.

The facts of this case are undisputed. The City of Moorhead, Minnesota, advertised for bids to build a wastewater treatment facility. Bids from general contractors were to be opened at a public meeting of the governing body on January 22, 1981, pursuant to Minn.Stat. § 471.705 (1982). Madsen decided to bid on the general contract for the project. It sent bid invitations

Do You Have An Ethics Story?

The American Society of Professional Estimators are on the lookout for examples of ethics or lack of ethics in the construction industry. If you have a story of construction, dealing with: pre-bid, bidding, buyout, a change order negotiation, etc. please share it.

My ethics story:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(Finish story on back of sheet if necessary)

May we use your story in our seminars and publications?
___ Yes ___ No

May we call you for more information?
___ Yes ___ No

Your name_____

Daytime address_____

_____

Daytime phone ( ) _____

Please send to

American Society of
Professional Estimators
11141 Georgia Avenue, Suite 412
Wheaton, MD 20902

ATTN: Bev Perrell

SURVEY QUESTIONNAIRE
FOR BIDDING/CONSTRUCTION
ETHICS

1. Consistently bid shopping and chopping in your market area will result in higher profits to your company. YES NO

2. As a general contractor do you always receive the same prices as the other general contractor? Why not? YES NO

3. Would you notify a sub that his price is more than 10% low? YES NO

4. Would you be in favor of having separate prime bids on major portions of the project to help eliminate bid shopping? YES NO

5. Are you more willing to "work" with someone during the bid process if they give you check quantities on materials? Would you expect better prices? YES NO

6. Have you, as a general contractor, ever asked/been asked to cut material suppliers or subcontractors prices by an owner? YES NO

7. If a subcontractor had known that one general contractor was less knowledgable about prices than the other generals, is it o.k. that the sub bids him higher? YES NO

8. Would Bid Depositories work in our market area? YES NO

9. If two subcontractors are very close in price, say within $300 on a $200,000 contract, but your favored is not low bidder, would you use him? YES NO

Generals

SURVEY QUESTIONNAIRE
FOR BIDDING/CONSTRUCTION
ETHICS

1. Consistently bid shopping and chopping in your market area will result in higher profits to your company. YES NO

2. As a sub do you give the same prices to all the general contractors? Why? YES NO

3. Would you want a general contractor to notify you that your price is more than 10% low? YES NO

4. Would you be in favor of having separate prime bids on major portions of the project to help eliminate bid shopping? YES NO

5. Are you more willing to "work" with someone during the bid process if they give you check quantities on materials? Do you give better prices? YES NO

6. Have you, as a sub, ever asked/been asked to cut material suppliers or subcontractors prices by a general contractor? YES NO

7. If you had known that one general contractor was less knowledgable about prices than the other generals, would you bid him higher? YES NO

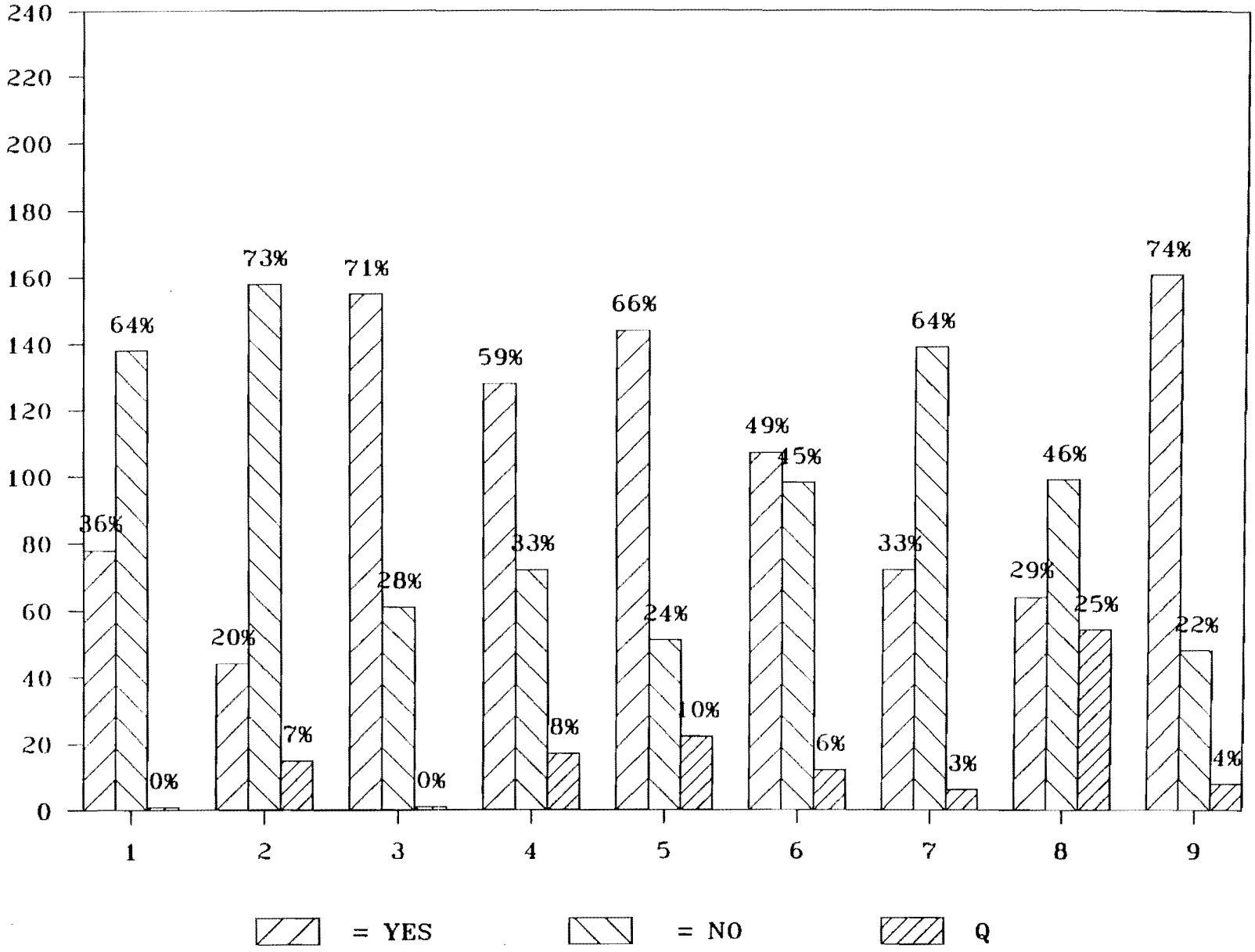
8. Would Bid Depositories work in our market area? YES NO

9. If two subcontractors are very close in price, say within $300 on a $200,000 contract, but your favored is not low bidder, would you use him? YES NO

Subs

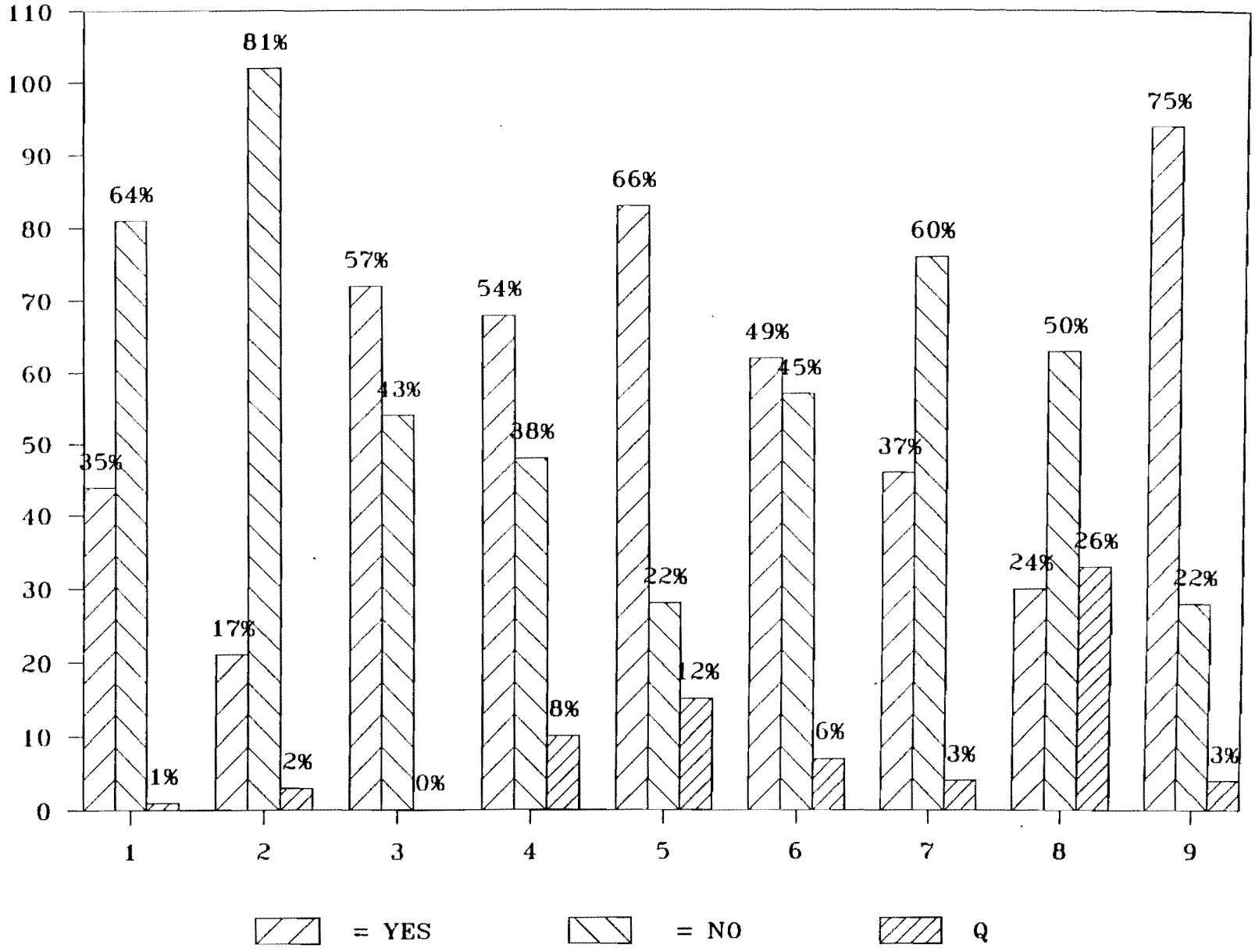
ASPE ESTIMATING SURVEY

Total of All Respondents



ASPE ESTIMATING SURVEY

General Contractors



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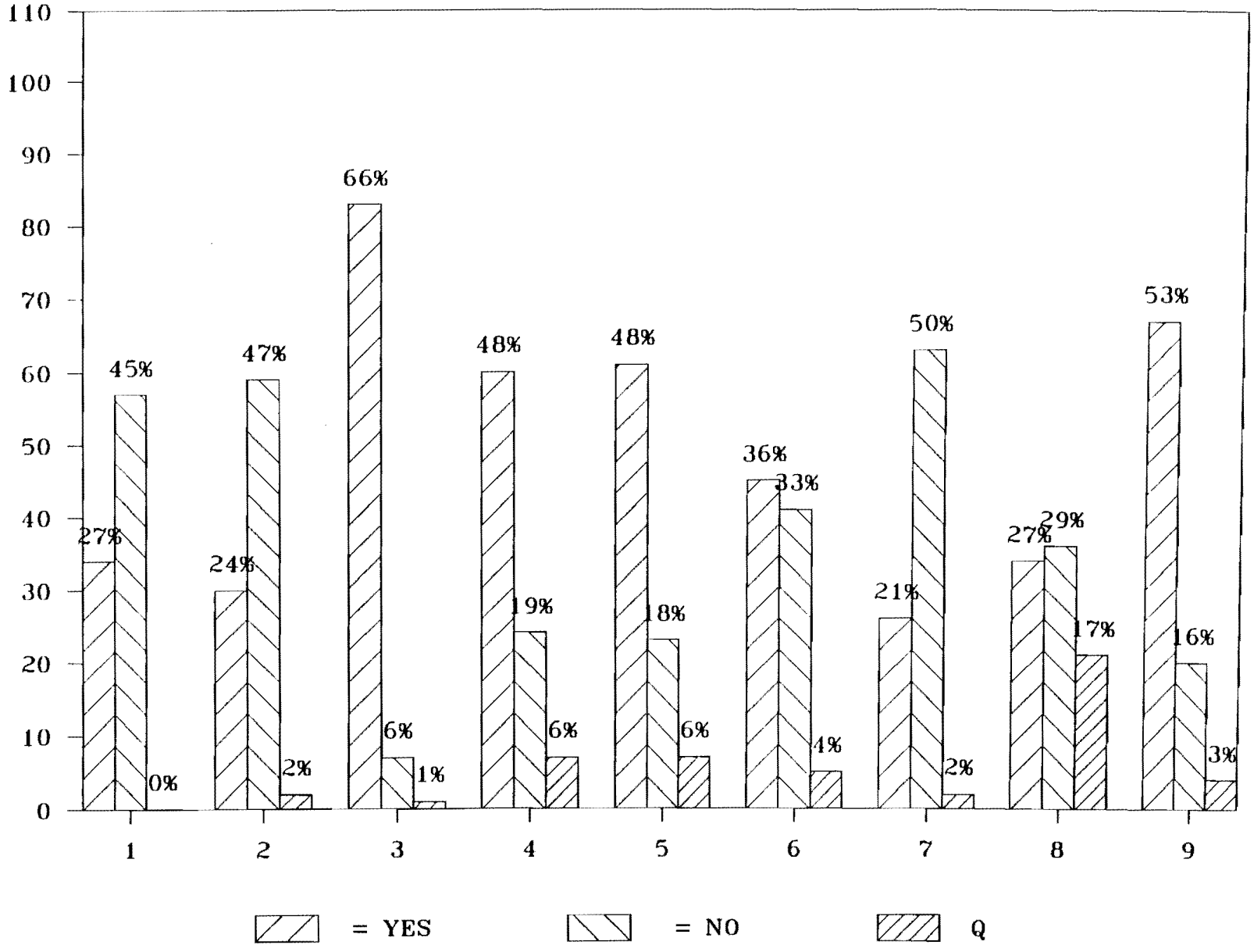
ASPE ESTIMATING SURVEY

Subcontractors



ASPE Code of Ethics
Basic Canons

CANON #1 - Professional estimators shall perform services in areas of their discipline and competence.

Canon #2 - Professional estimators shall continue to expand their professional capabilities through continuing education programs to better enable them to serve clients, employers and the industry.

Canon #3 - Professional estimators shall conduct themselves in a manner which will promote cooperation and good relations among members of our profession and those directly related to our profession.

Canon #4 - Professional estimators shall safeguard and keep in confidence all knowledge of the business affairs and technical procedures of an employer or client.

Canon #5 - Professional estimators shall conduct themselves with integrity at all times and not knowingly or willingly enter into agreements that violate the laws of the United States of America or of the states in which they practice. They shall establish guidelines for setting forth prices and receiving quotations that are fair and equitable to all parties.

Canon #6 - Professional estimators shall utilize their education, years of experience and acquired skills in the preparation of each estimate or assignment with full commitment to make each estimate or assignment as detailed and accurate as their talents and abilities allow.

Canon #7 - Professional estimators shall not engage in the practice of "bid peddling" as defined by this code. This is a breach of moral and ethical standards, and this practice shall not be entered into by a member of this society.

Canon #8 - Professional estimators and those in training to be estimators shall not enter into any agreement that may be considered acts of collusion or conspiracy (bid rigging) with the implied or express purpose of defrauding clients. Acts of this type are in direct violation of the Code of Ethics of the American Society of Professional Estimators.

Canon #9 - Professional estimators and those in training to be estimators shall not participate in acts, such as the giving or receiving of gifts, that are intended to be or may be construed as being unlawful acts of bribery.

Section #5 - Where Are Your Projects and Where Are They Going?

I. *Objective of section*

To show the basics of setting performance standards for construction projects and to review auditing and monitoring techniques.

II. *Questions to answer*

- A. *How do you measure project health?*
- B. *How do you track cost performance on a project?*
- C. *How are effective decisions made?*
- D. *What are the most troublesome elements of projects?*
- E. *How do you effectively resolve job problems?*
- F. *What is the estimator's role in resolving job dysfunctions?*

III. *Topics*

- A. *Management by exception principles*
- B. *Setting standards of performance*
  1. *Cost*
  2. *Construction*
  3. *Design*
  4. *Procurement*
  5. *Closing out*
- C. *The concept of the project audit*
- D. *The role of the estimate in measuring project progress*
- E. *Effective decision making*
- F. *Predicting and resolving project problems*
- G. *Documents used to monitor the project*
- H. *How to monitor the project*
- I. *Who's responsible for monitoring the job?*
- J. *Color coding*
- K. *Isoquant lines*
- L. *Project reporting*
- M. *The legal process*
- N. *Documentation in project control and monitoring*

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Consulting Engineer

IDENTIFY VITAL TARGETS

Which inputs and outputs most affect the results, the conditions and the performance the manager wishes to achieve? In considering these questions the following should be kept in mind.

A. Rarely is more than one problem out of four worth other than a manager's fleeting glance.

B. The good manager must quickly identify where his efforts are going to do the most good.

C. The effective manager must understand Pareto's law - the principle of the vital few and the trivial many.

D. In general, fewer than one third of the people a manager supervises require more than two thirds of his time.

E. Managerial missteps resulting from not understanding the vital target concept include:
1. Following prejudices
2. Sticking with pat systems
3. Doing what is easiest
4. Playing hunches

F. How to pick the vital few
1. Prepare and use to do lists
2. Set priorities
3. Use a rating system
4. Identify the critical tasks in a plan of action

G. Moving from a situational view (macro) to the vital few (micro)

H. What to do with the trivial many
1. Delegate
2. Defer (How long?)

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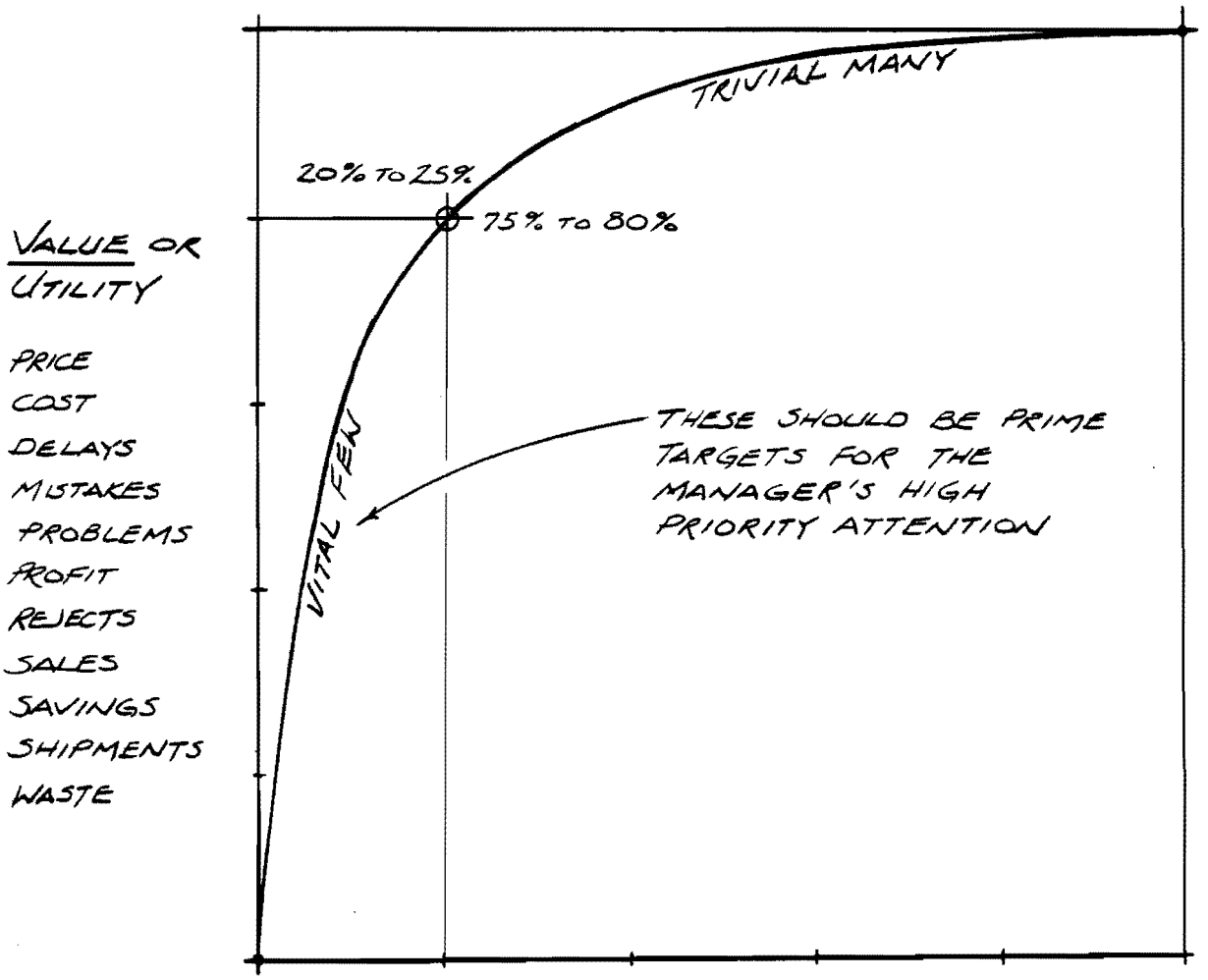
PARETOS LAW - IN AN OBJECT/VALUE SITUATION ONLY A FEW OF THE OBJECTS ACCOUNT FOR THE GREATEST PART OF THE VALUE.



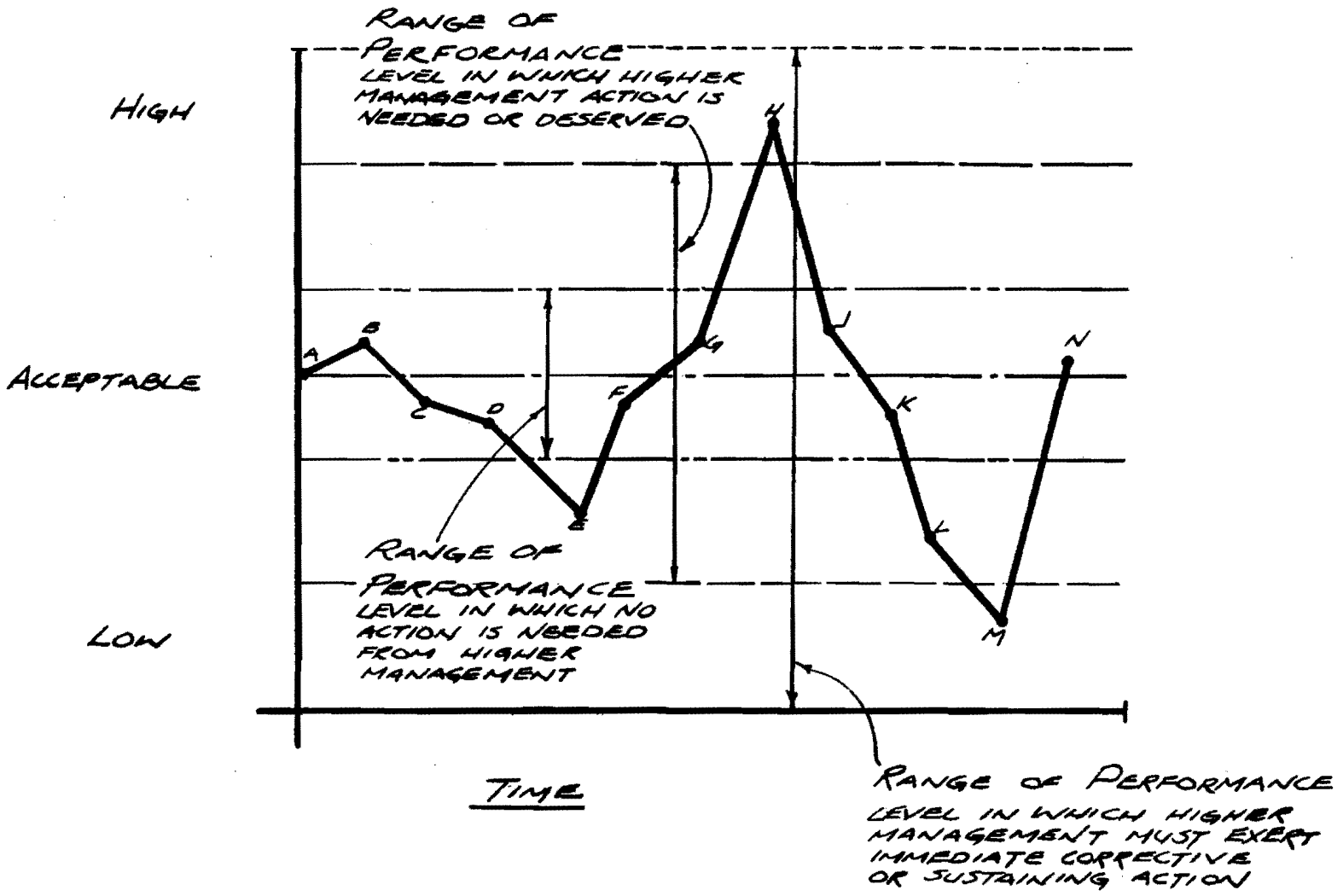
VALUE OR UTILITY

PRICE
COST
DELAYS
MISTAKES
PROBLEMS
PROFIT
REJECTS
SALES
SAVINGS
SHIPMENTS
WASTE

OBJECTS OR RESOURCES

ACTIVITIES
CAUSES
OCCURANCES
PROBLEMS
RESOURCES
PRODUCTS
DECISIONS
FACILITIES
MATERIALS
METHODS
PRODUCTS
SALES CALLS
SERVICES
STAFF

H/O 146



MANAGEMENT BY EXCEPTION (MX) AND PERFORMANCE LEVEL ACTIONS

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5.03

H/O 150 3/77

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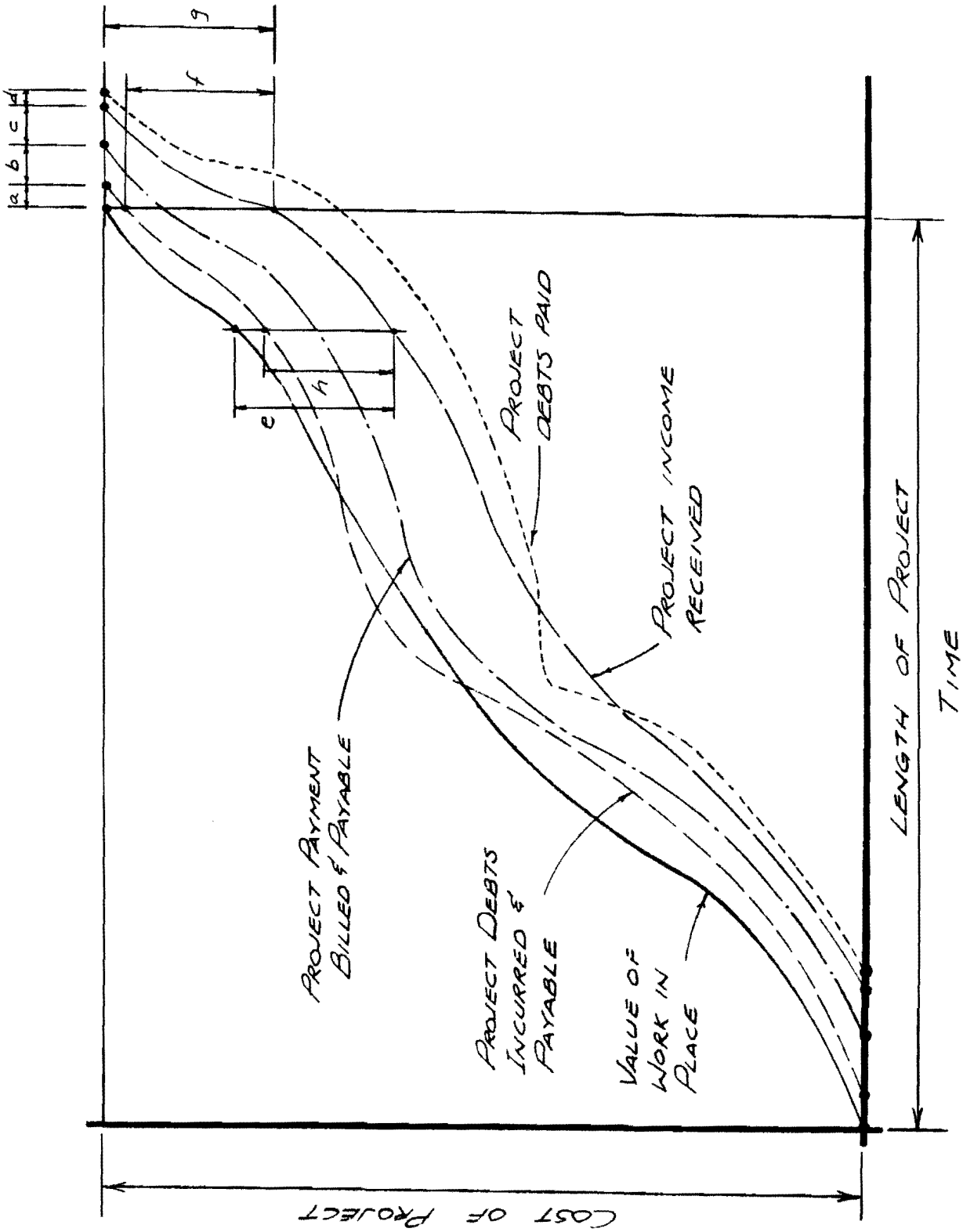
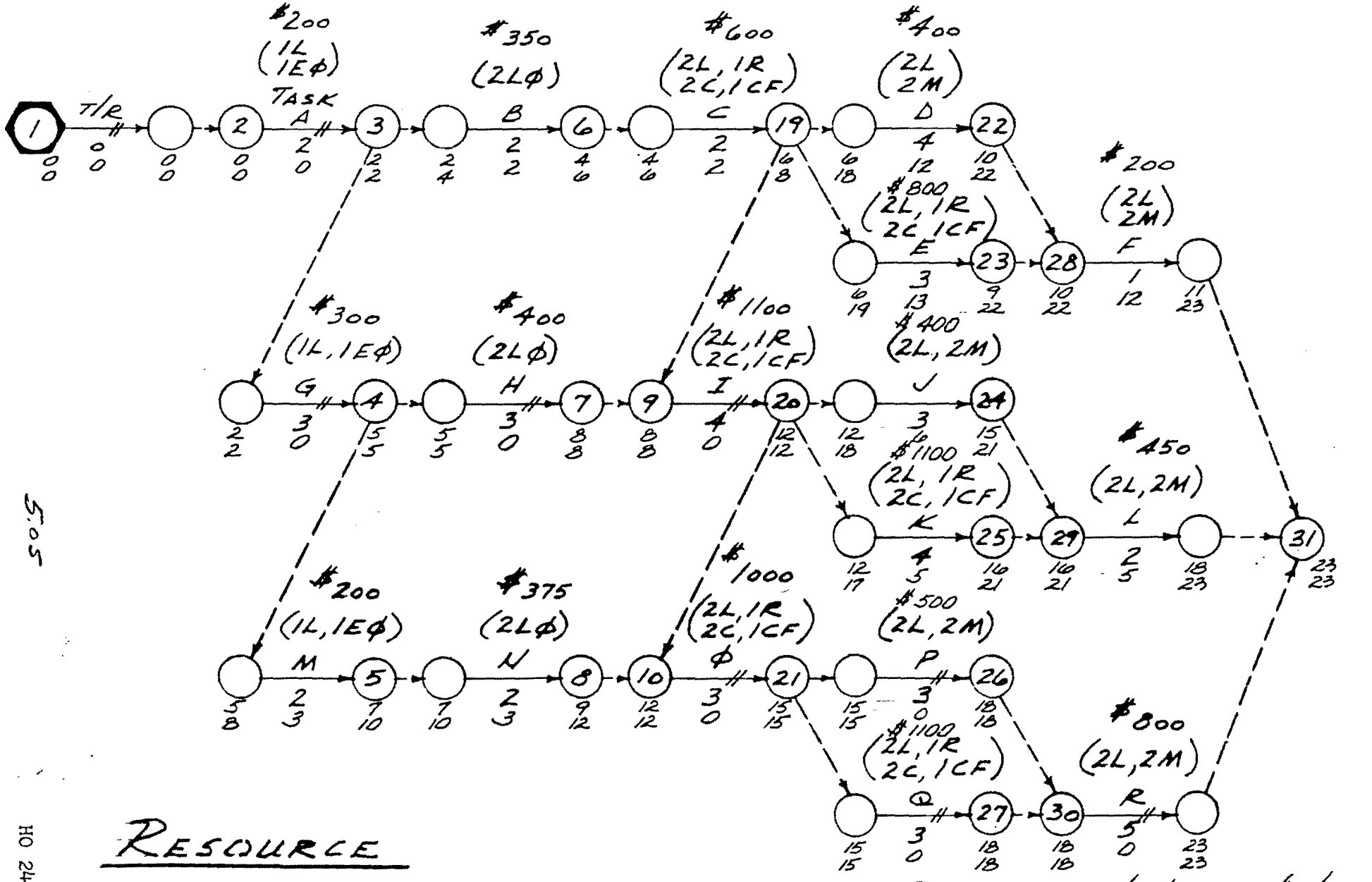


PROJECT MONEY FLOW

5.04

H/O 147



RESOURCE ALLOCATION

RESERVED NODE NOS.

11	15
12	16
13	17
14	18

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MAY 29, 1968

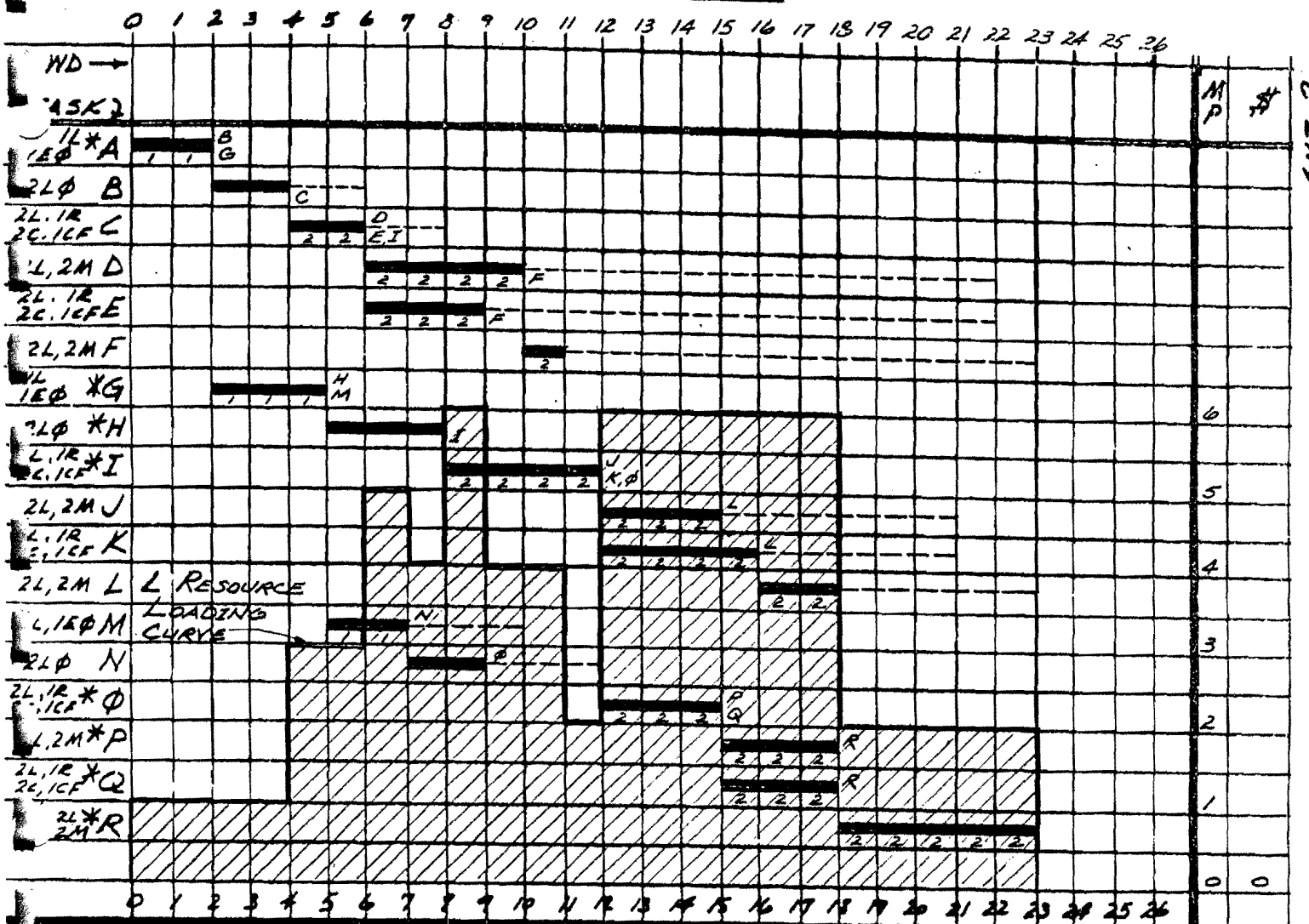
SHT 1

S.05

HO 244

O/H

ES/EF SCHEDULE



SHT 2

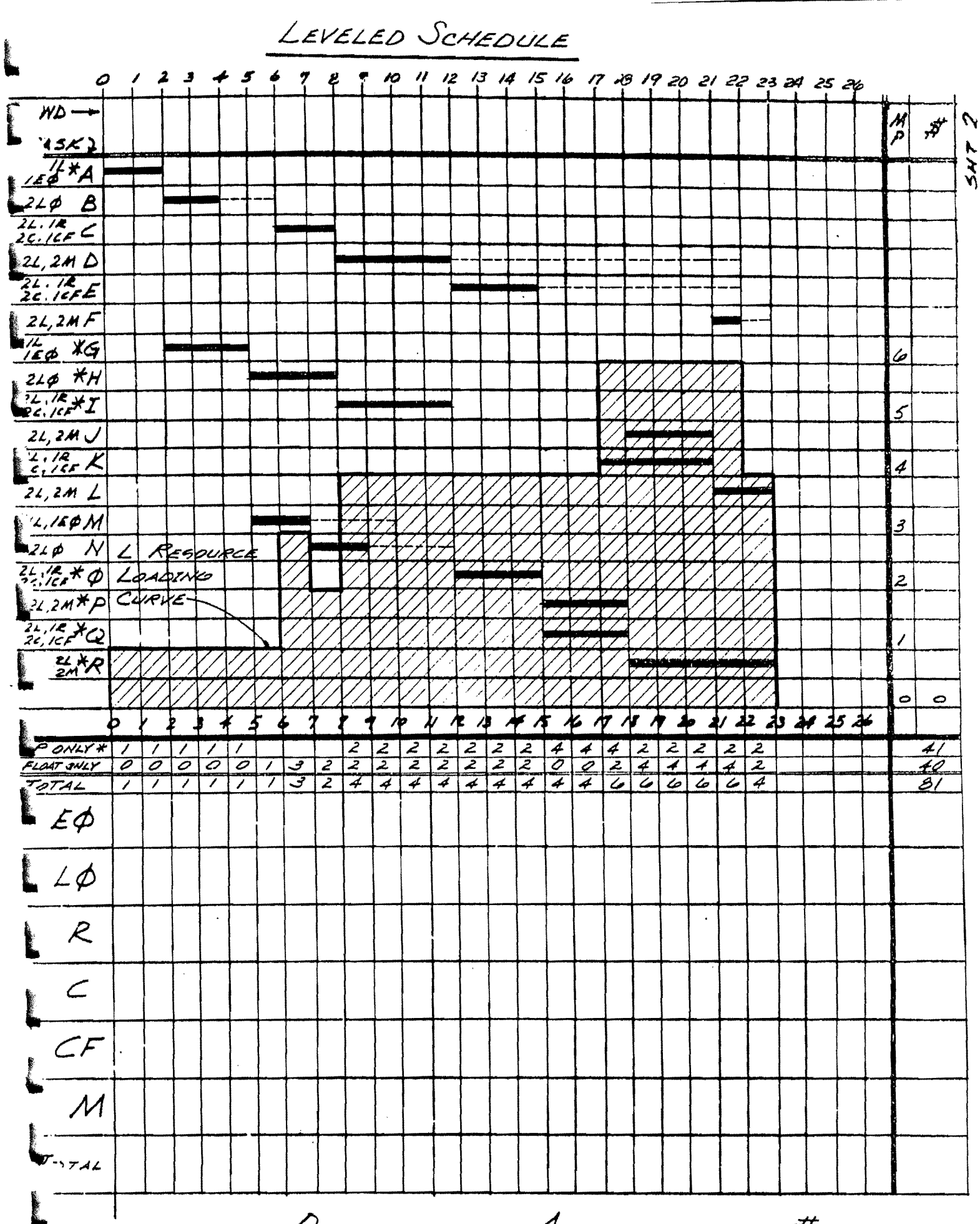
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
L		1	1	1	1	3	3	5	4	6	4	4	2	6	6	6	6	6	6	2	2	2	2	2				81
EΦ		1	1	1	1	1	1	1																				7
LΦ				2	2		2	2	4	2																		14
R						1	1	1	1	2	1	1	1	2	2	2	2	1	1									19
C						2	2	2	2	4	2	2	2	4	4	4	4	2	2									38
CF						1	1	1	1	2	1	1	1	2	2	2	2	1	1									19
M							2	2	2	2	2		2	2	2	2	4	4	2	2	2	2	2					36
TOTAL	2	2	4	4	8	10	14	14	18	10	10	6	16	16	16	16	14	14	4	4	4	4	4					214

RESOURCE ALLOCATION #1

HO 245

MAY 29, 1968 5.06 RALPH J. STEPHENSON, P.E.

LEVELED SCHEDULE



RESOURCE ALLOCATION #2

HO 246

MAY 29, 1968 5.07 RALPH J. STEPHENSON P.E.

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Claim Prone Job Characteristics

During the profiling, proposing and negotiating period, it is often possible to gain a good insight into the expected nature of a job if one is fortunate (or unfortunate) enough to be the successful proposer. The problem job is becoming increasingly serious in our business and professional lives and it should be identified early. The problem job generally results in increased costs during the construction period and quite often requires arbitration or litigation to achieve resolution of costs and damages.

Thus, it is good policy for the perceptive owner, architect/engineer and contractor to become familiar with those characteristics that early identify a job as having potential for being a trouble project.

This list of characteristics is by no means complete, nor is it meant to imply that a job having these features will necessarily be claim prone. It is, on the other hand, an honest effort to state certain unique job features that have been identified in projects that have ended up in litigation or arbitration. The list is at random with no attempt to classify or characterize the features.

Claim prone job characteristics may include:

a. A wide spread in proposal prices.

b. Issuance of a large number of pre-bid addenda and instructions.

c. For subcontractors, a poor general contractor reputation if the project is being built by one prime.

d. For projects with separate primes, poor other prime contractor reputations.

e. More than four to six prime contractors involved(applicable on normal building work only).

f. Poor reputation of architect/engineer preparing contract documents.

g. Excessive how-to-do-it emphasis in contract drawings and specifications.

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h. Non-liable party involvement in responsible positions, i.e. non-liable construction manager.

i. Large numbers of allowance items.

j. Zero (or excessively small) tolerance specifications.

k. Poorly defined authority and responsibility patterns in the offices of the architect/engineer, the owner, the general contractor or other prime contractors.

l. Inexperienced specialty contractors.

m. Excessive number of pre-selected suppliers for key material and equipment.

n. Large dollar amount or numbers of owner purchased equipment.

o. Location in strike prone areas.

p. Location in jurisdictionally sensitive areas.

q. Heavy use specified for untried products and equipment.

r. Non-liable party involvement in establishing delivery commitments, i.e. construction manager, architect/engineer, owner representative.

s. Involvement of politically accountable owners, architect/engineers or other contractors.

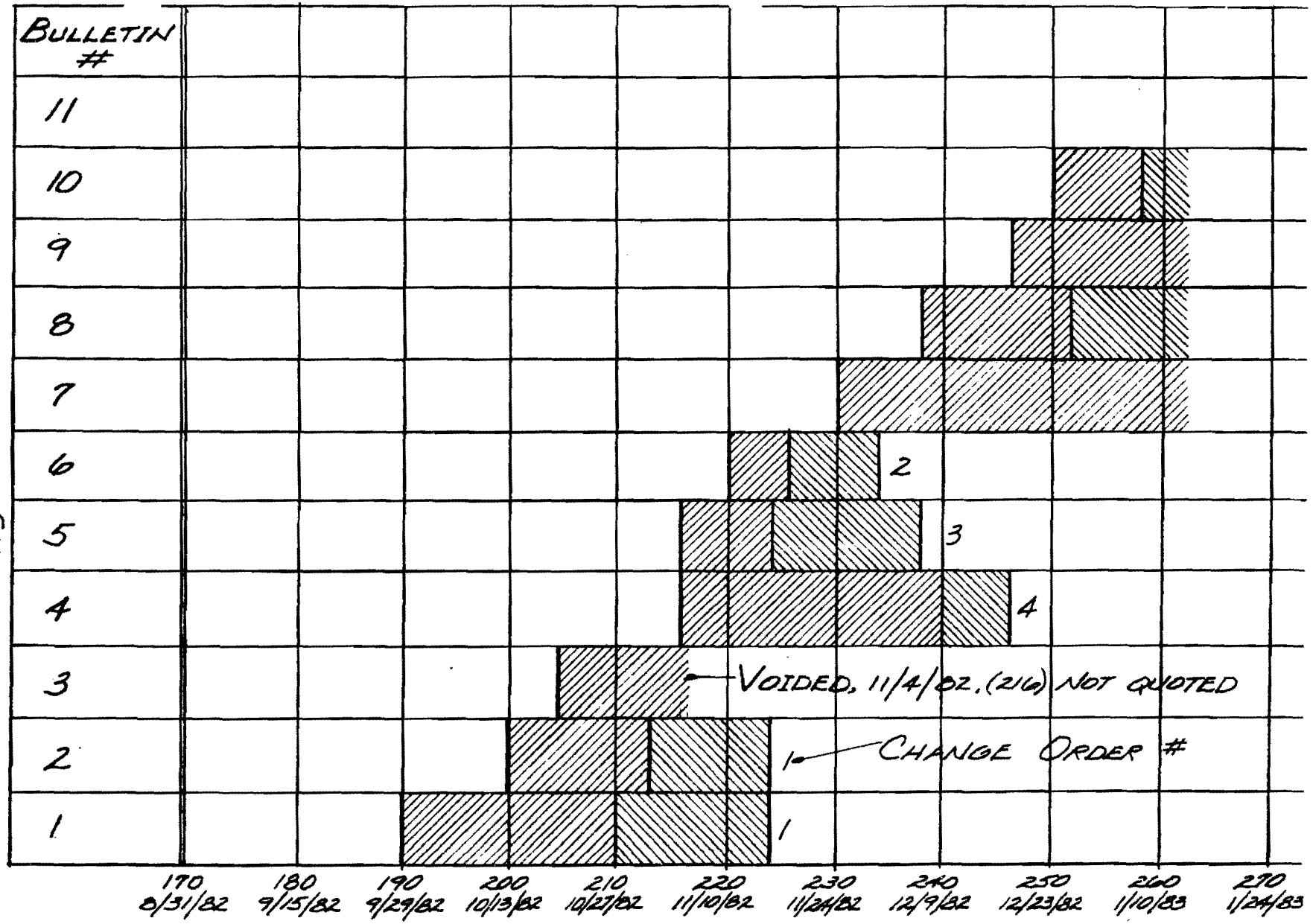
t. Multi responsibility payment structures.

u. Excessively long time periods to award contracts after a proposal.

(Note: This often occurs in public work where many non-project approvals and agencies are involved.)

v. Poor owner reputation.

5.09



Bulletin quoting period

Quote evaluation period

BULLETIN/CHANGE ORDER RECORD

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COLOR CODING

	1	2	3	4	5	6
IS TASK CURRENTLY PAST EF DATE?	N	N	Y	Y	Y	
IS TASK CURRENTLY PAST LF DATE?	N	N	N	N	Y	
WILL TASK MAKE LF DATE?	Y	N	Y	N	—	
COLOR CODE GREEN	X					
COLOR CODE ORANGE			X			
COLOR CODE BLUE		X		X		
COLOR CODE YELLOW					X	

Color coding is used to qualitatively evaluate project status. The status indicator colors described below are drawn on the solid task arrows, with the end of the color line shown at the approximate percentage of the task complete. The color line end is dated with the current calendar date.

Green

Task on time - currently not past early finish (EF) date.

Orange

Task on time - currently past early finish (EF) date.

Blue

Task behind - currently not past late finish (LF) date.

Yellow

Task behind - currently past late finish (LF) date.

Note that the evaluation is made on the basis of the current date. Changes in color are significant, indicating a deteriorating or improving sequence of work depending upon the progression. Color coding is primarily used to locate undesirable trends in work progress and to show job history.

H/O 91

Section #6 - It's Not Over Until It's Over

I. Objective of section

To present and discuss the principles important to closing out the project.

II. Questions to answer

- *A. What is needed to close out a project?*
- *B. Who should close out the project?*
- *C. What is the role of documentation in closing out the job*
- *D. When should the closing out process start?*
- *E. What is the role of the estimator in closing out the project?*

III. Topics

- *A. Project documentation for close out*
- *B. Elements of the close out*
- *C. How to plan for project close out*
- *D. Closing out the document files*
- *E. The post project critique*
- *F. How to measure project success*
- *G. Using the good close out as a marketing tool*
- *H. Abstracting data for future project use*
- *I. Elements of success in design and construction*

Ralph J. Stephenson PE PC
Consulting Engineer

Closing Out A Construction Project

A random summary of close out guidelines for owners, architects, engineers and contractors

The process of closing out a construction project has emerged as one of the most important sequences of events a project team may encounter during the course of the project. Reasons for this are:

• The close out process usually results in a formal and legal acceptance of the facility by the owner or occupant. Thus responsibility for the correctness of the work passes from the design and construction team to the owner. The transition must be clear and indisputable to avoid contested claims and residual obligations.

• The conditions imposed by the warranties on workmanship, systems and equipment must be clearly defined and accepted by all concerned if adequate guarantees of performance are to be placed in force.

• The design and construction team must have a definitive point in time where their contractual obligations have been fulfilled and they can consider their legal relations closed out so far as project design and construction administration and operations are concerned.

• The owner must have a specific point in time where he can consider the project legally his without any hang over potential encumbrances from the design or construction team.

• The design and construction team must be able to use the project as a facility which they have no hesitation in describing or showing to prospects and current clients.

• A well closed project is insurance of future good relations with specialty contractors on the job as subcontractors of the prime contractors.

• The properly closed project makes no unreasonable or unpredictable demands on the design and construction staff subsequent to the close out.

The close out process does not start as the construction phase is being completed but long before. Closing out is an ongoing action. Throughout all phases of the job the experienced construction team studies the documents and the work so as to set how each element can best be turned over to the owner in accordance with the contract.

Some of the many steps to be taken to properly close out a project are given below. The list is for all parties to the contract, since most are involved in the close out phase. Parties indicated in ( ) are those most concerned with the item. Where multiple parties are indicated it does not necessarily indicate the parties must participate together in the action.

The list is at random. (Note: This list will be arranged by categories as it is added to)

1. Prepare a construction record package. This set of documents was formerly called the as built drawing set. (contractor)

2. Obtain, where appropriate, a certificate of occupancy, or equivalent document, from the local building department, or other regulatory and enforcement agency. (owner, architect/engineer, contractor)

3. Prepare, distribute and have approved by the owner, the architect/engineer and the contractors, a punch out procedure. (contractor, architect/engineer, owner)

4. Punch out the project and complete the punch list requirements within an agreed upon time frame. (architect/engineer, contractor, owner)

5. Prepare, submit and accept the operating and maintenance manuals for the total project. (contractor, owner)

6. Clear final payments on the project and obtain proper waivers of lien. (contractor, owner)

7. Provide the owner with a proper set of construction documents for reference use. (contractor, owner)

8. Collect and store job logs, diaries, daily reports, test reports and all other documentation generated by the job activities. (contractor, owner, architect/engineer)

9 . Bring all meeting minutes and record files up to date so as to permit easy use and retrieval of needed information. (contractor, owner, architect/engineer)

10. Collect and bind all official and unofficial project photos. (contractor, owner, architect/engineer)

11. Collect and record all project network plans, schedules and bar charts by issue number, subject and date. (contractor, owner)

12. Close out and store all correspondence and other record files. (contractor, owner, architect/engineer)

13. Assemble and properly store all shop drawings and other job related submittals. (contractor, owner, architect/engineer)

14. Request the architect/engineer of record to make an inspection resulting in the granting of a certificate of substantial completion. This may be required to to obtain a certificate of occupancy. (contractor, owner)

15. Plan and implement grand opening or preview festivities for major team members, company principals and others contributing to the planning, design and construction of the facility. (owner, contractor)

29. Properly train and turn over the facility to the owner's representatives. Depending on the size and complexity of the project, the training process should begin from one to three months before occupancy. (owner, contractor)

30. Establish and approve the start of all warranty and guarantee periods for all material and equipment on the job prior to owner making the facility operative. (owner, contractor, architect/engineer)

31. Prepare and submit to the owner a Construction Record Package. This package should contain the following: (contractor)

a. The construction record set referred to above.
b. Specific warranties required by the specifications
c. Workmanship or maintenance bonds required
d. Maintenance agreements called for by the specifications
e. Damage and settlement surveys of the site and the facilities
f. Final property surveys of the site.

32. Submit a final billing to the owner containing a list of all incomplete items and a properly assigned cost to each item. (contractor)

33. Advise the owner of any insurance changes over existing or past requirements or dates. (contractor, architect/engineer)

34. Complete all pre start up testing, run in and instruction along with submission of operating and maintenance manuals. (contractor, owner)

Note: All pre start up and start up requirements should be fully described in the contract documents and clearly referenced to the warranty period.

35. Submit final meter readings for utilities, and measured records of stored fuel at the time of substantial completion. (contractor)

36. Submit to owner, the consent of surety to final payment if required. (contractor)

37. Have final inspection made by an experienced exterminator to rid the job of rodents, insects or other pests. (contractor, owner)

38. Read the full contract document requirements (drawings, specifications, and contract) for closing out the job. (contractor, owner, architect/engineer)

39. Provide the owner a certification as to the building area calculations including gross square footage, leasable square footage, and area use assignments.

- **Ralph J. Stephenson PE**
  - **Construction retentions, collections and final payment - ho 259**
  - **Introduction - Payment as a lifeline**

Lifeline has many definitions but one in particular strikes me as being most appropriate to the construction profession; "A lifeline is a line or rope for saving life".

Payment or money flow on a construction project can be just that - a line of strength that can preserve the life, vigor and integrity of a project, or a line of weakness that can cast the project adrift.

Successful firms are not often heard complaining about payment. This oddity bears close examination from those seeking to emulate them.

- **General nature of cash flow in the construction industry**
  - Legal background for progress payments
    Governed by the doctrine of conditions

Doctrine of conditions says that a party should not have to perform its promise without obtaining the other party's promised performance. The principle is central to any discussion of progress payments.

    Who is required to perform first?

Common law requires that performance of services precede payment

  - Role and obligations of the payer
    To maintain strong financial position that allows prompt payment when deserved
      Makes people want to work for you
      Improves potential for future reductions in proposal prices
    To pay promptly and within the context of the contract
  - Role and obligations of the payee
    To perform well and in accordance with your contract
    To bill accurately and promptly
    To follow the ground rules by which payments are to be made
    Frequently the payee holds the key to successful payment for the work
    Points for the payee to consider

Too often we in the construction industry blame everyone but ourselves for not being paid what we think is owed us promptly.

Many times the cause of slow or reduced payment lies with the payee, not the payer.

- **Conditions surrounding collections and payments**
  - Unsuccessful collections & payments often result from

Mistrust - Inability to work honestly with unwritten standards
Cupidity - Inordinate desire to get something for nothing
Doubtful risk taking - A high risk has a corresponding high penalty
Ultra conservatism - Excites suspicion and slows cash flow
Incompetence - Produces a lack of desire to pay or work - no incentive
Claim prone environment

The contested claim brings out the worst in everyone, and most particularly makes the payer reluctant to pay.

Understanding how to reduce the dust, noise and confusion that surround contested claims often can encourage prompt payment even in difficult conflicts.

Common causes of contested claims and their frequency are
Directed change - 48%
Constructive change - 42%
Defective or deficient contract documents - 41%
Delays - 41%
Constructive acceleration - 35%
Maladministration - 33%
Differing site conditions - 31%
Impossibility of performance - 18%
Superior knowledge - 18%
Termination - 7%

Stubborness - A balky mule cannot be depended on to pull the wagon
Dishonesty - Destroys incentives to play fair and pay promptly!

- Successful collections & payments

Trustful relations

Construction is a give and take situation. By the end of the job the gives and takes must balance out. The construction machinery is lubricated by the exchange of small favors.

Honesty

Honest people select their business associates carefully. Those who pay for services rendered generally recognize honesty in a company or an individual if they themselves are honest.

Competence

Competent people recognize competence in others. On most jobs, given the presence of a reasonable number of high value factors, the competent payee will be compensated fairly and promptly. Financial check and balance systems ask too many "why" questions to allow competent parties to remain unrewarded.

A willingness to give and take

All taking and no giving by either the payer or the payee will sink a project in a swamp of paper and a sea of red ink. The mistrust that results

from this lack of informal give and take will grow to a monster unless it is replaced by a mutual confidence by the parties to the situation.

- **Retentions**
  - Often used for doubtful reasons
    - As a club to assure proper completion
    - To save interest payments for 10% of the job cost
    - To insure construction damage to completed work is repaired
    - To pay for anticipated contested claims
  - The problems of retention are old and will probably remain problems until
    - Properly addressed by the parties involved
    - There is agreement among like parties as to its impact
    - All parties to a contract behave according to their contract
  - Attitudes and realities about retention
    - In 1976 a survey was made of the American Subcontractors Association (ASA)
      - Showed average retention among members was $200,000
      - Members said would reduce bid price 3.7% if retention was eliminated
    - A recent survey of the American Subcontractors Association indicates
      - Subcontractors are willing to give lower bids to generals who
        - Pay them promptly
        - Offer them a fair and equitable contract
      - Of 200 respondents
        - 89% said they give better bids to generals regularly or occasionally
        - 90% did so because the general had prompt payment policies
        - 91% said not paid within 3 days of billings
        - 69% said not paid within 7 days of billings
    - Policies on retention
      - + Recent AGC, ASC and ASA policy calls for payment within 7 days of billing
      - + In 1974 GSA went to zero retention
      - + At one time Department of Defense eliminated retentions
      - + EPA once wrote retention requirements out of its grants
      - + About 1984 Michigan Dept of Mgmt & Budget adopted zero retention
        - Was required by the legislature
        - Department had 2 choices
          - Put money in escrow
            - Problem - couldn't use state treasury for holding vehicl
            - Problem - private holding would have too complicated
              - Would have thousands of accounts
              - Prohibitively expensive and cumberson
          - Adopt a policy of total payment for completed line items
            - Each line item was to be explicit
              - On recent $2,000,000 job
                - Had about 1100 line items
                - Listed on 27 pages
                - Ranged in cost from $100 to nearly $70,000
        - Adopted zero retention route
          - Some state officials like it, some hate it
          - Some contractors like it, some hate it
      - + In 1983 the Office of Federal Procurement Policy decided that
        - A uniform governmentwide policy should be implemented
        - Retainage was not to be used as a substitute for good contract management
        - An agency cannot withold funds without good cause
        - Determinations on retainage are to be made on the basis of

Contractor's past performance
Liklihood that such performance will continue in the future
Suggested that
Retainage not exceed 10%
That it be adjusted downwards as the contract approaches completion
When contract is complete all retainages be paid promptly
Summary - there is no single attitude or reality re retentions!

- **Collections, or better yet, payments**
  - Direct payment from the owner
    Conventional method on self financed projects
    Success of method depends on the integrity and compentence of the owner
  - Direct payment from another contractor
    Evolved when general contractor did most of their own work
    The secondary payment process may be used as a club rather than a tool
  - Direct payment from another party
    Usually called the title company method
    Steps in the title company disbursement method
    A. Monthly draw requests received from the contractors
    B. Supporting documents reviewed by the appropriate tier of contractor
    C. Job inspected by inspecting architect retained by payer
    D. Payment made to the contractors directly
    Sometimes direct to subs
    Sometimes to general contractor for disbursement to subs
    Advantages
    Insures prompt payment to contractors
    Provides third party evaluation to gage performance
    Gives financing source full control of the money flow
    Tends to diminish tendency to front load or unbalance billings
    Disadvantages
    Removes some of prime contractor's leverage to get work done
    Creates excessive dependency on attitudes of financing source
    Owner plays secondary role in motivating performance
    Poorly qualified inspecting architect can create havoc
    Bad attitude toward contractors
    Jealousy between architect of record and inspecting architect
- **Final payment**
  - Elements of record used in closing out the job
    The punch list and the certificate of occupancy
    Usually these provide the rationale behind final payment being made
    You should decide early how the job is to be punched out
    Who is to do it?
    When is it to be done?
    What standards of performance are to be used to measure acceptability
    When is the contractor's punch list to be prepared?
    When is the owner's punch list to be prepared?
    The operating and maintenance manuals
    Inadequate OMM submittals may be cause for non payment
    Get them done and get them submitted!
- **Where successful collections and payment start**
  - The agreement

The starting point for cash flow success is preparation and execution of a well understood agreement up front

6.0 P

Often contractors take jobs that specify impossible performance

Leads to getting into a position where the owner, or the architect engineer feel they can withold payment for personal, subjective reasons, using the impossible clause as a legal reason.

Example: the witholding of payment because the contractor did not submit a acceptable schedule within a given period of time - usually an unreasonable time frame for preparation of a good plan of work and schedule.

Infeasible schedules
Inadequate contract documents
Unworkable contract agreements
Multiple primes
Installation of unknown systems
Undefined responsibility patterns

- The client - either owner or contractor

Most payment-successful contractors profile a prospect before proposing on a job. This is done with any new client, and sometimes on previous clients with doubtful records.

Profiling a client should follows a basic pattern
What factors describe how a client will pay?
Personal integrity
Business integrity
Past payment record with you
Past payment record with others
Current financial strength
Nature of assembled project financing
Process used for approving payment and releasing funds
Attitudes of the architect/engineer toward you and paying
Methods of closing out jobs

- The project

As with the client, the project must also be profiled. Not every job is for everyone. Be very selective so as to optimize your opportunities for success.

What factors describe a good pay project for you
+ Your past experience in building such facilities
+ The client's past experience in building such facilities
+ Funding sources
Individuals
Syndicates
Trust funds
Pension funds
Political entities
+ Payment method

Direct payment
Title company payment
Inspecting architect
Payment method specified to be used for sub contractors
Retention specified

- Evaluating the job

Once the client and project factors are identified, it is necessary to analyze them for a decision as to whether the job is potentially a good job or a bad job. Good and bad is evaluated as to the risk and the return on investment.

A. Weigh each factor
Weight each from one to ten as to its importance to you
One - totally unimportant to being paid
Ten - most critical to being paid
B. Assign values to the client and the project which you are proposing upon
Values should be from one to ten
One - Client and project produce worst pay potential situation for factor
Ten - Client and project produce best pay potential situation for factor
C. Multiply the factor weight by the value to get a profile number
Example of profiling

How you might profile the payment potential of a new prospect.

Factor weights multiplied by value for client Jones
Honesty in business - 10 x 08 = 80
Past payment record with you 10 x 06 = 60
Past payment record with others 07 x 03 = 21
Current financial strength 07 x 05 = 35
Nature of assembled financing 05 x 07 = 35
Process for approving payment and releasing funds 08 x 09 = 72
Attitudes of the architect/engineer - 06 x 06 = 36
Method of closing out jobs 07 x 05 = 35
Factor weights multiplied by value for Jones project
Your past experience in building such facilities 05 x 08 = 40
Client past experience in building such facilities 04 x 04 = 16
Funding sources 08 x 08 = 64
Payment method 07 x 05 = 35

Total = 529 out of a total possible of 740, or a 71% potential for good payment relationship

- **Rules for getting paid promptly**
  - Be certain of your agreement and understand what it says
  - Be honest in your dealings and your intent
  - Fulfil your contract

- Avoid legal entanglements and threats
- Be willing to use the lubricating oil of small favors exchanged

- **If you aren't entitled to it don't try to get it!**
- **ho 259 - Dec, 87**

Project Definitions

By Ralph J. Stephenson PE PC

Audit - as applied to projects

Inspect, analyze & evaluate project status, management and health against criteria established as a standard of performance for any give point in time. The audit encompasses such measurements as:

- Physical condition of project
- Project progress
- Procurement status relative to needs
- Project management techniques in use as reflected by project health
- Project team performance as reflected in project health
- Where appropriate, progress measured against expected money flow
- Resources allocation
- Status of interrelations between major parties to the project
- Trends in project progress
- Trends toward or away from claim prone status

Each auditing situation is unique and the scope of the audit should be determined as specially fits each individual project and project team. All, or a part of the above measurements might be used to make the audit.

Auditing usually is done through the following steps listed in rough order

- Make pre inspection review of measurement standards to be used
- Inspect project
- Discuss inspection observations & perceived project status with key project staff
- Evaluate current interrelation between procurement and field installation needs
- Identify areas of administrative (supportive) operational difficulty & strength
- Identify areas of line (ex' e' cutive) operational difficulty & strength
- Prepare monitoring documents from current network issues
- Evaluate need for project plan update
- Update current network models as may be appropriate or required
- Prepare & submit report of project audit

Building Components

The basic units into which most buiding construction projects can be divided. Ususally the components represent distinct construction & construction related actions that have common characteristics.

Design work (des)
: Project related work that concerns production and issuing of contract documents

Exterior skin (esk)
: All elements required to close the building to weather.

Front end work (few)
: All non construction project related work concerning real estate, financing and pre construction leasing.

Interior finish work (ifw)
: All interior building components that must be protected totally or in part from weather.

Interior rough work (irw)
: All interior building components that can be exposed totally or in part to weather.

Project Definitions

Off site work (ofs)
: All work outside the property or hoarding line that is included in the project contract scope of work.

On site work (osi)
: All project work outside the building line and inside the property or hoarding (contract boundary) line.

Procurement (pro)
: Work related to solicitation of proposals, award of subcontracts, preparation of submittals, approval of submittals, and fabrication and delivery of materials & equipment to the job site.

Substructure work(sbw)
: All foundation work upon which the superstructure bears directly or indirectly. Also includes site preparation for start of field work on the building area.

Superstructure work (ssw)
: All major structural load carrying components that bear on the substructure directly or indirectly.

Unit systems work (usy)
: All work that can be installed as a unit & is somewhat isolated during construction from other components of the building

Bulletin
: An official notice that a change is being considered and that it is desired that those affected parties to the contract provide an estimate of the cost of the proposed change. The bulletin is often given other names such as change estimate request, request for proposal, or proposed change notice.

Change Order
: An official notice that the changes specified in the change order are to be done. A properly executed change order is a revision to the scope of work and the contract documents.

Critical Transition Point
: The point in a project delivery system at which the responsibility and authority for the work passes from the supportive group to the ex'e'cutive group.

Development
: A business operation in which the primary goal is to locate and produce profitable and marketable real estate assets.

Document Control System
: A method of receiving, classifying, marketing, storing, and retrieving documents received and sent on a project.

Field Order
: An official notice that the actions or changes described in the field order are to be done. The field order is usually issued only in emergency situations where the time between decision and action does not permit issuance of a bulletin followed by a change order. A method of payment is usually specified in the field order.

Horizontal Growth (Integration)
: A management system that emphasizes diversifying by expanding existing functions by classes. For instance a design office could accomplish horizontal integration through dividing their operations into various kinds of projects such as commercial, institutional and industrial. These all use the same or similar functional disciplines but the organization is divided into separate groups that concentrate mainly on one of the three main building types.

Interfaces
: Points at which different but related activities exert direct influences upon each other. Interfaces are often the points where direct objective activities contact dependent objective activities. Poor management of interface situations ususally causes problems and dysfunctions.

Project Definitions

Marketing
Establishing your organizational and individual capacities, your market and a strategy of obtaining work wihin it.

Money Flow
The flow of income and expense measured against time.

Network Planning
A graphic technique of showing necessary and desired actions needed to achieve end, intermediate and peripheral objectives.

Pro Forma - in real estate development
A financial model ususually built early in a construction program to show by projecting income and expenses, how the money flow to and from the project will occur. It is often used to establish the capital amount to be allocated to a project based on simulated operating conditions. The term pro forma means according to form.

Profiling
The preparation and use of a selective, flexible and tailored systems of screening projects for potential participation.

Schedule
A graphic or written tabulation of project activities showing where the activities are to start and finish. The schedule is derived from the plan of action and the network model by locking the tasks and the resources they require into a specific time position.

Selling
Establishing and implementing the strategy of achieving the objectives of the marketing plan.

System
An assemblage or combination of things or parts forming a complex or unitary whole.

System - closed
A system in which there is no import or export of information or physical materials, and in which, therefore, there is no change of components.

System - open
A system which exchanges energy, information and physical components with its environments.

Ultimate Decision Maker (UDM)
The individual or group at the lowest management level that has the authority to make a final binding decision in any job related matter.

Vertical Growth (Integration)
A management system that encourages divesifying by adding new functions to existing functions. New functions added usually bear an organizational relation to the existing. An example of vertical integration is incorporating real estate control, building design, financing, construction, leasing and asset management into a single development operation.

Ralph J. Stephenson PE PC
Consulting Engineer

SUGGESTIONS ON SELLING TO DESIGN/BUILD CLIENTS

During a seminar several years ago, Dr. Harvey Thomas, a behavioral psychologist, outlined several suggestions as to how the designer/builder could best cope with customer motivation and pricing problems. The words of advice from Dr. Thomas are excellent, and are reproduced below for consideration in generic (G) construction sales situations where motivation and pricing are potential problems.

To Increase Customer Motivation:

1. Give the prospect or customer a role to play.

2. Make intangible benefits you are offering, real.

3. Eliminate or minimize distractions to your discussions.

4. Emphasize the advantages of what you are offering.

5. Allow catharsis of the prospect or customer's fears.

6. Stimulate the prospect or customer's discontent with anything less than what you are offering.

To Deal with Pricing Problems:

1. Investigate possible smokescreens.

2. Use sandwich technique (i.e. advantages vs. disadvantages).

3. Broaden the customer's perspective to all advantages of your suggestions.

4. Match his or her needs against your offering and its advantages.

5. Examine costs - item by item. Don't hesitate to show your pricing work sheets.

6. Don't negotiate on the basis of generosity.

7. Create favorable illusions (i.e., give the prospect or customer a throwaway if

appropriate).

8. Give the prospect or customer a less attractive choice.

9. Overstate the prospect or customer's objections.

10. Explore the cost of a bad decision or no decision.

Each point above should be examined and reviewed in detail. As quick reminders, they serve to emphasize the need to always be aware of what it is your prospects and customers require. Make sure you understand what motivates them; then always indicate and convey your desire to work with them to achieve the things that can be best obtained from you and you alone.

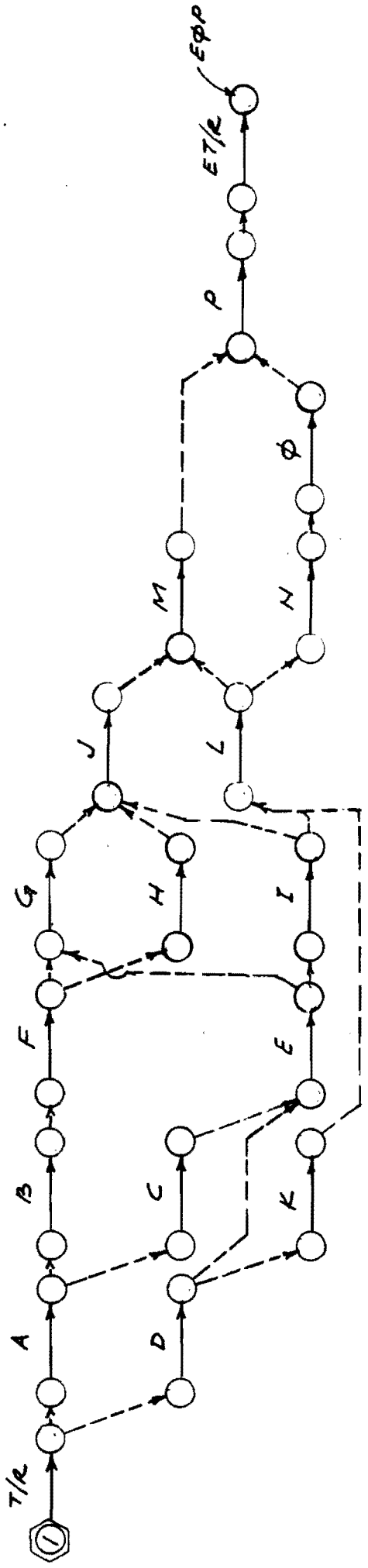
RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

CPM EXERCISE #1

Project starts with task A.
D can be concurrent with A.
B must follow A and precede F.
C follows A.
E cannot begin until both C & D are complete.
F precedes G & H.
G Cannot begin until E is complete.
H, G, & I must precede J.
I follows E and precedes L.
K follows D.
L cannot begin until K is complete.
J & L must be complete before M can start.
N cannot start until L is complete.
O follows N.
P is the last task and can start only when M & O are complete.

RALPH J. STEPHENSON, P.E.
CONSULTING ENGINEER

SOLUTION TO EXERCISE #1
ARROW DIAGRAM



Reserved Node Nos.

H/O 187

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Effective Record Keeping for the Project Manager

Definition - A record is any retained information that can be effectively used in the future.

Reasons that good design and construction record keeping is essential include:

1. The increasing numbers of people and organizations to whom the project manager is responsible.
2. A dramatic an continuing increase in the number of contested design and construction claims.
3. Higher quality and well documented design and construction performance is being demanded in an increasingly competitive business and professional environment.
4. An increased demand for higher levels of cost control than ever before.
5. The documentation demands being made by more complex financing and ownership arrangements in design and construction.
6. Use of multiple firm syndicates and joint ventures in design and construction demands particularly good documentation to protect the combined and individual business entities.

Basic guidelines for preparing record keeping forms.

1. If a standard form works, use it.
2. Display information in a logical, readable sequence.
3. Provide adequate space for proper data entries.
4. Preprint everything possible - remember it costs the organization about $90 per hour for your managers when they are not engaged in a profitable managing/decision activity. Use the manager's time well.
5. Make the form readable.
6. Prepunch the form for loose leaf binders. Use the oversize hole punch. It will save time and money.
7. Be certain the form, when complete, will provide the data you need: the user can always skip non applicable spaces.
8. Provide a specific place on the form for a date and the users signature.
9. Review all forms at least once per year to see if they should be discarded, revised or kept as is.

IF A RECORD IS NOT NEEDED DON'T KEEP IT!

	document	record action	record suptv action	record opin	record chngs	record dec & agrmts	record appvls	record progrs	record resrce flow	record data	record doc procsg	record results
1	Appraisals		x	x					x			x
2	Bulletins				x		x		x		x	
3	Certificates of completion					x	x	x				x
4	Certificates of occupancy					x	x	x				x
5	Change orders				x	x	x		x			x
6	Check lists			x					x	x	x	
7	Claim notification letters	x	x	x	x	x				x		x
8	Clarifications		x	x	x					x		x
9	Color coded network models	x		x			x	x	x	x		x
10	Construction record drawings	x				x	x	x		x	x	x
11	Construction site plan	x	x									
12	Consultant lists		x							x		
13	Contract document sign offs	x				x	x				x	x
14	Contract drawings				x	x	x		x			x
15	Contract specifications				x	x	x		x			x
16	Contractor lists		x							x		
17	Contracts	x	x		x	x	x		x			x
18	Cost estimates		x	x	x		x	x	x	x		x
19	Cost reports		x		x		x	x	x	x	x	x
20	Diaries	x	x	x	x	x	x	x			x	x
21	Document control files									x		x
22	Equipment data tabulations							x		x		
23	Expense reports		x						x	x		
24	Field orders	x			x	x	x					x
25	Field reports	x			x	x	x	x		x		x
26	Guarantees		x									
27	Impact reports	x	x	x	x	x		x	x			x
28	Interoffice memos (IOC)	x		x	x		x					
29	Isoquant line comparisons						x	x	x	x		
30	Letters	x		x							x	
31	Logs	x	x	x	x	x	x	x	x		x	x
32	Maintenance manuals										x	
33	Meeting minutes	x	x	x	x	x	x	x	x		x	x
34	Money flow curves		x					x	x	x		x
35	Monitoring reports	x		x	x	x	x	x	x			x
36	Operation manuals									x		
37	Performance evaluations	x		x		x	x					x
38	Permits		x			x	x	x			x	x
39	Phone records and logs	x	x	x	x		x	x				x
40	Photos	x			x	x		x	x			x

listed alphabetically by record type

	document	record action	record suptv action	record opin	record chngs	record dec & agrmts	record appvls	record progrs	record resrce flow	record data	record doc procsg	record results
41	Post job critiques	x		x	x		x	x	x		x	x
42	Pro forma financial analyses		x			x			x	x		
43	Project directories									x		
44	Project histories	x			x		x	x	x	x	x	x
45	Project network plans			x	x	x	x	x	x			
46	Project schedules			x	x	x	x	x	x	x		
47	Proposal spread sheets		x							x		x
48	Punch lists	x		x	x	x	x	x		x		x
49	Purchase orders		x			x	x		x			
50	Quantity takeoffs		x						x	x		
51	Requests for change orders	x	x		x	x	x		x			
52	Requests for information		x		x		x					
53	Requests for payment	x	x				x	x	x			x
54	Requests for proposals		x									
55	Resource histograms								x	x		
56	Risk management data		x									
57	Sample logs	x	x		x				x	x	x	x
58	Schedules of values				x				x	x	x	
59	Shop drawing logs				x			x	x	x	x	x
60	Site evlaluation data sheet	x	x	x								x
61	Specifications					x						
62	Testing reports		x	x	x					x		x
63	Time cards	x						x	x	x		x
64	To do lists	x						x				x
65	Transmittals	x			x	x	x	x	x		x	x
66	Waivers	x				x						x
67	Warranties					x						
68	Work orders	x			x	x	x					x

(1) Line #	(2) Equipment Description & Who Furnishes	(3) Present Location of Equip	(4) Final Location	(5) Action To Be Taken	(6) & By Whom	(7) Other Equip Affected	(8) Remarks
1	2 existing compressed air tanks (Telco)	Existing paint shop	New building paint dept	Relocate	Falstaff	New compressors must be ready to run	
				Set	Young & Falstaff		
				Hook up	Falstaff		
2	3 existing paint spray booths (Telco)	NW corner existing building	New building paint dept	Move & Set	Young	—	
				Hook up	Telco		
3	2 new paint spray booths (Falstaff)	New	New building paint dept	Erect	Young	—	
				Hook up	Telco		
4	6 existing column mounted jib cranes (Telco)	Cols 6C 5D 7D 3F 4C 2F	New bldg Cols 10A 11A 10B 11B 10C 11C	Remove	Telco	—	
				Move & Instl	Young		
5	2 new prefab shop offices 10'x15'x8' (Young)	New	1 in new bldg lab area 1 in existg bldg QA area	Erect	Young	In existg bldg after Telco clears space (watch!)	
				Mech/ Elect	Telco		

ho 200

Abbreviations

NW Northwest
QA Quality Assurance

Equipment Activity Tabulation

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CONSULTING ENGINEER

Turnover Cycle (t) Example

Definitions:

x = completion date in working days (wd)

i = starting date in working days

d = duration in elapsed working days to complete one unit

t = turnover cycle in working days (the number of working days between the completion of one unit and the completion of the next)

n = number of units

Basic equations:

$$x = i + d + t(n-1)$$

$$i = x - d - t(n-1)$$

$$t = \frac{x - i - d}{(n-1)}$$

Examples:

For x unknown

i = 160

d = 7 wd

t = 4 wd

n = 11 units

For i unknown

x = 325

d = 10 wd

t = 6 wd

n = 21 floors

For t unknown

x = 352

i = 280

d = 9

n = 15 sectors

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COMMON CAUSES OF CONTESTED CLAIMS

Contested construction claims have increased over the past few years and now must be recognized as a serious road block to proper and profitable construction procedures.

The reasons for the increase in contested claims are many and must be understood in the sense that our society has become somewhat legalistic. That is to say, the recourse to legal resolution, as opposed to interpersonal, technical, or administrative resolution of problems has become a common fortunately shows some signs of diminishing as costs and time involvement in legal matters have increased astronomically.

However, there are claims, there always have been claims, and there will probably always will be contested claims. Those in construction should however, thoroughly understand the structure of the contested claim.

Specifically, contested claims lead to resolution by an administrative settlement, litigation, arbitration, or mediation. There are some common causes of conflict and it is these that stimulate the parties to go to a formal settlement by outsiders. It is important for those in construction to understand how to avoid the mistakes that cause wasteful contested claims.

Several years ago a firm specializing in construction claims and their settlements studied some of the most common causes of disputes. Of two hundred occurrence of contested claims the following percentages were found.

1. Directed Change - 48%

A legitimate change within the contract scope for which the owner must pay.

Examples
- Owner changes the door color after the door is painted.
- Owner revises size of electrical room door opening

Advice
- Required extensions of time should be stated in writing.
- Costs for extended general conditions should be agreed upon early.
- The client or owner is obligated to pay for the change, if there is a charge.
- Payment for the work should be explicitly agreed upon before starting.

2. Constructive change - 42%

An owner's action or inaction that has the same effect as a written order.

Examples
- Shop drawing corrections, showing additional work not covered in contract documents.
- Owner's representative tells a superintendent to relocate a wall with no payment intended.

Advice
- Don't assume changes will be free. Find out if there is a cost.
- Don't enrich contract documents.
- Don't enrich shop drawings.
- Make certain the scope and costs of additional work is clearly understood.

3. Defective or deficient contract documents - 41%

Contract documents which do not adequately portray the true contract scope.

Examples
- A retaining wall shown dotted on the contract documents and expected by the architect/engineer and the owner to be built as part of the contract.
- Dimensional errors that cannot be resolved by verbal clarification.
- Contract documents that expect performance by default. For instance, specifying a miscellaneous iron ladder but not showing it on the drawings.

Advice
- Expect to pay your architect and engineer for good quality assurance in the production of contract documents.
- Select your design team on the basis of performance not cost.
- Clearly define design and construction delivery methods to be used.
- Don't expect your contractor to design the job unless it is a design/build project.
- Don't make unrecorded corrections to contract documents.

4. Delays - 41%

A delay situation beyond the control and not the fault of the contractor.

Examples
- Rock encountered that delays the job but was not shown on the contract documents.

Advice
- Be as thorough as possible in defining physical conditions of the site upon which the facility is to be constructed.
- Specify weather standards when it is necessary to clarify time extensions that might be caused by inclement weather.
- Determine delay costs quickly and eliminate them as soon as possible.
- Don't stop field work without proper authority and a very good reason.

5. Constructive acceleration - 35%

More work with no time extensions, or the same work and a shorter time period in which to do it.

Examples
- Owner refuses to grant time extension for work that will take longer to perform.
- Owner makes unauthorized use of critical path time without extension.
- Owner makes use of float time with the expectation that the contractor will not request or require a time extension.

Advice
- Never assume the contractor will do extra work within the contract time.
- Work out an early agreement on the use of float time in the network model.
- Never assume a field order is a no cost, no time extension change.

6. Maladministration - 35%

Owner interference with the contractor's right to enjoy least cost performance.

Examples
- Owner directs contractor to provide a certain space in a facility early without such early turn over having been specified in contract documents.
- Owner directs contractor to start work on an encumbered site.
- Architect/engineer unresponsive to legitimate requests for information.

Advice

- Always allow the contractor to select construction methods and means.
- Make certain the site is fully available to the contractor before the job begins.
- Process submittals promptly.
- Clearly define the time frame and the sequence by which submittals are to be processed, and do it early in the job.

7. Differing site conditions - 31%

The actual site differs from that represented on the contract documents, or deviates from ordinary or normal expectations of such a site in that area.

Examples
- Artesian water encountered in sand seam outside of where soil borings were taken.
- Existing basements encountered but not indicated on contract documents.
- Restrictive easements or assessments on the property not made known to the contractor before contract execution.

Advice
- Expect to pay for and get a good site survey
- Make certain soil borings are adequate to show any unusual conditions.
- Locate and define all easements.
- Check the site history for unusual or restricted conditions.
- Take photos of any unusual conditions encountered.

8. Impossibility of performance - 18%

A situation where it is impossible to carry out the contract work.

Examples
- Expecting a contractor to work on an encumbered site.
- Owner refuses to move interfering utilities he is supposed to relocate by contract.
- Specifying installation of above ceiling work that won't fit in the space provided.

Advice
- Expect the design team to check their work thoroughly for interferences.
- Accept your legitimate design and administrative duties and responsibilities and take care of them.
- Resolve dimensional difference early.
- Do your homework to presolve expected problems and interferences.

9. Superior knowledge - 18%

Withholding data or information during the pre contract period, that affects construction on matters of importance.

Examples
- On a steel erection contract not telling the bidders that the steel had been refabricated from a previous job.
- Failing to tell bidders that there is a cost cap on the first two months costs
- Not telling bidders that there is a high pressure gas line through the site that must be accommodated during construction.

Advice
- Be certain all bidders know as much as they must know to propose properly.
- Be certain demolition contract documents specify all work to be done.
- Locate, to the best of your ability, all site obstructions before bidding.
- Don't expect the contractor or the architect and engineer to read your mind.

10. Termination - 7%

Dismissal from the project for convenience or default.

Examples
- The section of the project is no longer needed and is removed from the contract.
- The contractor is behind schedule.
- The contractor's performance is unsatisfactory.
- The owner doesn't like the way the superintendent talks back to him.
- The contractor doesn't manage submittals promptly and accurately.

Advice
- Be certain the cause for dismissal is legitimate and well defined.
- Don't dismiss for minor reasons. Dismissal is serious business.
- If dismissing, be certain proper notice is given.
- Insure the contract documents give you the right to dismiss.

Swimming with the Sharks in construction

Program Evaluation

Speaker Ralph Stephenson **Date**_____

The rating scale is (5) "excellent" to (1) "poor'
please circle the appropriate score in each category

Overall program rating	5 4 3 2 1
Ultimate value of information to you	5 4 3 2 1
Organization and flow of material	5 4 3 2 1
Originality of content	5 4 3 2 1
Overall speaker rating	5 4 3 2 1
projected enthusiasm and a positive image	5 4 3 2 1
responsive to participants' concerns	5 4 3 2 1
demonstrated mastery of subject	5 4 3 2 1
Overall logistics rating	5 4 3 2 1
sound quality	5 4 3 2 1
speaker visibility (lighting, overheads)	5 4 3 2 1
registration and support people	5 4 3 2 1

Please take moment to help us better plan our future meetings.

What type of programs would like to see presented by ASPE in the next few months (select 3).

Trends in the construction industry
Estimating software packages
legal issues in construction
Scheduling and Planning
Bidding and Bid Mistakes
What's the Economic Outlook for construction
Lien Waver Law
Estimating Tools for Success
Others (please list)_____

How did you hear about the meeting to night ?

Mailing ___ Phone call___ Word of mouth___

Other comments:

Please list your name so we can contact you for future programs (optional)

Name_____
Address_____
_____
Phone_____