American Society of Professional Estimators
Project Management Seminar
Grand Rapids, Michigan

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MANAGEMENT AND TRENDS IN PROJECT DELIVERY SYSTEMS FOR THE DESIGN AND CONSTRUCTION PROFESSIONAL

American Society of Professional Estimators

Date: January 17, 2002

Location: Cascade - Grand Rapids, Michigan

Time: 08:30 A.M. to 12:00 noon and
01:00 P.M. to 05:00 P.M.

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ON CORRECT LANGUAGE

"If language is not correct, what is said is not what is meant: What ought to be done remains undone: Morals deteriorate: Justice will go astray: And the people will stand about in hopeless confusion."
(quote from Confucius)

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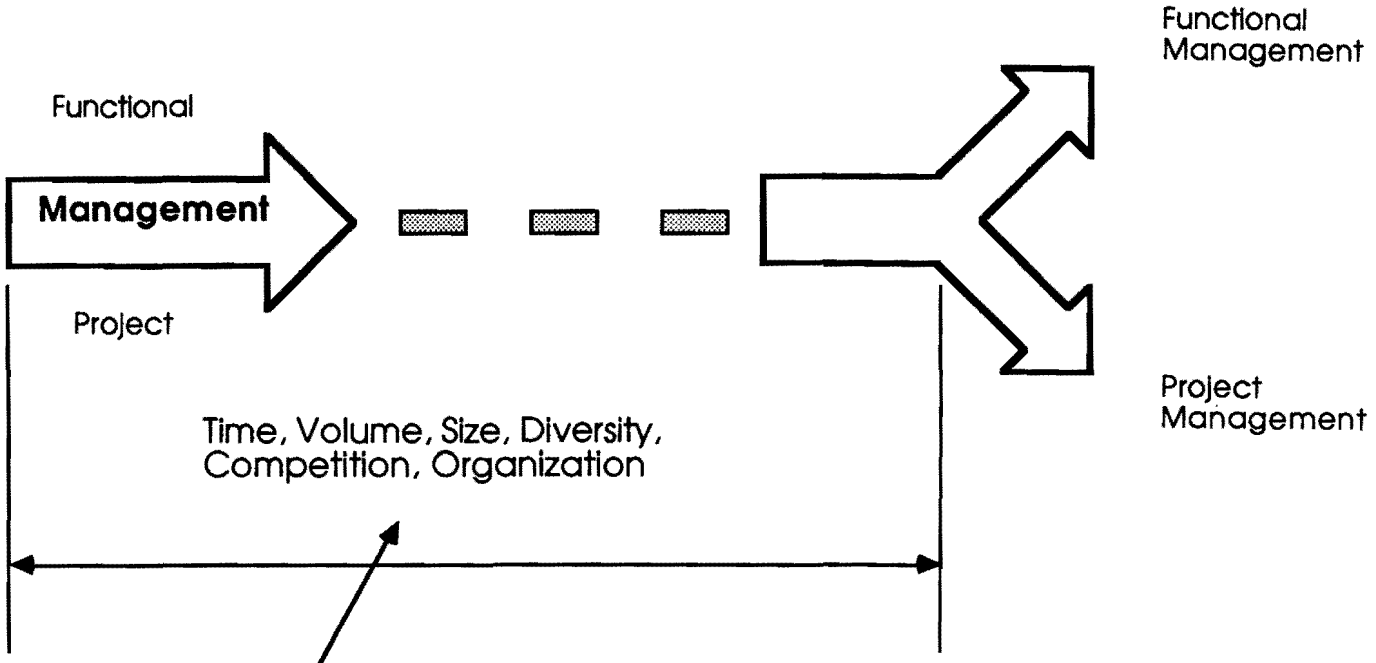

• These are some of the factors that initiate changes in the method by which a planning, design, construction organization is managed .

Relation between functional and project management in the evolving organization

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ho 364, Feb, 90

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THE NEED FOR PROFIT

A. KINDS OF PROFIT

1. Financial
2. Social
3. Self actualization
4. Value system
5. Technical
6. Enjoyment
7. Educational

B. ELEMENTS OF MULTI VALUE COMPETITION

1. Competence
2. Service
3. Integrity
4. Cost
5. Delivery
6. Understanding

C. HOW DO WE ACHIEVE PROFIT - TRUE PROFIT?

1. Be smarter
2. Plan better
3. Control closer
4. Achieve more

& profits will be automatic!

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The Project Manager - d494

I. **Project related definitions**

A. **Project**
A set of work actions having identifiable objectives, and a specific beginning and end.

B. **Project team**
A specific management group assigned to achieve a set of objectives by accomplishing a group of related, discrete operations which have a defined beginning & end. Examples include the design team, the program team, the construction team, the tenant work team, and others similar in nature.

C. **Project component**
A set of related objectives achieved by a defined work group, and gained by accomplishing a set of related, discrete operations which have a defined beginning & end. Examples include designing the project, constructing the foundations, putting the building in the dry, closing out the job, and others similar in nature.

D. **Project director**
The individual responsible for implementation of several projects upon which his organization is engaged.

E. **Project operations**
Management and staff direction of resource use to accomplish overall project activities.

F. **Project organization**
The arrangement and interrelations of people charged with actually achieving project objectives.

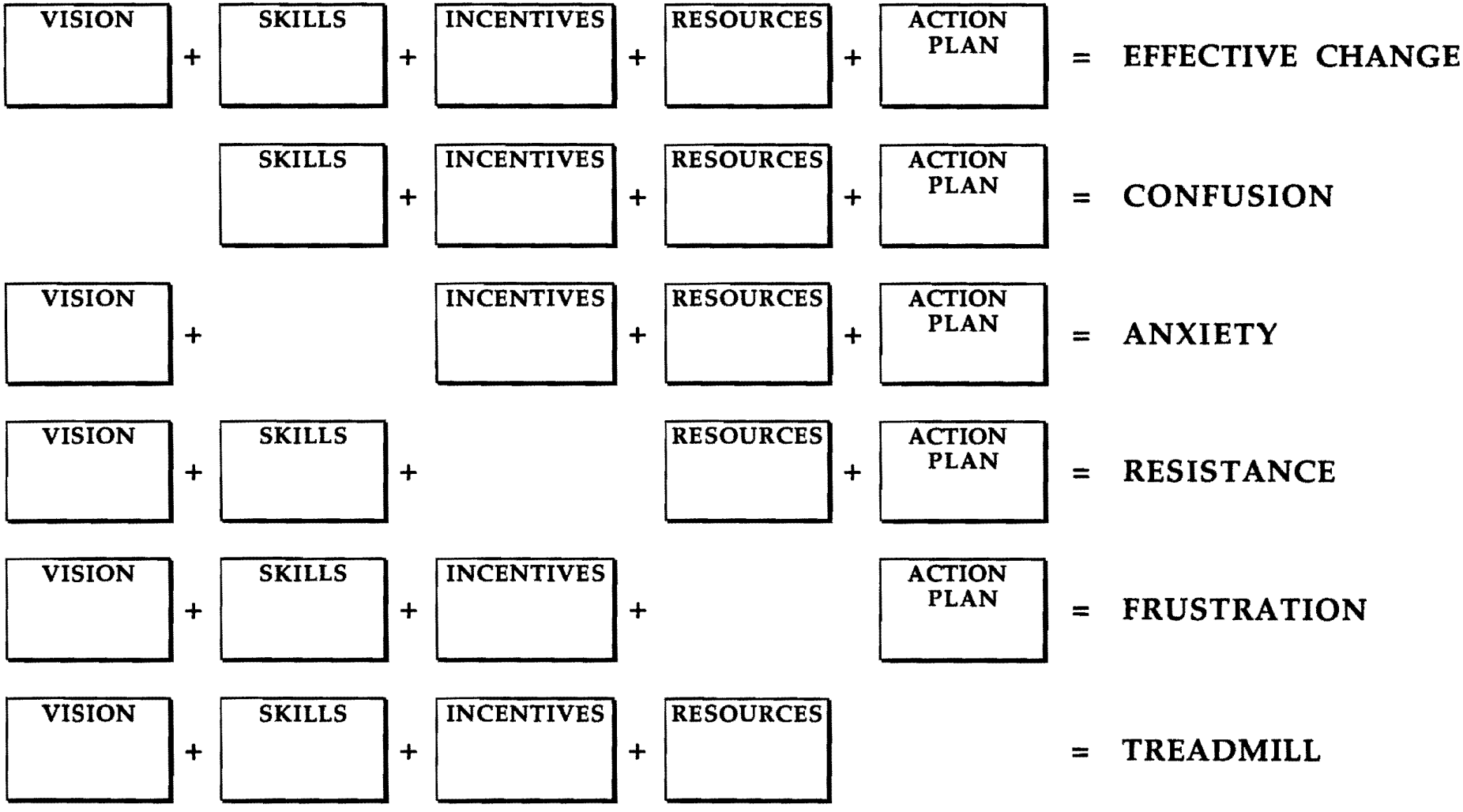
G. **Project stages**
The groupings of actions that make up an entire project work sequence such as conception, programming, approval, design development, contract document preparation and other similar sequential operations.

II. **What does a project manager do?**

In conjunction with the project team, establishes objectives generated by a need, plans how these objectives are to be reached through a set of work actions, and then assembles and directs the application of available resources to achieve the objectives on one or more projects.

Usually the project manager is most concerned with supportive actions which bring resources to the point of effective use.

MANAGING COMPLEX CHANGE



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Adapted from T. Knoster (1991)

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LINE OF ACTION

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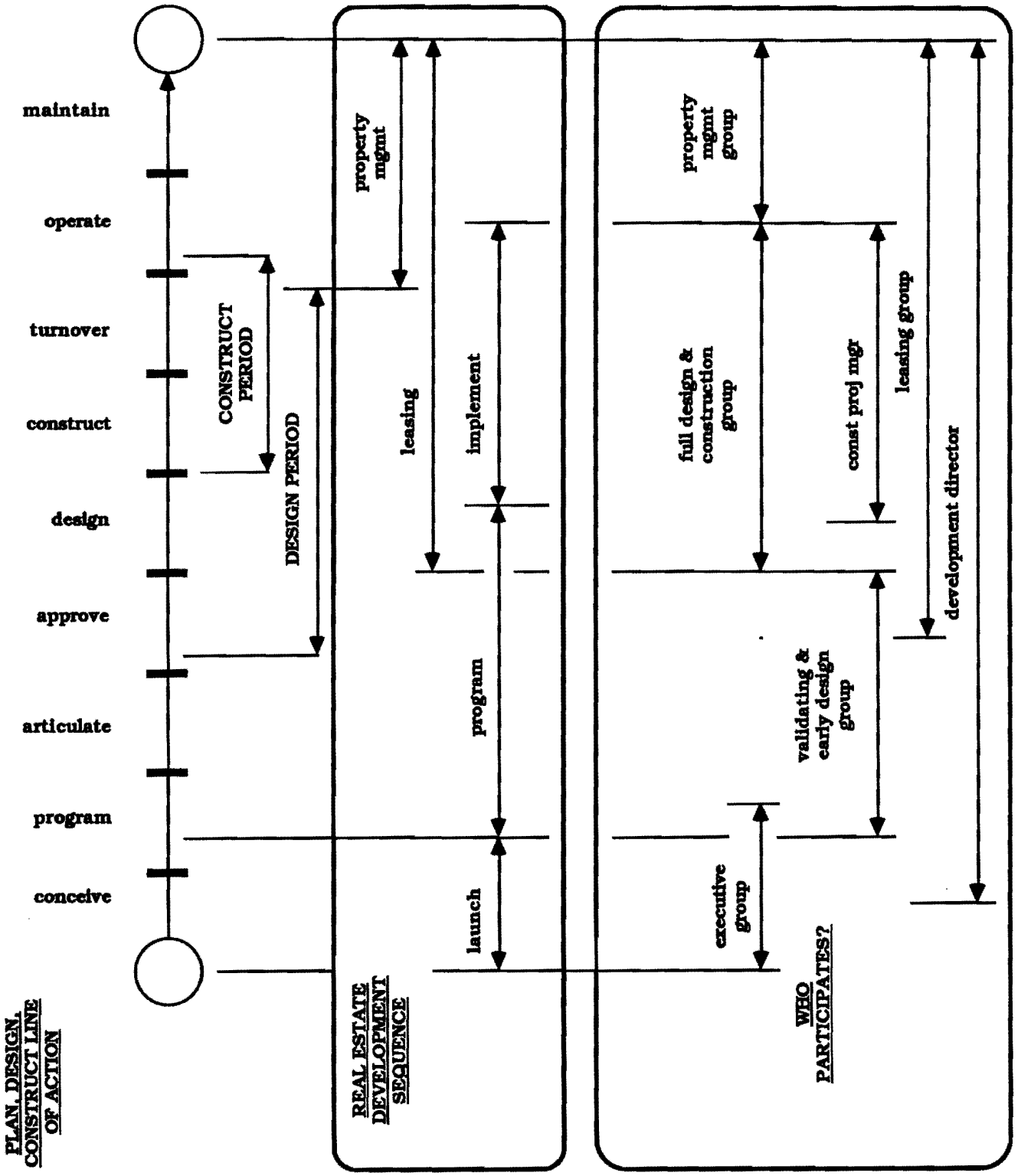

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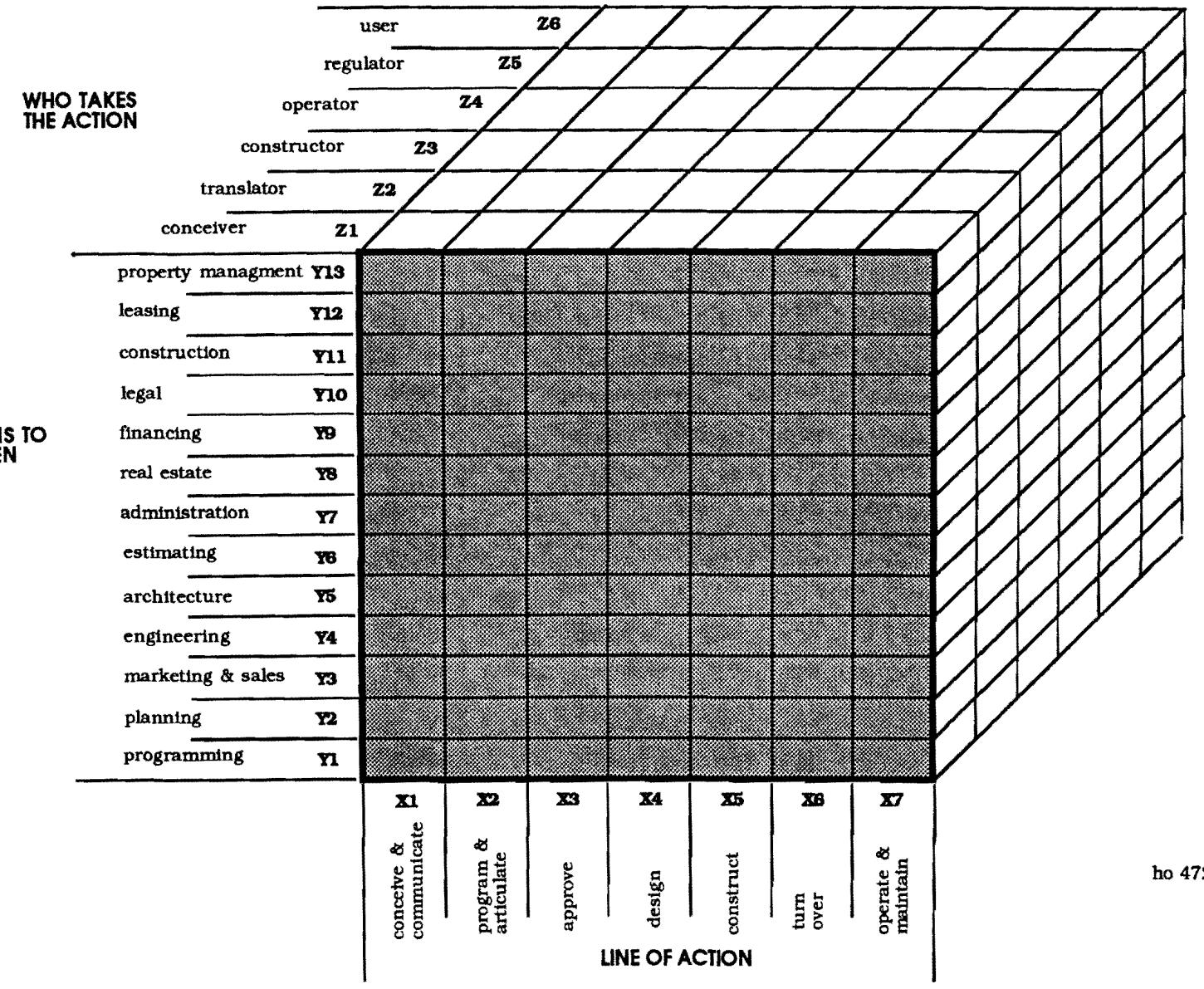
DEVELOPMENT CYCLE ACTIONS & ORGANIZATION

Oct, 1988 - ho321

FIGURE 472
MACRO MATRIX BOUNDARIES
OF DESIGN AND CONSTRUCTION



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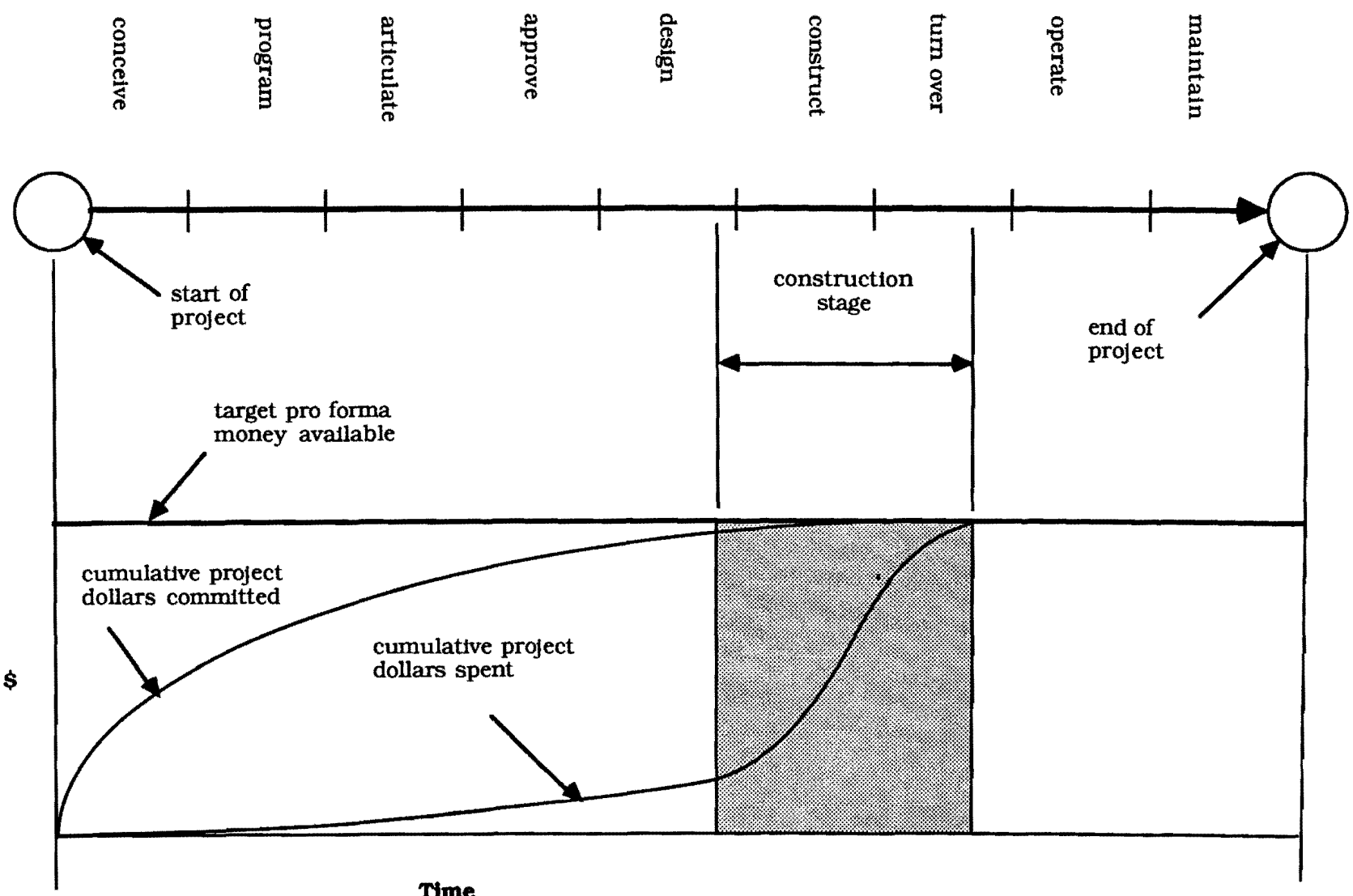

Costs Committed Compared to Money Spent on Construction Projects

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ho 350 Jan 90

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Costs Committed vs. Money Spent

Committed costs are promised funds for purposes, that if such purposes are aborted a penalty must be paid, and a loss is often incurred.

Penalties and losses may include such items as:

- OPTION COSTS
- RIGHT OF FIRST REFUSAL COSTS
- LEGAL FEES
- EARLY ENGINEERING FEES
- EARLY PLANNING FEES
- DISPLEASURE OF POLITICAL ENTITIES
- STAFF TIME EXPENDITURES
- LOSS OF CREDIBILITY
- LOSS OF OPPORTUNITY

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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 the 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 in litigation of 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.

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.

v. Poor owner reputation.

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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.

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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.

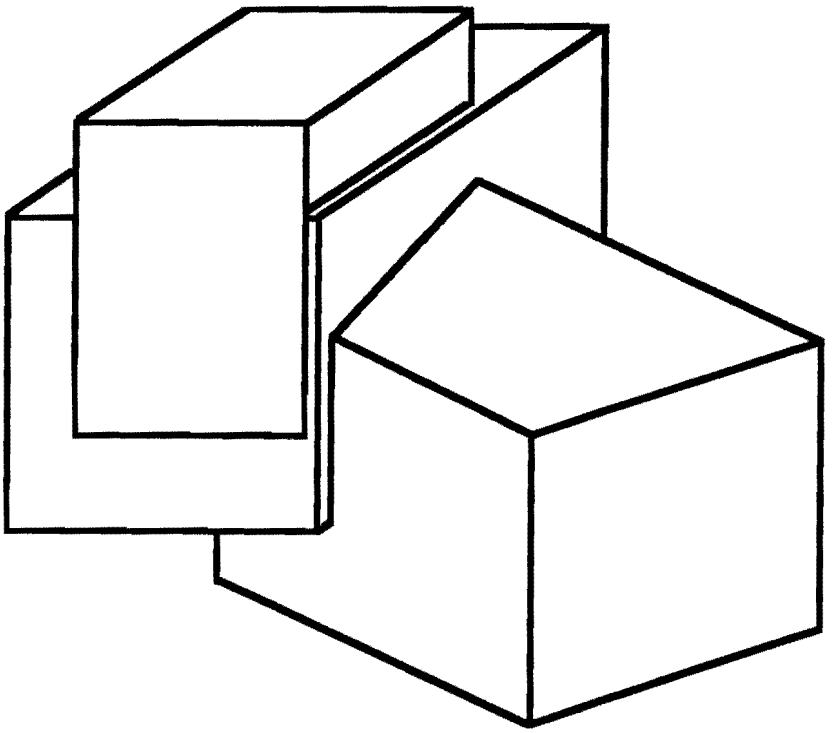
4. The action plan is translated into schedules, and the resources needed are determined and balanced for most profitable performance.
5. A project organization is built under (not over) the resources required to provide resource management quality, continuity, and monitorbility.

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.



PROGRAM

MANAGEMENT

ho 540 - April 4, 2000
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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

ho 362 Jan, 90

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

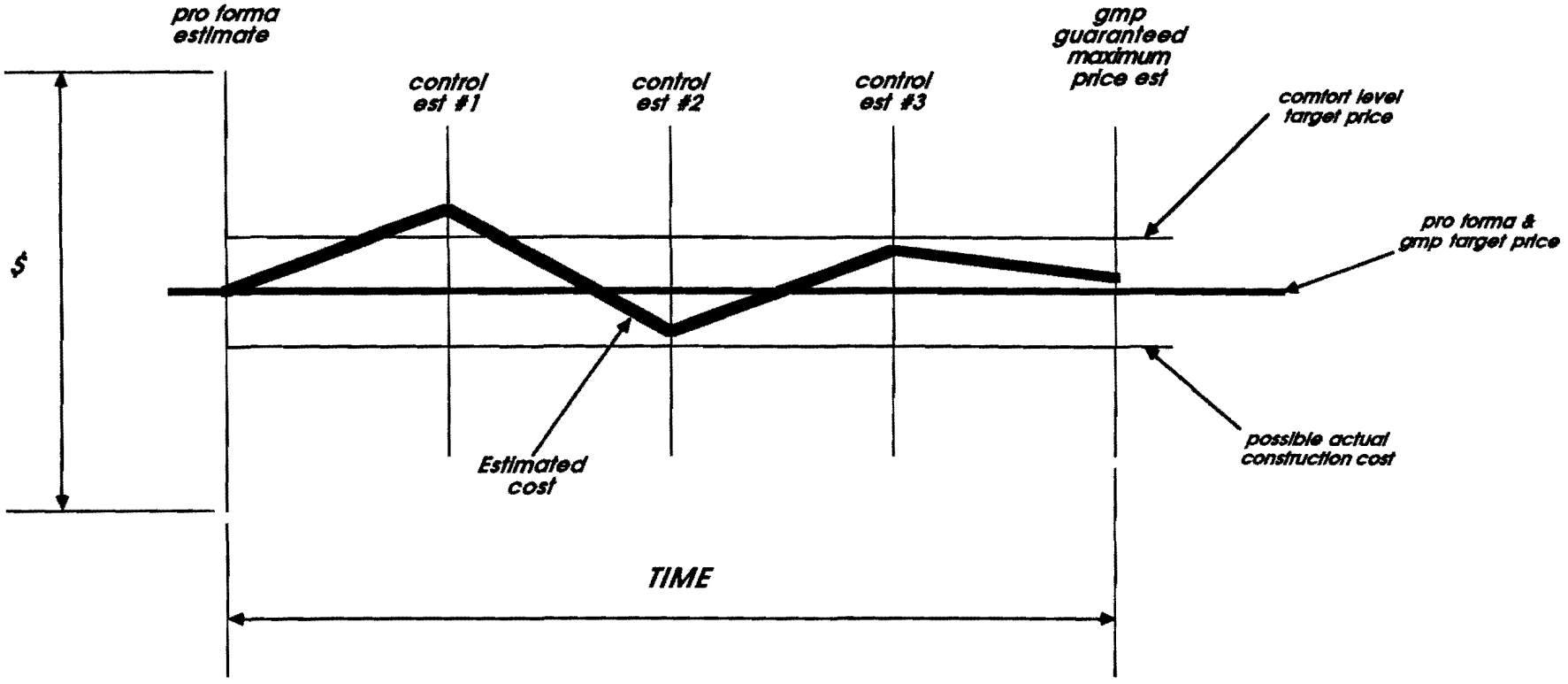
1. As full agent
2. As limited agent
3. As contractor

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
4. 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



THE ITERATIVE COSTING SEQUENCE

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Alternative Dispute Resolution and Partnering - an overview

I. Definitions
- A. Alternative dispute resolution.
- B. Neutral.
- C. Partnering
- D. Project partnering.
- E. Resolution
- F. Strategic partnering.

II. Alternative dispute resolution (ADR) systems and their application in construction.
- A. Some resolution methods available
  - 1. Non binding
    - a) *Prevention methods* - produces maximum harmony - usually least cost.
      - (1) Intelligent and proper risk allocation
        - (a) Risk should be assigned to the parties that can best manage or control the risk, i.e.
          - i) The owner, if the architect/engineer is expected to assemble and write the program.
          - ii) The architect/engineer, if the owner has prepared a well conceived and clearly stated program.
          - iii) The owner, where construction is expected to begin before construction documents are complete.
          - iv) The contractor, where full, well prepared, and checked construction documents are available prior to the start of construction.
        - (b) Attempts to shift risks to architects, engineers or contractors not able to absorb these risks is not cost-effective
          - i) Reduces competition
          - ii) Increases costs due to greater contingency allowances.
          - iii) Increases costs and reduces effectiveness because of the potential for increased numbers and intensity of design & construction project disputes.
      - (2) Incentives for cooperation
        - (a) Incentives or bonus provisions
        - (b) Disincentives or penalty provisions
      - (3) Partnering
        - (a) Stresses good faith agreements
        - (b) Emphasizes teamwork
        - (c) Encourages good communications
    - b) *Internal negotiation methods* - parties involved conduct negotiations - requires consensus - relatively cost free.
      - (1) Direct negotiations (often starts at UDM level)
      - (2) Step negotiations (starts at dispute originating level)
    - c) *Informal external neutral methods* - preselected external neutral serves as a informal dispute-resolver - relatively low cost.
      - (1) Architect/engineer rulings
        - (a) May be respected even though not legally binding.
        - (b) Must be impartial

(2) Dispute resolution board
(a) One member selected by owner and approved by contractor; one by the contractor and approved by the owner; a third by the first two members. Third selection usually acts as chairman.
(b) Those selected should be from the design & construction industry.
(c) Must have no conflict of interest.
(d) Conduct investigations and hearings on disputes and publish prompt opinions re the dispute.
(3) Independent advisory opinion.
(a) Mutually agreed upon neutral expert meets informally with interested parties, obtains information from both, and render prediction as to the ultimate outcome if not resolved at meeting level.

d) *Formal external neutral method* - preselected external neutral(s) serves as formal dispute resolver - relatively low cost - usually requires considerable preparation, and may require legal assistance.
(1) Mediation - settlement conferences and informal hearings conducted by a neutral third party.
(2) Minitrial - private settlement method usually initiated by an agreement between the parties - less formal than mediation.
(3) Advisory opinion - neutral expert meets with both parties, obtains information from both, and render prediction as to the ultimate outcome if adjudicated.
(4) Advisory arbitration - abbreviated hearing before neutral expert(s). Arbitrator(s) issue advisory award, and render prediction as to ultimate outcome if adjudicated.

2. Binding
a) *Outside of courtroom* - dispute given to knowledgeable third party - moderate cost - may require legal assistance.
(1) Binding arbitration
(2) Private judge
b) *Inside of courtroom* - most expensive - usually requires legal assistance.
(1) Bench trial - before a judge
(2) Jury trial - before a jury

B. To achieve successful dispute resolution requires:
1. A desire for a win - win result;
2. A desire for a fair settlement;
3. People in charge who want a fair resolution;
4. A negotiation technique that is acceptable to those involved;
5. Knowledge of how to arrive at a resolution system that can produce a decision;
6. Understanding that unresolved conflict and disputes often requires that a neutral view be considered as a tool for positive change;
7. A belief that if you aren't entitled to it don't try to get it!

III. Partnering is a system of conducting business with minimal destructive conflict.
A. Other names for partnering
1. A gentleman's agreement
2. "Let's look at the drawings a bit more closely."
3. "Let's tally up the favor score?"
4. "Let's settle this over a beer."
5. A handshake agreement.

IV. Why is partnering applicable in today's construction industry?
  A. What value is added by partnering?
    1. Lower costs to resolve conflicts.
    2. Quicker settlement of conflicts.
    3. Knowledgeable professionals make the resolution decisions.
    4. Decision makers are closer to the resolution process.
    5. Nature of decisions rendered lessen the probability of appeal.
    6. Participants gain privacy in the resolution process.
    7. Probability of fair resolution is increased by more timely consideration of the dispute.
    8. Helps cross critical transition points by setting the ground rules for the crossing
  B. Where and why has partnering been successful?
    1. Comments on partnering from the Albuquerque District Corps of Engineers staff in a guide to partnering dated February, 1991
      a) Disputes reduced - no formal claims.
      b) Common objectives achieved (schedule, safety, etc.).
      c) Increased responsiveness.
      d) Higher trust levels.
      e) Improved communication.
      f) Excellent cooperation & teamwork.
      g) Increased value engineering proposals.
      h) Developed expedited process for tracking and resolving open items.
    2. Comments on partnering by Colonel Charles E. Cowen - Commander Portland District Corps of Engineers in a strategy for partnering in the public sector - April 15, 1991
      a) 80 to 100 % reduction in cost growth over the life of major contracts.
      b) Time growth in schedules virtually eliminated.
      c) Paper work reduced by 66%.
      d) All project engineering goals met or exceeded.
      e) Completion with no outstanding claims or litigation.
      f) Safety records significantly improved.
      g) Pleasure put back in the process for all participants.
    3. Combination partnering relationships surveyed & studied by the Construction Industry Institute and reported in the publication ("In Search of Partnering Excellence" - July 1991).
      a) Shell Oil/SIP Engineering - 1984.
      b) DuPont/Fluor Daniel - 1986.
      c) Proctor & Gamble/Fluor Daniel - 1986.
      d) Proctor & Gamble/BGP - 1986.
      e) Shell Oil/Bechtel - 1987.
      f) DuPont/MK - Ferguson - 1987.
      g) Shell Oil/The Ralph M. Parsons Company - 1987.
      h) Alcan/Fluor Daniel - 1988.
      i) Union Carbide/Bechtel - 1988.
      j) DuPont/Day & Zimmerman - 1988.
      k) Great Northern Nekoosa/Rust International - 1988.
      l) Pillsbury/Fluor Daniel - 1989.
      m) Hoffman-LaRoche/Day & Zimmerman - 1989.
      n) Chevron/Bechtel - 1989.
      o) Bethlehem Steel/United Engineers & Constructors - 1989.
      p) Proctor & Gamble/M. W. Kellogg - 1989.

q) Chevron/Besteel - 1990.
r) DuPont/H. B. Zachry.

C. Situations in which partnering may be difficult to use
1. Where the parties intend to pay lip service only to the partnering effort.
2. Where individuals in key technical or management positions choose to resist intelligent discussion and fair decision making.
3. Where early commitments by the owner have made made good intercontract relationships difficult or impossible to maintain.
4. Where construction contracts are let as the documents are being released for field use.
5. Where several parties to the contract prefer to resolve disputes by contested claiming & binding resolution.
6. Where poor contract documents are made the basis of the partnering effort.
7. Where excessive, one sided conditions are placed on sub contractors by prime contractors.
8. Where unfair or obscure payment processing systems are specified and enforced.
9. Where risk has been poorly defined and unfairly allocated.

V. What are some of the ingredients of a successful partnering effort plan ?
A. Develop and maintain a strong desire to achieve project success for all.
B. Make intelligent commitments.
C. Avoid accepting or imposing unreasonable risk.
D. Work and act ethically, morally, and with integrity.
E. Work and act from a position of fairness rather than a position of power.
F. Suppress greed.
G. Try to establish an honest feeling of trust among participants.
H. Assign experience, competent people to responsible management positions.
I. Have empathy.
J. Prepare a good charter, a good partnership evaluation system, and a good issue resolution process.

VI. Experiences and applications of the partnering concept.
A. What actions do others engage in that create problems for us, or do we engage in that create problems for others? (sample responses from an actual charter meeting.)
1. Giving directions to proceed without a timely change order.
2. Failing to establish clear chain of command.
3. General contractor covering general conditions costs by charging subs.
4. Lack of timely acceptance of work.
5. Lack of timely responses to
a) RFI's.
b) Approval of shop drawings.
c) Site activity restrictions.
d) Change orders.
e) Value engineering.
f) Acceptance of work.
6. Improper passing of general conditions responsibility to subs.
7. Lack of forum to evaluate and resolve open issues.
8. Slow submittal turn around.
9. Unreasonable punch lists.
10. Failure to recognize impact of changes on ongoing work.
11. Late submission of proposals.

12. Untimely submission of as-builts, operating & maintenance manuals, and training of user personnel.
13. Failure to maintain clean efficient, safe working conditions.
14. Do your own punch lists.
15. Pretest special systems - equipment start-up.
16. Untimely delivery of owner equipment.
17. Slow payment.
18. Design errors and omissions.
19. Resistance to solving problems perceived as *contractor problems.*
20. Changes issued in incomplete form (sketches & narrative).
21. Slow owner response to concurrent reviews & changes.
22. Pass through attitude by general contractor.
23. Bid shopping.

B. Recommendations to help resolve some of the problems we or others cause. (samples from an actual charter meeting.)
1. Better communications.
2. Less defensiveness/more openness.
3. Fast dispute resolution.
4. Don't take issues personally.
5. Contractor review requests for information & submittals before processing.
6. Be willing to propose/suggest solutions.
7. Submittal schedule provided.
8. Prioritization of submittals.
9. Complete/thorough questions.
10. Positive attitude.
11. Recognition of owner's need to eventually occupy, operate and maintain facility/systems.
12. Recognition of importance of paper work.
13. Allowing necessary contract time for training.

VII. Guidelines for the application and use of partnering concepts.
A. Determine the need for a partnering system.
B. Set goals and objectives to be gained from a partnering system.
C. Obtain management commitment for use of a partnering system.
D. Develop a partnering plan of action (the charter).
E. Obtain management commitment to a partnering plan.
F. Train and educate project participants in the partnering concept.
G. Create and implement an issue resolution system.
H. Create and implement a partnering review and evaluation process.

VIII. Charters - provided by courtesy of project management and staff noted
A. *Veteran's Administration Medical Center Replacement Hospital* - Detroit, Michigan
1. Mission statement
2. Charter objectives
a) 01. Maintain open lines of communications.
(1) a. Recognize the need for quality information
(2) b. Minimize submittal and response times in all matters
b) 02. Keep paper and administrative work to a minimum.
c) 03. Develop and implement an alternative conflict resolution system.
(1) a. Prompt resolution of conflicts at lowest possible level
(2) b. Eliminate need for Contracting Officer decisions

(3) c. Fair interpretation of ambiguities
(4) d. Be proactive (not reactive) in problem solving
(5) e. Maintain objective attitude toward constructability and practicality
(6) f. Accept responsibility for your actions or inactions
(7) g. Have empathy in all matters
(8) h. Clearly describe changes to contract work

d) 04. Limit cost growth.
(1) a. Develop cost effective measures

e) 05. Maintain clean, efficient, secure work site.
(1) a. No lost time due to accidents
(2) b. Properly staff project
(3) c. Be a good neighbor

f) 06. Seek to maintain good job morale and attitudes.
(1) a. Promotion of partnering attitudes at all levels of contract administration
(2) b. Have fun
(3) c. Have pride in your product

g) 07. Commit to quality control in all project related matters.
(1) a. Do it right the first time
(2) b. Maintain proper work sequence
(3) c. Meet design intent
(4) d. Recognize owner's needs in occupation and operation of the facility

h) 08. Close out job in proper and timely manner.

i) 09. Maintain and implement a partnering evaluation system.

B. *Michigan Millers Mutual Insurance Addition & Renovation* - Lansing, Michigan

1. Mission
a) We the Project Team commit to construct a quality facility, on time and within budget, maximizing safety, communication, & cooperation so that all participants can be proud and profitable in their accomplishments.

2. Objectives - to accomplish our mission we recognize a need to work to the following goals and objectives.
a) Submittals
(1) Clarify objectives and expectations of the submittal process.
(2) Minimize submittal and approval times.
(3) Provide accurate, prompt, clear, concise approvals.

b) Payments
(1) Make payments in accordance with the published flow chart process.

c) Information processing & paperwork
(1) Expedite all information and indicate desired response times .
(2) Maintain open lines of communication among Project Team members.
(3) Be available.
(4) Attempt to offer possible solutions to questions within a proper scope.
(5) Provide clear responses to requests for information.

d) Legal matters
(1) No litigation.
(2) Settle disputes at originating level .

e) Abatement
(1) Establish, approve and publish a plan of abatement.
(2) Abate promptly.

f) Planning and scheduling
   (1) Provide, obtain, and use accurate activity information.
   (2) Clearly monitor the project against the plan and schedule.
   (3) Commit to, and fulfill man hour projections.
g) Decision making
   (1) A/E team to regularly inspect work and advise compliance.
   (2) Define and clearly communicate quality expectations.
   (3) Properly empower those at all decision making levels.
h) Policies and procedures
   (1) Prepare, review, approve and publish policies and procedures that will serve as guidelines to manage the project.
i) Site layout and management
   (1) Formulate and publish a trash removal & parking plan.
   (2) Properly establish and maintain bench marks and control lines.
j) Processing revisions
   (1) Provide written authorization prior to work proceeding.
   (2) Respond to requests for information, bulletins and change orders promptly.
   (3) Prepare, approve & publish a flow chart for processing revisions.
k) Be a good partnering neighbor
   (1) Commit to protecting your work and the work of others.
   (2) Show all participants due respect and acknowledgement.
   (3) Maintain proper work sequences.
l) Total quality management (TQM)
   (1) Prepare, approve, publish, and commit to a TQM program.

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DESTRUCTIVE CONFLICT

Animosity or disagreement which results in lowering the potential for an individual or organization to succeed.

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Destructive conflict in today's technical world is often caused by:

- Not understanding that conflicts lead directly to results.
- Frustration over a lack of control of events affecting performance.
- Differences in goals and objectives of parties in the project.
- Lack of understanding about the needs of others also involved in the planning, design, and construction process.
- Resentment or dislike resulting from a perceived lack of value added to projects by those responsible for adding value.
- Excessive technical and legal delays to resolution of conflict.
- Excessive demands on resources normally depended on to assist in the resolution of conflict.

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- Greed.
- Incorrect assumptions made from biased perceptions.
- Demands for higher quality than specified.
- Failure to meet commitments.
- Insufficient time to make required decisions.
- Lack of ability to do the job.
- Poor or inadequate training.
- Inadequate credentials to do the job.
- Indifferent leadership.
- Actual or perceived overwork.
- Bad blood among participants.
- Desire to take advantage of those in weaker positions.
- Misplaced attempts to demonstrate who is in charge.

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Partnering Charter Objectives

The list of objectives below is designed to assist the stakeholders to write a sound, well expressed charter. If a numbered objective fits a particular recommendation your team wishes to make, note the number of the objective and any revisions you wish to make to it. We will then consider the objective for inclusion as we write the project charter.

Topics appearing below include:

A. Approval Processes
B. Being A Good Off/On Site Neighbor
C. Closing Out the Project
D. Communicating With Others
E. Decision Making
F. Documents and Documentation
G. Financial Matters
H. Inspection and Testing
I. Issue, Conflict, and Problem Resolution
J. Job Management
K. Legal Matters
L. Maintaining Regular Project Evaluations
M. Organization, Authority, and Responsibility
N. Planning and Scheduling
O. Payment Processing
P. Personnel Quality and Problems
Q. Regulatory Agency Matters
R. Revision Processing
S. Staff Morale and Attitudes
T. Submittal Processing
U. Work-site Conditions

Don't hesitate to change wordings since it is entirely possible that your expression of a desired objective may be different than that of the original.

A. Approval Processes

1. Provide required documentation and approvals within the mutually agreed upon time frame.
2. Make and document all decisions, and provide all approvals at their management level promptly, fairly and with consideration of the requirements

of the project.

B. Being A Good Off/On Site Neighbor

3. Maintain a clean, safe, accessible , and well-planned work site.
4. Recognize that project conditions and decisions affect other partners in achieving the overall design intent.
5. Maintain, in conjunction with other stakeholders, a work area plan to be implemented by affected stakeholders.

C. Closing Out the Project

6. Establish close-out guidelines that provide clearly understood direction for punching out the job, issuing Certificates of Substantial Completion, establishing intermediate occupancy dates, and maintaining and transmitting contract record documents.
7. Prepare and specify a close out plan.
8. Prepare and specify a rolling punch list and close out procedure.
9. Establish and implement guidelines that provide direction for accepting the work and closing out the job.
10. Do it right the first time and strive to achieve a minimal punch list.

D. Communicating With Others

11. Prepare, publish, keep current and respect a chart of channels of communication, responsibility, and authority.
12. Limit the release of public information through the owner's designated representative only.
13. Anticipate, identify, and accurately communicate potential job problems
14. Ask questions and request information clearly and accurately
15. Be sensitive to the informational needs of the design and construction team partners.
16. Communicate all issues in a timely fashion to all those affected by the issues.
17. Communicate clearly, accurately and in a timely manner through appropriate project channels.
18. Communicate effectively in an open, honest manner with all appropriate stakeholders.
19. Anticipate and communicate the conditions and disruptive circumstances inherent in demolition and construction activities, to the staffs of the various facilities that are a part of this total program.
20. Communicate the principles of partnering on this project to all participating

organizations and individuals.
21. Identify planned and required shut downs, and outages from and to the designers, builders, and the Capitol Complex operations staffs.
22. Ensure the design is understood and acknowledged by all the partners.
23. Maintain open lines of communication
24. Make progress and technical meetings productive and brief by preparing well, and bringing both problems and solutions to the table.
25. Prepare and publish a communications flow chart showing roles and responsibilities of all project team members.
26. Prepare well for progress meetings and make them brief and productive.
27. Promptly prepare and respond to requests for information, substitutions, and clarifications of project documents.
28. Provide adequate data re: user-furnished equipment for construction to proceed as desired.
29. Provide timely communications, responses, decisions... and be available.
30. Recognize that project conditions and decisions affect other partners in achieving the overall design intent.
31. Regularly monitor and discuss, all anticipated outages with utility company and subcontractor input and provide maximum possible notice to the user of anticipated outages.
32. Respond promptly to requests for information and clarifications of contract documents.
33. Stay in touch with the project, i.e. reading meeting minutes, attending meetings as needed, and being available for input
34. Prepare, publish and adhere to the lines of communication, authority, and responsibility for the school building partnering team.
35. Prepare and respond promptly and completely to requests for information and clarification of contract documents.

E. Decision Making

36. Make decisions in a timely manner and stand by the agreements you have made.
37. Make timely decisions in all project related matters.
38. Provide adequate backup data, within expectations, to allow timely and accurate decisions to be made by members of the project team.
39. Recognize that project conditions and decisions affect other partners in achieving the overall design intent.

F. Documents and Documentation

40. Accurately prepare and properly distribute project documentation in a timely manner

G. Financial Matters

41. Practice fairness in price proposals, backcharges, and all other financial matters.

H. Inspection and Testing

42. Provide for timely and professional technical inspection services with appropriate documentation and feedback to those affected.

I. Issue, Conflict, and Problem Resolution

43. Maintain the current issue resolution policy. (The current policy stresses the resolution of conflict at the originating or lowest possible working level.)
44. Minimize disputes and resolve conflicts quickly and at the lowest possible management level.
45. Prepare and publish an issue resolution policy which stresses the timely resolution of conflict at the originating or lowest possible management level and seeks to avoid litigation.
46. Prepare, publish, and implement a dispute resolution system designed to resolve conflicts at the lowest possible management level.
47. Strive to resolve job conflicts quickly and at the originating or lowest possible level.

J. Job Management

48. Anticipate events - be proactive.
49. Avoid surprises!
50. Be familiar with the contract documents.
51. Carefully evaluate and be sensitive to the impact that construction activities may have on the environmental integrity and safety of all ongoing hospital operations.
52. Continue to implement the partnering evaluation system (involving new participants).
53. Continue to improve and implement agreed-upon project procedures that provide all stakeholders guidelines for:
54. Time commitments for procedures.
55. Prioritizing assignments.

56. Design and construct a facility that is built so as to recognize the need for the builders and the designers to achieve a reasonable financial profit on their work.
57. Design and construct a facility that is built within the time and cost terms of the lease-purchase documents.
58. Develop a organizational matrix showing lines of communication and responsibility to be maintained on the project.
59. Encourage the participation of all parties at all project levels in the partnering process and the partnering spirit.
60. Enforce the construction traffic and parking plans.
61. Foster understanding of construction documents
62. Identify and remedy incorrect performance in a timely manner.
63. Insure that each of their management team members is fully aware of the requirements of the project.
64. Keep current with project status and requirements.
65. Keep paperwork to a minimum.
66. Maintain a close relationship between expectations and reality
67. Maintain a continuous and efficient work force and effective procurement to ensure quality, sequence, and schedule
68. Maintain an adequate management and work force to fulfill contract commitments.
69. Maintain client safety and user satisfaction during construction.
70. No surprises
71. Plan for and meet the human resource requirements of the project, and maximize opportunities for women and minorities.
72. Plan for future service access to equipment during mechanical, electrical and plumbing installation.
73. Plan for the future not for the past.
74. Prepare and publish a calendar of project events indicating when key personnel are required to participate in project management activities. Partners will attend and participate in all required meetings and provide backup management where necessary.
75. Preplan work recognizing the impact plans have on achieving the design intent.
76. Properly staff and maintain competent personnel, and equipment required on the project.
77. Provide proper resources to support the agreed-upon plan and schedule of work.
78. Provide resources to fulfill contract & charter obligations.
79. Recognize and be sensitive to the needs of other stakeholders on the project.
80. Strive for a zero punch list.
81. Use human and technological resources to their maximum effectiveness.

82. Meet individual and organizational obligations.
83. Maintain a clean, safe, accessible and well-planned job site.
84. Maintain a clean, secure, accessible and well-planned job site.
85. Continue to improve... a. Submittal and request for information (rfi) processing, including agreed-upon schedules and response times to meet the needs of all parties.
86. Continue to improve... b. Prompt payment processing including retention.
87. Continue to improve... c. Revision and change order processing, including a streamlined process for minor changes ($1000 or less).

K. Legal Matters

88. Strive to avoid litigation.
89. No litigation.

L. Maintaining Regular Project Evaluations

90. Prepare, publish, and implement a partnering evaluation system by which the effectiveness of the system is regularly monitored. (stakeholders task force)
91. Prepare, publish and implement a project partnering evaluation system.

M. Organization, Authority and Responsibility

92. Be accountable for your actions.
93. Fulfill respective responsibilities and commitments to permit on-time completion of the project.
94. Maintain continuity of key job personnel.
95. Prepare and publish a project directory showing people, work category, position and alternate contact.
96. Prepare, publish, and use a project chain of command
97. Prepare, publish, and keep current a chart of channels for communication, responsibility, and authority.

N. Planning and Scheduling

98. Adhere to agreed upon schedules and resource commitments.
99. Adhere to the current master construction schedule in effect on the project.
100. Develop a realistic plan of work and project schedule and honor it.
101. Distribute and regularly monitor and discuss, with subcontractor input, a master project schedule, and update schedules as required.
102. Mutually prepare, publish, implement, and keep current a project action

plan and schedule of work that is useful to all stakeholders.
103. Prepare, distribute and regularly monitor and discuss, with subcontractor input, a master project schedule, and update schedule as required.
104. Solicit all team member's input for planning and scheduling

O. Payment Processing

105. Promptly prepare, submit, and process all payment requests.
106. Submit properly prepared requests for payment.

P. Personnel Quality and Problems

107. Do it right the first time and strive to achieve a zero punch list.
108. Prepare, publish, promote, and adhere to standards of work place conduct.

Q. Regulatory Agency Matters

109. Work closely with all regulatory agencies to assure compliance to their current standards and regulations.

R. Revision Processing

110. Accurately price changes to the project in a timely, reasonable and fair manner.
111. Approve and process changes in a timely manner.
112. Approve changes in a timely manner including formal issuance of supplemental agreements.
113. Control revisions being considered for the project to maintain the planned budget.
114. Prepare and implement guidelines for screening proposed changes to the project prior to requesting formal pricing of the changes. (owner, user, designers)
115. Provide accurate data and adequate time to ensure pricing changes that are fair and timely.
116. Provide reasonable change request budgets and identify insufficient budgets promptly.
117. Provide reasonable field change orders and change issue budgets, and accurately price changes to the project in a timely, reasonable, and fair manner.

S. Staff Morale and Attitudes

118. Be available.

119. Be cooperative.
120. Be willing to suggest and consider cost and time effective options.
121. Establish a trustful work environment with other stakeholders.
122. Establish and maintain good informal working relations on the job.
123. Extend the spirit of partnering to all project participants.
124. Have fun!
125. Have fun and celebrate the successful completion of the project.
126. Maintain high job morale and cooperative attitudes among all project participants.
127. Make the project a fun place to work and to meet new friends.
128. Promote and adhere to acceptable standards of conduct by the project team on the site.
129. Recognize individual and team accomplishments.
130. Respect all project participants and their work.
131. Respect and treat other's and their work as you wish you and your work to be treated; accept responsibility for damage to other's work.
132. Respect design and construction excellence as a fundamental goal to be achieved.
133. Respect financial profit as an incentive for private sector stakeholders.
134. Respect other team members' work and abilities.
135. Take pride in our work, respect the ideas and work of others and treat others as you would have them treat you.
136. Treat others as you would have them treat you.
137. Practice fairness in price proposals, back charges, and all other financial matters.

T. Submittal Processing

138. Prepare, package, and process submittals in a timely, fair, and considerate manner consistent with the priorities of the contractors, designers, and owner.
139. Promptly review and determine the merit of properly submitted requests for extensions of time.

U. Work-site Conditions

140. Continue to maintain continuity of work points between trades. (Work points refer to building control coordinates and elevations.)
141. Maintain a safe, orderly, well organized work site.
142. Maintain a well planned and clean work site.
143. Maintain continuity of work points between trades.
144. Maintain, in conjunction with other stakeholders, a work area plan to be

implemented by affected stakeholders.
145. Prepare and publish a construction traffic and parking plan.
146. Prepare, publish, and implement a project clean up program for contractors on site.
147. Promote a clean and safe job environment.
148. Provide complete and unencumbered access to needed work areas in accordance with the project schedule.
149. Respect and treat others and their work as you wish you and your work to be treated. Take responsibility for damage to other's work. Amen!

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PROBLEM MENTIONS

Total assignments of problem types from 2,855 responses to the questions, "What job difficulties are caused by us and by others?" Listed by frequency of mention.

01. 1146 - Job management
02. 0984 - Communicating with others
03. 0684 - Staff morale and attitudes
04. 0593 - Personnel quality and problems
05. 0475 - Being a good on-site neighbor
06. 0467 - Timely action
07. 0396 - Planning and scheduling
08. 0371 - Organization, authority, and responsibility
09. 0288 - Work site conditions
10. 0268 - Revision processing
11. 0267 - Construction document quality
12. 0233 - Program conditions
13. 0205 - Submittal processing
14. 0166 - Issue, conflict, and problem resolution
15. 0166 - User group interaction
16. 0145 - Equipment and material problems
17. 0141 - Documents and documentation
18. 0133 - Decision making
19. 0125 - Procurement of materials and equipment
20. 0116 - Project cost structure
21. 0112 - Closing out the project

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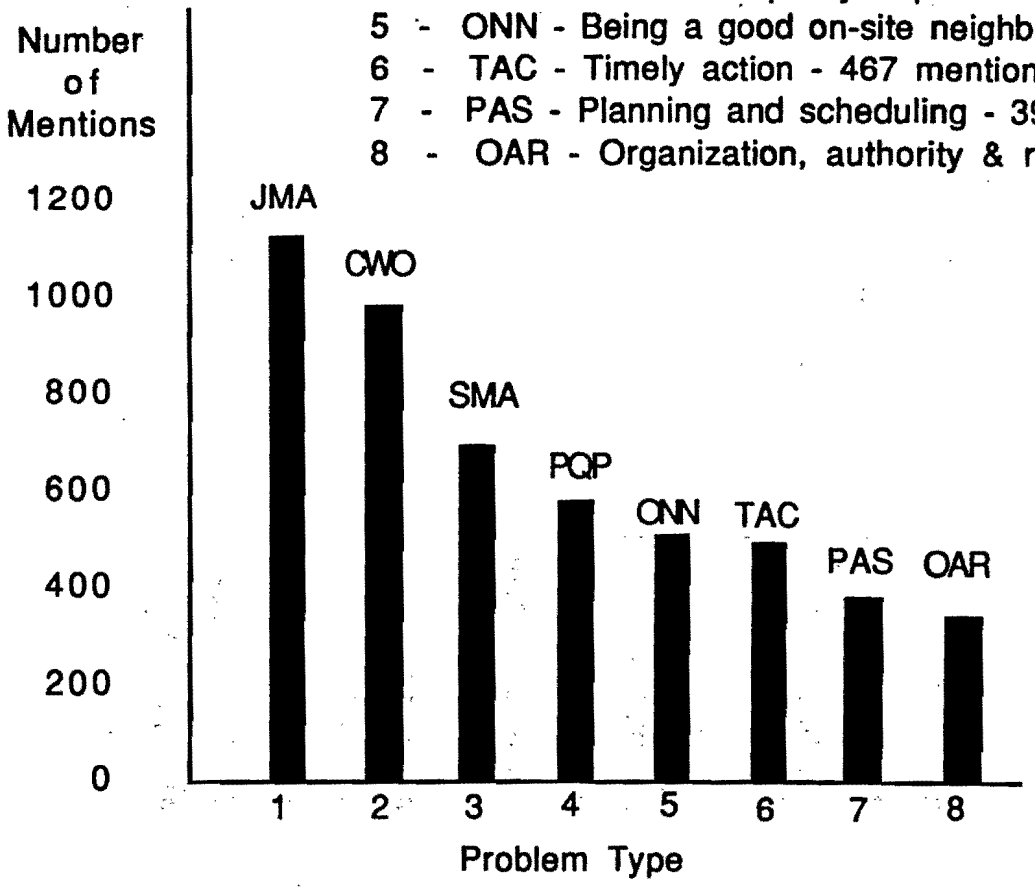
22. 0097 - Contract interpretation
23. 0097 - Quality management
24. 0095 - Payment processing
25. 0092 - Paper and administrative work
26. 0090 - Approval processes
27. 0088 - Being a good off-site neighbor
28. 0073 - Time growth
29. 0070 - Policies and procedures
30. 0069 - Inspecting and testing
31. 0069 - Staffing and manpower
32. 0064 - Cost growth
33. 0058 - Substitutions and alternates
34. 0052 - Maintaining regular project evaluations
35. 0052 - Safety
36. 0049 - Regulatory agency matters
37. 0022 - Constructibility
38. 0022 - Training
39. 0022 - Value engineering
40. 0014 - Labor conditions
41. 0014 - Legal matters
42. 0011 - Backcharges
43. 0011 - Financial problems
44. 0010 - Weather conditions
45. 0005 - Warranty conditions

- The eight most frequently mentioned design &construction problems. From a total of 2,855 responses to the question "what job difficulties are caused by us and by others?"

Problem Type

1 - JMA - Job management - 1146 mentions
2 - CWO - Communicating with others - 984 mentions
3 - SMA - Staff morale & attitudes - 684 mentions
4 - PQP - Personnel quality & problems - 593 mentions
5 - ONN - Being a good on-site neighbor - 475 mentions
6 - TAC - Timely action - 467 mentions
7 - PAS - Planning and scheduling - 396 mentions
8 - OAR - Organization, authority & responsibility - 371 mentions



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Eight actions to smooth out and resolve potentially destructive conflict

Action #1 Understand the cause of the conflict.

Action #2 Put yourself in the other person's shoes.

Action #3 Understand the relative importance of resolution versus nonresolution.

Action #4 Communicate openly and clearly

Action #5 Become competent in the proper application of the technical and professional tools of the design and construction profession.

Action #6 Thoroughly understand the obligations you have to society and to your clients, your employer, and your peers.

Action #7 Understand everything you can about your responsibilities - and work to be effective in managing intersections of diverse interests.

Action #8 Clearly document the conditions under which the conflict is resolved.

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Budgeting terms

I. Proforma - in real estate development

A financial model unusually 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.

II. Program - as defining a step in the design process

A narrative oriented statement of the needs and character of the proposed user operation, the requirements of the user and owner, the nature of the environment to be planned, designed and built, and the corresponding characteristics of the space that will satisfy these needs and requirements. Sometimes called the brief.

III. Program - as defining a generic construction effort

A major planning, design, construction, and operational construction effort made up of several projects.

IV. Must list

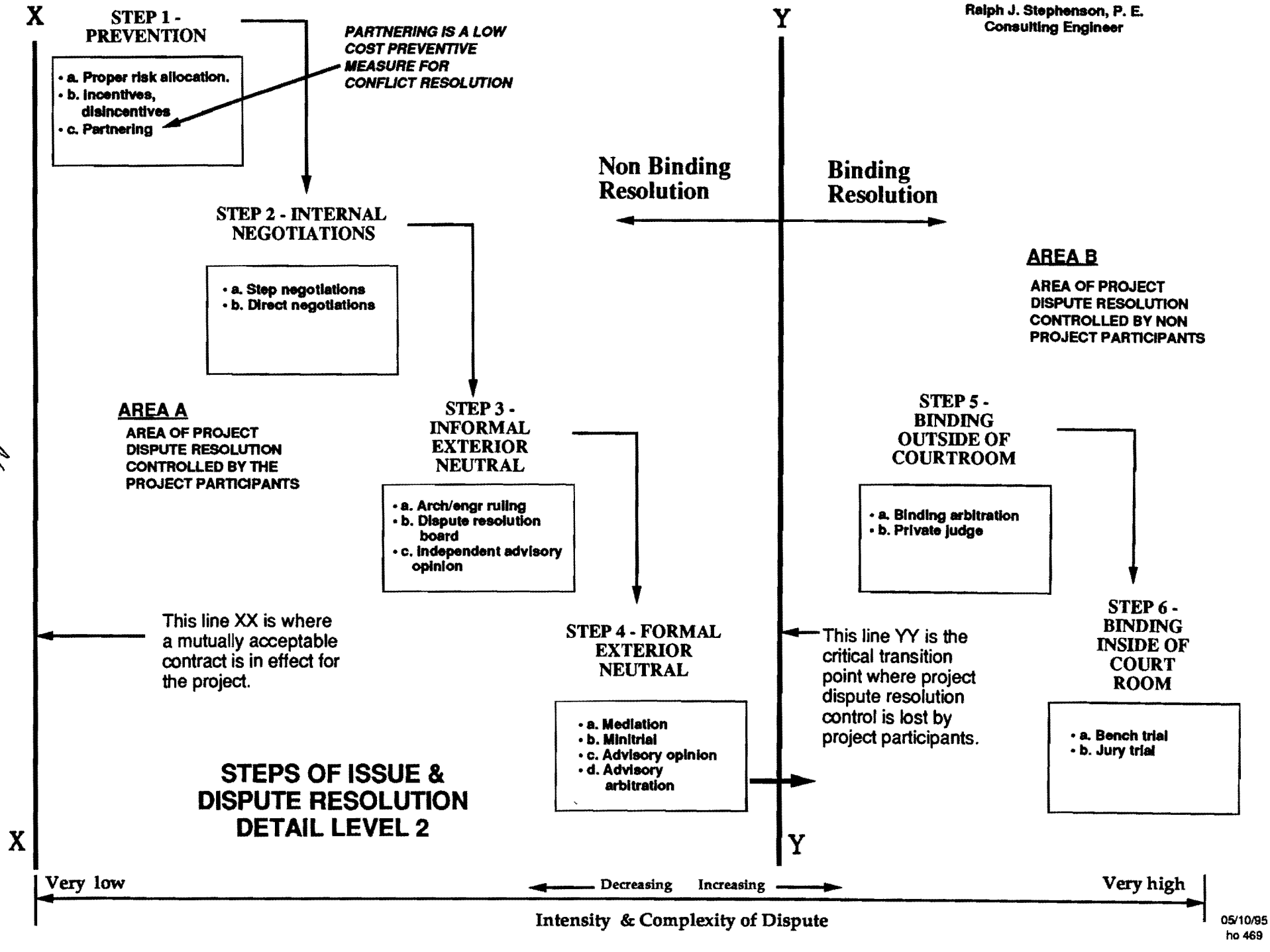
Items that must be included in the scope of work to make the project a go. If any of the items in the must list are not able to be included the project is a no-go.

V. Want list

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 rate of return on their cost.

VI. Wish list

Items that the owner and the 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.


X
STEP 1 - PREVENTION
• a. Proper risk allocation.
• b. Incentives, disincentives
• c. Partnering
PARTNERING IS A LOW COST PREVENTIVE MEASURE FOR CONFLICT RESOLUTION
Y
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Non Binding Resolution
Binding Resolution
STEP 2 - INTERNAL NEGOTIATIONS
• a. Step negotiations
• b. Direct negotiations
AREA B
AREA OF PROJECT DISPUTE RESOLUTION CONTROLLED BY NON PROJECT PARTICIPANTS
AREA A
AREA OF PROJECT DISPUTE RESOLUTION CONTROLLED BY THE PROJECT PARTICIPANTS
STEP 3 - INFORMAL EXTERIOR NEUTRAL
• a. Arch/engr ruling
• b. Dispute resolution board
• c. Independent advisory opinion
STEP 5 - BINDING OUTSIDE OF COURTROOM
• a. Binding arbitration
• b. Private judge
This line XX is where a mutually acceptable contract is in effect for the project.
STEP 4 - FORMAL EXTERIOR NEUTRAL
• a. Mediation
• b. Minitrial
• c. Advisory opinion
• d. Advisory arbitration
This line YY is the critical transition point where project dispute resolution control is lost by project participants.
STEP 6 - BINDING INSIDE OF COURT ROOM
• a. Bench trial
• b. Jury trial
STEPS OF ISSUE & DISPUTE RESOLUTION DETAIL LEVEL 2
X
Y
Very low
Decreasing
Increasing
Very high
Intensity & Complexity of Dispute
05/10/95
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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

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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.

ho 285 March 1996

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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 !

Ralph J. Stephenson, P.E., P.C.
Consulting Engineer

Act from a Plan - If you can't plan it, you can't manage it. Good plans shape good decisions.

I. **Five essential planning questions for the manager to ask and answer.**
   A. What?
   B. Where?
   C. When?
   D. How?
   E. Who?

II. **Five essential planning actions for the manager to take.**
   A. Set goals and objectives.
   B. Prepare and action plan.
   C. Organize the work.
   D. Assemble the resources needed.
   E. Do the job.

III. **Set goals and objectives.**
   A. Definitions
      1. Goals - Targets, desires, wishes and aims expressed without a time scale.
      2. Objectives - Expressed goals upon which a time frame has been imposed.
   B. The DIG/DEG/DOG
   C. Be specific when setting objectives.
   D. Set objectives so that movement toward their achievement can be measured.

IV. **Prepare and action plan.**
   A. May be verbal, written, or visual.
   B. May be strategic or tactical, detailed or summary.
   C. May be short, medium, or long range (the manager must set the planning time scale.
      1. The shorter the time interval covered by the plan, the greater is the chance the plan will succeed. However, the shorter the time interval, the greater the probability that longer range needs, which truly measure the manager's effectiveness, will remain unfulfilled.
      2. The higher you are in the management structure the larger and longer the planing scale you must use.
      3. The concepts of decision to action time span.
   D. Plan the work and work the plan!

V. **Organize the work**
   A. Plans should be build upon maximum integration of management viewpoints.
   B. Establish relationships through functional diagraming of interconnections.
      1. Formal.
      2. Informal.
      3. Reporting.

4. Staff.
5. Temporary.

C. Mack clear cut assignments.
   1. The manager should not assume a person will automatically know his full pattern of responsibilities.
   2. Don't leave definition of authority and responsibility to chance. Be specific.

D. Build a feedback system.
   1. Grapevine often used in informal feedback.
   2. Formal feedback system should be built by specific assignment (must have a standard of performance for the feedback system to work well).

E. Organize to accomplish goals and objectives.
   1. Keep organization lean - avoid unnecessary overhead.
   2. Make provisions in the organization to delegate and train.
   3. Tend to build around targets and needs rather than people (there are major exceptions to this, watch carefully)
   4. Provide for proper grading of decision to action time spans.

VI. **Common planning failures**

A. Not touching all organizational bases - what, where, when, how, and who.
B. Committing to too many goals ad objectives at one time.
C. Underestimating the value and need for good forward planning.
D. failure to challenge plans and actions at the right time.
E. Not providing proper escape hatches and safeguards.
F. Failure to encourage timely, knowledgeable participation.
G. Not obtaining higher level approvals of goals and objectives.
H. Inadequate monitoring and control of costs, progress, documentation and resource loading.
I. Poor assignment of duties, responsibilities, and actions.
J. Failure to understand that planning is a major task of the manager.

Ralph J. Stephenson P. E., P. C.
Consulting Engineer

ADVANTAGES OF GOOD PLANNING

1. Provides accurate simulation of the project.

2. Provides early statement of intent.

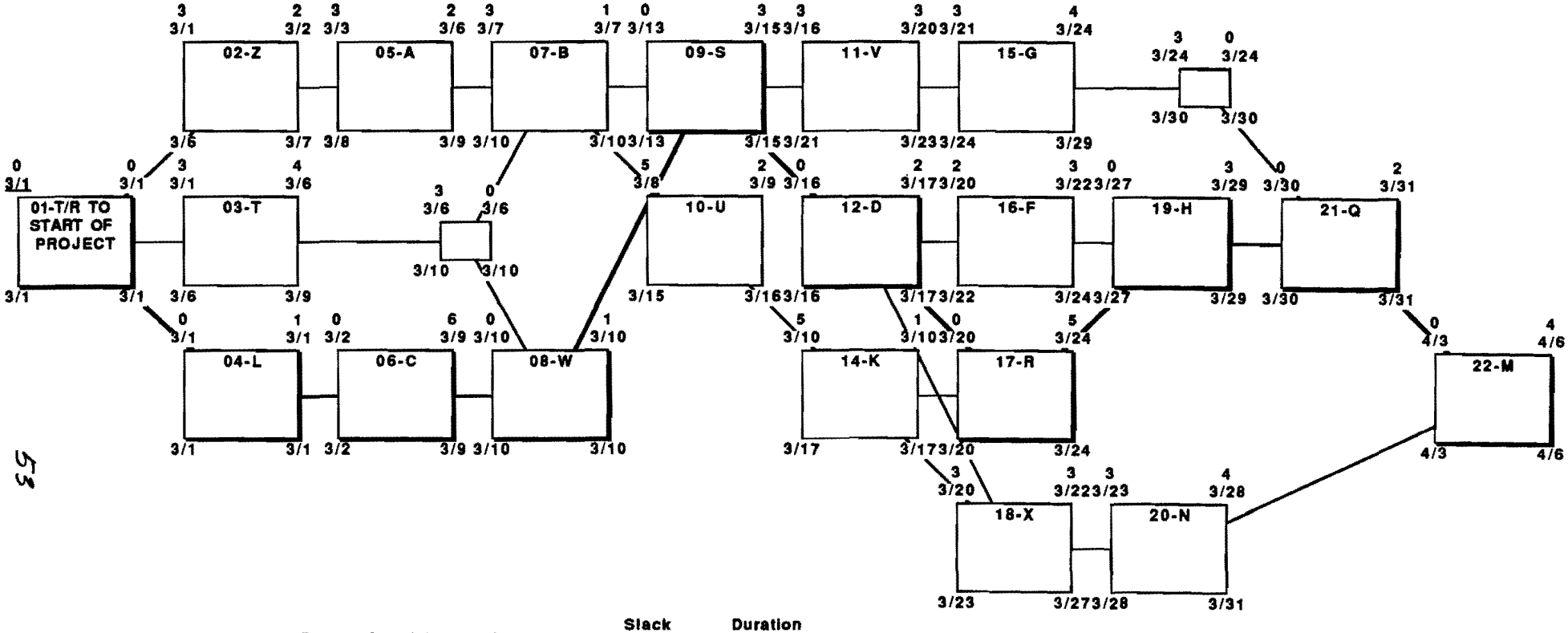
3. Encourages good communication on the project.

4. Provides management by exception potential.

5. Allows accurate tracking of project progress.

6. Allows accurate performance evaluation.

7. Provides accurate project history.



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Reserved activity numbers

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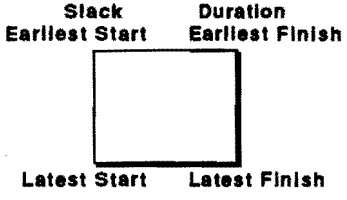

ACTIVITY LEGEND

Issue #1 - March 8, 2000
exercise #2

NETWORK MODEL FOR EXERCISE #2

WEX PM 2000 Project Team

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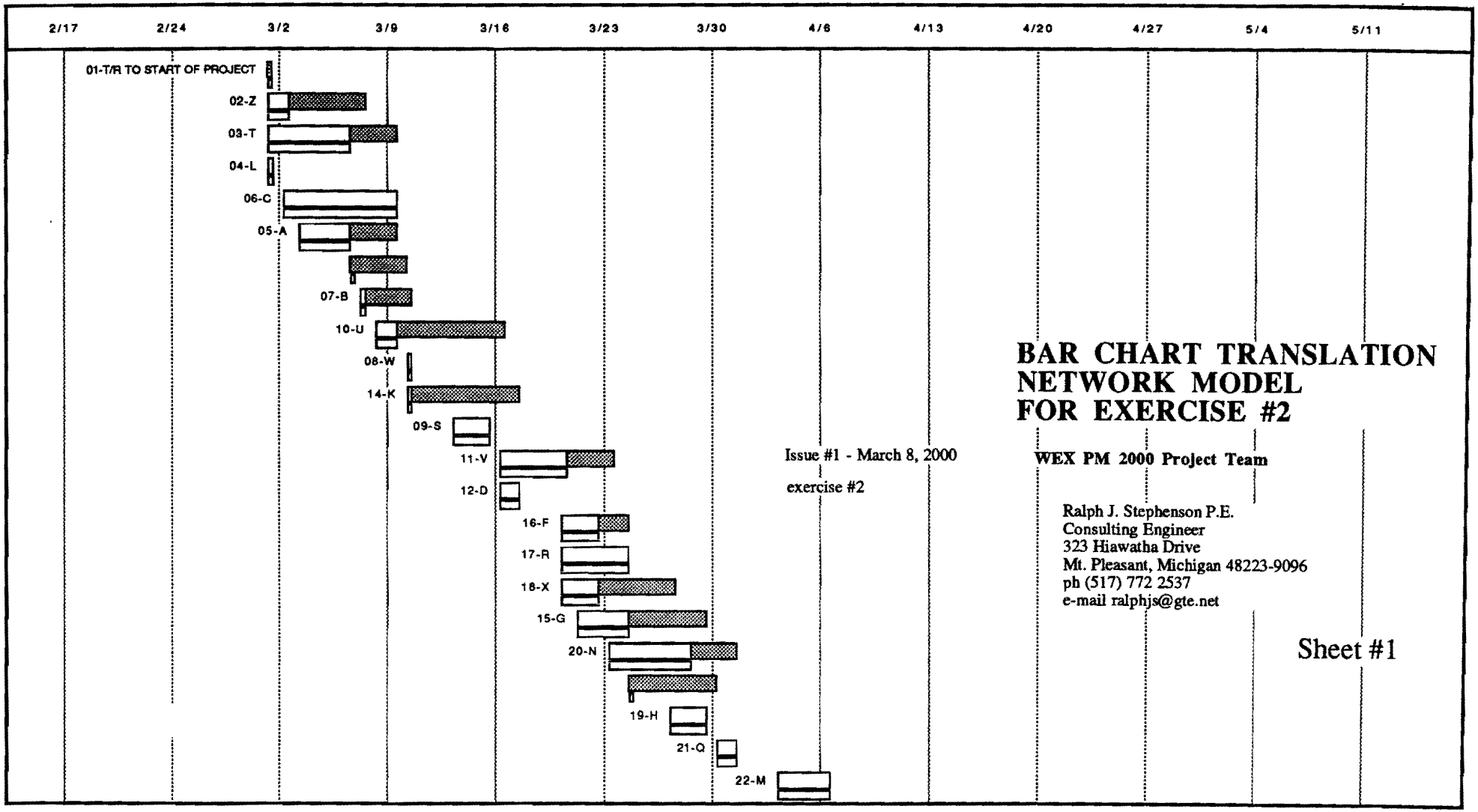
Sheet #1

Note:
Float time shown in this network model is for the sole use of the WEX PM 2000 project team. Use of float time by others is to be only by written permission of the WEX PM 2000 team management.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BAR CHART TRANSLATION
NETWORK MODEL
FOR EXERCISE #2
Issue #1 - March 8, 2000
exercise #2
WEX PM 2000 Project Team
Ralph J. Stephenson P.E.
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Sheet #1

54

Four Year Working Day Calendar
Starting from January 1, 2001

Ralph J. Stephenson, P.E., Consulting Engineer
323 Hiawatha Dr., Mt. Pleasant, MI 48858-9096
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55

Four Year Working Day Calendar
Starting from January 1, 2001

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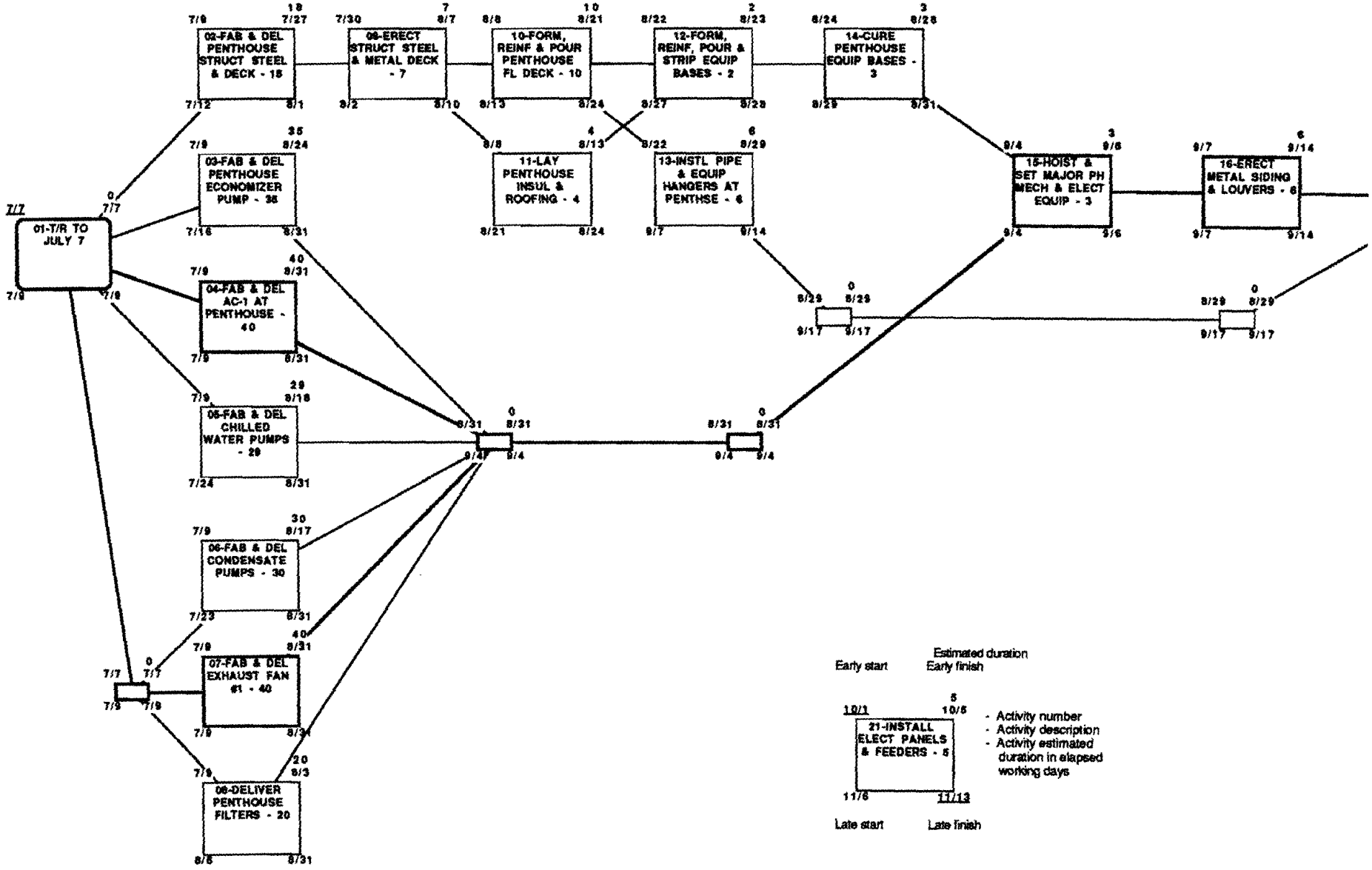

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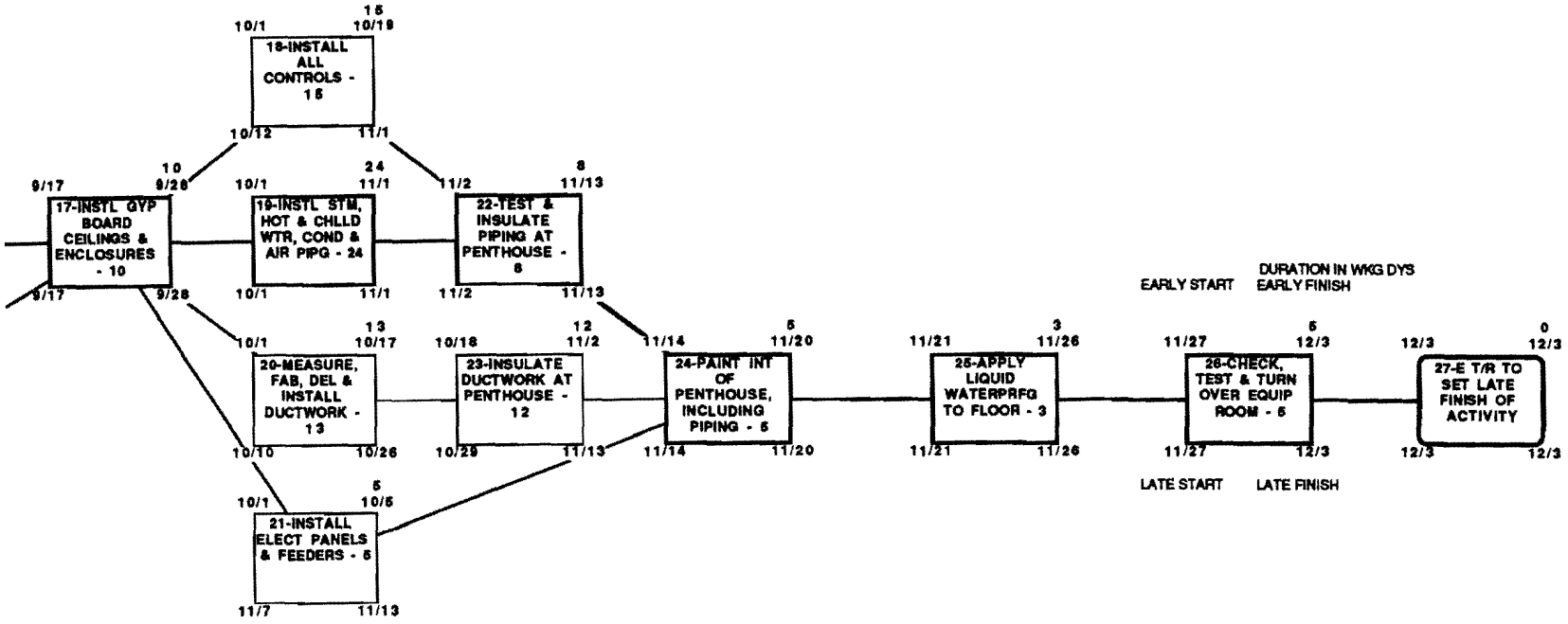

Base Plan of Action

NETWORK MODEL FOR CLARION OFFICE BUILDING PENTHOUSE MECHANICAL EQUIPMENT ROOM #1

Luther Mechanical Contractors
Washington D.C.

Issue #1 - July 7
330 clarion base plan
disk 162

Reserved Activity Numbers

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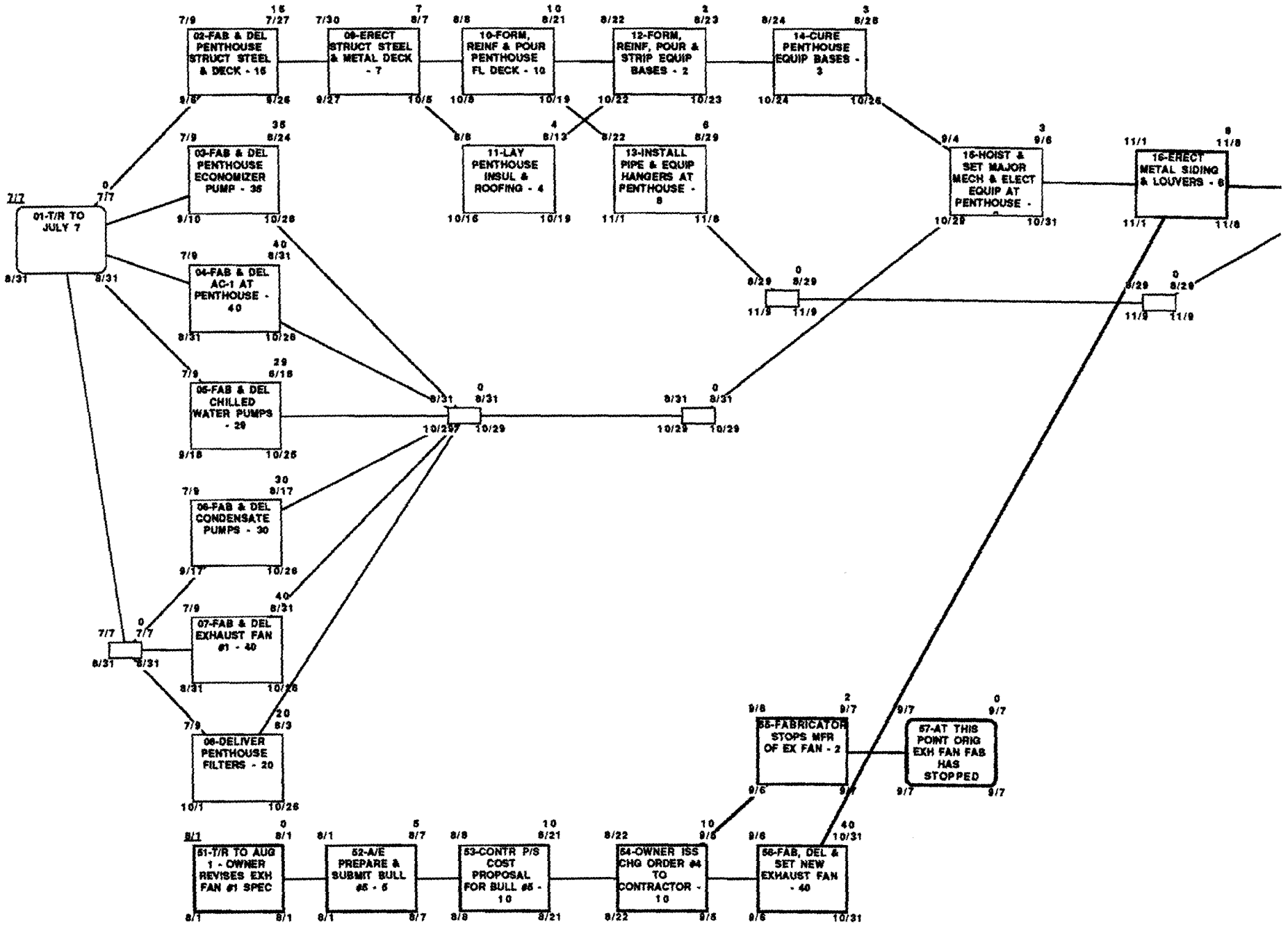
sheet ph-1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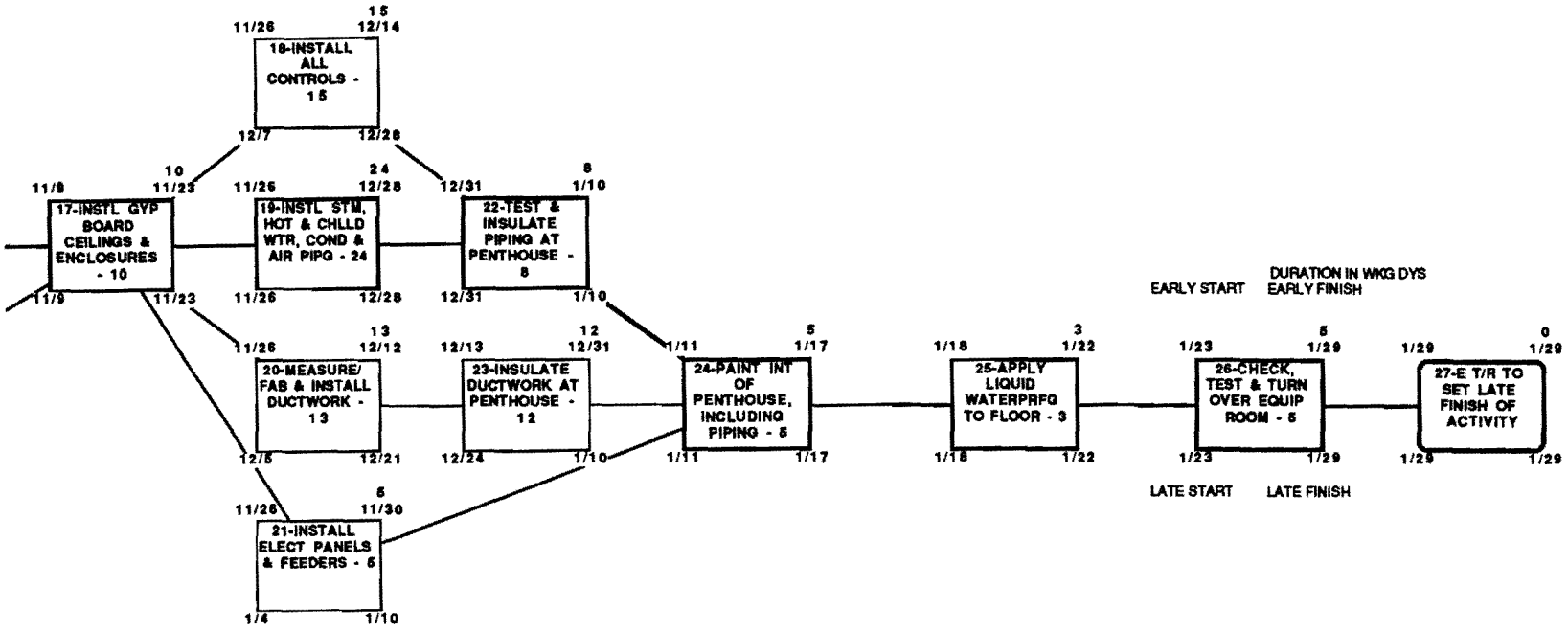
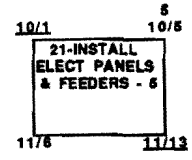
02-FAB & DEL PENTHOUSE STRUCT STEEL & DECK - 15
03-FAB & DEL PENTHOUSE ECONOMIZER PUMP - 35
04-FAB & DEL AC-1 AT PENTHOUSE - 40
05-FAB & DEL CHILLED WATER PUMPS - 29
06-FAB & DEL CONDENSATE PUMPS - 30
07-FAB & DEL EXHAUST FAN #1 - 40
08-DELIVER PENTHOUSE FILTERS - 20
09-ERECT STRUCT STEEL & METAL DECK - 7
10-FORM, REINF & POUR PENTHOUSE FL DECK - 10
11-LAY PENTHOUSE INSUL & ROOFING - 4
12-FORM, REINF, POUR & STRIP EQUIP BASES - 2
13-INSTALL PIPE & EQUIP HANGERS AT PENTHOUSE - 8
14-CURE PENTHOUSE EQUIP BASES - 3
15-HOIST & SET MAJOR MECH & ELECT EQUIP AT PENTHOUSE -
16-ERECT METAL SIDING & LOUVERS - 8
51-T/R TO AUG 1 - OWNER REVISES EXH FAN #1 SPEC
52-A/E PREPARE & SUBMIT BULL #5 - 5
53-CONTR P/S COST PROPOSAL FOR BULL #5 - 10
54-OWNER ISS CHG ORDER #4 TO CONTRACTOR - 10
55-FABRICATOR STOPS MFR OF EX FAN - 2
56-FAB, DEL & SET NEW EXHAUST FAN - 40
57-AT THIS POINT ORIG EXH FAN FAB HAS STOPPED



Change order impact on base plan of action

Early start — Estimated duration — Early finish



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

Late start — Late finish

ACTIVITY DATA KEY

Issue #1 - July 9
Issue #2 - August 1
333 clarion chg order
disk 162

Reserved Activity Numbers

041 048
042 047
043 046
044 049
045 050

NETWORK MODEL FOR CLARION OFFICE BUILDING PENTHOUSE MECHANICAL EQUIPMENT ROOM #1

Luther Mechanical Contractors
Washington, D.C.

sheet ph-1

Ralph J. Stephenson, P. E., P.C.
Consulting Engineer

Chicago Area Weather
Source: Jack Kolstadt

Week		Working Day	Total Working Days Worked	Loss in Working Days
Dec.	1	234	3.5	1.5
	2	239	3.5	1.5
	3	244	4	1
	4	249	3	2
Jan.	1	256	2.2	2.8
	2	261	2.2	2.8
	3	266	3.5	1.5
	4	271	3	2
Feb.	1	277	3	2
	2	282	3	2
	3	287	4	1
	4	292	3.5	1.5
Mar.	1	297	4.5	0.5
	2	302	4.5	0.5
	3	307	4	1
	4	312	3.5	1.5
Apr	1	320	3.5	1.5
	2	325	4.5	1.5
	3	330	4	1
	4	335	5	0

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 items are added)

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)

16. Each party should conduct their own job critique during which responsible parties to the project meet and identify points of strength and weaknesses in carrying out the job. One major product of this critique should be a set of recommendations for improvement of future performance, and documentation of the problems encountered and how they were resolved. (contractor, owner, architect/engineer)

17. Relinquish, or account for, all client owned tools, spare parts, and extra stocks of materials, rightfully the property of the owner. (contractor, owner)

18. Provide the owner copies of all releases, including final inspection certificates, occupancy permits, operating certificates, health department approvals and permits, and all other similar documents to allow the owner to occupy the building under full understanding of the conditions of the turnover. (contractor, owner, architect/engineer)

19. Label all electrical panel boxes, plumbing lines, valves and equipment as required for proper operation and maintenance. (contractor)

20. Provide all keys and keying schedules. (contractor, owner)

21. Submit a final statement of accounting, as required, to the owner and the architect/engineer. (owner, contractor, architect/engineer)

22. Obtain, prepare or issue a final change order reflecting adjustments to the contract sums not previously made by change orders. (contractor, architect/engineer, owner)

23. Send sincere thank you letters as appropriate to the owner, to the design team and to various contractors involved on the job. (contractor, architect/engineer)

24. Provide the owner a complete list of contractors and vendors participating in the job and indicating their installation responsibilities. (contractor)

25. Insure the owner is placed on the marketing call list, mailing list and other action tickler files as appropriate. (contractor, architect/engineer)

26. Arrange for such open house activities as may be desired or required (owner, contractor, architect/engineer)

27. Insure that your company identification is shown somewhere in the building if permitted. (owner, a/e and contractor)

28. Insure the project is as clean or better than called for in the specifications when your staff moves off the job. Don't lose the good will of the owner by leaving him a dirty job. (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.

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RECOMMENDATIONS TO IMPROVE OUR PROFESSIONAL AND BUSINESS PRACTICES

- Manage the job as if all team members are working toward the same project end objectives.

- Set a good example for other managers on your project.

- Exercise intelligent, consistent decision-making tempered with good judgment and empathy for others.

- Plan the project well, communicate the plan, & know yourself what your plan says.

- Listen well.

- Avoid using emotional words in project discussions.

- Try to match your non-word world with your world of words.

- Submit properly prepared pay requests.

- Learn to close out your job quickly and cleanly.

- Properly manage the submittal system.

- Consider the regulatory agencies as

friends and important participants in your project.

- Educate and train your staff in partnering principles.

- Take the project mission and the partnering charter seriously and work hard to accomplish both.

- Set a good example to industry newcomers. They are the hope of today, and the you of tomorrow.

- Be available.

- Believe that others on the job want to do well -- it's contagious.

- Keep the job clean and the site well organized.

- Keep good people on the job by making them want to stay.

- Be honest and open with the project team about your plans and schedules.

- Determine early in the job what each party's profit motive is, and then help them achieve that specific profit.

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Notes on Forerunner & Conservatively Managed Companies

• What are alternative names to forerunner and conservatively managed companies? Proactive & reactive, positive & negative, front & back, do & wait, high risk & low risk, maximum & minimum, go & no go, try & no try, run & walk.

• The forerunner managed company tries to optimize the probability of being right.

• The conservatively managed company tries to minimize the probability of being wrong.

• It is critical to understand that both types of companies can be, and often are successful or unsuccessful. The style of forerunner or conservative is merely an indication of the way the organization achieves success or goes through the twinges of failure.

• Some characteristics of the forerunner vs the conservative company are:

Forerunner
- Aggressive in their field of work
- Young
- High risk takers
- High leveraging of all resources
- Good morale
- General absence of recognizable management structure
- Healthy cooperation among lower management
- Strong competitive drive at all levels of management
- Strong sensing (not necessarily knowledge) of total purpose about
  - Financial return on investment
  - Social obligation
  - Professional integrity
  - Technical excellence
  - Ethical behavior
- Provision of sense of worth to projects
- Provision of sense of exciting flux to staff
- Maintenance of an exciting environment
- Constant forging ahead in their business arena
- Desire & ability to adapt to positive change
- Desire & ability to institute change
- Desire & ability to accommodate change
- Medium to low levels of incompetence tolerance
- Strong leaning toward high individual performance levels
- Low level of interest in business planning
- Often learn by mistakes

ho 315 March 1996

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Conservative
- Usually well managed from top down
- Moderately well managed from bottom up
- Tends toward paternalistic management
- Major decision making centered in top management
- Good financial strength, if mature
- Dependable
- Predictable
- Closely controlled employee training
- Modest salary structure
- Good standard employee financial benefits
- Usually stress hygiene as opposed to motivational drive
- High levels of employee loyalty in those who like the system
- Provision of employee security
- Generally pretest decisions at executive management levels

ho 315 March 1996

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Setting goals & objectives

To effectively manage a project you need to know what is to have been accomplished when the job is complete.

Some guidelines to identifying and writing out project goals and objectives are given below:

Step 1.
Answer this question

- **What is the most important result to be achieved by this project being successfully completed?**

Write your response.

Your statement now becomes a project mission from which detailed goals and objectives can be generated.

Step 2.
Decide upon and write the major activity classifications within which you wish to achieve the mission stated in Step 1. Some classifications for detailed goal definition in project management might include:

- Company
- Organizational
- Departmental
- Project
- Social
- Financial
- Community
- Technical
- Professional
- Educational
- Personal
- Project staff
- Career

Step 3.
Select the classifications you feel most comfortable with, and write several brief statements of what you want to achieve within these activity categories. Don't think about numbers and time frames yet. Concentrate on getting good content in each statement. Typical statements might be:

For the project:
- To implement a job data base tracking system for submittal turn around
- To significantly reduce job meeting times and improve follow up results.
- To design and implement a structured job inspection and reporting system procedure

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For your career:
- To learn and use network modeling techniques
- To work specifically toward using this project experience to move to the next higher position rating
- To diagram and study the organizational structures of effective design and construction firms on the project

Step 4.
When you have written out as many targets you wish or must achieve, and that you can comfortably think of, reorganize them into a classification system best suited for the project you are on. Classification can be by the original groups, or you may wish to rearrange them by subject, time span, people involved, degree of achievability, people influencing their achievement, or any other common qualities that allows you to work comfortably in converting the desires to accomplishments.

Step 5.
Once you have a satisfactory list of desires, begin assigning quantities to the goals in the list. Quantities may be in dollars, manpower, time, space, talent, opportunity, or any other you may wish. This quantification step converts non numerical goals to numerical objectives. It is a step you must take to get from wish to reality. Remember project management is objective oriented. Converting goals to objectives is essential for effective project management.

For example the unquantified target stated in Step 3 above, "To significantly reduce job meeting times and improve follow up results.", might now be amplified by such specific objectives as:

- Within 3 weeks of field job start to have all project minutes being done on an IBM compatible word processor.
- Within 6 weeks of field job start to be using technography methods to record and approve job meeting notes.
- Within 7 weeks of field job start to publish job minutes by late afternoon of the meeting day.
- Within 1 week of field job start to be discussing in job meetings only job matters having a minimum decision to action time span of one week.

Step 6.
When you have enough objectives, to satisfy your initial needs, stop for a while and concentrate on achieving what your objectives demand of you. The call now is for action!

Step 7.
As you put the goal and objective achievement process into operation, keep adding goals and objectives to the list you have prepared.

Remember, your needs, and the project's needs change continually. In Step 1 you defined the fundamental project mission. Around this stable base the detailed goal & objective setting must continue as the project unfolds.

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

- 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 38 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

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- 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.
- Six 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 facility
  4. **Operators** - Those who operate the completed facility
  5. **Regulators** - Those who help assure project adherence to the cause of public good
  6. **Users** - Those who occupy and use the facility for the purpose for which it is intended
- 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

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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.

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Summary of the Nine Master Keys of Management

(Adapted from the Nine Master Keys of Management by Lester R Bittel)

Three Requirements of the Good Manager

A. Acquire a discerning (unique) point of view.
B. Follow an effective mode of action.
C. Employ a sensitive touch in interpersonal relationships.

A Discerning Point of View

Action #1 - Apply situational thinking	Result #1 - Your decisions will be more objective and less impulsive.
Action #2 - Identify vital targets	Result #1 - You'll quickly recognize turning points in critical situations.
Action #3 - Prepare for the probable	Result #3 - You'll be less flappable in difficult situations.

An Effective Mode of Action

Action #4 - Focus on performance criteria	Result #4 - You'll better satisfy yourself and your superiors.
Action #5 - Act form a plan	Result #5 - You'll be able to get projects under way quickly and with certainty.
Action #6 - Manage by Exception	Result #6 - You'll accomplish more work than you ever thought possible.

A Feeling for People

Action #7 - Develop your confidence in others	Result #7 - You'll find that people cooperate more freely.
Action #8 - Employ the power of training	Result #8 - You'll find that employee attitudes improve.
Action #9 - Know your true self	Result #9 - When you truly comprehend your whole self you'll find people responding to your ideas more directly and often more favorably.

Construction University
CU #004
Using Intelligent Questioning

Ralph J. Stephenson, P.E.
Consulting Engineer
February 4, 2000

To Construction University faculty

CU#4 is an introduction to a management skill needed by professional planners, designers, and constructors. As usual, we welcome your comments and suggestions.

Regards,

Ralph J. Stephenson, P.E.

USING INTELLIGENT QUESTIONING

by Ralph J. Stephenson, P.E.

– 1,623 words
– Approximate reading time - 8 minutes

(Every man and woman is satisfied that there is such a thing as truth or they would not ask any questions - paraphrased from Charles Sanders Peirce)

Over the years I have been impressed by the amount and quality of information some professionals in the design and construction business are able to acquire in a very short time. After much watching, listening, reading and thinking I have concluded that this information is a direct result of their use of a talent...the talent of intelligent questioning. Part of this talent grows out of a sincere interest in what others think; the other part is learned.

The sincere interest portion of questioning must be acquired by a belief that what others know can add value to your professional responsibilities to society, your clients and your peers.

The learned part of acquiring quality information requires an understanding of the power of various kinds of questions. An actual example might illustrate how important it is to know the types of questions you can ask and how they are

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used.

The Case of the Closed Question

This event happened several years ago on the construction of a large discount store in Chicago upon which I was engaged as a consultant. My responsibility was to regularly inspect, evaluate, and report on construction progress of the job to the owner.

The general contractor's field superintendent on the job, Linton (not his real name), was originally a farmer, and a good one. He had earned an architectural degree from an excellent Midwest university and had received his professional architectural registration. Linton had learned, as do many farmers, to keep his mouth shut except when he added value by opening it.

I came to the job about nine o'clock in the morning and checked in at the field office. Linton was occupied but told me to go ahead and tour the job and he would catch up later.

Site grading was in work for a major share of the parking areas and the foundations for the building were substantially complete. I noticed that building work and site grading were meeting planned dates between early and late starts and finishes. However, several trenched utility excavations were standing open and empty.

It was not a serious schedule problem at the time, but with wet, cold weather in the forecast, the open excavations might force a site-work cost overrun for my client.

Linton caught up with me just as I was heading back to the shanty to review job progress with him. On our way I asked--"Linton, do you have all your building permits," knowing that Linton, an honest person, would quickly explain why he wasn't installing site utilities in the open trenches. However, Linton responded with a terse one-word answer: "yes."

This puzzled me because normally our superintendents, including Linton, worked very hard this time of the year to get their site underground work completed as quickly as possible.

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February 4, 2000

I was disconcerted at what I thought was less-than-honest answer and it showed in my face. Linton, both a perceptive and conscientious man, was concerned at my lack of acceptance of his explanation and clammed up until we arrived at the trailer. Once in a warm and relatively comfortable work place, I said to Linton, "If you have all your permits...and knowing from my inspection that you have the underground pipe and conduit on the job...why aren't you installing the parking lot utilities in those open trenches?"

Linton told me quickly and impatiently that I had asked him if he had all his building permits--not all of his construction permits. He said he did have a full building permit, but that his site work permit was still pending and would be available later that day.

So, Linton felt that he would have been lying--and rightly so--if he had told me he didn't have the building permit.

The lesson learned: Don't ask the Lintons of this world a yes or no question unless you are totally satisfied that a yes or no will provide you with all the correct information you need. Linton had given me a right answer to a wrong question.

Questions stimulate the mind. Most active, interested people love to answer a question because it gives them a chance to think constructively about situations. To use questioning as an intelligence tool we, as design and construction professionals, must understand that although there are fifteen or twenty kinds of questions in common use, most of these are either open or closed. This two-part division gives us a basis for effectively formulating almost any question we choose to ask.

Let us begin our discussion with a few fundamental definitions.

A question is a brief sentence in an interrogatory form addressed to someone, and is designed to elicit information.

*A closed question is one that can be answered with a yes or no, or with a simple statement of fact:
- Are you going to the committee meeting tonight?
- Is the structure concrete or steel?
- I hear a large crowd is expected at the basketball game. Is this true?

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The closed question is valuable in opening a line of inquiry. It can be used to narrow down a group to those individuals who probably know something about a particular subject.

* An open question is one that cannot be answered with a yes or no, nor with a simple statement of fact:
- What is the best approach to inspecting and monitoring the project?
- How do you open this word processor?
- Why do you want to bring the utilities in from the south?

The open question is best used to encourage those responding to a closed question to further elaborate on their knowledge. It is a valuable tool with which to build a meaningful discussion base and to zero in quickly on the details of a topic.

The Soccer Program

Fred Thompson, the program manager for a sports-facility developer, is meeting with a working group of fifteen people from various architectural and engineering disciplines. They are about to begin discussions of the project-delivery systems available for a proposed soccer complex. Fred wants to quickly locate those in the meeting who know something about writing narrative programs about sport facilities. He asks a closed question: "Who in the room has experience in writing narrative design programs for sports facilities?"

Notice the question is devoid of specific details. Instead, Fred has allowed the audience members to provide their ideas about what he is asking. This stimulates the group to supply their own interpretation about what Fred wants and to give answers that will help direct the discussion into more specific channels.

Lisa raises her hand, answers "yes" to Fred's closed question, and begins to converge the discussion by asking Fred another closed question: "Are you looking for experience with interior design narrative programs for facility support areas?"

Others who answered Fred's opening question are now also asking both closed and open questions to further narrow down what it is that Fred is really trying to find from the group. At the same time, Fred is gathering information about the people who will probably prove valuable as he makes design-team

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management assignments.

When formulating questions we should distinguish clearly between various types of closed and open questions. To set the stage for further discussions of intelligent questioning, I have defined below some sub definitions that may be formatted either as closed or open inquiries.

a. **Ambiguous** - questions possible to interpret in different ways:
* Do you like this job?
* What are your career objectives?
* How many sections do you use in your specification format?
* Who owns small tools at the end of the job?
* Where is this specified?

b. **Closing** - questions that cut off or freeze the discussion temporarily or permanently:
* Is that your best price?
* Their proposal includes several options we want but you have excluded - can you match the options?
* Take it or leave it--ok?

c. **Direct** - questions with a strong indication who should answer:
* What does the group think about design/build? Tony, how about you?
* Here's a question that probably should be answered by a safety expert. What do you think, Hal?
* Is this a code problem, a design problem, or a construction problem?
* How do our clients feel about chemical environmental issues?

d. **Directive** - specific questions about specific issues:
* What quality of graphics do you want to use in this presentation--high, medium, or sketch level?
* What do you mean when you say we should start our cost estimates by figuring the "must" items first?
* Are you aware of the business risks you are taking with our client by using iterative costing with a guaranteed maximum price?
* When did you first realize how good that glass system really was?

e. **Indirect or overhead** - asked of a group without indication who is to answer:
* How do you approach the problem of governmental restrictions on the type of project delivery system your division can use?

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* How has the use of commissioning improved your project costs?
* What type of management organization has proven successful in your respective offices?
* How do you prorate equipment rental costs?

This is by no means an exhaustive list of the types of questions that are out there and there will be more to follow in the next Construction University paper.

As always, your input and questions are welcomed! I'd especially like to hear about any times when your questions led to...hmmm...interesting answers. Remember to change the names of all the parties.

Here are some references I suggest if you want to know more about questions and questioning:

Smart Questions by Dorothy Leeds - McGraw-Hill Book Company

The Nine Master Keys of Management by Lester R. Bittel - McGraw Hill Book Company

Give and Take by Chester L. Karrass - Thomas Y. Crowell Company.

I. 84 to 89 Definitions that are important to all liable members of the design and construction profession

Alternative dispute resolution - adr

In its generic form, is a method of resolving disputed construction claims outside the courtroom.

Includes systems of resolving disputes in planning, design and construction by cooperative, internal, or third party assistance methods that are alternatives to conventional dispute resolution methods currently in common use. Conventional methods are usually considered to be litigation and binding arbitration.

Alternative dispute resolution may make use of non traditional combinations of conventional dispute methods.

Construction

The business or work of building. The way in which something is put together.

Construction hierarchy

A range of construction classifications from the smallest component through to the largest component . Shown below are other possible names for classes of construction.

Specialized construction - S construction

The field of business practice that encompasses single phases of the construction profession. Examples of "S" construction organizations are architectural/engineering firms and departments, mechanical contractors, plastering contractors, and planning consultants, among others. Includes nearly any single organizational unit active in design, planning, construction or related fields.

S construction
Sub contracting
Specialty contractors

Macro construction - M construction
The immediate business, act, or process of building on or improving real estate so as to raise the value of the property. To convert a concept and its related plans and specifications into an actual physical environment. The act of using some or all of the specialized building occupations to build a facility that is under one general management responsibility.
Generic construction - G construction
The field of business practice that encompasses all phases of the construction industry, including programming, planning, designing, building, operating, and maintaining facilities. Described best as the full set of activities shown in the line of action. (See line of action.)
Universal Construction - U construction
Universal construction (U construction) is the application of S, C and G construction in the full range of economic, business, technical, social, professional and other components that make up our world civilization.

The all encompassing name applied to a profession, discipline, grouping, organization or other combination of elements that collectively make up an enterprise or effort ultimately resulting in all, or part, of a physical object that is useful to the society engaging in its creation.

Destructive conflict
Animosity or disagreement which results in lowering the potential for an individual or organization to succeed.

Education
The teaching and learning process by which the principles of doing things are conveyed to the learner.

Estimate
A statement of what would be the approximate cost for a certain work to be done in the future. The work can be done by the estimator or by others.

Glossary of terms
A list of difficult or specialized words with definitions.
Interactive
A group of actions that may or may not be designed to have an effect on each other, but do. Does not imply goodness or badness as a result of the effect.
Leverage
The effective use of vested and earned authority to solve problems and achieve goals and objectives.
Neutral
An unbiased outside expert capable of objectively listening, analyzing, and evaluating construction-related demands or claims which are in dispute and rendering an opinion or decision as to its disposition.
Operative words
Those words, usually nouns, verbs, and some adjectives, which best, and most quickly, convey the true meaning of a sentence or thought to the reader or listener.
Organization
The arrangement of resources (talent, skill, money, time, space, people, et al) that has evolved, or been selected, to accomplish the functions, activities, and management, and goals and achieve the objectives of a business or institution.
Partnering - a base statement
A method of conducting business in the planning, design, and construction profession without the need for unnecessary, excessive and/or debilitating external party involvement.
Partnering - Associated General Contractors
A way of achieving an optimum relationship between a customer and a supplier. A method of doing business in which a person's word is their bond, and where people accept responsibility for their actions.

Partnering is not a business contract, but a recognition that every business contract includes an implied covenant of good faith.

Partnering - project or tactical

A method of applying project-specific management in the planning, design, and construction profession without the need for unnecessary, excessive and/or debilitating external party involvement.

Partnering - strategic

A formal partnering relationship that is designed to enhance the success of multi-project experiences on a long term basis.

As each individual project must be maintained, a strategic partnership must also be maintained by periodic review of all projects currently being performed - Ida B. Brooker 1994 WEX

Planning

Establishing and arranging necessary and desired actions leading to end, intermediate and peripheral objectives.

Professional

Having great skill or experience in a special contributive field of work that is gained by extensive training and education in those fields of effort requiring specific and related education.

Profit - financial

Fundamentally, the difference between organizational cash income and organizational cash expense. Further definitions of financial profit are complex and often unique to an organization or project.

Program - as defining a step in the design process

A narrative oriented statement of the needs and character of the proposed user operation, the requirements of the user and owner, the nature of the environment to be planned, designed and built, and the corresponding characteristics of the space that will satisfy these needs and requirements. Sometimes called the brief.

Resolution

A course of action determined or decided upon that can result in clearing conflict or dispute.

Risks
Exposures to the possibility of harm, danger, loss, or damage to people, property, or other interest.

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.

Training
The teaching and learning process by which specific, explicit methods and systems of doing something, usually by rote, are conveyed to the learner.

Universal
The sphere or realm in which something exists or takes place.

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About Ralph J. Stephenson, P.E.

Ralph J. Stephenson, P.E., is an engineering consultant who has a diversified background in land planning , facilities location, building design, and construction.

Mr. Stephenson earned degrees 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, and Grylls, Victor Gruen Associates, Benjamin Schulz Associates, and the H. F. Campbell Company. With the latter three organizations Mr. Stephenson occupied executive positions as vice president. In 1962 he started his own consulting practice, specializing primarily in providing operational and management direction to owners, designers, and contracting firms.

He is a registered professional engineer in 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, the American Planning Association, the Detroit Area Economic Forum, and the Mid-America Economic Development Council.

Since 1952 Mr. Stephenson has been involved at middle and upper management levels in the planning, programming, design, construction, and operation of several billion dollars worth of construction related projects. These include work on industrial, commercial, and institutional programs throughout North America.

Mr. Stephenson has also chaired more than 50 partnering charter meetings for both public and private sector projects, and has lectured extensively on the subjects of project management, network modeling, alternative dispute resolution and partnering . He has also recently completed a book on Project Partnering for the Design and Construction Industry published by John Wiley & Sons.

He has also taught hundreds of technical and management seminars in the United States, Canada, and Europe, has written several technical magazine articles, and is the co-author of a book on critical path method. His broad experience has given him an understanding of the nature of small, medium, and large size companies, and of the need to solve their management problems through creative, systematic, and workable approaches.