



Construction Industry Institute®

Contractor Planning for Fixed-Price Construction

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Contractor Planning for Fixed-Price Construction

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INTRODUCTION

The creeping erosion of construction efficiency and productivity with the accompanying increase in construction costs is well documented in The Business Roundtable Construction Industry Cost Effectiveness (CICE) Project reports. Wasteful labor practices, ineffective cost, schedule, quality, and materials control systems, outdated contracting procedures, and a host of other factors all were cited as contributors to the overall problem. One major conclusion reached in these reports, however, is that most of these problems are attributable to management failure. Many of the modern management principles and techniques available and practiced elsewhere in industry seem to have somehow escaped much of the construction segment.

In all fairness, construction is unique when compared to manufacturing, process, distribution, transportation, and other industries. Each project is different: most contracts are awarded based on a competitive bidding or selection process; projects usually must be planned and executed under extreme time pressure; the workforce is transient, heterogeneous, and involves many crafts; union contractors may be dealing with several unions; much of the work is subject to weather; a tremendous variety of materials and equipment must be handled and managed; and construction workers are continually working themselves out of a job. These differences present an extreme management challenge.

Fixed-price contracting for construction is a common contracting strategy for owners. Occasionally such contracts are negotiated, but more often are competitively bid. For competitively bid projects, a number of contractors are provided identical sets of drawings, specifications, and other contract requirements and are given a period of time for preparing their pricing and other submittals. A contractor eventually is selected, the contract is awarded, and a notice-to-proceed is given. The time available for bid/proposal preparation invariably is short, and the time available between contract award and expected mobilization date is equally short. Yet, the contractor is expected to meet all bidding requirements by the bid date and to have final control schedules, procedures, and other control documentation available for client review shortly after the contract award. Detailed planning is essential if goals are to be successfully accomplished.

Pre-mobilization planning by a contractor for competitively bid, fixed-price construction is the subject of this publication. Planning is addressed from the time a contractor receives a set of bidding documents or a request for proposal until mobilization. The definition of planning and its role in project success is discussed first. Next, the characteristics of fixed-price construction that influence planning are identified. Finally, the principles

of planning are applied to the fixed-price construction situation and a planning structure. The ultimate goal here is the definition of a planning structure which best: (1) assures development of an accurate cost proposal and other bid submittals; and (2) establishes the framework for rapid conversion of preliminary plans into workable final plans after contract award.

This publication is condensed from Reference 2, which was prepared by Texas A&M University under contract to the Construction Industry Institute (CII). Readers are encouraged to obtain copies of that source document from CII as it contains additional detail and a number of forms and checklists that are useful in the planning process.

PLANNING

Planning may be simply defined as making decisions today with a view towards the future. One must consider the who, what, why, when, and where for a particular effort today while trying to anticipate its effect at some future date. Planning is also defined as preparing for the commitment of resources. This future-oriented decision process involves setting objectives, gathering and organizing information, determining feasible courses of action and choosing among them, implementing the actions, and monitoring the results to assure compliance with the objectives. Planning is an ongoing process which involves constant updating and revision.

The Planning Process

Plans are the products of a planning process. This process consists of:

- Establishing a set of goals required to achieve the desired result.
- Formulating feasible alternative plans to achieve the goals.
- Establishing criteria for evaluating and screening alternatives.
- Selecting the best alternative using the criteria developed.
- Implementing the alternative selected.
- Continuous review and evaluation of selected alternative.

A structured approach to planning as described above will yield significant benefits as compared to a random approach. The first benefit of a structured approach is minimizing the potential for overlooking something. Second, the process forces the scope of the project or activity being studied to be defined. Third, if handled as a team effort, a structured approach permits all viewpoints and ideas to be presented. Fourth, the plan produces a baseline for control during the execution phase.

Hierarchy of Plans

Most management and project management literature agree that there are multiple levels of management planning. The following are representative levels:

- *Policy planning* establishes permanent or semi-permanent guidelines or procedures that reflect the standing top management policy. These guidelines help lower-tier managers solve many problems without reference to top management.

- *Strategic planning* is considered to be long-range, but the definition of long-range may be as short as one year or as long as 20. This planning requires the participation of most functional units within the organization since it affects future organizational structures, equipment needs, personnel requirements, and budgets. Strategic plans chart the direction of the company based on the knowns at the time the plan is prepared. The strategic plan is usually updated annually. A five-year plan is a typical strategic plan.
- *Tactical planning* is for a shorter period of time (length again is a matter of opinion). This planning expands the near-term portion of the strategic plan into greater detail. Tactical plans should be in place to guide annual budgeting.
- *Operational planning* may be considered synonymous with tactical planning, but for purposes here it is useful to separate and define it as planning related to a specific project, operation, or opportunity within the total of those included in the tactical plan.

Establishing A Planning Culture

Although each level of management has responsibility for some aspect of planning, the initial commitment must come from top management and must be projected to the entire organization. If top executives do not put their influence behind the planning process and create the environment to bring order out of disorder from their level down, the tasks of lower level managers become more difficult and the planning process may be inefficient and meaningless.

A team approach to planning that involves all levels of management builds confidence in the organization because it stimulates communication among all affected parties and promotes their commitment to plans they helped to develop. A team approach also shows that management has a direction, that decision making is under control, and that the total organization is working to achieve the same objectives. An additional but no less important benefit is the training that lower-tier managers receive in company procedures and operations while engaged in planning. They will be in a much better position to assume higher levels of responsibility as opportunities develop, and will bring with them a planning philosophy that is fully ingrained.

The following premises serve here as a starting point in developing a positive organizational planning attitude:

- Planning activities must be performed by the managers who ultimately will be responsible for implementation of the plan.

- Professional planners can facilitate the planning process, but cannot do the planning for management.
- Creative planning is inherently a group activity because it involves many different functional units of the organization, each with their own expertise.
- Managers must be motivated to spend time on planning through a formalized system that permits their contribution to be recognized, assessed, and evaluated.
- The planning process must provide for the development of relevant databases — qualitative and quantitative — that facilitate the definition and evaluation of strategic alternatives.

Note the emphasis is on *managers*, not planners. If managers play a passive role in the planning process, the output will reflect the values of the technicians rather than those of managers. The manager who is content only to review the work of planning technicians loses a large degree of control over the organization's destiny.

Planning vs. Controlling

Planning establishes the baseline for controlling. Controlling provides the experience data for future planning. Thus, it is essential that planning formats be totally compatible with control formats. For example, the estimate must be broken down into a structure that is totally compatible with work- and cost-tracking structures that will be used in the field.

THE FIXED-PRICE CHALLENGE

Characteristics of Fixed-Price Construction

In Chapter 1, some of the unique characteristics of construction were briefly compared to other industries. Some of these characteristics are now discussed in more detail, particularly as they may influence the planning process.

The Fixed-Price Commitment. The fixed-price contract establishes the price to be paid the contractor for work described within the contract documents. Often other commitments must be made in the form of submittals such as a schedule, the management reporting system, or quality control program. The successful contractor does not turn back from these commitments; extremely careful planning is essential to avoid the consequences of omissions and other errors.

The Competition. Normally, fixed-price contracts are competitively bid. Awards usually are based solely on price as long as the contractor meets basic qualification criteria. The contractor's challenge is to bid a price that covers the work involved and provides a reasonable profit while still being better than that of the competitors. Accomplishing this requires that the contractor plan the bid preparation so that no requirements are overlooked and accurate data is assembled for pricing. Detailed evaluation of work methods and work sequencing must be included to provide the desired products in the most economical manner. Unfortunately, the competition factor can cause a contractor to adopt cost-cutting strategies both in preplanning and in execution, the philosophy being that field management personnel will have the experience and ability to "pull it off." This strategy often backfires in the form of cost/schedule overruns, lower quality work, and lost owner confidence.

Bidding Time. Bids usually are prepared under time pressure that comes from two sources. First, the time allowed by the client between the invitation to bid/propose and the due date usually is tight. Second, a contractor normally is working on more than one bid/proposal at a time and must split resources among all active invitations. To effectively operate in this atmosphere, the contractor must have complete, established procedures to guide all but the most controversial features of bid preparation. Policy planning (standard operating procedures and guidelines) establishes such a structure for use on all bid work.

Award to Mobilization Time. The time normally allowed between award of a contract and required mobilization date is also short, often less than a month. It is during this period, however, that a contractor must finalize most of the detailed plans associated with the project and

then implement all actions to achieve mobilization. The contractor often is expected to produce a detailed critical path format schedule within 30-90 days of award. To meet these requirements, the contractor must have been preparing preliminary plans and formatting other actions that need only to be refined during this period.

Contract Approach. The contractor may choose to subcontract all work, perform all work using direct-hire forces, or use a combination of direct-hire and subcontracting. Direct-hire craft personnel may be hired under either union or open shop rules. If all work is subcontracted, the options are union, open, or merit shop. These decisions are required early in the operational planning process. In some instances, the client will have dictated the approach in the bidding documents, or the contractor may have union obligations that dictate the mode of operation. Once the approach is selected, implementing personnel must be assigned and subcontracting plans must be formulated.

Direct-Hire Labor Force. With the exception of key supervisory personnel, the hiring of the direct-hire labor force will be handled from the area of the project, although recruiting may extend elsewhere. If the contractor intends to perform the work under union conditions, the contractor must coordinate with all involved union locals to obtain local bargaining agreements that will govern pay and work rules for each craft. The contractor alternately may choose to seek a project labor agreement rather than work under separate craft agreements. Such an agreement must originate with affected unions at the international level, and be signed off at the local level. On some projects, the owner obtains the labor agreement to be utilized by all participating contractors. If the responsibility is left with the contractor to obtain the agreement, negotiations must start early in the bid preparation process since the results will affect wage hour scales and work rules relating to crew sizing and productivity.

If the project is direct-hire open shop, the contractor must conduct a thorough area labor survey to determine availability of labor and area wage scales. A labor shortage of any kind means that plans must be developed to compensate. One option is to recruit in areas outside the project area. A second option is to establish special craft training programs. A third alternative is to compensate for shortages by extended scheduling. In any case, plans must be made for personnel recruiting, screening, and training (if applicable) as part of operational planning.

Site Population Turnover. Construction proceeds from the civil/structural phase through mechanical, electrical, and instrumentation phases and is finally completed with start-up and landscaping/site cleanup. During these phases, more than a dozen crafts will have come and gone and any number of subcontractors and vendors may have been on site. This particularly impacts all functions relating to personnel management, site organization, safety, and security and must be considered in planning.

Subcontractors. Most general contractors will subcontract portions of the work. Since the quality and schedule performance of these subcontractors directly affect the total project quality and schedule, they must be carefully chosen and their requirements for space and other forms of support included in project plans. Prequalification of subcontractors will require extensive effort by the general contractor, particularly when working in a new area.

Project Controls. The owner may: (1) specify a project controls system that the contractor must adopt to interface with the owner system; or (2) only provide performance-type specifications that relate to scheduling and reporting, thus allowing the contractor to choose the system. In either case, the contractor must plan the project control support carefully so that adequate project controls personnel and system capability are planned.

Materials Management. Permanent materials for the project will be a combination of owner-furnished and contractor-furnished. On-site warehousing responsibilities for these materials may be split between owner and contractor to parallel the procurement responsibilities, but this is usually assigned totally to the contractor. The contractor must develop preliminary procurement plans for materials for which the contractor is responsible, and a warehousing/materials control plan for assigned on-site materials management responsibilities, since these functions have considerable cost implications.

Regulatory Compliance. Countless federal, state, and local laws and regulations can affect a contractor's operations. As examples: (1) a state may require that a contractor have a license to practice in that state or that certain members of the professional staff or crafts be licensed to pursue their work in that state; (2) various local permits may be required prior to mobilization for the project or for conducting specific operations; or (3) local traffic regulations may restrict availability of public roadways to project traffic completely or during certain hours. The burden for knowledge of these requirements is on the contractor.

Environmental concerns have become particularly important. When surface vegetation is removed, it creates conditions for dust, erosion, and possible silting of waterways. If refueling and equipment maintenance facilities are maintained on-site, the potential exists for fuel and oil spillage that can infiltrate into water supplies of nearby communities. Also, numerous other hazardous materials that may be handled during the course of construction (such as some paint products and herbicides) can pollute the air or ground if not controlled. In urban areas, special noise protection may be required. Environmental regulations can be specific and significant fines may be levied against contractors for noncompliance. Some federal regulations have national application and there may be additional state and local regulations requiring that a project maintain specific written implementation plans.