

CONSTRUCTION MANAGEMENT

LECTURE TWO: CONSTRUCTION PARTICIPANTS

There are five main agencies actively associated with the execution of major works. These are: Business promoters, construction management consultants, architects-engineering associates, input suppliers and the contractors.

Business Promoter:

Also called the client, he is the potential owner of the construction facility. He sponsors the construction works and ultimately utilizes them. A client can be a government body, a public or private enterprises, or some private individual.. it is he who sponsors the works, finances their construction, and utilizes the facility constructed.

The construction works can be executed through the clients own organization, that is, departmentally, or through contractors, or through a combination of both.

Construction management Consultants:

The emerging trend these days among the clients is to hire the construction management consultants for rendering certain services on contract basis for the entire life of the project. The nature of tasks assigned to this group by the clients vary, but it includes the following:

- 1) Project feasibility, including cost estimates.
- 2) Site survey and soil investigations.
- 3) Scrutiny and coordination of designs and drawing work
- 4) Estimating, initial planning and budgeting costs
- 5) Processing prequalification of construction agencies, tendering and awarding contracts to the successful bidders.
- 6) Designing project organizations for executing works and developing standard operating procedures and systems
- 7) Developing detailed construction plans, project schedules and performance measuring standards
- 8) Supervising works, including administration of contracts and controlling of project time, cost and quality objectives.

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Architect-engineering associates:

An architect is an individual who designs the buildings, landscapes and other artistic features. The engineers associated with architect develop structural, electrical, mechanical and other specialist systems and designs. Architect-engineering associates are the firms employing both architects as well as engineers to provide complete design services under one roof. Some of these firms also provide construction management services.

Input Suppliers:

Construction process needs resource input. Construction inputs exist in the form of men, materials, machinery and money. The workforce connected with construction includes architects, engineers, managers, technical and non-technical staff, highly skilled operators, and skilled and unskilled man power.

Money is the at the core of all business activities and construction being a capital intensive business, generally also operates under money constraints. Construction input resources are converted into construction facilities by using the standard construction practices and management methodologies. This process of input procurement, conversion and management of resources covers a wide spectrum of the construction business activity.

Construction Contractors:

Builders who supervise the execution of construction projects are traditionally referred to as contractors, or more appropriately called constructors. The general contractor coordinates various tasks for a project while the specialty contractors such as mechanical or electrical contractors perform the work in their specialties. Material and equipment suppliers often act

as installation contractors; they play a significant role in a construction project since the conditions of delivery of materials and equipment affect the quality, cost, and timely completion of the project.

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Construction contractors form the backbone of the construction business as they execute most of the construction works. In the competitive construction business, which requires special resources for different types of construction work, the contractors generally tend to specialize in a particular area of construction. From this functional angle, the contractors can be classified into the following categories:

- a) General contractors
- b) Building contractors
- c) Specialist contractors for various types of heavy infrastructure construction work such as highways, bridges, dams, marine works etc.
- d) Specialist (mostly turnkey) contractors for various categories of industrial works like power plants, process industries and so on.
- e) Specialist utility services contractors. These include electrical contractors, water supply and sewage disposal contractors, HVAC (heating, ventilation and air-conditioning) contractors and so on.

Moreover depending upon their resource capability to handle construction work and their financial position and past performance, the contractors are further categorized by the various government bodies into work-load capability divisions (like S,A,B and C class) for the purpose of awarding contracts.

General Contractors: The function of a general contractor is to coordinate all tasks in a construction project. The general contractor is also knowledgeable about the labor force employed in construction. The labor force may or may not be unionized depending on the size and location of the projects. An experienced general contractor will make good use of the benefits and avoid the pitfalls in dealing with organized labor.

Specialty Contractors: Specialty contractors include mechanical, electrical, foundation, excavation, and demolition contractors among others. They usually serve as subcontractors to the general contractor of a project. In some cases, legal statutes may require an owner to deal with various specialty contractors directly. With the exception of such special cases, an owner will hold the general contractor responsible for negotiating and fulfilling the contractual agreements with the subcontractors.

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Material and Equipment Suppliers: Major material suppliers include specialty contractors in structural steel fabrication and erection, sheet metal, ready mixed concrete delivery, reinforcing steel bar detailers, roofing, glazing etc. Major equipment suppliers for industrial construction include manufacturers of generators, boilers and piping and other equipment. Many suppliers handle on-site installation to insure that the requirements and contractual specifications are met. As more and larger structural units are prefabricated off-site, the distribution between specialty contractors and material suppliers becomes even less obvious.

FINANCING OF CONSTRUCTED FACILITIES

The direct costs associated with a major construction project may be broadly classified into two categories: (1) the construction expenses paid to the general contractor for erecting the facility on site and (2) the expenses for land acquisition, legal fees, architect/engineer fees, construction management fees, interest on construction loans and the opportunity cost of carrying empty space in the facility until it is fully occupied. The direct construction costs in the first category represent approximately 60 to 80 percent of the total costs in most construction projects. Since the costs of construction are ultimately borne by the owner, careful financial planning for the facility must be made prior to construction.

Construction Financing:

Construction loans to contractors are usually provided by banks or savings and loan associations for construction financing. Upon the completion of the facility, construction loans will be terminated and the post-construction facility financing will be arranged by the owner.

Construction loans provided for different types of construction vary. In the case of residential housing, construction loans and long-term mortgages can be obtained from savings and loans associations or commercial banks. For institutional and commercial buildings, construction loans are usually obtained from commercial banks. Since the value of specialized industrial buildings as collateral for loans is limited, construction loans in this domain are rare, and construction financing can be done from the pool of general corporate funds. For infrastructure construction owned by government, the property cannot be used as security for a private loan, but there are many possible ways to finance the construction, such as general appropriation from taxation or special bonds issued for the project.

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Traditionally, banks serve as construction lenders in a three-party agreement among the contractor, the owner and the bank. The stipulated loan will be paid to the contractor on an agreed schedule upon the verification of completion of various portions of the project. Generally, a payment request together with a standard progress report will be submitted each month by the contractor to the owner which in turn submits a draw request to the bank. Provided that the work to date has been performed satisfactorily, the disbursement is made on that basis during the construction period. Under such circumstances, the bank has been primarily concerned with the completion of the facility on time and within the budget. The economic life of the facility after its completion is not a concern because of the transfer of risk to the owner or an institutional lender.

Facility Financing:

Many private corporations maintain a pool of general funds resulting from retained earnings and long-term borrowing on the strength of corporate assets, which can be used for facility financing. Similarly, for public agencies, the long-term funding may be obtained from the commitment of general tax revenues from the federal, state and/or local governments. Both private corporations and public agencies may issue special bonds for the constructed facilities which may obtain lower interest rates than other forms of borrowing. Short-term borrowing may also be used for bridging the gaps in long-term financing. Some corporate bonds are convertible to stocks under circumstances specified in the bond agreement. For public facilities, the assessment of user fees to repay the bond funds merits consideration for certain types of facilities such as toll roads and sewage treatment plants. The use of mortgages is primarily confined to rental properties such as apartments and office buildings.

Many financial institutions offer other arrangements such as a combination of debt and a percentage of ownership in exchange for a long-term mortgage or the use of adjustable rate mortgages. In some cases, the construction loan may be granted on an open-ended basis without a long-term financing commitment.

For international projects, the currency used for financing agreements becomes important. If financial agreements are written in terms of local currencies, then fluctuations in the currency exchange rate can significantly affect the cost and ultimately profit of a project. In some cases, payments might also be made in particular commodities such as petroleum or the output from the facility itself. Again, these arrangements result in greater uncertainty in the financing scheme because the price of these commodities may vary.

LEGAL AND REGULATORY REQUIREMENTS

Legal Responsibilities:

An owner generally tries to shift the risks to other parties to the degree possible. However, such action is not without cost of risk. For example, a contractor who is assigned the risks may either ask for a higher contract price to compensate for the higher risks, or end up in non-performance or bankruptcy as an act of desperation. Such consequences can be avoided if the owner is reasonable in risk allocation. When risks are allocated to different parties, the owner must understand the implications and spell them out clearly. Sometimes there are statutory limitations on the allocation of liabilities among various groups, such as prohibition against the allocation of negligence in design to the contractor. An owner must realize its superior power in bargaining and hence the responsibilities associated with this power in making contractual agreements.

Mitigation of Conflicts:

There are enough problems in design and construction due to uncertainty rather than bad intentions. The owner should recognize the more enlightened approaches for mitigating conflicts, such as using owner-controlled wrap-up insurance which will provide protection for all parties involved in the construction process for unforeseen risks, or using arbitration, mediation and other extra-judicial solutions for disputes among various parties. However, these compromise solutions are not without pitfalls and should be adopted only on the merit of individual cases.

Government Regulation:

To protect public safety and welfare, legislatures and various government agencies periodically issue regulations which influence the construction process, the operation of constructed facilities, and their ultimate disposal. Among them are, safety standards for workers issued by the Parliament of India, environmental standards on pollutants and toxic wastes issued by the Central and State Pollution Control Boards, and design and operation procedures for nuclear power plants issued by the Atomic Energy Regulatory Board.

Owners must be aware of the impacts of these regulations on the costs and durations of various types of construction projects as well as possibilities of litigation due to various contentions. For large scale projects involving new technologies, the construction costs often escalate with the uncertainty associated with such restrictions

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ROLE OF PROJECT MANAGERS

The project manager is the important person around which the whole organization revolves. He is entrusted with the task of integrating the interdisciplinary and interorganizational efforts under changing environments for successful accomplishment of the specified objectives. His responsibilities include team building, financial control, contract management, technical management, resources management, interface management and quality management. His functions vary with the nature of the project and organizational setup, but his roles which reflect the behavior patterns identified with their specified position are similar in almost all types of projects.

The different roles of project manager includes the following:

- 1) Leadership Role: As a leader, the project manager directs the interfunctional efforts through a complex web of relationships created in the project organization by building a performance-motivated organization a team of skilled and experienced people who collectively face the challenge posed by the people.
- 2) Entrepreneur's Role: The project manager seeks and identifies opportunities to promote improvements and needed changes.
- 3) Monitoring Role: The project manager focuses a planned approach for performing tasks, and implements time, cost and quality planning and monitoring system for the project that highlights the commitment of the project team to provide assured results.
- 4) Spokesperson's Role: The project manager acts as the sole representative through whom all communications with the client or other external parties are conducted outside the project site.
- 5) Disturbance Handling Role: The project manager maintains organizational harmony by resolving conflicts and diagnosing organizational behavior on time. He applies corrective action when the organization faces important unexpected disturbances.
- 6) Resources allocator Role: The project manager takes responsibility for allocating/altering the project resources and makes any changes which are necessary to ensure the availability of adequate resources on time. This role also calls for developing and monitoring budgets and predicting future resource needs.
- 7) Liaisoning Role: The project manager maintains contacts outside the organization, deals with those activities which may involve correspondence and contact with the concerned government officials contract vendors, professionals and top persons of the construction industry.

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- 8) Figurehead Role: The project manager, is the legal and social head of the project, is the single focal point for making decisions, ceremonial functions and symbolic duties.
- 9) Disseminator's Role: The project manager transmits the relevant information received from external sources and internal systems to the concerned people in the work place. This information may be written or verbal, formal or informal.
- 10) Negotiator's Role: The project manager negotiates important conflicting issues and business related matters, both inside and outside of the project environment. He represents the organizations on major negotiations.