


# 1

## Unit



# Construction Management

### Warm-up Questions

1. What is construction management?
2. What are the five sequential stages of the construction project life cycle? Put the following phrases into the right sequence.
  - ① Pre-project phase
  - ② Project closeout and termination phase
  - ③ Field work phase
  - ④ Bidding phase
  - ⑤ Planning and design phase



### Situational Dialogue

Today, Mr. Wu, a construction project manager, supervises the construction site. A intern, Li Ming, follows with Mr. Wu. Mr. Liu, a construction contractor, introduces their work to Mr. Wu.



- Mr. Liu: Hey, buddy, what's up?
- Mr. Wu: Nothing much, just the same as usual. How about you?
- Mr. Liu: Well, I'm a little busy right now. We have to speed up to meet the deadlines.
- Mr. Wu: Yes, I know. We don't have very long time. You had better get a move on. I find some workers aren't wearing their safety helmets.
- Mr. Liu: Yeah, I know. I guess maybe they think it's too hot for them. After all it is 38 degrees out there today.
- Mr. Wu: I can appreciate that but for safety regulations they have to be worn. We can get into big trouble if they don't wear them. So you'd better tell them "hats on or they are off the site".
- Mr. Liu: Yes, you're right. I'll warn them right away.
- Mr. Wu: OK, another thing, the painting is not up to scratch. You had better get it sorted straight away!
- Mr. Liu: Well, I think you are just being a little picky. I think it's good enough to meet the finishing standards.
- Mr. Wu: Come on, don't mess me about. I know the deadline is close, but we should still do our best. At the end of the day shoddy workmanship can cost us contracts in the future. Get this mess cleaned up! The owners are coming next week and they don't want to be seeing people painting with all this dust flying around.
- Mr. Liu: I'll find a couple of laborers and get them onto it. Why are the owners coming?

- Mr. Wu: They are coming to look at the finishing standards and to see if we are going to meet our deadline. Now we have to be careful. They will be looking for any excuses to bring in the fine print clauses to cut their bill. That's it for now. I'd better be getting a move on; I have another meeting in half an hour. Bye for now.
- Mr. Liu: OK, see you later.
- Li Ming: Is it serious if the workers don't wear their safety helmets?
- Mr. Wu: Of course, safety regulations are very strict. Health and safety officials will visit a site very often to make sure all the rules are strictly adhered to. If everything is not done correctly then they will close a site until it is corrected. For minor infractions they will issue a warning and allow a short period of time to correct them. This is usually anywhere between one and three days. For major issues they will close the site immediately.
- Li Ming: OK, got it.

**Reading****Text A****Construction Management**

The management of construction projects requires knowledge of modern management as well as an understanding of the design and construction process. Construction projects have a specific set of objectives and constraints such as a required time frame for completion. In the construction management, there are some special fields, such as Project Quality Control and Safety Management, Project Supervision, Real estate, etc. .

Generally, project management is distinguished from the general management of corporations by the mission-oriented nature of a project. A project organization will generally be terminated when the mission is accomplished. So what is construction management? It can be defined as follows:

Construction management or construction project management (CPM) is the overall planning, coordination, and control of a project from beginning to completion. CPM is aimed at meeting a client's requirement in order to produce a functionally and financially viable project.

The functions of construction management typically include the following:

- (1) Specifying project objectives and plans including delineation of scope, budgeting, scheduling, setting performance requirements, and selecting project participants.
- (2) Implementing various operations through proper coordination and control of planning, design, estimating, contracting and construction in the whole process.
- (3) Maximizing resource efficiency through procurement of labor, materials and equipment



according to the prescribed plan and schedule.

(4) Developing effective communications and mechanisms for resolving conflicts among the various participants.

Throughout the whole construction management process, from the time the owner first contemplates launching a construction project to that celebrated time, many months or years later, when the completed project is ready for use, then tasks carried out by the various parties vary in type and intensity. We name it as The Project Life Cycle, which may be viewed as a process through which a project is implemented from cradle to grave.

This process is often very complex, there is no single best way to define an ideal project life cycle; however it can generally be decomposed into several stages. There is a brief overview of each of the five phases of the construction project life cycle.

### **1 Pre-project Phase**

A construction project begins with an idea, a perceived need, and a desire to improve or add to productive capacity or the wish for more efficient provision of some public service. Whether the idea will be converted into a completed project will be decided during the planning and design phase. However, prior to that, among the first things the owner must do is to decide what sort of project delivery system will be used. How will the various parties be related? Will the owner engage a design professional to prepare plans and specifications and then contract separately with a construction contractor? Or, will a single entity be responsible for the entire project?

### **2 Planning and Design Phase**

The project is fully defined and made ready for contractor selection and deployment during the planning and design phase. It is convenient to divide this phase into three stages.

In the first stage, a project brief will be developed, more details will be set forth in a program statement, various sites may be investigated, public input may be sought, a preliminary cost estimation will be prepared, funding sources will be identified and a final decision on whether to proceed with the project will be rendered.

In the second stage, the design professional will use the results of the planning efforts to develop schematic diagrams showing the relationships among the various project components followed by detailed design of the structural, electrical and other systems.

The output from this design development effort is used in the final stage and worked at the construction site. The design professional prepares not only the detailed construction drawings but also written contract conditions containing legal requirements, technical specifications stipulating the materials and the manner in which they shall be installed and a set of other documents related to the process of selecting the contractor and finalizing the contract with the successful bidder.

### **3 Bidding Phase**

In anticipation of selecting a contractor, the owner must decide whether an open

invitation will be issued to all possible bidder or whether only certain contractors will be invited to submit offers and whether any sort of pre-qualification process will be invoked to limit the number of tenders. On the other side, contractors will have to consider a number of factors in deciding whether they will make the effort to assemble a proposal for a particular project. Wherein contract documents are prepared for use in contractor selection and installation.

#### 4 Field Work Phase

In this phase, the responsibilities of contractor involve three basic areas: Monitoring and control, resource management and documentation, corporation and communication. Four aspects of monitoring and controlling the work are important.

(1) Actual schedule progress must be compared against the project program to determine whether the project is on schedule.

(2) The cost status must be checked to establish how actual performance compares with the budget.

(3) Managing the work safely and in a way that minimizes adverse environmental impacts.

(4) Materials and plant must be managed so that these same goals are met.

#### 5 Project Closeout and Termination Phase

Finally, as the project nears completion, a number of special activities must take place before the contractor's responsibilities can be considered complete. There are the various testing and startup tasks, the final cleanup, various inspections and remedial work that may result from them and the process of closing the construction office and terminating the staff's employment. In addition, a myriad of special paperwork is required, including approvals and certifications that allow the contractor to receive final payment, a set of as-built drawings that include all changes made to the original design, operating manuals, warranties and a final report. The contractor will also be responsible for transferring and archiving project records and will conduct some sort of project critique and evaluation, etc..



### Basic Vocabulary

constraint	/kən'streɪnt/	<i>n.</i>	强制,限制,约束
relevant	/'reləvənt/	<i>adj.</i>	有关的,相关联的
viable	/'vaɪəbl/	<i>adj.</i>	切实可行的;有望实现的
delineation	/'dɪlɪnɪ'eɪʃn/	<i>n.</i>	描绘
scope	/'skəʊp/	<i>n.</i>	(处理、研究事物的)范围;见识



scheduling	/ˈʃedʒu:lɪŋ/	<i>n.</i>	行程安排, 时序安排
coordination	/ˌkəʊ.ɔːdn'eɪʃən/	<i>n.</i>	协调; 和谐
mechanism	/ˈmekənɪzəm/	<i>n.</i>	机械装置
contemplate	/ˈkɒntəmpleɪt/	<i>vt.</i>	凝视
		<i>vi.</i>	沉思, 深思熟虑
entity	/ˈentəti/	<i>n.</i>	实体; 本质
plant	/plɑːnt/	<i>n.</i>	设备
approval	/əˈpruːvl/	<i>n.</i>	审核; 批准; 认可
output	/ˈaʊtpʊt/	<i>n.</i>	产量; 输出; 作品
		<i>vt.</i>	输出
stipulate	/ˈstɪpjʊleɪt/	<i>vt.</i>	(尤指在协议或建议中)规定
monitor	/ˈmɒnɪtə/	<i>vt.</i>	监视; 控制; 监测; 追踪
inspection	/ɪnˈspekʃn/	<i>n.</i>	检查; 检验; 视察; 检阅
certification	/ˌsɜːtɪfɪˈkeɪʃən/	<i>n.</i>	证明, 鉴定; 证书
drawing	/ˈdrɔːɪŋ/	<i>n.</i>	图纸; 绘画, 制图
warranty	/ˈwɒrənti/	<i>n.</i>	保证, 担保; 授权, 批准
archive	/ˈɑːkaɪv/	<i>vt.</i>	存档
		<i>n.</i>	档案室
critique	/krɪˈtiːk/	<i>n.</i>	评论; 批评
		<i>vt.</i>	发表评论; 评判
evaluation	/ɪˈvæljuːeɪʃn/	<i>n.</i>	评估; 估价



## Professional Vocabulary

project quality and safety	工程质量和安全
project supervision	工程监理
real estate	房地产
construction contractor	施工承包商
cost estimation	成本估算
schematic diagrams	示意图
construction site	施工现场

operating manuals

操作手册

construction drawings

施工图纸



## Notes

(1) Generally, project management **is distinguished from** the general management of corporations by the mission-oriented nature of a project.

【译文】一般来说,项目管理与其他公司管理的区别在于项目的任务导向不同。

【分析】be distinguished from 意为“区别……”。

(2) We named it as The Project Life Cycle, **which** may be viewed as a process through **which** a project is implemented **from cradle to grave**.

【译文】我们把这个过程称为项目生命周期,可以把它视为实施从准备到完工的过程。

【分析】第一个 which 引导非限定性定语从句修饰 The Project Life Cycle; 第二个 which 与 through 连用形成介宾结构。from cradle to grave 的本意指“从生到死”,在本文中指“项目从准备到完工”。

(3) However, **prior to** that, among the first things the owner must do is to decide what sort of project delivery system will be used.

【译文】然而,在这之前,业主首先必须要决定的是使用哪种开发方式。

【分析】prior to 意为“在……之前”。

(4) Actual schedule progress must **be compared against** the project program to determine whether the project **is on schedule**.

【译文】实际的施工进度必须与施工项目相比较来确定是否能按时交工。

【分析】be compared against 意为“与……相比较”; be on schedule 意为“按时,准时”。



## Exercises

I. Translate the following phrases into Chinese.

(1) construction site

(2) construction contractor

(3) project supervision

(4) operating manuals

(5) cost estimation

(6) project quality and safety

II. Translate the following sentences into Chinese.

(1) This process is often very complex, there is no single best way to define an ideal project life cycle; however it can generally be decomposed into several stages.

(2) Contractors will have to consider a number of factors in deciding whether they will make the effort to assemble a proposal for a particular project.

(3) The contractor will also be responsible for transferring and archiving project records and will conduct some sort of project critique and evaluation, etc..



III. Answer the following questions according to the text.

- (1) What should we consider in the pre-project phase?
- (2) What are the responsibilities of contractor in field work phase?

### Text B

## Main Bodies of the Construction

Owner, contractor, construction supervisor and project manager are the main bodies of construction. The relationship among them is trustor-trustee relationship based on contract. They are the relationship of client and trustee based on the contract. The relationships between the contractor and owner, construction supervisor and contractor are the client and trustee. The relationship between the project manager and contractor is subordinate and superior, but now there is also the relationship of client and trustee based on the contract.

### 1 Owner

Owner here refers to the owner of the property. Owners may be natural persons, legal persons and other organizations, may be the citizens or organizations of its nation and can also be a foreign citizen or organization.

In construction project contract, construction unit is also called the owners or project owner. It refers to the main investment subject or the investor in the construction project, it is also the main body of the construction project management.

### 2 Contractor

The contractor shall design, execute and complete the works in accordance with the contract, and shall remedy any defects in the works. When completed, the works shall fit for the purposes for which the works are intended as defined in the contract.

The contractor shall provide the plant and contractor's documents specified in the contract, and all contractor's personnel, goods, consumables and other things and services, whether of a temporary or permanent nature, required in and for this design, execution, completion and remedying of defects.

The work shall include any work which is necessary to satisfy the employer's requirements, or is implied by the contract, and all works which although not mentioned in the contract are necessary for stability or for the completion, or safe and proper operation of the works.

The contractor shall, whenever required by the employer, submit details of the arrangements and methods which the contractor proposes to adopt for the execution of the works. No significant alteration to these arrangements and methods shall be made without this having previously been notified to the employer.

### 3 Construction Supervisor

Construction supervisor refers to the legally qualified engineering supervision unit who



supervises the construction process in construction quality, construction duration and use of construction funds of the contractor on behalf of client to supervise the construction process in accordance with the entrustment of client and based on laws, administrative regulations and relevant technical standards for construction, design documents and construction contracts.

#### 4 Project Manager

During the design phase, the construction manager suggests involving the performance criteria, site conditions, and availability of materials and labor. Information pertaining to temporary job facilities is also provided. Where long lead-time machinery, equipment, or materials are needed, construction manager will make arrangements for their procurement and delivery. During the design process, construction manager prepares preliminary, interim, and final project budgets and construction schedules.

During construction operations, project manager assumes the responsibilities for the supervision, coordination, and administration of the project. Of top importance in this regard are coordinating the work of the separate contractors, checking the actual progress of the project against an established time schedule, and exercising every effort to keep the cost of the work within the approved budget. Also often involved are quality control, safety, progress payments, contract changes, claims, expediting the construction progress, shop drawings, acceptance testing and so on. The extent of services to be provided by the construction manager can be tailored to suit the individual owner's requirements.



#### Basic Vocabulary

owner	/ˈəʊnə/	n.	业主
contractor	/kənˈtræktə/	n.	承包商
supervisor	/ˈsju:pəvaɪzə/	n.	监督人, 管理人
contract	/ˈkɒntrækt/	n.	合同, 契约
		vt.	订合同
client	/ˈklaɪənt/	n.	客户, 委托人
trustee	/trʌsˈti:/	n.	受托人, 理事
subordinate	/səˈbɔ:dɪnət/	n.	属下, 附属物
		adj.	下级的, 次要的
		vt.	使居下位, 使服从, 把……放在次要
superior	/suːˈpiəriə/	n.	上级; 高手; 上标



		<i>adj.</i>	上层的, 上好的, 出众的; 高傲的
investment	/ɪnˈvestmənt/	<i>n.</i>	投资; 投资额
investor	/ɪnˈvestə/	<i>n.</i>	投资者
remedy	/'remɪdɪ/	<i>n.</i>	药物; 治疗法; 补救
		<i>vt.</i>	治疗; 补救; 矫正
defect	/dɪˈfekt/	<i>n.</i>	缺点
		<i>vi.</i>	背叛
consumable	/kənˈsju:məbl/	<i>adj.</i>	可消费的
		<i>n.</i>	消费品
temporary	/'tempərəri/	<i>adj.</i>	暂时的, 临时的
permanent	/'pɜ:mənənt/	<i>adj.</i>	永久的, 持久的
execute	/'eksɪkjʊ:t/	<i>vt.</i>	执行, 处决, 实行, 完成
stability	/stəˈbɪləti/	<i>n.</i>	稳定性
alteration	/ɔ:l'tə'reɪʃən/	<i>n.</i>	变更, 改变



## Professional Vocabulary

construction management	建筑工程管理
construction project contract	建筑工程合同
engineering project supervisor	工程监督
construction supervision system	监理制度
engineering report/project report	工程报告
change in the work	工程变更
schedule drawing	工程图
invitation for bid	邀标
planning approval	规划许可
planning permit of construction engineering	建设工程规划许可证
public bidding	公开招标
quality assurance	质量保障
quality control	质量控制
statement of work	工作说明

planned start date	计划开始日期
late finish date	最晚完成日期
valuation	估价



## Notes

(1) The relationship between the project manager and contractor is subordinate and superior, but now there is also the relationship of client and trustee **based on the contract**.

【译文】项目经理与承包商之间是上下级关系,但目前也会出现建立在合同基础上的委托人与被委托人关系。

【分析】based on the contract 是过去分词短语做后置定语,修饰 relationship,相当于定语从句 which is based on ...。如: The marriage based on true love often brings happiness. 基于真爱的婚姻常常会带来幸福。

(2) The contractor shall design, execute and complete the works **in accordance with** the contract, and shall remedy any defects in the works.

【译文】承包商应该按照合同设计、实施和完成工程,并修补工程中的任何缺陷。

【分析】in accordance with 意为“按照;与……有关的”。如: International business should be conducted in accordance with the law of nations. 国际的事务往来要遵守国际法。

(3) The work shall include any work **which** is necessary to satisfy the employer's requirements, or is implied by the contract ...

【译文】工程应该包括为满足雇主要求或者合同隐含要求的任何工作。

【分析】which 在本句中引导的是一个限定性定语从句,修饰 any work。如: This is the watch which I am looking for. 这就是我要找的那块手表。

(4) No significant **alteration to** these arrangements and methods shall be made without this having previously been notified to the employer.

【译文】若事先未通知业主,对这些安排和方法不得做重要变更。

【分析】alteration to 意为“改变”。如: There is a structural alteration to the building. 这座建筑物有一处需要做结构上的改变。

(5) Construction supervisor ... **on behalf of** client to supervise the construction process ...

【译文】建设工程监理……代表发包人对工程建设过程实施监督。

【分析】on behalf of 意为“代表”。如: At the airport he read an address of welcome on behalf of the association. 在机场上他代表该协会致了欢迎词。



## Exercises

I. Match the English in Column A with their Chinese equivalents in Column B.

Column A

Column B

( ) 1. construction project contract

a. 建设工程监理



- |                                |           |
|--------------------------------|-----------|
| ( ) 2. contractor document     | b. 技术标准   |
| ( ) 3. technical standard      | c. 建设资金   |
| ( ) 4. construction quality    | d. 工程进度付款 |
| ( ) 5. design document         | e. 建设工程合同 |
| ( ) 6. construction supervisor | f. 在线协同工作 |
| ( ) 7. construction funds      | g. 施工质量   |
| ( ) 8. progress payment        | h. 设计文件   |
| ( ) 9. online collaboration    | i. 施工进度表  |
| ( ) 10. time schedule          | j. 承包商文件  |

II. Translate the following sentences into Chinese.

(1) Owners may be natural persons, legal persons and other organizations, may be its own citizens or organizations and can also be a foreign citizen or organization.

(2) The contractor shall, whenever required by the employer, submit details of the arrangements and methods which the contractor proposes to adopt for the execution of the works.

(3) During construction operations, project manager assumes the responsibilities for the supervision, coordination, and administration of the project.

III. Answer the following questions according to the text.

(1) What's the relationship between the project manager and contractor?

(2) What shall a contractor do according to the text?

(3) How does the construction supervisor work on behalf of the client?

## Practical Writing

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### Letter of Authorization

#### 授权书

在投标书中,当投标书和合同签字人不是投标商(bidder)的法人时,必须要有法人授权书,投标商代表签署投标书和合同。

#### Sample

#### Letter of Authorization

I, the name of legal representative, the undersigned legal representative of the company name of the bidder, hereby authorize the undersigned the name of duly authorized representative to be true and lawful representative of the company from the date of this letter of authorization to act for and on behalf of the company with legally binding effect for and in respect of the name of the project to sign the bids. And I acknowledge all contents contained in the bids signed by the authorized representative.

It is hereby authorized. My entrusted agent has no right of sub-entrustment.

Name of the company: \_\_\_\_\_ (official seal)

Legal representative: \_\_\_\_\_ (signature)

Authorized representative: \_\_\_\_\_ (signature)

Date: \_\_\_\_\_

**Extended Reading****Project Spot Visa****施工签证**

施工签证是工程承发包双方在施工过程中按合同约定对支付各种费用、顺延工期、赔偿损失达成一致意见的补充协议。经双方书面确认的签证即成为工程结算或最终结算增减工程造价的凭据。

- (1) 工程签证是双方协商一致的结果,是双方法律行为。
- (2) 工程签证涉及的利益已经确定,可直接作为工程结算的凭据。
- (3) 工程签证是施工过程中的例行工作,一般不依赖于证据。

**Project Spot Visa**

file:001

Project Name			
Visa Place		Construction Unit	
Content: 1. When constructing before the zoo, we found that we should mend the sewers because they were too old. So these increased our quantities as follows: (1) Excavation before the zoo: $6 \times 0.8 \times 0.6 = 2.88 \text{ m}^3$ (2) Backfilling the earth: $6 \times 0.8 \times 0.6 = 2.88 \text{ m}^3$ (3) $\phi 300$ mm Sewers <u>6</u> m 2. During the construction, we found that some wells couldn't be used use again. We torn them down and this increased the trash qualities as follows: Garbage Sino trans(transport distance 15 km): $20 \text{ m}^3$			
The Owner(seal)		Supervision Unit(seal)	Construction Unit(seal)
Date:		Date:	Date: