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ملاحظات

إدارة عقود التشييد

فيرست

إعداد : شهد قطيش

Construction Contracts Administration (CE110401348)

1 – Introduction

Khaled Hesham Hyari

صناعة الانشاءات
*construction industry

في اختلافين

construction industry
* المقاول بقطع الـ product
* المقاول بأجهزته ومعداته بجميعها للموقع
* والـ product ثابت مكانه
مثال: عمرت جسر بفل مكانه مابتحرك

manufacturing industry
المنتج ثابت ومكان الـ product متحرك
مثل مصنع الحاسوب بيصنع الحاسوب لمكان ثابت وبوزع الـ product (الحاسوب) product الـ هو متحرك

البناء — عقود — ادارة

Construction Contracts Administration

- What is construction?
  - Construction is the execution of the work as required by the contract documents.
  - Construction is the process that sets up a portable plant, bring material to the site, and on completion of the work moves the plant away, leaving its output standing
    - Output: all immobile structures (airports, buildings, dams, roads and tunnels, power plants, municipal treatment plants, pipelines …etc)

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Construction Contracts Administration II

- What is a contract?
  - Legally binding document that describes the responsibilities and rights of the parties
- How are contracts formed?
  - Owner issues Invitation for Bids (IFB)
  - Contractor prepares and submits bid
  - Owner reviews and accepts bid
  - A contract document is developed, reviewed, and agreed upon by parties
  - The contract is signed by parties

Construction Contracts Administration III

- What is Construction Contract Administration?
  - Construction contract administration (CCA) involves the activities necessary to effect and determine the fulfillment of the contract requirements by the parties to the construction contract
- Construction contract administration begins when the agreement between the owner and contractor is executed and ends when final payment is accepted by the contractor

Project's Contract Administration I

- What is project?
  - Project: A temporary effort undertaken to create a unique product or service
  - "Any undertaking with a defined STARTING and ENDING point and defined OBJECTIVES by which completion is identified. In practice, most projects depend on limited RESOURCES by which the objectives of the project are accomplished."

Project Management Institute

Project's Contract Administration II

- Project attributes :
  - Has a well-defined objective—an expected result or product (unique purpose)
  - Is temporary
  - Requires resources, often from various areas, to carry out the tasks
  - A project has a primary customer or sponsor that provides direction and the funds necessary to accomplish the project
    - In a business setting, the customer can be internal or an external to your organization

Project's Contract Administration III

- Project attributes:
  - A project has a specific time frame - a start time and a date by which the objective must be accomplished.
  - A project is carried out through **a series of interdependent tasks** in a certain sequence in order to achieve the project objective
  - Involves uncertainty

Who are Project Stakeholders?

- **Stakeholders** are the people involved in or affected by project activities
- Stakeholders include:
  - Project sponsor
  - Project manager
  - Project team
  - Support staff
  - Customers
  - Users
  - Suppliers
  - Opponents to the project

Project Participants (Construction) I

- The main participants are:
  1. – The Owner
  2. – The A/E (Designer/Consultant)
  3. – The Contractor
- Other participants: involved in the project with one of the main participants
  1. – Subcontractors
  2. – Product representatives, who assist with submittals and furnish field services such as inspecting installed work

Project Participants (Construction) II

3. – Suppliers, who furnish materials or products for the project
4. – Manufacturers, who produce materials or products
5. – Consultants, who provide professional services to the A/E, contractor, or owner
6. – Testing laboratories and inspection agencies, which provide quality control (QC) services to the owner and contractor
7. – Financial advisers and institutions that arrange for the project financing

Project Participants (Construction) III

- Attorneys, who coordinate the legal and contractual issues of the project
- Insurance advisers and companies that provide risk coverage to the owner, contractor, and A/E
- Bonding companies, which ensure the performance of the contractor and subcontractors
- Authorities and regulatory agencies which have jurisdiction over the construction and that establish criteria in the form of codes, ordinances, and permits

Project Categories

- Public vs. Private Projects
  - A private party can award a contract in any way they choose to anyone they choose
  - Private party can make one contract or multiple
  - Public party is limited by laws and regulations
  - Public party commonly awards bids by competitive bidding

Phases of a Project

1. Business Planning
2. Conceptual Design
3. Detailed Design
4. Procurement
5. Construction
6. Testing, Start-up & Implementation
7. Operations & Utilization
8. Decommissioning

Project management

- Project management is the application of knowledge, skills, tools, and techniques to project activities in order to meet project requirements (meet or exceed stakeholders' expectation from a project)
- Organizing and managing resources so the project is completed within defined scope, quality, time and cost constraints

Construction يعني project

Construction Management

- Construction Management: the act of managing the construction process
- The construction manager manages the basic resources of construction
  - Workers and subcontractors
  - Equipment and construction plant
  - Materials
  - Money (income, expenditure, and cash flows)
  - Time

يخلص المشروع في الفترة المحددة

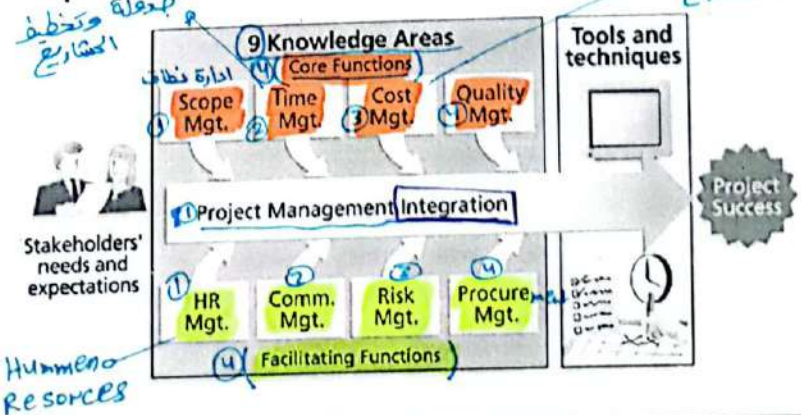
الفلوس اللي بياخدها المقاول من المالك

المصاريف

المشروع

Project Management Framework

- A set of processes, tools and templates, designed to be used together to manage a project through its lifecycle



جدولة وتخطيط المشاريع

ادارة نطاق

تقدير تكلفة المشاريع

كل ال project management تعود حول هذه ال Knowledge Areas

managing dos Knowledge Areas هاذي هي ال Construction manager How to manage Areas

Nine Project Management Knowledge Areas I

- Scope Management
- Time Management
- Cost Management
- Quality Management
- Human Resources Management (HR)
- Communications Management
- Risk Management
- Procurement Management
- Integration Management

Construction Procurement Management: The process of securing all the goods and services needed to bring a construction project to completion

Nine Project Management Knowledge Areas II

- Knowledge areas describe the key competencies that project managers must develop.
  - Four core knowledge areas lead to specific project objectives (scope, time, cost, and quality).
  - Four facilitating knowledge areas are the means through which the project objectives are achieved (human resources, communication, risk, and procurement management).
  - One knowledge area (project integration management) affects and is affected by all of the other knowledge areas.
  - All knowledge areas are important!

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specifications
مواصفات

هاد الدور الرئيسي لـ
project manager

PM Triple Constraints I

- Time
- Cost
- Scope

Scope

Manage these or they will manage you!

minimum quality requirements
لازم المقاول يحققها
اذا ما تحققت المقاول راح يرفضها ممكن يعيدها او مايقبلها

project managment triple cons traints OR project management traingle

صدة محددة للتنفيذ المقاول لمايأخذ المشروع الله وقت محدد اذا تجاوزه المقاول يكون في غرامات تحفيز بدفعها المقاول اذا تأخر عن التنفيذ لازم ينعطي مدة (time frame) الموجود بال Contract

المقاول يحلل budget (ميزانية) للمشروع

estemet

بناء عليه يسعر المشروع لازم Cost ال تكون اقل من budget اللي حطها المقاول اذا كانت اكثر راح المقاول يدفع منه

كامل الاعمال اليلي بشملها المشروع لازم تتحقق

PM Triple Constraints II

- **Scope**: all the work to be done in order for the deliverables to meet the requirements agreed upon at the onset of the project.
- **Cost**: the amount the customer has agreed to pay for acceptable project deliverables.
- **Schedule**: the timetable that specifies when each activity should start and finish.
- **Customer's satisfaction**: To complete the scope within budget by a certain time to satisfy the customer.

taskes كل ال

مثال budget

المقاول لما يجي ينهي schedule على معين من ال time frame

المقاول لازم يجي ينهي المشروع عشان ان the customer be satisfy should

الهدف يكون راضي

* لازم ينهي المشروع ضمن ال Time وال budget وال Quality وال scope المطلوب

كل هاد المفروض المقاول يحققه

هاد الاشراف هدف اي construction manager

وهدف جهاز

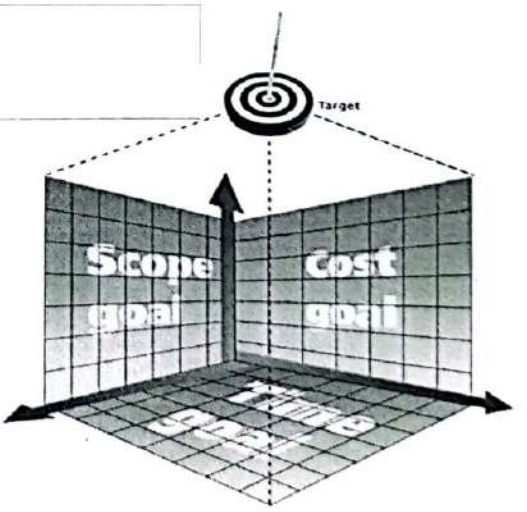
PM Triple Constraints III

- It is the project manager's duty to balance these three often-competing goals.

Courtesy of Dynamic Graphics, Inc.

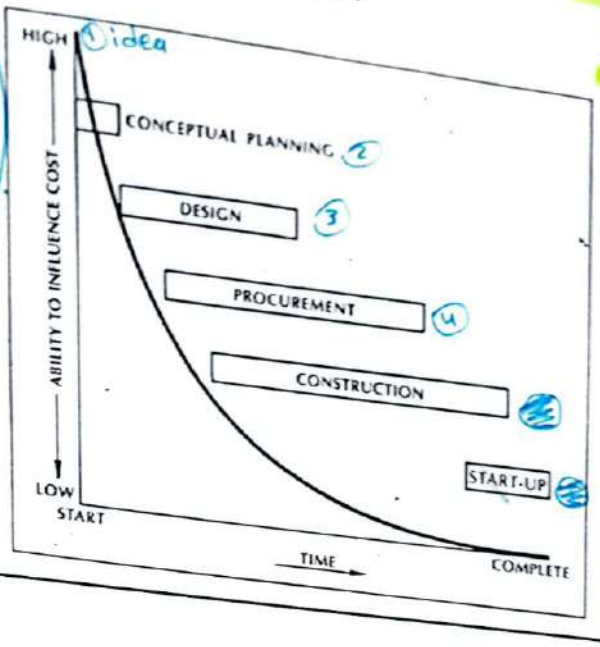
PM Triple Constraints IV

- Successful project management means meeting all three goals (scope, time, and cost) – and satisfying the project's sponsor!



Project Management

- The level of influence concept



Construction Contractors

- Construction contractors: Companies and individuals engaged in the business of construction
  - They operate under a contract arrangement with the owner
- Construction contractors
  - General contractors: engage in a wide range of construction activities and execute most major construction projects
  - Specialty contractors: limit their activities to one or more construction specialties

*any construction project we have 3 major participants
1- owner
2- contractor
3- consultant / Designer

Construction Contracts Administration
(CE110401348)

2 – Project Delivery Approaches

Khaled Hesham Hyari

Introduction

- Three major participants in a project:
  - Owner (employer)
  - Designer (architect/engineer) A/E
  - Builder (contractor, subcontractor)
- Three Major Project Phases
  1. Design phase (owner & Designer)
  2. Bidding and Award phase
  3. Construction phase

بدء المقاول بتنفيذ

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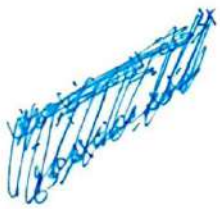
① Design Phase

- The owner enters into a contract with the architect/engineer to plan and design a project
- At this stage, the owner participates to set criteria for:
  1. – Design (architectural, structural, mechanical, etc.)
  2. – Cost
  3. – Schedule
  4. – Other decision making inputs

② Bidding Phase

- After completion of the planning and design phase, the project is advertised for construction
- Opening bids
- In most cases the bid is awarded to the lowest responsive bidder



Award Phase

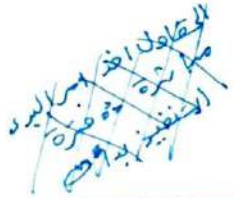
- The owner enters into contract with the contractor
- Both parties sign an agreement

صار عندي legaly bids relationship

(3) Construction Phase

- The owner issues notice to proceed أمر المباشرة
- Usually contractors hires subcontractors to construct portions of the project
- The contractor and the subcontractor enter into agreement; the owner is not involved in this agreement
- The contractor is fully responsible in front of the owner for the whole project, whether executed by the contractor or the subcontractors

* ظهر احنا اخترنا المقاول وصار في contract



* ال owner او جهاز الاشراف يستلم الاعمال من ال contractor العمل المشترع مع المقاول subcontractors

ال owner يعطي المقاول امر ان يبدأ بالتنفيذ

* يعني فترة التنفيذ تبدأ من التاريخ الموجود في the notice of proceed

مثلاً مدة التنفيذ كاملة 400 يوم يبدأ أول يوم هو عند ال notice of proceed

*Who is responsible if the owner? contractor

owner وال ما الو علاقة بهاي ال Agreement

Contract between contractor + subcontractor = Agreement

* في مرحلة التنفيذ يقوم المقاول بمجموعة من الاعمال و ممكن يعطي جزء من هي الاعمال ال subcontractors

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Initiating a Project

- The 5-step process
  1. Advertise for bids
  2. Open bids
  3. Award contract
  4. Sign agreement (contractor & owner)
  5. Issue notice to proceed

Project Delivery Approaches

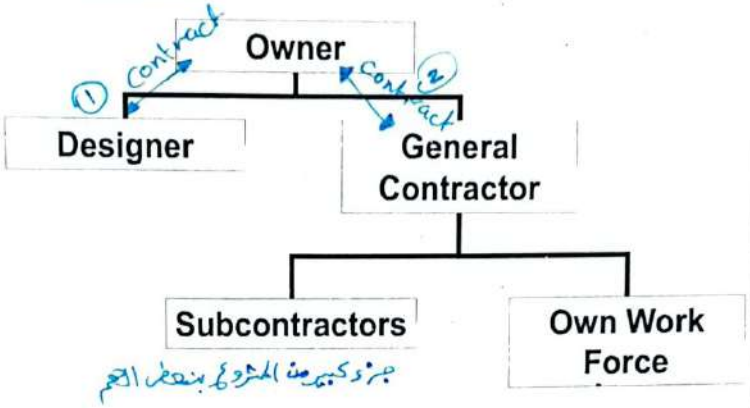
- Four major approaches:

1. – Traditional
2. – Design/Build
3. – Construction Management
4. – Owner/Builder

owner → Contractor
Designer

Project Delivery Approaches

1. • Traditional



جزء كبير من المشروع بنعطي الحجم

* ال owner يروح اول اشي عند ال designer يعملوا التصميم

* بعدين ال owner بصير يدور على Contractor

* ممكن في عندي 2 contractors بالترتيب 1 2
owner + Designer
owner + Contractor

* وغالبا المقاول بيشتغل هو جزء من الاعمال والباقي الاعمال على ال Subcontractor

Traditional Delivery Approach

- **Owner enters into two separate contracts**
  - Architect/Engineer (Designer)
    - Drawing
    - Specification (Design)
  - General Contractor
- **Advantages**
  1. Fixed price for the project before any work commences
  2. Price competition between contractors

لكل مشروع في مجلد للمواصفات

* قبل ما اروح على ال Construction phase بكون عارف بالربط شو بدي اعمل كان التصميم جاهز
1 بعرف كم بكلف المشروع من قبل ما يبدأ قبل ما يتم توقيع العقد

كمالك بعرف كم بكلفه المشروع من قبل ما يبدأ الشغل

2 منستفيد من العلاقة بين ال Contractors
كان لنا 5 مقاولين بيعرضوا المشروع كل صد فيهم بكون بيختار اقل سعر حتى ياخذ المشروع فالمالك مستفيد بستفيد من التنافس

1 بعرف كم بكلف المشروع
2 نستفيد من التنافس بين المقاولين

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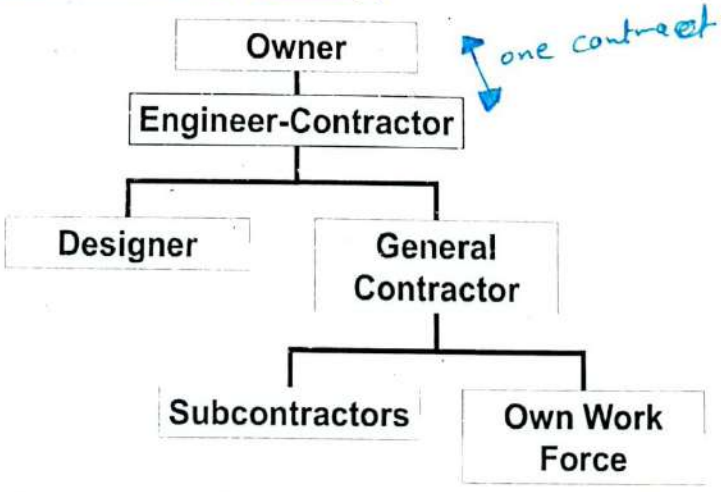
Traditional Delivery Approach

- **Disadvantages**

1. – Contractors/subcontractors have little opportunities to suggest improvements until after the award is announced
2. – Difficult to phase or fast-track the project
3. – Less opportunity for interaction between the significant parties (Designer & Contractors)
4. – Misinterpretation of the drawings and specifications can be difficult to eliminate

Project Delivery Approaches

2. **Design-Build (Turnkey)**



Design-Build Delivery Approach

- Under this approach, the owner enters into one single contract:
  - Design/Builder (D/B) → (contractor)
- The D/B is responsible for both design and construction
- Can be achieved using joint ventures between a designer (A/E) and a builder (GC)
- Because of the low bid system in public bidding, the D/B approach can not be used

Design-Build Delivery Approach

- The D/B approach is usually used in:
  - The case of fast track, where construction can start before design is completed
    - Main objective for fast track is to shorten construction time
  - The case of complex projects where few companies are qualified to design/build such as petroleum refineries

(Designer & contractor)

Design-Build Delivery Approach

- Advantages
  - Seamless communication within the single firm encompassing both design and construction (One source of responsibility)
  - Contractor is able to improve constructability
  - Scheduling is more effective, and fast-tracking is possible
  - Design changes are simpler

① التصميم والتنفيذ from the same company

بال Traditional Approach كان اي Communicate between the designer and contractor كان مسؤولين ال owner

* يكون في صعوبة from the same company

ممكن نبدا بال Foundation وانا بمرحلة التصميم

التعديل سهل

في المشاريع الكبيرة يعملوا Constructability analysis (تحليل قابلية البناء) بعد ما نخلص تصميم المشروع كامل قبل ينطرح العطاء منشان ان اعضاء التصميم مشوفي اشياء ممكن نعدلها

Design-Build Delivery Approach

- Disadvantages
  - Owner may not have a firm fixed price in hand early
  - Owner' knowledge and awareness of the project is less (Crucial Decision making)
  - Less checks on contractors' performance (More vulnerable)

* المالك مايكون لدى المالك بمعلومات في وقت مبكر
* المالك بدري كم بتكلف المشروع قبل ما نبدا بمرحلة ال Construction ولكن احيانا في مرحلة ال Construction تعديلات بتكلف اكثر

معرفة ال owner عن تفاصيل المشروع قليلة لان ال Designer بكون بين ال Designer and contractor بكون تواصل مباشر

الشركات

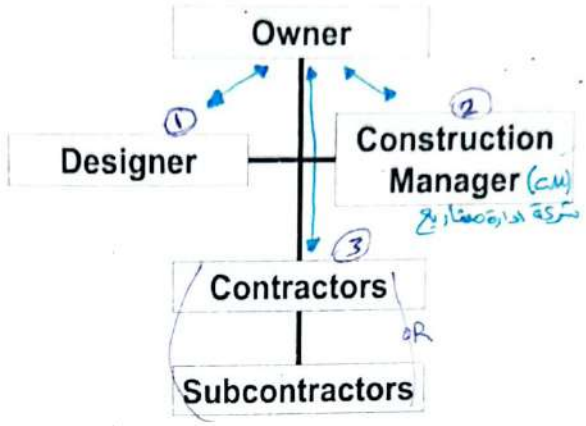
كبيرة عندها Prosegor

صغيرة لاقل صيت ال owner

مابتغير لها يتغير ال owner

Project Delivery Approaches

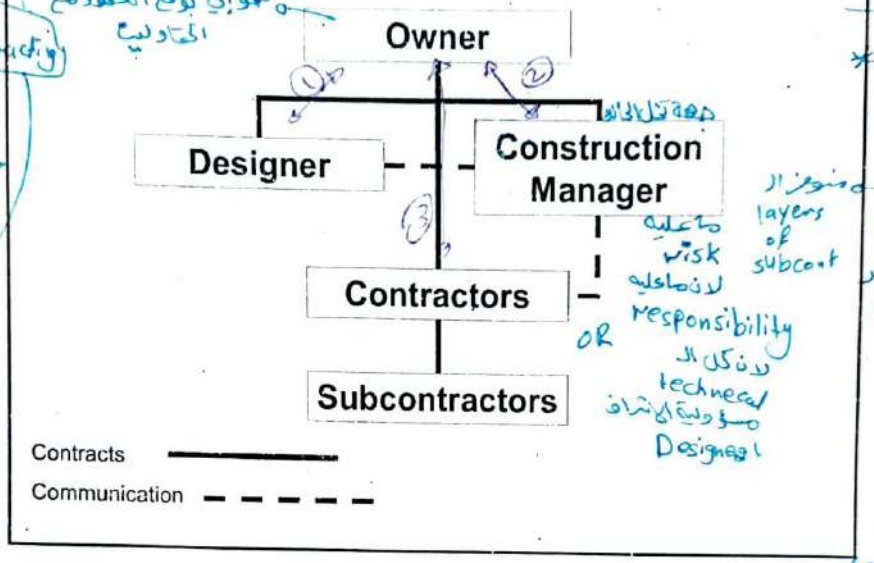
(3) • Construction Management



Construction Management Delivery Approach

- Many owners engage construction managers (CMs) to assist in developing bid documents and overseeing project construction.
- CM:
  - Is a professional or a firm trained in the management of construction processes.
  - Is generally interposed between the owner and some or all of the other participants.
- There are two general types of CM:
  - Construction Managers as Agent (ACM)
  - Construction managers-at-risk (CM-at-risk)

Construction Management as Agent



Construction Management as Agent

- Owner enters into 3 contracts
  - A/E (Designer)
  - CM
  - GC (general contractor)
- The CM acts as the owner representative in both design and construction (CM acts as advisor to the owner)
- The trade contracts are held by the owner rather than the construction manager. With the CM Agency approach, the owner is responsible for procuring all trade contracts for the construction phase, which the CM can coordinate.

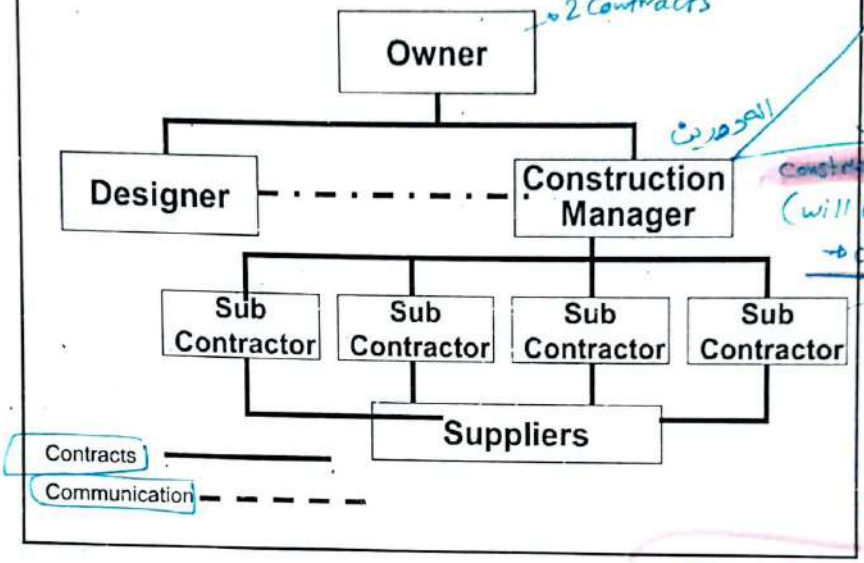
Construction Management as Agent

- The CM provides for the project:
  - Project management
  - Schedulers
  - Estimators
  - Construction coordinators, field engineers, quality control personnel, etc.
- Construction can start for some portions of the project as soon as design of that portion is completed
  - Overall design is not completed yet
  - i.e., foundation construction starts as soon as its design is complete, before columns, beams, and slabs are designed

Construction Management as Agent

- Advantages
  - Extends the owner's internal capabilities in performing traditional owner responsibilities.
  - Builder selection flexibility
  - Effective communication between the three parties
  - Allow simultaneously phasing various tasks in the project in coordinated effort (Faster schedule delivery)
  - Owner is able to benefit from competitive bidding by contractors and subcontractors
- Disadvantages
  - Possible communication problems between parties involved

Construction Management at Risk



Construction Management at Risk

- The CM at Risk delivery method:
  - The CM act as consultant to the owner in the development and design phases, similar to CM-as-Agent
  - The CM act as the equivalent of a general contractor during the construction phase.
- The Construction Manager at Risk contracts directly with multiple subcontractors and has single point of responsibility for the delivery of the project
  - Here, the CM holds the risk of subcontracting the construction work to trade subcontractors

Construction Management at Risk

- CM-at-risk arrangement increases significantly owner's delegation of control and risk.
- CM-at-risk typically contracts with the owner in two stages.
  - First, CM-at-risk manages and undertakes services during the conceptual and preliminary design phases with the design professional.
  - When the design is complete, the owner and CM-at-risk agree on a price and schedule for the completion of the construction work.

Construction Management at Risk

- **CM At Risk Advantages**
  - Majority of project risk is passed to the CM, limiting owner's liability
  - A high level of control over cost and schedule early on in the project
  - Single point of accountability: CM At Risk signs contracts with all subcontractors
  - Enables fast-track delivery – time savings
  - Full pre-construction services are available (CM hired for pre-design allows design assistance and CM involvement in estimating and constructability)

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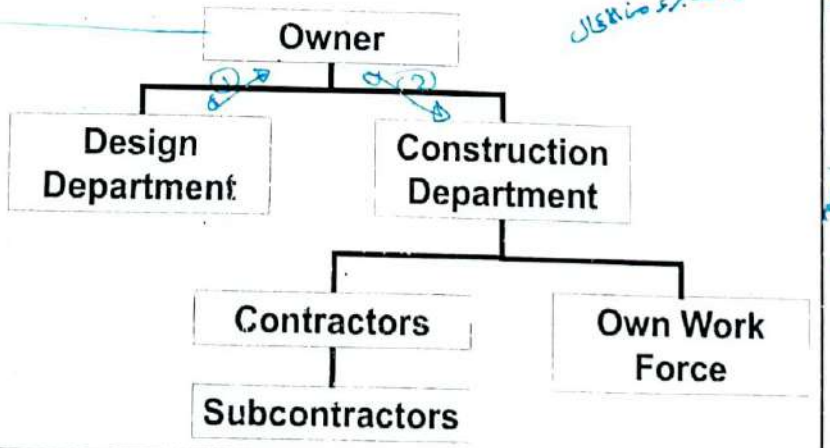
Construction Management at Risk

- **CM At Risk Disadvantages**
  - Difficult for Owner to evaluate value of contract
  - Typically less competition in bidding (especially for self-performed work)
  - Additional pre-construction fees and CM fee may increase "first cost" (but may result in lower final cost)

Project Delivery Approaches

- **Owner-Builder**



The owner-builder project delivery method is where you, the owner, act as the general contractor for the project. You would be responsible for managing the planning, coordinating, scheduling, and execution of the project.

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Responsibilities for Subcontractors Coordination

- For the traditional, design/build and CM approaches:
  - As long as the owner awards the contract to one single GC, he has no coordination responsibility; the GC is fully responsible for coordinating the work of the subs
- For the Owner/builder approach:
  - The owner has coordination responsibilities if he awards the contract to multiple contractors; or if he performs part of the work with his own forces

Eng Student

Construction Contracts Administration
(CE110401348)

3 – Contract Types
(Contract Pricing)

تسعير العقود

Khaled Hesham Hyari

Contract Pricing

- Because of the unique nature of constructed facilities, it is almost imperative to have a separate price for each facility
- The construction contract price includes the direct project cost including field supervision expenses plus the markup imposed by contractors for general overhead expenses and profit
- The factors influencing a facility price will vary by type of facility and location as well.
- All pricing arrangements have some common features in the form of the legal documents binding the owner and the supplier(s) of the facility

(profit margen) + (indirect cost) + (direct cost) = مجموع التسعير

activefis

profit an overhead = project markup

indired cost + project margen

1

Procurement Methods

عملية اختيار المقاول تبع أمن ① ②

- Two major procurement methods:

public
المشاريع الحكومية

① – Competitive bidding → (اكثر من مقاول بتنافسوا حتى ياخذوا المشروع)

② – Negotiated bidding → اذا owner بختار مقاول وبتفاوض انا واياه على سعر معين وممكن اروح لمقاول تاني وثالث وممكن اعمل مفاوضات عادي مع بعض عادي

لانه صار في competition

① Competitive Bidding (seal Bidding)

حتى يصير عندي competition في شرط اساسي (prerequisite) ان يكون بالزبط عارفين شو بدهم ياخذ الا اذا كانت the detal of design is completed = Drawing + specification

The general framework of competitive bidding

- The basic structure of the competitive bidding process consists of:

① – The formulation of detailed plans and specifications of a facility based on the objectives and requirements of the owner ← Design صدر بالـ

② – Invitation for Bid (IFB) is issued by owner ← لازم يكون open يكونوا محددين مواصفات المقاول

③ – Contractors prepare bid ← بتنقل لهاي المرحلة

– Contract is typically awarded based on lowest responsive or responsible bid → لدعوا المقاولين انهم يعرضوا المشروع بأحسن طريقة

(he complies with all owner requirements) المقاول يوافق مع جميع متطلبات المالك حالة اي تحفظ على اي شرط من شروط العطاء لازم يكون بشرط

هاد المقاول عنده القدرة انه ينفذ المشروع

He have all skiles necessary to perform the task عنده
- experience
- Financial capability القدرة المالية

بعد ما المقاولين يدرسوا الوثائق ال Design وال spicifications (site investigation) وبعملوا وكل حد بحضر سعر

then the owner he will the offer he cede

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Competitive Bidding II

- Invitation for Bid (IFB) is often restricted to qualified contractors
- The definition of a qualified contractor usually calls for a minimal evidence of previous experience and financial stability
- In the private sector, the owner has considerable latitude in selecting the bidders, ranging from open competition to the restriction of bidders to a few favored contractors

Competitive Bidding III

- In the public sector, the rules are carefully delineated to place all qualified contractors on an equal footing for competition, and strictly enforced to prevent conspiracy among contractors and unethical or illegal actions by public officials

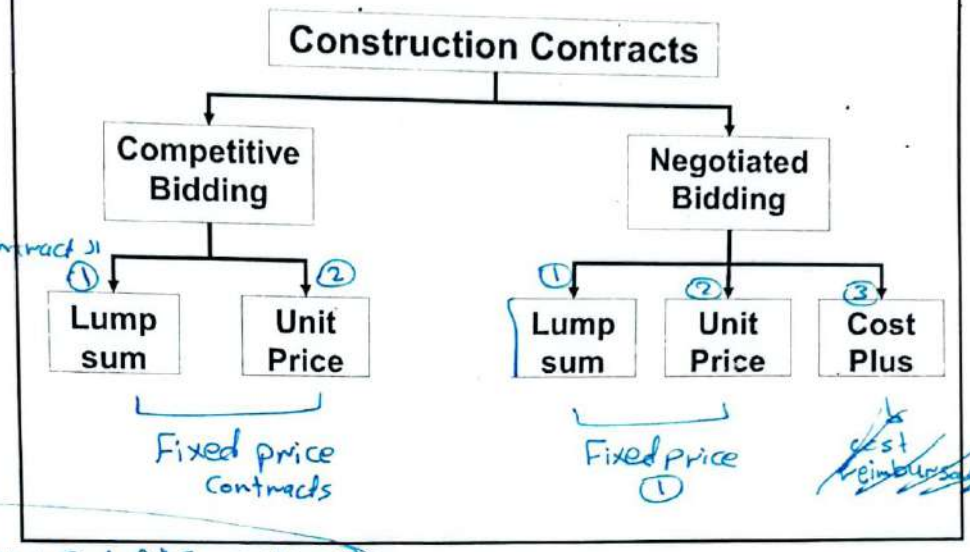
(2) Negotiated Bidding

- **Negotiated Bidding**: The basic structure of the negotiated bidding process consists of:
  1. – Bidders are often selected by owner
  2. – Bidders prepare price, schedule, and presentation on qualifications
  3. – Owner selects successful bidder and negotiates a final price
- Common in the private sector

Negotiated Bidding II

- A major reason for using negotiated contracts is the flexibility of this type of procurement, particularly for:
  - Projects of large size and great complexity
  - Projects which substantially duplicate previous facilities sponsored by the owner.

Construction Contracts



Contract بكون از

Fixed price ريسك اكتر ← كل ما زادت مدة المشروع بكون از

ch2 ← مرتبط بـ Delevary approsh

Contract Types

- Two fundamental contract families
  - Fixed price
    - Lump sum
    - Unit price
  - Cost reimbursable
    - Cost plus
    - Guaranteed Maximum Price

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contract type اول

(1) Lump-sum Contracts

- The contractor agrees to perform a stipulated job of work for a predetermined price that includes profit
- Scope of work is typically well-defined
- The contractor must complete the work for the fixed price shown as long as the scope of the contract has not been altered by change orders
  - Any cost overruns must come out of the contractor's pocket
  - Similarly, any money that is saved on the job, as long as it conforms to the plans and specifications, belongs to the contractor

simple type of contract

Lump-sum Contracts II

- The lump sum contract is popular among owners because
  - The total cost of the project is known in advance
- Lump sum contracts are more popular in building projects compared to highway projects
  - Quantities are usually known in the case of building construction and unknown in the case of highway construction

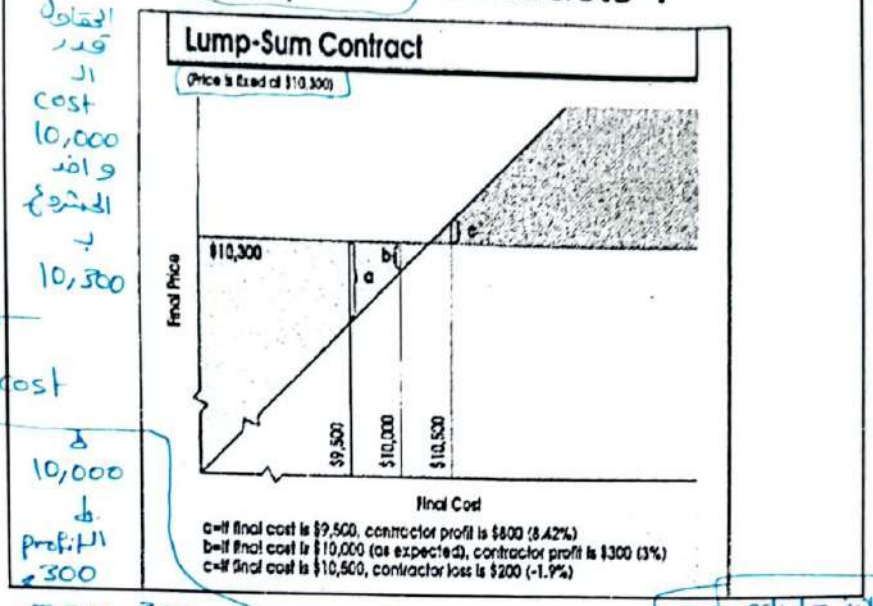
Lump-sum Contracts III

- When it is appropriate?
  - When the plans are fully completed and accurate quantities of work can be estimated
  - When the owner has a limited budget because it is the only form that gives a fairly accurate indication of the final cost of the project

Lump-sum Contracts IV

- Advantages:
  - Generally competitive bid contracts
  - Benefits owners because they know exactly what they have to pay
  - Total price fixed in advance
  - The simplest type of contract
- Disadvantages
  - Risk is on the contractor but he can make money by finishing faster
  - Scope must be fully defined (no fast tracking)
  - Bid unbalancing can occur

Lump-sum Contracts V



Unit Price Contracts

- Another form of fixed price contracts
- Unit price contracts are based on:
  - An A/E estimate of quantities of defined work items
  - A unit price for each of these work items
- The owner/design firm provides a list of all individual bid items, along with an "engineer's estimate" of the quantities involved

Item	Unit	Quantity	Unit Price $	Bid Amount $
Excavate sand	Cubic Meters	8,000		
Excavate rock	Cubic Meters	2,000		
Fill material	Ton	4,000		
		Total		

actual quantites

owner ← المالك ← الدفعات للمقاول حسب الكميات المنفذة فعلا قبل ما يعطيها

Unit Price Contracts II

- Blanks are provided in the proposal document for the bidder to insert a price per unit
- Multiplying this unit price by the quantity shown in the A/E estimate indicates the total amount of the bid for each item
- The sum of the unit costs multiplied by the estimated quantities of all items in the contract is used to determine the low bidder

Item	Unit	Quantity	Unit Price $	Bid Amount $
Excavate sand	Cubic Meters	8,000	4	32,000
Excavate rock	Cubic Meters	2,000	20	40,000
Fill material	Ton	4,000	12	48,000
Total				120,000

Unit Price Contracts III

- Because payment to the contractor is made on the basis of units of work actually done and measured in the field:
  - The owner needs to provide a field force for the measurement and determination of the true quantities of work accomplished
- The contractor is obligated to perform the quantities of work actually required in the field at the quoted unit prices, whether they are greater or less than the owner estimates

Unit Price Contracts IV

- The contractor must include all anticipated costs in the bid items
  - Overhead
    - Temporary structures (formwork)
- Often used for public works projects
- Very common with earthwork
- When it is appropriate?
  - When the project is fairly well defined but the actual quantities are difficult to estimate with accuracy

Unit Price Contracts V

- **Advantages**
  - Generally competitive bid contracts
  - Accommodates quantity adjustments
- **Disadvantages**
  - Disadvantage: estimate vs. actual quantities
  - Neither the owner nor the contractor know what the total project cost will be until the completion of the project
  - Bid unbalancing can occur
  - Additional staff requirements are needed by the owner to certify in-place quantities

Cost-"plus" Contracts

- Cost-"plus" contract: The contractor is reimbursed for his expenditures plus an allowance for overhead and profit
- Sometimes referred to as a "time and materials" contract
- Normally negotiated between the owner and the contractor
- Two types:
  1. – Cost plus a percentage fee
  2. – Cost plus a fixed fee

Cost-"plus" Contracts II

- **Cost-plus-percentage-fee contracts**
  - Contractor agrees to perform the work for the cost of materials and labor plus a percentage fee to cover overhead costs and profit
  - Fee is a percentage of the total cost of the project
- **Cost-plus-fixed-fee contracts**
  - Contractor agrees to perform the work for the cost of materials and labor plus a fixed fee to cover overhead costs and profit
  - Fee is a fixed amount regardless of actual cost of work
  - This form removes the incentive for the contractor to increase costs in an attempt to increase the fee

Cost-"plus" Contracts III

- When is a cost-plus contract appropriate?
  - When the actual costs of a project or portions of a project are difficult to estimate with accuracy
  - Projects of experimental design, new materials, or an unusual site that is hard to predict
  - When plans and specifications can not be completed before construction starts
  - When the true nature of the project cannot be accurately described before construction begins (example: remodeling or renovation projects)

Design is not completed

Cost-"plus" Contracts IV

- The contractor computes the amount of the fee on the basis of:
  - Size of the project
  - Estimated time of construction
  - Nature and complexity of the work
  - Hazards involved
  - Location of the project
  - Equipment and manpower requirements
  - Similar considerations

Cost-"plus" Contracts V

- Advantages
  - Does not place the owner and the contractor in an adversarial relationship
  - Construction can start before scope fully defined
  - Changes can be easily incorporated into the scope of work under contract
  - The contractor is almost assured of not losing money

Cost-"plus" Contracts VI

- Disadvantages
  - The owner has little idea of what the actual cost of the project will be
  - Can be bad for the owner if the contractor takes longer than he should
  - The owner must maintain additional staff to monitor the progress of the contractor with an emphasis on documenting reimbursable costs
  - Often noncompetitive bids
  - Risk is on the owner
  - Lack of upper boundary, open-book

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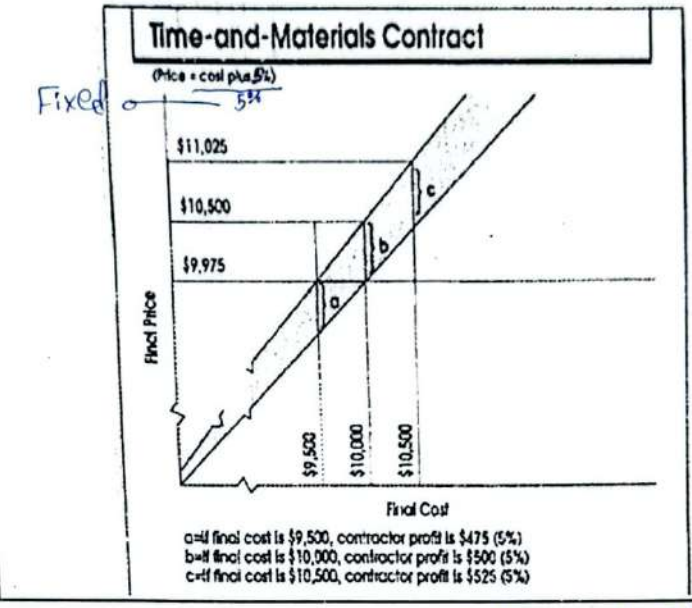
Risk of ~~contractor~~ owner

Cost-"plus" contract VII



Fixed

actual cost
9,500
→ المقاول راح ياخذ
we will get
cost + 5%
من
9,500
= 9975

actual
10,000
Cost + 5%
من
10000
= 10500

Variation related to cost-plus contracts —

1 Guaranteed Maximum Price Contracts I

- **Guaranteed maximum price GMP** (upper limit)
  - Cost plus fee with guaranteed maximum price
  - Contractor agrees that the total amount needs to be paid by the owner will not exceed a pre-established maximum price
  - Costs above the guaranteed price are absorbed by the contractor
  - Savings may be reverted to the owner or, in many cases, shared by the owner and the contractor

Simply cost-plus contract
وفيه upper limit على المبلغ اللي راح يدفعه الowner

نفس الـ cost plus contract وبكن عندي upper limit

Cost plus 10%
وبكن في شرط اضافي على هذا الـ contract
guaranteed
900,000 دينار
أكثر مبلغ راح يدفعه الowner
إذا طلعت الـ cost 500,000
المالك راح يدفع
500,000 + 10%
800,000 +10%

فيحال كان
cost + profit > GMP
الowner يدفع فقط GMP
الزيادة راح يتحملها المقاول

Cost + profit
كان الـ Total
ما يتجاوز الـ guaranteed maximum price

~~50~~
850,000 +10%
85,000
= 935,000
وبكن صعوبة المالك راح يدفع فقط 900,000

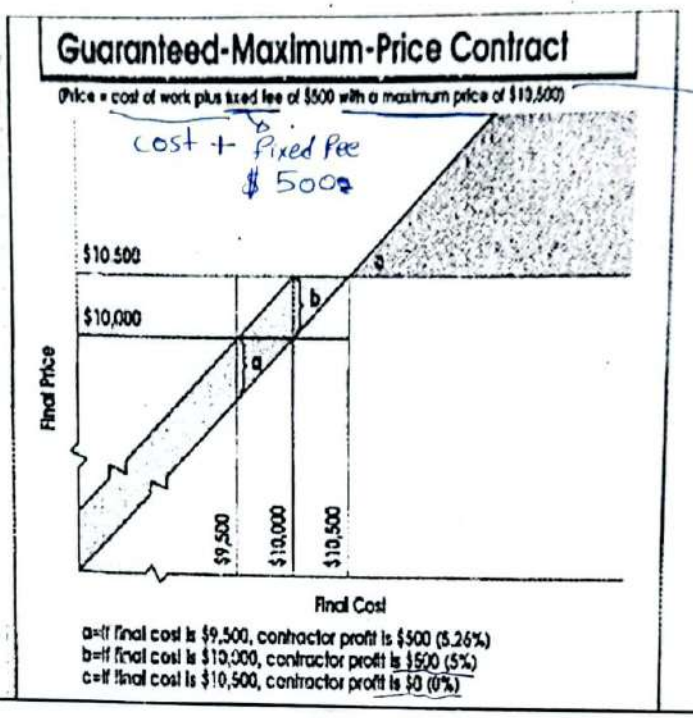
Guaranteed Maximum Price Contracts II

- **Advantages**
  - Does not place the owner and the contractor in an adversarial relationship
  - Construction can start before scope fully defined
  - Changes can be easily incorporated into the scope of work under contract
  - The owner is assured that the total project cost will not exceed a stated amount (upper boundary)

Guaranteed Maximum Price Contracts III

- **Disadvantages**
  - Difficulty in establishing GMP
  - Often noncompetitive bids

Guaranteed Maximum Price Contracts IV



Incentive Contracts

- What?
  - Incentive contracts are:
    - Fixed amount with bonus
    - Fixed amount with an arrangement for sharing any cost savings
- Why?
  - To motivate the contractor to keep the cost of the work and/or the time of construction to a minimum
- The owner and the contractor agree to target estimates of cost and/or time of construction
- Bonus or penalty are tied to these target figures

Incentive Contracts II

الهدف

- Cost Incentives:
  - As a stimulant for the contracting firm to minimize costs, a bonus clause providing for share savings can be written according to which it shall receive, in addition to a base fee, a stated percentage of the amount by which the total actual cost is less than the target estimate
  - There may also be a provision whereby the contractor's fee is reduced if the construction cost exceeds the target estimate

Incentive Contracts III

- Duration Incentives:
  - When time of completion is critical to the owner, the contract can be drafted to provide that the contractor receives a fixed sum of money in addition to the base fee for each day of beneficial occupancy realized by the owner prior to the originally agreed-upon completion date.
  - This can be extended to provide that the contractor's fee will be reduced by the same amount for each day completion is delayed

بال Contract
مدة التنفيذ 180يوم
معوض حق المالك ان يطلب
من المقاول يخلص اسرع

Rate Loading (Bid Unbalancing)

- The process of adjusting rates throughout the bill of quantities while keeping the total constant
- A balanced bid is one in which the anticipated costs for the various bid items are accurately reflected in the unit prices that are submitted
- Unbalancing a bid is a method used by some contractors in which the unit prices of the various bid items are altered so that they do not reflect the true costs of those items
- Unbalancing does not alter the total bid amount

Rate Loading (Bid Unbalancing) II

- Why?
  - To minimize money needed to finance the project or to offset mobilization costs that occur at the beginning of the project
    - Front-end loading: obtain greater early income by increasing the rates of the initial site activities
  - Increasing Profit
    - "Estimating Error Unbalancing: Increasing the rates on items the quantities of which are believed to have been underestimated and decreasing the rate on items which are believed to be overestimated
    - Perceived productivity advantages or disadvantages

-increasing profit

* ممكن يكون Quantities related (unit price) الي بتكون موجودة Quantities

bill of Quantities

Rate Loading (Bid Unbalancing) III

- Front-end loading: (lump-sum / unit price)
  - Can occur in lump sum contracts and unit price contracts
- "Estimating Error" Unbalancing: (unit price) ومرتبط بتخمين الكميات مابصير الا بال
  - Occur only in unit price contracts

هاي بتكون estimated Quantities معناه ان ال actual ممكن تكون اكتر او اقل

ولان ال payment بتكون على ال actual مرات بتكون بالمشروع ال Quantities مو حقيقية

المقاول راح يستغل اذا كان عنده خبرة راح يعرف ان ممكن فعل التنفيذ هاي الكميات راح تزيد هاد اسمه (estimating error) unbalanced فالمقاول من الاول برفع اسعار ال items إلي بتوقع ان كمياتها تزيد بنفس الوقت بنزل اسعار ال items إلي بتوقع ان كمياتها راح تقل هاد بحكي ال profit اكيد

Rate Loading (Bid Balancing) IV

- Disadvantages
  - Unbalancing can result in losses to the contractor (change orders) ممكن المقاول يخسر لان ممكن المالك يكتشف فعل التنفيذ ان المقاول رافع سعر items
  - The contracting authority may disqualify the bid as unsuitable if it recognizes these maneuvers (Especially severe unbalancing) اذا كان الفرق كبير اكتر من المقاولين التانيين او كبير اقل بحيث ان unbalance
  - Rebidding may occur in large projects, and first bids may be known (Past winning bids are open knowledge)

تأثيره على ال owner negative لان اما بدك تدفع ظلوس early للمقاول اكثر من اللازم او معرض لخطر risk

اذا اذا المقاول عمل Estimating Error unbalancing المقاول ممكن يرفع ال cost على ال owner profit بدون اي زيادة بال profit راح تكون على حساب ال owner

* اذا بلغ ال owner ان المقاول عنده (unbalance bidding) ممكن يرفض ال offer (العطاء) ويعتبره rejected

معجب جدا المالك يكشف ان unbalance bidding اذا المقاول كان عامله بشكل واضح

وفي items المقاولين بحطو مندون profit لا بتعارضان اذا عملي صح

راح يقل تنافسهم مع المقاولين التانيين

ممكن المقاول يعمل bid unbalancing اذا حس ان راح يكون عنده Perceived Productivity Advantages or disadvantages (مزايا الايجابية او عيوبها) في items جهة المقاول بعرف انه سعرها جيد اقل من المقاولين التانيين ونفس الاشي المقاول بعرف ال items إلي سعرها عالي اعلى من المقاولين التانيين

(items + profit + overhead)

الخلاصة

cost اكتر	ينزل السعر	cost اقل	برفع السعر	حتى يحافظ على تنافسهم مع المقاولين

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items احسب المقاول سعر كل الـ

(unit cost) direct cost + indirect cost + profit

Example 1: Front-end Loading

- **Balanced bid** (الـ owner بكتبها)

Item	Unit	Quantity	Unit Price $	Bid Amount $
1 Excavate sand	Cubic Meters	8,000	4	32,000
2 Excavate rock	Cubic Meters	2,000	20	40,000
3 Fill material	Ton	4,000	12	48,000
	Total			120,000

- Assume that sand will be excavated before excavation of rock

- **Unbalanced bid**

Item	Unit	Quantity	Unit Price $	Bid Amount $
Excavate sand	Cubic Meters	8,000	4.5	36,000
Excavate rock	Cubic Meters	2,000	19	38,000
Fill material	Ton	4,000	11.5	46,000
	Total bid amount			120,000

اول خطوة الاقيها ويقدم فاتورة للـ owner بعد ما يخلص

اذا كان المقاول عامل Balance bid الـ 8 و 4 نضرب = 32

اول فقرة 32 بدل 36 اذا قلت اكثر في early stages

الهدف هون ان ياخد فلوس بالبداية اكثر

عل Unbalance ضل غير ما يتغير الـ total

طيب بشو استفاد المقاول

الـ items اللي بالبداية زدت سعرها ... بالنهاية قللت سعرها

Example 2: "Estimating Error" Unbalancing

- **Balanced bid**

Item	Unit	Quantity	Unit Price $	Bid Amount $
Excavate sand	Cubic Meters	8,000	4	32,000
Excavate rock	Cubic Meters	2,000	20	40,000
Fill material	Ton	4,000	12	48,000
	Total			120,000

- **Unbalanced bid**

Item	Unit	Quantity	Unit Price $	Bid Amount $
Excavate sand	Cubic Meters	8,000	1	8,000
Excavate rock	Cubic Meters	2,000	32	64,000
Fill material	Ton	4,000	12	48,000
	Total			120,000

رزم اقل بكتير

رزم اعلى بكتير

المقاول هون توقع ان هاي الـ Quantities الـ actual الها راح تكون مختلفة حسب خبرته

طيب موضوع هالـ 2 بستفيد المقاول صح او لا ؟ مبعرف كل شوفكم للحالة الـ actual Quantities

الهدف هون ان المقاول من فترة شاف ان في حيات لازم تكون اقل بكتير لازم اخر شي يحقق Profit

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ممكن باد unitprice و payment على الـ actual Quantities

Example 2: "Estimating Error" Unbalancing II

- Actual Cost (Balanced bid)

Item	Unit	Quantity	Unit Price $	Bid Amount $
Excavate sand	Cubic Meters	5,000	4	20,000
Excavate rock	Cubic Meters	5,000	20	100,000
Fill material	Ton	4,000	12	48,000
Total				168,000

- Actual Cost (Unbalanced bid)

Item	Unit	Quantity	Unit Price $	Bid Amount $
Excavate sand	Cubic Meters	5,000	1	5,000
Excavate rock	Cubic Meters	5,000	32	160,000
Fill material	Ton	4,000	12	48,000
Total				213,000

لو فرضنا إني توقعه المقاول صحيح الكميات الـ actual مختلفة كثير عن الـ estimated

الـ profit صارت امتعاف للمقاول

213,000 − 168,000 = 45,000 زيادة

اسمها payment gain استفاده المقاول لانه عمل unbalancing

هنا يقل هيك لانه المقاول يكون عنده خبره بالموقع ويعرف كيف يقدر الكميات

(insertece) time , quality , safty

(المقاول والمهندس)

Estimated 9million تقديرية

actual الفعلي

cost + 8%

Final

8m < cost < 10m

cost +6%

cost > 10m

cost + 10%

cost < 8m

a) cost = 7.5m

b) cost = 8.5 m

c) cost = 10.5m

هاي افضل اشي للمقاول لانو عم profit اكثر

بهي افضل اشي للاونر لانو كلفه اقل اشي

a) profit = 0.1 * 7.5 = 0.75 m

owner = 7.5 + 0.75 = 8.25m

10% من 7.5

b) profit = 0.08 * 8.5 = 0.68 m

owner = 0.68 + 8.5 = 9.18 m

c) profit = 0.06 * 10.5 = 0.63 m

owner = 10.5 + 0.63 = 11.13 m

المالك والمقاول يتعاقدا على Targets

Target contract (cost plus)

ex cost + 10%

Target cost = 50m

C<T اذا طلعت المقاول ياخذ النصف

50/50 sharing Formula C>T واذا طلعت مشاركة يدفع النصف

Final cost

a) 45m (Final cost 45 < 50 Target)

b) 50m (F=T)

c) 54m (F>T)

a) profit = 0.1 * 45 = 4.5 + 5 * 0.5 = 7m ← احسن وضع للمقاول

owner = 45+7 = 52 ← والمالك احسن

b) profit = 0.1 * 50 = 5

owner = 50+5=55

c) profit = 54 * 10 = 5.4 − 0.5 * 4 = 2 = 3.4

5.4

Owner = 54 + 3.4 = 57.4

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Ex 3

cost ±10 %

target cost = 40m

20/80 sharing formula (contractor/owner)

a) 35 m

b) 40 m

c) 43 m

a) profit = 0.1 * 35 + 5 * 0.2 = 4.5 m

owner cost = 35 + 4.5 = 39.5

b) profit = 0.1 * 40 = 4

owner = 40 + 4 = 44 m

c) profit = 0.1 * 43 = 4.3 − 3 * 0.2 = 3.7

owner = 3.7 + 43 = 46.7 m

Hamad Melhem Press

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Ex] cost +10%

Target = 40m

30/70 sharing formula

a) 35m

b) 40m

c) 43m

profit = 35 * 0.1 + 0.3 * 5 = 5m

owner = 35 + 5 = 40m

profit = 40 * 0.1 + ~~0.3~~ = 4m

owner = 40 + 4 = 44m

profit = 43 * 0.1 - 3 * 0.3 = 3.4m

owner = 43 + 3.4 = 46.4m