FE Review
Construction Management

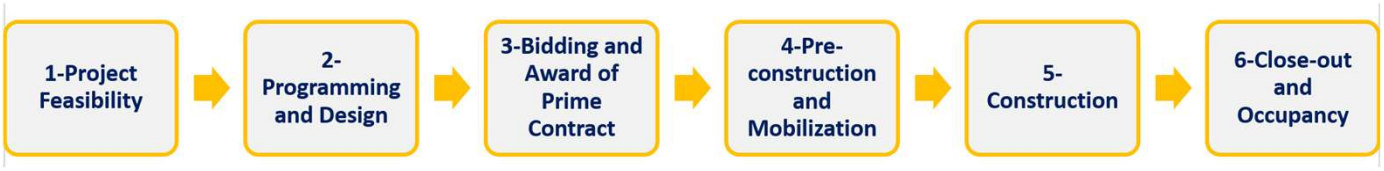
Min Deng, Ph.D.

Main Contents

1. **Construction Project People, Acquisition and Contractual Methods**
2. **Project Estimation**
3. **Project Scheduling**

1. Which party is mainly responsible for the pre-construction and mobilization stage?

A. Owner
B. Construction manager
C. Architect engineer
D. Contractor



2. Off-site labor usually are associated with what type of construction:

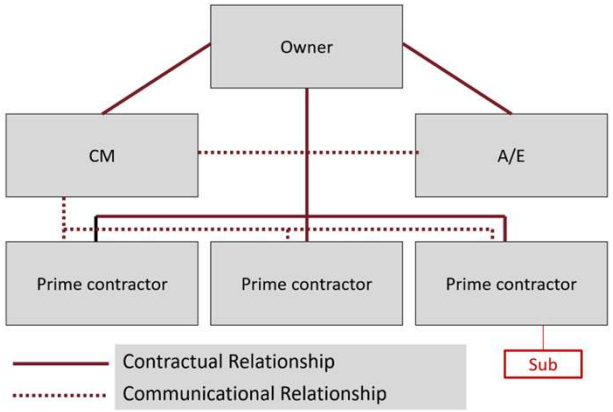
A. Modular construction
B. Fast track construction
C. Highway construction
D. Building construction

3. If you want to defend your right as a construction worker, it will be easier if you are a ____?

A. Open shop worker
B. Union worker

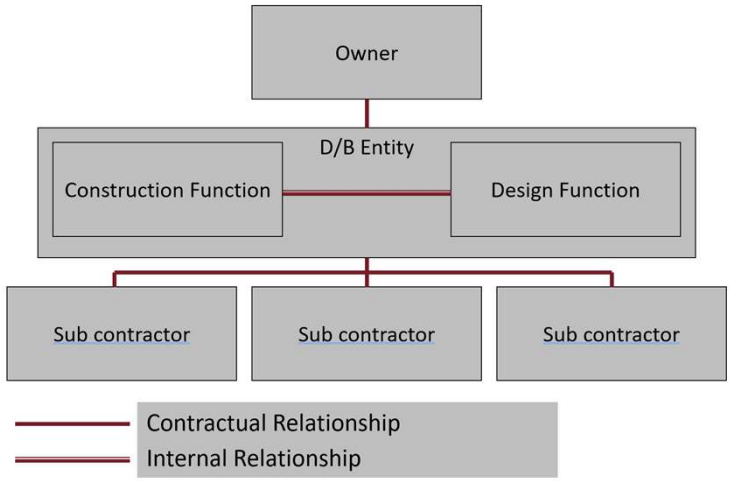
4. In a Pure Construction Management project delivery system, the construction manager has contracted with:

A. Only the owner
B. Only the contractor
C. Both the owner and the contractor



5. For the Design-Build project delivery method, what is the relationship between the construction entity and design entity within the design/build firm?

A. Contractual relationship
B. Communicational relationship
C. Internal relationship (we also refer to it as joint venture)



6. A contractor signed a $1,500,000 lump sum (fixed price) contract with an owner. This number included an estimated $100,000 profit for the contactor. At completion of the construction, the project final cost for the contractor was $1,600,000. How much did the contractor lose?

A. -$1,600,000
B. -$100,000
C. -$200,000
D. -$50,000

7. A project decided to use a unit price contract for its concrete placement. The owner estimated that the concrete quantity will be 15,000 CY. The contractor's equipment cost is $8/CY, material cost is $4/CY, and the labor cost is $4/CY. The burden factor is 1.25. What will be the unit price (per CY)?

A. $8
B. $10
C. $16
D. $20

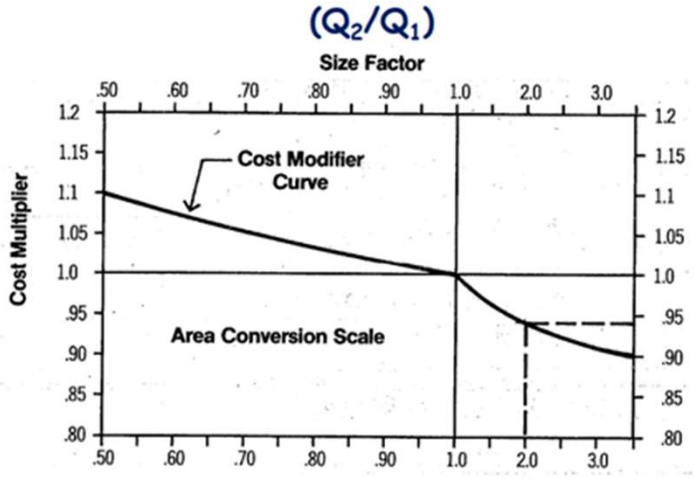
8. The owner and the general contractor have a cost plus 10% percentage fee contract. The final cost of the project was $140 million. What is the contractor's fee on this project?

A. $14 million
B. $15 million
C. $10 million
D. $5 million

9. The owner and contractor signed a cost plus $5,000 fixed fee contract with a GMP of $100,000. The contractor ended up spending $90,000 on the project. How much will the owner pay to the contractor if no incentive clause is used in the contract?

A. 90,000
B. 95,000
C. 100,000
D. 105,000

Building Type	Median Cost per S.F.	Typical Size Gross S.F.	Typical Range Gross S.F.
Apartments, Low Rise	$ 84.50	21,000	9,700 - 37,200
Apartments, Mid Rise	107.00	50,000	32,000 - 100,000
Apartments, High Rise	116.00	145,000	95,000 - 600,000
Auditoriums	141.00	25,000	7,600 - 39,000
Auto Sales	105.00	20,000	10,800 - 28,600



10. You want to estimate the cost of a 63,000 S.F. low-rise apartment using RS Means Project Size Modifier - Cost Capacity Factor using the data given below. What is the cost multiplier?

A. 1.1
B. 1.05
C. 0.95
D. 0.90

11. You want to estimate the cost of a 63,000 S.F. low-rise apartment using RS Means Project Size Modifier - Cost Capacity Factor using the data given below. What is the total project cost?

A. $1,597,050
B. $1,774,500
C. $4,791,150
D. $5,323,500

12. You want to build a 4-story 100 ft x 100 ft apartment building with a steel frame. The east and west walls will use Face Brick with Concrete Block Backup. The south and north wall will use Decorative Concrete Block. Considering the exterior wall variation, what is the cost per square foot? (Remember your answer for the next question)

A. $153.30
B. $156.28
C. $157.63
D. $160.55

Exterior Wall	S.F. Area	40000	45000
	L.F. Perimeter	366	400
Face Brick with Concrete Block Back-up	Steel Frame	161.95	160.55
	R/Conc. Frame	171.20	169.70
Decorative Concrete Block	Steel Frame	153.30	152.00
	R/Conc. Frame	156.75	155.45
Precast Concrete Panels	Steel Frame	166.30	164.65
	R/Conc. Frame	169.40	167.80
Perimeter Adj., Add or Deduct	Per 100 L.F.	6.50	5.75
Story Hgt. Adj., Add or Deduct	Per 1 Ft.	2.10	2.10

13. You want to build a 4-story 100 ft x 100 ft apartment building with a steel frame. The east and west walls will use Face Brick with Concrete Block Backup. The south and north wall will use the Decorative Concrete Block. After considering the exterior wall variation, you need to do the perimeter adjustment. What is the cost per square foot after perimeter adjustment? (Remember your answer for the next question)

A. $155.42
B. $151.13
C. $159.84
D. $164.13

14. A subcontractor needs to haul 450 CY of excavation material. Assume the hauler (Truck) bucket capacity is 20 CY. The total cycle time (Loading+Hauling+Dumping) is 10 minutes. There is 50 minutes of effective work per hour. The owning and operating cost for a hauler is $50 per hour. The fuel cost for a hauler is $5 per cycle. If the work needs to be completed in one hour and no standby hauler is needed, how many haulers are needed? You can round up your answer. (Remember your answer for the next question)

A. 3
B. 4
C. 5
D. 6

15. A subcontractor needs to haul 450 CY of excavation material. Assume the hauler bucket capacity is 20 CY. The total cycle time (Loading+Hauling+Dumping) is 10 minutes. There is 50 minutes of effective work per hour. No standby hauler is needed. The owning and operating cost for a hauler is $50 per hour. The fuel cost for a hauler is $5 per cycle. The work needs to be completed in one hour. What is the total owning and operating cost to the subcontractor?

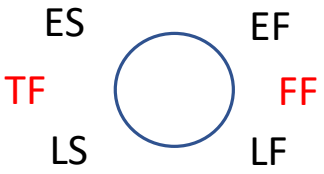
A. $50
B. $200
C. $250
D. $300

Construct the AON Network

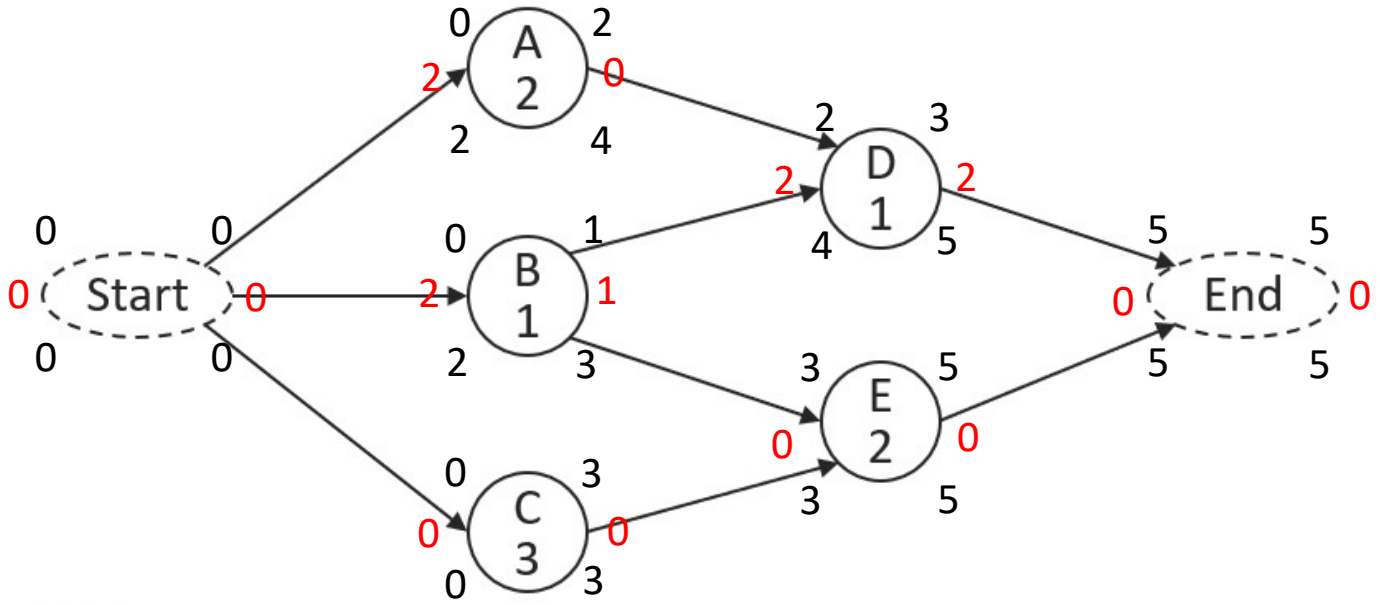
Activity	Duration	Predecessors	ES	EF	LS	LF	TF	FF
Start	0	-						
A	2	-						
B	1	-						
C	3	-						
D	1	A, B						
E	2	B, C						
End	0	D, E						

fill in the table and determine the critical path.

Practice: Construct the AON Network



FF<=TF



Critical Path

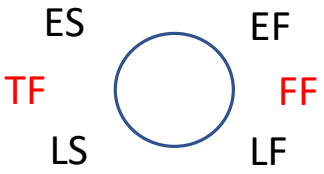
Definitions

- A critical path is the sequence of critical activities that forms a continuous path between the start of a project and its completion. A delay in any activity on the critical path will delay the completion of the project.

Characteristics:

- The critical path is a path of activities with zero floats spanning from the beginning to the end of the network.
- Critical path has the longest duration in the project. It determines the shortest time possible to complete the project.
- Some projects may have more than one critical paths.

Practice: Construct the AON Network



FF<=TF