

## 05-2 Budgeting a Construction Project

**Direct vs Accounting approach**

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## Scheduling > Today Lecture

### Budgeting

Basics of structuring breakdowns of project costs (CBS)

Costs and their underlying financial transactions

The Owner perspective

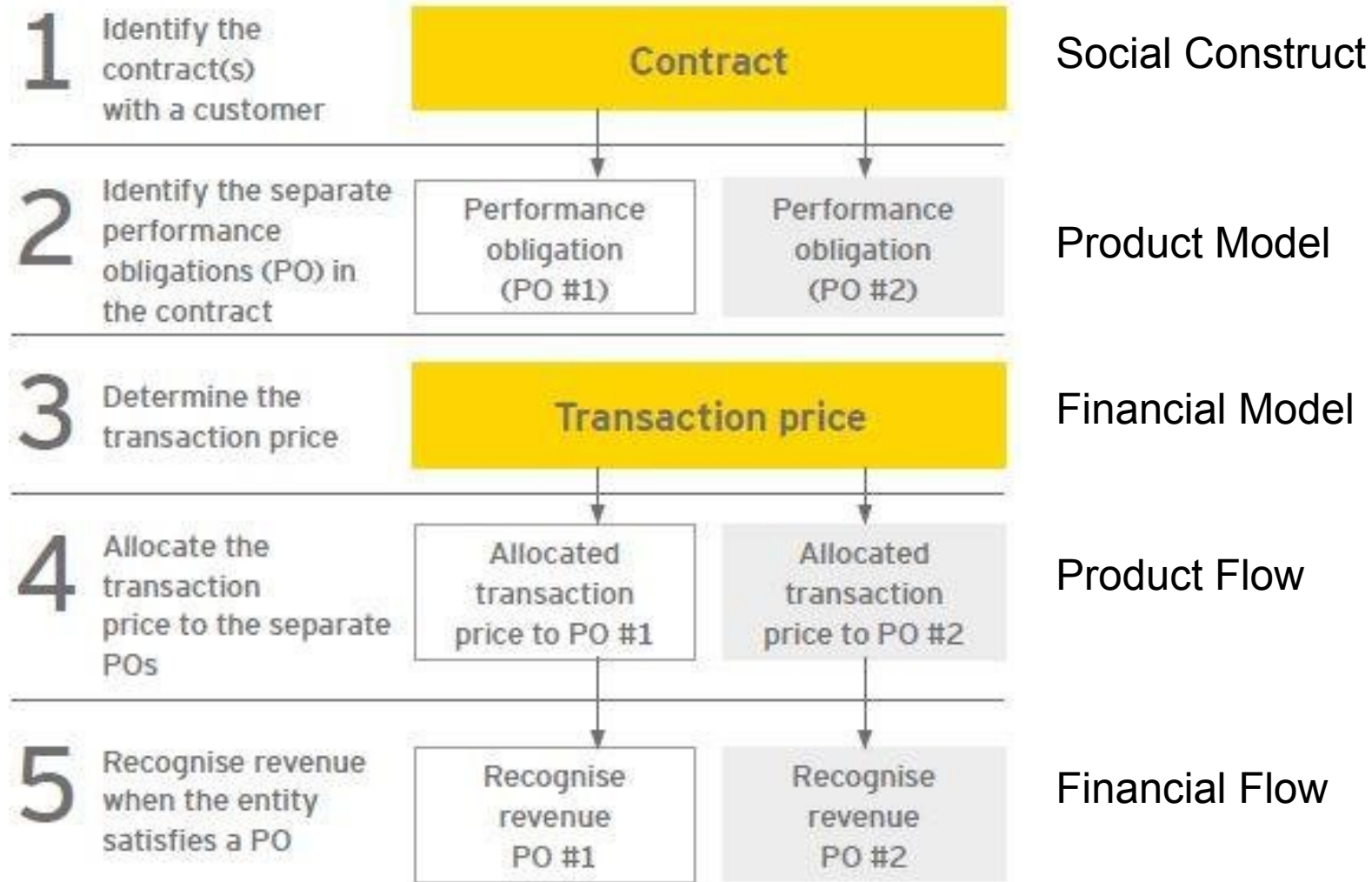
The Contractor perspective

## Budgeting > Organizational Challenge

- The project environment needs a detailed budget showing the estimated **line costs** of the project activities to establish the overall project baseline of total cost allocation.
- While the Owner (Client) needs only to allocate the contract price to contractor agreed performance, the Contractor must align those allocations to their accounting cycle.
- Both parties need a common rule to recognize transactions to be recorded in their respective accounting system

## **IFRS 15 Revenue from Contracts with Customers. The five steps model**

1. Clarify the contract: mechanism, parties, terms and obligations
2. Identify the deliverables as product performances
3. Determine the price as a function of performances costs and context
4. Identify the product flow (CBS = WBS)
5. Associate transactions to product flow = financial flow



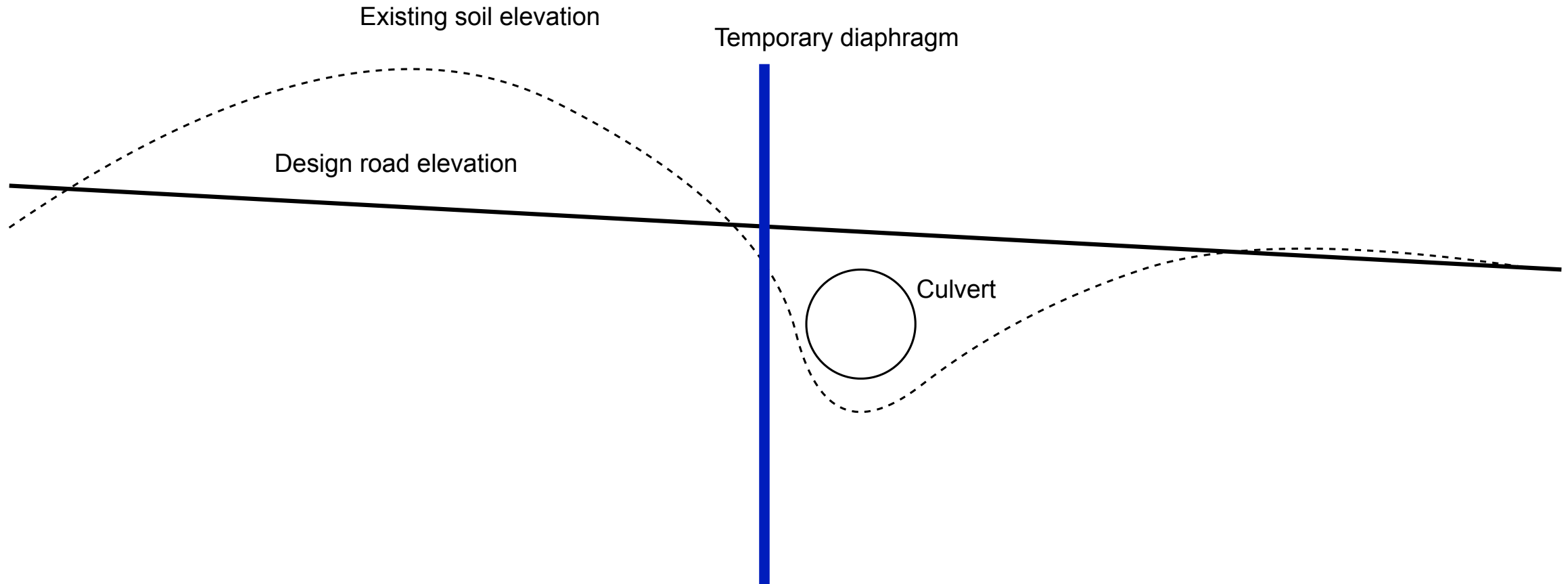
## Budgeting - Identify performances

The performances are identified using a hierarchical structure that breaks down the project expected deliverables.

If the WBS is structured with the functional / built elements approach the performances are identified by Work Packages to be rendered by the Contractor(s)

The hierarchical structures details:

- the main functions to be delivered by the projects
  - the main sub-functions that interact to deliver the function
    - The elements that form the subfunctions architecture
      - the sub element that build the elements



## Function: Local road

- **S/Function:** Site grading
  - **Element:** Excavation
    - **S/Element:** Top soil removal
    - Open section to grade
  - Back fill
    - Cut and fill
- Site drainage
  - Culvert
- Roadway
  - Foundation
  - Paving



## Budgeting - Price

Determining the costs to price(s) is done through the Cost Breakdown Structure (CBS).

The CBS is a system for dividing project costs into cost accounts, typically:

- Direct costs: labor, materials, equipment rental.
- Indirect costs (Overheads): support staff, site maintenance materials, facilities, headquarter costs allocated to the project

## Budgeting - Allocating Price fractions to Performances

- The costs detailed according to the CBS are allocated to the WBS items
- **According to the Contracting Mechanism**
- As WBS elements are time-controlled also the budget transactions are time related.
- This allows for monitoring costs along the project lifecycle

## **Budgeting - Recognizing transactions when performances are rendered**

- Have a quality control group of processes to recognize rendering of performances
- Record contract / project cost transactions at the time when performance are rendered

## Budgeting - Contractor perspective

- Define CBS items as resources
- Allocate resources to task
- The scheduling system calculates cost
- Report Aggregation of costs according to WBS

Resource Name ▼	Type ▼	Material ▼	Initials ▼	Group ▼	Max. ▼	Std. Rate ▼	Accrue ▼	
▴ <b>Group: Equipment</b>				<b>Equipmen</b>	<b>1,000%</b>		<b>Prorated</b>	
Equipment1	Work		E1	Equipment	1,000%	\$300.00/hr	Prorated	\$
▴ <b>Group: Labour</b>				<b>Labour</b>	<b>1,000%</b>		<b>Prorated</b>	
Labour1	Work		L1	Labour	1,000%	\$70.00/hr	Prorated	\$
▴ <b>Group: Material</b>				<b>Material</b>			<b>Prorated</b>	
Material1	Material	Ton	M1	Material		\$50.00	Prorated	

Task Name	Duration	Start	Finish	Cost	Details	Nov	Dec	1st Quarter Jan	Feb	Mar
▸ <b>Local road</b>	<b>98 days</b>	<b>11/15/21</b>	<b>3/30/22</b>	<b>\$1,960,300.00</b>	Cost	\$357,700.00	\$656,700.00	\$318,800.00	\$298,666.67	\$328,433.33
▸ <b>Site Grading</b>	<b>25 days</b>	<b>11/15/21</b>	<b>12/17/21</b>	<b>\$370,000.00</b>	Cost	\$177,600.00	\$192,400.00			
▸ WB - Excavation	20 days	11/15/21	12/10/21	\$296,000.00	Cost	\$177,600.00	\$118,400.00			
Labour1		11/15/21	12/10/21	\$56,000.00	Cost	\$33,600.00	\$22,400.00			
Equipment1		11/15/21	12/10/21	\$240,000.00	Cost	\$144,000.00	\$96,000.00			
▸ EB - Excavation	5 days	12/13/21	12/17/21	\$74,000.00	Cost		\$74,000.00			
Labour1		12/13/21	12/17/21	\$14,000.00	Cost		\$14,000.00			
Equipment1		12/13/21	12/17/21	\$60,000.00	Cost		\$60,000.00			
▸ <b>Site Drainage</b>	<b>46 days</b>	<b>11/15/21</b>	<b>1/17/22</b>	<b>\$689,300.00</b>	Cost	\$180,100.00	\$343,400.00	\$165,800.00		
▸ <b>Roadway</b>	<b>73 days</b>	<b>12/20/21</b>	<b>3/30/22</b>	<b>\$901,000.00</b>	Cost		\$120,900.00	\$153,000.00	\$298,666.67	\$328,433.33

## Practice

Let's switch to msproject and excel  
use files

- 05-02-CS.mpp
- 05-02-budgetCF.xlsx

## Accounting basics

<https://youtu.be/yYX4bvQSqbo>



## Network diagramming > Reading

A. De Marco, Project Management for Facility Constructions, Second Edi. Springer International Publishing, 2018:

§ 7.1.3. Cost Breakdown Structure—“How Much”