2C11

Business economics and entrepreneurship

Claudiu Albulescu

Lecture 6: Project management systems applied in constructions

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European Erasmus Mundus Master Course
Sustainable Constructions
under Natural Hazards and Catastrophic Events
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Universitatea Politehnica Timişoara

LIST OF LECTURES

Lectures

L1 Trends and challenges for the construction industry
L2 Business strategies and business development in construction companies
L3 Financial management in construction companies
L4 Project management – generalities
L5 Project management – support activities
L6 Project management systems applied in constructions
L7 Entrepreneurship issues
L8 Standard contracts in civil engineering
L9 Risk management in construction company
L10 Summary and discussion of the exam questions

Applications

A1 General presentation of the case study (WTP – Hunedoara)
A2 Financial analysis and management in construction company (WTP – Hunedoara)
A3 Cash flow analysis (WTP – Hunedoara)
A4 Visit – WTP Hunedoara
A5 Project's presentation

L6 PROJECT MANAGEMENT SYSTEMS APPLIED IN CONSTRUCTIONS

OBJECTIVES

- **Student can practically complete a Bill of Quantities list.**
- **Student can practically construct a Gantt Diagram starting from the BoQ**
- **Student understands which are the main issues related to the procurement activity**

L6 PROJECT MANAGEMENT SYSTEMS APPLIED IN CONSTRUCTIONS

TOPICS

I. BILL OF QUANTITIES (BoQ) – PRACTICAL EXAMPLE

- Purpose
- Structure of an investment
- Pre-measurement
- Assessment of the required financial resources
- Bill of Quantities for each object
- General Bill of Quantities for the entire investment

II. GANTT DIAGRAM – PRACTICAL EXAMPLE

- Purpose
- Steps
- Example

III. PROCUREMENT PROCEDURES

- Key aspects and principles
- Types of procurement procedures
- Steps of an open tender procedure

I. BILL OF QUANTITIES (BoQ)

TOPICS

- Purpose
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I. BILL OF QUANTITIES (BoQ)

Purpose

- When planning an investment for the execution of works related to an object or group of objects, the Investor/Beneficiary/Contracting Authority needs to know the **budgetary envelope required to finance the necessary works** in order to ensure the appropriate financial resources.

- In order to determine the required budget for the envisaged investment, a **pre-measurement of the works quantities to be executed has to be performed**. The aim of this pre-measurement is to establish the work quantities per each item and work category for every object covered by the respective work contract.

- This pre-measurement is usually made based on the **final design of the works** and on the corresponding drawings.

- This pre-measurement is also the **starting point for the measurement and payment of the works** actually carried out by the Contractors on site.

I. BILL OF QUANTITIES (BoQ)

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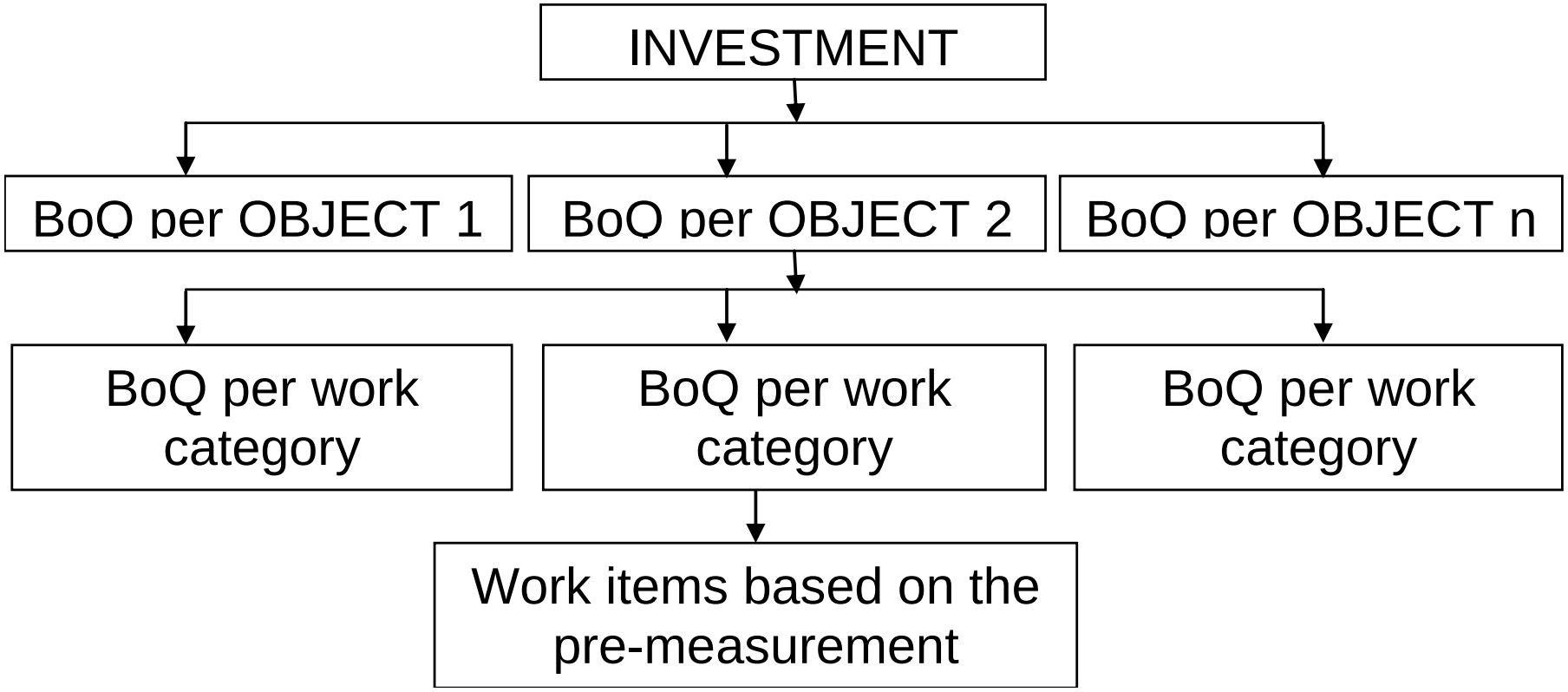
I. BILL OF QUANTITIES (BoQ)

Structure of an investment

Example



I. BILL OF QUANTITIES (BoQ)

TOPICS

- Purpose
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I. BILL OF QUANTITIES (BoQ)

Pre-measurement

- A correct pre-measurement enables a **correct assessment of the costs** required for a specific investment object (water pipes, sewer pipes, pumping station, highway, concrete dam, etc.)

- It is based on the **final design drawings** prepared by the designer

- It is **compulsory to identify all the operations** required to complete the works

- The pre-measurement should contain a **detailed calculation of the work quantities** to be executed (see pre-measurement Version A bellow)

- Another possibility is to identify **the main items** to be included in the BoQ and to list all the associated activities required for the execution of the works, mentioning that the unit rate will cover all the indicated associated activities (i.e., *Pipe laying items shall include provision, transportation and laying of pipes, bedding, backfilling with specified imported granular materials, compacting and testing*).
- (see pre-measurement Version B bellow)

I. BILL OF QUANTITIES (BoQ)

Pre-measurement

Pre-measurement Version A (detailed calculations)

Version A: Pre-measurement for Object 1 – Execution of sewer pipes

No.	a. Name of the work item b. Measurement unit c. Detailed calculation of the work quantity
1	Manual digging with trench support systems and manual removal of the resulting material, at a depth of 0,0 – 2,00 meters [M.U]: m^3 (2 x 1,2 x 200) + (1,5 x 1,2 x 100) = 480 + 180 = 660 m^3 (depth x width x length) Section 1 (depth x width x length) Section 2 Total: 660 [m^3]
2	Manual digging with trench support systems and manual removal of the resulting material, at a depth of 2,01 – 4,00 meters [M.U]: m^3 (2,5 x 1,4 x 150) + (4 x 1,4 x 300) = 525 + 1680 = 2205 m^3 Total: 2205 [m^3]
3	Mechanical excavation with the excavator [M.U]: 100 m^3 2 x 1,4 x 500 = 1400 m^3 Total: 14 [100 m^3]
4	Sand bedding [M.U]: m^3 …….. = 1750 m^3 Total: 1750 [m^3]

I. BILL OF QUANTITIES (BoQ)

Pre-measurement

Pre-measurement Version B (main items)

Version B: Pre-measurement for Object 1 – Execution of sewer pipes

No.	a. Name of the work item b. Measurement unit c. Detailed calculation of the work quantity
1	Excavation [M.U]: m 480 (ND=800mm) + 180 (ND=1000mm) = 660 m Section 1 Section 2 Total: 660 [m]
2	Pipe laying [M.U]: m 480 (ND=800mm) + 180 (ND=1000mm) = 660 m Total: 660 [m]
3	Manholes [M.U]: pieces 10 + 4 = 14 pcs. Total: 14 [pcs]
4.1	Gullies and interceptors [M.U]: pieces 20 + 6 = 26 pcs. Total: 26 [pcs]

I. BILL OF QUANTITIES (BoQ)

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I. BILL OF QUANTITIES (BoQ)

Assessment of the required financial resources (1/4)

- Using the **pre-measurement as starting point**, for the identified work category/work item required for each investment object, the **unit rates can be split in costs** related to materials, manpower, plant and transportation.

- Each unit rate is **multiplied with the required work quantity** per each item.

- The sum of the costs for each category/item results into the **direct costs** of the investment.

- Usually, based on **national standards**, some specific **coefficients are used to update the direct costs** of an investment (i.e., Direct costs with materials = 60.000 euro; Updated direct costs with materials = 60.000 x 0,88 = 52.800 euro)

- There are also some **other direct costs**, mainly those associated with the manpower, such as social security contributions, the share for the unemployment fund, etc.)

I. BILL OF QUANTITIES (BoQ)

Assessment of the required financial resources (2/4)

- Apart the direct costs, there are also some **indirect or fixed costs**, which remain the same, no matter the amount of the production/executed works ….; usually a percent of 10% is applied to the total direct costs of the investment, but this percent may vary from country to country

- If the **profit** is also taken into consideration, we see that the final budget required for the investment object is finally determined

- The **same procedure is followed for each object** included in the respective work contract (i.e., pre-measurement and BoQ per work categories determined for the execution of the highway, for the by-passing sections, for the connection points, for watercourses and railways overcrossing, etc.) obtaining thus the budget for the entire work contract.

I. BILL OF QUANTITIES (BoQ)

Assessment of the required financial resources (3/4)

BoQ per work category for Object 1 – Execution of sewer pipes (for Version B)

	Item in the pre-measurement	Unit rates	Prices for:					Materials total weight
	a. M.U. b. Work item c. Unit weight	a. material b. manpower c. plant d. transport	Material	Manpower	Plant	TOTAL	Transport	
	2	*3*	*4*	*5*	*6*	*7*	*8*	*9*
echnical section		Financial section						
Chapter A: Direct costs for the items in the pre-measurement								
	480 m Excavation for 800 mm dia. pipe, invert 4.0 m deep 0,000	*0,00*	*0*					
		0,00		*0*				
		21,00			*10.080*	*10.080*		
		0,00					*0*	
	…							
l Chapter A: Direct costs for the items in pre-measurement			60.000	70.000	25.000	155.000	5.000	200
ces update	Materials	60.000 x 0,88*	52.800	-	-	52.800	-	
	Manpower	70.000 x 0,645*	-	45.150	-	45.150	-	
	Plant	25.000 x 0,775*	-	-	19.375	19.375	-	
	Transport	5.000 x 0,885*	-	-	-	-	4.425	

I. BILL OF QUANTITIES (BoQ)

Assessment of the required financial resources (4/4)

BoQ per work category for Object 1 – Execution of sewer pipes (for Version B) - continued

al Updated Chapter A: Direct costs for the as in the pre-measurement		52.800	45.150	19.375	117.325	4.425
pter B: Other direct costs						
Transport of materials		4.425			4.425	
Manpower expenditures						
B.2.1. Social security	45.150 x 35%		15.803		15.803	
B.2.2. Unemployment tax	45.150 x 5%		2.258		2.258	
B.2.3. Risk and accident funds	45.150 x 2%		903		903	
TAL DIRECT COSTS		57.225	64.114	19.375	**140.714**	
pter C: Indirect costs	140.714 x 10%				**14.071**	
pter D: Profit	(140.714 + 14.071) x 8%				**12.383**	
TAL II	140.714 + 14.071 + 12.383				**167.168**	
	167.168 x 24%				**40.120**	
TAL BoQ – Object 1	167.168 + 40.120				**207.288**	

I. BILL OF QUANTITIES (BoQ)

TOPICS

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I. BILL OF QUANTITIES (BoQ)

Bill of Quantities for each object (1/4)

- **Based on the BoQ for the work categories**/work items needed for each object, the Investor/Contracting Authority can prepare the **BoQ to be included in the Tender Dossier**

!!! In big infrastructure projects, it is not compulsory to ask potential bidders to provide unit rates for the materials, manpower, plant and transportation required for different work items in the BoQ; in practice, the Tender Dossier specifies that, if required, the Contractor will provide the Contracting Authority with the breakdown of the unit rates after the contract signature

- Usually, the **BoQ provided to interested Contractors** includes the work items, the measurement unit and the estimated quantities

- The **bidders are required to fill in the unit rates**; the unit rates and prices entered against individual items shall be multiplied by the quantities stated for those items and the resulting amounts shall be entered in the column corresponding to the total amount for the items.

I. BILL OF QUANTITIES (BoQ)

Bill of Quantities for each object (2/4)

- The unit rates are very important because they will be **used for valuing the work executed and paid to the Contractor**

- When **establishing the unit rate**, the possible tenderers must take into account **all the requirements of the Tender Dossier**, as for example it can be stated in the Technical Specifications that certain costs, apart material, manpower, plant and transport should be included in the unit rates inserted in the BoQ (i.e., temporary works, costs for obtaining different permits and approvals, costs for the insurances, costs for guarantees and securities, etc.)

- Under a **Yellow FIDIC Contract, no Bill of Quantities is provided for potential bidder**; they have to fill in and submit a **Schedule of Prices** with amounts inserted for each object in the contract.

I. BILL OF QUANTITIES (BoQ)

Bill of Quantities for each object (3/4)

BoQ for object 1 – sewer lines (for Version B)

em	Description	Unit	Estimated quantity	Unit rate EUR	Total EUR [4x5]
1	*2*	*3*	*4*	*5*	*6*
ect 1	**Construction of sewer lines**				
1.1	**EXCAVATION**				
	Items to include excavation in any material and disposal of excavated material.				
.1.1	**Excavation for 800 mm dia. pipe, invert 4.0 m deep (incl.) below original ground level, including rock and all kind of soil and top soil layers**	m	480		
.1.2	**Excavation for 1000 mm dia. pipe, invert 3.0 m deep (incl.) below original ground level, including rock and all kind of soil and top soil layers**	m	180		
	Sub-Total A.1.1 Excavation				

I. BILL OF QUANTITIES (BoQ)

Bill of Quantities for each object (4/4)

Schedule of Prices (Yellow FIDIC Contracts)

Ref.	Main activity	Price, without assemblage (lump sums in euro, without VAT)	Price, with assemblage (lump sums in euro, without VAT
1.1	**Pumping station**		
1.1.1	Design		
1.1.2	Construction		
1.1.3	Testing		
	Or		
1.2	**Pumping station**		
1.2.1	Design		
1.2.2	Civil works		
1.2.3	Mechanical Works		
1.2.4	Electrical Works		
1.2.5	Testing		
1.4.6	Commissioning		
….	.....		
TOTAL			

I. BILL OF QUANTITIES (BoQ)

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I. BILL OF QUANTITIES (BoQ)

General Bill of Quantities for the entire investment (1/4)

The General Bill of Quantities for the entire investment (all the objects included in a work contract)

- Expenditures for **land procurement and preparation**: these are incurred by the Investor prior the award of the contract, if the case may be (i.e. procurement of the land for the construction of a pumping station, expropriation for highway construction, etc.)

- Expenditures for **utilities required for the proper functioning** of the investment objective: these may fall either in the responsibility of the Investor or in that of the Contractor if this is clearly stated in the Tender Dossier

- Expenditure for **design and technical assistance**: these costs are related to studies required for example at the feasibility study phase, for design preparation (final design under the Red FIDIC and preliminary design under the Yellow FIDIC – fall in the responsibility of the Investor; Working Drawings such as, reinforcement detail drawings and bending schedules, working drawings for shuttering, insulation details, excavation and back filling, mechanical equipment, architectural plans and electrical work under the Red FIDIC and the final design under the Yellow FIDIC – fall in the responsibility of the Contractor), etc.

I. BILL OF QUANTITIES (BoQ)

General Bill of Quantities for the entire investment (2/4)

The General Bill of Quantities for the entire investment (all the objects included in a work contract)

- Expenditures for the **main investment**: these costs group the investment costs in the BoQ for all the work objects in the respective contract, making a clear distinction between costs for constructions and plants and costs for plants and equipments with or without assemblage

- **Other expenditures**: cover the costs incurred by the Contractor with site preparation, costs with fees and taxes (these may be in the responsibility of the Contractor or of the Investor, but the Tender Dossier should clearly indicated who is responsible for what to avoid ambiguities), and the costs incurred by the Investor in case a credit is required to finance part of the investment

- **Expenditures for the commissioning**: cover the costs associated with the tests at the completion of the works (or tests before and after the commissioning, in accordance with the provision of the Tender Dossier) and with the training of the operational staff that will be in charge with the operation and the maintenance of the works.

I. BILL OF QUANTITIES (BoQ)

General Bill of Quantities for the entire investment

(3/4) GENERAL BILL OF QUANTITIES

No	Expenditure chapters and sub-chapters	Value (without VAT) euro	VAT euro	Value (including VAT) euro
1	2	3	4	5
PART I				
CHAPTER 1				
Expenditures for land procurement and preparation				
1.1.	Land procurement	0,00	0,00	0,00
1.2.	Land preparation	0,00	0,00	0,00
1.3.	Environment protection and reinstatement works[1]	500,00	120,00	620,00
TOTAL CHAPTER 1		**500,00**	**120,00**	**620,00**
CHAPTER 2 **Expenditures for the utilities**				
2.1.	Expenditures for the utilities required for the objective[2]	500,00	120,00	620,00
TOTAL CHAPTER 2		**500,00**	**120,00**	**620,00**
CHAPTER 3 **Expenditures for design and technical assistance**				
3.1.	Land surveys[3]	250,00	60,00	310,00
3.2.	Tax for permits and approvals (construction permit, etc.)	0,00	0,00	0,00
3.3.	Design and engineering[4]	20.000,00	4.800,00	24.800,00
3.4.	Tender procedure organization	0,00	0,00	0,00
3.5.	Consultancy[5]	3.500,00	840,00	4.340,00
3.6.	Technical Assistance	0,00	0,00	0,00
TOTAL CHAPTER 3		**23.750,00**	**5.700,00**	**29.450,00**

I. BILL OF QUANTITIES (BoQ)

General Bill of Quantities for the entire investment

(4/4) GENERAL BILL OF QUANTITIES

CHAPTER 4 **Expenditures for the main investment**				
4.1.	Constructions and plants			
	BoQ Object 1	207.288,00	49.749,12	257.037,12
	BoQ Object 2			
	BoQ Object …			
	Total 4.1	***500.000,00***	***120.000,00***	***620.000,00***
4.2.	Assemblage of Technological equipments	0,00	0,00	0,00
	BoQ Object 1			
	BoQ Object 2			
	BoQ Object …			
	Total 4.2			
4.3.	Plants, technological and functional equipments with assemblage	0,00	0,00	0,00
	BoQ Object 1			
	BoQ Object 2			
	BoQ Object …			
	Total 4.3			
4.4.	Plants without assemblage and transport equipments	0,00	0,00	0,00
4.5.	Endowments	0,00	0,00	0,00
4.6.	Intangible assets	0,00	0,00	0,00
TOTAL CHAPTER 4		**500.000,00**	**120.000,00**	**620.000,00**

L6 PROJECT MANAGEMENT SYSTEMS APPLIED IN CONSTRUCTIONS

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II. GANTT DIAGRAM – PRACTICAL EXAMPLE

- Purpose
- Steps
- Example

III. PROCUREMENT PROCEDURES

- Key aspects and principles
- Types of procurement procedures
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II. GANTT DIAGRAM – PRACTICAL EXAMPLE

TOPICS

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II. GANTT DIAGRAM – PRACTICAL EXAMPLE

Purpose

The Gantt Diagram is a graphical method used for planning the implementation of different projects and contracts, such as:

- construction works
- training programs
- educational programs …(see Lecture 5)

II. GANTT DIAGRAM – PRACTICAL EXAMPLE

TOPICS

- Purpose
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II. GANTT DIAGRAM – PRACTICAL EXAMPLE

Steps
(1/3)

In respect of the construction contracts, several basic elements should be remembered and steps should be followed:

- All the work items identified in the pre-measurement phase should be grouped into a **list of activities**

- Based on the execution technology, the **sequence of the activities** is planned

- **Interdependencies between activities** are also established (i.e., the concreting cannot start before the shuttering and the reinforcement are executed)

- The **duration of each activity should be determined**:
  - the duration for the execution is established based on the available resources
  - the available duration for the execution is imposed and the resources required to complete the works in due time have to be determined

II. GANTT DIAGRAM – PRACTICAL EXAMPLE

Steps (2/3)

- For the list of activities, the **national standards indicate the time required** (for manpower or plant and machinery) to execute one unit of the work quantity; for example, in order to install 1 square meter of shuttering, a carpenter and an unqualified worker should jointly to work 1,20 hours

- Based on the standard work times, the **work volume** can be computed: thus, for a quantity of 100 square meters of shuttering, the required work volume is: 100 x 1,20 = 120 hours

- Taking into account the fact that people usually **work on shifts** of 8/10 hours, we can determine the **number of days in which each activity can be performed**: 120 hours/10 hours per shift = 12 days. In addition, if two teams are available for example for this activity, the shuttering will be completed in 6 days.

II. GANTT DIAGRAM – PRACTICAL EXAMPLE

Steps (3/3)

List of activities (i.e. 1 work shift = 10 hours)

No.	Activity	Component items			Standard time *man/plant x hour*	Work Volumes (WV)			Resources	Duration
		Item	Unit	Quantity		WV	WV/work shift	Total WV		
1	2	3	4	5	6	7=5x6	8=7/10h	9	10	11
1	Preparation for the execution of the foundation	Manual digging, depth =0-1 m	m^3	200,00	1,32/ -	264/ -	26,40/ -	27/ 2	6/ -	5
		Mechanical excavations, depth =0-1 m	100 m^3	10	- / 1,95	- /19,5	- /1,95			
2	Execution of the leveling layer	Sand bedding	m^3	15,00	0,97/ -	14,55/ -	1,45/ -	28/ 6	5/1	6
		Granular material bedding	m^3	15,00	1,26/ 0,05	18,9/ 0,75	1,89/ 0,08			
		Blind concrete, poured in layers of 3-20 cm	m^3	50	5,09/ 1,06	254,5/53	24,45/ 5,3			
3	Execution of the foundation	Reinforcement	kg	200	0,055/ -	11/ -	1,1/ -	75/ 16	15/ 3	5
		Shuttering	m^2	100	1,20/ -	120/ -	12/ -			
		Pouring of the reinforced concrete	m^3	150	4,1/ 1,06	615/ 159	61,5/ 15,9			
4	…..									

II. GANTT DIAGRAM – PRACTICAL EXAMPLE

TOPICS

- Purpose
- Steps
- Example

II. GANTT DIAGRAM – PRACTICAL EXAMPLE

Example

No.	Activity	Resources	Duration	Estimated Duration															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Preparation for the execution of the foundation	6/-	5																
2	Execution of the leveling layer	5/1	6																
3	Execution of the foundation	15/3	5																
4	……	…….	……..																

L6 PROJECT MANAGEMENT SYSTEMS APPLIED IN CONSTRUCTIONS

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III. PROCUREMENT PROCEDURES

TOPICS

- Key aspects and principles
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III. PROCUREMENT PROCEDURES

Key aspects and principles (1/2)

!!! In case of procurement procedures initiated by national public authorities, of procedures involving financing from the EU Budget or from International Financing Institutions (IFI), specific procedures must be applied according to national regulations, to the Practical Guide to contract procedures for European Union external actions (PRAG) or to IFI's internal procurement rules, as the case may be.

- All contract awards must obey the **principles of transparency, proportionality, equal treatment, non-discrimination and fair competition**

- Attention must be paid to **avoiding the conflict of interests** which may occur when the impartial and objective exercise of the functions of the Contracting Authority, or observance of the principles of competition, non-discrimination against or equality of treatment of candidates, tenderers, applicants and contractors, is compromised for reasons involving family, emotional life, political or national affinity, economic interest or any other shared interest with a beneficiary

III. PROCUREMENT PROCEDURES

Key aspects and principles (2/2)

- Contracts take **effect from the date of signature** of the last signatory
- **Standard** contracts and document formats must be used
- Subject to the Contracting Authority's legislation on access to documents, **written records of the entire procurement and award procedure** must be kept confidential and kept by the Contracting Authority in accordance with the policy adopted on archiving
- **Financial guarantees** (originals) must be kept in a safe place where they are protected against the risk of loss or theft up to the end of their validity period
- Before initiating any procedure, the **required funds must be available**

III. PROCUREMENT PROCEDURES

TOPICS

- Key aspects and principles
- Types of procurement procedures
- Steps of an open tender procedure

III. PROCUREMENT PROCEDURES

Types of procurement procedures (1/3)

There are several different **procurement procedures**, each allowing a different degree of competition:

- **Open procedure**: all economic operators may submit a tender and the contract is given maximum publicity by publishing a notice in the Official Journal of the European Union or on national electronic sites for public procurement procedures, as the case may be

- **Restricted procedure**: all economic operators may ask to submit a tender, but only those who satisfy the selection criteria may be invited to do so; the selection criteria and the tasks to be undertaken are described in the published contract notice; subsequently, a “long list” of all the candidates replying to the notice is cut down to a “shortlist” of the best qualified

- **Competitive negotiated procedure**: the Contracting Authority invites candidates of its choice to submit tenders. From the technically compliant tenders, it selects the one that offers the best value for money in the case of tenders for services, and the cheapest, in the case of tenders for supplies or works; the tenders are evaluated and the contract is awarded in the same way as they are in the restricted procedure

III. PROCUREMENT PROCEDURES

Types of procurement procedures (2/3)

- **Framework contracts**: a framework contract is an agreement between one or more contracting authorities and one or more economic operators, the purpose of which is to establish the terms governing specific contracts which may be awarded during a given period, particularly as regards the duration, subject, price, maximum value, implementation rules and the quantities envisaged
- **Dynamic purchasing system**: a dynamic purchasing system is a completely electronic process for making commonly used purchases, for a limited period, which is open to any economic operator who meets the selection criteria and has submitted a technically compliant indicative tender
- **Competitive dialogue**: in the case of particularly complex contracts, where the Contracting Authority considers that neither direct use of the open procedure nor the arrangements governing the restricted procedure will result in the best value for money, it may use the competitive dialogue; a contract is considered to be “particularly complex” if the Contracting Authority is objectively unable either to specify the technical means of satisfying its needs or objectives or to specify the legal or financial makeup of the project; this procedure is, however, exceptional and must be used with caution
- **Negotiated procedure/single tender procedure**: a contract may be awarded directly when the contract to be concluded does not exceed a certain threshold (i.e. EUR 20 000, according to the PRAG) or in exceptional and duly justified cases, where the factual or legal circumstances described in the national or international procurement rules are met.

III. PROCUREMENT PROCEDURES

Types of procurement procedures (3/3)

For example, according to the PRAG, the following are recommended:

SERVICE CONTRACTS	**≥ € 300 000** International restricted tender procedure	**< € 300 000 but > € 20 000** - Framework contracts or - Competitive negotiated procedure		**≤ € 20 000** Single tender For service and supply contracts, a payment may be made against invoice without prior acceptance of a tender if the expenditure is ≤ EUR 2 500
SUPPLY CONTRACTS	**≥ € 300 000** International open tender procedure	**< € 300 000 but ≥ € 100 000** - Local open tender procedure or - Frame work contract	**< € 100 000 but > € 20 000** - Competitive negotiated procedure or - Frame work contract	
WORKS CONTRACTS	**≥ € 5 000 000** - International open tender procedure or - International restricted tender procedure	**< € 5 000 000 but ≥ € 300 000** Local open tender procedure	**< € 300 000 but > € 20 000** Competitive negotiated procedure	

III. PROCUREMENT PROCEDURES

TOPICS

- Key aspects and principles
- Types of procurement procedures
- Steps of an open tender procedure

III. PROCUREMENT PROCEDURES

Steps of an open tender procedure

1. Preparation of the Tender Dossiers (1/2)

- The Tender Dossiers represent a **set of documents covering all the information required** so as the interested bidders to be able to prepare and submit an offer in accordance with the requirements of the Contracting Authority
- Special attention should be paid to **Specification/Employer's Requirements** as it describes the scope of works and gives instructions and guidance to contractors to submit a tender which responds to all technical and administrative requirements. These Terms of Reference (for service contracts) or Technical Specifications (for supply and works contracts) must reflect the situation at the time of project start-up so as to avoid considerable effort being spent on re-designing the project during the inception period.
- The **Terms of Reference/Technical Specifications** include information on: works to be executed, services to be provides, goods/equipments to be supplied, quality levels, environmental performance, levels of and procedures for conformity assessment, the procedures relating to quality assurance and the rules relating to design and costing, the test, inspection and acceptance conditions for works and methods or techniques of construction etc.
- The Technical Specifications **may not point to particular brands and types**, and they may not limit competition by being too specific.

III. PROCUREMENT PROCEDURES

Steps of an open tender procedure

1. Preparation of the Tender Dossiers (2/2)

Volume 1 - The Tender:
1. Instructions to Tenderers
2. Tender Form for a Works Contract
3. Appendix to Tender
4. Tender Guarantee Form
5. Questionnaire Forms
6. Evaluation Grids
7. Glossary of Terms

Volume 2 - The Contract:
1. Form of Contract Agreement
2. General Conditions of Contract
3. Particular Conditions of Contract
4. Form of Performance Security
5. Form of Advance Payment Guarantee
6. Form of Retention Money Guarantee
7. Form of Parent Company Guarantee
8. Dispute Adjudication Agreement

Volume 3 - Specification (RED BOOK Contracts):
1. 3A - General Specification
2. 3B - Particular Specification

Volume 3 - Employer's Requirements (YELLOW BOOK):
1. General Project Requirements
2. Special Requirements for Civil Works
3. Special Requirements for M & E Works

Volume 4 – Schedules (RED BOOK Contracts):
1. Preamble to Bill of Quantity
2. General Items
3. Work Items
4. Day-work Schedule
5. Schedule of Provisional Sums
6. Schedule of Provisional Quantities
7. Operational Costs, Relevant Taxes,

Volume 4 – Schedules of Prices (YELLOW BOOK):
1. Preamble and Schedule of Prices
2. Activity Schedule
3. Day-work Schedule
4. Cash-flow Forecast
5. Schedule of Guarantees

Volume 5 – Design documents, including drawings:
1. Drawings
2. Geotechnical Information

III. PROCUREMENT PROCEDURES

Steps of an open tender procedure

2. Selection of the procurement procedure **(see the procurement procedures above)**

- The basic means of awarding contracts is **competitive tendering** aimed at:
  - ensuring that operations **respect the awarding principles**
  - obtaining the **quality** of services, supplies or works wanted, at the **best possible price**.

- The most **appropriate procurement** procedure also depends on the **type of contract** to be awarded:
  - **Works contracts**: cover either the execution, or both the execution and design of works (standard FIDIC type contracts - Red Book, Yellow Book, Green Book, Silver Book, Gold Book)
  - **Service contracts**: (i) Global-price contracts: specified outputs are defined and the service will be paid on the basis of the delivery of the specified outputs (studies, evaluations, audits, organization of events such as conferences, trainings, etc.);(ii) Fee-based contracts: it is impossible to exactly predict the output or the workload to achieve the specified output, and consequently the services are paid on the basis of time actually worked (works supervision, technical assistance, facilitation in a multi-stakeholder process, etc.).
  - **Supply contracts**: cover the purchase, leasing, rental or hire purchase (with or without option to buy) of products.

III. PROCUREMENT PROCEDURES

Steps of an open tender procedure

3. Publication of the contract notice (1/5)

Depending on the international or national procurement rules, **it is sometime required to publish an individual contract prior information notice**, setting out the content and the specific characteristics of the planned tender procedure (i.e., according to the PRAG, the contract prior information notice must be published, save in exceptional circumstances, at least 30 days before the publication of the contract notice).

- The contract notice must state clearly, precisely and completely:
- The type of procurement procedure
- The budget and the financing sources
- The Contracting Authority
- The brief description of the contract
- The number and titles of the lots, if applicable
- The eligibility criteria
- The selection criteria
- The award criteria
- The required securities/guarantees (performance security, advance payment guarantee)
- The validity of the tender
- The deadline for submission of tenders and the tender opening session
- Other specific information needed by the tenderers.

III. PROCUREMENT PROCEDURES

Steps of an open tender procedure

3. Publication of the contract notice (2/5)

Eligibility requirements:

- The **rule of origin**, if applicable: according to the PRAG, participation in tendering is open on equal terms to all natural and legal persons. Bidders shall certify that they meet the above conditions and prove their eligibility by a document, dated less than 1 year than the deadline for the submission of Tenders

- Tenderers or applicants **will be excluded from participation** in procurement procedures if:

- they are bankrupt or being wound up, are having their affairs administered by the courts, have entered into an arrangement with creditors, have suspended business activities, are the subject of proceedings concerning those matters
- they, or persons having powers of representation, decision making or control over them, have been convicted of an offence concerning their professional conduct
- they, or persons having powers of representation, decision making or control over them, have been the subject of a judgment which has the force of *res judicata* for fraud, corruption, involvement in a criminal organization, money laundering or any other illegal activity
- they have been guilty of grave professional misconduct proven by any means which the Contracting Authority can justify
- they are not in compliance with their obligations relating to the payment of social security contributions or the payment of taxes in accordance with the legal provisions of the country in which they are established.

III. PROCUREMENT PROCEDURES

Steps of an open tender procedure

3. Publication of the contract notice (3/5)

- The Tender Dossier clearly provides the bidders with information on **what documents to provide** to prove the conformity with the eligibility criteria. Based on the Form of Questionnaires in the Tender Dossier, the bidders can be for example asked to submit:
  - Copies of the most recent documents showing the organization chart, legal status and place of registration of the headquarters of the bidder, financial identification data and a written Power of Attorney empowering the person signing the tender and all related documentation
  - Data about Joint Venture / Consortium, if applicable, including the Joint Venture/ Consortium agreement
  - Data about subcontracting, if applicable, etc.

Selection criteria

- The selection criteria should be clear and non-discriminatory and should enable the Contracting Authority to assess if the bidders have sufficient financial, economic, technical and professional capacity to implement the tasks of the contract. The **chosen criteria shall be proportionate and may not go beyond the scope of the contract.**

III. PROCUREMENT PROCEDURES

Steps of an open tender procedure

3. Publication of the contract notice (4/5)

Selection criteria

A. Financial information:

- An annual **turnover** equal to or twice the value of the contract to be awarded could be required; the bidders have thus to submit the financial statements of the company over the last three years, audited be a chartered accountant
- Evidence showing that the **liquid assets** and **access to lines of credit** or other credit facilities are adequate for the Contract, confirmed by a bank statement attached.

B. Technical and professional information:

- For **works** contracts: **successful experience** as main Contractor in the construction, during the last five years, of a specified number of contracts of a nature and complexity similar to those of the contract to be awarded
- For **works and service** contracts: the **staff/experts** involved in the project, indicating the minimum **experience** requirements to be met (educational and professional qualifications).
- For **service** contracts: successful **experience as services Provider**, during the last five years, of a specified number of contracts of similar nature and complexity
- For **supplies**: samples, descriptions and/or authentic photographs and/or certificates drawn up by official quality control institutes or agencies of recognized competence **attesting the conformity of the products** with the specifications or standards in force.

III. PROCUREMENT PROCEDURES

Steps of an open tender procedure

3. Publication of the contract notice (5/5)

Award criteria

- The **award criteria** are described in the contract notice and can be established in one of the following two ways:
- The contract is awarded to the bidder that, while being in order and satisfying all the conditions laid down in the Tender Dossier, quotes the lowest price
- The contract is awarded under the best-value-for-money procedure (i.e. the most economically advantageous tender); in this case, certain evaluation factors (annual costs for the maintenance and operation of a wastewater treatment plant, level of automation, etc.) can be defined and a certain number of points can be assigned to different aspects of the technical and financial offer so as to enable the Evaluation Committee to make a ranking based on the assigned points.

- The Tender Dossier can either be uploaded, together with the contract notice, on an electronic, national or international public procurement site, or it can send to would-be tenderers upon request, in exchange of a fixed fee, if the case may be, or made available for inspection at the premises of the Contracting Authority.

III. PROCUREMENT PROCEDURES

Steps of an open tender procedure

4. Appointment of the Evaluation Committee

- The Contracting Authority should appoint an Evaluation Committee, made up of an **odd number of professionals** in the field, prior to the deadline for submission of tenders.

5. Submission of tenders and tenders opening session

- The tenders must be submitted at the latest **before the deadline** indicated in the contract notice, otherwise they will be automatically disqualified.

- The opening session can be made **either in the presence of the Evaluation Committee** only, **or** in the presence of **both evaluation members and representatives of the bidders** having submitted an offer for the respective contract.

III. PROCUREMENT PROCEDURES

Steps of an open tender procedure

6. Evaluation procedure (1/2)

- The Tender Dossier includes a **set of evaluation grids (see annex)** that will underlay the evaluation process and will offer the bidders a clear image on what and how is checked.

- During the tender opening session, the **administrative compliance of the tenders is verified**, based on the elements indicated in the Administrative Compliance Grid.

- A **detailed technical evaluation** of the tenders takes place **after the administrative compliance check**. The criteria to be applied are those published in the Tender Dossier and, accordingly, the evaluation grid included in the Tender Dossier must be used.

- Once the technical evaluation has been completed, the Committee checks that the **financial offers contain no obvious arithmetical errors**. Any obvious arithmetical errors are corrected without penalty to the tenderer. If the tender procedure contains several lots, financial offers are compared for each lot.

- During the evaluation, the Evaluation Committee can request form the bidders **clarifications** in respect of any aspect of their submitted tender. Failure to respond to the Evaluation Committee requests or evasive answers will result in the respective bid being declared as not in conformity with the requirements of the Tender Dossier.

III. PROCUREMENT PROCEDURES

Steps of an open tender procedure

6. Evaluation procedure (2/2)

EVALUATION GRID 1, Administrative Compliance - Opening Session (public session)

Contract title:		**Publication reference:**	

Item No.	Reference Clause	I. Administrative Compliance		Bidders		
I.1	Invitation	Timely submission	Yes/No			
I.2	Vol. I, Sect. 1, Clause 24	Withdrawal submitted	Yes/No			
I.3	Vol. I, Sect. 1, Clause 21	Sealed and intact package marked with Bidder's name and address	Yes/No			
I.4	Vol. I, Sect; 1, Clause 14.1.1	One original and 6 copies of the Tender	Yes/No			
I.5	Vol. I, Sect. 1, Clause 14.3.1	Form of Tender duly completed and signed	Yes/No			
I.6	Vol. I, Sect. 1, Clause 14.3.2	Appendix to Tender duly completed and signed	Yes/No			
I.7	Vol. I, Sect. 1, Clause 18 and Clause 14.3.3	Original and validity of the Tender Security attached, and in compliance with requirements	Yes/No			
I.8	Vol. I, Sect.1, Clause 15.2	Bill of Quantities expressed in Euro	Yes/No			
I.9	Form of Tender	Value of the Tender Price	Euro			
Tender accepted for further evaluation or rejected **(P = Passed; F = Failed; C** = Clarification requested; NA = Not applicable)						

III. PROCUREMENT PROCEDURES

Steps of an open tender procedure

7. Award of the contract

- Based on the award criteria, after the evaluation, the Evaluation Committee will prepare an **Evaluation Report** describing all the steps in the evaluation procedure and will establish a ranking of all the tenders that met the eligibility, selection and award criteria.
- The **successful tenderer** is:
  - the one submitting the least expensive tender, meeting the eligibility and selection criteria and classified as technically compliant during the technical evaluation
  - the one offering the best value for the money, based on the cumulated points assigned for each of the evaluation factor, after having met the eligibility and selection criteria and being classified as technically compliant during the technical evaluation.
- The respective bidder must be declared the successful tender if the financial offer, after the arithmetical corrections, is **equal to or lower than the maximum budget available** for the contract.
- At the same time with the notification of the award to the successful tenderer, **all the other bidders having submitted a tender are informed about the result** of the evaluation procedure, being informed about the name of the successful tenderer and about the reasons for which their offer was not declared successful (price offered or score obtained by the successful tenderer versus price offered or score obtained by the respective tenderer).

III. PROCUREMENT PROCEDURES

Steps of an open tender procedure

8. Contract signature

- After all the bidders are informed about the outcome of the evaluation procedure, the Contracting Authority **must wait a certain period**, according to the regulations in force, because the unsuccessful tenderers **may contest the result** of the tender procedure.

- If no such contest is received within the legal period, **the contract can be prepared and signed by the relevant parties**. The contract will have the structure and content presented in the Tender Dossier.

9. Award notice

- **After the award of the contract**, the Contracting Authority is obliged to publish in the Official Journal of the European Commission or on national electronic public procurement sites, as the case may be, the **award notice** specifying the name of the successful contractor and the accepted contract price.

CONTACT

claudiu.albulescu@upt.ro

http://www.ct.upt.ro/suscos/index.htm
http://steel.fsv.cvut.cz/suscos

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