

# CM3 - PLANNING OF CONSTRUCTION TECHNOLOGY

BMEEPEKA701

## Introduction

- BMEEPEKA701
- CM3 - Planning of construction technology
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- Requirements
  - ▣ 1 mid-semester test.
  - ▣ Presence on at least 70% of the practices.
  - ▣ Preparation of all practical exercises on the practices.
  - ▣ Exam.

## Introduction

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- Main topics
  - Planning the technology of the construction work process.
  - Construction of steel structures.
  - Construction of prefabricated and monolithic reinforced concrete structures. Concreting work, use of formworks.
  - Masonry, bricklaying.
  - Doors and windows, curtain walls. Brick, stone, plastered and rendered façades, façade coverings.

## Introduction

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- Main topics
  - Carpentry, roof coverings, metal roof work.
  - Thermal and water insulation. Flat roofs. Bitumen and PVC, etc.
  - Assembled partitions, suspended ceiling, dry-floors, raised floor.
  - Interior flooring and wall coverings. Concrete screeds.
  - Building diagnostics and refurbishment.

## Planning the technology of the construction work process.

Basic terms. WBS.

## Basic terms

- Construction
  - is a kind of technical **project** in accordance with an **investment of a real estate**, where a part of a building or a whole building is established or restored.
- Construction work process
  - starts with **setting up the site**, followed by constructing the **sub- and superstructure**, then **finishing**, and **building installations**.

## Basic terms

- Technology
  - ▣ is the sum of **all work process** regarding to **one work activity**.
  - ▣ The **know-how** of the construction.
- Work activity
  - ▣ Is the **basic element** of the construction, closed technological interval.

## Basic terms

- Steps of planning the technologies of construction processes
  1. Defining the task
    1. Building = the sum of all building construction elements
    2. Constructing the building = constructing all building construction elements
  2. Defining the way of realisation = technologies
    1. Selecting technology for each building constr. element
    2. Defining the order of technologies = time sequence
    3. Defining and covering the conditions of the technologies

## Basic terms

- Work Breakdown Structure (WBS)
  - ▣ It is a technique for breaking down a total job into its component elements;
  - ▣ It is a tool used to define and group a project's discrete work elements in a way that helps organize and define the total work scope of the project;
  - ▣ It is NOT a project plan, a schedule, or a chronological listing

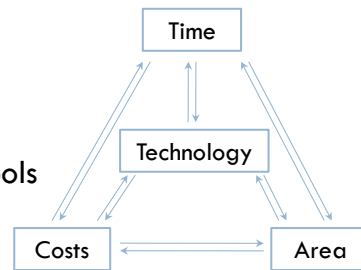
## Basic terms

- List of operations (activities)
  - ▣ All (and only) the **required activities** of the construction.
  - ▣ There are activities for completing building construction elements – **direct activities** (e.g. FLOORING WITH 30x30cm glazed ceramic TILE fixed with adhesive glue)
  - ▣ There are **indirect activities** needed to complete technology processes, like formworks, scaffolding, propping, etc.
  - ▣ **Exact technical content** needed for all activities:  
WHAT? HOW? WHERE?

## Planning the technologies

### □ Selecting technology – aspects of selection

- technical circumstances
- cost
- required time → cost
- workability / viability
- requirements in equipment / tools



## Planning the technologies

### □ WBS

- WBS includes 100% of the work defined by the project scope (all that is needed to finish the building).
- There is no overlap in scope definition between two elements of a work breakdown structure.
- Levels in WBS – there are no defined levels – depends on the task
  - 17. Steel works
    - 17.01. Prefabrication of reinforcement
      - 17.01.01. Cutting and bending reinforcing bars

## Planning the technologies

- Building processes
  - ▣ Construction of substructure
    - Excavating
    - Creating foundation
  - ▣ Construction of superstructure
    - Formwork
    - Concrete reinforcement
    - Concreting
    - Masonry works (loadbearing walls)

## Planning the technologies

- Building processes
  - ▣ Finishing works
    - carpentry
    - joinery
    - roof covering
    - tinwork
    - locksmith's work (ironwork)
    - glasswork
    - tiler, paver works
  - ▣ parquetmaker works
  - ▣ painting
  - ▣ insulation works
  - ▣ masonry of inner walls, (bricklaying, plastering)
  - ▣ exterior facings
  - ▣ drywall construction
  - ▣ + applied arts and historical technologies
  - ▣ + building services

## Planning the technologies

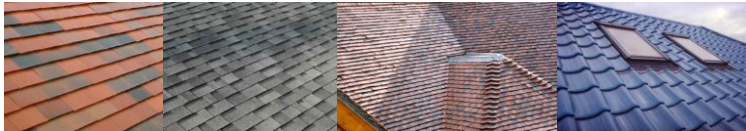
Carpentry – roof superstructures, wooden frame structures, formwork (traditional)



Joinery – wooden doors & windows, wooden structures, interior fix furniture



Roof covering – covering pitched roof by slate, thatch, different tiles etc



## Planning the technologies

Tinwork – flashings by the gable, the eaves and gutter



Locksmith's work, ironwork – gates, railings, grills, steel frame structures etc.



Glasswork – window glasses, glass walls, etc.





## Planning the technologies

Tiler, paver parqueter works – etc.



Painting – painting walls, pipes, steel structures, windows, doors



Insulation works – thermal and waterproof insulation on flat roofs, facade etc.



## Planning the technologies

Plasterboard – drywall construction



Masonry – inner walls, plastering (rendering), concrete finishing



Exterior facing – plaster, stone, brick, wood, metal etc.

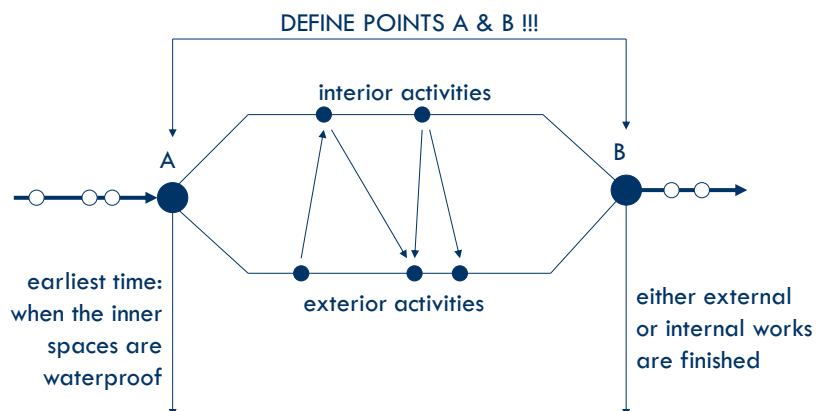


## Planning the technologies

- Time sequence of the activities
  - ▣ Depending on the technological and organisational conditions
  - ▣ Between the limits of technical feasibility the sequence can vary
    - interior plaster – fitting windows – exterior plaster
    - fitting windows – exterior plaster – interior plaster
    - exterior plaster – fitting windows – interior plaster
    - interior plaster – exterior plaster – fitting windows

## Planning the technologies

- Time sequence of the activities



## Planning the technologies

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- Priorities in planning the time sequence
  - ▣ Deadline (scheduling)
  - ▣ Costs (e.g. minimising the costs, or cash-flow)
  - ▣ Site organisation
- Limitations
  - ▣ Protecting finished parts
  - ▣ Allowing adequate working space
  - ▣ Technological intervals (e.g. solidifying of the concrete)