INTRODUCTION

Aspects of selecting the technologies

Technologies in the construction process

Time-sequence of the construction works
TECHNOLOGY

DEF:

Construction technology is the sum of all work processes of a work activity.

The know-how of the construction.
ASPECTS OF SELECTION

- technical circumstances
- cost
- required time -> cost
- workability / viability
  • requirements in equipment / tools = What tools / equipments are at the contractor’s immediate service? / What has to be hired?

COST ESTIMATION

- cost of the technology
- costs of the materials used
- cost of the time
- additional costs

  e.g. - scaffolding
TIME ESTIMATION

- time of the work activity
- required time of the technology
- costs depending on time

E.g. – AAC / clay block

THE PHASE OF THE PLANNING

workability / viability

- workable / viable details
- optimal choices of technology based on local human sources
- details considering the expected (expectable) accuracy of the local construction industry
Technologies in the construction process

- construction of substructures
- construction of superstructures
- finishing works (+ electric wiring and building installation works)
- gardening, etc.

Harmonizing foundation levels

Influencing factors
- necessary depth of excavation pit
- foundation level of the neighboring buildings
- foundation level of the constructed building
- characteristics of the soil

Options
- placing subsequent strip foundation under an existing building
- slurry wall
- jet grouting
- injecting
- pile-wall
Selecting foundation type

- load of the building
- load bearing capacity of the soil
- type of the soil (loose/dense)

- pile
- drilled / prefabricated
- slurry wall
- slurry pillar
- strip foundation
- slab foundation

Monolithic reinforced concrete structures
selecting technology

Vertical structures (wall, pillar)
- reinforcement
- formwork
- concrete placement

Horizontal structures (slab)
- formwork
- reinforcement
- concrete placement

Drilled piles, slurry wall
- concrete placement
- reinforcement

Work sequence
**Monolithic reinforced concrete structures**

**selecting technology**

**Concrete supply**
- influencing factors: cost, time, owned equipments, required quality, etc...
- In-situ concrete
- Transport concrete

**Concrete placement**
- influencing factors: scale of the concrete work
- with concreting bucket
- with concreting pump
Monolithic reinforced concrete structures
selecting technology

Formwork system – for horizontal structures

modular tables (pre-assembled)

panelized slab drophead formwork system

girder slab formwork

work speed ↔ flexibility

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Monolithic reinforced concrete structures
selecting technology

Formwork system – special solutions for horizontal structures

variations of the systems

special heights

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Monolithic reinforced concrete structures selecting technology

Formwork system – for vertical structures

- Metal panel formwork wall formwork system
- Girder wall formwork system (single faced ↔ double faced)
- Pillar formwork

Monolithic reinforced concrete structures selecting technology

Formwork system – special solutions for vertical structures

- Climbing wall formwork system
- Sliding formworks
- Self climbing systems: No crane is needed!
- Circular wall formworks

TECHNOLOGIES IN CONSTRUCTION

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Masonry

Bricks and blocks - materials

AAC* block
clay blocks
high accuracy clay blocks

ceramic bricks - facade bricks

lime-sand bricks and blocks

*autoclaved aerated concrete / porobeton

Steps of technology

- set up the first course (dimensions, water level, etc.)
- laying the second, third, etc. courses
- jointing / grouting
- surface

Surface treatment (depending on the accuracy)

high accurate clay blocks, AAC blocks
thin plaster layer + undercoat + painting (coating)

clay blocks
1.5 cm plaster + undercoat + painting (coating)

Brick surface
- cleaning the surface
- finishing the joints

joints
recessed
flush
half-round

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Masonry

Wall types

brick walls

block walls

single or multi unit course

single unit courses

Masonry – Brick wall bond types

stretcher running bond

English bond

heading bond

crossbond

wider walls

Dutch bond

Flamish (Polnish) bond
Carpentry

Material

- timber
- glued laminated timber (GLT)
- cross laminated timber (CLT)
- plywood
- etc.

Structure types

Traditional structure
- timber (rafters, beams, planks, battens)
- traditional timber joints (+ wrought iron)
- in-situ (on site)

Modern structures
- different materials (timber and/or modern ones)
- different joints — mainly with screws, nails, metal sheets, etc.
- partially or totally prefabricated
Carpentry

Traditional - joints

- notched, double notched, housed, coggled, saw coggled, halved, bevelled halved, dovetailed halved, keyed, wedged
- wedged tenon
- birdmouth
- housed
- stab tenon
- wedged tenon
- wedged
- tenon- mortised
- bridled
Carpentry

**Traditional – advanced joints**
- Cleated (with strap)
- Mounted with metal (wrought iron) elements
- Tusk tenoned
- Cleated (with dog)
- Cleated (with stub tenon)
- Strapped, lapped

**Modern joints**
- Gang nail plates
- Posi-struts
WORK ACTIVITY

DEF: Basic element of the construction. Closed technological interval.

- during an unbroken interval
- one trade
- at the same place

The time of the construction activity

- time of the activity
- required time
- the following activity
**Time-sequence of the construction works**

The time-sequence of the construction works of a certain construction depends on various things – there are many possibilities.

**IMPORTANT** = the technical feasibility of the sequence

- Interior plaster – fitting windows – exterior plaster
- Fitting windows – exterior plaster – interior plaster
- Exterior plaster – fitting windows – interior plaster
- Interior plaster – exterior plaster – fitting windows

**DEF.:** TIME SEQUENCE = The right order of the activities.

**Total time of the construction**

The total time of the construction depends on the optimal interval, optimal cost, technical limit of the construction, physically impossible, increasing costs, and possible rational or emotional limits of the construction.
Sources

http://www.peri-usa.com/products.cfm 2010-10-26
http://www.wienerberger.hu 2010-10-26
