Technical preparation and controlling of the construction. Contracting process.

INTRODUCTION

Preconstruction period

Construction process

Technical preparation of the construction

Controlling / quality management
1

Preconstruction period

PRECONSTRUCTION PERIOD

idea
pre-feasibility study report
or planning competition
architectural conception making
or competition plan
建设性研究 (preliminary set of drawings)
and/or competition plan
construction plan
expert studies
design program
financial study
technical study
legal study
urban study
environmental study
historical/archeological etc.

+ electrical design
building installation design
structural design

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FEASIBILITY STUDY

DEF.:

Feasibility study is analysis and evaluation of a proposed project to determine if it

is technically feasible,

is feasible within the estimated cost,

will be 

* = income or appreciation

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CONTENT OF A FEASIBILITY STUDY

General contents
(5 common factors)
- technology and system analysis
  - analysis of technical solutions
  - capacity study
- economic study
  - cost analysis
  - benefit analysis
- legal study
- operational analysis
  - functional studies
- schedule (time) analysis

Project specific contents

Cultural feasibility
- urban study
- historical study
- archeological study
- etc.

Environmental study

Resource feasibility

Market feasibility

feasibility study report = the output of the process

ARCHITECT SELECTION PHASE – DESIGN CONCEPT

direct commission
possible aspects:
- references
- acquaintance
- prize

concept plan
architectural concept

competition*
(the process is defined by law)
aspects (should be defined before the competition):
- the result of the competition
- references
- prize

competition plan

* in the particular cases it is obliged by law
ARCHITECTURAL PLANNING PROCESS

Phase 0: developing architectural conception

Phase 1: planning consent – drawings for building permission

• legally prescribed
• permission is provided by the local authorities*
• the content is described by the law:
  • technical content:
    • technical drawings – scale = 1:100
    • architectural - technical description
    • technical descriptions of the load bearing structure, the building
      installation and the electrical systems
  • legal content:
    • disclaimers of the designers and the owner
    • official documentation on evidence of ownership
    • statements of the involved authorities and public services
    • official map of the site

* in case of monuments the National Office of Cultural Heritage

ARCHITECTURAL PLANNING PROCESS

Phase 2: construction drawings

• legally prescribed
• the content is described by standards – should provided all the necessary
  information graphic and written
  • technical content:
    • technical drawings (architectural, structural, electrical, installation,
      etc.)
    • general drawings – scale = 1:50; 1:25; 1:20
    • detail drawings – scale = 1:10; 1:5; 1:2; 1:1
    • finalized description and detailed specification (architectural,
      structural, electrical, installation, etc.)
  • legal content:
    • disclaimers of the designers

+ After the construction will be requested (for the permission of use):
  • permissions of the involved authorities
  • consent of the public services
THE SELECTION OF THE CONTRACTOR

direct contracting  
optional aspects: 
• references  
• acquaintance  
• prize

simple competition  
optional aspects: 
• references  
• prize

official tender*  
(the process is defined by law)  
aspects (should be defined in the tender documentation): 
• references  
• prize  
• other aspects (e.g. specialization)

* in the particular cases it is obligated by law

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SIMPLE COMPETITION

Phase 1: providing the invited contractors with the documentation  
• simple list of the planned work activities  
• drawings + list of the work activities  
• drawings + specification

Phase 2: collecting the bids from the candidate contractors

Phase 3: the selection process of the contractor

Phase 4: contracting

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**TENDERING PROCESS** (legally prescribed)

(open / restricted / negotiated)

Phase 0: preparation of the announcement and the documentation of the tendering

(see content is defined by the law)

Phase 1: publish the tender in the adequate forums (legally defined)

Phase 2: present the documentation to the applying firms

Phase 3: collecting the tender bids from the candidates

Phase 4: selection of the contractor

Phase 5: contracting process

**DOCUMENTATION FOR TENDERING**

Contents (described by law):

• the conditions of the participation on the tender

• architectural plans
  • construction drawings (if possible)
  or tender plan (=the documentation of the planning consent + final specification) in case of necessity

• the aspects of the selection

• the deadline of the tender

• legal documentation
SITE PLANNING

drawings + written documentation

- general site plan for the whole construction process
- construction phase plans for the distinct phases of the construction
- earthwork
- substructures
- superstructures

(at least)

for different phases of the finishing works

Who does what?

Who is responsible for what?

Identified hazards and risks.

How the works are controlled?
SITE PLANNING

written documentation

Project description
Technical data
Management of the work
Arrangements for controlling significant site risks
Health and Safety file
TIME MANAGEMENT

Forms of programming

- Cyclogram
- Network planning
- Gantt diagram / bar chart

Schedule forms:
- Project manager: project timetable – network plan
- Site manager: schedule of the entire construction – network plan / Gantt diagram
- General foreman: schedule of the present construction phase – Gantt diagram
- Foreman: list of the following activities
COST ESTIMATION / CALCULATION
during the technical preparation

cost estimation

selection of technology

time sequence of construction works

3 CONSTRUCTION PROCESS

START
SET UP THE SITE

DEMOLITION (IF NEEDED)

FINISHING
(The most time-consuming part of the construction)

SUB- AND SUPER- STRUCTURES

GARDENING

ELECTRICAL WIRING

PLUMBING (BUILDING INSTALLATIONS)

TURNKEY HANOVER

correcting defects & supplying deficiency

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SET UP THE SITE

precondition: the client allows work on the site

installation temporary facilities:
• welfare facilities (canteen, toilets, drying rooms), first aid point
• office container
• guard’s container
• fence
• lighting
• storage container(s)
• silos (mortar, cement)

handling the networks of public services
• temporary shortcuts (in case of need)
• install temporary transformer box and electric cables
• install temporary sewage and water pipelines, etc.

appointment of
• the pedestrian and traffic routes (temporary road in case of need)
• the material deposits
• the deposits for temporary structures (formwork, scaffolding, etc.)

setting up the construction equipments
• tower crane(s)
• concreting equipments (in case of need)
• etc.
CONSTRUCTION SITE INDUCTION

the „welcome” process at the site

Providing information for the workers (visitors) on the followings:

• responsible personnel of the site (site manager, site foremen, supervisor)
• welfare facilities (canteen, toilets, drying rooms) + first aid point/first aider
• access of arrangements (pedestrian routs, parking)

• work and fire safety rules, site rules
• emergency procedures (muster point, fire fighting, site reentry after emergency)
• accident procedures (report and recording procedure)

• daily working hazards (hot works, groundwork, working in height, etc.)
• the work activities, that requires permission (not allowed to start without it)
• handling of the equipments

DEMOLITION WORKS

The execution is depending on

• the scale
• the structures
• the materials
• the states of the structures
• the environment (built/natural)

Different techniques

• man-power
• construction equipments
• explosives
• complex methods
CONSTRUCTION OF SUBSTRUCTURES

• excavation (groundwork)
• construction of foundations
  • masonry (traditional)
  • formwork
  • concreting
  • slurry wall
  • construction of different kind of piles
• foundation reinforcement works

CONSTRUCTION OF SUPERSTRUCTURES

• formwork
• concrete reinforcement
• concreting
• masonry (external walls)
• scaffolding
• carpentry
**FINISHING WORKS**

the most time-consuming and cost worthy part of the construction

- carpentry
- joinery
- parquet flooring
- roof covering
- sheet metal work
- locksmith’s work (ironwork)
- glasswork
- wall- and floor tiling
- painting
- insulation works
- masonry of inner walls, bricklaying
- plastering
- exterior facings
- drywall construction

**FINISHING WORKS**

applied arts + restoration technologies

- smithcraft
- stained glass
- pargeting, stucco making
  - etc.

+ electrical work
+ building installation work
CONTROLLING PROCESS

client

project manager

controlling by the contractor

architectural supervision

standards
Continuous control of the work

QMS
Continuous control of the company

quality surveyor

standards

the activity is regulated by the law

aesthetic control

accordance with the plans

QUALITY MANAGEMENT - STANDARDS

DEF.:

A technical standard is an established norm or requirement. It is a formal document that establishes uniform engineering or technical criteria, methods, processes and practices.
QUALITY MANAGEMENT - STANDARDS

• for a product
• for a procedure

international standards
CE, EN

national standards
ANSI, NS, TSE, SA, MSZ, DIN, ÖN, BS

local standards
Guidelines (used by a group of company)

company standards

QUALITY MANAGEMENT – BUILDING STANDARDS

CE = conformance mark

The manufacturer on his sole responsibility declares, that the product meets the EU consumer safety requirements.

Building construction

The building fulfills the EU consumer safety requirements if all used material meets with the EU consumer safety requirements:

are marked with CE marking.

or

are uniquely certified.
QUALITY MANAGEMENT SYSTEM

QMS = Quality Management System

Quality Management = quality control + quality assurance + quality improvement

QMS = the organisational structure, procedures, processes and resources needed to implement for quality management.

International Organization for Standardization

ISO 9000 family of standards for QMS

ISO 14000 family of standards for effective environmental management system

TQM = Total Quality Management

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