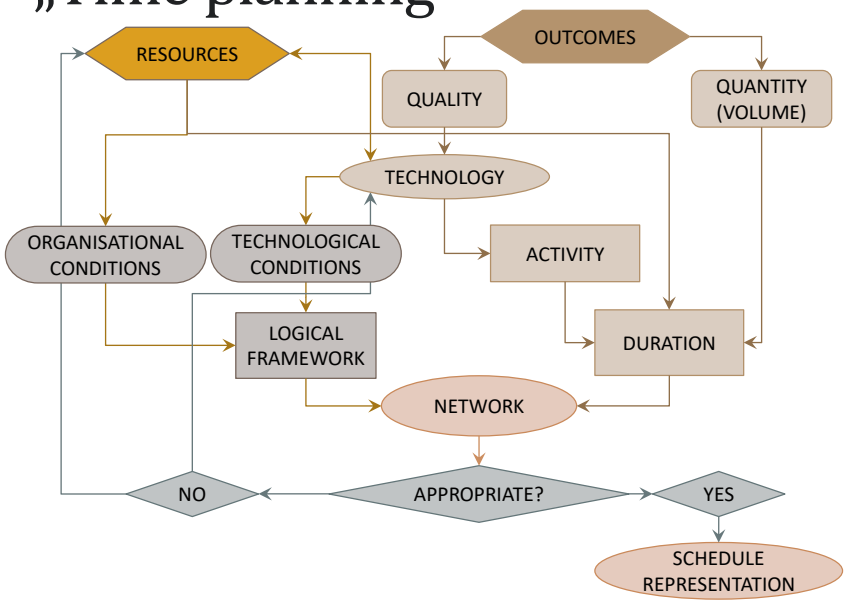
Time scheduling II.

Building Project Management

Adrienn Lepel – BME Department of Construction Technology and Management

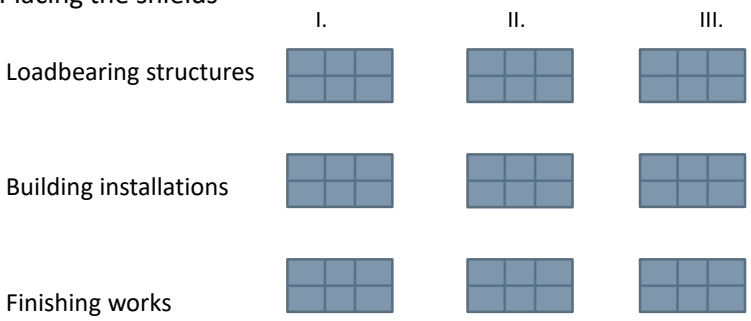
13.11.2019.

„Time planning”



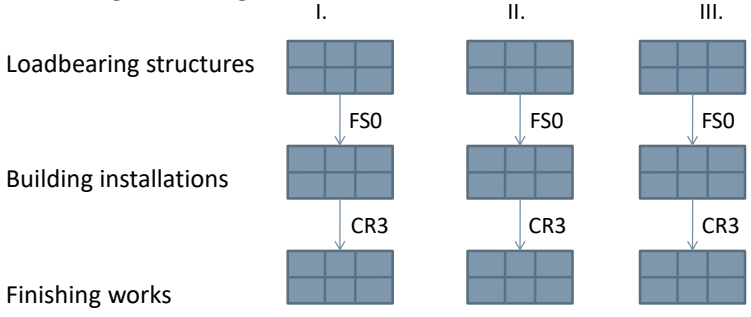
Composing an MPM network

- Placing the shields



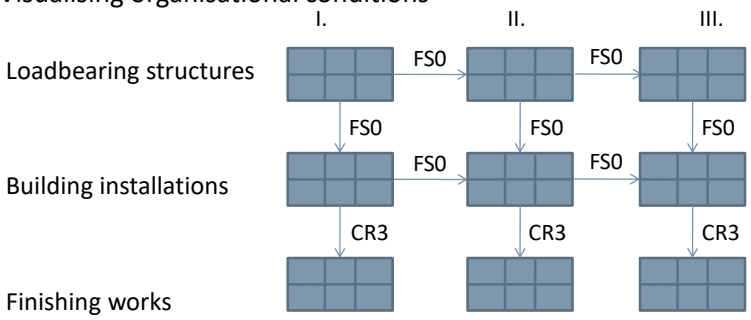
Composing an MPM network

- Visualising technological conditions



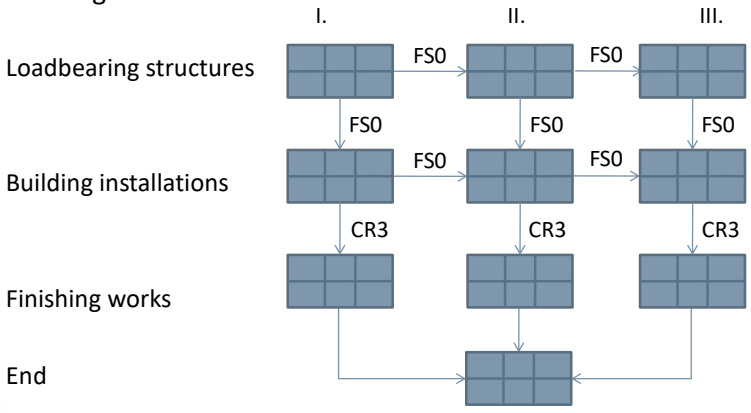
Composing an MPM network

- Visualising organisational conditions



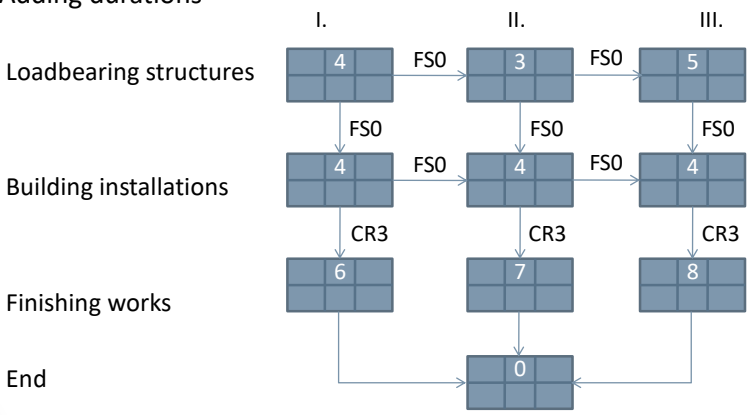
Composing an MPM network

- Checking network



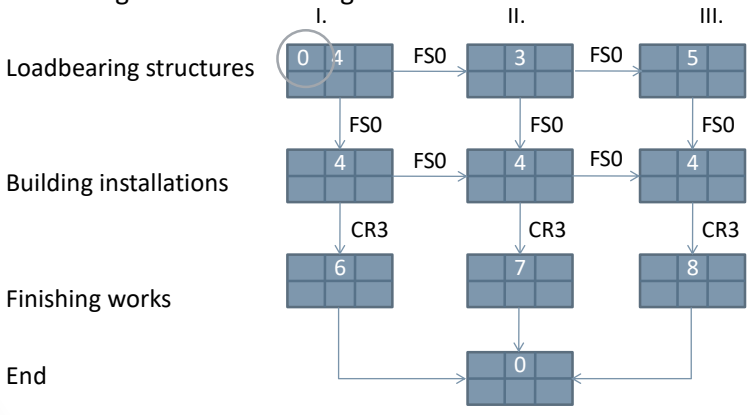
Composing an MPM network

- Adding durations



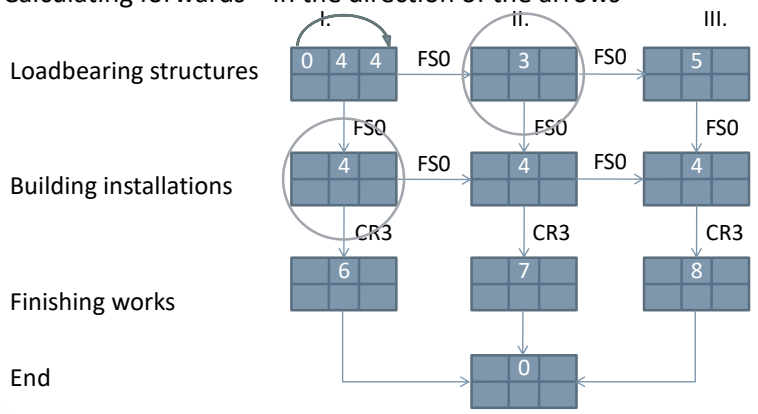
Time analysis

- Calculating forwards - starting



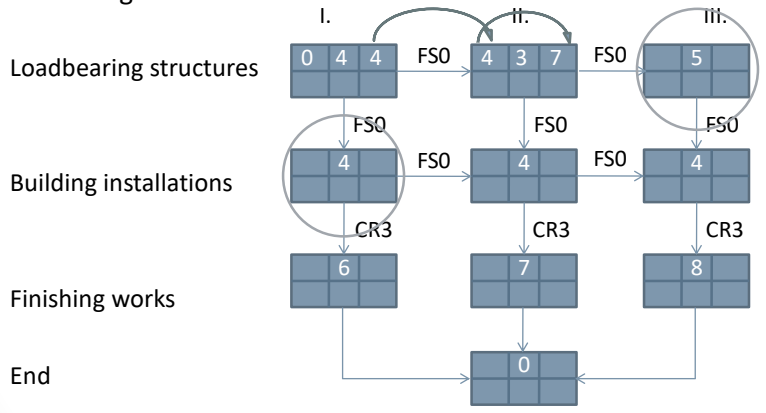
Time analysis

- Calculating forwards – in the direction of the arrows



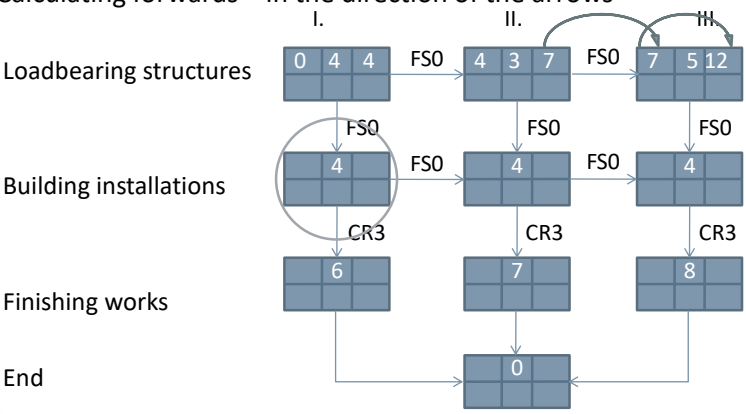
Time analysis

- Calculating forwards – in the direction of the arrows



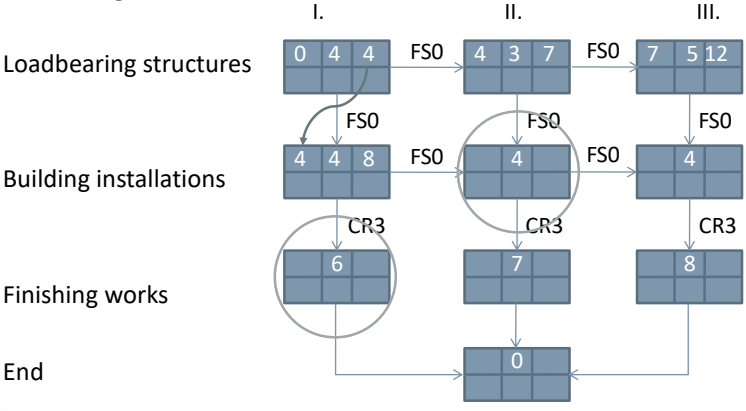
Time analysis

- Calculating forwards – in the direction of the arrows



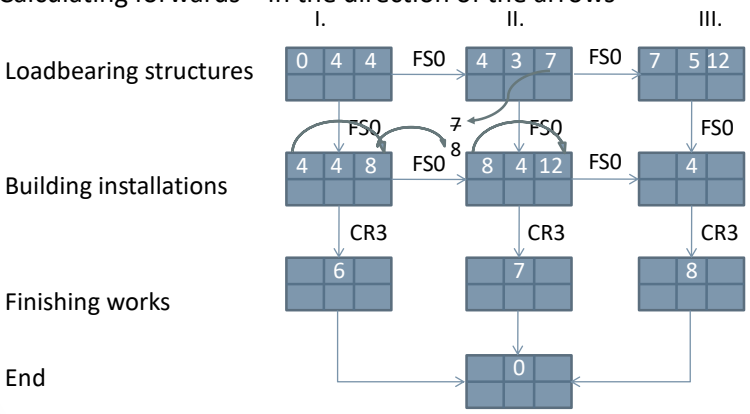
Time analysis

- Calculating forwards – in the direction of the arrows



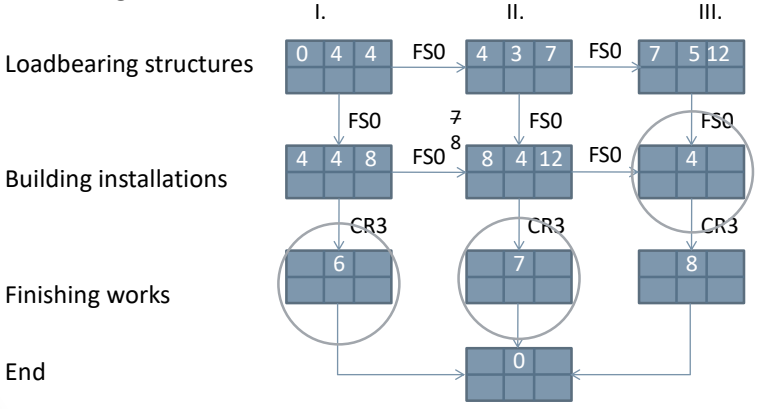
Time analysis

- Calculating forwards – in the direction of the arrows



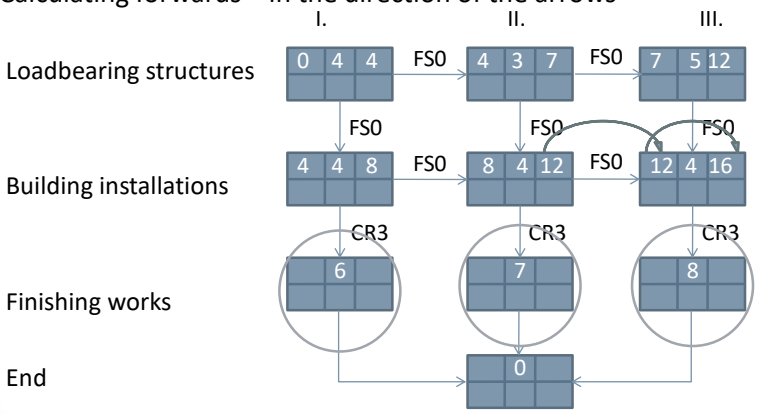
Time analysis

- Calculating forwards – in the direction of the arrows



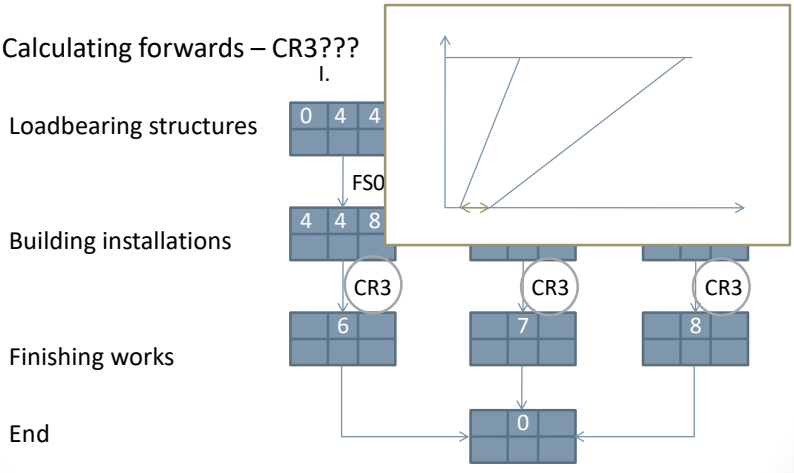
Time analysis

- Calculating forwards – in the direction of the arrows



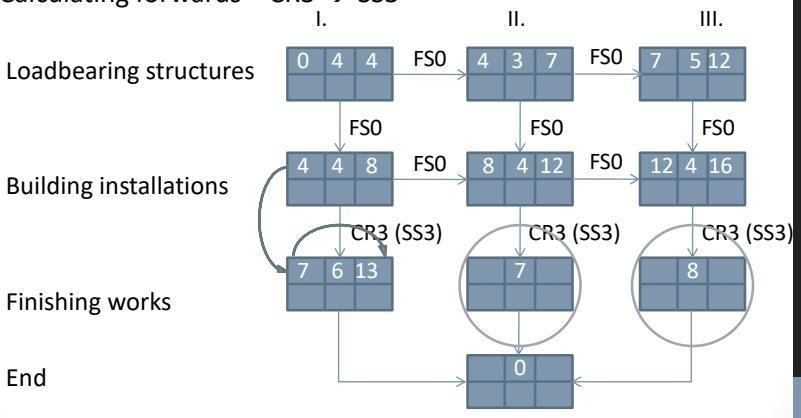
Time analysis

- Calculating forwards – CR3???



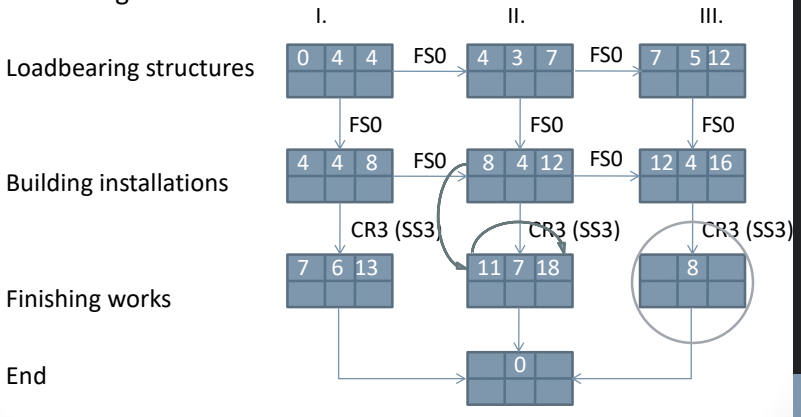
Time analysis

- Calculating forwards – CR3 → SS3



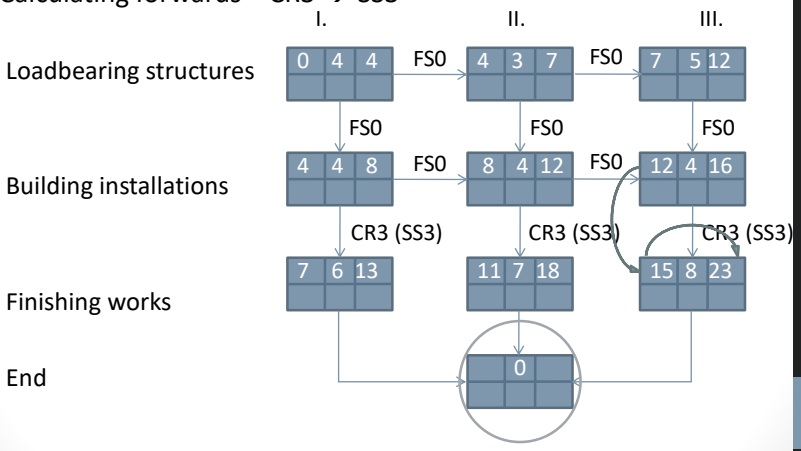
Time analysis

- Calculating forwards – CR3 → SS3



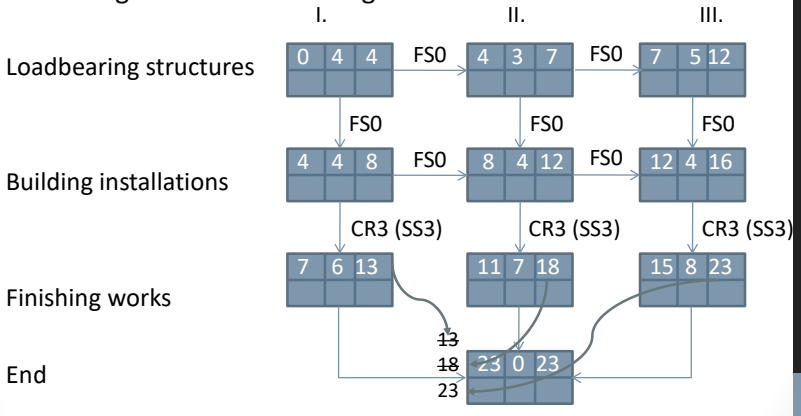
Time analysis

- Calculating forwards – CR3 → SS3



Time analysis

- Calculating forwards – choosing the maximum



Time analysis

Calculating forwards

- Early dates
- Appointed starting date
- Proceeding in the direction of the arrows
- Maximal values

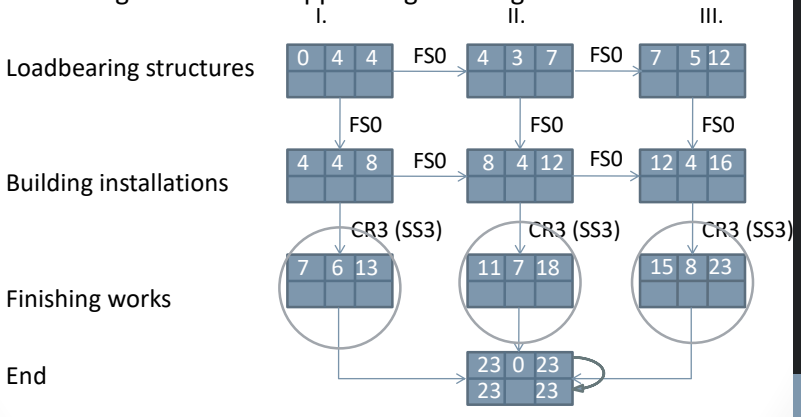
Calculating backwards

- Late dates
- Appointed finishing date
- Proceeding against the arrows
- Minimal values

SAME ORDER OF STEPS!

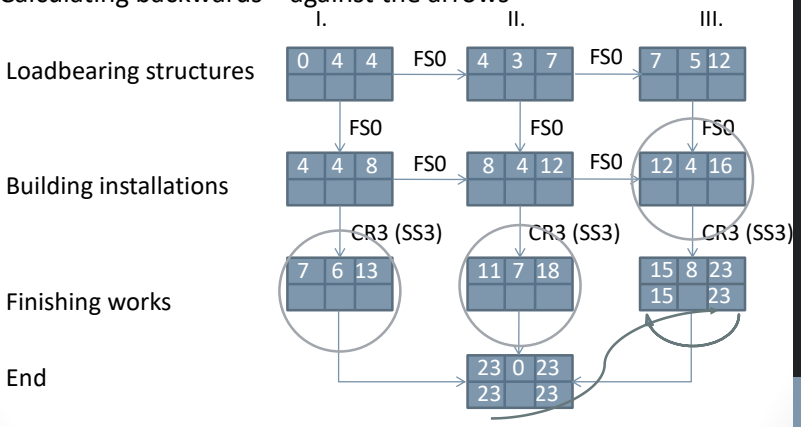
Time analysis

- Calculating backwards – appointing finishing date



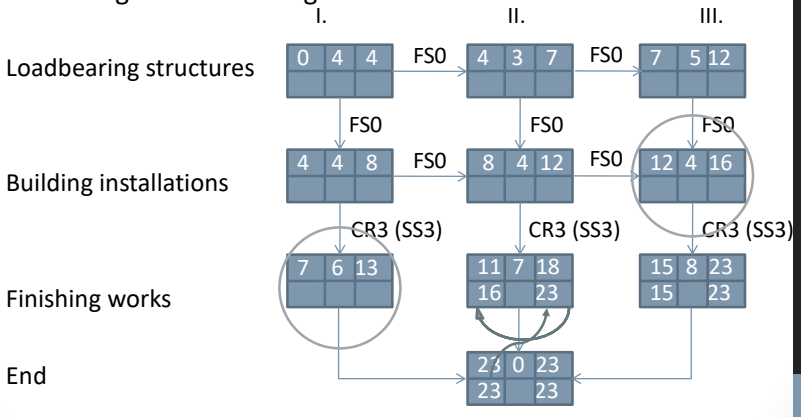
Time analysis

- Calculating backwards – against the arrows



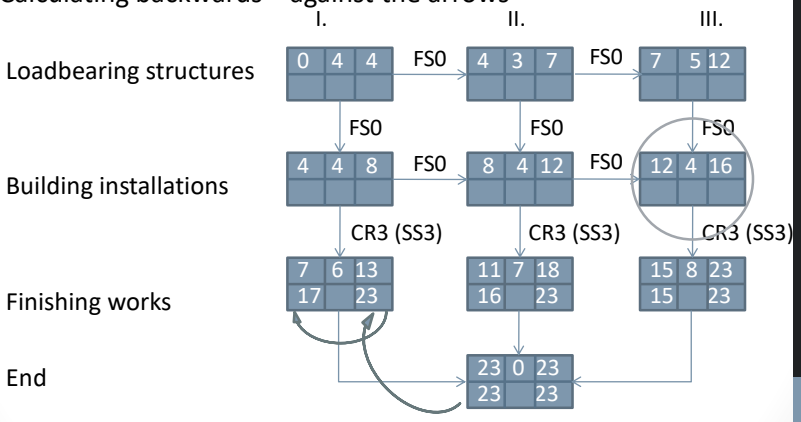
Time analysis

- Calculating backwards – against the arrows



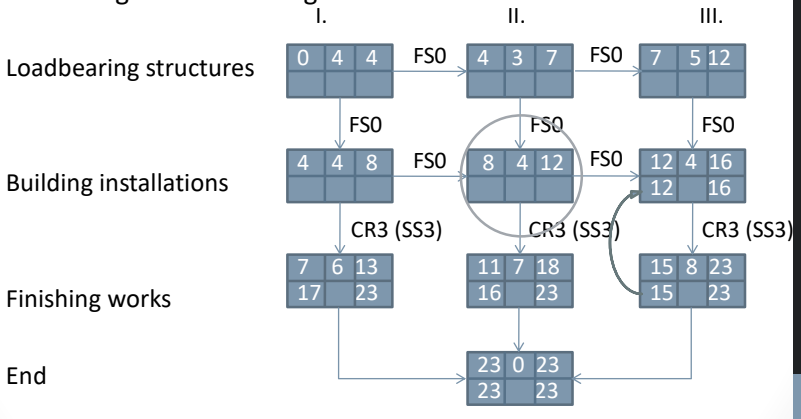
Time analysis

- Calculating backwards – against the arrows



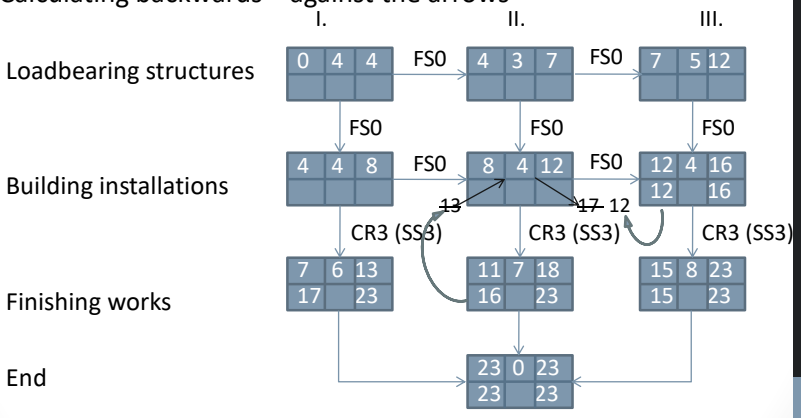
Time analysis

- Calculating backwards – against the arrows



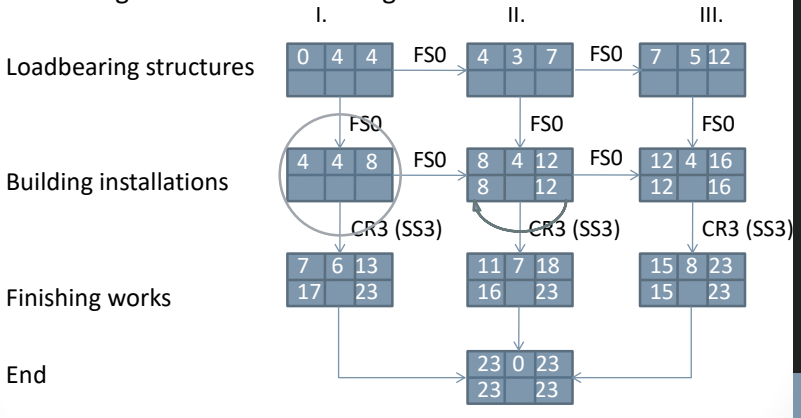
Time analysis

- Calculating backwards – against the arrows



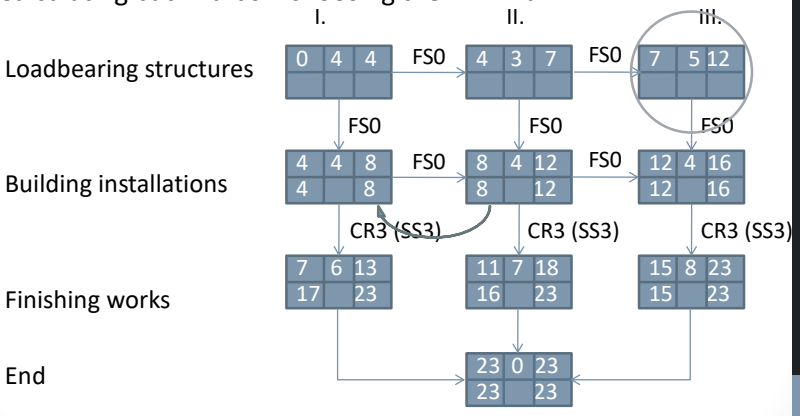
Time analysis

- Calculating backwards – choosing the minimum



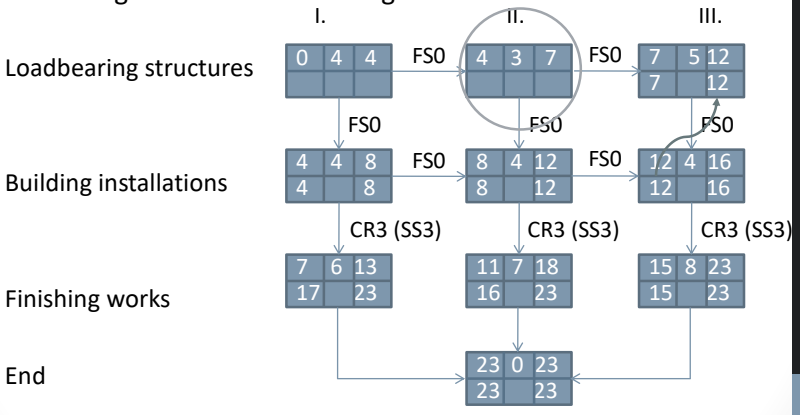
Time analysis

- Calculating backwards – choosing the minimum



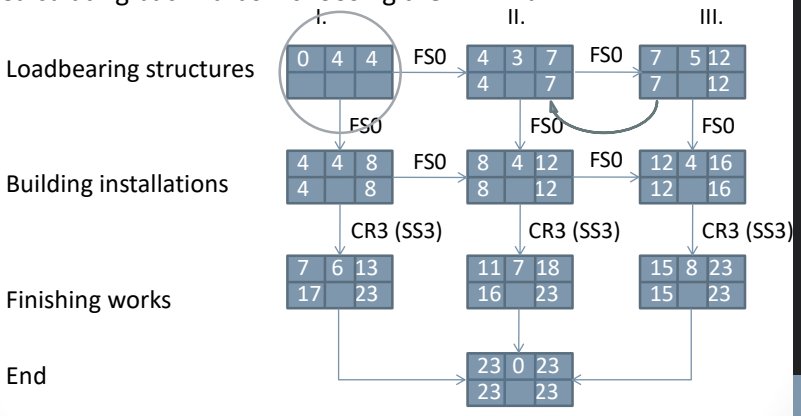
Time analysis

- Calculating backwards – choosing the minimum



Time analysis

- Calculating backwards – choosing the minimum



Time analysis

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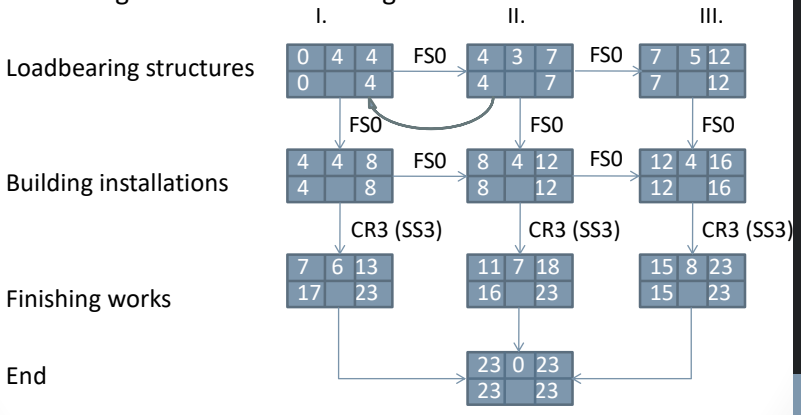
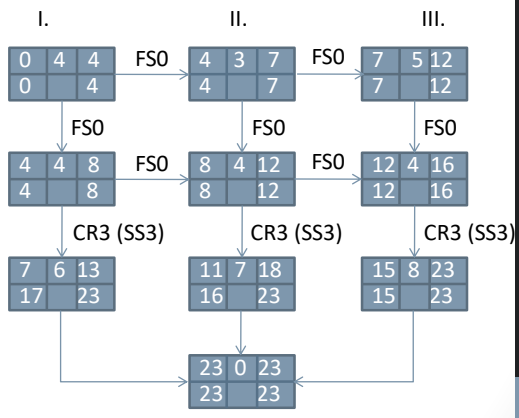


Time analysis

- Checking the network
  - Getting back 0 as the starting date
  - Late date ≥ early date



Analysing the network

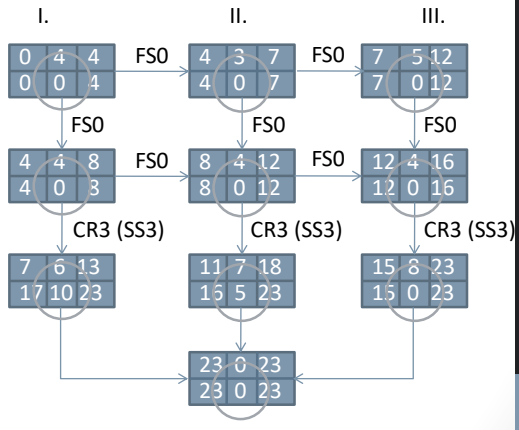
- Float – total float

Loadbearing structures

Building installations

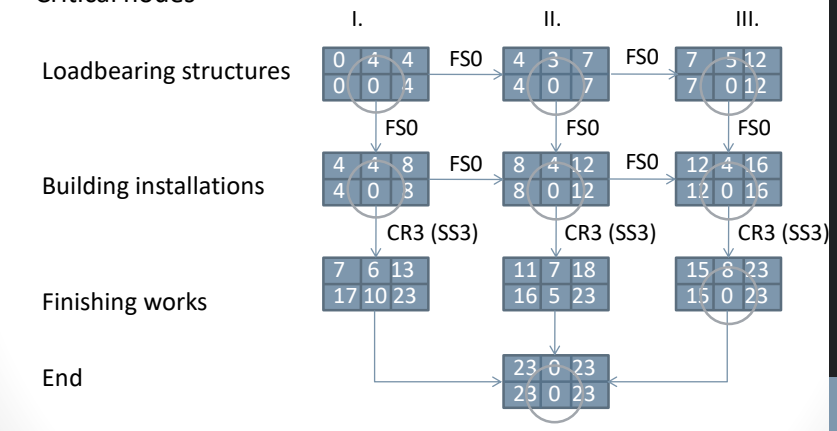
Finishing works

End



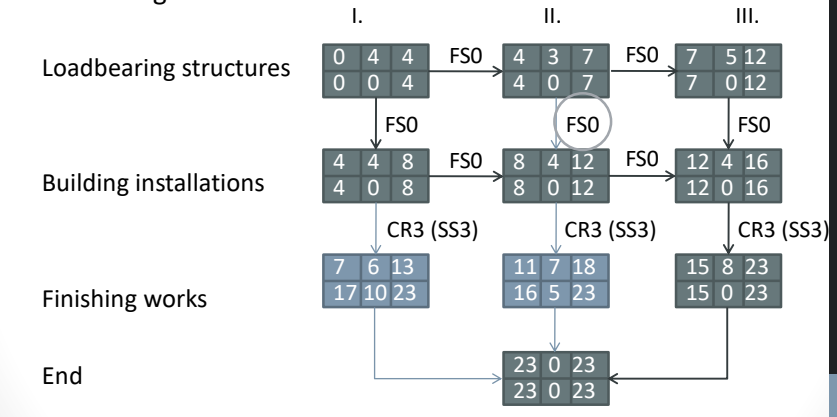
Analysing the network

- Critical nodes



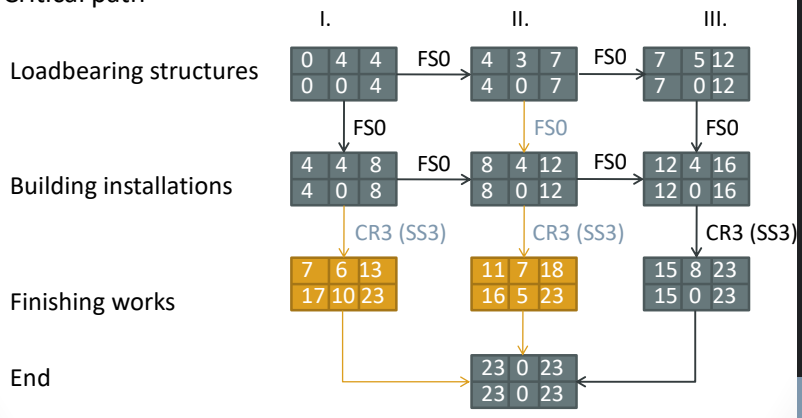
Analysing the network

- Critical edges



Analysing the network

- Critical path

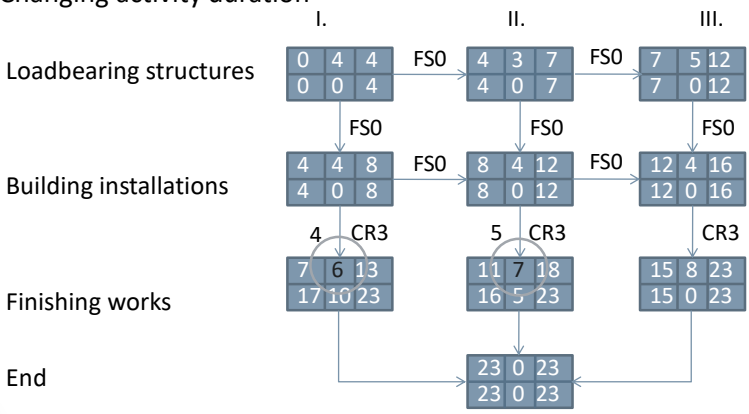


Analysing the network

- Modifying the network
  - When?
    - During the planning phase
    - During the construction – according to actual data
  - Why?
    - To reduce the total duration
    - Delay in the preceding activities → keeping end deadline
  - How?
    - Changing activity durations in the critical path
    - Changing relations in the critical path
      - Allowing greater overlapping
      - Using more resources (e.g. labour) →eliminating relations

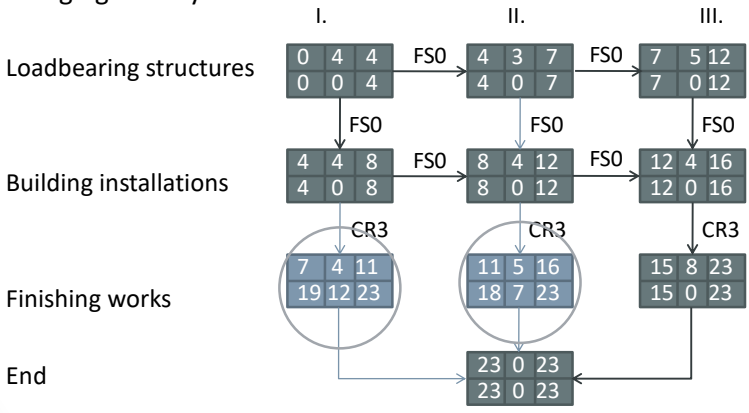
Modifying the network

- Changing activity duration



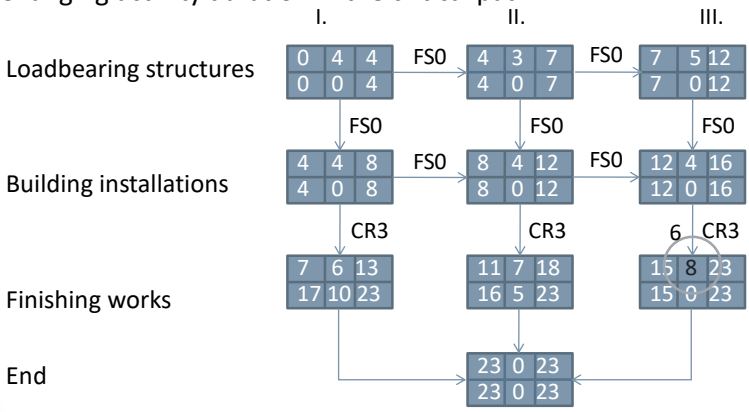
Modifying the network

- Changing activity duration



Modifying the network

- Changing activity duration in the critical path



Modifying the network

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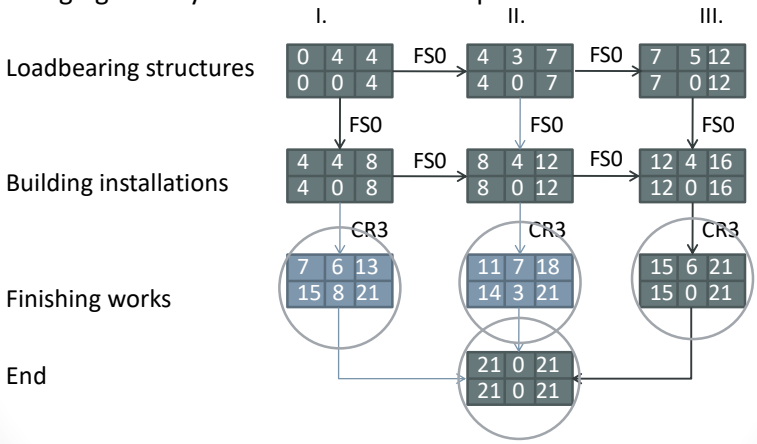
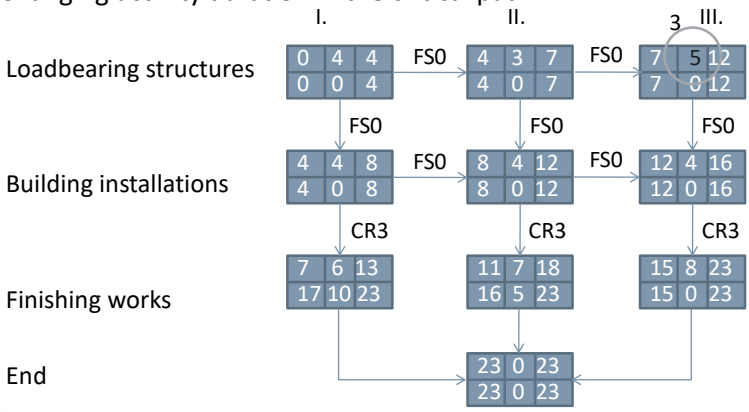


Modifying the network

- Changing activity duration in the critical path



Modifying the network

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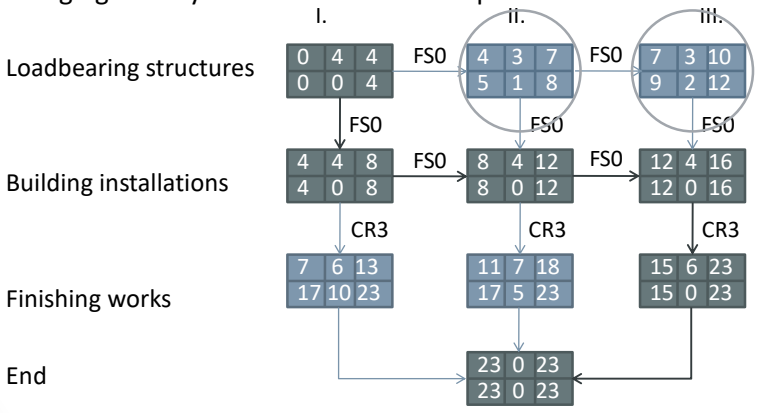
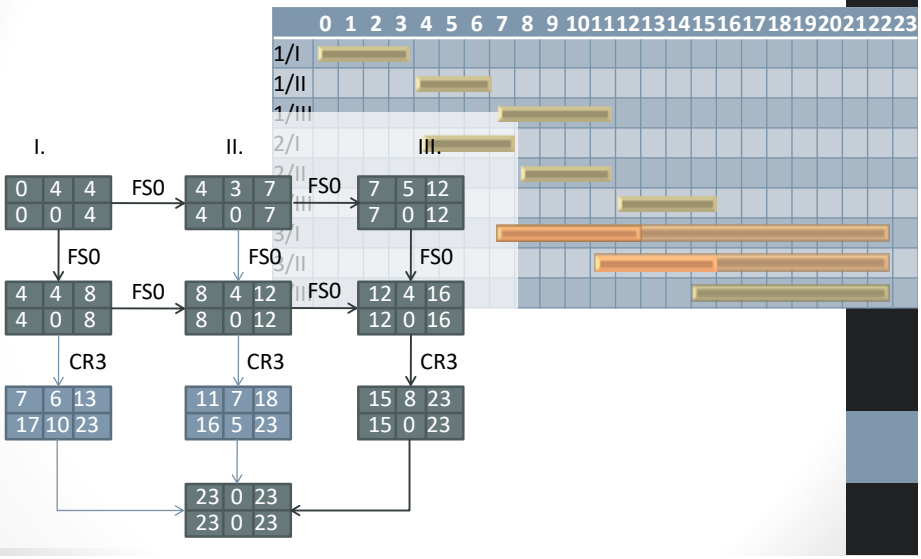


MPM network → bar chart



MPM network → bar chart

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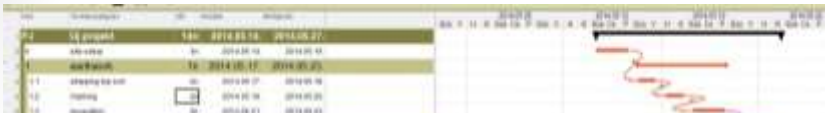
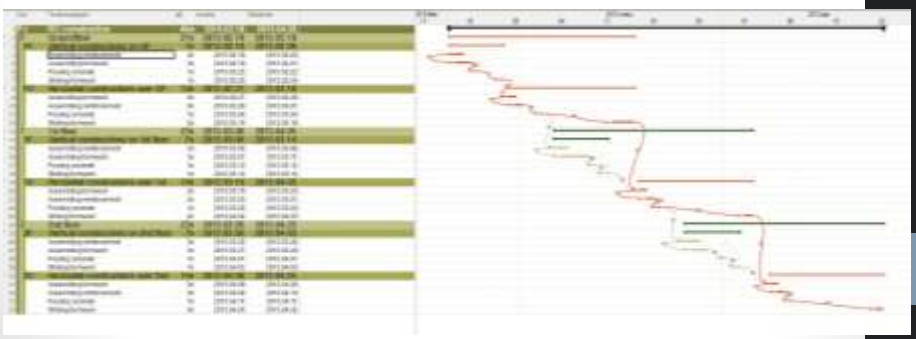


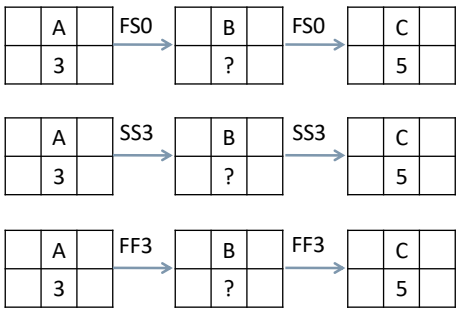


Time planning in construction projects

Activity/Milestone	Duration
Project start	0 – Date
Preparation phase	
Project preparation	1-3 months
Analyses	1-6 months
Feasibility study	1-3 months
Financing	1 week-6 months
Planning phase	
Choosing architect	2 weeks-6 months
Concept plan	2 weeks-
Documentation for building consent	2 weeks-
Building consent (permit)	0 – Date 2 months after finishing the plan
Preparation of implementation	
Documentation for tendering	1 week-
Construction plan	1 month-
Tendering, contracting	2-5 months
Implementation	
Construction start	0 – Date 1 (or more) months after contract
Earthwork	Depends on the size/structure of the building
Foundation	Depends on the size/structure of the building
Loadbearing structures	Depends on the size/structure of the building
Exterior finishing works	Depends on the size/structure of the building
Interior finishing works	Depends on the size/structure of the building
Handover-takeover procedure	1 week-
Fulfilment plans	1 week-
Construction finish	0 – Date
Project end	
Permission of use	0 – Date 2 months after finishing construction
Project closing	1 year

References

- Lepel Adrienn – *Basics of construction – Basics of scheduling* http://www.ekt.bme.hu/ArchEng/Basics%20of%20scheduling.pdf
- Dr. Vattai Zoltán – ***Construction management – decision support***, Network techniques I-II http://www.ekt.bme.hu/CM-BSC-MSC/CM-BSC-MSC.htm
- http://en.wikipedia.org/wiki/Work_breakdown_structure
- http://en.wikipedia.org/wiki/Project_network
- http://en.wikipedia.org/wiki/PERT

Exercise

- What happens if the duration of activity B is changed from 4 to 5?