CTU in Prague
Faculty of Civil Engineering
Department of Building Structures

Restoration of load-bearing structures

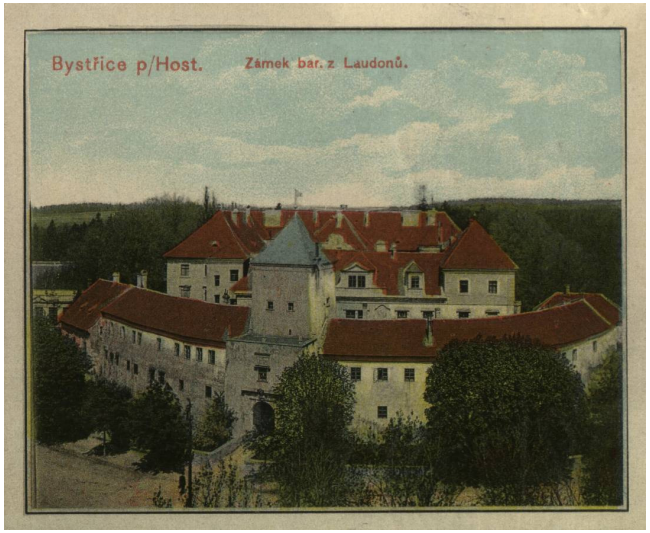
Chateau in Bystřice pod Hostýnem

Presentation was created with the kind support of Ministry of Education Grant FRVŠ 2960/2011.

History of the object

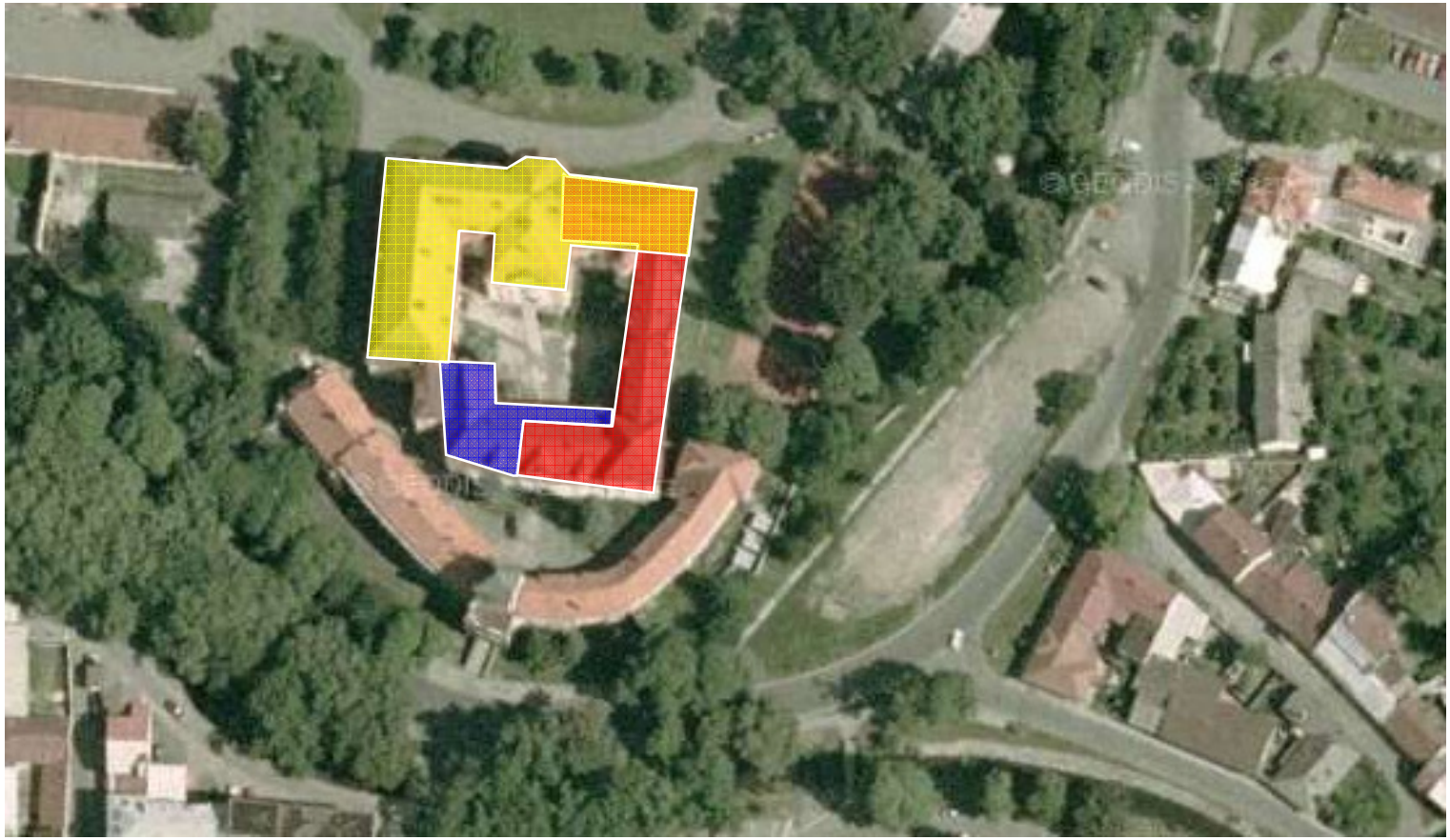
- Range of Gothic fortress and a Renaissance chateau

- Extension of chateau in the late 17th century



History of the object

- Finishing of a chateau by F. A. Grimma



History of the object

- Staircase pavilion in the courtyard

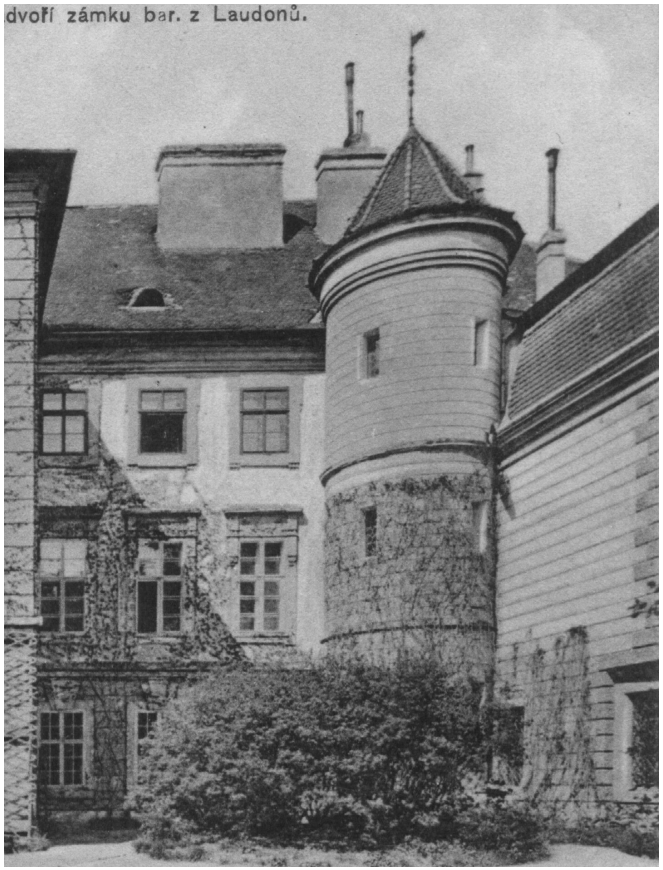
- Saddle roofs after the fire in 1789

History of the object

- Classical three-storey annex building

History of the object

- 1881 Construction of the roundel



History of the object

- 1889 fake mansard roof of the east wing

courtyard view

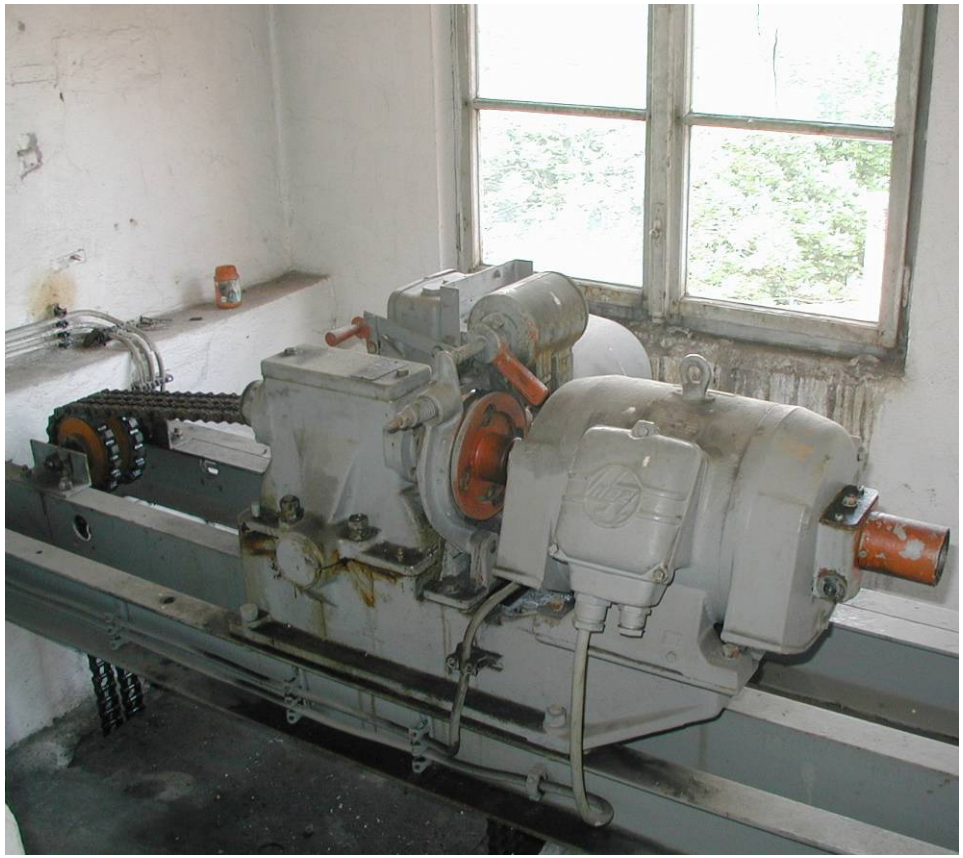
east view

History of the object

- 1924 mansard roof renewal

History of the object

- 1960 installation of a service lift



Description of the object

- The chateau southern face

Description of the object

- Vertical load-bearing structures
  - 1st underground floor stone masonry (sandstone)
  - 1st floor - mixed masonry (stone and bricks) in the south, brick masonry (fired brick) in the north and west
  - 2nd and 3rd floor brickwork (clay bricks)

probing into the masonry in 2nd floor

Description of the object

- Horizontal structures

Floor structures:

- 1st underground floor:
  barrel vaults
- 1 st floor:
  various vaults
- 2nd ,3rd floor:
  flat floors

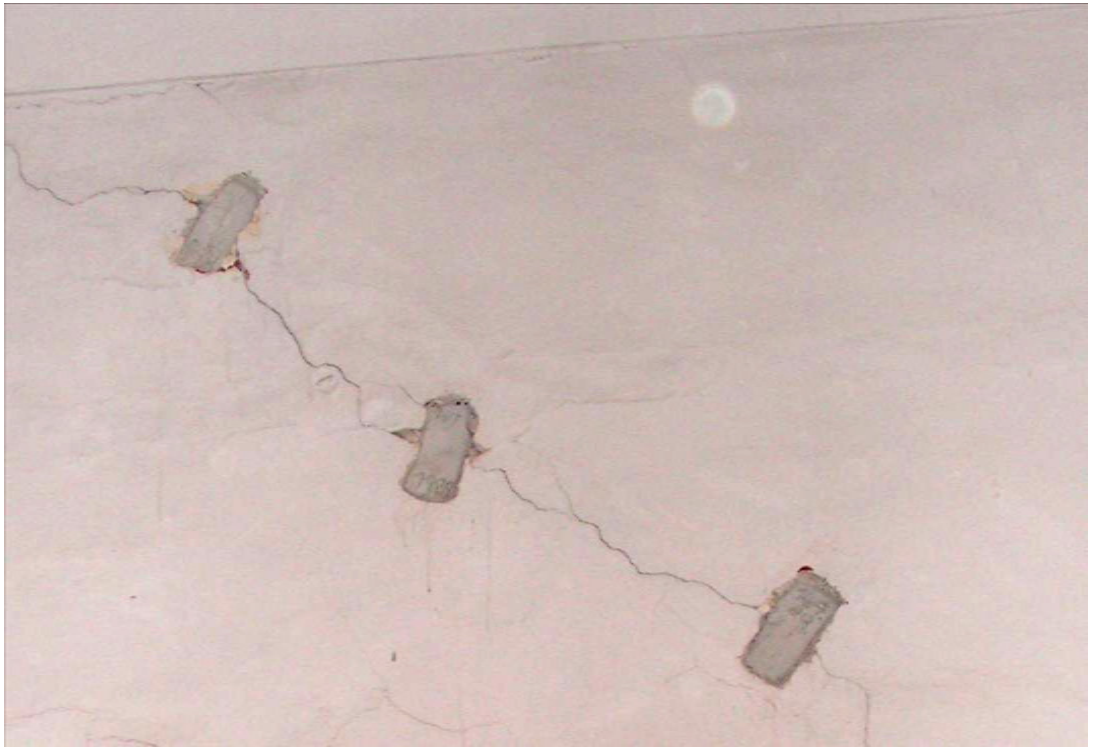
Flooring:

1st underground floor:
concrete floor

- 1 st to 3rd floor:
  concrete floor
  plank floor
  wooden parquet
  ceramic paving
  stone paving
- attic
  bricks

Description of defects

- Defects of vertical structures in 2nd floor
  - plaster labels



Description of defects

- Defects of vertical structures in 3rd floor

Technical analysis of structures

- Probing between1st – 2nd floor
  - board flooring 20 mm
  - wooden crate 50 x 100 mm
  - filling 110 – 600 mm
  - brick vault 150 – 300 mm
  - lime plaster 20 mm

Technical analysis of structures

- Probing between 2nd – 3rd floor
  - board flooring 20 mm
  - wooden crate 50 x 100 mm
  - filling – rubble 150 mm
  - bricks placed horizontally 70 mm
  - mortar 30 mm
  - board deck 20 mm
  - beams 250/200 250 mm
  - board deck 20 mm
  - reed plaster 20 mm

Technical analysis of structures

- Probing above 3rd floor
  - board flooring 20 mm
  - beams 150/120 150 mm + filling - rubble aprox. 80 mm
  - air gap 300 mm
  - bricks placed horizontally 70 mm
  - rubble 30 mm
  - board deck 20 mm
  - beams 250/200 250 mm
  - board deck 20 mm
  - reed plaster 20 mm

Technical analysis of structures

- Probing roof floor
  - bricks 50 mm
  - sawdust filling 30 mm
  - board deck 20 mm
  - beams 300/200 300 mm
  - board deck 20 mm
  - reed plaster 20 mm

Description of defects

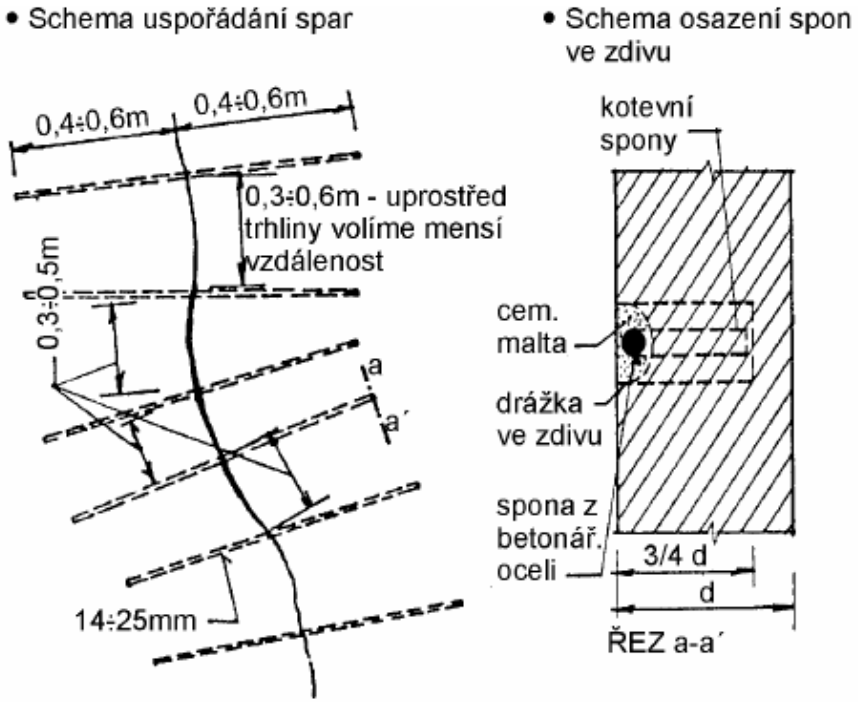
- place of roof floor collapse

Analysis of defects

- increase in loading during chateau conversions caused drop of roof floor structure and the formation of cracks in the load-bearing walls

Restoration of defects

- Proposal of restoration – vertical structures
  - wall 1 - pulling down
  - wall 2 – steel buckles according to the scheme
  - wall 3 - pulling down



Restoration of defects

- Proposal of restoration – horizontal structures