CTU in Prague
Faculty of Civil Engineering
Department of Building Structures

Restoration of vaults

Šlechta restaurant in Prague - Bubeneč (Main Hall)

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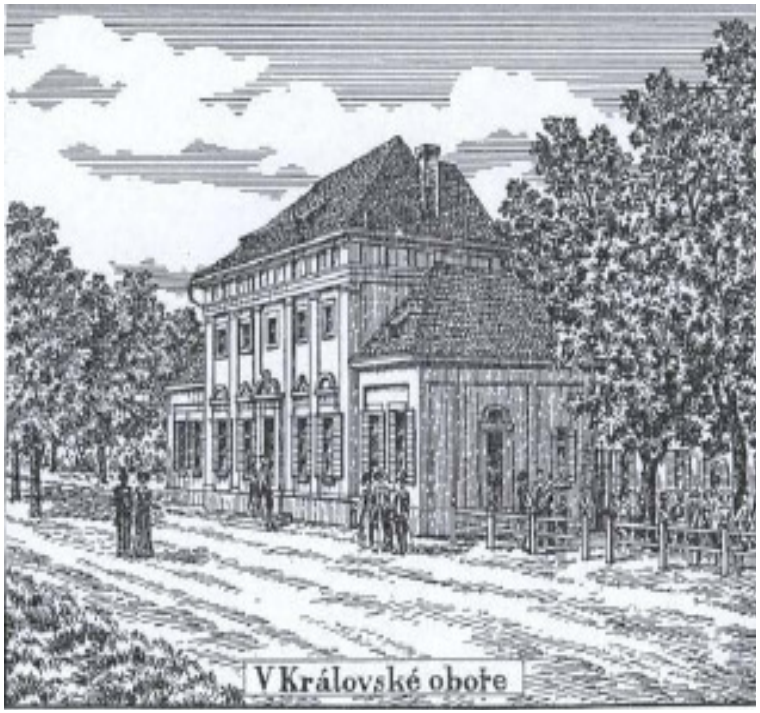
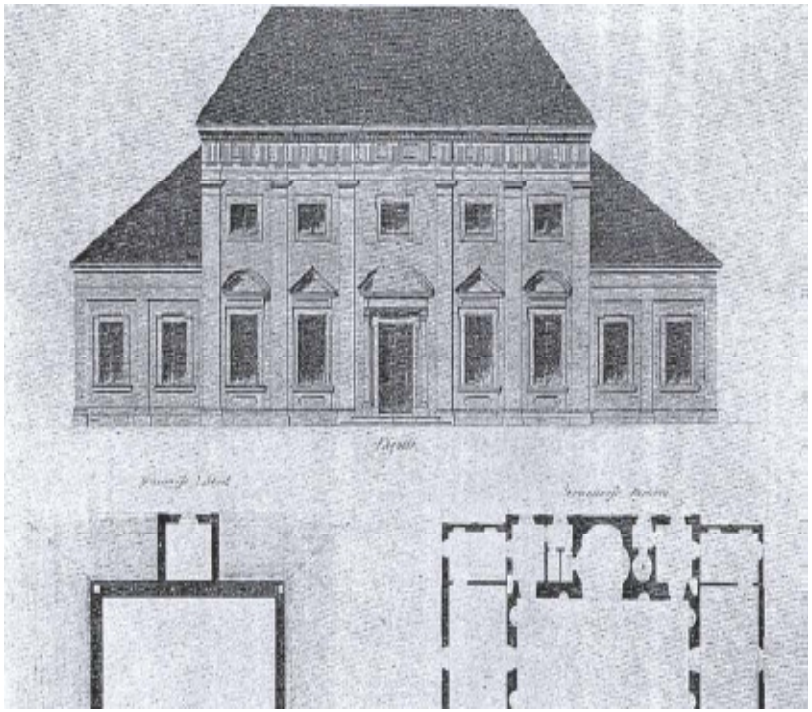
Description of the object

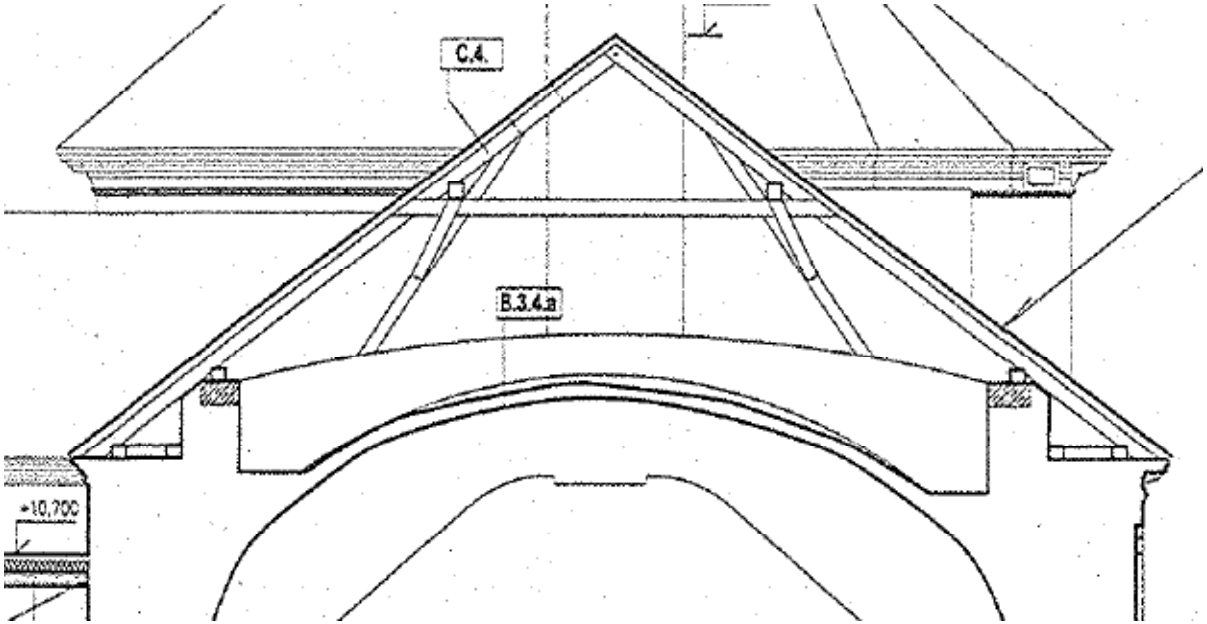
- Historical views on Šlechta restaurant





Description of the object

- truss above the main hall
  - New-made King Post Truss above the main hall
  - supported by circuit reinforced concrete rims and arch reinforced concrete ribs
  - full frames – King Post Truss with 2 purlins

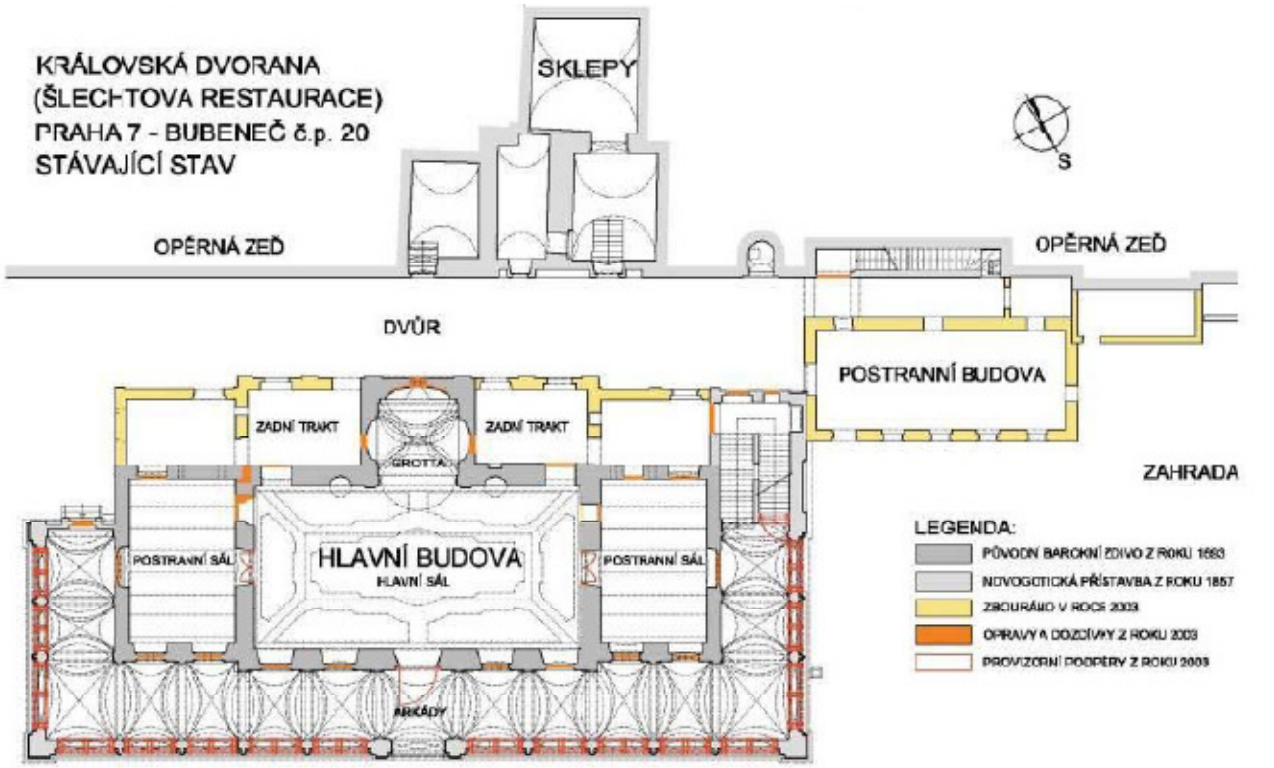


History of the object

- construction time(1688 – 1693) – scale variant of Sternberg villa in Troy
- author – J. B. Matheym?? (same form as Sternberg villa)
- double-aisle building
- main hall was connected to a side halls by door openings (doors bricked before r.1725)
- in 1726 construction works caused by poor condition of the truss and roof (S. Löffler)
- in 1792 new ground floor hall was built on the west side
- in 1808 adapted into a restaurant
- in 1855 decided on reconstruction and extension of the terrace with veranda (B. Grueber)

History of the object

- the conversion of the early Baroque facade to the Gothicism facade
- made extension of both side-wings to the two storeys

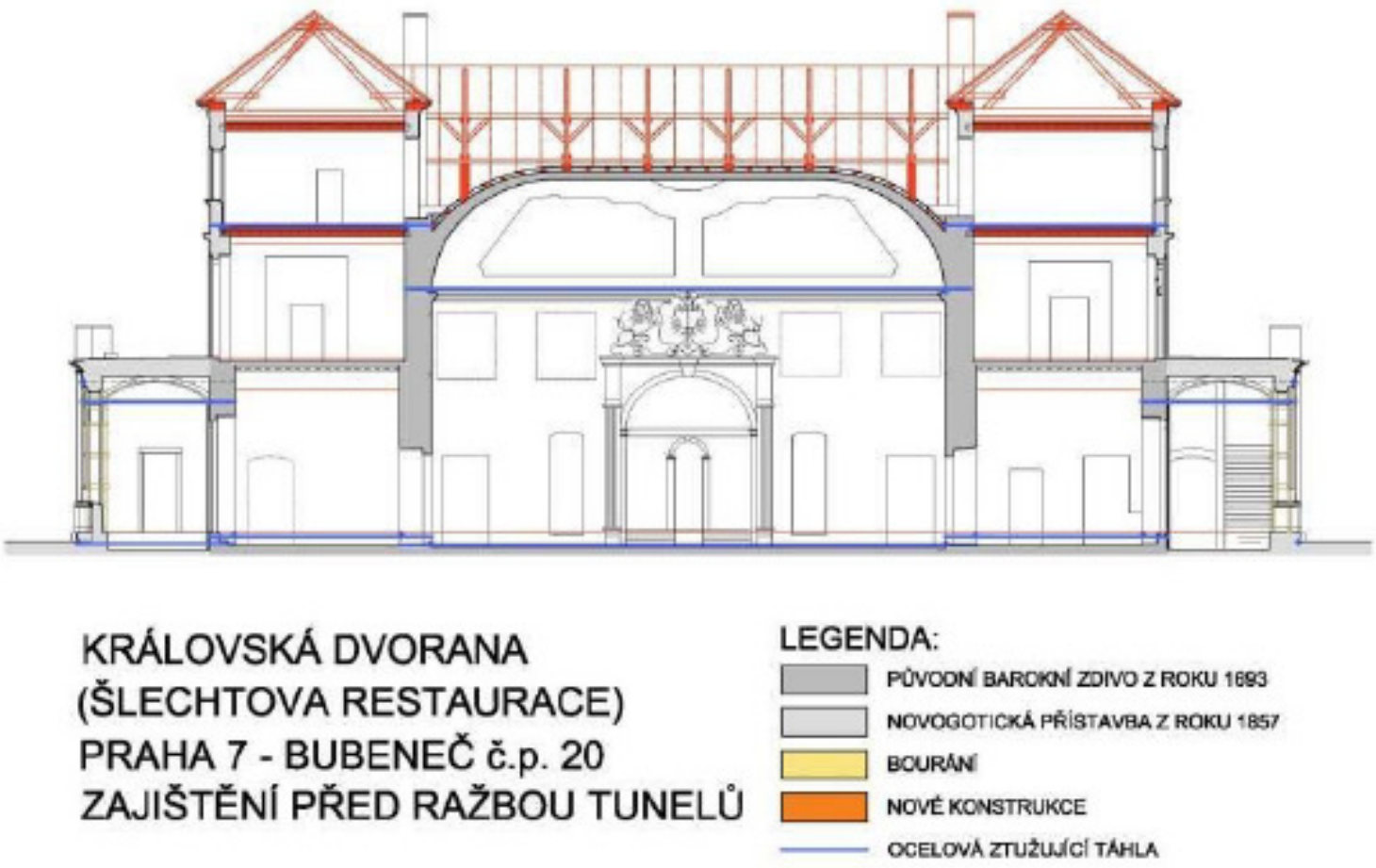


History of the object

- Current state of Šlechta restaurant
  - waiting for the start reconstruction of Šlechta restaurant
  - there are static securing needed in the context of the construction of the tunnel Blanka

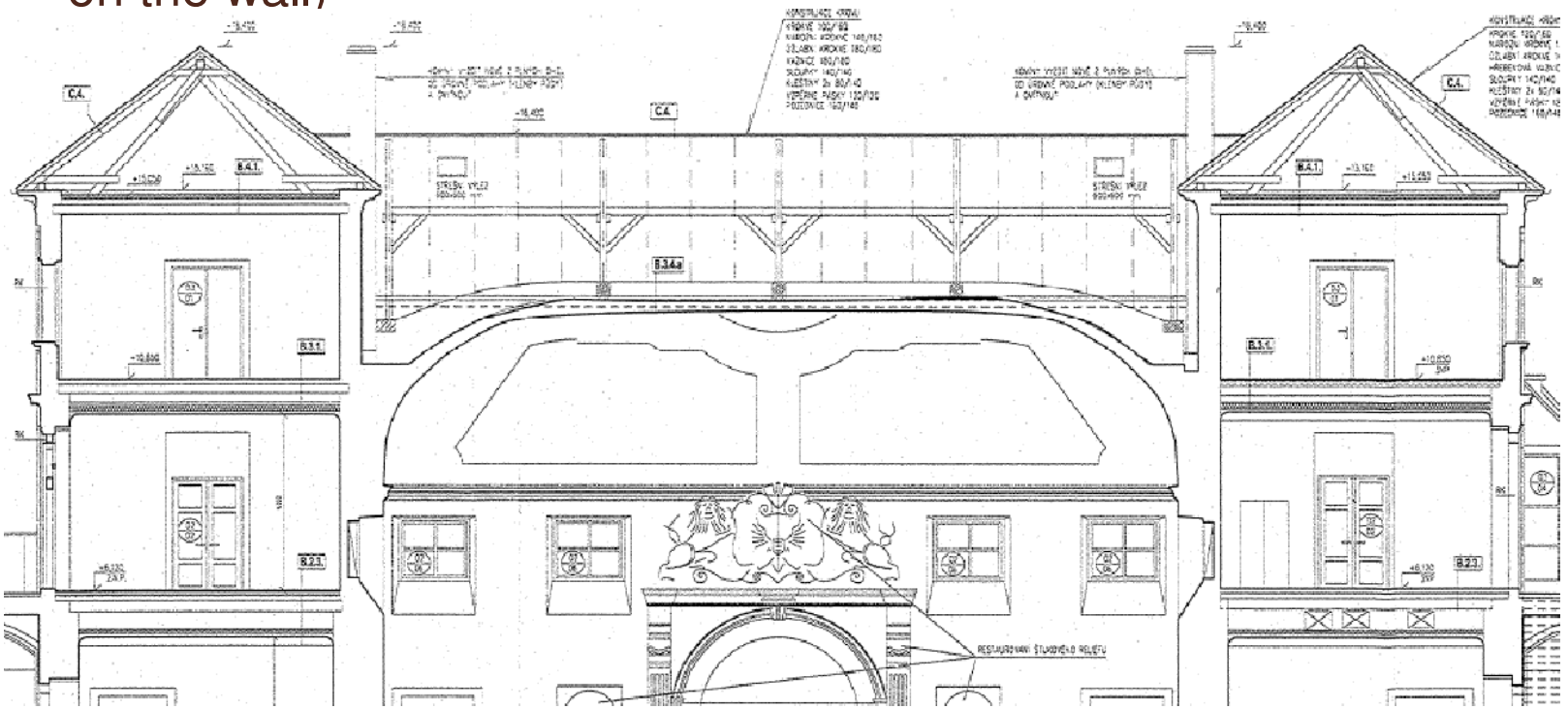
History of the object

- Current state of Šlechta restaurant



Description of defects

- Brick vault above the main hall
  - in the arch abutment at the northern perimeter wall crack exists (large horizontal reactions and insufficient rigidity in the imposition on the wall)



Analisis of defects

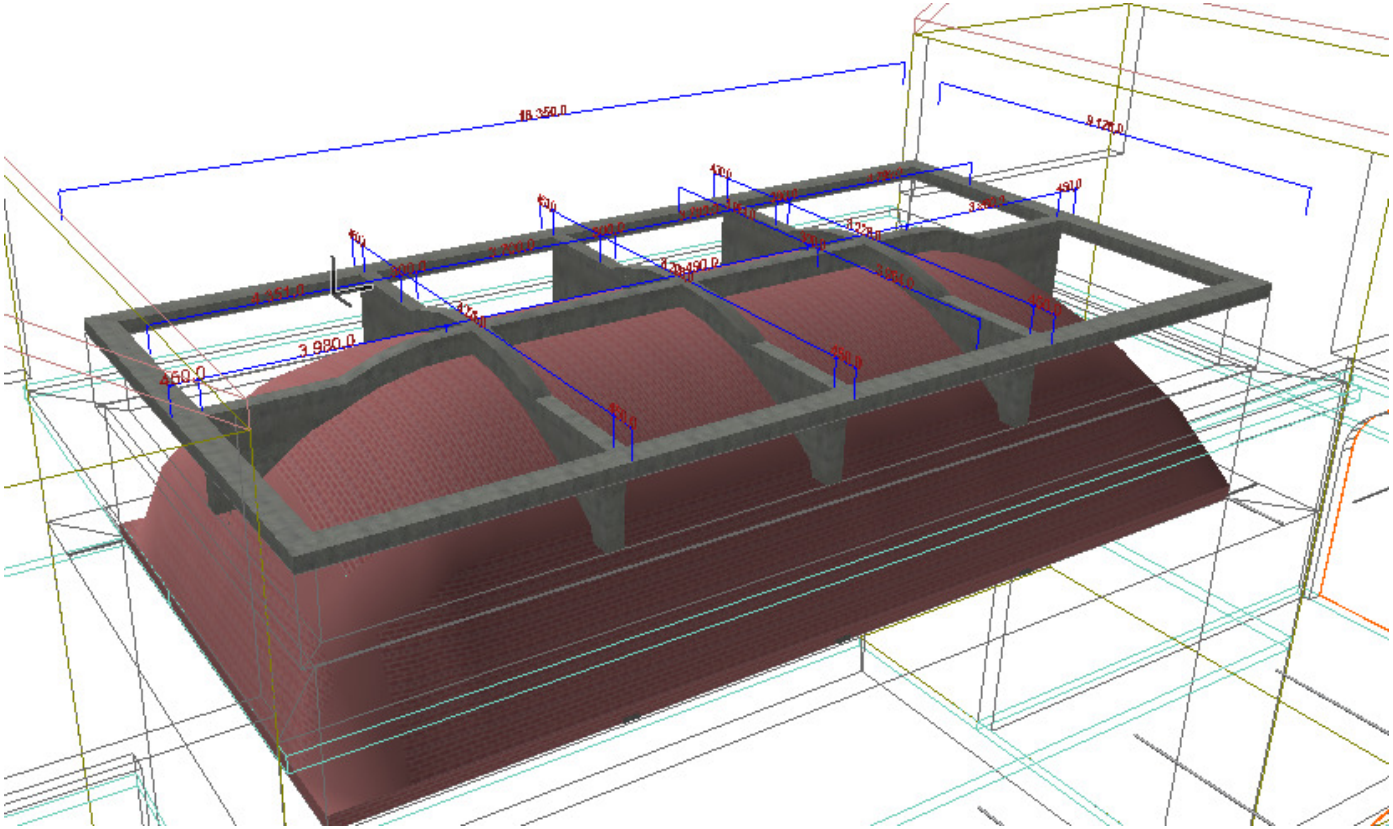
- Brick vault above the main hall
  - large horizontal reaction and insufficient rigidity in the imposition on the masonry caused cracks in the arch abutment at the northern perimeter wall

Restoration of defects

- The vault is sufficiently bearable to buckling
  - => steel rods will be made visibly under a listed fresco and after finalization of the tunnel will be removed)
  - => Reinforced concrete grid above the vault will be made
    - peripheral ring of reinforced concrete closed together with arch ribs(1 longitudinal, 3 transverse ribs)

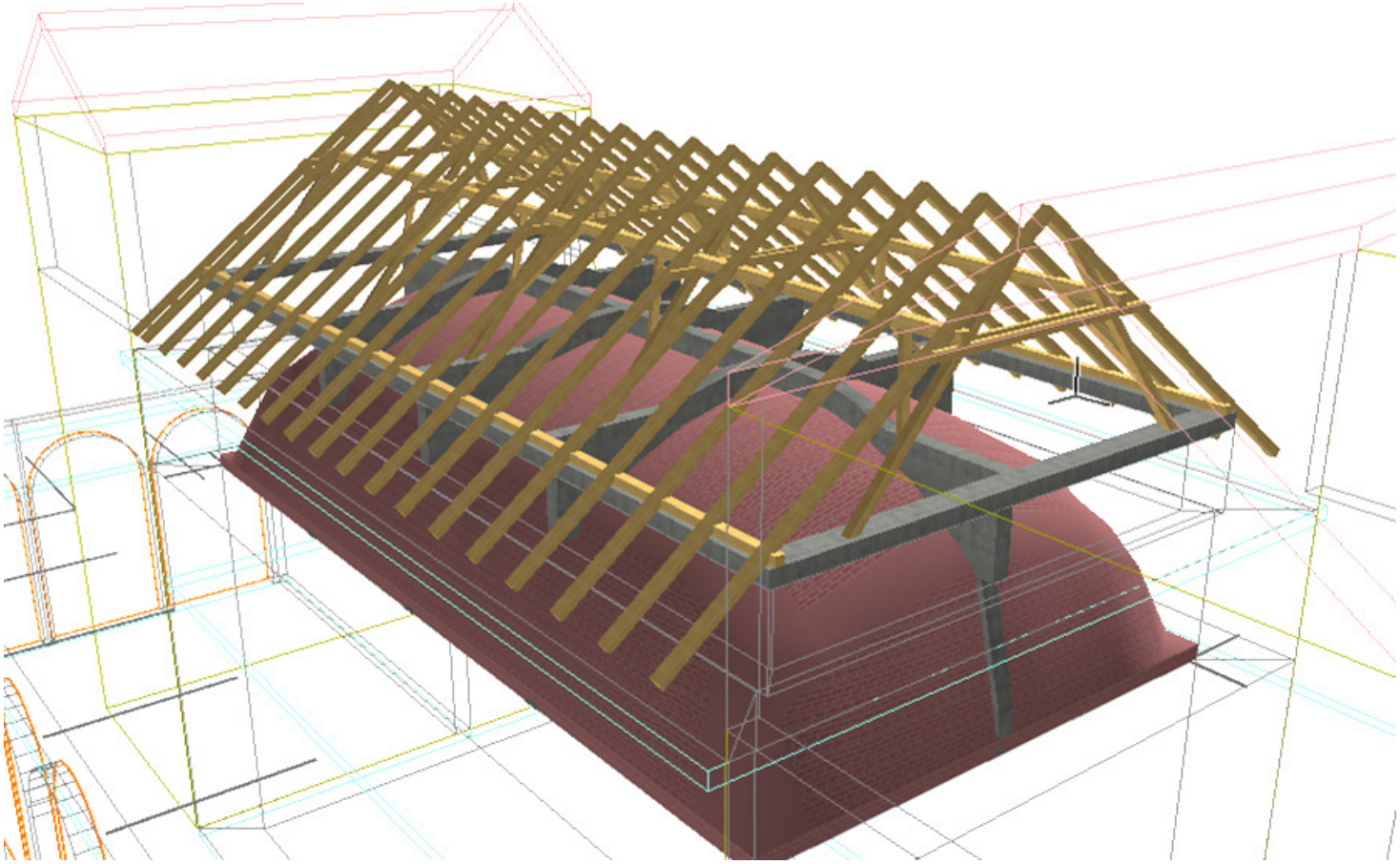
Restoration of defects

- Brick vault above the main hall – grid construction of reinforced concrete



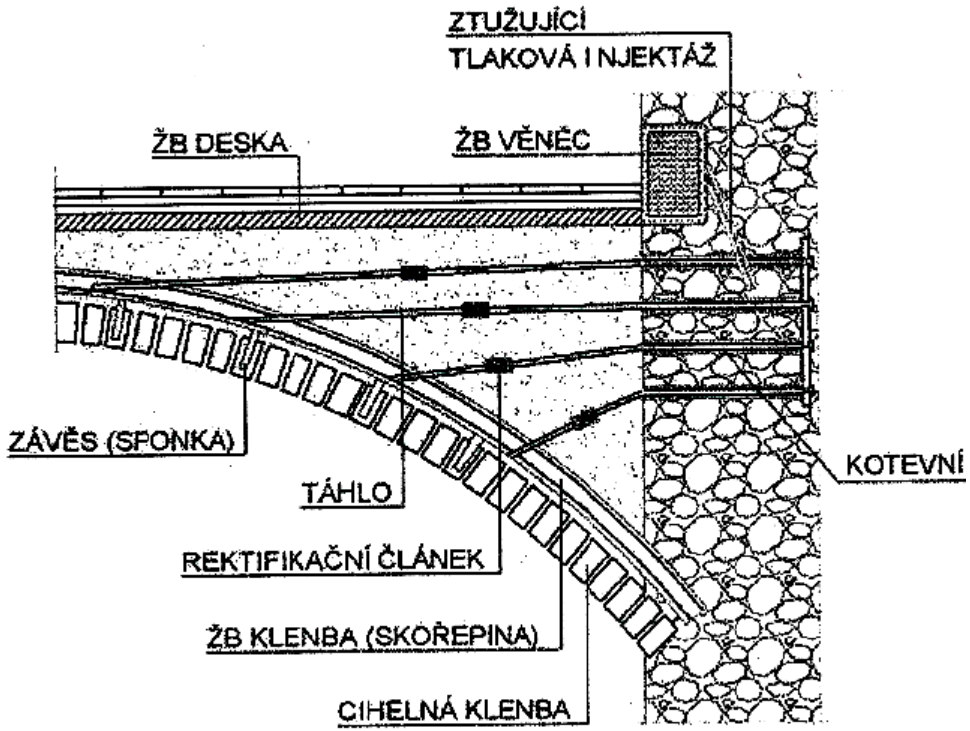
Restoration of defects

- Brick vault above the main hall - truss



Restoration of defects

- Alternative Option 2: Hanging damaged vault to masonry by reinforced concrete shell and steel draw rods
  - for significantly damaged vaults, reconstructed greater load than before reconstruction
  - shell – 60 mm concrete slab with KARI net
  - tied together with brick vault
  - steel pins
  - shell secured by draw rods with rectification

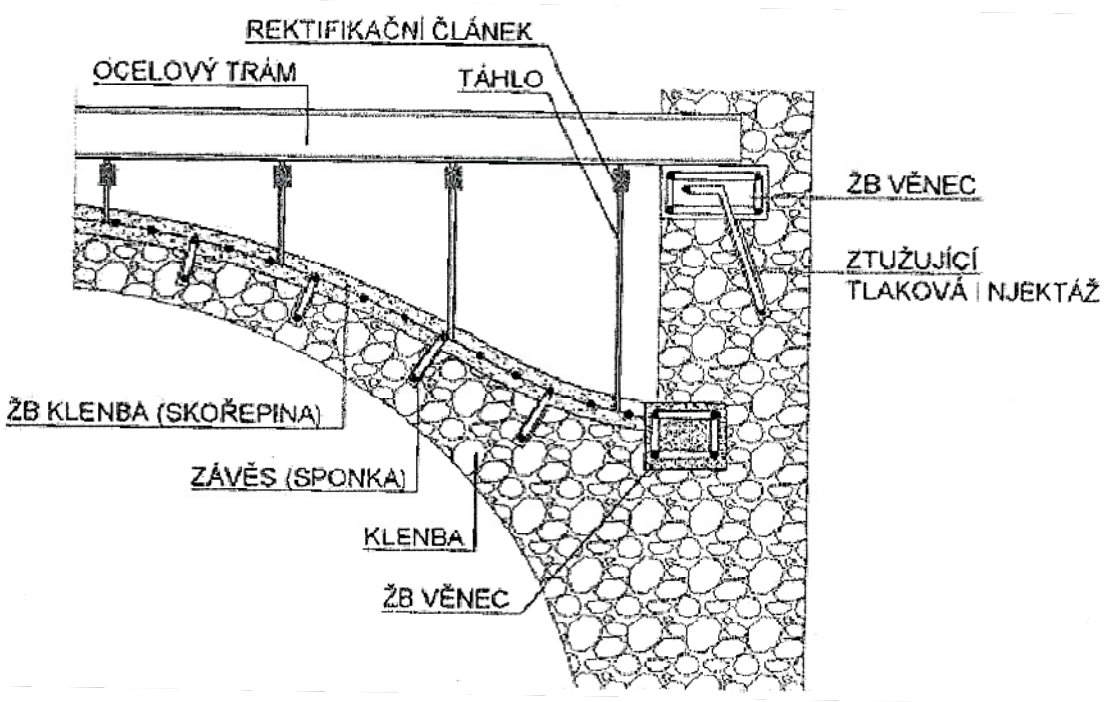


Restoration of defects

- Alternative Option 2: Hanging damaged vault to masonry by reinforced concrete shell and steel draw rods
  - shear forces in the area of anchorage partially eliminated by reinforced concrete floor slab and rim

Restoration of defects

- Alternative Option 2: Hanging damaged vault to steal beam by draw rods
  - for significantly damaged vaults, reconstructed greater load than before reconstruction
  - reverse shell thickness approximately 60 mm, tied together with vault by pins (by 250 mm)
  - steel rod connecting the shell with steel profile



Restoration of defects

- Alternative Option 2: Hanging damaged vault to steal beam by draw rods
  - draw rods with rectification
  - => steel beam is a tension member, situated on the reinforced concrete rim
  - the masonry must be reinforced by grouting