

Refurbishment *Längshallen HB Zürich*

Florian V. Mueller, PL Stv. „IG LHZ“, AFRY Schweiz AG

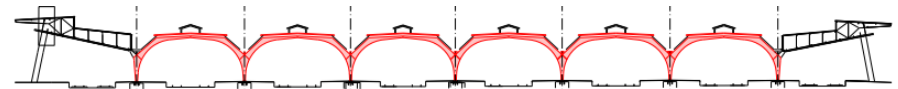
Aldo Conti, PL SBB, SBB AG Infrastruktur

Thomas Suter, PL „IG LHZ“, Aegerter & Bosshardt AG



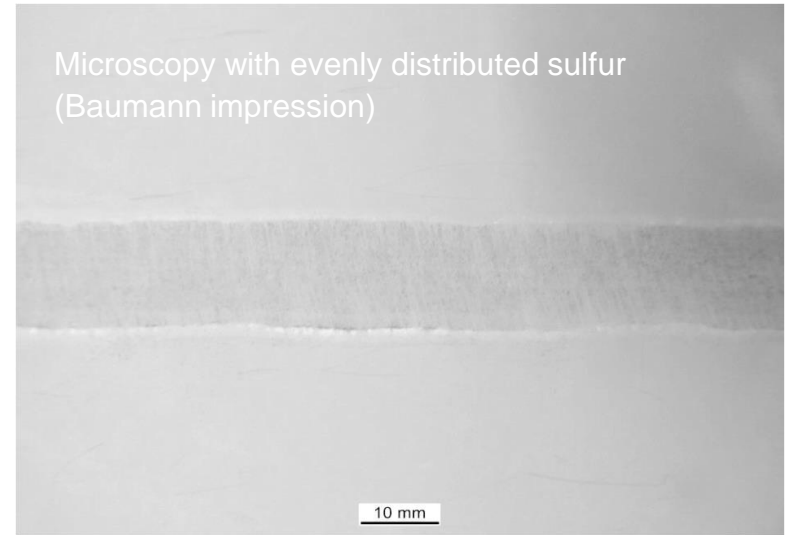
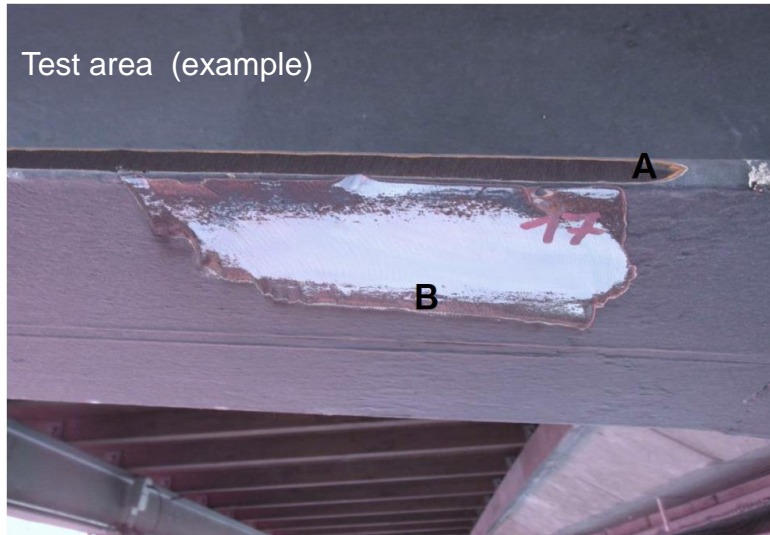
Introduction

- Main train station in Zürich, Switzerland
- Built in 1927-29
- Object listed as cultural heritage preservation canton Zurich
- Steel framework with wooden roof, rooflight and shed with wire glass, ribs with precast reinforced concrete elements and metal sheeting
- 6 halls with 14 railtracks involved
- Excluded: 1990-tees extensions at both sides
- Refurbishment under full operation



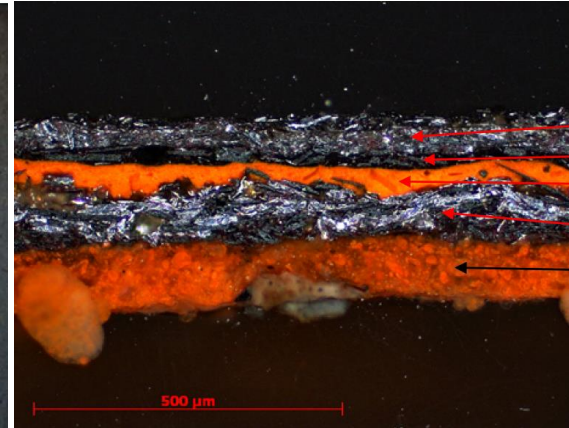
Steel – aging aspects

- Analysis of steel status including non-destructive testing (eddy current) and small samples
- No significant aging detected + mechanical properties approximated for usage in further calculations
- No actions required regarding steel structure



Corrosion protection

- Measurements at various spots
 - Aged protection system with sometimes doubled layer system
 - Containing Pb based mennige
 - Coating with various defects
- Treatment to be established with test arrays in collaboration with SBB-DPFL



- Cover 2 (alkyd resin)
- Intermediate (alkyd resin)
- Base 2 (mennige)
- Cover 1 (oil based)
- Base 1 (mennige)

Coating - Execution

Enclosure of single column



Test sample for final application method, i.e. brush vs roll



Coating - impressions

Test array for colour at beams



Appearance during process (old vs. new)



Wodden roof - Challenges and solutions

- Load capacity
- Weight of roof (wood + sealing + gravel)
- Condition of timber (local)
- Condition of aged sealing
- Condition of ancient (wire) glas
- State of safety equipment
- Execution above platforms in use
- Execution near overhead contact line
- Load release with new roof system
- Definition of pathways during construction process
- Local replacement of timber
- Areal replacment
- Remaining, but considered into safety aspects
- New lifeline to attach personal safety equipment
- New lightning conductor
- Protection mesh, working at night if necessary
- SBB safety concept in place

Wooden roof - impressions



Wooden roof - impressions

Color test array for replaced timber



Finished roof incl. lifeline and lightning rod

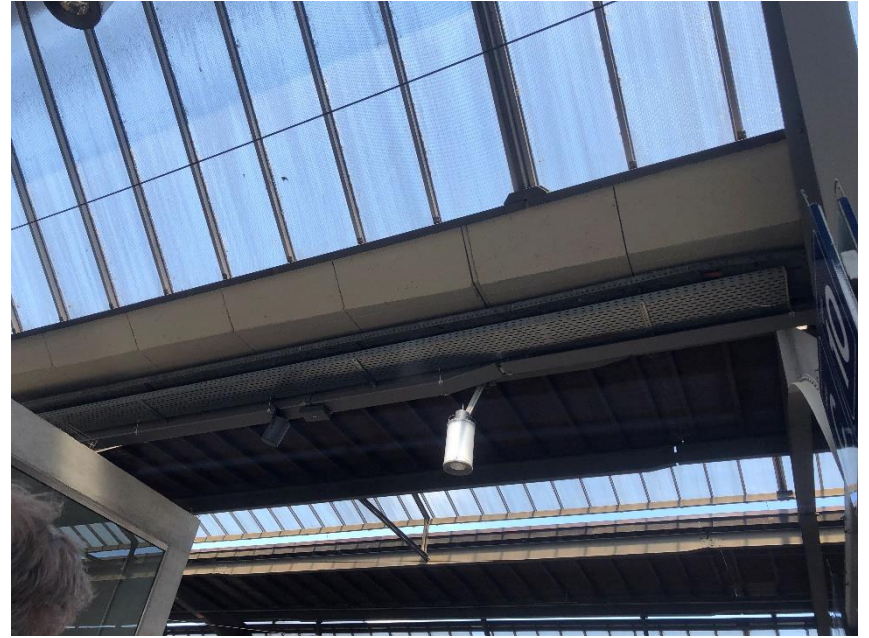


Concrete refurbishment / sealing / drains

Appearance after local refurbishment



Appearance with surface cover

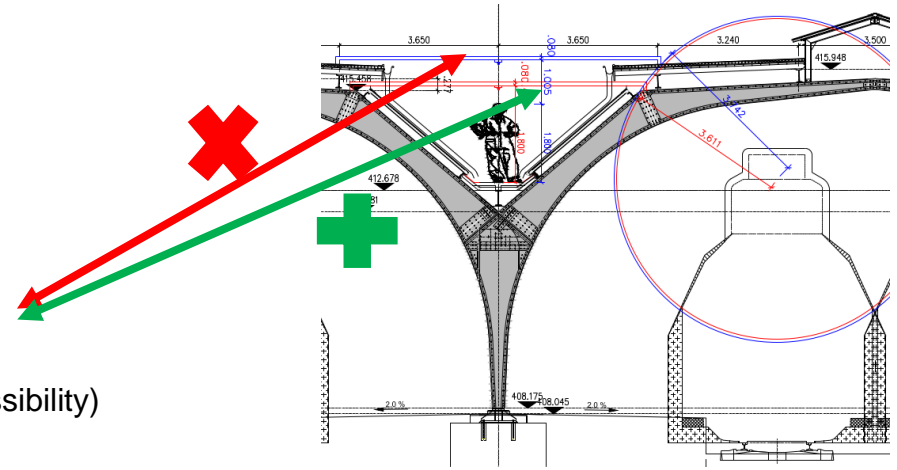


Safety

→ Optimizing:

safety requirements vs.
requests regarding heritage preservation vs.
engineering aspects (load capacity) vs.
feasibility (safety, impactfree operation, accessibility)

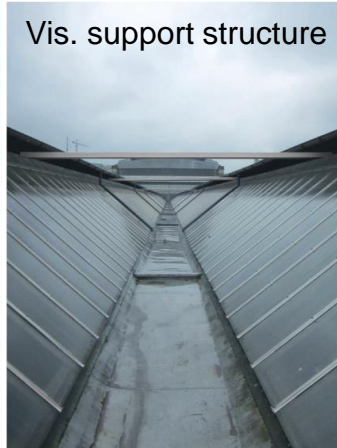
→ Lifeline System incl. support structures (where needed)



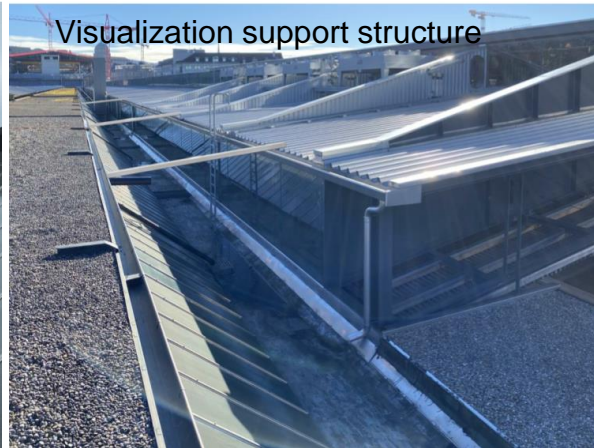
Visualization support structure



Vis. support structure



Visualization support structure



Lifeline System

