

# Flood Protection Kleine Emme

## Flood Protection and Renaturation Kleine Emme, Lots 1–3

### Client

Transport and Infrastructure Department

### Consultant

IUB Engineering AG in consortium

### Construction period

2007–2011

### Construction costs

Approx. CHF 130 million

### Services provided

Design and partial implementation of flood protection and revitalisation measures as part of a flood risk management and mitigation plan such as river widening, bank flattening, lowering of the river bed, raising the river bed, facility protection etc. Hydraulic simulations, bank strengthening, bioengineering and measures for river bed structuring.

### Description

Preliminary project, construction and approval process for the section Emmen/Lucerne to Wohlusen (0.7 km to 23.4 km) and implementation (in part immediate measures and accelerated measures).

### Special features

Coordination of activities of 5 Consortium members in 3 lots with EIA and recreation concept and taking into account complex technical constraints (e.g. confined space in lots 1 and 3, sensitive groundwater protection zones in lot 2).

Lot 1 (Upper Zollhaus bridge – Thorenberg):

- Micro-groynes in very confined sections with steep river bank slopes (construction of new river bank walls) down to the river bed structure and raising of the flow diversity (pools and low water channels)
- Reconstruction of the biological passability by means of partial ramps and a technical fish pass
- Dams consisting of blocks combined with dead wood interlinking lengthways within the channel
- Creation of secure access for human and animals (steps, ramps and ladders, tunnels for small animal etc.)

Lot 2 (Thorenberg – Mouth of the R. Rümli):

- Concept for a side channel which can be expanded in a nature compatible and cost-saving way: autonomous widening of the river cross-section to guarantee sufficient discharge capacity
- Groundwater protection: Section below the mouth of the River Renggbach is of great importance for the water supply in Lucerne region and therefore lowering the river bed is out of the question; enhancement of the river bed with coarse material to counter the tendency to erode

Lot 3 (Mündung Rümli – Mündung Fontanne):

- Widening of the river and the “Hinter Langnau” floodplain in Werthenstein by means of an initial channel and intervention line
- Reconstruction of the Kommetsrüti weir (Wolhusen / Werthenstein): installation of an inflatable rubber weir to enable a reduction of the water level if there is a threat of flooding
- Optimisation of existing corridors for wild animals



Side channel and intervention line - Langnau Widening, Werthenstein (composite photo)