

case study

from the point of view of the planning engineer

Strengthening of historic masonry with re-bar



Overview

The listed «Alte Bauamt» in Dietikon's Kronenareal has already experienced quite a bit since it was built in 1777. Now another chapter is to be added to its history; After the core renovation, there will be space for a studio on the ground floor and two flats on the upper floors.

Problem

The supporting structure consists of rubble stone masonry and wooden ceilings. Founded on medium soil and small strip foundations, the building has experienced slight differential settlements over the centuries. The lime mortar joints of the sandstone walls are defective in some places. Especially between the ground floor and the upper floor, numerous vertical cracks have appeared.

Project:	Altes Bauamt Dietikon
Location:	Dietikon ZH, Switzerland
Engineer:	dsp Ingenieure + Planer AG
Architect:	stehrenberger architektur gmbh
Contractor:	Jäggi + Hafter AG / re-fer
Year:	2023
Installation time:	3 working days

Solution

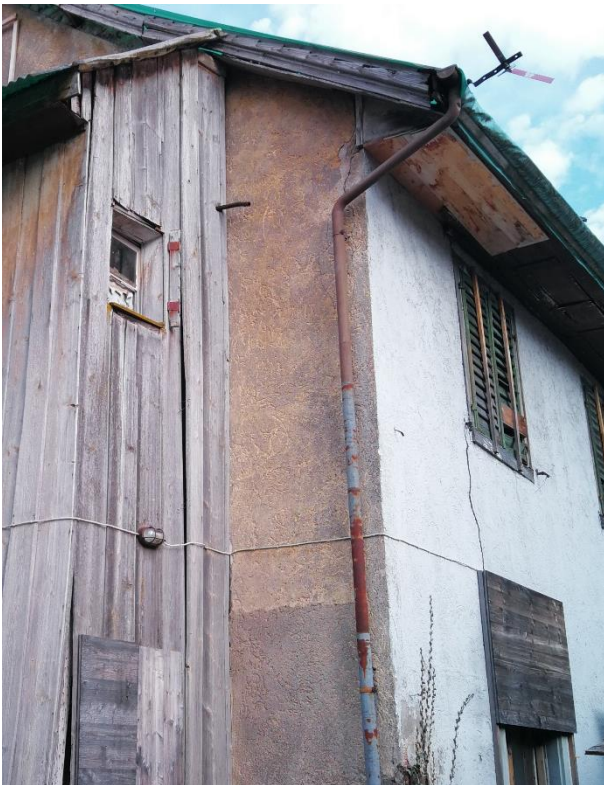
The entire building will be hollowed out and completely renovated. The roof truss and the wooden ceilings are replaced and renewed. Larger holes in the masonry are partially filled with spandrels (stone splinter wedges) and repointed with soft, low-cement lime mortar. A specialist cut grooves horizontally

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around the building. In these, it was possible to place re-bars, which are bended around the corners for anchoring. The end areas are mortared. After curing, the re-bars can be heated and prestressed in a controlled manner, and are finally embedded in a soft mortar. The lightly tensioned ring around the building stops the masonry cracks from progressing.

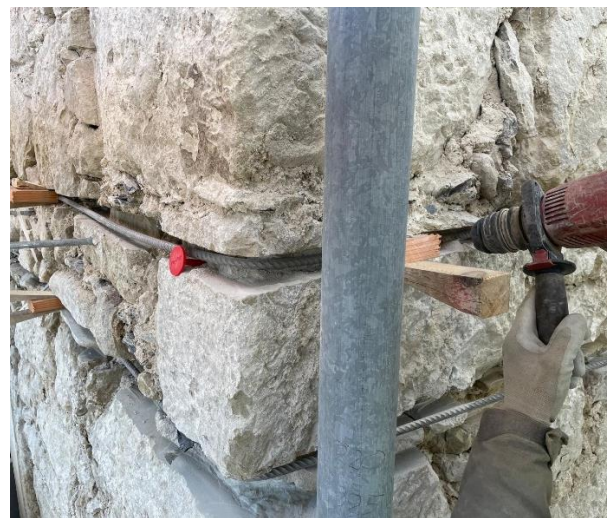
The facade is finally covered with a high-performance insulating plaster to create a good insulating effect.



Situation before, vertical cracks in masonry



Grooves in rubble stone masonry



Positioning of the re-bar with end hooks in the corners

Different cracks in the sensitive rubble stone walls at the level of the first floor were filled with mortar. The use of re-bar all around the building prevents these vertical cracks from reopening after the renovation due to vibrations damaging the new facade.

This easy-to-install solution was not available in the past.

Markus Malloth, dsp Ingenieure + Planer AG

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strengthening solutions



re-bar with mortar end-anchorage



Activation of re-bar



Sections in the middle are filled with mortar

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