



Apartment building Magnusstrasse - Zürich

Author: Cristina Polo (SUPSI)

External Insulation - Mineral wool Solution 1

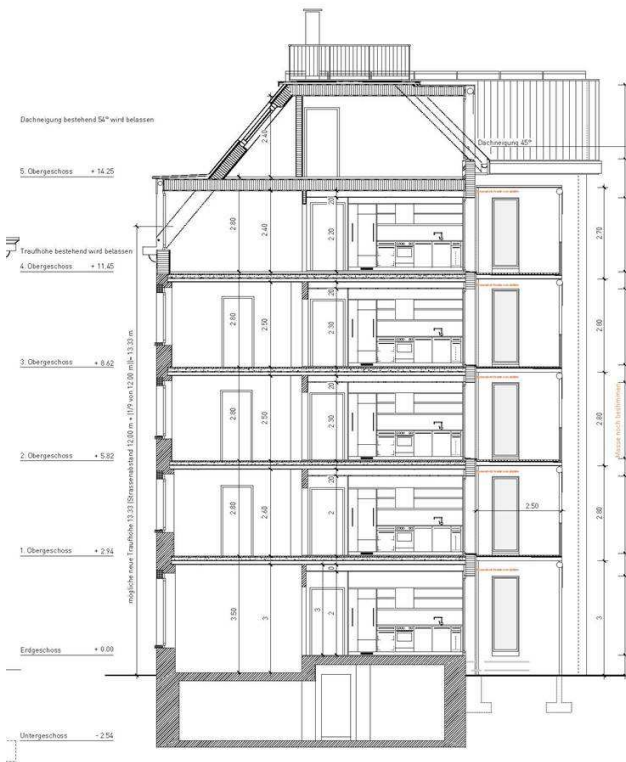
Walls

What is the solution?

Conventional thermal insulation materials, such as mineral wool were placed overlapping on the existing stone wall. This insulating layer is covered with a 5 mm layer of plaster as finishing layer. The insulating panels can be fixed to the support by means of adhesives or by mechanical fixing. The bonding must be done with adhesive mortars and then laid on the surface to be insulated, as regular and stable as possible, taking care to perfectly match them and staggering the joints. After that, the panels must be smoothed with high vapor permeability adhesive mortars with the application of an internal reinforcement mesh to prevent the formation of cracks in the plaster and an external finish to resist bad weather and sudden changes in temperature. The façades on the courtyard side are provided with 28 cm external thermal insulation (plastered rock wool panels). The base was made with insulated fiberglass concrete elements (height approx. 20 cm).

Cross section of the wall build-up, available pictures of the solution:

Cross section with both façade. © Viridén + Partner AG

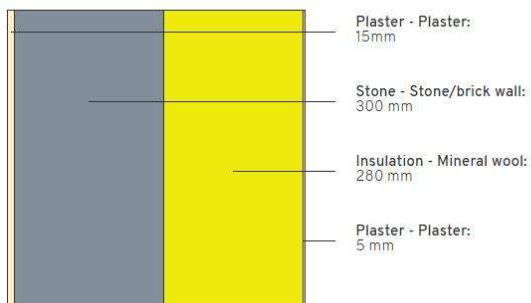


Court view after © Nina Mann



Retrofitted wall build-up

Retrofitted wall build-up



Why does the solution work in terms of compatibility with conservation, moisture safety and energy improvement?

The street facades are fully preserved in their existing condition. For reasons of

monument conservation, it was not possible to install external thermal insulation. The paint and loose plaster spots in the base and the facade surface have been removed. There was a net embedding and plaster that was painted over the entire area. The transition from the facade to the underside of the roof had to be made again with decorative strips (monument conservation requirement). The partially damaged window walls have been repaired and repainted.

Description of the context:

During the refurbishment of the residential building on Magnusstrasse in Zürich and despite preservation requirements, the building could be well insulated today reaches the Minergie new construction standard. Minergie® Certification for low energy consumption buildings is the Swiss brand that certifies the sustainability of new or redeveloped buildings. The street front has not been thermally insulated, while the facade on the court has been very well insulated.

Pros and cons of the solution:

Mineral wool is naturally moisture-resistant. It retains its insulating qualities even when wet. On the contrary, to meet high energy efficiency requirements corresponding to current standards a relatively thick insulation layer is required. In this case, based on the orientation, the comfort of the north-facing rooms is not optimal. At the level of the energetic balance the new elements (windows, façade on the court and roof plans) compensate numerically for the major losses. This cladding insulation delivers excellent fire protection and soundproofing performance.

Additional Information:

Huge energy savings are possible with this insulation measure contributing towards a high level of comfort for the inhabitants. The thermal transmittance value of the wall was significantly reduced after the intervention (U-value pre-intervention 0,80 W / m²K; U-value post-intervention 0.12 W / m²K). The climate in this area is classified as Cfb: Temperate oceanic climate (Köppen climate type), characterized by a temperate climate, without dry season, with warm summer. the coldest month averaging above 0 °C (32 °F), all months with average temperatures below 22 °C (71.6 °F), and at least four months averaging above 10 °C (50 °F) with no significant precipitation difference between seasons. This climate characteristics implies that external optimal energy efficiency can be achieved with a good insulation system.

Is there any related publication? If yes, please provide any available link or document for further reading

https://www.hiberatlas.com/smarteredit/projects/88/BaubeschriebMagnusstrasse_1.pdf

Factsheet construction (German)

Link to best practice example (Hiberatlas):

<https://www.hiberatlas.com/en/apartment-building-magnusstrasse-zuerich--2-88.html>