



## Gasthof Adler Langenegg

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Mineral Wool under shingle facade

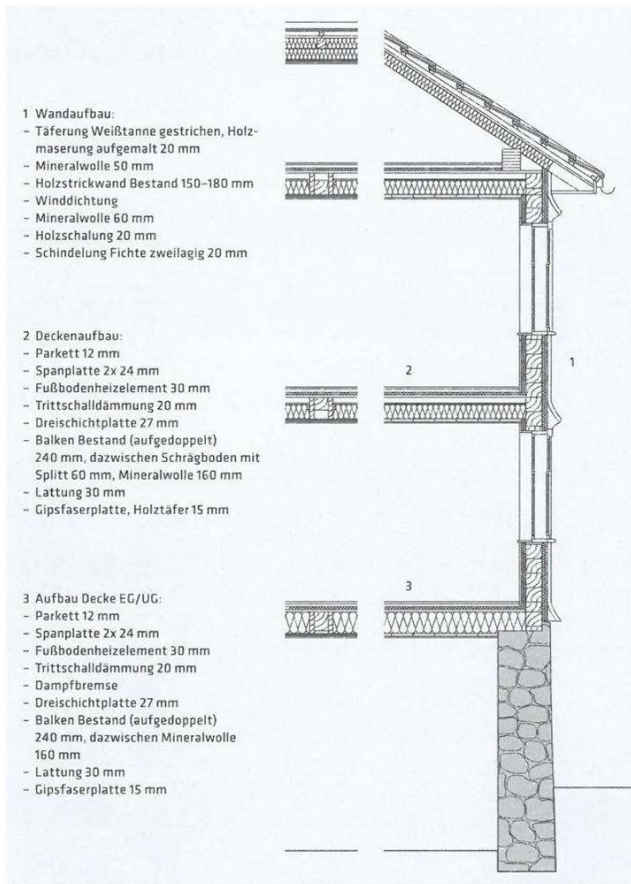
### Walls

#### *What is the solution?*

The renovated wall consists of the following layers (from inside to outside) like shown in the graphic below. 20 mm panelling made of silver fir; Installation level: 50/30 mm vertical wooden columns with mineral wool in between (A vapor control layer of low-medium resistance can be added); 150 to 180 mm log wall (original layer); External insulation 60/30 mm vertical wooden columns with mineral wood in between; diffusion open wind paper; 20 mm timber formwork and 20 mm double layered shingles made of spruce. The vapour control layer of low-medium resistance can be placed after the 50 mm vertical wooden columns with mineral wool in between because this layer is used for electrical installation. This placement enables a vapour control layer of low-medium resistance over the whole surface without any openings caused by the installation. A strong vapour barrier can lead to damage in this case. A vapour control layer of low-medium resistance should be enough, as the external insulation is increasing the temperature of the internal insulation-wall surface. Also, a vapour barrier would inhibit any inward drying of the original timber. This measure resulted in an improvement of the U-value from 0,56 to 0,28 W/(m<sup>2</sup>K).

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

Cross section of the renovated historic wall with external insulation ©Josef Fink



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

The appearance of the historic building is preserved by placing the external insulation layer behind the shingle façade. By using the vapour control layer on the inside and the wind paper on the outside, the construction is prevented from moisture damage. A building physicist should calculate each case to ensure moisture safety and specify the properties of the vapour control layer.

*Description of the context:*

The approximately 250-year-old Gasthaus Adler in Langenegg was listed as a historical monument in 2002. The building was vacant for many years before it was purchased by a committed and technically talented Neighbour. The new owner of the house renovated it mainly on his own. The brother of the owner, a well-known architect from Bregenz, developed an architectural concept based on which four residential units could be accommodated in the building. Due to the careful handling of the historically valuable elements, both on the inside and on the outside, the historical flair and the generosity of the traditional guesthouse could be retained.

*Pros and cons of the solution:*

The appearance of the historic building is preserved by placing the outside

insulation layer behind the shingle façade. This measure resulted in an improvement of the U-value from 0,56 to 0,28 W/(m<sup>2</sup>K). A point against this solution could be the completely replacement of the old façade, but in many cases, this is necessary to guarantee the driving rain protection of the building. The renovation of the external walls leads to a reduced energy demand of the building but also an increased risk of moisture due to the higher airtightness of the building. Therefore, a vapor control layer of low-medium resistance should be installed. Also, a strong vapour barrier would inhibit any inward drying of the original timber. This solution with the external insulation in general is a robust solution to prevent condensation in the wall.

*Type of data available (level of information, simulation):*

Detailed drawings of the building Photo comparison of the building before and after the renovation. Calculation of the moisture protection.

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



Photo of the building before the renovation,  
©EIV



Photo of the building after the renovation,  
©EIV

[https://www.hiberatlas.com/smartedit/projects/144/BDA\\_wiederhergestellt\\_35\\_WEB\\_201115.pdf](https://www.hiberatlas.com/smartedit/projects/144/BDA_wiederhergestellt_35_WEB_201115.pdf)

Description of the renovation by the "Bundesdenkmalamt"

<https://www.hiberatlas.com/smartedit/projects>

[/144/Sanierung\\_Historische\\_Aussenwand.pdf](#)

Calculation of the moisture protection

*Link to best practice example (Hiberatlas):*

<https://www.hiberatlas.com/en/baur-residence-lustenau--2-230.html>