



House Moroder

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Replacing the window



Windows

What is the solution?

Existing windows are replaced by new, mostly industrially produced windows. However, this should only be the case if the existing window construction has no maintenance value whatsoever. The new windows can deviate considerably in their design from historical models but should nevertheless be characterized by a high design standard. The new windows are generally much more energy-efficient and typically have a U-value improved by 70-80%, which sometimes justifies replacement from the point of view of resource conservation.

Why does the solution work?

This solution is only to be recommended if a repair or retrofit of the historical window construction is not possible (i) due to major damage, (ii) or it is only be possible at disproportionately high expense, (iii) or if there are no requirements for its preservation from heritage point of view. If one of there requirements are given, the solutions works, because the energy efficiency of the window construction can be improved significantly. If installed properly, it offers the possibility of improving the thermal bridge and the airtightness at the window-wall connection, preferably when installed with internal insulation.

Description of the context:

The not listed building was constructed at the beginning of the 20th century near the old town of Bolzano as residential house. Since then, nothing has been changed in the appearance of the building. Aim of the retrofit was a cost-efficient energy retrofit, the reduction of heating costs and the maintenance of the historic appearance of the façade. The window refurbishment foresaw the

removal of the old box-type windows and the installation of new triple-glazed windows with a special focus on the connection of the new window to the existing window frame (see detail drawing).

Pros and cons of the solution:

The pros of the solution are: Energy performance of the new window can reach passive house standard and can be improved significantly, improves indoor climate (higher surface temperature, less draught) and the possibility of improving the thermal bridge at the window-wall connection when installed correctly and preferably in connection with (internal) insulation. The main disadvantage of the solution is that it significantly alters the inside and the outside of the building and the loss of the existing window construction.

Type of data available:

Photos, digital drawing, description, thermal simulation, U_w -value calculation, evaluation of conservator afterwards

Available pictures or publications of the solution:



Windows before renovation



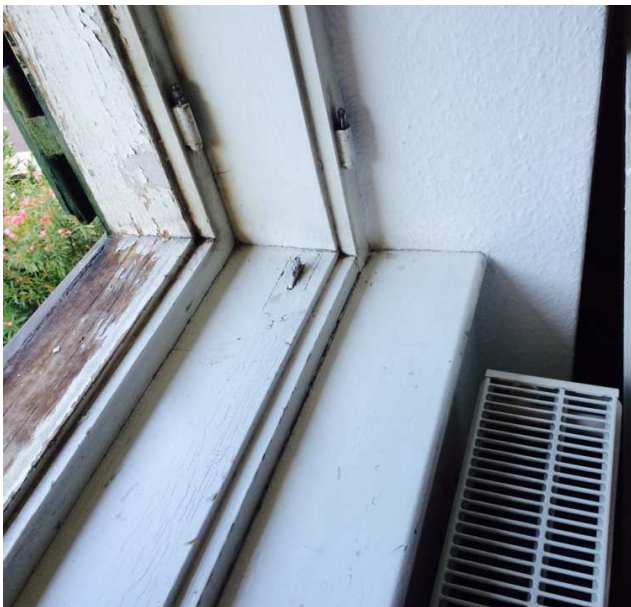
Windows after renovation



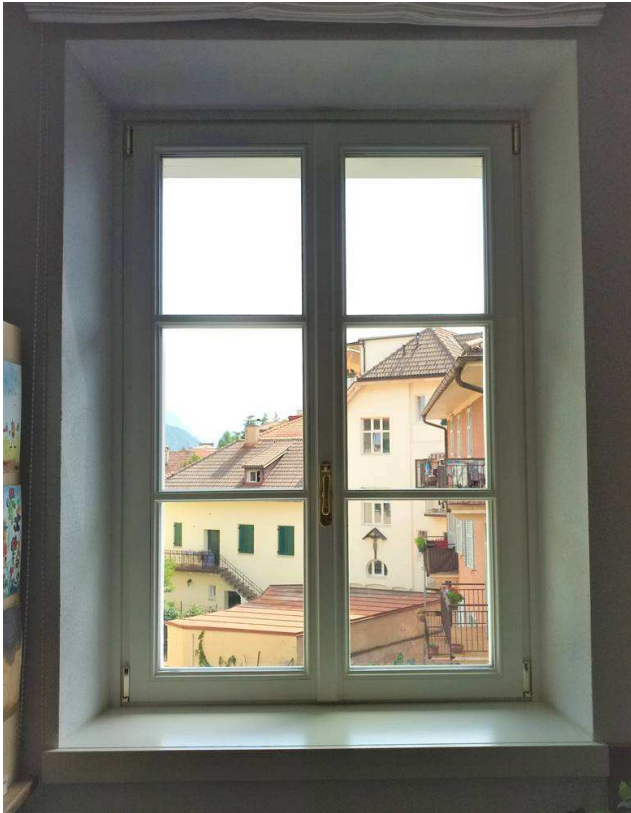
Windows after renovation



Window details before renovation



Window details before renovation



Window after renovation



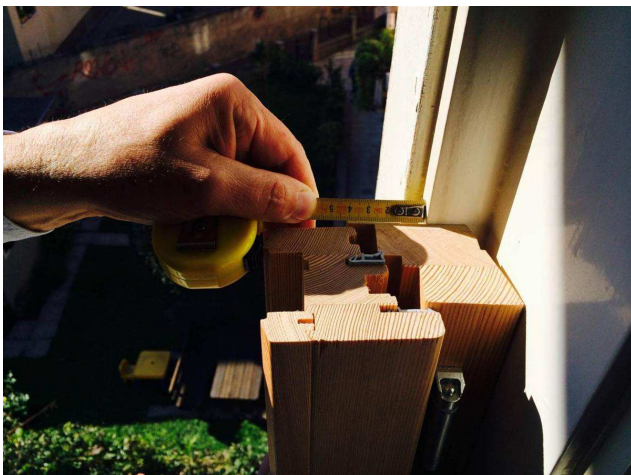
Window after renovation



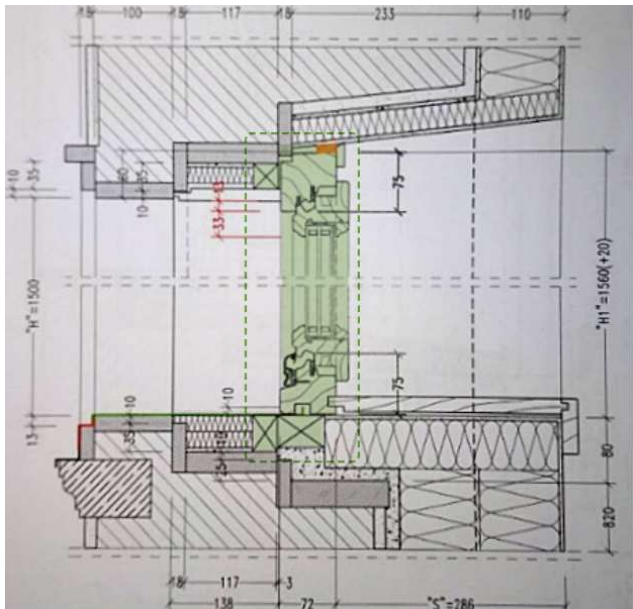
Window after renovation



Internal insulation at the window reveal



Connection of new window to existing frame



Window detail

Thermal properties	Existing window	Refurbished window prototype
Window type	Box-type window	Single window
Glazing	Inner window: single glazing Outer window: single glazing	Triple glazing (4-12-4-12-4 mm)
Shading	Existing window shutters	Existing window shutters
U _w	-	1,13
U _g	-	0,7
U _f	-	-
g-value glass	-	0,49
Air tightness	-	2-fold sealing
Approximate installation year	1926	2015

[https://www.hiberatlas.com/smartedit/projects/178/08_RE_Planfenster_Villa Moroder_03.pdf](https://www.hiberatlas.com/smartedit/projects/178/08_RE_Planfenster_Villa_Moroder_03.pdf)

Factsheet project PlanFenster - Villa Moroder (German)