



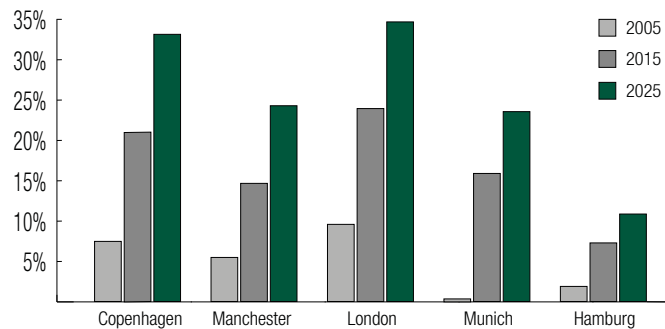
# binderholz ROOF CONVERSIONS AND EXTENSIONS

Urbanisation has been rapidly increasing in recent years. The process of urbanisation has been evident for centuries and reached a first peak in the late 20th century. In 2008, more people around the world lived in towns and cities than in the countryside and this process is set to continue. The United Nations calculates that 5 billion people will be living in urban conurbations by the years 2030.

## POPULATION GROWTH IN CITIES

Cities	Year			
	1995	2005	2015	2025
Copenhagen	1,048	1,127	1,268	1,395
Manchester	2,308	2,434	2,646	2,868
London	8,323	9,119	10,313	11,207
Munich	1,241	1,254	1,438	1,533
Hamburg	1,707	1,739	1,831	1,892

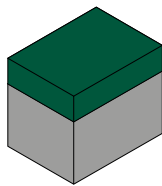
Unit in million inhabitants



Source: United Nations, Department of Economic and Social Affairs, Population Division (2014). World Urbanisation Prospects: The 2014 Revision

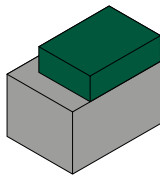
**Roof conversions and extensions** can **create** homes and workplaces where **the available space is now limited and expensive**, as is the case today in cities and conurbations. This form of post-densification of the urban space preserves building land, utilises the existing infrastructure and promotes social mixing within buildings.

## TYPES OF ROOF CONVERSIONS AND EXTENSIONS



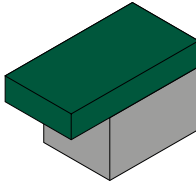
### Addition

One or more additional floors



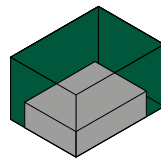
### Partial addition

One or more additional floors, staggered floors



### Addition with overhang

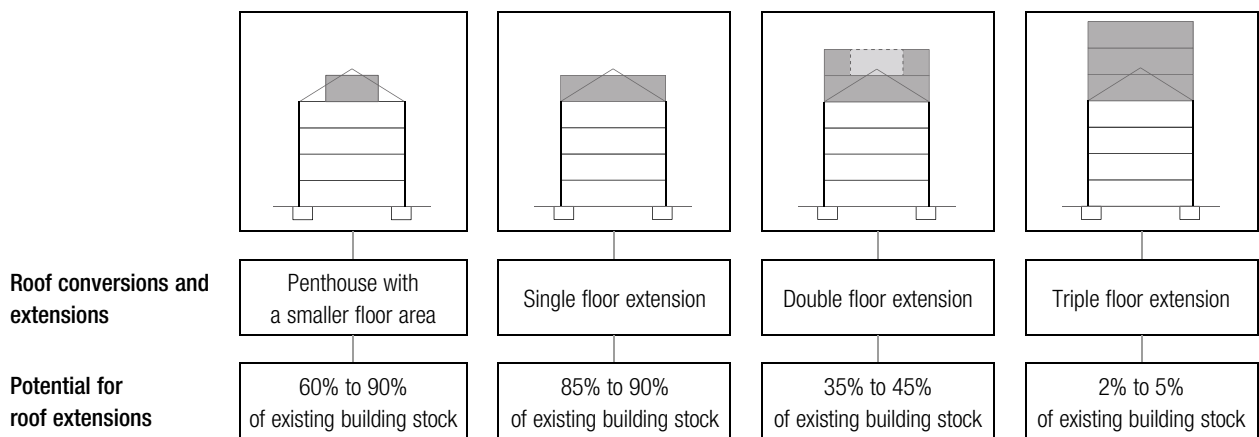
One or more additional floors



### Addition with enclosure of the existing building

Horizontal and vertical space gain, major design freedom

According to a study carried out by the TU Darmstadt University, there is the potential for an additional 1.5 million apartments in existing buildings in Germany alone. In the study they were obtained by means of addition.



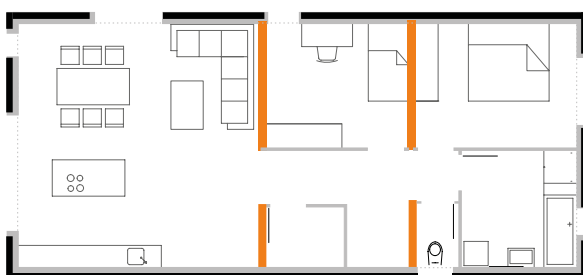
Feasibility of roof conversions and extensions (Source: Deutschland- Studie 2015 „Potential living space created by roof conversions and extensions“, TU Darmstadt University)

## GENERAL BENEFITS OF USING BINDERHOLZ CLT BBS IN ROOF CONVERSIONS AND EXTENSIONS

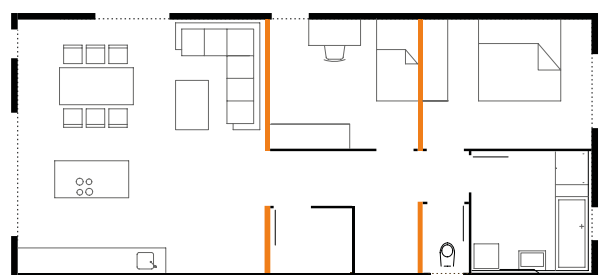
- The conversion work can be carried out with the building still inhabited and involves no additional resettlement costs.
- Prefabricated finished system components guarantee a short construction period with a high level of prefabrication and simple detailing.
- The solid wood elements are delivered just-in-time to site and do not require any additional site equipment or temporary storage on the street, resulting in considerable cost savings in terms of possible road closures or diversion of public transport.
- Increased space: comparatively minimal element thicknesses are possible, resulting in an economical ratio between gross and net floor areas
- Timber: comfortable living climate, thermal store in winter, insulator in summer
- Visible quality: pleasing, warm wooden finishes - nature in architecture

## BUILD WITH WOOD AND GAIN AN EXTRA ROOM!

Wood possesses outstanding thermal insulation properties, which is why solid wood buildings have considerably thinner walls than buildings constructed with other wall elements. By way of example, walls make up only up to 20% of the total constructed area of a timber building, whereas this percentage is higher with conventional builds. This equates to a gain of up to 10% of living space with a wooden building with the same outer dimensions - almost an entire additional room in a single family house. This exceptional construction property of wood also has a positive impact on the density of the development with larger projects: significantly less land is needed for higher-quality residential properties, also reducing the basic costs for all involved. Building with wood creates more living space.



Floor plan of a conventional style of apartment  
Living space 100 m²



Floor plan of a timber construction apartment  
Living space 110 m²



## COMFORT AND AIR QUALITY, THERMAL INSULATION IN SUMMER

When coupled with the outstanding properties of timber as a store of heat and humidity, the warm timber surfaces guarantee a balanced living environment and a high level of comfort. As CLT BBS stores heat exceedingly well, it also helps to provide optimum protection against the building overheating in summer.

Solid wood is synonymous with well-being and living comfort, as guaranteed by its multi-faceted architectural design possibilities alone. The visible CLT BBS surfaces of diverse species of wood, such as spruce, stone pine, larch or antique fir, can be combined in the interior of the building and further individualised using coloured glazes and planed or brushed finishes.



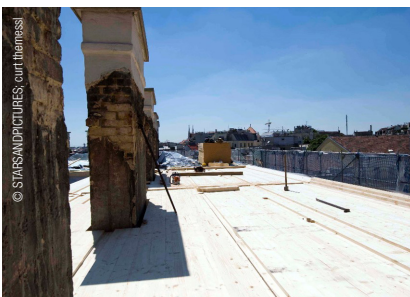
Nursing home in the former Robert Bosch School in Arnstadt | D

## LEAN AND LIGHTWEIGHT CONSTRUCTION WITH A HIGH DEGREE OF PREFABRICATION

binderholz construction solutions provide for a very high degree of prefabrication, significantly shortening construction times and guaranteeing a high level of quality. The economically attractive ratio of gross to net living space also sets solid wood constructions apart from conventional construction methods. This fact is becoming increasingly important in light of current building costs, particularly in urban areas.

A major benefit is their outstanding load-bearing strength based on the dimensions of binderholz CLT BBS elements. This strength is literally brought to bear with roof conversions and extensions. The structural possibilities offered by the CLT BBS elements come into their own here, coupled with the fact that their comparatively light weight does not significantly increase the load on the building.

### ALSERBACHSTRASSE, VIENNA | A



BBS 125 system ceiling



Temporary storage of materials



CLT BBS elements with visible wooden surfaces

On the Alserbachstrasse in Vienna, the old roof truss was demolished around the listed fireplaces. A BBS 125 system ceiling was installed on top of the existing building on which the two-storey roof extension rests and the loads are deflected onto the existing load-bearing walls. From this point onwards, the ceiling could be used as temporary storage space for the materials needed for the overall conversion. As a result, city traffic down below could continue to flow unimpeded and no parking spaces were lost. The visible quality ceilings used also mean that no subsequent work is needed in the interior.

## **BENEFITS WHEN BUILDING ROOF CONVERSIONS AND EXTENSIONS WITH BINDERHOLZ CLT BBS**

- Rain-tight after a few days
- Minimal noise pollution, no dust pollution and minimal waste
- No drying time needed
- Materials can be stored directly on the ceiling, resulting in no major site equipment being needed at street level
- Finished system parts: shorter construction periods with a high degree of prefabrication and simple detailing
- Crosswise construction of the CLT BBS elements:  
excellent dimensional stability | 2-axis load deflection is possible | Overhangs can be fitted directly from the ceiling
- Permeable: BBS acts as a vapour retarder, enabling construction largely without the need for vapour films

### **BUILDING WITH BINDERHOLZ CLT BBS - SILENT, DUST-FREE, RAIN-TIGHT**

Noise, waste and dust are 3 words indelibly associated with any inner-city building project. Not if you build with binderholz CLT BBS. Noise, waste and dust can be drastically reduced owing to the high level of prefabrication and simple assembly of CLT BBS. No noisy machinery is needed to assemble the solid wood elements, as the individual elements merely need to be bolted together on site. The high level of prefabrication of CLT BBS elements minimises the number of machining stages on site, reducing dust, waste and also noise pollution. Multi-floor extensions and conversions can be quickly constructed in a few days, as solid wood constructions require no drying times and the site is rain-tight as soon as the roof has been installed.

### **DIMENSIONALLY STABLE AND YET BREATHABLE**

CLT BBS elements are multi-ply and made of solid wood throughout. They have a high level of dimensional stability on account of their crosswise construction, due to their natural shrinkage and swelling being minimised through the gluing of the individual layers. This crosswise structure also enables load-bearing on 2 axis along the longitudinal and lateral layers of the CLT BBS. In spite of this structure, the wood does not lose its natural property as a breathable construction material, enabling the building to be largely built without the need for vapour films, hence conserving resources.

### **BINDERHOLZ CLT BBS**

CLT BBS is a completely solid, multi-ply wooden element. Bonding longitudinal and transverse layers together reduces the „movement“ of the wood, that is its swelling or shrinkage, to a negligible degree. The solid finished element can bear heavy loads, is fire-proof, can quickly be fitted dry and has sound and thermal damping properties. The use of binderholz solid wood products and construction solutions results in building projects that meet all the regulatory structural physics and fire protection requirements. Solid wood structures retain their value, are stable and meet the most exacting demands in terms of quality, efficiency and environmental sustainability.





ROOF CONVERSIONS AND EXTENSIONS USING BINDERHOLZ CLT BBS





## COMPLETED ROOF CONVERSIONS AND EXTENSIONS



Axtell House Business Centre, Soho London | GB



Freiburger Hof, Freiburg | D



Franziskusheim, Fügen | A

# BINDERHOLZ CLT BBS | CONSTRUCTION SOLUTIONS

Single-family house  
Residential Buildings  
Public | Municipal  
Commercial | Industrial  
Tourism

For more information see [www.binderholz.com/en](http://www.binderholz.com/en) under  
Construction solutions | Top references



binderholz office building  
in Baruth | Germany



Train station and town hall  
'Stadshus', Växjö | Sweden



Quartier Prinz-Eugen-Park,  
Munich | Germany



Hotel MalisGarten,  
Zell am Ziller | Austria



Seethalerhuette at the  
Dachstein | Austria



Coffee Production Plant Johannson,  
Vestby | Norway



Single-family house,  
Uderns | Austria



Water Park Rulantica,  
Rust | Germany



Private semi-detached house  
Mut zur Lücke, Innsbruck | Austria



Student Dormitory 'Adohi Hall',  
Arkansas | USA

## SALES | CONTACT

[bbs@binderholz.com](mailto:bbs@binderholz.com)

**binderholz** ■

**Binderholz Bausysteme GmbH · CLT BBS**

Solvay-Halvic-Strasse 46 · A-5400 Hallein  
fon +43 6245 70500 · fax +43 6245 70500-17001  
[bbs@binderholz.com](mailto:bbs@binderholz.com) · [www.binderholz.com](http://www.binderholz.com)



Deutsches  
Institut  
für  
Bautechnik



Download