

*Łancut Castle parquet

Possibilities to Use Modern Biobased Materials in Traditional Wooden Beam Floors



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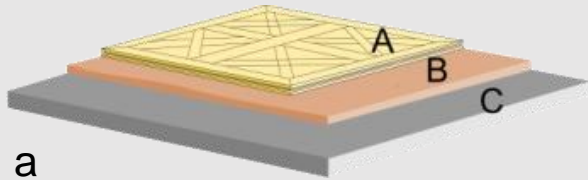
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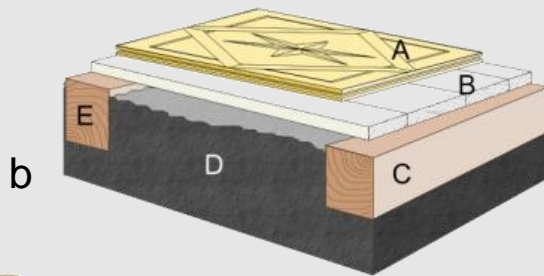
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University of Life Sciences in Lublin, Poland

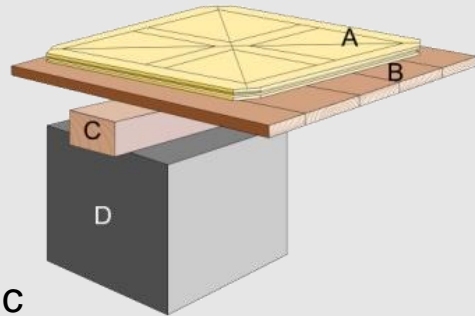
Construction Solutions in Antique Floors



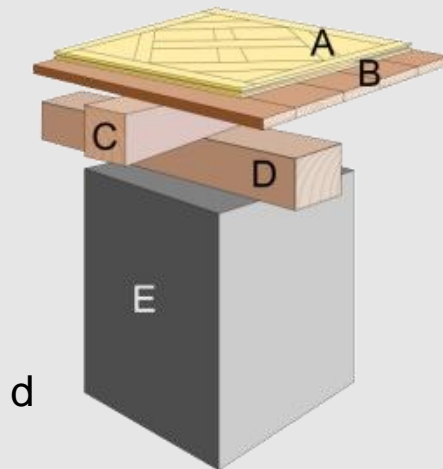
Chapel in the Łańcut Castle
(a: A- panel, B- sand, C- concrete)



Ball Room in the Łańcut Castle
(b: A – panel, B – boarding, C - ceiling beams,
D – sand)

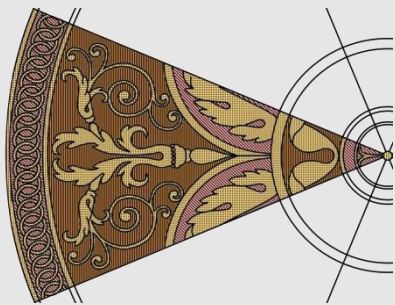
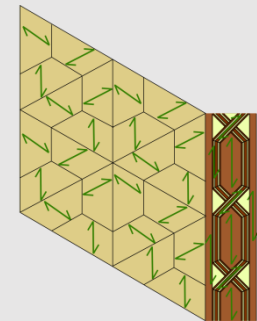
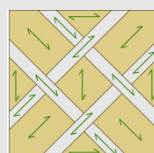
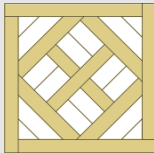
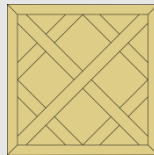
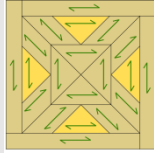
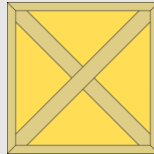
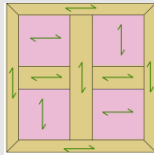
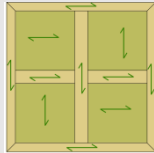
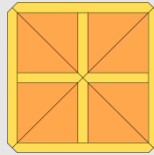
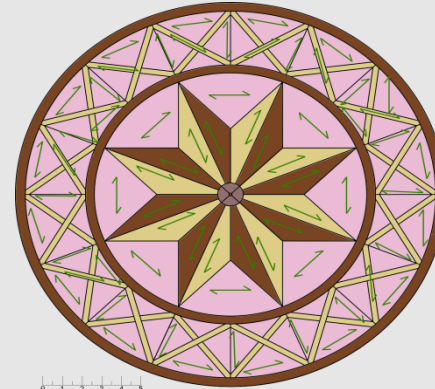
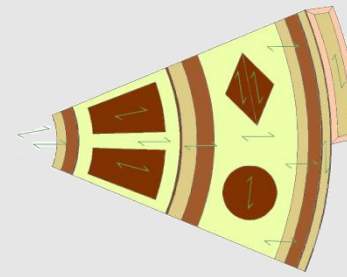
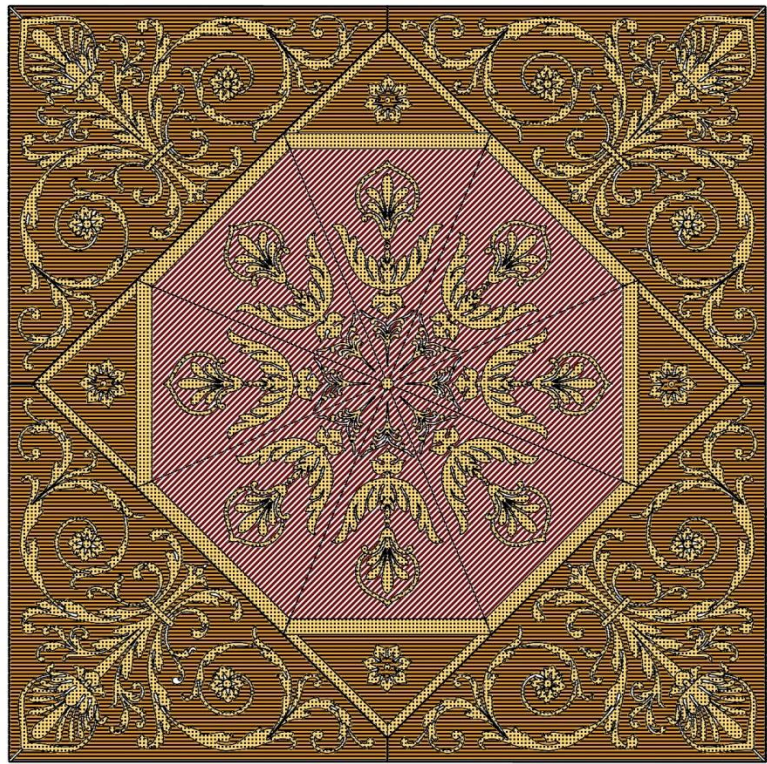


Przewrotne Manor House
(c: A – panel, B – boarding, C - ceiling beams,
D – bricked post)



Falejówka Manor House
(d: A – panel, B – boarding, C -
ceiling beams, D – binding joist,
E -bricked post)

Parquets Design in Antique Floors



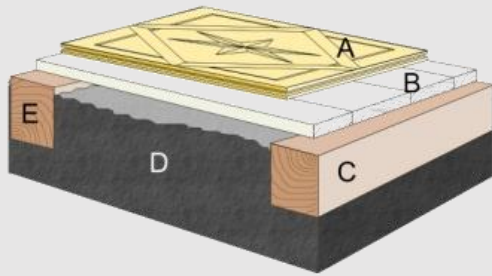
- oak (*Quercus sp.*)
- fossil oak (*Quercus sp.*)
- birch (*Betula L.*)
- sycamore maple
(*Acer pseudoplatanus L.*)
- hornbeam (*Carpinus L.*)
- yew (*Taxus baccata L.*)
- ash (*Fraxinus excelsior L.*)
- elm (*Ulmus L.*)
- beech (*Fagus sylvatica L.*)
- walnut (*Juglans regia L.*)
- cherry (*Cerasus Mill.*)
- mahogany (*Swietenia sp.*)
- pine (*Pinus silvestris L.*)

The criterion to admit modern biobased materials for conservation works in floors

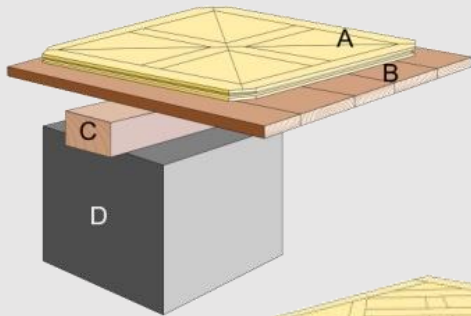


- confirmed efficiency
- lack of negative impact on the technical, historical, artistic and aesthetical value of the antique object or structure
- issue refers mostly to covered structural elements such as joists or the decking
- contributing, to a large extent to longer durability of wooden antique parquets, often having decorative character

Designed in accordance with the requirements of EN standards

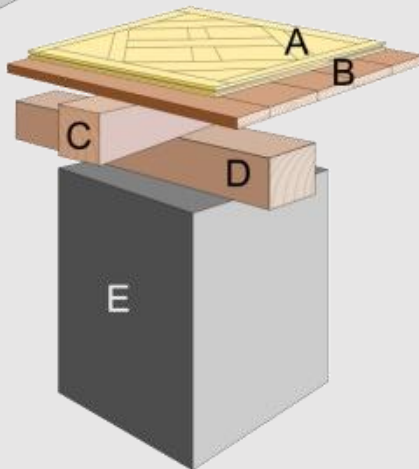


The dimensions of the cross-section of load bearing elements that transfer loads from the floor, such as joists, binding joists or bricked posts, have to be designed in accordance with the requirements of the designing standards specified in **Eurocode EC 5**.



Structural elements can be made only of wood approved for construction applications, that is coniferous wood (spruce, pine, fir or larch) that has been strength graded and has a defined **strength class C (C24)**.

The wood has to be marked with a **CE mark** and should fulfil the requirements of the **EN 14081** standard.



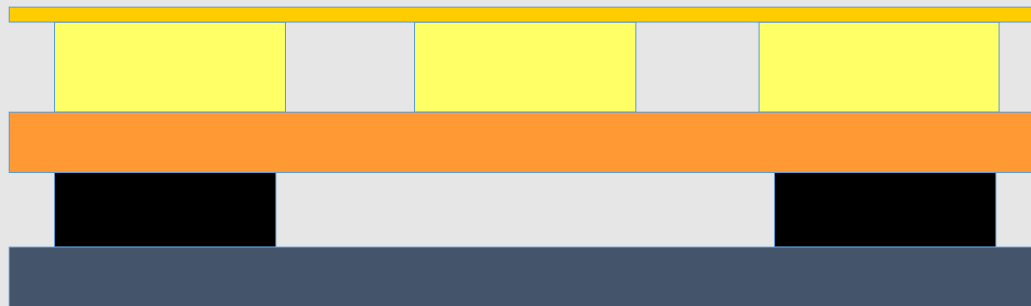
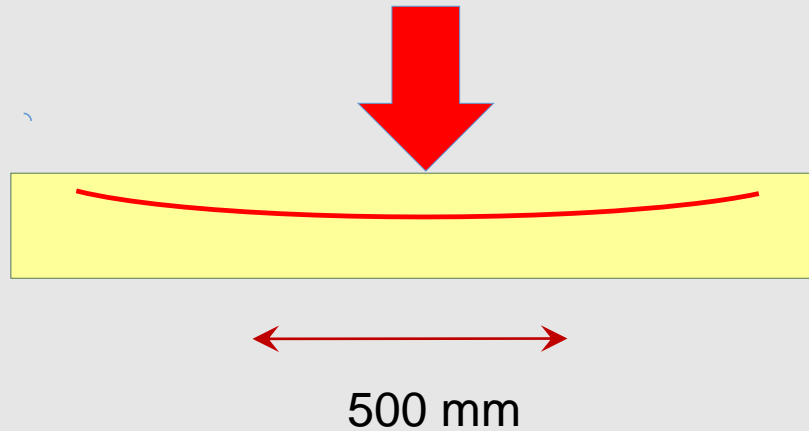
The blind floors should be made of strength sorted pine wood planks with joists (dowel type fasteners that fulfill the requirements of the **EN 14592** standard) or of engineered wood panels, under the condition that they meet the requirements of **EN 13986**.

Considering that in construction practice joists should be made of impermeable or impregnated materials, apart from the most popular solid pine, joists made of **plywood strips or OSB boards** fixed to the subfloor are also used.

TEST RESULTS

Panel parquets are similar to area elastic sports floors
EN 14904.

Transfer of dynamic loads through shock adsorption –
force reduction EN 14808



parquet

top transversal joists

bottom longitudinal joists

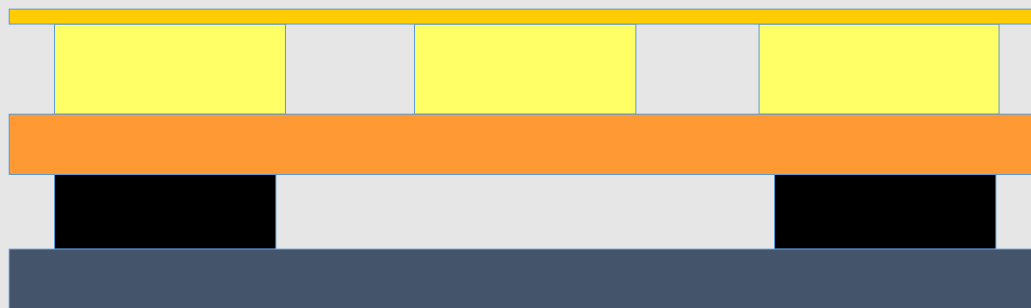
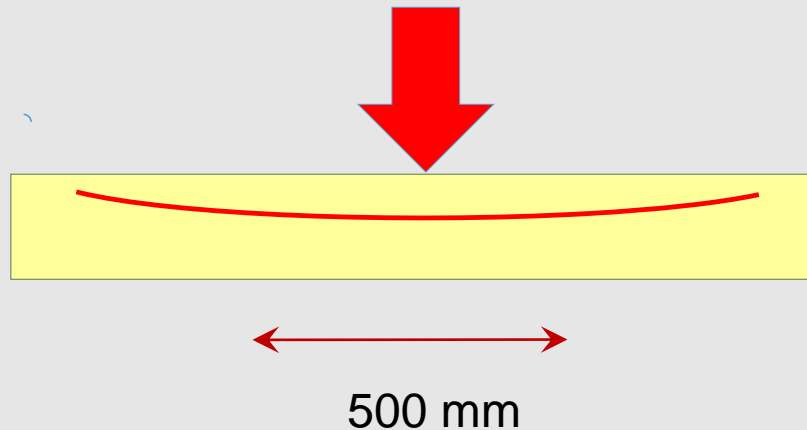
elastic pads

concrete base

TEST RESULTS

Panel parquets are similar to area elastic sports floors
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➔ Antique constructions have similar characteristics as contemporary floors exposed to frequent dynamic loads, and are able to meet the contemporary standards [EN 14342].

➔ The decisions to replace traditional technical solutions are not due to their lower quality, but to the fact that beam floors with panel parquets are labour-intensive and time-consuming.

➔ Therefore, in case of antique floor conservation or reconstruction, it is worth considering keeping the beam load-bearing structure, which should reflect historical solutions, at the same time taking into account contemporary requirements and materials.



Thank you for your attention!

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