Rieke K. Güttler, Karl-Wilhelm Haake and Franz-Josef Bockisch, Brunswick

Guidelines for Reusing Former Agricultural Buildings

Remarks to Building Condition, Function and Investment Costs

Many former agricultural buildings stand empty today, because few suggestions for possible reuse exist [1]. This often results from a lack of knowledge of the environmentally relevant, economic and construction-functional aspects. The useful exploitation of empty buildings is sensible, since they have a hierarchical economic meaning and serve sustainable development [2]. Creating guidelines should show how comprehensible data can be gained for the potentially reusable buildings, which can serve as the basis for decisions by public authorities and investors.

In the BLE supported project „Reuse potential of agricultural building structures and their meaning for the development of rural areas“, selected building types were studied on the basis of detailed constructional study of the building volume, type of building and typical building damage and damages caused by the previous use. Plans for a „4-column-half-timbered house“ from 1850, a three sided farm from 1910 and a farm from 1973, a relocated farm stead, were made. The work at the object level included the planning survey of the building with measurements and evaluation of the conditions, the planning of reuse alternatives and the cost assessment. The University of Münster evaluated previously the supply and demand structures in each region.

Planning survey

The prerequisite for every reuse plan is, in addition to measuring [3] and creating the plans, the systematic evaluation of the construction substance. With the help of digital photogrametry it is possible to get 3-D data as a basis for CAD-programs. There the condition of the object is established in both words and pictures and the damages are noted (*Fig. 1*). In an evaluation of the condition, the general condition and the immediate safety requirements, deformations in parts of the building, breaks, visible damage at adjoining building parts, characteristic animal and plant pests, discoloration, signs of moisture and salt damage are observed and documented. In the evaluation of damages, it is necessary to make sure that non- or minimally destructive processes are used in order to keep loss of the substance at a minimum.

Planning of Use Variants

Several reuse variants were planned for each of the three selected objects and the costs were calculated. In order not to overstress the building substance, uses were sought that were suited to the given structure. For the building type „4-column-half-timbered house“, the variants were „restoration workshop“ (*Fig. 2*), „living accommodations“, „organic food shop“ and „advertising agency“. For the building „Three Side Farm“, the variants were „holiday apartments and seminar“ and „vegetable processing and carpenter's workshop“. For the relocated farm stead, the variants „food processing“ and „spin-off bicycle developer“ were planned.

Rieke K. Güttler (Dipl.-Ing. M. Eng.) is a guest-scientist at the IBB of the FAL and was employed as a scientist by the University of Münster for a joint research project; Dipl.-Ing. Arch. K.-W. Haake is a scientific-technical assistent and Prof. Dr. F.-J. Bockisch is the director of the Institute for Production Engineering and Building Research (IBB) of the German Federal Agricultural Research Centre (FAL); e-mail: *rieke.guettler@fal.de*.
The project supported by the BLE is managed by Prof. Dr. Ulrike Grabski-Kieron, director of the Institute for Local, Regional and State Development of the University of Münster; Dipl.-Geogr. Stephanie Arens advises this project as a scientific assistant.

Keywords

Change-in-use planning, former agricultural buildings, evaluating conditions, costs assessment

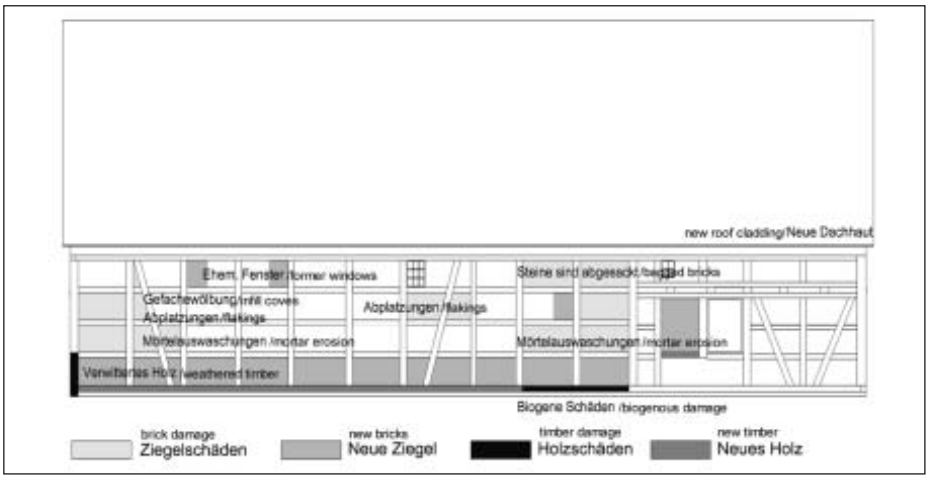

Fig. 1: Surface mapping on a timbered house cladding

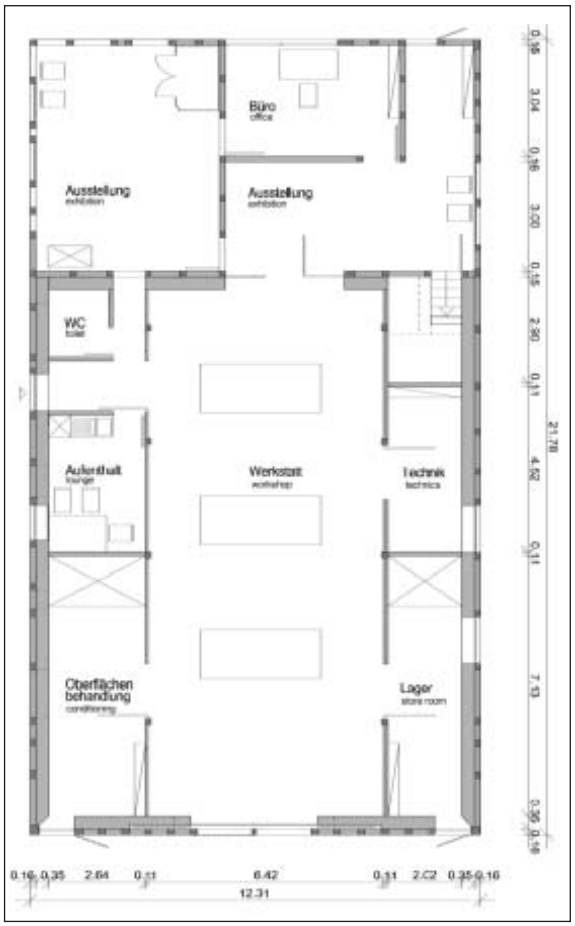

Fig. 2: Restorer workshop as one of four change-in-use versions for a timbered house

Cost assessment

After the planning of the reuse variants a concept for the repair, modernisation and technical construction in a catalogue of measures should generally describe the renovation steps [4], in order to make the cost calculations understandable. On the basis of the pre-planning, the costs are calculated for building parts and tasks according to DIN 276 [5]. In order to make a cost comparison of the various use concepts, the cost calculation is undertaken according to the DIN-cost groups (200: Adaptation and Utilities Hook Up, 300: Building Construction, 400: Technical facilities, 500: External facilities, 600: Equipment, 700 Additional Building Costs) and the tasks by using average prices from literature [6]. The costs for the planned use „restoration workshop" are about € 254,189 for the hooking up of utilities, constructions, technical facilities, external facilities, equipment and additional costs, i.e. € 1,031 per m^2 usable area, which is a normal sum for a half timbered house of this standard. With the calculated building cost index, one obtains a sum of € 214,918. For the use as „living accommodations" the square meter price is € 1,095. In the building type three-sided farm, a square meter of usable area costs € 1,021 for the use as a holiday apartment or seminar and € 638 for the use vegetable processing and carpenter's workshop. A square meter for the use „Spin-off bicycle developer" costs € 904, and for the relocated farm stead the use for „food processing" costs € 698 (*Fig. 3*).

Conclusions

Since every unused building is in a different condition, there is no generally valid evaluation method. Each building must be carefully checked and necessary measures must be selected for the specific building. The approach to every building is always the same: After measuring and creating the plans, the systematic evaluation of the construction substance is the next step. On the basis of the planning of the reuse variants, costs are calculated. Some basic principles do apply to the maintenance of the available building and the costs for each renovation:

It is important that in the making a building reusable, a use be found which does not overstress the building. That means that the new use must suit the building and not that the building is adapted to the new use. In the planning of construction measures, it is necessary to limit the measures to the most necessary and that modern solutions have an advantage over the existing ones. If the building condition is too bad and the expected reuse costs are too high, and possibly only an unsatisfactory demand exists, it is necessary to consider whether demolition is more sensible and everything speaks against a reuse.

Literature

Books are identified by •

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[3] *Haake, K.-W. und F. J. Bockisch*: Aufmaß und Bauphysik: Bedeutung für die Umnutzung funktionslos gewordener landwirtschaftlicher Gebäude im ländlichen Raum. Landtechnik 56 (2001), H. 4, S. 266-267

[4] • *Böhning, J.*: Altbaumodernisierung im Detail. 4. Auflage, Köln, 2002

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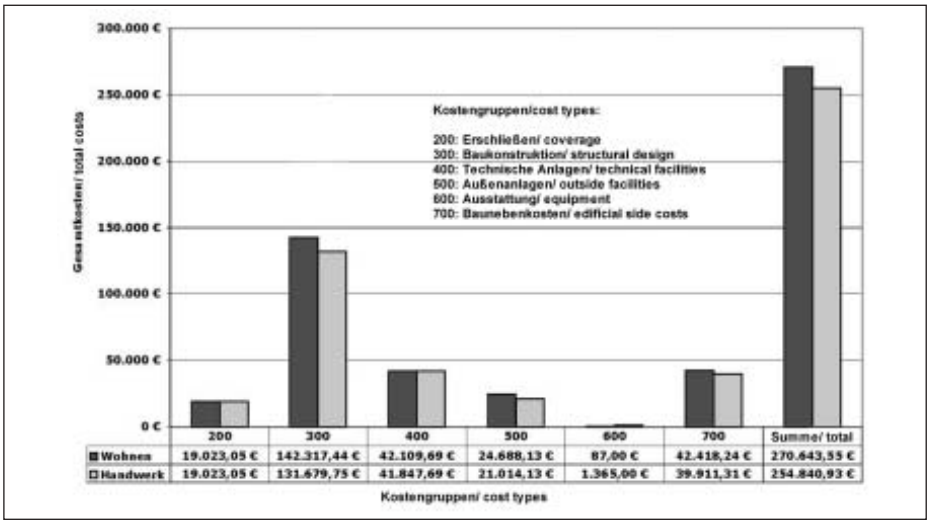
[6] • *Schmitz, H., E. Krings, U. Dahlhaus und U. Meisel*: Baukosten 2002, Instandsetzung, Sanierung, Modernisierung, Umnutzung. 15. Auflage. Essen, 2001



	200	300	400	500	600	700	Summe/ total
Wohnen	19.023,05 €	142.317,44 €	42.109,69 €	24.688,13 €	87,00 €	42.418,24 €	270.643,55 €
Handwerk	19.023,05 €	131.679,75 €	41.847,69 €	21.014,13 €	1.365,00 €	39.911,31 €	254.840,93 €

Fig. 3: Comparing costs of the two change-in-use versions „habitation" and „restorer workshop"