Proceedings of the International Conference on Adaptive Reuse. Volume 1
Crudeli A., Molle F., Carrai E. (Eds.), STH Press, 2026. ISBN 9791281661141
Paper DOI – https://doi.org/10.65686/VPSF7667

On-Site Reuse—Design Strategy for the East Wing of the Festspielhaus Hellerau

Julian Snethlage

Architect, Dresden, Germany, julian@snethlage.net

Abstract

The further development of existing buildings is the central task of current design practice. The Festspielhaus Hellerau ensemble has had an eventful history. Built in 1911 as the centrepiece of the garden city Hellerau in northern Dresden (Saxony), its role as a hub for the avant-garde art and life reform movements of the early 20th century was short-lived. In the 1930s, it was turned into barracks by the Nazis for training police and SS units. After the war, it was used by the Red Army of the USSR for almost 50 years. In 1979, it was placed under heritage protection. After reunification, the process of reclaiming the ensemble for artistic use slowly began. Today it hosts "Hellerau – European Centre for the Arts". The East Wing reflects the various phases of use and conversion of the area. The transformation of this 'uncomfortable monument' from barracks to a centre for modern dance requires a design and conversion strategy that enables an adequate culture of remembrance, while simultaneously adapting the building fabric from the 1930s to contemporary uses – all while meeting requirements for resource conservation, waste minimisation and socially compatible neighbourhood development. The concept of 'On-site Reuse' takes into account the built environment at all scales. Potential for continued use is examined and developed from the scale of the building, M 1:100, to the component, M 1:10, to the material, M 1:1. Highlighting specific tasks from the project, which was realised between 2018-2024 by heinlewischer Dresden, this case study provides an insight into the implementation of this approach and argues in favour of reuse and its effects on planning and construction. The potential in terms of cost-effectiveness and CO_2 savings, as well as the limits of reuse, are presented in this paper.

Keywords: On-Site Reuse, Heritage Protection, Scalability

Introduction

Against the backdrop of the general demand for resource conservation, sustainability and ecology, established demolition and new construction practices in the building industry are appearing increasingly anachronistic. The building and construction sector currently accounts for 37% of global greenhouse gas emissions of which the production of new building materials plays a significant role (UN environment programme, 2023). On a more local level in Germany, this figure stands at 33% (BBSR 2020). At the same time the German government claims that around 320.000 must be built each year until 2030 (Tagesschau 2025) while 1.9 Million apartments are empty and disused for various reasons (Tagesschau 2025). From a simplified grey-energy-perspective, disregarding factors such as location etc., it would seem that this housing crisis could simply be solved by reuse and renovation. These figures do not even include the potentials of vacant non-residential buildings. In reality though, there are many hurdles—in Germany specifically, legal ones within the building law—which complicate a simple repurposing or reuse of existing structures. The motto of the German pavilion at the 2012 Venice Biennale, "reduce-reuse-recycle" (Petzet and Heilmeyer 2012), summarises the most important areas for change in a concise call to action. Based on this triad, 'recycling' has been increasingly present in discourse for several years. 'Reuse' stands for an approach of 'recycling on site' or 'reuse within buildings,' thus avoiding the problematic aspects of collecting, sorting and returning materials to a goods or construction cycle. Recycling, or the re-use of building materials alone will not solve the emission issues of the building sector—but could on-site re-use be the key to reduction? The "East Wing of the Festspielhaus Hellerau" will serve as an example for this design strategy to examine the approach in terms of its potentials, limitations, causes and effects. The project for the East Wing was developed and design by heinlewischer Dresden for the City of Dresden starting in 2018. Jens Krauße was the managing partner and I had the pleasure of leading the project team at the Dresden office throughout all phases until the completion in May 2024. The Festspielhaus Hellerau and the surrounding area were built in 1911 as a festival theatre and educational institution for music and rhythm according to designs by architect Heinrich Tessenow and were part of the garden city of Hellerau. The garden city was established beginning in 1909 in the course of the reform movement and is today considered the first, most complete and most radical implementation of a garden city in Germany. The Festspielhaus was built as a 'temple of the arts' on the highest point of the city and was an important centre and school for arts, dance, theatre and music. After the National Socialists came to power in 1933, the site was redesigned: several small buildings were demolished and two large barracks wings were erected in their place, including the so-called "East Wing". This housed the National Socialist military police school, which was under the command of Reichsführer SS Heinrich Himmler. After the end of the war, the Red Army also used the buildings as barracks. It was not until 1994 that the Festspielhaus Hellerau and the surrounding buildings began to be recultivated for their original use and it now houses the European Centre for the Arts. Due to this eventful history, the 'East Wing of the Festspielhaus Hellerau' project is suitable in many ways as an example for the following design strategy.

Method

The example is examined on two levels: The first level is the scale – from the entire building to the individual element to the material.

Within the respective scale level, the second level deals with the difference between the existing situation and the desired use (current vs. target state), the consideration and reasoning behind preserving a building or constructing a new one as well as concept development (preservation vs. new construction) and the effects on planning, execution, socio-cultural aspects, waste, costs and carbon footprint (effects). The different categories of effects are determined through the following questions:

<u>Planning</u>: What are the special principles, requirements and results of the planning process?

<u>Execution</u>: What obstacles, findings or special features arose during the construction process?

Sociocultural aspects: Based on the weighing system used in sustainability certifications, what are arguments for and against reuse?
Waste: Against the backdrop of resource conservation and the exploitation of existing material stocks in existing buildings, what is the impact of reuse on the waste balance of the project?
Costs: As before, (construction) costs remain the key criterion for almost all decisions in construction projects. What are the costs of reuse compared to those of demolition and new construction?
Carbon footprint and global warming potential (GWP): The consideration of the carbon footprint is a relatively new criterion for construction projects. What are the CO2 savings (based on the grey energy stored in the existing building) compared to a new building of the same type? This is determined using the ÖKOBAUDAT data on GWP for production (A1–3).

Analysis

The analyses presented are divided into three groups. Based on the scale, the approach is from large (1:100) to medium (1:10) to small (1:1).
Scale 1:100 – East wing of the Festspielhaus Hellerau
After being vacant for 30 years, the east wing of the Festspielhaus Hellerau has been modernised and repurposed.

Current vs. Rarget State

The vacant barracks building from the 1930s was in a dilapidated condition and could only be converted because emergency repairs were carried out on the leaky roof in 2017, thus averting total loss. Together with the identical west wing, the east wing bears witness to the massive redesign of the festival theatre complex in the course of its conversion from a rhythm school to barracks and thus represents an important component of the ensemble.
In purely quantitative terms, the east wing represents 13,000 m^3 of enclosed space. From the perspective of material reserves, there are approximately 1,500 m^3 of brickwork, 700 m^3 of concrete and around 300 m^3 of wood. The task was to complete the ensemble around the festival grounds and to accommodate a rehearsal centre with a studio stage and

Fig. 1. View of the Festspielhaus Hellerau (left) and the east wing before renovation (photo by Brigida González, 2019)

rehearsal room, guest apartments for the artists-in-residence programme and a catering unit in the east wing.

Preservation vs. new construction

With its roof structure made of Kroher trusses, the building was classified as an individual monument. Due to its important position in the ensemble, its significance for the history and redesign of the area, and its status as an individual monument, from the outset the only option was to preserve the building and adapt it to its new functions.

Fig. 2. East façade before renovation and visualisation of the rehearsal stage (photo by Brigida González 2019, visualisation: heinlewischer, 2020)

Effects

Planning and execution:_The planning phase for the conversion of a building generally requires an in-depth examination of the existing structure, its construction, weak points and damage. In addition, these specifications must be reconciled with the requirements of the new use, and any conflicts and/or adaptation requirements must be identified.

These points are also decisive for the plans for the east wing, supplemented by a very intensive coordination period with the monument protection authorities. Due to the distinctive character of the ensemble and the east wing, the authorities attach particular importance to detailed coordination. For example, a deformation-accurate measurement of the dormers on the west wing had to be prepared (as a basis for an identical reconstruction), as well as a detailed drawing of the snow guard system on a scale of 1:1, which was submitted for building approval.

Sociocultural aspects and waste: On a positive note, preserving an existing building also preserves, develops and enhances the surrounding area. In the case of the east wing, this is particularly evident at the 'rear' of the building (east), where the former cul-de-sac situation with frontal access to a ruin is given a new spatial continuation through the foyer.

The conversion of the building, which was constructed in the 1930s using traditional craft techniques, can only be carried out by craftsmen. This type of construction project therefore promotes small and medium-sized craft businesses as well as craft skills and traditions. Promoting craftsmanship also means providing concrete support for the local and regional economy.

As a counterargument to preservation or conversion, it can be noted that the accommodation of the use is associated with a restriction in comfort, as the existing building structures cannot be optimally adapted to this use.

The conversion of the east wing allowed the walls, ceilings and wooden roof structure to be preserved and reused. This prevented around 3,900 m^3 of construction waste with a weight of 6,200 tonnes.

Costs, carbon footprint and global warming potential: The reuse of the east wing with all adjustments to the new use is being completed as a real project with a total investment of €12.2 million (across all cost groups according to DIN 276). In comparison, demolition and new construction can of course only be calculated and should therefore be viewed with caution. A building with the same volume and usable floor space is calculated at €10 to €16 million in investment costs according to the construction price index (BKI, 2023). To simplify, one can say that €12 million in renovation costs are offset by €13 million in new construction costs. The conversion is therefore more cost-effective. Reusing existing building fabric has a positive impact on the carbon footprint of the measures. Through preservation, refurbishment and continued use, this project will conserve 232 tonnes of carbon dioxide equivalent (CO_2e) in grey energy or save this amount compared to a new building of the same design. This saving comprises 118 tonnes of CO_2e for the preservation of reinforced concrete components, 92 tonnes of CO_2e for brickwork and 22 tonnes of CO_2e from timber structures. If the total savings are related to the gross floor area (GFA) according to DIN 277, this results in a saving of 66 kg CO_2e / m2 GFA.

Scale 1:10—Casement Windows. Current vs. Target State

The ruinous condition of the building after more than 30 years of vacancy also extends to the 110 preserved original casement windows with puttied single glazing. Only a few elements were replaced during its use until 1994. The requirement of the department for heritage protection to preserve the external appearance (window profile and division) and to retain as much of the original structure as possible contrasts with the high sound insulation requirements due to aircraft noise and the building's use for musical performances.

Preservation vs. New Construction

The expert assessment determines that only three windows were in good enough condition to be removed and refurbished. The remaining 107 windows had to be replaced due to their poor condition and technical requirements regarding noise proofing.

Fig.3. Casement windows before and after renovation (photos by Heinlewischer 2018, 2022)

Effects

Planning and execution: As is customary in restoration work, the planning process is based on a condition report with recommendations for refurbishment. In this case, this report can be integrated directly into the planning and tendering process due to its relevance to the feasibility of the carpentry work. The restoration work is carried out in accordance with the specifications of the report and the service description.
Socio-cultural aspects and waste: The preservation of original materials and construction techniques (fittings, wood joints) as well as the heritage value of the building are viewed positively. On the negative side, preserved windows offer less comfort, a shorter service life, higher maintenance/repair costs and poorer technical quality.
Costs, carbon footprint and global warming potential: The commissioned quote prices the refurbishment of a window at € 2,500 net and the construction of a new window at € 2,800 net. This refutes the argument often put forward against renovation, that this approach is more expensive. There are no relevant findings with regard to the carbon footprint. Replacing the damaged single glazing essentially only preserves the wood and therefore does not result in significant savings.

Scale 1:1—Roof Tiles. Current vs. Target State

The roof covering of the east wing was completely renewed as part of an emergency renovation of the roof truss and covering. As this new roofing was carried out in consultation with the department for heritage protection, the appearance and technical design meet all requirements.

Fig. 4. Removing roof tiles for re-use (photo by Heinlewischer, 2022)

Preservation vs. New Construction

Due to the very good condition and a remaining service life of more than 40 years, preservation of the roofing was planned from the outset. The new construction of the dormers and minimal insulation of the roof area to prevent frost in the attic required the removal and reinstallation of the roofing.

Effects. Planning and Execution

As there is good documentation on the emergency renovation, no assessment was required. The planning approach (preservation of plain tiles) was secured in the tender by including

both removal and re-roofing as well as demolition and new construction in the service description. The planning approach was implemented smoothly during construction, but a small proportion of the existing tiles were lost due to breakage and special cuts. Particular attention was paid to the load conditions during removal and the changing spatial requirements for crane positioning. The space required for storing the removed tiles and securing them on the construction site until they are reinstalled required additional planning.
Socio-cultural aspects and waste: Removing the roofing without causing damage had to be carried out by trained roofers in order to avoid damage. This resulted in an increase in the contractor's own added value of around 50% (or 25 €/m²). The earnings for removing the roofing replace (in real terms) the costs of purchasing new tiles. This increases the quality and qualification requirements for the work on site and the added value of the craft businesses carrying out the work, both of which are very positive from a socio-cultural perspective.
Costs, carbon footprint and global warming potential: The contracted price for covering, storing and re-roofing is 56 €/m², while demolition and new construction are contracted at 51 €/m² (costs as of 2021). This means that reusing the existing roofing is 10% more expensive in this contract. In terms of the carbon footprint, there is a significant saving. The GWP (A1–3) of the tile is stated as 16 kg CO_2e/m^2, which means that 1,400 m² of reused tiles will save 22,400 kg CO_2e in grey energy (ÖKOBAUDAT, 2025).

Conclusion

The preceding examples showed how reuse, specifically on-site reuse can be implemented on different scales within a project. What potentials, limitations, causes and effects can be derived from the analyses with regard to reuse?
Potentials: It is clear that reuse promotes craftsmanship, as it increases the added value for those carrying out the work. Through the sensitive handling of materials and existing situations, this approach preserves the identities of buildings and their environment.
Limitations: High technical requirements according to current standards conflict with reuse. There is a lack of tools for determining the qualities of installed materials.
Causes: Reuse can result from planning approaches (CO_2 savings) or simply be based on technical specifications of the existing building (e.g. measurement systems).
Effects: The above examples show that reuse saves money, avoids waste and conserves grey energy.
The reuse approach thus demonstrates significant improvements in terms of resource consumption, waste avoidance, carbon footprint and the socio-cultural aspects of a construction project. The economic dimension is heterogeneous and must be assessed on a case-by-case basis. In summary, it can be said that on-site reuse brings about significant improvements in the key areas of the construction transition, leading to material conservation and savings, lower energy consumption and reduced waste.
On a global scale it is difficult to determine what the grey-energy and on-site reuse potentials are. It is certain though, that nearly anywhere in the world, where buildings are being constructed, other structures are being demolished or stand vacant – disregarding their re-use potentials. Therefore it is not only important to further research the potentials of on-site reuse and set scientific and legal precedents for its implementation, but also to set good practical examples. We must convince those who build, regardless of where in

the world, to do so in a way which allows future repair and on-site reuse of structures and materials. This means the utilization of high-quality and durable materials and building products, single-variety materials, avoidance of composite materials, construction- and production technology which allows future repair, accessibility, and an outstanding aesthetic architectural design worth saving for future generations. For if we must construct new buildings for the future, we should do so in a manner which considers the problems that we are facing in the present.

Bibliography

BKI Baukosteninformationszentrum Deutscher Architektenkammern, Baukosten Gebäude Neubau 2023. Köln: RM Rudolf Müller Medien GmbH&Co. KG, 2023

Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR) im Bundesamt für Bauwesen und Raum- ordnung (BBR). 2020. Umweltfußabdruck von Gebäuden in Deutschland. BBSR-Online-Publikation 17/2020. Accessed December 21, 2025. https://efaidnbmnnnibpcajpcglclefindmkaj/https://www.bbsr.bund.de/BBSR/DE/veroeffentlichungen/bbsr-online/2020/bbsr-online-17-2020-dl.pdf?__blob=publicationFile&v=3

ÖKOBAUDAT. 2025. Datenbanksuche. Accessed January 2, 2026 https://www.oekobaudat.de/no_cache/datenbank/suche.html

Tagesschau. 2025. Jährlich braucht es 320.000 neue Wohnungen. Accessed December 21, 2025. https://www.tagesschau.de/wirtschaft/verbraucher/wohnbau-wohnungsbedarf-prognose-100.html

Tagesschau. 2025. Fast zwei Millionen Wohnungen stehen leer. Accessed December 21, 2025. https://www.tagesschau.de/wirtschaft/verbraucher/mikrozensus-wohnraum-leerstand-100.html

Petzet, Muck, and Heilmeyer, Florian, *REDUCE, REUSE, RECYCLE*. Ostfildern: Hatje Cantz Verlag, 2012

UN environment programme. 2023. “Building Materials And The Climate: Constructing A New Future”. Accessed December 20, 2025. https://www.unep.org/resources/report/building-materials-and-climate-constructing-new-future