

Future construction

STRUCTURE / SHORT REPORT OUTLINE

Title

Long version of title: Low-cost housing construction: Identification of existing obstacles to the use of room modules in housing construction

Reason / starting position

Brief description of the problem and the approach to solving it

Against the background of the current deficit of (affordable) living space, the use of prefabricated room modules with subsequent assembly on the construction site represents an alternative design variant in housing construction.

Surveys of the demand and supply sides were carried out to identify barriers to the use of room modules in housing construction in order to derive practical action requirements.

Subject of the research project

Description of the work steps and the solution

The research project was based on surveys conducted in two steps. The first of these was a survey of the demand side in housing. Obstacles that have hitherto hindered the use of the room module construction method as an alternative to traditional construction methods on the demand side in housing were identified. An online questionnaire was used to examine assessments of the room module construction method made by private and public clients, in particular housing associations, municipalities and planners working in the housing sector. In addition to technical aspects, aspects of the planning and tendering process were highlighted. The contents of the questionnaire were developed with a preliminary definitional and historical classification of the room module construction method and by identifying the characteristics and potential advantages and disadvantages of the room module construction method based on market and literature research. The evaluation of the survey was supported by numerous graphics. A differentiated evaluation was conducted using selective inquiries, for example, according to the respondents' project experience with the construction method.

The second survey took the form of interviews conducted with nine suppliers offering room modules made from wood, steel and concrete. The views of these companies with regard to the current low prevalence of the modular construction method in housing construction were presented in detail. On the one hand, the suppliers questioned the obstacles previously perceived on the demand side. On the other, they also identified other obstacles impeding the alternative realisation of projects using the room module construction method. A critical analysis of existing technical possibilities also provided objective insights into the extent to which suppliers of room modules already have practical solutions to meet the requirements on the demand side.

Both surveys essentially dealt with topic areas addressing "Possible uses and application areas of room modules", "Planning aspects", "Contractual aspects" and "Guiding principles for project implementation". In addition, an assessment of potential scale effects was carried out.

The potentials, obstacles and solutions identified were then merged. First, the different concepts of the supplier side were analysed, taking into account the views identified on the demand side. In addition, the areas of application, the suitability for the project and the limits of application of the room module construction method were described. The feasibility of economies of scale was also assessed on the basis of the findings. Subsequently, the obstacles from the perspective of the demand and supply side were subdivided into the following fields of action: "Information", "Planning aspects" and "Tendering and contract models". Suppliers' approaches to finding solutions were discussed in relation to the fields of action. Finally, measures were proposed which, from the researcher's point of view, constitute relevant steps towards more efficient application and use of the advantages of room modules in housing construction.

Conclusion

Description of the planned objectives and results achieved

In addition to identifying significant obstacles, the surveys also outlined existing solutions for the use of room modules in housing construction. These obstacles were subdivided into the following fields of action: "Information", "Planning aspects" and "Tendering and contract models".

The resulting need for action under planning, construction and organisational aspects as well as the corresponding measures were described. The need for action is aimed at the elimination of identified core problems that have hitherto prevented the extensive use of the room module construction method. Furthermore, estimates on the economies of scale could be made.

Key data

Short title: Use of room modules

Researcher / Project management:

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Total cost: € 74,426.00

Share of federal subsidy: € 43,856.00

Project term: 11 months

PICTURES / GRAPHICS:

Fig. 1: Konzept des Forschungsvorhabens.JPG

Caption: Research project concept

Fig. 2: Rolle der befragten Organisationen im Wohnungsbau.JPG

Caption: Role of surveyed organisations in housing construction

Fig. 3: Erfahrungen der Befragten mit der Raummodulbauweise.JPG

Caption: Experiences of interviewees with room module construction method (multiple answers possible)

Fig. 4: Auswirkungen eines Einsatzes von Raummodulen im Vergleich zur konventionellen Bauweise.JPG

Caption: Effects of using room modules in comparison to conventional construction

Fig. 5: Bauphysikalische und gestalterische Aspekte beim Bauen mit Raummodulen im Vergleich zur konventionellen Bauweise.JPG

Caption: Physical properties and design aspects of using room modules in comparison to conventional construction methods

Fig. 6: Bewertung der vergaberechtlichen Aspekte beim Einsatz von Raummodulen im Vergleich zum konventionellen Bauen.JPG

Caption: Evaluation of procurement law aspects when using room modules in comparison to conventional construction methods

Fig. 7: Uebersicht.JPG

Caption: Overview of the developed fields of action and the need for action in the overall context with obstacles for demanders and for/according to suppliers as well as solutions according to suppliers