Bewertungsmatrix für die Kostenplanung beim Abbruch und Bauen im Bestand

Datenbanksystem zur Analyse und Bewertung in Bezug auf Kosten, Technologien und Dauern

Englischer Kurzbericht gemäß Anlage 8

TECHNISCHE UNIVERSITÄT DARMSTADT
Institut für Baubetrieb

Gefördert durch:

Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit

FORSCHUNGSINITIATIVE Zukunft BAU

Zuwendungsempfänger: Technische Universität Darmstadt Fachbereich Bau- und Umweltingenieurwissenschaften Institut für Baubetrieb, Univ.-Prof. Dr.-Ing. Christoph Motzko	**Förderkennzeichen:** SWD-10.08.18.7-13.21
Kurztitel Vorhabensbezeichnung: Bewertungsmatrix für Abbruchmaßnahmen	
Projektleiter: Univ.-Prof. Dr.-Ing. Christoph Motzko Dr.-Ing. Jörg Klingenberger	**Bearbeiter:** Dipl.-Wirtsch.-Ing. Jan Wöltjen Dipl.-Ing. Daniela Löw
Laufzeit des Vorhabens: 01.Oktober 2013 bis 30. September 2015	
Berichtszeitraum: 01.Oktober 2013 bis 30. September 2015	

Brief report

Title

Title (extended version)

Evaluation matrix for the cost planning of demolition works and construction in existing context – database system for the analysis and evaluation with regard to costs, technologies and duration –

Motive/current situation

Short description of the problem and solution approach (max. 450 characters including all blanks)

The demolition of buildings and building components as well as building redevelopment constitute a complex challenge that requires the consideration of a large number of conditions and requirements to be met with regard to economy, ecology and technology. For a budget planning for example, it is therefore necessary to provide a cost plan and a completion period as precisely as possible.

Research subject

Description of the process steps and approach (max. 4300 characters including all blanks)

The purpose of this research project is to advance the evaluation matrix of the “technical and economic evaluation of demolition works in industrial construction” developed at the Institut für Baubetrieb at the Technische Universität Darmstadt. The advancement of this tool is primarily based on the transparent presentation of the expected demolition costs and completion period. In addition, the latest state-of-the-art technology concerning demolition works, the current legal requirements, as well as an evaluation of the environmental impact of certain demolition methods and their relation to each other has been developed.

The implementation is carried out by a computerized database system, which serves as a tool to support the evaluation of tenders of potential contractors and enables a plausible cost and time schedule calculation. Similar to the consideration of the completion period and the cost analysis, the determination of the environmental impact of every individual method should also be possible and visible as well as their relation to each other.

Altogether the scope of work to implement the underlying objective is divided into four consecutive packages with regards to content (P1, P2, P4 and P5). In addition to this, the research project has been carried out in two further work packages (P3: interim report and P6: final report).

Work package 1 (P1): Representation of the status quo of the basics according to literature research

In the first step of the research project the present state-of-the art technology in the field of demolition technologies is examined by literature research. In this context the different demolition techniques are compared with regard to possible fields of application and operating efficiency. Moreover an overview of the current legal and environmental concerns and requirements in the context of demolition works has been developed.

Work package 2 (P2): Special focus economy: Determination of cost criteria

A further emphasis of the research is to identify costly positions of demolition works. Knowledge is gained about specific criteria that exercise a significant influence on pricing and the completion period of demolition works and construction in an existing context. In the same way, knowledge about the

prevailing economic models used for the pricing of demolition works is gained by analyzing or post calculation respectively of tenders submitted. These findings are compared with statements that were determined in the course of expert surveys. The selection of tenders as well as interview partners was carried out with the external participants named in the application (BASF SE, Krebs+Kiefer Ingenieure GmbH, Schleith GmbH).

Work Package 4 (P4): Special focus Time: In-situ research

Exemplary selected demolition projects are evaluated according to the REFA labor studies method. Thus time values of demolition works can be determined with regards to the prevailing conditions. The selection and determination of the number of chosen in-situ-research studies according to matching projects is also carried out in coordination with the above mentioned, external participants. By means of a quantitative analysis of different construction sites general time cost values for demolition works at different construction sites subject to the dimensions, building structure, elevation etc. can be generated and parameters can be identified that are significant for the pricing consideration of demolition works.

Work Package 5 (P5): Advancement of the evaluation matrix

The pooling and transfer of the results of the literature research, the expert interviews and the in-situ-research studies into the advancement of the evaluation matrix forms the finishing stage of the research project. In this context it will be re-examined in what way it is possible to assign each demolition method a valuation regarding the ecological impacts. In particular, the possibility of generating interfaces to ecological database systems as e.g. ÖKOBAUDAT will be examined.

Work Package 6 (P6): Compilation of the results, Final report

Finally the results obtained in the project are processed and prepared for publication in form of the present final report.

Conclusion
The description of the targeted goals and the gained results (max. 700 characters including all blanks)

Demolition works as well as building redevelopments are characterized by a complex interaction of legal concerns as well as technical, economic and ecological requirements.
The present definitions of DIN 18007:2000-05 cover all common demolition methods currently on the market. The use of hydraulic excavators as a carrier device is still dominant. A trend to universally applicable equipment can be detected.
The total set of values and performance data that has been generated present a significant complement to the current state of scientific knowledge.

The evaluation matrix was extended by the “ecological evaluation module” and has gained more transparency and user-friendliness from the user´s perspective.

Basic data:

Short title:
Evaluation matrix for demolition works

Researcher / Project manager:
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Total cost:
212.925,74 €
Thereof government grant:
148.218,26 €

Project period:
24 months

Figures:
Picture credits
Figure 1: Filename.xxx
Legend:

All image files can be found on the attached CD-ROM.

Figure 1: Bild 1.jpg
Legend: Research object 1 – Cracking of ground plate

Figure 2: Bild 2.jpg
Legend: Research object 4 – Demolition works

Figure 3: Bild 3.jpg
Legend: Research object 5 – Demolition works

Figure 4: Bild 4.jpg
Legend: Research object 5 – Demolition works

Figure 5: Bild 5.jpg
Legend: Research object 3 – Demolition works

Figure 6: Bild 6.jpg
Legend: Ecological evaluation module – detail

Figure 7: Bild 7.jpg
Legend: Result-module