Jürgen Gartung, Brunswick

Revised Set of Rules and Regulations on the Classification and Ascertainment of Construction Costs

To avoid bad investments, costs must be examined during planning, prior to construction measures. Comparing costs of alternative solutions is a suitable method. Cost standards, retrievable from KTBL data base "Baukost," make this possible. This data base is based on the Construction Cost Network System, making it possible to use computer technology to universally process construction costs from the finely structured level of "unit prices" up to the rough structure levels of cost groups and functional cost pools. Clear definitions and differentiations of building and facilities are the basis for comparable data. The structuring of DIN 276 costs in structural engineering is a necessary factor here. After revision of this standard, the question of which adjustments need to be made in the Construction Cost Network System must be settled.

Dipl. Ing. Architekt Jürgen Gartung belongs to the scientific staff of the von Thünen Institute (vTI) – Federal Research Institute of Rural Areas, Forest and Fishery – Institute of Agricultural Technology and Biosystem Technology (Director: Prof. Dr. K.-D. Vorlop) in D-38116 Braunschweig, Bundesallee 50; e-mail: *juergen.gartung@vti-bund.de*

Keywords

Construction costs, investment requirements, annual building costs, functional cost pool, construction cost network

The DIN 276 1:2006, "Costs in Construction – Part 1: Buildings" is the eighth revision of the norm since its implementation in 1934 by the German Standards Institute [1]. In contrast to previous versions, it includes important aspects related to costs and the calculation of costs in planning and building. Although the DIN 276-1:2006-11 is still largely directed at the cost planning and the realization thereof, it becomes evident that the topic is very closely linked to the economics of buildings. For this reason, the DIN 18960:1999-08 "Costs of use in building" is currently being adapted to the new conditions. According to information from the Standards Committee, the final version will be available soon. For the purposes of completeness, at this point the "life cycle costs" are mentioned in addition to the building costs and usage costs, which are, above all, calculated together with facility management methods. They include everything from the costs of planning, through the realization and usage, through to the demolition of an object.

Changes in the DIN 276

The DIN 276 is one of the most important standards for architects and engineers. At the heart of this standard is the calculation of costs before beginning to build. The norm always consists of two main parts:

- Basic cost calculations for different planning of construction phases
- Framework to classify costs. The structure of the cost breakdown also serves as the basis for the comparability of the costs.

The standards always serve as an important link to other sets of rules, particularly with the DIN 277 "Basic Areas and Spatial Content of Buildings."

With the publication of the standard in 1981, the classification of costs of construction was introduced, according to building elements. A further revising occurred in 1993. The classification was carried out to the third level. Thus the cost element method was first made public for the first time to a broader audience. Parallels to the classification according to building elements permitted the DIN, but also the classification by type of structure or performance areas. Both types of classification are considered in the FAL Construction Cost Network.

The DIN 276-1:2006-11 brings significant changes for the construction cost planning process, which results from the changed market situation. The building supplies market has become a consumer market. To some extent the builder determines the price within the limits of his own budget. Thus, as a consequence, the cost requirements have been recently included in the new DIN [2].

Cost Allowance

Under 3.2 the cost allowance of the standard is explained:

"3.2.1 the goal of cost allowances is to increase the cost security, to minimize investment risks and to promote early consideration of alternatives in planning."

"3.2.2 A cost allowance can be established on the basis of budget or cost calculations. Before the establishment of a cost allowance, it must be tested, whether the project can be realized with regard to the further planning goals. In establishing the cost allowances it must be determined if they shall serve as the upper limit for costs or as a target sum for planning. This approach is also to be used for an advancing cost allowance – particularly due to planning changes.

Even in agriculture, cost allowances have long been common practice. Business allowances and promotional regulations have been used for this purpose for a long time.

Cost Ascertaining

The types of cost ascertainments according to the old DIN have been expanded to include the cost frameworks. At the same time, the figures used to carrying out the projects at time of the cost estimates must be more precise.

Cost Framework

The standard states:

" the cost framework serves as a basis for the decision on planning needs as well as for the basic viability and financing considerations, and to the establishment of the cost allowance."

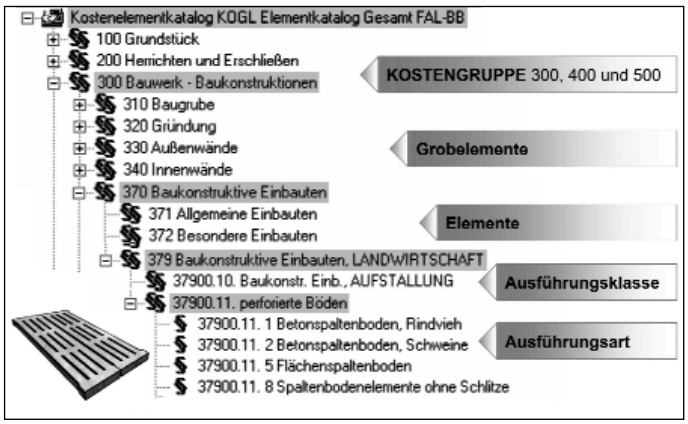

Fig. 1: Excerpt from the cost-element catalogue of FAL Building Research with supplements for DIN 276-1:2006-11

This expansion of the standard is due to the normal practice. The cost framework is already formulated in the course of calculating the cost requirements. This decision is common in the calculation of costs for farm buildings. On the basis of cost values, to some extent related to an animal slot (€/Cow; €/Fattening slot; €Productive sow), a cost framework can be delineated even without a detailed drawing.

Cost Estimates

No notable changes

Cost Computations

No notable changes

Cost Estimate

The cost estimate is changed as followed in the standard and described more precisely:

The cost estimate serves as a basis for the decision on the planning of construction and preparation for the task assignments.

In the cost estimate the total costs must be calculated according to the cost groups at least to the third level of cost classification and ordered according to the planned assignment units. The cost estimate can accordingly be broken down into one or more steps according to the course of the project. [1]

The cost estimate shall be more strongly based on the construction plans with the help of cost statistics of the planner. Thus the cost estimate is 100 percent planner activity, the preparation on the cost estimate on the basis of the assignment results and the process level is no longer expected in the standard.

In the directions for carrying out the project in Part 3.4.4. of the standard, it is stated that the cost estimate is based on the tenders, evaluated with the costs of previously granted assignments, already existing costs for the land and for the building costs. Thus we are not dealing with submission prices.

Part 3.5 "Cost control and cost monitoring" was introduced in the new norm for the dynamic process of assignment, calculation and amendments.

Cost Hierarchy

The presentation of the cost breakdown was adapted to the current state of technology. The cost breakdown allows for three levels marked through three figure classification code. The current seven cost groups remain unchanged:

- 100 Plots of land
- 200 Land preparation and utilities
- 300 Building Construction
- 400 Facilities Construction
- 500 External Facilities
- 600 Furnishings and Artwork
- 700 Additional Construction Costs

Changes and increases at the second level (large elements) and at the third level (building elements) of the cost breakdown have no decisive influence in the use for farm buildings.

Furthermore the following large elements of the cost group 300 building construction can be applied

- 310 Excavation Pit
- 320 Foundation
- 330 Exterior Walls
- 340 Interior Walls
- 350 Ceilings
- 360 Roofs
- 370 Built-in constructions
- 390 Other measures for building constructions

The special parts agricultural building described in the element catalogue of the FAL Institute for Building Research, and adapted to the coding of the DIN 276, continue to be assigned the classification number 379. Also, the type and class of building is described because each building element is constructed in a different way and with different materials.

- 379 special agricultural built-in constructions
- 379.10 Stables
- 379.20 Feeding
- 379.30 Manure Removal
- 379.40 Animal Product Extraction

In the cost group 400, technical facility construction, the classification is also maintained at the second level.

- 410 Waste water, water and gas facilities
- 420 Heating facilities
- 430 Ventilation facilities
- 440 High Voltage Current facilities
- 450 Remote and information technology facilities
- 460 Conveyor equipment
- 470 Specific use facilities
- 480 Building Automation
- 490 Other Measures

Special agricultural needs are classified under the Code 470 in accordance with the to the FAL Element Catalogue [3, 4]

- 479 Special use facilities, farms
- 479.10 Stables
- 479.20 Feeding
- 479.30 Manure Removal
- 479.40 Animal Product Extraction

Similarly, the external facilities needed especially by farms are described and accordingly placed in the cost group 500 External Facilities, and here, especially in the 530 Building Constructions in external facilities as well as in 540 Outside Technical Facilities.

Summary

The use of the DIN 276-1:2006-11 in the calculation of costs for farm buildings is also given without limits through numerous changes to the original version from 1993.

For the built-in constructions, compiled especially in an own element catalogue for agricultural purposes, the norms deal with supplements that are seamlessly joined to the previous systematic of the DIN 276-1:2006-11 and not in an own classification system.

Thus it is further ensured that the cost values from the FAL Building Research Institute, which comprise the major portions of the KTBL Data base "Building cost," are at the same level of cost values of other databases (for example, BKI) in terms of further building types.

Literature

Books are marked by •

[1] Normenausschuss Bauwesen (NABau) im DIN, DIN 276-1 Kosten im Bauwesen – Teil 1: Hochbau 2006-11

[2] • *Blecken, U., und W. Hasselmann*: Kosten im Hochbau. Verlagsgesellschaft Rudolf Müller GmbH Co.KG, Köln, 2007

[3] *Gartung, J.*: Baukostenermittlungen. Wo steht das landwirtschaftliche Bauwesen? Landtechnik 58 (2003), H. 2, S. 80-81

[4] *Gartung, J., und K. Uminski*: Informationstechnik (IT) als Hilfsmittel zur Planung von Stallgebäuden. Landtechnik 62 (2007), H. 2, S. 108-109