Budgeting in Germany
Speaker

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- Professorship für building economics and construction management, university of Siegen
- More than 40 books as author or editor
- Member of the standardisation committee DIN 276
- Member of the advisory board of BKI

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regulations and standards for budgeting in Germany

building costs (investment):

- **DIN 276** – Kosten im Hochbau

Operating costs:

- **BetrKV** – Betriebskostenverordnung
- **DIN 18960** – Nutzungskosten im Hochbau
- **GEFMA** – guidelines for Facility Management

Scope of architects / engineers:

- **BGB** – legal base for contracts
- **HOAI** – legal base for planning fees, also base for scope of architects and engineers
Regulations of the DIN 276

1. Definitions
2. Elements of budgeting processes (incl. cost calculation, controlling and management)
3. Completeness / presentation of costs
4. Steps for budgeting (along the scope of architects)
5. Structure of cost subdivision / specifying costs
Budgeting

Cost planning („Kostenplanung“) has 3 elements:

1. Cost calculation
2. Cost controlling / monitoring
3. Cost management

[Diagram showing Kostenplanung with sub-elements: Kostenermittlung, Kostensteuerung, Kostenkontrolle]
Steps of cost calculation (276:2008)

- **Kostenrahmen („budget“):** feasibility of cost limits / budgets
- **Kostenschätzung („cost estimate“):** first estimation based on preliminary design
- **Kostenberechnung („cost calculation“):** calculation based on the approvable design
- **Kostenanschlag („quotation“):** detailed calculation based on the tendering documents before the contract awarding procedure
- **Kostenfeststellung („cost statement“):** proof of real costs after completion

### Budgeting in Germany

<table>
<thead>
<tr>
<th>Component</th>
<th>Construction Element</th>
<th>Quantity</th>
<th>Unit</th>
<th>Inclusive Price (EUR/unit)</th>
<th>Total price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling</td>
<td>Storeware tile 30 x 60 cm, arboricote, laid using the thin bed method, grouting in tile shade, skirting tiles</td>
<td>60</td>
<td>m²</td>
<td>80</td>
<td>EUR 4800.00</td>
</tr>
<tr>
<td></td>
<td>Cement screed as floating hot screed, d = 6 cm, on 3 cm foottall sound insulation</td>
<td>60</td>
<td>m²</td>
<td>25</td>
<td>EUR 1503.00</td>
</tr>
<tr>
<td></td>
<td>Reinforced concrete ceiling, in-situ concrete, d = 25 cm, shuttering, reinforcement, underbeams</td>
<td>60</td>
<td>m²</td>
<td>115</td>
<td>EUR 6900.00</td>
</tr>
<tr>
<td></td>
<td>Sprayed ceiling rendering, gypsum rendering, d = 1.2 cm, pre-treatment of floor</td>
<td>60</td>
<td>m²</td>
<td>19</td>
<td>EUR 1140.00</td>
</tr>
<tr>
<td></td>
<td>Indoor emulsion paint, ceiling, white</td>
<td>60</td>
<td>m²</td>
<td>4</td>
<td>EUR 240.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>EUR 14,580.00</strong></td>
</tr>
</tbody>
</table>

| Wall      | Exterior paint for mineral substrates, white | 40       | m²   | 13                          | EUR 520.00  |
|           | Exterior wall rendering, lime cement plaster, d = 3.0 cm, pre-treatment of floor | 40       | m²   | 42                          | EUR 1680.00 |
|           | Masonry wall, porous concrete, d = 36.5 cm | 40       | m²   | 105                         | EUR 4200.00 |
|           | Interior wall rendering, gypsum plaster, d = 1.5 cm, pre-treatment of floor | 40       | m²   | 25                          | EUR 1000.00 |
|           | Interior emulsion paint, wall, light colour | 40       | m²   | 4                           | EUR 160.00  |
|           | **Total**            |          |      |                             | **EUR 7560.00** |
Steps of cost calculation (276:2018)

- **Kostenrahmen**: feasibility of cost limits / budgets
- **Kostenschätzung**: first estimation based on preliminary design
- **Kostenberechnung**: calculation based on the approvable design
- **Kostenvoranschlag**: detailed calculation based on the tendering documents before the contract awarding procedure
- **Kostenanschlag**: updating the costs during the tendering and construction process in several steps
- **Kostenfeststellung**: proof of real costs after completion
## Scope of work for architects in Germany

The scope is based on the HOAI, especially on the Leistungsphasen (LP):

<table>
<thead>
<tr>
<th>HOAI-Phase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Grundlagenermittlung</td>
<td>evaluation of the frame conditions</td>
</tr>
<tr>
<td>2: Vorplanung</td>
<td>preliminary design</td>
</tr>
<tr>
<td>3: Entwurfsplanung</td>
<td>approvable design</td>
</tr>
<tr>
<td>4: Genehmigungsplanung</td>
<td>approval process (building permission)</td>
</tr>
<tr>
<td>5: Ausführungsplanung</td>
<td>detailed design</td>
</tr>
<tr>
<td>6: Vorbereiten der Vergabe</td>
<td>preparation of tendering (performance description)</td>
</tr>
<tr>
<td>7: Mitwirken der Vergabe</td>
<td>contract awarding procedure</td>
</tr>
<tr>
<td>8: Objektüberwachung</td>
<td>site supervision</td>
</tr>
<tr>
<td>9: Objektbetreuung</td>
<td>documentation</td>
</tr>
</tbody>
</table>
Connection between cost calculation and scope of architects

Steps of cost calculations are docked on the scope at the points where the client has to make important decisions:

- LP 1: feasibility of the project framework / conditions
- LP 2: decision for the design idea to continue
- LP 3: decision for obtain the building permission (fixed design)
- LP 5/6: decision to seek construction partners with fixed scope of service in a contract
- LP 8: retrospective view for documentation and proof

If the client has to make a important decision he has to know every parameter incl. costs.
**Cost controlling / monitoring**

1. At the beginning of every project the client define a budget / cost limit
2. In the context of cost calculations the architect has to check the estimation against the budget and the last step of cost calculation
3. Necessity for documentation of changes, modification of qualities or quantities etc.
4. Proof of the development of costs and budgets

<table>
<thead>
<tr>
<th>No.</th>
<th>Date</th>
<th>Decision/change</th>
<th>Approved/rejected</th>
<th>Affects costs</th>
<th>Costs increased (+) Costs reduced (−)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10.03.14</td>
<td>Patterning on the tile product by client</td>
<td>yes</td>
<td>yes</td>
<td>EUR −1535.00</td>
</tr>
<tr>
<td>2</td>
<td>20.03.14</td>
<td>Change of tile colour</td>
<td>yes</td>
<td>no</td>
<td>0.00 EUR</td>
</tr>
<tr>
<td>3</td>
<td>25.04.14</td>
<td>Amendment 01 for compensating</td>
<td>no</td>
<td>yes</td>
<td>EUR +2670.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for the uneven ground</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cost management

- Means the intervention and steering the project in a certain way to keep the budget
- Maybe it is necessary to adjust the qualities, quantities or the budget
- There are two ways:
  1. Minimum principle: fixed quantities/qualities and minimized costs
  2. Maximum principle: fixed budget und optimized quantities/qualities
- The architect has to prepare the decisions of the client in accordance to the project management
Structure of cost detailing

There are two ways to break down costs:
1. structure in accordance to the part of the building
2. structure in accordance to the building contracts
DIN 276: 1. level of cost division / structure (in accordance to the part of the building)

| KG 100 | Grundstück       | plot of land            |
| KG 200 | Herrichten und Erschließen | development / explotation of the plot |
| KG 300 | Bauwerk – Baukonstruktion | structural and finishing elements of the building |
| KG 400 | Bauwerk – Technische Anlagen | technical elements of the building |
| KG 500 | Außenanlagen      | outdoor space / facilities |
| KG 600 | Ausstattung und Kunstwerke | equipment / furnishing |
| KG 700 | Baunebenkosten    | ancillary building costs (planning costs) |
| KG 800 | Finanzierung      | financing costs (new DIN 2076:2018) |

KG = Kostengruppe (cost category)
Devision / structure of costs according to DIN 276 (level of detailing)

1. level

300
Bauwerk - Baukonstruktionen

2. level

310
Baugrube

340
Innenwände

390
Sonstige Maßnahmen für Baukonstruktionen

3. level

341
Tragende Innenwände

345
Innenwandbekleidungen

349
Innenwände, sonstiges
Devision / structure of costs according to DIN 276 (level of detailing)

<table>
<thead>
<tr>
<th>Cost group</th>
<th>Construction element</th>
<th>Work type</th>
<th>Room groups</th>
<th>Quantity</th>
<th>Inclusive price</th>
<th>Total price</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN 276</td>
<td>Description</td>
<td>Room numbers</td>
<td>Quantity</td>
<td>USD/unit</td>
<td>EUR/unit</td>
<td>EUR</td>
</tr>
<tr>
<td>350 Decken</td>
<td></td>
<td></td>
<td></td>
<td>120 m²</td>
<td>87.00</td>
<td>10,440.00</td>
</tr>
<tr>
<td>351</td>
<td>Reinforced concrete ceiling</td>
<td>Shell</td>
<td>Offices and corridors</td>
<td>120 m²</td>
<td>87.00</td>
<td>10,440.00</td>
</tr>
<tr>
<td>352</td>
<td>Floating cement screed ZE20, thickness 50 mm on footfall sound insulation 20 mm. Rest of structure in thermal insulation PS 20 WLG 035, total height 150 mm.</td>
<td>Screed work</td>
<td>Offices and corridors</td>
<td>120 m²</td>
<td>16.00</td>
<td>1920.00</td>
</tr>
<tr>
<td>352</td>
<td>Parquet, wide oak planking, 22 mm, surface oiled in white</td>
<td>Parquet work</td>
<td>Offices and corridors</td>
<td>120 m²</td>
<td>47.00</td>
<td>5640.00</td>
</tr>
<tr>
<td>353</td>
<td>Gypsum rendering under the ceiling, average thickness 15 mm</td>
<td>Rendering work</td>
<td>Offices and corridors</td>
<td>120 m²</td>
<td>15.00</td>
<td>1800.00</td>
</tr>
<tr>
<td>340 Interior walls</td>
<td></td>
<td></td>
<td></td>
<td>12,000.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>341</td>
<td>Reinforced concrete wall 15 cm, no surface requirements</td>
<td>Shell</td>
<td>Staircase</td>
<td>80 m²</td>
<td>120.00</td>
<td>9600.00</td>
</tr>
<tr>
<td>345</td>
<td>Inner rendering on both sides, average thickness 15 mm</td>
<td>Rendering work</td>
<td>Staircase</td>
<td>160 m²</td>
<td>15.00</td>
<td>2400.00</td>
</tr>
</tbody>
</table>

Diagram:
- 360 Dächer
- 363 Dachbeläge
- 361 Dachkonstruktionen
- 364 Dachbekleidungen
- 352 Deckenbeläge
- 351 Deckenkonstruktionen
- 330 Außenwände
- 350 Decken
- 340 Innenwände
- 335 Außenwandbekleidung
- 336 Außenwandbekleidung innen
- 345 Innenwandbekleidungen
- 320 Gründung
- 325 Bodenbeläge
- 324 Bodenplatten

Budgeting in Germany

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UNIVERSITÄT SIEGEN - BERTBIEFELD&PARTNER ARCHITEKTEN INGENIEURE
requirements DIN 276: 2018 for detailing the costs

- LP 1: Kostenrahmen 1. level
- LP 2: Kostenschätzung 2. level
- LP 3: Kostenberechnung 3. level
- LP 5/6: Kostenvoranschlag 3. level + contracts
- LP 7/8: Kostenanschlag contracts
- LP 8: Kostenfeststellung contracts / 3. level

Building in existing has other requirements: budgeting maybe directly 3. level or contracts
Switching between part of the building and the contract

Structural component bases

- Costs for interior walls
  - loadbearing interior walls
  - plasterboard walls
  - plaster rendering
  - wall tiles

Ceiling costs
- reinforced concrete ceiling
- floating screed
- carpeting
- floor tiles
- plaster rendering

Building components

Contract award bases
- Shell work
  - loadbearing interior walls
  - reinforced concrete ceiling
- Dry wall construction and rendering
  - plasterboard walls
  - plaster rendering
- Tiles and ashlar
  - wall tiles
  - floor tiles
- Floor covering work
  - carpeting
Scope „Kostenanschlag“ during the construction process

- Shell
- Building exterior
- Rendering/screed
- Dry construction
- Other finishing work

Contract award period | Building period | Point reached in building period

Final invoice total
Contract award sum + additional costs
Contract award sum
Tender sum
Budget

∑ Current financial position
Presentation of costs

1. Costs has to be presented completely with all elements. So the client has a complete overview to the building's costs.

2. Point in time of every cost calculation – no forecast for future development of markets, maybe as a separate estimation.

3. Documentation of changes in costs / sources of values.

4. Separation of costs for stages of construction / one’s own work / demolition – new elements etc.
Methods of cost calculation

The DIN 276 defines no methods or way to estimate the costs, it defines the level of quality for the results.

There are some useful methods to calculate the costs:

- Volume, floor area or rental space (1. level)
- Part of building like roof, wall etc. (2. level)
- Components (Bauelemente) (3. level + contracts)
- Specification elements / description (contracts)

There are statistic database like BKI or STLB Bau.
Thank you very much!