

The CEEC Code of Cost Planning, Introduction and Practical Examples

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SUMMARY

The European Committee for Construction Economics CEEC (Comité Européen des Economistes de la Construction) was established over 20 years ago as a pan-European Federation of Professional Associations in the field of construction economics.

The principal objectives of the CEEC include the harmonisation of practice and information exchange at a European level. To this end, standards are being developed that will ensure the exchange of data while, at the same time, permitting national standards and innovative parallel developments to co-exist.

The CEEC Code of Measurement for Cost Planning provides a long-sought for basis for meaningful European cross-border cost comparison of buildings. References to national standards enable analysis and comparison of building projects based on available data. The European Committee for Construction Economics (CEEC – Comité Européen des Economistes de la Construction) focused on this cost planning instrument to improve cost assessment at a pan-European level. The Code defines standard cost groups and basic quantities. The cost groups cover both the construction costs as well as costs in use and form a framework for life cycle cost analysis. The basic quantitative units are used for the establishment of common European cost indicators. The current version of the CEEC Code will be further developed over the years to come. National standards that have not been included to date will be incorporated in the future and the level of detail of the code will be enhanced.

The CEEC Code for Cost Planning: Introduction and Practical Application

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1. INTRODUCTION

The primary purpose of planning, constructing, maintaining and operating buildings is to serve peoples' needs (cf. MBO). Accordingly, occupants, owners and, if applicable, managers, all play a vital role (cf. SIA 2000). It is their needs that decide either for or against an investment, with their decision-making process being influenced by a variety of factors. It is the intention of every rational owner (or investor) to achieve the optimum balance between costs (e.g. costs in use) and benefits (e.g. gross rental income) associated with a given property (cf. Schulte et al. 2000,15). The aim is to maximize long-term success and optimize the use of capital. To this end, both costs and benefits must be projected at an early stage and subsequently continuously monitored.

Today, investors can avail themselves of a number of nationally defined instruments for the planning of these costs. However, up until now, no such standards were available at a European level for the cross-border cost planning of building projects.

The European Committee for Construction Economics CEEC, established over 20 years ago as a pan-European Federation of Professional Associations in the field of construction economics, has been dedicating its efforts to rectifying this shortcoming. The principal objectives of the CEEC include the harmonisation of practice and information exchange at a European level. To this end, standards are being developed that will ensure the exchange of data while, at the same time, permitting national standards and innovative parallel developments to co-exist.

The CEEC Code for Cost Planning has created a standard high level summary for the classification of construction costs and the costs in use of real estate (cf. Figure 1). In addition, the Code defines the basic quantities that enable the development of uniform cost indicators and thus a meaningful cost comparison. The structure of the Code is designed in such a way as to allow existing national standards to be applied at a more detailed level (principle of subsidiarity).

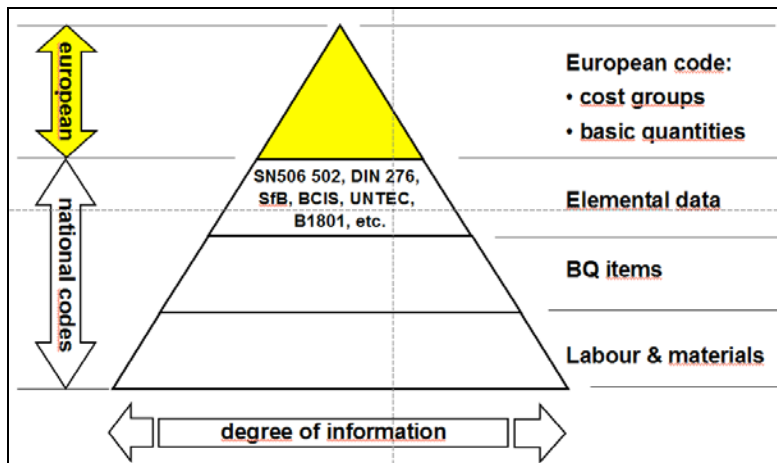


Figure 1: Interaction between European and national cost classifications

This paper provides an introduction to the CEEC Code outlining the current situation in Europe and demonstrating the practical application of the Code by use of an example. The first section identifies the differences in the basic quantities defined in the various national standards, which are a serious impediment to cost planning. The second section provides an overview of the CEEC Code and provides examples of definitions for cost groups and basic quantities. Finally, in the third section the application of the CEEC Code is illustrated by use of an example, showing a cost comparison between a Swiss and a German office building.

2. STARTING POINT IN EUROPE

A seminar held at the Swiss Federal Institute of Technology in Lausanne (EPFL) in 1998 marked the starting point for the work towards a European standard for cost planning. The seminar focused on the fact that differing methods and standards for cost planning are in use throughout Europe, and endeavoured to identify both the similarities and differences used by the national approaches.

In collaboration with the CEEC, experts from Denmark, Finland, France, Ireland, Netherlands, Spain, Switzerland and the United Kingdom met to address these issues:

Using typical projects as examples, representatives of each country demonstrated the approaches to cost planning used in their respective countries. In addition, they applied their national standards to the determination of the building costs of a common “model” building. On this basis, differences and similarities in the approach to cost determination were highlighted.

The initial finding was that all countries use element-orientated cost planning processes. This approach entails the subdivision of a building into its individual functional components (e.g. roofs, walls, heating systems, etc.) using element-based reference quantities (e.g. roof area, internal wall area, etc.) and composite unit rates for the components to estimate their construction costs. The overall construction costs are the sum of the costs of all individual building components. It also transpired that the contents of the various elements were quite comparable, even though their country-specific coding and grouping revealed significant differences.

Despite the common ground, the overall cost indicators from the same “model” building arrived at different results, which could not be solely explained by differing national costs. The problem was found to be that neither the reference quantities nor the overall scope of costs were in fact not really comparable.

As a common denominator, the floor area was used as the relevant basic unit in all countries. However, it emerged that there were significant deviations in the various definitions of floor area, which rendered the resulting comparison of cost indicators invalid. Figure 2 illustrates just how different the results of the floor area determinations were (for the same “model” building).

Figure 2 demonstrates the relevance of uniform definitions for basic quantities, which are required in addition to cost group definitions. The results from Denmark and Spain on the one hand and France on the other hand indicated a deviation of almost 100%.

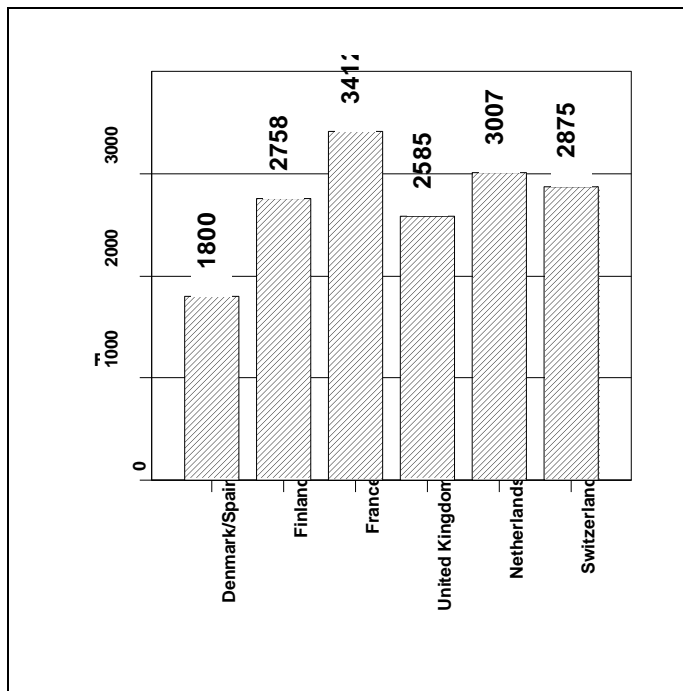


Figure 2: Determination of floor area for a “model” building, based on national standards

In addition it was discovered that costs calculated covered differing scopes and, depending on the country the following costs were included:

- Building construction and external works (all countries)
- Professional fees for planning (all countries except France)
- land costs (only Switzerland and Denmark)
- the cost of finance (only Switzerland and Denmark)

The resulting comparison of costs per square meter were thus highly misleading!

A number of requirements were identified for the development of a common CEEC Code:

- The CEEC Code must have a high level structure for standard summaries.
- The CEEC Code must allow the integration of existing national standards.
- The CEEC Code must define both cost groups and basic quantities.

3. CEEC CODE OF MEASUREMENT FOR COST PLANNING

The initial development of the CEEC Code was carried out by a CEEC working group consisting of representatives from Germany, Ireland, Switzerland and the United Kingdom. Input was also provided by the national associations from Belgium, Finland, France, the Netherlands and Spain.

Based on the results achieved by this working group the Code was approved by the General Assembly of the CEEC in 2003 and introduced as a European standard for cost planning in 2004. The contents are explained in greater detail in the following sections. Given their

volume and scope, the illustrations are limited to the basic structure and to examples of the definitions of typical cost groups and basic quantities.

3.1 Cost Groups

The cost groups of the CEEC Code provide a common structure for summarising the costs of real estate (building and land). Covering overall investment costs (including initial costs and costs in use) the Code takes a more comprehensive approach than is the current practice in a number of countries. This enables long-term cost planning beyond the planning and execution phase.

The entire usage period of a property, including operation and maintenance, whether incurred on a regularly recurring basis (e.g. electricity costs) or a sporadic basis (e.g. costs for replacements and repair) can be analysed using this classification.

The CEEC Code summarises cost under four main headings, which are further subdivided into the cost groups.

- Construction costs: including the production costs of the building and external works and incorporating both the costs of preparatory work, structures, technical installations and finishes.
- Design and incidental costs: these include the design team fees, ancillary costs for insurance coverage, permits and charges, etc., as well as budget contingencies.
- Costs in use: the costs of operation, maintenance, disposal and decommissioning of the property. Excluded are the users' operation-specific personnel and material costs not directly associated with the building.
- Land and finance: these cost groups cover costs of land, the cost of capital and finance (including the financing costs during the construction phase) while also allowing for income from the amounts received from grants and subsidies.

The classification enables the comprehensive assessment of the costs of a property, while at the same time permitting the exclusion of individual cost groups. The use of the CEEC Code emphasizes the differing scopes of national practice. The Code states specifically: "Not all cost groups or basic quantities will be applicable to every country. Where cost groups or basic quantities are not used, this will be clear and avoid misunderstandings on scope and content" (CEEC 2004).

A number of general comments regarding cost comparisons should be made before addressing the classification details.

The CEEC Code sets out additional information that is necessary for a meaningful cross-border cost comparison:

- Cost information should always include base date and exchange rates.
- In the case of costs in use, the time period being evaluated should also be included.
- Information on the scope and quality must be included.

- Where possible, the project time scale for construction, including planning and approval, should be stated.
- If all costs cannot be directly allocated to the CEEC cost groups, this should be noted. In such cases, the combination of cost groups is foreseen (e.g. the combination of cost groups C + D in Spain).
- The limits of any costs (e.g. costs within site boundaries) should be clearly stated.

Table 1 below has been taken directly from the CEEC Code and provides a trilingual summary of the cost groups.

Table 1: Cost groups of the CEEC Code (2004)

Cost groups	Groupes de coût	Kostengruppen
CONSTRUCTION COSTS	COÛTS	DE BAUKONSTRUKTIONEN
	CONSTRUCTION	
A Preliminaries	Installations de chantier, échafaudages	Baustelleneinrichtungen und allgemeine Kosten
B Substructure	Fondations, infrastructure de base	Struktur bis Oberkante Bodenplatte
C External superstructure/envelope	Structure externe/enveloppe	Struktur außen oberhalb Bodenplatte
D Internal superstructure	Structure interne	Struktur innen oberhalb Bodenplatte
E Internal finishings	Finitions intérieures	Innere Bekleidungen
F Services installations	Installations	Installationen und Transportanlagen
G Special equipment	Equipement spécifiques	Spezielle Ausrüstungen
H Furniture and fittings	Mobilier, Agencement	Ausstattungen und Einbauten
I Site and external works	Aménagements extérieurs	Außenanlagen
J Construction contingencies	Divers et imprévus (construction)	Bau-Reserven
K Taxes on construction	Taxes sur les coûts de construction	Steuern auf Baukonstruktionen
DESIGN AND INCIDENTAL COSTS	HONORAIRES ET FRAIS GENERAUX	PLANUNGS- UND BAUNE BENKOSTEN
L Design Team fees	Honoraires de conception et de construction	Planungshonorare
M Ancillary costs and charges	Charges et Frais Généraux	Baunebenkosten
N Project Budget contingencies	Réserves (variation économique)	Budget Rückstellungen und Reserven
O Taxes on design and incidental costs	Taxes sur Charges et coûts auxiliaires	Steuern auf Planungs- und Baunebenkosten
COSTS IN USE	COÛTS D'EXPLOITATION	NUTZUNGSKOSTEN
P Maintenance	Maintenance	Unterhalt
Q Operation	Coûts d'exploitation	Betrieb
R Disposal	Vente et rendement	Veräußerung
S Decommissioning	Démolition	Rückbau
T Taxes	Taxes	Steuern auf Nutzungskosten
LAND AND FINANCE	BIEN-FONDS FINANCES	& GRUNDSTÜCK UND FINANZIERUNG
U Land costs	Coût du bien-fond	Grundstückskosten
V Finance	Finance	Finanzierung
W Grants and subsidies	Aide et subsides	Beiträge und Subventionen
X Taxes on land	Taxes sur le bien-fonds et finance	Steuern

In addition to listing the cost groups, the CEEC Code also provides precise definitions, as demonstrated below for cost group E, “internal finishings” (cf. Figure 3) and assists users by listing references to individual national standards. Where a national standard does not provide the relevant cost groups this is stated.

E Internal finishings	E Finitions intérieures	E Innere Bekleidungen
<p>Definition Internal floor, wall and ceiling finishes including screeds, raised floors, internal panelling and cladding, suspended ceilings, decoration and finishes to balconies.</p> <p>Belgium / Switzerland SN 506.502/2000 M3 Floor finishes M4 Wall finishes M5 Ceiling finishes</p> <p>Germany: DIN 276 / 1993 336 Internal wall linings (of external walls) 345 Internal linings (of internal walls) 352 Floor coverings 353 Ceiling linings 364 Roof linings</p> <p>Hollande - Architectural costs (sub-division) - Construction costs (sub-division)</p> <p>Ireland 35 Suspended ceilings 42 Wall Finishes Internally 43 Floor Finishes 44 Stairs,ramps finishes 45 Ceiling Finishes</p> <p>United Kingdom: BCIS 3A Wall finishes 3B Floor finishes 3C Ceiling finishes</p>	<p>Définition Les finitions des dalles et plafonds comprenant chapes, revêtements de sols, panneaux intérieurs revêtement de parois, plafonds suspendus, décoration, finition des balcons.</p> <p>Belgique / Suisse: SN 506.502/2000 M3 Revêtements de sols M4 Revêtements de parois M5 Plafonds</p> <p>Allemagne: DIN 276 / 1993 336 Revêtement de mur extérieur, à l'intérieur 345 Revêtement de cloison 352 Garnitures de plafonds 353 Revêtement de plafonds 364 Revêtement de toit</p> <p>Hollande - Dépenses architecturales (subdivision) - Coûts de construction (subdivision)</p> <p>Irlande 35 Plafonds Suspendus 42 Finitions Murales Intérieurement 43 Finitions de Plancher(d'Étage) 44 Escalier, rampe Finitions 45 Finitions de Plafond</p> <p>Royaume Uni: BCIS 3A Finitions murales 3B Finitions de plancher(d'étage) 3C Finitions de plafond</p>	<p>Definition Innenbekleidungen der Böden, Wände und Decken einschließlich Estriche, Doppelböden, Innenpaneele und -verkleidungen, abhängehängte Decken, Dekorationen und Verkleidungen von Balkonen</p> <p>Belgien / Schweiz: SN 506.501/2000 M3 Bodenbeläge M4 Wandbekleidungen M5 Deckenbekleidungen</p> <p>Deutschland: DIN 276 / 1993 336 Außenwandbekleidungen, innen 345 Innenwandbekleidungen 352 Deckenbeläge 353 Deckenbekleidungen 364 Dachbekleidungen</p> <p>Niederlande - Architectural costs (sub-division) - Construction costs (sub-division)</p> <p>Irland 35 Suspended ceilings 42 Wall Finishes Internally 43 Floor Finishes 44 Stairs,ramps finishes 45 Ceiling Finishes</p> <p>Grossbritannien: BCIS 3A Wall finishes 3B Floor finishes 3C Ceiling finishes</p>

Figure 3: Definition of cost groups of the CEEC Code (2004) (extract)

3.2 Basic Quantities

As indicated above, it was imperative to define the basic quantities for cost planning. The CEEC Code creates clarity by working with multilingual definitions and cross-references to existing national standards. As a result, differing national measuring approaches can remain in existence, but the differences can be readily identified. The resulting cost indicators can then be suitably interpreted.

The definitions are limited to 12 basic quantities for site, floor areas and functional units (cf. Table 2). As yet, no definition has been provided for the element-based quantities (e.g. roofs, external walls, internal walls). For this purpose, national standards may still be used although differing national definitions make comparison at a more detailed level more difficult.

In addition, certain overall considerations regarding basic quantities are set out:

- All quantities are to be measured net up to the appropriate finished surface of construction.
- Sloping areas are generally measured on the slope (and not as projected in relation to a plan area).

Along with these general comments, all 12 basic quantities are defined and cross referenced to the national standards. Figure 4 illustrates the definitions of gross internal and gross external floor areas.

Table 2: Basic quantities of the CEEC Code (2004)

Basic quantities	Quantités de base	Grundmengen
SITE	TERRAIN	GRUNDSTÜCK
#01 Site area	Surface terrain	Grundstücksfläche
#02 Footprint area	Surface bâtie	Gebäudegrundfläche
FLOOR AREAS	SURFACES PLANCHER	DE GESCHOSSFLÄCHEN
#03 Floor area not fully enclosed	Surface plancher externe	Außen-Geschoßfläche
#04 Gross external floor area	Surface plancher brute	Geschoßfläche brutto
#05 Gross internal floor area	Surface plancher nette	Geschoßfläche netto
#06 Area of internal divisions	Surface de construction	Konstruktionsfläche der Innenwände
#07 Area ancillary to main function	Surface utile secondaire	Nebennutzfläche
#08 Ancillary area for services	Surface installations	Funktionsfläche
#09 Circulation area	Surface dégagement	Verkehrsfläche
#10 Usable floor area	Surface utile principale	Hauptnutzfläche
FUNCTIONAL UNITS	UNITÉS FUNCTIONELLES	FUNKTIONALE EINHEITEN
#11 Primary functional units	1. Unités fonctionnelles	Primäre funktionale Einheiten
#12 Secondary functional units	2. Unités fonctionnelles	Sekundäre funktionale Einheiten

#04 m2 Gross external floor area	#04 m2 Surface plancher brute	#04 m2 Geschoßfläche brutto
<p>Definition The area of all floor space which is covered and enclosed to its full height, including the area of basements, measured to the outside face of outside walls and including the area of all internal walls, columns and the like measured at each floor level, excluding floor area not fully enclosed (see #03).</p> <p>Germany: DIN 277 / 1987 m2 Brutto-Grundfläche BGF a</p> <p>Ireland m2 not defined</p> <p>Switzerland SIA 504 416 / 2003 m2 Geschossfläche GF / Surface plancher SP</p> <p>United Kingdom: m2 RICS: Code of Measurement Practice GEA</p>	<p>Définition Toutes les surfaces de plancher couvertes et comprises dans le volume (fermées de toute part), comprennent les surfaces des sous-sols, mesurées contre la face extérieure des murs (HO, hors oeuvre) et comprennent les surfaces des murs internes, colonnes et toutes les surfaces mesurées à tous les niveaux.</p> <p>Allemande: DIN 277 / 1987 m2 Brutto-Grundfläche BGF a</p> <p>Irlande m2 non défini</p> <p>Suisse: SIA 504 416 / 2003 m2 Surface plancher SP</p> <p>Royaume Uni m2 RICS: Code of Measurement Practice GEA</p>	<p>Definition Die Summe der Grundrissflächen aller Grundrissebenen eines Bauwerks, die überdeckt und allseitig in voller Höhe umschlossen sind, einschließlich unterirdischer Flächen, wird bis zur Außenkante der Außenwände gemessen und schließt die Konstruktionsflächen für Innenwände, -stützen usw. jedes Geschosses ein. Außengeschoßfläche ist nicht enthalten (siehe #03).</p> <p>Deutschland: DIN 277 / 1987 m2 Brutto-Grundfläche BGF a</p> <p>Irland m2 nicht definiert</p> <p>Schweiz: SIA 504 416/2003 m2 Geschossfläche GF</p> <p>Grossbritannien m2 RICS: Code of Measurement Practice GEA</p>
#05 m2 Gross internal floor area	#05 m2 Surface plancher nette	#05 m2 Geschoßfläche netto
<p>Definition Gross external floor area less the area of the external walls</p> <p>Germany: DIN 277 / 1987 m2 not defined</p> <p>Ireland m2 National Standard Building Elements 3rd edition</p> <p>Switzerland SIA 504 416 / 2003 m2 not defined</p> <p>United Kingdom: m2 RICS: Code of Measurement Practice GIA m2 BCIS: Gross floor area</p>	<p>Définition Surface de plancher nette sans la surface des murs extérieurs.</p> <p>Allemande: DIN 277 / 1987 m2 non défini</p> <p>Irlande m2 National Standard Building Elements 3rd edition</p> <p>Suisse: SIA 504 416 / 2003 m2 non défini</p> <p>Royaume Uni m2 RICS: Code of Measurement Practice GIA m2 BCIS: Gross floor area</p>	<p>Definition Geschoßfläche brutto / Brutto-Grundfläche ausschließlich der Konstruktionsfläche der Außenwände.</p> <p>Deutschland: DIN 277 / 1987 m2 nicht definiert</p> <p>Irland m2 National Standard Building Elements 3rd edition</p> <p>Schweiz: SIA 504 416/2003 m2 nicht definiert</p> <p>Grossbritannien m2 RICS: Code of Measurement Practice GIA m2 BCIS: Gross floor area</p>

Figure 4: Definition of basic quantities of the CEEC Code (2004) (extract)

4. COST COMPARISON OF A SWISS AND A GERMAN PROPERTY

To demonstrate the application of the CEEC Code, and highlight problems which may arise, a cost comparison between a German and a Swiss building was carried out. The purpose was to determine, which of the major differences are relevant in terms of cost. This involves a typical cost comparison task as it is frequently presented to construction economists in practice.

Both examples are outlined below together with the associated construction cost analyses. As an illustration of the national differences, country-specific cost planning standards and the selection of the properties are presented.

4.1 German and Swiss Cost Groups

The German cost planning standard DIN 276 (1993) breaks down costs at three levels. On the first level, it differentiates between the structural parts of the building and its technical installations. On the second level, the specified cost groups are broken down into so called macro elements (cf. Figure 5). As a general principle, the allocation follows the idea that a building is segmented on the basis of its structure and layout.

300+400 Building construction costs (DIN 276, 1993)	
300	Structure – construction works
310	Excavation
320	Foundations
330	External walls
340	Internal walls
350	Floors and ceilings
360	Roofs
370	Structural fitments
390	Other construction-related activities
410	Sewerage, water and gas systems
420	Heat supply systems
430	Air treatment systems
440	Power installations
450	Telecommunication, other communication systems
460	Transport systems
470	Function-related equipment and fitments
480	Building automation
490	Other services-related work

Figure 5: German cost groups in accordance to DIN 276 (1993)

It is only on the third level that DIN 276 (1993) provides the building elements required to allow allocation according to the CEEC Code. The macro element 330 “external walls”, for example, comprises the following elements:

- Loadbearing external walls (DIN cost group 331, CEEC group C)
- Non-loadbearing external walls (DIN cost group 332, CEEC group C)
- External columns (DIN cost group 333, CEEC group C)
- External doors and windows (DIN cost group 334, CEEC group C)
- External cladding units (DIN cost group 335, CEEC group C)
- Internal wall linings (of external walls) (DIN cost group 336, , CEEC group E)
- Prefabricated facade units (DIN cost group 337, CEEC group C)
- Sun screens (DIN cost group 338, , CEEC group C)
- External walls, other items (DIN cost group 339, CEEC group C)

Similarly to DIN 276, the Swiss cost planning standard, the EKG (SN 506502 2000).also involves a cost classification by elements, This also includes all costs incurred during the construction of a building. In contrast to the German standard, it is applicable to both construction and civil engineering works.

On the first level, the costs are broken down into so-called element groups (single-digit codes A to Z, cf. Figure 6). Elements follow directly at the second level (two-digit numerical codes). These are used for allocation to the CEEC Code.

Construction costs – Building construction (SN 506502 2000)	
A	Site
B	Preparatory work
C	General work to building structure
D	Building substructure
E	Building superstructure
I	Mechanical and electrical services to construction
M	Finishing work to buildings
P	Special equipment and services
Q	General equipment
R	Furnishings
T	External works
V	Incidental costs
W	Professional fee
X	Provisional sums and contingencies
Z	Value added tax

Figure 6: Swiss cost groups in accordance to EKG Elementkostengliederung (SN 506502 2000)
Both cost standards adhere to the concept of an element-oriented cost classification on which the CEEC Code is also based.

4.2 German and Swiss Basic Quantities

In addition to the cost definition, the definition of the reference quantities must also be examined more closely in connection with a cost comparison. This is necessary for the development of typical reference data at a more detailed level.

Both the German and the Swiss standard work with the “gross external floor area” as the reference unit for the costs of the building. However, they use different definitions of area.

The German definition differentiates between three types of “gross external floor area” (cf. DIN 277-1 1987a).

- Area A: covered and fully enclosed on all sides
- Area B: enclosed on all sides but not covered
- Area C: covered but not enclosed on all sides

The Swiss “gross external floor area” only includes the areas in Area A (cf. SIA 416 2003).

The CEEC Code defines a standardised gross floor area and references this back to the appropriate definitions in the national standards. The gross external floor area is the ground projection plan area – covered and enclosed on all sides – of all accessible floors including the base surface area of structural elements” (SIA 416 2003). This only covers the German Area A.

4.3 Selection and Brief Description of Examples

A typical use of the CEEC Code for the comparison of a German and a Swiss office building is illustrated in the example below.

The major cost databases in Germany and Switzerland were available for the selection of buildings to be analysed:

- BKI (Baukosteninformationszentrums Deutscher Architektenkammern)
- crb (Schweizerische Zentralstelle für Baurationalisierung)

While the German cost database offers more than 1,000 buildings analysed at various levels of detail, the Swiss database provided only approximately 75 buildings, which were however all analysed in detail (at element level according to SN 506502 2000). The large number of German analyses is however not relevant in the present assessment since the overwhelming majority of the buildings is not available at a sufficiently detailed level. The allocation of German buildings to the CEEC Code requires the third level according to DIN 276 (1993). Only 321 German buildings are available on this third level.

The available buildings were first narrowed down by selection of buildings with office usage. In this process it emerged that only 29 German and 2 Swiss buildings included more than 80% of office space or space used for offices. All other buildings are mixed-use office buildings or include substantial amounts of other types of usage.

Additionally, in order to identify comparable buildings, a selection was made from among the remaining data with respect to the following characteristics:

- Year of construction
- Type of construction
- Absolute size (measured in m² gross external floor area)

On the basis of the selection processes described above, two buildings were identified showing largely similar characteristics. They are used for the comparison of cost indicators below:

- Germany: 1300-062 “Office building with bank branch office” (cf. BKI 2004)
- Switzerland: 065/113 “Administrative centre” (cf. crb 2004)

Figure 7 contains a brief description of these two office buildings and the associated data in accordance with CEEC Code conventions. Neither of the buildings is used solely for offices. The German building also includes bank premises while the Swiss building also accommodates a police station. However, the majority of the area of both buildings is in fact used for offices.

CEEC Code of Measurement for Cost Planning				
Standard form of cost analysis	Office building with bank branch office		Administrative centre	
Project reference		BKI: 1300-062		crb: 065/113
Country of origin		Germany		Switzerland
Location		Konstanz		Langenthal
Currency/Price base date	€	2005	€ (1 € = 1.56 CHF)	2005
Evaluation period (from / to)	-		-	
Period for costs in use (years)	-		-	
Quantity used for analysis	Gross external floor area		Gross external floor area	
Refurbishment area (%)	0 %		0 %	
Programme	Start on site 1992 Handover 1993		Start on site 1990 Handover 1992	
Description of works and quality	Basement: plant rooms, lift room, storage and toilet areas. Ground floor: Bank including entrance area, conference room, and delivery area. Remaining area not fitted out. 2 upper floors with individual and open plan offices, partly including computer cabling, storage areas, tea kitchens and toilet areas. Reinforced concrete frame, grid 4.25x16.20m, reinforced concrete floor slabs, suspended slabs, columns and walls with aluminium external cladding, glazing partly to open, partly fixed, raised floors, suspended ceilings, flat roof, built in fittings, electrical, heating, ventilation and sanitary installations, sprinkler system, light fittings and lift installations.		2 basement floors: parking, lift room, delivery area, central archive, plant rooms and computer room. Ground floor: entrance lobby, information, offices, police station. Upper floor: offices, conference rooms, cafeteria, archive, general rooms. Floors below ground in reinforced concrete construction, partitions in brickwork, above ground steel framed construction with concrete suspended slabs, aluminium external cladding, flat roof, open staircases, floor finishes in lino and carpet. Mechanical and electrical services including integrated wall lighting and lifts.	

Figure 7: Project information of examples in accordance to the CEEC Code (2004)

In addition to the aforementioned descriptions, both databases provide detailed descriptions of elements. Due to scope, a discussion of these is omitted here. These descriptions are particularly helpful for the interpretation of the cost comparison (see section “Comparison of Cost Indicators of Examples”) since they provide a precise overview of the building.

4.4 Cost Data and Basic Quantities of Examples

The analyses are restricted to construction cost data analysed in accordance with the national classifications. The CEEC cost groups for “costs in use” and “land and finance” were not included in the available data and were excluded from the analysis.

The comparison of the German and the Swiss cost data requires a definition based on uniform reference units. The CEEC Code provides floor area definitions and definitions of functional units for this purpose (cf. Table 2).

Given the available data, the determination of reference units for both the German and the Swiss property is only possible in part (cf. Figure 8). In the databases, only the number of workplaces and the gross external floor area are available for both properties. It must be noted, above all, that only the German gross external floor area for area A can be used and not the total for areas A, B and C (see section “German and Swiss Basic Quantities”).

CEEC Code of Measurement for Cost Planning				
Basic quantities	Office building with bank branch office		Administrative centre	
		% of GEFA		% of GEFA
#01 Site area	41'009	774	7971	91
#02 Footprint area	1'346	25	1'383	16
#03 Floor area not fully enclosed	-	-	1'698	19
#04 Gross external floor area (GEFA)	5'301	100	8'792	100
#05 Gross internal floor area	-	-	-	-
#06 Area of internal divisions	-	-	-	-
#07 Area ancillary to main function	1'280	24	-	-
#08 Ancillary area for services	181	3	-	-
#09 Circulation area	777	15	-	-
#10 Usable floor area	2'589	49	-	-
#11 No. of workplaces	120	-	200	-
#12 Secondary functional units	-	-	-	-

Figure 8: Floor areas and functional unit of examples in accordance to the CEEC Code (2004)

4.5 Comparison of Cost Indicators of Examples

In Figure 9 the cost indicators for the properties used as examples are shown in accordance with the CEEC Code. The German property produces significantly lower reference values. However, the differences must be further investigated with reference to the scope and quality of the work.

These differences illustrate the difficulties encountered comparing statistical data, where additional information is not available. However, they also demonstrate, that the CEEC code can be used to highlight differences, which in practice it is usually possible to clarify with the planning team concerned.

CEEC Code of Measurement for Cost Planning				
Cost groups	Office building with bank branch office		Administrative centre	
	€	€/m ² GEFA	€	€/m ² GEFA
CONSTRUCTION COSTS	5'906'451	1'114	13'209'121	1'502
A Preliminaries	242'794	46	397'405	45
B Substructure	393'960	74	242'925	28
C External superstructure/envelope	1'916'905	362	3'625'658	412
D Internal superstructure	972'217	183	3'261'429	371
E Internal finishings	449'957	85	732'754	83
F Services installations	862'213	163	2'433'137	277
G Special equipment	22'527	4	0	0
H Furniture and fittings	1'199	0	1'217'604	138
I Site and external works	158'710	30	294'315	33
J Construction contingencies	0	0	0	0
K Taxes on construction	885'968	167	1'003'893	114
DESIGN AND INCIDENTAL COSTS	606'669	114	2'459'781	280
L + M Design Team fees	515'669	97	2'272'838	259
N Project Budget contingencies	0	0	0	0
O Taxes on design and incidental costs	91'000	17	186'943	21
TOTAL	6'513'120	1'229	15'668'902	1'782

Figure 9: Absolute and construction cost indicators of examples in accordance to the CEEC Code (2004) (cost as at: 2005)

5. CONCLUSION

The purpose of the CEEC Code is to guarantee a uniform standard for comparing cost indicators across countries. The CEEC Code in its first version of 2004 fulfils this purpose, integrating national standards in doing so. The relevant components of the Code include, above all, higher-level cost and area definitions that are capable of validation.

The cost comparison of a German and a Swiss office building described as an example demonstrates that differences must also be investigated at a more detailed level. Here the CEEC Code does not yet offer assistance. There is, above all, a lack of suitable definitions of additional areas (for example a uniform definition of external wall area) that would permit a comparison of cost indicators.

Demands for the future development of the CEEC Code include support for cost comparison at a more detailed level. It would also be desirable to incorporate the standards of additional countries (for example from France and Italy) in addition to the national standards that have been integrated to date (for example Germany, Switzerland, United Kingdom and Ireland).

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