CEGA - Competition 2014
Katharina Graf, Natalie Heise
Comparative analysis of processes in building construction
in Germany, Switzerland and the United Kingdom
with a proposal for an international planning basis

Abstract:
In today’s working world the number of transnational projects and planning activities
are increasing. However, within the individual European countries, different
classifications and definitions of planning steps and scope of work (parts) are existing.
Different design teams and operating teams are working on numerous levels at
different points in time during the planning process. The state regulations describe
country-specific boundaries of working phases and milestones. Not all working phases
and contents do exist in every country at the same level of planning, which can lead to
coordination difficulties in international planning.
There is a strong need for a standardized basis for processes in building construction in
order to support straightforward international communication and cooperation.
Available references are merely covering comparative descriptions of country-specific
definitions without a common basis or principles of arrangement. Only the cost
planning and the bill of quantities have been standardised by the CEEC-Code.
The main focus in this study lies on finding a consistent, unified description of the
working stages of Germany, Switzerland and the United Kingdom and is proposing an
overarching structure for the processes. The involved teams, their areas of
responsibility, scope of work, timely sequence and work flow of the individual
countries shall be reflected in this analysis.
This supports a comparative overview on the existing transnational and country
specific processes in its entirety and thus contributes to the mutual understanding of
the differences and significantly simplifies international processes in building
construction.

Keywords:
working stages in building construction, CEEC - code, international planning,
interdisciplinary design teams, country specific and transnational processes,
standardised basis for processes in building construction

1 Introduction

In the building and construction industry planners, contractors and clients have to deal
more and more often with transnational project organisation and processes during the
last decades. Either they are building abroad or foreign clients assign and plan in the
respective other country. There are no common trans-border prescriptions, terms or
schedules for planning stages and descriptions of tasks for the increasing international
planning. Even if this is defined, many involved stakeholders are not familiar with the
foreign processes and thus cannot compare the tasks and chronological sequences
with their own ones they are familiar with. Furthermore the specific regulations for 
processes in building construction differ in their binding character. In some countries 
they are statutory provisions, in others they are established by private organisations in 
order of government. They allocate the schedule of services and responsibilities 
differently to the involved players. Moreover the number and kind of parties which are 
named in the specific regulations vary from country to country as well as their job title.

With the aim to establish understanding of international processes in building 
construction this study is an attempt to take a step towards generation of a 
superordinate framework for those processes, which shall serve as a guideline for the 
sequence of activities, the main involved parties and their tasks and thus support a 
unified, mutual understanding. Furthermore the comparability of the specific national 
processes shall be analysed.

2 Literature Review

The processes in building construction are split into different work stages in every 
country. The processes and the specific objectives are defined by the country-specific 
standards. The progress of the whole life cycle of building projects are structured by 
and organised in working phases. Also the various planning activities and their 
interaction are coordinated by them. The priority of the particular phases is defined in 
the respective contracts.

This study is based on the literature research of the system of rules from each country, 
which are HOAI in Germany, the SIA in Switzerland and the British Plan of Work from 
the RIBA. In addition country-specific reference books, research papers and student 
research projects served as source of information. In several sources the national 
working steps are described in detail, but comparisons between different countries are 
made rarely. Above all there are hardly any conclusions drawn for international 
processes in building construction and their coordination. This topic is sporadically 
covered in university seminar papers. A transnational standard for working in the 
international building industry, which would significantly simplify international 
processes in building construction, does not exist at the moment. This study strives to 
make a first step forward.

3 Research Methodology

The basic principle of this study has been the literature research. The processes 
described in the regulations of the three countries have been identified and analysed. 
The results are presented graphically for easier comparison. In a second step an 
overarching structure has been developed in which the working steps of the individual 
countries have been subordinated. The next step has been the examination of the 
compiled findings by interviews of experts and minor amendments of the study hereupon. In this course the specialists have been asked for their personal opinion 
regarding the necessity for a standardized basis for processes in building construction.

Due to the fact that the building projects, the organisational forms and the respective 
contract types are multifarious even within one country, the scope of this study had to 
be limited and prioritised on processes in building construction. As far as possible the 
analysis of the procurement procedures by partial tender, which is common practice
by smaller projects, was prioritised over the procurement via a general contractor or a project manager. Moreover, due to the writers’ specific fields of study this study concentrates on the different scope of work of the architects and their associated teams in the three country.

4 Findings and Discussion

The comparison of country-specific standards for processes in building construction has revealed that the standards have different judicial binding character within the three countries. In Germany the schedule for work stages and the standard benefits of the consultants are regulated by the Official Scale of Fees for Services by Architects and Engineers (Verordnung über die Honorare für Architekten- und Ingenieurleistungen, HOAI). This ordinance has been adopted by the Federal Government of Germany. Whereas in Switzerland the private Association of Swiss Architects and Engineers (Schweizer Architekten- und Ingenieursverein – SIA) publishes norms, which are recognised and applied recommendations by specialists, by order of government. For the building process and tasks the SIA 112 - Scope of Work (Leistungsmodell) and the SIA 102 - 108 Direction for Fees and Services (Ordnungen für Leistungen und Honorare) applies. Linkwise in the United Kingdom the building sector is dominated by professional associations. For the processes in building construction the Royal Institute of British Architects (RIBA) released the Plan of Work (2013) for example. It is an overview of the work stages and the tasks of the main involved parties. Like this every professional guild which is involved in the building process makes its own regulations.

This study makes an attempt to create a superordinate international structure for the processes and planning phases in building construction to facilitate transnational communication and mutual understanding about the processes by all project parties of the three countries which have been analysed. The aforementioned superordinate structure divides the international building process into five phases: Initiation, Design, Approval, Construction and Use (ref. table: International Work Stages). This standardised schedule allows involved parties with different country-specific background knowledge a first overview of the transnational planning process. In addition the respectively national work stages have been subordinated to the international structure in a way that the tasks and planning steps, which are described and named in the specific standard rules, correlate with the superordinate work phases (ref. table: Service Profile Germany/ Phases Switzerland/ Work Stages UK). By mapping of the corresponding single phases of the process models of the three countries they can be compared more easily. Thereby it stands out that in Great Britain and Switzerland a strategic and defining preparation step is preceding the first Initiation Phase. However in Switzerland this preceding step is not part of the standard benefits and has to be stipulated separately. Whereas in Germany this initial step is performed within the Design Phase and is strictly included in the standard benefits. The remaining Design Phase is divided in all countries in a first conceptual and a second more developed concept. At the end of the following Approval Phase the countries differ in the level of detail of their elaborate plans, which are handed into the approval process. Although there is no separate process step like this in Switzerland, the level of detail of their plans submitted for approval is significantly higher. Due to this the competitive tender and the procurement procedure with the contractors can take place directly at the beginning of the Construction Phase in
Switzerland. In the other countries the design is detailed further in the Approval Phase and afterwards the individual works are awarded to the trades. The construction of the building and its inspection follows commonly in all three countries as well as the final handover and the Use Phase. The last step again is not part of the standard benefits in Switzerland and has to be contracted separately. Extended benefits can also be agreed in the other nations, but there the standard benefits do cover the whole planning and building process. This can also be awarded in single phases and sections to different work groups. In order to support the involved parties finding their roles and activities in the respective processes of the foreign country and to enable them to compare those with their own well known roles, this study lists the involved parties of each country below the work stages. Further the period of activity of the involved parties within the process is shown as they are listed and described in the national standard rules (see table, page 5) and the general scope of work is listed accordingly for each phase (see large tables in the appendix). By direct comparison of the different involved actors in the respective countries and their common basic field of activities it becomes obvious that also the responsibilities and scope of work differ in the national specifications. Thus even the vocational title can lead to misunderstandings. Using the example of the vocational field of the architect and his associated team this phenomenon is shown below.

The vocational title “architect” is protected in all three countries, but they differ regarding the pre-requisites which have to be fulfilled to be authorised to bear the title. In Germany and Great Britain you have to graduate at a technical university with the respective degree, gain professional experience and you have to be registered in one of the professional associations. Joining those associations is possible without additional pre-requisites in Germany, whereas in Great Britain and also in Switzerland an explicit invitation by the association has to be extended. In Switzerland everyone can call himself an “architect” and is authorised to submit a building project to the proper authorities, because there is no professional code requiring a specific qualification. However a possibility to gain further qualification is to join one of the private professional associations of the country or an entry into the REG – register (Foundation of the Swiss register of professionals in the fields of engineering, architecture and environment), which however is mostly unknown in Europe.

For smaller projects in Germany and in Switzerland the architect-team is responsible in most cases for the overall coordination and management. This includes, representation of the client’s interests, coordination of the consultants and contractors, compilation of the time and cost schedule and supervising the complete design and inspecting works. However in the United Kingdom the client’s representative consist of three disciplines in most cases. The architect-team, including project leader and lead designer, is responsible for the creative management and is supported by a separate Quantity Surveyor. His responsibilities are the contracts, preparation of the bill of quantities and the cost and measurement calculation. The execution is supervised separately in most cases by the Clerk of Work. In large-scale projects and also when big companies are building, there is the tendency to commission a general contractor who is as well responsible for the project control. Due to the fact that our study has to be limited in its volume and scope this scenario could not be covered here.
### International

#### Service Profile

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#### Involved Parties

- **Client**
- **Project Leader**
- **Architect**
- **Clerk of Work**
- **Health & Safety Adviser**
- **Economist**
- **Landscape Architect**
- **Civil Engineer**
- **Building Physicist**
- **Acoustician**
- **Lighting Designer**
- **Technology Engineer**
- **Geometer**
- **Survey Engineer**
- **Contractors**
- **Proper Authority**

#### Phases

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#### Work Stages

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#### Involved Parties

- **Client**
- **Project Leader**
- **Architect**
- **Clerk of Work**
- **Health & Safety Adviser**
- **Quantity Surveyor**
- **Landscape Architect**
- **Civil Engineer**
- **Building Physicist**
- **Acoustic Consultant**
- **Lighting Designer**
- **Services Engineer**
- **Geotechnical Engineer**
- **Survey Engineer**
- **Contractors**
- **Proper Authority**

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**Notes:**
- **Associate Members:** HAO/I/IA/RIIBA: **Employed** / **Partially Employed**
- **Other Reference:** **Employed** / **Partially Employed**

**Process:** Building Construction in Germany, Switzerland, and the United Kingdom with a Proposal for an International Planning Basis
5 Conclusion and Further Research

In today's international building industry the mutual understanding of processes and responsibilities, the communication and thereby also the cooperation is significantly hindered by national building regulations for processes in building construction of the three countries, which differ in essential points. This is compounded by countless specific regulations within those countries. By introduction of an international superordinate work phase structure and matching the three different national schedules of building processes with it, the split of the workflow in basic phases and the allocation of tasks and associated benefits of the various involved parties can be read out directly and becomes comparable. Thus every party knows which tasks are to be performed, at which phase, at what point of time within the process and which activities run in parallel. This allows a quick orientation across the country-specific work stages and hence provides help especially for foreign parties and professional newcomers.

Deepening this subject by expanding its scope and including more countries in the comparison would be a rewarding objective for continuative studies. However in order to simplify international processes in building construction significantly it is not sufficient to compile a comparison of the different process phases of the countries. In the long run such a superordinate structure should be integrated in the European basic building law principles. This could form a framework for international building processes as well as for schedules and responsibilities. A future simplification of the planning structure and communication between the involved countries would be beneficial also for large-scale projects and ones from internationally acting companies.

6 Acknowledgement

We would like to thank all contributing experts who supported our research work for this study and subsequent rechecking of our findings with their numerous comments and help by sharing their experience and knowledge of the processes and everyday work life in international building construction.

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### Leistungsbild der Architekten und Ingenieure

#### Grundlagen der Leistungsberatung

- **Initiation (Aufgabenklärung):** Erstellt den Aufgabenvertrag und den Aufgabenverarbeitungsvertrag, fasst die bisherigen Erkenntnisse zusammen und prüft die Leistungsbereitschaft.

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**LEISTUNGSPHASEN UND LEISTUNGSBILDER DES BAUPROZESSES IN DEUTSCHLAND**

**HOAI ERWARTETE ARBEITSCHritte UND -ERGEBNISSE**

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**BESCHREIBUNG**

**1. INITIATION**

1.1 Grundlegende Erarbeitung der Bauleitungsgrundlagen (Bbauvorschriften, Baubestimmungen) und Baunebenbedingungen
1.2 Konzeptionelle Vorplanung der technischen Lösung und des Bauwerks
1.3 Erstellung der Bauregelungsbilanz und Festlegung der Baumaßnahmen
1.4 Erstellung der technischen und organisatorischen Konzeption für den Bauwerkverkehr
1.5 Erstellung der Bauplanung und Festlegung der Bauabläufe
1.6 Erstellung der Baubeschaffung und Festlegung der Baustoffe

**2. DESIGN**

2.1 Erstellung der Planungsvorlage (P1) und Festlegung der Bauabläufe
2.2 Erstellung der Planungsvorlage (P2) und Festlegung der Bauabläufe
2.3 Erstellung der Planungsvorlage (P3) und Festlegung der Bauabläufe
2.4 Erstellung der Planungsvorlage (P4) und Festlegung der Bauabläufe
2.5 Erstellung der Planungsvorlage (P5) und Festlegung der Bauabläufe

**3. APPROVAL**

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3.2 Erstellung der Planungsvorlage (P7) und Festlegung der Bauabläufe
3.3 Erstellung der Planungsvorlage (P8) und Festlegung der Bauabläufe
3.4 Erstellung der Planungsvorlage (P9) und Festlegung der Bauabläufe
3.5 Erstellung der Planungsvorlage (P10) und Festlegung der Bauabläufe

**4. CONSTRUCTION**

4.1 Erstellung der Planungsvorlage (P11) und Festlegung der Bauabläufe
4.2 Erstellung der Planungsvorlage (P12) und Festlegung der Bauabläufe
4.3 Erstellung der Planungsvorlage (P13) und Festlegung der Bauabläufe
4.4 Erstellung der Planungsvorlage (P14) und Festlegung der Bauabläufe
4.5 Erstellung der Planungsvorlage (P15) und Festlegung der Bauabläufe

**5. USE**

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5.3 Erstellung der Planungsvorlage (P18) und Festlegung der Bauabläufe
5.4 Erstellung der Planungsvorlage (P19) und Festlegung der Bauabläufe
5.5 Erstellung der Planungsvorlage (P20) und Festlegung der Bauabläufe

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## Leistungsphasen und Leistungsbilder des Bauprozesses in Deutschland

### HOAI Erwartete Arbeitsschritte und Ergebnisse

### Appendix 1.1

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### Zweite Spezialisten

- **Wirtschaftlichkeitsprüfung**
- **Gebäudeenergieberatung**
- **Bauphysikberatung**
- **Materialetatmen**
- **Schall- und Vibrationsschutzberatung**
- **Klimatisierungsbereitung**
- **Sicherheitsberatung**
- **Bauphysikberatung**
- **Materialetatmen**
- **Schall- und Vibrationsschutzberatung**
- **Klimatisierungsbereitung**
- **Sicherheitsberatung**

### Unternehmen

- **Architektur**
- **Baubeaufsichtiger**
- **Bauunternehmer**
- **Bauinhaber**
- **Bauhilfsbetrieb**
- **Baugewerken**
- **Bauabwicklungen**
- **Baufachkraft**
- **Bauinhaber**
- **Bauhilfsbetrieb**
- **Baugewerken**
- **Bauabwicklungen**
- **Baufachkraft**

### Behörden

- **Stadtplanung**
- **Baugewerbe**
- **Bauaufsichtsamt**
- **Bauinspektion**
- **Bauämter**
- **Bauregierungsämter**
- **Bauüberwachungsämter**
- **Bauinspektionen**
- **Bauämter**
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- **Bauinspektionen**

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**APPENDIX 1.3.**

**WORK STAGE SCHEDULE OF WORKS UK**

**RIBA - Plan of Work 2013**