

CONSTRUCTION PROCEDURE OF SINGLE-FAMILY HOUSES
IN SLOVENIAČLENITEV POSTOPKA GRADITVE PRI ENODRUŽINSKI GRADNJI
V SLOVENIJI

izvleček

Pri nastajanju projektov, se prepletajo različne stroke. Ob tem je ključnega pomena ustrezno sodelovanje med projektantom, investitorjem in ostalimi udeleženci v postopku. Tako je lahko pot do skupnega cilja najučinkovitejša.

Čeprav je glede na zahtevnost, gradnja individualne stanovanjske hiše manj zahteven projekt, je na primeru graditve le-te najprimerneje prikazati časovnico graditve in faze v projektiranju.

Kljub temu, da so si projekti, ki jih arhitekt oz. projektant sprejme v izvedbo različni, si določene faze terminskega plana projekta sledijo po pretežno istem zaporedju pri večini projektov. Optimalnost postopka projektiranja se pokaže v skrbno izdelanem modelu in zaporedju faz, ki nam omogoča najhitrejšo pot do cilja v najkrajšem možnem času. To je prizadevanje tako investitorja in/ali uporabnika kot projektanta. Optimalen postopek projektiranja se oblikuje na podlagi strokovnosti, primerni strukturi dela in aktivnem sodelovanju vseh udeleženih akterjev, s primernim usklajevanjem stroke, upoštevanjem predpisanih zakonov, postopkov, razpoložljivih financ investitorja in kulture.

abstract

In the formation of projects, a combination of several disciplines is often used. Crucial in the process is appropriate cooperation among planners, clients and other actors in the process, since in this case the path to the common goal is faster.

Although in terms of complexity, the construction of individual residential houses is less-demanding project, it can be a case study to display the display the timelines of construction and the design phases. Despite the fact that the projects differ, phases of the specified time schedule of the project, are in most cases followed in the same order. The optimality of the design process is shown in a carefully crafted model of phase sequences, which allows us the quickest route to the destination in the shortest time. This is an effort of the investor and/or user and the designer.

The optimal design process is formed on the basis of expertise, appropriate structure, active cooperation of all involved subjects, and adequate coordination of the profession, adhering to prescribed laws, regulations, procedures and available finances of investor and culture.

ključne besede

postopek projektiranja, investitor, uporabnik, arhitekt, sodelovanje, modeli sodelovanja, enodružinski objekti

key words

Designing procedure, investor, user, architect, collaboration, cooperation models, and single-family houses

Introduction

The article is focused on individual residential construction that is meant for users and for further selling facilities of investors. Problematic will be exposed through the aspect of architectural designing and collaboration of architect with user and/or investor. Although it does not mean that procedure, which is through the work more and more formed, will not be useful in other engineering sciences, where they also deal with the users and/or investors. The main goal of the article is a review of key figures, review of optimal terminal work in time of the object construction and fragmentation of planning procedure of single-family design (that is just the phase of the scheduled work procedure of construction).

If we want that any kind of work process would be good and efficient, a thorough work preparation is needed – we have to define and choose the optimal way to the goal. Goal has to be exactly defined, clear and achievable, with realistic outline of the procedure and time determination.

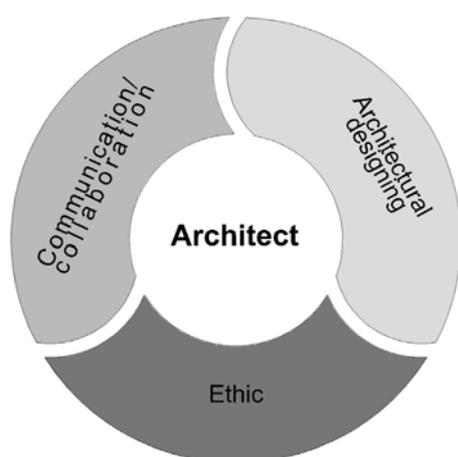
Such an approach is reasonable in any kind of project. That way we can follow the working procedure, without unnecessary leaps over or skipping certain procedure phases, which actually makes the work difficult and prolongs the whole procedure. Correctly planed work plan enables time review over work phases and points out the work course.

Two special branches of science deal with enigma of work plan – praxeology as unspecified science and theory of architectural designing as a science which is dealing with a field of architecture and is specific to the field that the article deals with.

Praxeology or the logic of action is a science about human action and work planning, which follows two main streams. The establisher of the first was Tadeusz Kotarbinski, who defined general praxeology, usable on all fields, and the establisher of the second was Austrian Ludwig von Mises, who was dealing mostly with the praxeology in economy [<http://mises.org/>]. In an essay with the title Characteristics of the good working plan (1966), Kotarbinski dealt with the basic facts of work well organized. In his opinion in every well prepared work plan we can expose eleven common characteristics, which are:

- Expedience;
- Feasibility;
- Inside coherence;
- Operability;
- Flexibility;
- Limitation at detail;
- Optimal time fixation;
- It has to have an end point;
- It has to embrace the wholeness of the problem
- Reasonability and;
- Simple to understand [Kotarbinski, 1966].

In any case it is necessary to specify criteria for optimality and proportionate them from case to case. It has to be separated between the cases, when there are only two actors involved or more. By working on a common project, there are many branches of professions, which interfere, like psychology, sociology, culturology, management etc. In architectural designing, there are even more of them – like geodesy, geology, civil engineering, structural engineering, landscape architecture etc. Of course they do not necessarily interlace at the same time during the procedure. We complement the complex matter, as is the designing for (un)known user, with different fields or branches, what depends also upon facility location, investors' claims, his lifestyle, the approving authority, relevant administrative body. What used to be feasible to solve and edit by one person - an architect, is now virtually impossible due to the increasing number of regulations and specialization in the fields of design, that need to be participating in the building permit documentation. The architect still needs to have an overview of all professions if he wants to successfully manage and control the project. That is why he still needs to have certain knowledge of different professions (Figure 1).



Slika 1: Shema arhitektovih načel.

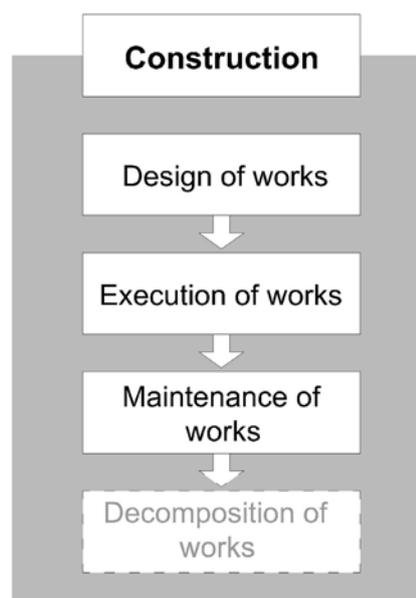
Figure 1: Scheme of architects' principles.

In architectural designing, all involved branches tend towards defending their own requirements and because of that the documentation is often not transparent. Transparency is the tendency of administration (administrative body) because of normed administrative procedure. Problematic of over norming can be seen in the legislation of Bavaria-Germany, where because of many prescriptions, is almost impossible to include in project some designers' creativity.

In continuation of article it will be described the content of documentation, that is needed by construction of single-family house in Slovenia. According to Slovenian Construction act [Zakon o graditvi objektov ZGO-1, Official Gazette of RS no. 110/02] article 1, the construction means design, execution and maintenance of works.

Recently the profession is adding fourth phase - decomposition (Figure 2). Design is a special phase of construction, which comprehends designing, drawing plans, technical descriptions

and reports, execution of the final documentation and also managing the procedure issuing the building permit (administrative procedure).



Slika 2: Shema graditve objekta s predlogom nove faze.

Figure 2: Scheme of construction.

Designing of facility: key figures

The descriptions of frequently used terms that occur in the article and their terminological explanation are taken from the current legislation and from official English translation of Slovene legislation:

1. The architect is a person that is through the study qualified for planning of facility in space. An architect by profession deals with planning, designing a space and supervision of execution. As the spectre of fields architect can work on (infrastructure, buildings, conservation, protection of cultural heritage) is wide, in most cases they specialize in certain fields. In the construction of residential architecture, the architect is mostly also the responsible design manager and coordinator of the project.

At the start of the procedure, architect as responsible design manager has to inform the project investor about legislation, possibilities and limitations from the field of construction and environment that is applicable in given area. This way the whole procedure of designing is open and transparent for both sides.

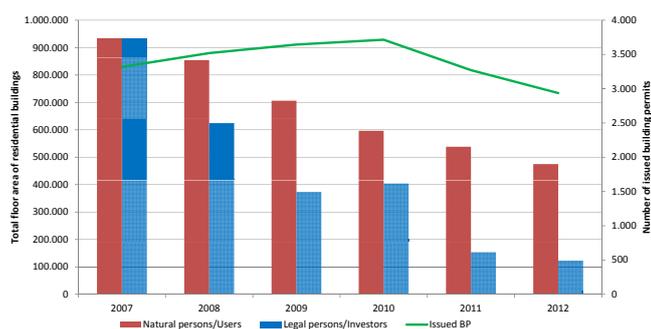
The architect has to be the strongest link among all engineers, referents on administrative unit, approving authorities and also by investor and/or user. At his work and communication he has to take into consideration also the Code of professional ethics of architects, landscape architects and spatial planners (OGRS no. 06/05), that is similar to the professionals' codes in foreign countries. The investor and/or user have to be informed also about the planned schedule, so that at the execution time there are no disagreements because of delays. That is why it is necessary that the schedule of work is made at the start of the designing construction documentation.

The matter that is important for the architect to acquaint the

investor, are the dates that relevant approving authorities have for firstly conditions for designing and secondly for approvals, that are essential for the legal building permit. The terms are in most cases every time for 30 days and there are in many cases disagreements with the investor by designing a facility as it can prolong the finalization of documentation.

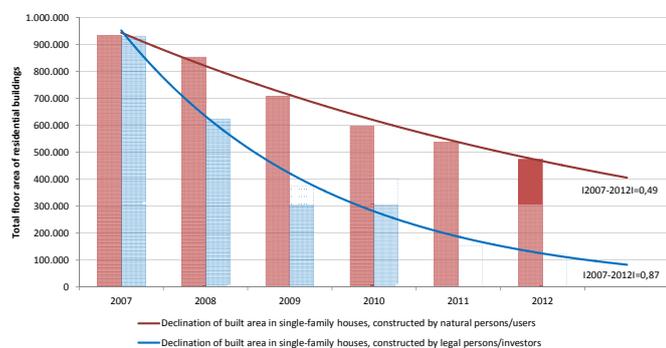
2. Investor/client in architectural designing is legal or natural person that selectively invests financial resources. The investor is not necessarily the one that orders the building, but can be just a broker. We can divide investors into two categories according to the purpose:

2.1 Investors-users who have often pre-made criteria and requires. Investors-users are specific, as in most cases they only deal with the architectural designing just once in the lifetime. The architect should follow their wishes and design reasonably. Specific in this group is in communication and wishes where the architect has to be specialised professional, who offers them advises and solves the situation. Once again we can divide them in two groups – the ones that already own the plot or the second that are buying it. In next comparative chart we can see, that the trend of construction of single-family houses from the beginning of crises 2008 is declining (Figure 3,4).



Slika 3: Skupna površina enostanovanjskih objektov in število izdanih gradbenih dovoljenj v Sloveniji med leti 2007 in 2012 [vir podatkov: Statistični urad RS].

Figure 3: Total area of single-family houses and number of issued building permits in Slovenia between 2007 and 2012.



Slika 4: Upad stanovanjske površine pri enodružinski gradnji med leti 2007 in 2012.

Figure 4: Single-family house built area deflection between 2007 and 2012.

2.2 Investors as forth-sellers of facilities that will in the future sell the facility. This group of investors is in most cases not

demanding concerning the quality and appearance. They look at the project through the economic aspect. In most cases their demands are oriented in the direction, that the facility is exploited at its most and that the construction is relatively beneficial.

In investment facilities, it is particularly necessary for the architect to pay attention to yield when designing, but is also important to advise the investor on the size and structure of the program of facility. In most cases this is the task of the responsible design manager.

3. Public is the special group of participants that usually appear in acquaintance with foreseen intervention in the space or at the beginning of execution of foreseen investment. They are indirectly included in the procedure of construction (in German „die Betroffenen“) and general public, that will meet with the newly built facility, although they do not live on the site of the spatial intervention. In the first place they are mostly neighbours, including the professional and laic public, which are in any way connected with the facility. If the spatial intervention is bad, the surrounding environment is usurped and degraded.

All engineers but especially the architect who is a carrier of responsible space intervention must know that every procedure in the environment is public and that those kinds of procedure will interfere also with the surroundings. Spatial Planning Act in 3rd article, paragraph 3 prescribes, that spatial designing is in public interest [OGRS no. 33/07].

It has to be known that nevertheless how much we try to include the facility into the environment, and maybe even with active public participation, we cannot assure that everyone will agree with the intervention. If we take into the consideration besides the surrounding facilities, suitable integration in the space and colour scheme, also ethical code of the architects and the professionalism, we can at least expect that the affected and the public will accept the intervention positively.

4. The coordinator is the person, who coordinates the activities of others. In the field of architecture he is a person, who is acquainted with the work process by other engineers and takes care for the whole reconciliation of the project as well as for the time schedule. In Slovene practice this person is not often represented in procedure. An architect in Slovenia is not necessarily the coordinator of the project. In the former legislation, firstly was defined, that the responsible works manager is the designer, whose works dominate – by facilities this means the architect. With the Act Amending the Construction Act [Zakon o spremembah in dopolnitvah zakona o graditvi objektov, OGRS, no. 57/12] this was amended.

5. The buyer is a legal or natural person, which buys the facility. The buyer is not necessarily the user of the facility.

6. Responsible design manager is the individual responsible for the mutual compliance of all the designs that form the project documentation and for the quality of the processing of the entire project, which he confirmed with a stamp. The stamp gets the designer, after successfully passed professional exam

on particular professional chamber after Rules on professional examinations for the provision of engineering services [OGRS, no 124/03, 56/05, 78/11]. Exams are graded according to the authorisation that the designer receives after successful completion of the professional exam, as follows: architectural design, landscape architectural design, spatial planning - license P, spatial planning license A and KA, the audit plans of architecture and landscape architecture and design exam after 100th article of ZGO-1c. After the change of 1st article of ZGO -1d, is the responsible design manager the individual who is responsible to the investor for mutual compliance of all the designs that form the project documentation.

7. Other participants – at the realization and designing, there are many more participants beside the investor and/or user, architect and engineers. After gathering project terms from the relevant approving authorities the whole documentation needs to be completed to the point, from which the whole intervention can be seen. The certain approval authority has to confirm it and write an approval to the project solutions. Whole and aligned project documentation is checked by the competent administrative body and the project gets its legal building permit, which is in Slovenia legally valid after eight days from handing over [Article 70, ZGO-1].

8. The designer is a person that drafts and prepares the plans. According to ZGO-1 [OGRS, 110/02], 2nd article, paragraph 4.2., is project designer a legal or natural person that provides project design services as a commercial activity, whereas the responsible project designer is individual responsible to the designer for the compliance of the design with spatial planning acts, building regulations and the conditions of the relevant approving authorities. A project designer that takes over project documentation for formulation must appoint a responsible project designer for all the plans that form the project. If there is only one responsible designer then he is also the responsible design manager, what is common by single-family houses design. Responsible project designer is responsible for every plan that he made and ratified it with an official stamp. He also guaranties that the plan is made according to spatial planning documents, building regulations and conditions for designing and that it fulfils all principal demands and is in accordance with the expert's detailed report. Designer, whether he is an architect, spatial planner, geodesist, mechanical engineer or electrical engineer, static or any kind of other expert from certain professional field, which participates in the project, has to be the representative of the profession and adviser to the investor and/or user.

9. User is in architectural planning a person or group of people, who uses and lives in the facility. The user can also be the investor of the project (as written in point 2.1.).

Designing

Designing is a separated phase of the process of facility construction. Project documentation is a composition of

different individual projects. According to the Rules on design documentation of Slovenia [Pravilnik o projektni dokumentaciji, OGRS, 55/2008: 5965] and ZGO-1 [OGRS 110/02], article 7, 2nd paragraph, the different plans follow one after another with the specific code numbers according to the sequence:

- 0: Basic design documentation
- 1: Architecture plans
- 2: Landscape architecture plans
- 3: Construction plans and other building plans
- 4: Electrical installation and electrical equipment plans
- 5: Machine installation and machinery plans
- 6: Telecommunications plans
- 7: Technological plans
- 8: Excavation and basic sub works plans for underground works

Some of the projects have to include as an obligatory experts' detailed report:

- Surveying plan;
- Study on fire safety, which is made after the regulations about fire safety studies in buildings or draft for fire safety;
- Waste management plans, which are made according to the regulations about waste management, for the waste that occurs in execution works;
- Conservation plan, which is made according to the regulations of cultural heritage conservation;
- Physics study-thermal protection, made according to the Rules on thermal insulation and efficient energy use in buildings;
- Construction physics study- acoustics, acoustic protection, made according to the regulations of protection against noise of buildings;
- Study of the feasibility of alternative systems of energy supply, made according to Rules on efficient use of energy in buildings.

The composition of project documentation depends upon the type of intervention that is defined by the ZGO – 1, 2nd article, paragraph 7: execution of new works, reconstruction and removal of the works, where some of the elements are obligatory for all interventions.

At this point we have to define the terms works, building and civil engineering works that are defined with ZGO-1, article 2, and paragraph 1:

- Works are buildings or civil engineering works fixed to the ground and made of construction products and natural materials together with any inbuilt installations and technological fittings.
- Buildings are works with one or more premises into which a person can enter and are intended for residence or execution of activities.
- Civil engineering works are works intended for satisfying human material and spiritual needs and interests that are not residential and are not intended for the execution of activities in buildings.

Architectural designing and work process

For successful designing and formation of prescribed building documentation according to the rules, several professionals

from different fields of expertise that will work together need to be gathered and brought into line already at the start.

Cooperation procedure and with it also the design, must come out from realised optimal environment and should strive towards optimal target, which with minor variations is possible with a well-chosen model of the design according to the given situation. All actors should strive towards it in the shortest possible way, for the first goal, which is common to all - successful acquisition of building permit. In continuation are defined also other goals. The final goal is completed facility.

Theoretical thought of Toš says that this structure has evolved through history and did achieve a series of developmental stages. As a development stage may be marked those changes, which brought a significant quality change in the attributes structure [Toš, 2003:81].

In the case of collaboration it is crucial that the designer and investor and/or user agree and harmonize in the shortest possible time. Because we know that every person involved in the design procedure has his sub goals. It is expected, that the elementary goal is common to all, although in many cases individually interpreted. The designer has to be the one, who is able to resolve this tangle of sub goals and extract it into a single one, comprehensible and acceptable to all.

An important factor in this is mutual trust and respect between designers and investors, as it is crucial for good cooperation. Christian Norberg-Schulz writes: "Architects are reluctant to deal with the theory of design, mainly due to the assumption that the theory kills creativity. At the same time, the position of the users is such that they "reluctantly" decide for architects, because they turn out to be a necessary evil that trims their ideas about architecture" [Norberg - Schulz, 1997:13].

These problems that are partly taken from Christian Norberg Schulz, occur inter alia due:

- Lack of time during the designing process, as the designer mostly has more projects to work on;
- Time limitation on investment of investors that consequently press on the designers. They give designers unsuitable time to do the project documentation, which leads to the plans of poor quality or uncompleted plans, quality declines, weaker relationships in the architectural biro, weak relationship to the investor;
- Lack of communication, which is increasingly common only over the phone, e-mail, Skype or other contemporary media;
- Lack of cultural awareness and identity of landscape. In the designing for foreign countries also because of the lack of knowledge in architectural regions and architectural landscapes, the terms that are in Slovenia defined in the Ordinance on Spatial Planning Strategy of Slovenia. With this theme also deals Schumacher in *The Autopoiesis of architecture* (2011), where he says: "Aesthetic sensibility is a constant, universal feature of all human behaviour and action. All of this implies that aesthetic appeal can be subjected to rational analysis and criticism. We cannot trust our sensibilities blindly. They need to be subjected to a critique that queries their historical pertinence. "
- Due to the inability of presentation of designing or understanding of the design. Here is important the method

of designed project presentation, what can be in the form of sketches, 3d visualisations, model or plans;

- Due to the uncritical imitation of architectural designs from other architectural regions.

Great importance in the design has also coordination and project management. Coordination of the project means the coordination of the project through the phases in accordance with a schedule of works. Project management means to be on the highest position of the group and lead the group with communication, motivation and control.

We have to highlight the project coordination and project management for the user, that in the phase of designing is not yet known, or when there is designed for the predictable unknown user for example the construction of set of single family houses, settlement... The basis for the designing procedure must be a collaboration between two (or more) persons, so that in the end of the project no one feels unrealized or tricked, what is of course the issue of the correct, appropriate and reciprocal collaboration. This relationships and relations are in Slovenia defined also with Code of professional ethics of architects, landscape architects and spatial planners (OGRS, no. 06/05), in Germany – Bavaria with *Berufsordnung* and in Austria with the *Ziviltechnikergesetz*.

At this time we have to pay attention also to the project assignment. The project assignment is a systematically ordered documentation which comprises the textual and graphical material and other necessary texts in the form of guidelines for how the project designer should formulate the project documentation, definitions of tasks and work of the project designer, responsible project designer and investor. It is important also because it partly defines the time duration of certain phases in the procedure of construction and at the same time it optimizes it. The project assignment is in most cases done by a designer or responsible design manager, but here we need to highlight the introduction of coordinator in Slovenia (point 4), who takes over the preparation and execution of the project assignment, submitted in the timeline and organizes and coordinates the participation of other designers and their work tasks.

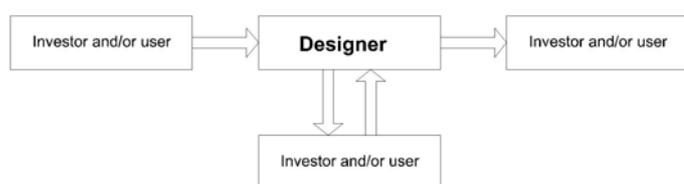
Optimal procedure of design should consider all the possible factors that may in any way influence the designing. Designers should predict/know these factors and be able to resolve them as soon as possible. They have to follow the changes of society, the profession, standards, legislations, techniques and technology. The task of an architect or designer about this is to inform also the client about them. Important here is good knowledge of established design practice and procedures, since only upon this it can be objectively built and improved the attitude to the investor and/or user and developed a proper collaboration between them.

In the continuation of the article, there will be fragmented the construction procedure of single-family house and more in detail also the designing.

Collaboration

Collaboration requires open and trustworthy correlation between all included sides, where information needs to be objectively presented, discussed and understood by all, so that it can lead after the shortest possible route, on the basis of learning, work and agreements to a satisfactory goal. Here needs to be mentioned that the agreement is meant in the way of „win-win“ situation for all parties involved. Especially in conflict resolution is the mediation strategy, which aims for an optimal solution for all the parties to the litigation.

From the field of collaboration models will these be summarized after Pocock and Hudson (1978) who claim three models of designers' behavior, according to the nature of determining the desired environment or concept of participation in the planning and are summarized by Polič (2007):



Slika 5: Prikaz modelov sodelovanja v arhitekturnem projektiranju na shemi.
Figure 5: Scheme of collaboration models in the field of architectural designing.

Designer as a leader

Designers' conception of reality is crucial according to this model; clients can just follow, irrespective of their intrinsic desires. Collaboration with the client is done no matter of the later responses to the basic offer of a designer [Polič, 2007:78]. The word client (after Polič) as used in that part of the article means investor and/or user.

Maybe this kind of collaboration is in any other discipline appropriate, but it is not for the architectural design, especially for a known user. Every person wants to arrange his/her home or business space in his/her own way so that the comfort and well-being in the room encourages creativity. With such a model approach to the investor and/or user architectural design is impossible, as the users' wishes cannot be taken into the account. This model turns out to be good only in the case of designing for the unknown/universal user, where it is not necessary to take into the consideration the users' wishes, but is important that apartments are at least designed according to the minimum norms and legislations without any personal involvement. The problem is in the fact that due to the lack of connection with the building, the environment and also with the user of the facility; these buildings often stand out from the rest of the built environment.

Designer as a copycat

This model is the opposite of the previous one. The designer is responding to the expressed needs of the client, as he is experiencing. The question is whether we dispose with the appropriate tools for detection of the desired images of the environment; as well if the needs change over time. People are often constrained by the existing experience and are not prone to innovation [Polič, 2007:78].

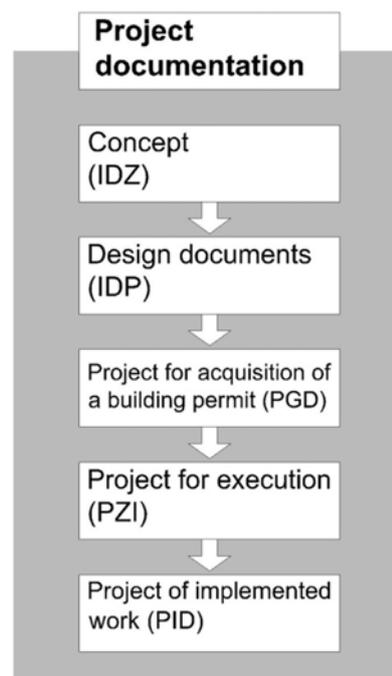
In this model, which is diametrically opposite of the first one, the architect or designer is shown just as an obedient copycat, designing and imitating the ideas of a client, even if they are not useful and reasonable.

That kind of model is very common by young designers, that still did not formulate architectural expression and commonly look toward the end of the project, not considering the convenience and comfort of designing a space. As well it can be noted by designers, which in most cases work on so called type projects for the single-family houses, as the main motivation for them is profit. Expressed can be also the economical optimisation of architectural designing, but less suitable architectural designing in the relation with the architectural region on landscape.

Comparison model can be seen in so called Michael E. Porter's Competitive Strategy, who developed his three generic strategies: lowest cost, differentiation, and focus [Porter, 2011], what can be in economy suitable, but less suitable for architectural designing.

Interaction designer - client

The third model is based on the assumption of interaction between the two parties: the designer explains the reasons for his actions; the client transfers to the designer his needs, just as he is experiencing them. On the basis of ongoing dialogue, there is created a consensus on the best solution. This approach raises a number of problems and assumes a designers' desire to serve the needs of different groups of clients, regardless of their status or power [Polič, 2007:79].



Slika 6: Shema projektne dokumentacije.
Figure 6: Scheme of project documentation.

This model, which combines both of the listed models of cooperation, is most suitable as the basis of such a form of cooperation can be arisen functional-aesthetic object according

| | |
|--------------|--|
| PA | Project assignment (Section Architectural designing and work process). |
| I1 | Investor that already owns the plot (point 2.1.). |
| I2 | Investor that is buying the plot for the purpose of construction of a building. |
| I3 | Investor as forth-sellers (point 2.2.). |
| P1 | The initial phase of the design (prior design) where in the current situation designers are often not included. |
| P2 | The designing phase which is in current time most common. |
| P3 | Continuation phase that is rarely implemented. |
| P4 | The final phase that is also rarely implemented. |
| SP | Surveying plan. |
| IDZ | Concept. |
| FIDIC | Construction contracts which became applicable on the proposal of the international financial institutions. They have to be subordinated and adapted by the applicable national law. |
| IDP | Design documentation. |
| PGD | Project for acquisition of building permit. |
| AB | Relevant administrative body. |
| BP | Building permit. |
| PZI | Project for execution. |
| DN | Plans for the constructors. |
| PID | Project of implemented work. |
| TI | Technical inspection. |
| PU | Permit of use. |

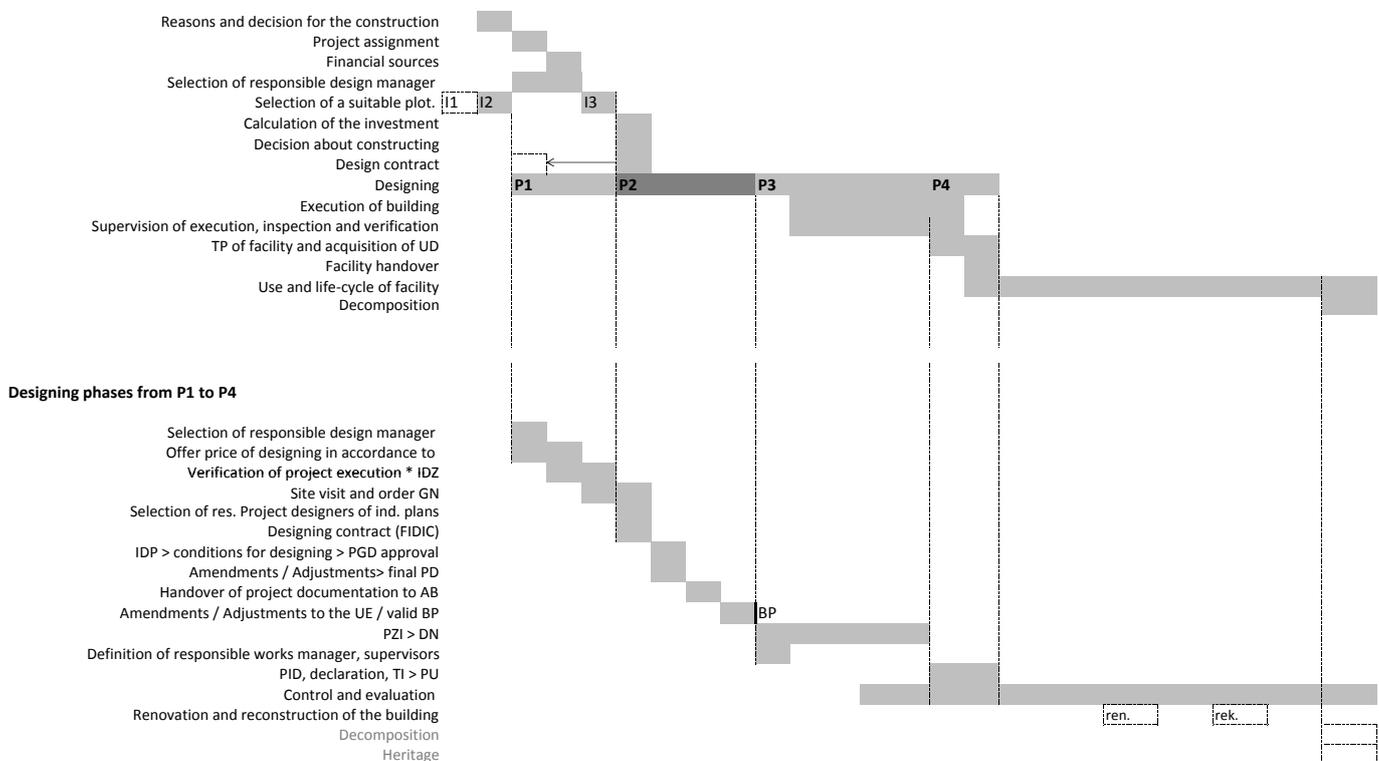
to the wishes of the investor and/or the user. But still, in the case of architecture is the building aesthetically rigid touch of the criteria of the architect, who diverse mosaic composes of high-quality, functional and aesthetically pleasing building. Indeed, such an interaction between designers and/or users is possible on the project with the end user of the facility. This means that this model is useful in the design of single-family houses or in the case of other designers for small projects, where the contact with end users is possible. This model enables individual approach and common search for the solutions, which are optimal and customized for user. As well it requires architects knowledge about time needed to complete the design and construction expertise which is reflected in a high performance of project.

Possibilities for that kind of collaboration are proportionally smaller, as the project and the number of involved people grow in the designing procedure. The above-mentioned models highlight a very important cooperative relationship, while they put attention of the two procedures, which usually take place simultaneously, but each opens their own problematic. These are:

- Phases of scheduled work procedure, that we plan at the beginning of work after the model of good plan and
- Phases of design procedure that are part of the scheduled work procedure and are in most cases taken for granted to the project manager and designer, but not to the investor and/or user.

Timeline of construction in architecture

Time



Slika 7: Grafični prikaz členitve postopka.
Figure 7: Scheme of graphical subdivision of phases.

Coordination by the construction of building

Basic principles and characteristics of professional work, to which we came closer at the start of the article, are same for every work and planning. Hereinafter will this procedure focus on designing of single-family house, as less demanding facility. The complexity of objects is defined in Regulation on classification of construction with regard to their complexity [OGRS, 37/08], where are in 3rd article defined the facilities, that are not classified in the demanding, undemanding or simple objects.

Correctly set schedule of work procedure has to take into account the key features that were detailed presented at the beginning of the article; in the profession it is known as Gantt chart. Timeline of construction should follow the following sequences:

1. Reasons and decision for the construction. Investor and/or user define his needs for the building. The aim of the phase is beginning of construction.
2. Content of investment. Investor and/or user define the content and circumstances of the project. Aim of the phase is determination of projects' content and the preparation of project assignment and concepts.
3. Financial assets. Investor and/or user have known budget for the financing of the project or ensured financial resource for carrying out the project to the desired goal. The aim of the phase is defined financial construction of the project.
4. Selection of responsible design manager – coordinator, over references etc. Projects' investor makes the contract of collaboration and consulting with the selected project leader. The aim of the phase is defining the appropriate responsible design manager.
5. Selection of a suitable plot. Investor and the chosen responsible design manager, on the basis of investors' wishes and needs search for some suitable plots for the desired space intervention. This is followed by the decision for the one, on the basis of the research about municipal infrastructure and other traps that can be hidden at buying. The aim of the phase is choice and decision for the right plot.
6. Calculation of the investment. Experiences by designing, managing of projects, environmental constructions etc. give the responsible design manager the option to calculate the amount of investment with possible minor deviation. The aim of the phase is pairing the investor with the height of the investment.
7. Decision about constructing. In accordance with decision of investor and/or user, the procedure can end here because of incorrect financial plan, that is not high enough for the investment, or it can continue with the purchase of the plot, that is suitable for the investors' wishes and desires as well it fits to legislation about spatial act for the field of construction. The aim of the phase is the start of construction procedure.
8. Design contract. Between the investor and the responsible designer is signed the contract. The aim of the phase is signed collaboration contract.
9. Phase of designing. The procedure of designing begins. This is also a very complex phase separated into more sub phases (collection the conditions for designing, designing of the facility, collection the approvals and finishing of the building documentation...), that are described more in detail in the phases of the design procedure. Phase of designing is one of the longest one in the scheduled work procedure and in most cases also the most demanding one due to the improper approach to the implementation of the aim and also because of the too late inclusion of designer in the whole process. The aim of the phase is the acquisition of the building permit and making of Project for execution (PZI).
10. Execution of building. After obtaining a building permit, the execution of building can start. The aim of the phase is suitable beginning and end of the execution.
11. Supervision of execution, inspection and verification. During execution, it is necessary to practice control over the work so that errors do not get potentiated. This is the job of the responsible supervisor. For larger facility it is necessary also to audit work. The aim of the phase is to monitor the construction site after the scheduled work plan, successfully completed facility and for the designers the preparation of the Project of implemented work (PID).
12. A technical inspection – is an inspection of the constructed or reconstructed works by which it is determined whether the works has been constructed or reconstructed in accordance with the building permit and whether it will fulfil the prescribed essential requirements. The aim of the phase is verification of the executed construction and artisan works at the facility.
13. Facility handover – handover and takeover of facility. This phase can be made between different subjects that are involved in the design procedure. Handover can be made:
 - Between work contractor and investor and/or user.
 - Between investor and buyer.
 - Between owner and warden of the facility.
 The aim of this phase is the handover of the building into the use of the users.
14. Use and life of the facility. This phase is the longest. From this phase we can see the quality of the facility construction; from draft, designing, to execution, takeover and to moving into the object. The aim in the phase is monitoring of facility life-cycle, facility management, maintenance, improvement and evaluation of the work.

Architects are rarely included in the last phase although the awareness of importance of this phase is rising. It is important to study, managing and monitor the facility even after facility is handed over to use as the basis, and we can all learn a lot of it.

Phases of design procedure

The structuring of the design procedure at individual phases is meaningful because of the review. Phases of design procedure

are most frequently structured in the next following order, where certain phases can be repeated:

1. Decision of the investor and/or user for the certain designer and approaching the selected one.
2. Acquaintance of investor and/or user with the indicative price of architectural designing.
3. Review of the basic acts and regulations, which are applicable in the area of the planned construction.
4. Visit of the plot and order of the land survey plan.
5. Selection of engineers in the field of electrical installations, mechanical installations and construction, and identification of the cost of each project.
6. The contract between the investor and/or user and the responsible design manager and start of the designing process.
7. Collection of the conditions for designing of the relevant approving authorities.
8. Designing of concept (Idejna zasnova - IZ) and Design documents (Idejni projekt - IP), on the basis of conditions for designing of the relevant approving authorities, legislation and spatial planning acts with active collaboration of architect with the investor and/or user.
9. Submission of the planned design documents (some can be also planned as project for acquisition of building permit) – formed by different individual projects like plans of architecture, plans of electrical and mechanical installations etc; to the relevant approving authorities. It can contain possible coordination with approving authorities about additional requirements and finally obtainment of approval.
10. Designing of plans and making of documentation to the level of project for acquisition of building permit.
11. Submission of complete composition of different individual projects for the legal building permit (Projekt za pridobitev gradbenega dovoljenja - PGD) to the administrative unit in whose area the real estate that is the subject of the building permit is located; this is then the relevant administrative body. There is possible potential coordination of documentation for the legal building permit.
12. Obtainment of the building permit.
13. Detailed designing and planning of all plans for the project for execution (Projekt za izvedbo - PZI)
14. Execution of facility and supervision/monitoring of the execution.
15. Designing the project of implemented work (Projekt izvedenih del – PIZ), statements of assurance, technical review and the issued permit of use.
16. Usage of building.
17. Control and evaluation of building in use.

In consideration needs to be taken that every project is individual and has its own characteristics that separate it from others and make it special. Nevertheless the phases in designing are very similar almost in every project, also because of the easier determination of the deadline for project finishing. Graphical subdivision of phases is shown in the Figure 7.

Conclusion

The article is focused on the current legislation about construction, which includes also single-family houses design, in Slovenia. Legislation was compared with selected German legislation, which in practice often serves as basis for foreign legislation, including Slovenian.

In the article was considered and used most common acts and rules from the field of spatial planning and project documentation. Some of the legislation that regulates the relations between investors and contractors exists still from former Yugoslavia, for example Special construction usances [Posebne gradbene uzsance, UL SFRJ, 18/77].

In conclusion we can highlight specific problem of architectural and engineering profession in Slovenia, which after 22 years of Slovenia's independence, still has not accepted the Act of architectural and engineering activities, despite already prepared draft few years ago (Zakon o arhitekturnem in inženirskem projektiranju 2007). The fact is that majority of European countries have the profession defined by law, including duties, rights and obligations of architects and engineers, for example Ziviltechnikergesetz in Austria and in Germany almost every region (Bundesland) has its own Code of Architects (Architektengesetz).

Review of terminology and definition of the key players in the process of architectural design is also important from the standpoint of understanding technical terms. Based on the definition of key persons and the relations between them were defined models of cooperation, as defined by Pocock and Hudson. They are also common in architectural design.

Exposed collaboration is presented, not as active participation in the acceptance of state or municipal spatial plans, but as individual collaboration of architect with investor and/or user and with other engineers. The main part is that we, as architects know that every project is individual and that it has specific relations between the parties. Rachel Luck (2007: 220) writes about the active participation following: "While it is acknowledged that learning is a two-way process: that the participants will learn more about design and the purpose of an event, to have a better understanding of their situation, while the designers learn about the participants' situation." It is therefore obvious, the importance of active participation, which is exposed in the article as a priority, besides the division of procedure, as with the active participation we strive to energy efficiency, optimization of the time of the involved people, to procedural economy and resources with maximum performance.

At the end of the article is schedulable divided the procedure of construction and procedure of designing. Contribution of that part is in transparency of the procedure, not only for the architects, but also for investors and/or users. The table comparison in the article was made between the procedures of construction and segmented the design process. Defined were the time limits prescribed by current legislation, which are most common. The importance of the table is in the transparency of described phases in the article, with which are faced designers as well as clients and/or users in the process of construction and design of the building. The highlight is on the extension of the designing procedure and fastest in inclusion of designer and coordinator in described procedures.

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iz recenzije / reviewer notes

Arhitektura kot inženirski poklic že dolgo izgublja ta atribut. Zgodovinski razvoj diferenciacije poklicev ki je privedel do ločitve arhitekta in gradbenika se še nadaljuje. Arhitektura naj bi veljala za dokaj univerzalen poklic, a je že izgubila urbanizem, krajinarstvo in industrijsko oblikovanje. Specializacija pa seveda pomeni nevarnost zoževanja pregleda nad celoto.

Šole, strokovna javnost in mediji promovirajo najboljše dosežke z lepimi slikami, teksti in nagradami. Vse to privlači mlade, da izberejo ta poklic. Malo ali nič pa ni povedanega o vsem, kar je zadaj: dolgotrajni pogovori in postopki, nepričakovane omejitve in spreminjanje, nespoštovanje dogovorov in rokov med sodelujočimi, tehnološke in finančne zagate, vedno novi in strožji predpisi, negotova plačila... Že dolgo velja tudi spoznanje, da je tako za večji blok kot za

enodružinsko hišo potreben projekt v obliki cca 10 cm debele mape. V njej je ena sama "mapica" delo arhitekta – tisto, kar ga edino zanima in privlači. Vse ostalo prepusti drugim – ali ker tistega (razumljivo) ne obvlada ali je daleč od kreativnega dela.

Obravnavani članek je zato že sam po sebi "nezanimivo" branje, ki visoko letečega mladega arhitekta postavi na realna tla. Opozarja na tisti inženirski del poklica, ki ga čaka če hoče samostojno nastopati in odgovarjati kot projektant, sposoben svoje kreativne zamisli tudi realizirati. Govori o tem, da mora obvladati različna orodja, med drugim tudi metode učinkovite organizacije dela, ne samo svojega, ampak velike skupine sodelujočih pri tako kompleksnem opravilu kot je projektiranje.

dr. Vladimir Brezar