

## GROUND CONDITIONS AND THE LAND OPERATIONAL PARAMETRS DETERMINED IN THE PLANNING DECISIONS

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**ABSTRACT:** Optimal land-use planning is a tedious and long lasting process, and in its genesis the actions which set itself the goal of creating spatial order and sustainable development are taken. Inherently, in almost each country planning policy, the basic instruments of planning action are the planning decisions. They have been determined with the details of the location, purpose, method of use as well as the architectural form. As the result of these decisions, the possibility of designing and implementing a harmonious space that consider all factors and functional, socio-economic, environmental, cultural, aesthetic and compositional requirements are created. But whether planning decisions always protect interdisciplinary interests, even such an important aspect as the water ground conditions. The article based on specific example from Polish yard will appear the effects of skipping ground parameters issues related with the planning of building investment on particular area, which according to Polish legislation, are not treated as planning arrangements. Consequently, the threats to the already existing water ground relations are very probable as far as the changing of these relations may have significant influence or even challenge the implementation of a specific building investment. This situation creates a huge risk including financial consequences and frequently has a significant impact on the future of the building investment process, including the danger of suspension of works.

*Keywords: Geotechnical conditions, Land zoning, Planning document, Investment costs.*

### 1. INTRODUCTION

Undoubtedly the special planning is the art of organizing the environment, which despite to an aesthetic experience also performs important functions starting from the socio-economic through environmental or even teaching effects. However, foregoing art is easier to define, because the criteria for determining it are not only a matter of taste, but also refer both to the tough market or economic rules.

The combination of these different aspects in the creation of spatial plans requires the sustainable performance on many levels, and therefore it is reasonable to say that special planning is also an art unique, which should be guided by the law of democracy. Its essence is the ability to choose the alternative solutions, that in each case will create a harmonious and balanced extent. Notwithstanding, whether the certain solution reveal successful decide the future expense user, which is usually deeply embedded in the context and relationships with other people. Therefore, should the alternative choice was possible and equivalent, planning should be based on robust knowledge and understanding of the characteristics of the certain area as well as the empathy with respect to its current and future users.

The foremost means of expression of special planning are the planning decisions that as well as

the local and regional level organize space striving to its most rational use.

### 2. THE CHARACTER OF PLANNING DECISIONS IN POLAND

An underlying basis of each construction project is a detailed analysis of its cost-effectiveness namely cost estimation and efficiency of such plans.

The basis for obtaining the data for these analyzes are the planning decisions issued in the form of broader contextual local plans or zoning decisions usually for a single land area [1]. It contained therein information about acceptable method of zoning and land use as well as the architectural form. Moreover, the criteria determined in above way should be the result of not only the architectural and urban conditions but also environmental, cultural, historical, social, and what is very important, also groundwater factors. Only though properly constructed building conditions can give a full picture of the certain land property and allow to calculate its absorption i.e. the optimal management based on defined criteria. This attitude is directly associated with the market value of the parcel and other economic aspects relating the building project or its execution.

As it is observed the spatial planning is also an 'art' that can be directly estimated and measured. Furthermore, it underlies all investment activity as

obvious is the relationship that the greater amount of information about the area, the lower is the risk in decision-making regarding the purchase of property.

According to recent studies, more than half of all investment projects launched in Poland take place in areas avoided the zoning plans, based only on the legal provisions of the spatial planning bill concerning so-called "good neighborliness". Hereby the new objects and buildings are formed with the similar function as their neighborhood pre-existing buildings [2].

At the same time the other factors are often ignored such as groundwater conditions, which may significantly affect on the nature of the investment, regarding for instance the cost reasons.

Currently, the planning decisions very rarely define the conditions allowing the elimination of natural interactions on the planned investment and vice versa. Furthermore, if the investment does not constitute the significant impact on the decision of the environmental condition of the project or there is no indication for preparing the environmental report above decisions include very limited information about the characteristics or parameters of the substrate [3].

It may be surprising, especially in the context of the contemporary nature of the construction process, which consists plenty problematic factors concerning at least difficult land conditions and time or money limit. Whereas conditions associated with the parameters of the ground are one of the most cost and time consuming, that can greatly reduce the potential of the land and its attractiveness to future investor. Also, the environmental aspect should not be forgotten, because the effects of interference in the subsoil can be permanent and irreversible.

Thus, in planning documents, in addition to the typical architectural and urban planning parameters defining the acceptable dimensions of buildings, their height, form and building area should also be found the records of the land parameters that especially define the development of the plot and consequently its form of building.

Thereby we would obtain a full picture of the potential investment area, where in addition to the visible characteristics affecting to its market value such as location, access to communication, shape of the plot, its surface or equipment in the media, we would be able to determine the characteristics of the hidden handlers concerning the geotechnical parameters substrate, soil and water conditions or other environmental considerations [2].

Then, one could speak of the investment process in which the investor always has the right of conscious choice and is not forced to choose the solution which is necessary and become apparent only upon the stage of design or workmanship. The planning decision should apply equivalent solutions correctly typed in the context of space so that the

investor should be further guided only by his subjective investments purposes.

### **3. PLANNING DECISIONS AND THE SELECTION CRITERIA OF THE TYPE OF INVESTMENT**

Information about the geological and hydrogeological specific of grounds are very important and often fundamental when deciding about the commence of the investment or its character.



Fig. 1 View of historical park. Own photograph.

Above can be demonstrated on the building project of the multi-family housing in Poznan, the fifth largest city in Poland. The investment was planned on a very attractive market-plot, in the city center, adjacent to the downtown building from the beginning of the XX century and one of the most beautiful urban parks with its historic Palm House.



Fig. 2 View of historical park. Own photograph.

Despite the spectacular location the investment area was heavily degraded in the urban context as the result of many years of functioning the chemical plant in this place. Therefore, the planned investment gave the great opportunity to create a

whole new quality of public space, adequate for this part of the city.



**Fig. 3 View showing the location of investment Performance of Geoprojekt.**

In relation to the lack of a Local Land Development Plan, the building parameters have been identified in the zoning decision issued for the parcel owned by the investor, without reference to the environmental values of the adjoining park. Consequently, multi-family housing was decided to design on the north-south axis, along the boundary of the botanical garden.

In order to the most efficient use of commercial values of the land it was assumed that the most architecturally and economically reasonable solution would be to design the underground car parking thus releasing space for main development. This resulted the fairly dimensional arrangement of the buildings and gave the usable amount of surface intended by the investor.

Implementation of the parking lot required pursuing an earthworks at a depth of 11.0 m below ground level. The analysis of geotechnical conditions of foundation the buildings showed that the ground soil had the complex ground water conditions as well as the level of ground water that imposed the necessity to perform the construction of an underground garage in the form of cavity/slot walls erected on the slab base [4].

Generally, the investment demanded complicated and expensive design solutions. However, preliminary analysis of soil and water conditions made on the basis of archival material before the purchase of the property suggested the possibility of such situation, allowing the investor calculate these extracurricular expenses in the overall cost of construction.

These water factors, together with the decision on building conditions were the main parameters of the investment. They have become the foundation of building project and cost estimates.

During the advanced design works it turned out that the planned investment would be a huge threat to the historic neighboring forest. There was also a feasible risk of changing the water conditions in this botanical park as a result of carried out excavations

works or establishing some kind of baffle in the free movement of ground water, due to the method applied in construction project using cavity walls.

In the event of the above investment the planning decision refers only to the parameters of architectural and urban planning, instead analyzed additional conditions other than previously existing context of the building.

The above example shows that the standard approach applied in such a complex investment turned out to be insufficient, and the planned construction works could cause irreparable consequences for the environment and would make impossible to take any subsequent preventive action in this matter.

Merely performing the additional hydrogeological studies could give a full picture of the situation. It was also presented that the results of the study may question the financial legitimacy of the implementation, as in the case of negative results the complete change of profile of the investment would be necessary. In fact without an underground garage residential development would probably be unprofitable especially in the view of high costs incurred for the purchase price in such a strategic location in the city. Thus, the investor has been deprived of choice and in return 'sentenced' to the selection of an unexpected solution. Ultimately, to maintain the whole investment it was necessary to change the function of buildings to the office one thus less favorable concerning the context of this part of the city. Paradoxically, skipping the groundwater issues, recognized as not planning assumption led to selection of less favorable urban solutions [5].

Therefore, evidently the zoning conditions for the areas with higher risk of natural hazards or extremely valuable for the city should apply the obligation of carrying out a specific range of geological and hydrogeological studies in order to recognize the subsoil. Obviously, this incurs certain costs but disproportionately smaller than the investment ones.

The relevant solution would be to create a database system with the ground conditions details which would greatly speed up an entire investment process, minimizes financial risk or improves design works. In addition, it could also be the perfect promoting and investor's drawing factor since the city possessing such comprehensive planning documentation could parallel simplify the entire building construction procedure, that will become much more attractive for the future investments.

#### 4. CONCLUSION

Typically, the basic criteria defined in planning decisions are: the architectural and urban

parameters, determining acceptable size of buildings, their height, form or building area.

On the contrary with above remains the example discussed in this article which proves that the investment can be completely dominated by the land operational parameters not established in the legal decision. These parameters are strictly essential at the stage of developing the architectural and structural solutions, that usually reflect the existing building conditions. If planning decisions determine the underground building, it shall also contain the guidelines for geological or hydrological area. Additionally, in case of complex terrain conditions, the these architectural criteria should be described in a way that does not prohibit the investment integrally thus showing the possible directions to the investor that could freely decide the optimal course of investment.

In the example brought up in present paper there were several optional functions for the building from multi-family housing with a different combination of usable space and associated underground parking to office one. Any change of features would result the commencement of the administrative procedures of obtaining the required approvals or legal decisions. Consequently, issuing that decision required the new time-consuming results of research that in turn equals the suspension of the investment and had major financial implications for the investor.

In contrast, the development of specific ground parameters at the design and planning stage would greatly accelerate the investment process and thus gave better control over the correctness of applied urban solutions.

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