Revitalization of Post-mining Excavations at the Diving Center in Sulejów

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Abstract
The aim of this article is searching for the answers to issues of re-use of the inoperative post-mining excavations, which, at the time of their activity gave as a result of its production - important building material, and work for the immigrant population. It made them main actors in process of creation of the city. Proposed in this study conception of Diving Center building, in the context of a revitalization of the former Lime Industry Department in Sulejów. Municipality Sulejów characterized by the presence of numerous minerals, inbetween: sand, gravel, limestone and marl.

Economic history of the city is closely connected with the mining of raw materials. The town became famous for the production of lime, which was initially artisan way fired.

In the second half of the nineteenth century, Sulejów became an important center for the lime industry, and in 1901 started its activity Limestone Mine Sulejów, which also specialized in the production of lime-kilns.

Old mine, today in the form of a deep stone-pit, filled with crystal clear water, due to its natural attractiveness, become as a natural recreation's attraction, often visited by divers and anglers, as well as walkers.

The area is rich in resurgent fauna and flora, and their habitats are numerous kinds of birds and fish, as well as beavers, deers and hares. One of the excavations, commonly known as "Lime", due to the direct neighborhood of the Pilica Valley and Sulejów National Nature Park areas were protected by the nationwide Natura 2000 program.

Key words: transformation, revitalization of the stone-pit, city of Sulejów, the National Nature Sulejów Park.

Introduction
The aim of the study is to create in abandoned mine limestone quarries in Sulejów a conception of Diving Center, which carry a spatial composition of the new value of the selected area. The main aim of the concept is an attempt to extract the landscape values at the same time respectful of the surrounding nature. The project aims are to increase the importance of the tourist area and the number of visitors, as well as the presentation of the National Nature Park. The form of the building of the Center will be a recognizable part of the landscape, which at the macro level will be associated with Park, while at the micro level will be associated with its use.

Methods of research
The study will be presented as a first step – inspirations based on world famous example, and as a next step in more details the study area with analyzes with motivation, aimed at bringing the issue of the scope of work.

In the next stage of work there will be presented description of the design solutions adopted and the idea of the whole project in the context of the real situation of the place.

For the easy understanding of the research method, description has been attached by graphic material, whose job it is to bring shown assumptions.
In the final section there was drawn up a description of the architectural-construction solutions adopted and summary of the basic parameters of the object. Development completed the presentation of its conclusions.

**Results**

A limitation to the revitalization activities is, in a sense the legal aspect, lack of money for their adaptation to the new features, and, perhaps above all, a lack of vision. The size and location of the objects are often limitation in the actions of future investors or developers.

Trying to interested potential investors in the capabilities of this type areas and encourage them to similar initiatives arose from my participation some interesting suggestions for revitalizing objects in this category. Here is presented a short presentation of these studies.

**Inspirations.** The inspiration for the given topic of the post mine limestone quarries in Sulejów revitalization were conducted studies of objects already designed. The most interesting cases include the located in the Songjiang Tianmenshan Mountains, close to the Shanghai in China Hotel InterContinental Shimao (Fig. 2). Object completed between 2012–2016, based upon the architectural design coming from the Atkins Atelier – New Britain.

![Fig. 1. Visualization of the InterContinental Shimao Hotel (Source: author)](image1)

This five-star hotel is designed inside of the 100 m deep abandoned quarry on the Tianmenshan's slopes, in the Songjiang, near Shanghai.

The concept uses the natural terrain. The hotel itself consists of 19 storeys and provides 400 beds (Fig. 1). The two lower floors are located below the water surface. The guests of the local restaurants designed there, will be able to enjoy a 10-meter deep aquarium. The project also includes additional features inbetween: luxury banquet halls and bars and sports halls. Designers also predicted a lot of attractions for fans of extreme sports, like bungee jumping and wall climbing.

Estimated construction is expected to be final in the beginning of 2017, and the cost of the investment will be $ 552 million.

![Fig. 2. Visualization – night view of the InterContinental Shimao Hotel (Source: author)](image2)
Motivation to choose this location. The motivation to create the concept of the Diving Center at this location became the influence of many factors, which was analyzed thoroughly, and tied into a logical whole. The main stimulus to the given topic, has become a problem due to the sale of part of the area "Lime-Wapiennikowa" to a private investor who has plans to transform the mine into dangerous waste landfills (Składowisko odpadów..., 2013). However, the investment was stopped by the intervention of citizens and national media. The problem was publicized, and it got into the hands of the court.

The concept of designed the Diving Center in the area of the quarry, is an expression of opposition to the planned by the current owner investment, as well as the proposal to create ecological alternatives for this area, which will affect the development of tourism in the region and attract Sulejów not only actively interested in diving whole Polish population, but also European countries.

Another factor in favor of the location of Diving Center in the "Lime-Wapiennikowa" is the fact that the reservoir itself is very popular among divers.

After combining the above aspects, a concept of creation in central Poland first Diving Center, which not only would solve the divers’ problems, but the Sulejów too, with growing lack of development of local tourism.

A few years back, in municipality there were several prosperous centers providing these services into the field of daily, weekend and long term stay recreation, up to the visualization of the problem of lack of demand caused by pollution Sulejowski Lagoon.

Turning attention to the diving bases problems, and analysis of the above factors, it was possible to develop the concept of the object that combines all the necessary features to create the perfect Diving Centre, additionally located in central Poland, with good possibilities for travel, and communication crisscrossing around Sulejów (Plan sytuacyjny..., 2011).

Here is presented the location in relation of the Sulejów to the position of the cities, where there is the largest number of residents actively interested in diving in this location (based on the analysis of his own) – Fig.3.

Location. General characteristics of the post-mining excavations in Sulejów

The area, which was adopted as an ideal location for the planned Diving Centre, is the therein of the old mine that once flooded by the nearby river, created the zone of lake, now ideal for the development of water tourism (Fig. 4 and 5).

Flooded mine's equipments and the beautiful structure of the walls surrounding the quarry, they give extraordinary conditions for the uprising of this Diving School place. The area is distanced just a few kilometers into south from the Sulejów city. It is a kind of a secluded place where it's possible to relax from everyday city noise. It is also characterized by exceptional natural values, rich fauna and flora. It is proved by its location – the area covered by the project, directly adjacent to the richly forested valley of the Pilica River, and the Sulejów National Nature Park. Parts of the proposed area are located on the western part of the quarry, with access to the bay. Its surface area is 3.43 ha.

Natural values of the municipality, in particular the shape of area, the high forest cover and the nature of the terrain of a valley situated in the main ecological axis of the Pilica River, highlights not only the projected area, but the whole municipality of Sulejów.
Nature has equipped the area in solid minerals, in particular – limestone. The chosen plot has an irregular shape, the difference in level is about 8 m. The terrain is leaning towards the south-east, this section is reduced by approximately 6 meters.

According to a local plan of conditions and directions of spatial management, in terms of dynamism of the function and socio-economic development in opening green belts, as well as the intensification of the development of weekend tourism, residence and holiday housing, which speaks in favor of the draft of presented concept (Fig. 6).
**Solution design – Diving Center. General information and argumentation.** Designed building, in addition to professional facilities of the dive base, also includes features of the hotel, restaurant, training center for all levels of diver education, as well as the shopping facilities with professional equipment and well-provided with equipment rental.

The main way of the concept is the minimalism and simplicity of the form. The task is a summary of all above areas in the form of a single-storey building in the shape of several cuboids which combined in perfect harmony, creating outline of the shoreline of the western part of the quarry. The whole is a combination of the inner zone of the building, with directly adjacent to the outer zone, which consists of a wooden platform, located at different heights above the water level (Fig. 7 and 10).

The external form of the object, designed to visually do not reduce the extremely rich in natural beauty of the existing state of land. The designed building has no negative impact on the environment, people and the immediate surroundings.

Expected structure will be based on a combination of:
- Water
- Limestone rocks
- Green existing and planned
- Glass
- Wood

The building is functionally divided into two parts: wet and dry (Fig. 9 and 10.). Part of the wet is designed on the diving base and areas it supports. Part of the dry is characterized as the representative for the whole complex. The complex consists of objects intended for use all year long (Fig. 8.). Part of the base rising for users interested in diving. Part of the dry is an open zone, accessible to all visitors. This is to eliminate the costs associated with periods of reduced diving activities. At this moment basics of use will be the representative part, which is "to make money for all centre". In this aspect, it will be possible to use the hotel rooms, restaurants, shopping centre as well as renting conference rooms and training.

![Fig. 7. Elevation of the centre – south direction](Developed by arch. Kamila Forczmanowicz)
Fig. 9. Level "0" – division of the building into zones. Diving base zone (blue), Main, open zone (violet), technical-service zone (grey) (Developed by arch. Kamila Forczmanowicz)

Fig. 10. Elevations of the centre – north(top) and east(bottom) direction. Visualizations of the exterior (top left) and interior (bottom left) (Developed by arch. Kamila Forczmanowicz)

**Conclusions**

Historical factors of the creation of the cities are very different. Quite often, the existing environment was the light motive of the forces for development. Indisputable influences had a choice of the location. Location on the main trade route gave an opportunity for economic growth. Location on the water – performing the functions of life and the defense allowed dynamically developing of the urban tissue due to the growing number of residents.

Other significant factors were also production – the location of agricultural areas, the deposits of ores and minerals, neighborhood near the mines gave employment, and better opportunities for existence.
For Sulejów – a city that owes its development to the mine, as in many other cases currently greatly affected by the lack of production. An additional problem is the existence of the difficult to secure, and hazardous to humans and animals post mine therein, without any possibilities of rational re-use. Considerations of economy, lack of vision or their bad determination by investors is an essential component of the stabilization process of the negative state of affairs.

Presented the concept draft gives new value to the Sulejów city and the National Nature Sulejów Park.

Its main purpose is to add spatial values by introducing new anthropogenic forms of nature, which over time can become a symbolic place. The proposed infrastructure will also contribute to increase the number of visitors to this area in summer and winter.

The measures taken could be used to promote the region and to promote a healthy lifestyle. Multi-functional part of this conception has been adapted so it’s possible at any time alter their functions and adapt to the needs of customers.

Project of the Diving Centre in Sulejów could be a part of the harmony of the landscape and is a very interesting solution for tourist development area, which would give a chance to the Sulejów city to change the profile of the industrial city on the touristic one. The introduction of this type of interference with the existing landscape can be called revitalization of post-mining excavations.

List of literature