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ARCHITECTURE —
AND — **SUSTAINABLE**
DEVELOPMENT —

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ARCHITECTURE AND SUSTAINABLE DEVELOPMENT 18

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PREFACE

It is our great pleasure to present this collection of contributions representing the current situation in approaches to breathing new life into unique buildings and sites. The peer-reviewed conference papers in this collection were written by European doctoral students and professors.

The collection is divided into two sections (one having two subsections):

- I. New Life of Unique Objects and Entities
 - Industrial Heritage
 - Other Structures and Sites
- II. Innovative Structural and Technical Solutions

The conference from which these papers were drawn was held in Prague on October 5, 2018, and was organized by doctoral students with the support of professors from Czech Technical University (CTU) in Prague's Department of Architecture, Department of Building Structures, Department of Indoor Environmental and Building Services Engineering, and Department of Urban Design, Town and Regional Planning. The conference, entitled **AUR18 – Architecture and Sustainable Development 2018**, follows previous conferences organized by the CTU Department of Architecture. The venue, a former factory, was chosen as a space representing the spirit of the topic.

We strongly believe that this publication will help students in their future work, open up further discussion, and offer reliable solutions. We would like to thank to all participants and guests for their collaboration.

Jan Bartoníček
Anna Marie Černá
Aleš Vaněk

CZ

Výkladové slovníky nám pojem konverze vysvětlují, že se jedná o přeměnu, změnu, obrat a přeneseně změnu názorů vůbec, obrat v smýšlení. K těmto pojmům autor vybral a přiřadil stavby z Barcelony, Kolína nad Rýnem, Amsterdamu a jižní Moravy. Je vynechána konverze průmyslových staveb, autor se zaměřuje na přeměnu kostela, fary, umělecké tiskárny a národního muzea. Vybrané stavby změnilly svou původní funkci a nově byly doplněny dostavbou.

Kromě popisu úprav těchto budov je upozorněno na vývoj a délku procesu hledání nového využití, nových náplní, úprav, hledání sponzorů, seznamování se záměrem představitele měst a obcí včetně široké veřejnosti. Vybrané realizace jsou Fundació Tàpies, Kolumba, Café Fara a Rijksmuseum z období 2007 až 2013.

- ***přeměna** Sídlo Fundació Tàpies a galerie díla katalánského výtvarného umělce v Barceloně. Výstavní a další prostory vznikly z bývalé umělecké tiskárny, kterou by zde už málokdo poznal.
- ***změna** Může se kostel proměnit na muzeum výtvarného umění? Zcela jistě se to podařilo v případě Kolumby v Kolíně nad Rýnem. Novému využití původní stavby předcházely úvahy trvající několik desetiletí.
- ***obrat** Je možnost, aby se podobně jako kostel i fara stala objektem nového využití? Fara v malé obci na jižní Moravě? Ano, podařilo se, a Café Fara je dnes proslulá v celé naší republice.
- ***změna názoru** Obrat ve smýšlení. Obrat nad tím, co je vstup do budovy nastal u vedení proslulého Rijksmuseum v Amsterdamu. Realizace vítězného architektonického návrhu nových vstupních prostorů muzea je na úrovni 21. století a jsou svým uspořádáním velmi vstřícné k návštěvníkům.

EN

Dictionaries explain the concept of conversion as a transformation, change, turnabout and a change of opinion at all, a turning point in thinking. To these terms, I choose and assigned buildings from Barcelona, Cologne, Amsterdam and South Moravia. I missed the conversion of industrial buildings, I deal with the conversion of church, parish, art printers and the National Museum. Selected buildings have changed their original function and have recently been complemented by a completion.

In addition to describing the modifications to these buildings, I would like to draw attention to the development and length of the process of finding new uses, new contents, modifications, sponsors' search, familiarization with representatives of cities and municipalities, including the general public. Selected projects include Fundació Tàpies, Kolumba, Café Fara and Rijksmuseum from the period 2007 to 2013.

- ***Conversion** The seat of the Fundació Tàpies and the gallery of the work of a Catalan artist in Barcelona. Exhibition and other spaces were created from a former art print, which is rarely known.
- ***Change** Can the church turn into a museum of fine arts? This was certainly the case for Kolumba in Cologne. The new use of the original building was preceded by reflections lasting several decades.
- ***Turnabout** Is it possible, like the church and the no-one, to become the object of new use? Not in a small village in South Moravia? Yes, it was successful and Café Fara is now famous throughout our country.
- ***Change in thinking** Turn in mind. The turn of what is the entrance to the building took place at the management of the famous Rijksmuseum in Amsterdam. The realization of the victorious architectural design of the new entrance areas of the museum is at the level of the 21st century and they are very friendly to visitors.

Keywords: conversion; change; turnover; change of opinion; museum; foundation; parish; church; entrance

1 Conversion

A cultural centre and museum dedicated to the work of Antoni Tàpies, Catalan artist.

The foundation's building – Fundació Tàpies [Fig. 1, 2] – is incorporated into one of the building blocks which create the typical grid-like pattern of streets in Barcelona.

The foundation has been established in 1984 to promote study and knowledge of modern and contemporary fine art. It hosts exhibitions, symposiums, lectures, and also publishes books. In 1990, the foundation acquired this building which formerly served as an artistic printing house, located near the famous square Plaça de Catalunya. So, it only took six years for the foundation to move into its permanent seat. The building's project dates back to 1879 and it was built in 1882 according to principles of Catalan Modernism, combining exposed bricks with steel and cast iron. It resembles industrial buildings and gives away the original function of a printing and publishing house. The author of the project was architect Lluís Domènech.

The place gained today's appearance of the interiors and a new construction in the courtyard in 2010, both designed by Ábalos + Sentkiewicz architecture studio. They improved safety conditions in compliance with new regulations, especially concerning fire escapes.

They preserved cast-iron supporting columns and ceiling lighting from the original printing house. Newly renovated interiors perfectly match the current trends for exhibition spaces. There is a library for studying the works of Antoni Tàpies. All the necessary facilities and offices are moved to the extended building.

1 →



Fundació Tàpies, Barcelona
www.fundaciotapies.org

2 →



Fundació Tàpies, Barcelona
author's archive

On the roof of the extension, there is a terrace for the visitors to relax. Fundacio Tàpies foundation displays not only Tàpies' own work, it hosts exhibitions of other artists and various events as well. For example, there are modern dance and theatre performances organized in the exhibition space.

This modern conversion from a printing house into an exhibition space and the foundation's headquarters did not touch the façade, which is now a declared historical monument. All the interventions concentrated on the interior and the extension in the courtyard. Behind an almost mundane façade, there is a hidden example of a contemporary architectonic approach to buildings' conversion. The work of an artist belonging to the best of the 20th century fine art can fully resonate in such interior.

Transforming the Publishing House into a seat of Foundation and museum.

Architect Ábalos + Senkiewicz, Madrid, Spain

Location Barcelona, Spain

Founding of the Foundation 1984

Opening a renovated building 1990

Editing the building to its present form 2010

2 Change

In the city centre of Cologne, an extraordinary centre for art and culture has emerged. Today, at a place with a rich history dating back to the ancient Rome, there is a structure of contemporary architecture connected to the old times, inviting to reflect on fine art and the history of humankind. This structure is Kolumba – museum of art. But not that kind of museum we are used to. Kolumba is an aesthetic laboratory, Kolumba is a museum of contemplation.

3 →



Kolumba, art museum in Cologne

www.kolumba.de

The area, this building was built in, stands for 2000 years of history, including Roman excavation site, Romanesque and Gothic churches and ruins left after the Second World War. In the 1950s, a chapel was by the architect Gottfried Böhm on the site of the former St. Columba church. That is also where the museum's name came from. By the way, the first mention of St. Columba church dates the way back to 980.

Such a place needed without a doubt an extraordinary building that would somehow emphasize its significance. Some long years, in fact from the 1970s were spent by thinking and searching for the content of the designed building, and a unique programme of annual exhibitions has come up – a confrontation of antique and contemporary fine art.

In June 1997, the results of the anonymous architectural design competition were announced. The competition was open for all architecture studios in Cologne and surroundings together with seven invited European studios. The jury voted 12:1 for the architect Peter Zumthor to win the first prize. More than ten-year-long period of designing and construction started. Construction work of the new Archdiocese museum took place from 2001 to 2007. The main material of the new building is fair-faced brick. For Kolumba, Zumthor designed a special brick that in terms of colour, format and way of bonding correspond with the preserved parts of the building. The bricks are of a light grey cement hue.

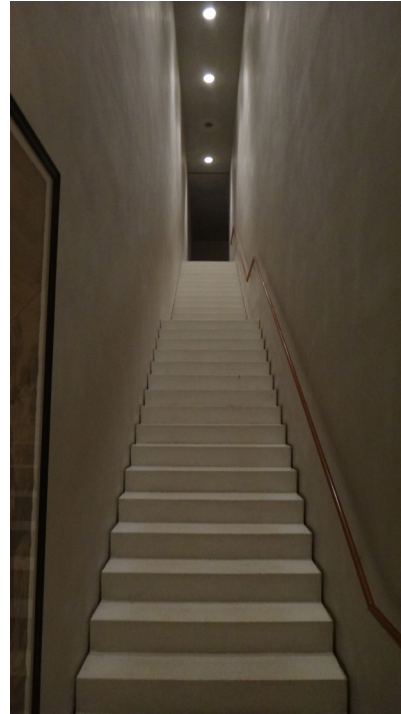
The new building rises from the ruined walls of the church. It consists of multiple exhibition spaces of a various height. Interesting elements are narrow, long staircase and a small number of large windows. One of them has a view of the Cologne cathedral.

The museum building covers the excavations. The museum has a simple, unsophisticated entrance. It is followed by a minimalist ticket counter, publication sale and cloakrooms.

The building has only three storeys, the floor is concrete, and the indoor walls have a fine concrete screed of a very pleasant light grey colour, so it does not interfere with any of the displayed art pieces. An unexpected feature of the museum is the lack of café which only emphasizes the intention not to let the visitor get distracted from the art. Moreover, in the second floor there is a library offering the visitors a place to think, it is furnished with comfortable leather armchairs and small coffee tables where you can study some books chosen depending on a current exhibition. The library space is quite small, clad with walnut tree panels. The quality and cosiness of the space is complemented by a tall window going across the whole width of the room.

A different intent in displaying fine art, interesting management, used materials, details of the building and the architecture all make, it is a museum of contemplation [Fig. 3, 4].

4 →



Kolumba, art museum in Cologne
author's archive

Change of the former church to the Museum of Fine Arts.

Architect Peter Zumthor, Haldenstein, Switzerland

Location Cologne, Germany

Competition 1997

Construction Period 2001–2007

3 Turnabout /almost unwanted/

Is it possible for a church or a clergy house to serve as something else? When it comes to a clergy house in a small village in South Moravia? Yes, indeed, it was a success and nowadays Café Fara is well-known all over the Czech Republic [Fig. 5].

A clergy house next to a church. Mostly common image of many villages in our country. A simple clergy house complemented by an extended building. A modern extension in a traditional style of the Czech countryside. At first sight based on a shape of barn in an elongated floor plan with a saddle roof. All of that in a size corresponding with the scale of surrounding architecture. Although they at first intended to open just a small café for the people from the Klentnice village, mostly for the neighbours, nowadays it has become a popular complex consisting of several buildings. The clergy house was renovated and opened in 2009. It is situated right next to the St. George church. Both the buildings were built during the reign of Joseph II and the style is characteristic of late Baroque. The house is a single storey building with a rectangular floor plan built in 1785. The original use corresponded with the priest and clerk functions. In the past, the clergy house had a cowshed and a barn on the side. Today, in their place there are modern extended buildings – a guest house, a shop with products complementing the café and an entrance to the cellars. It was all built in an elongated floor plan and it created a small courtyard around a tall walnut tree, with a garden at one end.

The clergy house – the simple building with original layout - fully meets the requirements needed to run a café. After 224 years, the clergy house changed its function from an administrative to a social one.

The guest house – the new building consists of nine rooms with modern interior where a cowshed and a barn were once. The building including the roof has a cladding from vertical laths from larch wood.

5 →



Café Fara, Klentnice
www.cafefara.cz

Turn in the use of the building. From the Cafeteria to the Guest House.

Architect Marek Jan Štěpán, Brno

Location Klentnice, Czech Republic

Design work 2008–2011

Construction Period 2009–2015

4 Change in Thinking

Change in thinking. Reflecting on what an entrance to a building actually is. The world-famous museum of fine art Rijksmuseum in Amsterdam [Fig. 6, 7] was built in 1885, designed by the Dutch architect Pierre Cuypers. The building had two functions – a museum and, at the same time, an entrance gate to the south part of Amsterdam. That brought about an interesting element, a pedestrian walkway across the museum's ground floor.

The museum was built as a solitary building with a brick façade with a central floor plan with two roofed inner atriums.

The building's character resembles the National museum in Prague. However, unlike in Prague, it roofed both atriums already within the original project by rather large glass roofs.

The museum's high attendance numbers called for new expositions. Winners of the invited architectural competition for a new layout of the museum were Cruz y Ortiz architecture studio from Sevilla, Spain.

The exterior of the building remained unchanged, whereas the exposition space changed completely. The most substantial change was in the entrance. The new entrance hall connects both the original atriums by lowering the floor under the ground, below the water level of the Amsterdam canals. The daylighting is also preserved, and it greatly enriches the space.

The entrance to the museum is placed from the pedestrian walkway mentioned above which goes through the ground floor. The hall provides the visitors with all the comfort of the 21st century. Ticket counters, information, multiple cloakrooms, toilets, museum shop and a roomy café.

An undisturbed visit can be enjoyed also owing to the acoustic treatment. Both atriums have a space (as high as the buildings) where steel constructions with acoustic boards are hung in the air. The constructions consist of rather slender rods, so they do not spoil the impression from the spectacular space.

In my opinion, the sequence of entrance – information – ticket counters – cloakrooms is very well designed [Fig. 6, 7]. A visitor finds the shop and the café without hesitation, they are also comfortably accessible, without doors. The shop is a little bit lower than the floor of the entrance hall. The café is situated right above

6 →



Entrance hall, Rijksmuseum, Amsterdam

www.rijksmuseum.nl

7 →



Entrance hall, Rijksmuseum, Amsterdam

author's archive

the shop – on its roof. All of the rooms and spaces are accessible by elevator.

The construction process must have been complicated and demanding but new entrance space deserves to only get the best. After all, having professional divers present at the construction work is certainly not so common. Correspondingly, the overall cost of the Rijksmuseum reconstruction amounted to ten billion Czech crowns.

Change in thinking. New expositions, new entrances.

Architect Cruz y Ortiz, Sevilla, Spain

Location Amsterdam, Netherlands

Competition 2001

Design work 2001–2013

Construction Period 2007–2013

Other references:

[1] www.fundaciotapies.org

[2] www.abalos-sentkiewicz.com

[3] www.kolumba.de

[4] www.cafefara.cz

[5] www.atelier-stepan.cz

[6] www.rijksmuseum.nl

[7] www.cruzyortiz.com

CZ Autor článku se zaměřuje na vybrané stejnosměrné veřejné elektrárny postavené na území budoucí Velké Prahy na konci 19. století. Tyto výrobní objekty popisuje s ohledem na původní funkci. Dívá se na ně pohledem aktuálního stavu objektů a jejich současného využití. Neopomíná fenomén okamžité konverze na počátku minulého století, kdy všechny tyto objekty byly ihned nově využity. A to po ztrátě své původní funkce, po dostavění a přivedení elektrické energie z Holešovické elektrárny. Autor hodnotí architektonické a urbanistické hodnoty, které se zachovaly do dnešních dob na vybraných jednoúčelových objektech.

EN The author of this article describes selected direct current public power stations built on the territory of so-called "Great Prague" at the end of the nineteenth century. The article describes these production buildings from the perspective of their original functions and in light of their actual states and current utilizations. The phenomenon of instant conversion at the beginning of the last century, when all these buildings were immediately used, was common to all buildings described here. And even after the loss of their original functions, after building completions and after the bringing of electricity from Holešovice power station. The author assesses architectural and urban values which have been preserved up to the present in selected single-purpose buildings.

Keywords: direct current power stations; conversion; genius loci; Prague

1 Introduction

The first power stations on the territory of today's Czech Republic are associated with František Křižík, because he was a supporter of direct current (DC) and – even in the period when alternating current (AC) was introduced – he did not give up on "his" direct current. This is the reason that lightning and transport (trams, trains) are associated with power stations. Foreign companies tried to enter the market and electrify the Czech Republic, but they were not successful because Křižík offered intentionally lower prices.

DC power stations at that time, the end of the nineteenth century, only produced electricity. Later, they also produced warm non-potable water or steam as a residual product.

The shape of any power station is directly influenced by their original individual function. The final shape and dimensions correspond to the exact functional requirements for a space, including consideration, such as the size of the fuel storage, boilers, turbines and generators. The dimensions and the dividing of power stations define the volumes of the energy and fuel which can be produced. Therefore, these buildings often do not have smaller dividing elements such as lighting and entrance openings. Only basic shapes remain. [1] The scale of DC power stations at the end of the nineteenth century were not significantly more advanced than the surrounding built-up areas, and the volumes of energy produced were not large, because they provided a local source of energy for a relatively small number of subscribers. So, in terms of architectural expression DC power stations were typical small

Name	Křižík Power Station in Žižkov [5,6]	Electrical Central Station in Karlín [7,8,9]	Power Station in the town of Smíchov [10,11]
Location	Koněvova 1730	Pernerova 31, No. 378	Svornosti 952/19
Source of energy	gas	coal	coal
Put in operation	1. 12. 1889	1895	1.10. 1897
Initial aim of the power station	For lighting of offices and the yard of gasworks	For local works, factor	For local works, factories
Year of the partial ending of power station operation	1912	1939	1924
Year of the full ending of power station operation	1925	1941	1927
Influence of František Křižík	yes	yes	no

Selected direct current power stations in Prague

industrial objects when compared to the large AC power stations of the twentieth century.

DC power plants built on the territory of today's Prague have basic features in common: it is a one-story high hall with large industrial windows, a low structured façade, and a dominant chimney. These also halls typical include both an engine room and a boiler room, and this division is not to be found on the facade. These architectural aspects are not typical for other DC power plants built at the turn of the nineteenth centuries into the twentieth that I have explored in other countries. The reason could be that these power plants were intended not only provide energy for a limited number of electricity customers in individual Prague cities, but a much larger number of potential customers with diametrically different demands. An example, it can be mentioned such as the Edison Electric Light Station (London, UK) [2], the Pearl Street Station (NYC, USA) [3], or the Ultimo Power Station (Sydney, Australia) [4].

Based on author's experience, it is possible to formulate general principles to be followed in conversions. To illustrate these principles, three DC power plants were selected in the territory of Great Prague for which conversion has already been made: the Křižík Power Station in Žižkov, the Electrical Central Station in Karlín, and the Power Station in the town of Smíchov. The principles were formulated using an inductive process, generalizing specific author's experiences.

2 Selected Prague Power Plants

2.1 Křižík Power Station in Žižkov

The Křižík combustion power station in Žižkov has the first power station in Prague and on the territory of the Czech Republic, and therefore, the most attention is paid to it in this article. The power station came into existence 8 years after the first power station in the world, Thomas Alva Edison's put operation in New York. The first fully put into operation public power station in today's Czech Republic was a hydroelectric power station in the town of Písek in 1888, located in a former mill house. The architect of the first two Czech power stations was František Křižík. [5]

The first DC power station was the Žižkov gasworks in 1884. In the beginning, production of electricity was provided experimentally in the building of the gasworks. The character was more likely experimental-scientific than production itself. [5]

The building project had to be approved by the town council of Žižkov. The decision of the Žižkov town council from 27th February 1889 for the construction of its own municipal power station provoked protests in the Prague municipality and was commented as "hasty". The real reason was an expected loss of Žižkov as a significant customer of the municipal gasworks. The gasworks in Žižkov in today's Seifertova Street, belonged to Prague. [5]

The inhabitants of the adjacent flats and the owners of the neighbouring houses withstood, discontentedly, the presence of the power station. The power station smoked unpleasantly and loused numerous ground tremors. [5]

In this town power station, the electricity was produced by gas combustion in a steam engine, which drove a dynamo to produce direct current. Therefore, it is mentioned in technical texts more oft under the name of an electric central station (the engine produced electricity, not the turbine) [6]. The technological equipment at the beginning of operation included one sloping steam engine with 60 HP, and two dynamos. Even in 1910, two engines with each 200 HP and one 500 HP engine were still operating. [7]

The power station was in full operation until 1st December 1889. Design and implementation was done by František Křížík. Less than a year later, at that time independent town of Žižkov took control over the operation of the power station. The first director of the power station was Pavel Bauše, Emil Navrátil in 1895, future professor and rector of Czech Technical University (1928), and co-founder of the National Technical Museum. [5]

At the time it began operating, the power station served 2 subscribers and powered 32 arc lamps for public lighting. But in 1910 the power station already had 1 800 subscribers (shops and households), and the streets were lighted by 155 arc lamps and 300 light bulbs. The operation of the power station ceased in 1926 after introduction of electricity from the Holešovice power station. [5]

The street lightening of Žižkov was a pioneering act, because in Prague itself permanent electric lighting of streets was only installed five years later, on Wenceslas Square (powered by the power station in Sokolska street). [5]

In 1912, transformers were added to the power station building. Thanks to that, the power station partially served to produce

1 →



View of the Žižkov power station chimney, the power plant hall visible only partially and just behind the chimney

<http://www.ceskatelevize.cz/ct24/archiv/1370073-prvni-verejna-elekt-rarna-v-ceskych-zemich-v-provozu#&gid=1&pid=1>

2 →



Current state of the power plant

author's archive

electricity until 1925, when distribution technology for electricity was relocated in more suitable buildings and the former power station was left empty. [5]

Architect Karel Paul proposed a new use of the space. He designed the reconstruction and extension of the complex of buildings into a market hall. It was opened on 26th October 1931 and included an administrative and residential building in the street line itself. [5]

The building of the market hall with the building entrance forming a small piazzetta, was a unique “breathing” space, in construct to the original industrial “urbanism”. The original hall of the power station, 13 m wide and 52 m long, was converted into two halls.

Natural lightening of the halls was provided by a ridge skylight. The market hall was ventilated and heated. Heating was provided by three aggregates.

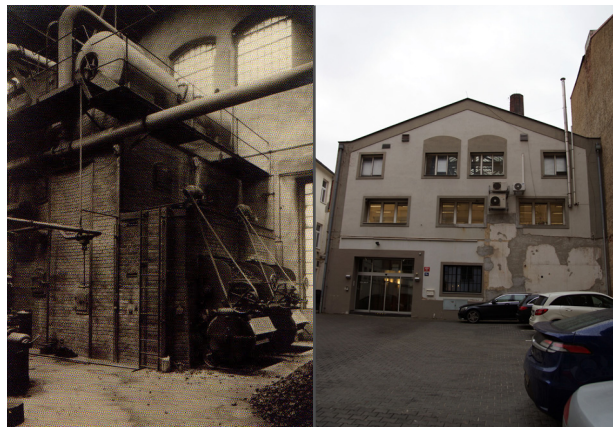
Since the beginning of the 1990s, when the areal changed ownership its various uses have changed. Today, a wellness centre and a bowling alleys are run on the premises of the original power station and gasworks. The back part of the building is accessible from a side street, where there is also now a music club with the poetic name, STROM (TREE).

There is nothing left of the original architectural expression of the power station, neither the original volume, openings nor even a chimney. The attentive viewer will not miss the very strange “conglomerate” of buildings in the back wing. This conglomerate of shapes in the back wing, taken from outline of the building of the original power station, has no architectural and urbanism value. Currently, the complex is owned by an Italian company which is considering demolition of the existing buildings for a hotel.

2.2 Electric Central Station in Karlín

The Electric Central Station in Karlín was built by Václav Nekvasil's construction company between 1892 and 1895. The main function of this power station was the electrification of Karlín. František Křížík also participated in the building of this power station. The primary purpose of this DC power station was for the street lighting. The secondary use of the residual steam from four operated boilers later was a steam spa, built in 1912. It is the first public steam supply in Prague. This building closed a plot of land and “hid” the power station in an inner courtyard. In the building itself, steam was used, also for laundry. The spa was in an Art Nouveau building designed by architect Josef Sakař, and it was used until 1934, when it was converted into flats. [8, 9]

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The original equipment of the Karlín power plant

<http://podzemi.solvayovylomy.cz/techpam/elkar/02.JPG>

Current state of the power plant
author's archive

In 1914, the power station was widened and modernized with new steam boilers having generators for electricity. The power station was connected to the distribution networks of Prague in 1922 after completion of a transformer station and a substation. Since 1939 (some document sources mention 1937) this building was only used as a transformer station. [8]

After World War II, the former power station was used as a repair shop for transformers. Today, there are warehouses, offices, and studios in the building. There are still flats in the former spa building. [8]

An eight-sided 30-meter-high chimney has been preserved up until today although it has been modified. In 1960, it was statically fixed, and in 2016, it was covered with sheet metal. It is a dignified reminder of the original purpose of the building, although the original character of the building does not remain because of the influence of major reconstructions. [10]

2.3 Power Station in the Town of Smichov

The power station in the town of Smíchov started operation on 1st October 1897. Smíchov like Žižkov, had its own power station earlier than Prague itself. This is the reason why its distribution network was direct current until 1930. [11]

The Smíchov Power Station was built under the design by architect František Šafránek, with a one-story hall with fair-face brickwork in the neo-Renaissance style. Typical for that time, the building had industrial, large windows forming the window openings. The interior technology was delivered by Robert Bartelmus's Electrical Company from Brno. The power station produced direct current for lighting the town as well for private use. In 1909, a two-story office building, designed by Karel Hajný, was built on the object.

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The original equipment of Karlín power plants

<http://www.industrialnitopografie.cz/karta.php?zaznam=V003911>

Current state of the original power plant in Smíchov

author's archive

In 1926, architect František Vahala increased the office building and rebuilt it for residential purpose. [12]

The annexation of Smichov and other independent towns to "Great Prague" in 1922 marked the begin of the unification of urban infrastructure. The Electrical Companies of the Capital City of Prague formally took over the Smíchov Power Station on 12th December 1922, but rebuilding begin prior to that. Since 1923, the Smíchov Power Station is part of the Electrical Companies of the Capital City of Prague. [12]

The first cascade converter for trams with 450–500 kW was put into operation on 18th May 1922, and the converting substation at Smíchov started its activity. On 11th December 1930, the production of direct current for private consumption stopped, but its boilers heated a nearby buildings until 1970. [11, 12]

In 2000, reconstruction of the 22 kV switching substation began and control cabinets were installed. One year later, traction transformers and rectifiers were reconstructed. Though they remained after the reconstruction from same material (silicon), they occupy significantly less space now. The interior of the substation was given an “optical change” in 2005. The company PRE-distribuce (in English, PRE-Distribution), owner of the object today, decided to use the floor-to-ceiling height of the former factory hall of the former engine room to placing one more floor, which that caused the original crane track to disappear. [12]

The Smíchov Power Station has been preserved in its original shape up to the present. During the reconstruction of the technologies, the facade was carefully reconstructed as well. The building still serves for electricity, so the spirit of the place is preserved. Therefore, it is valuable both for architectural and urbanistic perspectives.

3 Conclusion

Because of physical and technical reasons, the production and the subsequent transfer of direct current ended up being a futile pursuit. All DC power stations on the territory of Great Prague were built in span of approximately 10 years at the end of the nineteenth century, but it was not technically and economically possible to transfer direct current over longer distances, and DC power stations became obsolete. Since our ancestors did not live so consumable as us, in today’s “consumer culture”, no power station was demolished. On the contrary, all the power stations described here were repurposed, used as substations, transformer stations, as emergency power unit sources in case of failure of the Holešovice Power Station and eventually as a source of electricity for public transport. The buildings are now used as workshops, studios, offices, the seat of the company PRE, and as a distribution building.

These power stations are not well recognizable in the urban environment, they show themselves rather as inappropriate features of the city, certain “conglomerate”. However, in a future, more detailed study, we can recognize buildings of former DC power plants thanks to their slightly different scales, which differ from the surrounding built-up areas, and especially because of the size of their window openings, doors, and preserved chimneys. Their values lie in the preservation of their original characters and thus remind us the faded glory of the production of the direct current at the turn of the nineteenth century into the twentieth century.

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SK V príspevku sa zaoberáme problematikou site specific projektov a konverzií pre účely súčasných divadelných scén v priemyselnom prostredí. Konkrétne prechádzame rôzne príklady realizácií – Projekt, za ktorého zrodom stojí komunita hľadajúca priestor pre svoje kreatívne pôsobenie. Bez potreby jasného funkčného vymedzenia sa postupne vyvíja na základe meniacich sa potrieb. Tiež sa zaoberáme realizáciou, v ktorej si špecifický divadelný súbor nachádza vhodný objekt pre svoje pôsobenie. Tento objekt postupne vyplňa všetkými príbuznými odvetviami, čím vytvára vhodné tvorivé prostredie a príležitosť na ich spojenia. Ďalej sa zastavujeme pri site specific projekte, ktorého význam zaznieva výhradne v priemyselnom prostredí, železnice. A v neposlednom rade nastoľujeme otázku využitia rozsiahlych priemyselných areálov. S ohľadom na urbanizmus a verejný priestor majú všetky spomenuté projekty vplyv na nové formovanie oblastí, ktoré by inak zostali opustené, alebo sociálne vylúčené. Z hľadiska atraktivity sú tieto divadlá a inscenácie často veľmi atraktívnymi protikladmi k tradičným divadlám. Stávajú sa centrami nových scén, ale tiež centrami nových komunít.

EN In this article, site specific projects and their conversion to theatrical sites in industrial environment are described. Various examples of such projects are listed – a project of a community trying to find a place for their creative action. Without the need of clear functional specification, it gradually develops itself based on changing needs of the community. The article also deals with the project of a theatre company which found a suitable building for operation. This place is then filled with all other related forms of art, by which a creative environment is created. So a specific project is observed, its significance is accented mostly in the industrial environment – a railway. Last but not least, the article proposes

a question about using large industrial grounds. Considering urbanism and public space, all the projects mentioned influence shaping of areas, which would otherwise be left abandoned or socially excluded. These theatres and performances are often very attractive counterparts to traditional theatre. They become centres of new scenes, and also centres of new communities.

Keywords: Keywords: conversion; re-use; industrial heritage; theatre; performance; site specific; community

1 Industrial Environment and Theatre

In the past years, there has been a major increase in realization of site specific projects and multiple-purpose conversions in the Czech Republic as well abroad. These projects are often a combination of different cultural functions and they provide new opportunities for developing specific art types – visual arts, music, theatre and other creative industries. In this research scenic space and theatre are examined, since theatre is often an integral part of many projects focused on recurrent use of building facilities and campuses of industrial heritage. We can find the roots of this tendency in theatrical reforms accompanied by shifts in views of scenic space. During the 20th century theatre architecture has shifted from the forms of conventional theatre to unconventional forms. Authors are using deserted building facilities and city spaces more frequently apart from using newly built stages. A typical feature is the use of industrial facilities, such as old factories, station buildings, warehouses, abandoned coal storages, engine rooms, or buildings and grounds of former coal mines. New use of these can have the form of a conventional

theatre, or companies may use these premises only temporarily. In a large number of cases, theatrical function exists alongside other cultural uses of the premises in question. In each case, the industrial sites and theatre events are perceived in a new context. This fact is one of the reasons why we can see a rise in conversions from former industrial building facilities to theatres in the past decades. An analogical tendency can be seen in cases where the industrial environment is used for theatrical purposes only temporarily. Apart from the influence of the environment on formation of the stage, we can also observe a positive influence on new formation of spaces which would stay deserted or socially excluded. These connections will be exemplified on projects from three basic categories – transformation of a building facility to a permanent theatre site, a low cost project and a site specific performance.

2 Culture nod Stanica – Záríečie

This culture centre originated in a functional railway station Žilina – Záríečie [Fig. 1]. The station is situated on a junction of a railway station, a highway, and a municipal traffic communication – in the middle of the so-called Rondel. The site is in walking distance, about 2 km far away from the city centre and it is reachable by public transport, train and car, as well. The project has been operated by association Truc Sphérique, founded in 1998, from the start. The Culture nod Stanica – Záríečie has been housed by a station built in 1964. The premises are being rented from the Slovakian Railways for a symbolic fee. The authors of the project have managed to combine an art gallery, a bar converted from the waiting room, and a small theatre stage in the attic.

After it was sure the concept of this place is able to last, the project grew and was joined by a building designated mainly for a theatre – S2 building, which is built under an overhead crossing (so called Rondel). The floorplan is in the shape of number 8,

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Object of Cultural nod Stanica Žilina - Záríečie

<https://www.zilina.sk/assets/images/za/posts/img-1/1463824583-program-stanice-zilinzaricie-na-jun-2016.jpg>

and its walls are built from crates for beer vertically bonded by threaded rods. The insides of the walls are filled with haystacks reinforced by wooden raster. The roof of the building is made up of the overhead crossing mentioned above.¹ The unconventional S2 building is very popular among visitors. Sounds of cars and trains passing by make up the atmosphere of the scene and the presence of infrastructural features deepens the experience of spectators. Apart from theatre, this hall can be used for concerts, projections, lectures, and workshops. The centre does not have one predominant function. All its functions come from the needs of the community, which forms around it. Culture nod – Stanica is ever-changing, it does not have a defined form, and its development does not end with its walls, it surpasses the building

1. LENYI, Pe, (ed.): design handbook for cultural centres. Žilina: Truc sphérique cultural centre Stanica Žilina-Záríečie, 2014. p.: 50. ISBN 978-80-969392-8-2

and includes the adjacent greenery, a playground, and a nearby park with a legal graffiti wall.²

When it comes to stage productions, Stanica offers several options – it can embrace hosting performances and offer different places with unique atmosphere, such as the space in the attic of the station, or in its waiting room with a bar, or in the hall in S2 under the overhead crossing. At the same time Stanica can also become an inspiration for a performance connected to this environment, developing even outside the buildings. Even public space of this location can become a scene – a platform, an underpass ramp, the adjacent greenery blending with children's playground, a summer terrace, and the omnipresent area of the overhead crossing. All these places are ready for action and creation of new connection between actors, spectators, and the environment.

3 Jatka 78

The use of Holešovice marketplace in Prague consists of many functions, today. The place is in the distance of 3,5 km from the city centre with good public transport accessibility. The grounds comprise buildings rented to various users beginning with vendors of fruit and vegetables, a building converted to a marketplace with products of young designers, a restaurant, a club, a supermarket, the headquarters of an e-shop, or buildings devoted to culture purposes, such as theatre of contemporary circus. The theatre company Cirk La Putyka led by Rostislav Novák has settled in halls 7 and 8 of the grounds after years of nomadic life in leased premises. The name of this new cultural spot on Prague's theatre scene comes from its original function (jatkan = slaughterhouse). The place was designed by MJÖLK atelier and the current state of the premises fulfils most of the needs of the specific theatre company. The theatre found its home in a section of two halls, which are a part of a three-wing building in the North-West part of the marketplace. Visitors first come to the lower hall. The interior interferes with its vast space only in a minimal way, on the contrary,

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Jatka 78 – theatre hall

http://www.jatka78.cz/content/images/1600__null/lveRU6c59eyJxszz.jpg

it benefits from the original high and continuous space. The place is without any significant segmentation, therefore it can become a reception, foyer, bar, gallery, or a dance floor. A passageway leads to the second hall, which is different, distinctly segmented, and it offers only a theatre hall [Fig. 2]. The hall is predominantly high, contrary to the entrance hall, which is more horizontal. The hall, with a sloping auditorium on one side and a stage on the other, gives the impression of a black box of considerable size. The height of the building is suitable for the genre of contemporary circus, but on the other hand, the hall presses for innovations of classical technology regarding the sound and lightning of the stage. Behind the scene is a training area which gives the

2. POLÁČEK, V., POKORNÝ, V. Recyklované divadlo. Prague: Grada Publishing and National Museum, 2015. p.: 314. ISBN 978-80-247-5751-3

company a suitable place for training and rehearsals. It also enables occasional emergence of another stage, which resembles street theatre. Apart from the main scene and a training space, there are other, smaller training places, administrative part rooms with equipment for the company, and also a smaller scene.³

The premises are a residential theatre of the Cirk La Putyka company, but there are other contemporary circus performances of companies from abroad, also a drama and dance theatre. The whole building with its programme motivates to a new approach. An entrance hall can become a scene, and from the very first moment it can keep the spectators in uncertainty whether the spectators themselves are not a part of the performance. The space also stimulates the artists, and its goal is to produce a certain contact between different kinds of art forms. A gallery can easily become a place for theatre performances, the art concept of the walls can blend with exhibited art works and costumes of the actors, and the architecture in itself and its supporting structures can transform into abstract sculptures which may reminiscent an acrobatic performance. The relationships between individual functional units are changing in time, but thanks to the variability of equipment, the programme can change according to current needs. Thanks to the principles and motivations above, an abandoned place can become a functioning culture facility showing new options in development of theatre scene and performing in contact with other sectors of art.

4 Lustig Train – Modlitba pro Kateřinu Horovitzovou (A Prayer for Kateřina Horovitzová)

A lot of theatre projects entering the industrial environment are searching for a suitable place for their productions, but there are also projects for which their environment is a stage and an inseparable part of their origination. Modlitba za Kateřinu Horovitzovou [Fig. 3] belongs to the latter group. A story of a futile

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Train Lustig – A Prayer for Katerina Horovitz

http://archeologiezla.dacc.cz/wp-content/uploads/2012/12/IMG_5943.jpg

fight of a Jewish woman with the Nazis by Arnošt Lustig was first staged in 2012 during Devět bran festival. It was performed in an adjusted cargo wagon with a wooden platform in front of it. With no wall as in classic theatre, the stage crossed to the auditorium by railroad tracks or railway platform. A spectator coming to a railway station does not get a ticket, but a summons for transport. Suddenly, the spectator becomes an indirect participant, and boundaries between the stage and the auditorium become unclear. The train set of Lustig is a modified stage wagon, wagons with the company's base, and a wagon with accompanying exhibition.

The performance can travel to different cities. Frequent stops

3. <https://www.ceskatelevize.cz/porady/10920655240-jatka-78/21554215215/>, state to 26.8.2018

were cities connected to the history of transporting Jews to camps. In Prague, for example, the performance took place in Praha – Bubny station, since 50 thousand Jews were transported to Terezín from this station. Lustig Train can be considered as a site specific project, with its aim to point out to the problem thanks to its place and context of place.⁴

5 Nákladové nádraží Žižkov

This terminal station was originally used as a transshipment place for storage and trans loading of goods. The storage rooms are situated in two wings with two floors of basement and two floors above the ground, with the total area of 30 000 m². The length of the longer, southern wing is 335,25 m. Both wings are connected by ten steel footbridges with lift towers on a roofed ramp in the middle of railroad tracks. Last building of the premises is an administrative building.⁵ The location of former freight train station is the almost 5 km from the city centre, but connection by public transport is convenient even at night hours.

Scenic space passes through the whole grounds – inside places, where a construction from reinforced concrete becomes a part of the scene, ramps with creaking sliding gates, or poetic dance afternoons on the platform. These vast grounds were thanks to their size and potential declared a National Heritage. Many student proposals were made concerning this place, however, the discussion about its future form did not happen only as a part of academic discourse. The endeavour to revive this place came true in 2014, when the Landscape Festival Praha took place here. During summer months, the station was transformed. Dozens of installations balancing on the border of art and landscape architecture contributed to this. Many events took place here, such as guided tours, exhibitions, lectures, concerts and theatre performances. Landscape festival Praha showed only one of the possible solutions for this place. Currently, transshipment railway

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Nákladové nádraží Žižkov

<https://www.prague.eu/file/edee/2015/06/5.jpg>

station Žižkov is being used for a summer cinema, ateliers, as well for theatre performances [Fig. 4]. Some of authors use the scenic space of this industrial site, and some of them are inspired by the place and atmosphere, too.⁶ The future form of this area is not yet known, but all the events, which took place, hint that the place can live again, and be, for example, a centre of culture.⁷

4. POLÁČEK, V., POKORNÝ, V. *Recyklované divadlo*. Prague: Grada Publishing and National Museum, 2015. p.: 292 - 295. ISBN 978-80-247-5751-3

5. FRAGNER, B., SKŘÍAN, T. (eds.): *Pražská nádraží ne/využitá. Průmyslové dědictví a urbanismus. Alternativní projekty pro Nákladové nádraží Žižkov*. Prague: České vysoké učení technické v Praze, 2012. p.: 23. ISBN 978-80-01-05009-5

6. <https://www.kauza3.cz/kauzy/kauza-nakladove-nadrazi/reziser-bambusek-nakladove-nadrazi-je-temer-uz-muj-domov.html>, state to 26.8.18.

7. <http://nfa.cz/cz/o-nas/nfa/>, state to 4.4.2017; <http://nakladovenadrazizizkov.com/cs/o-nnz>, state to 4.4.2017.

6 Conclusion

The theatricality of urban space predicts a possible involvement and benefit in the process of creating new life in abandoned buildings of industrial heritage. Therefore, it is no wonder that when transforming abandoned buildings into places of culture, theatre becomes a part of them. If we focus on the progress of theatre space, the most interesting are experimental and multimedia projects. By connecting them with another culture use, such as music and visual arts, the attractiveness of these projects and their potential to become catalysts of new development of the theatre and urban space is enhanced. Outside the city centre, these projects can come into contact with industrial landscape. The projects with strong message and progressive character can bring the audience to these sites, too. Sometimes the longer distance from the city centre, is not so big problem.

All the described projects show that a perfect vision is not the most important element, but establishing a vital combination of initiating functions and needs specified for the given location is. Sometimes, this depends only on author's dedication. Sometimes, even the smallest interventions can bring large outcomes. The same can be said for securing viability of the project, because a large financial deposit is not always needed. What is important is the dedication to the project and enthusiasm.

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CZ V příspěvku se zabývám příklady v současnosti stále fungujících nebo znovu obnovených kin na území Prahy. Tato kina jsou v textu rozdělena do třech kategorií. První kategorie, artová kina, je věnována jednosálovým biografům se specifickým uměleckým zaměřením. Jako příklady jsou uvedena kina Pilotů a 64 U Hradeb. Druhá kategorie se věnuje jednosálovým kinům s přímo nevyhraněnou dramaturgií artovým směrem, však neméně zajímavým. Příkladem je domovská scéna Filmového klubu Národního filmového archivu - kino Ponrepo anebo multifunkční prostor, který prezentuje v současnosti udržitelnou formu využití původních budov kin, jako prostor pro více druhů umění a společenské zábavy - Royal. Třetí skupinu tvoří o něco novější multikina, jež ale nejde v kontextu s jednosálovými biografy opomenout, reprezentovaná jedním z nejmodernějších multiplexů společnosti Premiere Cinemas.

Znovu rostoucí trend "chození do kina" poukazuje na určitou podobnost s tímto trendem na počátku minulého století v kontextu hledání identit a učení se žít v rychle se vyvíjející společnosti plné nových technologií a pracovat s velkým množstvím informací. Část filmu se relokovala z oblasti umění na celospolečensky využívaný komunikační prostředek, a to včetně architektury, a stal se tak dominantním interfejsem dvacátého století. Díky této vazbě filmu a architektury můžeme sledovat skrze vztah společnosti a filmu také vztah společnosti a architektury.

EN This article deals with still functioning or renewed cinemas in Prague. These cinemas are divided into three categories. The first category of art cinemas is devoted to single-viewing-room cinemas with an art specialization. Pilotů cinema and 64 U Hradeb

cinema are given as examples of this category. The second category deals with single-viewing-room cinemas with non-art dramaturgy. The home of Film Club of the Czech Film Archives, Ponrepo cinema can be taken as an example of the category, also the multifunctional place combining more kinds of entertainment – Royal, exemplifies this category. The third chapter of this article deals with new multiplexes that form a category which cannot be omitted when talking about single-room cinemas. Multiplexes are represented by one of the most modern multiplexes of Premiere Cinemas Company in this article.

The increasing trend of cinema-going shows a certain similarity to the trend of cinema-going in the last century in context of searching for identities and learning to live in a fast-developing society full of new technologies, and working with a vast amount of information. A part of film has relocated from the sphere of art to a means of communication of the society, including architecture, and therefore has become a dominant interface of the 20th century. Thanks to this connection between film and architecture, we can watch the parallel connection of society and film, plus society and architecture.

Keywords: cinema; film; architecture; Prague; public urban space; contemporary art; digital age; identity; significant buildings

1 Contemporary Cinema

The subject of contemporary cinema is based on current architectural theories interacting with the theory of cinema in the context of the change of status and function of motion pictures and socio-cultural relationships from the 20th century until today. To begin with, it is crucial to describe how cinema is understood in this article. What is a film? Cinema studies have never been able to agree on the answer to this question. What is a cinema like after digitalization? What is a film like outside cinemas and is it still a film? Does this change or loss signify the death of the cinema? Questions like these were discussed in the academic film discourse through the second half of the 1990s of the 20th century, when digital technologies were massively spreading. Digital technologies, television, video, and the internet have also caused changes in production, distribution, and perception of cinema, and even film genres and sujets. Paolo Cherchi Usai, an Italian film critic and essayist, also criticizes the "spectators' morale". The viewers themselves can disrupt the continuity of film by pausing it, rewinding it, or by cutting it in PC programs.¹ According to Cherchi Usai, our cultural experience of film watching was irreversibly transformed into television and video, and later to computers and computer networks. Apart from the internet, DVDs, and other types of storage, which enable fast, cheap, and high-quality data transfer, film festivals, museums, and film conferences are a part of cinephile forums.² Recognized cinephiles combine private and social experiences.³ This article is devoted to the latter type of experience.

According to Lev Manovich, the film is perceived as a dominant cultural interface of the 20th century.⁴ Francesco Casetti, a cinema and television theorist, regards the retreat of cinema with the experience of cinema visiting in a nostalgic way, but simultaneously, Casetti regards the new approach to cinema as a challenge. "(...) because cinema has multiple roots (...) it can pass through different channels, it is a part of various communities,

where it plays different roles (an object of entertainment, lease and sale, a part of a collection, art installation, an object of desire...) (...) What cinema has been – an acted feature film on photographic picture screened in movie theatres and watched by audience – is now sharing its status with other forms".⁵ Cinema is not the privacy of home or the open world of metropolis. While watching a film, the reality experience of a cinema is combined with the unreal situation of the film.⁶

2 Prague's Case

The following text is concerned with the renewed or still running cinemas of the capital city of Prague. The content is divided into three parts. In the first part, there is information about specialized cinemas or art cinemas, chapter two describes ambivalent cinemas with a single viewing room, and the final chapter presents the functioning of multiplexes. Despite the origin of multiplexes being dated to the beginning of the third millennium, this article will also shortly cover them.

1. CHERCHI USAI, P. *The Death of Cinema: History, Cultural Memory and the Digital Dark Age*, London: British Film Institute, 2001.

2. CHERCHI USAI, P. *The Death of Cinema*.

3. MARIJKE DE VALCH, HAGENGER, M. (ed.), *Cinephilia*, p. 11.

4. MANOVICH, L. *The Language of New Media*, Cambridge: MIT Press, 2001. Available online at: <<http://www.manovich.net/LNM/index.html>> (cit. 19. 2. 2018).

5. CASETTI, F. Theory, Post-theory, Neo-theories: Changes in Discourses, Changes in Objects, *Cinémas: revue d'études cinématographiques. Cinémas: Journal of Film Studies*, yr. 17, no. 2–3, 2007, p. 38 and 41. Available online at: <<http://www.erudit.org/revue/cine/2007/v17/n2-3/016749ar.pdf>> (cit. 19.2.2018).

6. CASETTI, F. *Filmová zkušenost, Illuminace*, no. 1, 2011, p. 71.

The emergence of multiplexes influenced directly the functioning of cinemas with a single viewing room. Even though it looked like the public was going to watch films to giant shopping centres only, and the fine architecture of cinemas would have to find a new use, luckily, this catastrophic scenario was not fulfilled.⁷ Not everybody decided to trade top class projection technology, comfortable seats, and rich variety of refreshments for the genius loci of small cinemas with long running tradition. Therefore, the single-viewing-room cinemas started to differentiate themselves by a different dramaturgical focus, and started to target demanding viewers, who favour independent films, art films or documents from all over the world. Apart from the ordinary program, smaller cinemas offer various film festivals, live broadcasts of theatre performances, concerts or operas from world metropolises. Apart from rich main and accompanying program, cinemas with a single viewing room are trying to lure spectators by lower prices of tickets. Even though, a lot of small cinemas have endured the crisis of the new millennium, for some it has been the catalyst of their doom.

2.1 Art Cinemas

Even though it looked as if the small cinemas were about to die out and be replaced by multiplexes, today's situation is different. Cinemas with a single viewing room, primarily the art ones, which offer an interesting alternative program, are on the rise. The spectators are drawn by quality pictures, which might not happen into multiplexes. Film screening can take place in non-traditional setting as a part of the project Cinema Royal (in a church, film ateliers, or in a transformer station), there are projects connecting the screened film with live music, or there are live broadcasts from world opera or drama venues. Relocation of films to people's homes has also taken place. Kino Aero, Oko and Světozor have introduced Aerovod – a platform, where a spectator can watch films online legally for a small fee. These are the ways in which art

cinemas offer visitors something more than expensive popcorn and mainstream film choice.

Despite the growing interest in art cinemas, multiplexes are not endangered. Both platforms have their supporters. There is not a difference in technology, but in the individual perception of experience. In times when it was not clear whether single-viewing-room cinemas were going to keep up their number of visitors, project OSA 9 (Axis 9) emerged as an attempt to face the competition of multiplexes in the field of film distribution. OSA 9 is a union of Aero, Evald, MAT, and Světozor cinemas, which cooperate in distributing of selected films in all four cinemas in a specific time sequence. This manner of distribution ensures that a film is not going to leave the cinemas too early, when its potential is yet to be exhausted. The author of this project is Jan Jíra, a former director of CinemArt. *"By traditional line 9 to traditional cinemas"* was the unifying thought. According to Jíra number 9 "(...) was a joke, so that it was somehow connected."⁸ However, previous contacts of cinema operators played a significant role, when Oldřich Záměstný was appointed as a director of MAT cinema. The project caught interest of other cinemas on the tram line number 9 (Lucerna, Pernštýn – now Brouk), OSA 9 is, however, not able to coordinate the program of more than the 4 original cinemas.

Operation on trial began on 9th September 2004, when the film *Eternal Sunshine of the Spotless Mind* and *Bug* was screened. In January of the following year, after probation period, the project commenced its full operation. Central position is held by Světozor. It is the biggest and the most visited cinema of the group, and because of these reasons, it gets copies of films from distributors. For spectators, the logo of OSA 9 next to a film title is a guarantee of quality, as well as films of the distribution company Aerofilm,

7. ČVANČARA, J., ČVANČARA, M. Zaniklý svět stříbrných pláten: Po stopách pražských biografů, Praha: Academia, 2011.

8. MOHORITOVÁ, N. Proměny využití budov kin v Praze v letech 1989-2012, Prague, 2013, Diploma Thesis (Mgr.), Masaryk University, Faculty of Arts, Department of Musicology.

which originated from close cooperation between Aero and Světozor cinemas.⁹ Their distribution features not only live action films, but also animated films or project Aerodok, which is trying to bring interesting films from the documentary world to cinemas. In the text to follow, examples of existing cinemas in Prague in 2018 are listed alphabetically.

2.1.1 Pilotů

In the 1920s of the 20th century, nomadic cinemas were very popular. When they visited, they did not omit Vršovice and their restaurant gardens. U Města Mexika Inn in Havlíčkova street (now Donská), no. 168 was particularly popular. From autumn 1908 until the end of January 1909, Grand Opera Biograph of Dégon Hájek, a pioneer of cinema, was operated here, and after that, an outdoor cinema of Jan Kitličko was based here. Later, Otto Zahradka's cinema was permanently based here. In the 20s, the cinema changed its owner and its name to Pilotů cinema. The building was demolished in 1933 and in 1943 – 1936, a modern tenement grew in its place, which had a parterre with ceramic tiling and a new viewing room with 297 seats. It has taken its name from its predecessor, as well as its operator – Union of Czechoslovakian pilots, which has appointed František Macoun as its head. Macoun had previously operated Maják cinema in Smíchov, Na Míčáncích cinema and from 1928 also outdoor cinema Republika in Žižkov, where silent German grotesque films were screened. The first big reconstruction was carried out in the 70s. The cinema started operating again on 1st December 1976 and has been in operation for the next 20 years. Art films and documentaries were screened only occasionally. After the Velvet Revolution, the cinema was rebuilt into squash courts, which have not stayed for long, and an unofficial punk club has established itself in the deserted place.¹⁰

The interior was damaged and only fractions of the original architecture were preserved. The second reconstruction was carried out in 2016 and was financed by the State Fund of Cinematography and private resources. The aim was to create a

1 →



Cinema Pilotů – interior of the hall
www.dcinema.cz

cinema corresponding to current standards with reference to history of the cinema so that there would, again, be a cinema of greater significance, making the location better equipped for the local inhabitants. It was intended to create a smaller cinema with program competing with multiplexes. The projection room was divided by an acoustic partition into two smaller ones in accordance with the project of architect Adam Wlazel. These two smaller rooms enable to create a more varied program and the viewers have a greater choice. It has turned out recently that there is no point in trying to fill a high capacity room. For the sustainability of a cinema, it is crucial to have a varied and interesting program, as well as a wider choice of screening times.

9. Ibid.

10. ČVANČARA, J., ČVANČARA, M. Zaniklý svět stříbrných pláten: Po stopách pražských biografů, Praha: Academia, 2011.

One room is designed with slight elevation and is accessible through a corridor leading under the second room. This room's elevation is therefore steeper. Apart from the access corridor, there is a server room. All screening equipment is hanged in an "acoustic box" beneath the ceiling in both rooms, therefore an independent screening cabin is not needed. The reconstruction was low-cost, so that the cinema could open as quickly as possible. Most of the used finances were utilized for screening technology and the installation of air conditioning, so the architecture of the interior is minimalistic. Since most films are coloured, both the rooms are completely black. The only coloured feature are comfortable violet seats. Both rooms are impressively modern [Fig. 1]. Café and foyer are designed in contrastive white.¹¹

The operator of the cinema is Jan Makola, producer of films *Cesta ven* and *We Are Never Alone*. The program of the cinema consists mostly of films which do not get much opportunities in other cinemas, for example films screened at Locarno, San Sebastian, and other festivals. Makola does not perceive his cinema as a competition for art cinemas like Aero, Světozor, or Bio Oko. The screening is daylong. Program is adjusted to the time of day and presumed target group. Films for mothers with children, families or senior people are screened. Apart from films, the cinema is probably going to offer dance lessons in the future, since the rooms should frequently change into a room for Argentinian tango.¹²

2.1.2 64 U Hradeb

In the first half of the 20th century, there was just one cinema in Malá Strana – Čechia. The preparatory work for construction for a cinema in Mostecká Street began at the end of the 1930s, however, the construction was disrupted by complications in the setting up of the rear tract of the building and by the war. It was necessary to secure the neighbouring buildings with beams, so that they would not be destructed, and the construction site was enclosed by a wooden street wall covered in wallpapers, which stayed there until

2 →



Culture space 64 U Hradeb – foyer (during the reconstruction)
64 U Hradeb – facebook profile

1952. Meanwhile, Ministry of National Defence showed interest in the building, because it wanted to build apartments and cultural facilities for its officers. The first plans were based on soviet models, later, a cinema for 600 spectators was added into the plan. Because of the development of events, the Ministry of National Defence lost interest in the building, so its completion was passed to the National Committee of the Capital City of Prague with the authorization of Directorate-General for Construction of Housing Estates. The main focus of the project was therefore building the

11. Czech Architecture Award, Registered works 2017, Rekonstrukce kina Pilotů. Available online at: <<https://ceskacenaarchitekturu.cz/projekty/2017/rekonstrukce-kina-pilotu/>> (cit. 16. 6. 2018).

12. MOHORITOVÁ, N. Proměny využití budov kin v Praze v letech 1989-2012, Prague, 2013, Diploma Thesis (Mgr.), Masaryk University, Faculty of Arts, Department of Musicology.

apartments and completion of the cinema. Chief designer was Ing. Arch. Miroslav Hudec from the Military Project Institute.¹³ The new architectural solution from 1954 preserved the character of the two original gothic houses with gables, thus the architecture succumbed to the character of the street. A courtyard with typical Prague pavement was created inside. The plan contained 32 apartments, a delicatessen and diary buffet, a cinema, a wine bar and a library. Since it was the first Prague post-war building focused on the socialist cinematographic scene, modern materials and techniques were used. The interior was modern, designed in Brussels' style, the latest technology was used for screening and stereophonic sound.¹⁴

The construction was finished in 1964 and in the same year spectators could watch *Starci na chmelu* from softly upholstered seats. 64 – U Hradeb cinema was successful and it became a model for other newly built cinemas such as Ruzyně (1970), Kosmos on Novodvorská housing estate (1973) and Vltava (1980).

During the years after privatization, the cinema was owned by Barrandov film studio, and has premiered several Czech films. The end of this era came with the second half of the 1990s when first multiplexes emerged. The cinema's final year was 2002. The screenings stopped in May and after that, a black light theatre, spiders' exhibition, and the exhibition of torture instruments all resided here. After the 2002 floods, only concrete pillars and grounding were left. When finding investor for the premises' reconstruction, the most favoured proposal was to build garages and a fitness centre in the building. This was opposed especially by Klub Za starou Prahu and the construction of garages was cancelled. The building was, however, still unused.¹⁵

Since 2015 the association of Jan Čep, Jsme U Hradeb, has been trying to save the premises. According to an architectural study of Linhart Architects studio, the building should be transformed into a multifunctional culture centre with the emphasis on audio-

visual and film production with the overlap to other areas of creative industry.¹⁶

The raw industrial image of the interior uncovering iron, concrete and brick structures will be kept, to increase the contrast of lightness, transience, and fluidity of new visual arts. Division of the auditorium to first floor and a balcony and the rounded stage will be kept from the original plan of František Trmač. The space covers the area of 3 000 metres square, and a part of its groundings is a preserved part of ramparts from the 13th century. The revitalized cinema will open in autumn 2018 [Fig. 2].¹⁷

2.2 Classic Single-viewing-room Cinemas

During the times when multiplexes' popularity was growing, the management of single-room cinemas with analogue equipment decided to aim at alternative visitors. It seemed that ordinary program could not keep visitors coming, therefore small cinemas started profiling themselves as art cinemas. Today, the boom of

13. ČVANČARA J., ČVANČARA M. Zaniklý svět stříbrných pláten: Po stopách pražských biografů, Praha: Academia, 2011.

14. BIEGEL, R. Věstník Klubu Za starou Prahu (Z písmenek kule, z kina garáže? K historii a osudu budovy s kinem U Hradeb na Malé Straně v Mostecké ulici), no. 2/2004. Available online at: <http://www.zastarouprahu.cz/webdata/80101230-6FA5-4553-87BC-D539565E5C61_02.pdf> (cit. 16.6.2018). Hudec Miloslav, added by Veselý Jan, Věstník Klubu Za starou Prahu (Nová tvář domu U Hradeb v Mostecké ulici na Malé Straně, no. 3/2004. Available online at: <<http://stary-web.zastarouprahu.cz/kauzy/mostecka/mostecka4.htm>> (cit. 16.6.2018).

15. ČVANČARA, J., ČVANČARA M. Zaniklý svět stříbrných pláten: Po stopách pražských biografů, Praha: Academia, 2011.

16. Czech Film Commission, Kino u Hradeb, no. 8/2016. Available online at: <<http://www.filmcommission.cz/cs/locations/featured-locations/082016-cinema-u-hradeb/>> (cit. 16.6.2018).

17. VRÁNOVÁ, Z. 27.2.2018, Personal interview.

multiplexes is over. Technical equipment of single-room cinemas and multiplexes is equal, so it is likeability that decides what cinema will a spectator visit. Thus, even smaller cinemas offer a mainstream programme without having a fear of visitors' decrease. People who prefer watching Hollywood movies with a glass of wine rather than with an overpriced popcorn have become regular visitors of these cinemas. In the next chapter cinemas without a specific programme profiling are listed alphabetically.

2.2.1 Ponrepo

We cannot find a place in Prague that would be more connected to cinematography with origins reaching so far in history, as a monastery in 11, Bartolomějská Street. Baroque grounds with four wings was founded by Jesuits in 17th century in a place of former Jerusalem house, where an Organic school, in which Antotnín Dvořák studied, was once based. It was used as a boarding house for young noblemen. It was rebuilt at the beginning of 18th century. Even Ludwig van Beethoven performed in its refectory. In 19th century the monastery was extended by old neighbouring houses, and the Ordo Sancti Francisci Griseorum (nun congregation) moved here. The building was at the peak of its fame during the period of National Revival, because the first Czech ball was held here in 1840. The first film experience took place here in 1908, when Grand biophonic theatre visited this culture centre. This event inspired Josef Tupý in 1908 to commission František Zelníček to build a permanent cinema Konvikt. Before the World War I, spectators could, apart from others, see an experimental "talking film" of German film pioneer Oskar Messter. During the interwar period the cinema changed its owners, for example Václav Pštross, Václav Pštross jr. or jazz campaigner Arnold Reimann were running the cinema.¹⁸

The cinema was nationalized after the war and it did not operate for long. In the second half of 1948, the cinema was changed to Puppet Film Studio, in which the illustrator Jiří Trnka, the founder of *Bratři v triku*, performed. In the 1970s, Konvikt was in state of

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Cinema Ponrepo – interior of the hall

Photo by Tereza Čivrná

disrepair and it was necessary to make a general reconstruction. The reconstruction commenced in 1981 and lasted 15 years. In 1996, a cinema was once again opened in the place thanks to Czech Film Archive, and a new base for Film Club was established here.¹⁹ Club cinema Ponrepo was moved to Konvikt with its top-class equipment and 118 comfortable seats. Along with Ponrepo, the administrative workplace of Czech Film Archive, *Illuminace* and *Filmový přehled* magazines, and a unique library with more than

18. ČVANČARA, J., ČVANČARA M. *Zaniklý svět stříbrných pláten: Po stopách pražských biografů*, Praha: Academia, 2011. *Kongregace Šedých sester III. Řádu sv. Františka, Historie (Kostel sv. Bartoloměje)*. Available online at: <<http://www.sedesestry.cz/komunity/praha/kostel/historie/>> (cit. 16.6.2018).

19. ČVANČARA, J., ČVANČARA M. *Zaniklý svět stříbrných pláten: Po stopách pražských biografů*, Praha: Academia, 2011.

80 000 volumes also moved here. A second room, located right under the viewing-room, is nowadays used by a dancing club.

Even though visitors of Ponrepo will not find the latest Hollywood movies here, and though the program features some art films, the cinema could be regarded as a classic one. Ponrepo is a place for archive film fans and art film fans. It focuses on classic and less known films of Czech and world cinematography. The screened films are organized into cycles linked together by a certain element, such as the film style, creator of the film or time. Contemporary work of alternative Czech and foreign authors is also being screened, as well as student films. Cycles of children films or films for students are being screened regularly. The cinema operates 7 days a week, however its operation is suspended in July and August. The cinema also participates in film festivals, such as Jeden svět, Aussie kiwi film fest, Mezipatra, or Filmasia.²⁰

Mostly Prague visitors come to Ponrepo, however, according to David Havas, even visitors from other parts of the country visit the cinema. The programme of Ponrepo is very different from programmes of almost every cinema in the Czech Republic, therefore the visitors are not solely local. In the long run, the cinema's visitors are largely students or students of film studies, who visit the cinema multiple times a week. Another large group of visitors are senior citizens, who like to watch older films to remind themselves of the time when they were young. Currently, the cinema is trying to offer programmes for younger children, schools and middle-aged visitors. Despite limited resources, the cinema survives mostly due to a unique collection of films and thanks to the Czech Film Archive, which can offer spectators an exclusive program [Fig. 3].²¹

2.2.2 Royal

Commercial and apartment palace in Vinohradská 48, later known as Maceška's palace, was built by Jan Jarolím in 1928-1929. The ground floor housed a cinema for 900 spectators with the



Culture space Royal – interior of the hall
www.leroyal.cz

interior in art-deco style with garden pansy blossoms made by Ferdinand Kallik. The investor of the whole project was a factory owner Emanuel Maceška, whose name the cinema inherited. It started operation on 27th August 1929, and the opening ceremony was attended by several celebrities of that time. After ten years of standard operation Maceška was promoted to “prolonged premiers” category.

A raid on 14th February 1945 has hit the opposite factory of Emanuel Maceška, who then got only the cinema, which was unfortunately

20. National Film Archive's program. Available online at: <<http://nfa.cz/en/ponrepo-cinema/program/>> (cit. 16.2.2018).

21. MOHORITOVÁ, N. Proměny využití budov kin v Praze v letech 1989-2012, Prague, 2013, Diploma Thesis (Mgr.), Masaryk University, Faculty of Arts, Department of Musicology.

nationalized in August 1945 and renamed Bystrica shortly after. The cinema was operating for a long time under this name, since it was closed and used only for conferences. The name Bystrica was temporarily taken by a nearby cinema Flóra.

The comeback of Bystrica happened in the second half of the 1960s, when the cinema started operating under the name Illusion. Dramaturgy of the cinema was focused on archive films of Czechoslovakian film department, and it was so popular during the period of normalization, that some visitors could not get tickets for the shows, since they were all sold out.²²

The cinema was returned to Maceška family after the Velvet Revolution. In the half of the 1990s, the turnout dropped to 24 %, due to television and video spreading. In 2001, the cinema stopped screening films due to economic reasons. The producer Miloslav Šmídmajer tried to revitalize the cinema by screening solely Czech movies, however, his endeavour ended unsuccessfully in 2006. A year later, the same fate met the actor Pavel Trávníček, who was running a combination of theatre and classic cinema with the name of Theatre Illusion Biograf there. After Trávníček, the place was taken by Children's Opera Prague for a while.²³

The name Royal was assigned to this place in 2014 as a reference to the famous era of Královské Vinohrady (royal vineyards). The new leaseholder of the place became Jean-Christoph Gramont, and the interior was given a new visage by Renata Slámková, who has revived the style of First Czechoslovak Republic with all the comfort of contemporary technological equipment. Stuccoing of balconies, woodcutting, or marble detail of the staircase are some of the original features of the viewing room. Seats upholstered from velvet were newly manufactured and their placement can be changed according to the type of performance [Fig. 4]. In these days, Royal is a multifunctional platform where drama, ballet, film screening, concerts, burlesque or cabaret take place.²⁴

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Multicinema Premiere Cinemas Hostivař – interior of the hall
www.realfilm.cz

2.3 Multiplexes

The phenomenon of multiplexes has appeared in the second half of the 1990s in the Czech Republic. In 2000, a modern centre Park Hostivař with the first multiplex was built in Švehlova Street. The history of modern multiplexes therefore goes beyond the set framework of this article, but it is impossible not to mention them. The example of Premiere Cinemas in Hostivař was chosen as a representative of all of them.

22. ČVANČARA, J., ČVANČARA M. Zaniklý svět stříbrných pláten: Po stopách pražských biografů, Praha: Academia, 2011. Dvořák Tomáš, Rousek Jan, Pražské Biografy, Pomíjivé kouzlo potměných sálů, Praha: Muzeum hlavního města Prahy, 2016

23. Ibid.

24. About Royal. Available online at: : <<https://www.leroyal.cz/o-royalu/>> (cit. 29.12.2017).

2.3.1 Premiere Cinemas

This network of three modern cinemas exists from 2012. The Premiere Cinemas Company owns an eight-viewing-rooms cinema in Prague located in VIVO! shopping centre in Hostivař, with an overall capacity of 1750 seats. This postmodern building designed by architectural studio GAMA was built in 2000, and it was only the second shopping centre in Czech Republic. In 2015 a reconstruction of the whole area took place. Apart from the look of the centre, even its name was changed from Park Hostivař to VIVO! The multiplex first opened in 2000, and after two years, the cinema has undergone a reconstruction. The seats were changed, and the viewing rooms were equipped with the newest screening technology and huge projection screens. Luxury dark viridian seats are divided into three parts by two backlit staircases. The walls are covered by burgundy curtains, and a homelike atmosphere is provided by black carpets with a fine checked pattern. The cinema is equipped by Sony Digital Cinema 4K projectors, Dolby Surround 7.1 sound standards, and by four Sony Digital 3D screening systems. A novelty of the biggest viewing room is Dolby Atmos sound and HFR projection. Also, Sony 4K SRX R320 projectors are used [Fig. 5]. The foyer is very different from the ones we know from other multiplexes. White colour predominates, and the white ceramic tiles in combination with ceramic lining create almost a bathroom-like impression. Circular sale counter backlit by magenta neon seems like it came from a different world, considered the sterile surroundings.²⁵

The visitors of this multiplex are interested mostly in action movies, romantic comedies, and in animated family films, which are the main attraction of multiplexes across the whole republic. The operator of Premiere Cinemas has stated that the greatest obstacle is a fluctuating quality of films. Premiere Cinemas also operates two other cinemas in Olomouc and Teplice.²⁶

3 Conclusion

In contemporary digitalized era, optimized and unified due to globalization, people are overflowed by quantity of information, and lost in their own world, which is losing its characteristic features differentiating it from other places in the world. They tend to visit more the renewed single-viewing- room cinemas, where they can identify with the story line, and where they can relax and do not have to try to find individual best solutions, as they do in real world. This approach concerns architecture too. The creation of cinematography and cinemas as such contributed to forming national identities in individual newly formed countries. Nowadays, we witness a disappearance of national identities, because of the influence of globalization. Feeling rootless and lost people are getting back to basic and simpler evolutionary identities, local identities connected with their place of residence, and community living in the immediate surroundings. As well as single-viewing-room cinemas, even multiplexes are an identification mark of the given location.

The presented projects show that we are witnessing a symbiosis of single-viewing-room cinemas functioning alongside multiplexes. Both types of cinemas are not competing, and the turnout is determined by personal preferences of the visitors. The future of both types of cinema is very hard to predict in this time of fast changes and new technologies, but we can say that during the 20th century – the century of film, firm connections have been established between the art of film and architecture. And through film and our attitude to it as to a communication medium of today, we can observe how the architecture is perceived by contemporary society.

25. Premiere Cinemas, The Latest Multicinema in Prague. Available online at: < <http://www.premierecinemas.cz/kino/> > (cit. 30.12.2017).

26. Ibid.

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CZ

Téma vody ve veřejném prostoru post-industriálních objektů je velmi široké jak svojí historií, tak rozsahem v samotné městské struktuře. Město Plzeň ve svém urbánním vývoji ke konci 20. století lehce zaspala. Průmyslové objekty a areály, které ukončily navždy svoji výrobu, se staly nepřístupnými a vůči svému okolí se vymezily oplocením. Přitom se mnohdy jedná o lokalitu v těsné blízkosti historického centra města, která je nejen dostupná, ale díky přírodnímu motivu řeky také velmi lukrativní. Až s příchodem projektu Plzeň - Evropské hlavní město kultury 2015 se začaly objevovat první vize a koncepty, jak nakládat s post-industriálními prostory a veřejným prostranstvím. Je fakt, že tyto aktivity v Plzni přišly tzv. zespoda díky několika aktivistům a podpoře města. Jedním takovým projektem je Festival Náplavka k světu., který nyní již s pětiletou tradicí oživuje břehy plzeňských řek a snaží se poukázat na jejich možné využití a zpřístupnění. Na základě dat, které v průběhu festivalu organizátoři od návštěvníků dostanou, vzniká Studie využitelnosti území. V prvních třech letech, kdy probíhal festival u řeky Radbuzy, byla zpracována studie, která byla následně městem adaptována a na konci května letošního roku byla oficiálně započata rekonstrukce břehu řeky dle této studie, a to přesně v území, které festival svým úsilím doporučil. Nejen tento projekt, ale i proběhlé konverze objektů jako je bývalá Papírna Piette nebo DEPO 2015 se u veřejnosti setkávají s oblibou a díky tomu mohou plánovat další rozvoj. Zajímavým tématem na pomezí industriálních objektů a krajinného prvku řeky ve městě je tzv. přechodové nebo nárazové území, které oba zmíněné prvky spojuje a vytváří přechod skrze veřejná prostranství, jež po vzoru skandinávských nebo britských měst v západočeské metropoli v kontaktu s vodou chybí.

The theme of water in the public space of post-industrial objects is very wide in both its history and its extent in the urban structure itself. The town of Pilsen overslept a bit in its urban development at the end of the 20th century. The industrial buildings and areas that cancelled their production forever have become inaccessible and surrounded by their fencing. It is often a locality close to the historical city centre, which is not only accessible, but also thanks to the natural element of the river, very lucrative. With the start of the Pilsen – European Capital of Culture 2015 project, first visions and concepts began to emerge as to how to handle post-industrial spaces and public spaces. It is the fact that these activities in Pilsen have come so called “from below” thanks to several activists and the support of the city. One such a project is the Festival Náplavka k světu., which now with a five-year tradition revives the banks of the Pilsen rivers and tries to point out their possible use and accessibility. Based on the data that the organizers receive from the visitors during the festival, a Land Use Study is created. In the first three years, when the festival was taking place at the Radbuza River, a study was prepared, which was subsequently adapted by the Authorities of the City and at the end of May 2018, the reconstruction of the river bank was officially started, according to this study, precisely in the territory recommended by the festival. Not only this project but also the conversion of objects such as the former Piette Paper Mill or DEPO 2015 are popular with the public, can be planned for further development. An interesting topic on the boundary between industrial buildings and the landscape element of the river in the city is the so-called transition or collision area, which combines and creates a crossing through public spaces, which is according to the model of Scandinavian or British towns, but is absent in the West Bohemian metropolitan.

EN

Keywords: industry; post-industrial area; water; river; riverbank; waterfront; embankment; public space; Pilsen; architecture; transitional territories

Pilsen is a city on the confluence of four rivers. Two of them are shaping the city centre and offer many potential for development and utilization of public space in the context of the water element. The interesting thing is that each of the river is completely different. The Radbuza River is located in the very centre of the city and apart from several industrial and post-industrial complexes in its meander, the river also includes several major public buildings. In contrast, the River Mže flows around the city walls with far more friendly faces and much more natural elements. This contrast creates great potential for the varied development and transformation of unused areas around the river, especially in the context of post-industrial objects.

The importance of Water in the City over Time

Water is the most basic element of our being. Without water there would be no life. And perhaps we can create a small parallel to this consideration and transform it into a system of urban structure.

The first mention of the settlement of the landscape was always in relation to the water source. Both the villages and the first cities were founded by rivers or springs of water. Squares were always understood in connection with a well or a fountain, and for a long time they resembled places of meeting local people. Man always used the river for elementary needs and as a source of raw material. For fishermen, the river was a source of livelihood, millers used the water stream, and women in the river even washed the laundry. The first buildings located directly in the river flood were water mills. By the time of the modern age, the houses of the poor fishermen were pushed to the riverbeds, but they had to

be adapted to frequent floods. With the turn of the 18th and 19th centuries, the river became the place for the development of the industry in the form of first manufactories, machine paper mills, breweries, etc. These buildings were located outside the built-up area of the city. The river was still, especially in the countryside, used for relaxation and walks. Over time, the river began to be used for rest in the cities as well. The first swimming baths and beaches were created.

About a century later, cities had to deal with the development of floodplain urbanization. These were often areas close to the edge of the city centre, and it was necessary to meet the needs for its development. The river began to be seen as a channel that had to be trodden so that it would not interfere the city basically. In addition to its undeniable advantages, this intervention also had its disadvantages. The water element was perceived as a forced part of the urban structure, which was used purely pragmatically. Most of the water also disappeared from the viewpoint of the pedestrian's horizon, and eventually the river in the city completely failed in some cases. We cannot forget that during the flood the river often returns to the place where it was pushed out by dykes and buildings. Then the river spills into its original flood.

Nowadays, there are finally tendencies to bring the natural character of the riverbeds within the city centre and to apply these trends in the transformation of abandoned or unused post-industrial territories, which create great locations for the city to develop inwardly. These are often very lucrative lands on the very edge of a historic centre with a satisfactory infrastructure and an indisputable genius loci. What, however, hampers the revitalization of these territories in the city? We can say that the transformation of post-industrial territories is delayed by the following factors: private landowners (in most cases developers who do not want to invest in the reconstruction of buildings, but they want to build the territory completely new); the missing overall concept of river revitalization in the broader sense (cooperation between

cities and competent authorities throughout the river flow); strict water management requirements for flood-land operations; the need to adapt to climate change in cities; little experience with this topic (low awareness and interest); the lack of cooperation of the affected specialists for interventions of this nature (hydro geologist, architect, landscape architect, civil engineer, urbanist-investor-city, etc.) or, for example, insufficient or overcrowded infrastructure in the area (unpreparedness of the redevelopment concept).

It is very important to know that the nature element of the river is the new one in the modern city structure. In the history, the area around the river had only an industrial or recreational character at the very edge of the city. The situation nowadays is very different due to the huge enlargement of our cities and its development. Therefore, the issue of the form of development and revitalization of coastal areas is so complicated and so far without much experience.

The Composition of the City of Pilsen along the River

The city of Pilsen was founded at the confluence of the River Mže and the River Radbuza. The core of the city spread regularly from the square in a square arrangement. The floodplains of both rivers long lined the city with their farmland until the middle of the 19th century. Here and there, houses were built behind the river and were gradually interconnected by bridges. The centre of the city was restrained by the shoulders of two rivers that branched out towards the centre and separated the free and urbanized landscape.

At the end of the 19th century, Pilsen looked for suitable land for the construction of industrial buildings. These included the brewery or paper mill at the Radbuza. It is therefore logical to

build industrial areas beyond the river, away from the city and in addition to the railway. The river supplies factories with the basic raw materials – water and energy sources. At the beginning of the 20th century, the city acquired its present form. The branches of rivers were eliminated, and the river diverged further from the urbanized part of the city. At the same time, the river was lined with a barrier wall. In the first third of the 20th century, important buildings were built around the River Radbuza, which formed the present embankment. These include the Municipal Baths (Bedřich Bendelmayer, 1926–1932), the District Health Insurance Company (Bohumil Chvojka, 1925–1927), the Masaryk Student House (Bohumil Chvojka, 1927–1929), the Police Headquarters Building (František Čermák, 1936–1939), the Administrative Building and the Hydroelectric Power Plant of the Electricity Company of the City of Pilsen (Hanus Zápál, 1920–1926), the Corps House and the Corinth Church Corps (Jaroslav Fišer, 1935–1938) or Carriage, stalls and workshops of the Electricity Company of the City of Pilsen (Hanus Zápál, 1925–1926). After 2000, there was no production in industrial sites around the river Radbuza except of Pilsner Urquell and Škoda ETD.

The current concept of coastal development depends mainly on the following factors: supporting the development of biodiversity; varied composition of functional areas to fulfil the socio-economic aspects of the development as a concept of the modern safety city; motorized transport solutions for limiting the traffic and promotion of pedestrian or cycling transport through the city as a support of green city axes; sensitive work with transition zones between the natural element of the river (water) in the city and the built-up area (the street) of the city/industrial zone and finally the proposal of the revitalization and transformation of the area, which supports the further development of river banks.

Inspiration for Transformation of Unused Post-Industrial Territories

In 2015 Pilsen was the European Capital of Culture (ECOC). This project came to the West Bohemian metropolis at the right time. At that moment, when it became clear, that something had to happen with the decaying objects, where the industrial production had long been completed, a dialogue started through cultural and activist events in the public space thanks to this project. Grants from European subsidies supported a myriad of projects, which were based on the concept of using neglected sites or post-industrial sites. In addition, this event has prompted an interest in dialogue with the local community and the professional public, and so the city's inhabitants have begun to take care of the events and spaces around them and to perceive them!

The most significant act of that time is undoubtedly the wave of interest in industrial space and its use for the platform of art, festivals or site-specific. Very important was also a change in the understanding of the industry as purpose-built inaccessible buildings and complexes. With similar principles, the atelier **K světu** began to work. Unused or usually closed objects became the scene for PechaKucha Night for one evening. Public spaces with missing facilities were added for a while by so-called **Containers k světu**, which offered small refreshments. The inaccessible banks of the rivers in Pilsen are, above all, the very frequent theme of the Festival **Náplavka k světu**. [Fig. 01]. This project aims to make it accessible through the summer cultural program and show practical use of the river banks (the Radbuza River and the Mže River). Based on the usability study, which was made during the first years of the Náplavka festival, the riverbank revitalization is actually realized in the location: Anglické nábřeží – Štruncovy sady. Another project, supported by ECOC, is the renewal of the Municipal Swimming Pool, run by the Pěstuj Prostor Association. All of the above-mentioned projects have the commonality of being so-called bottom-up activity, which is characterized by

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Festival Náplavka k světu by the River Radbuza
author's archive

the enormous effort of the will of several individuals who are not indifferent to their surroundings. The City itself, namely the City of Pilsen's Concept and Development Unit, prepared the Concept of River Revitalization on the basis of nature-friendly measures under the REURIS project, also supported by the European Union. Thanks to REURIS, the Lobežská louka or Božkovský ostrov projects were created. Both realizations are on the Úslava River.

All these and many more other projects have started the transformation of public spaces in context of water and industrial element in the city of Pilsen. Foreign examples, apart from the already mentioned traditional Czech tendency to develop so-called activity "from below", talk about "Stream Daylighting" or "Shrinking Cities" projects. Both concepts are linked to the revitalization of riverbanks in city centres. The first mentioned project works with the possibility of making more visible the

river or stream in the street profile again. In the past water was often hidden in the underground pipeline because of the fear of flooding. While today we are using the principles of adaptation to climate change during revitalizing of the rivers and trying to keep water in the city and use it practically. The Shrinking Cities project proposes to use deprived areas around the rivers to create the capacity for increasing population.

Conversion of Post-industrial Objects: the Former Paper Mill Piette and DEPO 2015

Conversion of the Factory Hall: the Former Paper Sorting Hall – Cultural Centre Papírna

At the end of the production, the site was for some time completely unused, and it was expected how to continue. The free spaces began to be leased. Besides warehouse and office space, the karts also appeared in the complex. In 2011, several friends leased over 2,000 square meters of space on the top floor of the paper sorting house. They were searching for their own place for cultural events they wanted to hold. This was the basis for the Cultural Centre Papírna [Fig. 02], which is still funded from their personal resources and the coffee shop earnings made on the ground floor. This space was subsequently rented by the association of Studio Petrohrad and Pilsen Live. After complete cleansing of garbage, shards and pigeons, a vision of use was born. The first event, which was organized in the site, was the qualification for the European Championship in a swallow throw. Further actions and plans followed. All the original windows were restored, a large-format double-glazed panes were anchored behind the existing glazed and double-glazed frames. A subsidy from the City of Pilsen Municipality was used for this event. Furthermore, the original masonry was cleaned and restored, and young architects who helped with the production of interior equipment were invited. They created a very successful cafeteria with backgrounds

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Papírna – Cultural Centre
author's archive

for both musical and other productions. On the upper floor of the object of adaptation were created test rooms, a dance hall and a photographic studio with a social facility. There is still a plan for a residential apartment for guest artists. Nowadays, the association leases over 8,000 square meters of space and hopes for further ambitious plans, f. ex. transforming the former boiler room into a multifunctional sports facility. The Papírna Cultural Centre has four main dramaturgical lines: concerts, community meetings (surfers' community, skateboard community, architects, etc.), exhibitions (young artists, students of Ladislav Sutnar's Faculty of Design and Art) and eventually dance dramaturgy. It is interesting that the Papírna industrial space was not supported by the European Capital of Culture in Pilsen 2015, which does not mean, however, that Papírna was not included in the ECOc program.

Nowadays it is hard to guess what the area with an unmistakable atmosphere awaits. The owner does not want to invest in the

transformation due to the historical conservation status of protection of the buildings and bad situation of the traffic in the area. At the same time, the property owner is not sure whether to encourage cultural enthusiasts who are interested in further gradual minor rebuilding of partial spaces, according to the model of the café and the upper floor. Instead of space for small businesses and multifunctional sports facilities, other warehouses with temporary building modifications were created. For these purposes, the courtyard between historical buildings was cleaned and it was awaited better times. A vision was created about the use of this public space to link the area with the home for the seniors and the river. However, this idea was interrupted by construction work on the delivery ramp for trucks that supply new warehouses. Finally, I will mention the optimistic idea from the report of the monument care department, which shows that the reconstruction of the Papírna complex will not strictly hold the requirements for the reconstruction of historic buildings. On the contrary, the elements of modern and contemporary architecture will be supported, which will inspire an entirely new area according to the European trend. Most of the historical buildings inside the area of former Piette's paper mill are under the conservation status.

Conversion of the Carriage, Stalls and Workshops of the Electricity Company of the City of Pilsen – DEPO 2015

At the beginning of the 21st century, the technical condition and equipment of the buildings did not suit the current needs of the city transport company. Therefore it was decided a new depot to be built in another area. This complex was completed in 2014; the last buses and trolleybuses left the carriage in Cukrovarská Street in the same year.

However, the depot area has not been used for a long time – a large hall of heavy repairs and two smaller halls of former buses repair shops have been transformed into the so-called DEPO2015 [Fig. 03]: a creative zone in 2015, which in addition to exhibition and cultural events, currently connected with the Pilsen – the City

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DEPO 2015
author's archive

of Culture 2015, will also offer a backdrop for a creative incubator, artistic residence, shared work space or office spaces. Unused workshops and depots are managed by Pilsen 2015, a contributory organization of the City of Pilsen.

Revitalization (with a built-up area of 5,400 m²) was funded by the city, the region, grants, and private sources. The new construction interventions do not interfere in the original constructions, they are based on the fulfilment of the hygienic and safety needs for public use. The intention was to support the authentic atmosphere of the post-industrial spaces, which should be adapted to different activities by reversible modifications. In the next few years, a total reconstruction of the whole area should be started according to the urban-architectural study of the Prague D3A atelier from 2013–2014. No buildings in the area are under conservation status.

Transitional Territories – a New Public Place for the Revitalization

In connection with the interest in the transformation of post-industrial objects, very interesting sites are formed with the potential to become full-fledged new public spaces. It is the closest industrial area to the river, which is currently fenced and forms a private zone that serves only as a supply or parking space. In the case of transitions between the waterbed and this area we often find only a cycle path and a grassy inaccessible bank. If we imagine a space without fencing, we find here a huge potential for developing a public space in the spirit of a modern city.

Both the former paper mill and the DEPO 2015 sites are counting on their outlook for the revitalization of public buildings. Therefore it is certain that the present form of private space will be replaced by a fully accessible territory for public. So there are completely new urban elements that will create a very desired and lucrative location. Such a location, where the space around the building will be thoughtfully and systemically linked to the landscape element, the river, is missing in Pilsen, although Plzeň has four rivers!

Such a public space must be designed sustainably. It must respect the economic, social and ecological character of the territory. It must be remembered the flood protection, the permeability of the area, the comfort and the comprehensibility for the visitor. At the same time, the newly designed space should offer new features that are lacking in the site to encourage community gathering and sharing public spaces across all groups. However, the natural character of the place must not be neglected, so that the river bank remains a zone for relaxation and preserves its unique character of the landscape element in the city centre.

It should be remembered that quality housing reflects the environment in which we live. Every house has usually its own garden and the city's inhabitants should have a place where to go. The river is the ideal place to use the area around it as a

garden in the city – it can be a place for having a rest, meeting and relaxation. At the same time, it fulfils an important function of the natural continuum of the fauna and flora bio corridor.

Inspiration for the City of Pilsen

Pier Head and Canal Link, Liverpool, UK [Fig. 04]

The surrounding of this space is a mixture of new and old buildings and waterside presence. Landscaping is not seen as a landscape design, but rather as an urban, park space that connect two main aspects: water and original development in the area. The multi-

level solution of the whole concept of revitalization provides not only simply privacy for the visitor but also amazing views of water level and a sense of security. At the same time, it creates plenty of



Pier Head and Canal Link, Liverpool, UK

<http://www.broxapdesignandbuild.com>

space for sitting and relaxing. In addition to a new building, the Liverpool Museum links the area to three major buildings in the area (so called Three Graces): the Royal Liver Building (1911), the Cunard Building (1916) and the Port of Liverpool Building (1907). The very presence of public institutions or cultural objects is very important for the area, whether new or revitalized. Still, the Pier Head project also counted with sufficient public space for organizing various festivals and cultural events.

Client: Liverpool City Council, British Waterways – Canal Link
Collaboration: Arup, 20/20 Liverpool, Graham Festenstein Lighting Design

Bjørvika, Oslo, Norway [Fig. 05]

During the 20th century, the Bjørvik district gradually became an isolated and unwanted part of Oslo. The city ended at the boarder of communications that lined the fjord and the old unused shipyards and docks. At the beginning of the new century, the Norwegian government decided to complete the transformation of the territory into a representative part of the city, reflecting the relationship of the people to the Oslo fjord. The first step was the construction of the Norwegian National Opera, which has a walking roof and offers a unique view of the countryside. Oslo is a unique example of the fact that high-quality public institutions accessible to visitors to the city will attract the necessary attention. Today Bjørvika is one of the most popular localities and offers plenty of opportunities to use public space in the context of water.

Client: Norwegian Government, the city of Oslo
Architect: Snøhetta

Askvågen viewpoint, Atlanterhavsveien, Norway [Fig.06]

The viewpoint is situated along the Atlantic Ocean Road in Møre and Romsdal, near the small fishing village Askvaagen. The existing pier is lined with large natural rocks and was originally designed to make a safer harbour. A big piece of Visstallitt stone

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Bjørvika, Oslo, Norway
author's archive

(a local variation of gneiss) enclosed by glass plates was placed at the very tip of the pier. Overhanging the existing platform it brings tourists even closer to the Atlantic Ocean and offers views over derelict fishing villages on numerous islands on the horizon. The project comments the current change from food-providing, fishery based societies to service minded, adventure-providing ones. A transformation which is affecting and increasing number of coastal communities in the region. This very small realization of its size is very big by its idea. It is enough to put just a piece of architecture in the area we solve to encourage our imagination and start to perceive our closest neighbourhood.

Architect: Smedsvig Landskap AS, 3RW Arkitekter

Maxipes Fík Waterfront, Kadaň, Czech Republic

The main idea of the project was the renewal of the river-city relationship. The height difference of the local site was connected by a steel footbridge. A cycle track and an in-line track were

proposed to enhance the promenade's meaning. The area was equipped with the necessary furniture (pier, benches, public lighting and info system). An integral part of the rehabilitation of the embankment was the rehabilitation of existing stands and new landscaping of the entire territory.

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Askvågen viewpoint, Atlanterhavsveien, Norway

<http://landezine.com/>

Řešené nádraží bylo vybudováno v roce 1874 „na zelené louce“ a po následujícím rychlém rozšíření (a zavedení soustavy vleček do Schichtových závodů) za posledních několik desetiletí nedoznalo významných změn. V současné době je stále v provozu, nicméně v podstatně menším rozsahu než dříve (díky obecnému zmenšení podílu železnice na nákladní dopravě). Mnoho kolejí je zcela nevyužitých a nyní tedy i nadbytečných. Vlečka do továrního areálu je stále zavedena. Do budoucnosti se dá očekávat, že význam nádraží bude nadále klesat a areál bude spíše veden k funkci menšího nádraží pro osobní dopravu (na druhé straně řeky na stejné dráze je totiž podstatně větší a lépe umístěné nákladní nádraží Ústí nad Labem západ, jehož obrovská kapacita je také nevyužitá). Nádraží je v městské evidenci vedeno jako předpokládaný brownfield. V problémovém výkresu UAP je identifikován problém na Střekově – rozdělení obce železniční tratí. Do budoucna se dá očekávat revitalizace území, kdy si nádraží ponechá pouze několik kolejí dostačujících pro osobní provoz (a průjezd nákladních souprav) a zbytek uvolní k výstavbě nebo parkové úpravě.

Cost-benefit analýza se zabývá dvěma variantami projektu na revitalizaci území nádraží Ústí nad Labem – Střekov. Obě varianty projektu se zakládají na reálných číslech a potřebách, nicméně byly vytvořeny čistě pro účely této studie (a nejedná se tedy o skutečné projekty). Cílem je ověřit realnost revitalizace takovéhoho území a porovnat dva možné scénáře tohoto procesu (lišící se především množstvím nové výstavby a komerční vybavenosti) s využitím metody cost-benefit analýzy. Výsledek potvrdil, že doba návratnosti varianty s větším množstvím komerční vybavenosti je i přes podstatně vyšší počáteční investice zřetelně kratší (a také kratší než zvolený referenční horizont 30 let) a její vnitřní výnosové procento je vyšší než zvolená (typická) diskontní sazba 5 procent.

Citlivostní analýza také prokazuje relativní odolnost této varianty vůči výkyvům a nepřesnosti v odhadech zhodnocení.

The railway station was built in 1874. Currently, it is still in operation, but to a much lesser extent than before (thanks to the general reduction in rail freight transport). Many railway tracks (out of approx. 18) are unused and now redundant. In the future, it is to be expected that the rather large railway station will slowly transform to a smaller passenger train station and the remaining unused area could be used for redevelopment /a park.

The cost-benefit analysis deals with two variants of the project to revitalize this site. Both variants of the project are based on real numbers and needs, but they were created purely for the purposes of this study (and are not real projects). The aim was the reality of the revitalization of such a site to be verified and two possible scenarios (differing mainly by the amount of new construction and commercial amenities) using the cost-benefit analysis method to be compared. The results show that the variant with less commercial facilities is not viable (the return time is outside a realistic time horizon) and that the larger (more commercial) option with significantly higher initial investment proves to be more advantageous in the long run. Its return time is 21 years, which is shorter than the 30-year reference horizon, and its internal rate of return of 7,2 percent is higher than the set 5 percent discount rate. Sensitive analysis also demonstrates the relative resistance of this variation to fluctuations and inaccuracies in estimates.

Keywords: railway; station; revitalization; cost-benefit analysis; redevelopment; brownfields

1 Introduction

The rather large Ústí nad Labem - Střekov railway station was built in 1874. It is still in operation today, but to a much lesser extent than before (thanks to the general reduction in rail freight transport). Many railway tracks (out of approx. 18) are unused and now redundant. In the future, it is to be expected that the significance of the railway station will continue to decline, and it will slowly transform to a smaller passenger train station.

The ownership of this site is relatively simplified and unfragmented - as it is quite typical for railroad areas compared to standard brownfields. The owners are only two, namely České dráhy, a.s. and the Správa železniční dopravní cesty. This simplifies any possible future intervention and redevelopment of the area.

The station area is registered by the city as an anticipated brownfield that divides the district. Therefore, a revitalization of the area can be expected in the future, leaving only a few tracks sufficient for passenger traffic (and a passage of freight trains) and leaving the rest for redevelopment / a park.

This paper deals with a summary of the analysis and an assessment of possible revitalization. This is done using a cost-benefit analysis applied to two variants of the project to revitalize the site of the station Ústí nad Labem - Střekov. Both versions of the project are based on real numbers and needs, but they were created purely for the purposes of this study (and they are not real projects). The aim is the reality of the revitalization of such a site to be verified and two possible scenarios of this process (differing mainly in the amount of new development and commercial amenities) to be compared. The cost-benefit analysis method was chosen because it is one of the basic techniques for evaluating investment projects. This method of analysis extends the current financial evaluation of the project to all the socio-economic (social) effects of the project (externalities), which is crucial for the revitalization project of

this type. In the Czech Republic it is also used in connection with the Structural Funds, where this analysis is often required as a mandatory annex to the application for support.

2 Demand

2.1 Development of the Region

821 377 people lived in the Ústecký region at the end of 2016. The long-term year-on-year decline of about one thousand people was affected by both natural decline and negative migration.

The number of completed dwellings per thousand inhabitants of the region is for several years the lowest compared to other regions and the national average.

The long-term recovery trend continues in the field of tourism in the region. Year-on-year, both the number of guests and the capacity of collective accommodation facilities have increased. The number of overnight stays in the region was higher than in 2015 by 8.2% (a total of 527,500 guests a year, of which 181,072 were foreigners) [1].

2.2 Dwellings

According to the Statistical Yearbook of the Czech Statistical Office, a total of 1,196 dwellings were started in the region in 2017. Compared with 2016, there is a decrease of 103 dwellings, i.e. by 7.9%. 66.6% of new dwellings were family houses (796 dwellings) [1].

The character of Střekov is, with the exception of the former Setuza industrial area, significantly residential, and the site has a very good accessibility to the centre and to the main railway station.

However, due to the preserved (though greatly reduced) operation of the railway, the area is inappropriate for the construction of family houses, which are most sought-after (they make up the vast majority of new flats in the region).

2.3 Office Space

For the site in question, this function appears to be inappropriate both for urban and transportation reasons. In addition, several large projects such as Palác Zdar or CPI City Centre have been finished in the city in recent years, which may have saturated the demand for some time.

2.4 Commercial Areas

In 2009 the Forum shopping centre was opened in the city, offering nearly 100 stores on an area of 27,000 m² [2]. In the city centre there are many other shops and several department stores.

In the district of Střekov, where the site is located, there are only basic amenities – a supermarket, several small groceries, restaurants and pubs and just a few other shops. The OC Střekov shopping centre project was planned (which was however suspended due to protests and resistance of the people to the form and location of the building), which offered approximately 22,000 m² of commercial space. From this it can be concluded that there is a demand in this area.

The site is located in a less favourable position a bit further from city centre, so it is expected that the demand will be smaller and the target group will be predominantly inhabitants of Střekov and surrounding villages on this side of the river. The population of Střekov is 10,915, the population of neighbouring villages 3,126 [3].

If we consider that the local shops and services were to be used by 85% of the inhabitants of Střekov and 35% of the inhabitants of neighbouring villages, we reach a target group of approx. 12,000 customers.

From this and from the information about OC Střekov, it can be concluded that in this area there is demand for at least 7,000 m² of commercial space.

2.5 Public Amenities

Ústí nad Labem has long been trying to attract tourists (f. ex. the realization of the ropeway to the Větruše Chateau). In 2016 the city was visited by 59,604 tourists and conference visitors.

There are a fewer lodging facilities in this city than in other cities in the region (a quarter compared to Děčín with double visitors) [4]. The attendance of the main "attractions" of the city is for Střekov Castle about 21,000 [5] and for ZOO 135,000 [6].

The city has always been welcoming new "attractions" and because the area is closely linked to the railway and its history (the significant station of the famous Austrian Northwest Railway), the construction of a railway museum focused on this era seems to be a logical choice. Because in the Czech Republic there are a few other museums of this type, the nearest and most comparable in size museum is in Lužná with an annual attendance of 30,000 [7] (and a museum in Prague at Masaryk station is expected to be realized in the near future). The railroad is a popular theme and a welcome destination for tourists. Due to the fact, that the museum in Lužná is not ideally accessible by traffic, one can expect that the museum in Ústí nad Labem would attract at least the same number of visitors. In addition, it is also very well reachable from the German side, where the railways are very popular (f. ex. there was a meeting of steam locomotives in nearby Dresden, which

attracted 16,000 people in a few days) [8]. The advantage of the location in Ústí nad Labem is the fact that the city is located on the main railway line and therefore the fans of the railway can easily move to the city by train and most of the way on a very attractive railway with impressive views of the landscape (especially from north through Hřensko, but also from the south through the river valley).

2.6 Park

Střekov has been suffering from the lack of city parks compared to the rest of Ústí nad Labem, which is also perceived by the inhabitants [9]. There are several parks in the city, forming a relatively dense and extensive green network, but this side of the river lacks any major park (there are only a few miniature parks). The area in question is suitable because it is located in the very heart of Střekov and it is very well accessible from all its parts (and basically from the city centre itself).

3 Variants

3.1 Description of the Project

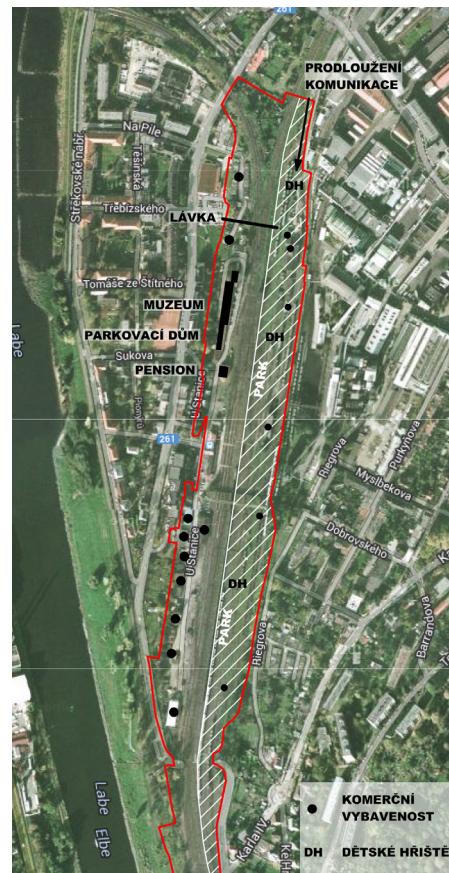
3.1.1 Variant 1

On the western side of the site existing buildings will be rebuilt as the Museum of Railways. The museum will have a guesthouse aimed at the railway fans. There will be a parking house.

The station building, 6 tracks and the objects required to run the track will remain unchanged.

The other objects will be used for business and services (mainly food, restaurants, cafes, retail, but also in the southern part smaller companies, not large warehouses though). These new functions

1 →



Variant 1

photo by mapy.cz, scheme by author

will be created by the reconstruction of the existing buildings, where the ground floor extension of the buildings should be as small as possible. No construction of new buildings is planned.

On the eastern side of the site, railway tracks will be partially removed and a railroad-themed park will be created in their place. Children playground areas and small facilities such as cafés or small refreshments booths are planned within the park. In order to secure the site, the park will be fenced (by a transparent fence) and closed at night. Its closure will be regularly checked by the City Police, alternatively by a private security agency.

The amount of contamination should be predominantly harmless (it is necessary to further verify with geotechnical survey), therefore the area will be repaired mainly by the phyto-sanitation method (contaminated areas by thermal desorption). The nature of the park will be phytosanitary.

Existing communication from the north will be stretched to allow access to the park in this direction as well. Besides the existing footpaths, the eastern and western parts will be interconnected with a new pedestrian walkway in the northern part of the territory to improve the accessibility of both the site and the park (the footbridge will be traced towards the industrial zone, which is also identified as a brownfield ready for revitalization) [Fig. 1].

3.1.2 Variant 2

Differences compared to Variant 1:

There is no guesthouse, but only a thematic café. A parking house will not be built, instead there will be a parking lot with greenery. There are no new commercial facilities planned, the use of the existing buildings will remain the same (mainly warehouses and headquarters of smaller companies).

The park will not include facilities such as cafés and so on.

3.2 Investment and Zero Option

Both variants are similar in this regard.

In the case of a zero (no investment) option, the site would continue to deteriorate and increasingly acquire the negative attributes of a brownfield. It would become even a bigger barrier and a negative element in the territory and would define Střekov as the marginal, outer part of the city.

In the case of an investment option, the complex will be transformed into a multifunctional commercial and recreation site (in the case of variant 2 museum and park site), which will positively shape Střekov and to some extent also Ústí nad Labem. The quality of life of the population will increase. Prices of neighbouring properties will rise. There will also be an evaluation of the site itself. The potentially ecologically degraded area will be decontaminated and partly transformed into a park, thus improving the quality of the environment. Thanks to the railway museum, in Střekov district there will be more visitors coming, as well as in the city itself (which will benefit, among other things, commercial areas). Střekov civic amenities will improve significantly (whether commercial or public) and create new jobs, thus reducing unemployment (less valid for variant 2). The district will acquire a city park in which the people will be able to relax. Thanks to the park and the new pedestrian walkway the area will cease to be a barrier and it will help to create suitable conditions for the eventual further revitalization of neighbouring industrial brownfields. The park and public utilities will burden the city budget every year. The museum in Lužná might see less visitors (nevertheless most likely not significantly, as the interest of people should be able to support more such places).

3.3 Beneficiaries

Both variants are the same.

They will be: Real estate owners nearby - Owners of land itself and real estate on it - Residents of Střekov district - Střekov district - Retailers nearby - Retailers in the center - Castle Střekov - Railway Museum - Railway Museum in Lužná - Railway guesthouse - Retailers on the land itself - Odbor správy veřejného prostranství a zeleně - resp. správy obecního majetku (Department of Public Spaces and Park Management) - České dráhy (Czech railways) - Správa železniční dopravní cesty (Railway Infrastructure Administration) - Tourists arriving in Ústí nad Labem

3.4 Reference Horizon

The standard horizon for projects of a similar scope ranges from 25 to 35 years [10], we have chosen 30 years.

3.5 Discount Rate

This is a project requesting EU funding and therefore a set discount rate of 5% is chosen.

3.6 Benefits

3.6.1 Value Increase of Surrounding Plots

As a standard, the price of surrounding plots will increase by 2.5% [11] as a result of the revitalization of brownfields, but given that in our case the result is a multifunctional area with a large park, we choose for variant 1 an increase of 3% (for variant 2 then 2.5%). The current cost of a residential property in a given area was estimated using similar cities and their price maps and local market surveys.

3.6.2 Value Increase of Surrounding Buildings

According to the research, the revitalization of brownfields will increase the building value by 4.9 - 32.2%. [12] For multifunctional variant 1, we choose conservative 8%.

For variant 2 (with a much smaller share of commercial amenities and therefore a smaller revitalization effect), we choose a slightly below-average 4% (after a local market survey).

3.6.3 Value Increase of the Plot Itself

By exploring price maps of similar cities, we estimate the final price after valuation will be 700 CZK per m².

3.6.4 Commercial Facilities

Only for variant 1. Shops, services and smaller headquarters of companies will make profit. We expect annual earnings of 4100 CZK per m² [13].

3.6.5 Warehouses

Only for variant 2. Rental of warehouses in Ústí nad Labem costs approximately 60 CZK per m² per month [14].

3.6.6 Operation of the Railway Museum

25,000 visitors per year (based on attendance of similar attractions in the Czech Republic and Ústí nad Labem) are estimated.

3.6.7 Increase in City Tourism

Around 15,000 additional tourists will arrive in the city (10,000 museum visitors will be from Ústecký region), which will spend money on their journey and during their stay in the city.

3.6.8 Guesthouse

Only for variant 1 thanks to the museum, an extra 800 overnight stays per year can be expected (due to the focus of the railroad fans and connections with the museum and the railway themed park).

3.6.9 Proximity to the Park, Playgrounds

In calculating the benefits, we operate with the inhabitants' time saved by creating a nearby large park.

3.6.10 Increasing the Ecological Value of the Area

The ecological value of the area before the intervention is CZK 76 per m² (category Road and railway network with the surrounding area) and after the intervention is CZK 260 per m² (category Green Areas in City). [15]

3.6.11 The Creation of New Jobs

We estimate that the project will create 40 new jobs (6 in the museum, 30 in retail and service, 3 in the park, 1 in the parking place) for variant 1. For variant 2 there are 14 new jobs (10 in the museum, 3 in the park, 1 in the car park). The cost per unemployed per year is 137,000 CZK [16].

3.6.12 Parking House / Green Parking Lot

The parking designed primarily for museum visitors.

3.7 Costs

Costs of buying land are not accounted because the purchase takes place before the project is implemented and therefore does not enter the project evaluation. In addition, the land is currently owned by SŽDC and ČD, which are state-owned organizations and the planned investor is a city (or a state). In terms of BF analysis, the cost of buying land is irrelevant.

Generally, project uses existing buildings on the site. Reconstruction is 20% cheaper than demolition and new construction [17].

Estimates of costs are based on table values or market price surveys (e.g. estimation of pedestrian bridge price or price of phytosanitary decontamination and thermal desorption).

There are main following costs (usually comprising of initial investment and annual upkeep):

Railway Museum - Parking house (variant 1 only) - Green parking lot (variant 2 only) - Commercial facilities (variant 1 only) - Warehouses (variant 2 only) - Decontamination and preparation of land - Park (with children's playground) - Construction of the footbridge - Stretching Road

3.8 Sensitivity Analysis

3.8.1 Variant 1

Investment is, of course, very sensitive to fluctuations in the item Commercial facilities, a 20% drop against the estimated annual yield will shift the positive balance sheet cumulatively from the present value by 8 years to 29th year. The maximum drop that may occur if the investment's 30-year maturity limit is to be met is 22% lower than the original estimate. The variant is therefore quite resilient even if some commercial areas are not leased for longer time (and it is even more resistant against the short-term vacancy, for example, when changing tenants). Positive is that the shift in the construction of commercial facilities (e.g. due to prolongation of the decontamination process) shifts the year of the positive balance of the investment only proportionally, so the 2-year delay moves it by 2 years.

One of the most important benefits is the assessment of surrounding buildings. If 8% value increase was not realized and only 4% increase happened instead, the investment would begin to be positive 3 years later (or 6, if the property value didn't rise at all) so by the 24th year.

Changes in other items does not affect the resulting balance as significantly (for example, the annual loss of the museum would have to be multiple to reach 4 million CZK so it would move the maturity of the investment to 27th year).

3.8.2 Variant 2

Investments in this option have proved practically irretrievable (both in the reviewed 30-year period, but also in the 40-year test – it can be deduced from the cash flow that the return on investment is far beyond any realistic horizon). The biggest chances of influencing this result lies in warehouses (which are the most significant source of annual money supply), however it is only the rather unrealistic more than doubling the increase in annual benefits that leads to a financial return on this variant in the 30 years.

4 Conclusion

Return time for variant 1 is 21 years (internal rate of return equal to 7.2), return time for variant 2 is completely outside of the reviewed and realistic time horizon (for 40 years the internal rate of return is approximately catastrophic 1.3). It is clear that variant 1 is much more advantageous and realistic, mainly due to highly profitable commercial amenities. The initial investment in it is approximately 60% higher than variant 2, but the annual profit is about four times higher. The 21-year payback period for variant 1 is fully within the chosen reference horizon of 30 years and the internal rate of return of 7.2 is approximately one and a half times the 5 percent discount rate, which shows that this variant of the revitalization of the territory is viable and beneficial to the district. Therefore if the city should ever decide to revitalize this railway brownfield, it needs to include commercial facilities in its project otherwise it won't be financially viable. In order to finance the whole investment, it seems optimal to go through PPP (Public Private Partnerships), where the private sector's capabilities and experience are used and the risks are shared between stakeholders. It would also be advantageous to use the appropriate operational programs for the 2014–2020 period co-financed by the European Structural and Investment Funds (covering up to 40–50% of the total cost of the project), possibly using other subsidies such as brownfield regeneration

programs of The Ministry of Industry and Trade, the Ministry for Regional Development and the Ministry of the Environment. The whole project should be carried out in cooperation with the CzechInvest (Business and Investment Support Agency).

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COST-BENEFIT ANALYSIS

VARIANT 1 (museum + commercial facilities + park)

Investment thousands CZK		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
cost - income +																		
direct costs																		
initial investm.	railway museum	-20 000	-49 575	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	parking house	0	-7 425	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	commercial facilities	0	-35 274	-35 273	-35 273	0	0	0	0	0	0	0	0	0	0	0	0	0
	decontamination of the plot	-41 512	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	park (with children playground)	-10 000	-32 000	-20 000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	footbridge construction	0	-25 000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	stretching road	-1 650	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<i>sum</i>																	
operational	railway museum	0	0	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640
	parking house	0	0	-660	-660	-660	-660	-660	-660	-660	-660	-660	-660	-660	-660	-660	-660	-660
	commercial facilities	0	0	-2 240	-4 480	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960
	park (with children playground)	0	-520	-1 500	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100
	footbridge construction	0	0	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15
	stretching road	0	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33
	<i>sum</i>																	
benefits																		
one-off	value increase of surrounding plots	0	5 438	5 438	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	value increase of surround. buildings	0	5 878	5 878	5 878	5 878	5 878	5 878	5 878	5 878	5 878	5 878	5 878	5 878	5 878	5 878	5 878	5 878
	value increase of plot itself	0	2 188	2 188	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	increasing the ecological value	0	1 690	5 060	3 370	0	0	0	0	0	0	0	0	0	0	0	0	0
	<i>sum</i>																	
annual	railway museum operation	0	0	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000
	increase of tourism	0	0	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900
	guesthouse	0	0	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360
	commercial facilities	0	0	7 467	14 933	22 960	22 960	22 960	22 960	22 960	22 960	22 960	22 960	22 960	22 960	22 960	22 960	22 960
	nearby park, playgrounds	0	680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680
	parking house	0	0	745	745	745	745	745	745	745	745	745	745	745	745	745	745	745
	creation of new jobs	0	0	3 196	4 338	5 480	5 480	5 480	5 480	5 480	5 480	5 480	5 480	5 480	5 480	5 480	5 480	5 480
	<i>sum total</i>																	
balance																		
r = 5,0%																		
current value		-69 678	-121 500	-22 849	-9 047	21 621	20 592	19 611	18 677	17 788	16 941	16 134	12 093	11 517	10 969	10 446	9 946	9 469
cumulative current value		-69 678	-191 178	-214 027	-223 074	-201 453	-180 861	-161 250	-142 572	-124 784	-107 843	-91 709	-79 616	-68 098	-57 131	-46 684	-36 736	-27 287
IRR	0,07207	-68 244	-184 793	-206 259	-214 584	-195 098	-176 923	-159 969	-144 155	-129 404	-115 644	-102 810	-93 388	-84 600	-76 403	-68 757	-61 624	-54 987
	0,07207 for 30 years																	

Cost-benefit analysis spreadsheet, by author

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18	19	20	21	22	23	24	25	26	27	28	29	30	
0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	
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0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	
340	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-3 640	-312 982
360	-660	-660	-660	-660	-660	-660	-660	-660	-660	-660	-660	-660	
960	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960	-6 960	
100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	
-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	
-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	
0	0	0	0	0	0	0	0	0	0	0	0	0	-395 177
0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	0	0	0	0	84 150
3000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	
900	900	900	900	900	900	900	900	900	900	900	900	900	
360	360	360	360	360	360	360	360	360	360	360	360	360	
960	22 960	22 960	22 960	22 960	22 960	22 960	22 960	22 960	22 960	22 960	22 960	22 960	
380	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	
745	745	745	745	745	745	745	745	745	745	745	745	745	
5480	5 480	5 480	5 480	5 480	5 480	5 480	5 480	5 480	5 480	5 480	5 480	5 480	
													985 234
													361 225
717	21 717	21 717	21 717	21 717	21 717	21 717	21 717	21 717	21 717	21 717	21 717	21 717	
24	8 594	8 185	7 795	7 424	7 070	6 734	6 413	6 108	5 817	5 540	5 276	5 025	
237	-9 643	-1 458	6 337	13 761	20 832	27 566	33 979	40 086	45 903	51 443	56 719	61 744	
766	-42 977	-37 578	-32 542	-27 844	-23 462	-19 375	-15 562	-12 006	-8 689	-5 594	-2 708	-16	

COST-BENEFIT ANALYSIS

VARIANT 2 (museum + existing warehouses + park)

Investment thousands CZK		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
cost -																	
income +																	
direct costs																	
initial investm.	railway museum	-20 840	-50 000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	parking lot with greenery	0	-576	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	decontamination of the plot	-36 583	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	park (with children playground)	-10 000	-32 000	-20 000	0	0	0	0	0	0	0	0	0	0	0	0	0
	footbridge construction	0	-25 000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	stretching road	-1 650	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	<i>sum</i>																
operational	railway museum	0	0	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726
	parking lot with greenery	0	0	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185
	warehouses	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888
	park (with children playground)	0	-520	-1 500	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100
	footbridge construction	0	0	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15
	stretching road	0	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33
	<i>sum</i>																
benefits																	
one-off	value increase of surrounding plots	0	4 312	4 313	0	0	0	0	0	0	0	0	0	0	0	0	0
	value increase of surround. buildings	0	2 939	2 939	2 939	2 939	2 939	2 939	2 939	2 939	2 939	2 939	2 939	0	0	0	0
	value increase of plot itself	0	402	403	0	0	0	0	0	0	0	0	0	0	0	0	0
	increasing the ecological value	0	1 690	5 060	3 370	0	0	0	0	0	0	0	0	0	0	0	0
	<i>sum</i>																
annual	railway museum operation	0	0	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750
	increase of tourism	0	0	900	900	900	900	900	900	900	900	900	900	900	900	900	900
	tourist accommodation	0	0	55	55	55	55	55	55	55	55	55	55	55	55	55	55
	warehouse	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248
	nearby park, playgrounds	0	680	4 248	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680
	creation of new jobs	0	0	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918
	parking lot with greenery	0	0	208	208	208	208	208	208	208	208	208	208	208	208	208	208
	<i>sum total</i>																
balance		-66 723	-95 746	695	11 121	7 751	7 751	7 751	7 751	7 751	7 751	7 751	7 751	4 812	4 812	4 812	4 812
<i>f =</i>	5,0%																
current value		-63 546	-86 844	600	9 149	6 073	5 784	5 508	5 246	4 996	4 758	4 532	2 680	2 552	2 430	2 315	2 096
cumulative current value		-63 546	-150 390	-149 790	-140 641	-134 567	-128 783	-123 275	-118 029	-113 032	-108 274	-103 742	-101 063	-98 511	-96 080	-93 766	-89 484
IRR	0,01293	-65 871	-159 188	-158 520	-147 956	-140 687	-133 511	-126 427	-119 433	-112 528	-105 712	-98 982	-94 858	-90 786	-86 766	-82 797	-75 011
	0,01293 for 40 years																

Cost-benefit analysis spreadsheet, by author

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-196 659
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
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0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
26	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-3 726	-342 715	
35	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185	-185		
38	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888	-1 888		
00	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100	-3 100		
15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15		
33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33	-33		
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0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
50	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	3 750	48 940	
90	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900		
55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55		
48	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248	4 248		
90	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680	2 680		
18	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918	1 918		
38	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208	208		
12	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812	4 812		525 682 35 248
99	1 999	1 904	1 814	1 727	1 645	1 567	1 492	1 421	1 353	1 289	1 228	1 169	1 113	1 060	1 010	962	916	872	831	791	754	718	684		
32	-87 462	-85 558	-83 744	-82 017	-80 372	-78 806	-77 314	-75 893	-74 539	-73 250	-72 023	-70 854	-69 740	-68 680	-67 670	-66 708	-65 792	-64 920	-64 089	-63 298	-62 544	-61 827	-61 143		
11	-71 193	-67 423	-63 701	-60 027	-56 400	-52 819	-49 284	-45 794	-42 348	-38 947	-35 588	-32 273	-29 000	-25 769	-22 579	-19 430	-16 321	-13 251	-10 221	-7 230	-4 276	-1 361	1 518		

CZ Příspěvek se zabývá historií bývalé průmyslové oblasti Karolina v Ostravě a nastiňuje dobové snahy o zachování části tamějších technických památek. Konkrétně se zaměřuje na osudy energetické ústředny č. III Žofinské huti a bývalé elektrocentrály koksovny Karolina. Dvojice budov je dnes již jediným dokladem průmyslové historie místa. Přitom jejich zachování nebylo dlouho dobu jisté a oběma objektům hrozila demolice. Téměř na poslední chvíli se povedlo vyjmout je z demoličního výměru a dočasně využívat pro nové účely. Od konce 90. let minulého století ale opět budovy chátraly a snahy o jejich integrální zapojení do centra města se objevily až po roce 2000 spolu s výsledky mezinárodní ideové architektonické soutěže na dostavbu území na Karolině. Na své nové využití ale musely oba historické objekty čekat více než jedno desetiletí, až v roce 2014 proběhla jejich konverze dle návrhu architekta Jana Pleskota. Přes velice zdařilý výsledek, který konverze přinesla, čelily budovy, nyní souhrnně nazývané „Trojhalí“ obavám, zda se skutečně mohou stát „širším městským centrem“. Těto vizi nepřispíval fakt, že budovy Trojhalí jsou poměrně nevhodně upozaděné gigantickým nákupním centrem, které bylo na Karolině postaveno v jejich těsné blízkosti, další komplikací byly rovněž spory mezi vedením města a vedením městské části Moravská Ostrava, v jejímž obvodu se Trojhalí nachází. Ohledně jeho využitelnosti tak panovaly spíše obavy, nicméně se zdá, že po čtyřech letech provozu se Trojhalí přece jen podařilo najít si cestu, která by nebyla na úkor sousedního městského centra, spíše naopak se ukazuje, že i přes nevhodné urbanistické řešení území na Karolině se historické budovám podařilo navrátit k životu.

EN The paper deals with the history of former industrial site Karolina in Ostrava and outlines the periodic efforts to preserve some of the technical monuments there. Specifically, it focuses on the destiny

of the power plant No. III of Sophien Ironworks and the former power station of the Karolina coking plant. The pair of buildings is today the only proof of the industrial history of the site. For a long time their preservation was not certain matter. Both buildings were supposed to be demolished. Almost at the last minute they were removed from demolition area and temporarily used for new purposes. From the end of the 1990s buildings were dilapidated. After 2000 together with the results of an international ideological architectural competition for the completion of the Karolina area, there were made efforts to integrate the buildings into the city centre. However, the historic buildings had to wait for their new use for more than a decade, until 2014, when they were converted by architect Jan Pleskot. In spite of the very good result that conversions brought, the buildings, now so-called "Triple hall", faced doubts if they could actually become "wider urban centres". This idea did not contribute to the fact that the Triple hall buildings are quite inappropriately shaded by the gigantic shopping centre, which was built in close proximity to them. Disputes between the city leadership and the leadership of the Moravian Ostrava district, in which Karolina is located, posed also other difficulty, despite from the beginning prevail certain concern about applicability of new Triple hall. However, it seems that after four years of function, Triple hall did manage to find a way that would not be at the expense of a neighbouring city centre but, on the contrary, it turns out that despite the inappropriate urban planning of the Karolina area the historic buildings have managed to return to life.

Keywords: Ostrava; Karolina; industrial heritage; industrial sites; coking plant; Sophien ironworks; power station of Karolina coking plant; power plant No. III of Sophien Ironworks

1 Industrial History

On the edge of the city centre of Ostrava there is situated a thirty-hectare area called "Karolina", connected with long industrial history. Everything began in 1842 when the Moravian-Ostrava Coal Company began excavating mining works in the area. Only a year later the Vienna banker Salomon Mayer Rothschild bought the emerging mine and caused the subsequent expansion of the entire territory. In the course of time industrial facilities were established at Karolina, such as mine, coking plant, blast furnaces (Sophien Ironworks) and, in later years also power and chemical plants. On a relatively small area the industrial branches of mining, metallurgy, coke-making and associated chemical production and last but not least also power engineering were developed at Karolina.

The historical and construction-technical development of individual plants began at different times in the light of scientific and technological progress and events in the Ostravian mining district. As well as the decline in the activities of industrial plants in the second half of the 20th century reacted to certain factors, which were not only technical limits, such as decrease of coal sources and old technology, but also a growing interest in reducing pollution, supported by political decisions of the city's leadership. The sole existence of one of the heavy industrial centres, such as Karolina was, in the historical heart of the city was tough experience. Through the whole area the confusing tangle of various industrial plants took a place. This "metal jungle" stood in contrast with surrounding city centre. Nearby Karolina there were located important social places, such as commercial and fashion house Ostravica Textilia, Hotel Palace with its famous cafeteria, gallery or theatre. Over the time, due to the tendencies that preferred increase of living environment in the city centre, occurs as certain that industry will no longer be a main interest. First visions, which dealt with new functions of the Karolina area, appeared in the 1960s of the last century.

Two different approaches existed simultaneously. The first one continued in industrial development, whilst the construction-technical activities in the areal basically never stopped, while the second one dealt with new possibilities of use of thirty-hectare area.

The first urban study anticipating the redevelopment of Karolina was "Study of demolition and further use of coking plant Karolina and surrounding area" created in 1967 by "Hutní projekt Frýdek-Místek". In the study a demolition of "noneffective plants in area of Sophien Ironworks and power station Karolina" was assumed from 1969 (1970) to 1974. This estimate was not quite accurate (demolition itself lasted till 1989), however, the mentioned urban study was important because as a first study it brought ideas of new redevelopment of the industrial site Karolina.

The idea of redevelopment got more realistic shapes in the 1960s, when many investment projects in the city were refined esp. from 1965.

The demolition of industrial areal Karolina, ongoing until 1989, was total. Almost nothing left from the former tangle of industrial plants and buildings. Though it did not have to be so, in the beginning of the 1970s the first intentions of preserving a part of Karolina industrial heritage appeared. Firstly, there was an idea of preserving the blast furnace No. 3 in the Sophien Ironworks. More important was the effort in the 1980s to prevent demolition of valuable functionalism building of so-called "New coal washing plant" belonged to the coking plant Karolina. Both of these attempts were unsuccessful, especially the demolition of the coal washing plant was irreplaceable loss of excellent industrial interwar architecture and furthermore loss of one the city landmarks.

2 Double Hall of Power Plant No. III of Sophien Ironworks and Former Power Station of Coking Plant Karolina.

After the unsuccessful attempts to preserve one of the blast furnaces of Sophien Ironworks and the coal washing plant, it seemed that in the late 1980s almost hundred years old history of industrial site Karolina would be vanished once for all. Luckily, this was not entirely true. Almost at the last minute two industrial buildings were exempted from the demolition schedule. These were the power station of the coking plant Karolina and the power plant No. III. of Sophien Ironworks – so called “Double hall”. The power plant No. III was built between years 1907–1909 and it was used for blowing wind to the blast furnaces of Sophien Ironworks. According to the original documentation the construction of power plant was conceived as a spacious double hall – composed of two identical halls. Their construction was divided into two stages: whereas the first hall was built yet in 1909, the second hall was not finished until 1920. The halls (each with dimensions 80x29m) stand on a 5m high concrete plinth. Approximately, at the level of the plinth there is a technical ground floor with base pits for the machines. The halls have steel framed construction roofed with trusses. The padding structure consists of masonry.

The power station of coking plant Karolina is located next to the Double hall of the power plant No. III of Sophien Ironworks. Built in 1905 the power station is an example of traditional masonry industrial architecture. As well as at the Double hall, power station has technical ground floor and open space first floor. Its steel framed construction is again roofed with trusses system. Façade, made of white and red bricks, is divided by a rich set of ledges, columns with stone heads and brick frames.

The preservation of both buildings: the Double hall of power plant No. III of Sophien Ironworks and the former power station of the coking plant Karolina, was for long time one uncertain matter. The

demolition plans of Karolina industrial plants (from the 1960s and 1970s) did not assumed their preservation. Moreover, a demolition project of coking plant Karolina from 1984 planned total surface demolition of all the industrial plants, including the power station building.

The circumstances were more promising for Double hall, because the Office of city Chief Architect placed it on the list of the industrial architecture selected to preservation and new use. These chosen objects had to fulfil several conditions, such as compliance with local development plan and a practical new function. Besides Double Hall, which should become an integral part of the city centre, there were also another technical sites on the list, such as the mine Eduard Urx, the mine tower along hotel Jndřich and the mine Petr Cingr.

In an attempt of preserving both historical buildings the events of the year 1988 were eventually crucial. The company Ostravsko-Karvinské koksovny (Ostrava-Karvina Coking plants) on 28th January 1988 sent a letter to District National Committee Ostrava I. with a request of prolonging the date of demolition of the former power station of coking plant Karolina (at that time used as a workshop). According to the original schedule, the demolition should have been finished until the end of 1989. The company asked for prolonging the schedule until the end of 1993, because the Regional investment department was itself interested in new usage of the former power station.

However, the Regional investment department in April 1988 withdrew from the idea of new temporal use of the former power station and the demolition was about to occur in the expected date. But then in September it was again requested for cancellation of demolition date. The Office of Chief Architect received a letter with request in this matter from Directorate General of OKD Company. Besides the cancellation of demolition the letter requested for approval of permanently use of former power station building as

a depository of Mining museum. The request was approved under certain conditions. At first, the former power station should be used as depository only for temporal period for maximum of ten years. It was also settled that after this time the city would become an owner of the building. Another condition was an obligation to repair the façade and to maintain the former power station in a good condition.

Stanislav Vopasek, the chairman of the commission for the establishment of the Mining museum, came with the idea of using the old industrial building as a depository. Vopasek spoke about the circumstances led to his choice: *"We were looking for an appropriate space for a temporary depository and this solution seems to fit. But most of all, even though I'm not from Ostrava, I cannot watch how everything that was so characteristic for this town just few decades ago, now, step by step, disappears. How would one recognize that they are in Ostrava in twenty years?"*

In the light of recent experience with demolition of the functionalist building of coal washing plant this reflection is indeed a certain proof of the changing public opinion on protection of technical monuments. The possibilities of further use of the former power station were explored also by the Office of Chief Architect, through expert studies of young architects in the competition organized by the Czech Chamber of Architects. The topic was also given to students of the Faculty of Architecture, in a form of an orientation study. The Office of the Chief Architect expresses its opinion through Ing. arch. Mojmir Sonnek: *"It is clear that this historic hall must remain and we must thoroughly explore all the variants of its further existence, including economic impact, which was missing in the past. And we have to start conserving and repairing right now. Otherwise, in few years, we are again going to face the decision whether to destroy a completely dilapidated monument."* Some of the construction repairs of the former power station were carried out in the autumn of 1988. The money originally destined for the demolition of the building financed the replacement of

the concrete floor and, besides the most necessary repairs, a reconstruction of the entire wiring was done.

The Double hall temporarily served as a warehouse. In 1989 the City Chief architect Miloš Bartoň expressed himself about the possibility of using halls, stating that the efforts made so far for its dislocation for either sale purposes or sports ones have not yet found a response among the investors. *"All of this would be technically very demanding, because underground urbanism was based on a network of gas distribution, canals and sidings but the necessary documentation was lost during the war."* There was no transformation of the Double hall to new uses, and the building continued to dilapidate. A similar destiny was encountered by the former power station of the coking plant Karolina, which, after ceasing to be used as a depository of the Mining Museum, failed to be reused meaningfully again.

In 1991 the former power station was declared a cultural monument. The Double hall had already been registered in the list of cultural monuments, probably due to its inclusion in the list of industrial architecture objects selected for conservation and new use. For their "second life", however, the former power station of the coking plant Karolina and the power plant of Sophien Ironworks had to wait for more than twenty years.

3 Karolina in the 1990s

Although there were some efforts to connect newly freed area of Karolina to urban structures right away, the plans for new construction were interrupted by the state of the soil, which was strongly contaminated by the years of industrial works across the whole grounds. Firstly, before the beginning of the constructional works, it was necessary to initiate extensive and very expensive decontamination of the area. This necessary action postponed

the new construction at Karolina for an indefinite period of time, the decontamination itself did not start until 1997, when state aid was granted for its development. An obvious requirement of the National heritage institute for the course of the rehabilitation was that the structural stability of the former power station of the coking plant Karolina cannot be disrupted, since it had already been registered as a cultural monument.

On the background of the decontamination process, the largest of all previous architectural competitions and studies on Karolina from the 1960s took place. The International Architectural and Urban Ideal Contest, announced in the late 1990s, was attended by 70 teams from different corners of the world and the winning project was supposed to be the basis for the city's new land-use planning documentation. The most successful was the proposal by a team of Polish architects from the nearby Gliwice, based on the knowledge of the Silesian industrial tradition they excelled especially in their skill of tying the old with the new, without disturbing the spirit of the city. The promising project, which was reworked in a more specific urban study in 2003, failed on its financial side. The persistent inability to find suitable investors eventually resulted in a controversial developer competition. After years of planning and a number of architectural and urban studies, the developer company Multi Development was entrusted with the power to decide on the new construction, whose final "New Karolina" project brought the construction of a gigantic shopping mall. The historic buildings of the former power plant and power stations were already included in the "New Karolina" concept in the first phase of construction and their conversion started in 2012.

4 Triple Hall Karolina

The author of the design of the conversion of both historic buildings is architect Jan Pleskot, who found his way to Karolina

through his previous construction works in neighbouring Vítkovice. The Double hall of the former power plant of Sophien Ironworks and the former power station of the coking plant Karolina were in a bad state at that time, as they stood on the edge of interest for years and were inevitably turning into ruins. The last construction adaptations were those of 1988, when the smaller of the buildings, the former power station, was prepared to be used as a depository of the Mining Museum. As part of the conversion of the two buildings, which began under the Pleskot's project in 2012, it was necessary to carry out extensive repairs of the façades and to all the steel structures. In particular the truss system and the associated roof replacement. The technical background was in both buildings located underground.

The Double hall was to fulfil the function of so-called "roofed square", it should become a space for various cultural and sports events. Its multifunctional use should allow open space of connected halls. The former power station Karolina now serves as a sports ground with courts and other facilities for various sports. Although the idea of a "roofed square" generated contradictory responses, Jan Pleskot was able to make a sensitive conversion of both historic buildings.

The conversion of the now so-called Triple hall promised to bring about the creation of a new public space to help to revive social life in the city. Not everyone, however, welcomed this opportunity. The neighbouring historical centre of the city has been struggling with the negative trend of depopulation for some time. The opening of a new shopping centre at Karolina significantly contributed to the closing or relocation of smaller shops from the city centre. Similarly, the planned activities under the new Triple hall, specifically the establishment of a new market, meant another strike to fading life in the heart of the city. The mayor of Moravská Ostrava and Přívoz (the city centre), commented on the situation in 2014: "It is a pity that the municipality has a different view on what is the centre of the city. According to us it is the Masaryk Square and its

surroundings, not the shopping centre surroundings." There was a paradox situation where Karolina's surroundings, intended as an integral part of the historical centre, became its competitor.

The relative isolation of the buildings was seen as problematic when considering the new concept. The Triple hall stands apart not only from the city centre but also from the neighbouring Vítkovice. The reconstruction of both buildings was more than necessary, but the initial concept of the New Karolina project, which separated the Triple hall from the rest of the building eventually, complicated the effective use of its potential.

The assumption that social events will move from the historic city centre to the Triple hall and to the shopping centre fortunately did not fulfil. The Triple hall itself, although problematic from urbanistic point of view, since it got overshadowed by other buildings, is now, after four years, often used for different cultural events. In addition, the Mayor of Moravská Ostrava and Přívoz, Petra Bernfeldová, speaks no longer about competition but about cooperation with the Triple hall management. Perhaps, despite all expectations, thanks to a successful conversion, the Triple hall managed to be included into the wider city centre, as this was planned in the late 1960s.

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CZ Původně průmyslová přístavní oblast přiléhající k centru města Brémy v Německu zažívá v dnešní době transformaci využití svých ploch. Tato práce přináší srovnávací studii dvou různých částí Brém s cílem vysledovat jejich minulý a současný rozvoj povzbuzovaný především tržními silami. Obě lokality ukazují snahu zachovat alespoň část prvků ze své bohaté historie v příznivé koexistenci s nově budovanými rezidenčními či komerčními projekty.

EN Formerly the industrial harbour area adjoining the city centre of Bremen in Germany has experienced a transformation of land use in recent years. This paper brings a comparative study of two different parts of Bremen with the aim to track their past and current development encouraged mostly by market forces. Both localities show the effort to preserve at least some elements of their abundant history in appropriate coexistence with newly emerging residential or commercial projects.

Keywords: urban heritage; harbour; gentrification; Bremen

1 Introduction

In the history of urban landscapes, many cities saw the emergence of large industrial areas during the Industrial Revolution in the 19th century. The shipyard in the city of Bremen is just an example of many industrial areas that emerged in a lot of western cities, mostly in North America and Europe. There are some processes of which can be said they took place in most, if not all, of these

industrial areas. Large parts of the empty land were turned into large factories, shipyards and entire industrial areas. However, what happened to these areas after the industrial decline is much less homogeneous.

The goal of this paper is to find out how the Bremen shipyards have developed historically, what the present situation is and how the areas might develop in the future. An important characteristic of the waterfront in Bremen is that it exists out of more areas because historically, the A.G. Weser Company has relocated itself more than once to new locations. Nowadays, there are two areas that are being developed: Überseestadt and Gröpelingen. The research question is as follows: What are the development trajectories of Überseestadt and Gröpelingen and how do they differ from each other? Firstly, general developments on waterfronts and the potential of heritage preservation will be discussed. Secondly, a short history of the Weser company will be given. Thirdly, the developments of Überseestadt and Gröpelingen will be laid out respectively. Lastly, this paper concludes with a comparative perspective of the development of the two aforementioned areas.

2 Waterfront Development

Waterfronts have historically been important areas for import and export of raw materials. The waterfront, the edge between the city and water, was the most intensively-used zone in the 19th century and was almost exclusively port and manufacturing related. The wealth of the city was dependent on these industrial areas (Marshall, 2004). However, the second half of the 20th

century saw the rise of the post-industrial economy. The post-industrial economy is characterized by a transformation in the occupational structure. Underlying structural changes that caused this were the rise of the service sector, the advent of new technology, increasingly-skilled labour, internationalization of the economy and the increasing importance of small firms. Modes of production became specialized and flexible (Mikich, 1990). The socio-economic changes also changed lifestyle and culture, with the growing importance of consumption and diverse lifestyles (Mikich, 1990). These changes also led to a different social and physical make-up of the post-industrial city. Alternative housing forms, quality of urban life, the physical environment and mixed land use, became important (Mikich, 1990).

This also affected waterfront development. Port and railway operations became more important instead of the manufacturing function. This was coupled with different needs in the physical aspects of ports, such as cargo handling facilities and intermodal facilities. Old harbours relocated out of the city centre because of lack of space, high land prices and traffic congestion within the city and located further downstream. The result of this is disinvestment and physical and economic decline of the old harbour locations. (Mikich, 1990).

The mentioned socio-economic development also created opportunities for distressed waterfront areas. The way how these opportunities have been dealt with nowadays differs. The waterfront is generally located near the city centre and is, therefore, an attractive place for redevelopment. Redevelopment on the waterfront has been fuelled by international concern about the natural environment, the attractiveness of the waterfront location and demand for inner-city housing, commercial space and public amenities (Mikich, 1990). Common objectives of waterfront development are the exploitation of prime inner-city land reserves, restoration of historic links, enhancing lifestyle opportunities, capitalizing on amenity value, revitalization, new

business development, satisfying housing demand and to improve the quality of the physical environment (Mikich, 1990). These kinds of urban transformation processes are often coined as processes of gentrification, because they capitalize on the de-industrialization of the harbour locations, displace the working class out of the neighbourhood and create new, more elite landscapes (Hagerman, 2007).

According to Tunbridge (1988), there is a primary source of conflict when it comes to waterfront revitalization, namely conservation versus redevelopment. However, conservation might even be an important tool for redevelopment. Redevelopment projects are often "placeless", because they are aesthetically detached from the city the project is located in. Preservation gives a sense of place (Donofrio, 2007; Balsas et al., 2000) and creates a unique image of the area. Further, the industrial buildings are suitable for adaptive use as they offer high ceilings and flexible floor plates (Donofrio, 2007). Preservation might also be an important economic asset for the area because it can attract tourism, create a pleasant living environment for a heterogeneous population and be an inspiration for creative activity (Balsas et al., 2000)

3 History of A. G. Weser

A.G. Weser was founded as a successor of "Eisengiesserei & Maschinenbau-Anstalt Waltjen und Leonhard", an iron-foundry and machine factory in Überseestadt back in 1843. The company's name was changed to C. Waltjen & Co. and then the assembly of ships started. Due to the increasing importance of the shipbuilding industry, A.G. Weser, which means "construction of ships of all kind and marine engineering", was founded on the share by influential merchants, bankers and politicians in Bremen in 1872. Due to the need of expansion, the shipyard gradually relocated from Überseestadt to Gröpelingen.

During the First World War, the company merged with seven other shipyards due to financial difficulties. It was then named as Deschimag. Only A.G. Weser and another small company, called Seebeckwerft, survived finally in 1928. In the lead up to and during the Second World War, A.G. Weser started building warships. Therefore, A.G. Weser often became the target of the bombing. From 1945 to 1948, Deschimag was dissolved and the production facilities of A.G. Weser were confiscated by the USSR. It was the period of modernization from 1963 to 1983 in which the shipyard started to build tankers. In 1983, the A.G. Weser company closed, as the tanker boom came to an end. The number of workers shown in figure [Fig. 1] clearly reflects the ups and downs of the A.G. Weser company from its establishment until its closure.

4 Historical Development of the Überseestadt Harbour (Überseehafen)

During the last decades of the second half of the 19th century, dockyard activities in the area of Hohentor began to diminish. The A.G. Weser Company started to move its harbour to

a more appropriate location, which is farther from the city centre of Bremen. Überseehafen was established in 1897 and opened fully nine years later. A decade after opening, on the north-eastern side of the peninsula, cotton warehouses were built. These warehouses are known as Speicher XI [Fig. 2]. They were built beside further development of the whole area, comprising an extension of the quays, deepening of the pelvis and laying another railway track connecting the port with the city.

Destructive air raids during the Second World War almost completely destroyed all industrial activities, port facilities in Bremen and its surroundings [Fig. 3]. However, owing to the importance of a newly establishing German economy, the general reconstruction of Überseehafen took place in August

1 →



Number of workers in A.G. Weser through history
Schwarz (2016)

2 →



Speicher XI in the 1910s
Harbour museum in Bremen

1945, followed by extension of facilities and development of new buildings [Fig. 4]. In 1966, the harbour was prepared to accommodate containerships and transhipment of their cargo.

In the 1980s and 1990s, subsequent expansion took place also in Bremerhaven, which gradually attenuated harbour activities

in Bremen. In 1998, Überseehafen was backfilled with almost 3.5 million m³ of sand. Two years later, 1.8 km² of land has been reclaimed [Fig. 5, compare with Fig. 9]. This brownfield area was quickly ready for its next development. In 2001, the large warehouse building was established [Fig. 6], followed by the creation of a residential quarter a few years later [Fig. 7]. Only a part of the peninsula around Speicher XI was preserved [Fig. 8, compare with Fig. 2]. The overall view of the current development in Überseestadt is depicted in [Fig. 9].

4.1 Gentrification vs. Preservation of Harbour Heritage

Several development trajectories of the Überseestadt peninsula can be distinguished during the past two decades. According to the spatial plan of the area, the land appointed to apartment flats [Fig. 10, in the middle and right area] will also expand in the next years, besides certain continuous, though partial, preservation of

3 →



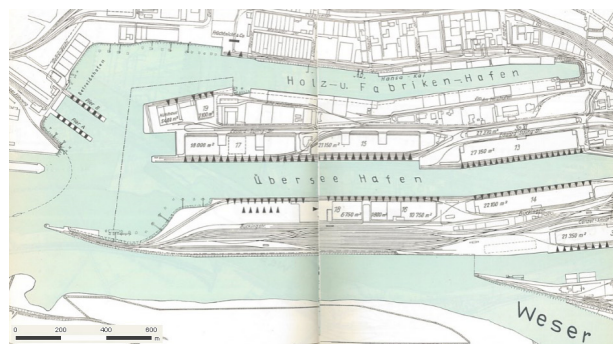
Harbours in Bremen in 1945
Harbour Museum in Bremen

4 →



Reconstruction of Ports in August 1945
Harbour Museum in Bremen

5 →



Überseehafen in the 1960s
Gesellschaft für Wirtschaftsförderung Bremen (1960)

6 →



Warehouses built in 2001
Authors' own photo

7 →



The Residential quarter of Überseestadt built in the late 2000s and 2010s
Authors' own photo

8 →



Speicher XI in November 2017
Authors' own photo

9 →



Überseestadt around 2016
Unknown

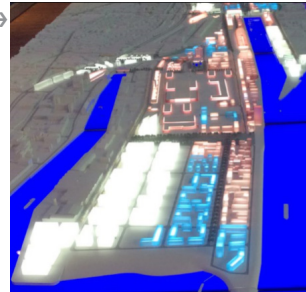
the warehousing area (on the left side). However, still undeveloped areas (including renewal of top left corner of the peninsula) will be transformed into residential functions probably in the near future. New residential apartments comprising mostly 5-storey high buildings are under construction since the late 2000s. Simultaneous development of this area with a gradual termination of harbour activity in the 1990s and therefore the emergence of the first brownfields is obvious. According to the Neil Smith's rent-gap theory (Smith, 1987), there could have been a fundamental discrepancy between the actual and potential value of undeveloped land that has triggered the described change of the land-use by private actors.

This residential area including its public spaces and surroundings does not clearly show or remind its historical grounds except visible brick facades [Fig. 11, compare with Fig. 8 – preserved historical warehouses from the 1910s]. This indicates the ongoing process of gentrification. Firstly, average rental prices are almost two times higher in comparison to other localities at a similar distance from the centre of Bremen (including Gröpelingen). Secondly, the services and civic amenities inside the locality correspond to the usual features of typical actors of gentrification – young professionals [Fig. 12].

On the other hand, some features of preservation of industrial heritage remained in Überseestadt in the 2000s. The former cotton warehouses known as Speicher XI were renovated and held their indigenous facades [Fig. 13]. Nowadays, they accommodate the museum of the harbour area, a restaurant, offices and a high school. Surroundings of the warehouses express a number of details from their past, such as a cargo crane, railroad tracks and a weight or former boards [Fig. 14, 15].

Overall, the whole Überseestadt area clearly shows several ongoing processes. The new development on the peninsula brought young gentrifiers. The rest of the area is currently undeveloped, except

10 →



Red: Developed area
Blue: Developing/planned area
White: Planning area
Grey: Preserved development

The spatial plan of Überseestadt in November 2017
 Harbour Museum

11 →



The apartment building from the 2010s
 Authors' own photo

for the presence of some warehouses belonging to various companies. Only a small part of this locality (around Speicher XI) has been preserved and a notion of industrial history can be seen from facades or close surroundings.

5 Development of Gröpelingen

Due to the growing incoming orders and the large dimensions of ships, i.e. warships, it was necessary for A.G. Weser to expand their shipyard. The company started to lease land at the Bremen suburb Gröpelingen, located on the right side of River Weser [Fig. 16, 17]. The production and personnel gradually moved from Überseestadt to the new premises. Four slipways and a floating dock with workshops, magazines, etc. were established at the new



The coffee-bar inside the new residential area
Authors' own photo



Speicher XI and its surroundings in Nov. 2017
Authors' own photo



The entrance to Speicher XI in Nov. 2017
Authors' own photo



Details of Speicher XI surroundings in Nov. 2017
Authors' own photos

terrain, which accommodated the needs for constructing ships of all dimensions and categories. The shipyard was further expanded in the following years (GeoMapedia, 2018).

Gröpelingen was a suburb back in the 19th century and was developed with the port industry after 1901 when A.G. Weser moved to the area [Fig. 18, 19]. Being the largest employer in the district, A.G. Weser's workers were concentrated in the neighbourhood and lived with their families there. It is, therefore, logical to say that the wealth of the area depended greatly on the development of the company (Marshall, 2004). After the Second World War, some of the buildings and facilities were destroyed. Reconstruction took place between the 1950s and 1970s. It is noted that from the 1960s migrant workers from Turkey amongst others were hired for the port industry. Thus, the district remained a working class district with cultural diversity (bremen.online, 2018). This has even characterized the district nowadays.

There are still cargo facilities and containers in use at a small part of the waterfront in Gröpelingen. However, after the closure



Location of Gröpelingen in the 1960s
Gesellschaft für Wirtschaftsförderung Bremen (1960)



Gröpelingen in 2014
Google Maps (2018)

18 →



Gröpelingen in 1914

Van Valanger (2018)

of A.G. Weser in 1983 and since 1990 onwards, the area has been redeveloped into a commercial, residential, cultural and recreational district whilst portraying its history as an industrial harbour (bremen.online, 2018). Former workers at the shipyard still live in the district which maintains its multicultural character. Parts of the facilities of A.G. Weser are now officially listed among heritage buildings. Former industrial buildings have been reused and revitalized for new purposes.

5.1 Change of Land Use in the District

One of the significant changes in land use at Gröpelingen after the closure of the shipyard is from post-industrial to commercial and recreational land use. In the early 1990s, the idea of a Space Park was developed at the former site of A.G. Weser. The Space Park Bremen, an amusement park with the space travel theme, together with a hotel and shopping mall was opened in February 2004.

19 →



Gröpelingen nowadays

bremen.online (2018)

20 →



View of A. G. Weser around 1914

Wikipedia (2018)

However, due to the lack of visitors, it was closed in September 2004. In 2006, the building was reopened as Waterfront Bremen, which is a shopping mall with carparks, chained stores, food court and movie theatres. Numerous visitors were attracted. While the service sector of post-industrial era emerges, consumption with retail stores replaced industry with shipyards as explained in the literature by Mikich (1990). It is vivid that the former area of A.G. Weser at Gröpelingen changed drastically and it is hard to trace the past with the present development [Fig. 20, 21, 22].

A change to cultural-recreational land use can also be found at Pier 2 [Fig. 23]. Pier 2 is located on the edge of the harbour. It had been transformed from a warehouse to multifunctional halls for concerts and events (bremen.online, 2018). The Lighthouse (Lighthouse) is another example [Fig. 24]. This historical building is the former administrative building of A.G. Weser, which was built in 1916 and restored in the 1990s. It now operates for culture, education and communication while it used to be the workers' office to supervise and manage the workforce of the shipyard

21 →



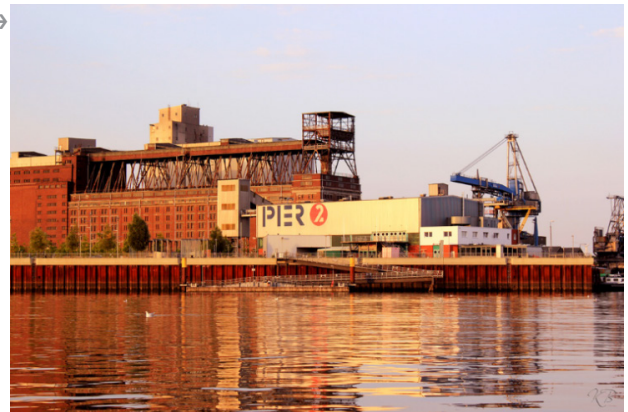
Aerial view of the waterfront
Flickr (2018)

22 →



Waterfront Bremen
bremen.online (2018)

23 →



Pier 2
bremen.online (2018)

(bremen.online, 2018). In addition, "Feuerspuren", an international narrative festival has been organized every year since 2007, which further shows the trend for cultural development in the area.

5.2 Historical Traces in the District

The change in development has put the history of A.G. Weser, which much behind that one could barely find the history of the shipyard on the websites of these buildings. Nevertheless, a strong bonding of A.G. Weser in the district can still be found for various reasons.

Firstly, it is noticed that A.G. Weser is also being called or referred to as "Use Akschen" by the residents in Bremen, which means "Our Share". It is worth noting that there is a street named "Use Akschen" at Gröpelingen. This has as a result that there is "still some sense of connectedness to the former largest Bremen shipbuilding company" in the district (AG-weser-werftarchiv, 2018).

Secondly, historical traces of the shipyard can be found in the arts that can be found in public space. There is a bronze sculpture "Zur Schicht" in Lindenhofstraße, which memorizes the shipyard workers [Fig. 25]. It is made by Waldemar Otto in 1983 and shows the everyday commute of the former shipyard workers. A mural painting titled "History of the district Gröpelingen and the A.G. Weser 1878-1978" is found near Pastorenweg [Fig. 26, 27, 28] (mioch.net, 2009). It was painted by Jürgen Waller and students of the College of Arts in 1978. It illustrates the situation and history of the shipyard. These artworks remind the residents nowadays of the history.

Lastly, there is still a strong bonding between former workers of A.G. Weser, which helps in preserving the history of the shipyard. The workers' association "Use Akschen" was founded by the disappointed and angry shipyard workers after the closure of

24 →



Lighthouse (Lichthaus)
bremen.online (2018)

25 →



"Zur Schicht" Sculpture
bremen.online (2018)

the shipyard for helping former employees with employment law issues and claims [Fig. 29]. It continues to function up to this day after being set up 35 years ago. “Inherited solidarity” is their spirit and there is still an annual general meeting (Digitales Heimatmuseum Bremen, 2017; Geschichtswerkstatt Gröpelingen e.V., 2018). Former shipyard workers and their family members have shown their enthusiasm in preserving the history by establishing online archives, which collect all details of the shipyard and sharing them with the general public. Jörg Suhling was one of the employees, who runs the website A.G. Weser Bremen (<https://www.ag-weser-bremen.de/>) and Daniel Sokolis, a former employee’s son, collects everything related to the shipyard and runs the website A.G. Weser Archiv (<https://ag-weser-werftarchiv.jimdo.com>). There also was an exhibition in 2014 which displays films, tools and pictures of the shipyard (Janssen, 2013).

In the view of all of the historical traces in Gröpelingen, it is shown that the shipyard history is a shared symbol among the people living in the district. Thus, all aforementioned elements together form the identification of A.G. Weser in the district of Gröpelingen.

6 Conclusion with a Comparative Perspective

As a corollary of the development trajectories of the two areas, it can be stated that the activities of the labour are undoubtedly diminishing and only a few cargo/container facilities still operate nowadays. The land use in Überseestadt is mainly residential and warehousing now. For Gröpelingen, it is not only residential as it has been in the past, but now there are also the commercial, recreational and cultural activities which flourish. Historical traces with physical reminders are found in both areas. In Überseestadt, this is shown by the preservation of heritage like the old cotton warehouse with the museum of harbour history inside. In Gröpelingen, this is shown by old administrative buildings and

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27



28



“History of the district Gröpelingen and the A. G. Weser 1878–1978”
mioch.net (2018)

piers. While gentrification is predicted to be a continuing trend in the area of Überseestadt, there are strong cultural reminders of the neighbourhood as a living place for the former workers in Gröpelingen. They intend to remind the general public of their shared memory of A.G. Weser and its industrial development. Both areas have experienced great changes and have new developments, but the history of the industrial era and A.G. Weser is continued to be remembered in various ways.

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Logo of the Workers' Association
Use Akschen Use Schipp (2018)

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Original Country Farm as a Part of Urbanistical Pattern and Contemporary Settlement Centre (Manor House Chotíkov)

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CZ Historické statky a dvory jsou nedílnou součástí urbanistických struktur historických jader českých vesnic. Jedná se o původní významná zemědělská centra, kolem kterých se utvářela vlastní sídla. Jejich současný stav je ovlivněn nedostatkem financí na jejich údržbu a současně přerušením kontinuálního vztahu s místními obyvateli v důsledku jejich využívání v období kolektivní zemědělské výroby v 2. polovině 20. století a průběžným i následným chátráním. Přesto, že jsou tyto stavby podstatou kulturně historické tradice, mají neopomenutelný urbanistický potenciál a měly by se tak stát přirozeně základem pro trvale udržitelný rozvoj sídla, padají úvahy na jejich odstranění. Historické stavby je nutné vnímat jako podstatu identity sídla. Je snad možné odstranit historickou památku z map a myslí občanů způsobem, kdy nevznikne sociální jizva a prázdné místo v urbanistické struktuře, které se bude jen stěží vyplňovat. Naší povinností je udržet kontinuitu urbanistického vývoje a najít pro původní objekty uplatnění. Text se zabývá možným přístupem k původním budovám v historických jádrech obcí na příkladu panského dvora v obci Chotíkov u Plzně.

EN Original country farms or little manor houses are an inseparable part of urbanistic patterns of historical centres of the Czech villages. By these we understand original essential agricultural centres that created a base for development of the settlement. Their current state is affected by several factors such as a lack of financial resources for their maintenance, discontinuation of relationship with original owners and inhabitants in the area due to enforced collectivisation and their use for centred agricultural production in the second half of the 20th century which was followed by decay of properties. These structures are an inseparable part of cultural-historical heritage, they represent essential urbanistic

potential and they should naturally become a base for sustainable development of the settlement. However, there are raising voices calling for demolition of these historical buildings. We have to perceive them as the essence of the identity of the settlement. It is our duty to maintain the continuity of countryside development and to find a role for the original objects in the future. This text deals with a possible approach to the original buildings in the historical centres of the Czech villages on the example of the manor house in Chotíkov near the city of Pilsen.

Keywords: spatial planning, original country farm, settlement centre, sustainable development, village square

1 Introduction

Original country farms or little manor houses are an inherent part of urbanistic patterns of historical centres of Czech villages. They have a significant position due to their location in the centre and their size. They represent very often original essential agricultural centres that created a base for development of the settlement.

These buildings are not only historically valuable objects but an integral part of the settlement in the historical and spatial context. The layout of each village is basically unique so we can find farms in a variety of forms and positions.

Composition and spatial parameters of the settlements were determined by their historical layout and development phases which are more or less reflected in their current state. Stages of colonization processes, war conflicts and consecutive stabilization

and revitalization changed unevenly from the early Middle Ages. This fact logically prevents the reconstruction of the original state. In combination with different natural conditions a wide variety of different forms of village layouts were created, which are subjects of study and inspiration.

The village Chotíkov was founded at the foothill of Krkavec. It was with a non-fertile position from the point of view of the requirements of early medieval agriculture. Therefore we expect the formation of the village in the time of medieval colonization in the 12th, rather the 13th century [1].

The settlement has an irregular composition. The manor farm and the church are situated in the centre [2].

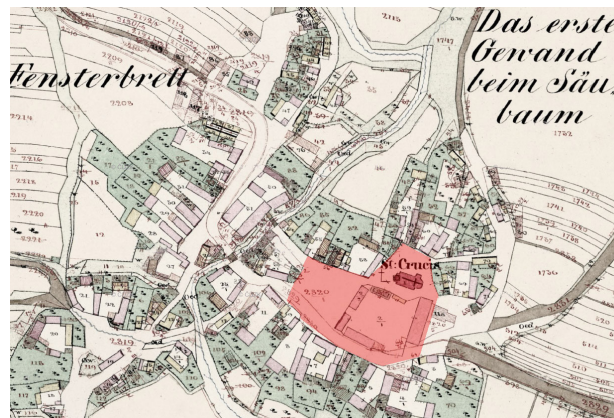
The manor house Chotíkov is an integral part of the historical centre. It is surrounded by the scene of a very preserved original rural architecture probably from the turn of the 19th and 20th century. We can watch the historical composition on maps from 30th years of the 19th century [Fig. 1]. These smaller row farms probably respect the position of the former buildings [3].

Although the survived buildings of the manor house are characterized by Baroque style, this is the original centre of the original settlements. Its origins date back to the 14th century. A subsequent housing development evolved around the centre [4].

It can be assumed that the current layout is based on the original settlement and construction continuity. Historical sources mention the original fortress as a part of the centre. However, its story is unknown.

The manor house is a dominant feature of the centre which accents the former agricultural importance. It forms a beautiful composition with the church. This area is the natural and optical centre of the village. A dignified entrance to the manor house was

1 →



Village Chotíkov on a historical map from the 30s of the 19th century
Manor house, church and village square are colored
<http://archivnimapy.cz/ckz>

created as a free public space. Its negative garden transformation from the second half of the 20th century is possible to change (rough terrain, plants, exterior furniture).

The relation between the house and the church is problematically visible because of the later addition of sheds with no historical value. Demolition of these buildings would be positive for the space composition. The current situation is visible on the aerial photograph airframe [Fig. 2] and the photo [Fig. 3].

The manor house consists of five buildings which define the internal yard. The building site is rectangular and sloping.

The residential building is situated towards the village square. The main gate is there. The building is a one-storey. It is covered by a saddle roof with dormers. Its ground plan is rectangular. The street façade has four axes. It is necessary to mention the statue of St. Jan Nepomucký. Its pedestal is adjacent to the façade.

The torso of the second residential building is located on the other side of the gate. Its shape is captured on the historical maps and photographs. It is worth to mention the internal system of simple ventilation, which has been mentioned by some witnesses, unfortunately not documented.

On the southern side of the plot along the main road there is a cowshed which consists of two buildings. The building has a saddle roof with a pair of dormers in the gable. The perimeter wall is thoroughly made in a Baroque structure with large stones in the corners. The ceiling from the second half of the 19th century with the characteristic vault and the steel riveted supporting construction is preserved. There is an additional trapezoidal extension in the corner of the plot.

The eastern side of the manor house is lined with a large barn with two original entrance gates. The perimeter wall is also Baroque, made of sandstone blocks mostly. The roof is saddle-shaped with an entrance central dormer, at the top of roof with an elliptical-shaped dormer [4].

The historical centre and its original buildings form the oldest part of the village. It is relatively well identifiable in contrast to the later development and so we can work well with it separately. A professional research is the main condition for the formulation of actual needs of monuments protection or other legal possibilities. Comprehensive analysis is a necessary part of designing a quality architectural work [6].

2 →



Aerial photograph of Chotikov

Sheds from the second half of the 20th century are colored mapy.cz, 2. 7. 2018

3 →



Manor house on the photograph from the year 2018

sheds from the second half of the 20th century are colored author

2 Today

The partially depopulated and decaying centres are a common picture of the Czech villages. A new delimitation of the development areas at the edges of settlements is not sustainable for the future. So the original centres present great potential. The significance of the original rural areas is primarily in the historically created genius loci which is typical for this space. However, this is a sensitive attribute that can be easily destroyed by inappropriate interventions.

Is it possible to damage or demolish the historical monument from the maps and citizens' minds? This empty space will be hard to fill. Our duty is to maintain the continuity of development and to find a new use for the original objects.

Despite the above-mentioned the local plan does not provide any necessary protection to the manor house and whole historical centre. "The proposed development does not violate the interests of historic preservation. The conditions of land use regulate the high level and area of buildings in existing and new areas. The character of the original building from the 19th and the beginning of the 20th century must be respected"[7, p. 3].

The deteriorating technical condition of the house led the local authority to a groundless decision to demolish the manor house. The local initiative prevented it. Public debates with experts and general discussions began. A relevant documentation of the construction was presented.

The value of the Manor House Chotíkov is supported by the currently worked out construction-historical exploration of the West Bohemian Institute for the Protection and Documentation of Monuments from July 2017. Demolition would result in irreversible loss of historical heritage. The complex of buildings uniquely determines the appearance of the village. Expert opinion

recommends such use of objects which enabled renewal and integration into public life. Buildings were marked as technically satisfactory [4].

The history of the village is written on the walls of the house. In the public debate one of the witnesses talked about the end of the Second World War and about the arrival of the liberation army, which he watched from the stone wall of the manor house as children. Other witnesses mentioned social and cultural events or the beginning of a cooperative farm (public debate, 27th of March 2018, Community Centre „Slávie“, author´s notes).

It should be mentioned that the Church is a Czech cultural monument [8] and its relation to the surrounding area must be protected as a necessary urban, architectural and historical context.

The Department of Architecture of the Faculty of Civil Engineering participated in the discussion. An architectural workshop was organized in cooperation with the municipality: MANOR HOUSE CHOTÍKOV / NEW VILLAGE CENTRE [9].

The involvement of university students in the discussion may open new questions that could contribute to an effective solution. Interviews between architects and locals can be an important source of understanding the image of the village.

3 Protection of the Settlement Pattern

The urban pattern is a unique feature of every settlement, which must be protected and seen as the bearer of our cultural and historical heritage. The architectural qualities of the original buildings are given by proportions, rhythm, harmony, moderate colours and materials used.

In general, any structure can be considered as an aggregate of elements and relations. We speak about a layout pattern and a shape pattern, which form an inseparable whole in a real space [6]. Primary spatial concepts of the villages were based on centrality, linearity, spatial shape or combinations of these. Development was subordinated to technical possibilities at the time of formation, the configuration of the terrain, the climate and other local conditions.

Layout pattern means the layout of the village on the surface, historical plots of land and the position of objects, the relation of objects to the public space. Advanced layout may show periodicity and regularity.

The shape pattern is described as a basic shape of the building, ground plan, height, type of the roof, etc.

The historical pattern of the villages shows compositional disturbances in central areas and peripheral parts. We speak about „sub-urbanization“, which is the problem of this analysed settlement bordered by the city of Pilsen.

When we compare the current and available historical maps of the village Chotíkov, there is an identified still preserved and sufficiently readable layout pattern of the original village (historical plots of land in the first half of the 19th century) [Fig. 1]. This fact should be the main basis for further development. The bearer of value is the manor house with the church around which the historic centre was formed. Surrounding farms define the main public space.

4 Future

The necessity of reconstructing and rebuilding of the original architecture and revitalizing public areas is evident. The main

architectural, urbanistic and historical links cannot be ignored. It is necessary to promote methods for preservation of the village values and to offer examples of designs and realizations. Modern interventions in the village pattern were documented by publications summarizing the student works of several universities [10].

The manor house in Chotíkov was historically a natural economic centre and it maintained this position in the problematic socialist period before 1989. The post-revolutionary direction is still a topical issue. Is the building able to be the centre of the village again?

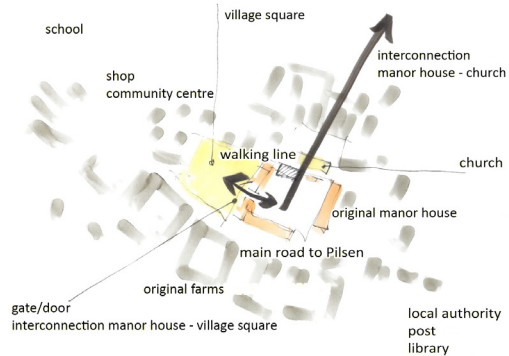
Conversion of the original spaces usually creates great controversy. This is the reason for inactivity and then decay of some objects.

The creation of the new concept of the Chotíkov centre can be based on the following variants which work with the main spatial elements (manor house, church and its parterre, village square) and interaction between them. Particular spaces can be interconnected optically or functionally.

- a) Separation of spaces.
- b) Interconnection “manor house - church”.
- c) Interconnection “manor house – village square”.
- d) Maximal Interconnection “manor house – church and its parterre – village square” [Fig. 4].

The aim of future rebuilding in our case should be the restoration of original interconnection between the manor house and the church, respectively the village square. It is necessary to open the manor house (its yard) to the surrounding spaces and to strengthen the perception of the place as the centre of the village [Fig. 5, 6, 7].

4 →



Concept, maximal Interconnection "manor house – church and its parter – village square"

author

6 →



Sketch of conversion, top view

author

5 →



Sketch of conversion, layout

author

7 →



Sketch of conversion, perspective

author

The function of the buildings would be derived from the actual needs of a developing settlement near the city of Pilsen. There is a need to solve the lack of local amenities. The new centre should fulfil the cultural and social function, as well as tourist and recreational activities. Missing public amenities, such as a cultural centre with a multifunctional hall, a library and a basic art school are applicable. The settlement needs commercial premises, such as a restaurant, a café or doctors' offices. Tourism can be supported by the location of an info centre or a regional museum.

Student projects present possible visions for the future: <https://workshopchotikov.webnode.cz> [9].

5 Conclusion

The transformation of the rural environment has been characterized by a gradual loss of identity and historical ties since the middle of the last century. We perceive it in public spaces, settlements, panoramas and landscape. The original country farms and their positions in the village patterns are just one of many unfinished chapters.

Fortunately, the transformation of the countryside is a continuous process. It should be built on solid foundations in the future, but not ideological ones. The new development should respect the form of original urbanism and architecture, to refer to local typical characteristics and to evoke authenticity in the contemporary views. Many contemporary studies and realizations show the possibility of accepting historical references.

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Území Čech a Moravy disponuje poměrně hustou sídelní strukturou, jejíž základy byly položeny již v období středověku, kořeny založení některých sídel dokonce sahají i dále do historie. Z celkového počtu sídel, který činí přibližně 6 250, má necelých pět tisíc sídel méně než jeden tisíc obyvatel. Ačkoliv tato malá sídla tvoří většinu z celkového počtu, jejich rozvoj ve většině směřů značně zaostává. Často chybí základní vybavenost a základní sídelní infrastruktura, kde významnou kapitolu tvoří komunikační síť spolu s náměstími či návsemi, tedy systém veřejných prostor. Přitom to jsou právě veřejné prostory, které jsou klíčové z hlediska žití života a vzájemné interakce obyvatel. Současná podoba sídelní struktury je tvořena specifickou sítí sídel. Ta se vyznačuje velkou hustotou a rovnoměrností rozložení (průměrná vzdálenost sídel je 1,5 km) převážně malých sídel pevně spjatých s okolní krajinou.

Cílem práce je zachytit a popsat typický veřejný prostor ulic (jak současný, tak ve vazbě na historii) malého sídla se zaměřením na dopravní prostor, který je pro českou vesnici charakteristický a nezaměnitelný. Pomocí podrobné analýzy malých sídel na území Čech budou specifikovány jednotlivé znaky veřejných dopravních prostor. Opakující se znaky budou zaznamenány jako charakteristické rysy daných prostor. Jejich souhrn spolu s popisem by měl sloužit k uchování či znovuvytvoření obrazu typického českého venkova.

The territory of Bohemia and Moravia has a compact settlement structure, which was founded in the Middle Ages, in some cases even earlier. The total number of settlements in the Czech Republic is approximately 6,250, about five thousand settlements have less than one thousand inhabitants. Although these small villages is the majority of the total, they are mostly underdeveloped than bigger

towns. There is a total absence of public amenities and elementary infrastructure, where a communication network with the squares or villages, i.e. the public space system mainly exists. At the same time, the public space is the key to living and mutual interaction of the population not just in smaller settlements. Czech settlement structure consists of a specific network, which is characterized by a high density and evenness (the distance between settlements is about 1.5 km in average) of small settlements connected with the countryside.

The aim of the thesis is to catch and describe actual and historical typical public space of the streets of small settlements with a focus on the transport area, which is characteristic and typical for Czech villages. A detailed analysis of Czech small settlements will specify individual characters of public transport areas. Repeating characters will be recorded as characteristic features of this spaces. The summary of these features together with their description should be used for preservation or recreation of the image of typical Czech countryside.

Keywords: countryside; villages; street space; rural public space.

1 Introduction

Movement and exchange are an essential element of the surviving and developing of humans and society. The movement of persons and things is carried out by transport forms and continuous transport infrastructure between settlements and in intravilan, regardless of their size. The concept of transport is

very comprehensive - it can be understood as air, water and land transport, where the most important topic is the motorized land transport, pedestrian transport and cycling. Traffic in the streets is currently a topic of many discussions. Unfortunately, this is particularly the case in large cities or metropolises, smaller settlements and villages are left out. It is clear there is no such concentration of life as in the cities and metropolises, but the importance of streets as public spaces is no less important. The size of villages can not be an argument for neglecting the safety and functionality of street areas.

2 Transport Links

2.1 Binding to History

The beginnings of the major transport links can be dated to the Neolithic Revolution, when the first settlements were established. In Central Europe it was in 4th–5th millennium BC. The basic routes naturally increased and differentiated according to the importance of the route in response to the need for interconnection and human movement over time. Continuous road network was developed with a clear structure of significant transport flows, completed by a minor network of secondary roads.

During the 20th century the perception of transport was completely inverted. The transport network and space grew considerably in response to the increased need of mobility. This had an impact on local roads, mostly in the streets, which became monofunctional transport zones without public life. The primary function of streets changed into transport space with the domain of motor vehicles. Of course, communications are indispensable for an effective journey between places, they are important for maintaining of the regional mobility, for the national economy and, last but not least, for modern life. But communications in intravilan create streets and should be basically adapted for people. They should not be

unhealthy places where a pedestrian feels uncomfortable and unnecessary. Streets should allow social interaction and physical activity and should offer a potential of space and with other types of transport at the same time. When all these requirements are matched, a unique, multifunctional public space will be created to provide opportunities in social, economic and cultural terms (Madden and Wiley-Schwartz, 2005).

3 Rural Settlements

3.1 Definitions

The smaller settlements with a characteristic structure of foundations are located mainly in the countryside - it is possible to speak about "rural settlements". There are some basic terms associated with this thesis below.

3.1.1 Countryside

The definition of the concept of countryside is not clearly defined scientifically or legislatively. Simplified, one could say that the countryside is an abstract designation of the cultural landscape. Negative delimited it is a space outside urban spaces. A countryside can also be defined as a space characterized by a lower density of population with settlements with typical architecture and character, with distinct cultural and social features and focusing mainly on agricultural production (Štoger, 2001). [Fig. 1]

3.1.2 Czech Countryside

Today's countryside typical for Bohemia and Moravia is the result of evolution and formation of several centuries. First permanent settlements were established in the Middle Ages for the purpose of farming – the typical agricultural villages with rural features and character. In the 19th century during the Industrial Revolution these settlements began to lose their purely agricultural function. The rapid population growth in cities and in countryside led to

increasing living standards in combination with rising hygienic habits. But due to limited capacities in agriculture or related fields this resulted in relatively massive urbanization, i.e. migrating rural residents to cities where workforce was needed for emerging industrial production. This massive flow of people into towns slowly began to stabilize after the Second World War (Perlín a kol., 2010).

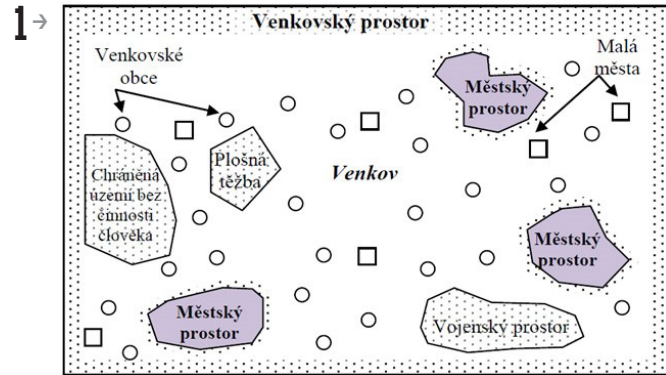
3.1.3 Country village

The village is a spatially defined unit formed by a group of houses that has or had a residential or recreational function in the past. This unit is separated from the other settlements by a free, unbuilt space. So if we talk about a rural home, it means a spatial grouping of houses in a certain configuration, but always in the overall layout of the country.

3.2 Definition of Rural Settlement

It is appropriate to define a rural settlement from an urban point of view according to RNDr. Perlín for the purposes of this work: "The countryside is defined as a settlement with a typical urban structure of a low-rise building with a high proportion of family houses with a poorly developed street network with a dominant area of the village as a social and cultural centre of the settlement and a high proportion of greenery in it." (Perlín, 2008). It is already clear from this definition that the neglected and undeveloped street network is a common matter in these settlements.

A village can be defined by capacities, according to the number of inhabitants. In the Czech Republic, the two thousand inhabitants of the headquarters are commonly used as a determining factor for "undoubtedly a rural residence". This limit is set for the typical Czech settlement structure, in other states this conventional aspect is set up to the size of five thousand inhabitants. But even on our territory, this limit of two thousand inhabitants can be



Spatial structure of the territory from the point of view of approaches to rural delimitation (city space, villages, cities, ... others, between – rural area)

Binec a kol., 2009

controversial – there are settlements with more than two thousand inhabitants and they are clearly rural, on the other hand there are small towns with fewer than two thousand inhabitants whose overall character is clearly urban. For this reason, settlements with a population of between two and ten thousand are often defined purposefully according to the needs of individual authors (Perlín, 2008).

3.3 Typology of Rural Space in Terms of Historical and Socio-economic

Typical rural areas can be seen in the Czech Republic. These spaces are characterized by specific features such as typical buildings, a characteristic layout of the buildings or the shape or layout of

a common. These features have been formulated by historical developments in the area and by various social and economic relationships in the past and present. To a certain extent, the common features of rural space can be seen in settlements based in a similar terrain configuration.

According to the historical development and the current socio-economic position of the settlement together with its position of the settlement system, it is possible to determine the individual features of the individual rural areas. But defining the exact limits of the different typologically same rural areas is not so clear. Individual characters may intersect within the headquarters, and therefore it is not possible to clearly identify the classification into a certain typological space – one typological space may change to another (Perlín a kol., 2010).

The following division of rural settlements based on historical development and socio-economic relations is appropriate for monitoring the typical characters of the transport and street space. Villages that were classified in the same typological area had very similar evolution and socio-economic events, which caused that their interior spaces were similarly shaped.

The following division of rural settlements based on historical development and socio-economic relations is appropriate for monitoring the typical characters of the transport and street space. Villages that were classified in the same typological area had very similar evolution and socio-economic events, which caused that their interior spaces were similarly shaped.

3.3.1 Types of Rural Space

According to RNDr. Perlín (Perlín, 2008):

1. SUBURBAN ZONE (SUBURBÁNNÍ ZÓNY)

These areas, known as satellite towns, will not be further explored in the course of their work. These places are not and will never be

rural settlements.

2. AGRICULTURAL AREAS – Rich Rural Areas (zemědělské oblasti)

Location: Polabí, Poohří, Moravské úvaly, southeastern part of Moravia (wine regions).

Types of settlements: Larger and smaller villages, smaller towns (microregional centres), cities (local centres), cities (regional centres).

3. RICH SUDETENLAND (bohaté Sudety)

Location: Ašský výbežek, Karlovarsko, Severní Čechy (Chomutovsko, Mostecko, Ústí n. Labem), České středohoří, Liberec, Krkonoše and Orlické hory, Jeseník.

Types of settlements: small villages, smaller towns (micro-regional centres), cities (local centres), cities (regional centres).

4. POOR SUDETENLAND (chudé Sudety)

Location: southwestern Bohemia, Pošumaví, Novohradsko, southeastern Bohemia.

Types of settlements: villages, smaller towns (micro-regional settlements), cities (local centers), cities (regional centers) – all at a low density, settlements start at about 10 km from the border.

5. INNER PERIPHERY (vnitřní periferie)

Location: Rakovnice, Central and South Bohemia (Příbram, Písek, Tábor, Benešov Pelhřimov), Bohemian-Moravian Highlands.

Types of settlements: a dense network of villages and small towns, cities (local centres), cities (regional centres).

6. MORAVIAN-SLOVAK BORDERLANDS

(moravsko-slovenské pomezí)

Location: southeast Moravia – the border with Slovakia.

Types of settlements: village settlements, smaller towns, cities (local centres), cities (regional centres) – density of settlements with decreasing tendency. [Fig. 2]

3.4 Rural settlements

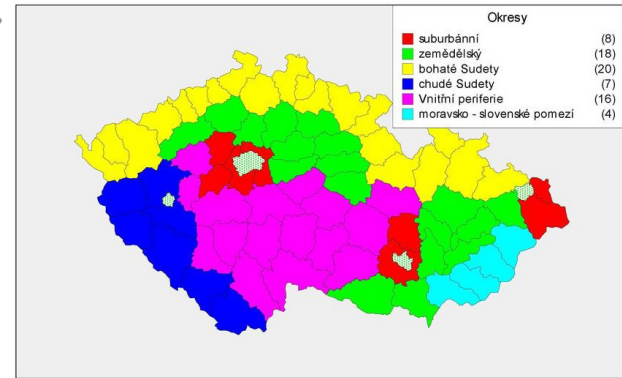
From the above-mentioned division of rural space into specific groups, it can be seen that there are six typologically different areas in our territory, which contain differently large estates. This work focuses only on village settlements, so this division can be reduced to five groups (excluding suburban areas), which can be used to find and enumerate the characteristics of the rural transport area (street public space).

4 Transport area of the village

Villages have undergone historical and social changes since the time when they were founded. These changes could have been intensive and have changed the settlements from the ground, or have just grown up with minimal interventions in the original structure. Together with the settlements a transport structure has been also developed. It has had to respond to progress in the transport sphere, when f.ex. carriages and wagons were replaced by cars, and also to changes in the demands of a society that had perceived these spaces diametrically different over the years.

Spaces of villages that are perceived to be traditional by today's society came mostly from the late 19th and early 20th centuries. In the second half of the 20th century, the "city-rebuilding" of the rural areas began, when typically urban elements were brought into the villages. That disrupted the individual buildings or the whole urban structure and the typical traditional face of Czech villages was losing slowly. The major change was during the time of construction of transport and technical infrastructure, involving

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Complex typology of rural area of the Czech Republic by district
Perlín, Kučerová 2009

the adaptation of surfaces and structures of roads, which in some cases changed street profiles.

Currently, the trend is to create city-streets in small settlements, streets that prefer motor traffic, strictly dividing space into different traffic lanes and creating an unhealthy area. For small settlements, where the street is one of the key public spaces, it can be totally devastating, especially for the elementary functions of the village.

4.1 Description of the research

4.1.1 The aim of the work

The aim of the thesis is to catch and describe actual and historical typical public space of the streets of small settlements with a focus on the transport area, which is characteristic and typical for the Czech villages. Spaces of villages, which today's society is perceived to be traditional, came mostly from the late 19th and early 20th centuries. These traditional street areas in the villages have remained in some settlements until today, somewhere they have been rebuilt into another structure. They are also caught in old plans and photographs, which are sometimes hardly accessible. On the contrary, a very good source of information about spatial relationships and constructions in village settlements are historical postcards from which very detailed features and contexts can be easily read.

4.1.2 Method of research

A detailed analysis of Czech small settlements, which is implemented in situ of current settlements and especially from historical postcards. Individual characters of public transport areas are specified from these sources. Recurrent characters are established as characteristic features of public transport spaces of small settlements. Each character is specified in detail, described and shown in a typical example. The summary of these characters together with their description should be used for preservation or re-creation of the image of the typical Czech countryside.

Author's note:

In the first part you can see the division of characters in two levels. The basic group consists of characters describing the common characteristics of the transport area, which can be found in the most of the village settlements, regardless of their location or historical development. The subgroup is then the specific characters that appear and are typical for each group of villages in the typologically different rural areas.

4.2 Basic characters

SCALE

The main character of any rural space is a scale. In villages it is typical that all proportions and ratios of different buildings and spaces hold a scale that respects and honors human. Places with such parameters are close to their users and create spaces where it is pleasant to stay (rest, interaction of the population) and move (walking as an elementary type of movement).

The scale of a human is also used within the transport area or street space. The width of the street space, which is most often defined by the front walls of buildings or fences, depends on how the village is established and located. Its cross-sectional span can range from a narrow one-way lane of communication to a generous 15-20 meter wide space. The wider the space is, the more it is divided, which appears in a form of different lanes with functions such as dividing (green) ones, technical (drainage ditches) or ornamental (flower beds). In history, there are also cases where the wide street area was left as a paved area with tall trees.

VILLAGES IN FLAT AREAS AND IN THE HIGHLANDS

In places where the founding of the village was not limited by natural conditions, settlements with generous street space were established. Its width is about three to one (width of street space to the height of adjacent buildings), but often the streets are also wider. In some cases, the streets expanded to form the central space of the village. [Fig. 3]

Appearance: Agricultural Area, Inner Periphery (flat parts)

MOUNTAIN VILLAGES

In villages built in mountain areas or in rugged terrain it is used the rule that the ratio of street width and height of street

area approaches the ratio one to one. This is mainly due to the arrangement of the terrain, which provided limited space and intention to protect against weather conditions – a more confined building configuration provided the protection of the street space. In the scattered settlements, communications were mostly with pure transport character. This resulted in settlements in the valley between the hills, on the slopes or in the mountainous plains. In villages with confined spatial conditions, it is often not a classic village square, but it forms a street whose profile has been extended to create the central space of the village. [Fig. 4, 5]

Appearance: Sudetenland, partially Inner Periphery (mountain areas), Moravian-Slovak Borderlands

MOVING PART OF THE STREET SPACE

Communication was originally designed to transport wagons, which were the main measure for determining the width of the transport lane. During the second half of the 20th century the village was marked by “city-rebuilding”, new surfaces were built, and the streets were adapted to the growing motorization. Modifications were made to the scene for the agricultural technology, and bus integration was introduced as a part of rural integration.

Villages in flat areas and in the highlands

There was a double solution of wide street space historically in villages in flat areas. In the first case, the whole surface of the street was dusty, possibly later paved, with trees at the edges. The traffic lane was mostly in the centre of the street, in the dusty surface indicated by rails from the carriages. The second way was to define the dusty or paved way with grassy lanes, which was passing at the edges of the road. Along the buildings there were once again dusty paths and next paths to the house for pedestrians. If this route was missing, pedestrians used grass for walking or the edge of the road. At present, most roads in such

3 →



Village with a wider street profile and different lanes, human scale (Podhradní Lhota, okr. Kroměříž, about 1900)

<http://www.podhradnilhota.cz/historie/historicke-fotografie/>

4 →



Mountain village (Mikulov, 1910)

<http://www.ukp98.cz/polabi/labe/obce/tp/mikulov.htm>

areas have an asphalt pavement that clearly defines its width, then passes into a grassland where growing greenery may appear. [Fig. 6]

Appearance: Agricultural Area, Inner Periphery (flat parts)

MOUNTAIN VILLAGES

Villages with a lack of public space have a narrow profile of communication between façades of houses or fences. Because of the deficit of space, the whole street profile is a road that previously had a dusty surface, later surfaced by asphalt. The communications are designed to pass in one direction with a reserve to avoid passing cars, sometimes there were green strips, which in some cases were along the communications. Pedestrians take place within communication. There is often no grown greenery, for which there was not enough space in the street. This occurs in the common of the village or in the extension of the communication, which represents the central part of the village. In a scattered villages the street network serve as a transport link, and the character is very similar to extravilan communications. At present, most of these roads have an asphalt surface that can pass into the dusty edge of the sideways. [Fig. 7]

Appearance: Sudetenland, partially Inner Periphery (mountain areas), Moravian - Slovak Borderlands

EDGES OF STREET SPACE

Street space in the village is defined in various ways. An essential sign is characterized by a gradual permeation of private and public space. There is no anonymity of spaces which could be in the areas separated by a wall where is not clear what is on the other side. If the space in the village is determined by the façades of houses, the front façade with windows and entrances to the living rooms is turned into public space. This space gives a certain degree of openness and acts "habited". The location of the front

5 →



Example of today's street scene (Olšová Vrata, okr. K. Vary, 06/2018)
author

6 →



Settlement with a dusty path passing into grass lane (Nové Dvory, okr. Kutná Hora, about 1900)

<http://www.novacky.cz/2014/10/nove-dvory-pohlednice-stare-foto-grafie.html>

garden is also a step between private and public spaces. In front of the residential area can be a semi-private area – a raised porch before the entrance or a bench next to the entrance.

If necessary, the separation of the private land was used by a classic wooden plank fence, which does not act as a barrier but as a sensitive separation of space. The fences are without socle, planks are made of wooden poles, the fence plates are narrow with spacing, about 1.5 meters high. In areas where there is a need to divide, f.ex. communication from the water surface, about one meter of high stone pillars are used, interconnected horizontally by a wooden post. The stone pillars are sometimes replaced by wooden poles.

A next typical character is a trench, which is along the roads and is often used to drain communications. These trenches are not continuous along the entire road, they work as water reservoirs and subsequent slow pumping and drying. [Fig. 8, 9, 10]

Appearance: within all rural settlements, ditches especially in Agricultural Areas

SURFACES

The material of the space has the same meaning as the spatial structure. A kind of material, which is used on different surfaces, makes up the general image of the site. Only natural-based surfaces were originally used in the village. The public space and the street area were dusty or with stone surfaces (paving, gravel, macadam), lawn, plank flooring or threshing. The simplicity of space and reasonable use of different materials (more temperate = closer to rural) are also important. A significant detail is the contact between two surfaces. The “soft contact” is typical for the rural settlements typical, i.e. the least noticeable contact or the changeover in the contact of two surfaces. It is not typical for

7 →



Mountain village – narrow profile of communication (unknown, about 1900)

<http://www.pohlednice-sberatelstvi.cz/2163/Vesnice>

8 →



Example of orientation of the building into the public space – front garden (Rybí, okr. Nový Jičín, about 1910)

<http://www.rybi.cz/historie-obce/>

villages the edges to be clearly defined and height divisions of individual areas (curbs, etc.) to be used. This is only used when it is absolutely necessary or desirable.

At present, the majority of the transport area, the roads, has a uniform asphalt surface. If the asphalt does not cross the entire width of the street, it passes through the edges into a grassy surface (possibly with a dusty sidewall). Its structure which is solid from a distance and diverse from a close view, is combined with the ability to form soft edges, places the asphalt among the materials that are well integrated into the landscape and in the rural environment. The reverse of this surface is the use of interlocking pavement, mostly in combination with a high curb, which is a typically city-solution. Nowadays, in the context of the "city-rebuilding" of villages, this solution appears, especially in suburban areas.

Appearance: within all rural settlements

CONCEPTION OF ARCHITECTURE

Each country residence is characterized by its own architecture and urbanism. This, as well as the urban structure, differs regions and individual rural areas. In general, each region has its typical layout of buildings on parcels as well as throughout the site. There is a typical build-up along the road, a direct connection to the main part of the building on the public space (the village centre, the road) and connecting the second part of the plot to the non-built-up production areas in the rural areas. A typical rural character is very close building and landscape contact. Nature grows into settlement and buildings spread back into the countryside. There is an indefinite edge between nature and urban areas which can be seen as a continuation of the alley through the street, or the realization of monuments and small sacral architecture on the access roads to the village. [Fig. 11]

9 →



Settlements with a dusty road and ditch (Nové Dvory, okr. Kutná Hora, 1908)

<http://www.novacky.cz/2014/10/nove-dvory-pohlednice-stare-fotografie.html>

10 →



Example of a preserved ditch (Olšová Vrata, okr. K. Vary, 06/2018)
author

Note: The analysis of individual types of buildings according to rural areas is not the subject of this thesis, it is briefly mentioned only from an urban point of view.

Appearance: within all rural settlements

4.3 Research – word at the end

The above items present basic characteristics that describe the transport area of the Czech village. Depending on the specific location of the village, additional specific characters may be found for a specific area. These items are regional characters and can not be included in the global overview. They can not be neglected, they always have a crucial meaning for the given area. However, their identification, enumeration and description are a matter of much more detailed research at the regional level, which can work in this direction further to expand the enumeration of the characters.

The list of general characters is based on the division of the Czech rural area by typology of rural space in terms of historical and socio-economic (RNDr. Perlin) in order to identify the specific character in each different region. By dividing by typology, it is guaranteed that there are always similar characters in the given area. Of course, there are areas where the diversity of the particular characteristics is wiped out and intertwined, especially at the borders of the individual regions. In such cases, it is good to do an individual survey and identify the specific features of the area.

Summary of the characteristics of the village transport area

	Character	Character description	Appearance
Scale	Human scale	Settlement with dimensions of space, which are close to human, pleasant for a stay in	in general
	Wide street area (>3:1)*	Streets with a full function of the public space, mostly divided into different traffic lanes	Agricultural Area, Inner Periphery (flat parts)
	Narrow street area (1:1, 2:1)*	Streets with dominant traffic function, the public space areas are not along all length of the street	Sudetenland, part of Inner Periphery (mountainous area), Moravian - Slovak Borderland
Transport part of street space	Wide street area - in the center	Communications mostly for bidirectional traffic passing through the green strips on the sides (previously the whole area could be dusty) pedestrians use separate segregated space, they can also use green edges or the edge of communication	Agricultural Area, Inner Periphery (flat parts)
	Narrow street area - from the edge to the edge	Transport part is throughout the whole street area, or possibly a hardened or green sidewalk	Sudetenland, part of Inner Periphery (mountainous area), Moravian - Slovak Borderland
Edges of street space	Living room windows turned into a public space	Connection of public and private space, control of public space	in general
	Front gardens	Gradual transition between public and private space	Agricultural Area, Inner Periphery (flat parts), partly Sudetenland
	Benches at the entrance / heightened portage	Gradual transition between public and private space	in general
	„Transparent“ fences and barriers	„Soft“ partition of space - the blending of public and private space	in general
Surfaces	Ditch along roads	Drainage of roads	especially in Agricultural Area
	Natural or nature-friendly surfaces	Dusty roads, gravel, macadam, mlát, lawn, other stands, pavement, clay surfaces, wood, stone pavement, asphalt...	in general
	Soft edges	gradual transition of surfaces in one level, minimum height grading of different surfaces	in general
Architecture	Typical buildings	Built on the border of public space, courtyard, interconnection with production areas	depends on region
	Harmonic transposition of settlements by nature	Nature passed into settlements (alleys, solitary greenery ...)	in general
	Penetration of settlements into nature	Solitary buildings in the open countryside, small sacral architecture	in general

*ratio of the width of the street space: the height of the building

5 Conclusion

Evolution is still in progress but everybody still has the opportunity to interfere and define the direction of this development, to preserve the tradition and historical values of the Czech nation. Legislation allows managing the development of territories and settlements, it is up to us to choose direction. Of course, that the faces of some villages have been remodeled from the ground, but there are still settlements where these changes have affected at least or not at all. These villages, if at least minimally maintained, are rightfully considered picturesque and typically rural. Thanks to them and to the sources of history, it is possible to inspire and create typical rural areas during revitalization or rebuilding.

Czech villages have their typical symbols and characters, like a typical ground-type typology, that has been preserved since the founding of the village, or a typical folk architecture. The same characters can be found within the transport area, or within the road network in the settlement. Because the streets are the places where people meet or just pass or where important events take place, it is simply the place where people live. The purpose of this work is to identify these features, describe the common characteristics of the transport area, which can be found in most of the village settlements. The inventory of characters should serve as a basis for designing or rehabilitating the public spaces of small settlements, i.e. villages. Ideally as a "helper" for public authorities and general public. It should show them the roots of the Czech traditional space and how to make the streets to preserve their picturesque face. Street rehabilitation is not a case of a few days – it is a thorough systematic and comprehensive planning of the public space concept combined with the regulation of car traffic, so it is important to ensure that it develops in the right direction.

11 →



An example of a typical arrangement of village buildings (Plav, okr. Č. Budějovice, about 1920)

<https://www.plav.cz/fotogalerie/plav-3556685-1805.3556685.1>

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Building with Earth in the Czech Republic, Survey on the Level of Awareness of Professional and Lay Public on Earth and Other Natural Building Materials

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CZ Nepálená hlína jako stavební materiál byla našimi předky používána po staletí a tradiční venkovské objekty z nepálené hlíny v Čechách a na Moravě jsou dnes právoplatnou součástí historického dědictví naší stavební kultury. S rozvojem moderních průmyslově vyráběných stavebních materiálů se však užití hlíny postupně vytratilo. Až v posledních letech můžeme opět pozorovat návrat k užití přírodních stavebních materiálů, tedy nejen nepálené hlíny, ale i dalších, jako například izolační slámy a dřevěných konstrukcí, se kterými je užití hliněného materiálu často kombinováno. Tyto tendence návratu k přírodním stavivům jsou do velké míry spojeny s kulturními, sociálními i psychologickými následky tlaků dnešní doby a civilizovaného světa a zájmem společnosti o zdravé bydlení a prostředí k životu. Jsou to zejména ekologické a ekonomické vlastnosti těchto materiálů, které opět budí zájem stavebníků i projektantů. Kdo jsou však potenciální stavebníci a jaká je současná informovanost o těchto materiálech v české společnosti?

Tento článek podává stručný přehled historického vývoje hliněného stavitelství v lokálních souvislostech a zabývá se současnou situací hliněného stavitelství v Česku. Zaznamenává také výsledky dotazníkového průzkumu, v němž je zkoumána informovanost a zájem dnešní české, odborné i laické veřejnosti o přírodní stavební materiály včetně hliněného. Sleduje potenciál rozvoje užití hliněných konstrukcí a možné formy osvěty založené na meziregionální spolupráci a vzdělávání odborné i široké veřejnosti.

EN Earth as a building material was used in our country by our ancestors for hundreds of years, and traditional earth architecture in the Bohemian and Moravian countryside is a rightful part of

the historical, cultural building heritage. With the development of modern, industrially-produced building materials, however, use of earth was gradually phased-out completely. Yet in recent years, we can notice again the return to the use of natural materials. Not only earth is used, but also materials such as straw insulation and timber structures with which earth, as a construction material, is often combined. To a great degree these tendencies to return to natural building materials are connected to the cultural, social and psychological consequences of the pressures of our times and civilization, as well as the interest of society in healthy living and in the environment. It is especially the ecological and economical properties of these materials that once again attract the attention of builders and developers. But who are these potential builders and what is the current level of awareness of these materials in Czech society?

This article provides a brief overview of the historical development of building with earth in local context, as well as the current situation of building with earth in the Czech Republic. It also presents the results of a survey which researches the awareness and interest of the current Czech professionals and the lay public regarding natural building materials including earth. It focuses on the potential development of the use of earth in construction and possible ways of educating professionals and the general public through interregional cooperation and teaching.

Keywords: earth architecture; vernacular housing; healthy environment; questionnaire; natural building materials

1 Introduction

Nowadays earth building can step on a long and rich historical tradition. In the past, earth was used mainly in areas having a shortage of other building materials. Today, we return to this building material mainly due to its natural origin and its lack of negative impact on human health. More and more, environmentally conscious builders are returning to natural-based materials which also include earth.

2 Historical Context

The use of earth-filled timber structures with the combination of wattle is evidenced already when the first Slavic tribes settled in our country. In the High Middle Ages, it was used as one of the main building materials. The expansion of earth buildings dates back to the 17th and 18th centuries to the era, when massive fires in areas with predominantly traditional timber structures destroyed the whole villages and towns. Therefore, the earthen buildings were especially appreciated for their fire-resistance. Construction regulations in building codes developed during that time meant an increase in safety and longevity of buildings. The earthen architecture came to a halt at the end of the 19th century, when technological advancements in brick firing and production methods led to a rapid surge in their manufacture and the brick industry replaced the use of earth as a building material [1]. Vernacular earthen buildings in our country are 100 to 300 years old, but the earth is usually hidden behind plaster or facing bricks and often only become visible during reconstruction and building work [2].

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Example of vernacular architecture in Southern Moravia, where earth was used as a building material – barns in Hrubá Vrbka
photo: Eva Neumayerová

2.1 Traditional Earth Buildings and Construction Technologies

Historically, earth was usually used in combination with wood and stone in the Czech country [Fig. 1, 2]. There are three types of vernacular architectures where earth was used as a building material: the earth brick house, the timber frame house and the log house. For the construction of earth brick houses, the use of unfired sun-dried bricks was the most common technology. The walls of these houses were also built with earth reels in a characteristic herringbone bond (*opus spicatum*) without the use of mortar [2]. Monolithic technologies, known as the cob technique and rammed earth, were also utilized for the construction of load-bearing structures. Cob structures were created by layering the mixture of subsoil, straw and husk, usually without the use of any formwork [4]. Rammed-earth structures were made by ramming material consisting of soil, gravel and sand into an adjustable formwork [4]. Buildings were usually finished with earth plaster both in the interior and the exterior, and most also had earthen floors. The earth brick houses are mostly found in southern and central Moravia and are known as the "Danubian houses". This type of house is located also in the regions of Lower Austria, southern Slovakia, large parts of Hungary and neighbouring parts of Romania and Ukraine [2].

In the case of the timber frame house, appearing mostly on the border with Germany, the earth was used in the filling of timber structures in the form of unfired earth bricks or rammed earth. Both inside and outside, earth plaster and earthen floors were applied.

In log houses, found in mountain areas, the earthen material was used for filling gaps between horizontal elements of the walls, in the construction of earthen floors or partition walls. Log walls occasionally had earth plaster [3]. In the 18th century some building façades were provided with a thick earth/clay-straw finish (100 mm or more) for fire protection [2].

The knowledge of historical earthen structures is an important connecting link for research and use of this building material in the present day is useful for renovations, as well as for new building constructions.

3 Contemporary Use of Earth as a Building Material, Public Awareness

In the last few decades, we have been returning to the use of earth material by traditional technologies on one hand, but also to new concepts made possible by automatization of production in today's processing techniques of materials and construction on the other. There are already several companies on the market, for example, producing and offering prefabricated, unfired compressed bricks or ready-made bagged mixture for clay plaster. It is also possible to use mechanical pneumatic rammers in making the rammed earth wall more efficient. The widening range of products can satisfy the requirements of even the most demanding architectural details and can appeal to a wide group of builders. The number of tradesmen and civil engineers with experience in using natural building materials is increasing.

Hand production of earth plaster or unfired earth bricks at the construction site is not the only possibility for producing of building products made of earthen material anymore, even though traditional methods continue to have their supporters. Production of building materials from earth at the construction site is still very attractive for environmentally conscious builders. It utilises local resources, it is ecological and economical, and the earth is pleasant and suitable for hand manufacture. Therefore, it is still an ideal material for a 'do-it-yourself' building.

Most commonly, earth today is used in the form of plasters [Fig. 3]. Furthermore, it is used as a filling material in combination with

other natural building materials, most often as wall infill in timber structures. Walls made of unfired earth bricks or rammed earth in interiors also have an advantage in their attractiveness. The use of earth in renovations of traditional earth architecture should also be mentioned. Most commonly we find the use of earth in the building of residential houses. However, there are also successful examples of public buildings such as ecological centres and restaurants.

Some of the most valued properties of earthen material include their health safety, ability to capture air pollutants, regulation of humidity and security of favourable microclimate. Similar to other building materials, earth also has its disadvantages. These can, however, be avoided with careful knowledge of the material and technology, and by following the basic principles of implementation of these types of buildings [5]. Earthen material has a particularly low resistance to moisture and so it is necessary to protect these constructions from running water and rising moisture. Whether for new constructions or renovations, in using earthen material, it is necessary to use a specific approach and also to have detailed knowledge of the behaviour of the building materials used in such constructions [3].

3.1 Earth Building and Legislation

Building with earth is usually regarded as a “non-engineered” construction technique with roots in a rich tradition of building heritage that needs to be maintained. As a consequence, building standards in the field of earth building have been drawn up in only a few countries. In the last decade, however, the use of earth in construction has become increasingly widespread in many countries [10]. In the Czech Republic, the research on properties of earth and associated theories for designing buildings made from this material has not been developed for a long time. On the contrary, all mentions of earthen building material gradually

3 →



Example of clay plaster in contemporary architecture: Straw-bale house in Tetčice, realization of plaster Aleš Dorazil, Kateřina Šmardová
photo: Aleš Dorazil

disappeared from technical literature and norms. In the Czech-Moravian norm from 1939 [6], for example, earthen bricks are listed as one of the building materials. In it, the requirements for production and properties of clay mortar, as well as clay finishes, are specified. In the technical norm for brick masonry, ČSN 73 2310 from May 1964 [7], only the existence of clay mortar is mentioned. Earth bricks are no longer mentioned, as it is noted in the publication “Earth buildings” of Žabičková [2]. Nowadays, there is also no technical standard directly targeted to earth as a building material in the Czech Republic. Building permits for buildings with load-bearing walls from earthen material are currently regulated only by declaration of the building code [8] and the responsibility

lies on the person in charge - the civil engineer - who has to prove the loading capacity of the building with calculations. Because this is a difficult task and communication with authorities is lengthy, the use of earthen material in load-bearing walls in the Czech Republic is minimal. On the other hand, non-load-bearing structures such as earthen plasters, partitions or the use of infill masonry are not in conflict with legislation and, with increasing trend, are used in all house types.

3.2 Available Options in Education for Professionals and General Public

Those interested in earthen buildings can currently find a lot of useful information on the internet. Practical and theoretical knowledge about earthen buildings can be gained from a wide variety of specialized workshops and vocational trainings. Professional courses on earthen architecture and craft techniques are organized, for example, by the Earthen Architecture Association (official name: "Sdružení hliněného stavitelství z.s.") [Fig. 4, 5]. The association connects people interested in earthen architecture and natural materials, promotes the use of earth in new buildings and the protection and preservation of existing earth houses as a part of our cultural heritage [9]. It also co-organizes the annual conference "Healthy Houses".

In the technical universities (faculties of civil engineering or architecture), the study of earth material is more-or-less a minor subject. In recent years, however, the interest of students has been growing and challenging projects using this building material are emerging. However, the theme of earthen material is currently represented mostly in PhD theses.

For primary and secondary schools, environmental programmes are organised by ecological centres where it is possible to learn more about natural building materials. In the Ecological Centre

4 →



Practical workshops on earthen building techniques organized by the Earthen Architecture Association

photo: Jana Šerá

5 →



Practical workshops on earthen building techniques organized by the Earthen Architecture Association

photo: Eva Neumayerová

Sluňákov in Horka nad Moravou (architects of the project: Projektíl architekti), it is even possible to learn about earthen material. In the construction of this building, among other materials, unfired earthen bricks were used in combination with a timber construction.

3.3 Public opinion – Survey on the level of awareness of professional and lay public on earth and other natural building materials

To date, only a small number of studies has been carried out into investigation of earth architecture and earth buildings [11] with focus on the interest and involvement of the public. The author of this article has conducted a comparative research through an online survey of professional and lay public on the theme “Natural building material – public awareness and interest”. This survey is not focused on earthen material only, as earthen material nowadays is commonly used in combination with other natural building materials. The social survey was divided into two questionnaires: one targeted to professionals – students and teaching staff of civil engineering and architecture faculties, civil engineers, architects (as potential designers) and the other to the lay public (as potential clients). Both investigated the level of awareness and interest in natural building material. 120 professionals [Fig. 6] and 97 lay respondents [Fig. 7] took part in the survey. It is necessary to consider the fact that the questionnaire was sent to approximately 600 people and was also distributed via social networks. It is thus possible to conclude that less than a third of those asked to participate actually did. The received answers were, however, all overwhelmingly positive towards the given theme.

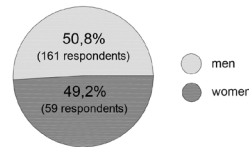
3.3.1 Questionnaires – Questions and answers

In both questionnaires, the same structure of questions was designed in order to get comparable results from these two

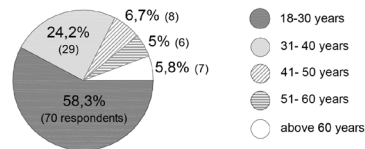
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Questionnaire - Professional public:

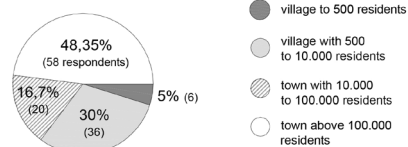
Total number of respondents :
120 (61 men and 59 women)



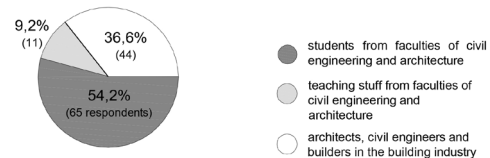
Age of respondents :



Residence of respondents :



Professional qualification of respondents:



Questionnaire results – Respondents participated in the survey – professional public

author Eva Neumayerová

targeted groups and to obtain an overview about possible differences in perception of the surveyed topic. The answers of both targeted groups were organized into diagrams with the possibility to compare the answers of both groups for each question. Questions no. 1- 6 focused on interest, involvement and experience with natural building materials in general; questions no. 7, 8 focused on the awareness of earth only; questions no. 3, 4, 7, 8 were identical for both groups; and questions no. 1, 2, 5, 6 were adapted to each group. The questions were structured as follows:

Question 1 [Fig. 08]

– for professionals:

Would you be interested in using any of the following natural building materials in your project's realization?

– for lay public:

Would you be interested in using any of the following natural materials for building or renovation of your apartment or house?

Question 2 [Fig. 09]

– for professionals:

Have you already used natural building in your design, implementation?

– for lay public:

Have you already used natural building materials in the building or renovation of your apartment or house? Which ones?

Question 3 [Fig. 10]

– for professionals and lay public:

In your opinion, do natural building materials have the potential to compete with commonly used building materials in the future?

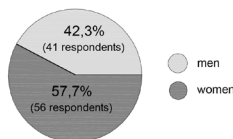
Question 4 [Fig. 11]

– for professionals and lay public:

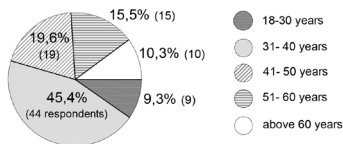
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Questionnaire - Lay public:

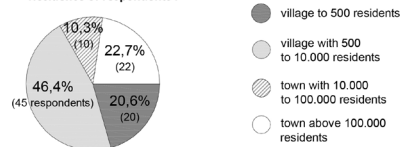
Total number of respondents :
97 (41 men and 56 women)



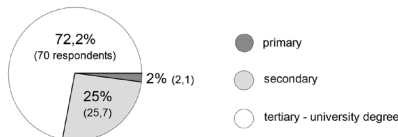
Age of respondents :



Residence of respondents :



Education levels of respondents :



Questionnaire results – Respondents participated in the survey – lay public

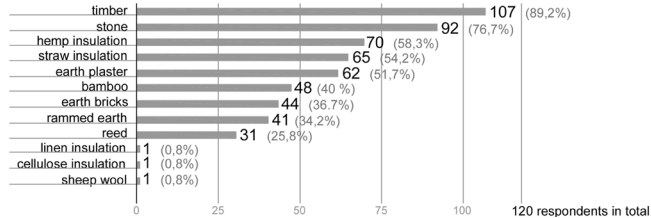
author Eva Neumayerová



Question 1/ Professional public:

Would you be interested in using any of the following natural building materials in your project's realizations?

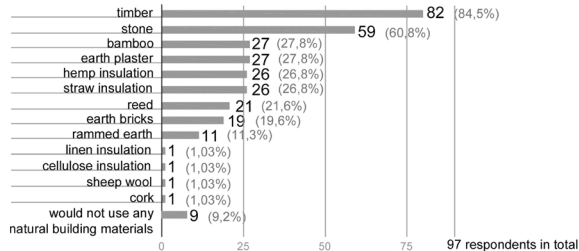
(it was possible to mark more than one answer)



Question 1/ Lay public:

Would you be interested in using any of the following natural materials for building or renovation of your apartment or house?

(it was possible to mark more than one answer)



Questionnaire results - Question no.01

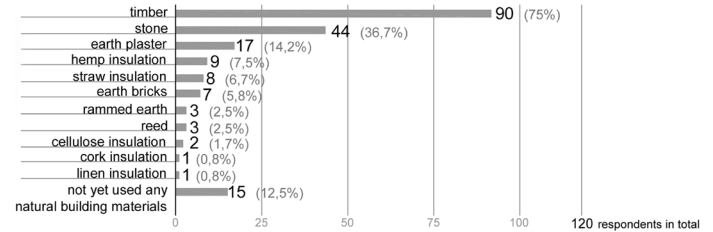
author Eva Neumayerová



Question 2/ Professional public:

Have you already used natural building materials in your design, implementation? Which ones?

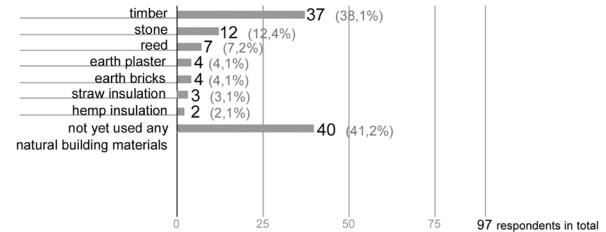
(the answer should have been given in words or a sentence)



Question 2/ Lay public:

Have you already used natural building materials in the building or renovation of your apartment or house? Which ones?

(the answer should have been given in words or a sentence)



Questionnaire results - Question no.02

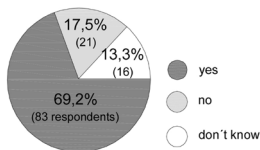
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Question 3:

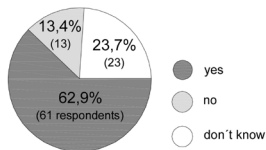
In your opinion, do natural building materials have the potential to compete with commonly used building materials in the future?

(the possible answers were: yes, no, don't know)

Professional public:
(120 respondents in total)



Lay public:
(97 respondents in total)



Questionnaire results – Question no.03

author Eva Neumayerová

Where would you look for information about natural building materials?

Question 5 [Fig. 12]

– for professionals:

In your opinion, what is the greatest barrier to the wider implementation of natural building materials in the building industry?

– for lay public:

In your opinion, what are the negative aspects of natural building materials?

Question 6 [Fig. 13]

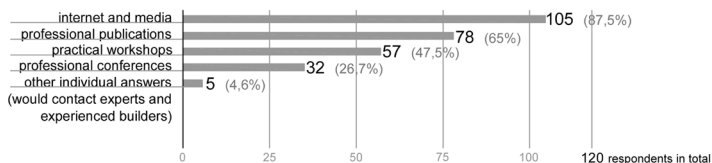
– for professionals:

Would you welcome a greater time and space given to the teaching about natural building materials in the curricula of the facul-

Question 4/ Professional public:

Where would you look for information about natural building materials?

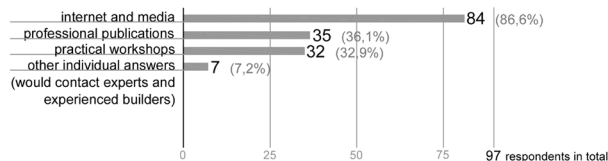
(it was possible to mark more than one answer)



Question 4/ Lay public:

Where would you look for information about natural building materials?

(it was possible to mark more than one answer)



Questionnaire results – Question no.04

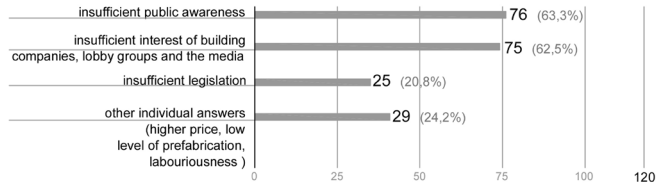
author Eva Neumayerová

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Question 5: Professional public:

In your opinion, what is the greatest barrier to the wider implementation of natural building materials in the building industry?

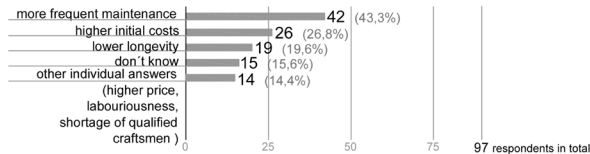
(it was possible to mark more than one answer)



Question 5: Lay public:

In your opinion, what are the negative aspects of natural building materials?

(it was possible to mark more than one answer)



Questionnaire results – Question no.05

author Eva Neumayerová

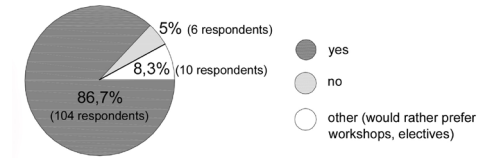
13↓

Question 6: Professional public:

Would you welcome a greater time and space given to the teaching about natural building materials in the curricula of the faculties of civil engineering and architecture? (lectures, workshops, principles of construction design)?

(the optional answers were: yes, no, other - in words)

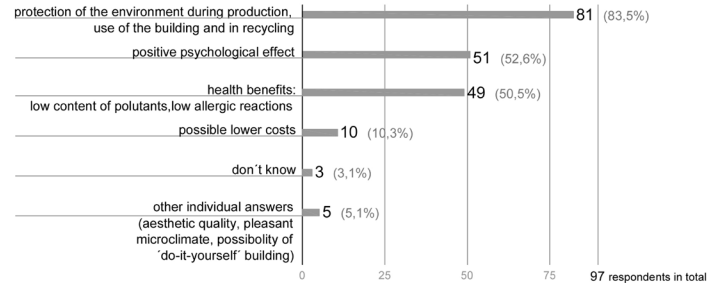
(120 respondents in total)



Question 6: Lay public:

In your opinion, what are the positive aspects of natural building materials?

(several optional answers were possible)



Questionnaire results – Question no.06

author Eva Neumayerová

ties of civil engineering and architecture? (lectures, workshops, principles of construction design)?

– for lay public:

In your opinion, what are the positive aspects of natural building materials?

Question 7 [Fig. 14]

– for professionals and lay public:

Have you ever personally visited any contemporary realizations where products from earthen material had been used (for example plaster, bricks)?

Question 8 [Fig. 15]

– for professionals and lay public:

Do you know any producers/companies offering building products made from earth (plaster, earth bricks)?

3.3.2 Questionnaires – Analysis

From both questionnaires, it is possible to evaluate general interest in the issues with natural building materials by both groups of respondents, the professional and lay public. Comparing both questionnaires, there were very similar opinions in both groups. Important fact is, that in the group of professionals, more than a half of respondents were students aged 18-30 years [Fig. 6]. The group of lay public was largely represented by respondents aged 31-40 years (45%) and 72% of the respondents from the group of lay public have a university degree [Fig. 7].

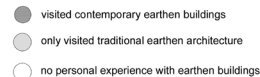
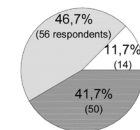
The greatest interest in all natural building materials in both groups given the questionnaire was shown in timber and stone [Fig. 8]. The interest in earthen material was the highest in earth plaster and the least in rammed earth. Also, timber was the most used material in projects and realizations of both groups, with the second most used being stone [Fig. 9]. These results were expected considering the common use of timber and stone in

14→

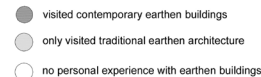
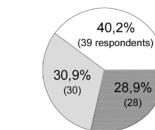
Question 7:

Have you ever personally visited any contemporary realizations where products from earthen material had been used?

Professional public:
(120 respondents in total)



Lay public:
(97 respondents in total)



Questionnaire results – Question no.07

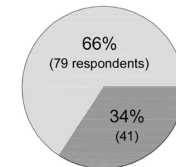
author Eva Neumayerová

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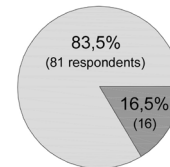
Question 8:

Do you know any producers/companies offering building products made from earth (clay plaster, earthen bricks)?

Professional public:
(120 respondents in total)



Lay public:
(97 respondents in total)



Questionnaire results – Question no.08

author Eva Neumayerová

construction sites nowadays. Earth plaster was the most widely used product from earthen materials. In both target groups, more than 60% expect that natural building materials can compete with other commonly used building materials in the future [Fig. 10]. Most respondents from each group would choose the internet and media as the main information source for natural building materials [Fig. 11]. One of the greatest barriers as perceived by the surveyed professional group is insufficient awareness of the public. This can lead to many misunderstandings, which could be refuted by quality professional education [Fig. 12]. 87% of respondents from the group of professionals would welcome greater time and space given in the curricula of the faculties of civil engineering and architecture [Fig. 13]. The group of lay public stated the greatest positive aspects of natural building materials as the protection of the environment and positive psychological effect, with the greatest negative aspect for this group being the frequent maintenance and higher costs [Fig. 12, 13]. In both questionnaires negatively perceived factors were mentioned, such as a higher cost of natural building materials and their production, a low rate of pre-fabrication, little experience with these materials, a difficulty with availability of information for general public or distrust in durability of these materials, as well as the level of professional building execution. In the last two questions focused on the earthen material only [Fig. 14, 15], a lesser awareness in both groups compared to other building materials was notable. 66% of professionals and 83% of lay public do not know any producers of building products made from earth. 40% of respondents of the lay public and 12% of professionals have no personal experience with earthen architecture. From the results of the questionnaire, it can be concluded that natural building materials are generally gaining, including earth, which is still lagging behind more commonly used materials such as wood and stone. Quality information and opportunities in education (since there is a growing interest by the group of young adults) would help to spread the awareness and interest of these material in both the professional and lay public.

4 Conclusion – Future potential

The current conditions in the Czech Republic, as well as in surrounding European countries, are overall favourable for earthen material. So far, we could observe two parallel trends in the use of building with earth. On the one hand, there are low-budget buildings, often self-built, and on the other hand, there are professional and high-budget buildings for wealthy customers. However, these trends are gradually changing and natural building materials, including earth, are increasingly popular with more builders from the general public. In the future, the use of clay plasters and combinations of earth with other natural building materials can especially be expected. The great challenge for modern earth buildings will be to increase construction efficiencies without abandoning the environmental and aesthetic worth of the material. [12]. An important objective for the future is also to further extend valid information on earth building, and involve and inform the public, since today's consumers can influence the building industry with their demands [12]. Higher demand can lead towards the lowering of the costs of earthen products and the overall cost of building. Greater interest of the public can also initiate legislative changes and thus make the process of building with earthen material more effective. Closer cooperation with earthen associations from other European countries and of ecological tourism, and knowledge of earthen heritage, could strengthen the interest of the general public.

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Emil Adamec

CZ

Tradicionalismus hraje významnou roli v udržitelnosti a kvalitním designu. U pasivních domů, které vyžadují dovážené stavební materiály ze vzdálených zemí, kde pobýváním v pasivních domech vznikají zdravotní problémy, kde tyto budovy jsou závislé na elektřině, s často podhodnocenou, neudržitelnou platformou; tradiční budovy nabízejí ověřenou platformu dlouhodobé udržitelnosti. Díky srozumitelnému architektonickému jazyku, který je imunní módním trendům, zaměřuje se na ulice a náměstí pro pěší dopravu, respektuje výškové a materiálové omezení s použitím esteticky příjemných detailů, jako je ornament, socha nebo řád, nabízejí tradiční budovy dlouhodobé řešení a příjemné prostředí. Místní přírodní materiály zahrnují dřevo, kámen, nepálenou nebo pálenou plnou cihlu, konopí, slámu, rákos, vápennou (bez cementovou) maltu, sádku nebo hliněnou omítku, jsou preferovány v tradicionalismu, protože minimalizují ekologickou zátěž při produkci a transportu a zároveň regenerují ekologickou degradabilitu. Používají se tlusté zdi, malá okna, podpěra a architráv, které přirozeně regulují vlhkost a mikroklima. Úzké průchody s monumentálními sochami, náměstími a dalšími uměleckými zásadami, představují prvky ideální kulturní krajiny pro kvalitní bydlení a udržitelnou turistiku. Poundbury, urbánní projekt vizionářské architektury pro architekturu a urbanismus je příkladem demonstrujícím výhody a praktičnost tradicionalismu, nabízí řešení a odpovědi týkající se udržitelnosti v architektuře, urbanismu, kvalitě života a planety Země. Město Poundbury bylo postaveno Léonem Krierem, jako řešení rehabilitace tradicionalistické architektury, vize prince Charlese v osmdesátých letech.

EN

Traditionalism plays an important role in the sustainability and the quality design. For passive houses, which require an

imported building material from remote countries, alarming health issues appear and these houses depend heavily on electricity to run, often with an understated unsustainable basis; whereas traditional buildings, in contrast, offer a solid ground of long-proven sustainability. With a comprehensible architectural language which is immune to fashion trends and focuses on streets and squares for pedestrian traffic, respects height and material limitations and uses aesthetically pleasing details such as ornaments and sculptures, traditional buildings offer a long-term indoor solution and pleasant outdoor environment as well. Local natural materials, such as wood, stone, brick, hemp, straw, reed, natural lime mortar, plaster or clay stucco are preferred by traditionalism, as they minimize the environmental burden on the production and transportation and as well regenerate ecological degradability. Designed elements such as thick walls and small windows are incorporated in vernacular buildings to regulate humidity and microclimate, while narrow pedestrian prioritized streets, together with monumental sculptures, squares and other artistic rules, are elements of an ideal cultural landscape. For quality housing and sustainable tourism, Poundbury, a pilot traditionalism city project for the fields of architecture and urbanism, is a visionary initial example to demonstrate the efficiency and practicality of traditionalism in offering solutions and answers to sustainability issues in architecture, urbanism, the quality of life, and the planet Earth. Built by Leon Krier, the town of Poundbury has been a result of the rehabilitation of traditional architecture vision introduced by Prince Charles since the eighties.

Keywords: traditionalism; classicism; vernacular; urbanism; architecture; sculpture; tourism; sustainability; efficiency

1 Introduction

Vernacular architecture around the world is a result of the extended learning processes of human race trying to meet their accommodation need. When local environment such as topography and climate is the unavoidable consideration of the traditional construction decision, sustainability is clearly a significant feature widely incorporated into the traditional construction knowledge as a result. Hence, it is sensible to look into the solutions adopted by local vernacular architecture when sustainability becomes a major element in today's architectural design. As one of the most fundamental purposes of building is to regulate interior climate opting for a more comfortable indoor environment, extensive use of bioclimatic means to achieve such a purpose was the solution before the Industrial Age, where significant energy inputs were required to achieve the same purpose by active mechanical heating and cooling [1,2]. Without utilizing traditional architectural wisdom that took generations, if not centuries, to develop, our current construction practices have created unmanageable issues including the effects of human induced climate change, the increase of the greenhouse gases concentration and the depletion of the natural resources [3]. The uncontrollable energy consumption pattern promoted by contemporary architecture is fairly evident:

"Modern buildings consume 30–40% of the overall energy used all over the globe and experts predict this percentage will rise up to 50% by the year 2050. Due to such great energy consumption, buildings produce up to 30% of the greenhouse gases released into the atmosphere every year, causing numerous problems around the world including global warming and climate change. A closer inspection on energy consumption issue reveals the fact that cooling and heating of modern buildings is the responsible factor for 10–20% of total energy use of buildings in developed countries and this ratio increases to 50% in less developed ones [4]."

These issues were not noticed before the Industrial Age as natural and local materials used by vernacular architecture offered a more sustainable and environment-friendly solutions or centuries. On the top of building material choices, it was found that traditional houses furthermore promote a more sustainable lifestyle for its occupants when compared with homogeneous lifestyle suggestions encouraged by contemporary building techniques [5]. Beyond environmental concerns, vernacular architecture excels as it addresses socioeconomic and sociocultural characters of the local community through gradual modification in response to the evolving local lifestyle over a long period of time. It is self-sufficient in the terms of natural resources, causes much lower environmental impact, and economically and socially cost efficient at the same time when compared with the modern architectural invention [18].

In contrast, most of the contemporary tangible city development advertised and realized today promotes minimalistic design, modernistic architecture and vehicle-lead transportation urbanism. These concepts are instilled into every aspect of today's life with conviction that they are the only option. Especially in the architecture and urbanism fields, these concepts are even being ironically promoted as sustainable choices that promise to survive for centuries. The practical result says the opposite instead, that shaping our world in such doctrine is not only unsustainable, but also unhealthy and unaesthetic.

In retrospect, building solutions obtained by traditional wisdom response directly to local climate, topographical features, available resources and technologies that have evolved with the people from the beginning of settlements. The decisions of settlement pattern, building volume configuration, semi-open and open space arrangement, material choices and construction techniques are all made accordingly, resulting a genuine climate-responsive and environmentally-friendly architectural solution. The indigenous building style is not only addressed to

environmental issues the modern construction created, it also plays a non-replaceable role in safeguarding aesthetic values in the local architectural composition [2,6,7].

The passive houses promoted and produced by the latest contemporary solution, where technologies are imported from remote countries, are designed to function based on electricity consumption even such buildings are built from natural materials like wood, straw or even adobe. The way how it is built simply does not provide real solutions to the sustainability issue created by modern architecture in the first place. For example, the default use of imported building materials and infrastructure components encouraged by contemporary housing projects regardless of the local climatic and cultural condition are the most common practices in today's construction process. Uniform-type reinforced concrete structures, as a result, are being built all over the world even they are uncomfortable to live in, unnecessarily energy-consuming, and have no connection with the local culture and historical past [7]. Failures in addressing local traditions aesthetically are not uncommon too. A sterile geometric shape with thin walls and large windows is always found in the design of these concrete structures, where small pleasant details such as local traditional ornaments do not exist. The failure continues to the larger scale of modern "sustainable" urbanism. It is evident that common urban design of city life as a pedestrian is a failure because the streets are always full of cars, buses, and even trams. They are obviously designed for car transportation, leaving the street level noisy, dusty and hostile for pedestrians. On the other hand, citizens who do use cars are forced to spend extra effort maintaining the vehicle and learning the transportation system. Furthermore, instead of enjoying the arcades, streets, squares, fountains, benches or parks, modern urban-dwellers are constantly bombarded by advertisement everywhere around the city, leaving people no room to ponder about the issue of sustainability after all.

This paper will look into these issues and describe them, as well it will seek to find a solution with tradition, aesthetic and sustainability in mind for today's world and for future generations. It is inescapable that the buildings and the construction industry, and the discipline of architecture in particular, bare a prominent responsibility in sustainable adaptation of modern architecture that brings back time-tested wisdom from vernacular architecture [8].

2 Traditionalism

Traditionalism prefers time-proven solutions. It is based on generations of real life experience and continues in the same manner. Traditional forms mentioned in this paper focus on urbanism, architecture and sculpture, while traditionalism is nonetheless affecting many more fields including design and music, etc. In oppose to today's prevailing contemporary solutions, where these disciplines are separated from each other, the traditional mind set connects them into one instead. The effect of traditional approach is sustainability that would last for generations and centuries to come, while its basic rules are applicable to any landscape, village, city or place on the planet Earth. Furthermore, traditional knowledge, passed down from masters to their apprentices, would become the healing process for the century old failure in the construction of our living environment. Hence, based on thousand years of experience, traditionalism cannot fail and it is the only cure for the wrongly built cities, transportation mode and so-called contemporary solutions to the culprit.

As experienced today in most of places, ignorance and impudence common building choices are proven destructive to our living environment and they are not sustainable at all no matter how green the label sound looks like. An urgent reconsidering on the ways how we build is necessary in the era of globalization, desirably

by reflecting on the past experience for a more sustainable future construction. Criteria from vernacular architecture, especially those ones dealing with energy efficiency, are simple, clever and pragmatic to be adopted into both the design of renewal projects and the construction of new buildings. One of the criteria of traditionalism to ensure indoor comfort is to utilize passive climate control systems based on available indigenous resources that are given prime importance in building construction. Other criteria, such as geographical characteristics, insolation, orientation, geomancy, form and materials, are taken into consideration at the very beginning stage of design instead of heavy reliance on use of electricity dependant options [9].

2.1 Traditionalism in Urbanism

Traditional urbanism, from the sustainability perspective, focuses on pedestrians and promotes an energy saving compact form. Individual buildings are built in harmony with local geography and, together with other buildings, they have to create a uniform and interlocking urban form that provide safe and unique atmosphere for dwellers. Buildings in traditional urbanism are chosen to be built just one storey or only a few stories high. Streets are narrow, walkable and pedestrians friendly that people need not to be disturbed by noise, polluted air and danger from cars. In opposition to nowadays' street grid system filled with cars and other disturbance on the streets, traditional urbanism offers a calm solution with natural, intuitive, organic structure. The best examples for traditional urbanism are the winding streets in medieval cities, which connect naturally every part of the city, as it is very important to thoughtfully plan on how each element of the city is related. Traditional sustainable urbanism chooses narrow winding streets to maximize city experience for pedestrians so as a result streets become truly liveable. For countries and cities located closer to Equator, where the sun's radiation is stronger, traditionalism makes the streets even narrower in order to provide

fluid air circulation and natural shading against the strong sun. Such wisdom is not adopted into our current homogenous urban hot islands around the world, which clearly disregard where the cities are situated. Another necessary element of traditional streets and city life is the fluid connection among buildings and public space by arcades, in-between places, squares, benches, fountains and sculptures. Hence, each of these features are essential fragments in crafting the complete pleasurable city dwelling atmosphere as a whole. During applying traditional urbanism a special attention should be paid to sacred buildings, municipal buildings, squares and sculptural monuments. It is critical to the designed carefully angles of the building and the way how they are connected with squares, buildings ornamentation according to traditional rules, that verify the non-centralized placement of sacred buildings and monuments as the key for successful and sustainable urbanism.

Apart from the general environment, incidental natural phenomena such as earthquakes also place a significant impact on city's architectural designs. With attention paid according to local functional, cultural and religious choices, it is important to reference vernacular architecture on their use of local material, construction system, together with traditional knowledge and experiences of the urbanities [20]. The twentieth century's fashionable designs, that are made available in the majority of countries, neglect the context of the local environment, cultural values, social performance and even economic perspective and sustainability [10].

"All modern urban foundations are unsuccessful, because the whole draft of the regulatory lines is always processed without any idea what to do [11]."

Whereas in contrast, traditional medieval cities, composed from narrow winding streets, predicted successfully feasible city structure, that have been functional since they were built, all the time until now, and possibly also in the far future.

An international network for traditional building, architecture and urbanism (INTBAU) was established under Prince Charles' patronage with branches in different countries including the Czech Republic, with the goal the traditionalism to be revitalized. One of the best modern adaptation on traditionalism today is the project Poundbury, a town which was built to demonstrate as an example of possible traditional solution to our chaotic living environment. The prominent philosopher Roger Scruton and the theorist Nikos Salingaros advocate traditionalism as well.

2.2 Traditionalism in Architecture

"Traditional and vernacular housing was developed in close relation between the functional needs of the occupants, the culture, climate, and other aspects of the living and built environment [7]."

Since our natural living environment and the human biology have not changed as drastically as our way of building, it is simply reckless to assume that those fashionable modern innovations are suitable for our gradually evolving environment and biology. It is noticeable that the time-proven traditional way of building houses caters our need much better than the experimental gimmicks that are made widely available to us nowadays for mysterious reasons.

"Traditional buildings are the true expression of the architecture that provides comfortable living conditions in all different climates. Vernacular builders avoid windy places, extreme sloping surfaces, and areas that have been in the shade for a long time. Using local materials that can be easily reached in the region thus decreasing carbon foot-print of the transportation. It is clear that the structural construction and surface installations provided by brick, cement, ferrous materials and reinforced concrete systems are not suitable for the natural conditions and environment of the region. When these systems are continuously exposed to the

rains, it will get to a point in time where the masonry materials will become excessively wet which may affect the durability of the materials [12]."

Similar to traditional urbanism, much attention is required on how architecture looks and from what material is used for building. Traditional architecture has been the most sustainable solution available so far. No any other contemporary solution will prevail in terms of longevity, sustainable ecology, health and aesthetic values. Traditional buildings are built following the human scale and architectural order. They ensure the healthiest built environment by choosing long-lasting materials and adopting aesthetically pleasing designs. The way how traditional buildings are constructed is based on centuries' proven experience. Continuing the same way guarantees presumably success in terms of sustainability; whereas, deliberately ignoring traditions and inventing experimental new ways of building, just as most modern trends do, will most likely fail hard as proven by existing city issues. Moreover, sustainability in architecture means much more than saving money on energy which is the only benefit advertised by modern passive building solutions.

"Vernacular architecture establishes a harmonious relationship between climate, architecture and people. Vernacular architectural products could be associated with sustainable architectural principles. This is because the common goal of sustainable design and vernacular architecture is to produce environmentally friendly constructions that are compatible with the surrounding conditions and that can last for many years. The most important factors that form the vernacular architecture are the natural, economic and socio-cultural conditions. The best way to raise the heat holding rates of the houses is to use the soil and ground which have almost infinite heat retention [12]."

This cannot simply be compared to the single benefit promotion of modern passive houses as a solution to our current build environment problems.

2.2.1 Traditional Architecture as Most Sustainable Solution

In terms of sustainability, traditional architecture, including vernacular architecture, is the best option available. Individual buildings constructed from local natural materials over time and centuries are connected and support each other by local traditions and geography.

Vernacular architecture contains tangible and intangible values of identity which belong to the culture where it is included. The construction of the vernacular architecture, which is organised by local people, has the use of recyclable natural resources. Vernacular architecture has devised original plan typology and construction systems based on to respect to nature and people [13].

With such a concept, a community grows gradually into a comprehensive sustainable region. A self-sustainable city or community is hence "made" for centuries to come. That is why traditional architecture does not only ratify them, but cures modern, wrongly constructed buildings and cities as well. We can easily discover all aspects and elements of quality solutions incorporated with pleasant aesthetic experience in traditional architecture.

It is clear that vernacular architecture of the region establishes an adaptable responsive spatial organization by using adequate principles of design, expertise in the integration to the place, smart ways of producing natural renewable energy, and reduction of cost and transportation. Vernacular buildings have become a guide for sustainable development [2].

Vernacular housing also provides endless possibilities for sustainability, such as natural, locally available materials with highest level of ecology concerned in mind. Using correct design according to local geography is the key for successful and healthy solution.

Old vernacular houses were designed and constructed in order to be sustainable and to subsist through hundreds of years. Today's concrete buildings are replacing the low-cost mud bricks structures, which attempt of redesigning the village, where concrete takes over other local materials, was also a huge failure [14].

Therefore, traditional architecture is the most sustainable solution available today.

2.2.2 Ornament, Arts and Crafts as Sustainable Elements of Architecture

Ornament, arts and crafts are details that have always been widely employed in traditional architecture. They are the inseparable elements of traditional architecture as they create complexity in architectural space as a presumption for healthy and liveable architecture [15,16,17]. Painting, mosaic, stained glass, fresco, etc. are contemplated from the very beginning stage of traditional architectural design process, that one can easily identify with intentional spaces reserved in churches and buildings for further addition of art pieces.

2.3 Traditionalism in Sculpture

Traditional sculpture and art is an inseparable part of traditional architecture. It includes free standing sculpture in urban space, sculpture directly imbedded into architecture, relief and ornament. Traditional sculpture (as oppose to contemporary sculpture and art) is a part of architecture, which shares the same goal of creating a pleasant and artistic space hand in hand. To achieve such a goal, the traditional exterior sculpture is created conventionally by carving on natural materials such as stone, wood or even bricks; while the traditional interior sculpture and ornaments can be made from plaster or stucco directly placed on the wall, that are less durable because they are well protected

from the elements. The majority of traditional sculpture adopts figural forms and natural shapes with substantial attention paid to naturally arranged lighting and shades that highlight the atmosphere. *Inhabitants of traditional buildings used to sculpt everything: niches, beds, bath tubs and even cabinets. Each house possesses a different personality that differs from one to another. Also old houses present an instructive lesson of architecture. Each of these houses was built simply to fulfil its user's needs and reflect its owner's personality a straightforward adaption of the existing materials that represents sustainability concepts in its simplest forms* [14].

2.3.1 Traditional Sculpture and Ornament as an Important Part of Architecture

Architecture and the surrounding are an indivisible part of human life which shapes our personality and health unnoticeably. Thus, it is necessary to pay attention to how architectural and urban space is constructed around us. There is no doubt about the fact that traditional space filled with sculptures and ornaments is much more valuable than empty and sterile contemporary places that remind us of unpleasant spaces such as jail, military facilities or hospital. It is scientifically proven that human health is much better during the stay in architecturally complex environment. The result is measured by medical methods strongly proved, to the amaze of modern architects perhaps, how much those forgotten, if not forbidden, artistic details in architecture affect human development. The complexity in architectural space enriches individual segments such windows, doors, chimney, furniture, etc.; while ornaments provide the riches experience all over the architectural design.

Architectural education today, however, does not include any teaching of traditional crafts. To ensure healthier and more pleasant results our future architectural construction, it is suggested for institutions to include ornament workshops into

basic architectural education in the style of master-apprentice. With one to two weeks length workshop, students of art and architecture would be offered the opportunity to experience traditional craft techniques that will be later needed in their architectural projects. It is also the only possible way which passes on skilful knowledge and know-how from generations to generations through the irreplaceable hand crafting process. Such continuity traditional craftsmanship, together with adoption of traditional forms in new construction projects, works hand in hand with conservation of traditional buildings and their sculpture parts to safeguard the long accumulated knowledge on creating the best living human environment from being lost.

3 Sustainable Development in Landscape and the City

Sustainable development, especially in urbanism and architecture, is the most fundamental requirement we should consider in planning for the future of human race. The construction industry is inevitably the largest producer of greenhouse gases, according to various reports from different fields. In that sense, it is necessary to seek for a solution that would greatly eliminate pollution and ecology impact imposed by human alteration of nature into liveable landscape and city.

4 Conclusion

One of the major differences that have occurred between the academic and traditional architecture arose from the development of the so-called Modern Movement in the twentieth century. The rationalist theoretical foundations, self-defined as anti-academicist, cut off all forms and methodologies that came from the past, among which were those derived, logically, from vernacular constructions [18]. Therefore in order to rectify the mistakes, *architects, who have a prominent role in*

construction industry and have a great responsibility in building environmentally-friendly buildings, should take into account sustainable architectural characteristics of traditional houses while designing buildings [19]. Likewise, traditionalism presents undeniably valuable wisdom for authorities around the world to achieve sustainable development in landscape and the city, especially in the fields of urbanism, architecture and sculpture.

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CZ Pražské Vnohrady jsou z hlediska bytové výstavby výjimečné hned z několika hledisek. Unikátní kopcovitá poloha za hradbami města, velmi rychlá a komplexní výstavba, která probíhala převážně mezi lety 1875–1910 vtiskla Vnohradům specifickou kompoziční kvalitu, která je dnes vyhledávána širokou veřejností.

Architektonický rozbor, který pomůže osvětlit kvalitu kompozice této specifické lokality, musí být prováděn víceúrovňově, aby obsahl jednotlivé faktory, které kvalitu ovlivňují. V širším hledisku se musíme zaměřit na urbanismus, který respektuje organický tvar původních královských cest (dnešní Francouzská-Ruská ulice, Vnohradská třída) mezi které vyčleňuje ortogonální síť ulic, která však není po vzoru amerických měst tak silně striktní a vytváří endemické rozdíly, které pomáhají v orientaci v oblasti.

Další oblastí, kterou je nutno z kompozičního hlediska rozebrat je kompozice domu v rámci bloku i kompozice domu samotného. Kopcovitá oblast Vnohrad dává prostor k vytváření vlnité krajiny korunních říms, které jsou i v rovných částech nesrovnány a vytváří tak specificky hravou kompozici, která je pro obyvatele mnohem přátelštější než utilitárně zarovnaná krajina říms, která se vytvářela s příklonem k racionalitě od 20. let 19. století. Dalším prvkem, který podporuje hravost oblasti je všeobecné nerespektování kompozice sousedních objektů a barevná hravost objektů.

EN Prague district Vnohrady is unique in the apartment building history because of several reasons. Unique hilly location right in front of the city walls, very quick and coherent development that was done during years 1875–1910 provided Vnohrady with specific composition quality, that it is considered as a prestigious place to live in.

Architectural analysis that helps to illustrate the quality of the composition of this specific location has to be done on a multilevel basis to cover the various factors. In a wider perspective, we must focus on urbanism, respecting the organic form of the original royal paths (today's Francouzská-Ruská street, Vnohradská Street), which separate the orthogonal network of streets, which however, are not so strictly as American cities and they also create endemic differences in orientation in the area.

Another part that needs to be analysed from a compositional point of view is the composition of the house within the block as well as the composition of the house façade itself. The hilly area of Vnohrady creates space to build a discontinuous landscape of ledges that are not continuous even in non-sloped parts, thus creating a playful composition that is friendlier to the inhabitants than the utilitarian aligned landscape of ledges, which were created with a rational architectural forms from the 1920s. Another element which promotes the playfulness of the area is general disrespect to the composition of neighbouring objects and the colourful variety of objects.

Keywords: composition; Vnohrady; tectonic; symmetry; neo-historicism; apartment buildings

1 Introduction

If we want to evaluate the quality of the architectural composition of larger area such as Vnohrady we must always count with a smaller or larger amount of simplification. In this article due to

limited space significant amount of simplification is applied and only the most important composition qualities are described. The composition by itself contains several layers and the deeper we go, the more acknowledgments we can find. This article applies the most common approach of composition analysis, the top-down approach and focuses on these topics: Urban composition, composition of building inside a block and lastly composition of building itself. In concrete composition of buildings the article will not focus too deeply into sub disciplines and will focus only on the most common and very interesting part of façade composition through some examples.

2 Brief History of Vinohrady District

Even though the history of Vinohrady is remarkable and thrilling and we can date the first building up to 13th century, for purpose of this article the most important part of history begins from 1875 when Královské Vinohrady were split into two parts Vinohrady I (today's Žižkov) and Vinohrady II (today's Vinohrady). A more important fact was that before 1875 all buildings, which were expected to be built, needed an agreement from Pevnostní velitelství (Fort headquarters), because the researched area lay in front of city fortifications. It was hard and impossible to obtain a permit without proving the government interest. In 1875 obtaining such a permit was no longer necessary for new buildings and thus we can see a rapid growth in new construction. We can also see large involvement from the local authorities with the first mayor Vilém Viček [1] (1875–1885). The focus of the local authorities was to create a modern and compact city with a block design of western cities with inspiration from Paris and other cities that came through large development during industrial revolution era. In attachment in Pic.1 we can see a cut out part of Prague map by K. Kořistka from 1875 for reference. In comparison we can see in Pic. 2 a photocopy of map of Vinohrady at state of years 1884–1885. The difference is clear and significant. In the map from 1884 we can

see several blocks already built and the main layout of Vinohrady already drafted. From then Vinohrady continued in unprecedented large growth till 1897 when the final layout was based. We can still see several plots empty but nevertheless a compact and modern city. We can demonstrate this rapid growth in the number of citizens registered for permanent residence. Which is not exactly accurate number but we can deduct that number of people living there was in the time of massive development significantly larger, but estimation of exact number would be only a speculation. In 1875 Vinohrady consisted of 235 houses and 8935 citizens. In 1880 citizens number grew to 14 831 and in 1890 to 34 531. So just in 15 years the number of the permanent residents grew by 286%. [1] This phenomenon of significant growth can be also seen in other small towns around Prague such as Smíchov, Karlín, Žižkov, Libeň, Holešovice, Bubny etc. but nevertheless in Vinohrady we can see a vast amount of buildings which were built within 35 years (1875–1910), which we will take under a composition examination. [6]

Year	Permanent residents	Growth to 1875	Growth for last 5 years
1849	169	-98%	—
1875	8.935	Base value	—
1880	14.831	+66%	+5.896
1885	23.950 (estimate)	+168%	+9.119
1890	34.531	+286%	+10.581
1895	40.200 (estimate)	+350%	+16.250
1900	52.504	+488%	+12.304
1905	66.550	+645%	+14.046
1910	77.120	+763%	+10.570
1922	90.000 (estimate)	+907%	—

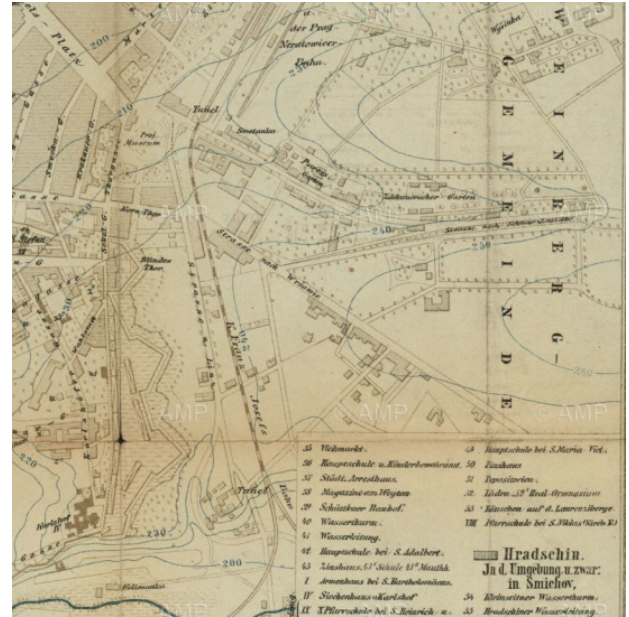
Growth of permanent residents of Vinohrady

Author, based on data from [1]

3 Composition of Vinohrady Urbanism

As it is mentioned in chapter 2, the vision of local municipality was to create a modern and dense city at the border of Prague. The former urbanism concept was designed by Association of Architects under the leadership of Josef Schultz [2]. However, the local municipality decided not to continue with the proposed design and decided to continue the natural and unorganized development without a carefully selected master layout. Therefore, we can see a unique combination of old merchant roads (Vinohradská, Francouzská-Ruská, Bělehradská) and among them we can see a logical rational system of blocks [3] which are impaired by large areas of greenery, belonged to nobility and was not yet ready to be divided. As it is clear from [Fig. 1,2] the main development started from the west part, close to the newly demolished city wall and continued eastwards toward village of Vršovice. The main composition scheme is dedicated to central area of the main square, today's náměstí Míru with the significant monument of Church of St. Ludmila by Josef Mocker. The composition of main view from Karlovo náměstí (Prague 1) is very interesting. If we look through Ječná street to náměstí Míru, we will not see the whole dominant of St. Ludmila church but only one side tower. The same effect was possible to be seen in Moravská street with a Synagogue that did not survive the bombardment during World War II. From composition analysis we can introduce a very interesting concept of intentional non-axial composition that forces us to go closer to discover the whole picture/building, which is intentionally hidden. But from the historical resources it is uncertain whether for both buildings we can consider this as a carefully selected principle or whether the circumstances led to this composition unintentionally. For unintentional circumstances it is indicated by the fact, that the church is located in the axis of the square whose layout was already proposed and that in the axis of church we can see the town hall building. For the Synagogue we can think of the easiest solution, the two plots, which were bought for the building of the synagogue, had already exact layout that

1 →



Map of Prague 1875

K. Kořistka

was not in the axis of the street and in the time of construction “fewer” there was no time to change layout to meet the desired composition principles. Nevertheless, both buildings offered interesting composition principle, which was unique in their time and can only seldom be seen.

To conclude this very brief selection of this part of history of Vinohrady, the work aims to describe only the composition of

buildings from selected range of timing from about 1975 till the start of World War I. Newer buildings could be also seen but their overall impact to the composition of whole area is minimal.

3.1 Street Profiles Composition

Even though the streets layout was not designed as a typical Master plan but it was rather approved part by part by the local authorities, we can see clear hierarchy of streets. The broadest were the streets that reflect the position of former merchant roads. These vary from 30m wide (Vinohradská), 27m Francouzská to 20m Bělehradská. Width of 20m is a typical width for streets in Vinohrady and can be considered as the most typical width of streets in that time around Prague. The smallest streets vary from 13m-Varšavská street to 15m-Americká street. These could be considered as reduced widths in comparison with Paris/Vienna [5] etc. but they are balanced by a typical boulevard style of wide sidewalks and tree alleys.

For composition the width itself is not important parameter. What is more important is the ratio between the width of the street and the height of buildings surrounding it that can be described by offset angle [4]. Thus, for proper analysis we need to know the second parameter necessary, the height of surroundings. In the early part of the development we can see majority of 3-storey high buildings being built, which would lead to around 10m height to the ledge. From 1875 we can see that majority of buildings was built as 4-storey high buildings—13m to the ledge and later from 1890 majority of building was built as 5-storey and former buildings were also extended or demolished for the building of new 5-storey buildings with height around 16–21m. The current state of 6-7-storeys additions with 7-8-storey of built in attic was done during the communist era from late 1950s till late 1980s. From this evolution of height we can see that relative width or offset angle varies even though the street width is the same. From

2 →



Map of Vinohrady 1854–85
Archive of Prague 2

composition point of view we can consider 3-4-storey buildings on a street with width of 20m as typical small town style. For metropolitan area the angles can be higher and even sometimes inconsiderate extension intervention during the communist era can be considered as metropolitan area forming intervention that has no negative impact to the surroundings. We must also consider the fact that the main reason for building of lower storey buildings was the fact that the construction technology was not advanced enough to provide economic feasibility for higher buildings due to extreme thickness of walls necessary.

4 Composition of Buildings Inside a Block

As it is previously mentioned Vinohrady development was formed in a modern block form. Thus, the largest compositional unit is the block itself. From compositional point of analysis it is important to describe the ratios and compositional forms of buildings between each other.

Firstly, we must describe the block and its unique characteristics. Due to unorganized master layout sizes of the blocks vary a lot. We can find very small blocks consisting of 8 plots in size from 45x65m to very large blocks of almost 50 plots in size of 200x75m. To find the compositional connection between the buildings inside a block it is also important to know how a typical plot looks like. From compositional point of view we can divide plots into two types. Corner plots which are compositionally more important and typical plots usually with a length of 12–18m. Corner plots are usually larger than typical plots around 22–25m. For lengths of plot up to 25m it is optimal to use stair-type layout of buildings, which we can see in almost all buildings in Vinohrady. For all buildings built to 1930s we can see that the street line is strictly respected. Several buildings that were built when the plan for broadening the streets was mandatory e.g. J. Masaryka 46 do not respect the street line but these are only a couple of cases not having a large impact on the overall composition. From composition perspective it is very important that for the block layout a street line is respected. If more than few buildings do not respect it, the feeling of street will fade away and compactness of layout could not be seen anymore. Nevertheless seldom not respecting of a street line can provide more pedestrian space and create the feeling of “hidden” square, such an innovation is not desirable and is not in compliance with Vinohrady layout, but can be desirable for more modern block layouts or for districts that have not been developed in such a compact structure as Vinohrady but aiming to reach charm of Vinohrady area.

4.1 Ridge Height and Ledge Height

Even though it might seem that when the buildings have the same number of storeys, thus the ridge height and ledge height of all building should be the same, but they are not. This is such an important fact that reflects a lot more information which could be seen on first sight. Intentionally not respecting of the neighbouring building height might seem from our perspective rude and unintentional but this non-uniformity is very refreshing and gives every building its uniqueness. Sometimes for new development of extension in an area it is demanded to abide the height of ridge and ledge of neighbouring building but this is in complete contradiction to what was typical for development area from 1850s till late 1920s and Vinohrady is no exception.

4.2 Tipple Division Plinth-body-entablature

Every building that was built during the main development era was either in historic style or eclectic thus respecting the triple division. As it is mentioned in the paragraph above, the end of body and entablature in the form of ledge was always present but not respecting the neighbours the same counts for plinth it is always present but seldom respecting the height of the neighbour. What is important to mention is that for every building the division of each part were strictly linear. In several restorations in the area we can see the mistake of respecting neighbours ledges and plinths as well.

4.3 Colour

For colour count the same rules as for other mentioned parts are applied. The colour was selected according to the desire of the investor and was not even subjected as a part of the official documentation to the building authority. Respecting neighbouring

colour was not very common but it could be seen quite often. The main reason was that the available colour palette was not very wide. We can see several possible layouts: monochromatic façades, two coloured façade in tectonic style where a brighter colour was for "filling" and a darker colour was for "tectonic" part. But the opposite anti-tectonic schemes were also quite common. But the basic rule was that what was desired by the investor was the final colour scheme which is now also sometimes seen as only possible. A recommended procedure from composition view would be to select possible palettes from which could the owner freely select the desired colour.

4.4 Acknowledgements

As it is stated in paragraphs above each building was a part of a larger block and even if it was always respecting the street line, it was a unique and completely self-centred compositional unit that did not respect neighbouring buildings in any strict relation. This creates unique originality and a very comfortable space for living. Each building could be described as unique and it has its own set of qualities that differentiate it from others thus providing home feeling for its tenants.

5 Composition of Façades of Several Selected Buildings

As it is stated in the previous chapter every building had their own unique sets of properties but also some typical composition characteristics could be seen. As it is shown above, every façade was divided into three classical architecture parts: plinth-body-entablature.

From a compositional view we can clearly see tectonic composition: heavier elements are below lighter elements. So in

the plinth part we can see deeper bossage than in higher storeys. In the last few storeys façade is usually not bossaged at all. Pillars between the windows are sometimes profiled into classical era pillars (typically variation of Corinthian style).

Another typical composition element is symmetry: the typical part of the body is in almost all cases strictly symmetrical. Double T shape windows are composed in a symmetrical way either in even or odd numbers but in both cases creating a symmetrical composition. Typically only one asymmetrical element is the entrance door. It tends to be in axis of the apartment building in about half of the cases.

To obtain more information about composition of apartment buildings from Vinohrady area we will describe particular selected buildings and show typical and unusual elements of composition.

5.1 Apartment Building Korunní 762/17 (1892, extension 1928)

This building was selected because it belongs to the large part of buildings that was extended by one floor in between the world wars. The building itself belongs to the later part of Vinohrady development and it is in neo-renaissance style. It is less decorative heavy bossaged 5-storey building from 1892 with one more floor added in 1928. The façade design could be seen in picture. [Fig.03]

The composition is symmetrical with six axes. The first two and the last two axes are closely associated. The ground floor is divided only into four axes with first and the last connected to the middle of two first and last axes of upper part.

The tectonic composition is clearly visible. The plinth is in this case of two-storey high ended by ledge ending the second storey, even though the windows composition in the ground and the second

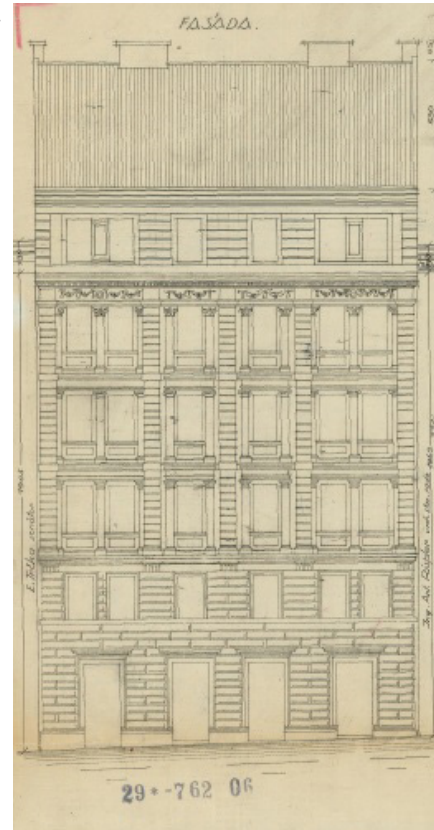
floor is different. This creates enharmonic composition. Plinth is heavy bossaged with deep bosses. The first floor of the body (3rd floor) is started with balustrades under the windows making the mass lighter. Five thin vertical bossaged pilasters are created, each dividing window axis respectively first and last double axis. This creates massive tectonic feeling to the building. Furthermore pilasters with Eclectic-Corinthian style are located on the each side of window axis. This creates tectonic redundancy that is common in neo-historical styles but somehow nonsensical. The last extended sixth floor is also heavily bossaged with larger bosses without lighter Eclectic pilasters. This creates non tectonic composition because heavier mass is put on the top of lighter one. This contradiction damages whole classical tectonic feeling and is also common for later extension. This is the main mistake in composition of later proposed and built extension for this building.

In conclusion this neo-renaissance building is a typical example of buildings commonly built in area that combines tectonic and strictly symmetric composition with the aim to create harmonic static composition, damaged by unreasonably connected plinth to second floor with different approach to symmetry in the first and the second floor with non-tectonic extension. Even though the building contains compositional mistakes, which most of other contemporary buildings did not have, and it is interesting documentation of that time.

5.2 Apartment Building Ibsenova 1207/3 (1902)

This smaller apartment building belongs to the newer part of Vinohrady development which is in eclectic style. The building is located in the prestigious street Ibsenova that faces towards famous Vinohrady theatre. The building was built as a 5-storey high with unused attic. The façade design could be seen in picture. [Fig. 04]

3 →



Façade of building 762/17
Archive of Prague 2

The composition is strictly symmetric with six axes each represented with a window. The composition is closed on each side with larger 6 table windows thus, the composition could be viewed as completed/closed. The central axis, which belongs to even rows of windows between the third and the fourth axis, is emphasized with decorative shields in eclectic style. A gable crowns the symmetrical style and closes the whole composition. This case of that building ground floor was designed for retail purposes, therefore the problem of the main entrance for even rows of windows leading to the asymmetrical ground floor was solved by adding another portal entrance for the retail space. This is very unique and smart solution leads to pure symmetrical composition.

The façade is also strictly tectonic. The plinth is closed by ledge on top of the ground floor. Its heaviness is achieved by deep profiled bossage. The first and the sixth axis are emphasized by bossage in the body of object. The middle part is also bossaged in the second floor, but with lower deepness, thus continuing with tectonic technique of putting lighter mass on heavier-baring mass. The side axis is also furthermore emphasized by two rows of balconies cantilevered with dynamic volutes on the third and the fourth floor as well as with other decorative elements.

So this most significant combination of strictly tectonic and symmetric composition provides a clear harmonic form of the static composition.

6 Summary

In conclusion we can say that the area of Vinohrady is unique in its coherent and vast development, mostly done within only 35 years. This created specific and rare area with atmosphere that is sought by people to live in. To understand its unique properties and the reason why more and more people desire to live there, we have

to look into composition of this area on a multi-level scale. The present article provides a basic and shallow discourse into the topic.

4 →



Façade of building 1207/3
Archive of Prague 2

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Aleš Vaněk

CZ Příspěvek autora se zaměřuje na moderní konstrukční principy a materiály z oblasti lehké membránové architektury, které jsou realizovány v rámci historických budov. Historické budovy vypovídají o stavitelských možnostech a dovednostech v minulých staletích a každá historická budova oplývá zvláštní a nezaměnitelnou atmosférou, která ji do jisté míry činí jedinečnou.

V dnešní době je v mnoha případech patrná snaha vdechnout historickým budovám nový život, přivést je zpět do současnosti a vytvořit přidanou hodnotu, která jim umožní udržet je uživatelnými, navštěvovanými a atraktivními. Zároveň je třeba zajištění ochrany před nepříznivými klimatickými podmínkami. Lehké membránové konstrukce dnes můžeme považovat za právoplatného konkurenta klasickým osvědčeným konstrukcím, jsou schopny vytvořit elegantní a plně funkční architekturu.

V oblasti historických budov je díky membránové architektuře možné vytvořit prvek, který nesoutěží se současnou stavbou, ale naopak ji esteticky a funkčně podporuje a doplňuje. V kombinaci s působivým dvojitě zakřiveným tvarem pak vytváří zajímavý kontrast oproti těžkým a klasickým materiálům.

Lehké membránové konstrukce mohou někdy působit jako "pouhé" umělecké dílo – originální a efektní konstrukce s malou přidanou hodnotou, dobře navržené a provedené lehké konstrukce však dokáží plnohodnotně ochránit zejména před sluncem a deštěm. Do dnešní doby byla realizována řada plně funkčních lehkých konstrukcí, které jsou schopny odolávat i velmi nepříznivým povětrnostním podmínkám, přičemž si zachovávají vysokou estetickou hodnotu.

EN Author's contribution focuses on modern lightweight architecture structural principles and materials in contrast to historical buildings, which are telling us about the past centuries building options and skills. Historical buildings have a special and strange atmosphere which makes them unique.

At present, in many cases there is an effort of breathe a new life in the old buildings and structures, bring them back up to present days and create an additional function to keep them lively, useful and attractive. There is also a need for protection against adverse weather conditions.

At present lightweight membrane structures are acting as a rightful competitor of classical proven structures, able to create a beautiful and fully functional architecture. In the field of historical buildings, it is additionally possible to create a really new kind of structure, which does not compete to a present one. On the other hand, it is supported due to created contrast between something heavy and classical in combination with modern double curved shape, created using lightweight membrane materials.

Lightweight membrane structures sometimes may look like "just" a piece of art—a sculpture without any additional function. On the other hand, many successful and fully functional structures have been built. In many cases, due to the material durability, these structures are able to withstand even very unfavourable weather conditions.

At the end of the paper, there is a concrete example where a lightweight structure can serve as an inexpensive provisional enclosure. This can be used for quickly and cheaply covering

a space or damaged building in case of an unexpected event (natural disaster, fire).

Keywords: architecture; lightweight membrane structure; double curvature; historical building; modern material, transparency; translucency; retractable roof

1 Introduction

A lightweight structure (also possible to name as “little weighing”) represents a structure which is not heavy. At first glance, this definition may sound somewhat in general and ridiculous, but it must be added that the boundary line between a light structure and a heavy one is difficult to be defined and it depends on many factors and angles of view.

The goal of this article is not to define this boundary line, because it would be a very complex topic that can only be speculated. The intention is to deal with the consciousness of light and material architecture, which clearly points to the development of architectural structures and documents significant progress in building philosophy, space perception or material progress, given by the developmental difference of several centuries.

In the next step, several realizations are described as unique structures that are considered to be successful and well managed. These are mentioned to be representatives in the field of the interaction of modern lightweight membrane architecture and historical structures.

In the field of lightweight membrane structures, two main categories may be considered for its purpose—single layer tensioned membranes, which are in most cases translucent, made of coated polyester fibres by PVC and films, which are transparent (can be also printed), most known as ETFE foils. Foils are single- or multi-layered (used as air-filled cushions).

A big advantage of lightweight structures is their ability to cooperate with other kinds of structures (which are also needed to take high tension forces) and create an interesting combination of solid and lightweight items without a negative visual effect in between. The issues of lightweight membrane structures in collaboration with historical buildings are further presented on several case studies, which show the structural and collaborating possibilities. There were several different realizations mentioned to show the wide range of use of such structures, which are translucent or transparent, fully functional, lightweight, elegant and impressive.

2 Case Studies

CASTLE RAPPERSWIL—COURTYARD COVERING

For any structures which are additionally connected to historical objects, especially the anchoring of horizontal forces is problematic. In case of tensioned membrane structures, this is far more complicated, mainly due to the transfer of large tensile forces and the limited possibilities of fitting the anchor elements of the historic walls and ground, which is also the result of heritage preservation.

The inner courtyard of the historic castle Rapperswil in Switzerland is used as a garden restaurant from April to October. The extremely light cover made of transparent PVC film is especially used to protect visitors from the rain [Fig. 1]. The lightweight structure is framed along the overhanging eaves by a steel pipe. The welding seams are nicely arranged to create an open and light atmosphere. In case of rain, water flows in the direction to the middle of the membrane surface through the inverted conical shape of the membrane and into the prepared drainage channel. The feeling of lightness due to the material is extremely high and in case of bad weather conditions, the whole courtyard is well protected [Fig. 2].

REINHOLD MESSNER MOUNTAIN MUSEUM

An interesting shading structure is realized at the Sigmundskron castle in Firmian in Switzerland, which is the home of the Mountain museum of world-famous writer and mountain lover Reinhold Messner. This realization consists of 2 symmetrical pieces each of 9-point sail, which is an elegant solution for its purpose as a shading canopy over the restaurant terrace [Fig. 3]. The whole structure reminds of the open bird's wings inviting visitors to sit and enjoy the atmosphere. The feeling of lightness and double curvature is supported by the patterns layout.

If necessary (winter, predicted poor weather conditions), the membrane can be easily uninstalled and stored. In similar cases the use of a membrane structure is a seasonal matter, serving mainly as a protection against sunlight [Fig. 4].

KUFSTEIN FORTRESS RETRACTABLE ROOF

The roof for the multipurpose courtyard space of the Kufstein castle in the north of Austria is known for its useful retractableness, which offers the usage of the space during the whole year [Fig. 5]. To compare with other mentioned structures, the retractable roof of Kufstein fortress is different in that the tensile forces are not transmitted to the peripheral walls but to the stand-alone steel structure [Fig. 6].

From its structural point this symmetric solution is advantageous and friendly to the historic building, because it is possible to anchor the membrane as needed at a particular location, which is often a problem for historical walls due to the different profile of the perimeter, also for its different condition.

CHIDDINGSTONE CASTLE ORANGERY

Chiddingstone castle orangery roof is made up of a gridshell structure, which is mounted on a steel collar supported by steel columns [Fig. 7]. This timber frame is the world's first gridshell to support a frameless glass roof [Fig. 8]. In essence, it is a self-

1 →



Rain protection canopy over the castle courtyard, exterior view

<https://www.formfinder.at> (15. 8. 2018)

2 →



Rain protection canopy over the castle courtyard, interior view

<https://www.formfinder.at> (15. 8. 2018)

3 →



Shading canopy over a restaurant terrace, exterior view [2]

Pictures made by Dr. Rainer Blum, August 2015

4 →



Shading canopy over a restaurant terrace, interior view [2]

Pictures made by Dr. Rainer Blum, August 2015

5 →



Kufstein fortress retractable roof, Austria, closed situation [3]

<http://econ.biz/case-study/festungsarena-kufstein> (8. 7. 2018)

6 →



Kufstein fortress retractable roof, Austria, opened situation [3]

<http://econ.biz/case-study/festungsarena-kufstein> (8. 7. 2018)

supporting retrofitted structure, which is, as a result, most attentive to the existing historic pavilion. The unique gridshell roof structure belongs to really considerate realizations, mounted on a historic wall.

THOMAS HERZIG - PNEUMOCELL®

There are often durable structures that are able to withstand adverse climatic conditions throughout the year, but in many cases they are temporary realizations that serve a short-term purpose, with the aim to make the place more pleasant and lively, attracting visitors, last but not least function as functional roofing or shading element [Fig. 9].

“Pneumatic windows based on Pneumocell-technology consisting of 4 layers of polyurethane membrane. The heat insulation and light transmission is equal to argon filled insulated glazing, by only 1/5th of the cost for glazing. Furthermore unlike glass larger panels with free curved geometry can be produced and easily transported and mounted. The pneumatic windows could be cut by a knife, but they are hail safe and break proof on the other hand” [5]

The feeling from the interior space when using pneumatic elements instead of walls and windows greatly supports a high degree of clarity [Fig. 10]. If necessary, it is possible to unlock the whole element by means of zippers, thus complete linking the interior with the exterior.

The originality of the design favours the contrast between the existing wooden construction and the transparent TPU material, which greatly improves the structure and adds value to it. The great value of these structures is then the possibility of efficient lighting in the evening. This added value is now commonplace. There is an interesting example of using extremely lightweight structures in context to present ones.

7 →



Gridshell structure over the orangery in Chiddingstone, England, interior view

<http://carpenteroakandwoodland.com/project/orangery-gridshell/>
(15.8.2018)

8 →



Gridshell structure over the orangery in Chiddingstone, England, detailed view

<http://carpenteroakandwoodland.com/project/orangery-gridshell/>
(15.8.2018)

Customized pneumatic pillows are able to replace the glass. The advantage is freely configurable geometry, larger possible individual formats and a lower, more advantageous price. The pillows could be cut off by a knife, but they cannot break, unlike glass. The building shown here has exposed concrete flooring and an internal stone wall for storing solar energy. On a sunny day, even at outside temperatures below zero, 25° C is achieved inside without heating.

PALAIS ATTEMS TEMPORARY ROOFING

The other realization from the architect Thomas Herzog represents an extremely light pillow that is set in the courtyard of the historic building in Steirisches Herbst in Austria [Fig. 11]. This kind of functional sculpture is going to be used again for many upcoming events during the whole year.

The structure consists exclusively of a transparent polyurethane film and spans almost 18 meters without any supporting solid components. The structure is almost airtight. When the pressure drops, two independent pressure switch-controlled side channel blower fans automatically compensate. Due to the high transparency, the Baroque courtyard façade of the Palais Attems as well as the sky continues to be experienced almost unhindered [Fig. 12].

GASOMETER BERLIN

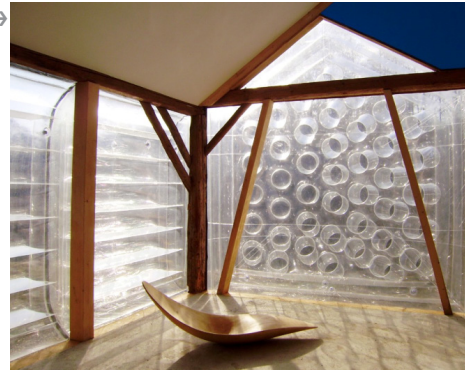
In 1913 the historic gasholder in Berlin was opened and it was used till 1995. The overall height of the steel structure reaches 78 meters. For the Football World Cup in 2006 the structure became an enclosure and was renovated. The air supported single layer membrane covers an area for approx. 600 people [Fig. 13]. The Gasometer is essentially made up of two independent lightweight structures—the 20 meter high cupola of EUREF Campus as an air-supported structure realized in 2006, which is modelled to a shape of Berlin Reichstag and the external enclosure [Fig. 14].

9 →



Workshop of the architect Thomas Herzog, Austria, exterior view
KRAUEL, Jacobo, INFLATABLE – Art, Architecture & Design, Barcelona: Links books, 2013, page 147, ISBN: 978-84-15492-34-4 (22.8.2018)

10 →



Workshop of the architect Thomas Herzog, Austria, interior view
KRAUEL, Jacobo, INFLATABLE – Art, Architecture & Design, Barcelona: Links books, 2013, page 147, ISBN: 978-84-15492-34-4 (22.8.2018)

The impressive dome represents a unique and flexible location for congresses, symposiums and corporate events. Due to the roof over a transparent dome, space can be used in all weather conditions and throughout the year.

VIENNA RATHAUS RETRACTABLE ROOF

The amazing convertible membrane roof above the arcade courtyard of Vienna City Hall [Fig. 15] was finished in August 2000. It serves as rain and sun protection for the numerous events. The roof covers space of 1100 m².

The structure replaces the previously used tents for rain shelter and sun protection. Rails are arranged along the long sides of the roof, where the carriages of the crosswise tensioned cables operate. Between these so-called ridge cables the membrane is essentially carried uniaxially in longitudinal direction. The valley—each respectively between two ridge cables—was ballasted, so that the membrane folds up like an accordion between ridge and valley when moving [Fig. 16].

PROVISIONAL COVERING APPLICATION OF LIGHTWEIGHT STRUCTURE

The gridshell structure is a special example of lightweight roofing. It is a compressed self-supporting structural system that arises from the forming of the original orthogonal grid. In this example, the structure is used to cover the natural theatre Menteatrál in Neratov in Orlické Mountains. With the use of a minimal amount of material (larch roofing laths), a relatively large temporary roofing was created here [Fig. 17]. For the purpose of a theatre, which does not allow the daylight coming inside the building, two layers of covering membrane were used there—black as the first layer [Fig. 18] and white on the top of the surface to avoid overheating.

The identical solution was used for the design of temporary roofing for the castle in Horní Maršov, which burnt down in August 2018 [Fig. 19, Fig. 20].

11 →



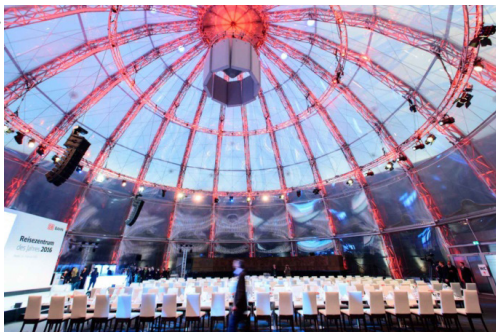
Palais Attems transparent roof, Austria, exterior view
<http://www.gat.st/news/pneu-im-palais> (15.8.2018)

12 →



Palais Attems transparent roof, Austria, interior view
<http://www.gat.st/news/pneu-im-palais> (15.8.2018)

13 →



The interior view to the Gasometer multipurpose space, Berlin
<https://www.euref.de/index.php/de/veranstaltungen/eventlocations/gasometer/> (26.7.2018)

14 →



The entrance view to the Gasometer, Berlin
<https://www.euref.de/index.php/de/veranstaltungen/eventlocations/gasometer/> (26.7.2018)

15 →



The retractable membrane roof, Vienna town hall courtyard, bird view
 Formfinder database <https://www.formfinder.at> (15.8.2018)

16 →



The retractable membrane roof, Vienna town hall courtyard, interior view
 Formfinder database <https://www.formfinder.at> (15.8.2018)

The proposed structure for the castle covering was finally not used due to complicated property relations but could serve as a variant for similar cases in the future.

Acknowledgement

This contribution is based on author's research and development during the work on the membrane lightweight platform Formfinder, which serves as an amazing information database of the world's most successful realizations.

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- [11] Pictures made by the author, August 2018

17→



Gridshell roof over the Menteatrál theatre in Neratov, exterior view
POLÁČEK V., POKORNÝ V., Recycled Theatre, Praha: Grada Publishing a.s., 2015, page 309-310, ISBN: 978-80-247-5751-3

18→



Gridshell roof over the Menteatrál theatre in Neratov, interior view
POLÁČEK V., POKORNÝ V., Recycled Theatre, Praha: Grada Publishing a.s., 2015, page 309-310, ISBN: 978-80-247-5751-3

19→



Castle in Horní Maršov during the fire on 19. 8. 2018
Pictures made by the author, August 2018

20→



Castle in Horní Maršov after extinguishment on 19. 8. 2018
Pictures made by the author, August 2018

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CZ Lidská činnost má negativní vliv na stav životního prostředí, včetně vyčerpávání zdrojů, znečištění a produkce odpadu. Vystavěné prostředí na tomto stavu významně participuje. Pro snížení dopadů lidské činnosti na životní prostředí je proto nutná změna přístupu k navrhování staveb.

Architekti musí proto být schopni uchopit a především řádně využívat všechny aspekty a možnosti udržitelného navrhování, včetně špičkových technologií, a to tak, aby je dokázali skutečně zapojit již do konceptu stavby. A právě inovativní využití integrované fotovoltaiky, tzv. Building-integrated Photovoltaics (BIPV), představuje jednu z cest, kterou se lze vydat, zejména v kontextu městského prostředí. Použití těchto systémů ale musí být součástí integrálního procesu navrhování, který je základem kvalitní udržitelné architektury.

Cílem tohoto příspěvku je prezentovat teoretická východiska a důvody pro přípravu manuálu BIPV pro architekty, který by nabídl metodickou pomůcku pro práci s pokročilými fotovoltaickými systémy s důrazem na možnosti jejich použití zejména v městském kontextu, včetně historických center.

EN Human activity, including resource depletion, pollution and waste production, has a negative influence on the environment. Built environment is one of the major causes of the situation. It is essential to change the approach to building design to lessen the impact of human activity on the environment.

Architects should be able to grasp and implement all aspects of sustainable design, including cutting edge technologies in a

holistic and integral fashion. Building-integrated Photovoltaics (BIPV) represent an important field to explore, since photovoltaic systems have an enormous potential to be used within the context of the city. Their implementation though, has to be a part of the integral design process which is essential for the creation of quality sustainable architecture.

The aim of this paper is to demonstrate the theoretical background behind, and the motivations for, the creation of an Architects' Manual of Building-integrated Photovoltaics that would provide architects with a methodical guide to working with advanced photovoltaic systems in architectural design, concentrating primarily on their implementation in urban context including historical city centres.

Keywords: architecture; building-integrated photovoltaics; BIPV; photovoltaics; sustainability; sustainable architecture; design; design manual

1 Sustainability and Architecture

1.1 Environment and Building Industry

Already in the 1960's the American architect and visionary Richard Buckminster Fuller stated that the Earth was a mechanical object much like a car – *“and so we have to change the oil, fill up the fuel tank and put water into the radiator, to take care of it as a whole [1].”*

The rising number of inhabitants on the planet and their striving for improved living standards are creating enormous pressure on the environment including climate change, pollution, disappearance of the ozone layer, exhaustion of natural resources, unsustainable treatment of water resources, deforestation, soil degradation, waste production or loss of biodiversity. The built environment participates significantly in this situation.

In the developed world the building industry accounts for 40% of the total energy consumption [2] and around 40% of all human-produced waste. At the same time, it is responsible for approximately 30% of CO₂ emissions [3]. It is obvious that to reduce the impact of human activities on the environment a change in approach to building design is needed in order to integrate sustainable design strategies.

As architects we take on the responsibility for the built environment and its quality. Architects should be able to grasp and implement all aspects of sustainable design in a holistic and integral fashion.

1.2 Sustainable Architecture and Integral Design

Sustainable architecture is a fundamental topic, a consequence of decisions made during the design process. Since architects need to be able to address and coordinate all aspects of a design,

they should evidently be aware of the existing, as well as arising, technical and technological possibilities available to them. These play an important role in architectural design and should definitely not be neglected already in the conceptual phase of the design.

“Sustainability is an opportunity to ask old questions in a new way [4].”

Ignoring technological progress does not seem to be the correct way to approach sustainable design on the large scale, although in some cases it may look very tempting, and a substantial percentage of architects as well as the general public still today tend to interpret sustainable (or “green”) architecture as a substantially low-tech issue [5]. At the same time however, sustainable architecture should not be dependent exclusively on technologies, nor should these be a mere “add-on”. Hence the need for a change of approach to architectural design.

However, for architects, technologies are often a design feature which proves difficultly to tackle and implement successfully. This limitation creates the need for an interdisciplinary team to take part in the design process from the very beginning – from the conceptual design phase. A team capable of working on an integral design.

Architects often tend to work with various technologies either as with an “invisible” component of the building (i.e. both leaving its design to the engineer and at the same time trying to limit the impact of such technologies on the aesthetics of the building) or an “add-on” element which is an overtly visible part of the form of the building, used in an extrovert advertisement-like and exhibitionist fashion. Technologies are thus frequently not integrated with the architecture and remain a separate field which reduces both the quality of the building and often also the quality and efficiency of the technologies themselves.

However, in sustainable architectural design, technologies should always represent a “natural” and ingenious part of the overall process and result. Integral design seems to be the only correct path to sustainable architecture and sustainable built environment.

2 Building-integrated Photovoltaics

2.1 Energy and Landscape

“Civilization requires energy, but energy use must not destroy civilization!” [6]

Energy is one of the key issues of the environmental (ecological) pillar of sustainable development (with the other two being economic and social). The way mankind manages energy and what sources are used to produce this energy has direct consequences on the ecology of the Planet, but equally it affects the world’s economy and society. When thinking about energy, it is essential to have in mind that approximately 1 billion of the world’s population still does not have any access to electrical energy. [7]

Furthermore, the European Union’s climate package for 2020 works with a “20-20-20” strategy on climate and energy meaning that as a whole, the EU has set three key targets:

*„20% cut in greenhouse gas emissions (from 1990 levels)
20% of EU energy from renewables
20% improvement in energy efficiency“ [8]*

For 2050 the objectives are even more ambitious – to reduce greenhouse gas emissions by 80-95% compared to 1990 level [9].

If we were to meet these goals by producing all electrical energy from solar radiation only, this would require the installation of

1 →



Les Mées solar farm (Alpes-de-Haute-Provence, France).

Area of 200 hectares with a total of 112,000 solar modules is an example of the ecological impact of displacing natural environment and wildlife with large-scale ground-mounted PV installations.

photo: Reuters / Jean-Paul Pelissier

about 5,000 square kilometres of photovoltaic panels over the following 40 years. Thus would be a surface equalling to about 0.1% of the area of the European Union.

Shrinking of natural landscape due to man-made construction is yet another threat to the environment we live in. It has increased rapidly over the last decades, mainly due to massive and unceasing urbanisation.

Large scale ground-mounted PV installations unfortunately play an increasingly important role in this process as well. They not only contribute to the reduction of the production areas for

agriculture, but also to the loss of open countryside along with its cultural, ecological and aesthetic functions. At the same time, they produce electrical energy far from the main places of consumption – concentrated urban areas [Fig. 1].

2.2 Urbanisation and Photovoltaics

Constant urbanization generates the need for the creation of truly sustainable cities.

"Today, 54 per cent of the world's population lives in urban areas, a proportion that is expected to increase to 66 per cent by 2050." (...) *"The urban population of the world has grown rapidly from 746 million in 1950 to 3.9 billion in 2014. (...) The world's urban population is expected to surpass six billion by 2045."* [10]

These alarming figures prove that in the near future the built environment and its needs will continue to play a core role with respect to sustainable development.

"Managing urban areas has become one of the most important development challenges of the 21st century. Our success or failure in building sustainable cities will be a major factor in the success of the post-2015 UN development agenda" says John Wilmoth, Director of UN DESA's Population Division [11].

Photovoltaic systems are already today a mature technology that has an enormous potential within the context of the cities: on roofs, façades, transparent and semi-transparent elements and constructions, complementary structures or transport and technical infrastructure. This is especially evident for "Building-integrated Photovoltaics" (BIPV), which can be fully integrated aesthetically and structurally in buildings and other structures and thus become an integral part of the urban environment. Photovoltaics in general represents one of the important

2 →



A deterrent example of photovoltaics use—insensitive roof-mounted PV installations on residential block in the urban conservation area of Mikulov, Czech Republic.

Photo: Martin Čeněk

technologies that can in the near future have a strong impact on the image of the buildings and the cities we live in. Photovoltaic systems do not need to be only a "mere" energy-generating technology but in the form of Building-integrated Photovoltaics present an opportunity and challenge to be taken up by architects [Fig. 2].

2.3 Building-integrated Photovoltaics

"More than just providing electrical energy, BIPV can enhance and satisfy a building image. BIPV makes a statement about innovative architectural as well as engineering design." [12]

The described approach of implementing photovoltaics in urban environment however has its challenges which originate from the dense and diverse city fabric (orientation, form, massing, layout, height of surrounding buildings, total space available), social (acceptance of new material with specific aesthetic quality) and cultural aspects (use of photovoltaic systems in city conservation areas, i.e. zones of special architectural or historic interest, the character and appearance of which should be protected and preserved) of the urban environment.

When designing with BIPV architects have a number of opportunities how to integrate the currently existing photovoltaic solutions into the building design. The main possibilities include shading systems, rain screen (cladding) systems, curtain walls, double skin façades, application on atria and canopies, as well as progressive glazing solutions. Advanced photovoltaics can be an integral part of more traditional building elements, such as roof tiles. It can be either practically invisible or give architecture new aesthetics [Fig. 3, 4, 5].

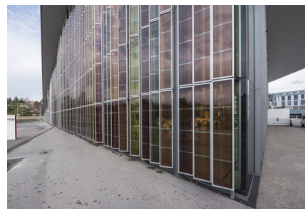
To sum up, BIPV represent a possible solution to land depletion and constant urbanization, as well as an architectural element to be used in sustainable architectural design.

3 BIPV Design Manual

3.1 Data

Engineers from the Faculty of Civil Engineering of the Czech Technical University in Prague, as well as experts on micro grids from University Centre for Energy Efficient Buildings, as a part of the multidisciplinary team of the Centre for Advanced Photovoltaics working on the topic of BIPV, carry out detailed studies on building physics and grid phenomena in order to provide necessary technical data. The energy needs, usage patterns, demands etc. of

3 →

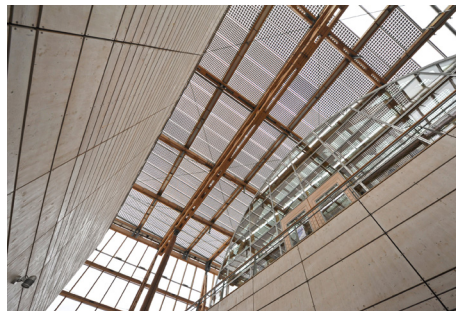


Convention centre in Lausanne (Switzerland)
architect Richter Dahl Rocha & Associés

A newly built Centre is a part of the EPFL campus. An array of dye-sensitized solar cells with green, yellow and red hues is installed on the outside of the glass facade. The facade functions as solar shading and produces light effects in the interior of the building.

Photo: Martin Čeněk

4 →



Akademie Mont Cenis in Herne (Germany)
architect Jourda & Perraudin

The building presents an integral bioclimatic design which works with the principle of a glass house creating an inner environment. Photovoltaic cells are integrated in the glass house transparent elements and have a varying "density" according to shading needs.

Photo: Martin Čeněk

BIPV solutions as well as a selected typology of existing buildings in real urban situations are being analysed. The resulting information for a series of model urban situations in Prague then serves to establish the methods of BIPV implementation.

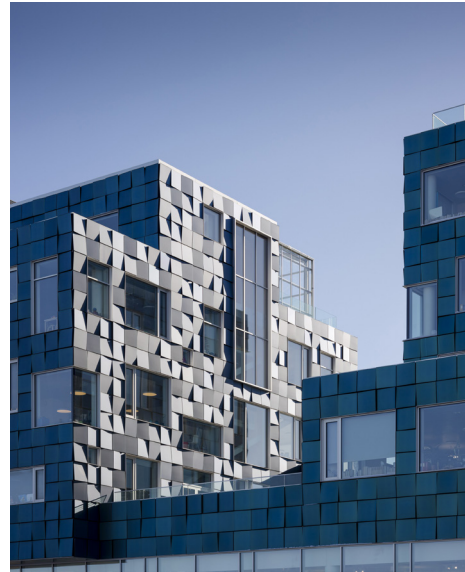
The goal of the architects from the Department of Architectural Design II of the Faculty of Architecture engaged in the project is to create (based on this data and on the possibilities of state-of-the-art advanced photovoltaic products) a design manual that would aid the design process and address some of the most demanding issues in successfully applying - and integrating - photovoltaics in architecture.

3.2 Model Urban Locations

Existing urban environment presents great challenges to the implementation of any new technology. Urban environment can have many variations and offer a broad scope of possibilities for various approaches to BIPV. Also, in an urban context, we need not only design new buildings, but right the opposite – the urban texture is already in place and existing buildings need to be used, often even protected and updated with utmost care in such a way, that their value and the value of the urban context is not damaged. Prague was chosen for the Manual mainly for its richness of typologies and urban fabric, ranging from heritage UNESCO protected historical centre, to various present-day suburban situations, and its needs to develop and face the challenges of the future. Prague can also serve as a representative of many Central European cities.

Using available data from IPR Praha (Institute of Planning and Development of the City of Prague) development areas within the city of Prague were identified. These model locations and appropriate building typologies and forms should represent typical scales and densities of urban tissue:

5 →



**Copenhagen International School Nordhavn (Denmark)
architect C. F. Møller**

The façade of the new build school is covered in 12,000 photovoltaic panels, each individually angled to give the façade its glittering effect. The panels supply more than half of the school's annual electricity consumption and cover a total area of 6,048 square meters. Archdaily.com Photo: Adam Mørk

- I. Historical (medieval) city (e.g. parts of Staré Město)
- II. Compact city (19th century block tissue, e.g. Vinohrady)
- III. Modernist city (1960-90's, e.g. Jižní Město)
- IV. Garden city within urban core (e.g. Ořechovka)
- V. Low rise suburb (example of urban sprawl)
- VI. Commercial suburb

In these locations the ways to apply BIPV, if application is possible and desirable, are to be analysed and described. From architectural point of view in some urban situations any change of the status quo is problematic, but today's technological possibilities in PV integration offer a varied range of opportunities which should be taken into account carefully.

The demand for different colours, structures, textures, sizes and shapes that are lacking in current PV applications is to be addressed and negative aspects of photovoltaic application in the urban structure identified. In the listed urban situations, the possible impacts of PV implementation on the lifestyle of the city inhabitants will be discussed and the influence and limits of specific urban fabric on the use of photovoltaic systems analysed in detail.

Based on the hard data currently available (locations ii. Vinohrady and iii. Jižní Město), it is obvious that implementation of photovoltaics from energy point of view is only really useful on a relatively small portion of the actual buildings' surfaces: effective surface percentages for buildings vary between 5-18% in Vinohrady and 15-27% in Jižní Město respectively. This knowledge has to be taken into account when considering the various ways in which BIPV can be used in the model situations.

By generalizing the lessons learned from the described analytical work, a methodology of design and assessment of BIPV in the early stage of an architectural concept in urban context is being created. This is particularly important, because the conceptual phase of the design has major impact on all the following design phases and thus on the quality of the resulting building as well as its surroundings.

Acknowledgement

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CZ V nevytápěných zimních stadionech bez řízeného větrání jsou časté problémy se vznikem mlhy nad ledem, s kondenzací na povrchu konstrukcí a se vznikem krápníků na ledu. V těchto halách je větrání zajišťováno otvory v obvodových stěnách a vnitřní mikroklima je závislé na aktuálním venkovním prostředí. Nepříznivé podmínky se vyskytují hlavně na jaře a na podzim, vzhledem k tomu, že ledová plocha není v provozu v létě.

Vlhkost z venkovního prostředí, vlhkost vznikající při rolbování společně s vlhkostí od osob na ledu i v hledišti způsobují vysokou vlhkost vzduchu v hale. Aby mohlo být zabráněno výše uvedeným problémům, nadměrná vlhkost musí být ze vzduchu odvedena odvlhčovací jednotkou. Investiční a provozní náklady jednotky jsou velmi vysoké, proto v mnoha menších stadionech systém není instalován nebo je využíván zřídka.

Způsoby provozování odvlhčovacích jednotek jsou odlišné na každém zimním stadionu, proto byly provozní hodiny odvlhčovací jednotky simulovány v programu Trnsys. Článek je zaměřen také na analýzu zvýšení tepelné zátěže na ledovou plochu od vzdušné vlhkosti, která tvoří až 22 % z celkové tepelné zátěže. Provozní náklady odvlhčovací jednotky je možné snížit využitím odpadního tepla z chlazení k ohřevu regeneračního vzduchu. Vypočtená úspora je 35 až 55 % na ohřevu regeneračního vzduchu adsorpční odvlhčovací jednotky.

on an ice surface causing its damage. When air distribution is ensured by windows and openings in building envelope hence internal microclimate in the arena depends on outdoor weather conditions. The adverse conditions appear mostly during spring and autumn period as the arena is not in operation during summer.

Humidity from outside air, made by ice resurfacing machine, together with human humidity leads to high moisture supply. To prevent above mentioned problems the humidity has to be removed from air by a dehumidification unit with a desiccant rotor. Investment and also operation costs of the unit are very high, therefore in many local arenas the system is missing or used rarely.

Operation conditions vary in every arena, therefore optimal working hours of the dehumidification unit were simulated in a Trnsys programme. The paper is focused also on analysis of increasing heat load on ice sheet due to high air moisture which represents up to 22 % of total heat load. A possibility of operation costs decreasing by using waste heat from cooling system is analysed. Calculation results introduce savings from 35 up to 55 % on regeneration air heating in the adsorption dehumidification unit.

Keywords: adsorption dehumidification; refrigeration heat; waste heat; ice arena

EN In ice arenas without heating and ventilation systems many problems leading to dissatisfaction of players, auditorium and owners may occur. The common problems are fog above the ice sheet, condensation on cold surfaces consequently dropping

1 Introduction

The subject of internal microclimate in ice arena has been solved and discussed in many papers. For example paper [1] deals with the advantages of adsorption dehumidification unit usage, reasons why condensing on a ceiling appears, describes used desiccant materials and basic design parameters. Papers [2] and [3] are more focused on the construction part of the topic, used materials, shapes and heights of a roof envelope structure and also on possibilities of ventilation air supply into occupational zone. The present paper deals with the waste heat from the cooling system utilization to decrease operational costs of the dehumidification unit which has to ensure good internal microclimate in the ice arena.

2 Adsorption Dehumidification

Compared to the cold-coil dehumidification, which removes moisture by condensing on a cold surface, the desiccant dehumidification is based on adsorption or absorption. Adsorption dehumidification units are able to ensure very low air dew point temperature for low air temperatures often appearing in ice arenas. Adsorption desiccant does not change phase when collecting air moisture.

The rotor in the unit is made of or covered by solid desiccant. The rotation speed is from 10 to 30 rev per hour. The humidity transition is ensured by vapour pressure difference on a desiccant surface and passing air.

Since relative humidity is vapour pressure function the direction of humidity transition can be characterized as a difference between regeneration air and process air stream relative humidity. The pressure difference is essential for reasonable usage of this kind of dehumidification. The accessible process air relative humidity

decrease is possible up to regeneration air humidity level. Desiccant removes humidity from the process air stream (latent heat) and simultaneously add the same amount of sensible heat into the air stream.

3 Ice Arena and Cooling System Specification

The ice arena has two ice sheets in two separated halls. The first hall is bigger and used mainly for tournaments, there is space for 5000 people in audience. The second hall is smaller and used for practice when first hall is occupied. There are also cloakrooms and office building. The full season starts on August 15th and ends at the end of April. During the summer the arena is used for in-line skating. The area of the ice surface is 1500 m². Working hours start at 6 am and end at 9 to 12 pm. The ice treading machine is used approximately 12 times per day.

The cooling cycles were simulated in the Coolpack software [6]. The cycles (separate for every type of chiller) were simulated for condensing temperatures which appears during cooling season regarding to variable outdoor air wet bulb temperature. Evaporation temperature was constant. The gained results as variable power input, power output, temperatures and pressures of the coolant were used as an input into following Trnsys simulation (chapter 4). Also amount of superheat and condensing heat was calculated. The temperature of the superheat is about 50 °C, maximum 55 °C. The temperature of the condensing heat is between 20 or 25 °C. A diagram of the cooling cycle is showed in figure [Fig. 1a].

The cooling system consists of three chillers. Cooling power output is 2x252 kW and 378 kW at -12/35 °C. Motor power input is 2x70 kW and 90 kW. The chillers run for 1975, 2140 and 1660 hours per season. Ammonia direct evaporation system is applied for cooling of the ice sheet. The calculated amount of superheat is 397 MWh.

year⁻¹ and of condensing heat 1782 MWh.year⁻¹. The amount of the refrigeration heat per months in season is shown in figure [Fig. 1b].

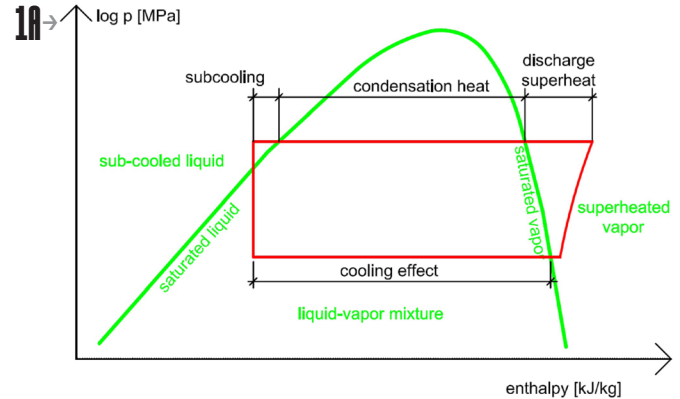
The superheat share of the total amount of refrigeration heat is 18 %. Condensing heat is used as a primary source for water to water heat pumps.

4 Dehumidification Unit Operation Schedule Simulation

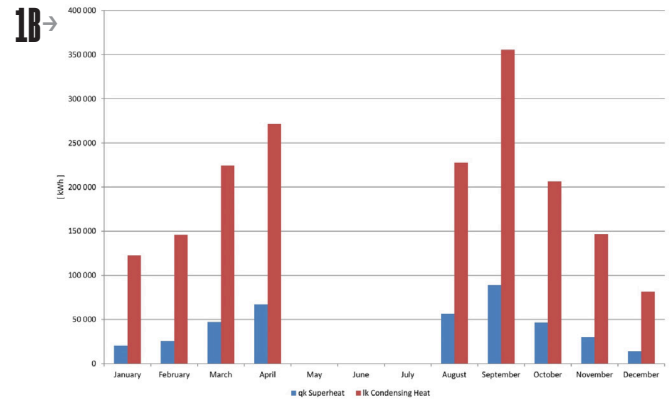
The main hall with ice sheet was simulated in a Trnsys software [5]. Climate data of Prague were used as an input. The simulation was carried out using one hour time step, simulated time period was one year. The components used in the simulation are described in a table [Fig. 1] and their principle connection is showed in picture [Fig. 2]. Air exchange was estimated 1,5 1.h⁻¹. Air infiltration was simulated as a function of a wind speed. Heat load brought by 700 people in audience was entered as 75 W per person, considering latent and also sensible heat. Heat load brought by 15 people skating on the ice sheet was simulated as latent heat 340 W per

Component purpose	Trnsys model	Description
Hall	multi-zone building	The building with ice sheet
Ice sheet structure	type 705d	Concrete desk with cooling pipes included, connected with multi-zone building
Heat load delivered by people	type 574	Sensible and latent heat load in the hall
Air heating	type 6	Air heater
Control system	type 2b,2d	Control tool
Dehumidification unit	type 683	Adsorption dehumidification unit

Components used in the Trnsys simulation



Cooling cycle diagram



Refrigeration heat delivery graph

person and sensible heat 185 W per person. The ice surface was considered -5°C . Sub-floor heating water temperatures heated up by condensing heat were inserted into calculation based on the Coolpack results.

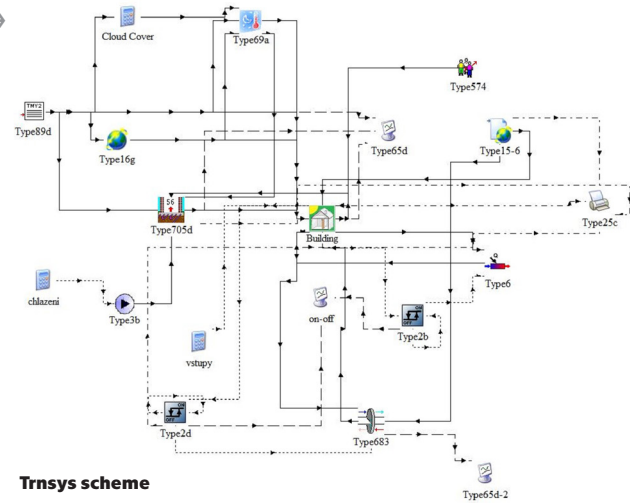
Calculation results for February, March and April are shown on a picture [Fig. 3]. As the outside air humidity ratio increases the dehumidification unit is working longer period of a day. Based on the Trnsys calculation it was applied into energy balance that the unit is in operation for $5 \text{ hours} \cdot \text{day}^{-1}$ in December, January and February, for $7 \text{ hours} \cdot \text{day}^{-1}$ in May and November and $10 \text{ hours} \cdot \text{day}^{-1}$ in April and September. During summer, due to high outside air humidity ratio, the dehumidification unit would not be able to maintain required dew point temperature under 4°C .

5 Ventilation and Dehumidification Mode Description

The main purpose of a ventilation system is to remove heat load, to ensure required amount of air, constant air temperature and air flow above the ice sheet, to protect structures against condensation on its surfaces, which may be caused by radiation from the ice sheet.

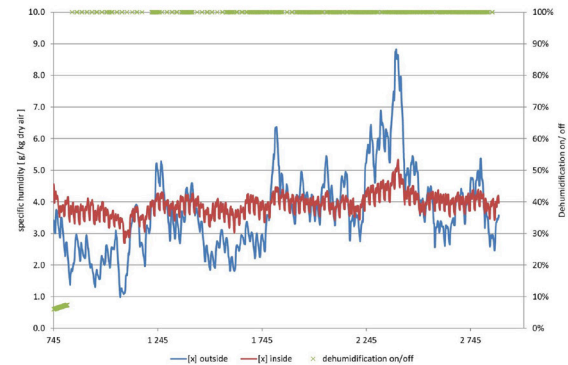
Total heat load on the ice sheet is composed of embodied air humidity, heat convection, ice treading machine and lighting. Air dew point temperature has influence on the bulk of the heat load on the ice sheet and always should be taken into account when calculating total heat load. When a decrease of the dew point temperature is ensured by dehumidification unit, consequently the heat load on ice sheet decreases, too. If dehumidification system is not in operation, the ice sheet converts the humidity in ambient air into condensation on cold surfaces or frost layer on the ice sheet. Technically the ice sheet is cooling and dehumidifying ambient air by water vapour condensation [Fig. 4].

2 →



Trnsys scheme

3 →



Simulation results

Required dew point temperature is maximum 4 °C, in NHL ice arenas up to 1,7 °C [4].

Depending on required humidity level and desiccant material the regeneration air temperature is from 80 to 140 °C. The higher temperature of the regeneration air the lower process air humidity can be achieved. The regeneration air will be heated up in two stages.

Superheat will be used for the first stage of regeneration air preheating up to 50 °C. The final required temperature will be ensured by electric or gas heater in the unit. Two regeneration air temperature levels will be evaluated, 85°C and 120°C.

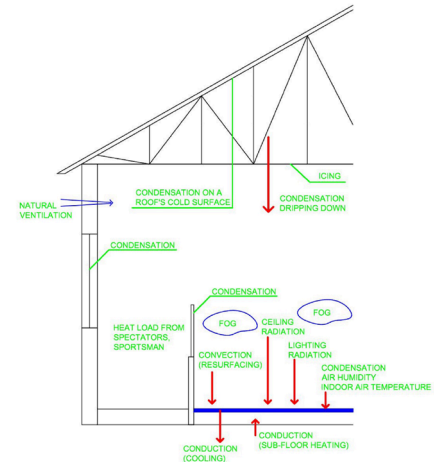
To increase dehumidification unit efficiency the process air is cooled down before entering the rotor. Technically, temperature and pressure difference of the regeneration and the process have to be maximized.

When designing air handling units for two halls it is essential not to connect air supply and exhaust pipes but to ensure separated control of each ventilated area.

The amount of air delivered into the first hall is 10 000 m³.hour⁻¹, whereas the amount of regeneration air is 2000 m³.hour⁻¹. The volume of air delivered into the second hall is 7500 m³.hour⁻¹, whereas the volume of regeneration air is 1500 m³.hour⁻¹. A dehumidification unit will be in operation as described in the previous chapter. When a dehumidification unit is not in operation, only AHU with a recuperator is used. The principal scheme of the air handling unit and the dehumidification unit is shown on figure [Fig. 5].

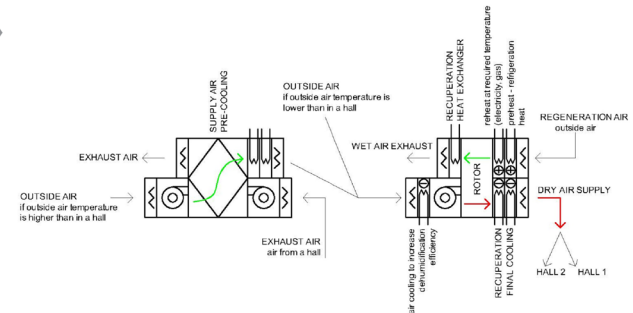
The dehumidification unit control depends on the measured dew point temperature in an exhaust air pipe from the halls. The unit has to ensure air with dew point temperature lower than 4 °C.

4 →



Principal scheme of the hall and indoor heat loads

5 →



Ventilation and dehumidification unit group order

6 System Control

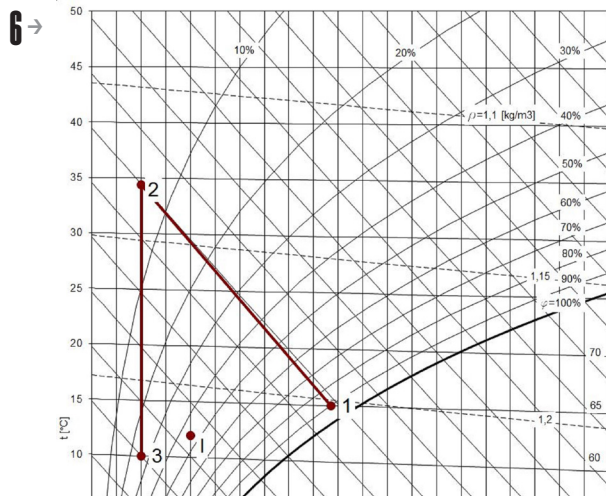
A fundamental scheme of the system is on figure [Fig. 7]. Superheat is accumulated in a storage tank no. 1. Water heated up by superheat will be used to preheat the regeneration air stream. When the dehumidification unit is not in operation, the water is distributed into tank no. 4. This storage tank also gathers heat from two exchangers. The first heat exchanger gathers heat recovered from the regeneration air stream before exhaust outward. The second heat exchanger gathers heat from cooling of the process air stream before distribution into hall with ice layer. The final re-cooling on required temperature of the process air flow is ensured by cooling water from chillers (a separate heat exchanger). Hot water in the tank no. 4 can be used for float ice melting in a snow melting pit or for subfloor tempering (heating).

Condensing heat is accumulated in an individual storage tank no. 2. The water is intended as a primary energy source for water to water heat pumps. Water heated up by the HP (heat pump) on temperature 60 °C is stored in tank no. 3. Hot water in tank no.3 is used for space heating, domestic hot water heating and technological water heating for ice treading machine. When the cooling system is not in operation the heat for space heating or domestic hot water heating is delivered by gas boilers.

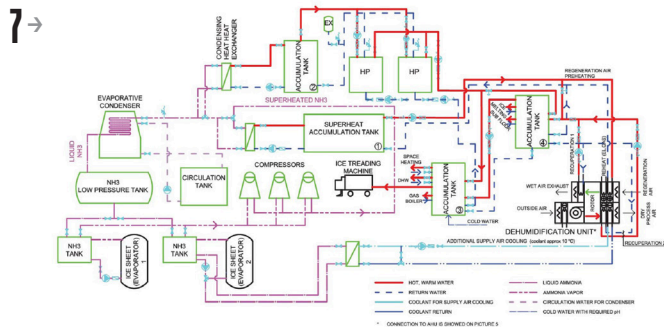
7 Heat Load on Ice Sheet Caused by Air Humidity

One of the heat loads on ice sheet is inflicted by humidity embodied in an ambient air. It was examined by calculation how much the heat load on ice sheet increase with respect to humidity ratio of ambient air.

The calculation considered ice surface 1500 m², air layer thickness 2 m thus air volume 3000 m³, humidity 1,23 kg.m⁻³. Ice surface



Mollier diagram



Scheme

temperature is $-5\text{ }^{\circ}\text{C}$. Ice specific heat capacity is $2400\text{ J}\cdot\text{kg}^{-1}\cdot\text{K}^{-1}$, water specific heat capacity is $4200\text{ J}\cdot\text{kg}^{-1}\cdot\text{K}^{-1}$, ice latent heat of melting is $334\text{ J}\cdot\text{kg}^{-1}$.

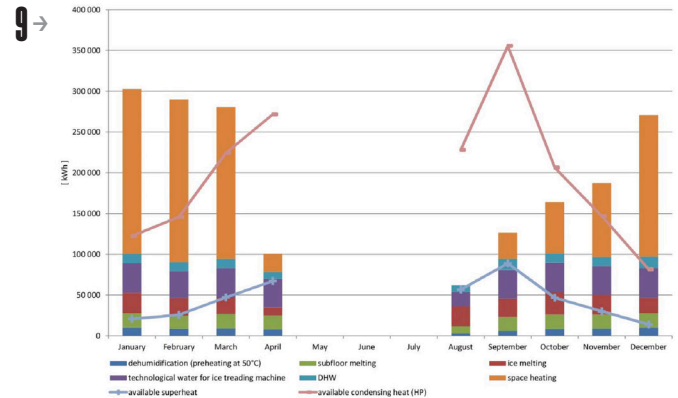
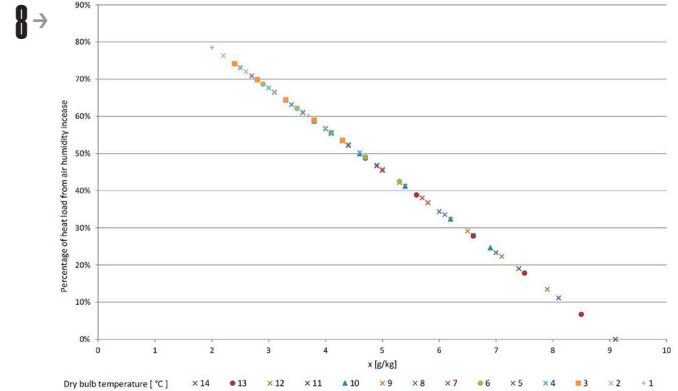
The graph on figure [Fig. 8] shows increasing percentage of the heat load on the ice sheet caused by air humidity. On horizontal axis there is specific humidity, on vertical axis there is percentage of load decrease. Dry bulb temperatures are evaluated if the indoor air are marked by various symbols.

8 Energy Balance

The energy balance was calculated per months during one year period. Energy flow was considered as shown on a scheme on the figure [Fig. 9]. The results are shown on the graph on figure [Fig. 6]. In the graph there are energy consumers, which can be supplied by refrigeration heat and calculated amount of the refrigeration heat. Recuperation from process air cooling is not considered.

In this case study all available superheat can be used since the consumption is ensured by heat loads with various time schedule. The impact of time mismatch is declined. Savings on regeneration air flow heating are up to 50 % in case of regeneration air temperature $85\text{ }^{\circ}\text{C}$ and 35 % in case of regeneration air temperature $120\text{ }^{\circ}\text{C}$.

From the total amount of the available condensing heat 56 % can be used in the ice arena. The remaining 44 % which rises up in the April, August, September and November is not possible to reuse due to time mismatch. Available accumulation volume is not big enough to save the available energy until it is necessary. Therefore this refrigeration heat is rejected to outdoor environment by an evaporative condenser (the refrigeration heat is all available waste heat rising up in a cooling cycle).



9 Conclusion

In ice arenas with absent dehumidification system the ventilation is ensured by outdoor air. Frequently the ventilation is ensured by openings in surrounding walls. Thus, the indoor air parameters (temperature and humidity) depends on actual outdoor conditions. Therefore many problems in spring and autumn deteriorate indoor microclimate (considering ice arena not operated during summer).

The operation costs of the dehumidification unit are high therefore in some ice arenas real operation hours depends on decision of a user and does not depend on a control system instruction. When deciding about dehumidification unit turning on and off it should be considered that the impact is also on the heat load on the ice sheet quantity and probability of damaging structures by condensation is higher.

There is an effort to increase the refrigeration heat usage since surpluses appears. Several options of utilization extending can be introduced. When the AHU is in operation and supply air has to be heated up the superheat can be used. This situation occur when the outdoor air temperature is lower than the temperature in the hall, when the recuperator uses heat from the exhausted air and the supply air is reheated up on the required temperature.

Acknowledgement

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Conversion of Disused Buildings – One of the Options how Architecture Contributes to the Sustainability of the Development: Case Study of Metropolitan Innovation Centre in Bratislava, Slovakia

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SK

Konverzie alebo adaptácie budov na novú funkčnú náplň sú ekologickým spôsobom využívania existujúcich stavieb a získavania „nového“ priestoru v rámci sídla. Zmenou funkcie sa opäť zatraktívnia nevyužívané budovy aj lokalita. Príspevok prezentuje konverziu nevyužívaných budov a areálov ako jednu z možností architektúry prispieť k udržateľnému rozvoju, prostredníctvom prípadovej štúdie Centra metropolitných inovácií v Bratislave. Riešená budova je súčasťou komplexu Novej Cvernovky na Račianskej ulici v Bratislave, tvoreného dvomi objektmi zo začiatku 50. rokov 20. storočia – budova školy a budova internátu Strednej priemyselnej školy chemickej aj s areálom, ktoré boli pôvodne súčasťou priemyselného areálu Chemických závodov Juraja Dimitrova. Štúdia sa zaoberá konverziou budovy internátu s areálom na polyfunkčné mestské komunitné centrum, zahŕňajúce funkciu sociálneho bývania a netradičného – zdieľaného bývania, kultúrno-spoločenskú funkciu, administratívnu funkciu a športovo-rekreačnú funkciu, vo väzbe na susedný objekt – sídla rôznych kreatívnych profesií a mimovládnych organizácií so sociálnym zameraním. Filozofia návrhu konverzie budovy vychádza zo zámeru investora projektu Nová Cvernovka: „Nový zmysel pre starú budovu“, pričom základnou ideou projektu je občiansky aktivizmus a participácia budúcich užívateľov. Týka sa to nielen požiadaviek na dané priestory, ale aj zainteresovania budúcich užívateľov do realizácie a tieto determinanty sa premietajú aj do návrhu, ktorého cieľom je dosiahnuť vyváženosť prevádzkového, technického a ekonomického aspektu s výtvarným pôsobením celku i jednotlivých komponentov exteriéru aj interiéru budovy. Návrh interiéru v maximálnej možnej miere rešpektuje požiadavku na čo najnižšie náklady, pri zachovaní výtvarného a dizajnerskeho konceptu.

EN

Conversion of buildings to new functional uses is an environmentally friendly way of using existing structures and getting "new" areas within urban settlements. By change of function, disused buildings and disused sites again gain attractiveness. The contribution presents the conversion of unused buildings and sites as an option how architecture can contribute to sustainable development, through a case study of Metropolitan Innovation Centre in Bratislava. The building is part of the complex New Cvernovka at Račianska Street in Bratislava, consisting of two objects from the fifties of 20th century – the school and dormitory building of the Secondary Chemical School and surrounding area, originally part of Chemical Plant of George Dimitrov. The study deals with conversion of the dormitory building and its surrounding area to multifunctional community centre, involving function of social housing and non-traditional co-housing, cultural, social, administration, sports and recreation functions, in relation to neighbouring offices of various creative professions and non-governmental organizations with a social focus. Philosophy of the proposal is based on the intent of "New Cvernovka" investor: "a new sense for old building", whilst the underlying idea is civil activism and participation of future users. This applies to requirements put on spaces, but also involvement of future users in implementation, and these determinants are reflected in aims to achieve balance of operational, technical and economic aspects in visual effect of the whole and individual components of exterior and interior. Interior design as much as possible respects requirements of lowest cost, while maintaining the creative design concept.

Keywords: building conversion; participatory project; interior; cultural and social spaces; cluster flat

1 Introduction

Conversion is a summary of processes, which after the demise of the original purpose of the building or buildings maintain their spatial structures and appropriately adjust them to new uses, to further serve the new functions. Conversion and adaptation of existing buildings offer a distinctive area of design [1]. Conversion actively adapts the original building substance to the new function in technical, construction, architectural and urban planning aspect. As a result, the consistency of the new features with a historic substance and context of place may appear [2, 3].

Conversion or adaptation of buildings and their new functional filling is an environmentally friendly way of the use of existing structures and getting a "new" functional area within the city. By change of functions the abandoned buildings and sites become once again attractive. Adaptation is an example of one of the methods of restoration of historic properties, by which we prolong their lifespan. At present, the conversion is also used in the cases of buildings without the historic preservation values, in cases of underused properties. Changing socio-economic conditions speed up not only the physical, but in particular the economic and moral wear of such properties.

From the typological point of view, we meet with a variety of examples of conversions. It is already common practice for many years abroad, when, for example, brownfields and old industrial sites are converted to new commercial, administration, or residential quarters and parks [4, 5, 6], industrial buildings are converted to office and commercial spaces, or to loft apartments, favourite, in particular, among young creative people, artists, etc. Another cases represent, for example, conversions of obsolete hospital complexes [7, 8], conversion of barracks [9], and a common case is the conversion of office buildings to specific forms of housing [10].

The buildings of the former Secondary Chemical School at Račianska Street no. 78-80 in Bratislava enter also this category. In the changing socio-economic conditions the school has undergone a transformation and was relocated. From 2015, the project of transformation of the former school building to a new cultural and creative centre began to take shape, because the cultural centre using the spaces of "Cvernovka", the former yarn and thread products factory on Svätoplukova Street, was forced to seek other spaces.

The new complex of "New Cvernovka" consists of two objects from the 1950s of the 20th century, the school building and the dormitory building, situated in a campus of the secondary chemical school, originally located in the industrial area of Chemical plant of Georgi Dimitrov. Both buildings have a skeleton construction system, which is in terms of conversion very useful in terms of versatility and flexibility. Thanks to these characteristics, the original office building was shortly after the construction converted into a school and now, to a certain extent, it returns in a transformed form to the original features, in innovative form partially preserving residential function, and gaining new more.

The presented study is dedicated to the conversion of one of the objects, the dormitory building, to the multifunctional community centre - Metropolitan Innovation Centre, involving the social and non-traditional housing function, cultural and social functions, administrative, sports and recreation functions, in relation to the adjacent school building, which hosts seats of various creative professions and non-governmental organizations with a social focus. The investor of the conversion project is the Foundation "New Cvernovka". The study was compiled as a pre-thesis work and thesis work in the academic year 2017/2018 [11]. The proposal includes the revitalization of the former dormitory building, its adjacent exterior space, redesign of the façades, the functional-operational solution and follow-up to an adjacent building of the school. The common socio-cultural spaces and an

apartment cluster as a form of experimental community housing are designed in detail [Fig. 1].

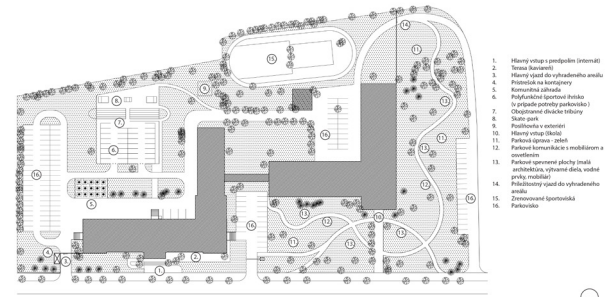
The low-cost adaptive conversion is based on the ideas of participation and cohousing.

Participatory means being involved in something, participating, cooperating. The terms participation and participatory planning in the context of public space and public building planning indicate direct, structured and transparent involvement of users (also future users) in the process of a developing project or plan, giving them the possibility to influence the result in order to meet best the needs of users. Participatory planning is a set of methods that allow to search for the most appropriate discussion and agreement about the use of the area or an object. The project depends on the participatory community: a group of professionals or public, experts, interest groups, individual citizens, interested institutions, local authorities or persons that become involved in. The initiator of the project may be a citizen, a civic association, a governing body, there are many projects in the framework of the charitable activities of the churches. Project funding is provided from multiple sources through a participatory budget. The basic rules governing the participatory community are: openness, transparency, a civic principle, democracy, cooperation, and the formalization of the activity. In the process of preparation of the projects and plans three different types of tasks/positions meet:

- Users, who have the greatest local knowledge, they are the future users, the proposal should meet their expectations,

- Experts, architects, designers, holders of the theoretical and practical methodologies, expertise, and experience,
- Public administration – which holds powers and responsibilities in the process of representative democracy, responsible for decisions on the basis of the expert documents.

1 →



The „New Cvernovka“ campus, at the Račianska Street 78-80, the overall situation, the proposed condition. Source: Adam Tóth, 2018

The participation in the project "New Cvernovka" means that the Regional Government who is the owner of the buildings has conditioned a favourable long-term lease for 25 years to the Foundation Cvernovka. The Foundation is required to invest 1.6 million € in the first 10 years. The Foundation is required to approve all leases and constructions by the authorities of the Foundation where the Government is represented as well. The Foundation uses a variety of sources such as bank loans, grants, various funds, etc. for the financing of the project.

The idea of shared housing (cohousing community, housing) is togetherness. Keywords are a community, a collective, shared, and common. These words connote ownership, responsibility, collaboration, freedom. Cohousing is often closely related to alternative movements. Shared housing has the ambition to be a home for all, mainly the young (and the spirit of the young), who are longing for a non-standard solutions to their housing.

Social spaces, kitchen, sanitary facilities, public spaces are shared, privacy is assured by minimal facilities for sleeping (cabin housing). Cohousing is associated with the conversion of unused buildings, this is a non-traditional housing not only by its idea, but also by its form. Non-traditional living spaces arise most often in unused industrial or administrative buildings, also in the former health care or school buildings. Today, the idea of shared housing gives the developers a creative solution to the shortage of housing in the big cities. In Western Europe, the US and Australia many such examples can be found, for example Costal Cohousing Community in Portland, United States, formed by a set of single family homes [12], Jaegersborg Water Tower, converted into a mixed-use building, occupied by student housing in Copenhagen, Denmark, Residential Building Refurbishment in Venice, Italy, or the Church Conversion into a Residence in Chicago, United States [13], or a developer project The Collective in Old Oak, Willesden Green, London, United Kingdom [14] and many others.

2 Case Study of Metropolitan Innovation Centre in Bratislava, Slovakia

2.1 Historic Context

Emerging industries in the post-war Czechoslovakia expanded and constructed not only industrial buildings, but also new administrative buildings. In 1947 Vladimír Karfík, the author of the famous pre-war 16-storey office building in Zlín, using his architectural experience in this area, made a project of a central administrative building for the Bratislava chemical plant Dynamite Nobel (later the Chemical plants of Georgi Dimitrov) on Račianska Street. Although this was a smaller project than his projects in Zlín, he used here many progressive elements: a reinforced concrete skeleton with movable partitions allowing variability of the interior, building, however, soon in 1951, uses the management

of the factory for the change of function from administrative to school building. The inability to convince the management of the factory about the need for the construction of a new school Karfík considered as a personal loss and he ended the cooperation with the chemical factory [15]. Shortly after transformation of the office building to school, the building of the dormitory was added to it, in the spirit of Karfík's architecture, but likely not designed by him.

In 2008 the chemical school was relocated, the school building remained empty, the dormitory served as a lodging-house. In 2015, the community "New Cvernovka" is formed, from artists and other creative professionals displaced from "Cvernovka" at Svätoplukova Street to the building of the school at the Račianska Street, and to the project is added also the building of the dormitory, with other socio-social activities and experimental type of housing.

2.2 Background and Determinants

The investor's requirements of new functions as a residential section with specific forms of housing as a shared housing (co-housing – cluster apartments), temporary accommodation for the socially weaker groups, starting flats for young, short term accommodation for teachers, lecturers, etc., work spaces for creative work and administration (public services, non-governmental organisations and creative studios, leisure activities), in the campus sports fields and parking lots, were the starting point for the study of the conversion.

For the interior and exterior design of the building, the requirement was to minimize the implementation costs associated with the basic idea of the project, civil, non-profit and community service activities, support of the socially disadvantaged groups, support of young artists, and also with the idea of participation of future users on the project in the form of their involvement in financing

the implementation. The proposal also took into account the reciprocal links between the former school and the dormitory, both of which are part of the project "New Cvernovka" and are operationally linked.

2.3 The Philosophy of the Proposal

The philosophy of the proposal for a new use of the building of the former dormitory is based on the skeleton construction system, and the principles of the functionalist architecture of the post-war generation architect Vladimír Karfík, who was the author of the neighbouring building. At the same time the philosophy of the proposal is based on the intent of the investor of the project: "a new sense for the old building". The two buildings together with adjacent territory receive a new functional filling with cultural and social and sports and recreational uses. The basic idea of the project "New Cvernovka" is the civil activism and participation for future users and this idea is reflected in the design of the exterior, the campus and the design of façades, and in the interior design. The building of the school, although it is not the subject of the study, is closely linked structurally and operationally.

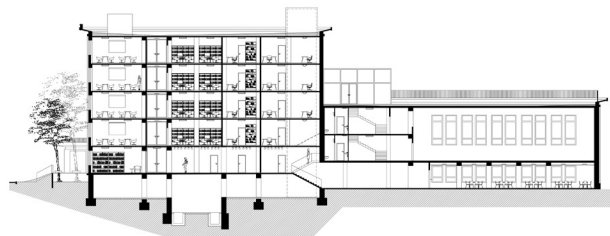
2.3.1 The Exterior

In the post-war period the chemical plants were situated in the industrial zone on the northern edge of Bratislava, which was gradually absorbed into the city and the site has acquired urban values, especially after the transformations in the beginning of the new century. Currently there is the need to complement the urban structure by lacking cultural and social functions. Industrial areas have relatively large amounts of green space, which can become a part of the high quality public green space after the revitalisation [5]. The proposed solution supports the intention of opening of the premises to Račianska Street and to rebuilding it to a public park. The main entrance is from Račianska Street. In the

foreground of the building the paved area is created, distinctively marking the building, and except the stairs, the proposed ramp allows wheelchair access to the building and to the terrace cafe. Landscaping is gently designed to accommodate existing trees, which "grow" through the hardwood floor of the terrace [Fig. 2]. The area behind the two buildings remains reserved for the needs of the complex "New Cvernovka" and "Metropolitan Innovation Centre".

The campus is intended to be equipped with sport facilities – a universal playground for ball games, a skate park, a community garden, and also with new parking places. It is possible to use the paved areas variably for the different types of activities and the proposal maintains the existing green areas and existing vegetation, which requires revitalization, as much as possible.

2 →



The conversion of the dormitory building of the Secondary Chemical School to the Metropolitan Center of Innovations – by rebuilding of the stairs to two-arm staircase and by addition of the lift the direct access to the gym was enabled and also the wheelchair-accessible links were resolved to all spaces of the building ground floor plan, section. Source: Adam Tóth, 2017

The design of the façades stems from the construction system of the building. The surface of the façade is created by the façade plaster. A darker shade of grey colour is used for load-bearing elements and enhances the vertical breakdown of the filling masonry under the windows, plastered by the lighter grey tone. As an additional material for the full parts of the façades the classic orange-brown brick facing is used. Material and colour solution is reflected in the interior, too. The south-eastern façade is complemented by suspended balconies with a black metal construction and exterior wooden floors, in the working zone the classic windows are replaced by "French" windows.

2.3.2 The Interior

The principle of sustainability applied by the conversion of the building itself is reflected in the solution of interior architectural disposition. The basic philosophy of the civil activism and participation of future users in establishing the concepts of future uses and requirements on spaces and the possibility of their partial participation in implementation and realisation is reflected in interior design of the residential and also social zone. The individual elements of the fixtures and fittings are designed so that, while maintaining the quality of the design, remains an option to perform some of the work themselves in the community.

The proposal also envisaged in the social areas even more expensive solutions, using natural materials, even with the use of the works of artists located in the building of the "New Cvernovka", less expensive and highly durable alternatives and the possibility of recycling some of the elements are being considered in the working and residential areas. The proposal maintains the purity of the open air space in its diverse functionality by furniture variability. Art effect is based on the contrast of materials (smooth white plaster, rough brick tiling, reflections and transparency of glass, black metal, wood, textile). Art concept pushes the interior towards the industrial style.

2.4 The Architectural Disposition Layout

In the architectural disposition layout, the variability of spaces is given by the construction system with movable partitions. The original breakdown of the disposition is preserved to the maximum extent, as so far it is consistent with the new functional and artistic intent. The interior of the building is broken down into individual functional zones.

The main entrance of the building from the street, along with Račianska Street is solved to allow barrier-free access, open to the street and attracting attention. This intention is supported by the design of the foreland and the location of cafeteria, extended to the exterior terrace. The entrance space is divided into two separate entrances. The residential zone is separated from the social zone by a lockable door, a separate staircase and a lift. To the right of the entrance door is a separated porter room.

Optical interconnections and preservation of axial symmetry of space of the vestibule is achieved by the use of glass partitions. The lobby is followed-up by the extension of exhibition-social space in the Hall I, by enlightened corridor connected with another extension of the Hall II near the side entrance from the parking lot. The café-libresso, adjacent to the library-club may be occasionally used also as an exhibition space. Halls, corridors, libresso and the library are linked optically through the glass wall and continue up to the dining room and to the connecting corridor to the school building. Right of the main entrance in the southwest wing, in addition to the cultural, social and exhibition spaces, the administration, kitchen and catering facilities are placed.

The most significant encroachment on the disposition represents the resolving of the operational relation to the building of the former school, by linking with a two-storey corridor. The original single-arm staircase from the ground floor allowed access only to the dining room and to the connecting corridor, the access to

the gym was only from the 1st floor. By rebuilding of the stairs to two-arm staircase and by addition of the lift the direct access to the gym was enabled and also the wheelchair-accessible links were resolved to all spaces of the building, including the dining room, the gym, the roof and the adjacent building. The roof terrace above the gym is an extension of social spaces to the outside, and can be used also for business meetings, or as an exhibition space [Fig.03].

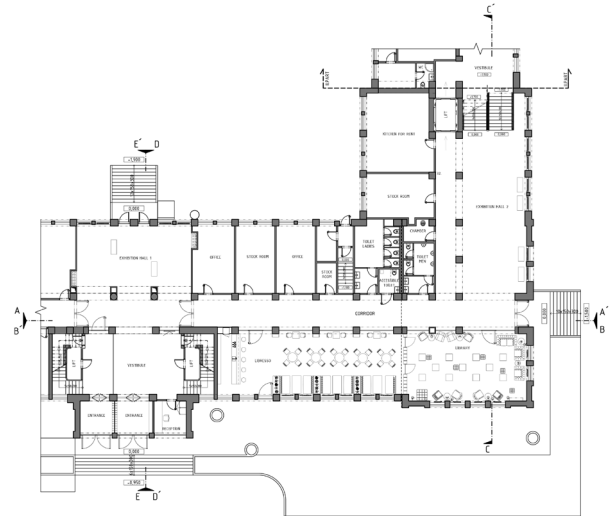
To the left of the main entrance in the northeast wing proposed for senior centre with complex equipment for diverse activities, the main lounge opens to the exterior of the campus through the terrace on the southeast side. Workspaces for rent are located on the 1st up to 4th floor of the southwest wing. The residential zone with specific forms of housing is located on the 1st up to 4th floor of the north wing, and includes several types of residential units of differing size and equipment according to a specific designation (shared housing, starter homes, social housing, and short term accommodation). The proposal includes a large apartment with an area of 168.8 square meters located at the end of the north wing for 11 persons, intended to be shared housing (cohousing), another type of the apartment for social housing with an area of 21.3 square meters (Project Housing First Cverna) with the most necessary equipment for 1 or 2 persons, or hotel type of short-term accommodation. Another type is a flat, with an average area of 30 square meters for 2-4 persons. In the basement of the building, the placement of the technical rooms as a boiler room, a laundry room, a workshop, and a bicycle storage room are being considered.

2.4.1 Interior Design of the Entrance and Socio-cultural Spaces

The basis of artistic concept of the interior of the social zone is to contrast of the clean minimalist spaces of the exhibition halls versus the spaces of libresso and the club, inducing the atmosphere of well-being and calm, "good old days" in the vintage and industrial style. The proposal of materials and

surfaces follows the design principles of their use [16, 17, 18]. The basic materials for building interior elements are: concrete (beton look), brick cladding, glass, metal and smooth white surface of the walls. A poured concrete floor is in all of the public areas, with the exception of the library, where a wooden floor is proposed. Variability of furniture and the glass panes bringing natural light into the interior create a clean and open airy space adaptable to diverse uses. The proposed staircase brings attractiveness and appropriately ends the exhibition space of the Hall II. Reinforced concrete staircase is direct, two-arm, with steps illuminated by concealed LED strip. Stair arms are separated by a glass partition with a chrome-plated steel handle.

3 →



Interior design of the entrance and socio-cultural spaces.

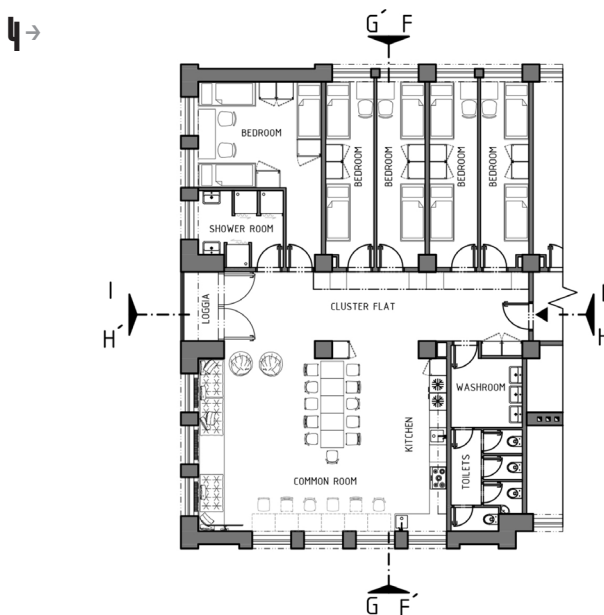
Source: Adam Tóth, 2018

A neutral and achromatic colour of in-built interior elements of the exhibition spaces with a minimum of movable furniture allow you to excel the displayed exhibits. The options for sitting are solved by built-in bench and movable sitting furniture created by artists of "New Cvernovka". The dominant element of the Interior is a raised soffit with lighting and acoustic function. Coloured and textured brick siding, referring also to its use in the redesign of the external facade is used to a lesser extent – in the lobby, the partitions between the corridor and the administration spaces and in the area of the bar on the front wall of a café. In accordance with the principles to achieve comfort in micro-environments [19], wood and textiles are used as a surface material in the libresso and the club. The dominant features of the interior are the atypical elements of the furniture; double-sided library between the cafe and the club, in the cafe part upholstered seating boxes with integrated shelves with books, and the facilities of the area of the bar accompanied by designed chairs, in the club section the mobile boxes for books. In the area of libresso high windows without sills are proposed, visually connecting the Interior with exterior.

2.4.2 Interior Design of the Shared Social Space of the Cluster Apartment

The proposal for the conversion of the dormitory building contains except small-sized flats also four apartments of the 168.8 square meters situated at the end of the Northeast wing on the 1st – 4th floor. These apartments are designed for shared housing, designed for 11 persons. A cluster apartment is an experimental type of housing. Residents can be very diverse age and social groups, connected by the same philosophy of life, and whose members may have mutual benefits from the shared housing.

The apartment is structured similarly as standard apartments to entrance, private, health, economic and social (living) part. The proposed loggia is also part of the apartment as well. The basic



Interior design of the shared social space of the cluster apartment.

Source: Adam Tóth, 2018

idea behind the shared housing (cohousing, community housing) is togetherness, keywords are community, collective, shared, common. This principle is also reflected in the ratio of private and shared zone, private space is minimal, and the shared social space is designed generously on an area of 82 square meters. A private zone consists of five separate bedrooms with sleeping and storage furniture, four with an area of 10.9 square meters for 1-2 people, one with an area of 19.6 square meters, situated to the

right of the entrance, oriented to the Southeast, to the campus. The other zones are shared. The proposed disposition layout was achieved by building partitions in a private area and their removal in the social zone. The main principle is the variability of the space, which performs several functions. Built-in furniture is designed for the entrance to the apartment (storage) and on opposite sides of the main shared space (the kitchen on one side and a built-in sitting in a window niche, on the other hand), what allows to furnish the apartment according current needs.

The individual furnishing elements are designed so that, while maintaining the quality of the design, there remains an option to perform some work by users. Visual effect is based on the creation of pure, simple space with neutral colour of construction and built-in interior elements. The mobile furnishing elements and accessories, in colour, shape and a variety, brighten up the interior. The design as much as possible respects the requirement for the lowest cost, while maintaining the creative and design concept. It uses the natural materials, but especially in a residential section alternatives of the use of less expensive, durable and easy-to-clean materials are considered with the possibility of recycling some of the elements. The proposal leaves the future residents of the area the possibility of participation in implementation and the possibility of identification with the space.

3 Conclusion

The project "New Cvernovka" lives its life. Representatives of the Foundation Cvernovka, the investor of the project, attended the presentation of the student proposals made by nine students from the Faculty of Architecture of the Slovak University of Technology in Bratislava only in the early stages of the creative process. From the interim statement of the representatives of the Foundation in the media is clear, however, that with a lot of encouraging student

ideas they identify themselves. Maybe it is a pity that the creative potential of students is not used to a greater extent. At the time of writing of this paper (June 2018), in the building of the former dormitory and in the future Center of Metropolitan Innovation "New Cvernovka" a pilot program "Housing First Cverna" was started by civil association Vagus, focused on solving homelessness. In cooperation with the partners of the project they prepared first three residential units, which will help the homeless to return to a normal life.

The architectural and interior design proposal has created a basic frame for the conversion and the subsequent low-cost adaptive re-use of the dormitory building continues using the civil activism, volunteerism and participation of future users in the completion and finalization of the interior spaces. The conversion of the dormitory building and its surrounding area to a multifunctional community centre, involving functions of social housing and non-traditional co-housing represents an experiment and the first experience with this type of low cost adaptive re-use of an old building in Bratislava.

The New Cvernovka is a project that has a generational dimension and it is a project that is unique and ground-breaking as a partnership between Government and civil society and the third sector. This project is a proof that creativity and the culture can be a very powerful tool for placemaking. This type of partnership becomes a reference point and initiates the change of thinking of the local governments.

Acknowledgement

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Renáta Hajnová

CZ Článek se zabývá českým cukrovarnictvím, především podrobným popisem událostí od 90. let 20. století dodnes. V daném období byla situace na trhu velmi proměnlivá. Cukrovary se často zavíraly či dokonce demolovaly, v několika případech došlo i k obnovení provozu nebo nalezení nového využití. V porevolučním vývoji se zásadně odrazilo období po skončení druhé světové války. Následkem toho nebylo mnoho provozů schopno konkurence na otevřeném evropském trhu s cukrem. Uvolněné prostory továren se musely poprat s otázkou, jak s daným objektem naložit do budoucna. Tato otázka nebyla mnohdy dodnes zodpovězena.

EN The paper focuses on Czech sugar industry, specifically on the situation since 1990's until today. The development in this period has been very variable: some of the sugar refineries got closed or even demolished, on the contrary some got their production renewed or brand new purpose for the production sites was found. Also, the situation in the 1990's strongly reflects the conditions of the 2nd half of the 20th century, which caused inability of many Czech sugar refineries to compete on the European sugar market. Hence, it became necessary to find a new purpose for the emptied refineries' sites. In many cases, that has not happen until today.

Keywords: sugar refinery; sugar industry; Dymokury; Čakovice; Nymburk; Chrudim; conversion; sugar quotas

1 Czech Sugar Industry

Sugar industry has been a very important industrial sector for many years and has had a sovereign position in the Czech

lands. It may seem that this issue has already been thoroughly explored, but we still find topics that no one has dealt with so far. A particularly omitted period is the situation since the 1990s to the present day. This topic has always been dedicated to expert papers or conference papers, but without deeper insistence.

This paper looks into the evolution of the sugar industry after 1989 in the context of socio-political events and, in particular, their impact on the current situation. It seeks answers to the question of why many of sugar refineries have met so much of the fate that is being discussed today (global-terminating factories, demolition, etc). It also disproves several myths about the privatization processes of the 1990s and the following acceptance of the European Union sugar quotas. For this purpose, several models of sugar refineries have been selected as examples of evolution in the 1990th and following years and they can be put into context.

One of them is the sugar refinery in Dymokury, which is a representative of aristocratic sugar factories. A fateful point was in the unclear property relations during the restitution process and in the derelict condition of buildings since the communist era at the same time. Today it is out of order and ruined.

Another examples are two conversions of former sugar factories to compare different approaches to the new use of industrial buildings. The former Schoeller sugar factory in Čakovice (Prague - Čakovice) was one of the most extensive in the Czech lands. However, the current situation is very poor. The whole area is being used by dozens of companies for a variety of purposes. There were also many very insensitive building modifications. This way of conversion can be compared with the sugar refinery in Chrudim,

which underwent reconstruction as a unit and another production process was implemented. These two realizations are conceived in a completely different way, and it is only a question of whether and to what extent these approaches are sensitive to the surviving industrial heritage. In the 1990s, following the Velvet Revolution and the first decade of the new millennium, many sugar factories were shut down or even demolished and their machines were destroyed. Given that this is a relatively debated topic for the general public, mainly due to dozens of newspaper articles with inaccurate or misleading information, there is an example of the former sugar refinery in Nymburk, demolished at the end of the twentieth century. It was primarily important due to many years of work of the sugar-maker Hanuš Karlík and his great contribution to the sugar industry.

It is important to say that today Czech sugar industry is represented by seven working factories which is only a small fraction compared to the peak period of this industry.

1.1 Brief Historical Development

For the first time in our country sugar started to be produced in the first decade of the 19th century, then as a manufactory production. After years of experimentation and testing, sugar industry has been developed to a level of industry excellence. In the Bohemian countries, the peak was reached in the 1970s when 221 sugar factories were in operation¹. Due to both the economic crisis and the following world war, the industry was weakened. Nevertheless, during the interwar period, Czech sugar-makers managed to recover and to reach the world's top. Not only because of the amount of sugar produced and exported², but also thanks to Czech engineering, which started to export whole sugar factories abroad³.

The Second World War caused a stagnation as well as for all food industries, depended on the allocation of basic raw materials, which is always deficient during the war. After the end of the war in 1945, 95 sugar factories remained in operation⁴. In 1945, all sugar factories didn't have the same fate. Post-war decrees⁵ led to the nationalization of those incorporated in joint-stock companies. The National Administration was established in the sugar factories that took the Nazis to the original Jewish owners. Only farmers' sugar factories, where shares of more than half of stocks were held by beet growers themselves with fertile ground of up to 50 ha, were to be converted into cooperative enterprises. However, April 1948 came and all operating factories were nationalized and the central governing body was established: the Czechoslovak Sugar Industry⁶. During this period only two new sugar factories were built, in Hrochův Týnec (1969) and in Hrušovany (1970)⁷. Gradually there were lagging behind of the technical level but above all of the total physical wear of sugar-making machines. In the 1970s

1. DUDEK, F. Vývoj cukrovarnického průmyslu v českých zemích do roku 1872. Praha: Academia, 1979, 145 s.

2. DUDEK, F. Monopolizace cukrovarnictví v českých zemích do roku 1938. Praha: Academia, 1985. 76 s.

3. DUFEK, K. Zamyšlení: Český Cukrovarnický průmysl – historie a současnost. In Cukrovarnictví, cukrovary a cukrovarníci: fenomén českého hospodářství v 19. a 20. století. Praha: Národní zemědělské muzeum Praha, 2011. Prameny a studie (Národní zemědělské muzeum). s. 24

4. VODICA, A., FRIMLOVÁ, Z. Cukrovarnictví na území České socialistické republiky po druhé světové válce. In: Sto padesát let cukrovarnického průmyslu na území ČSSR: sborník. Praha: Cukrovarnický průmysl, koncern, 1981. 60 s

5. Dekrety prezidenta republiky o znárodnění cukrovarů z 24. 10. 1945. VODICA, A. a FRIMLOVÁ, Z. Cukrovarnictví na území České socialistické republiky po druhé světové válce. In: Sto padesát let cukrovarnického průmyslu na území ČSSR: sborník. Praha: Cukrovarnický průmysl, koncern, 1981. 58 s.

6. At the same place, 59 s.

7. VODICA, A., FRIMLOVÁ, Z. Cukrovarnictví na území České socialistické republiky po druhé světové válce. In: Sto padesát let cukrovarnického průmyslu na území ČSSR: sborník. Praha: Cukrovarnický průmysl, koncern, 1981. 97 s.

the situation reached a critical point. Businesses had to deal with the situation, therefore in the next few years the necessary reconstruction and modernization took place, but more or less self-help by sugar workers rather than professional mechanical workers. It could be said that the whole post-war period was in the spirit of the gradual decline of the sugar industry, which had until then a very good reputation far beyond the borders of Czechoslovakia.

1.2 Sugar Industry after Velvet Revolution

After 1989 the national enterprises became state-owned enterprises and in 1992 industrial privatization began. At this time, the rest 52 sugar factories were operating⁸. It was the first time the foreign company entered into the Czech business space - SDA Origny (now known as Tereos), which bought the majority share of the sugar refinery in Dobruška⁹. This factory is still one of the most active in our country and, above all, it is the largest in terms of the quantity of sugar produced and the most prosperous. In the democratization of the whole political system, of course, there were many changes that had an impact on the sugar industry. One of these changes was the end of imports of no-refined sugar from Cuba, which was partially refined in several Czech refineries (for example, the Čakovice sugar refinery)¹⁰. The state government also ceased subsidizing the export of refined sugar, which meant re-establishing the production to a quantity that would find sales on the Czech market. The situation in sugar industry was also further complicated by the import of sugar from abroad and the incipient trend of artificial sweeteners¹¹.

The privatization of the entire sugar industry had a very adverse impact because it was no longer possible to solve the problems on a flat and efficient basis. New owners often failed to cope with the harsh competitive environment, the weariness of their plants,

and also because of the low initial production they didn't have the means to invest. There were only two reasons: either to end the activity, which in many cases happened, or to get the funds to finance the loan by selling a majority stake to another owner. Other foreign companies were entering the Czech industry. In 1993 there were 28 different companies, both domestic and foreign, which operated 38 sugar factories. Besides the French SDA Origny, these were German company Nord Zucker AG, Austrian Agrana and British-French Eastern Sugar¹². The Czech sugar industry came into a direct contact with the European environment much earlier than the Czech Republic officially joined the European Union. The whole situation in the 1990s was very volatile, the owners of sugar factories were changed or the sugar production was completely disturbed. There was a period of transformation that culminated in the preparation of sugar factories for accession to the European Union. This was the promise of the Czech Republic to apply gradually the demands of the common agricultural policy. The most important moment was the introduction of production quotas, which resulted in the closure of sugar factories, but on the other hand, in the efficiency of production and market stabilization. It is from this overview that the sugar refineries did not only disappear, but some were able to restore their operations, such as Litovel, Prosenice, Vrdu or Český Brod. Vrdu and Český Brod maintained only few campaigns in operation before being

8. DUFEK, Karel. Zamyšlení: Český Cukrovarnický průmysl – historie a současnost. In Cukrovarnictví, cukrovary a cukrovarníci: fenomén českého hospodářství v 19. a 20. století. Praha: Národní zemědělské muzeum Praha, 2011. Prameny a studie (Národní zemědělské muzeum), 27 s.

9. At the same place, 26 s.

10. DUFEK, Karel. Zamyšlení: Český Cukrovarnický průmysl – historie a současnost. In Cukrovarnictví, cukrovary a cukrovarníci: fenomén českého hospodářství v 19. a 20. století. Praha: Národní zemědělské muzeum Praha, 2011. Prameny a studie (Národní zemědělské muzeum). s. 26

11. At the same place.

12. At the same place. s. 28

completely abolished and subsequently demolished. It should be noted that the end of the Vrdy sugar refinery and the Český Brod sugar refinery did not become because of the European Union sugar quotas, but the reason of the changes in their ownership structures.

In 2004, when we finally became a member of the European Union, there were 11 functional sugar factories. Due to overproduction in the 2006-2007 campaign, the EU had to take measures to reduce its quota to Czech sugar factories¹³. The worst hit was Eastern Sugar, which operated three sugar factories in the Czech Republic at that time. The management of the company found this situation to be untenable and decided to use the possibility of canceling the quotas in exchange for financial compensation, which was however conditional on the complete destruction of the sugar factory, including all buildings and machines. This unfortunate event affected the Hrochův Týnec, Němčice nad Hanou and Kojetín sugar factories, which had to be completely razed, including their machinery¹⁴.

After these changes, the Czech market stabilized. The released quotas surrendered by Eastern Sugar were divided among the remaining seven plants¹⁵. A bigger and more radical change came in October 2017, when the European Commission released all constraints on sugar production for all member countries. It is a bit like the situation after the Velvet Revolution, when the sugar industry also got a free hand in sugar production and trade. According to experts, it is not entirely clear what will happen at the European and world sugar industry¹⁶. There is a possibility that the liberalization of the market environment will result in the sacrifice of many European sugar factories, but at the same time it is not impossible that there will be a rapid development. Despite all the predictions, we can proudly say that Czech sugar industry is currently in a very good shape and should stand in the open market.

2 Dymokury Sugar Refinery

The sugar refinery in Dymokury was founded as a peasant stock in 1871, but after a year it became a part of the Czernín's aristocratic estate¹⁷. The factory was owned by the noble manor until 1942, when it was transferred to the administration of the Protectorate of Bohemia and Moravia¹⁸. After the 2WW, the sugar refinery was nationalized in October 1945 under the decree of the President Edvard Beneš and became a part of the National Enterprise¹⁹. After the revolution in 1989, the Czernín family tried to restore all their former properties in Dymokury. The whole process run for several years. Even in 1993, the process was not completed and the sugar factory was out of order all the time²⁰. Already in its operation, the

13. STRNADOVÁ, H. Dopady vstupu ČR do EU a reformy Společné organizace trhů v odvětví cukru na trh s cukrem v ČR. In: Listy cukrovarnické a řepašské: odborný časopis pro obor cukrovka-cukr. Praha: VUC Praha. 2009, roč. 125, č. 12, s. 334-340.

14. REINBERGER, O. České cukrovarnictví po reformě Společné organizace trhů s cukrem v EU. In: Listy cukrovarnické a řepašské: odborný časopis pro obor cukrovka-cukr. Praha: VUC Praha. 2010, roč. 126, č. 4, s. 124-127.

15. DUFEK, K. Zamyšlení: Český Cukrovarnický průmysl – historie a současnost. In: Cukrovarnictví, cukrovary a cukrovarníci: fenomén českého hospodářství v 19. a 20. století. Praha: Národní zemědělské muzeum Praha, 2011. Prameny a studie (Národní zemědělské muzeum). s. 31

16. REINBERGER, O. Návrat českého cukrovarnictví do liberálního prostředí. In: Listy cukrovarnické a řepašské: odborný časopis pro obor cukrovka-cukr. Praha: VUC Praha. 2017, roč. 133, č. 5-6, s. 166-169.

17. BARTOŠOVÁ, D. Czerninové a dymokurský statek ve dvacátém století. Praha, 2011. Bakalářská práce. Univerzita Karlova, Pedagogická fakulta, katedra dějin a didaktiky dějepisu. Vedoucí práce PhDr. Bohdan Zilyskyj

18. Státní okresní archiv Nymburk (se sídlem v Lysé nad Labem), Nezpracovaný fond EL NAD č.1533. Prohlášení o převedení majetku do správy Protektorátu Čechy a Morava

19. VODICA, A., FRIMLOVÁ, Z. Cukrovarnictví na území České socialistické republiky po druhé světové válce. In: Sto padesát let cukrovarnického průmyslu na území ČSSR: sborník. Praha: Cukrovarnický průmysl, koncern, 1981.

20. Státní okresní archiv Nymburk (se sídlem v Lysé nad Labem), Nezpracovaný fond EL NAD č.1533. Dopis ČÍŽP o stavu kotelny, která měla dle projektu z roku 1992 projít rekonstrukcí, což se nestalo, 3. 2. 1993, karton 11

1 →



Dymokury sugar refinery

entire area was in a relatively unheard state and several years after its last campaign 1990/91 also did not benefit. In the 1990s, the municipal administration wanted to buy the entire site of factory, with the aim of destroying the sugar refineries, to divide the land and to evaluate them as building plots. But an agreement was not reached²¹. Finally, the plant was bought by the company Praga Mineral, which wanted to open a new well of mineral water, which proved to be not profitable. Therefore, in 2007, the company was bought by the entrepreneur Mr. Havelka, who set up a trolley and a warehouse of coal that operated here until 2014. At present days, the site is abandoned without any activity and dilapidated. Only a few inhabitants live in the adjacent apartment building.

2 →



Dymokury sugar refinery

3 →



Dymokury sugar refinery

21. Osobní vzpomínky bývalého starosty Dymokur, p. Jaroslava Červinky

3 Sugar Refineries SCHOELLER & Co. – Čakovice

Čakovice sugar factory was built in 1849 and started its first campaign in December 1850.²² It belonged to the business corporation Schoeller & Co. until the nationalization in October 1945.²³ Schoeller's Čakovice factory underwent regular modernization processes that ensured a high quality of work and thus the profitability of the entire production. Due to this occasion, the Schoeller sugar company participated to a relatively large extent (10-25%) of the total refinery exports from Czechoslovakia.²⁴ During the era of socialism, the structure of the enterprise changed several times. After 1948, the Čakovice sugar refinery was a separate national enterprise. Eventually it became a part of the national company Prague Sugar refineries in 1957.²⁵ Čakovice sugar refinery was a significant exporter of sugar abroad and also became a refinery for Cuban imported cane sugar. This cooperation with Cuba lasted until the early 1990s, when political conditions changed and this trade was no longer supported. Perhaps the last successful campaign was the 1985/86 season, when excellent yields and production of 1 hectare of sugar beet were reached. But from that time the sugar factory ceased gradually to prosper.²⁶ After the revolution, the stagnation of production peaked in 1990 and production was canceled. For some time at least sugar was packed together with other candies.²⁷ Nowadays the sugar



Sugar refineries SCHOELLER & Co. – Čakovice

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Sugar refineries SCHOELLER & Co. – Čakovice

22. Číž, K. Cukrovary na území Prahy. 210 let od zahájení první výroby cukru na Zbraslavi. In: Listy cukrovarnické a řepašské: odborný časopis pro obor cukrovka-cukr. Praha: VUC Praha, a. s. ve spolupráci s ČMCS a SPC. 1998, roč. 114, č. 2, s. 54-58.

23. Dekrety prezidenta republiky o znárodnění cukrovarů z 24. 10. 1945. VODICA, A. a FRIMLOVÁ, Z. Cukrovarnictví na území České socialistické republiky po druhé světové válce. In: Sto padesát let cukrovarnického průmyslu na území ČSSR: sborník. Praha: Cukrovarnický průmysl, koncern, 1981. 58 s.

24. Státní okresní archiv Praha, fond NAD č. 483, AP č. 430). Cukrovary Schoeller a spol., a.s. Zápis z jednání správní rady z roku 1929, bod č. 5 – Volba člena správní rady (rekapitulace historie firmy)

25. Číž, K. Cukrovary na území Prahy. 210 let od zahájení první výroby cukru na Zbraslavi. In: Listy cukrovarnické a řepašské: odborný časopis pro obor cukrovka-cukr. Praha: VUC Praha, a. s. ve spolupráci s ČMCS a SPC. 1998, roč. 114, č. 2, s. 54-58.

26. KRÁKOROVÁ, J., ŘEHÁKOVÁ R., ŠVĚDA J. Čakovice, Miškovice, Třeboradice. Praha: FATUM v nakl. Ivo Železný, 2005.

27. Číž, K. Cukrovary na území Prahy. 210 let od zahájení první výroby cukru na Zbraslavi. In: Listy cukrovarnické a řepašské: odborný časopis pro obor cukrovka-cukr. Praha: VUC Praha, a. s. ve spolupráci s ČMCS a SPC. 1998, roč. 114, č. 2, s. 54-58.

factory is crushed among dozens of different owners, and sugar production is reminded of only two sugar powders belonging to TTD Tereos - Cukrovár Dobruvce, which uses it as a sugar dump. The entire factory complex remained largely complete with many subsequent rebuilds and modifications.

4 Nymburk Sugar Refinery

The sugar factory in Nymburk was founded in 1869 as a peasant sugar refinery. Its beginnings were not entirely successful. Everything changed with the advent of talented sugar-maker Hanuš Karlík in 1881.²⁸ He was able to get the sugar industry's peak in raw sugar production and he also came up with several innovations in technology, making the Nymburk sugar factory a sought-after training center.²⁹ After nationalization in 1945,³⁰ the sugar factory belonged to the Kolín sugar factories, a national enterprise. In the beginning of the 1990s, after the first wave of coupon privatization, the sugar factory was transferred to the administration of UNION Cukr Kolín, a concern which included 12 sugar factories (Dobruvce, Vrdu, etc.). The substantive moment was the purchase of the Dobruvce sugar factory by the French company SDA Origny. There was a substantial increase in production capacity, which led to the decline of surrounding sugar factories. They were unable to cope with such a competition, which was one of the reasons for the collapse of UNION Cukr Kolín and thus, the end of sugar production in Nymburk in 1996. Both the factory and the land were sold to developers with an investment intention. As a result, all equipment and technology were sold to redemption of collection of raw materials.³¹ Probably there was not a chance and a desire to preserve anything. In 1999 the planned demolition took place.³² The new owner never considered the preservation of industrial buildings, because from the beginning his main intention was to use of the acquired area for building sites. It was a purely pragmatic step. Due to the proximity of the city center, the site was suitable for family houses.

6 →



Nymburk sugar refinery

Today there is a hypermarket building, a petrol station and another stores. The only remnant of the industrial era is the original villa of the director of the sugar factory, which is a part of the new villas area. The two office houses, escaped from demolition, form an imaginary gateway to the former factory zone.

28. PLAVEC, M., Karlík H. versus Jan Baptista Nebeský. Spor ohledně modernizace nymburského cukrováru v roce 1886. In: Cukrovarnictví, cukrovary a cukrovarníci: fenomén českého hospodářství v 19. a 20. století. Praha: Národní zemědělské muzeum Praha, 2011. Prameny a studie (Národní zemědělské muzeum). 291-297 s.

29. ONDRÁŠEK, Jakub. Hanuš Karlík 1850 - 1927. Praha, 2012. Bakalářská práce. Univerzita Karlova, Filozofická fakulta, Ústav hospodářských a sociálních dějin. Vedoucí práce Prof. PhDr. Ivan Jakubec, CSc.

30. At the same place.

31. Osobní vzpomínky Miloše Petery, bývalého pracovníka v nymburském cukrováru.

32. FRAGNER, Benjamin a Jan ZIKMUND, ed. Co jsme si zbožili: bilance mizející průmyslové éry - deset let = What we destroyed (ourselves) : taking stock of the vanishing industrial era - ten years. V Praze: České vysoké učení technické, 2009

5 Conversion of Sugar Refinery in Chrudim

Former Chrudim sugar factory started its first campaign in 1867-1868. The significance of the sugar factory was based primarily on the personalities associated with it, as well as the link with the Wiesner family, whose members belonged to capable entrepreneurs and inventors in the sugar industry.³³ In the interwar period Chrudim sugar factory was one of the strongest and the most succeeded in the crisis of the 1930s. World War II has been signed by both demolition and human losses on the sugar factory.³⁴ After its end in 1947 the national company Cukrovar was established in Chrudim. Its production was not long, campaign 1955-1956 was the last and in May 1956 the operation was officially ended under the pretext of building a new factory, which never happened. Thereafter, the factory buildings were rebuilt to store the wholesale of household goods.³⁵ In thirty years of storage, the appearance of objects did not virtually change.

Already at the end of 1990 new owners, a total of three different companies, settled in the complex. In 1996 all properties were purchased by the thriving company TMT, which made the former sugar factory area united again and the independent owner could proceed to long-planned building modifications.³⁶ The objects were not virtually used due to a neglected state. The deficiencies consisted in the devastated form of interiors, the attack on wooden structures by various pests, the falling ceilings, the falling masonry and, last but not least the absent roof. After the initial assessment, the owners were thinking about the entire sugar factory to be demolished and a new building to be built. Nevertheless, on detailed exploration, it was suggested that it was not unrealistic to preserve objects, even with the utmost use of masonry, foundations and spatial layouts. Five different reconstruction studies were carried out, after which the designer who came up with a proposal for the preservation of the sugar factory, including its features, was also selected, but at the same time proposed modifications had to meet the needs of the new

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Nymburk sugar refinery

8 →



Chrudim sugar refinery

33. JOUZA, Ladislav a Jozová, Miroslava. Wiesnerové a cukrovarnictví ve středních a východních Čechách. In: *Listy cukrovarnické a řepašské: odborný časopis pro obor cukrovka-cukr*. Praha: VUC Praha, a. s.. 2010, roč. 126, č. 9-10, s. 304.

34. SMUTNÝ, Vlastislav. Cukrovar v Chrudimi. In: *Listy cukrovarnické a řepašské: odborný časopis pro obor cukrovka-cukr*. Praha: VUC Praha, a. s.. 2012, roč. 128, č. 2, s. 75.

35. At the same place.

36. BROTON, Aleš. *Nový život opuštěných staveb: průmyslové dědictví*. Praha: Informační centrum ČKAIT, 2013. *Stavební kniha*. s. 67.

operation. The project was implemented in 1999, and in its first phase.³⁷ The second phase took place in 2005 and lasted two years. The renovation of the entire industrial complex was carried out in the spirit of a uniform style, with as much as possible the preservation of the original architecture. TMT, s.r.o. was a success for many of its awards: "Industrial Zone of the Year", "Brownfield of the Year 2005", "Construction of the Year 2008" in Pardubice Region.³⁸

Summary

The complicated and unclear situation in the last decade of the 20th century made one to draw hasty conclusions and spreading untrue information about the development of Czech sugar industry. The common agricultural politics of the European Union was never meant to bully or discourage sugar producers of member countries. Sugar quotas were always only meant to create effective industry able to compete with the rest of the world. The downfall of most refineries was not connected to this tactics. The former sugar refineries in Dymokury, Prague – Cakovice and in Nymburk can serve as examples. These businesses ceased their production due to unkempt sites, ineffective production or insufficient competitiveness. With the 20 years of time distance we can conclude that the state of the Czech sugar industry was not prepared to face strong European market. Hence, it seems almost surprising that the Czech Republic managed to return to the market after certain reforming.

There are still tens of currently unused sugar refinery sites in the Czech Republic which await complete renovation strategy. Only few industry heritage sites received such strategy; unfortunately, sites heritage conservation is not a current topic within the industry aims. Although the state of Moravian sites has already been mapped, a large part of the Bohemian sites is still out of

researchers' focus. We can only hardly judge the importance and authenticity of former sugar refineries without complex research. But surely it is possible to say this is a very important chapter of our industry history and it should be focused on appropriately.

Acknowledgement

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³⁷ At the same place.

³⁸ SMUTNÝ, Vlastislav. Cukrovar v Chrudimi. In: *Listy cukrovarnické a řepařské: odborný časopis pro obor cukrovka-cukr*. Praha: VUC Praha, a. s., 2012, roč. 128, č. 2, s. 77

CZ Na stavby se můžeme dívat jako na parazity: zabírají místo, stojí peníze a spotřebovávají energie. Architekt má však nástroje, kterými může parazitující stavbu proměnit v prostředí příjemné pro člověka a podporující mezilidské vztahy.

Bezdomovectví představuje extrémní společenské vyloučení. Řešení tohoto fenoménu vyžaduje komplexní přístup: spolupráci odborníků – také architektů (sic!) a lidí, kterých se tato situace bezprostředně týká. Vystavěné prostředí nás ovlivňuje. Slovy Winstona Churchilla *We shape our buildings and afterwards our buildings shape us*. Zahraniční příklady dobré praxe dodávají hledání řešení problematiky bezdomovectví optimismus.

Příspěvek vysvětlí přínos architektury v sociální udržitelnosti města na zahraničních realizacích. Byly vybrány tři příklady z rakouského prostředí, které je České republice kulturně i geograficky blízko. Vybrané příklady (VinziRast-mittendrin, Of(f)'n – Stüberl a magdas Hotel) spojují tři aspekty: jde o sociální projekty s inovativním přístupem (týkají se lidí ohrožených sociálním vyloučením: lidí bez domova či uprchlíků), týkají se rekonstrukce stávajících budov, a ve všech třech příkladech je důležitou součástí architekt, který projekt pomáhá formovat.

Projekt VinziRast-mittendrin se nachází v širším centru Vídně. Architektonické studio navrhlo pro přestavbu nevyužívaného biedermaierovského domu pionýrský koncept, ve kterém našli domov studenti a (bývalí) lidé bez domova. Díky kvalitnímu návrhu a promyšleným detailům se VinziRast-mittendrin stal společenským a kulturním centrem.

MagdasHotel je standardním vídeňským hotelem s nestandardním

přběhem. Jednak se pro hotel adaptoval opuštěný domov seniorů ze šedesátých let, ale také v něm našli bydlení, práci a možnost vzdělávání lidí, kteří přišli do Rakouska v migrační krizi. Na přestavbě se pod vedením architektů podíleli i sousedé. Hotel funguje i jako komunitní centrum v místě.

Záměry přestavby nízkoprahového denního centra Of(f)'n – Stüberl v historickém jádru Lince se po vstupu architektů dramaticky změnil. Namísto plánované demolice domu se realizovala jeho citlivá rekonstrukce. Povedlo se zachovat nejen historický objekt, ale i *genius loci*, který dům v městské struktuře spolutváří.

Buildings can be seen as parasites: they take up space, cost money and consume energy. However, architects have tools to turn a parasitic structure into an environment that is pleasant and fosters interpersonal relationships.

Homelessness is an extreme social exclusion. Solving this phenomenon requires a complex approach: collaboration of experts - also architects (sic!) and people who are directly affected by this situation. The built environment has an influence on our lives or according to the words of Winston Churchill: *"We shape our buildings and afterwards our buildings shape us"*. Examples of good practice from abroad bring optimism to the search for solutions of phenomena of homelessness.

The paper explains the contribution of architecture to social sustainability of the city on foreign realizations. Three examples were selected from Austrian environment that is culturally and geographically close to the Czech Republic. The selected examples (VinziRast-mittendrin, Of(f)'n – Stüberl and magdas Hotel)

are connected by three aspects: they are social projects with innovative approach (they deal with people in danger of social exclusion – homeless people or refugees), all are refurbishments of existing buildings and in all the three examples architects played an important role; they helped to shape the project.

VinziRast-mittendrin project is located in the wider centre of Vienna. The architectural studio has designed a pioneer concept for an abandoned Biedermeier style house: home for both, students and (former) homeless people. Thanks to the high quality of design and sophisticated details the project has become a social and cultural centre.

Magdas Hotel is a standard Viennese hotel with a non-standard story. The hotel is located in an adapted former senior home from the 1960s. It offers housing, work and the opportunity of education for people who have come to Austria in the recent migration crisis. The refurbishment was led by architects and neighbours took part in it. The hotel also functions as a community centre for the neighbourhood.

The intentions for the rebuilding of the low-threshold day centre Of(f)'n – Stüberl in the historic centre of Linz have changed dramatically after architects' entry. Instead of the planned demolition of the house, its sensitive reconstruction was carried out. Thanks to that, not only the historic building but also the genius loci which is co-created by the house, was preserved.

Keywords: architecture; social sustainability; refurbishment; homelessness

1 Introduction

Architecture and social sustainability

Architecture consists of both art and technology. It mirrors the condition of the society and reacts (with a certain delay) to its changes. Human and space stand in the centre of architecture's interest. The built environment has an influence on our lives, as Winston Churchill emphasised: *“We shape our buildings and afterwards our buildings shape us”* [1].

The main current social changes in the globalized world tend to call for a discussion about the future development and a *sustainable solution*. There has been an on-going debate about social, ecological and economic changes in the western countries since the sixties, which has led to the terms of sustainability and sustainable development. This topic started to be a theme in the Czech Republic only after 1989; it has become well-discussed in the new millennium though.

Sustainable development can be defined as a way of acting that *meets the needs of present without compromising the ability of future generations* [2]. Sustainability has three important pillars, which are economical, ecological and social. These three pillars are connected a lot to each other and influence each other. From the economic and ecological point of view, architecture and building industry are an important player in sustainable development, because they are responsible for 30% emission of CO₂ [3]. From the social point of view, architecture is also an important player, because – as already mentioned above – built environment has a big influence on our lives.

Social sustainability cannot be easily measured and it is hard to be defined. According to the British research group Social Life, *social sustainability combines design of the physical realm with design of the social world – infrastructure to support social and cultural life, social amenities, systems for citizen engagement and space for people and places to evolve*. [4] The goal of social sustainability can be seen in a coherent society, where everybody has the

same possibility to access the resources (housing, education, employment, social and health care).

Homelessness

Homelessness is an issue which comes from, concerns and influences the whole society. It is a relatively new phenomenon in the Czech Republic [5]. It is an issue which no one wants to see: it does not benefit anyone and hurts everyone. Nevertheless, passive attitude together with no attempt to solve the matter only cause a deeper social problem (!).

Since 2013 the Czech government uses the following definition: *Homelessness is a synonym for extreme social exclusion which is caused by and causes poverty. Homelessness is a continual social phenomena; to find its efficient solution a complex attitude is needed.* [6]

The issue of homelessness and its state in the Czech Republic can be introduced in five points which are important for the content of the paper.

There is no system of social housing in the Czech Republic today. A process of privatization (which began after the Velvet revolution in 1989) has changed the dwelling market. The majority of flats were owned by the state or municipalities during the socialistic period. In 1991 they were just about 13% and in 2011 only 2.7% [7]. In other words, the majority of flats are privately owned nowadays. There are non-estimated 30,000 homeless people and about 100,000 are in danger of homelessness in the Czech Republic [6]. That is about 1% of the whole population.

The most endangered persons are young adults leaving institutional care, seniors, single parents and families with more children.

There is a lack of information, research and professional discussion in the topic of homelessness. It is a side-topic for architects and on the other hand architects are not seen to be the right profession to work with this topic.

Questions

The paper argues that the issue of homelessness needs a complex approach in which architecture is included. The aim of this paper is to answer the question: Can architecture contribute to social sustainability? Is there a task for an architect and architecture in the topic of homelessness?

2 Three Examples from Austria

Three examples from Austria were chosen for this paper. First reason for choosing Austria is the common history during the Austro-Hungarian Empire. In that period, many cities developed a building structure with certain similarities (above all Prague and Vienna). Secondly, the attitude of the society in Austria towards homeless people is more developed, so that there are several examples of good practice nowadays. Thirdly, it is the proximity to this neighbour country which enables studying the examples on site.

The three presented examples were chosen based on the following criteria. They are recent realizations (from time period between 2010 and 2016), they are social projects with an innovative approach dealing with vulnerable people (homeless or refugees) and an architect was involved in the process.

The author of the paper worked with sources from the literature, online sources and has contacted the authors, employees and guests of the presented examples.

Instead of Us and Them, make just Us: VinziRast – mittendrin, Vienna

All begun with a student protest in 2009, when students occupied for many days the auditorium of the University of Vienna. After that some homeless had also attended the protest, an outstanding symbiosis between students and homeless sparked the idea of a common project for both of them.

An initial group asked for help a non-profit organisation VinziRast (Vinzengemeinschaft St. Stephan); the idea was to create a day-centre with workshops. When an architectural studio gaupenraub+/- joined the team, the idea turned into a pioneer project of a bigger scale.

An abandoned Biedermeier-style [Fig. 1,2] house in the heart of the Austrian capital was refurbished into a home for both former homeless and students and it also works as a meeting hub for the public. The project works with all the inhabitants and users equally, everybody has the same chances and possibilities. According to the testimonies of the inhabitants, after some time it no more matters if they WERE homeless or students, but it is important who they ARE or who they WANT TO BE.

The hybrid-type house includes several functions - housing, workplace and a meeting point. The functions are spread in both horizontal and vertical way.

The restaurant [Fig. 3] on the ground floor works like a connection place between the public and the inhabitants who can find a job there. Even people who do not know that it is a social project come inside. The warm interior welcomes visitors not only because of quality food for a reasonable price, but because of the design of the dining hall as well (e.g. the simple form of the room enables good visibility and control, possibility of sitting in the windows connects you with the street while sitting inside). The

1 →



VinziRast – mittendrin, Abandoned Biedermeier-style house before the refurbishment

<https://experimentdayswien.wordpress.com/2011/11/09/vinzi/>

2 →



VinziRast – mittendrin, Nowadays look of the house

Photo: Sebastian Schubert, <http://gaupenraub.net/vinzirastmittendrin>

furniture is made in up-cycled design: old pieces are used for new purpose or in a new way which makes them both interesting and environmentally sustainable. They are not waste any more (e.g. old wooden beams are used for the construction of the bar, the wall cladding is made from pieces of fruit boxes).

There are several workshops around the inner yard of the house (like bicycle repair or sewing). The vulnerable public can work there and the general public can use the workshops as a service. Beside the housing units on the upper floors, there are lecture rooms for public used e.g. for lessons of German language. On the very top floor there is a luxurious attic: a spacious room with a terrace and an outstanding view. The attic is used by the inhabitants as well as rented for conferences and parties. It serves as one of the economic incomes of the house. On the very low floor, in the basement of the house, another room which can be rented is located: it is suitable for concerts, exhibitions or lectures.

There are three apartments on each of the three housing levels. Three (in some two) inhabitants live in the apartments: former homeless people together with students. Based on the idea that private space for each inhabitant is very important when designing a community project, there are single-bed rooms [Fig.4] in the apartments. The kitchenette, the bathroom and the toilet are shared within the apartment.

There is a common kitchen with a living room on each floor. The common spaces are carefully designed. One aspect is a graded spatial system, which offers a variety of spaces and social interactions – the first step is a private room, the second is a common room for each floor and the third step is the yard and restaurant for the whole community. Secondly, attention is paid to allowing enough entrances and ways out, in order to always provide the possibility to leave a room when it is needed.

The main difficulty of this project – first of its kind – were neighbours' prejudices. As the authors say, they were caused

3 →



VinziRast – mittendrin, Interior of the Restaurant
Kurt Kuball, <http://gaupenraub.net/vinzirastmittendrin>

4 →



VinziRast – mittendrin, Private single-bed room
Simon Jappel, <http://gaupenraub.net/vinzirastmittendrin>

by fear of the unknown. Therefore, the team worked on many presentations for the public which could help the neighbours to understand the up-coming project. The project was carried out in 2014.

After five years of full operation the project can be evaluated. There are some former inhabitants who did not stay in the house for longer time. But the majority is satisfied. [8] Another contribution of the project is seen in the broader context, the Viennese society sees now that there is no need to be afraid of this type of project.

VinziRast - mittendrin comes with two messages: the future of the city is not in dividing the society - us and them; it lies in a different way of thinking: just us. The future is in a mixture of inhabitants which makes the houses and communities sustainable. Another important aspect was the reconstruction of a current structure: according to their own words, the people with complicated history feel better if they are surrounded by walls and furniture with memory instead of new structure and materials. [9]

Variety of Uses and Possibilities: Magdas Hotel, Vienna

A very unique hotel [Fig. 5] stands in the proximity of the famous Prater Park in the Austrian capital. A former senior house from the 1960s stayed abandoned for some years until a project of Charity Archdiocese Vienna for vulnerable people – in this case for refugees – has started. Vienna gained many new inhabitants during the migration crisis with a small chance to find a job, home and become a part of the society. The magdas Hotel offers a solution for them.

The situation of refugees is in many aspects similar to the situation of homeless people – they are not seen as a part of the society. They do not have a place to call home and they do not have a job.

5 →



magdas Hotel, Entrance with hand-written words on the way
Karolína Kripnerová

6 →



magdas Hotel, Dining hall with up-cycled furniture
Karolína Kripnerová

How to offer education, job and home to many different people and how to create a sustainable project?

The design of the architectural studio Alles Wird Gut was based on the idea to offer a variety of uses and possibilities to a variety of users: A hotel which hosts visitors of Vienna, which offers an education for refugees, which provides them with a job, which even offers housing for some of them and which will be open to the public. All together it demands well-designed spaces that are able to fulfil all the purposes.

The basic scheme of the house was maintained and therefore the construction costs were reduced. The existing layout of the senior house was suitable for the new purpose as a hotel: a big entrance hall, a reception, a café and a dining room [Fig. 6] are located in the basement. The upper floors are used for hotel rooms and partly for housing of refugees. Part of the hotel is also a publicly accessible garden and extension of the café.

The interior design was based on up-cycling. Donations received were used in new ways (e.g. the variety of chairs in dining room create a special atmosphere, old train shelves were used in hotel rooms for luggage), and carefully combined with new furniture to satisfy all guests' taste. Another aspect was to individualize the interior so that both employees and guests can identify themselves with the hotel, e.g. personal stories and photos of the refugees are displayed in the stair hall, hand-written words "welcome" in many languages are in front of the entrance.

Employees of the hotel are from all over the world, both professionals working in hotel trade and amateurs – refugees, who are being trained to become professionals as well. Even the offer of jobs in the hotel is wide: from receptionist to the helper in the kitchen. The project was based on the collaboration of volunteers and neighbours and led by architects. Everybody could bring their

ideas and help with the refurbishment, so the project is welcomed in the neighbourhood and people still meet there.

The project magdas Hotel brings the idea of a variety of uses and possibilities. The more diverse the offer is, the more people it can suit and more can thus find their place in the society.

Work Interdisciplinary: Of(f)'n – Stüberl, Linz

In the southern part of the centre of Linz, the capital city of Upper Austria, there used to be a day centre for vulnerable people for a long time. The provider, Evangelic City Diaconia, decided to demolish and build a new house for the same purpose after nearly two decades of use. The architects together with the users were able to persuade the provider to maintain and refurbish the old house. [10]

The low-threshold centre of Evangelic City Diaconia was situated in an old house from the second half of the nineteenth century, maybe one of the oldest houses in the surroundings [8]. The house co-creates a specific atmosphere on a small square and therefore a unique *genius loci*. Even though the house is not a listed monument, it still plays an important role in the city structure.

The project of a new day centre was prepared by an interdisciplinary team – including architects and users of the house. For both these groups the building was important: the users were used to the old house and for the architects it was a historic footprint in the urban neighbourhood.

The final project accepted by the provider was different from their former ideas: keeping the old structure and applying a very subtle reconstruction. The users themselves were involved in the works on site.

The Of(f)'n Stüberl project gives a clear answer to the question if involving an architect in social projects is a luxury. The answer is no: A luxury is to build a house which needs to be demolished after a few years.

3 Three of the Aspects of Social Projects

The paper argues that creating low-budget design for the weakest part of our society (or no design at all) which just fulfil the basal needs (sleeping and eating) and deal with the consequences of the problem only is not the correct attitude. Instead, special attention is to be paid to social projects which are created for the poorest.

As it is mentioned above in the definition of social sustainability, it is important to design carefully both the physical and social environment in order to create places for cultural life and a space for people.

The same applies in the design of social projects for vulnerable people. Three significant aspects of this type of design were presented in the examples from Austria:

1. Instead of Us and Them, Make just Us

As it is clearly mentioned in the VinziRast-mittendrin project, the acceptance of the people endangered by homelessness or homeless people as a part of our society is an important step to change the thinking from dividing into "Us and Them" to just "Us". Even in both the other projects this aspect is very strong: accepting vulnerable people and their needs. All of the presented projects look at them as humans, with certain differences and their own needs.

7 →



Of(f)'n – Stüberl, Maybe one of the oldest houses in the surroundings

<http://www.urmannradler.at/projekt/offn-stueberl-linz/>

8 →



Of(f)'n – Stüberl, Old and new parts

<http://www.urmannradler.at/projekt/offn-stueberl-linz/>

2. Variety of Uses and Possibilities

The idea of the magdas Hotel is based on offering a wide range of possibilities for vulnerable people: a job, training accomplished with a certificate for those who do not know the job and even housing. The house connects three groups: guests, employees – refugees and neighbours in a non-formal and therefore natural way.

This aspect is very strong in the VinziRast-mittendrin project as well. The house offers not only housing, instead, it is rather a hybrid typology: housing, working, spaces for rent, and a meeting hub.

3. Work Interdisciplinary

The problem of homelessness is often seen as a task just for social workers and paying taxes is perceived as a sufficient civic duty for the society. The paper argues that there is more that everybody personally has to do so that the society functions in the future.

Interdisciplinary teams including architects are beneficial to social projects. It can well be seen on the Of(f)'n Stüberl day centre, where the contribution of both, an architect and a homeless person, proved to be an asset (lower costs and maintaining the old structure). As demonstrated, this aspect of creating an interdisciplinary team is present in all three selected examples. According to Miki Mielonen [11], a member of the Finnish project for Young Homeless *A Home That Fits*, good ideas can arise only with a multidisciplinary team.

4 Conclusion

The paper has raised two questions: Can architecture contribute to social sustainability? Is there a task for an architect and architecture in the topic of homelessness?

The three presented examples of socially sustainable projects from Austria, in which the architect was an essential player in the whole project, give positive answers to both of them. Each project is a contribution to social sustainability: they create an infrastructure to support social and cultural life and a space for people.

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