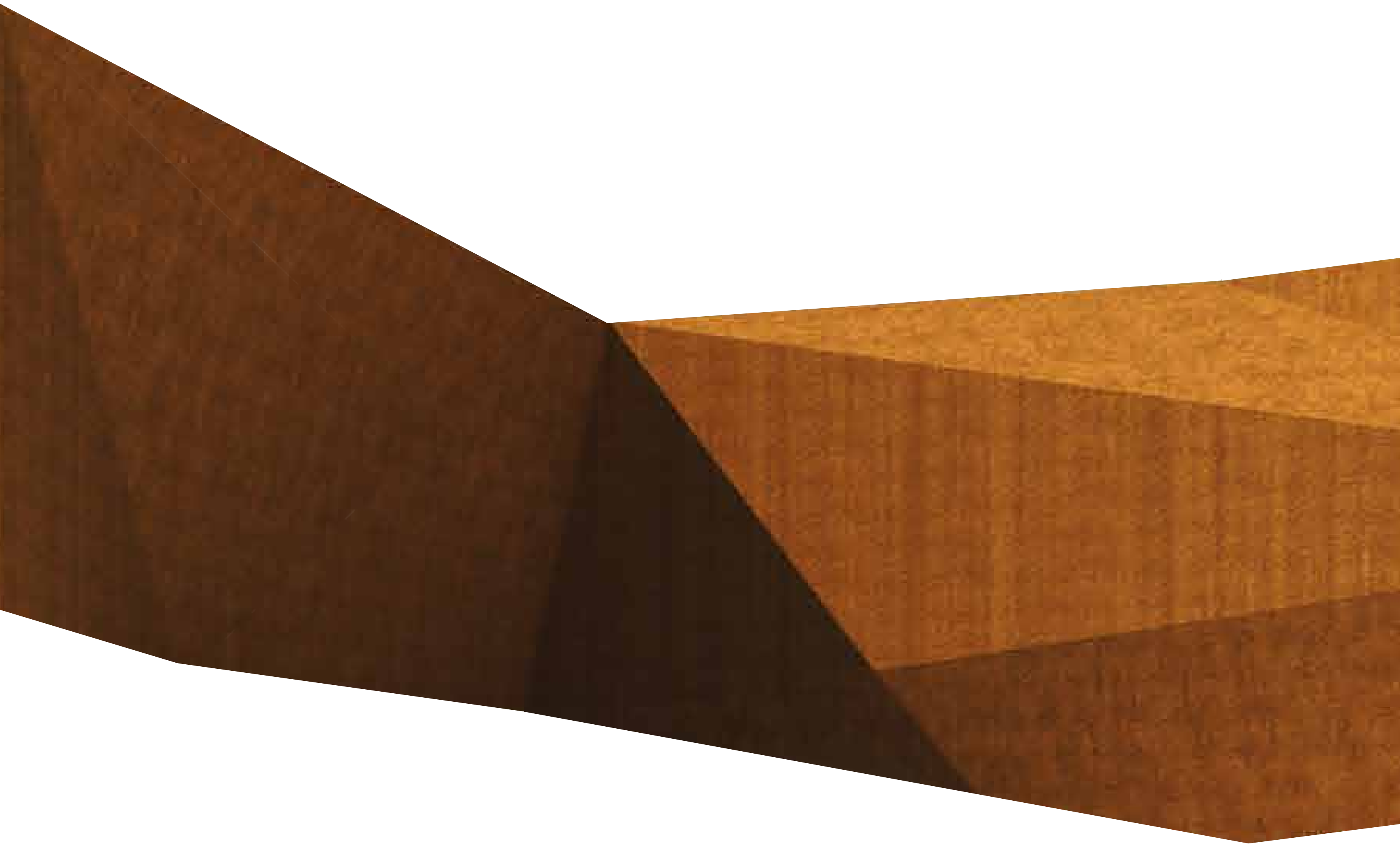

IGNACY
mixed use complex

ma4-ark21
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May 2011

SUMMARY

This report documents the project focussed on the revitalization and adaptation of historical mining complex in Rybnik, Poland. The fundamental requirement is to develop a project with a respect for its historical values where attention to scale, surroundings, aesthetics and sustainability is the essence when combining old and new. This is done through the extensive registration of the site and urban concept development. Part of the new development including museum of the mine, culture & conference center and office buildings is closer detailed and structurally analysed.

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“(...)what is it we are trying to do by listening buildings and other structures as being of special architectural or historic interest, and also by scheduling them as Ancient Monuments. In fact, the principal reason and the aim of the whole process is clear : to preserve and enhance the nation’s heritage of fine architecture and other important structures for the benefit of all, both now and in the future. The question of how that aim is to be achieved is an altogether more difficult one.”

Martin Robertson “Conservation and authenticity”

FOREWORD

This project is a proposal for an adaptation of a historical mine complex ‘Ignacy’ in Rybnik, Poland. The mine was established in 1792 and is one of the oldest in the region.

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#1

Introduction

Industrial revolution in the 18th century resulted in the creation and development of steel works and mines and turned Silesia into an important European industrial centre where new investments increased the demand for workforce. Consequently, the influx of people resulted in the region becoming one with the highest population density. The rapid development of ironwork, glasswork and zinc work, as well as improvements in the land and water communication systems, transformed Silesia into a region of technical and industrial culture.[1]

In recent years, the closure of numerous historical plants became necessary. It questioned the future of the region's heritage. Working out effective forms of preservation and promotion of the industrial heritage is one reasons the 'Industrial Monuments Route of Silesian Voivodeship' came into being. [1]

The revitalisation of industrial areas gives an opportunity for development, as examples in the U.S. and European Union have shown. New work places could be created and these areas could gain new value for potential investments. It has numerous direct and indirect economic impacts.

In Silesia, for every ten accommodation places created, it can be assumed that around a hundred jobs (direct and indirect) could be generated. People who have lost jobs as a result of the closure of old industrial centres might find employment in tourism.[1]

The Ignacy mine is one of the oldest in the region and an important site on the Silesian Route of Industrial Heritage lately connected to European Route of Industrial Heritage network. There is a need for regeneration that manifested itself with the establishment of the Association of Historic Mine Ignacy by the locals. The statutory objective of the association is to preserve the mine and develop the site. In 2010 the Rybnik municipalities and Upper Silesian Agency for Enterprises Restructuring in Katowice announced an open architectural competition for adaptation of the site. The brief however was not that specific and only mentioned that the new use should have cultural and business functions.

Our intention is to use these suggested new functions just as a starting point for this project and not as the guideline for the whole design.

The purpose of this project is to learn how to approach and develop this type of industrial areas. The amount of unused industrial sites in Silesia is increasing therefore it seems natural to find solutions for their adaptations.

The intention in the design is to develop a project with respect for its historical values where attention to scale, surroundings, aesthetics and sustainability is the essence when combining old and new.

Program

Brief for the project is based on the main points from the agenda of the 'Industrial Monument Route of the Silesian Voivodeship' . It also refers to the latest interest in the development of the site.

The project aims to :
- Show the richness of the economic and cultural heritage of the voivodeship
- Preserve the historic industrial sites
- Promote a new image of the Silesian voivodeship and to overcome the 'grey Silesia' stereotype
- Restructure and convert industrial sites into facilities for service, trade and business sectors

The proposal should bring social, economic and environmental life back to the site of Ignacy mine. Transform the place, strengthen the community's self-image and re-creates viable, attractive places which encourage sustained inward investment.

The project will include the design of the following :
- Museum of the Ignacy mine
- Offices
- Cultural centre with auditorium and covered public space that could be used for bigger events and concert
- Restaurant and a bar directly connected to the cultural centre (with the intention to provide service for the office part of the complex during the day hours).

Design issues

How to adapt the mine complex and bring new life to it while bearing in mind the importance of historical preservation ?

How to create architecture that fits to the context and at the same time brings new exiting values and new image to the area ?

How to create a landmark that gives the locals a sense of identity and is attractive for tourists and new businesses ?

Integrated design

The project is composed by using the Integrated Design Process (IDP). The IDP it's a method where technical, functional and aesthetic parameters all have an impact on the design. [2]

Analysis & Theory

The site analysis of the area including history of industry in the region and the mine itself, registration of the site, mapping and climate conditions. Besides the site analysis this part of the project includes theory behind conservation and preservation, adaptation and reuse of old buildings and industrial sites.

Design process

Through the process of sketching the architectural ideas are developed. The different solutions and their suggested advantages as well as the architectural qualities are evaluated continuously according to the analysis and theory. The design takes it's final form where architectural and functional qualities are combined with the construction and all the elements create new qualities.

Presentation

The final project is presented in a report, technical drawings, physical and digital models.

#2

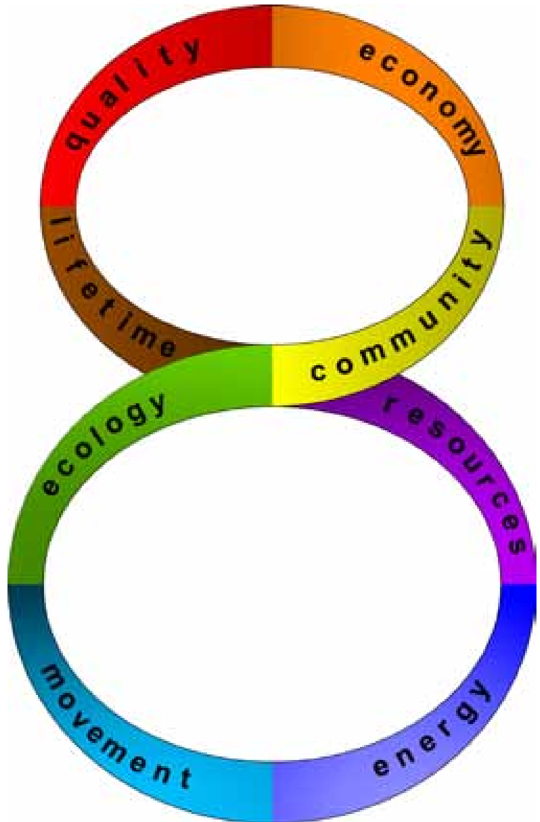
Theoretical framework

Adaptive re-use for industrial buildings embraces both projects promoted largely through public initiatives and dominated by cultural uses, and conversions undertaken by private developers motivated more by profit-seeking than any altruistic concern. The process of evolution and adaptation has been largely pragmatic, motivated as much by the need to save money and time, as any considerations of preservation or cultural enrichment. One might argue that the key to success in conservation and regeneration is to combine the economic pragmatism of re-use in the past with the inspirational qualities and community benefits of successful modern projects. The criteria for protecting factories and warehouses have broadened out from a preoccupation with architectural and constructional innovation. Several studies have been conducted of local factories and workshops to identify those that have potential for re-use, even though they may not be of sufficient architectural merit to justify being protected otherwise. [3]

The following chapter is going to investigate different theoretical aspects within conservation and approaches to adaptation projects on sites with historical value. Typologies and possible future uses are introduced in means to provide basic guidelines for the design. It has to be remembered that even planning an adaptation for the old industrial sites the future use of the site might alter still further from the designed one therefore conservation, renovation and new design should always be designed and though with added flexibility into it. This will be further analysed in a part of successful regeneration.

Regeneration and sustainability

Being an international cause, conservation of buildings with improvement to living conditions should be combined in regeneration process. This in some projects means offering a new exciting cultural provision, improved public transport as well as new architecture to the community. Cities have rich resources and values that can be nurtured and revived, therefore improvement to the environment and new jobs created will bring lasting and sustainable benefits to the community. This can be seen as an underlying philosophy in regeneration process. In contrast to the emphasis on physical renewal in the post-war period, regeneration implies that the existing urban form is a starting point, to be upgraded within social, economic, cultural and, where appropriate, natural contexts.[3]



#3 elements of sustainable planning

For many, regeneration is seen as means to build on the qualities of urban living, to integrate work, home and recreation, and to counter rapid and traumatic change and wastage of assets. This ecological philosophy, aims not simply to preserve buildings largely unchanged but to bring back into use the energy and materials invested in them. This principle can be encapsulated in term sustainability. If minimum intervention to protect the structure from change is conservation, recycling is the minimum effort to make best use of existing resources. Sustainable planning aims to achieve a balance between new development and conservation. [3] Rehabilitated projects provide many advantages, including maintenance of historical and architectural integrity, revitalizing urban areas, and avoiding negative environmental impacts and unnecessary consumption of materials and energy. In planning a sustainable rehabilitation project, it is necessary to consider the surrounding context of the project, potential impacts to human and natural environment and economic viability compared to other alternatives. [4]

According to authors Moradi and Akhtarkavan positive benefits of adaptation and adaptive reuse include:

- Minimizing consumption of energy
- Reusing existing material
- Positive environmental impacts
- Reusing existing sites
- Reducing construction waste
- Accommodating human needs
- Meeting performance requirements
- Preserving architectural history
- Reviving urban areas
- Creating economic advantage
- Time saving for new construction
- Maintaining traditional standards

The same authors also recognised barriers to sustainable adaptation which have mainly straight connection to building and maintenance cost. They identify barriers to adaptive reuse as follows:

- Building owners do not see economical benefits in reuse
- Older buildings may require extensive and costly refurbishment
- Inability to match the performance of a new building
- Ongoing maintenance costs may be higher than a new building
- Older buildings may be unable to meet current sustainability standards
- Availability and price of matching existing materials may create problems
- Maintaining the structural integrity of older building may be difficult

There is great value in seeing industrial buildings and industrialized inner-city areas in dynamic context. Large robust buildings have already had long, chequered histories and most are undergoing dramatic functional change when they are being adapted to re-use. Protection of twentieth-century large commercial and industrial buildings, structures that need commercial uses to fund their maintenance, specialists evaluates these with strong eagerness, but the broad public can only be expected to share their enthusiasms if these buildings are made attractive and usable. According to Stewart Brand this kind of " change can augment, rather than dilute the historical significance of a complex—most buildings are born to evolve and often perform better after they have been through a period of adaptation." [3]

Different approaches to conservation

Theories about conservation and, by implication, about reconstruction, have oscillated between two extreme attitudes, from which the works of the French architect Eugene Emmanuel Viollet-le-Duc and the English art and social critic John Ruskin are precursors. [5]

John Ruskin, who in his books, showed a strong appreciation for the virtues and values of ancient buildings and defended them wholeheartedly. He argued that the historical building's authenticity should be defended through the preservation of its original material, rejecting, as consequence, any form of intervention. For Ruskin, the signs of history are one of the most valuable features of the object. They are a part of the object itself, and without them, the object would be a different thing, thus losing an important element of its true nature. Nothing present should disturb the original remnants from the past. [6] [5]

The French architect **Eugène Viollet-le-Duc**, who was an enthusiast of Gothic, as an architect did not feel the similar restrains to Ruskin and felt fully authorized to fill-in-the-blanks of damaged buildings. For him, the building could, and indeed should, be restored to as good a state as possible even if this meant to its 'pristine' condition, a condition that might never have actually existed, as long as it was coherent with the true nature of the building. For Viollet-le-Duc, the most perfect state of a conservation object is its original state. Wear and tear deforms the object, and it is the conservator's duty to free the object from the ravages of time. Actually, he took this idea so far as to defend that the original state of the object was not the state it had when it was produced, but the state it had when it was conceived: not really the original state of the material object, but the original idea the artist had, or should have had, for that object. This lead into a his explanation of term restoration.

[Restauration:] *Le mot et la chose sont modernes. Restaurer un édifice, ce n'est*

#4

#4 Carcassonne Old town - stylistic approach to renovation

#5

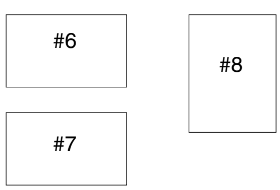
#5 Abbey ruins in Yorkshire - approach popularized by John Ruskin

pas l'entretenir, le réparer, ou le refaire, c'est le rétablir dans un état complet qui peut n'avoir jamais existé à un moment donné.

[[Restoration:] *Both the word and the thing are modern. To restore an edifice means neither to maintain it, nor to repair it, nor to rebuild it; it means to re-establish it in a completed state, which may in fact never have actually existed at any given time*.] [6]

Ruskin and Viollet-le-Duc are considered by many authors to be the first true conservation theorists. They have become icons of a sort, representing the two extremes about conservation, from the most restrictive to the most permissive.
Later theorists have oscillated between these extremes attempting to establish universal principles and standards. This is the reason why Ruskin and Viollet-le-Duc are so often remembered and quoted in their ability to clearly represent two very distinct attitudes when contemplating a conservation object. [6]

Conserving both an object's original state and the signs that history has left on it indicates the dilemma that later theorists have tried to solve. Science, the preferred method of truth determination, entered the scene quite early. It did so in a soft manner, if judged by present standards: the earliest manifestations of scientific conservation were scientific because the decisions were made with the aid of soft, historical sciences, such as archaeology, paleography or history itself. The Italian architect **Camillo Boito** was a bold defender of the idea of the monumentas- document, or to be more precise, of the monument-as-historical document.[6] His theoretical approach known as philological restoration, criticized the falsification of the monument, which was considered as "…a book, that I want to read without cuts, retouching and rehashes…". He was convinced that the only way to avoid fakes was to mark the new intervention "…so that everyone can recognize it as a modern work…" [5] This led him to establish some principles that continue to be widely accepted today; for example, the need for original and restored parts to



#6 Basilica of Saint Anthony, Padua - philological approach

#7 Palazzo Sforzesco, Milan - historical approach

#8 Basilica del Sacro Cuore - renovation conducted by Ambrogio Annoni

be clearly discernible, which allows for honest restorations of the object. Later, other principles, such as reversibility or minimum intervention came into the picture to minimize the impact conservation processes actually have on conservation objects. [6]
In he's publication, Charter of Restoration, he mentions the eight points to be taken into consideration in the restoration of historical monuments:

- The differentiation of style between new and old parts of a building.
- The differentiation in building materials between the new and the old.
- Suppression of mouldings and decorative elements in new fabric placed in a historical building.
- Exhibition in a nearby place of any material parts of a historical building that were removed during the process of restoration.
- Inscription of the date (or a conventional symbol) on new fabric in a historical building.
- Descriptive epigraph of the restoration work done attached to the monument.
- Registration and description with photographs of the different phases of restoration. This register should remain in the monument or in a nearby public place. This requirement may be substituted by publication of this material.
- Visual notoriety of the restoration work done.

The concern was for maintaining authenticity in terms of the identification of original materials. At the same time, the intention was to promote a scientific attitude toward restoration. [7]

Boito was only one of the many theorists who tried to find a balance between the extremes proposed by Ruskin and Viollet le-Duc, but there were others.

Luca Beltrami,who's historical restoration theory insisted that the restoration should not be based on imagination but concrete data in the monument itself. Although Beltrami was aware of difficulty in achieving reconstruction corresponding exactly to the original, he insisted that it was essential for good results to always "know how to find the way to follow, the means adopt, and that limits of respect, from study of the monument". This meant a thorough archaeological and historical research on the monument itself, as well as studies of documents and other analogous structures. This insistence by Beltrami on the importance of documentation as a basis of any restoration, has justified a later definition of his approach as "historical restoration" [8]

Gustavo Giovannoni's theory of restoration is seen as an intermediate theory – between stylistic restoration and pure conservation. He considered Viollet-le-Duc's theory to be anti-scientific causing falsifications and arbitrary interventions writing about restoration as follows. "The intention to restore the monument, both in order to consolidate them repairing the injuries of time, and to bring them back to a new living function, is a completely modern concept, parallel to the attitude of philosophy and culture which conceives in the constructive and artistic testimonies of the past, whatever period they belong to, a subject of respect and of care." Giovannoni placed emphasis on maintenance, repair and consolidation, the aim of the work essentially to preserve the authenticity of the structure and respect the whole "artistic life" of the monument. Giovannoni divided restoration activities into four types or categories:

- Restoration by consolidation
- Restoration by recomposition
- Restoration through liberation
- Restoration through completion or reno vation [8]

Austrian art historian **Alois Riegl** provided a basis for the assessment of cultural "values" of historic artefacts and buildings and their consequent treatments. The value theory was further developed by another Austrian art historian, **Max Dvorak**, who highlighted the historical and documental value of handicraft versus the academic notion of "artistic value". His contribution switched the preservation debate, which was so far focused on monumental masonry buildings, to a wider range of building typologies. [5]

Cesare Brandi was neither a practising conservator, nor an architect, but an art historian. Brandi distinguished between restoration of works of art and of "industrial products", the latter aiming mainly at the repair of an object into a working order. Although his theory was conceived mainly for the restoration of works of art, historic buildings could still be included in its sphere. A work of art was conceived in its material, aesthetic and historic aspects. Restoration thus consisted in the method of the definition of a work of art in its material consistency, and in its aesthetic and historic values, with the aim of passing it on to the future.
In his theory, Brandi has summarized the essential concepts of conservation in relation to works of art; he has emphasized the role of historical critical definition as a basis for any intervention and has underlined the importance of the conservation of authentic. Although conceived mainly in terms of works of art, Brandi considers them essentially relevant to architecture as well. In this way, his theory forms a sort of grammar, the use of which requires a mature historical consciousness. [8]

Ambrogia Annoni's importance and his contribution to the theory of the restoration is due to its denial of standardized methods. Being among the supporters of the "no method" in the restoration, Annoni rejects abstract theorising and prioritizing one theory above another.

#9 The medieval castle of Lattainville

He rejects the priority in the search for unity of style and states out that restoration projects should be viewed as individuals therefore intended restoration techniques should always be evaluated case by case. To sum up the Annoni's attitude towards restoration in his own words:

"*Today we think that the restoration should not only be art, not only science, but both together, requiring a great sense of balance, culture and love. Restoration or reconstruction of the building should not be interpreted as stylistic or historical reconstruction, but as preservation, accommodation and documentation*".
[9]

The historical-typological analysis as an approach is an important step of the survey phase in the restoration process. This analysis becomes fundamental in reconstruction, especially when other sources of information are lacking.
In this case, reconstruction gains by comparison with typologically similar artefacts. This approach confirms the assumption that historical buildings are "documents," providing an insight into past cultures and containing precious information about techniques and formal languages of the architectural production of a certain area and period. [5]

Design ethics and issues

What is important is not that new buildings should directly imitate past styles, but that they should be designed with respect for their context. Matters such as scale, height, form, massing, and respect for traditional pattern of facade, vertical or horizontal emphasis, and detailed design should be taken into consideration while designed new buildings in historical environment. Recent books on modern design in historic settings imply a division between architects and public taste. The majority of designers are keen to express new forms and materials while the public tend to appreciate more historic imagery and even façadism. [3]

According to Les Sparks 'architects must produce buildings that are recognizably of our own age but with an understanding and respect for history and context. If this involves some challenges to public taste and convention, it may not be a bad thing. At the same time we should treat our historic buildings with care and integrity, minimizing the changes they undergo to meet current needs, and maximizing their authenticity'. This means that different approaches are valid in different contexts. An inspired designer may succeed with either, and a poor one fails dismally whichever approach is taken. [3]

Industrial buildings are of particular interest in this context. Their scale, robustness and lower status in the conservation hierarchy might suggest that designers can experiment with radical interventions that would be unlikely to gain acceptance elsewhere. This opportunity for originality and freedom in design might rule out the heritage style in design for the industrial areas. New elements and buildings could be designed in other forms than just traditional and replicas of existing work showing their modernity through the use of simplified detailing. Conservation should be seen as an art rather than a science; there will be some projects that seek to adapt a building to new uses without affecting its appearance and others that update the appearance and image while leaving the same old structure and function buried underneath. [3]

What makes this issue intriguing is that the typology and quality of industrial buildings is varied, from listed buildings to secondary and unappreciated ones. There is a tremendous variety in future functions, from monuments to commercial offices and apartments. Partially guided by the perceived quality of the building and the nature of its future use, designers and clients will choose either to maintain the industrial image, reinforce a particular aspect of it, or, alternatively, to suppress or adjust the industrial character for a more commercial or homely identity. [3]

The preservation approach will be a natural starting point with most monuments as well as for buildings of high quality and a strong identity. Industrial archaeologists prefer to study monuments and buildings in their unrestored state, not only due to their picturesque state of decay, but since a lot of historical evidence may be lost after different specialist are done with their work. Scheduled industrial monuments are still vulnerable to such dramatic makeover, especially if they are being converted into well-funded museums or heritage centres, in a way that would be unimaginable for many other building types. Volunteers and firms with little money to spare may achieve a conversion that retains more of the original surfaces and fittings. Commercial schemes may successfully pursue a preservationist agenda, if the building has a strong image that will attract public in its new life as an apartment block, restaurant or in mixed use. In most simple terms a conservation approach, consists of retaining as much as possible of the original fabric. For success, the conservation approach requires an assured touch with modern materials and sympathy with the subtleties of the original architecture. [3]

Heritage vernacular

A more common way of reworking industrial buildings is to take a cue from the existing architecture, and then replicate or rework it. For extensions or new layout, historic forms, such as round-headed arcading or polychromatic brickwork, may be replicated. Modern roof-vents, lucarns and towers may be added to strengthen the flavour. Traditional design can readily drift into pastiche. Several brick makers offer a 'heritage range', with bricks that are battered and coloured to look old and reclaimed. A new curtain wall of red, buff and blue bricks may be almost indistinguishable from the old, once the latter has been sandblasted or cleaned with chemicals. Towns and cities have ended up with an amorphous jumble of new buildings made to look old and old buildings looking too new. Sensitive landscape design can enhance the individuality of a conservation area. Internal arrangements and services have been more susceptible to change than the building structure. In many cases the public is more concerned with external appearances of a building, while intending occupants demand the best possible working or living environment. Such justifications can become an excuse for too little care being taken with the interiors of industrial buildings, walls being grit blasted, spaces dramatically altered and any evidence of machinery removed. [3]

Juxtaposing old and new —modernism

Given that industrial buildings can readily take on new uses, one might assume that industrial architecture should also be adaptable to convey secondary functions and hence different meanings. Conservation philosophy and governmental guidance concur in recommending that new uses and additions should be marked by sensitive modern design. Polished metal and plate glass, the materials of high-tech modernism, appeal widely to architectural critics due to their industrial overtones and suave minimalism. High-tech design has also gained a strong credibility in conservation. Sadly even the use of steel and glass has become downgraded into stock-in-trade of conservation, especially for retailing. Modern design is likely to be considered appropriate by many architects for major new additions to historic factories or warehouses.

Designers, clients and planning agencies in other countries have proved more willing to experiment with radical juxtapositions of old and new at major industrial complexes. In Germany, Foster & Partners have designed purely modern display spaces at the Zollverein Colliery in the Ruhr for the North-Rhine Westphalia Design Centre. Their scheme draws upon the Bauhaus idiom of the Colliery buildings dating to 1930 and fully exploits the bold forms of the boiler house; even the interiors of the boilers themselves will contain works of art.

In Italy, Renzo Piano developed a philosophy for converting the Fiat Lingotto Factory in Turin—one of the great icons of industrial futurism—that juxtaposed preservation and modern design. The conversion of a car factory to a conference centre and hotel was expressed by introducing unapologetically modern design where original fabric had to be replaced, and by one major and symbolic addition. The rusted window frames of this vast daylight factory were replaced by lightweight designs with a series of perforations in the mullions. More controversially Lingotto is now topped by an addition: a futuristic dome housing a conference room and a helipad, the combination almost parodying the aspirations of the magnates who fly in for their meetings. Modern design can be justified as a way of marking a major re-use scheme, especially if it is clearly an addition, and if it is reversible. [3]

Old and new—post-modernism

An alternative is to pursue a broadly post-modern agenda, giving a factory new detailing that adjusts its imagery towards its new function and the expectations of its new clientele. In most simple terms, gaunt warehouses are given additional trim in the form of pediments, brightly coloured balconies and jazzed-up interiors. Post-modernism has a valid philosophical justification in terms of adding historical layers and articulating the changed role of historic buildings, but has been sold short by many of its advocates and even more so by commercial plagiarists. There are all too many buildings where green woodstains and pink renders are fading, while their loosely classical motifs seem more suited to housing estates than to the industrial heritage. The visual strength of a mill or warehouse may have become diluted through a dressing-up that seems contrived and, all too quickly, outdated. There are other more subtle design philosophies, rarely tried and never discussed. One is to rework the architecture to enrich the original

industrial image, even though the new function will not involve manufacture or storage. Philosophically controversial to say the least, this approach has been applied to great success in the case of the Luma Light Factory on the edge of Glasgow. The streamlined, modernistic style of the factory has been made even crisper and more characteristic of the new industries of the inter-war period through the complete replacement of the external walls and fenestration, even though the factory now houses homes rather than production lines. This is not conservation but an exceptional case of architectural reworking that successfully breaks the rules. Another approach is to design new additions not in a replication of the original form or a style of our time, but to take an intermediate point. If undertaken with sensitivity and to a high standard, the designer may succeed in creating a secondary, enriching layer that will not be pastiche and that will date more satisfactorily than either high-tech steel and glass or the latest brand of post-modernism. [3]

#10	#11

#10 Fiat Lingotto Factory, Turin

#11 Luma Light Factory, Glasgow

Future use & Typology

Buildings and complexes should be considered in terms of their typology, analysed through their basic form and therefore recognized their potential and constraints.[3]
Industrialists have traditionally preferred to adapt existing buildings rather than plan and build new ones. It has been seen as a valuable means of saving money, especially during periods of experimentation when no income is flowing into the company. By adapting existing buildings, firms avoided the major interruption to work required by clearance and building new building. Redevelopment should not been seen as a narrow, short-term considerations of costs and profits but as a type of property development in total.
The identification of future uses for redundant industrial buildings can be seen as a process pervaded by wishful thinking and gross optimism but new uses for the buildings have to be financially sustainable and development costs for different types of building and conversion should be balanced. Their costs will vary from country to country and according to the sophistication of the adaptation design. The cost of repairs will depend on the condition of the building, its previous use, and the extent to which it has suffered decay and vandalism. Different new uses and levels of finish will influence the cost of conversion but the provision of new services might be the largest expense. [3]

According to Stratton (2000) conversion costs can be analysed according to differing levels of intervention, from the most expensive to the simplest:

- Major structural alterations and additions
- Provision of new services
- General repairs and fireproofing
- Installation of non-structural partitions

One of the first priorities in finding new use for the building should be to seek to identify a 'vision' or 'theme' for it. This will determine the broad 'function' of the building, and make it easier to market and promote. [10]

Industry
To reuse old industrial buildings for industrial use pose probably the easiest adaptation to existing premises. According to Stratton (2000) it is worth noting some approaches taken by firms to improve the performance of their ageing factories may be the installation of a new services or, more radically, new windows and roofs, whereas long-established firms and those making traditional products, whether furniture, jewellery or chocolate, may gain prestige from their historic complexes and especially an ornate office block. Smaller businesses have found old, multi-storey buildings suitable for a modest scale of light assembly, and ideal for promoting a team spirit and collaboration with nearby firms. [3]

Housing

There are long traditions of people combining their workplace and their home. After a century when work and domestic life became increasingly segregated, there is now a trend back towards integration, as redundant factories and warehouses are converted into apartments. A number of historic factories have such strong images that re-use is worthwhile even if it would have been cheaper to build anew. At the more modest end of the market, housing associations have found old buildings to be ideal for creating apartments for a wide range of age groups, the structures being durable, adaptable and well-located for shops and recreational facilities. There have also been many conversions to house students. A sensitive re-use scheme for a large dramatic building can create an atmosphere akin to a historic college at modest cost. Overseas industrial buildings have been converted not just as halls of residence but into teaching and research accommodation as well. [3]

Offices

Offices have been a prime re-use for industrial buildings. Many early conversions were on a modest scale and for firms involved in design work or the media, which seek low cost and simply-designed and serviced environments. The large uninterrupted floor spaces of factories and warehouses are ideal for open-plan office-working. These spaces can provide sophisticated working environment through carefully designed partitioning, lighting and furnishing. Large and prestigious firms in the other hand are choosy almost by definition. They need to have a prime location and buildings that reflect their corporate aspirations. As regards design, it has proved possible to adjust the image of high quality historic work to form highly desirable offices. [3]

#12

#13

#12   Oxo Tower Wharf, London - housing adaptation
#13   Daily Express Building, Ancoats, Manchester by Owen Williams- converted into offices by Michael Hyde and As sociates

Mixed use
With large complexes there are many merits in mixed uses. Different forms of building can house the most appropriate functions, financial risks are spread across different markets, and several sources of funding can be tapped. Above all, complementary functions—residential, office, retail and cultural—can feed off each other, making a scheme more attractive to all users and giving it long term vitality. [3]

Cultural use
A key element of a mixed-use scheme may be a cultural centre—to attract large numbers of visitors, make best use of any wide interior spaces and, possibly, to provide a means of interpreting the building and its history. This approach emerged in the 1960s. Subsequent schemes may simply include a flexible auditorium or display space, but a number seek to exploit the qualities of the buildings and their interiors in a more direct way. Curators and artist continue to appreciate the potential of industrial buildings to provide more challenging display spaces than offered by the “white boxes” of modernist galleries or the formal room of Victorian museums. Cultural facilities, whatever their precise use, act as lead projects, drawing in visitors, restaurants, income and hence further investment to the site. [3]

Monument and museums
At the opposite extreme to a commercial re-use, some types of industrial heritage, in particular structures such as furnaces or engineering features are most likely to be conserved as monuments. Some industrial buildings make much sense as monuments only if they retain the equipment to demonstrate a process. It is accepted that such complexes cannot be truly viable in terms of the visitors they attract, but are worth subsidizing for their uniqueness and educational potential. Nevertheless these historic equipments should be operated at the slowest speed to limit wear and tear.

There is a long tradition for saving industrial monuments by changing them into museums. An industrial monument rightly imposes constraints on the development of a museum, since public may fail to retain their enthusiasm for an attraction that cannot be transformed to keep pace with fashions for science centres and computer inter actives. Museum buildings must have high standards of environmental controls, services, and full access for the disabled. It may be difficult to reconcile these requirements with a purist approach to the conservation of a monument. Combination of monument, museum and process can be highly successful if the process is relatively economical to operate, produces a marketable product and is visually appealing to the visitor. [3]

The public expect working exhibits to be operating when they visit, demand high standard catering, and dislike the aura of dereliction. It may be that industrial museums are trying to offer too much, since most of the visits are made as a part of a day and customer mostly don't want to stay-away holiday. Families and couples do not want to spend too much of their time choosing between an exhibition, restored building and sites that are equally popular. Spectators now demand that museum should be more fun, children friendly and educational at the same time. [3]

According to Taggart (2000) the most popular uses for old industrial buildings include:

- Housing
- Offices
- Workshops
- Manufacturing space
- Storage space
- Art galleries
- Restaurants
- Bars
- Performance space
- Shopping facilities
- Community facilities
- Leisure facilities [10]

Where "twenty-four hour" building and complex is not probably desirable approach for community should redevelopment of the industrial sites do better than assemble a group of activities which are only active during the working day. Activities that attract people in the evenings and weekends, even if they require part of the buildings to be closed off, create occupancy and make the site more attractive to the local community. This is also in many cases the only way to reach economic viability. [10]

Even designing adaptation for the old industrial sites it has to be remembered that future use of the site might alter even further from the designed one therefore conservation, renovation and new design should be made adaptable and further flexibility should be taken into consideration while designing the futures uses.

#14 #16

#15 #17

#14 Snape, Suffolk - convertion to a concert hall
#15 Stucky Mill, Venice - mixed use with hotel, health and beauty centre and apartments
#16 Merseyside Maritime Museum in Albert Dock, Liverpool - museum adaptation
#17 The Iron Bridge, Coalbrookdale - monument approach

Building evaluation

#18 Installation of floor heating in Tadao Andos restoration of Punta della Dogana, Venice

Some conservationists and entrepreneurs believe they can recognise the potential of a building or complex and evaluate its quality through design and location. Most will prefer to combine their background knowledge of industrial archaeology and completed re-use projects with a sober analysis of the nature of the site, the plan, the structure and the condition of the buildings.
It is ideal if a building or a group of structures only cover around 60 per cent of a site, offering better natural lighting, space for on-site access, and potential for expansion. There may be a pressure to demolish some unprotected buildings on congested sites but on historically significant sites, the coherency of the complex should be retained. [3]

The diversity of industrial buildings makes for variety in re-use. Even though few schemes successfully break all the rules according to Stratton (2000) it is worth making some generalizations in industrial buildings:

- Single-storey buildings are ideal for industrial use or associated functions such as training workshops or storage
- Multi-storey (up to four floors) layouts are often desirable for office, craft and certainly for residential use
- A total floor space of 4,500–15,000 square metres is ideal for many conver sion projects. Those below 1,000 and above 15,000 square metres are tend ing to be more challenging
- Ceiling heights of around 4.3–4.9 metres are desirable for ground floors and 3–4.3 metres for upper floors; below 2.4 metres makes many new uses uncom fortable if not impossible.

The nature of a particular historic interior will reflect the original function of the building, and influence the appropriateness of different new uses. Small single spaces in single storey, attributes a character for specialized uses whereas a large single spaces, such as warehouses, offers more flexibility and easy movement in them. Small repeated spaces in old workshops, up to four storeys, offer small units but poor access to them whereas large multi-storied repeated spaces provide flexibility but faces difficulties in subdividing. An open internal structure gives full flexibility, especially if columns are widely spaced. Internal partitions contemporary to construction of the building can add greatly to the sense of character. [3]

Natural illumination will be adequate during daytime if the floor plan is no deeper than 15 metres, since outside light can normally reach around 7.5 metres. These shallow buildings are ideal for uses where occupiers are pre-occupied with individual tasks. Deeper buildings can facilitate greater interaction and may be essential to accommodate larger machinery or other equipment but will need an artificial lighting during daytime. Their cores may be best used for services such as kitchens or bathrooms or be given a central atrium.
In residential conversions internal galleries can be created with stairs and doorways, not forgetting the problems in structural member removal in protected buildings. Provision must be made for disabled access since most factories will have lifts but these may be antiquated and unsightly. It may be especially difficult to achieve access for wheelchairs to clusters of workshops with lay outs at different levels and narrow, stepped doorways. [3]

Services such as heating, water supply, sanitation and lifts will typically need to be replaced, though more of the character of an old building can be retained by refurbishing fittings wherever possible. Housing conversions usually necessitate the most intrusive changes, as all plumbing and electricity provision has to be duplicated. High standards of food hygiene will be needed for restaurants, and sophisticated systems of security and environmental control for museums. [3]

Material strength in historic buildings can be assessed by a structural engineer and several manuals on the appraisal of historic structures that have been written about them. These studies emphasize the extent to which the strength and consistency of building materials have advanced since their early usage. More reassuringly for conservationists, they argue that a structure is likely to continue to remain stable if it has not deteriorated and if the loading is not increased. Nevertheless structurally it is crucial to understand how dead and live loads are transferred from columns and walls to the foundations. The dead load carrying capacity can sometimes be estimated from the standards defined by building acts in force at the time of construction. Mills and warehouses were usually built with great reserves of strength, while workshops and sheds may be lighter in their construction. It will be advisable to calculating the current, actual loads and relating them to those associated with the proposed new use, especially if a significant increase in loading is anticipated. [3]

Fire risks have to be taken into account when converting industrial buildings, especially if meeting halls or sleeping accommodation is being created. Historic factories might have only one staircase and contain materials that are combustible or fail in a fire. Exposed timber members are safe only if they are over-sized, to retain structural effectiveness after a given period of combustion. Cast-iron can shatter when heated and rapidly cooled by water and steel loses half of its strength when heated up to 550°C. To protect such structures, sprinkler systems, intumescent paint or sprayed coating-paint is often needed to provide sufficient fire resistance of one and two hours. The alternative solution is boxing-in columns and beams resulting in loss of space and perception of spatial character. Fire safety should be considered at an early stage of conversion project to avoid destructive alteration work. [3]

Successful regeneration

Regeneration is more about creating sustainable, vibrant communities than fixing bricks and mortar. Of course, by improving the quality of the built environment, the quality of residents' lives can be radically improved but creating community is about giving residents a sense of identity, pride and belonging; listening to their needs and desires; taking their views into consideration and, most importantly, ensuring they feel valued and respected.
The long term success of any regeneration project depends on community involvement. The excitement built in a redevelopment will soon wear off if the adaptation will not work for the local residents. Therefore a combination of good design, quality construction and meaningful community engagement is needed to ensuring the good intentions of the redevelopment and creating the successful regeneration. [11]

According to Duncan McCallum a checklist for successful regeneration would be as follow:

A strong vision for the future
– that inspires people and makes them want to get involved.
A respect for local residents and businesses
– who have often fought hard to stop an area declining; ensuring they are included in a regeneration partnership means the project starts with community commitment.
A tangible link to the past
– since places are not created in a vacuum, and people need familiar elements, visual reminders and a sense of continuity: landscapes, streets, spaces, buildings and archaeological sites play a part in defining a sense of place.
An understanding of the area
– since knowing what exists and how it came to be as it is makes it easier to plan its future.
A respect for what already exists
– making sure that places people will value are kept for the future.
A record of the area before work starts
– so that future generations can understand how the site has evolved.
An integrated, sustainable approach
– not concentrating on a particular social, economic or environmental consideration or a single use.
Achieving the right pace
– regeneration that happens too quickly can harm the fabric and the community, while that which happens too slowly fails to create the momentum, commitment and enthusiasm needed to make a scheme a success.
The highest quality design and materials
– to enhance local distinctiveness and sustain a sense of place that people can be proud of.
Early discussions between the community, the local authority and other interested parties
– ensuring that options can be discussed and designs modified at an early stage, before too much has been committed.[12]

The existing urban form should be view as a starting point, to be upgraded, through different theoretical approaches, still achieving balance between preservation and adaptation. The public will only understand the importance and share the specialist's enthusiasms for conservation if the historic buildings are made attractive and usable. The different conservation approaches can be listed with some of their authors as follows:

John Ruskin
conservatism

Viollet-le-Duc
stylistic approach

Camillo Boito
philological approach

Luca Beltrami
historical approach

Gustavo Giovannoni
scientific approach

Cesare Brandi
critical approach

Alois Riegl / Max Dvorak
value theory

Ambrogio Annoni
"case by case" approach

Whichever approach is selected it is crucial to conduct a throughout investigation of the existing facilities. It is necessary to document the existing stage and all the changes for the future generations, as some of the conservation approaches suggest. In this particular context buildings and their restoration plan should be evaluated individually. The new design does not have to follow any existing guidelines necessary, but can vary in accordance to the context; main interest should still be balance between preservation and added flexibility for future changes and functions.

Our opinion about conservation approaches toward the Ignacy mine will be stated in the report after registration chapter.


#19

Context Analysis

Context analysis are always important when starting an architectural project. The relation of the design proposal to it's surroundings is significant. In case of an adaptation of an historical site the significance becomes even grater. The Silesian voivodeship is a unique and diverse region. Therefore we decided to include in our analysis not only the historical background of the site but also the history of industry in Silesia.

The post-industrial areas, those remaining after the closure of industrial plans or belonging to the plants in the process of closure, occupy a considerable area of Poland (about 8 000km2) [1] and are mostly located in Silesia. Each of the sites is in certain way unique and in the process of redevelopment it is important to acknowledge that. For that reason our analysis of the 'Ignacy' mine include a fairly detailed registration of the site.

History of industry in Silesia

Due to the time limitations the history sections are placed in the report as a straight quotations from the Route of Industrial Heritage and the Association of Historic Mine Ignacy web pages.

“The region of Silesia has the greatest concentration of industrial objects in Poland. They constitute the wealth of the region. They give it a specific character and define the cultural identity. Their uniqueness and authenticity make them an integral part of the European cultural heritage. Lasting for over two centuries the development of industry on these lands caused Silesia, a peripheral region on the European scale, to become one of the leaders in the industrial era. Without the knowledge of this process there is no means of understanding the turbulent history of Silesia.
From ancient times, in the territory of the present region of Silesia, mining for ore have been developing. This includes silver and lead (Bytom, Tarnowskie Góry, Toszek) and mining for turf iron ore (the region of the river valleys of the Liswarta, Mała Panwa, Stoła, Bierawka, Ruda and also the iron bearing belt Wielun - Zawiercie). Until the 14th century forest forging endured, then developing into workshop and riverside forging. Equally the Cistercians, arriving in the 13th c. took up mining and forging, they possessed forges in Trachy (Sosnicowice municipality) and Stanica (Pilchowice municipality). Glassworks also developed with the Cistercians.

In the mid 18th century the development of industry in Europe brought significant social and economic changes to Silesia. An important stage in industrial development was the establishment of the Higher Mining Authority with its seat in Wrocław, in 1779 with Wihelm von Reden at its head. Owing to him, new technology, machines and qualified personnel were brought to Upper Silesia. The development of industry attracted the attention of the local feudal landowners, who saw a chance of increasing their estates. Among the industrial potentates one may count magnate families, including the Donnersmarck, Ballestrem, Schaffgotsch, Hochberg and Hohenlohe families. Greater industrial ancestry of the local inhabitants only appeared in the zinc industry, i.e. Godula, Winckler. Land rich in natural resources was covered with mineshafts, spoil dumps and foundry furnaces, new towns also arose. In the Austrian part of Silesia, Bielsko was the symbol of industry, where mainly textile factories developed. The development of industry enforced the building of an infrastructure to meet the needs of the developing transport of raw materials and ready products. New railway lines and stations were built. Throughout the 20th century, metallurgy in Silesia with regard to technological development was one of the European leaders. In the same period mining, integrally joined with metallurgy, was subject to a significant transformation as a result of developments in the coal extraction techniques, among others. The concentration of the 19th century industry, and also the prevailing economic policies in Poland after 1945, caused many historical establishments having historic machines, equipment and whole technological lines to continue to operate till the end of the 20th century. Together with the currently progressing processes of industrial restructuring, which began in the 1990s, and consequently with changes in ownership and the closure of establishments working till that moment, came the process of their devastation. It is connected with scrapping of historic machines and buildings demolition. A chance exists though to preserve some parts of the industrial heritage through their adaptation to new functions, e. g. the Mokrski Brewery in Katowice-Szopienice, the “Wilson” Shaft in Katowice-Janów. Industrial monuments also have a substantial tourist potential, on condition that their renewal

The greatest concentration of industrial objects in Poland that defines the cultural identity of Silesia .

#21 Poland / Silesia Province

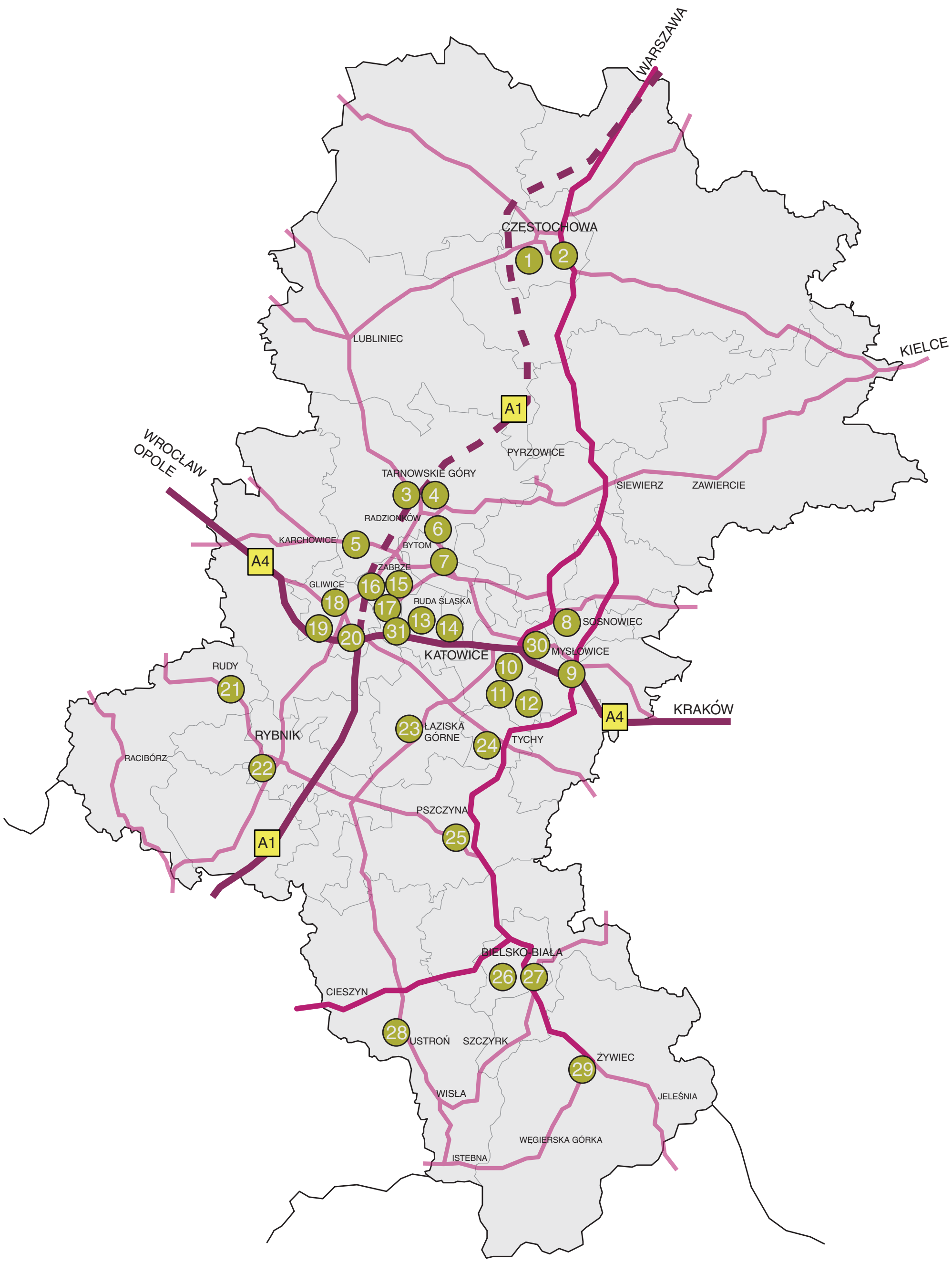
Silesia Province

Created in January 1999 is the fourteenth voivodeship in Poland in therms of the area (12 294 km2) and second in therms of population (4, 83 mln inhabitants). The population density is 394 inhabitants per km2, the highest in Poland. The Silesian voivodeship is located in the south of Poland and is divided into 19 city counties and 17 land counties whish are further divided into 166 districts (gminas). There are 71 towns and 1518 villages in the area. The capital of the province is Katowice (329 000 inhabitants).

The silesian voivodeship is the most industrialised region in Poland. The Upper Silesian Industrial District comprises the industrial units in the central-east part of Upper Silesia and Dabrowa Coal Mining Region. There are also several minor industrial districts around the bigger cities (Czestochowa, Bielsko-Biala).

Because of its geographical situation and natural resources, the Silesian region has been the object of numerous diplomatic and military actions by neighbouring countries throughout the ages. Silesia has become a multicultural region due to past changes in affiliation of this area (Polish, Czech, Austrian and Prussian).[1]

Industrial monuments in the Silesia Province



#22 Industrial monuments in the Silesia Province

1 **MUSEUM OF THE PRODUCTION OF MATCHES**
in Czestochowa

2 **MUSEUM OF RAILWAY HISTORY**
in Czestochowa
Dworzec PKP Stradom

3 **BLACK TROUT ADIT**
in Tarnowskie Góry
Park Repecki

4 **HISTORICAL MINE OF SILVER ORES**
in Tarnowskie Góry

5 **HISTORIC “ZAWADA” WATERWORKS**
in Karchowice

6 **MUSEUM OF BREAD**
in Radzionków

7 **UPPER SILESIAN NARROW GAUGE RAILWAYS**
Bytom - Miasteczko Slaskie

8 **RAILWAY STATION**
in Sosnowiec

9 **CENTRAL FIRE SERVICE MUSEUM**
in Mysłowice

10 **“WILSON SHAFT” GALLERY**
in Katowice

11 **NIKISZOWIEC WORKERS’ HOUSING ESTATE**
in Katowice

12 **GISZOWIEC MINERS’ SETTLEMENT**
in Katowice

13 **RAILWAY STATION**
in Ruda Slaska - Chebzie

14 **“FICINUS” WORKERS’ HOUSES**
in Ruda Slaska - Wirek

15 **MUSEUM OF COAL MINING**
in Zabrze

16 **OPEN AIR MINING MUSEUM “KRÓLOWA LUIZA”**
in Zabrze

17 **“MACIEJ” SHAFT**
in Zabrze

18 **GLIWICE RADIO STATION**
in Gliwice

19 **MUSEUM OF SANITARY TECHNOLOGY**
in Gliwice

20 **DIVISION OF ARTISTIC FOUNDRY**
in Gliwice

21 **AN ANTIQUE RAILWAY STATION OF NARROW GAUGE RAILWAYS**
in Rudy

22 **HISTORIC “IGNACY” MINE**
in Rybnik

23 **MUSEUM OF ELECTRIC ENGINEERING**
in Łaziska Górne

24 **BREWING MUSEUM**
in Tychy

25 **MUSEUM OF SILESIAN PRESS**
in Pszczyna

26 **MUSEUM OF TECHNOLOGY AND TEXTILE INDUSTRY**
in Bielsko-Biała

27 **RAILWAY STATION**
in Bielsko-Biała

28 **JAN JAROCKI MUSEUM OF USTRON**
in Ustron

29 **ZYWIEC BREWERY**
in Zywiec

30 **“SILESIAN PORCELAIN” FACTORY**
in Katowice

31 **THE HISTORIC “GUIDO” COAL MINE**
in Zabrze

is performed and they are adapted to the purposes of education, recreation and culture-forming.

Among the examples of industrial monuments in the Silesia region, mining has the dominant representation. Mining constituted the fuel base for the remaining sectors of industry. From the end of the 18th until the 1970s this sector was developing intensively. Objects from the middle period of mining development, that is the second half of the 19th and the beginning of the 20th centuries, are particularly valuable because of their age and from the architectural and technical point of view. These include, among others, Mine of Silver Ores and the Black Trout Adit in Tarnowskie Góry; the mines “Królowa Luiza”, “Guido”, “Pstrowski” in Zabrze-Mikulczyce; the “Saturn” mine in Czeladz; the “Pułaski” shaft of the “Wieczorek” mine in Katowice-Szopienice; the “Elzbieta” shaft of the “Polska” mine in Chorzów.

The second highly developed sector is metallurgy. Its development was caused by the building of great furnaces in 1796 in the Royal Iron Foundry in Gliwice (now GZUT S.A.). Its co-designer was John Baildon. The next foundry , after Gliwice, financed by the King of Prussia was the “Royal Foundry” in present-day Chorzow. Private iron foundries rose on the state example in the 19th century, in neighbourhoods where there were coal mines. Among the historic metallurgical objects, one may name many, which have historic or artistic value; they include buildings of the former zinc foundry “Uthemann” on the site of the present Nonferrous Metals Foundry in Katowice-Szopienie; “Baildon” foundry in Katowice; the group of buildings of the zinc rolling mill in the “Silesia” Metal Establishments in Swietochłowice-Lipiny; the “Gichta” charge tower of the “Waleska” foundry in Palowice; the multi-furnace charge extraction tower in Poreba; the “Klemens” and “Teresa” foundries in Ustron; “Huta Bankowa” foundry in Dšbrowa Górnicza; “Huta Czestochowa” foundry in Czestochowa.

Developing industry was assist-

#23 #24

#23 Miners change shifts at a mine in Zabrze, Poland. Mining certainly poses risks, but it also provides 100,000 jobs in Poland.

#24 These residents of Bytom pass near a power plant built in 1920, which was among the largest in Europe in the 1930s. Now used for a few months each year, it is slated to close down for good in 2015.

ed by auxiliary investment, of which the most important was the Kłodnicki Canal, which was begun in 1792, connecting the Zabrze mine with the Royal Iron Foundry in Gliwice, and via the Oder with other territories of the Prussian state. Sections of the canal and hydro-technical equipment are still visible on the terrain. The next water route is the Gliwicki Canal built in the years 1933-1940. The canal is 40.6 km long, and its greatest sluice is the “Dzierzno” sluice.

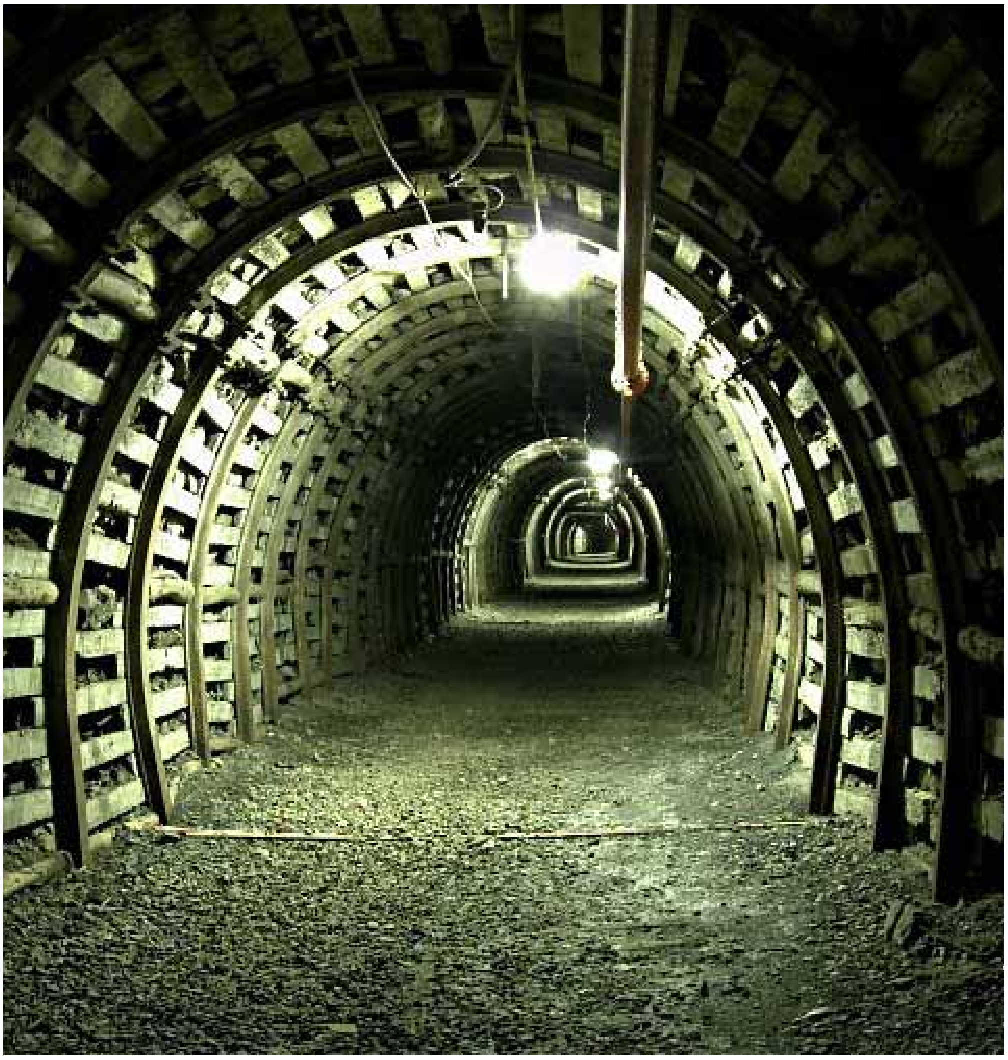
In the second part of the 19th century as a result of mining operations, an inflow of water took place into the mining excavations. This caused a disappearance of water from domestic wells. Additionally, the situation was made worse by the continually increasing number of people. The search by drilling began, which resulted in finding water sources in the surroundings of the village Zawada, where the “Zawada” Water Production Plant in Karchowice was settled. Other historic complexes are: the “Staszic” Water Production Establishment in Tarnowskie Góry; the Watermain and Sewerage Establishment in Raciborz; the sewage cleaning plant in Bytom; the iron reinforced concrete water dam and hydroelectric generating station in Poršbka (1928-1937); hydro-technical equipment in the former cardboard factory in Czaniec (Poršbka municipality).

A numerous group of historical objects, having regard for the novel construction, shape and architectural detail, is made up by water pressure towers. Among them one might mention: the water chimney tower at the clinical hospital in Zabrze designed by A. Hartmann; the water tower at Korczaka St. in Katowice built by G. and E. Zillmann in 1912; a water tower in Katowice-Giszowiec and in addition the numerous water towers in Rybnik, Gliwice and Swietochłowice.

The sudden 19th century expansion of the railway network began in 1846 with the opening of the Mysłowice-Wrocław railway line, in 1855 the Bohumin-Oswiecim line, and in 1859 the branching off from the Warsaw Vienna railway line commenced. Then the railway stations in Bielsko-Biała, Katowice, Rybnik-Paruszowiec, Sosnowiec-Maczki, Zawiercie were built.. The narrow gauge railway was also built including the routes: Tarnowskie Góry - Rudy, Bytom-Karb - Chorzów, Bytom - Miasteczko Slaskie. Many buildings, tracks and rolling stock have survived to this day and many of them are cared for in established museums and open-air museums.

In the territory of the present Silesia region the textile industry also developed, particularly in Bielsko-Biała, Czestochowa and Sosnowiec. In the 19th century many spinning mills, weaving mills and dying plants were established. The most important of these included: the Adolf Mänhardt Factory, the cloth factory of Franz Vogt (now the offices of the City Council), the weaving mill of Fryderyk Tyslovitz in Bielsko-Biała; the”Elanex” Czestochowa Woollen Industry Establishment in Czestochowa; the Sosnowiec Top Spinning Mill “Politex” in Sosnowiec. The Museum of Weaving Industry and Technology has been established in the former Büttner cloth factory in Bielsko-Biała.

The radio station complex in Gliwice is a



including Simoradz (Debowiec municipality), Swib (Wielowies municipality), Kochcice (Kochanowice municipality). There are also preserved: the former wine-making establishment in Raciborz founded in 1872; the rum and liqueur factory of Arnold Gross in Bielsko-Biała founded in 1854."[13]

There is a clear understanding of the great value this region represents. The Industrial Monuments Route of the Silesian Voivodeship lately became part of the European Route of Industrial Heritage and the redelopment of many sites is in progress. The region is the most industrialized part of Poland with many factories and mines at use. However the number of unused industrial sites is growing. Part of them will not avoid demolition to make place for new buildings, but many of them have an important historical value and would preferably be preserved. The question is what to do with all of heritage sites? They can not all become museums and heritage parks, the renewal should be carefully planed with a balance between historical preservation and adaptive reuse. One could suggest that an urban think tank, e.g. Design for London, would be at hand to create a unified strategy for the whole region.

monument of historic technology unique in European communication. The complexes are composed of three buildings and a wooden mast of a height of 110.7 m, which dates back to 1933. The Radio Station is protected because of its engineering and historical value.

There are interesting examples of wood and paper industry such as the Match Industry Factory in Czestochowa, which was founded in 1880-1882, with a still operational production line from the 1930s, the"Solali" Zywiec Paper Establishment in Zywiec; the cardboard factory in Czaniec (Poršbka municipality).
The former cement complexes plant of "Grodziec" in Bedzin, built in 1856; the cement works in Jaworzno-Szczakowa; and the lime plants in Mikołów-Mokry, Tarnowskie Góry, Sosnowiec are among other similar valuable industrial and technical objects.

The electricity generating industry has also left many historic relics linked with other industrial sectors. They include: the "Szombierki" power station, the "Miechowice" power station in Bytom and the power station at the "Anna" mine in Pszów.

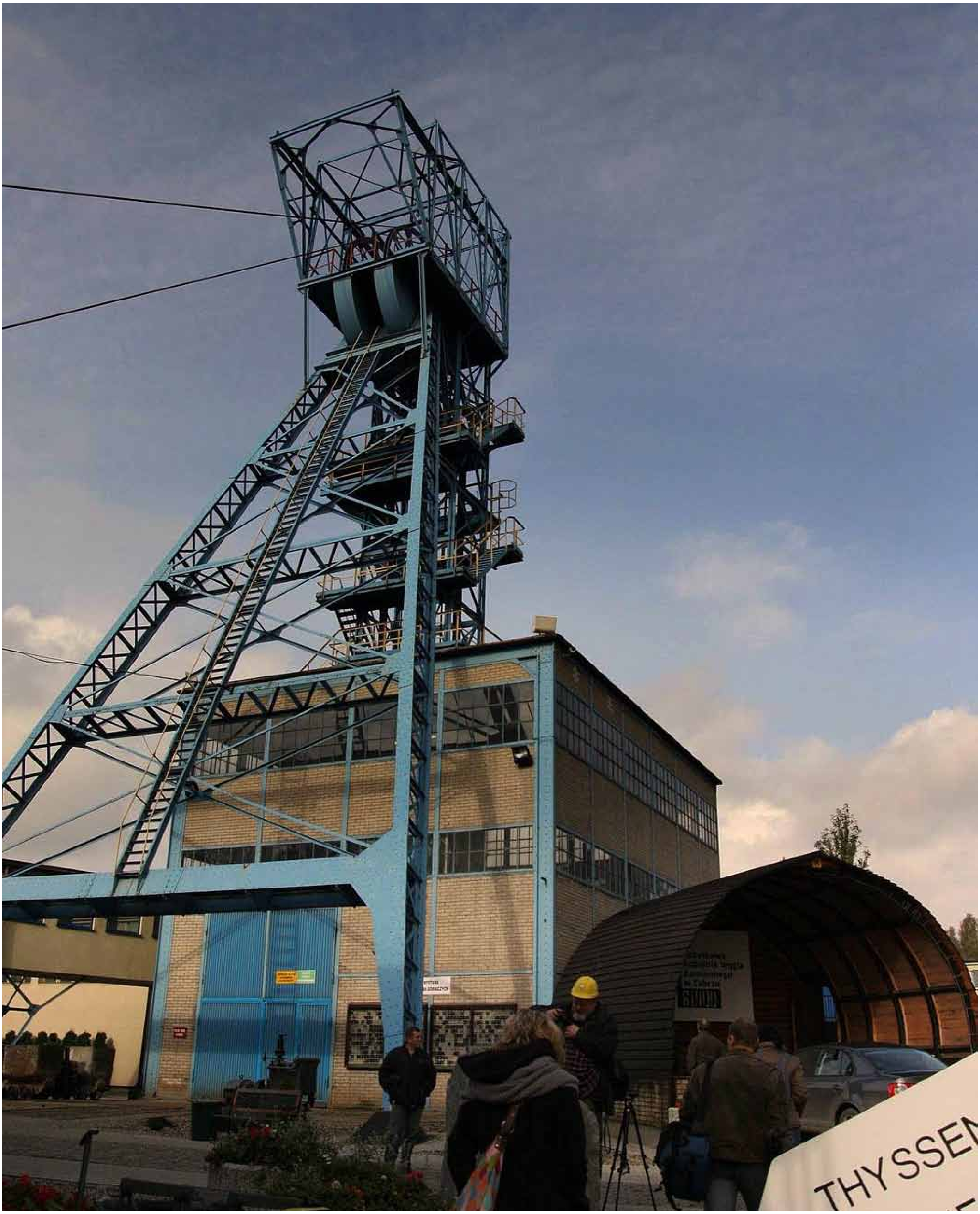
In Silesia region many historic relics of the food industry has been preserved. Among them the most numerous are breweries, which are still in use. The oldest of them is the castle brewery in Raciborz, which was mentioned as early as in the 16th century. In turn, the largest one is the brewery in Tychy. Other breweries include: the brewery in Cieszyn; the Mokrski brewery in Katowice-Szopienice; the brewery in Zywiec founded in the mid 19th century by Albrecht Fryderyk Habsburg. The second part of the food sector is represented by the distilling industry. In the region there are many stills, of which only some are still operating. They are mainly situated in palaces or manorial agricultural estate complexes,

#25

#26

#25 Historic Mine Guido in Zabrze
As one of several tourist attractions you can explore the footpaths 170 and 320 meters under the ground .

#26 Historic Mine Guido in Zabrze
Due to actions taken by many people, who care about the preservation of the industrial heritage of our region, appropriate measures have been taken in order to save this place by adapting it for museum and tourist purposes


THYSSEN

Location

Ignacy Mine is located in
-south Poland
-Silesian Voivodenship
-City of Rybnik
-District Niewiedom

#27

#28

#27 Satellite photo of the Ignacy Mine and surrounding areas

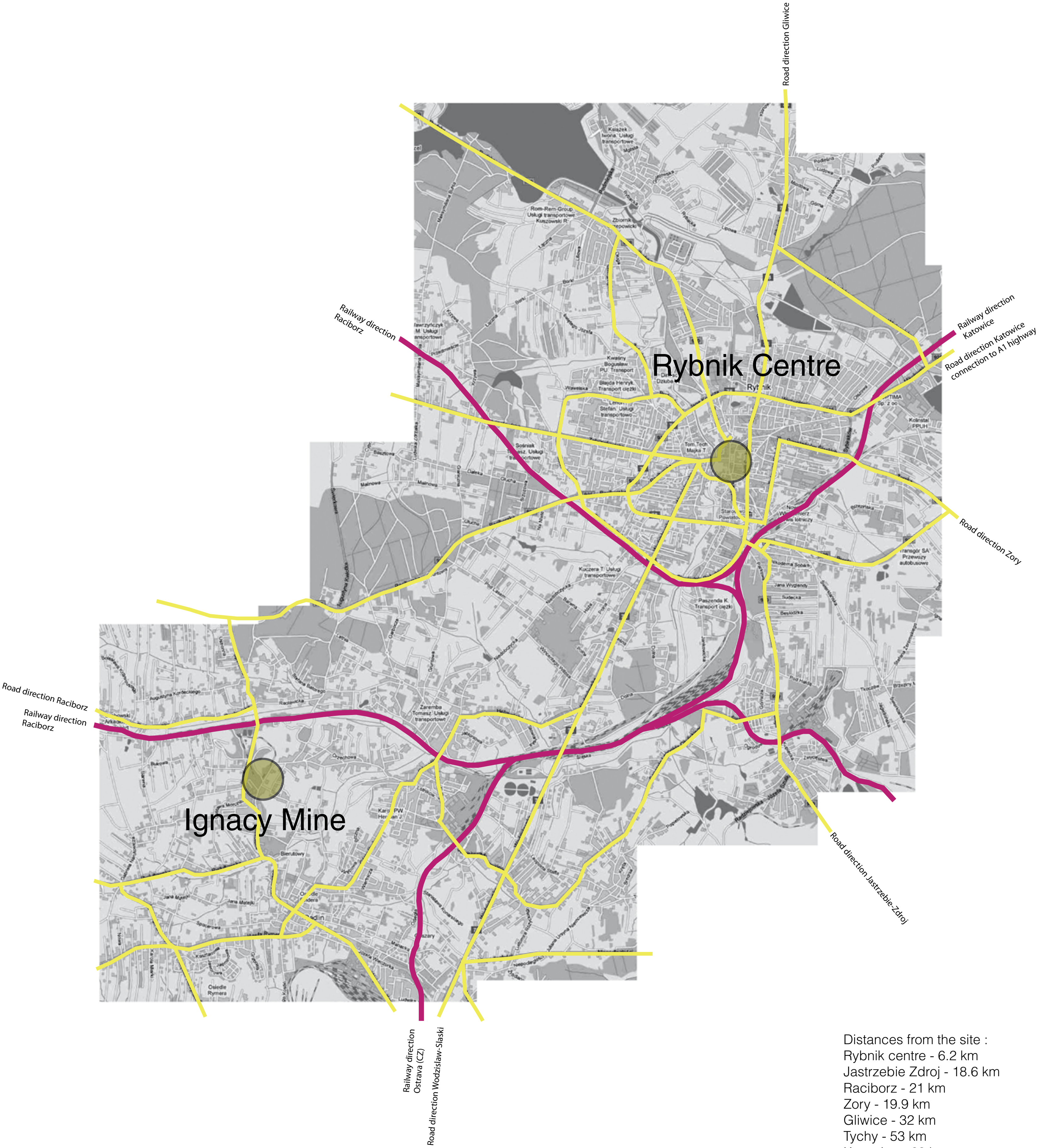
#28 Connection from our site to the centre of Rybnik and major cities in the area

#29 Silesia /Rybnik

Rybnik is a city in southern Poland, in the Silesian Voivodeship. Rybnik is located close to the border with the Czech Republic and just outside the southern border of the largest urban area in Poland, the Upper Silesian Metropolitan Union. Rybnik is about 290 km south of Warsaw and about 100 km west of Kraków.
The city of Rybnik has a population of about 141,387 (June 2009), and its metropolitan area is 0.7 million. The Rybnik area is an important economic region of Poland, and visible centre of culture. Rybnik is a county divided into 27 districts that have its own administrative body.[14]

#30 Rybnik / Niewiadom

Niewiadom (sl. Niewiadum, Czech. Nevedomí otherwise Hoym) -one of the 27 districts of Rybnik, situated in south-west of the city.
Documents show that Niewiadom (then spelled "Noviedomie"), already existed in the first half of the fourteenth century. In 1792, on the border of Radlin and Niewiadom one of the first in Silesia coal mine was opened, Hoym Extraction was carried out in the mine to 1995
In 1955 enrolled into the city Niedobczyce.
In 1975 Niewiadom became a part of Rybnik. [15]

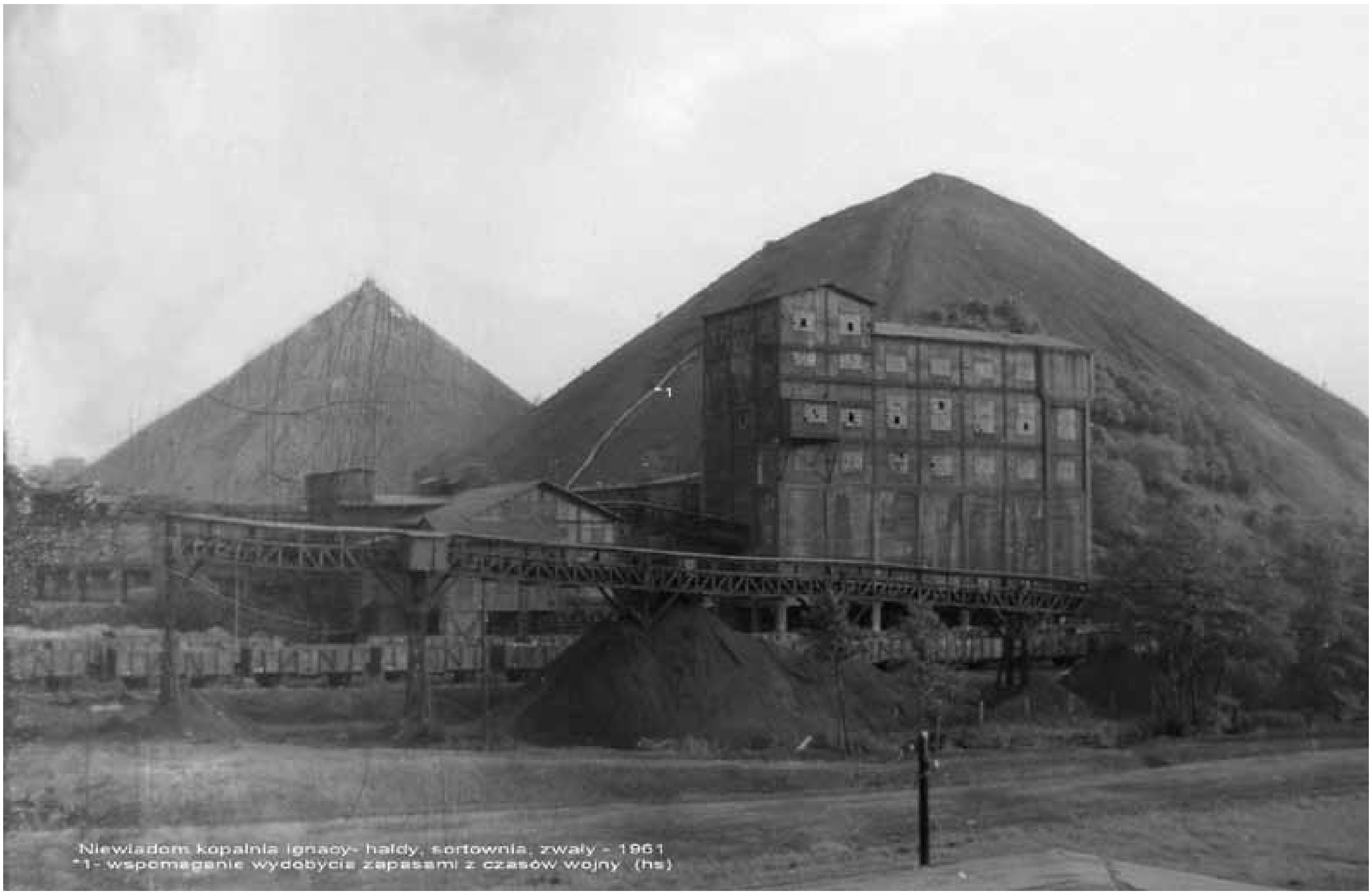


Distances from the site :
Rybnik centre - 6.2 km
Jastrzebie Zdroj - 18.6 km
Raciborz - 21 km
Zory - 19.9 km
Gliwice - 32 km
Tychy - 53 km
Katowice - 60 km

History of the mine

"The beds of coal were discovered in Niewiadom by Reichardt (a mining assessor) and Salamon Isaac (a juror) in 1788. They were both commissioned to look for coal in the area by the Upper Mining Office in Wrocław.
The "Hoym" coal mine was established in 1792. It was initiated by the Minister of the Silesian Province- Charles Hoym. It was a state-owned mine, situated between Niewiadom and Biertułtowy, where the beds were exploited by twenty shallow shafts. About 150-220 tones of coal were mined there every year. Soon next coal mines started to appear in the area.
In 1871 nearby mining fields were joined and, as a result, a miner's guild and a mine called "Consolidated Mine Hoym-Laura" came into being. In the same year they started to build two shafts – Kosciuszko (Grundman) and Głowacki (Oppurg) which still exist. In 1890 the Consolidated Hoym-Laura was bought by Duke Hugo zu Hohenlohe-Ochringen. In 1913 his heir, Duke Christian Krat, handed the mine and the mining field "Omer Pascha" over to a company "Czernica Coal Society" seated in Wrocław. The society was the owner of the mine till 1939.
In 1856 a railway station in Niewiadom was built and on 1st September it was opened for public use. Nearby the station a sorting place and a washer were built. In 1858 the mine managed to get a siding together with a loading platform. In 1924 the mine returned to using its previous name "Hoym" and in 1936 it changed the name into "Ignacy", after the first President of the Republic of Poland – Ignacy Moscicki.
In 1940 the mine Ignacy (then called "Hoymgrube") was joined to the national German corporation "Hermann Goring Werke" and it worked for the German Reich.
After the Second World War the mine became the property of the Polish Treasury and it was supervised by the Coal Industry Union in Rybnik. In 1963, 3059 tones of coal were mined every day, which was the highest result in the history of the mine. At that time 2795 people were employed in the mine .
In the following years there was less and less coal in the mine and on 1st January 1968 it was made a part of a neighbouring mine "Rydultowy". In 1992 the siding stopped working and the last truck of coal was mined on the 11thAugust 1995.
That was the end of the production in this mine.

However, coal mining lasted till 1996, the output was transported at the level of 800 metres to the shaft Leon 2 in Rydułtowy Mine. The real liquidation of the Ignacy Mine took place on 13th September 2006 (Friday). On this day the carrying ropes and the winding machine of the shaft "Kosciuszko" were



taken apart. The shaft has been filled up with granite rock since 22nd September 2006.
The steam-powered winding machine stopped working but it was still functional.
A steam-powered machine of the shaft "Glowacki ", dating back to 1900, still works as it is used to liquidate the shaft "Kosciuszko" and the shaft "Głowacki" is used as a ventilation shaft.
This year, it is 216 years since the "Ignacy-Hoym" Coal Mine was established." [16]

In 1999 the Association of Historical Mine "Igncy" was established. It is a community initiative that is supported by the city of Rybnik and the director of coal mine "Rydułtowy.

The basic foundation of the Association is to cultivate the traditions of mining and mining heritage and to promote traditions and history of the region. The main agenda is the creation a museum of the Ignacy mine and organization of various events with relation to the site.
Today the Association has 24 members. [16]

#31	#32

#31 Ignacy Mine in 1961

#32 Ignacy Mine in 1961, slag heap and sorting plant

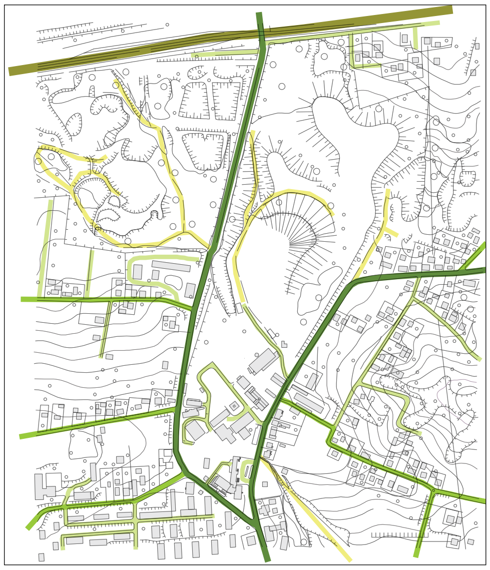
Mapping

The surroundings of the Ignacy mine will be analysed through mapping. This gives an recognition of the context and eventual impacts of our project on the area.

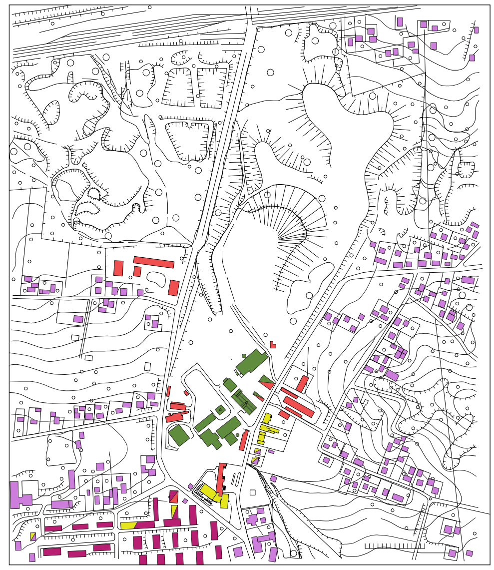
Mapping is done according to Kevin Lynch theories with additional analysis of green areas, polluted areas, climate and shadow analysis.

Lynch's most famous work, The Image of the City published in 1960, is the result of a five-year study on how users perceive and organize spatial information as they navigate through cities. Using three disparate cities as examples (Boston, Jersey City, and Los Angeles), Lynch reported that users understood their surroundings in consistent and predictable ways, forming mental maps with five elements:

paths - the streets, sidewalks, trails, and other channels in which people travel;
edges - perceived boundaries such as walls, buildings, and shorelines;
districts - relatively large sections of the city distinguished by some identity or character;
nodes - focal points, intersections or loci;
landmarks - readily identifiable objects which serve as external reference points.
[17]



#33 Paths



#34 Districts

Paths

Paths are familiar routes followed "… the channels along which the observer customarily, occasionally, or potentially moves. They may be streets, walkways, transit lines, canals, railroads." [18]

Paths are the major and minor of circulation that people use to move about. A district has a network of major routes and a neighbourhood network of minor routes. Major routes surrounding the project area are Sportowa street and Ignacego Moscickiego street. Further to the north Przyjemna works as a perimeter to the project area as well as Ludwika Zamenhofa and majora Brunona Janasa in the west. Only road occupied with notable traffic most hours of the day is Sportowa. Sportowa and Ignacego Moscickiego are in direct connection to the project site.

Districts

Districts "are medium-to-large sections of the city, conceived of as having two-dimensional extent, which the observer mentally enters 'inside of'." [18] and which are recognizable as having some common identifying character.

The site Kopalnia Ignacy-Hoym is situated in city district Niewiadom in Rybnik, Silesia, Poland. The site is an old coal mine complex that has been in use of coal extracting from 1792 to 1996 liquidated in 2006. Site is dominated by old industrial buildings common for the coal mining industry and a slag heap where the excessive soil from the mines shafts below has been dumped. Some of the existing buildings have partly been adapted to use while few other protected buildings are undergoing restoration work. Residential areas surround the site built to support the mine and the workers while the mine was still functional.

Landmarks

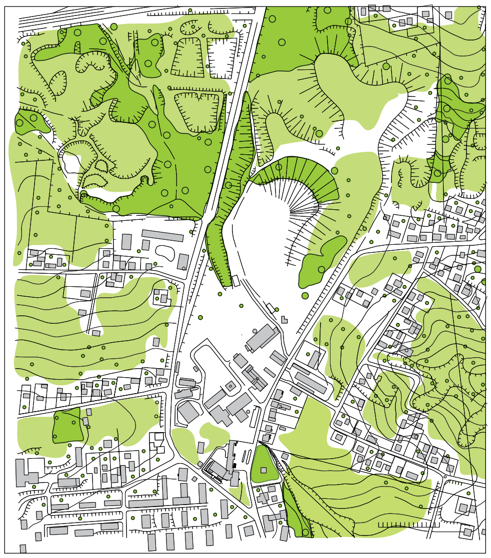
Landmarks "are another type of point-reference, but in this case the observer does not enter within them, they are external. They are usually a rather simply defined physical object: building, sign, store, or mountain" [18]

There are five visible landmarks on a site and in the nearby area. The slag heap, reaching up to 62 meters this man made mountain is seen from all around Rybnik. The soil from the slag heap is been excavated and put into use making the heap slowly disappear. The old water tower, combined from old chimney shortened in 1880 and steel tank added on top of the chimney in 1952, this tower is nowadays working as a 46-meter seeing tower open for public. The factory chimney towering over the site reaches 100 meters in height. The chimney itself is not in use anymore even though the factory is still in industrial use. Headrooms, steel tower structure for the mine shafts "Kosciuszko" and "Głowacki" still characterizes the site as an old coal mine complex reaching the approximate height of 40 meters each.

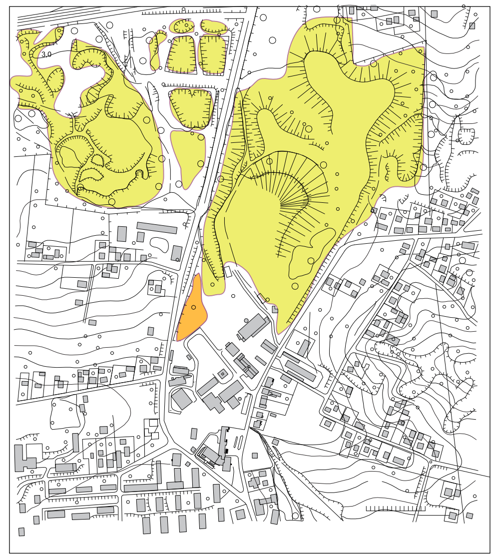
Nodes

Nodes "are points, the strategic

#35 Landmarks - nodes - edges



#36 Green areas



#37 Polluted areas

spots in a city into which an observer can enter, and which are intensive foci to and from which he is travelling. They may be primary junctions, places of a break in transportation, a crossing or convergence of paths, moments of shift from one structure to another. Or the nodes may be simply concentrations, which gain their importance from being the condensation of some use or physical character, as a street-corner hangout or an enclosed square. "[18]

Niewiadom's local cinema and culture house is located on a southern side of the site, behind them is the bus station and across the street a small park that gatherers the people especially the regions youth. Small shops and offices are placed alongside Ignacego Moscickiego street and the site Ignacy-Hoym itself serves as a meeting point for the people. Further to the north the Niewiadom's train station is a notable node even though it has no straight connection to the site. Smaller nodes and crossing are scattered around the site were different means of transportation meets.

Edges

"Dividing lines between districts are the linear elements not used or considered as paths by the observer. They are boundaries between two phases, linear breaks in continuity: shores, railroad cuts, edges of development, walls" [18]

The sites edges can be defined on northern side to be slag heap and further on the train tracks, ul. Sportowa running alongside of the site on a western side and Ignacego Moscickiego on a eastern side of the site.

Green areas

The darker green colour indicates trees and higher vegetation, located mostly to the north from the mine. The trees are partly covering the slag heap. The light green indicates grass and fields located mostly besides the single family housing.

Pollution

A spoil tip (also called a slag heap, bing, boney piles, culm, waste coal, gob piles, slate dumps or pit heaps) indicated by the yellow colour is a pile built of accumulated spoil - the removed overburden, which is a by-product of coal and ore mining. These waste materials are mostly composed of shale, as well as smaller quantities of carboniferous sandstone and various other residues. As to the rehabilitation, landfills are often covered with topsoil, and vegetation is planted to help consolidate the material. There has also been research into various recycling techniques, which result in spoil being removed from the site and potentially used for other commercial or construction purposes.

The orange colour indicates a small car scrap yard. Accidental spills and releases of vehicle fluids are the most common cause of environmental damage found at automobile salvage yards. Spills can occur if fluids are left in the vehicle when stored in the yard. Soils contaminated by heavy metals can be a concern at automotive salvage yards as well.
Although excavation and landfill disposal are suitable for any amount of contaminated soil, on-site treatment is suitable only for relatively small releases where there is no potential to impact surface waters, adjacent properties or sensitive environments. It is usually necessary to carry out a site survey for contamination before a redevelopment scheme for a site can be finalised.

Mapping analysis show that the site is placed rather fortunately in the Niewiadom district. Located centrally and very close to the main nodes. It's a perfect location in the aspect of local authenticity.

But in a city scale it's a more remote location which makes it harder to promote the site for the future investors. In that sense there is a bigger pressure to make the design attractive and unique. One could assume that if the importance of the site becomes more significant and the redevelopment is a success, in the future the local authorities might invest more money into the surrounding infrastructure. The best solution would include co-operation with the local authorities on that issue from the start.

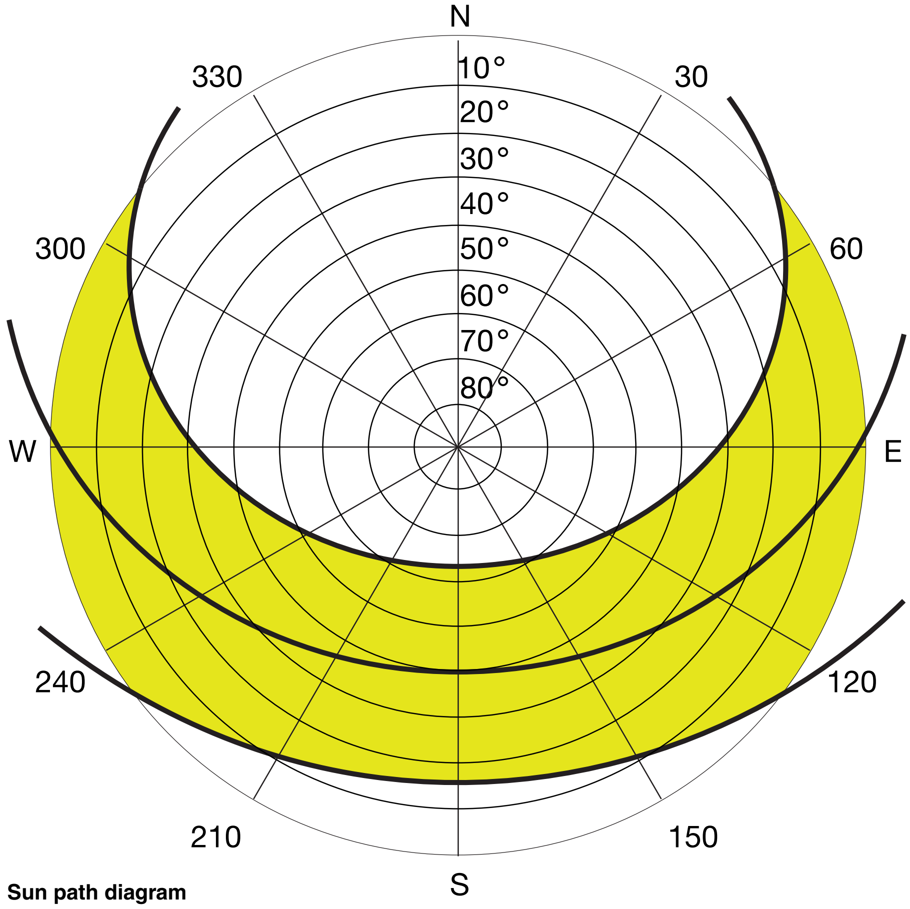
Climate & Shadow analysis

The macro climate is an important parameter for the design because it affects the buildings physical restrictions.

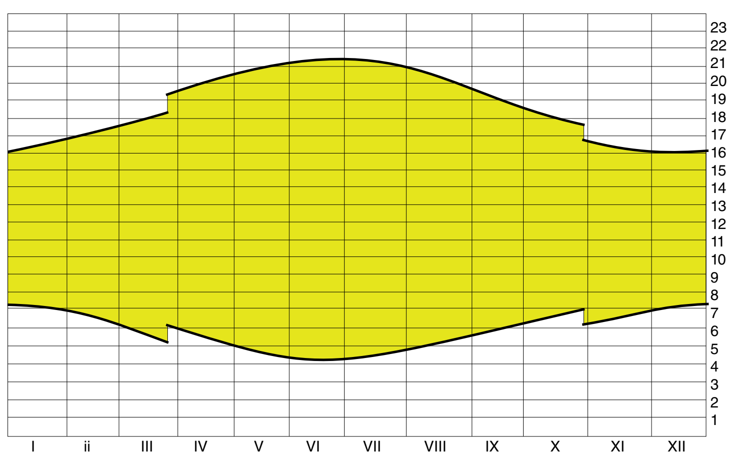
Rybnik climate is mild, which is affected by: the neighbourhood of the Odra River, forest east of Opole province, and most of all a short distance from the exit of the Moravian Gate, where the flowing mass of warm, humid air. The growing season of plants is from 210 to 230 days, frosts are recorded within 80 to 100 days per year and snow is 60 to 90 days.

Temperature:
The average annual temperature ranges from 7 ° to + 8 °. Is warmest in July, when the average temperature is 17 ° C to +19 ° C, while the coldest month is January, then there has been a medium-to-3 ° C 2 ° C.

Precipitation:
Precipitation ranges from 600 - 900 mm per year.



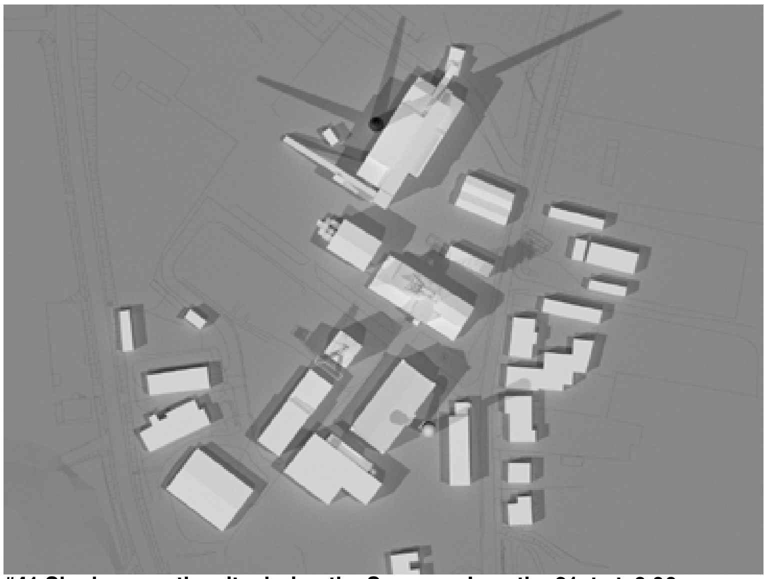
#38 Sun path diagram



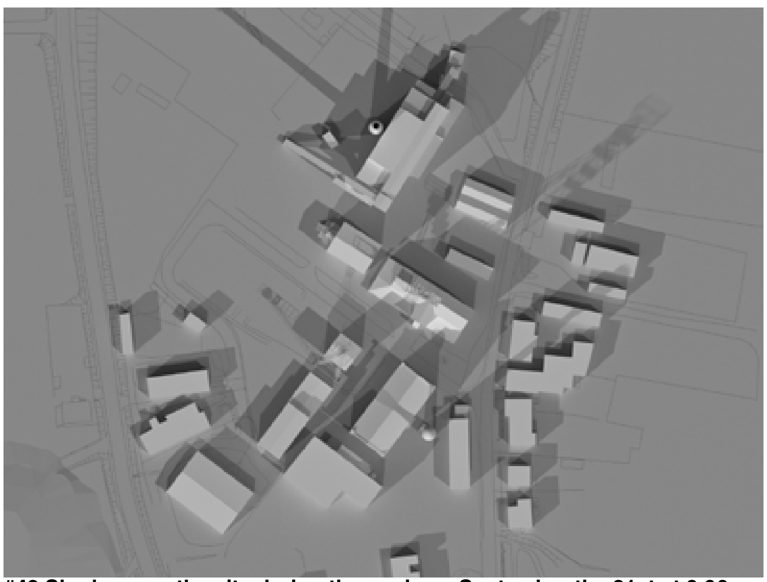
#39 Sunrise, sunset, dawn and dusk times, graph

Variable	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Insolation, kWh/m2/day	0.93	1.65	2.64	3.82	4.85	4.82	4.92	4.48	2.93	1.73	0.97	0.73
Clearness, 0-1	0.38	0.42	0.42	0.44	0.46	0.42	0.45	0.47	0.41	0.36	0.33	0.35
Temperature, °C	-2.96	-2.08	2.11	8.02	13.93	16.60	19.03	18.97	13.75	8.56	2.23	-2.17
Wind speed, m/s	8.31	7.48	5.87	5.32	4.71	5.85	5.80	5.46	6.31	5.34	6.31	8.05
Precipitation, mm	38	36	38	55	87	99	103	93	63	47	49	44
Wet days, d	14.9	13.9	14.0	13.4	14.5	15.8	14.8	14.2	12.6	12.4	15.5	16.5

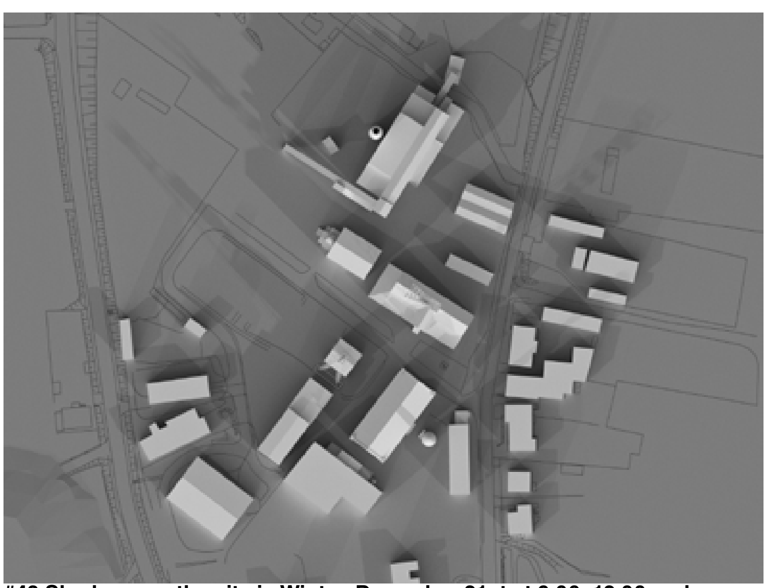
#40 Solar energy and surface meteorology



#41 Shadows on the site during the Summer, June the 21st at 9.00; 12.00 and 15.00



#42 Shadows on the site during the equinox, September the 21st at 9.00; 12.00 and 15.00



#43 Shadows on the site in Winter, December 21st at 9.00; 12.00 and 14.00.

Winds:
The city lies within the zone of weak winds and very weak. In 42% of the winds blow from the west and south-west, bringing gusts of warm air masses from western Europe and the Mediterranean. The average annual wind speed - 2.2 m / s.
[19]

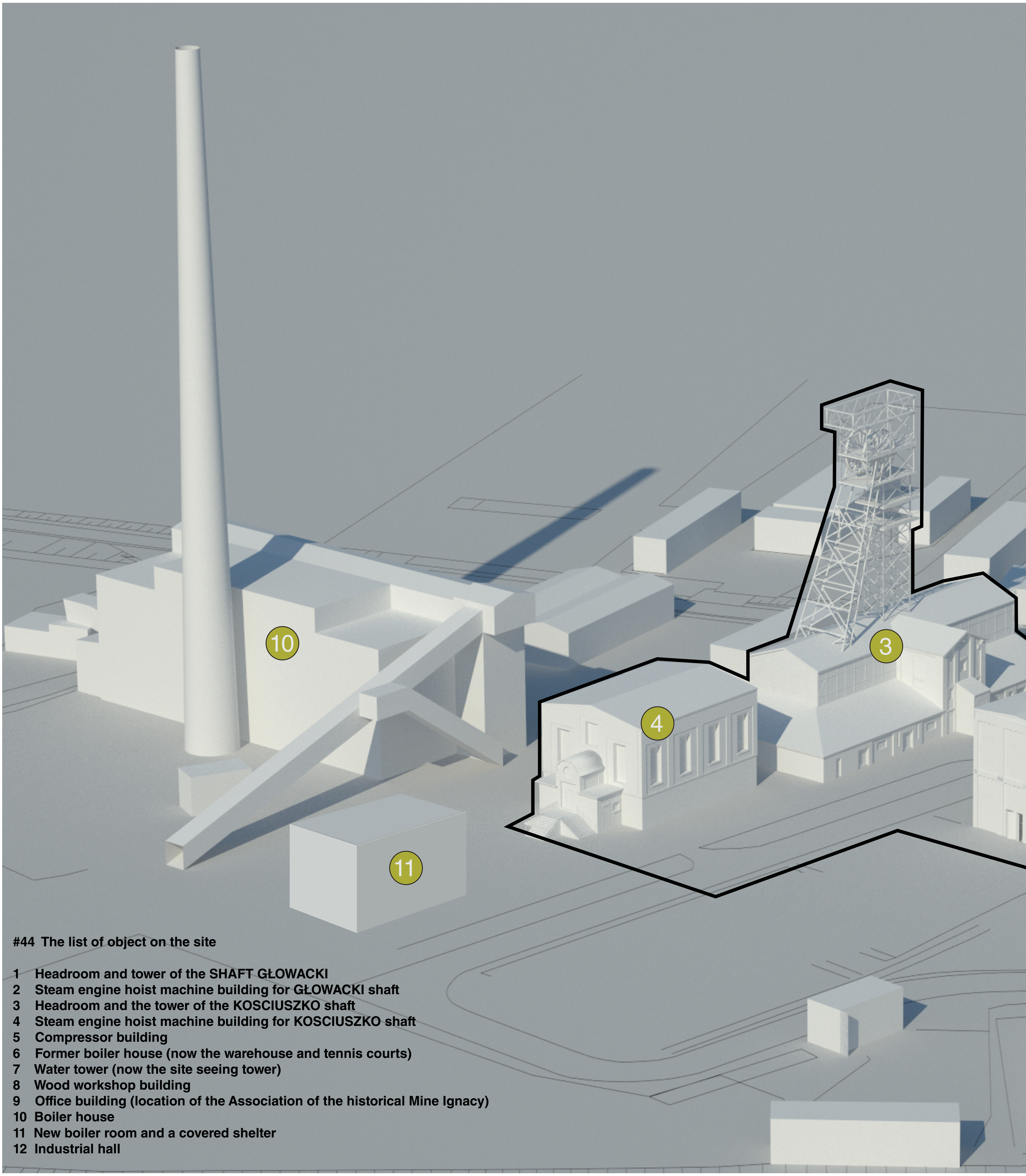
The macro climate should be taken into consideration, as it is not only crucial for construction and its preservation, but for outdoor and indoor climate as well.

The sun diagram and the shadow analysis has been conducted to recognize the possibilities and limitations of the site concerning natural daylight. Is works as a guideline for the space program which should be designed in a way that the different facilities get decent amount of natural light, according to the varying needs. At the same time one should try to avoid overheating in the summer months.

As seen on the illustration the narrow gaps between the existing buildings are mostly shadowed throughout the whole year. Therefore the new development should not add more shadows to already under lit spaces.

The insolation data provides information regarding possible solar energy gains if some installation would be applied on the site or on the buildings.

Although the winds are relatively small they should be taken into consideration, the fact that the buildings are in such close distance might suggest that wind gusts may occur and therefore applying shelter in the public spaces might be needed.

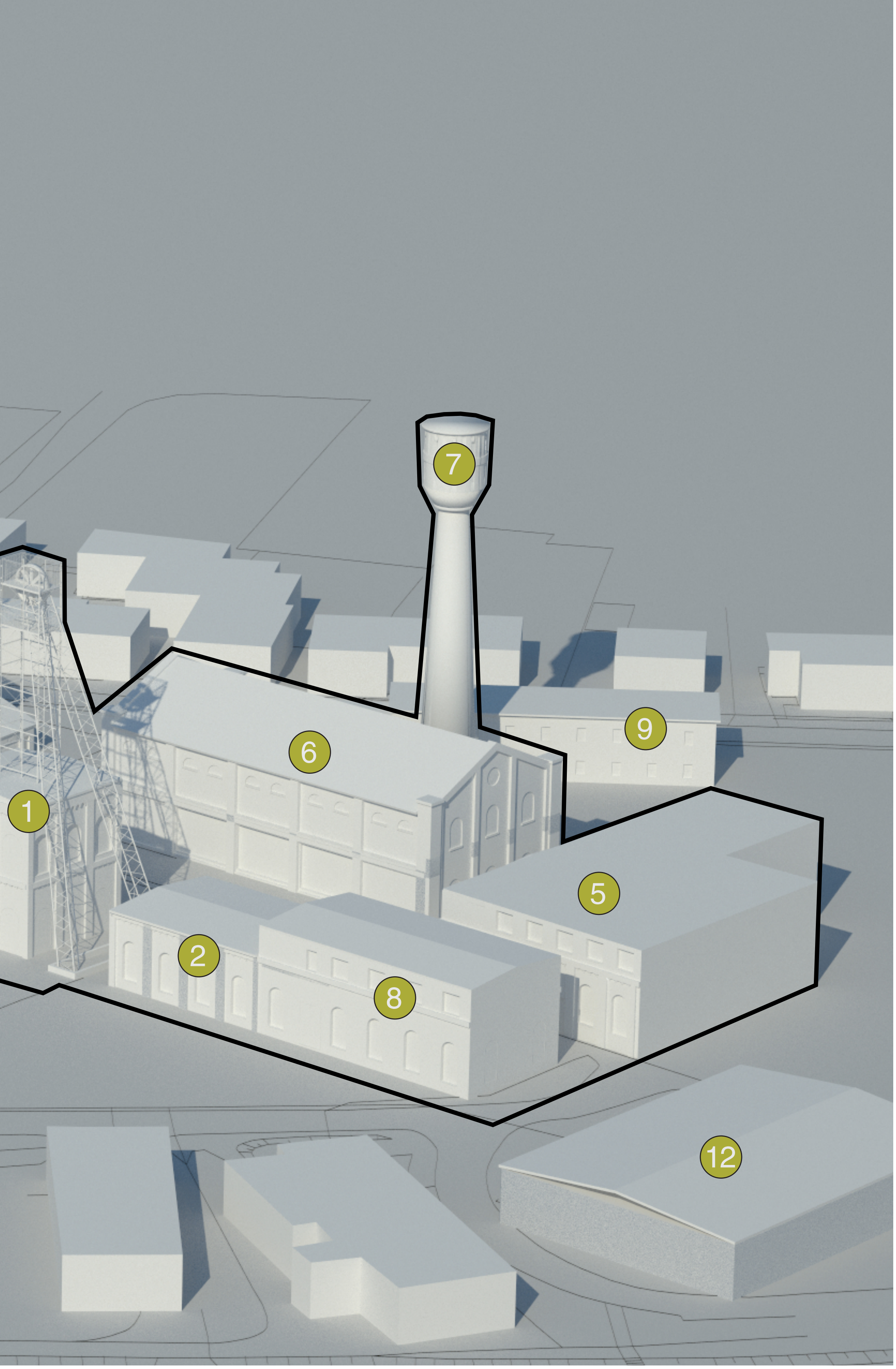


#44 The list of object on the site

1 Headroom and tower of the SHAFT GŁOWACKI
2 Steam engine hoist machine building for GŁOWACKI shaft
3 Headroom and the tower of the KOSCIUSZKO shaft
4 Steam engine hoist machine building for KOSCIUSZKO shaft
5 Compressor building
6 Former boiler house (now the warehouse and tennis courts)
7 Water tower (now the site seeing tower)
8 Wood workshop building
9 Office building (location of the Association of the historical Mine Ignacy)
10 Boiler house
11 New boiler room and a covered shelter
12 Industrial hall

Registration

This part of the report aims to present the site and the buildings of the Ignacy mine complex. Mainly focusing on the recognition of its current state but also tries to show the history of each building.



The area marked on the illustrations shows the group of building listed under protection by the Silesian Voivodeship Conservator.

The group of remaining buildings is preserved in an unaltered spatial layout, characteristic of a small, independent coal mine. The complex consists of buildings with interesting architecture deriving from the nineteenth and twentieth century's with their original equipment. Due to the unique and good condition of the equipment located in their original setting, this industrial complex has an international value. Unusual buildings and engineering structures have a high value for the history of material culture in the Poland. They consist of rarely common architectural solution of the mining shafts Kosciuszko and Glowacki, maintained in good condition steel towers for the shafts (Glowacki a fairly early provenance) and winding machines and buildings for the compressors. [20]

 # 45 Panoramic view of the mine from the main entrance
Visible division of the site into two parts created by the main access road leading through the plot

#46 **Map of the Ignacy mine area in scale 1:2000**

1 Headroom and tower of the GŁOWACKI shaft
- build in 1892
- steal tower build in 1902
- listed as protected building
- in the perimeter of protected area
- renovation of the external wall was done in 2009
- extention to the building was demolished

2 Steam engine hoist machine building for GŁOWACKI shaft
- build in 1892
- listed as protected building
- in the perimeter of protected area
- interior holds a steam engine from 1900

3 Headroom and the tower of the KOSCIUSZKO shaft
- build in 1921
- steal tower build in 1921
- listed as protected building
- in the perimeter of protected area
- extention to the building was demolished

4 Steam engine hoist machine building for KOSCIUSZKO shaft
- build in 1920
- listed as protected building
- in the perimeter of the protected area
- the interior hold a steam engine from 1920

5 Compressor building
- build around 1923
- listed as protected building
- in the perimeter of the protected area
- the interior holds two compressors from 1923 and 1944
- extention to the building was demolished

6 Former boiler house (now the warehouse and tennis courts)
- build in 1880 (assumed to be build together with the chimney)
- not listed as protected building
- in the perimeter of the protected area
- extention to the building was demolished

7 Water tower (now the site seeing tower)
- primarily build in 1880 as a chimney
- converted to water tank in 1952
- lately renovated and converted to a seeing tower
- not listed as protected building
- in the perimeter of the protected area

8 Wood workshop building
- combined with the hoist machine building for GŁOWACKI shaft but probably build later
- listed as protected building
- in the perimeter of the protected area

9 Office building
- modern building
- holds the office of the Association of the historical Mine Ignacy
- not listed as protected building
- not in the perimeter of the protected area

10 Boiler house
- build in 1920
- still partially in use
- not listed as protected building
- not in the perimeter of the protected area

11 New boiler room
- completed in 2011
- operative since
- not protected and not within the protected perimeter

12 Industrial hall
-no specific informations

RECORD NUMBER OF MONUMENTS
A/165/05

DESCRIPTION OF UNIT:
The Complex is located in the district Niewiadom in the eastern part of Rybnik, between the streets Sportowa and Ignacego Moscickiego. Buildings covered by this Decision are located within the complex and form its central part. The protected area is the oldest part of the complex along with the squares and components of an internal road. It Includes in addition, buildings and equipment of the former boiler house (now the magazines and tennis courts) and the water tower located next to it, built upon the boilers chimney. The boundaries run in accordance with the principle of land surveying division, which runs in the passage south along the fence of the establishment, in other regions using the historical divisions and layout of the site.[20]

The map explains the location of the buildings on the site.
Area marked with red line indicates the protected area.
Area marked with purple line shows the area of our interest for the design and development.
The red dotted line registers the location of former buildings and extensions to buildings that were demolished.
The red arrow points to the main entrance to the site.

Headroom and tower of the GŁOWACKI shaft

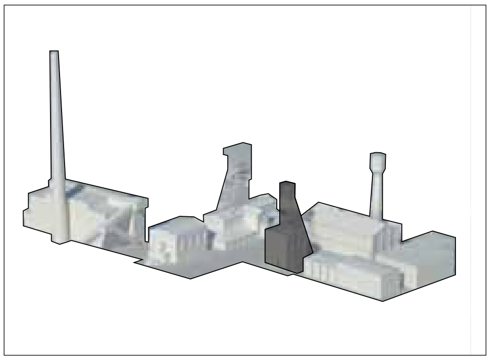
Headroom shaft was built in 1892, the building was originally a free-standing hoisting tower. Later it was combined with lower building adjoining the north-west corner. Currently the adjoined building is demolished and a steel tower from 1902 goes through the original headroom building. The old tower is erected on the projection of square. The building has a rectangular box shape, it's two-storey high and covered with a flattened gable roof. Constructed with masonry brick walls, plastered on the inside. The partition floor is made of steel structure. The roof, made of reinforced concrete panels on steel beams is covered with bitumen felt. Stairs built in steel construction, with steel landings. The floor in the bottom level is cement. The gate holes are rectangular, with single-and double doors made of contemporary metalwork. Window openings are sealed with a full arch and in the south-eastern elevation are rectangular, the windows are divided in multiple ways and single glazed. In the first level, most holes have been concealed.

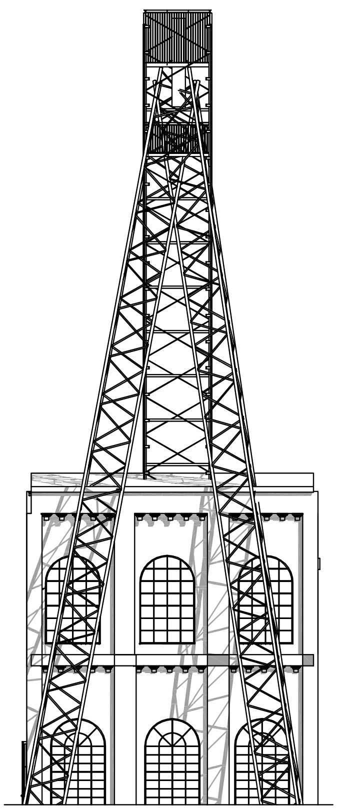
South-east elevation is made of two-storey, with a symmetrical triaxial system. The façade is articulated with pilaster strips and cornices dividing the elevation into two storeys. The top of the façade is finalized with flat strip with decorative brick work in the fields between the pilaster strips. Single widow openings are place on the axes. In the current state in the higher part there are rectangular windows, and in the lower level there is a steel door with a segmental arch. The windows in the lower part are bricked up and closed a full arch.

South-west elevation is a two-storey triaxial solution with a symmetrical arrangement. The articulation is the same as in the south-east elevation. Bricked up full arch windows are situated in the axes.

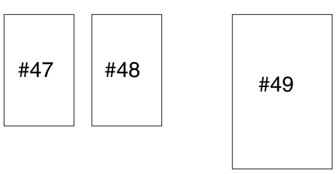
Elevation of the north-west, is a two-storey triaxial solution with a symmetrical arrangement. Bricked up full arch windows are situated in the axes except the middle part on in the higher level which is wider with a segmental arch.

Elevation of the north-east is a two-storey, symmetrical arrangement of triaxial solution. In the axes single window openings sealed with a full arch are located except the middle part on in the higher level which is wider with a segmental arch. The original window openings have been bricked up. In the centre axis in the higher part a rectangular opening with steel hatch has been made.





#50 Elevation



#47 Building before facade renovation
#48 Building after facade renovation (2010)
#49 Headroom and tower of the GŁOWACKI shaft - view from the south side

Inside there is a platform at a height of 6.7m.

Glowacki shaft extraction tower dates back to 1901. It was produced in Wilhelmshutte Eulau (Szprotawa). It is 'jednozastrzałowa' type of hoisting tower, with a pair of cart wheels in the 'above' system.
The tower was built in riveted steel truss construction. On the tower platforms have been placed above the ground level in the heights 6700mm, 20865mm, 23915mm, 28800mm. The wheels are on the high of 33300mm and are installed on two platforms in the head. Diameter of wheels is 4000mm. The total height of the tower is 36470mm.[20]

Steam engine hoist machine building for GŁOWACKI shaft with the machinery from 1900.

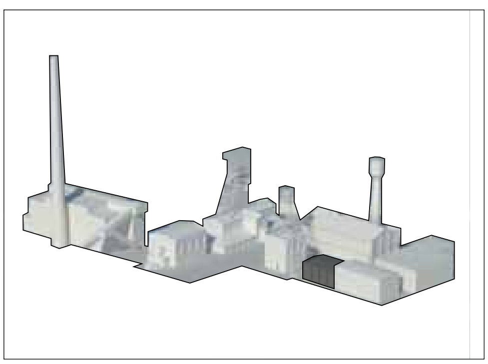
The Building was founded in 1892, and is located on the southwest side of the shaft. It is built on the projection of elongated rectangle as a compact shape, single-storey, with a flattened gable roof. The walls were built of brick, plastered on the inside. The roof (rebuilt) with concrete panels on steel beams. The floor is covered with ceramic tiles. Window openings are sealed with a full arch with multiple mullions and transoms woodwork and single glazing. Doorways are made with a full arch, a double-leaf full woodwork, but with glazing in the arch.

North-west elevation is topped with a flattened, triangular gable, a single-storey with symmetrical layout solutions. The elevation is articulated with lesenes in the corners of the building. In the middle part of the facade during the reconstruction a rectangular opening was made.

Elevations of the south-eastern and south-west are single-storey, four axial, divided with pilaster strips and cornices on consoles at the bottom. In the surfaces between the pilaster strips single window openings are placed and door in the first axis.
The interior is an open space without partition walls with a steam engine from 1900.

Glowacki shaft hoist machine in 1900, was built in Wilhelmshutte Eulau AG (Szprotawa).It has a steam engine, piston, lying, two-cylinder, twin, double action, direct, working on the exhaust. Is built on a foundation. The engine bodies are with bayonet bearings and heads for the drum shaft and guides for the crosshead slides. Engines cylinders are 700mm in diameter. Single slider guides with a single slip surface with a flat rack. Stroke length1500mm. Distribution of the steam in a valve system.

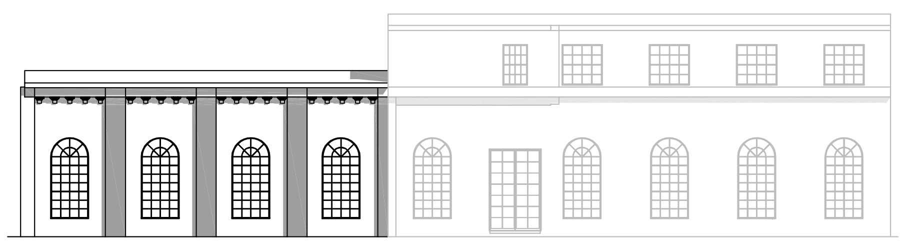
The valves are build parallel to the cylinders. Engine output 520 hp, with the inlet steam pressure 4.5 - 6.5 atm, temperature 270 degrees. The rope is rewind on a cylindrical drum with a diameter of 4,650 mm and a width of 2410mm. Lifting capacity is 3 tons.[20]



#51 #52

#51 Machinery room from inside

#52 Machine building for GŁOWACKI shaft - view from the northern side



#53 Elevation

#54 Elevation

Headroom and the tower of the KOSCIUSZKO shaft

Building is from 1921, is located next to (north-east side) shaft Glowacki in the central part of the complex. It includes the manufacturing part and the administrative (section south-east). The winding tower goes trough the building.

The building was erected on the plan close to a rectangle, with a complex, symmetrical single and two-storey shape. The walls were build with frame structure, steel profiles filled with brick (in the two-storey part) and brick masonry (in the single-storey part). The partition floors are made with Klein ceramic floor on steel beams. The roof is made with reinforced concrete panels on steel trusses, covered with bitumen felt. The roof of the higher part is a gable roof, in the lower a pent roof. The ground floor surface is covered with cement screed. Stairs are built in masonry construction, single flight, carried by the wall. Gate openings are rectangular with contemporary metalwork. Doorways are rectangular with modern carpentry. Window openings are rectangular, with multiple mullions and transoms made of ironwork.

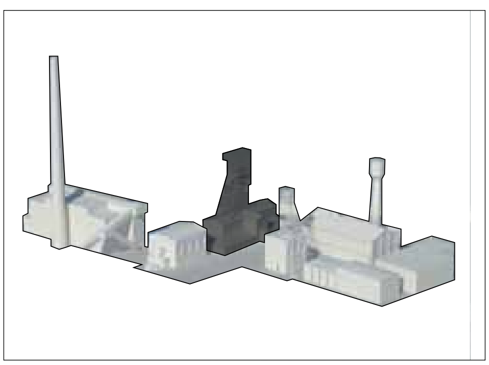
South-west elevation is symmetrical, multi- axis, consisting of two-storey. In the axes single window openings are situated. In the lower part and the 'transept' pilaster strips are located. Part of the windows has been modified multiple times.

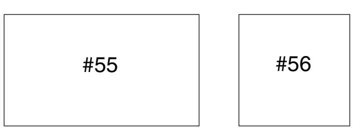
South-east elevation is symmetrical in the higher part and extended in the ground floor. Higher part is two-axle with single window openings. The lower part was recently removed, what is visible in the current state is a plastered brick work and a part of a steel structure.

North-eastern elevation is symmetrical, multi-axis, repetitive solution for the elevation of south-western (without the high central part).

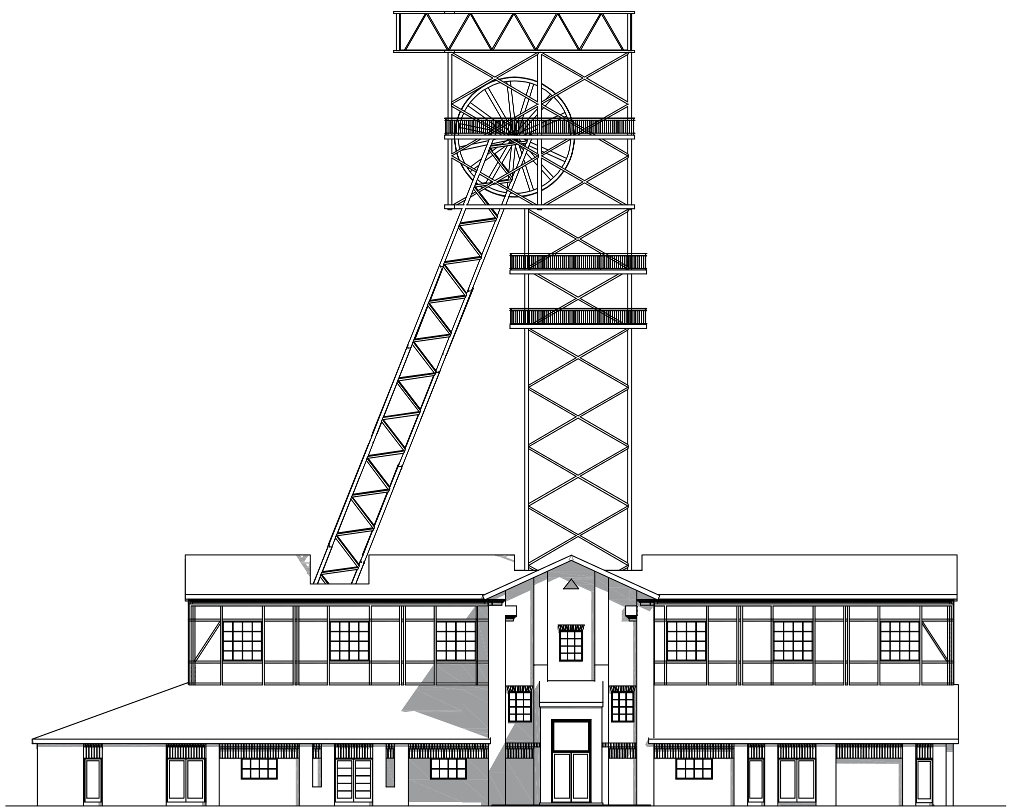
North-west elevation is symmetrical, with identical solutions as in the elevation of the south-east.
The interior is an open space in the main part of the shafts ground level.

Kosciuszko extraction tower from year 1921 was made by a construction company Humboldt from Koln. The tower is 'jednozastrzałowa', with a pair of wheels in a linear system 'beside', which was built in the design of riveted steel truss. The tower has two levels of platforms built 21458 mm and 29668mm above the ground floor. The level of rope wheels in the head is 22603mm. The Diameter of rope wheels 6000mm, wheelbase - 1400mm.[20]





#55 Panoramic view of the headroom
#56 The headroom and the tower - view from the courtyard between the machinery building for GLOWACKI shaft and the warehouse



#57 Elevation

Steam engine hoist machine building for KOSCIUSZKO shaft established in 1920.

It is located northwest of the shaft. Built on a rectangular projection, it's a compact shape, symmetrical, single-storey building with a basement. It has a gable roof with a slight decrease made of reinforced concrete panels (at the south-east) and ceramic structure (in the north-west), covered with bitumen felt. The walls were built in brick masonry construction, plastered only on the inside. Klein ceramic partition floor is constructed over a basement room. The floor is covered with terrazzo panels. Stairs are built out of brick as single flight stairs. Rectangular window openings are filled in a tripartite arrangement. Doorways in the main entrance are rectangular with double-leaf woodwork and windows above them.

North-west elevation (gable) is symmetrical, single-storey, triaxial, consisting of the principal part and the lower part of the projection, which is the engine hall vestibule.

In front of the projection two stairways are located. In the projection the main entrance and a window opening (in the shape of oculus) are placed. In the main part a high pedestal is visible, and a system of three vertically stacked window openings with the middle one placed higher.

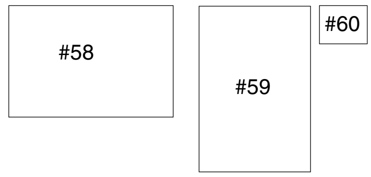
Elevation of the south-west is a single-storey, symmetrical, four-axis with a high plinth. The axes show Single large windows in a vertical arrangement are placed on the axes. The plinth part are small basement windows are situated.

Elevation South East (gable) is symmetrical, with two rope holes at different levels.

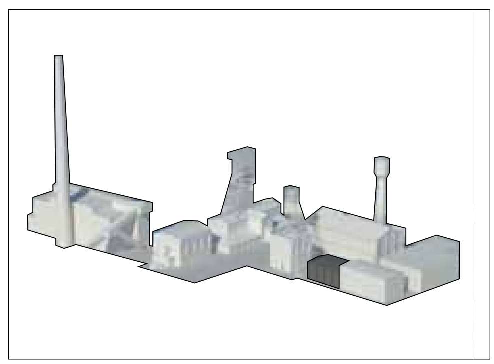
Elevation of the north-east is a single-storey with solutions identical to those in the south-west.

The interior of the main part is a single room with active exhaust steam machine. There are technical room in the basement.

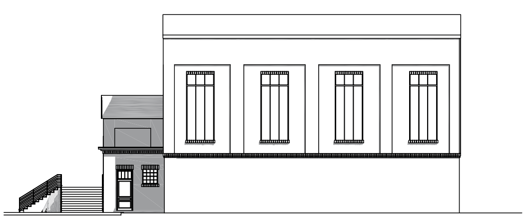
The steam engine for the shaft Kosciuszko from the year 1920 was built in the company Linke Hoffmann Werke, Breslau. (Wroclaw). It is a device with a steam engine, piston, lying, two-cylinder, twin, double sided action, direct, working on the exhaust. The engine is placed on a separate foundation. The engines bodies are bayonet bearings and heads for the drum shaft and guides for the crosshead slides with rounded cross-sections of lower and upper skids. The engines cylinders are 1000mm in diameter. Single slider guides with a single slip surface with a flat rack. Piston stroke length is 1600mm. Distribution of the steam in a valve system. The main shaft section is 700mm in diameter. The shafts are build parallel to the cylinders.
Control of carbon by an actuator.1800 hp engine power. Inlet steam pressure 8 - 12 atm. , Steam temperature 270



#58 Steam engine hoist machine building
#59 The main entrance to the building
#60 Steam engine



degrees Celsius.
The rope is rewind on a cylindrical double drum with the diameter of 6000 mm and width of 2 x 2200 mm. Shaft journalled wheel skid. Drive controller from 1920, produced by Linke Hoffmann Werke, Breslau. Lifting capacity is 8 tons.[20]



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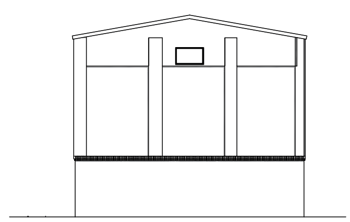

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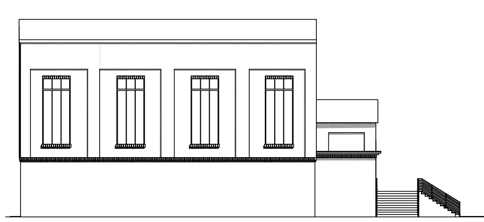

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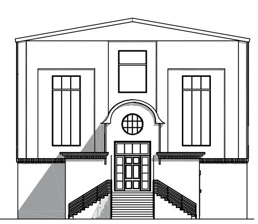


#64

Compressor building

Former power station building (now compressor room) is located in the vicinity of the engine room from Glowacki shaft and a former boiler room.

The building was erected on the plan that is almost rectangular in the main two-storey part as for the extensions and dobudówkami (jednokondygnacyjnymi), a block of compact, one- and two-storey and diverse gabarycie.

The walls are built of brick and unplastered. The building contains floors with ceramic tiles and concrete, and concrete stairs. Window openings are rectangular, made of wood joinery and steel. Doorways are rectangular with double doors.

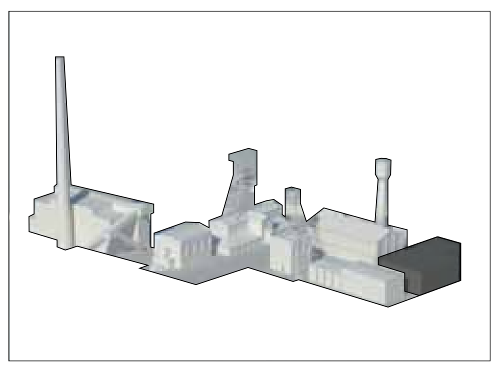
North elevation is composed of two parts, the two-storey main one and single-storey extensions. The facade in the two-storey is triple-axial, divided with pilaster strips. The different levels are articulated with a cornice.
On the ground floor in the first axis is bricked up window opening, in the second axis there is a door with a fanlight, closed with a full arch, the third axis contains a rectangular window with multiple mullions and transoms.
On the second floor the three windows closed with a full arch, with a double-leaf woodwork are located. Triple axial extension is divided with pilaster strips. Placed on the axes windows are closed with a full arch, with multiple mullions and transoms.

East elevation is single storey one, divided with pilaster strips. It has eight axles with triaxial projection. In the first two axes of the windows are closed with segmental arches, with multiple mullions and transoms. In the sixth, seventh and eighth axis the windows are rectangular. This fragment of the facade is obscured by a steel tubing and tank. Projection is a three-axis one, with rectangular windows and steel frames. In the south wall of the projection a rectangular door with contemporary steel doors is located.

The south elevation to a great extend (part of ground floor) is obscured by a modern extension. In the two-storey part in the first axis of the ground floor is a rectangular door opening with steel doors. The second axis the window is sealed with bricks. On the second floor both openings are bricked up.

Western elevation is mainly obscured by an electric workshop. Only the last two axes in the southern part of the elevation have rectangular windows

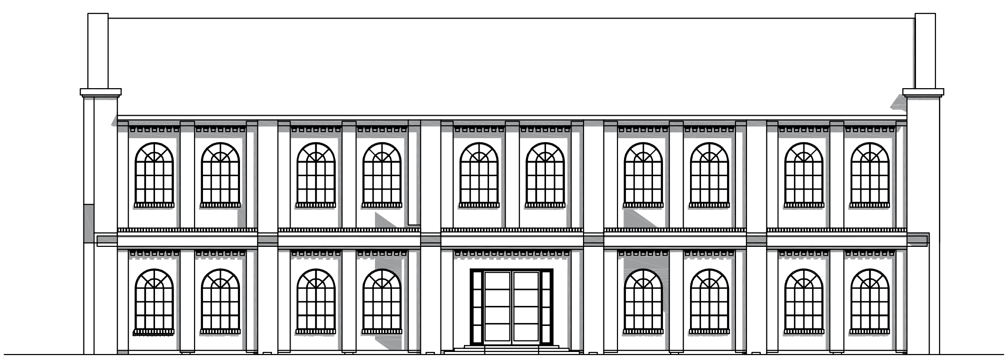
#65 The alley between the compressor building and the wood workshop
#66 Corner of the building - view from the courtyard
#67 View from the tower



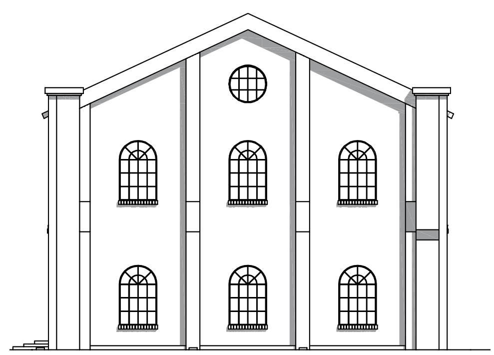
with contemporary metalwork.

The building has two partially preserved compressors, one from 1923 and the second from 1944.[20]

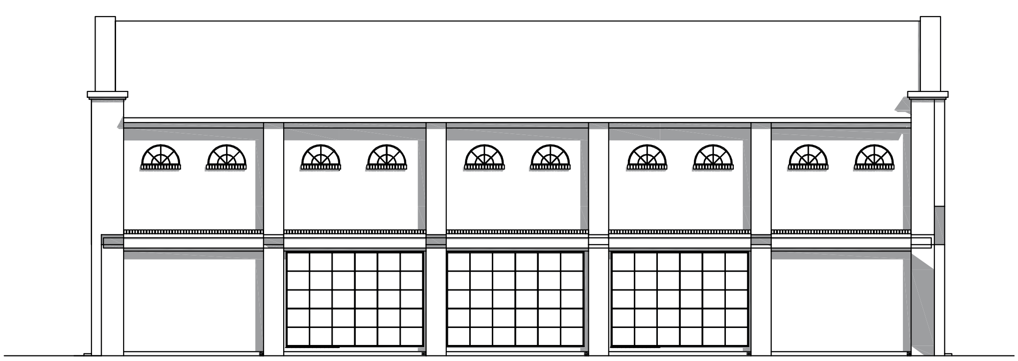
#68 Elevation



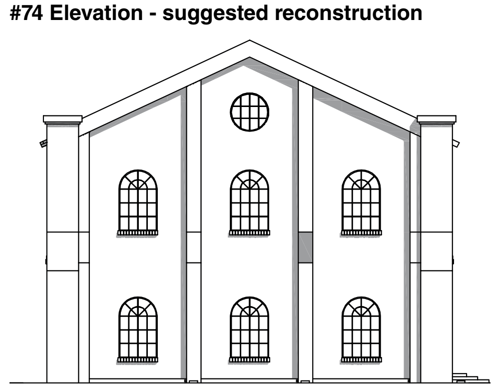
#72 Elevation - suggested reconstruction



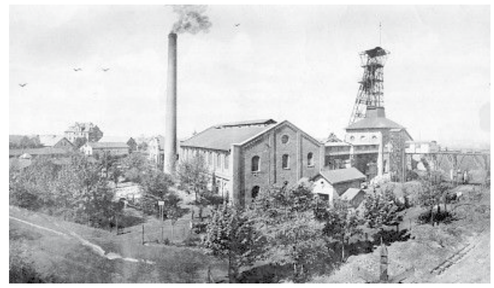
#74 Elevation - suggested reconstruction

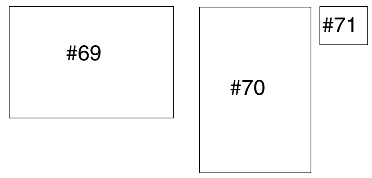


#73 Elevation - suggested reconstruction

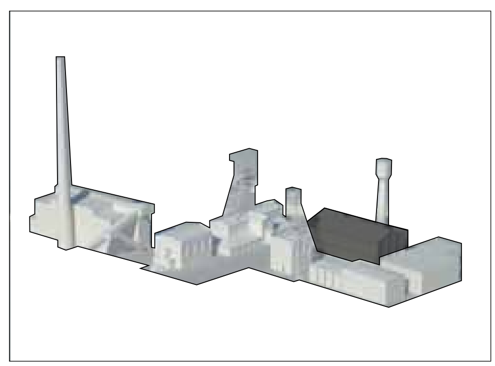


#75 Elevation - suggested reconstruction





#69 Warehouse building
#70 View from the main entrance
#71 Photo of the mine from 1916



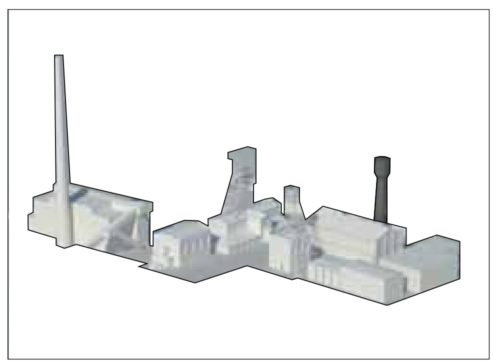
Former boiler house (now the warehouse and tennis courts)

Assumed to be build in 1880 (together with the chimney). Built on the projection of elongated rectangle as a compact shape, two-storey, with a gable roof. The walls were built of brick, plastered on the inside. Window openings are sealed with a full arch with multiple mullions and transoms woodwork and single glazing.

There is no formal description or documentation of the building and it is hard to estimate the exact look in its original state. However the building is not listed as protected and the renewed facade is our suggestion as how it could be renovated and cleaned up. The elevation are two-storey with symmetrical layout solutions. The elevations are articulated with lesenes in the corners of the building, divided with pilaster strips and cornices on consoles at the bottom.

The water tower

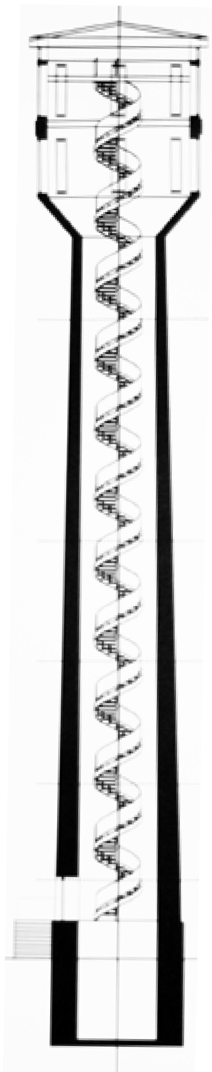
The mine, as one of the oldest in the area, had drinking water in its beds. It was led to the common collector at the level of 400 metres in the main drainage from the depths of 150, 200, 240, 300 and 400 metres. The water (3 cubic metres per minute) was pumped up to the surface to a container (capacity – 300m3) situated in the front of a shortened chimney from the year 1880. The container and the chimney formed a 46-metre water tower. In 1952 a steel tank, made in a factory Zieleniewski & Co. in Cracow, was added at the top of the chimney. The water tower was a source of drinking water for the nearby towns and companies until 1995. Due to the liquidation of the Ignacy Mine the water tower was adapted for tourist and recreational purposes. Changing the tower into an overlook was subsidized with the money from the European Union as a structure making it possible to observe the panorama of Rybnik and the neighbouring towns as well as the infrastructure of the mining enterprises and the mine dumps – the most characteristic picture of the industrial Silesian Province.[16]



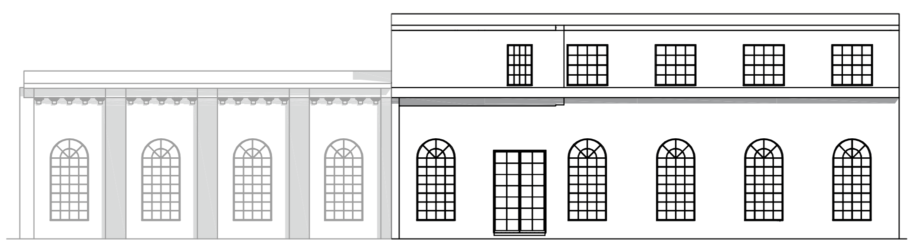
#76

#77

#76 The mine on a photo from 1975
#77 The tower in it's current state - despite the renovation and adaptation the outlook remained the same

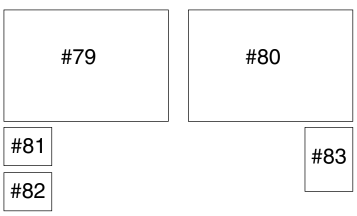


#78 Cross section

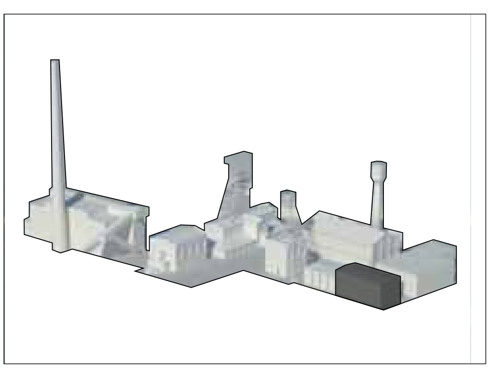


#84 Elevation

#85 Elevation



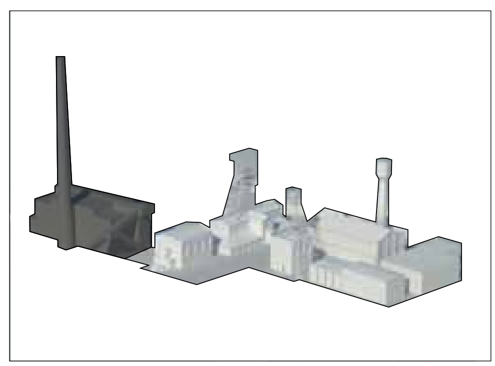
#79 View from the courtyard on the wood workshop building
#80 The main room in the ground floor
#81 Floor on the second storey
#82 The main room on the second storey
#83 View from the western direction



The wood workshop

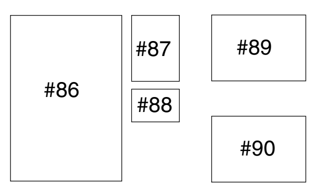
The wood workshop building is attached to the machinery building of Glowacki shaft. Both of them are listed as protected. Strangely there is no broad description of the workshop in the official conservation documents.

It's a two storey building on rectangular plan. The ground floor can be recognized as a continuation of the machinery building with the same window style and spacing in axels (except the second axle from the connection of the two buildings). However the second storey differs with its rectangular windows topped with concrete beams. The flatten gable roof is constructed with concrete slabs on steel beams covered with bitumen felt. The partition floor is constructed as ceramic hollow pot floor supported on external walls and centrally placed concrete beam.



Boiler house “Ignacy”

Build in 1920. With four boilers Linke-Hoffmann yield 7.5 t steam / h of steam to power lifting machines at the windows “Kosciuszko”and “Glowacki” then mine “Hoym. Successively boilers JWC bodybuilder was replaced in 1927 by Stirling boiler with a capacity of 12.7 tons of steam per hour, in 1955, a boiler with a capacity OSR-16/25 16 t steam / h, and between 1963 and 1969 installed two boilers OR-16 / 40 with a capacity of 16 t steam / h each. For heating purposes in 1969, the station was built exchangers, steam / water.
The height of the chimney is approx. 90 meters. The building is currently still partly in use.[21]



#86 Large chimney in front of the building
#87 Connection of the conveyor belts and the building
#88 Conveyor belts
#89 New boiler room
#90 Industrial hall

New boiler room

On May 27, 2010 the municipalities of Rybnik issued a decision on the permit for the construction of ‘free-standing coal boiler room and a covered shelter’. The building placed next to the machinery building for the Kosciuszko shaft, was finalized on the beginning of 2011. Provincial Conservator of Monuments has issued a permit for the erection. A decision in our opinion short sided and a mischief if one considers the fact that in near future the site is to be developed for new use.
However we will have to acknowledge the existence of this new building when designing the proposal.

Industrial hall

After second visit to the site we noticed that the industrial hall behind the wood workshop building is in a better shape than we previously thougth, and a decision was made to take into account for the future development of the site. Unfortunatlly there is no exact information about the building except its size.

There is a clear understanding about the historical significance that this site represents. Located at Niewiadom district, it is a perfect in the aspect of local authenticity. With successful redevelopment, one can only assume that the importance of the site increases, drawing investments towards attractive and unique new development. Nevertheless the adaptation should not be applied before a throughout investigation for conservation plan is conducted for the whole area. We understand than conducted registration is nearly not enough to start the adaptation, but full conservation plan is outside the scope of this report. With some of the protected buildings including historic machinery that due to its functional condition is unique in a global scale, it is important to recognise the possibilities that the existing historical facilities offer and respect their values.

Case study 01

Zollverein

Zollverein is a much bigger mining complex then the Ignacy mine, however there is a lot of aspects that we could relate to and learn from. In our opinion it is the best example of mining complex adaptation in the world and its impact on culture of the Rhur region and Europe is significant.

The Zollverein industrial complex located in Essen, North Rhine Westphalia, Germany consists of the complete infrastructure of a historical coal-mining and coke manufacturing site. It also includes 20th century buildings regarded for exceptional architectural merit. This unique site chronicles both the evolution and decline of the essential coal mining industry of Germany over the past 150 years.[22]

Coal was mined and processed at the “Zollverein” for 136 years, down to its closure in 1986. With the construction of the Zollverein School and the opening of the design and architectural exhibition “Entry”, a major part of a long restructuring process has come to a end. Pit XII with its tower, built by Fritz Schupp and Martin Kremmer between 1928 and 1932, is still emblematic of the mine.
In 1997, Norman Foster converted the former boiler house into the Design Centre North Rhine-Westphalia; but only since UNESCO declared the mine to be part of the World Cultural Heritage in 2001 has Brussels provided adequate support funds, allowing a long-held wish of the region to be realized, namely the creation of a museum for the natural and cultural history of the Ruhr area. The building, 90 x 30 m on plan and up to 47 m high, was converted by Rem Koolhaas in collaboration with Heinrich Böll and Hans Krabel. Koolhaas was also responsible for the master plan. In view of strict conservational conditions, however, the design measures were very restrained.

The singular flair of this industrial complex has attracted artists for years. In future, new design offices will be encouraged to move here, and the construction of dwellings and a hotel is envisaged. The greatest structure of all, however, remains invisible and unfortunately inaccessible, namely an entire underground city with a network of routes 120 km long and extending up to 1.2 km into the earth.[23]

The most important factors that make Zollverein a successful adaptation and could be used as guideline for our project:

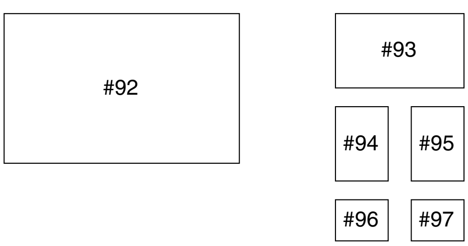
-great design and architecture helps to create an atmosphere in which discovery is encouraged

-a museum must create a sense of individual freedom to foster discovery

-it pays off to take quite some time to get visitors in the right mood and mindset before they enter the exhibitions.

-the tasteful collage between the artefacts of the industry and new installations create an artistic and creative atmosphere

-the use of light in the evenings and night is very important and adds new values to the perception of the site



#92 Zollverein complex
#93 Illumination of the main shaft
#94 Green area in front of the shaft
#95 White furniture contrasting with industrial soroundings
#96 Model of the complex made out of rusted steel
#97 New escalator leeding to the museum

Case study 02

Guido

On the opposite to Zollverein, Guido is a very small coal mine. However it has managed to accommodate the one aspect of mine adaptation that Zollverein hasn't - the adaptation of the underground tunnels. Despite it's size the adaptation was very successful and has gained popularity.

The mine was established in 1855 by the Count Guido Henckel von Donnersmarck. However, the layers of coal were exceptionally poor in that area, and that is why the main lost on importance in the early 30-ties. In 1967 an experimental coal mine was opened there, and it worked till 1982. Since then, works aiming at opening the mine for tourists started. They were successful and in 2007, first tourist could step on the hoist and take a narrated ride to the bottom of a mine shaft. In 2009, the deepest level of the mine was opened for visitors. It allows not only walking in extraordinary surrounding, there is also a Vauxhall where concerts and theatre plays are being organised.[24]

The shafts in the old Guido mine descend to a depth of 320 metres, making it the deepest visitor mine in Europe. A 250 ton rough coal container, conveyor belts, an Alpina tunnelling machine in full working action, hydraulic supporting pillars, a number of different transport constructions, a seismograph chamber and a simulated mining accident take visitors back into the midst of the underground world of the 20th century. One "storey" higher, at a depth of 170 metres, visitors can go even further back into the past, and experience working conditions around 1900 in such a realistic manner that they could be excused for thinking that time had stood still. Fragments of conversation can be heard, the low ceilings groan and creak, and somewhere in the dark you can hear horses whinnying and snorting.

These and other skilfully placed audiovisual effects conjure up a gripping colliery atmosphere. A particular attraction are the underground concerts and theatre shows that have been offered by the Guido colliery since the end of 2008. Along with a permanent exhibition of miners' portraits they make it clear that this visitor colliery also regards itself as an arts centre.[25]

The most important factors that make Guido a successful adaptation and could be used as guideline for our project:

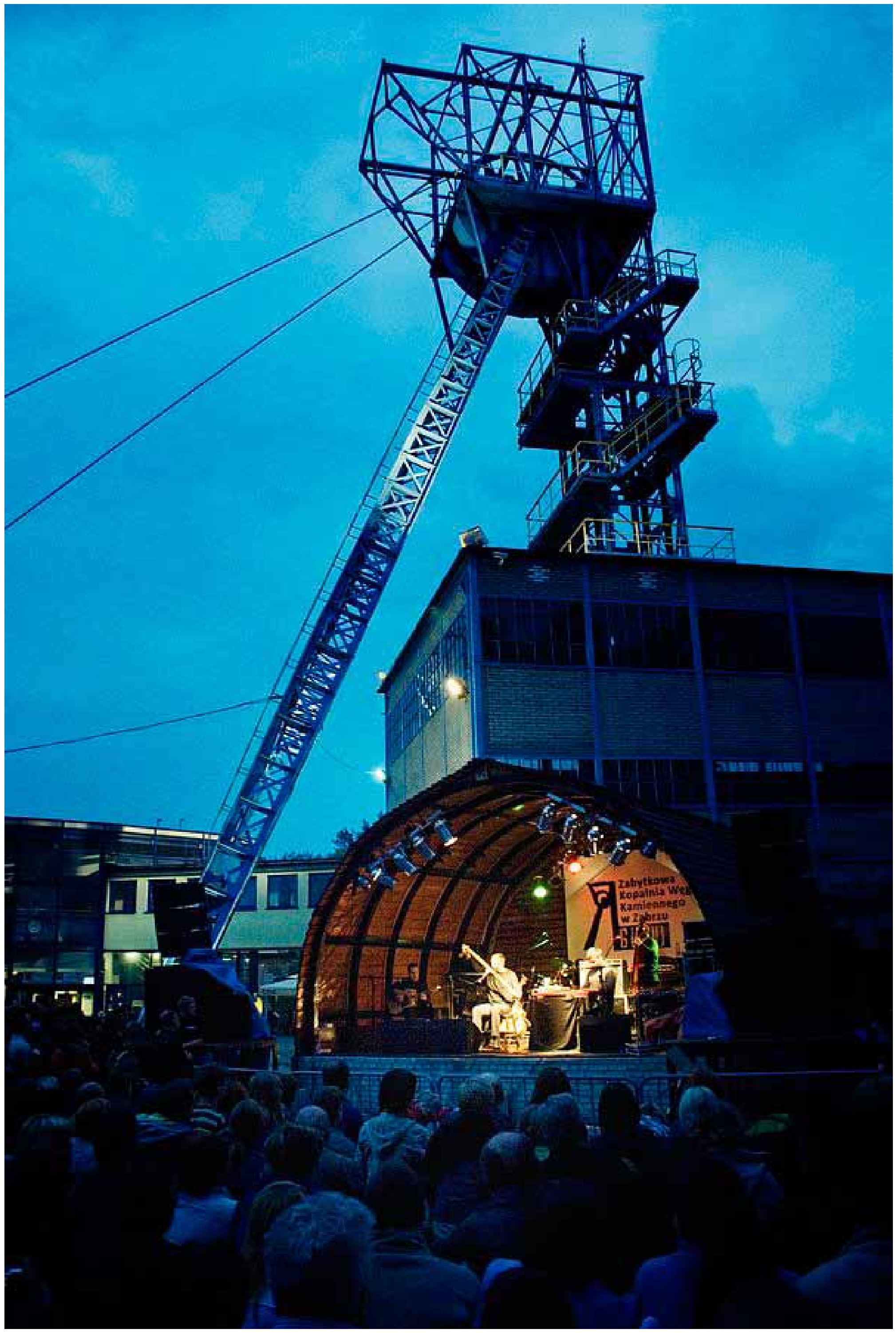
- importance of cooperation with the local community

- finding out what makes the place special and the right promotion of that aspect

- the use of underground tunnels not only for purpose of tourist visits and walks around the tunnels but also to accommodate cultural events and fine dining, which makes the experience unique

- importance of proper illumination of the site in night time

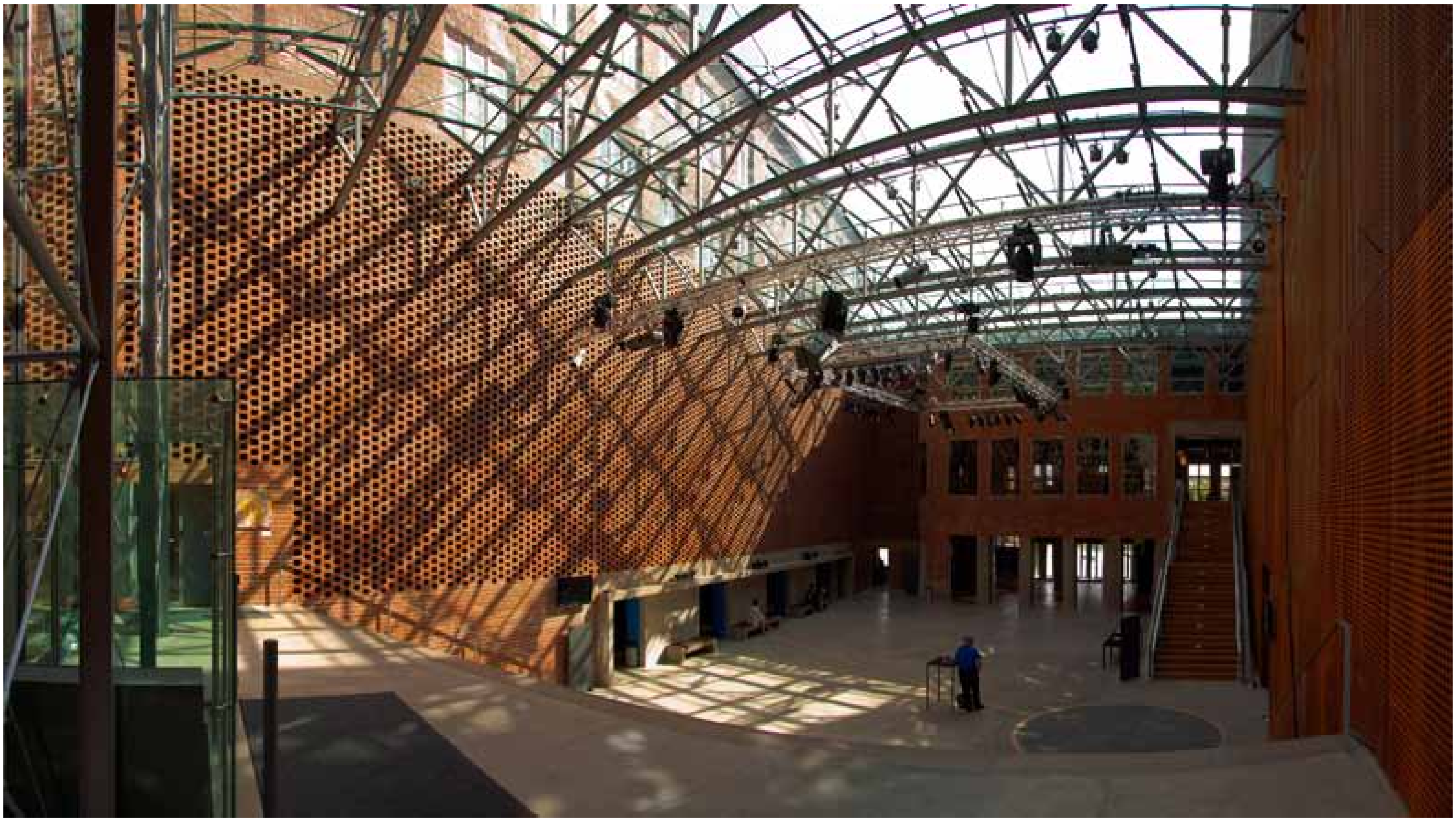
-simple installations that focus on other senses than the ordinary ones you use in a museum, such as sound and smell



#98 #99 #100 #101

#98 Undergound tunnels
#99 Concert in fron of the shaft
#100 Small cultural event in the underground
#101 Exposition of the machines

Case study 03



Verkatehdas

Verkatehdas gives us the opportunity to examinate how old and new could be juxtapose to create new architectural values while keeping the industrial atmosphere of the place. Despite the fact that it could be accused of facadism the application of new technologies carried out in a fortunate way.

Verkatehdas consists of a 30 000 sqm2 early 20th century fabric factory complex, which is now redeveloped into a cultural institution in Hämeenlinna locating in southern Finland. New annexes are called Verkatehdas Arts & Congress Centre, adding up to a one-third of the whole. The complexity of the final compositions intriguing structure could be compared with a medieval city. Project places a new concert hall within the existing factory courtyard. New annex with movie theatres will be efficiently visible in the townscape. A large glazed inner courtyard forms the primary space and functional heart of the cultural factory. This fan-shaped courtyard opens up towards Vanajavesi water front park through foyer spaces.

The high gables of the old factory and new concert hall are dominating features in townscape. New structures respect old ones tuning the composition over again. The aim was to form a composition where the old mill complex and new buildings form a harmonious entity, so that both together define the spirit of the place. Main materials are red brick, corten-steel, glass and concrete, and their handling is artless and plain. The new formal features and materials are kept in a simple and serene relationship with the old, thus emphasising the value of the existing structures like coarse surfaced concrete beams and brick masonry. Rough articulation of the whole enables to use strong colours and rustic surfaces like rubber, ceramics and rusted steel.

The concert hall is technologically sophisticated and transformable to allow multi-use of various performance types. The uses of concert hall vary from congresses to theatre performances, from classical music concerts with 700 seats, to rock concerts enabling 1100 spectators. The cinema annex includes four movie theatres seating 650 all together. Movie theatres are equipped with modern digital techniques. In the future also large parts of the old factory will be renovated to house new functions, mainly educational and atelier spaces. [26]

The most important factors that make Verkatehdas a successful adaptation and could be used as guideline for our project:

- the importance of choice in the materials when combining old and new

- technologically advance solutions for the adaptation and the new functions have to be used to meet modern standards and to serve future generations

- creation of new public spaces between the buildings is possible and adds new values to the site, however the focus on details and materials is crucial

- importance of proper illumination of the site in night time

-green areas in close distance of the site seem to work as perfect space for lunch brakes in the summer months

#102

#103

#104

#102 Glass covered inner yeard
#103 Corten cover of the new part
#104 Green public space in fron of the complex

Guidelines

Our conclusion from the previous chapters is a combination of design guidelines, preservation statement and future scenario. They work together as a starting point for our design.

Common guidelines

-respect to the context
-balance between historical preservation and adaptive reuse
- design that is attractive and unique
-the use of illumination in the evenings and night
- importance of cooperation with the local community
- all the buildings renovated and adapted should meet the current building standards
-design that allows future changes and functions
-ecological philosophy, aiming not only to preserve buildings largely unchanged but bringing back into use the energy and materials invested in them
"Try to reuse as much of the existing as possible"

New design

-changes of facades in the unprotected buildings to match the overall concept
- choice of the material when combining old and new; keeping the overall industrial atmosphere but distinguished the difference between the old and new

Public spaces

- creation of new public spaces between the buildings
-possible application of shelter from wind in the public spaces
-do not add more shadows to already under lit spaces
-green areas in close distance of the site

Office

-different facilities should get decent amount of natural light, according to the varying needs
- the new office building should have adaptive floor space that could be subdivided according to the changing needs

Cultural & Museum

-create a sense of individual freedom to foster discovery
-the tasteful collage between the artefacts of the industry and new installations create an artistic and creative atmosphere
- the use of underground tunnels not only for purpose of tourist visits and walks around the tunnels but also to accommodate cultural events and fine dining, which makes the experience unique
-simple installations that focus on other senses than the ordinary ones you use in a museum
-main focus in Ignacy mine museum is to demonstrate its particular process as it was working, not to create a mining museum for the mining industry in Silesia.

Preservation statement

The characterization of the Ignacy mine complex has been made by Silesian Voivodeship Conservator.

The following descriptions are specifying are our intentions towards this complex.

Protected area

The spatial layout of the area should be kept as a whole with its squares and roads. In our opinion none of the buildings including the unprotected should be demolished in that area and at the same time no new buildings should be implemented. Leaving only the space for:
-additions in forms of canopies covering for the spaces between the buildings
-adaptation of the gaps to more attractive public spaces.

Protected buildings

In these buildings the interference should be restrained. The main focus ought to be on renovation of the structure, the facades and the interiors. Adaptation for the new use should not lead to removal of important parts and the intrusion should be minimal focusing on upgrading the building to modern standards.

Not protected buildings in the protected area

In these buildings, particularly in the warehouse, the adaptation for the new use could lead to vast changes in the inner layout of the building. In our opinion it also gives more freedom in interpretation of facades, however the changes in the outer look should not interfere with the perception of the whole site. Demolition of such buildings could only be allowed if the buildings current condition does not show the basis for financially responsible renewal.

Not protected buildings outside the protected area

Restoration, adaptation or demolition, if needed at all, is open for debate and the result depends on various factors:
- the current state of the building
- what could be the possible new function
- how the building contributes to the site
- what could be changed to make the building a part of a bigger concept etc.


4
3
2
1
#105

Future scenario

Duncan McCallum in his "Understanding historical building conservation"essay mentions that a strong vision for the future as well as achieving the right pace for the project play key roles. He suggests that it might result in the commitment and enthusiasm of the local community. It also seems the right thing to do from the economical point of view because some unexpected factors may occur.

The purpose of this section is to present our vision of the future scenario and the stages in which the site could be developed.
In this part we would like to define the range of our work and state on what part of the development we are going to focus during the design and to what extend.

Our work is going to focus mainly on the stage 1 and part of stage 2. Which will include detailed design of the museum, cultural center, and the office building.
However a concept for the whole site is going to be developed in the urban scale.

1

First stage focuses on the redevelopment of the protected area and the office building next to the main entrance. In this stage the Ignacy mine museum is established with the first stage of the cultural centre. The building are renovated and adapted. The underground tunnels if possible are made accessible and developed. The site is ready for tourists, cultural events and exhibitions being held in the cultural centre.

Buildings renovated and used as a museum of the Igancy mine, exhibiting the machinery and the original interior

Buildings renovated and used as a museum of the Ignacy mine or part of the cultural centre, possible exhibition space or conference rooms

Buildings adapted or retrofitted for the use of the museum, the cultural centre and office space

2

In the second stage the further development of the cultural centre is made to accommodate the need for bigger exhibition and performance space. Furthermore offices and other functions are established to bring more life to the site during the daytime. The site draws more attention and more possible investors.

3

In stage 3 the boiler house is not in use anymore and more possible functions could be applied to the site such as housing and commercial use and others; adaptation of the boiler house, possible juxtaposing of new building with the old; possible direct railway connection to Rybnik centre.

4

Recultivation of the slag heaps and the area behind. Creation of parks, reinforcement of soil, covering of the heaps with topsoil, planting vegetation to help consolidate the polluted material.

#106

Design Process

Through the design process architectural ideas are created and developed. The sketching phase is done mainly with digital tools such as Skechup and Rhino. Investigations of the functions and their placement is done for the whole urban area. At the same time more detailed sketches are done for the chosen area of focus.
The different solutions and their suggested advantages as well as the architectural qualities are evaluated continuously.
The design takes it's final form where architectural and functional qualities are combined with the construction and all the elements create new qualities.

Inspiration


#107


#115


#114


#108


#111


#113


#109


#110


#112


#119


#122


#121


#123


#118


#117


#116


#120

Concept 1


#124

#125


#126

Existing area is divided according to suggested functions for the future use.

Green: Park and recreational areas Creation of new public space between the buildings. Slag heap to be recultivated and turned into a park.

Blue: New mixed use building connected to the old boiler house. Main functions retail and housing.

Red: Combinations of protected museum area with cultural functions and new office building.

Orange: Parking house supporting the whole development to ensure possibility of no car zone.

Yellow: Current communication zone with main bus connection to the surrounding areas and existing community center for the Niewiadom. New additional functions would include small local shopping.

Violet: Innovation park with offices and business functions

At the moment the site has one main access road to it. The initial idea was to connect the existing housing area in Niewiadom with the new development to ensure inhabitants to fully utilize the newly added functions. The area is at the moment separated from the community due to its earlier function as a mining complex. The arrow 01 indicate the new added access route and the arrow 02 shows the continuation for the existing access road to create a “boulevard“ like feeling.

The first conceptual placement of the buildings investigates their scale and shape and how they fit into their urban environment. The main idea was to follow the existing borders and internal paths of the site which gave the initial boundaries for the new buildings and created interesting interaction between new and old.

#127

As a result of conceptual building placement

1. The new office buildings are working as a boundary to the site and guiding traffic towards the created access road. The offices will be connected with the existing industrial hall which will be renovated for recreational use and sports.

2. Connection to the housing area the building mass works as a gate toward the site. It guides people to the main communication area and to the entrance of the museum area.

3. The existing bus station would be refurbished and small local shopping would be added to support the commuters.

4. The protected area is refurbished for museum and cultural center with additional office building to support its functions. The buildings are connected with glazed canopies to define the inner courtyard and ensure the communication between the buildings.

5. The park in the end of the created boulevard works as recreational area for the locals, visitors and everyday users of the complex. It can be use for informal meetings and concerts.

6. Parking house has the straight connection to the old boiler house. Its main function is to ensure that no normal parking lots are needed on the site and the restricted traffic is possible creating the car free zone.

7. Old boiler house together with new building mass creates a boundary between the recultivated slag heap and the developed site. This ensures that the main focus is concentrated towards old mining complex buildings.

8. The possible train reconnection from the main track to make the site more accessible.

The marked area indicates the possible buildings for further detailing if proposed concept would have been chosen.

Concept 2

#128

#129

#130

Existing area is divided according to suggested functions for the future use.

Green: Park and recreational areas Creating new square between new and old building entities. Slag heap to be recultivated and turned into a park.

Blue: New mixed use building connected to the old boiler house. Main functions retail and train station. Top floors of the building are designed for housing.

Red: Combinations of protected museum area with cultural functions, hotel and new office buildings.

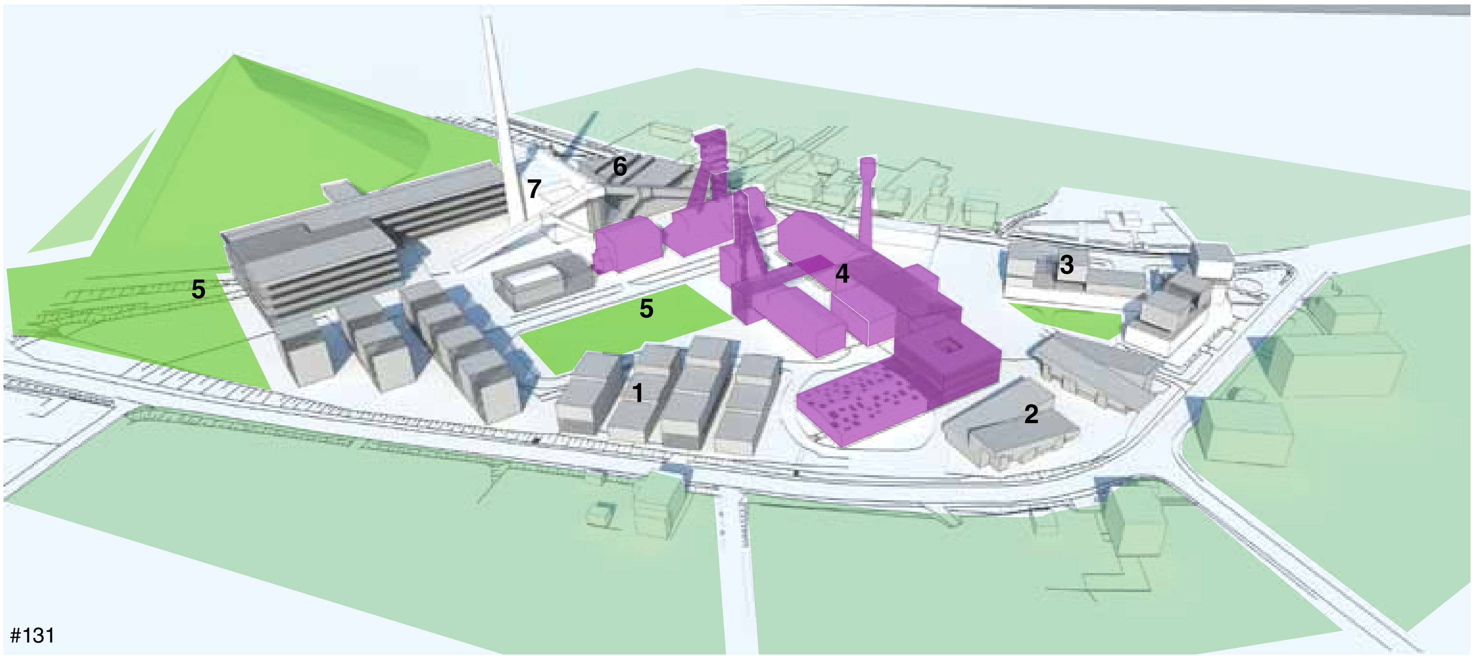
Orange: Parking house supporting the whole development to ensure possibility of no car zone.

Yellow: Current communication zone with main bus connection to the surrounding areas and existing community center for the Niewiadom. New additional functions would include housing units.

Violet: Innovation park with offices and business functions

As in concept number 1 the new access road leading towards the site from existing housing area is added indicated with arrow 1. In addition arrow 02 shows the new road is added starting behind the old Kosciuszko shaft next to the parking house leading up to the train station and retail center. Number 3 shows the connection through the building to the slag heap park. Number 4 indicates the centralized square surrounded by new and old building masses.

The second conceptual placement of the buildings investigates their scale and shape and how they fit into their urban environment. Main idea of the this concept is the creation of centrally placed square which would work as a focal point for the museum area. Buildings placed around the square create more closed and condensed city like atmosphere for the site. Building masses for this concept are smaller and more scattered without the impression of a strong edge.



#131

As a result of conceptual building placement

1. The new office buildings are created from smaller units that follow the modular design. These offices are meant for smaller companies but have the possibility to be connected together for bigger companies use.

2. Cultural center pavilions accommodating exhibitions and workshops.

3. The existing bus station would be refurbished and housing units are added on top of the existing building mass.

4. The protected area is refurbished for museum and cultural center with a hotel connected to the industrial hall turned into a concert and conference building. The hotel is connected with glazed canopy to the main museum mass and to the industrial hall.

5. The plaza works as main recreational area for the locals, visitors and everyday users of the complex. It can be use for informal meetings and concerts. All four corner of the plaza are open creating secondary connections to the site through the building masses.

6. Parking house has the straight connection to the old boiler house. Its main function is to ensure that no normal parking lots are needed on the site and the restricted traffic is possible creating the car free zone.

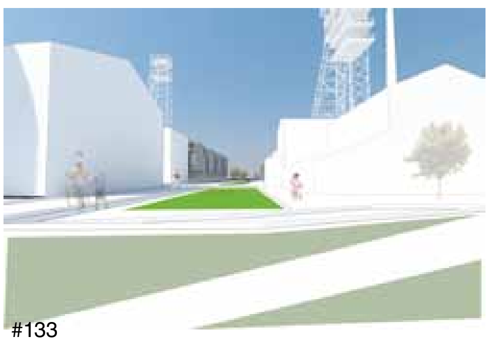
7. Old boiler house together with new building mass creates a boundary between the recultivated slag heap and the developed site. The building creates a smaller plaza of its own with the straight connection through it to the slag heap park.

8. Train station on a bottom floor of the retail center.

The marked area indicates the possible buildings for further detailing if proposed concept would have been chosen.

Concept evaluation

#132

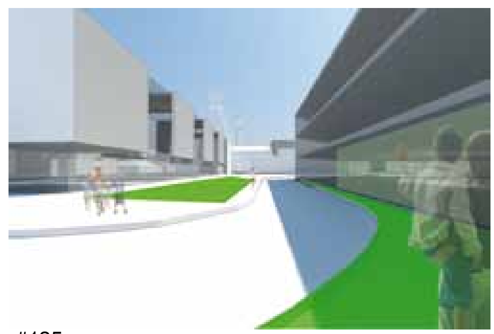


#133

Continuation of the existing building facade creates the boulevard outlook of the main access road. It is relating to the old site plan where an extension to the Glowacki shaft used to be.

#134

The scale of the new office buildings and space between creates a clear gateway towards the site.



#135

The space between the buildings in relation to their size is inadequate to create desirable public spaces which people would view as attractive and not just as a transition zone.

#136

The main green public space in the end of the boulevard is missing the well defined edges and therefore fails to contribute to the site. It separates itself due to its size and distance.

#137

Although the height of the new retail center is related to the old boiler house its connection creates a building mass that dominates the site and closes up the view.

The concept evaluation is done by picking up the most crucial focal points of the site and analysing them from a human perspective

#138

#139

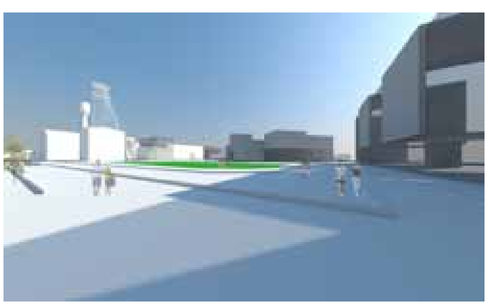
The access from the housing area fails to create a gateway look and does not create a clear continuation from the existing road, guiding traffic towards the site.

#140

The added access way creates the boulevard feeling guiding people toward the retail center and train station. It creates playful connection between the old and new.

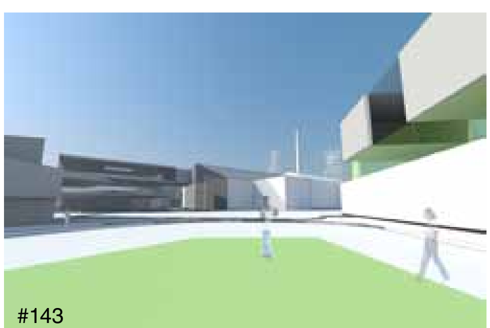
#141

The plaza is missing the well defined edges and creates a vast space in between the building masses.



#142

The square between separates the building masses and scatters the functions around the edges. It fails to merge the site together and therefore loses some of its industrial appeal.



#143

Natural intersection is created by guiding the added access road towards the existing bus station.

Iteration 1

#144

Iteration 1 is a combination of concept 1 and 2. The centralised square is picked from the concept 2 and the park area suggested in the concept 1 is changed into office area. This is defining the stronger edges for the main square.

The square still fails due to its size which is evident from the main access road. Even though the square fulfils the requirement of working as a view point for the museum site, it is blended into the main access road and therefore does not have the wanted qualities.

The strong gateway access toward the site is added from the residential area which leads to the natural meeting point between the buildings. This meeting point is connected to the main square by creating a back access that leads into it.

After visiting the site the train connections is discarded due to the removed infrastructure and the eventual cost of it. The site is in close connection to the track and therefore it is more plausible to organise a straight shuttle bus connections from the train station to the site.

Iteration 2

#145

Iteration 2 investigates a green connecting path through the development. The path would link the residential area to the slag heap park and create an inviting walkway through the site. Underlining theme is to magnify the revitalisation of the slag heap as a notion toward the development of greener Silesia.

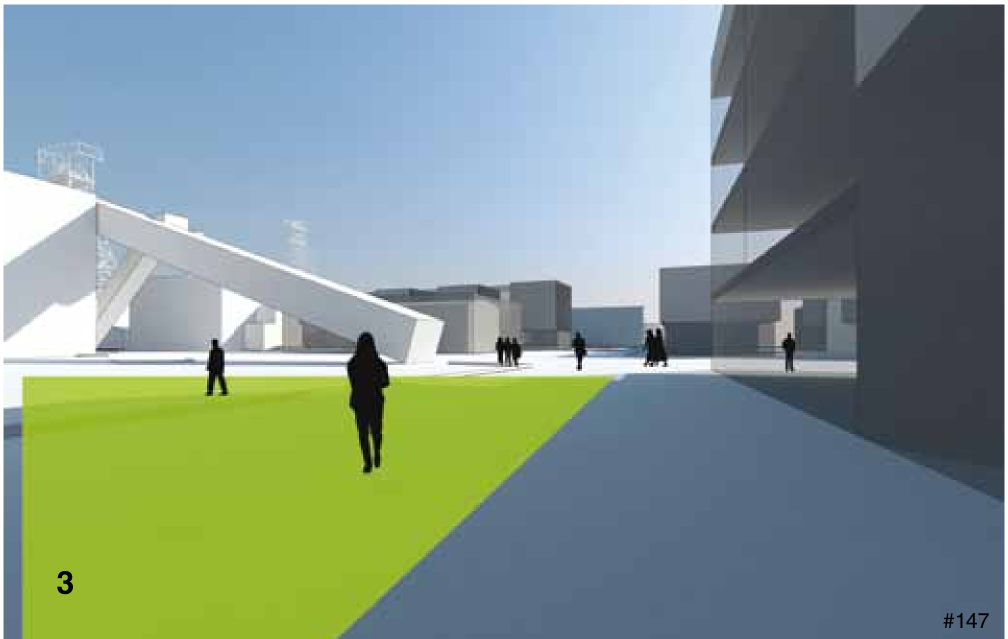
The fact that walking is tiring makes the pedestrians aware of the conscious choice of walk lines. Pedestrians tend to walk direct walk lines and use shortcuts. Long straight lines ought to be avoided. Curved and broken street lines make the walk more eventful.

Final concept

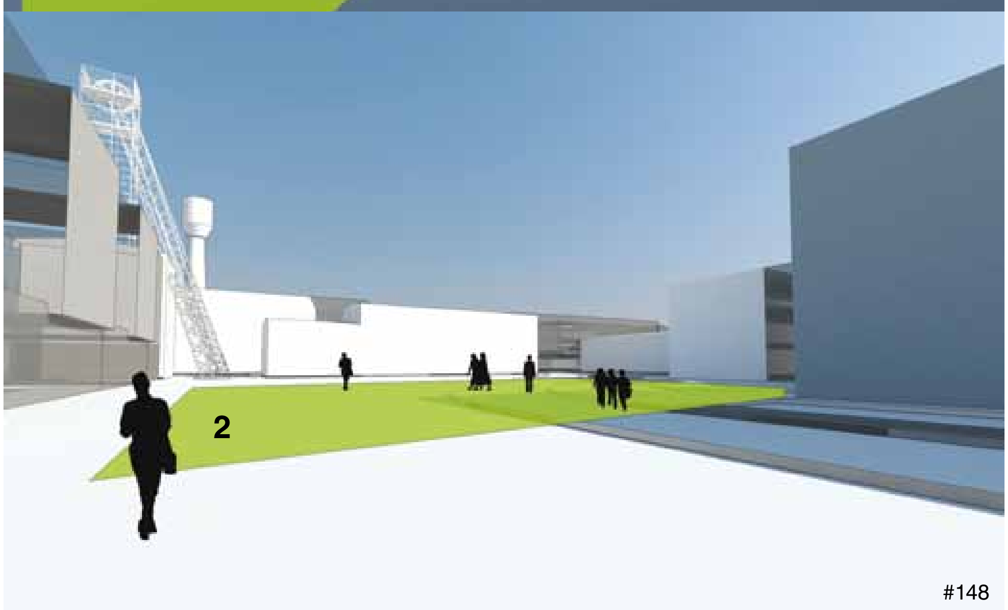
Final concept combines the suggested iterations to create optimal concept for the site. The main idea is to connect the existing residential area to the slag heap park with a green path through three squares. A walk-system with interaction between street spaces and small space formation will often have a psychological effect to make the walk experienced shorter. Therefore the trip is divided into a manageable stages where people move from one square to another without thinking of the total length of the trip.

The idea of the placement of the different functions and activities is to create various flows for the traffic. Dynamic and open spaces are in a close connection with the green areas, shops, cafes, museum and exhibition spaces.

#146

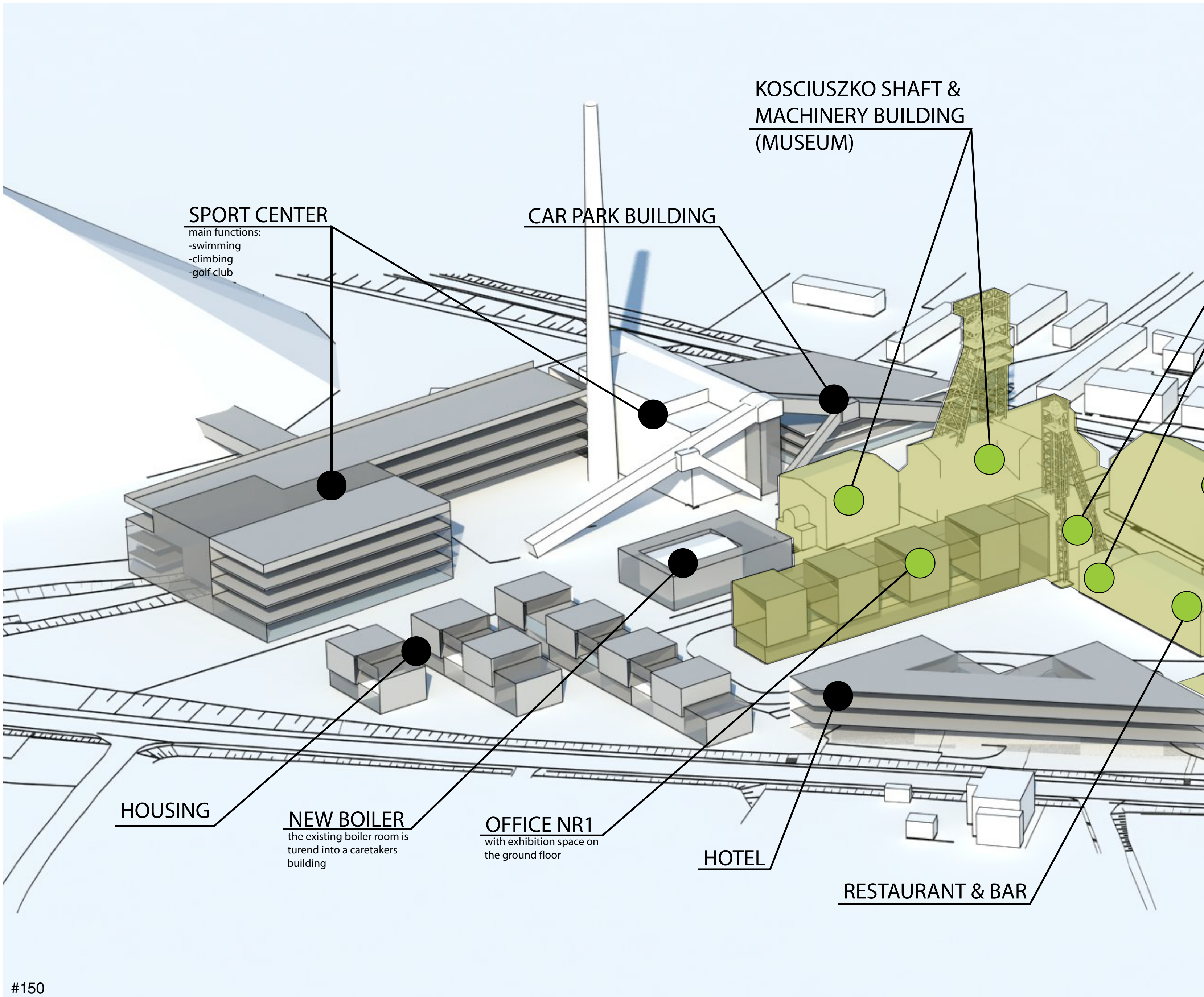


#147

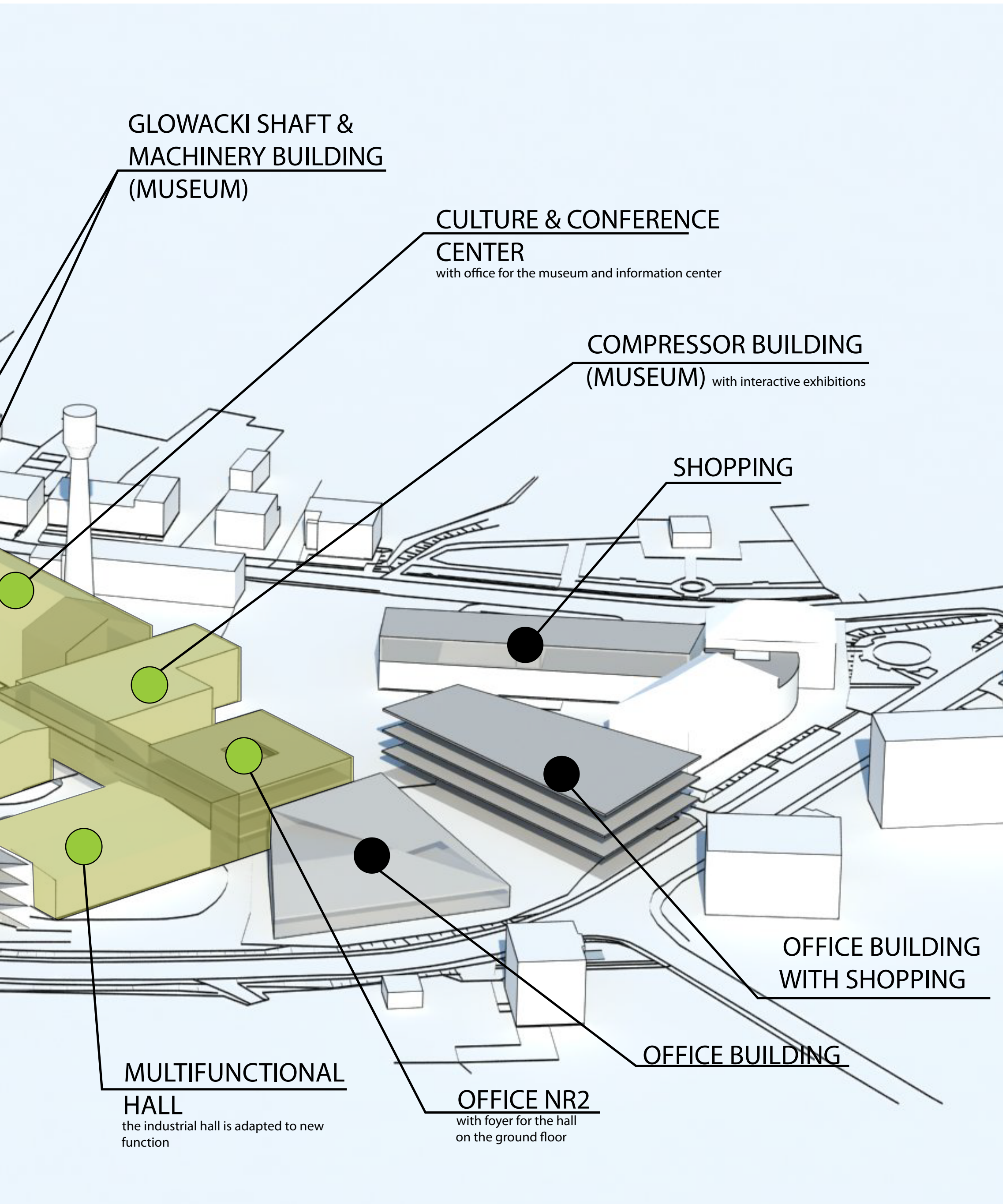


#148

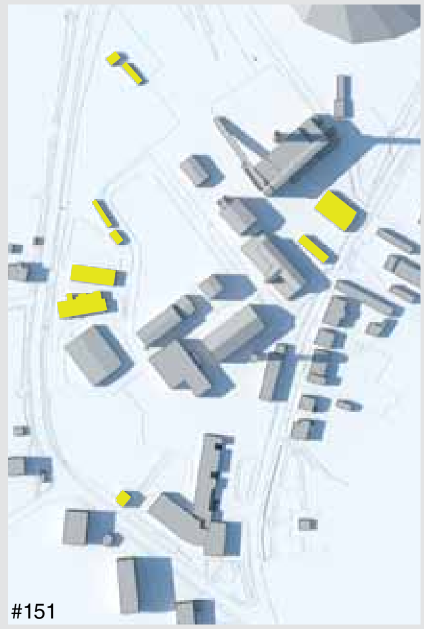
#149


KOSCIUSZKO SHAFT &
MACHINERY BUILDING
(MUSEUM)
SPORT CENTER
main functions:
-swimming
-climbing
-golf club
CAR PARK BUILDING
HOUSING
NEW BOILER
the existing boiler room is turend into a caretakers building
OFFICE NR1
with exhibition space on the ground floor
HOTEL
RESTAURANT & BAR

#150

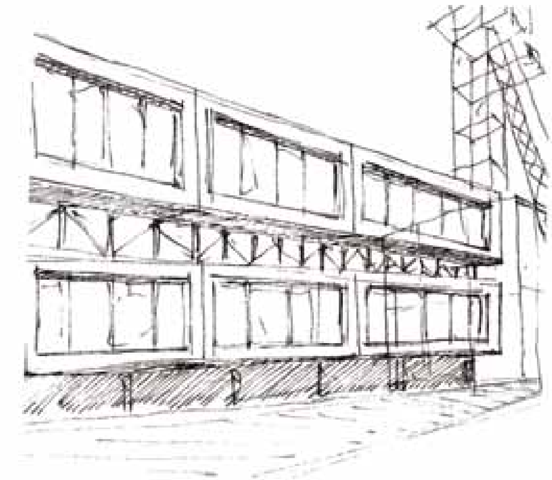


REMOVED BUILDINGS



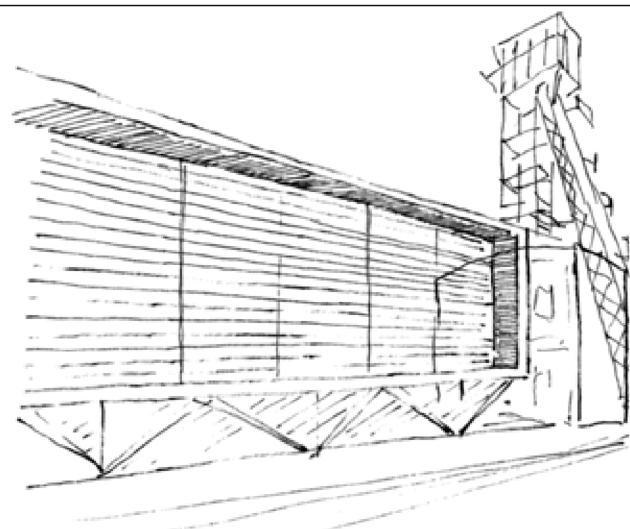
The yellow colour indicates buildings that have to be removed to make place for the new development. Most of them are sheds and single storey garage buildings that in our opinion have no significant value to the site.

Office nr 1



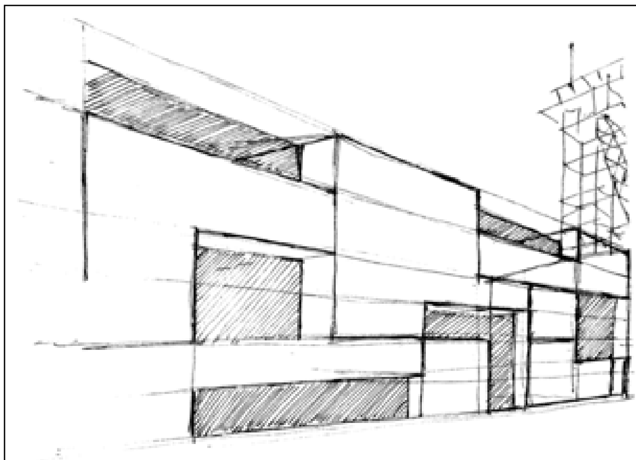
#152

Facade relating to the two storey facade of the Glowacki shaft.



#153

Simple, glazed facade outlook contrast with the traditional brick facade of the Glowacki shaft

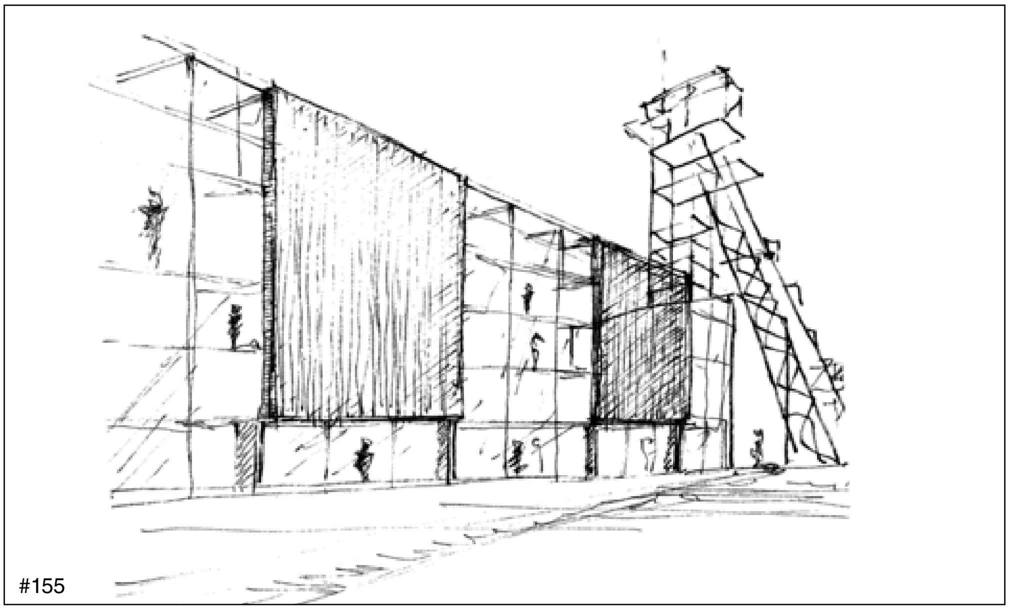


#154

Maze like facade expresses the modern and clearly divides the old and new.

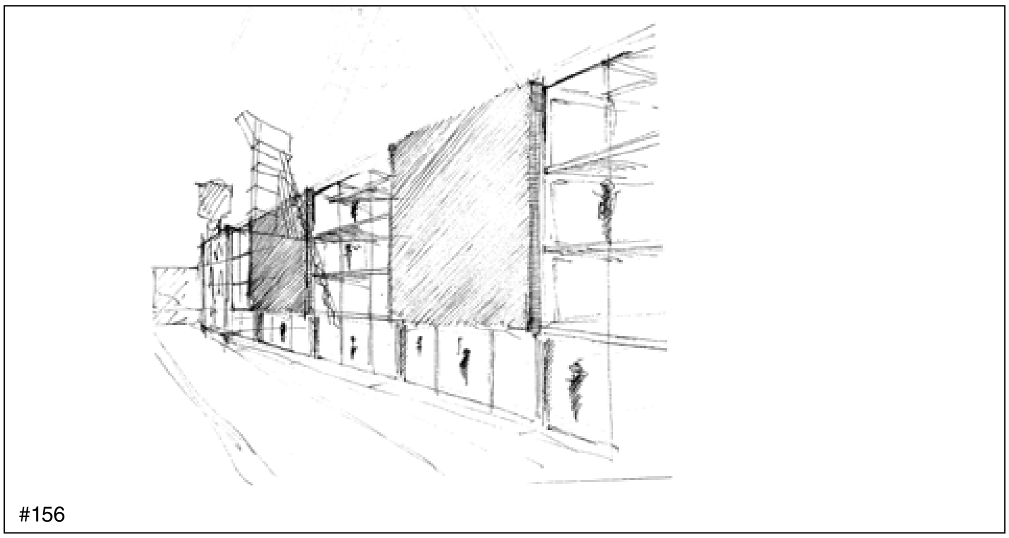
A the same time the different urban concepts were investigated, digital and hand sketches have been made for the new buildings to investigate different solutions.

The building mass is an extension of the Glowacki shaft and does not exceed the shafts dimension to ensure that the old shaft towers continue to dominate on the site. The idea is not to draw attention away from the historical buildings but to connect the old and new in a respectful manner.



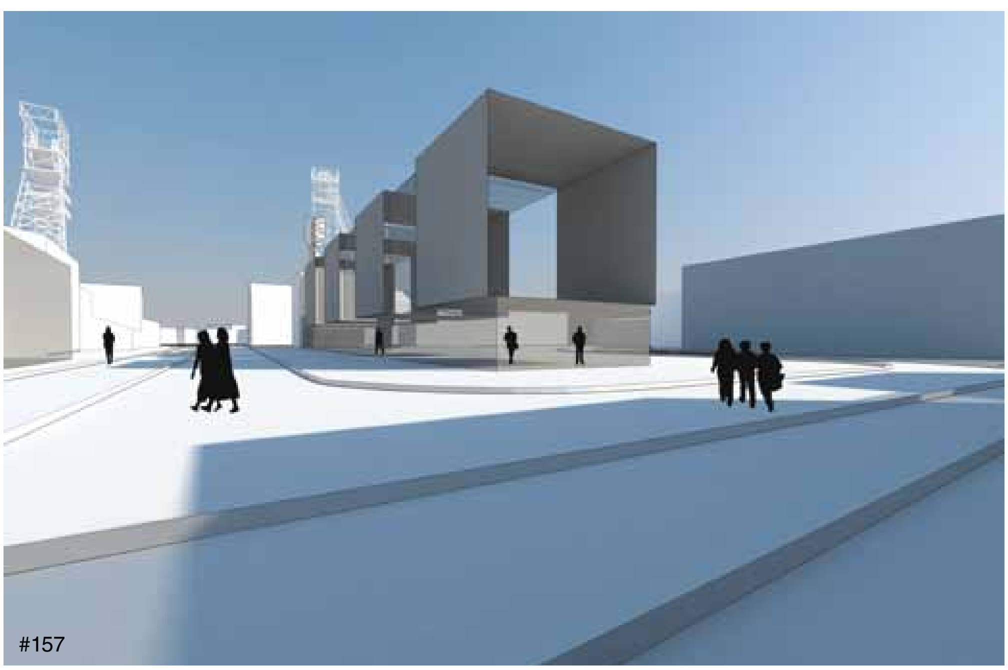
#155

Facade relating to the glowacki shaft by multiplication of simple squares the size of the old facade.



#156

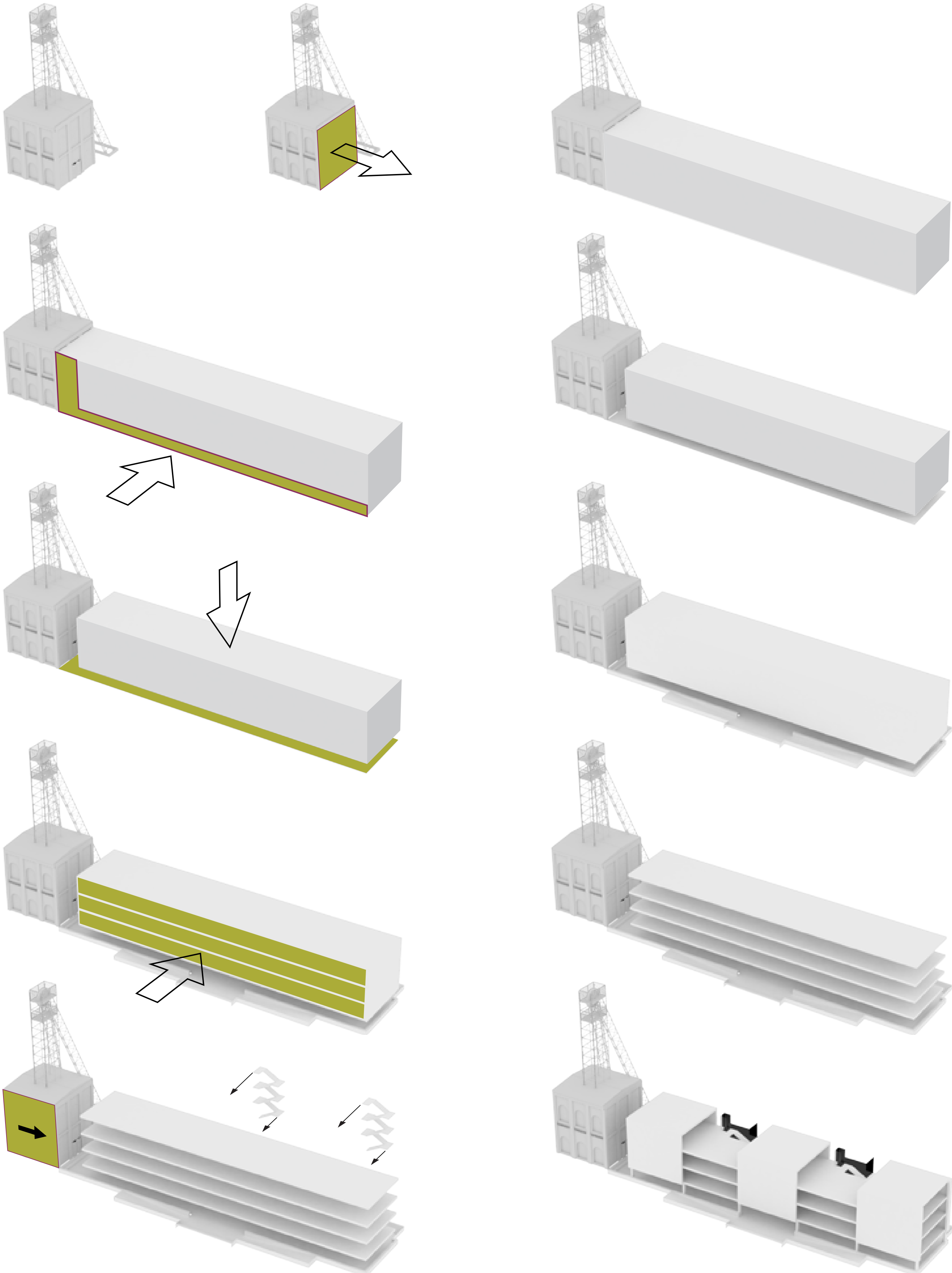
Creation of logical continuation of the old building.



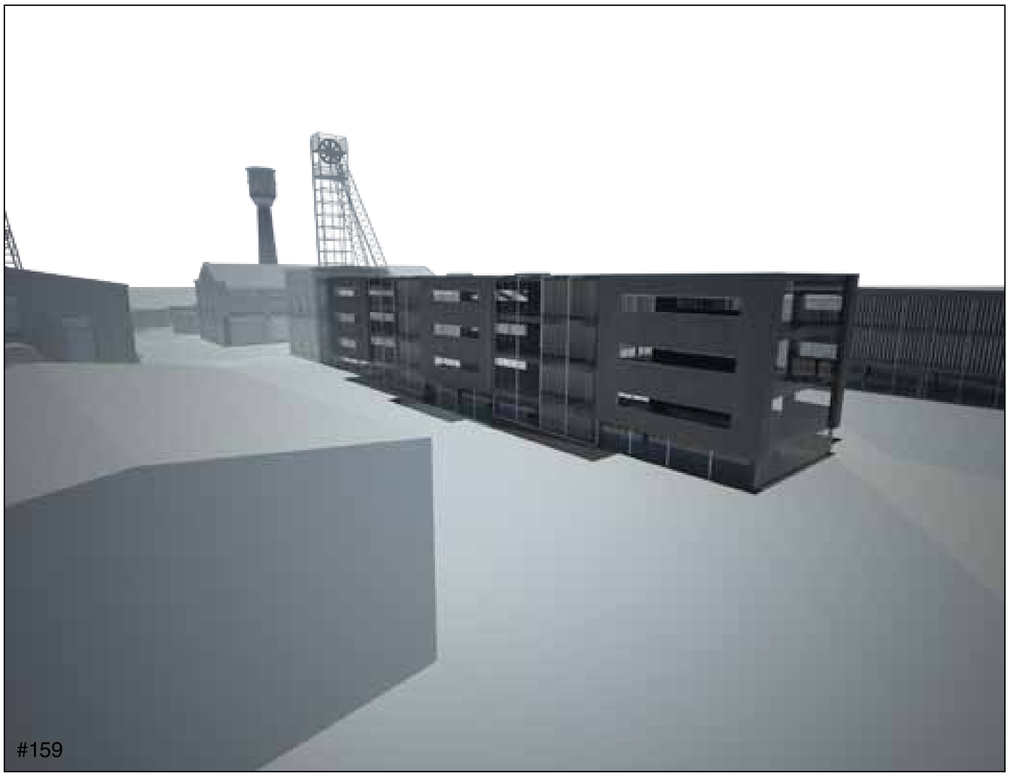
#157

Digital sketch shows the relation to rest of the site from human perspective. Concept is chosen for further detailing.

Digital sketch of the design process



#158



#159

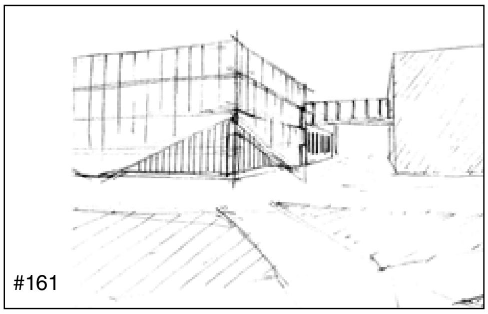
Digital sketch of building before application of the perforated facade, shows the structure of the building.

#160

Digital sketch of the office nr1 concept.
The building is divided into zones. The office rooms are placed behind perforated facade and the access area with meeting rooms would be covered with glazed facade.
The glazed ground floor works as an exhibition area and a visual connection between the two sides of the building. The glazed connection area between the Glowacki shaft and the rest of the building is a fully open high space where the old facade would be visible from out side.

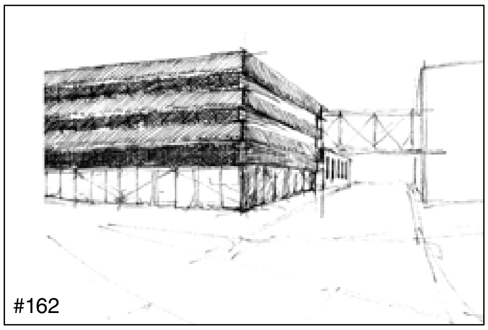
Office nr02

The buildings foot print and height is defined by the existing buildings. The main facade of the office nr 2 is aligned with the back wall of the compressor building to create the square. The connection with the complex is made with a bridge to ensure that the walkway to the site is not blocked.



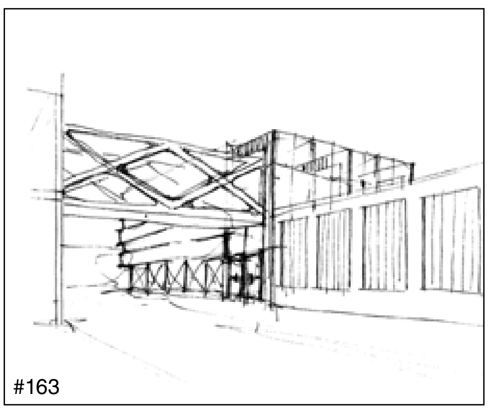
#161

Facade that opens at the corner



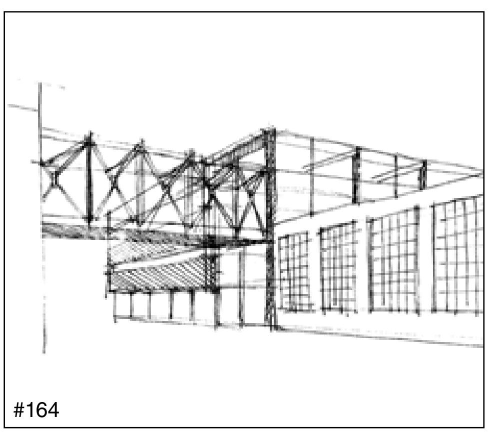
#162

Simple vertical lines and transparency in the ground floor



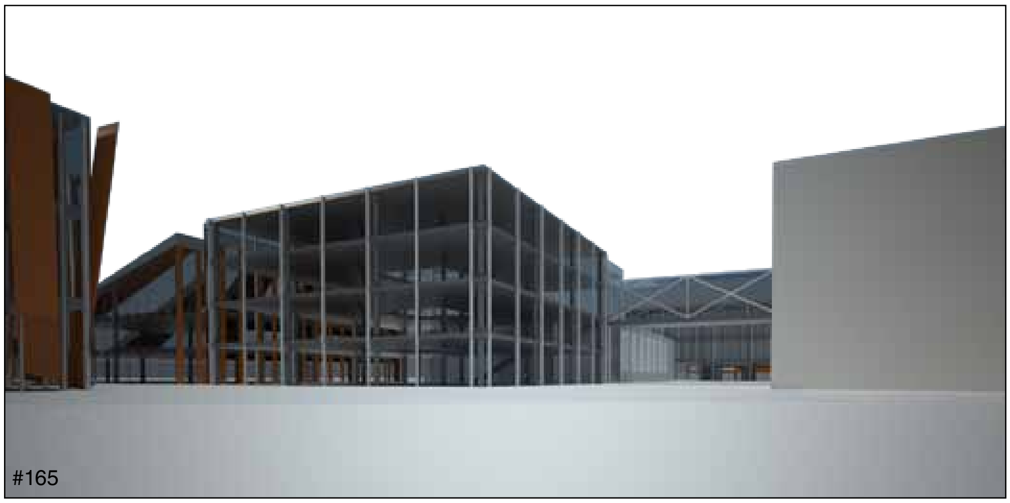
#163

Bridge connection with truss structure.



#164

Bridge connection with more dense structure.



#165

Digital sketch of buildings structure.

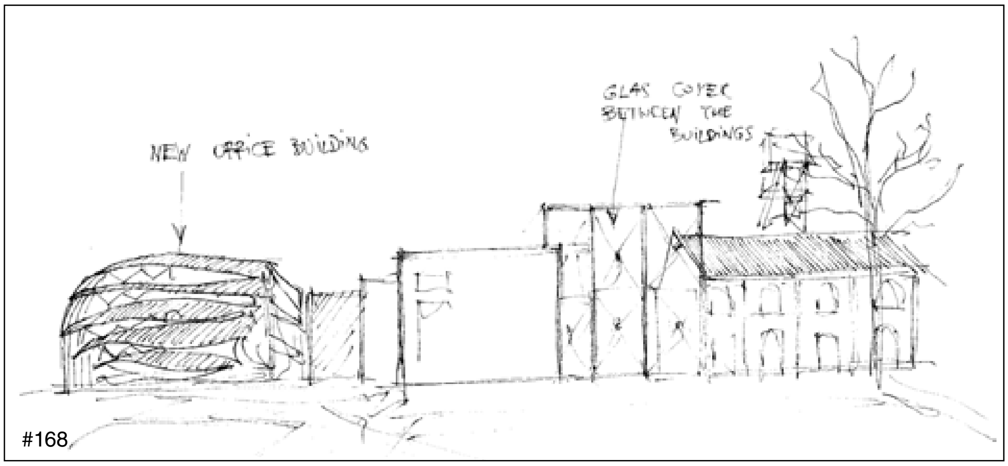
#166

Digital sketch of vertical panelling for the facade.

#167

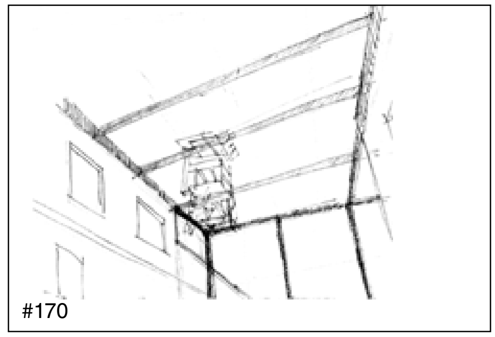
Digital sketch of horizontal sheets of shading facade.

Glazed cover

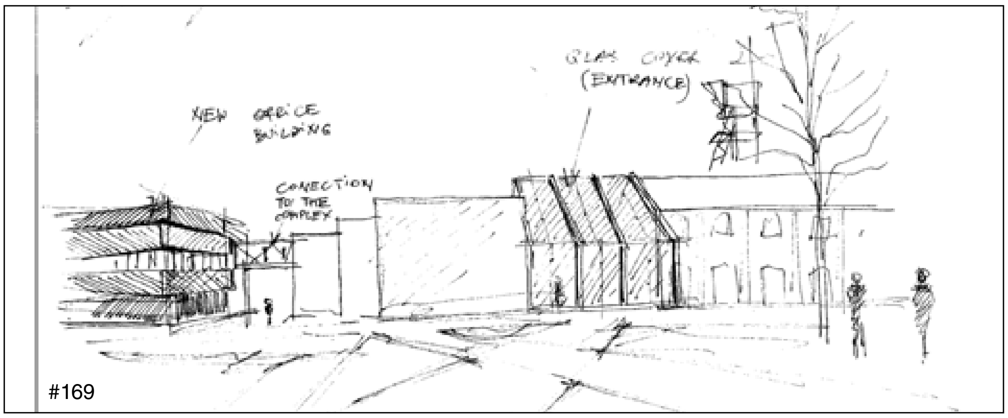


#168

View from the bus station towards the complex, the glazing between the building as a straight facade


#170

The glass cover between the old buildings, additional structure members would be added to ensure that no load is directly transferred through the old walls.

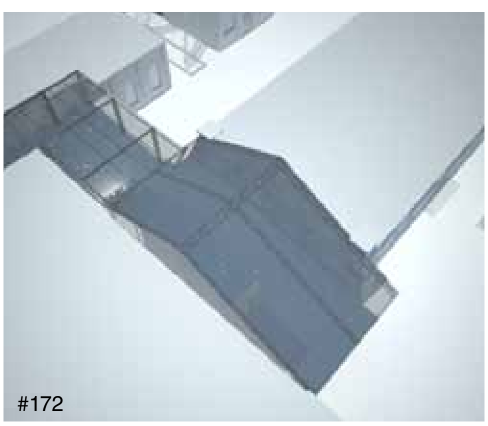


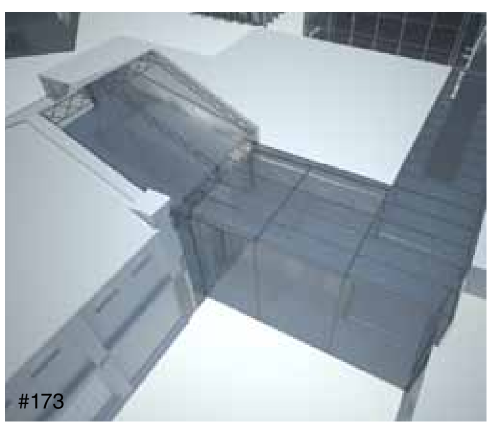
#169

View from the bus station towards the complex, the glazing between the building as continuation of the warehouse roof.


#171

Digital sketches of the glazed facade in the entrance area

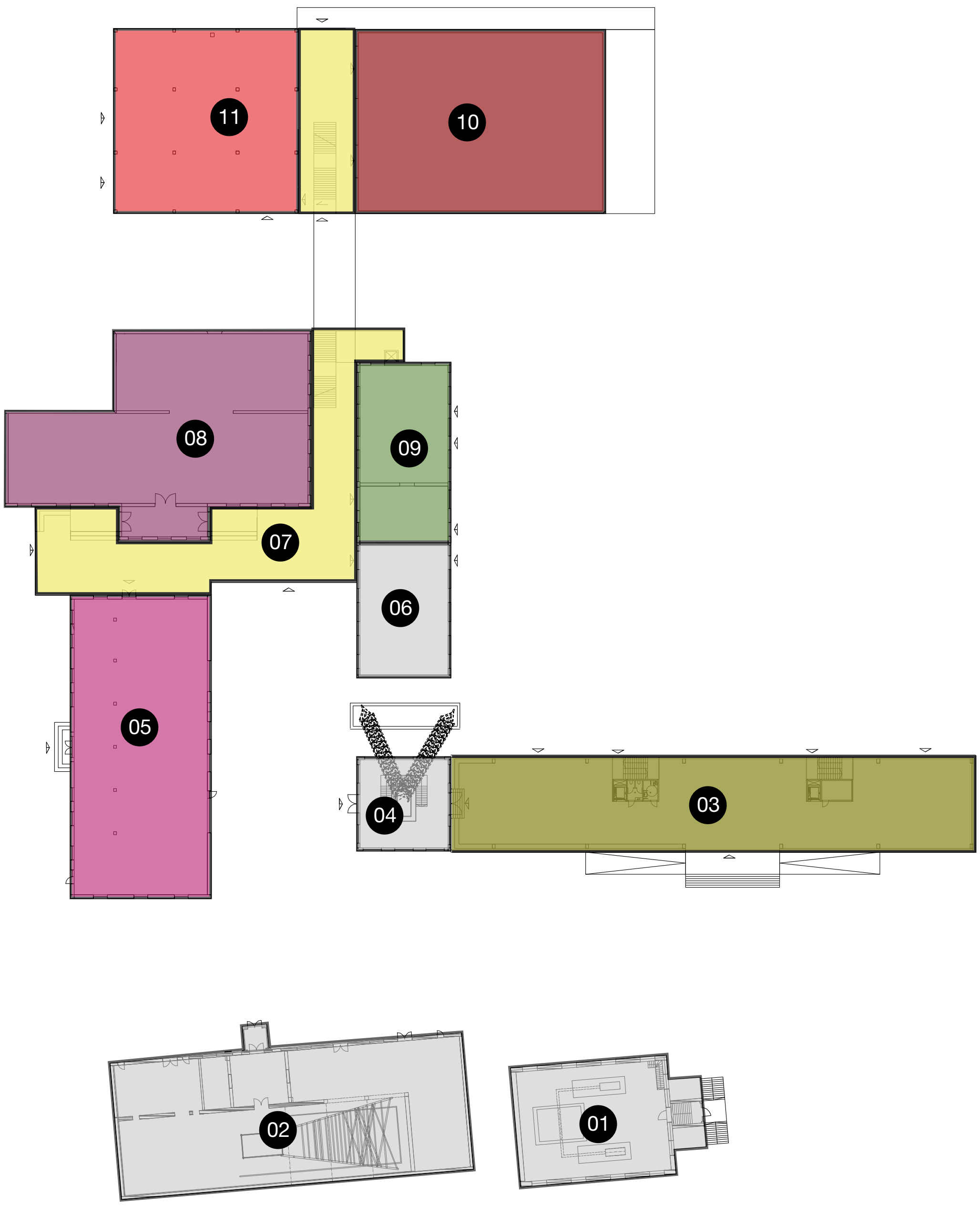

#172


#173


#174

Digital sketches of the glazed cover

Applying new functions



#175

1. Kosciuszko Shaft machinery room

function - museum of the Ignacy mine, exposition of the steam engine, small exhibition area in the basement

2. Kosciuszko Shaft building and tower

function - museum of the Ignacy mine, the building is renovated and maintained, small additional exhibition areas could be established

3. Ground floor of the office building nr01

function - exhibition space for the musem of mining in Rybnik area

4. Glowacki Shaft building

function - museum of the Ignacy mine, the building in maintained and kept in it's current state

5. Ground floor of the Warehouse

function - Office for the museum, lobby for the cultural & conference center, information and sales desk

6. Machinery room for Glowacki Shaft

function - museum of the Ignacy mine, exposition of the steam engine, the building is restored and maintained

7. Glazed cover structure

function - connecting space between buildings

8. Compressor building

function - museum of the mining in Rybnik, interactive exhibitions

9. Ground floor of the wood workshop

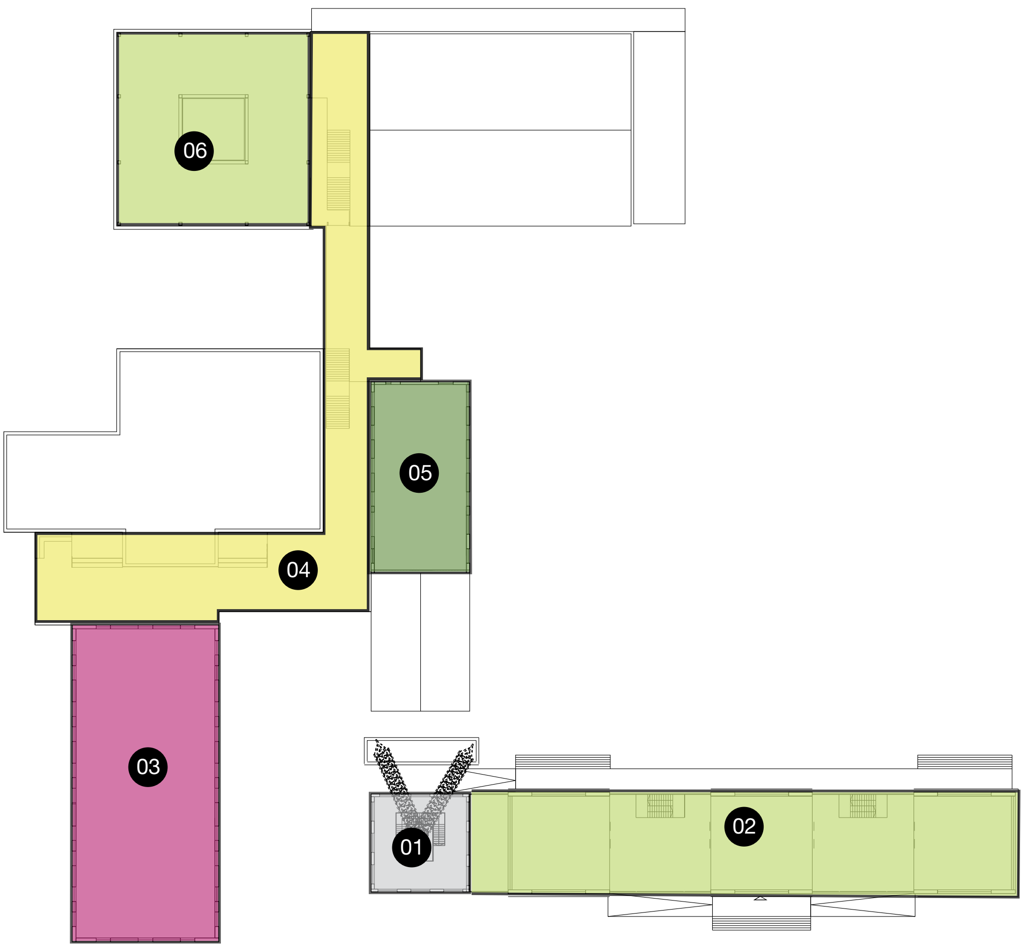
function - bar&cafe

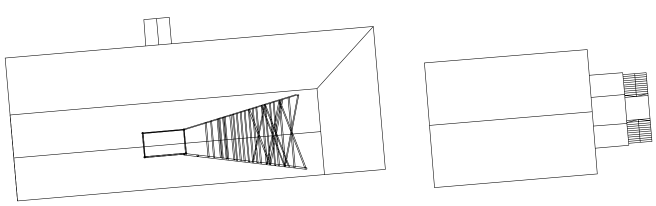
10. Industrial hall

function - multi hall for concerts and other cultural events

11. Ground floor of the Office nr02

function - foyer for the multi hall, shopping, lobby for the offices





#176

1. Glowacki Shaft building

function - museum of the Ignacy mine, the building in maintained and kept in it's current state

2. Office nr01

function - office space

3. Warehouse second floor

functions - auditoriums for the culture & conference center

4. Glazed cover structure and a bridge

function - connecting space between buildings

5. Second floor of the wood workshop

function - fine dining

6. Office nr02

function - office space

Materials

The main structural elements of the new buildings and the additions to the old ones are designed to be combinations of concrete, steel and glass. Main expression of the site is achieved with the facades made of COR-TEN steel structures and glass combined with the existing masonry to ensure the industrial feeling and outlook.

COR-TEN, Weathering steel

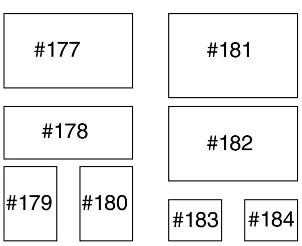
“Weathering” means that due to their chemical compositions, the steel has increased resistance to atmospheric corrosion compared to other steels. This is because the steel forms a protective layer on its surface under the influence of the weather. The cost-effectiveness of the material has been demonstrated in both short and long-term savings since the additional cost of the material can be often offset by the elimination of the need for initial painting or galvanizing. The corrosion-retarding effect of the protective layer is produced by the particular distribution and concentration of alloying elements in it. The layer protecting the surface develops and regenerates continuously when subjected to the influence of the weather. In other words, the steel is allowed to rust in order to form the ‘protective’ coating.

Using weathering steel in construction presents several challenges. The connection to the surrounding structure has to be designed to withstand the effect of weathering parts of the construction. Weld-points that have to weather at the same rate as the other materials may require special welding techniques or material. Weathering steel is not rustproof in itself therefore; water allowed to accumulate in pockets, will create higher corrosion rates on exposed areas. Also the discolouration for the surrounding structures has to be taken into account while designing the drainage system around the corten structures. [27]

The specific detail of the connection with COR-TEN is to be found in the appendix.

GLAZED FACADE

For the new office building and for the glazing between the new construction and old buildings a bonded glass solution is chosen. Bonded glass is a construction where the glazing is connected to the load-bearing structure by using profiles that are only visible from the inside. This creates the fine lined shadow jointed façade appearance that many manufacturer offers. The glass is attached to the main load bearing steel structure, but where the span between designed columns is too big for a single pane of glass additional mullions and transoms are added. Velfac Energy is a glass material which is used for glazing. The material has a high U-value and therefore reduces heat loss through the glass parts. An important factor is how the glass provides light, creates pleasant interiors and provides clear view of the exterior environment. Overheating might be a problem in the summer months and shading has to be taken into account to prevent it. The choice is a movable shading installation on the inside of the glass facade that can be changed according to the needs.



#177 corten facade illuminated from the inside
#178 possible application of led light into the facade
#179 connection between corten and glass
#180 patterns made with the perforation
#181 glazing as a break in the facade expres sion
#182 sleek glass facade expression
#183 shading added in to the glazing
#184 example of glazed bridge between buildings

Structural analysis

In the structural analysis part, Office building A, steel canopy and a steel roof structure, will be calculated for the correct structural member sizing and to ensure their stability. The calculations are done to get the correct outlook of the building's and to minimize the amount of changes made later by the structural engineers. These calculations will be conducted in a structural analyses software JIGI™.

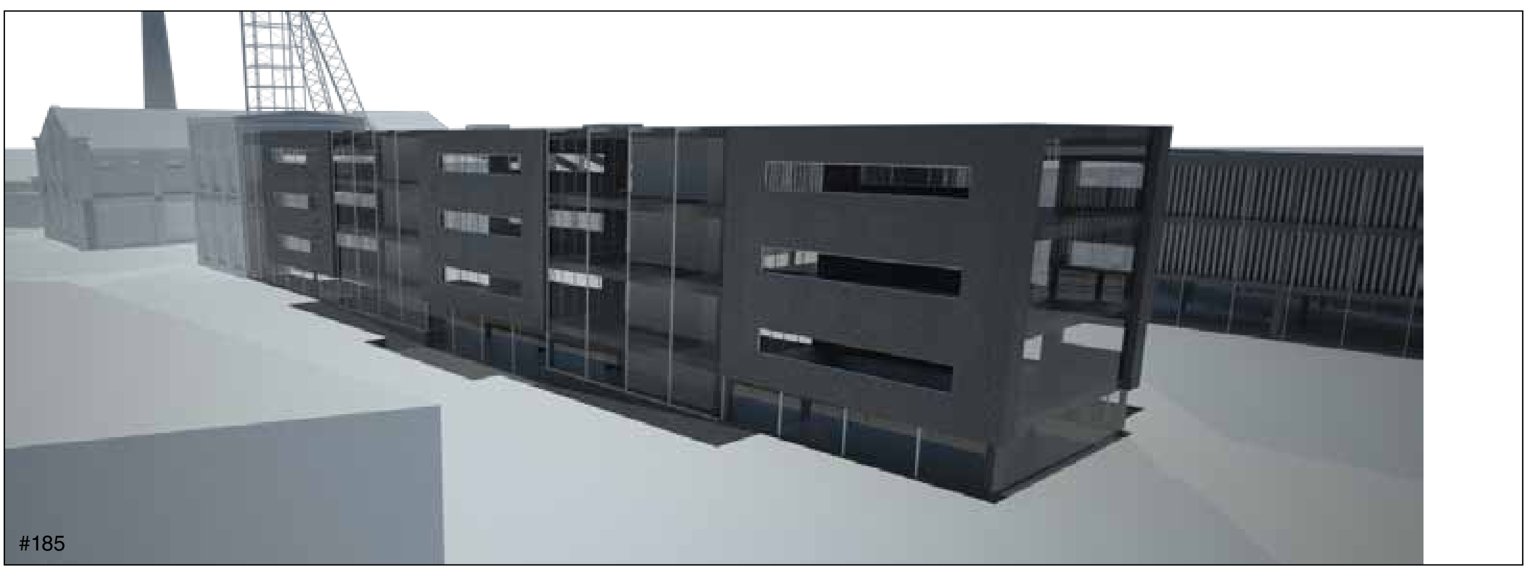
JIGI™ software provides structural engineers and architects with various structural analysis capabilities for framed structures, both simple and complex. It was designed to combined multiple simple softwares to create everyday calculation tool with a user friendly interface. It can quickly solved the structure response to various stresses and load combining for them. The analysis module is based on a linear static analysis FEM, Finite Element Method, solving both the 2 - and 3-dimensional rod structures. It calculates displacements, rotations, bending moments, torque, shear and normal forces, and support reactions on a bases of Eurocode.

Finite element method is a technique originally developed for numerical solution of complex problems in structural mechanics. The basic concept is that a body or structure can be divided into a smaller elements of finite dimensions called finite elements. The original body or structure is then considered as an assemblage of these elements connected at a finite number of joints called nodes or nodal points. The elements are interconnected only at the exterior nodes and altogether they should cover the entire body of a calculated structure as accurately as possible. The properties of the elements are formulated and combined to obtain the properties of the properties of the entire body. The equations of equilibrium for the entire structure are then obtained by combining the equilibrium equation of each element so that the continuity is ensured at each node. The necessary boundary conditions are then imposed and the equations of equilibrium are solved to obtain the required variables.

Jigi is enabling engineers and architects to quickly perform building and engineering analysis on a variety of structures to ensure stability and correct structural members from the start of the project.

JIGI™ is a new structural analysis program on a market and authors of this report are cooperating with the developing company and beta testing new modules for the software. The co-operation was established while using calculation program and noticing some errors in a user interface and calculation models. To ensure correct calculations for the analyzed structure in this project random member analyses with another programs were conducted.

The results from the calculation will be used as a bases for the technical drawings set.



#185

Before deeper structural analysis of the suggested structures and their members some decisions and estimations are made for the buildings in question such as main structural building material and building components.

Snow and Wind load

Snow load for the site has been taken from the Polish building regulations. The site is suggested to belong to region 2 and to have snow load of 0.9 kN/m². Wind load for the site is 0.3 kN/m². Taken into consideration the height of the building the design wind load in calculation is 0.55 kN/m².

Selfweight

Selfweight of the structure and materials has been determined inside calculation program JIGI™. Jigi only defines the selfweight for the modelled structure therefore leaving the other selfweights to be added into calculations manually.

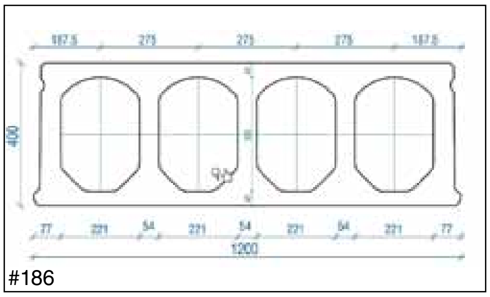
Office building nr01

The main structural frame for the office building is decided to be concrete columns and concrete beams with hollowcore slabs spanning as a floor structure in between. The roof structure is partly hollowcore slabs and partly glass with steel supports. The corten cladded facades are designed to be concrete sandwich elements supported by concrete beams. Live load used in calculation is taken from the Eurocode 1 which defines the usage load for the office building to be 2.5 kN/m².

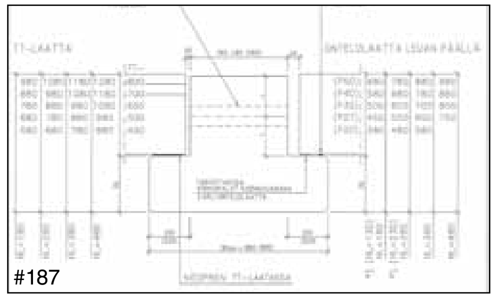
Building components will define the dead loads used in the calculations.

List of designed loads:

Snow load: q_S= 0.9 kN/m²
Wind load: q_W= 0.55 kN/m²
Live load: q_L= 2.5 kN/m²
Dead load$_h$: g_{hollow} = 5.0 kN/m²
Dead load$_s$: g_{screed} = 2.65 kN/m²
Dead load$_g$: g_{glass}= 1.0 kN/m²
Dead load$_w$: g_{wall}= 22.0 kN/m
Stair load: g_{stair}= 2.0 kN/m²

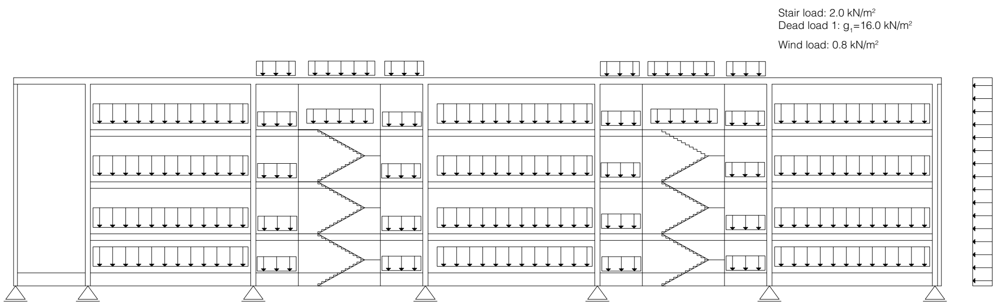


#186



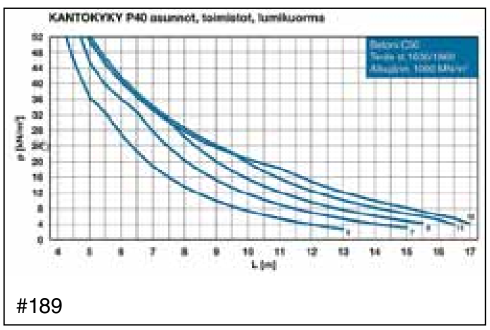
#187

Main supporting beams

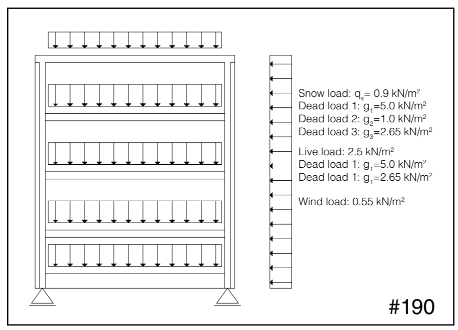


#188

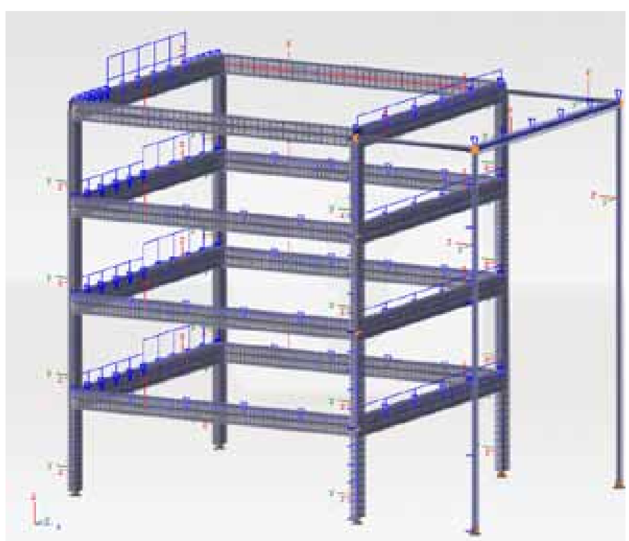
statical system of the office building



#189



#190



#191

Load diagram

For the structural analysis of the office, the building was cut into smaller sections from which one was picked for futher calculation. The calculated part of the building is the section connected to the headroom building number 1. The calculation were started by modeling the estimated structural elements and adding the loads to the structure.

Estimated structure:

Concrete beams: 400x600 mm
Concrete columns: 580x780 mm
Steel beams: HEA 200
Steel columns: HEA 200
Hollowcore slab: 400mm thick
Sandwich element: 150 + 220 + 70 mm

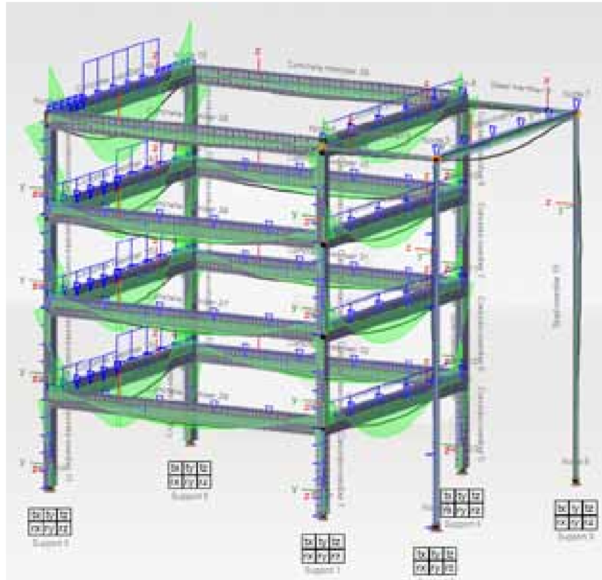
Hollowcore slab size was picked from the manufactures diagrams related to the free span and designed load on it

The limit for the deflection was set to L/300 and the concrete class was decided to be C40/50.

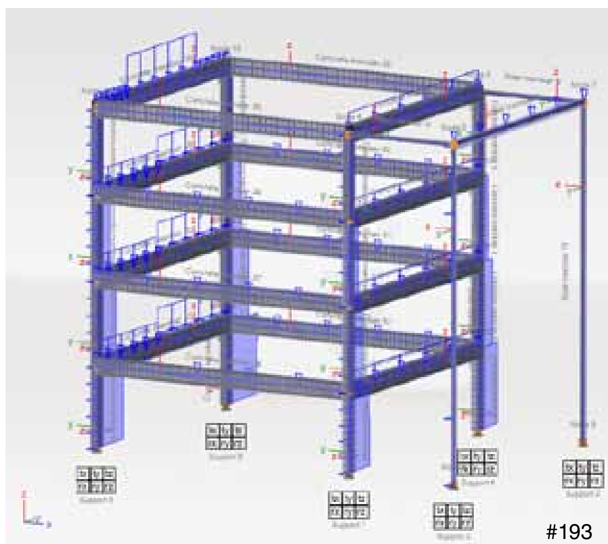
The concrete part of the office is supported from four points. The column structure follows the grid of 13.2 x 12.2 meters. The supporting beams for the hollowcore slabs are 12,2 meter long where as the beam supporting the sandwich wall element is 13,2 meters.

Calculations show that after using JIGI's concrete design module the estimated concrete structures have needed dimension to take the suggested loads. Consideration would have to be taken into account while estimating the beams total deflection and how they work together with the hollowcore slabs. This check has been made by using the program Flexible which calculates compressive load on the top section of the hollowcore slabs depending of the beam's total deflection and compares that to the compressive capacity of the concrete.

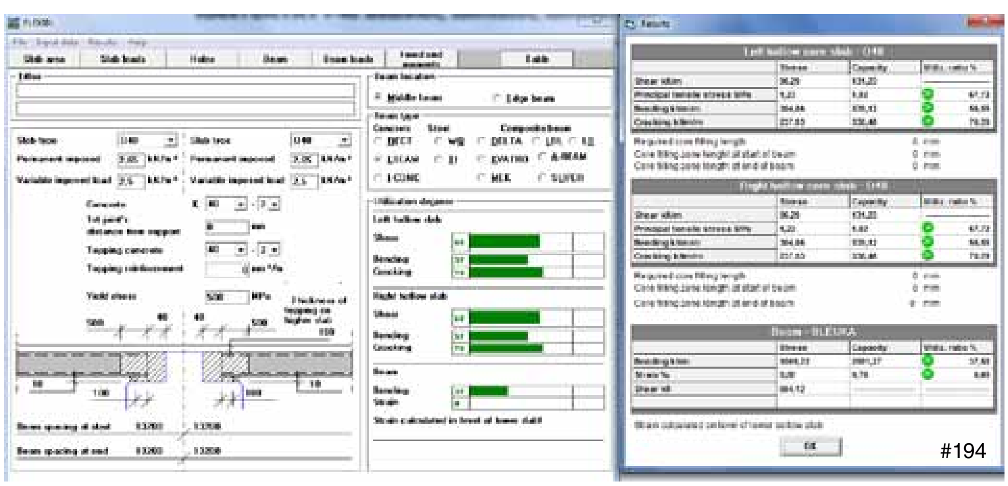
For further analyses of the structure two concrete members and one steel member were taken into closer look and designed against the suggested loads. Concrete member 16 is the top beam of the construction getting the biggest designed loads and therefore is analyzed and calculated closer. The other select-



#192
Bending moment, deflection and deformation



#193
Normal force diagram



#194

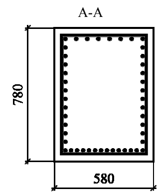
ed concrete member 14 is the bottom column taking the biggest normal forces and can therefore be seen as a base reinforcement for the columns. The steel member is the longest steel beam that is supporting the glass roof structure.

The analyzed structure works in total and therefore could be applied to the whole construction. Biggest considerations have to be the connections between different building materials. The beam deflection has to be checked in all situations where structure is connected to glass structures. Therefore the allowable deflection in these parts should be set higher to minimize the problems it may cause to the roof structure.

The calculated JIGI model uses normal reinforced beams and no prestressing has been taken into account in the design of the concrete beams. The suggested beam type is normally prestressed and therefore reinforcement for it cannot be taken straight from the calculations JIGI is giving. Nevertheless prestressing would have a positive effect on a total deflection and therefore it can be said that the structure would work better with prestressed members. The support loads that are coming from the structure to the ground are significant and footings for the office building should be checked . This calculation was conducted with Pilant program, which is checking the concrete columns piercing through the concrete footing and calculating reinforcement needed for the footing. The calculations and loads fairly indicate that the foundation for the office building will be pile foundation.

Final calculated structure:

Concrete beams: 400x600 mm
Concrete columns: 580x780 mm
Steel beams: HEB 400, HEA 200
Steel columns: HEB 220
Hollowcore slab: 400mm thick
Sandwich element: 150 + 220 + 70 mm
Footing: 1600x1600x800mm



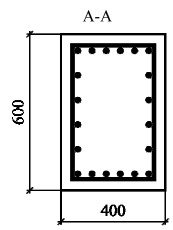
Main top: 8 x ∅25 mm
Main bottom: 14 x ∅25mm
Sides: 12 x ∅25 mm, 12 x ∅25 mm
Shear: ∅16 mm / 150 mm

#195

Utilization ratio: 0.78
Deflection: 35,9 mm
Weakest component shear capacity

Shear Z in point 11387 mm with combination 6: ULS: 1.35 x Perm.	Ratio: 0,78 ✓
Shear Y in point 813 mm with combination 6: ULS: 1.35 x Perm.	Ratio: 0,00 ✓
Bending Y in point 6100 mm with combination 6: ULS: 1.35 x Perm.	Ratio: 0,48 ✓
Bending Z in point 0 mm with combination 6: ULS: 1.35 x Perm.	Ratio: 0,00 ✓
Stiffness M_y = 56,8 % at point 6100 mm with char. comb. 7: SLS Cr: 1.0 x Permanent	max z = -35,8 mm
Stiffness M_y = 56,8 % at point 6100 mm with fre. comb. 10: SLS Fr: 1.0 x Permanent	max z = -35,8 mm
Stiffness M_y = 56,8 % at point 6100 mm with q-perm. comb. 13: SLS QP	max z = -35,9 mm
Stiffness M_z = 139,1 % at point 2801 mm with char. comb. 7: SLS Cr: 1.0 x Permanent	max y = 0,0 mm
Stiffness M_z = 139,1 % at point 2801 mm with fre. comb. 10: SLS Fr: 1.0 x Permanent	max y = 0,0 mm
Stiffness M_z = 139,1 % at point 2801 mm with q-perm. comb. 13: SLS QP	max y = 0,0 mm
Crack width moment Y 12200 mm with combination 7: SLS Cr: 1.0 x Permanent	Ratio: 0,51 (0,01 mm) ✓
Crack width moment Z 0 mm with combination 7: SLS Cr: 1.0 x Permanent	Ratio: 0,00 ✓

✓ *VERIFIED: Concrete member verified. Highest usage ratio was 78,0 % Used verification standard: EN 1992-1-1 Finland. Weakest component is shear capacity in z-direction.*



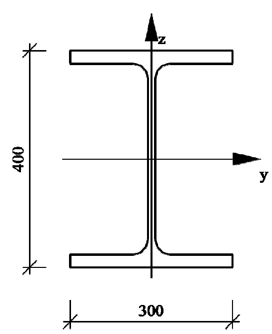
Main top: 6 x ∅25 mm
Main bottom: 6 x ∅25mm
Sides: 4 x ∅25 mm, 4 x ∅25 mm
Shear: ∅16 mm / 250 mm

#196

Utilization ratio: 0.96
Bending: 2,4 mm
Weakest component bending capacity

Shear Z in point 633 mm with combination 5: ULS: 1.5 x Wind	Ratio: 0,95 ✓
Shear Y in point 380 mm with combination 6: ULS: 1.35 x Perm.	Ratio: 0,31 ✓
Second order effects Y in point 3800 mm with combination 6: ULS: 1.35 x Perm.	M_y = 0,4kNm
Bending Y in point 3800 mm with combination 6: ULS: 1.35 x Perm.	Ratio: 0,96 ✓
Second order effects Z in point 3800 mm with combination 6: ULS: 1.35 x Perm.	M_z = 0,4kNm
Bending Z in point 3800 mm with combination 6: ULS: 1.35 x Perm.	Ratio: 0,35 ✓
Stiffness M_y = 53,7 % at point 2660 mm with char. comb. 9: SLS Cr: 1.0 x Wind	max z = -2,2 mm
Stiffness M_y = 53,7 % at point 2533 mm with fre. comb. 12: SLS Fr: Psi1 x Wind	max z = -2,3 mm
Stiffness M_y = 53,7 % at point 2533 mm with q-perm. comb. 13: SLS QP	max z = -2,3 mm
Stiffness M_z = 46,4 % at point 2533 mm with char. comb. 9: SLS Cr: 1.0 x Wind	max y = 1,2 mm
Stiffness M_z = 46,4 % at point 2533 mm with fre. comb. 12: SLS Fr: Psi1 x Wind	max y = 1,2 mm
Stiffness M_z = 46,4 % at point 2533 mm with q-perm. comb. 13: SLS QP	max y = 1,2 mm
Crack width moment Y 3800 mm with combination 9: SLS Cr: 1.0 x Wind	Ratio: 0,70 (0,28 mm) ✓
Crack width moment Z 3800 mm with combination 9: SLS Cr: 1.0 x Wind	Ratio: 0,25 ✓

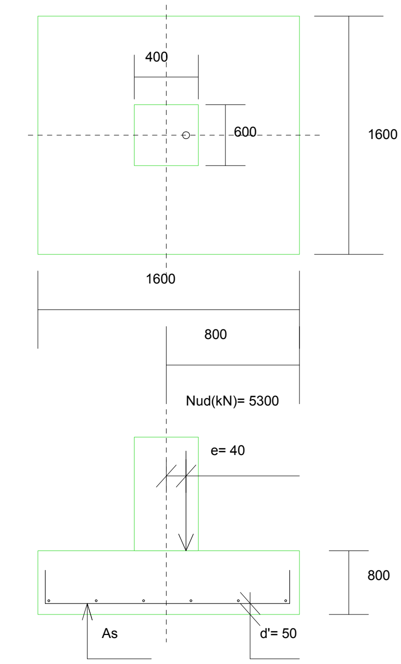
✓ *VERIFIED: Concrete member verified. Highest usage ratio was 96,4 % Used verification standard: EN 1992-1-1 Finland. Weakest component is bending capacity in y-direction.*



#197
Utilization ratio: 0.33
Bending: 15,8 mm
Weakest component lateral torsional buckling

Normalforce in point 0 mm with combination 5: ULS: 1.5 x Wind	Ratio: 0,00 ✓
Shear Z in point 0 mm with combination 4: ULS: 1.5 x Snow<2.7	Ratio: 0,06 ✓
Shear Y in point 0 mm with combination 5: ULS: 1.5 x Wind	Ratio: 0,00 ✓
Bending Y in point 6100 mm with combination 4: ULS: 1.5 x Snow<2.7	Ratio: 0,21 ✓
Bending Z in point 12200 mm with combination 5: ULS: 1.5 x Wind	Ratio: 0,09 ✓
bi-axial Bending in point 0 mm with combination 5: ULS: 1.5 x Wind	Ratio: 0,09 ✓
Buckling y in point 0 mm with combination 5: ULS: 1.5 x Wind	Ratio: 0,00 ✓
Buckling z in point 0 mm with combination 5: ULS: 1.5 x Wind	Ratio: 0,01 ✓
Lat. torsional buckl. 6100 mm with combination 4: ULS: 1.5 x Snow<2.7	Ratio: 0,33 ✓
Displacement Z at point 6100,0 mm with char. comb. 8: SLS Cr: 1.0 x Snow<2.7	max z = -22,0 mm
Displacement Z at point 6100,0 mm With fre. comb. 11: SLS Fr: Psi1 x Snow<2.7	max z = -15,8 mm
Displacement Z at point 6100,0 mm with q-perm. comb. 13: SLS QP	max z = -13,0 mm
Displacement y at point 9760,0 mm with char. comb. 9: SLS Cr: 1.0 x Wind	max y = -2,4 mm
Displacement y at point 9760,0 mm With fre. comb. 12: SLS Fr: Psi1 x Wind	max y = -0,5 mm
Displacement y at point 6506,7 mm with q-perm. comb. 13: SLS QP	max y = 0,0 mm

✓ *VERIFIED: Steel member verified. Highest usage ratio was 32,8 % Used verification standard: EN 1993-1-1 Finland. Weakest component is Lateral torsional buckling capacity.*



Betoni K 40 - 2 Teräs A500HW

#198

Betoni K 40 - 2 Teräs A500HW

**** TULOSTUS **** Suunnittelutoimisto Blueprint

Pohjarasitus(Mpa)	2,20
Ant momentti Mx(kNm/m)	392,27
Ant momentti My(kNm/m)	258,79
Asx vaad (mm2/m)	1279,63
Asy vaad (mm2/m)	838,59
Lävistysvoima (kN)	0,00
Au (d/2 et pil kylj (m2)	0,00
Piiri u (m)	0,00
Kerroin beetta	0,40
Kerroin k	1,00
roo	0,00138
Lävistyskapasiteetti (kN)	0,00
Leikk kap x-suunta (kN)	609,30
Leikk kap y-suunta (kN)	592,80
Leikk Voima x-suunta(kN)	0,00
Leikk Voima y-suunta (kN)	0,00

Second part for the structural analysis were done for the steel structures supporting the glass roof that spans between the old buildings. Since the deadloads and materials has been determined inside calculation program, only user defined load for the structure was the weight of the glass covering, snow and wind load.

List of designed loads:

Snow load: $q_S = 0.9\ kN/m^2$
Wind load: $q_W = 0.55\ kN/m^2$
Dead load$_g$: $g_{glass} = 1.0\ kN/m^2$

The analyzed roof construction is supported with five steel columns. The columns are added next to the old brick construction to ensure that the loads are not transferred to it. Since the roof is designed to be glass construction the biggest problems is to ensure correct deflection of the beam. The limit for the deflection was set to L/500 and the steel class was decided to be S355. This deflection limit meant that no structural beam should bend more that 20mm.

Estimated structure:

Steel beams: HEA 200

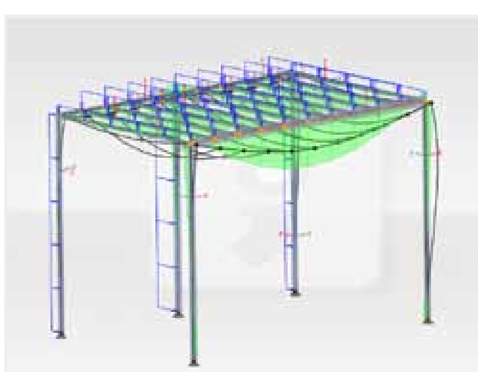
Steel columns: HEA 200

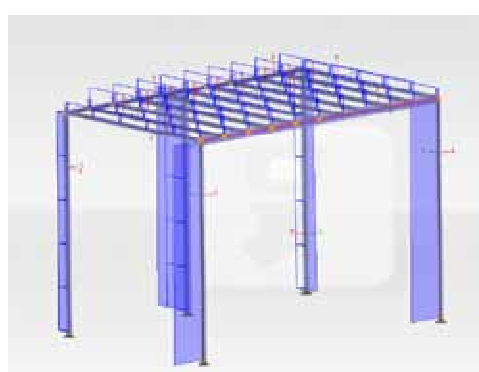
After calculating the steel frame with the estimated structure, iterations were done to ensure the deflection limit. Top beam system were changed into bigger profiles and the columns were changes to HEB sections.

Final calculated structure:

Steel beams: IPE 300
HEB 500
Steel columns: HEB 220


#199
Load diagram


#200
Bending moment, deflection and deformation


#201
Normal force diagram

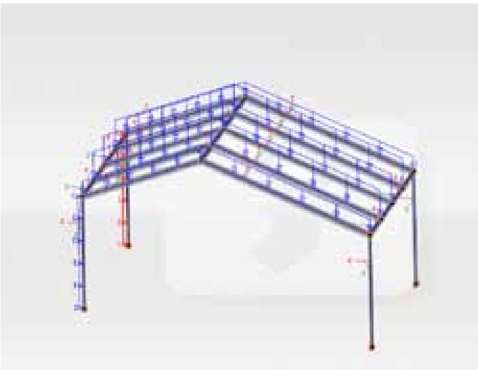
Third part analysis were done with the same methods that the second part. Same live loads and dead loads were used to conduct calculations. The estimated profile sizes were taken from the second part calculations.

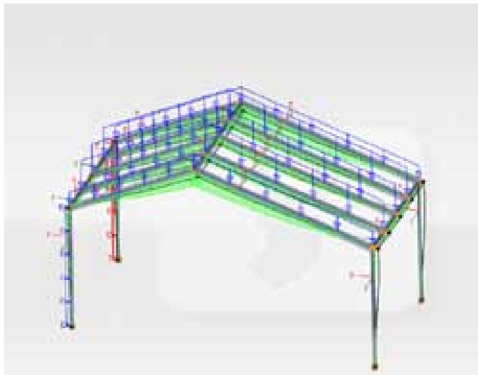
Estimated structure:
Steel beams: HEB 200
Steel columns: HEB 220

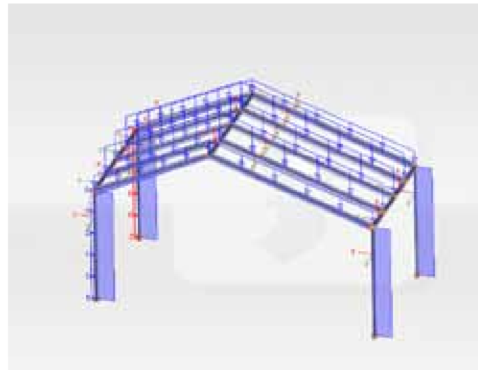
After calculating the steel frame with the estimated structure, iterations were done to ensure the deflection limit. Top beam system were changed into bigger profiles and the outer frame were changed into HEA profiles.

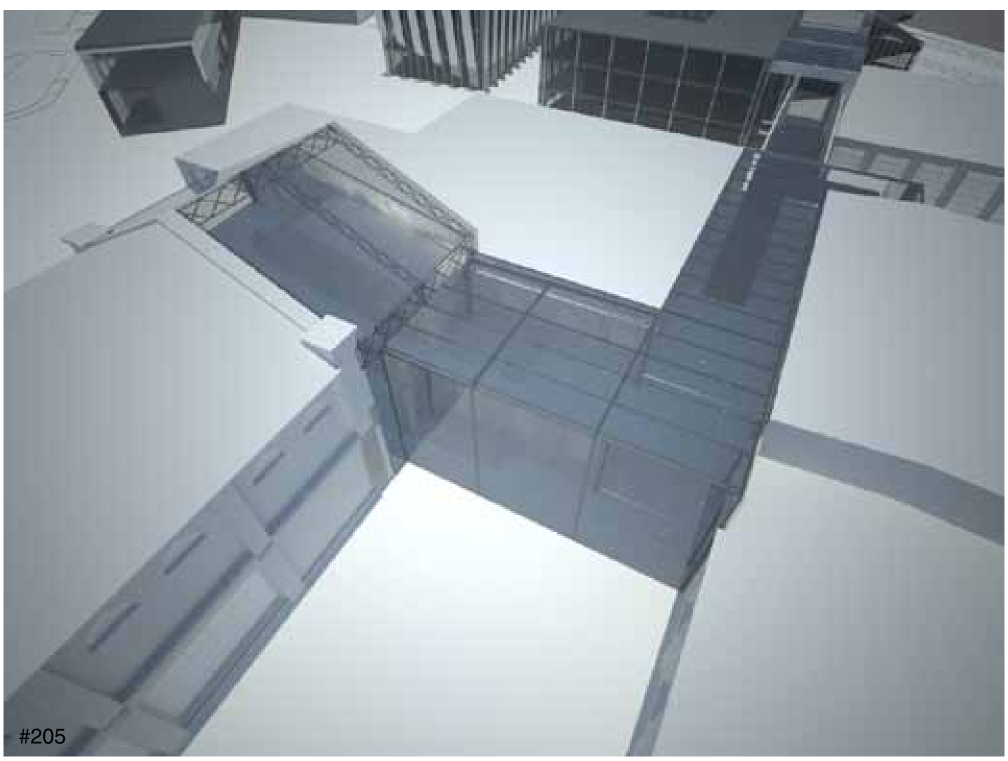
Final calculated structure:

Steel beams: IPE 600
HEA 600
Steel columns: HEB 220


#202
Load diagram


#203
Bending moment, deflection and deformation


#204
Normal force diagram


#205

The analyzed structures have a small differences to the final modelled ones. Some of the modelled steel structures are calculated as a single beam construction whereas in the model it is shown as a space truss structure. The calculations for the space truss could have been done with JIGI as well but since the structure worked fine with standardized beam construction the iteration for the space truss was not required.

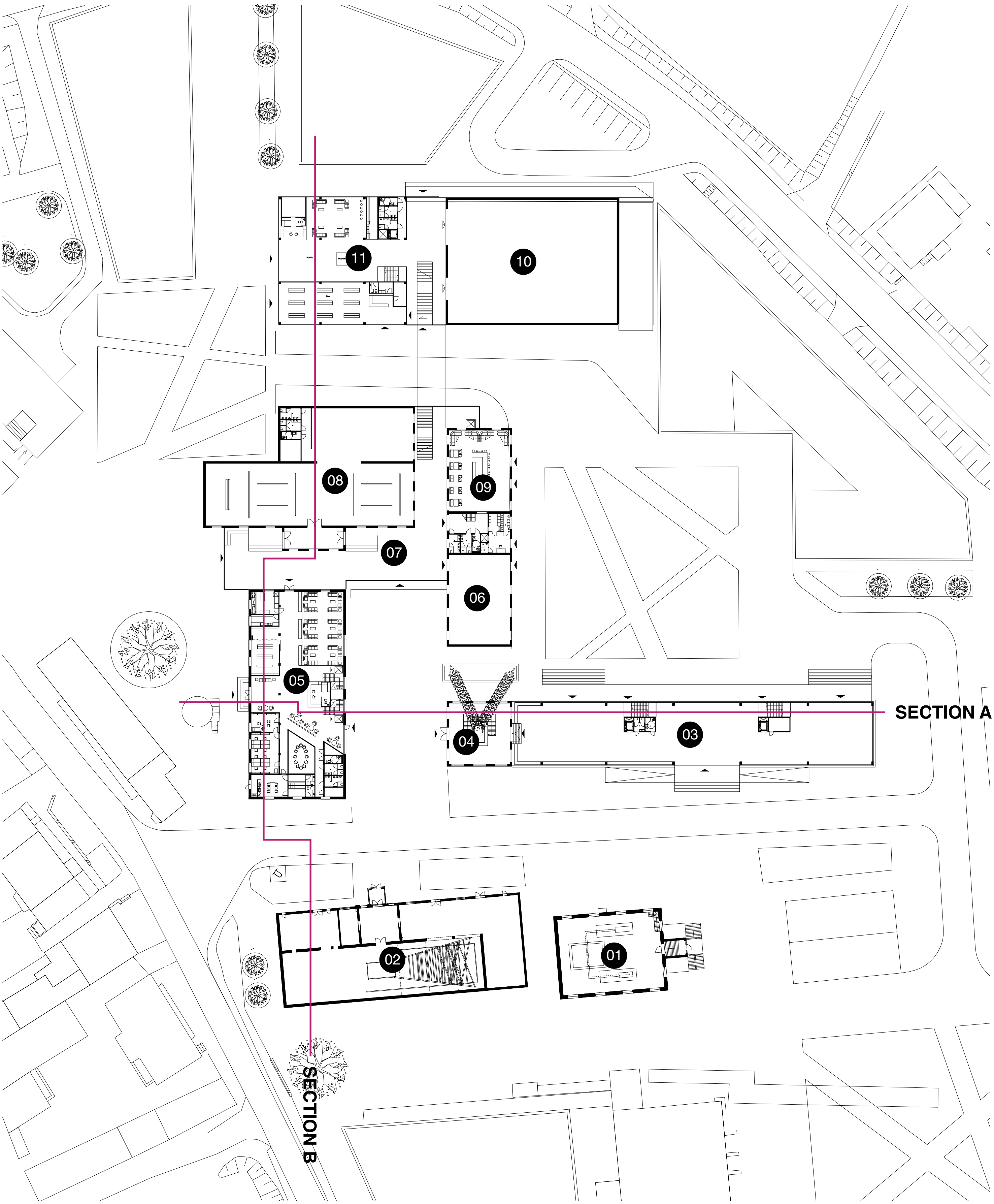
#206

Presentation

In the following pages the final proposal for the adaptation is presented.

#207 Render - office nr1

#208 Situation plan
1:2000



#209 First floor
1:1000

1. Kosciuszko Shaft machinery room, museum of the Ignacy mine

2. Kosciuszko Shaft building and tower, museum of the Ignacy mine

3. Exhibition space for the musem of mining in Rybnik area

4. Glowacki Shaft building, museum of the Ignacy mine

5. Office for the museum, lobby for the cultural & conference center, information and sales desk

6. Machinery room for Glowacki Shaft, museum of the Ignacy mine

7. Connecting space between buildings

8. Compressor building, museum of the mining in Rybnik, interactive exhibitions

9. Bar&cafe

10. Multi hall for concerts and other cultural events

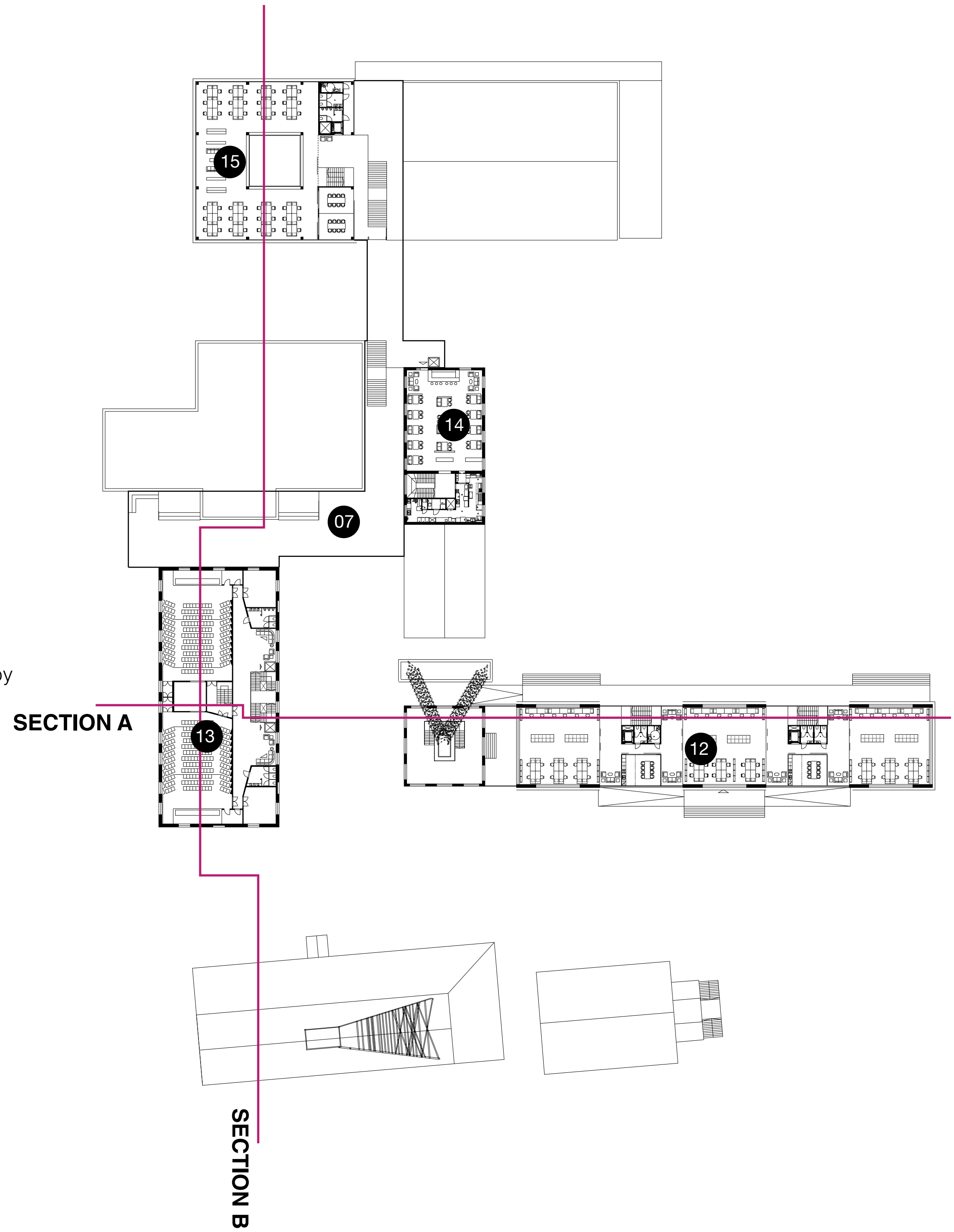
11. Foyer for the hall, shopping, lobby for the offices

12. Office space

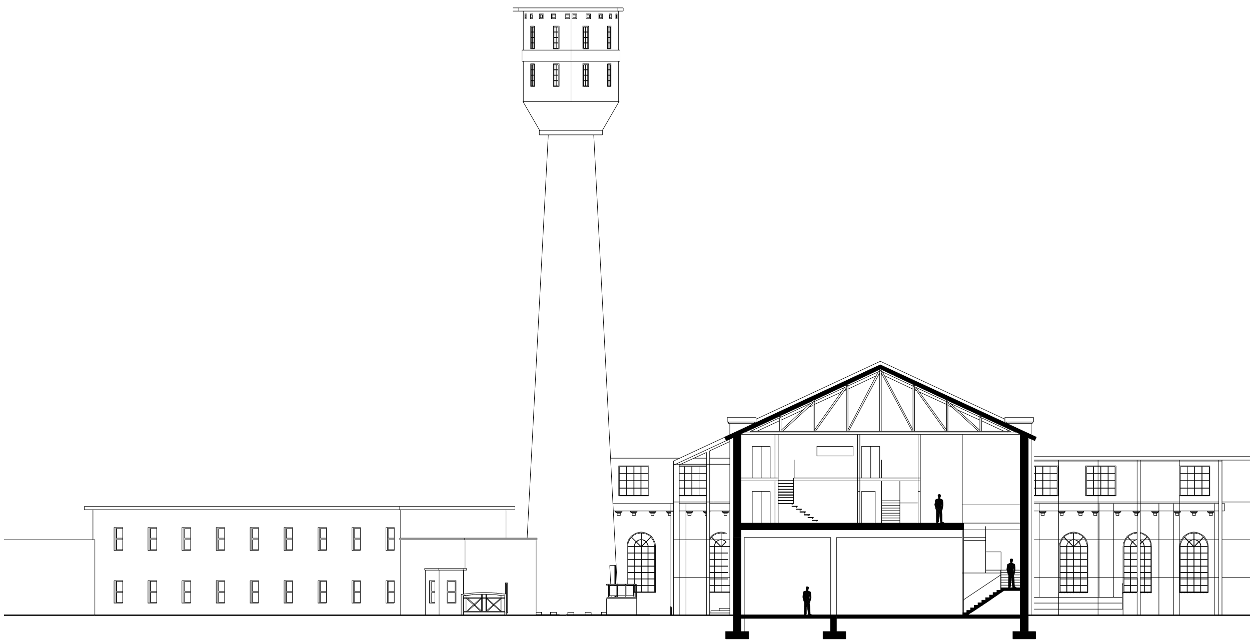
13. Auditoriums

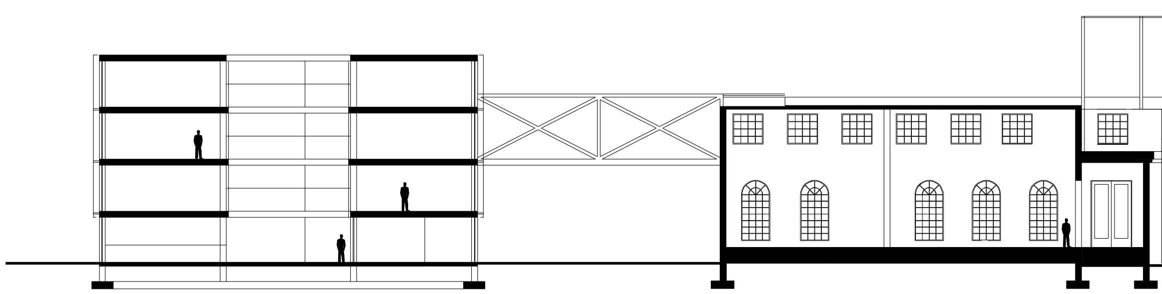
14. Restaurant

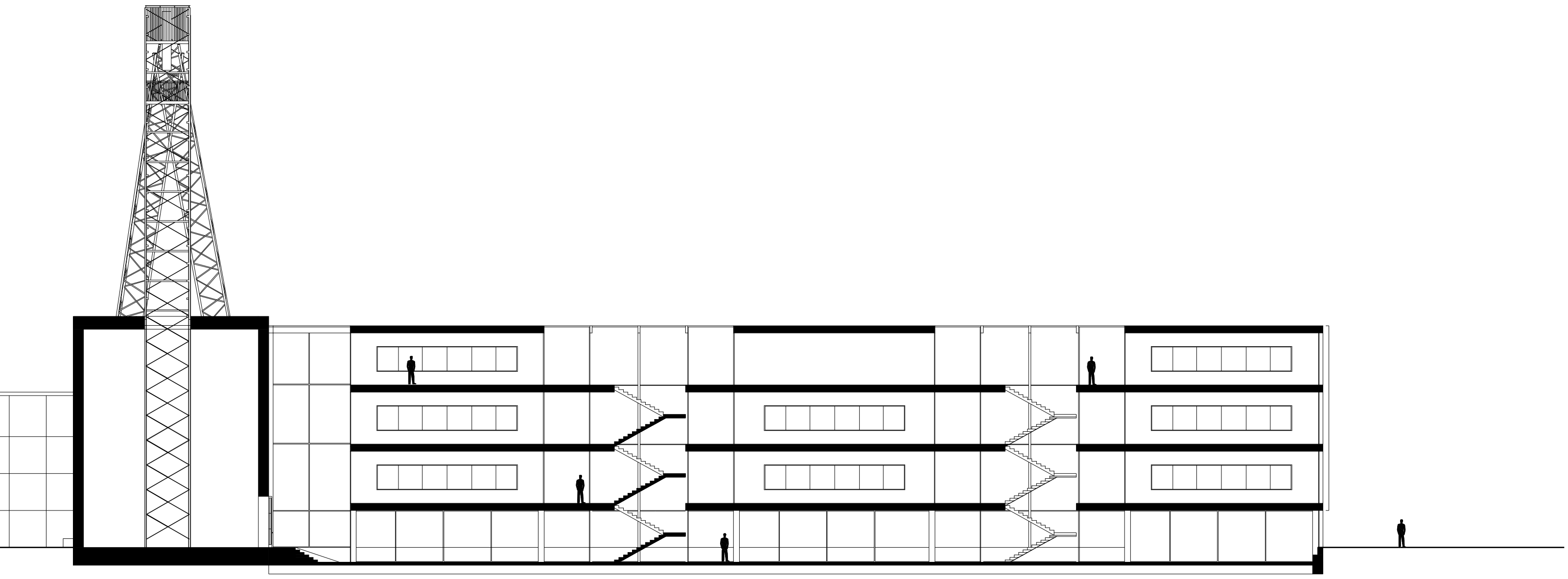
15. Office space



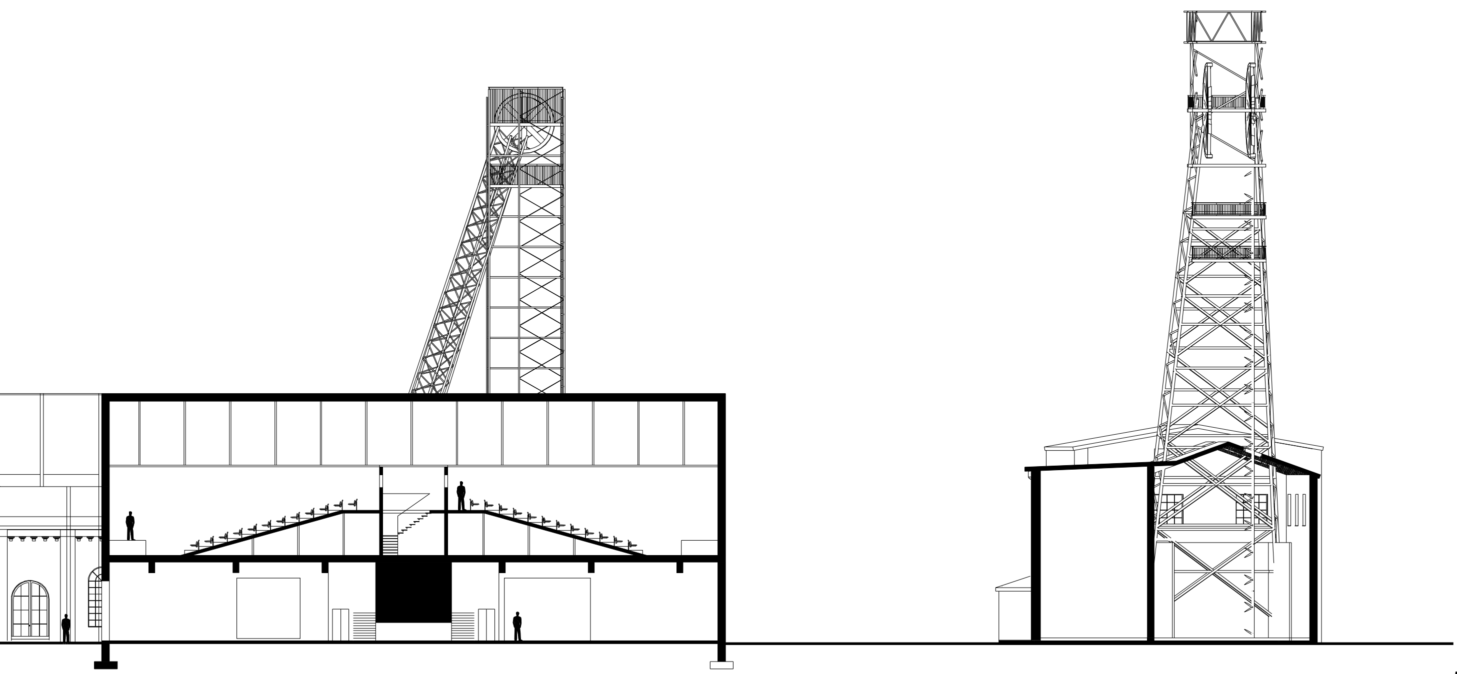
#210 Second floor
1:1000







#211 Section A
1:1000



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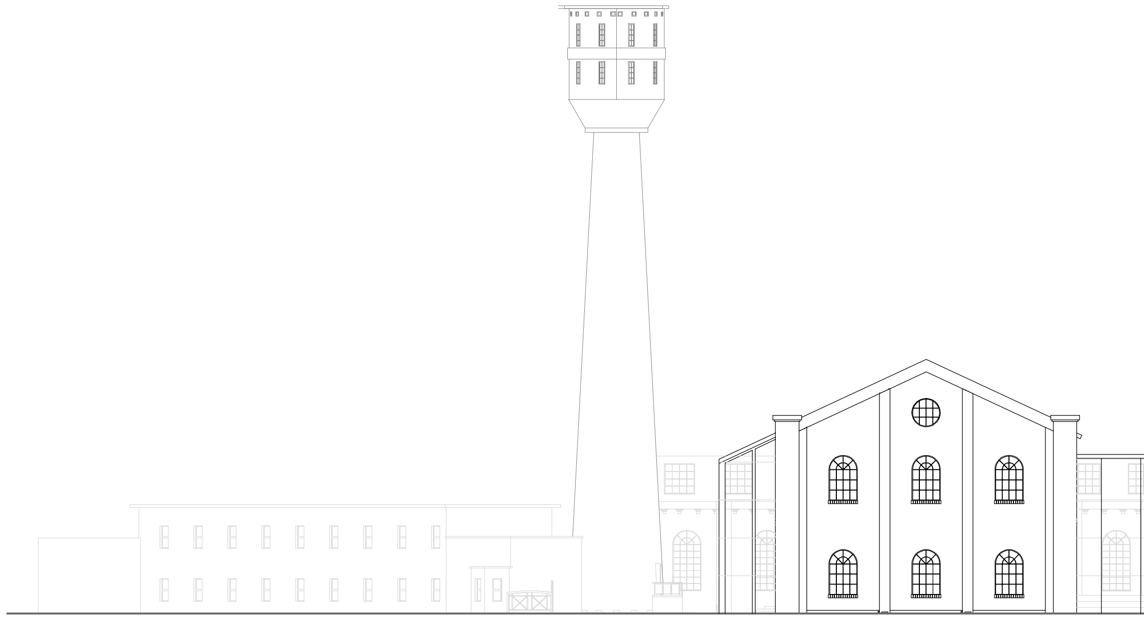
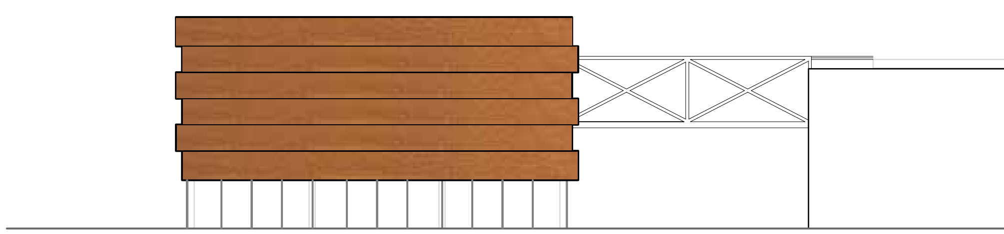
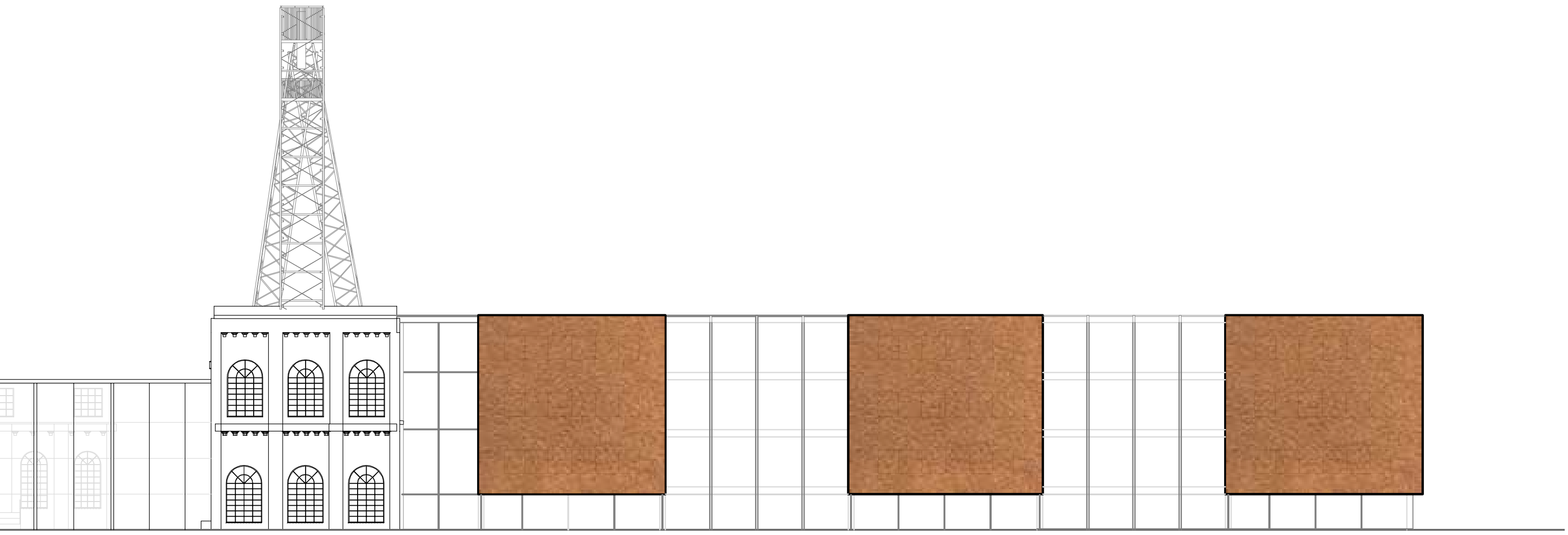
1:1000

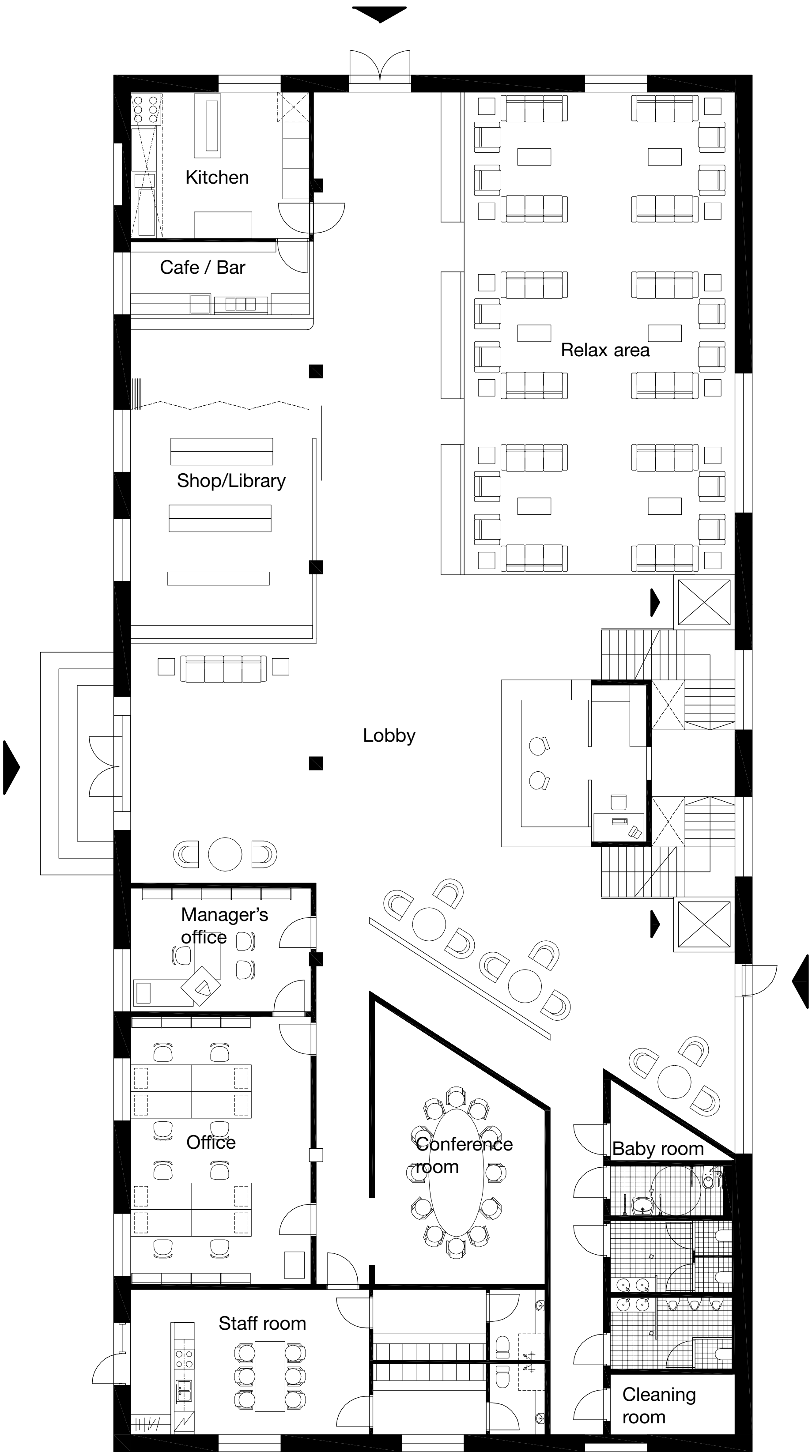




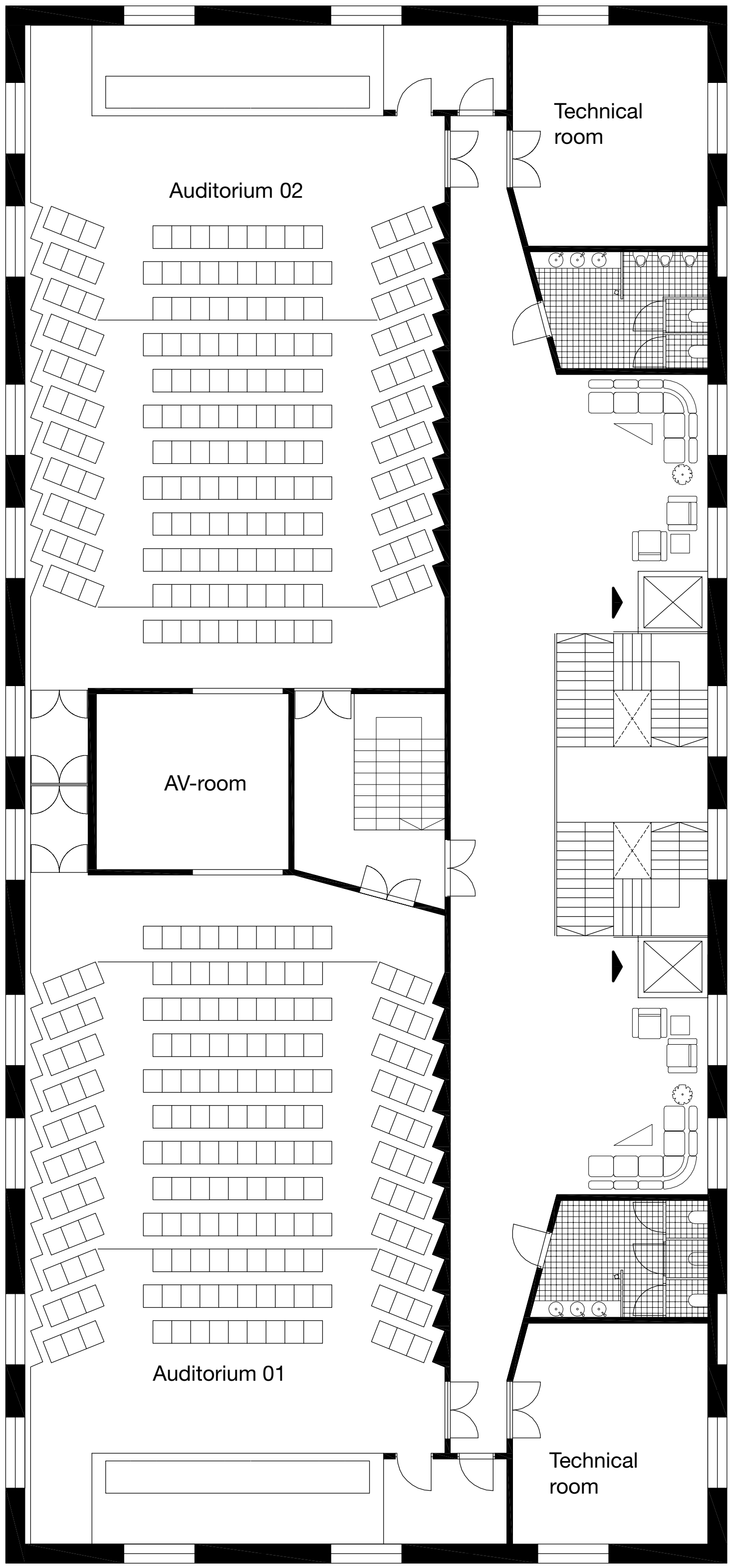


#213 Facade A
1:1000

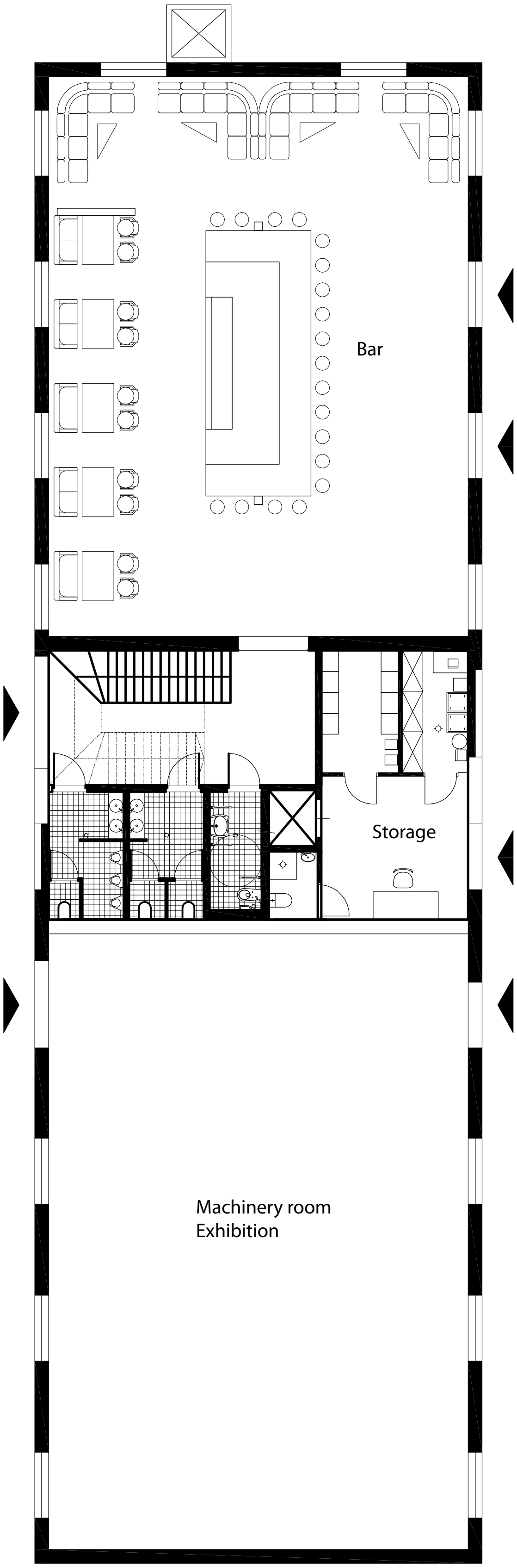
#214 Facade B
1:1000



#215 First floor
1:200



#216 Second floor
1:200



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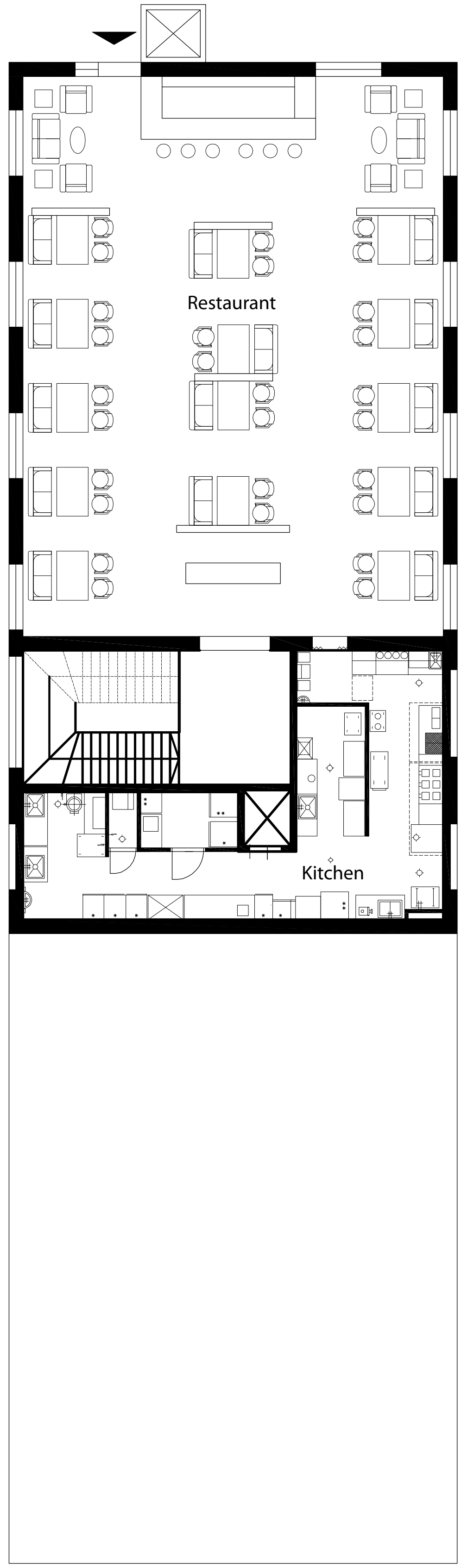
1:200



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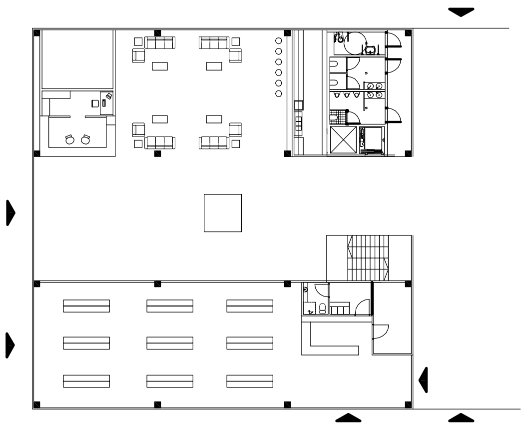
1:200



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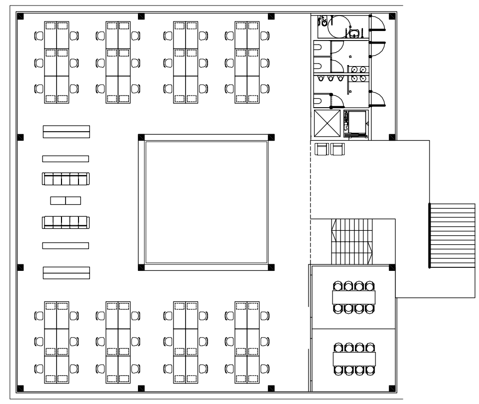
1:500



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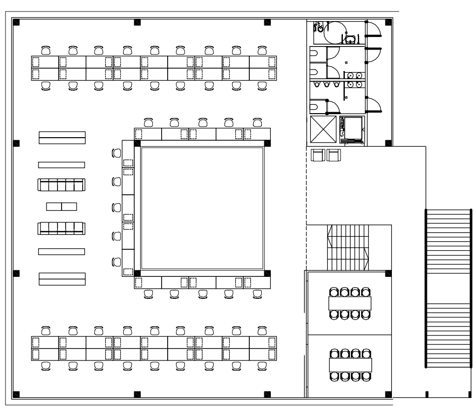
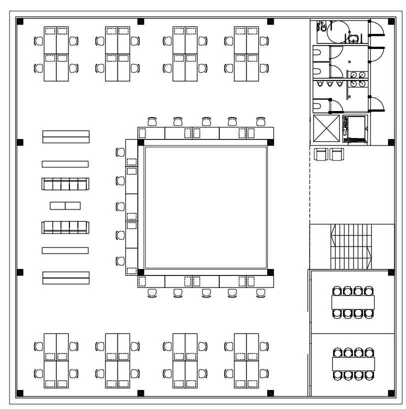
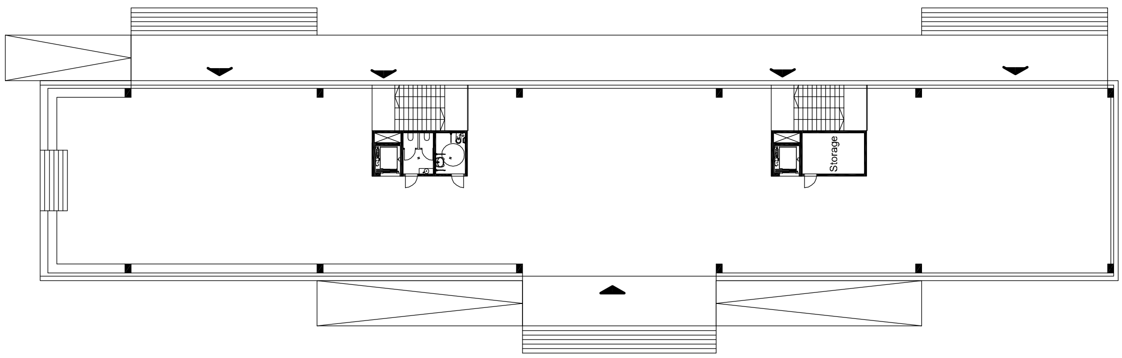
1:500



#221 3rd floor
1:500

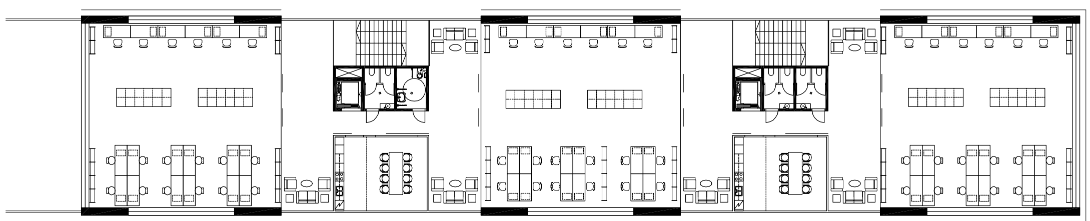


#222 4th floor
1:500



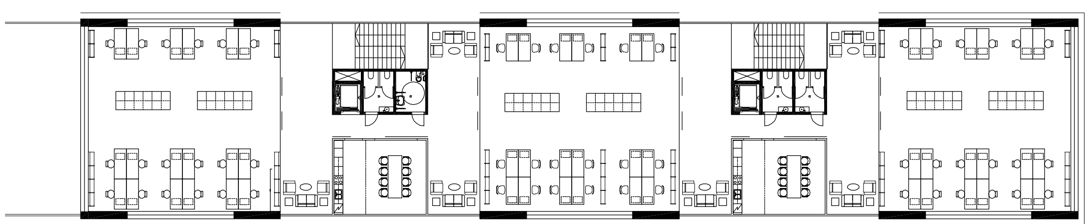
#223 1st floor
1:500

Exhibition area



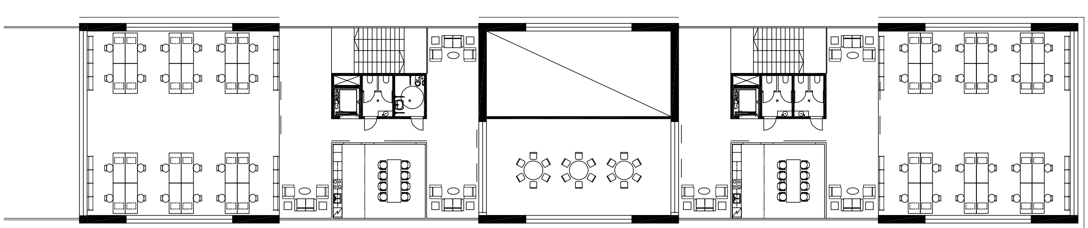
#224 2nd floor
1:500

Office



#225 3rd floor
1:500

Office



#226 4th floor
1:500

Office

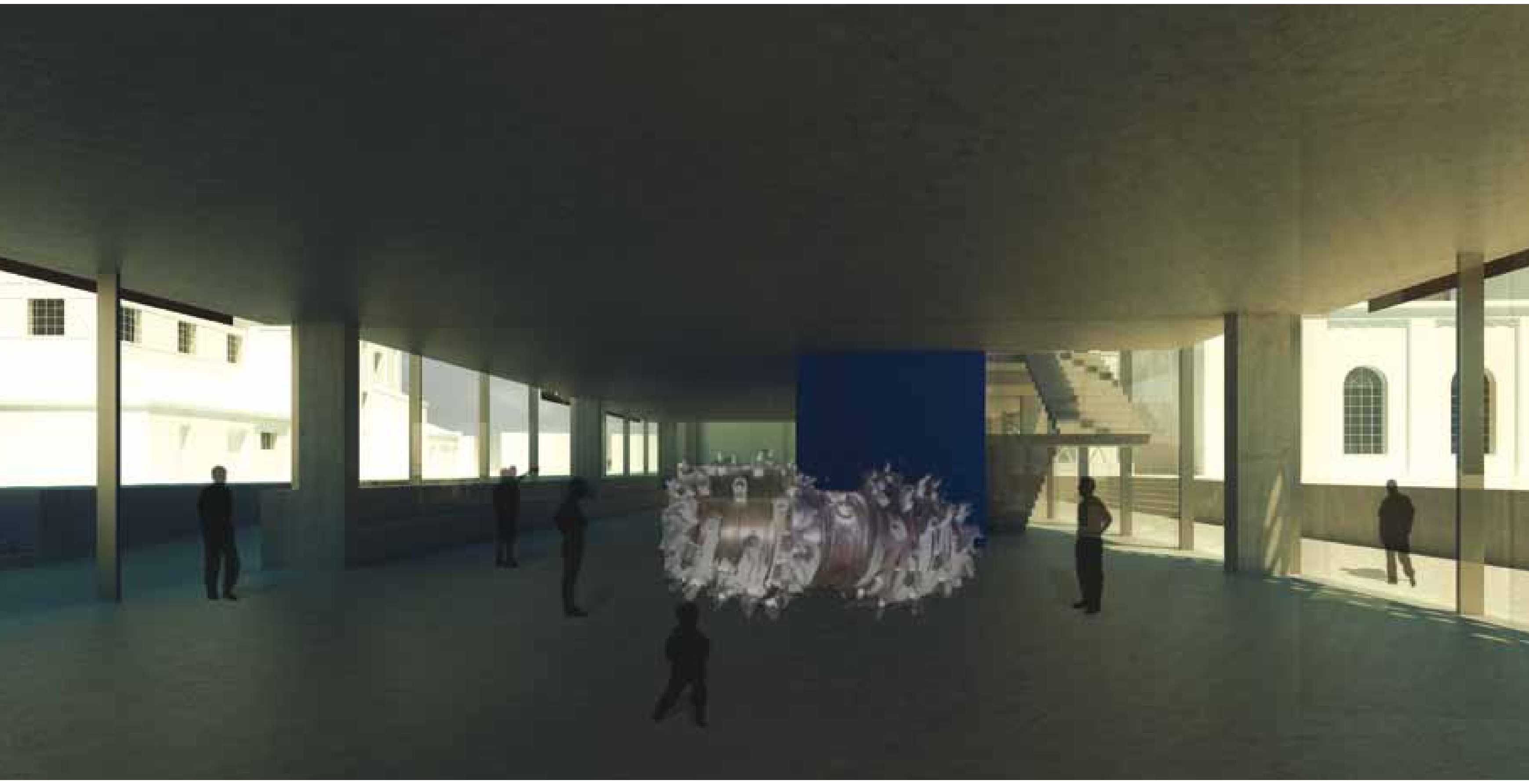
#227 Render - office nr1

#228 Render - office nr1

#229 Render - office nr1

#230 Render - office nr1
view from the exhibition area to the plaza

#231 Render - office nr1
view from the offices to the plaza



#232 Render - office nr1
exhibition area

#233 Render - office nr1
view from the offices

#234 Render - office nr2

#235 Render - office nr2 on the bridge

#236 Render - office nr2 and the concert hall

#237 Render - space between the office nr2 and the concert hall

#238 Render - glazing between the buildings

#239 Render - glazing between the buildings

#240 Render - glazing between the buildings

#241 Render - glazing between the buildings

#242 Render - car park building

#243 Render - entrance to the site from the housing are, office nr2 in the back

Conclusion

This project set out to revitalized and adapt the historical mining complex in Rybnik, Poland. The fundamental requirement were to develop the site with a respect for its historical values where attention to scale, surroundings, aesthetics and sustainability were the essence. This conclusion is meant to answer to the design issues stated in the program.

How to adapt the mine complex and bring new life to it while bearing in mind the importance of historical preservation ?

The project shows the richness of the cultural heritage and possibilities embed in it. The mining site in particular is preserved according to our set guidelines and protection statement. It manages to convert the site into the new use to bring social, economic and environmental life back to the Ignacy mine. The new added functions bring new flows to the area activating the site and inviting locals to use it. Balance between the historical preservation and adaptive reuse together with local communities involvement can be seen as the key aspects for the successful adaptation.

One can argue though that in reality the development is carried out in stages and the design only works and meets the criteria if all the elements of the design is in its place. If for some unseen reasons the site is not fully developed, some aspects of the design might be lost and the intended overall design will not work. This might make the site lose its significant value and open the possibility to deteriorate back into abandon site.

How to create architecture that fits to the context and at the same time brings new exciting values and new image to the area ?

Respecting the context and keeping the overall industrial feeling and atmosphere of the site should be the key design aspects of fitting architecture. The added building mass should not be perceived as dominating and drawing attention away from the existing historical buildings. The scale of the new building should always be evaluated from the human perspective to ensure that desired overall expression is achieved and suits the site.

The choice of material in this adaptation is the link between the old and new. Concrete, Corten, steel and glass has been picked due to their industrial outlook but also to their quality to distinguished the difference between the old and new part of the development. The existing building or the facade is continued with glazed extensions or Corten steel which colour wise blends it into the overall industrial outlook but clearly marks the spot of extension. The added part together with well planned functions will bring the exciting value and together with time, change the overall image of the site.

Illuminating the buildings by night would offer a new visible image and changing peoples perception of the site.

In our opinion the suggested methods and materials work in connections to the old industrial areas but one might argue that due to their wide use it would not necessary create a uniqueness for the site. Iterations could have been made to investigate more radical covering materials and methods to give the site its original look and make it stand out from the mass.

How to create a landmark that gives the locals a sense of identity and is attractive for tourists and new businesses ?

The transformation of the site itself will bring the local community new functions and places to experience. Well designed public spaces together with the buildings will upgrade the existing mining complex and strengthen the community's image outside. It will encourage development around it therefore uniting the community to promote the new achieved image and overcome the 'grey industrial' stereotype. The development will be viewed as a landmark in total not lifting any particular building to the higher value.

Some tourists will be attracted to the historical aspect of the complex whereas others to its newly added functions. Well designed areas that offer interesting functions and unique experiences will be the key to maintain a steady flow of oncoming visitors to the site. Investors will be drawn toward the development due to its supporting functions and the possible adaptiveness of the designated spaces.

Reflection

Looking back at the project we find few issues that we want to bring to attention.

During our conceptual urban design phase we should have allow ourself to investigate and try out more free forms of the urban plan and the building form development. From the start of the design we had a set of guidelines that defined us not to exceed certain boundaries and we settled to use the existing borders and lines of the site. This narrowed down the amount of concepts and left us with the feeling that we didn't investigate all possibilities.

In the design phase developing the urban scale we should have narrow it down quicker to ensure the deeper analyses of the detailed buildings. We realised that without of the urban design for the whole site we could not link the designed functions to the urban scale therefore making its design necessity. This nevertheless took a lot of our effort and therefore had a straight effect to our later design process.

The technical part of our project should have been integrated more closely to our design process. Our analysed structure is define to be free standing, having no effect on the existing building mass therefore excluding itself from the straight relation to the project. Although the renovation of the facade is added to the appendix of this report, it remains separate and has no influence to the final design . The more fitted technical analyses for the project would have been checking the energy consumption for the old and new buildings together trying to achieve balance between and retrofitting the interiors to ensure quality indoor climate which both fall outside the scope of this report.

The investigated idea of re-opening the shafts to give spectators unique experience underground is clouded by the fact that both shafts Kosciuszko and Glowacki turned out to be inadequate for this particular function at the moment. The re-opening of the Kosciuszko would mean excavating hundreds of meters of gravel out of the shaft and therefore is not plausible idea for the development. Glowacki instead could easily be equipt and re-opened but as it serves as a ventilation shaft for bigger Rydultowy mine its re-opening would have to wait until its present use would be obsolete.

Working on this project especially visiting the sites has given as better understanding of the difficulties related to old industrial sites in Silesia. The rising amount of similar industrial sites in Silesia clearly shows the necessity of turning the concentration toward their redevelopment instead of the neglecting them. After having conversations with the secretary of the Ignacy mine association we found out that there is a lot of problems concerning ownership of the complex as well as financing any renovations at the moment. However the association is not giving up and it is promoting the site and seeking solutions for its redevelopment. We realize that our proposal for the adaptation is out of their scope, but have decided to deliver our report for them with a hope that it brings fresh ideas and could be at least partially used.

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Attachment B