

Turning Brownfields into Goldfish

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Abstract

The novelty of a structure is not only the result of modern engineering by creating new forms, but also the recovery of construction inheritance. Such structures are the postindustrial spaces (brownfields) that create dead zones and discontinuities in space. Their restoration and reuse is considered an important design policy of sustainability (economy, society and environment) and aesthetic upgrade of the cityscape. This trend includes recycling, preservation and restoration to life. The aim of this research is to show the plans of restoring industrial sites, concerning the uses, design trends and materials used. The industrial spaces show significant advantages and dynamic. Located at strategic places, near city centers or in port areas, and, because of their proximity to infrastructure, they are the only land available for urban development. Also, they are major places, net-shaped, with a flexible plan. Moreover, because of variation in size and type, the selected use and design strategy, ranges from clean maintenance that includes static and sustainable design to large differences in shell and structure or a combination of new and old construction. Some popular examples are Tate Modern or the Emscher Park. In conclusion, the exploitation of such spaces seeks benefits at ecological, social and economic terms. The restoration will give employment to the construction sector in the future, as engineers will have to deal with an "aged" and densely built environment. However, the limitations one faces in existing structures are a different kind of creative energy. Therefore, we turn brownfields into goldfish.

Keywords

Sustainability, brownfields, industrial, restoration, urban development

1. Introduction

1.1 Birth and importance of brownfields

Today the strategy of reuse is an integral part of the planning policy which aims at sustainability and viability. After the second half of the 20th century the shutdown of many industrial units resulted in strong spatial effects. Urban industrial complexes have been degraded economically, socially and environmentally, leaving behind a legacy of abandoned buildings. As a consequence, a very important building stock has become inactive. Therefore, dead zones and discontinuities were created in space, called brownfields. The term brownfield¹ was first used in the early 90s to describe land, whose prior use has been abandoned and has consequences for public health and the surrounding environment. Thus, their reuse can benefit as a means to revitalize and ensure spatial and historical continuity, as a chance for

¹ According to the US Environmental Protection Agency, the word “brownfield” is used to describe the sites where it had previously developed industrial and commercial activity and today they suffer by the presence of hazardous substances and pollutants. The term “brownfield” in German, English and European law in general, refers to any piece of land, the prior use of which has been abandoned.

wider regeneration and rehabilitation, and to bring multiple benefits in economic, social and environmental levels, i.e. the pillars of sustainable development.

1.2 Brownfields as part of the industrial heritage

Another aspect regarding postindustrial spaces is that they are part of the industrial heritage, worthy of protection as a part of history. From the 1960s the first records of industrial facilities being abandoned were made and the first monuments of its kind were rescued. Thus, gradually, the science of industrial archeology was developed, i.e. the science which studies all tangible and intangible residues that contribute to the understanding of the industrial past. Simultaneously actions were made to maintain industrial monuments and a number of local and international organizations appeared, such as the UNESCO list of World Heritage, the TICCIH, Erih, international charters and councils, supported by the Council of Europe (Council of Europe, COE), ICOMOS, etc. It is evident that the concept of conservation and restoration helps to preserve people's memory and understanding of the recent past.

1.3 Benefits-dynamic of brownfields

Post industrial complexes (brownfields) constitute a stock of buildings and land in strategic positions of the urban tissue, available for urban development. They offer many advantages. They are big and functional areas, clean in shape with large indoors. Therefore, they can be easily modified and include many different uses. Those who exist today are a result of many additions, alterations and extensions. In other words, they are flexible structures and thus easily reusable. As aesthetic features, they have an archetypal form, rhythm, repetition and few materials (metal- wood- brick-stone). Also, they usually have easy access to energy sources. First examples of successful reuse of such buildings were the movement of lofts in America and London's Docklands.



Figure 1, 2: Reuse London's Docklands

2. Design Methods

At first, postindustrial spaces can include buildings, industrial complexes and even industrial landscapes. They present a variety concerning the scale and extent, depending on their size and their previous use. In this research many examples were looked into, to examine the design trends that were used. The choice of these particular examples was made after considering for their restoration success, functionality, aesthetics and public response. This research, presents some of the most representative restored industrial complexes, classifying them into six general design methods:

A) Clear conservation by supplementing the original image. Here, the respect for the industrial originality is dominating, no changes are made in the appearance of the buildings and the materials used are similar to those that had been used in the construction. This restoration has a conservative character.



Figure 3, 4: Headquarters Nestlé, France

B) Restoration with modern additions. Here, the industrial monument is a creative field that aims to create aesthetic contrasts. Trying to achieve a combination of old and new, modern architectural forms are imported to make the difference. As new interventions always differ because of their shape and material, the old emerge as unique and rare.



Figure 5, 6: Zeisehallen, Germany

C) Environmental improvement and urban sanitation. As it was mentioned before, many industrial complexes were contaminated and turned into degraded homes. In this case, the goal of rehabilitation is to exploit the stock, to renew it by making it viable. This restoration has an ecological character and also uses green technologies. It is desirable to ensure industrial atmosphere and aesthetics through conserving the patina (marks of the past) .Furthermore, contemporary interventions seek the harmony between old and new by using similar colors and materials.



Figure 7, 8, 9 : Officine del volo, Italy



Figure 10, 11: Evergreen Brick Works, Canada

D) Conservation of the outer look of the building (façadism). This trend is quite common and includes maintaining only the outer shell of an industrial building. This allows total redesign of the interior space, from scratch. For example in Gasometers' complex, the gas tank has been redesigned in a miniature city with shops and houses. Unfortunately, in these cases, the modern beats the old.



Figure 12, 13: Gasometers, Austria

One of the most popular examples, the Tate Modern was previously an energy production factory. Today, its interior has been redesigned to accommodate the various exhibitions. However, the new design exudes industrial spirit and style in colors and textures but in a completely modern way.

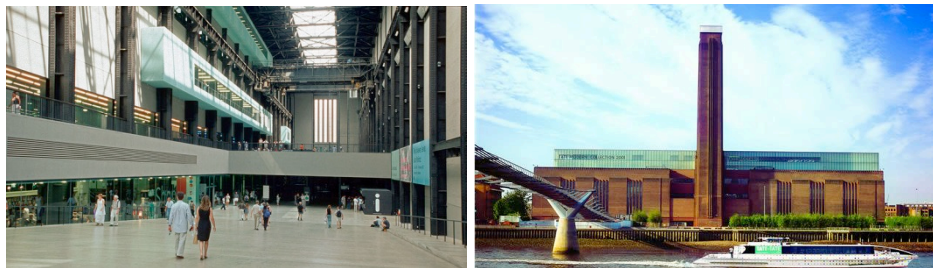


Figure 14, 15: Tate Modern, London

E) The romantic trend, conservation of ruins. This is the tendency of maintaining industrial atmosphere (wear, patina, equipment) along with a sense of abandonment. This is achieved by maintaining the buildings to their original form, without modern additions but with point interventions for reasons of safety and function. The aim is to create a landscape-scene of ruins, which reminds us of the romantic trend of restoration in the early 20th century.



Figure 16, 17: Sloss Furnaces Birmingham, USA

F) Creating postindustrial parks. It is the latest design trend towards sustainability by transforming the once repulsive landscape into a new public space for recreation and entertainment. It seeks to maintain industrial equipment inside and outside of the buildings and it also protects the industrial landscape, so that the former industrial area is a museum of itself. There is harmony between new interventions and old equipment and buildings.



Figure 18, 19, 20: Duisburg-Nord, Germany



Figure 21, 22: Bethlehem Steel Company, USA



Figure 23, 24: High Line, USA

3. General Results

Generally there is a complexity in order to plan the future of an industrial building. Through the various examples it is obvious that industrial shells present a variety in size and type, things that affect the process of design. Their reuse and revival assure not only the viability of buildings but also of entire landscapes. The main purpose is to recycle, rescue and restore through a creative reuse. Regarding design trends, it is admissible the fact that every method is unique and varies by period and region.

In particular, chronologically many of the first examples attempted to embellish industrial design. There was a tendency to throw off the "industrial identity". As a consequence, industrial shells were made as a part of something creative, something completely new aesthetically and importance is given exclusively to reuse, choosing differentiation and presenting a more "beautiful" picture (ex. Iron Bridge Gorge Museum, Usa). Furthermore, many times new design either for reuse or for aesthetic purposes covers the old. The new places are converted to modern and friendly spaces. The contemporary architectural vocabulary is a sure way for the everyday person.

In contrast, a trend of recent years is the promotion of industrial design, the "ugliness"² of the residue, rust (ex. Duisburg Nord, Bethlehem Steel, Steel yard, Figure 18-22). This image, in modern society is considered more attractive because of its rarity. Often the slogan "the beauty of ugliness" is used as a means of maintaining the industrial landscape, in order to effect the best connection between environment and past and maintain the industrial greatness (ex. High Line, Usa, Figure 23, 24). That constitutes a more "authentic" and true continuity. This method is accomplished by two modes of either full maintenance (restore original image) or a more creative-adaptive restoration. Often inspired by the industrial style in forms and geometries, similar materials and colors are used. The new forms are inspired by the past in an industrial aesthetic.

Also, another trend is the new interventions to be fully differentiated from the existing structure. This strategy tries to create contrasts using new materials, metal structures, transparency, and lightweight constructions. The aim is the absolute distinction between old and new. Sometimes, the restoration is trying to intervene in a more calm way by using materials and colors which don't differ visually by watching them from afar but when you come closer, they are distinguished as new interventions. A policy of equalizing the differences is used and that offers an harmony between old and new.

Finally, the most modern trend is the creation of industrial landscapes where industrial spirit is dominating by keeping part of the equipment, for example smelting furnaces, iron elements, machines. These spaces are converted to places of leisure and joy. Also in the latest examples of the 21st century, there is emphasis in designing the exterior space as well. In addition, there is an environmental approach which includes planting, use of recyclable materials and renewable energy. The trend of integrating green technologies for sustainable development and conversion makes the previous brownfields into ecological cells (ex. Evergreen Brick Works, Figure 10-11).

As to the choice of uses, the most popular is to achieve mixed use, to ensure the vitality during all day (ex. Gasometers, Zollverein, Figure 5-6, 12-13). Over the last two decades the range of possible reuse solutions has increased. Some of these are:

1. Continue from new industries, a common phenomenon especially in the 70s
2. Leisure and recreational activities such as exhibitions, theaters, concert halls
3. Education as schools, research centers, departments of universities and colleges
4. Malls

² Society often referred to industrial architecture as "ugly" because of its previous use.

5. Modern houses
6. Office Buildings
7. Postindustrial parks-museums of their self
8. Demolition for redesign

The character, who according to the examples sought to be highlighted, is related to many factors: economic, social, historical. However it is a key role in the success of restoration.

Finally, as seen in the examples, the revival process has dynamic, which gradually expands, resulting in an urban renewal form for the wider environment. In other words, a succeeded restoration and reuse of an industrial complex means that the wider neighborhood will benefit too. This strategy offers revitalization and could be a motive for wider rehabilitation in degraded spaces. Therefore an integration of the previous-abandoned areas in spatial tissue of a city would be achieved, expanding the urban space.

4. Conclusion

In conclusion, significant industrial complexes survive in the new generation of today, revitalized, despite the apparent passage of time on them. The benefits are social, economic and mainly environmental. Therefore, we turn brownfields into goldfish.

From the view of engineers, the limitations one faces drawing on existing structures, are a very different kind of creative energy. The restoration will give employment to the construction sector in the future, as engineers will have to deal with an "aged" and densely built environment.

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