Regenerating Post Industrial Sites through Landscape Urbanism
Course: Making Urban Studies
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Introduction

Modern urban environments are full of void, underused spaces. But it is these urban voids that are our opportunities to transform and revitalize struggling urban environments. While some brownfields are quickly capped and converted into new places of business, this kind of transformation does little to get rid of the site contamination and a future of concealed complications. On the other hand, if brownfields are converted into park and open space, they then become opportunities for recreation, education and true environmental revitalization. Park users are given the opportunity to learn about the natural environment and how it can be restored and are also able to enjoy the benefits of recreation to improve their social, physical, and mental health. Overall, major economic, social, and environmental benefits are reaped from this kind of redevelopment.

The purpose of this project is to explore the benefits of reclaiming an urban brownfield for reviving it through different regenerating strategies. Firstly through the development of a recreational space i.e a park and secondly through a residential area. While exploring these strategies a study of landscape urbanism as a new lens towards revival and study of environmental concerns such as soil remediation technique are involved.
From Brownfields to Green fields
Landscape Urbanism and Post-Industrial Sites

Landscape urbanism is a theory of urban planning arguing ‘that the best way to organize cities is through the design of the city’s landscape, rather than the design of its buildings’. The phrase ‘landscape urbanism’ first appeared in the mid-1990s. Since this time, landscape has become a lens through which contemporary city is represented and a medium through which it is presented (C. Waldheim, 2010). Landscape urbanism emerged over the past decade as a critique of the disciplinary and professional commitments of traditional urban design and an alternative to “New Urbanism”. The critique launched by landscape urbanism has so much to do with urban design’s perceived inability to come to terms with the rapid pace of urban change and the essentially horizontal character of contemporary automobile-based urbanization across North America and much of Western Europe. It equally has to do with inability of traditional urban design strategies to cope with the environmental conditions left in the wake of deindustrialization, increased call for an ecologically informed urbanism, and the ongoing ascendency of design culture as an aspect of urban development (C. Waldheim, 2010).

The established discourse of landscape urbanism revisited is seemingly enjoying a robust middle-age, at once no longer sufficiently youthful for the avant-gardist appetites of architectural culture, yet growing in global significance as its key texts are translated and disseminated in globally. One aspect of this middle-agedness is that the discourse on landscape urbanism, while hardly new in architectural circles, is rapidly being absorbed into the global discourse on cities within urban design and planning.

Ian McHarg a Dutch ecologist and planner made aspirations regarding translating scientific knowledge in design parameters for planning cities. One particularly enduring aspect of urban designs formation over the past quarter century has been the ongoing investment within its discourse to traditional definitions of well-defined disciplinary boundaries. This is particularly revealing for contemporary readers, since it contrast markedly with recent tendencies towards a cross-disciplinarily between landscape architecture and urban design studies. And these innovative practices have undoubtedly been shaped in response to the challenge and opportunities attendant on the contemporary metropolitan condition. In this context urbanism has recently been modified by adding the adjective landscape or ecological. This new perspective changed the traditional planning practices which were used to be top down. In the last decade design was the basic driver for addressing urban issues which involved architects, ecologists, urban planners and community activism in the whole process.
Landscape architects like James Corner’s proposal puts forth four inter practical themes from which to organize the emerging landscape urbanist practice: ecological and urban processes over time, the staging of horizontal surfaces, the operational or working methods and the imaginary. In his publication ‘Agency of Mapping’ he claims that that mappings are not transparent, neutral or passive devices of spatial measurement and description. They are instead extremely opaque, imaginative, operational instruments. Although drawn from measured observations in the world, mappings are neither depictions nor representations but mental constructs, ideas that enable and effect change. In describing and visualizing otherwise hidden facts, maps set the stage for future work (J.Corne  , 1999).
Landscape urbanism act as a new lens towards the urban realm and helps providing the abandoned sites a new life with a new flavor. Several examples in the world proves to be fruitful projects in changing the directions of urban design and landscape architecture. Hence with the introduction of this new tool post industrial sites can be reclaimed in an innovative and sustainable manner.
Post Industrial sites and their regeneration strategies - Case Studies

After Post-industrialization there were many sites that were abandoned creating the so-called void spaces in the middle of the cities. The case studies elaborated below are few good examples of how can these void spaces be transformed into a public recreational spaces which are most necessary in any city environments to bring the city to life. These could be inspirational for many postindustrial cities and towns which lacks the life after these brownfields are left empty with probability of harmful contamination which is one reason of why these spaces are empty despite the need for more space in the situation of growing urban population.

Gas Works Park: Seattle’s strangest park

Gas Works Park has drawn Seattleites and curious tourists to its unconventional site since it became an official city park in 1975. Richard Haag stands in front of Gas Works Park, which he fought to design in the 1960s and 70’s. Gas Works Park is perhaps Seattle’s most iconic and once-controversial city park. Its history is unique, and so is its place in the heart of many Seattleites who jog through or celebrate independence on its grassy expanse. It’s a piece of land surrounded by the waters of Lake Union, with unbeatable views atop its grassy knoll. Its towers are the pièce de résistance for some; piles of rusty junk to others(Sarah Radmer,2014).

Initially, it was the site of a Native fishing village. Then it was where Seattle burned its garbage. Eventually, it became a plant that manufactured gas. In 1956, the plant shut down, and by 1963, the city was working to purchase the site. In the 1960s, the City of Seattle purchased what had been a coal gas plant from 1906 to 1956, with the intention of developing a park on the northern banks of Lake Union. The design of the park by Richard Haag is visionary for treating the soil which had been polluted by the former industrial processes on site through a process called bio-phytoremediation. The most contaminated soil was formed into mounds and capped with clay. These man-made hills offer the striking landscape that offer views of downtown Seattle and the Olympic Mountains. Haag also campaigned to preserve some of the industrial structures of the former plant to provide visual interest, rather than demolishing them. Since opening to the public in 1975, the park has reconnected people to the north shore of the lake and to local history (Sarah Radmer,2014). Gas Works was recognized as the only surviving coal gas plant in the USA and added to the National Register of Historic Places in 2013.
Landschaftspark, Duisburg-Meiderich, Germany

Located in the heart of Germany's densely populated Ruhr District, Landschaftspark Duisburg Nord (North Duisburg Landscape Park) makes a clear break with this history. A milestone in landscape design, it epitomizes an innovative approach to the urban cultural landscape, one characterized by acceptance of its industrial heritage and dramatically altered natural conditions. On the site of a former industrial blast furnace, Latz + Partners have created a place of great beauty that will perpetuate the story of these industrial facilities for succeeding generations. At the same time, through a concerted program of bioremediation and on-site materials recycling, the design manages to neutralize or reverse much of the ecological damage done by those facilities. The 230-hectare (approximately 570-acre) project was developed in phases over the course of thirteen years, from 1989 to 2002. It consists of several layers of design elements that operate independently as park systems, and help create a sense of orientation that makes an extremely complex site interpretable at a human scale. Among major elements are a railroad park consisting of the raised ribbons of old rail-beds and other structures of a formerly man made topography; new footbridges and promenades; a water park at its lowest level; and fields of vegetation—woodland-like groupings of trees, pioneer plants, and prairie meadows—situated between more linear elements. Many memorable places, all unique in character, are interwoven within this spatial framework: the Sinter Park and its large multifunctional plaza used for events; Secret Gardens hidden in former storage bunker structures; and a central Blast Furnace Park with elevated observation platforms, climbing walls, rock gardens, and public spaces. The Piazza Metallica, situated at the symbolic heart of the park serves as its central event and gathering space. Here, a total of 49 recycled iron plates, each weighing seven to eight tons, were carefully arranged in a square, defining a plaza that is completely enclosed by looming industrial forms. With its unconventional appearance and unique new recreational opportunities, the park has become popular with local residents, making a great contribution to the surrounding lower-middle- and working-class neighborhoods on the north side of Duisburg (Stilgenbauer, 2005).

Norrköping, Industrial Landscape, Sweden

Norrköping is located in Öster Götaland province in the east of Sweden. Norrköping is one of the earliest cities in Sweden to develop industries and is especially well-known in Scandinavia for its textile industry. After the 1850s, Norrköping became a major center for the textile industry in Sweden. Most of the existing industrial buildings were built in the period from 1850 to 1920. However, after the Second World War, with the influx of cheap imported textiles from Japan and other countries, the textile industry in Norrköping faced crises. Factories closed one after another during the next years and in 1970 the closure of last large textile company declared the end of textile period in Norrköping, leaving the silent factories. The machines were either sold or abandoned. The main strategy of industrial heritage protection and renewal in Norrköping is to preserve the industrial buildings and give them new functions. The old building style was represented and very little creative architecture was added to it. One thing that might be taken into account from this viewpoint is the waterfall. There are 13 falls which measure 300 meters long and 18 meters high. Today, the waterfalls are not only used for water power, but also as a characteristic landscape for the Strömmen area. Imagining that there were few leaves and short sunlight hours in winter in Norrköping, the designers also thought to add some bright colors to break the monotone of the industrial buildings. Therefore, the largest one of the waterfalls is illuminated. Visitors are able to see the waterfall at the Cotton Mill illuminating in different colours every half hour in winter. Esplanades were also built on both sides of the river that give people an additional opportunity to appreciate the waterfall and feel the grand view of industrial landscape.
Soil Remediation Techniques

Toxic substances are highly soluble, leading to surface water pollution; leachates infiltrate the groundwater table if not contained; and Sulphur water in acidic soils can degrade construction materials such as PVC pipes and steel leading to a structural instability of some developments. These risks demand a precise assessment of the soil contamination intensity and require different treatment techniques according to costs and time availability for the operations. The remediation and redevelopment of brownfields is a real challenge for authorities, engineers and urbanists, whose common goal is to produce an improved and healthier environment. The soil of the site has been intensively polluted for the past several years. A balance between the cost of operations and time required for the treatments must be sought in order to deal with large amounts of soil contamination, answering current environmental concerns while stimulating the urban experience of the citizens.

Phytoremediation

The usage of vegetative cap as a phytoremediation process becomes part of the treatment process. This method uses the plants’ ability to bio accumulate, degrade organic pollutant and remove or stabilize the metal contaminants found of the soil. It also acts as a hydraulic control, “by maximizing the available storage capacity of soil, as well as the evaporation rates and transpiration processes of plants, thereby minimizing water infiltration,” and thus reducing the production of leachate, however does not completely prevent the contamination of the groundwater. In contrast to impermeable layers whose efficiency is expected to decrease after a certain period, the one of the vegetative cap improves with time and is exponentially related to the growth of the plant and their roots. Moreover, in the case of plants that accumulate metal contaminants, their root zones is limited to the top foot (top 30cm) of the soil. However if the contamination depth exceeds 3 meters, the extraction of the soil is required, deposited aside, and contained within capping mounds.

Water Treatment Requirements

The onsite treatment uses phytoremediation of trees to remove contaminants from the soils. This technique is used only in the case of industries that are determined as light contaminating. The application of this technique should be coupled with water runoff collection, to prevent storm-water from washing the contaminated substances into surrounding sites. Drainage should direct the runoff to a central wetland for cleansing before releasing storm-water into open waters.

In the event of an extraction and deposit/phytoremediation a 3 stage water treatment is required: from mechanical extraction of leachate deposit (1) to natural reed bed biological uptake (2) and finally to a cleansing constructed wetland (3) This treatment chain can be interrelated with surrounding sites, creating a new hydraulic network. A permanent facility must be set in place in the case of contaminated soil capping, where an ongoing water cleansing system is introduced to collect and treat the settled contaminants.
Remediation techniques used in Sweden

In Sweden, the environment law made in 1970 states the particulars of development on contaminated sites. According to this law the sites which were contaminated before the law was made were excluded from the remediation regulations[1]. But the sites which were recorded as contaminated by the activity going on there after 1970 should be remediated by the entity which is responsible for that particular contamination; be it the owner or a leaseholder. EPA of Sweden selects one heavily polluted site in a region and funds are allotted for remediation procedures1.

In the case of Malmö, the sites owned by the city are the ones which can be remediated and redeveloped in a timely fashion. The involvement of different actors and regulations complicates the process which in turn leads to the redevelopment of sites to stagnate. When the city comes across a contaminated site then an assessment is made by city to evaluate the probabilities of people coming in contact with the contaminants like the extent of contamination in groundwater, if there is a plan to grow any kind of vegetation in that land, if it is possibility of movement by air or direct contact and act accordingly. The city prefers to find temporary solutions like covering up the land if there is already an existing built structure on the site which must have a basement underneath so that the contamination does not affect the inhabitants1. And if there is a whole new built structure is planned in any contaminated site then the city tries to find a permanent solution to remediate the site extensively so that the contaminants are removed.

There are In-situ and ex-situ techniques like excavation, washing the soil, separating on the basis of size and bioremediation are widely used by the authorities to remediate the soil before development. There are pros and cons to every method. For instance the technique of soil washing was used in the Spårvägen site of Norra Sorgenfri where the developments are currently going on. With the washing, the soil is excavated and a washing unit is set up in the site itself so that there is no need to transport the contaminated soil in any way. This reduces the number of participants involved in dealing with the contaminated soil that in turn reduces the impact on both people and environment. This might not be economical but a timely process1.

Whereas in a site in Limhamn Malmö, the process of size separation is used. Here the soil is excavated and it was filtered on the basis of size. The bigger soil particles (min 1 cm diameter) were washed and the smaller ones were transported out of the site. Here the amount of soil transported is reduced1.

Moreover in Söderkaj, Halmstad the process of bioremediation was used to remediate. In this process the biotics are introduced into the contaminated environment which has an ability to clean the contaminants. This process make take time to remediate the site but it is comparably economical. There is also an issue of ownership of the excavated contaminated soil which is transported ex-situ.

According to Malmö Stad it is mentioned that it is the party of contaminated soil, which is responsible for restoring it. Sometimes the responsibility shared between several businesses and property owners. Those who bought the land after 1999 may be responsible for self-examine and correct their own land even if they are guilty before purification. Whoever finds contaminants in soil is always obliged to inform the environmental administration (Malmö Stad, 2016).

In Malmö’s land environmental group involved environmental management, highways departments, city real estate and real estate offices to improve communications and avoid the issues falling between the cracks. When the property owner has made its soil testing will be reviewed by the environmental department, which assesses whether it is sufficient. Sometimes even a cursory soil testing, but often also requires additional investigations to get answers to what really is in the ground and what measures are necessary. If the soil needs to be addressed should the property owner to develop a plan that environmental management must approve before the action begins.The risk of exposure to mercury pollution through the inhalation of vapor means that the measured concentrations of mercury in the soil may pose a risk to human health cross on condition that the pollution penetrates the basic structures and the building to be built above the contaminants in soil. (Malmö Stad, 2016).

[1] Interview with Torbjörn Håkansson, Fastighetskontoret, Malmö.
Forgotten terrain
Norra Sorgenfri

The city Malmö has a reputation for being ahead of its times in sustainable solutions. The green roofs, bicycle friendly infrastructure, open storm water management or the ecologically sustainable buildings in Västrahamnen to name a few. The city of Malmö has been growing in terms of area, population and economically. Norra Sorgenfri is one of the biggest abandoned industrial areas lying immediately east of the city center. When it was first established, Norra Sorgenfri was located on the outskirts of the town and it was the home of several important operations, such as the gasworks and the tram and bus garage. Later during the 20th century, the area comprised companies such as Addo, the calculator manufacturer, and Tripasin, the sausage skin factory. Since the 1970s, many business operations have closed down and on several sites, the buildings have been demolished. Although several businesses remain, much of the area is empty, providing the opportunity for change. The area has a total surface area of 120 acres, which is about the same size as the old town part of Malmö inside the area bordered by the canal. Norra Sorgenfri forms a barrier between central and eastern Malmö as a result of its size and its monotony; despite the relatively small distances between, for example, Värnhem and Rosengård, there is a feeling that there is a lack of connection between the various areas.

Vision of Malmö Stad

The city of Malmo plans Norra Sorgenfri to be a cosmopolitan area. The transformation from a pure industrial area to a mixed business/residential district will provide considerable diversity. Dwellings, business premises, boutiques, cafés, cultural and leisure/sports facilities. This mixed use of space will materialize within all levels in the area. Dwellings of different types and sizes will mean that both the young and the old, single parents and families with children will choose to live in the area. The area should be easily accessible by foot, car, bike and public transport (Malmostad Report, 2010). The district Norra Sorgenfri is to be divided up into smaller areas and will be given a variation with regard to the buildings and character. There are nine blocks namely Spårvägen, Verket, Smedjan, Brännaren, Spiralen, Grytan, Degeln, Tangenten and Ugnen. In total, 2500 new dwellings are planned. Industrigatan is the main street which is touching all the blocks except Degeln. New roads will be put down along the borders of the properties, something which will simplify a gradual expansion of the area. Industrigatan will be more defined and the street will be developed as a main urban route and linear space through the entire area. The connection between central and eastern Malmö will be stronger.
Brännaren

For this research we chose to work with Brännaren because of its reputation and also the location. Brännaren is multidimensional with diversity in its vicinities, it has the big road Nobelvägen on one side and Östra Farmvägen on the other side. Both of these streets are busy increasing the visibility of the site and calm cemetery on another side. A major part of the block is an empty site enabling imagination and opportunities.

History

This block consists of 8 properties and used to house 76 companies. One of the first private industries in the area were Malmo, established in 1898 in this quarter. Companies such as sausage skin factory were added in 1930’s n 40’s. In 2005, while Addo was closed down in the 1970s. During the 1980s and 1990s added a couple of major new construction, such as Apoteket plant, The IUD and Malmö Energy office buildings in the square. The site administration is now under 8 different entities including Malmö Stad (Brännaren 5 and 16).

Location

Kvartet Brännaren facing the cemeteries along its south side and thus has a major asset through vistas of mature greenery and calm environment. Towards the south, the buildings therefore advantageously characterized by somewhat lower house. On the northern side of the Industrigatan the buildings become somewhat higher and is characterized more by the urban public city life.

Site Specific contamination details

The whole site has been investigated of contamination four times. By Malmö Miljöförvaltning 1993, by KM Miljöteknik 1998, by Melica historisk invertering 2007 and by Ramboll Sverige 2015. (Ramboll Report, 2016). The most recent samples are collected in April 2015. These samples were extensively investigated. The contaminants that were scattered all through the site were metals like zinc, lead, copper and mercury, the poly aliphatic hydrocarbons(PAH), polychlorinated biphenyls(PCB), chlorinated aliphatic and also pesticides. These contaminants are not only in the soil but also in the groundwater. The contamination exists up to meter depth scattered all over the site. The city plans to have row houses in a part of site, there should be probability of growing vegetables, fruits and berries by the residents so the contamination up to at least 1.5 meter depth should be remediated before any sort of development. The drinking water is under a layer of limestone so it is not affected by the contamination. (Ramboll Report, 2016).

The assessment of the risk of the contamination situation has been done. The contamination of metals will affect the health of people who are exposed to, especially mercury. The risk of exposure to mercury pollution through the inhalation of vapor means that the measured concentrations of mercury in the soil may pose a risk to human health cross on condition that the pollution penetrates the basic structures and the building to be built above the contaminants in soil. The environment consultants also came up with recommendations for entire site and also each quarter of the site Brännaren. In Brännaren excavation is suggested up till 1- 1.2 m depth. To avoid the spread of pollutants to the groundwater Ramboll suggests installation of deep aquifer by pressure holes and also deep groundwater aquifer have been carried out by the installation of HDPE pipe and the casing drilling. (Ramboll Report, 2016)
Proposed Future Developments in the blocks in Brännaren by Malmö Stad

The future development zoning allows a conversion of industrial block to new neighborhoods for mixed use, such as residential, commercial activities (ex: creative industries) active ground floors (ex: public activities and trade), parks, squares, school (about 550 students) including sports hall and kindergarten (80 children). The zoning ensure conservation and the opportunity for re-use in culturally valuable buildings (Malmstad, 2010).

The roads on east and west side through the neighborhood are green in nature. In the Brännaren 18 and Brännaren 20 proposed small green spaces. A daycare with four departments on the block should be planned in a quiet location as well as integrated urban and neighborhood structure. It is important that the day care is established at an early stage in order to meet the need that the new residential needs. A train station is also planned in Rosengård which is a very close vicinity to the district of Norra Sorgenfrí. Within Brännaren 18 there is a gas station the corner of Nobelvägen/AgnesLundsvägen. The buildings within the property are however shielding against other properties in the neighborhood so gas station not expected to result in negative impacts outside the Brännaren18. In the Brännaren 9, Carl F transport business, which may affect the environment. The possibility of alternative locations for company’s operations should be examined. In the Brännaren 20 (the northern part of the property) has Cetec manufacturing / assembly of electrical components. The business is expected to continue indefinitely without conflict with the environment but can also be moved / when there is a reason therefor. The southern part of property, including a small car repair shop, should be previously used for other uses. All land within the area owned by private property (with the exception of Brännaren 5 which is owned by the City of Malmö). For property Brännaren 16, the municipality has decided to exercise its pre-sale opportunity (Malmstad, 2010).

Problematic

The specific site Brännaren has many strings attached to it in many ways. The site has 8 different owners which is one main problem about planning and also implementation. Being located next to Nobelvägen, the site tends to gather noise pollution because of heavy traffic. The growing population and acute need in housing sector prompts the city in opting for residential developments in the site yet the area lacks in interest of people to invest in. Factors such as lack of security and taking initiatives in the revival of this site proved to be the biggest barriers. Due to these reasons the site has been practically not functional since 1989, which provided various illegal and anti-social activities to seep in. Recently the site has been evacuated from the homeless people and a fence for trespassing has been placed to avoid all illegal settlements in this area. There is a dire need of regenerating the post industrial landscape of Brännaren with the close cooperation of private stake holders and instilling the elements of life in Brännaren through different strategy.
Adding Life
Proposed Solution through Design Scenario
On the basis of this research, probable solutions are suggested using design scenario as an instrument. Following are two scenarios through which brown fields can be revived.

Brownfield as a Recreational Land use
The conversion of brownfields into park spaces is a concept that is currently growing in popularity all over the world. Projects such as Landschaftspark Duisburg-Nord by Peter Latz, an old metal works operation, and Fresh Kills Park by Land Operations, once a 2,000-acre landfill on Staten Island, come to mind. While the use of contaminated and derelict properties may pose inherent dangerous risks, there is also a plethora of reasons why brownfields should be considered good candidates for the location of urban park space.

Brännaren as Park Space:
The site of Brännaren due to its prime location is barely using its potentials. The Character of the site urges for a revival strategy. The lack of life and the elements of life like the visibility, sound and odor could be instilled in this site by using landscape as a tool of regeneration.

The vision of the park instills various activities such as the sitting areas, playing areas for children, water fountains, hanging gardens and skating ramps. All these recreational activities may invite different kinds of people in this unused site. The remains of the post industrial sites are preserved so that the reminiscences of the era could be retained. The old brick structure has been transformed in the main entrance of the park. The two storey building which is having graffiti is also transformed into a water fall. This transformation is also done by keeping the noise pollution in mind. As the road of Nobelvägen is a very busy road so the sound of falling water from a height could prove to be a potential barrier towards the noise pollution.

Moreover adding trees all along the site can also act as a sound barrier towards noise. Keeping the aspects of visibility in mind the provision of hanging gardens are proposed at the farther end of the site which also comprises of infinity pools. Making the experience of vastness yet creating semitransparent boundaries through different design elements foster in providing a sense of security within the space. These gardens may provide a good source of creating new views and vistas within and outside the site. Women and children can also enjoy this part of the park.

While designing the site as a park the factor of safety is given due importance. Enhancing the security of the site special benches with lights underneath them are also proposed which can act as actors for de-stigmatization of that space.

Brownfield as Residential land use
Transforming brownfields into the residential areas have the advantage of generating revenue. In this regard a case study in Sweden is a complete success. Remediation works were accomplished at the Söderkaj site, in order to allow the completion of a large housing development project comprising the construction of 330 apartments in an attractive area along the shore of the river Nissan in Halmstad, Sweden. Historical activities at the site, including fisheries, metal plating, dry cleaning and maritime industries, have led to chlorinated solvent contamination in groundwater and PAH and metal contamination in the shallow soils (Wsp Environmental Report, 2010). The hydrogeological conditions for the area are controlled by seasonal variations dependent on precipitation and sea levels. 3DMe procedure was applied to the groundwater by the company Regenesis in order to enhance the biodegradation of the chlorinated solvents onsite and allow redevelopment of the site.

Brännaren as Residential Area:
Taking inspiration from Söderkaj a design scenario of converting Brännaren as a residential unit has been proposed. As the site lies along a very heavy traffic road of Nobelvägen so low rise buildings are proposed with less number of accommodation units along the road and higher at the other end of the site. An indoor green space is also suggested so that the inhabitants can enjoy the semi-private areas too. Instilling life through the residential blocks can help in generating higher property value of the area of Nora Sorgenfri. Moreover it could easily help in catering the acute needs of housing in Malmo. The availability of new apartments can also add to the density of population in this area. Thus contemporary architectural vocabulary can regenerate Brännaren and provide it with a new impression of luxury apartment buildings. Catering the market the stakeholders can easily get benefits and generate revenues from this regeneration strategy.
Design Scenario 1, Brannaren as Park space

A. Entrance from Old Structure

B. Sitting area as buffer zone

C. Skating ramps

D. Hanging Gardens

E. Old structure transformed in waterfall

Master plan
Design Scenerio 2, Brannaren as Residential Area
Continuum
Discussion

Urban green spaces or open spaces play a critical role in sustaining urban natural environments and the social systems that use these spaces. Urban green spaces are indispensable bridges between humans and nature as they are the primary preservers of biodiversity in cities. When a park is planned to be developed, many spontaneous responses arise contextually. It can be welcomed, not welcomed, accepted or it can be resented by various involved stakeholders. In a city like Malmö, where there is a housing deficiency, there might be more criticism than appreciation. In a district like Norra Sorgenfri, there are more things that are needed to be addressed while thinking of developing the site. The reputation of the site, the stigmatization of the site should be addressed. For that the site needs a park which may introduce a new vision and can act as a gateway to the district by inviting and creating interest in the district itself. Following are few benefits which justify the transformation of a brownfield to green field.

Environmental benefits

The location of park space on urban brownfields has several environmental benefits including the protection of groundwater and soil resources (De Sousa, Measuring 261). By removing the possibility of further water quality degradation and soil contamination is negated. Furthermore, the greening of vacant properties reduces storm water runoff by providing areas for water to infiltrate naturally and reduces the urban heat island effect by decreasing the amount of impermeable surface (schilling). Urban green space is also responsible for “enhancing biological diversity, improving water quality, cleansing air, recharging aquifers, and controlling floods” (De Sousa, Brownfields 166). Native wildlife may also benefit from increase in viable habitat, especially if the site is part of a of a larger green space network that may serve as a major wildlife corridor.

Social benefits

The community itself that surrounds the prospective park space may enjoy particular social and individual benefits. For example, they will have direct access to areas for both active and passive recreation thus allowing them to improve their physical health (H. Hugh, 2005). Additionally, if the brownfields are remediated properly, there will be a major reduction in health risks such as respiratory problems and other non-communicable diseases that are caused by exposure to hazardous materials (De Sousa, 2002). In a survey conducted of over 500 parks users in Indianapolis, the respondents considered the impact of park space on people’s health to be very positive” (De Sousa, 2008). Socially, improvements such as reduced violence and crime are possible. It has been proven that contact with nature is psychologically therapeutic and may reduce aggressive actions, which would then lessen the general sense of fear felt by residents in the neighborhood. Lower crime rates and the residents’ subsequent feelings of safety are important for the revitalization of the urban community. Furthermore, the conversion of a contaminated brownfield into a park space has the power to remove the stigma associated with derelict sites and encourage people to think differently about blighted areas of a lower socioeconomic status (De souse, 2002).

Economic Benefits

There are specific economic advantages of converting brownfields into park space, such as decreased rates of housing abandonment. People are less likely to desert their place of residence if it is located on a prominent green space. One reason for this is that real estate value of properties adjacent to green space is often higher than elsewhere in urban areas—often by approximately 20%. Properties within 2000 feet of a park space larger than 40 acres can be expected to incur the same advantage (De Sousa, 2008). On a similar note, the redevelopment of one brownfield often triggers a snowball effect that causes the property values of adjacent brownfields to increase by nearly 50%. Consequently, higher real estate values result in a stronger tax base that can be used to improve the community’s quality of life (De Sousa, 2013). One successful example of incremental funding and phased construction is Fresh Kills Park, a project designed by James Corner Field Operations. The 2,200 acre former landfill is primarily funded by the New York Department of state and the Department of Sanitation. The city has pledged a total of $ 100 million to complete Phase 1. Further funds will be acquired from environmental groups and private investors as construction continues. (Fresh Kills Park, 2010).
Conclusion

The district of Brännaren in the area of Norra Sorgenfri can act as a melting pot for re introducing the whole area. Being a victim of security and social issues it is in a dire need of revival from several past years. To provide solution to these existing problems a comprehensive knowledge has been provided in this report. Fostering with the study of Landscape Urbanism different strategies of revival of postindustrial sites in this contemporary period were explored. Weaving through this research the environmental as well as the physical aspects of the site were closely analyzed. But during this research the limitations such as economical aspects, short of time span and permission for complete access to the site were encountered.
Current practices of post industrial reclamation revolve around typical solutions. But this report proposes a more innovative approach towards the revival of post-industrial sites. These design scenarios are produced in accordance to the character of the site as well as keeping all the social aspects of the site. However more research has to be undertaken in future for a deeper knowledge of this urban realm.
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Interviewees
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