Architecture of Workplaces 1. Lecture 9

Out of date. Can it be saved? Must it be demolished? Or can it be reinvented?
reconstruction/revitalisation/rehabilitation
IPARTERV – Hungarian industrial architecture on the top

5-8. Bernhard "Bernd" Becher (August 20, 1931 – June 22, 2007), and Hilda Becher, née Wobeser (born September 2, 1934), German artists working as a collaborative duo. They are best known for their extensive series of photographic images, or **typologies of industrial buildings and structures**.
They first collaborated on photographing and documenting the disappearing German industrial architecture in 1959. The **Ruhr Valley**, where Becher's family had worked in the **steel and mining industries**, was their initial focus. They were fascinated by the similar shapes in which certain buildings were designed. In addition, they were intrigued by the fact that so many of these industrial buildings seemed to have been built with a **great deal of attention toward design**.
Objects included barns, water towers, oal tipples, cooling towers, grain elevators, coal bunkers, coke ovens, oil refineries, blast furnaces, gas tanks, storage silos, and warehouses. At each site the Bechers also created overall landscape views of the entire plant, which set the structures in their context and show how they relate to each other. One of their first projects, which they pursued for nearly two decades, was published as "Framework Houses" (Schirmer/Mosel) in 1977, a visual **catalogue of types of structures**, an approach that characterized much of their work.
In drawing attention to the cultural dimension of industrial architecture, their work also highlighted the need for preservation of these buildings. On the couple's initiative, for example, the Zollern coal mine at Dortmund-Bovinghausen in the Ruhr, for the most part an art-deco structure, was designated a protected landmark.

16. London Docklands is the name for an area in east and southeast London. The docks were formerly part of the Port of London, at one time the world's largest port. They have now been redeveloped principally for commercial and residential use.

17-18. Efforts to redevelop the docks began almost as soon as they were closed, although it took a decade for most plans and another decade for redevelopment to take full effect. The situation was greatly complicated by the large number of landowners involved.
To address this problem, in 1981 the London Docklands Development Corporation (LDDC) has been formed to redevelop the area. This was a statutory body appointed and funded by **central government** (a quango), with wide powers to acquire and dispose of land in the Docklands. It also served as the development planning authority for the area.
Another important government intervention was the designation in 1982 of an **enterprise zone**, an area in which businesses were **exempt from property taxes** and had other incentives, including simplified planning and capital allowances. This made investing in the Docklands a significantly more attractive proposition and was instrumental in starting a property boom in the area.
Over the past 30 years, the population of the Docklands has more than doubled and the area has become both a **major business centre and an increasingly desirable area to live**. Transport links have improved significantly. Canary Wharf has become one of Europe's biggest clusters of skyscrapers and a direct challenge to the financial dominance of the City. Although most of the old Dockland wharfs and warehouses have been demolished, some have been restored and converted into flats. Most of the **docks themselves** have survived and are now **used as marinas or watersports centres.** Although large ships can - and occasionally still do - visit the old docks, all of the commercial traffic has moved down-river.
The revival of the Docklands has had major effects in run-down surrounding areas. Greenwich and Deptford are undergoing large-scale redevelopment, chiefly as a result of the improved transport links making them more attractive to commuters.

19-21. The **Gasometers** in Vienna are four former gas tanks, each of 90,000 m³ storage capacity, built as part of the Vienna municipal gas works *Gaswerk Simmering* in 1896–1899. They are located in the 11th district, Simmering. They were used from 1899 to 1984 as gas storage tanks. After the changeover from town gas to natural gas between 1969 and 1978, they were no longer used and were shut down. Only the brick exterior front walls were preserved. The structures have found **new residential and commercial use** in modern times.
(Gas can be stored underground or in modern high-pressure gas storage spheres under much higher pressures and in smaller volumes than the relatively large gasometers.) In 1978, they were designated as protected historic landmarks. Vienna undertook a remodelling and revitalization of the protected monuments and in 1995 called for ideas for the new use of the structures.
The chosen designs by the architects Jean Nouvel (Gasometer A), Coop Himmelblau (Gasometer B), Manfred Wehdorn (Gasometer C) and Wilhelm Holzbauer (Gasometer D) were completed between 1999 and 2001. Each gasometer was divided into several zones for **living (apartments in the top), working (offices in the middle floors) and entertainment and shopping (shopping malls in the ground floors)**. The shopping mall levels in each gasometer are connected to the others by skybridges. The historic exterior wall was conserved.

22. The University of Milan-Bicocca was established in 1998. It is located in an area on the northern outskirts of Milan, which was occupied by the Pirelli industrial complex until the late 1980s. The industrial area has been redesigned by architect Vittorio Gregotti into an urban complex, including the University of Milan-Bicocca's research laboratories and student residence halls.

23-24. Lingotto once was an automobile factory built by Fiat. Construction started in 1916 and the building opened in 1923. The design (by young architect Matté Trucco) was unusual in that it had five floors, with raw materials going in at the ground floor, and cars built on a line that went up through the building. Finished cars emerged at rooftop level, where there was a **rooftop test track**. It was the largest car factory in the world at that time. For its time, the Lingotto building was avante-garde, influential and impressive — Le Corbusier called it "one of the most impressive sights in industry", and "a guideline for town planning". 80 different models of car were produced there in its lifetime, including the famous Fiat Topolino of 1936.

25-26. The factory became outmoded in the 1970s and the decision was made to finally close it in 1982. The closure of the plant led to much public debate about its future, and how to recover from industrial decline in general. An architectural competition was held, which was eventually awarded to Renzo Piano, who envisioned an **exciting public space for the city**. The old factory was rebuilt into a modern complex, with **concert halls, theatre, a convention centre, shopping arcades and a prestigious hotel**. The eastern portion of the building instead, is the headquarters of the Automotive Engineering faculty of the Polytechnic University of Turin. The work was completed in 1989. The track was however retained and can still be visited today on the top floor of the shopping mall and hotel.

28. Shopping mall, offices, cinemas, housing

29. Rebuilt unique buildings
It is the most-visited modern art gallery in the world, with around 4.7 million visitors per year. It is based in the former Bankside Power Station, in the Bankside area of Central London.
The **galleries** are housed in the former Bankside Power Station, which was originally designed by Sir Giles Gilbert Scott, and built in two stages between 1947 and 1963. The power station closed in 1981. The building was converted by architects Herzog & de Meuron.

30. The Turbine Hall, which once housed the electricity generators of the old power station, is five storeys tall with 3,400 square metres of floor space. It is used to display large specially-commissioned works by contemporary artists.
- preserving the original space structure, to understand and respect the building as basic structure, and preserving it's dominancy

32-33. Totally new use but in a quite larger scale
Transition from industry structure to industry culture. The Zollverein mine was active from 1847 to 1986 coal mine in Essen. Now it is an **industrial monument**. Together with the immediately neighbouring coking plant Zollverein XII and 1/2/8 are the locations of the mine since 2001 on World Heritage of UNESCO. Zollverein is the anchor point of the European Route of Industrial Heritage .
After the closure in 1986 bought the land of North Rhine-Westphalia, RAG, then Ruhrkohle from the ground, and put the entire ensemble under **monument protection**. In the following years the area was redeveloped.
Zeche Zollverein is now a **center for cultural and creative industries** with an emphasis on design and architecture in Essen. It houses the **Museum path way of the coal,** the **visitor center of the Industrial Heritage** Trail, in the former, by Norman Foster converted **boiler house**, the Design Centre North Rhine Westphalia, on the adjacent site of Shaft 1/2/8, the PACT Zollverein (Choreographic Centre of North Rhine-Westphalia, redesigned by architect Christoph Mackler) and the Art Zollverein.

34. In summer 2006, the extensive remodeling of the coal washing plant (designed by Floris Alkemade / OMA architects and Boll) concluded after several years. A new, 55 meters long gangway leaning on the existing bridges leads the visitors to 24 meters high into the new visitor center.
In the summer of 2009 drew the **new Ruhr Museum**, now in the south of Essen as Ruhrlandmuseum resident permanently **in the coal washing plant**.

35. Economic school and apartments
In June 2006 was the construction of the Zollverein cube designed by the Japanese architectural firm SANAA completed. While not on the original mine site, but at its entrance, is counted to the total ensemble.

36-37. Totally new use but in a quite larger scale
The North Duisburg Landscape Park is situated on a 200 hectare site of a **former ironworks**. It contains highly interesting industrial relics of brick, steel, concrete and glass. Today the park offers a wide variety of **recreational facilities** ranging from walks and cycle tours through its unique natural habit to conducted tours of the ironworks which closed down in 1985. Visitors can climb to the top of one of the blast furnaces, attend music concerts, theatre and dance shows in the old production workshops, climb the outdoor bunkers or even go underwater diving in a flooded gasometer. There is also a permanent exhibition on the subject of iron production. One last bonus: there is even a modern youth hostel on site.

38-39. The huge buildings of the former ironworks have been equipped to cater for cultural and corporate functions; in an old gasometer **Europe's biggest man-made diving centre** has been created; **alpine climbing gardens** have been created in ore storage bunkers; in a former casting house a high ropes course has been set up; and an extinguished blast furnace has been modified to provide a viewing tower.

69-71. IPARTERV=Company for Industrial Building Design 1948-1990
The years after World War II., then socialization in 1948
Socialist tasks: development of industry, heavy industry
Centralized (socialized design offices)
IPARTERV was established with a cabinet's decree on 5th December 1948.
Our department the Department for industrial and agricultural Building Design was founded in 1950 almost the same time with IPARTERV, for a similar purpose; to serve the tasks of build up industry in Hungary.
The built industrial heritage, thus the heritage of IPARTERV represents an important research field of our department.
Headmaster, later senior engineer: Dr. Szendrői Jenő 1954-1957, 1957-1971
Number of 1300 people (with assistants, fellow engineers)
Auguste Perret Prise (UIA) 1961 for „great-element prefabrication"
Between 1949-1974 11 000 new plants and halls, a building volume of 53 million m3
It's attitude is determining also today. It avioded „social realismus"
Many of Hungarian leader architects have begun their career here, or established the whole lifework.

74. The technology was an invention in the beginning of the 1950's in Hungary. It was inspired by the circumstances after World War 2nd; the shortage on building materials (reinforcing steel, cement and wood) and the immense number of unskilled manpower. Post-war restoration and new industrial establishments needed enormous building tasks. This was enabled by the outstanding performance of Hungarian engineers, who worked in the Company for Industrial Building Design – IPARTERV.
The invention: enormous building elements of reinforced concrete were precast on the building site and lifted to their final position with the help of gigantic lifting masts.

75. Due to the needs of economic politics of the era the tasks were mainly huge heavy industrial and energetic developments and along with the design of a number of agricultural establishments.
The engineering knowledge was there anyway. There were big scale industrial developments made already as preparation for world War II (so-called Győr program 1938). Huge industrial halls have been built meaning a real engineering challenge. These tasks were realized based on designs of Hungarian engineers who have studied in the Technical University of Budapest or in Germany.
New methods are often invented when old ones become inappropriate. This was the case in Hungary in the 1950s. There was a shortage on building materials, that is timber or wood for scaffolding, even structural steel. But there was a must to built huge industrial halls. Possible building materials were gravel, cement and reinforcing steel.

76. Great tasks 1950-1960 - Power stations. The first power station is the Inota power station, the facade is still monolitic made of small bricks.
The structure (pillars and main beams) of the first power stations was mainly set up of simple bar elements.
During great element prefabrication the huge building elements of often 40-50 tons are prepared, precast on the building site. The elements are firste simple bar element, later becoming rather material sparing. The elements were lifted with unique – quite sophisticated cranes, lifting pods to their position.

77-78. The second is the Berente power station, with a structure basically the same, the difference is here the facade is also built of prefabricated elements. Structure is basically simple bar elements, but a bit more sophisticated, that means thinner pillars and beams with diafragmes.
There was obviously no supporting industry of the new technology. So the engineers had to design the lifting machines, pods and special scaffolding as well.
Inner height of the boiler house: 33,50m, width: 23,00 + 2x8,00m, inner height of the turbine hall: 21,50m, width: 24,50m

79-80. The next one is the Tiszapalkonya power station. He structure is even more sophisticated, thinner and more material sparing. The pillars are costructed as vierendeel structures, beams as trussed main beams.
Inner height of the boiler house: 33,50m, width: 28,10 + 8,00m, inner height of the turbine hall: 24,20m, width: 27,30 + 11,00m. Weight of pillar: 60t, trussed main beam 48t and 53t.
Structural system has been common everywhere: restrained pillars, pin connected beams, trussed girders on the top.

81. The look of the building is often characterized by the ideological of the age that was culture politics that defined the social-realist style as the should be like outlook, furthermore being big-scale building these were in a way means of the propaganda as well.

82-83. The end of the structural development in the 1st three big power stations. Structural innovations 1: vertical elements are three dimensional cupboard-like elements or tubes with thin walls, functioning as space separation as well. U-formed, cupboard-like spatial pillars = facade wall elements as primary structures. Structural innovation 2: a vault shell structure.

84. Ikarusz is a legendary autobus factory; until its closure in 2007 it has been a determining company in the world's autobus production producing yearly up to 7000 buses still in the 1980s.
The construction of Ikarusz autobus factory Budapest. Principally a frame structure of plates.
Beside power stations, IPARTERV was involved in there were several different industrial tasks with sometimes similar details. The clear linear structural development in the 1st three big power stations was followed by structural innovations of IKARUSZ and the cable works in Budapest.
Structural innovations 1: vertical elements are three dimensional cupboard-like elements or tubes with thin walls, functioning as space separation as well. U-formed, cupboard-like spatial pillars = facade wall elements as primary structures. 17 stands of 9 m, length: 146,85m. cupboard-like spatial pillar: 2,47x1x13,53m. A hall with three naves: the nave: 20,64m, side-aisles: 16,9m.
Structural innovation 2: a vault shell structure: 2,24m wide, 2,5cm thick at the top! With surrounding 10/30cm stiffening ribs.

86. An outstanding example regarding both form and realization is the manure storage
Structure: a three-pin curved structure, a curved trussed main girder of 46,5m span, 23,85m height, stands 9,0m-s. It was the biggest span curved structure in Hungary of the era.
15 pieces of curved main trusses, hall length: 126m, curved trusses 20/80cm 1,4m distances.

87. Despite the once special function and dimension, there are a few promising examples for their utilization.

88. There was obviously no supporting industry of the new technology. So the engineers had to design the lifting machines, pods and special scaffolding as well. The huge elements of 40-50t were cast in situ; the closest possible place to their position. The lifting machines may seem primitive today. These were the so-called „A-frames" made of steel.
As roofing they used roof elements of 9X1m.

89. The era of great tasks mainly characterized by power plants lasted 1950-1960. The company was rewarded the Auguste Perret Prise (UIA) 1961.
The built industrial heritage, thus the heritage of IPARTERV represents an important research field of our department.