Architecture of Workplaces 1. Lecture 5

Size standardization-coordination
Constructions of space separation, external space separation, façades

6. It was the first time that standardized elements were prefabricated in series production. Paxton moduled the dimensions. He planned according to a module which was convenient with the dimensions of the glass boards in English industry. So he reached that the production works of the building could be divided between several factories and the whole work was finished in 6 months.

7. Wachsmann, the german-american architect was making researches for simple elements to be combined in many ways. The single elements' connection to each other persumed a modular coordination.
The Mobilar Structure, a system for the construction for a hangar of optional size. It was a space truss, an addition of same-size bar elements of steel tubes. He designed different joint elements for the nodes in order to enable rational connections.

14-15. One of the style's characteristic traits was to express or articulate the structure of buildings externally. Mies thought that the building's structural elements should be visible, more honestly converse with the public than any system of applied ornamentation. The Seagram Building, like virtually all large buildings of the time, was built of a steel frame, from which non-structural glass walls were hung. Mies would have preferred the steel frame to be visible to all; however, American building codes required that all structural steel be covered in a fireproof material, usually concrete, because improperly protected steel columns or beams may soften and fail in confined fires. For fire protection he used non-structural bronze-toned I-beams to suggest structure instead. These are visible from the outside of the building, and run vertically, like mullions, surrounding the large glass windows.

25. Over the massive bridge piers a multi-storey iron skeleton frame is constructed. The steel frame is filled with non-bearing walls made of hollow bricks.

26. Hans Poelzig designed a factory of brick masonry. It is a consequent building in construction, as the outer brick walls are filling the skeleton structure. This is strengthened by setting the windows planar with the brick walls.

27. outer brick walls are filling the skeleton structure. Gropius in was asked to add modern exterior elevations to promote a progressive image. The result was that Gropius imbued a strong delineation to the facade, marked by an emphatic two-storey brick entrance with its apparently floating staircase.

29-31. Vogelensangh, a brick factory with a rich history and the only one left where bricks are produced in traditionally coal-fired kilns, commissioned Bedaux de Brouwer Architects to design a contemporary pavilion. This resulted in a design that both in its exterior and interior emphasizes the timeless beauty of the tradition of hand-moulded brick.
The pavilion functions both as reception and office space, and complements the adjacent factory, which has been operating since 1919. The design process started on site and the design reflects the purity and simplicity of manufacturing bricks.
The pavilion, that materializes as an elongated volume with a fairly closed, brick-built entrance wall, is located on top of an elevated plinth. The bricks, that are produced on site, have purposely been laid in a simple bond that refers to the rational way bricks are stacked during fabrication.
On the inside, the building opens up to its surroundings through a glass facade that stretches over the entire width of the building. The clear view on the monumental factory, the busy site and the rural scenery offers an impressive panorama. The interior is characterized by vaulted brick ceilings, inspired by the traditional ring kiln. Just like this ring kiln, the pavilion exists of a rational sequence of rooms, each with its own purpose. Utility rooms have been located next to the closed wall, the other rooms are located at the 'open' side of the building. All in all, a pavilion that is closely related to its environment, not only designed for, but also materialized with and inspired by the client.

32-33. Värtan Bioenergy CHP-plant KVV8 is unique in its environmental ambitions and architectural form. It is the largest urban biofuelled CHP plant in the world. It's very point of being is to significantly reduce an entire metropolitan area's ecological footprint, while providing safe, reliable power and heat for the growing city.
The sinuous façade of terracotta panels mimics the brick of the historical industrial buildings nearby and helps to negotiate the size of the large-scale building, while its dynamic form proudly expresses its civic function and is unique in its size and form. The refined detailing and materials encourage the growing city to nestled up directly to its grassy embankments and ancient trees.

41. Nagler used a cladding of translucent honeycomb panels of polycarbonate. It ensures a diffuse light, so a pleasant light intensity. The building high polycarbonate panels are joined with tongue and groove. At the bottom they are restrained, at the top sliding to allow thermal movements.

42. Through the transparent facade the inside the structure, production process can be seen, and vice versa the exterior also influences slightly the interior through changing light intensity. The appearance is changing with different angles, from an angle looks like a shiny surface, standing in front the inside structure appears as well.

44. The design of the façade, whose elements are suspended in front of the exterior insulation on the concrete walls and encompass the entire building volume, presented a great challenge. The façade elements are made of acrylic glass with an undulating surface, measuring 1.8 metres in width by 11 metres in height – equal to the height of the building. The outer layer of acrylic is completely transparent, while the inner layer is an opaque white colour. The individual panels were first cast in flat sheets then heated to 60 degrees Celsius and vacuum moulded to create the wave structure. Since no manufacturer could be found who was capable of moulding such large pieces, an oven had to be specially constructed for the purpose.

46. The building body is covered with a delicate membrane constituted of aluminum louvers in order to avoid showing the disgusting clustered pipes. Concerning the maintenance ease, the louver aperture ratio and the space behind those offer a proper access to the pipes system.
The reconstruction was also an experimental way to reduce as much as possible the impact on the neighbourhood of the intimidating volume of the uninteresting factory.
To attain to this result, the louver's angles, and horizontal or vertical directions are directed by randomized mathematical rules. Some of the horizontally directed louvers are reflecting the moving clouds in the blue sky or the cars light crossing the street into the night. By moving the point of view, by looking at some of the vertically directed louvers, the segmented perception of the neighbourhood's image is changing. By reflecting the changing nature and vicinity scene of the building, this effect is fragmenting the building and his environment perception and this while preserving a form of human presence feeling.

47-48. Corten steel panels create a textured surface around the upper walls of the structures, and were chosen because they are easy to maintain and fit in well with the natural surroundings.

49-50. The Inapal Metal Industrial Unit is dedicated to the production of metal components for the automobile industry and is composed of two apparently autonomous volumes. One of these consists of two wings and a cantilever that combine raw material storage and different sections of production and delivery; the other consists of two floors where the technical and social areas of the programme are arranged.
Different use of the same metal sheet:
Simple cladding for closed spaces, cut in slices and used like honey-comb for shading, ventilation. It allows the construction of curvilinear shapes reminding the aerodinamical form of automobiles.

53. The supporting structure is made of concrete, also visible from the outside. The building is acoustic insulated and clad by a wooden planking. The inside is illuminated by natural light seeping in through the wooden planks which at the same time protect from the heat.

54. The BC Passive House Factory is an all wood construction demonstration project located in Pemberton, BC. Conceived as a simple, light filled, wooden box, the new 1500 sm facility is designed for the manufacturing of prefabricated 'Passive House' panels. The design, fabrication, and construction of the new facility exemplifies the client's, BC Passive House (BCPH), mission in wood construction, prefabrication, energy efficiency, and sustainable design practice.
The main inspiration for the design came from the belief that the industrial, everyday buildings that make up a vast amount of our built environment can be just as important, and well considered, as our 'public' buildings. **360-degree clerestory windows** provide natural daylight and views to the surrounding mountains. The exterior wood '2x4' **cladding** acts as **fixed screens** for the clerestories and have been designed to provide a **varied** 'openness', offering greater **solar shading** on the south and west facades, while maintaining the stunning views to the surrounding mountains. The abundance of daylight on the exposed wood finishes transforms a typical factory floor into a warm, comfortable, and inviting space to work in.
The facility is the first of its kind in North America and will assist BCPH in their promotion of the Passive House Standard and sustainable, energy efficient, wood based construction.

56. The envelope is made of stone to store the heat and protect from cold, thus making the best use of the climatic conditions. The facade is made of gabions; a typical construction of retaining walls. Prefabricated meshes form baskets and are filled with basalt stones from the region. Mock-ups were built on the site before constructing in order to test the appearance of the wall, to which degree it allows light into the building.

58. The conversion and regeneration of the rail tracks area of the Basel Railway Station. H&D designed a system of parallel buildings; sheds, carriage depots, workshops, offices. Massive longitudinal, in-situ concrete walls following the parallel system of the rail tracks. The girders span across the depots, day-lighting is ensured by profile-glass covered „light-trusses". Also the air-conditioning units are positioned on the roof like containers.

61-62. For this Factory and Office Annex in São Paulo Brazil, a **'high-low' fusion** was employed, where high-tech architectural design strategies imported from abroad were combined with local **low-tech construction methodologies** to create a 'tropicalized' digital aesthetic. Parametric design, digital environmental simulation, and digital fabrication were employed to design and prepare the instructional guides for a low-tech labor force using simple local materials to construct a parametrically rotating concrete-block façade screen, as well as custom-made digitally fabricated furniture and internal wall panels.
The overall intent of the building was to provide an economical, environmentally sensitive, yet novel design to give a contemporary industrial identity to the factory complex. The annex building houses various programs on a split level site in front of an existing factory in the São Paulo industrial suburb of Taboão da Serra. The double-height ground floor space contains a new mechanized-loaded raw material storage facility, the first and second floors are dedicated to administrative office space for the factory, and the final floor is a show-room for factory products.
This is the first time in Brazil that a differentiating component-based façade system is built using digital design and fabrication. In reference to the **traditional Brazilian 'cobogo' shading screen**, this environmental 'second skin' controls the filtration of indirect sun-light through the operable windows on the south and west facades, while also creating a thermal mass which prevents the penetration of hot air in the interior spaces. The north side of the new annex is connected to the existing factory building, while the east façade is partially shaded by the trees and neighboring wall, and open to prevailing wind directions which allow for a cross natural ventilation of the space. The interior space is thus cool and bathed in a bright diffused natural light highlighted by a phenomenological play of shadow and light along the circulation spaces in the late afternoon.
To mount the concrete blocks on site using the same rotations as those in the digital model, a parametric script created comb-like 'guides' to position the blocks, which were made by laser-cutting corrugated cardboard. Theses guides were placed on a moveable wood stand and track system that were fabricated of plywood using the CNC router. The concrete block mason only had to position the blocks against the guides and add vertical reinforcing bar in every other block, attached to the bottom and top concrete slabs, to obtain structural stability.

63-64. Hundreds of used black plastic chairs cover the facade of this furniture shop, which architecture studio Chybik + Kristof has created inside a former car showroom in the Czech city of Brno.
The former showroom was in need of an update, with the building's exterior lacking any visual connection to the company or its products. The furniture company MY DVA Group jokingly requesting Ondrej Chybik and Michal Kristof "do it cheap, ideally for free." Their solution was to create a sculptural facade requiring minimal interference with the original building. Chybik and Kristof used the seats from 900 generic black plastic seats – costing around 80 CZK (£2.50) each – to create the cladding. The firm used a standard Vicenza chair which the supplier delivers on a regular basis. The individual seats are removable from a large steel structure that is attached onto the original facade. Each piece is removed once or twice a year when the building is high-pressure cleaned.
The novel design feature acts as an advertisement for the office and school furniture company. The thematic building is situated on the outskirts of Vinohrady, a housing estate built in Brno in the early 1980s. The original structure of the car showroom was built in the 1990s, in line with the "non-architectural" commercial buildings that populate the local area.

65. „carpet principle": the form is covered by „cut off" surface from a homogenous, endless surface, monolithic solutions
„tile principle": the surface is distributed, paved with a number of coordinated elements, prefabricated, pre-assambled, industrialized solutions