Zeitschrift: Bauen + Wohnen = Construction + habitation = Building + home : internationale Zeitschrift

Herausgeber: Bauen + Wohnen

Band: 19 (1965)

Heft: 8

Rubrik: Summary

Summary

Walter Henn, Brunswick

Supplementary Remarks

Industrialized Construction and the Architect

(Page 295)

Industrialization, standardization, mass production, prefabrication, construction elements–these are the slogans which are invading the daily press and which are promising miracles. Thanks to them, building costs should become stabilized and the contradiction existing between the immense volume to be constructed and the methods of old-time craftsmen should disappear. It is clear that the production of 1000 cars aday calls for industrial methods of production. Everywhere this problem is being tackled according to criteria which are objective and economic, and the solutions differ little from one country to another.

The impossibility of realizing 1000 housing units a day by masons and carpenters is perhaps a generally recognized fact, but the criteria seem to belong to the world of philosophy and constitute part of a personal ethics.

Now then, ethics can lay claim to legitimate intervention in the field of building; for a machine is only a technical device devoid of tradition; all we ask of it is that it function and serve a very limited purpose, whereas constructions are not intended solely to satisfy a functional requirement, for every construction, including that which remains to be designed, is involved in a tradition, in a realm of symbols.

The shape of a cylinder for a motorcar engine is a purely technical problem. But the shape of a column of a building does not merely derive from considerations having to do with function, stability, the choice of a suitable material and economy; it will depend "on something else", on beauty, on a certain symbolism.

That is why building lends itself to so much confusion.

We are spoilt by technological progress. We are disappointed when we note that building does not measure up to the high level of technology prevailing in other fields. The making of a car can be determined down to the last detail. Now then, building will depend always on external conditions: the elements, the nature of the ground, etc. All the same, it will be necessary to get to the industrialization of the building trade in order to satisfy present-day needs.

A plane, a car, a radio set are completed within a single production concern, even if the team responsible is composed of people of different trades.

A building, on the other hand, is planned by the architect, the calculations are effected in an engineering office, the execution is handled by contractors and it is financed by a bank. There is no coordination here. Basically that would be the job of the architect, but he lacks the knowledge enabling him to judge the criteria where there are involved specialization, pre-fabrication or mass production. In what university could an architect acquire such training? Where would he have the chance to take part in seminars? Lack of time during his period of study limits even the acquisition of fundamental knowledge as well as of knowledge of new materials and of their adequate technical and aesthetic application. The information disseminated by the trade press is not generally studied with great care; readers merely flip through and look only at the pictures.

Where is there post-graduate training for architects? After all, every medical doctor tries to keep up with progress in his profession. Does this mean that medical progress is superior to that in the technological fields? Does this mean that an architect can remain content with notions picked up 20 years ago? Is not the architect alone responsible for his buildings, which represent a considerable material investment for his client?

What is to be done?

We have to free ourselves of prejudices and questions of prestige; we must organize teams of people with complementary backgrounds: engineers, sociologists, bankers, etc. and start from the beginning with basic research. It is a question of finding agreement for standards: standard dimensions, tolerances, assembly problems, economic factors, building codes, fire regulations.

The economic questions ought to be raised in all their complexity: the economic side ought not to be expressed on the level of pure return on the investment, but it has a social significance which concerns the entire community: why, for instance, can a car stop being a fiscal charge after 4 years, whereas a pre-fab house encumbers a budget for 50 years?

It is also a question of adapted programs to the requirements obtaining now. Is durability for 100 years desirable? A solid and well-built house may not be adapted to the modern style of life.

Above all, it seems necessary to discover again a certain order in the field of building. This entails a more openminded attitude on the part of the owner and of public opinion, where the purely material question assumes exaggerated importance during the building project and planning stage. The finished building is judged only according to purely architectural criteria, not even according to functional ones, when it is exposed to public criticism. It is necessary to define clearly the limits imposed by technical and financial factors.

Now then, if the architect does not concern himself with these problems, which are so urgent, it may be that the engineer will take over the project alone, for he will be subject to the conditions obtaining in the industrial age, and the only job left for the architect will be that of a historian of art.

Pier Luigi Nervi, Rome

Paper factory in Mantua

(Pages 296–299)

An exceptional program has led to an extraordinary resolution of the problem posed:

A shed 250 meters long and 30 meters wide was to be roofed over without intermediate supports; the reason for this was that there had to be installed here a machine to be fed logs at one end and to emit rolls of paper at the other; moreover, this shed is to be capable of being doubled for the installation of a second machine of the same type. After considering a system of vaulting, Nervi selected a system with 4 pylons taking cables which carry the secondary construction system of steel cables. The roof system comprises 4 steel beams at intervals of 10 meters and a diagonal grid of girders. The pylons, 50 meters high, resemble human figures with spread legs and stretched out necks. Foundations of on-the-site-poured concrete guarantee a firm anchorage for the pylons; they are surrounded by a surface of pre-fabricated concrete elements serving as a coffering for the exterior skin. The curtain walls are suspended from the exterior steel structure.

Gérard Grandval, Paris

Factory for electrical appliances at Plaisir, Seine et Oise

(Pages 300–304)

The assignment was to construct a factory for electrical appliances, having a utility area of 8,000 sq. meters, for 650 employees, on the edge of a forest in the vicinity of Paris. The site measured $5^1/_2$ hectares.

The total plant consists of administration, laboratories for the study of prototypes, production sheds and a canteen.

The following considerations led to the four-part complex on a square plan:

The manufacture of high-quality precision products in small bulk, with frequent changes in production program, is fundamentally a matter of craftsmanship. Automation cannot be applied. The production program requires of all sections of the plant a high degree of flexibility, along with uniformly lighted and heatable premises, with outlets at all points for different chemical fluids, and they have to be capable of extension. This entailed faces, intermediate walls and decks built up on a module of 120 cm. The high-quality and costly nature of the products is reflected in the choice of materials employed in the construction and in the incorporation of small patios with planting, pools and fountains.

In the production building, a structure on a square plan (60 m on one side), which is illuminated entirely from above, there are situated extensive worksites grouped around a core of stockrooms and general utility rooms. Concentric rings of conduits handle the distribution of the different fluids used in the operations. The lighting fixtures and the heating units are accommodated in the ceiling. The rooms are entirely glazed on the sides facing the patio. The administration and the section for prototype development have small offices accessible from an axial corridor. Here too there are patios measuring 22 m per side.

In the self-service canteen an automatic circular conveyor system and staggered levels guarantee efficient distribution of food and beverages.

The patio of the administration building is one single pool with small, planted islands. The patio of the laboratory building has brick flagging with lawn plots.

The site was very carefully chosen, and this shows that the architects were concerned not merely with architecture in the narrow sense, functional solutions, etc., but with over-all architecture in a given environment.

The designation "factory" is no longer quite pertinent in a case like this. The owner invented the term "production site", under the influence of the spare architectural design, and in this way he created a connection among raw material, end product, architecture, and the people who work here.

This complex can be meaningfully and functionally integrated in new large-scale regional plans.

Walter Henn, Brunswick

Associats: U. Maerker, D. Jentzsch, M. Gleditsch

Central Warehouse of the Municipal Works, Brunswick

Plan: 1962

Execution: 1963/64

(Pages 305–309)

On the site of the former gas works there was planned a central warehouse facility measuring 7000 sq. meters and an administration building with social services. The following stages are reserved for the canteen, repair shops and garages for trucks.

The rather restricted site is situated to the north of the city; the south access by road is parallel to the rail line.

This warehouse facility also comprises the public utility services (gas, electricity, water, head, etc.) and maintenance equipment.

Up to now these facilities have been dispersed all over the city and have been quite inadequate. Centralization ought to permit a more rational functional of the municipal services.

The complex is made up of a large building, housing equipment, spare parts, trucks and maintenance equipment, a covered warehouse and a pipe storage facility in the open air parallel to the rail lines, equipped with gantries, which can be interconnected to make a passage on two levels. Along the road, an unloading dock 60 meters long assures rapid delivery of materials and effective distribution. The cranes can service both road and rail transport.

The location of the building (64/70 m), of the unloading dock (7.8 /64 m) and the pipe storage facility (20/106.5 m) is essentially the outcome of the given conditions, by the shape and above all by the nature of the ground, which is covered with old foundations, ditches, etc., which entails foundation problems. The choice therefore had to do with a rather light construction necessitating a minimum of foundations.

A steel construction (interaxial 14/16 m and 10/20 m in the warehouse) was best adapted to these special conditions. A roof and an exterior skin of synthetic material reduced to a minimum the loads due to the weight of the structures themselves: construction system of welded steel, roof of tektal, exterior skin of platal planking.

Roof: elements of reinforced sheet metal, covered with synthetic material (1/7 m) placed on girders with a span of 7 meters welded to the main structure having a span of 16 m. The whole constitutes a rigid construction which is wind-resistant. This very light roof (20 kg/m^2), with fast assembly, is complemented by styropore panels to guarantee thermal insulation.

Exterior skin: steel sheeting faced with synthetic material assembled like slats and bolted on to a steel support composed of U sections, which are horizontal and affixed to peripheral supports by rods. The thermal insulation is assured by panels of laminated wood affixed to the same base as the exterior slatting.

Lighting: Natural: via skylights (1/2 m) of opalized glass placed on a superstructure of tektal sheeting. Artificial: fluorescent tubes mounted beneath the visible girders. Heating: Central building: 8 hot-air systems fed by the central plant at a temperature of 15°. The pipe storage facility is heated by 3 mural units. The low-silhouette part is lighted by a continuous window. The east face can be almost entirely opened, for it is made up of sliding doors of aluminium. The slat elements invest the greyish-blue elevation with a lively verticality which emphasizes the white ventilation flaps of the high continuous window.

A low section ties in the warehouse with the office building on 4 levels, which houses the technical offices (3 levels), the municipal services and the central organization which allots work to the employees (ground floor) in the maintenance department, as well as the showers, WC, etc. (basement).

This building measuring 19.50/32.50 m is made up of mushroom decks without mushroom structures to facilitate the passage of the mains. The reinforced concrete roof, with multi-ply roofing, comprises a superstructure of concrete, covered with aluminium, which accomodates the lift and refrigeration machinery. The connecting section is built of steel and covered with tektal. Temporarily, it serves as a breakfast room and canteen; it is illuminated via the narrow faces and by skylights. The basement is reserved for the air-conditioning plant.

The offices are designed as large rooms entirely air-conditioned, with acoustic insulation assured by wall-to-wall carpeting, absorbent ceilings, wall facing. The freely disposed interior arrangements comprise work groups divided off by movable partitions and flower troughs, and by a coffee bar on each level.

The faces are for the most part glazed; the elements, having the height of one storey, are of wood and aluminium with parapets of opal glass. The sunbreaks are made up of external metal slats. The ventilation flaps are of thermolux. The north face is solid and behind it is the installations core and communications block of dark brown clinker. This harmonizes well with the structure of painted white concrete and the turquoise-blue parapets.

Rolf Waldmann, Zurich

The work of the industrial planner

(Pages 310–314)

Industrial planning comprises all the functional domains concerning production. Knowledge based on past and present experience serves to determine the future development of an enterprise as realistically as possible.

For these important studies, large concerns can maintain a permanent team, which is out of the question for economic reasons in medium or small enterprises. However, even in the case of contact with an independent planner–who ought in any case to have plenty of varied experience–collaboration with responsible predecessors is fruitful.

Continuity of planning is assured only when the collaborators employed in

an enterprise understand the necessity of such planning and participate in it voluntarily.
During a period of continual economic expansion false arrangements and the wrong moves resulting therefrom are difficult to ascertain as such. During prolonged crises, these become more evident. For this reason, the Thirties were a very instructive time for industrial planners who were called upon to renovate run-down concerns.
A concern has a "dead" inventory: location, roads, buildings, machinery, installations. What makes a concern alive are all the various efforts of people who serve it by utilizing the dead inventory. Thus, our observations bear on human activity. To tap this activity in a positive way, it is important to create a certain order in the functional sectors adapted to the people concerned and which the people can adapt to. To achieve maximum efficiency, it is necessary to have an over-all view of events, for it is in this way that there is created a clarity of vision inspiring confidence.
Confidence–and reciprocal confidence–creates a spirit of teamwork which is genuine. Ends are clarified, working procedures are facilitated, the paper work is diminished and administration becomes more effective. Both quantity and quality of production improve.
The specific subject of planning which concerns us here is the creation of optimum conditions involving the technical domain of production and distribution as well as labour. Every enterprise–whether it exists or is to be formed–necessitates a proper location; it requires satisfactory premises, machinery, etc.
The choice of the location is of capital importance. It was on the basis of 270 questions that the author determined the locations of the Hindustan Machine Tool Factory in Karachi and of Simma SpA at Cuggiono, 24 km from Milan, after studying the advantages and disadvantages of an entire region (radius of 50 km).
The location of the sawmill already existing at Sachseln still proved to be the right one at the time of the extension study, because the demand of the region corresponded to the supply of the factory.
In all cases, the industrial planner ought to start his work by the establishment of a general plan of the special and specific conditions obtaining for each enterprise. They ought to correspond to a period of at least 15 to 20 years. Therefore it is a question of knowing the dynamic development of a concern in order to be able to define its limits. Thus, the factory at Cuggiono like that in Karachi is designed in such a way as to be capable ob being quadrupled. However, as production increases more than merely arithmetically in the course of an extension, it will finally be $5^1/_2$ or 6 times larger than at the beginning.
Once sound development is assured, it can be realized according to a known plan and order.
Aside from a well chosen location, it is important for the interior volume to be arranged judiciously in order for industrial production to develop freely. The criteria of good functioning are still an over-all view and an organization that is visible in terms of structural design. As the building, by the very fact of being constructed, will be "rigid", it is necessary to guarantee interior flexibility, permitting alterations adapted to sudden new requirements.
Technological and scientific developments are changing the means of production at an ever accelerating rate.
However, viable enterprises are even capable of changing their production program. Changes in the market can lead to the production of products in an entirely different line, completely modifying the conditions of fabrication and warehousing.
For these reasons, the volumes ought to be as neutral as possible thus permitting installations ranging from precision industry to heavy production.
Two polyvalent spaces illustrate this principle of adaptation to the maximum requirements of industrial production: the sawmill is made up of fields of 10.50 m with 25 m span lighted by a central skylight providing diffuse light. The two extremities accommodate the air-conditioning plant divided into distinct groups and a system of waste suction. The deck is furnished with outlets located every 100 cm, which do not interfere with the supporting structure and which permit a free siting of the machinery.
The warehouses are planned for the basement level. The lighting conditions, the ventilation system, etc. permit the establishment of production of the most varied types of products.
The requirements of precision production employing synthetic materials, or steel, even if it involves relatively heavy pieces necessary for the construction of machine-tools, are met by the types of production sheds built at Cuggiono or in Karachi: The spatial unit of 25/25 m is lighted by four shed roofs placed on horizontal beams at intervals of 6.25 m (maximum load: 22 tons), wich can take suspended cranes wighing 6 tons; four cranes, interconnected, can therefore carry up to 25 tons. They are easily replaced by gantries or other means of conveyance. Thus, the building can be equipped with an additional work level taking some of the load off the ground operations.
For the establishment of other pre-fab plants in India, this type of building has been further developed so as to make units of 12.5/12.5 m or of 18.75/18.75 m. The foundations, cables, work level and main supports will be poured on the site in reinforced concrete. The sheds, exterior walls, intermediate supports, etc. will be pre-fabricated. However, for the 3 types of buildings, the doors, windows, gates, etc. are standardized and interchangeable.
Moreover, the author takes up problems of modules from more than 25 years back. Fifteen years ago there had been utilized a module of 60 cm for a building near Bombay. But the need for larger volumes in hot countries has caused a modification into a module of 62.5 cm, which yields very functional dimensions and agreeable proportions.
The climatic conditions are all-important in architecture, especially there is involved a hot country like India. Thus, for the factory in Karachi the office building was sited in such a way that the sun never reaches the south windows or those on the east and west sides during working hours during the hottest season of the year. The air reaching the shaded ground floor circulates along the faces and beneath the double insulating roof. The production sheds enjoy a complete change of air, by the ascending pincipIe, 10 times an hour.
Often a functional space yields an aesthetically satisfactory solution to the given problem.
The spatial design dictated by various and precise functional needs, the rhythmic regularity of spatial sequences and the succession of the volumes in accordance with a production program leads to very complex architectural lay-outs with interior spaces and exterior ones that are highly varied and that remain valid later on, if they are realized by means of procedures and methods adapted to the given surroundings and to the requirements of the given time.

Vittorio Gandolfi, Milan

Air Terminal Building, Milan-Malpensa
(Pages 315–320)

Malpensa, one of the oldest airports in Italy (1907), situated 48 km from Milan, enjoys the relatively stable climate prevailing at the foot of the Alps. The new air terminal (1962) comprises 4 parts: national airlines, international and intercontinental lines, the customs office and the restaurants with the waiting-rooms. A foundation of reinforced concrete (basement) takes an elegant steel skeleton structure of from 1 to 2 floors, which, in Italy, can remain untreated. All parts of the building, arranged around a central shed (tickets, waiting-room, dispatching, etc. with passage to check-out gates and customs), with, in front, the waiting-rooms and the restaurants for the transit passengers on the ground-floor and those for visitors on the first, are surrounded by terraces commanding a general view of the airport. Near the runways are the control tower and the airport administration.
The annexes for freight and helicopters are located to the west of the complex, which resembles the Linate airport, Milan, by the same architect.
Aside from its effect of lightness, owing to the use of metal, this complex also offers a high degree of flexibility, which will be to its advantage in the future, in view of the extremely rapid developments taking place in the field of air travel. The provisional character of this air terminal thus corresponds better to its function than does the monumentality of certain terminals, which will soon be outdated.

Craig Ellwood, Los Angeles

IBM Office Building
Beaumont, Texas
(Page 321)

This low-cost small office building is to serve the local sales service needs of a major manufacturer of office machines.
The structure is a 9-bay exposed steel frame with belled caisson footings. The elevated floor and the roof are lightweight concrete spanning intermediate steel beam joists. All exterior walls are dark gray glass.
Mechanical equipment is in the basement and an undergrade tunnel to the west exterior provides chases for intake / combustion / exhaust air. This tunnel is sized for service and replacement of mechanical equipment.
Square footages are 900, basement; 6,690 ground floor; 8,930 second floor.

Craig Ellwood, Los Angeles

Litton Industries Office/Factory, New Rochelle
(Page 322)

The site for this structure is small, therefore the factory area is elevated and administrative offices and underground parking are provided on grade. The exposed steel frame is in bays of 35′×25′. Wall panels are glass in the office, pre-cast concrete in the upper walls. Grade level is 3,575 square feet, upper level 23,675 square feet.

Bruno Haller, Fritz Haller, Solothurn
Associate: R. Steiner
Engineers: Emch and Berger, Berne
Plan: 1961
Execution: 1963–1965
Cost of construction: Fr. 172.50/m³

Office Building, Schärer's Sons, Münsingen
(Pages 323–333)

This building is the complement planned for the production shed published in B+W, October 1964.
A structural unity measuring one half the production sheds constitutes a large office building which can be extended laterally by the juxtaposition of identical elements. While the same structural principles are applied as in the case of the factory, the details have been adapted to the specific requirements obtaining here (supports, main stringers, connections, etc.).
All the worksites are situated in one single large centre without partitions, the only exception being a conference room located near the stairs. The basement level comprises the technical installations, the toilets, the records and the shelters as well as a polyvalent room (bar, film projections, displays) tied in optically with the offices by means of vertical communications.
All the offices are entirely air-conditioned from a central plant by way of vents situated between the main structure and the suspended ceiling. The exhaust air is carried away via a main running along the elevation.
The new problems of interior appointments posed by such a large building entailed the complete study of the problem of office furniture, leading to the development of prototypes, which will be sold in shops and some of which have been patented.