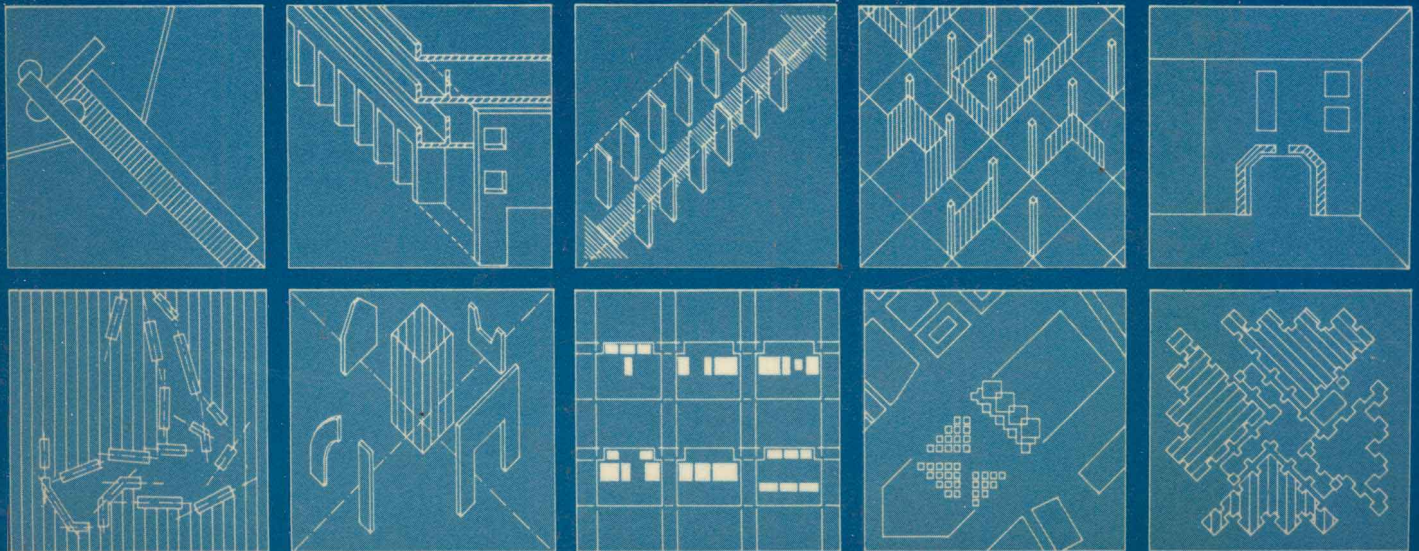


# IDEA, FORM, AND ARCHITECTURE

## *Design Principles in Contemporary Architecture*



***Egon Schirmbeck***

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## ***Design Principles in Contemporary Architecture***



***Translated by Henry J. Cowan***



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# ***Foreword***

The author of this book on the relationship of idea to form and architecture is an architect who, in spite of his youth, has designed a number of excellent buildings. He is therefore not concerned with abstract theories but with the process by which an original concept influences the realization of an actual building. He appreciates the fact that the concept must be modified and altered in the course of the design process, because the problems confronting the architect become clear only during the design. Therefore, an idea encompasses not merely an original concept but also the modification and alteration that it undergoes during the design process.

This investigation, like every other concerned with the manifold phenomena of contemporary architecture, has had to be limited in scope. However, it covers a broad spectrum of present-day architecture, even though many other architects could have been included in the discussion.

To analyze the nature of the buildings, the author employs not merely text but also the analytical drawings that are so familiar to architects. Although these are in themselves abstractions, they have the advantage of immediate accessibility. The author notes at the end of his book that they do not resolve the question of how the user, for whom the architecture is intended, perceives and experiences the goals expressed

by the architect in the form and shape of the building. This could only be answered by empirical investigations of contemporary buildings after a long period of occupancy.

The real value of this book, both for the architect and the student of architecture, lies in its method, the examination of the effect of ideas on action, and of action on ideas. If people complain about the irrelevance of contemporary architecture in meeting the needs of the user, this is because architects have spent too much time on abstract design and too little on reflecting on what has been accomplished.

JÜRGEN JOEDICKE

# ***Introduction***

The design activity of the architect consists of a multitude of individual decisions and evolutionary phases. In the end a planning concept evolves that is the model for future realization. Step by step, this planning concept is transformed into the final design through drawings, taking into account a number of individual problems, such as the requirements of form, function, technology, biology, ecology, and local government regulations.

In every design it is the task of the architect to reconcile the sometimes conflicting objectives of a new building and to propose a solution within the available means of construction. Every solution, and every building, mirrors in its entirety all the essential goals, requirements, or ideas in constructional form.

Apart from meeting the requirements, which should previously have been clearly defined and quantified as data, the suc-

cess or failure of the solution depends essentially on the adequate application of appropriate architectural principles. In recent years architects have been confronted with numerous demands resulting from theoretical planning discussions and from attempts at user participation in the planning process. In the process it became clear that the resulting goals and principles could not readily be transformed into action for a realistic design. On the contrary, during the last few decades a series of formal elements has been assumed uncritically from the Modern Movement, without considering the original goals; this created the potential for misunderstanding.

In the analysis of the design principles, an attempt has been made to describe and relate them to the constructional means available for the realization of the design. To illustrate the design activity of the architect, individ-

ual characteristics are illustrated by abstract sketches, analogous to the synthesis of design. These analyses attempt to relate retrospectively the various design decisions to the corresponding design elements. At the same time, a number of individual buildings are described to illustrate movements and trends in contemporary architecture and their dependence on formulated design maxims.

In chapter 1 the theme of “design” is discussed, and its goals and resulting operations determined and outlined. The derivation of the analysis from the design principles is also described.

In chapter 2 diverse buildings and projects from the 1960s and 1970s are analyzed. The individual design principles are enumerated and illustrated by sketches of building forms.

In chapter 3 description, comparison, and contrast of the prin-



ciples are followed by a classification and graphic presentation of their significance in distinctive periods of the development of modern architecture. The main purpose of the analyses is to attempt a description of the diverse design ideas and the resulting architectural characteristics in the form of sketches of the design elements. In the process, the relationship between design principles and the realized built forms is made evident.

The analyses show that the overall form of a building is determined by relatively few design principles. The number of fundamental and characteristic principles that determines the overall concept of three-dimensional design is limited and can easily be kept in view by the designer. These principles can be used as guiding concepts at various levels of planning. The much larger number of specific design decisions are developed subsequently without explicit formulation of goals.

By limiting the analysis to typical characteristics of individual architectural movements, it can be shown that all goals and/or formulations of principles are essentially qualitative. Quantitative aspects of the development of new architectural forms are barely detectable. Corresponding to the categories of building characteristics in individual design concepts, one can recognize three

essential types of principles as significant for the design of buildings. For example, one can determine the form of a building or the allocation of space primarily by rational considerations, such as structural principles, building services, or specific user requirements. These types of principles may be called "rational principles."

A second category of principles deals with built form and consequently the influence on the observer of the symbolic content of architectural elements. This aspect has acquired particular importance during the recent past in discussions on architecture.

Although the implementation of "rational" and "symbolic" principles may have specific and different psychological consequences, there are also principles whose expressed purpose is to produce specific psychic responses in people. These "psychological principles," for example, may aim at solutions that ensure user participation in the planning and design process or the feasibility of social contacts through appropriate layout of architectural spaces.

The limits of the individual types of principles are fluid, or at least there is a certain amount of cross-fertilization. The analysis of individual designs shows that in the period 1945–60, rational considerations have most influenced architecture; only in the

very recent past have symbolic and psychological aspects again received special attention. The analysis also shows that formulated principles are not of equal importance at all levels of planning.

The establishment of relationships between formal principles and the architectural characteristics of individual architectural spaces has been attempted throughout this book. The individual design elements are shown in each case in graphic form. By describing the original background of the architectural form, this analysis should help at the same time to reduce the possibility of an incorrect interpretation.

A special attempt has been made to draw attention to the various movements and trends in contemporary architecture for each of the design elements, with special reference to the creativity of the architect.

# ***Contents***

Foreword	iv
Introduction	v
<b>1. Design in the Planning of Buildings</b>	<b>1</b>
The Theme	1
The Contemporary Situation	2
Goals	4
The Steps in the Analysis	6
Limitations	6
Principles of Design	6
<b>2. Analysis of the Design Principles</b>	<b>9</b>
Development of the Analysis	9
Piet Blom, Monnickendam	12
Herman Hertzberger, Amsterdam	26
Hans Hollein, Vienna	40
Arata Isozaki, Tokyo	50
Louis Kahn, Philadelphia	64
Charles Moore, Los Angeles	86
Aldo Rossi, Milan	108
Oswald Matthias Ungers, Cologne	118
Robert Venturi, Philadelphia	132
<b>3. Design Principles and Architectural Characteristics</b>	<b>147</b>
Comparison and Contrast of Principles and Characteristics	147
Principles, Characteristics, and Planning Levels	166
Principles and Architectural Trends	167
Characteristics and Principles of Contemporary Architecture	168
Summary	170
Notes	173
Photo Credits	182
Index	183

# ***Design in the Planning of Buildings***

## **The Theme**

The terms “design system,” “structural grid,” “architectural theory,” “design theory,” and “design concept” all denote aspects in the planning stage of design. Even though they are distinctively different concepts, they all define a certain task in the building process by means of individual, basic principles or goals. This multitude of concepts demonstrates that architecture differs from other scientific disciplines. In accordance with strict scientific principles, the concept of a system denotes a “multitude of elements and a multitude of relations which exist between these elements” (1). A one-sided procedure of this type for the ordering of spatial elements and their interrelationships in the design process is only possible under certain conditions. The structures (which are the task of the architect) are developed

three-dimensionally from building elements, using generally formulated ideas, goals, theories, or programs. To this extent, a consensus is possible with regard to widely differing design systems or principles of order.

The concepts of “design theory” or “architectural theory” are often given varying interpretations. Christian Norberg-Schultz is of the opinion that the word “theory” is so threadbare and often so far removed from practical considerations that hardly anybody still believes architectural theories produced by architects once had direct significance for the practice of building (2). However, the value of theories, at least in the past, can in fact be determined unequivocally by the numerous testimonials to the quality of the architecture of great theoreticians and architects such as Vitruvius, Alberti, Palladio, Schinkel, and Le Corbusier. During their periods of influence,

their theories had an authority far greater than any theories do today.

Today, architectural decisions can be made on the basis of valid theories that are used in professional practice. However, these derive essentially from the realm of economics, industry, or administration. Decisions on the quality of architecture are made primarily on the basis of economics, finance, organizational and production technology, and their value systems. One can hardly claim equal acceptance in this decision-making process for any theory of architecture that defines the principles of design in the form of a man-ecology system. There is merely a multitude of individual theories or ideologies. Architects develop theories in accordance with their personal conception of the material and immaterial values within architecture, on the basis of life experience; indeed, all architects must



formulate their own goals or principles (as theoretical concepts or ideas) in order to use them as arguments or criteria for implementation in appropriate buildings. This fact has been responsible in recent years for the paucity of any meaningful application in architectural practice of discussions based on scientific or architectural theories. As a statement, this is not news. Even if one confines oneself to the supplementation of the above-mentioned theories from other disciplines with so-called explicit criteria and quantitative characteristics, it is still necessary to develop architectural theories, which are accepted as being of equal value, in order to achieve the desired goals in each case.

In statistics about the activities of architects, one hears time and again that design accounts for only about 5 percent of the total work load (3). With this statement one attempts at the same time to place a value on the design process and to limit the time available for it. It is true that a number of architectural tasks require far more time than design does. However, this obscures the significance and consequences of the individual decision-making phases in the work process. In the hierarchy of planning problems, it can be shown (4) that within this "5 percent activity," decisions must be made that are of fundamental

importance for the function or form of the building. Fundamental decisions are also made in this phase that determine the overall concept of the architectural solution; and goals are set that will continuously influence all the details of function, construction, and form. So it is evident that all the essential steps in planning derive directly or indirectly from the decisions and goals fixed at the design stage. The needs of the individual users and the demands they make on the design of the building are determined and defined at this initial stage of decision making.

It should be emphasized that none of the individual activities has a primary and specific claim on the architect's time. For example, comprehensive design concepts can achieve their goal (or benefit the user) only if the designer has the scope to develop a constructional scheme and realize it within an "optimal" technical and commercial framework. To avoid misunderstanding, it should be mentioned immediately that there is no logical sequence of steps in design. Revisions of the goals made in the beginning ultimately determine the design process. Venturi even considers it legitimate to define the ultimate goal of a design only after one has backtracked to it during a modification (5).

The reasoned description of the actual intention or goal, related

to the architectural means employed, is of importance in addition to the actual design process, because the desired function, construction, and shape can be achieved only if the architect has adequate architectonic means, or design elements, to put these goals or ideas into practice. So far, attention has scarcely been drawn to the dependence of the achievement of the goals of architectural planning on the availability of the architectonic means available for their realization. The presentation of the interdependence of goals and means may be of some help in clarifying the activity of design in this discussion. Furthermore, it assists a detailed understanding of the movements and trends in the development of architecture, and it may indicate appropriate future action for the design activity of the architect.

### ***The Contemporary Situation***

The development of a design concept is determined by a series of influence factors (design principles). In previous centuries of the history of architecture, the characteristics of quality—that is, the "theories" of architecture—were firmly set down, and their influence on form was unequivocally stated in terms of precise directions (by Vitruvius, Alberti, Palladio, Schinkel, Le Corbusier,

and Mies van der Rohe, among others). Some of the last comprehensive concepts for creative architecture were set out at the beginning of the twentieth century by groups such as the De Stijl movement, by representatives of the functional building concept such as Hugo Häring or Hans Scharoun, and by individuals such as Gaudí or Le Corbusier. Their work was largely based on comprehensive architectural theories, whose goals, consequences, and interpretations are even today the subject of controversy and discussion.

A discussion of the principles of architecture and of design started again, after a pause, during the last few years. Thus, Charles Jencks (6) speaks of a “method of design” to develop a “double-coded” architecture. Many of the contributors to the present debate refer to general considerations in the history of architecture, of art, or of culture.

These ideas depend on a multitude of factors influencing a certain period of time. They are determined by social, cultural, political, or climatic conditions. Theories about architecture and its relevance have existed, starting with Vitruvius, for more than two thousand years. Form and technology were time and again interpreted as the creative content and the symbol of the function of the building. In that process, form was frequently iso-

lated as the expression of fine art, as opposed to technology and science. For example, Philip Johnson, the friend and pupil of Mies van der Rohe, answered the question whether one should consult a sociologist, with: “For heaven’s sake, no!—They do not know how to build a city; only artists know that!” (7). Statements of this kind today serve at best to boost an individual’s ego, or they smack of utopianism. At the same time, they describe very clearly the dilemma of the architect’s field of activity; that is, it is almost impossible to give people in other specialized disciplines, who are concerned with planning, any direct description of the architect’s procedure when he is engaged in design. Heinrich Klotz (8) mentions the same problem in a talk with Hans Kammerer, in which he discusses the contribution of Alexander Mitscherlich to a planning commission, and the relevant descriptions of the architectural procedures. While other specialized disciplines can present and analyze a number of problems for architects, it is left entirely to their imagination and innovation how they interpret these problems and the contradictions inherent in them, and especially by what architectural means they propose to solve them. There are no direct rules as to how architects should act in those circumstances.

According to Gerhart Laage, the newer architectural theories no longer concern themselves with “only art, only technology, or only products,” but at least in part with a more comprehensive “man-environment relationship.” Their essential concern for the planning and realization of architecture is first to make decisions on the desired social, commercial, and technical goals and then to find adequate means for design and construction (9).

In the public discussions of the last few years, the architect has not really succeeded in offering society solutions for an environment that provides the user with a high workplace standard or high-quality habitation. Examples of contemporary architecture are designated by catchphrases like “monotony” or “inhuman architecture,” and the architect is held responsible for all the negative consequences of this development. In the 1960s there was a parallel development in the literature on the work of the architect—its fundamental principles, the range of work, and the methods for doing this work and the associated planning. Architectural design was to be redeveloped systematically and “optimized” through functionally and technically perfect procedures, which are repeatable. Sociology, psychology, and other specialized disciplines were to contribute to giving architecture a “human”

face. Catchphrases such as “user participation” and “appropriate scale,” and demands for better communication between the user and the architect, made the architect feel insecure, a technician in opposition to the needs of society.

One of the problems lay in the difficulties of communication between different disciplines. Another problem lay surely in the fact that the architect, at the decisive stage of planning and design, was left “on his own”; that is, no one was able to suggest concrete action to the architect when he came to the real planning problems (10).

In the meantime, past experience may offer the architect some guidance on how to avoid a repetition of past failures (11). It is essential that the technical requirements of construction are met; in addition, proper consideration must be given to the user's goals, the demands of an architectural form, and the specific requirements of a particular building project. Furthermore, there may be a major misunderstanding with the client, unless the architect formulates and presents his own goals in unequivocal form.

## Goals

In describing and analyzing actual examples of contemporary archi-

tecture, one can discern different, even contradictory goals. At a second stage of the analysis, one can contrast the building elements or built forms that have been used by individual architects to achieve these particular goals. It is then possible to determine which of the goals and ideas determine the development of contemporary architecture; which of the problems are potentially solvable by the architect; and what architectural means are at the disposal of the architect to enable him to translate his ideas into reality.

It is initially of no consequence whether it is possible to describe exactly the interpretation of the goals at any given moment. What matters is the relationship of an idea and of an architectural form to a given problem.

An attempt has been made to produce design principles to describe the interdependence of goals and of their realization in built form: design principles, such as are described by the HOAI (Honorarordnung für Architekten und Ingenieure) (12), that define the activity of the architect. Paragraph 15, Sections 2 and 3, defines the basic function of initial planning thus:

- Analysis of the principles;
- Determination of goals (boundary conditions, conflicts between goals);

- Drawing up a catalog of goals related to planning (programming goals);

- Design planning (planning of systems and their integration) as basic performance: “Detailed work on the planning concept (step-by-step elaboration of the drawings) considering the requirements of town planning, form, function, technology, environmental physics, energy, commerce, biology and ecology.”

The essential performance of the architect is defined unequivocally in this statement. It is the architect's task to combine the different goals and demands that the building must meet and to propose a solution by architectural means. Each solution to a building problem, that is, each building, therefore mirrors in its entirety the essential goals, demands, and ideas in built form.

It is an essential goal of this analysis to describe examples of goal-setting for future planning and their translation into built reality in accordance with defined systems of design and order. Backtracking analyses of this kind can rarely be found. The interpretation of a particular type of architecture is based on this “catalog of planning-related goals” (HOAI) and the information regarding the “stepwise elaboration of the drawings” (HOAI). The examples so produced may

serve as a basis and as a stimulus for the derivation of new planning concepts.

An attempt will be made to select a range of examples within the field of modern architecture to illustrate the diversity of contemporary architecture and its principal movements and trends. The beginning of the 1970s was a turning point in contemporary architecture, marked by the following events and developments:

1. Theoretical discussions of architecture were resumed at the beginning of the 1970s with contributions by Robert Venturi in *Complexity and Contradiction in Architecture* (13) and by Venturi and Denise Scott Brown in *Learning from Las Vegas* (14). A basis for an apparently new architectural symbolism was discovered in the process, with architecture becoming the carrier of expression and images with communicable content (15). The authors are of the opinion that architectural form and significance should not merely be appreciated by the abstract artistic concepts of “quality” and “originality” but also with the aid of popular pictures and signs that everybody understands, even though they may, in aesthetic terms, be borrowed or copied from elsewhere; the Las Vegas Strip is specifically quoted as an example. It is not only the func-

tionalists who consider themselves under attack by Venturi’s pleading for a symbolic architecture.

2. According to Klotz (16), the second hallmark of a decisive turning point was the discovery during the last few years that “we must consider every single new building to a much greater extent in relation to its surroundings: architecture is ecology! The overconfidence of modern architecture had until then to a great extent ignored its impact on its surroundings. The movement for the preservation of monuments can claim a large share in this change of attitude.” The concept of “adaptive or integrated buildings,” called by James Stirling “repair of the city,” has posed a question for all functional architecture.

3. Charles Jencks, in *The Language of Post-Modern Architecture*, critically reviews the development of modern architecture. He pithily analyzes the death of modern architecture and makes a case for an eclectic development of “Postmodern” architecture. Jencks defends the present move in the direction of confusion and eclecticism and concludes that an architecture will develop that will resemble the style of eighty years ago, which produced Neo-Queen-Anne and Neo-Edwardian styles in England. For him, this “radical”

eclecticism is multivalent, in contrast to modern architecture (17). Such a decisive condemnation of modern architecture and an open leaning toward a symbolic “pluralism of styles” was hitherto unknown.

4. Besides the change in the “internal” content of modern architecture, the beginning of the 1970s was also remarkable for an “external” event, which may equally be considered a turning point: the ideas and concepts of a new architecture and of utopias for new buildings were once again presented in exquisitely drawn architectural sketches. Whole cities were perfectly presented in these graphic works of art. The charm of these architectural presentations, by themselves, offered hope for a change for the better in the environment through architecture. Plans, layout plans, details, and isometrics by Peter Cook were exhibited in a London gallery and offered for sale. The work of several groups persuaded us, through sensible graphic presentation, to accept a narrow architectural vision—for example, the ideas of the Rationalists or of Leo and Rob Krier. The artistically significant architectural drawing was moved back to the center of architectural discourse.

The analytical part of this book limits itself to the discussion of design principles and architectural

realizations, using examples from contemporary architecture that are characteristic of the 1970s. The effect of the present-day debate on architecture may be evaluated by historians in the year 2000. The result of these explanations can presumably be used only by the next generation of architects. This means that conclusions on the goals and ideas of the present-day striving of architects can only be drawn at a much later point in time. However, architects today need to derive goals and solutions for tomorrow's architecture from the present situation. That is the reason for this analysis of examples drawn from present-day architecture.

### ***The Steps in the Analysis***

1. Statements on design in the planning of buildings/Theories in architecture/Concepts and definitions.

2. Analysis of examples of contemporary architecture selected according to their design goals or design ideas, and comparison with their solutions in the built form.

3. Comparison of goals, which are the present aim of architecture. Characteristics of the architectural means (elements of design that are at the disposal of the architect for a solution to the problem).

### ***Limitations***

The reason for the restriction of this analysis to selected examples drawn from contemporary architecture has already been explained. A further limitation lies in the choice of a few significant representatives of contemporary architecture. This choice is subjective, and it will be explained within the framework of this book through the examples. An attempt will be made to demonstrate the different and often contradictory concepts of contemporary architecture through the analysis of individual characteristic theories and buildings. This analysis is an attempt to examine more closely a series of frequently cited, publicized, and discussed ideas and concepts with particular reference to the design activity of the individual architects and their implementation into architecture. While some of these ideas will dominate building in the 1980s and 1990s, other concepts will prove to be unrealistic and will be forgotten. At the center of this controversy is the attempt to describe the dependence of projected goals, often formulated verbally or in abstract terms, on the practicability of realizing them by the available means of architecture; that is, in terms of constructional elements. One might quote as an example extreme concepts that may provisionally be placed into

one or the other group. It is essential to maintain an overview of currently discussed approaches, whereby new ideas are interpreted by new architectural methods. Specifically, design concepts by the following architects are presented, together with their expression in built form:

- Piet Blom
- Herman Hertzberger
- Hans Hollein
- Arata Isozaki
- Louis Kahn
- Charles Moore
- Aldo Rossi
- Oswald M. Ungers
- Robert Venturi

### ***Principles of Design***

The analysis of the design principles is intended to reveal the theoretical goals on which a particular collection of architectural concepts or an individual building are based. Some goals may be determined from pronouncements and responses. Insofar as architects have explained the reasons for their actual goals, or one can derive them from their context, they have been described directly with the goals themselves. The analysis of the design principles and the presentation of their relationship to the built form (architectural characteristics) should help to clarify the background of

the design process in each case and to describe individual, actual design concepts of contemporary architecture in more detail. The abstract and schematic drawings are intended to demonstrate the individual architectural characteristics through corresponding (sketched) design steps. At the same time, one can show the actual architectural elements by which the architect realizes, or at least attempts to realize, each particular goal. It is one of the peculiarities of the design process and of architectural creativity that one cannot establish a direct causal relationship between every one of its phases and every architectural expression.

An appreciation of the essential goals, and the architectural means used to implement them in the design, is essential to an understanding of the individual architectural examples. This analysis is an attempt to reduce the written description in the literature, dealing with the discussion of architectural theories, to actual design and planning goals in order to describe more clearly

the characteristic design intentions and the architectonic means currently used to implement them.

The presentation of the design principles and the architectural characteristics can essentially be divided into three parts:

1. A description of the use of architectural theory in the work of each individual architect. His general theoretical approach, his background, and his exposure to individual movements and trends are briefly presented.

2. A search for design principles, obtained from the literature, from conversations, from a description of the buildings, and from idea sketches. Analysis of the architectural characteristics of individual buildings, which have a direct relevance to the specifically defined principles of the individual architect. This part of the analysis is essentially limited to abstract sketches to illustrate the individual design elements clearly. An attempt has been made to backtrack on the original design process and dissect it into

individual "design sketches" to show visually the interrelationship between the principles and the architectural methods for their implementation. The individual aspects of the corresponding planning level are shown in parallel to the design process to identify the design phase in which each principle is realized.

3. A summary and comparison of the individual design goals in sequential form and a presentation of the different architectural characteristics are intended to identify the principles that may be realized by a particular architectural method and to show which of these methods are available to the designer to achieve a particular goal. For an understanding of the design solution, it is always necessary to couple each planning goal with the appropriate architectural solution. The multitude of approaches prevalent today should contribute to the definition of a spectrum of possible approaches to a solution (and of the architectural methods available for the purpose).





# ***Analysis of the Design Principles***

## ***Development of the Analyses***

The analyses of the following designs and plans aim to present design and planning principles and the methods of their realization by architectural means. In the process, the individual design elements on which the particular designs are based are demonstrated through a pictorial presentation of their architectural characteristics. This analysis is developed alongside an account of the designer's activity to make the clearest and most unequivocal statement on behalf of the given architect. The result of the design is thereby regressively dissected into individual design components, related to defined design principles. The process of design (as a synthesis) is followed backwards and presented approximately in its individual phases of design and decision. Alongside

this stepwise derivation of the built solution to the problem through design sketches and drawings, an attempt is made to present the corresponding design elements (that is, the architectural characteristics) both through text and through drawings.

Fritz Schumacher (1) defined three phases in the creation of a building:

1. the initial phase (the process of design or planning);
2. the middle (architectural characteristics and methods of building);
3. the goals (principles).

The aspects of the *initial phase*—that is, the process of design and planning—entered into the professional practice of the architect only about forty years after Schumacher had called for it. He had already

nominated for the *middle phase* a series of design elements: “Formal methods, for example the interpenetration of bodies, horizontality, verticality, contrapuntal composition, the juxtaposition of different motives, as well as the interconnection of bodies and building elements.” Furthermore, he mentioned building forms that are “determined by statics and construction, for example shell surfaces and structural skeletons, as well as color, paintings and sculpture” (2).

As far as possible, the individual architectural characteristics have been presented in abstract form; that is, without additional architectural features that have no primary influence on the particular goal under consideration.

The *goals* of the individual architects were expressed in the form of principles in “colloquial” or in “general” form (3). An

analysis of comments on design has shown that a further classification into “ideal” and “concrete” goals is not really possible, nor are there any criteria for “measurable magnitude” (4). The decomposition of goals (principles) into “partial” goals, or their representation in the form of a “tree of goals,” was not considered relevant in view of the type of information on the individual designs.

Consequently, the general principles on which the particular design is based are given in the first column. These general principles are documented with literal quotations (denoted by quotation marks) or by paraphrased statements (denoted by crosses). To provide an appreciation of the meaning and the purpose of a particular formulation, the next column contains its justification.

The analysis has shown that the overwhelming majority of formulated principles has been followed immediately by a justification of these planning measures. Usually, the reason for the design concept and its realization becomes clear only through this explanatory addendum.

Following the discussion of the design process of the architect, it seemed sensible to present some of the architectural characteristics at the particular level of design. As a starting point, it has been assumed that under normal condi-

tions a design develops by steps, from a treatment of the town planning aspects, via the problems of organizing the masses of the building, to the organization of the individual spaces. Backtracking to allow for factors that affect the use or function at any of the individual levels of design may require modifications to the design concept that has been developed by the previous steps. In contrast to the abovementioned lack of a hierarchy of goals, the sequence of architectural characteristics produced a logical chain of interactions at several levels of design. One can follow, for example, through several different design levels the demand for a “human architecture.”

In particular, architectural characteristics were examined at the following design levels:

- Town-planning level
- Object level
- Zone level

The *town-planning level* comprises everything within the context of town planning, such as the existing buildings, the environment, the landscape, the topography, the infrastructure, and other aspects, insofar as they can influence a concept at that level. The *object level* comprises the actual relation of the buildings to other buildings in their

immediate vicinity. The *zone level*, as the lowest step, concerns itself with the allocation of space and user zones and with construction details.

To avoid any misunderstanding, it should be pointed out that the transition between the individual design levels is fluid. Consequently, the relationships between the individual architectural characteristics should not be regarded as fixed. The determining factor is the sequence of the relationships. This is, for example, defined when formulating the town planning maxims and is then followed through as far as the choice of material in the statement made at the zone level. A further subdivision into additional design levels may be omitted in view of the statements that may be expected in relation to the principles and the architectural characteristics.

Since the designer expresses himself through sketches and drawings, the architectural characteristics are presented in the form of schematic sketches. This representation corresponds to the actual design activity and yields the actual design or the proposed concept of the solution as the sum of a number of individual sketches. The individual architectural characteristics are presented in written form next to the graphic presentation for the sake of clarity. These descriptions are