ARCHITECTURAL QUALITY

INVESTIGATION OF THE DESIGN PROCEDURES FOR BUILDINGS OF QUALITY IN MODERN ARCHITECTURE, WITH NOTES ON THE RELEVANT CONTEMPORARY SITUATION IN SYRIA

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To my wife shaza
my daughter lina

To my parents

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CONTENTS

Introduction

The thesis deals with the design process involved in the production of buildings of quality and ends with the note on how an analysis of British conditions might be transposed for use in Syria, the home country of the author.

The thesis opens with a brief statement about the present position of modern architecture and its critical reception at varying levels of society. This theme is continued in a brief historical survey of the present position of the aesthetic and philosophical theories current in contemporary architecture. A particular point is made of the position of functionalism, in the widest use of the word, as a major determinant of architectural form since the early days of the Modern Movement.

The second area to be covered deals with the concept of quality and is treated fully in both subjective and objective terms. An attempt has been made to define quality and show how the definitions found are related to building design. This section is completed by a survey of the present approach to quality performance and some methods used in Western Europe and the U.S.A. Four systems at present in use in Britain, France, Sweden and America are examined in some detail and the disadvantages and advantages are noted. This naturally leads on to the sociological problems associated with quality in the built environment and the role of the

architect in traditional terms as well as the possibilities that may exist for his future role.
There is a further survey of systems of evaluation that are already in use for determining the quality of housing developments and finally in this area the appraisal of building systems that are at present used by leading practices.

The third part of the thesis consists of an examination of a number of case studies and investigation into a number of practices which have been found to produce buildings of accepted high quality. The methodology involved in selecting the buildings and designer forms part of the work.

The case studies are fully illustrated and report is made of the office procedures and structures of those practices involved. The technique developed was to take a building produced by the office and use this as a vehicle upon which to draw out the processes generally in use in the practice. This was extended to cover a range of architectural activities. An analysis of the various design methodologies which determines the final form as a major part of the thesis and the conclusions which are drawn from this analysis lead on to the fourth and final part of the thesis which deals with the Syrian situation.

Good thought and data on architectural quality has always been available and comes from many sources; But mostly, work is carried-out under different titles. Facts have been drawn from all fields of architecture and from the knowledge of other fields of Human sciences.

It has been found essential to draw short term conclusions where felt appropriate.

Footnotes and references are listed at the end of each chapter in which they are discussed, and a general bibliography is at the end of the thesis.

Part One

THE PRESENT POSITION OF MODERN ARCHITECTURE

1. THE PRESENT POSITION OF MODERN ARCHITECTURE

In order to define clearly our approach to the subject of architectural quality and to identify those changes which have taken place and their effect upon the actual practice of architecture, it is important in this preleminary chapter to follow the developments of modern architecture in a way which reflects current conditions. It is also of importance before looking at the contemporary situation regarding the development of buildings of quality, to see by what stages the ideas behind them gradually established themselves.

It is acknowledged that the appreciation of architecture can be enhanced by studying contemporary work in relation to the history of the period and the people and factors leading to the production of fine buildings. There has always been a strong consciousness in architecture of the influence of the past.

In historical studies of buildings, it is much easier to recognise the aspect of quality in design them to make a contemporary assessment. On one hand the mere fact that a building has survived indicates durability. Furthermore, the relationship to other building of the period can be assessed more clearly at a distance. The out put of an architect over his lifetime or comparative studies between building types are also easier from a historian's viewpoint. One difficulty is that there may be a discrepancy between the architect's view and the historian's; perhaps both are not looking for the same thing. In this study it is intended to define the aspect of quality in design with a view offering conclusions may be useful to today's practising architect. Joedicke[1] explains the difficulties facing the architectural historian in avoiding speculation and possibly false interpretation in their explanationn of modern architecture; to quote:-

> "The validity of one's observations depends upon the moment in time when they are made. For observers after the event, the developments of a recent period are more easily appraised than they are for the man describing them at first hand. But he can claim to be a contemporary and therefore to detect details hidden from those who come later"[2]

Collins[3] acknowledges the importance of the work of those architectural historians which remain always as classic expositions of their subject. He argues that, their type of work has been concerned essentially with the evaluation of forms, rather than with changes in those ideals which produced them, and this according to Collins tends to minimize one of the most important factors in architectural design, namely the motives which dictate the character of an architect's work:

> "Architectural historians are quite right in emphasizing the importance of architecture as an end product, in concerning themselves mainly with what a building looks like, how it is constructed and how efficiently it

> fulfils its purpose. But the architects who created such buildings were obliged to be equally concerned with more philosophical problems; such as why anyone should choose one form, material or system rather than another."[4]

Collins concludes that the architect does not arrive at his finished product solely by a sequence of rationalisation, nor does he reach them by unihibited intuition. He thinks of forms intuitively, and then tries to justify them rationally; dialectical process governed by what we may call his theory of architecture, which can only be studied in philosophical and ethical terms. However, it is evident that most historians who write about modern architecture find it difficult to classify its real values. For them any classification of modern architecture is simply the means of identification. Their quality judgments always start from the external appearance of the buildings, and are mostly concerned with the relationship between appearance and spatial content. The easily recogisable qualities that are found in the work of architects are often described as 'style', when making qualitative judgments about buildings.

The word 'style' in itself has always helped to show the common factors between various building, designers and groups. It has also been used by the architectural historian to assess a building for its merit, considering it in relation, <u>in time</u>, to earlier and later building,

and in place, to the cultural context of the place which it was built, Sharp (1972)[5]. However historians of the modern movement with their emphasis upon the exploration of new forms have placed modern movement of architecture in many categories such as the 'international style', 'Expressionism', 'Elementarism', 'constructivism', 'Futurism' and 'functionalism'. For Sharp[5] these are a convenient classification for discussing characteristics and families of forms.
'style' has been defined in recent years by J.M. Richards[6] as "the fashion which each generation can promptly recognise as it is own", and by Nikilaus Pevsner[7], as "what ties together the aesthetic achievements of the creative individuals of an age".

However, the word 'style' can be related to both form and expression of ideas. Theorists in the philosophy of art have used terms such as 'the constant form', 'the constant elements' to describe those motifs and mode of expression on the part of an individual or group; "above all, a system of form with a quality and meaningful expression through which the personality of the artist and the broad out-look of a group, are visible"[8].

Allsopp[9], saw that the beginning of what might be called the "modern style" has emerged out of the concept put forward by the architectural movement pionneers, who rejected the idea of style and based their architecture upon universally applicable principles, advocated as being justification for their work. Up to the begining of the Second World War in 1939 the effect of the modern movement upon the actual practice of architecture had been slight and most buildings were traditional using watered-down versions of classical or other historically based design motifs. Nevertheless modern architecture is recognisable since the begining of the twentieth century, when the modern movement was emerging and the nineteenth century eclectic work became unfashionable.

The change took place partly because of the technological developments which offered new building materials especially steel and reinforced concrete. Some architects felt that the solution to modern architectural problems would be found in the exploitation of these new techniques. These changes together with the systematic examination of human needs in buildings brought the wider environmental issue into focus. This modern architecture, vastly different from the architecture of the past, gradually moved towards improving not only the form of buildings, but also the total environment. The later aim eventually became a prime characteristic of the modern movement.

Signs of modern architectural development appeared in many different forms and have been given many names, reflecting certain tendencies and philosophies. With the help of social science techniques, some of the basic human needs had been quantified and architects soon reacted to the changes taking place. It become apparent that a new architecture based on scientific progress, could help to solve some modern needs in a practical way acceptable to the people involved, the client and the critics. One important task faces the architects; the question of awarness of architecture practice in social progress. This, has been the subject of much debate; arguing the need for a new way of thinking about present architecture and for a new way of analysing past acheivement. Thus the roles of historian and architect again co-incide.

Allsop (1977)[10], extended the argument pointing-out the need not only for a new look at architecture in a way which reflect the conditions and the needs of our time, but also to enable ordinary people to explore them creatively not only in the enjoyment of architecture but also as participants in the design:

> "Modern people are becoming more aware of the architecture of the past as an irreplaceable part of the present environment and as something we have in truth. It is natural for people to make comparisons and to expect that the architect will know at least as much as the lay man about historic architecture and indeed help the lay man to widen and deepen his understanding and appreciation of all kinds of architecture."[10]

However, current architecture has been analysed in greater depth in the last few years and from the point of view of a study of quality two areas seem particularly appropriate to this study. Firstly, the ideal postulated by some founding members and pioneers of the modern architectural movement that buildings should reflect social ideals and represent in "built terms" a changing social scene. Secondly, and this is more usually associated with modern architectural form, the influence of new materials and techniques which have enabled revolutionary structural innovations to be made.

The former can be extended to include questions on the use of buildings and operational nature of buildings which led to the development of new building types. The second area covers a very important sphere of activity which is the transition from what was essentially a craft based industry to an industry which has gone a long way along the road to reorganisation and industrialisation.

The next part of this thesis will trace the recent history of the salient points in the modern movement to the present day where our study of quality in building commences. It will deal with various aspects of the two principles enumerated above and will try to show that realisation of quality in architecture has always been one of the aims of the modern movement and has, in fact, been achieved in some buildings. Some major criticisms will also be noted as , these can be taken to imply that the aims have not been realised.

Some very generalised critical views have been applied to the whole of new architecture. One purpose of this thesis is to refute this general criticism by identifying modern work which is of quality. A further objective being to analyse how these examples have been designed and the designs implemented.

Jencks[11] has put the position on some modern buildings well:-

> "Certain buildings have a richness of density of meaning which make them more enjoyable to inhabit, view and visit, than others. These are the buildings which are re-interpreted as new by every generation. We return to them again and again not necessarily because of any particular meaning which they may convey but more because of the exciting and deep way in which the meanings are interrelated or fused together into a powerful pattern."[11]

The foundations of the Modern Movement in which we will be looking for the sort of building with the qualities described by Jencks can be said to lie in the first two decades of the twentieth century. It was in this period that the technical, economic and social conditions of Western Europe changed dramatically and led to solutions being sought for architecture which lay outside the reproduction of past styles. Benevole[12] explained that avant garde culture from 1890 onwards has responded to these changes in many cases moving ahead of the usual culture control models. There is a paradox in that very often the influence of avant garde groups were greatly inferior to the requirements for buildings and the demand for change, particularly after the First World War. Nevertheless it is during this period that creative imagination in design control began to displace scholarship in knowledge of past styles. At the same time the effect of new materials and techniques used in industrialised society in the latter part of the nineteenth century also began to make changes in constructional techniques available to the architect, and very often the economy of building which was possible, especially when related to urban sites, led to a rapid change in constructional methods available to the building industry.

It is interesting to note that architectural historians point to the work of Berlage[13] and Berhens[14], both of whom tended to use industrial techniques for factory buildings, as a significant point and it is noticeable that both Mies van der rohe and Le Corbusier two masters of modern architecture were either working with Berhens or knew intimately of his work in the period before the First World War.
It is also important to recognise that the careers of these two architects spanned the period from the First World War until the 1970s and thus covered the period under review. Collins[15] wrote "there is no doubt that Le Corbusier's slogans exercised powerful influence on the twentieth

century's desire to adopt mechanical analogies". Corbusier's book "Towards a New Architecture" first published in 1927 includes three important points which can be used to sum up the period after the First World War until the mid 1930s. Firstly, that a well stated problem naturally finds its own solution; secondly, that since all men have the same biological organisation they all have the same basic needs and, thirdly, that architecture like machinery should be a product of competitive selection applied to standards which, in turn, should be determined by logical analysis and experimentation. We will see later how Corbusier's own ideas changed with experience and how he emerges once again as the leader of spiritual and poetic quality in architecture many years later. Although Corbusier is a necessary yardstick against which development must be measured Banham[16] has pointed out that the work of the major figures of the 20s cannot be understood without reference to their aesthetic intentions and that there is a strong element of what came to be called functionalism in the work of the two major figures of that period, Mies van der Rohe and Walter Gropius.

One of the famous slogans of this period "form follows function" is, of course, attributed to Louis Sullivan and was first coined in the U.S.A. in the latter part of the nineteenth century. Banham[17] stated:

> "It is doubtful if the ideas implicit in functionalism were significantly present in the minds of architects of the period." [17]

And Richards[18] goes further in stating that:-

> "It is doubtful as a matter of fact whether this theory, which is absolutely formed, has ever been held by practising architects. They would soon have found out that it would have prevented them from exercising their function at all." [18]

We do find, however, if we can take to the question of idealism in architecture that although the primary driving force of the period was aesthetically based the element of function in buildings, particularly with reference to the satisfaction of human needs, was part of the idealism which was an inherent, and in the author's view tangible, component in the aesthetics of the time.

One major criticism of the period as Banham[19] has pointed out was the failure of technology to come to terms with man's humanity. It is this which has called into question the intellectual framwork of rationalism of which functionalism is a part.

One important way in which architecture has developed has been though a greater awarness of the way in which buildings must be made to serve humanity, this has led in turn to a better analysis of human needs. The present position in design methodology rests heavily upon this development and all the buildings included in the case studies can be said to have the satisfaction of their function as a major contributor to the aesthetics of the final form. There is no doubt, however, that Banham has put his finger on one of the major criticisms of the Modern Movement in that technology in some ways outstripped the ability of designers to manipulate it and this led to many unfortunate and uncomfortable buildings which have helped to denigrate the Modern Movement as a whole. An example might be appropriate; Corbusier in his work 'Projects for Algiers in 1926' became aware of the problems of sun shading to protect the interiors of buildings against the climatic extremes found at certain times of the year. At the same time, experiments were being conducted with the use of one of the new materials - reinforced concrete - and the combination of these two circumstances led to his development of Brise -soleil using concrete as the primary material. Reinforced concrete has a high thermal capacity and what, in fact, Corbusier was doing was to erect large radiators on the exterior of buildings,which help to make them virtually uninhabitable and unusable for period late in the day. His influence was so profound that thousands of similar buildings have been erected, mainly by ex-patriate architects working in tropical areas. Indigenous architects must also take some blame and this again has brought discredit upon the aesthetics of the Modern Movement. Many other examples can be cited but perhaps it is sufficient to say that the contribution of modern architecture in making aesthetic considerations override those of locale and climate has been an unhappy chapter in its development.

The situation during the Second World War throws an interesting sidelight on the development of cultural values. Firstly, building work in western Europe, the main area of development of the Modern Movement, virtually stopped although work did continue in Sweden, which was neutral. At the same time there was a rapid demand for development in South America and many South American architects developed the theme set by Le Corbusier in his Ministry of Education building in Rio De Janerio in 1936. When the war ended Western European and American architects could begin to design again and there is evidence of strong influence from the development which had taken place in both of these areas. That of South America was predominantly that of Le Corbusier while that of Sweden and Denmark in the immediate post war years was of a more romantic modernism depending heavily upon careful usage of material. The way in which architectural style developed from the 1950s can be seen as an extention of these two streams, influenced during the early period by post war austerity.

Joedicke[20] confines that the 50s were still influenced by by and lay under the shadow of the pioneers of modern architecture, but that the situation altered around 1960 with the arrival of brutalism and formalism. Many critics feel that this is simply an extension of the work of Corbusier and Gropius. It is important to remember that there was a vast upsurge in building activity to repair the ravages of the war on the continent of Europe. In particular, housing and schools had to be built quickly to deal with the boom in the rising population which had occurred immediately after the war. There were shortfalls in design, construction and building which led to criticism of the programs which was further translated into general criticism of the terms used. This is where function, from the point of view of tailoring buildings to human needs, became important and although there have been failures; some aspects of mass housing and the British Schools programme stand out as being exceptionally good examples of modern architecture in its broadest sense. Building over this period, particularly in the poorer countries and this must now include Britain, suffered from many defects and a lack of durability. Failure of key elements - such as flat roofs - combined with greater expectation in housing needs has led, as has been seen, to generalised criticism of modern building. When this is seen in the context of the social/economic conditions of the time it is not a tenable criticism.

In a sense the use of the word "brutalism" was an extremely bad choice as it gave the critics of modern architecture a ready made epithet to use against it. Alison and Peter Smithson, prime movers in the movement, attempted to explain this:

> "any discussion of Brutalism will miss the point if it does not take into account Brutalism's attempt to be objective about reality - the cultural objectives of society, its urges and techniques and so on".[21]

There was no doubt that brutalism was related to Le Corbusier's late work especially his two buildings which used "beton brut" these being the Unite at Marseilles and Maison Jaoul. Jencks[22] acknowledged that his touch can be seen in widely different works by many architects in this country. At the same time, in addition to the restraint in a Corbusierian form which underlay many designs (Basil Spence's design for Sussex University, the Wolfson Institute and the National Theatre by Denys Lasdun), there is also an attention to social and symbolic meaning which shows how individual architects have taken his ideas beyond simple aesthetic expression.

There is no doubt that Le Corbusier was involved in a fundamental cultural transformation which challenged a division of labour and topography of urban functions upon which an immense number of established institutions, habits and interests depends.[23] This attack opitomizes the way in which many critics assess the work of famous modern architects; even Le Corbusier is accused of being anti human (at Marseilles) and in any case is regarded as being culturally obsolete. The progress of modern architecture seemed to suffer a set back after the expansion of influence in the early 60s. It was realised that architecture based primarily upon aesthetic values was not enough.

New thinking about architecture, which was not so much original but which pursued ideas to a greater depth than formally, stressed the qualities which the earlier period had neglected - convenience, construction, appropriate use of modern materials - often in new and exciting ways. Some writers have seen this as functionalism because of its emphasis on these qualities, but this form can be confused with the functional aesthetics of the 1920s; fortunately the problem of putting a name to this period does not concern us. It is important to know that architecture as an art includes new criteria which were formerly given little importance. It was strongly conditioned by tangible factors such as utility, material and construction and brought the demise of a craft based building industry. To some extent it can be seen that the values of this period which, in general, hold good at the present time, in many respects echo the earlier words of the pioneers and it is possible that the word "functionalism" can be used as an all embracing term. This period includes most of the buildings which will figure in the case studies later in the thesis. In many ways the last few years have been a period of re-evaluation and have been distorted by the success of the vernacular architecture which has produced many bizarre buildings.

York and Penn[24] point out that a look at architectural history shows that style has always been conditioned by the materials available for use in construction. Furthermore, Richards[25] explained that throughout history the general appearance of buildings have been determined by the knowledge of building technology available as well as the materials employed. Richards stated:

> ".. Modern architecture is conditioned by the same sort of factors that our knowledge is greater and the range of discovery and the availability of scientific increasingly leads to a search for new methods and techniques demanded by society.

If we stick to the fundamentals of architecture the various groups, schools, with their assorted manifestos, can be handled within this framework. The Archigram Group, team 10, the Metabolistsof Japan, as well as the rationalists, all have contributed to the vocabulary of modern design in various ways, although few of the more extreme examples have survived the test of being built for a real client. It is rather the architects such as Norman Foster, James Stirling, Bonnington, who have modified the concepts and produced buildings of merit which enable the architectural historian to test the ideas and place them in the context of the age.

It is not too early to examine some of the buildings which have sprung from the adoption of social techniques. It can be said that architecture is certainly more than a simple social tool, although some writers[26] would argue that is where architecture begins. It is possible to argue that in a sense quality should have more to do with the ideas and intentions of what gets built while agreeing that there seems to be a link between the intentions of the design and the ultimate value of the building in society. It seems that if a building is to be successful and of high quality the idea must be translated into reality and satisfy many aspects relating to architectural quality.

The truth is that this age is still a transitional one and modern architecture must still be regarded as experimental. James Richards again puts this rather well:

> "..architects are experimenting in the needs building, in what architects can do for society - as well as in technique -. In a more settled period, such as the eighteenth century, the types of building were fixed because building needs were fixed. The architects programme was a

> definite and familiar one, and he was able to concentrate his energies on the task of perfecting his few types of building and inventing new variations of them. But today, when conditions are so rapidly changing and problems are mostly without preceddent his task is far more complicated. He has to analyse needs with collaborators before he starts his design.."[27]

The idea of the programme in modern architecture is again becoming important according to the analysis and it will be interesting to see if the case studies bear this out. All writers agree that architecture at whatever period evolves gradually and it would be remarkable if modern architecture were not in the process of evolution.

Architecture in all periods has rested heavily upon tradition and it would be strange if at this time a similar tendency were not in evidence. In the last resort architecture is dealing with space and form but as we have seen any investigation of quality must now involve many other aspects of building in relation to society. In the section dealing with the selection of buildings which have achieved quality these general considerations will be taken into account and it has been a conscious decision to avoid extreme examples of the work of any particular group or individual. Inevitably there can be arguments as to why any particular architect or building has been selected or has not been included and as will be seen the author has been at some pains to reduce personal selection to a minimum.

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11. Jencks Charles, 1977, "Modern Movements in Architecture", Penguin Books, p. 14.

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13. Berlage Hendrik Petrus, regarded as one of the great innovators of architecture around the year 1900, he aimed at an honest awareness of the problems of architecture, and a craftsman like approach to material and construction, one of his famous works as Stock Exchange, Amesterdam 1897-1903.

14. Behrens, Peter, was one of the first architects of the 20th century to develops a form of architectural thought that would answer to the demands of an industrialised civilization, he exerted a leading influence in Germany between 1900 to 1914, this most famous pupils are Le Corbusier who worked in his Berlin office from 1910 to 1911, Gropius, from 1907 to 1910, and Mies Van Der Rohe, from 1908 to 1911.

15. Collins peter, 1971, "Changing Ideals in Modern Architecture", Faber and Faber, p. 166.

16. Banhams Reyner, 1977, second ed. "Theory and Design of the First Machine Age", The Architectural Press, London, p. 325.

17. Ibid., p. 320.

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Part Two

SOME ASPECTS REGARDING QUALITY IN BUILDING

2.1 INTRODUCTION - A BRIEF HISTORICAL SURVEY

I

OF

THE ELEMENTS

OF

ARCHITECTVRE.

The I. part.

IN *Architecture* as in all o-ther *Operatiue* Arts, the *end* muſt direct the *Ope-ration.*

The *end* is to build well.

Well building hath three Conditions. *Commoditie*, *Firmenes*, and *Delight*. A common diuiſion among the De-liuerers of this *Art*, though I know not

A how,

2.1 Introduction - A Brief Historical Survey.

Elements of Architecture - Contemporary views

Several ancient writers on architectural theory, suggest that the criteria of architectural excellence can be summarised briefly as commodity, firmness, and delight. However this notion goes back at least to Vitruvius's[1] categorisation of qualities which architecture should possess. Vitruvius stated that architecture had a triple basis in its objectives: convenience, solidity, lasting strength and beauty.

> "Public buildings should possess strength, utility, and beauty."[1]

This, as has been stated, was regarded later by Sir Henry Wotton as the basis of architecture and he wrote in his famous dictum:-

> "Well building hath three conditions, commodity, firmness, and delight."[2]

However, although these qualities seemed comprehensive enough at the time, other architects following Wotton have added other elements to the basic principles set by him. Wrens (1759), says "Beauty, firmness and convenience are the principles. Sir William Chambers added the principle of health: "Its purpose is to erect edifices in which strength and duration shall unite with beauty, convenience and salubrity."[3]

The tripartite phrase of Sir Henry Wotten has lasted well, conveying the essential sense of the important elements of good architecture. Throughout different periods from Vitruvis down to recent times architects designers and theorists have used the three factors, but given different interpretations and weight to them.

Hamline (1947)[4], refered to Wotton's phrase, as an acceptable statement providing that the three aspects of quality bound together in an actual building where each building has its own structural system, its own special material, and treatment. He raised fundamental issues about the relationship of the three elements to the architects' creativity, as one aspect of the processes present in the architect's mind, and which should be combined and integrated in the final building.

> "All work together create the final effect of the completed buildings; its beauty is therefore a matter depends on convenience, and structure strength as well as on design. <u>In great work of architecture these three factors are absolutely made one</u>. This one of the most powerful reasons for the richest of aethetic experience that flows from architecture, this integration gives reality, seriousness, and power to the whole and makes architecture eternally different."[4]

Allsop (1952), had touched on this matter, and described it as commonsense:

> "...as near as any epigrammatic statement is ever likely to be a right answer, but complex problems are seldom solved by

> neat epigrams, which are misleading because they are so trite, and easy to remember, they are good propaganda but bad for serious thinking."[5]

Allsop, however rejected the idea that architecture could be achieved by learning a set of rules. He stated that in good architecture there is much more than Sir Henry's three elements, and that this statement is rather too general and indefinite to have any real meaning. His opinion has met with approval from almost every kind of architect ever since it was published. Allsop came to the conclusion that in order to solve the architectural problem, which as he said "its existence depends upon the solution of an intellectual problem", the architect has to solve the planning, designing and structural problems. The design problem can be seen as part of the programme requirements which may include much more than simple space to live in. The structural problems are an inseparable part of the design problem. The architect must understand the two problems,which should go together in order to achieve good architecture.

The idea that architecture is basically generated as a response to practical demands was common to ancient and to medival philosophers. David Watkin in "Morality and Architecture"[6] claimed that the beginning of what might be called the "programme worship" of modern architectural theorists who believe that the elaborate specification which a modern client,often a public body,hands to architects and engineers in the form of a programme will and should, dictate its own architectural solution was started with Viollet-le-duc who summarized the mechanistic interpretation of Gothic:

> "There are in architecture two indispensable methods in which truth must be adhered too, we must be true in respect of the programme, and true in respect of the constructive process."[7]

More recently litrature dealing with modern architectural theory shows the difficulties of finding categories acceptable especially in building of high quality. Today's critic has generally pointed to the same criteria that Vitruvius implied, and accepted its element in general terms, although showing a distinct tendency for change to reflect contemporary conditions. For example, Gordon[8] (1968), discribed the triangular element of <u>commodity</u>, <u>firmness</u>, and <u>delight</u> as being in reality a five pointed figure with <u>time</u> and <u>cost</u> representing the two additional points. The principal objective is to achieve balance between the many factors which contribute to the total operation of architectural practice, not merely to deal satisfactory with one or two of the growing factors.

> "Well building hath five conditions; commodity, firmness, and delight; on time and at the right price."[8]

These views opposed later, by Broadbent[9] (1973) and other architects who raised a number of fundamental issues about man's relationship to architecture, are demonstrated by the extensive care that many architects now give to determine the requirements of people as they effect design. Broadbent's argument is particularly directed against the "managers and systems builders", who used the terms of commodity, firmness, time and cost in order to achieve the remaining condition, the much abused, "delight". For Broadbent, delight as the fundamental condition for architecture had been abused in two ways:

a) The manager-system practice views who saw delight as a visual matter only.

b) The system-manager who put the alternative views that appearance was not important in priority against apparently objective factors of usable space and cost.

These two items ignore the fundamental fact in the relationship of man to buildings that people experience, and which stimulates the senses in general.

> "Most of so-called systems building starts with the building technology: that is 'given' before the user's needs or even the site are known. The result of this approach so far have been disappointing in terms of environmental conditions, sound insulation, heat control and so on. But if the systemic interactions of building fabric with physical context and user requirements were also taken into account, then this approach would be just as valid as any other"[9]

Broadbent's statement underlines the connection between the meaning in which the architect relates to his work and the practice of architecture, including the patterns of knowledge, cognitive ideas, as well as subjective evaluations, and which lead to the complex structure of their organisation and professional roles. This issue was the subject of an empirical research study by Judith Blau (1977)[10] in which she investigated the significance of the relationship between architects' ideas and the structure of their organisation, Blau came to the conclusion that from ancient Greece to modern times, <u>architecture is meaning made manifest</u> which links the changes in modern architectural design with changes in society. It also appears that the <u>substance of design and of the meaning that underlines design are deeply implicated in the social structure of work and profession</u>.

By combining dimensions of meaning relating to the kind of work that architects do, Blau identified basic roles according to four distinctive groups classified by four critics Jenkes, Joedicke, Banham and Huxtable. The four groups are architects of professional designers, individual artist, co-ordinating manager, and progressive social reformer. The characteristic of the four groups are examined first in a "professional role" and secondly in a "Work role". The result of the analysis shows that there are two contrasting versions of the professional role, "subjectivists" and "camp" architects who stress a particular version, that architecture is an end in and of itself whether it be defined as design or as art. This closely followes Broadbent's evaluation of this situation. In contrast, the "meta-art" and "purist" architect's emphasis the views that architecture should serve other ends, possibly beyond architecture, especially in a social-political context. So, therefore according to Blau's analysis, on the one hand, the profession is an abstract enterprise divorced from social organisation and most practical concerns, and on the other, it extends beyond its traditional boundaries and encompasses diverse concerns.

The analysis of <u>work role</u>, results in other groupings. Constracting generalist and specialist: 'subjectivists' and 'purist' are opposed to 'camp' and 'meta-art'. A combination of professional and work attributes results in four roles summarized from Blau's analysis as follow:-

1. <u>Professional Designer</u>: According to Blau's analysis this group represents most current thought in contemporary architecture. As they contrast with architects who like "subjective" qualities in architecture evident in the work of Aalto and Stirling, and the "bureaucratic" tendencies revealed in the work of Stone, Yamasaki, Harrison, Lapidus. The second set of architects are less popular than the first, they are described as formalistic, stressing form over content, being monumental and artifical.

Using statements from Jencks's books[11], Blau described Stirling's work as powerful, expressive, functionalistic and alternative to the existing social system. For Jencks the contrast between Stirling's and Aalto's work is formal, as they share the belief that architects must help to realize a set of social ideals that are defined. Stirling's style is complex but solid-related, Aalto's is organic because of his plastic use of form and materials and naturaly expressive form.

However, the subjectivist architects are difficult to characterise to some extent because they resemble so much the popular stereotype of the professional architect, and are more likely than others to have won an award. They have strong opinions about aesthetic philosophies rejecting engineering or technical approaches. One charactistic provides the key for understanding the distinctiveness of this professional role. They reject the roles that is concerned with efficiency, profits, and public relations, and even reject the practical aspects of design. Their aesthetics may be multivalent but in their professional lives they reveal univalent tendencies. Their project has a somewhat humanistic character, they work on many different types of projects than do other architects, and the specific ones they work on most are public, residential and planning projects. They work on large scale projects for private and corporate business, whether industrial or commercial.

2. <u>Individual artist</u>: This group represents "camp" architects they include two fairly well-known New York architects Paul Rudolph, and Richard Meier. One of the defining characteristics of "camp" described in Jencks book (1973) "Modern Movement In Architecture", is that their style is given priority over content, and their aesthetic over morality, their work is playful and anti-serious. They do not usually share any intense commitment to well formulated aesthetic philosophies. They reject, as the "Subjectives", pragmatic business orientation. Their professional committment takes a somewhat lonely form, and they tend to adopt an individual artistic state, and are opposed to team practice, preferring instead practice firms in which design responsibilities rest in the hands of a single creative architect.

3. <u>Co-ordinating Manager</u>: Which represents the "purist" dimension. It includes architects like, Neutra and Niemeyer. Both are placed by Jencks in the "Idealist International Style" tradition. Nervi is also included in this group, described by Jencks as an example of "logical functionalism" quite distinct from the ideal international style attributed to the work of Neutra and Niemeyer. According to Blau, the work role Nervi's buildings share with the architecture of Neutra and Niemeyer despite obvious differences in style, include their marked disregard for inhabitant and their needs.

Niemeyer's Brazilia is practically uninhabitable by poor and rich alike. Neutra's work has always had an unreal, absolute look to it, and Nervi's engineering masterpieces are beautiful sculptures forbidding and uninhabitable. "Purist" are generalists like the subjectivists in group one but of a different kind. The base of their wide scope is different from that of subjectivists. They tend to work in many more distinct functional tasks compared with other architects. They also work on a great variety of specialized problems primarily involving engineering areas. In other words, whereas "subjectives" are project generalists the scope of their expertise is confined to architecture, whereas "purist" tend to have monopolistic work roles, encompassing more than architecture alone.

4. <u>Progressive Social Reformer</u>:

They represent the "meta-art" group, which includes architects like Wachsmann, Archigram, and Superstudio from the avant-guard. Despite their obvious differences they are associated with one another in Blau's findings. The political, technological and societal objectives, all are explicit intentions of their professional role. they share the belief that architecture must be redefined in non-artistic terms, that is, as an activity that transcends art. The notions are evident in Wachsmann's writings and projects,for example, in his space frames and modular systems. Archigram as part of the pop art movement and is an architectural style. Their idea is expressed in the form of a technological environment that is totally responsive to the individual.Their most famous work "The Centre De George Pompidou,Paris. The Superstudio described themselves as revolutionaries, their most famous scheme is "The Continuous Monument" a single piece of architecture that extends around the world. They are criticised by Jencks as they are outside aesthetic realms. The "Meta-art" is grouped like "camp" with specialized work roles. The former tend to specialize in a very rare project types. This is completely consistent with their beliefs, they tend to express their idealistic aims in a more ambitious way.

The four factors described in table -2.1- were used to analyse the way in which famous architects relate to their work and style, and to determine the underlying meaning of their professional role. Fourteen factors were generated in Blau's investigation, but the four described cover most of the variations in the data. In her analysis she noted that the most well known architects Le Corbusier, Kahn, Wright and Saarinen do not appear in the four groups. It seemed that they do not fall into any one distinctive category. They are so generally publicised opinions about them tend not to vary greatly and there are great differences in opinions about their architecture and their style.

The four dimensions of this analysis were reconsidered in terms of "commodity", "firmness", and "delight" by the analysis of Blau's table - 2.2 - this was based on the results of questionnaires which asked architects to give their opinions about the work of famous architects and controversial statements made by other architects and critics. According to Blau the classification of architects according to Sir Henry Wotton's Dictum recognises that:

> "An emphasis on "firmness", or in contemporary terms, structure is evident in the work of four architects described as Bureaucratic, Yamasaki, Stone, Harrison and Speer. Lapidus also belongs to this group but only because his buildings refer to the identical set of societal values and not because of similarities in design style. For as Wotton would say, Lapidus' hotels give "delight"; they are just for fun that is, for those who can afford it. While the purists - Neutra, Niemyer, and Nervi - have shown a high regard for structure "firmness" and for "delight", they have consistently ignored the criterion of liveability, or "commodity". We can contrast the view that architecture should only be what people want, or at least ought to want - for their own good or for the good of society - which is expressed by Archigram, Superstudio, and Wachsmann, with the counter-view, represented by Rudolph, that architecture must above all provide visual along with sensual pleasure, or in other words, satisfy the dictates of art as well as of good living. But Rudolph's engineers have given him bad advice, or else he has not heeded their good advice. His buildings have suffered from mechanical and structural difficulties, those of "firmness", Sir Henry Wotton would say, while Meier's homes are not such hyperbolic performances. They are deemed liveable and structurally sound."[10]

Table 2.1 Examples of architects on four factors of Blau analysis

1. Proffesional designer

   Subjectives qualities

   Stirling
   Aalto

   Bureaucratic tendencies

   Yamasaki
   Stone
   Harrison
   Speer
   Lapidus

2. Co-ordinating manager

   Neutra
   Niemeyer
   Nervi

3. Progressive social reformer

   Wachsmann
   Archigram
   Superstudio

4. Individual artist

   Meier
   Rudolph

Table 2.2 Classification of Architects According to Sir Henry Wotton's Dictum

"Commoditie" Wachsmann Archigram Superstudio	"Firmness" Yamasaki Stone Harrison Speer	"Delight" Lapidus
"Commoditie and Firmness" Meier	"Commoditie and Delight" Rudolph	"Firmness and Delight Neutra Niemeyer Nervi
	"Commoditie, Firmness and Delight" Stirling Aalto	

Blau recognised that these traditions in architecture that only fulfill part of Wotton's criteria can be contrasted with the synthesis of the three criteria that distinguishes the architecture of Aalto and Stirling, two elements said to characterise the work of these two architects are:

a) The fusion of elements at the levels of form and content which was described by Jencks (1971)[11] as the "multivalued levels of meaning".

b) The fusion that is rooted in, and inseparable from a social context which described by Blau:

> "It is assumed that the community of architects itself, has defined its univalent and (much rarer) multivalent structure of meaning in terms of its own social structure, and this reveals something about the nature of that community as well as about future development in form and content".[10]

However, one of the results of the R.I.B.A. awards wining programme survey in section three from our case study, indicates that it is possible to obtain some quite objective information from the study of the organisational structure, which the architects are part of, and what influence this has had on the quality of architect's work. It is apparent, however from the value analysis of such awards that most architects and others concerned with architecture agree that the nature of architectural quality is subject to such a wide variety of constraints that it is often difficult to assess or resolve by written work. William Curtis[12] in assessing the national theatre, came to the conclusion that there is little agreement on what architecture should be doing at present "beyond weakly disguised revisions of "firmness, commodity, and delight". He argued the point that in the profession of architecture today aesthetics goes to the bottom of the list of discussion while morality, sociology and politics go to the top:

> "The prevalent emphasis in England seem to be on "commodity" there is certainly little emphasis on or agreement about "delight" or what is beautiful. There is not even shared opinion about what a building should look like for there is no common architectural language."[12]

Allsop's (1977)[13] answer is that much of the confusion in modern architectural thinking has arisen from the failure to recognise that there are different kinds of architecture. He gives five of them as <u>folk</u>, <u>venacular</u>, <u>spiritual</u>, <u>mounumental</u> and <u>utilitarian</u>. The five kinds of architecture can do-exist and may merge in the building programme and in the solution but, fundamentally they are different, they require different skills and different criteria of criticism. According to Allsop there are indications that none of them completely nor all of them together can entirely satisfy our modern needs though all of them have specific relevance to specfic human problems and physical situations. He also suggests ten conditions which must be fulfilled to produce good architecture.

Some are practical matters of common sense in building design, but should be considered as part of the creative process of desiging. Allsop has placed the ten criteria against a matrix which incorporates three different levels of creativity and responsibility.

a) The human requirements for basic needs.

b) Physological and cultural factors.

c) Implementation and realisation.

The criteria described as follows:

a) The human approach to architecture requires design for people in the context of climate.

   1) Structural stability.

   2) Weather proof.

   3) Moderation of climate for the comfort of people.

   4) Moderation of climate can be achieved with low expenditure of energy.

   5) Economy in the use of scare materials.

   6) Durability and low maintenance costs.

b) Responsibility in design.

   7) Responsible attitude towards fears and dangers. Responsibility has an ethical and not merely a legal meaning.

   8) The necessary understanding among architects, clients, and the public demands upon a basis of common feeling which is deeply rooted in mankind.

c) Essential for the production of good architecture.

9) that the designer carry his part of the work only so far as is compatible with his remaining effective as an artist.

10) That the builder and others involved in the carrying out of the design admire and commit themselves to its realisation.[14]

In the context of the issues discussed by Allsopp, Fitch (1965) identifies architecture as a "third environment" that mediates between the hazards of the natural world and of civilized society, and thus:

> "Good architecture must thus meet criteria much more complex than those applied to other forms of art, and this confronts the architect, especially the contemporary architect, with a formidable range of subtle problems"[15]

However, it is may be difficult to assess the validity of any point of view discussed so far, largely because they deal with phenomena started in recent decades, as a response to the later stages of the industrial society, Nevertheless, discussion of this issue is at least potential because it is obviously related to a serious issue now taking place in architecture today. It shows that although designing in term's of commodity, firmness, and delight has to be included in the activities of the design process, as part of the creative process of designing to satisfy the totality of human needs, there are other aspects to consider.

There is more emphasis on physological and cultural factors to define the basic needs. There have been several attempts to adopt techniques used from operational research, systems analysis and the design process used in other fields in order to influence building design decisions, for the design of future buildings.[16] This emphasised the importance of different studies such as the human science techniques, with the growing preoccupation with measurement and appraisal of buildings in use[17], and to refer to the many aspects of the creation of architectural environment and modify conditions of the physical climate so that human activities can be carried out conveniently and in comfort.

However, one must devote attention to the lines of thought which influence the aspect of architectural quality described earlier. For this reason, the theory of quality will be stated first in general outlines. It will then become an easier matter to give details of the work as it is required, and to try to complete it with discussion of the developments of architectural theory up to the present day, which influence our subject and the future of architectural development. First we should turn to the more immediate and controversial subject of architectural aesthetics in general, and the visual qualities of buildings, and the link between the human being's response to the creative work of architecture.

CONSIDERATION OF THE PROBLEM OF AESTHETIC QUALITY:

The application of visual qualities in architecture involves many factors, begining with the study of aesthetics in general and the concept of beauty in the philosophy of "fine arts" and their validity in architecture. Visual qualities are the means of achieving delight from experiencing architectural form. It is very difficult to classify but it may be seen in lines, shapes, masses,forms... and their relationship to each other and their surroundings. It can be shown that starting from a functional base the range of experience has been built up over the centuries until a consciousness of aethetic quality is accumulated and forms a paradigm with the creation and original nature of programme design.

Philosophers and psychologists have given attention to the nonmeasurable properties of the environment which go by the name of aesthetic qualities, and their logic which has been investigated by many authors.
The most important aesthetic theories may be divided into three major classes, formal, expressionist, and psychological theory.[18]

The formal aesthetic theory associated with classical art and classical thought, where visual beauty is a matter of form, or form and colour. Among the formal aesthetic qualities are some works of art and architecture which are identified by such terms as "unity", "balance", "integration", "harmony", "proportion" etc. Sibley[19] (1965), among the examples he gives of aesthetic terms are; lovely, pretty, beautiful, dainty, graceful, delicate, unified, balanced, integrated, lifeless, serene, sombre, dynamic, powerful, vivid, moving, trite, sentimental, tragic. Others are qualities of texture, line and a non-representational element of art. This class of aesthetic qualities may be called "formal qualities".

Expressionist: Is associated with Romanticism and Medievalism, expressed the oldest thoughts in the perfect manner (Hegel). Aspiration either best represents or express nature (Ruskin), where the shape or forms are beautiful not in themselves but because of what it means or expresses. The theory became subject to religious and sometimes sociological and ethical interpretation. Veron (1878)[20], describes a work of art as an (emotive symbol), something by means of which an artist expresses his feelings and emotion. He contrasts this with the - cognitive symbol - by which one expresses what one knows or believes in contrast to what one feels.

The psychological theory Arose out of the application of modern science ideas. It is the type of idea by thinking, simple, emotional, elegant or scientific beauty which is the desirable result of the observer's identification of himself with the observed object.

Aesthetic psychology suggests that the study of form is mainly concerned with describing works of arts as directly perceived and felt, locating them in a larger setting of human behavior. It is concerned with discovering the creative processes and the appreciation processes in its critical terms and the relation to other phases of human needs to link them,with other branches of psychology such as perception, habit, learning process and emotion, toward the understanding of human mind. According to Munro[21] the important contribution of modern psychology to aesthetics has been an indirect and general one, such as changing attitudes towards art and aesthetic experience in general by adopting scientific method to a study of complete phenomena of art and emotional life. The aim is to encounter every problem in a naturalistic way, and offers new conceptions of particular mental mechanisms which involve aesthetic experience and other kinds of behavior.

An attempt has been made to relate the aesthetic principles to architectural work, or in some cases, to formulate roles applicable to architecture, which are different from those related to "fine art". The aim is to find-out the essential qualities of the art of architecture and to stimulate interest in them. Many writers who have attempted to define good design or to describe a process that would ensure design quality has touched on the field of aesthetics. Some hold the view that some kinds of general aesthetic theory are relevant to the architect's problems and can help him solving them, others will probably see them as useless. The most important issues in this controversy are obviously relating architecture to other works of "fine art", which is still a matter of open discussion and its implication is shown to be complex and controversial.

However, reference has been made to the difficulties of deciding which priorities are appropriate for the architectural profession. The most difficult issue concerns the place of architecture as an art and profession. According to Collins[22] the acceptance of architecture as both a profession <u>and</u> an art, or a profession <u>or</u> an art, has by no means been settled, even today. <u>Architectural institutes</u> tend to concentrate on organisational aspects of architectural practice. <u>Art historians</u> in general tend to see architecture solely as a visual art, and 'would probably accept Nikolaus Pevsner's assertion that what distinguishes architecture from painting and sculpture is its special quality, which cannot be seen in other arts.[22] Collins concludes that the fundamental criteria of architecture are not identical with those of other visual arts, but he adds:

> "It is not claimed that creativity, elegance, originality, and other values associated with the "fine art" have no place among the criteria of

> architecture, but simply a proper understanding of the way these values exist in other professions can provide us with an integrated set of criteria, as opposed to criteria which oscillate between two contradictory scales"[23]

Five points are identified by Collins to support his earlier views. The first point concerns the place of architectural criticism within the totality of aesthetic literature which uses theory without evidence or use of real examples to prove that the theory of aesthetics is valid for architecture. The second point concerns the validity of the whole concept of the "fine arts" where the values and criteria established by the architectural profession are totally distinct from those of arts. The third concerns the limitations of "aesthetics" which historically have proved so difficult to define "that if we trace the development of the general idea of aesthetics from history to the most recent text-books written by philosophers, who specialize in this topic, it is apparent that there is not and never has been a consensus of opinion as to which activities are the concern of aesthetics".[23] The fourth point related to the rational element in criticism, since the difficulty arises of deciding which activities can be regarded as "aesthetics". Attention is drawn to the difficulty of deciding which aesthetic activities can be regarded as professional. Finally, architectural integrity can no longer be identified with the expression of the individual architect's personality, without assessing its effects upon society and its needs, or the required needs of a client, to the extent that an architect's self-loyality becomes his supreme moral code. It is this consideration which, according to Collins, more than any other brings architectural criteria into line with those of the other learned professions. Allsop (1977)[24] accepted the views that, the moral standards and practices of any society have an effect upon architecture, upon what it is possible to build, "Priority may be given to interest rates over social needs",[24] for him this is something to do with the ethics of architecture and we must draw the line between ethical and aesthetic consideration in architecture. The ethical problems must lie outside the scope of enquiry into the theory of architecture. It concerns the architect's responsibilities in practice, responsibilities to society and to the profession, to design well is one of these responsibilities.

However, the use of aesthetic principles as a means of achieving beauty, no longer holds a central position in architectural work. The tendency has been notable in the recent period of avoiding theory in architecture development. It may be due to the scientific advances which marked the past half-century which has lead to undue changes in the basic beliefs and values of architecture as an art, and also to the consideration of other values such as social, political, economic and even moral aspects of professional practice which has marked the modern development, and which has forced a decline in the formal use of architectural theory.

The single concept of beauty along with a few other traditional aesthetic categories now seems quite inadequate to form the basis for architectural criticism, especially if the interested participation of the lay man is to be earned. Instead of using the traditional aesthetic terms, new methods devised to measure the effects of architecture on the experience of human beings have to be used. These may be developed towards recording the emotional subjective responses to the activities both in-side and out-side a particular building, but data of this sort should always be seen against the back-ground of the overall programme.

Change[25] spoke of emotional satisfaction in addition to the physical structure of architecture which should obey objective requirements.

> "Architecture aims at emotional satisfaction as well as physical integrity, it is a language which has the emotional power to express with authority the structural meaning of a functional space."[25]

Yet, it is very difficult to analyse the kind of satisfaction that an architect can give. Is it the satisfaction that a building is perfectly fitted to its purpose? With particular emphasis on the functional aspects of architecture, or is it? The human emotional satisfaction in the presence of good architecture, old or new, which according to critics and writers, interprets certain aspect's of human subjective emotional responses in a positive way. Morrise Lapidus[26] spoke of the visual and emotional impact a building has on people who see and use it, "Buildings that go beyond a mere fulfilment of functional requirements for human activities and comforts, to satisfy human emotional requirements". If a building has a certain quality acceptable to the architect, the critics and the public surely then his quest for emotion in architecture directed particularly at those elements which Vitruvius and later Henry Wotton called "delight" has been achieved; The emotional impact of architecture on man, as well as the other elements which are directed towards achieving new forms of structure and planning are still the basis of all architecture.

Allsop[27] and others spoke of factors such as shape, texture, colour, pattern, rhythm, balance, space, light, movement. tension, etc.., as stimulus to the emotions which an architect is always concerned to express. John Blecher[27] (1907), in the analysis of the principle and qualities to be looked for in a building he spoke of other factors as truth, beauty, strength, vitality, restraint, refinement, grace, breadth, scale, proportion, light and shade, colour, and balance.

In doing so they are simply making a list of qualities in architectural objects which stimulate our sense of beauty.

The psychology of visual perception shows that the appearance of any element depends on its place and function in the pattern as a whole[28]. For Change[29] the relevance of these views to the theory and practice of architecture is evident. Change describes the combination of the element described earlier as the surface quality of architectural composition, where any surface quality has no definite being unless it is compared with another surface quality:

> "In both, conception and perception, white is not white without the existence of black"... that "which is facing the light source will be reduced in brightness by diffusion, that which is hidden in shadow will recieve light from negative reflection and be brightened."[29]

Also the natural conditions besides the functional, economic and social considerations limit the architect's freedom to a certain area of action. He is still responsible for what and how man will see in relation to the visual elements which stimulate all other sensations directly or indirectly, and give him the feeling of existence in space, but it is no longer possible to consider the architect's process as to be self-contained, unrelated to what people do or want. Allsop (1977) acknowledges that in modern times the philosphical consideration of art has shifted from beauty to emotion and:-

> "If we are to believe that there is some common ground in all the different arts, and if we accept the intuition of our age that art is related to the emotions of people, rather than to an ideal concept of beauty, the relevance of emotion to architecture cannot be self-expression and must reside in the emotional relationship, between the architect's cognition of the subject-matter of the architecture (the programme) and his para-intellectual synthesis of his own understanding of the problem and its solution in architectural terms.
>
> This points to something much more useful - than a definition of architecture, it indicates the special qualities of mind and personality which makes a person capable of producing architecture, that is, of being an architect. He or she must have a developed talent for understanding a human complex of needs and interpreting them through feelings, intuition and reasoning in terms of built form within an environmental context."[30]

Some writers draw the conclusion that the subject of emotional delight in architecture, a varying and subjective factor in building, is determined by the individual designer, are without any rules or principles being established for its control.

> "In all other respects the aesthetic quality is the role responsibility of the architect, placing a heavy burden upon him and ensuring his importance and probable leadership of the design team. This fact, however, does not lessen the responsibility of other team members in assisting the architect in his area."[31]

The Functional Aesthetic (The Present Situation):

> "Architecture as........ an emotional act of the artist has no justification."
>
> "Building is a biological process. Building is not an aesthetic process."[32]

The former quotation, represents part of the argument which has restricted architecture from being directly concerned with aesthetic theory. It based on functional thought that has been manifested during the industrial revolution which marked the first half of the century. It shows a tendency to drop the word "art" as applied to utilitarian skills and to call them instead "industrial technology".[33]

However, it is recognised later that no restricted line can be draw between aesthetic and useful skills or their products, many skills regarded as primarily utilitarian are sometimes devoted in part to aesthetic aims, into making the product visually attractive. It is agreed, that product quality should be directed and determined throughout the human needs as a "fitness for purpose", as the determinant of beauty in things. The importance of building quality was explained as being due to the varying and subjective influence of users, and the knowledge of fitness. Later research into the knowledge of users' requirements, and the condition of use in buildings denies that it could make an independent contribution to the theory of quality in building. The argument is that the research into users' requirements and satisfaction of use may impose certain limits on the demand for quality in buildings, but within these limits, architecture may still be free to operate as a cause of visual delight, which is due to particular emotional effects.[34]

Some see the error of such an argument in the confusion of beauty of appearance which is an aesthetic matter with performance which is a utilitarian matter, which links function closer to ethic rather than aesthetics.[35]

Others feel that many different aspects of architecture and a variety of human needs and group processes are interconnected, and the argument should be particularly directed against the traditional emphasis in architectural training and criticism on the visual qualities of buildings, In favour of the more important subjects of human needs. The views describe the close relationship between all aspects of architecture and the other great number of biological, psychological, and cultural needs that architecture and the environment have the capacity to satisfy.

Deasy[36] stated that:

> "There is a vast different between solving the problem of human use and letting these solutions evolve an aesthetic of their own and alternate process of forcing these same uses into a fashionable form.
> Refering the problem to an aesthetic statement is a process of taking criteria of human use and manipulating them in accordance with a second set of aesthetic

> criteria that many have nothing to do with the users. This can easily lead to solving only selected problems or ignoring it altogether."[36]

Deasy's ststement indicates that many architects and designers continue to ignore the priorities that are appropriate for the design profession, by reforming the problem into aesthetic statements, "that still captures the attention and the applause of architects and designers". Deasy belives, like many behavioral scientists, that discussion of design quality should be more related to human behavior, and the architect's role is to find ways to apply this insight in his own work. He called for more focus on the first stage of design process, after writing the programme and the begining of design studies which he considered the focus of the creative process in design, and to evolve problem solving studies which is not a highly regarded ability in the design field today. Recently, however, a growing intrest in the issue of the creative process of designing has led to more work on these aspects in a number of studies.

Other studies also deal with the general issue of the relation of architecture to behavioral studies in response to particular design problems, such as the observation of human behavior which can be used to project new and more efficient environmental design. In this respect it should be noted that some architects make several points about the degree of difficulties inherent in the ideology of - behavioural psychology, sociology, statistical psychology and other human studies - and the doubts about their contribution to design, questioning the validity of their belief, especially the behaviourists' and the validity of their objectivity in their observation of human affairs.[37]

However, discussing the design quality as it related to human needs will be the topic of the next chapters. The first part deals with philosophy and theory of quality, covering the interest between quality design product and the requirements that these characteristics generate for the design of buildings of quality. The second area deals with the impact of the significance of architecture as the expression of social values and the characteristic of human needs. The third part includes methods used to measure some aspects of building quality relating to human requirements, and a series of models illustrating methods used to appraise building in use using various approaches.

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2.2 PHILOSOPHY AND THEORY OF QUALITY

(Bettman Archives)

"Quality is never an accident. It is always the result of intelligent effort. There must be the will to produce a superior thing."

–John Ruskin

2.2 Philosophy and Theory of Quality

Definition of Quality

As we have seen in previous pages the technical, economic and social development of the last decades has forced the question of new issues in architectural thinking, with less concern about architecture as an art and more concern with the changes that are taking place in society, and more emphasis on the human needs and the means of satisfaction. The technological advances made during these years and the complexity of new buildings resulted in expanding human expectations for higher and better quality. This move has increased the difficulties facing the profession by having to design buildings of a kind acceptable to the public at large. Now the question of quality is occuping an increasingly important place in the mind of the designer, the profession and the users; it is no longer merely a cosmetic treatment to enhance architecture, but is seen as important for the future development of the role of architecture in relation to society as a whole.
Thus, the fundamental concept of quality is worth studing, not only for the evaluation of these ideas arising directly out of the work, but the means of establishing relevant criteria in building. According to Arup[1], the frequent use of the expression "design quality" or "building quality" to describe good architectural works is still used because:

> "The word 'quality' implies something of value, something we prize. It is also

> related to purpose, it is the result of a discipline imposed by man, the result of something well done or well organised as opposed to shoddy work or lack of organisation"[1]

However, many different subjective meanings are attached to the word "quality" and this is where much confusion arises especially when the word used by a person has a different meaning to that of his listener, and which may convey quite different ideas. The scientific view[2], is that there is no right definition for a word. Each word is a symbol to which various meanings are attached by common usage, and there is nothing to prevent us from re-distributing them in a more convenient way if we so desire. If we consider "quality" in this regard , it is not necessary that all theories about the facts and values to which quality refers to in the following pages should be expressed as a definition of the word. Many of them could be supplementary propositions about such facts and values, or about quality in subjective or objective terms.

In the Oxford English dictionary[3], the word "quality" is defined under two headings:-

a) <u>Quality possessed in persons</u>: Means the feature of one's characters, his capacity, and ability or in some respect his skill.

b) <u>Quality possesses in things</u>: The means of "an attribute property, and special feature of characteristic of something... restricted to cases in which there is competition - expressed or implied - with other things of the same kind,

hence the degree or grade of excellence possessed by a thing. Quality is the aspect of things under which they are considered in thinking or speaking of their nature condition or properties.
quality used as the peculiar excellence of superiority of things, for a particular class, kind or grade of anything as determind by its quality to rate a certain quality value".

Perhaps, in these definitions, the contextual relation between the two meanings implies certain objective values. It is because quality is essentially excellence or perfection in the properties of things which may be influenced and distinguished according to qualities possessed in persons. The attributes of excellence, explained by John Ruskin[4] are important to consider in this regard:

> "The thing to which it is applied required a great power for its production... when applied to things it has always reference to the power by which they are produced."[4]

The meaning of excellence implied by Ruskin, is the power required for the production of a thing and the power by which the work has been produced "wherever, difficulty has been over come, there is excellence[4]." Hamline[5], has refered to the sense of power, which architect and designer can produce as:

> "The kind of power that every one has felt, at some time, in the presence of some great building ... it is one of the commonest and

> most obvious of the architecturally inspired emotions, because most permanent buildings produce it."

For many writers such philosophy, depends upon the solution put by the designers in a such way acceptable to the profession and the society as a whole:

> "Architectural design is knowledge of the problem and how to solve it intellectually"[6]

This kind of philosophy in architectural thinking argues generally that excellence in creative design follows from intelligent application. It is generally accepted that one important factor in assessing quality can be seen as a measure of its excellence in relation to the difficulties of the problem or problems which it is intended to solve. The application of such philosophy given by many prominent architectural writers, reflects the attitude of thinking about architecture in recent years, espcially in attempts to find a starting point to discuss quality in architecture. This is n addition to the objective factors which are interrelated and exercise a major influence over the result to be achieved. There has been greater emphasis on the architect's responsibilities and personality and their contribution to a successful work of architecture at the design stage of process. This will be the subject of section three and the case study in this work.

Nevertheless, it is apparent, as we have seen earlier in chapter one, most architects and those concerned with architecture agree, that the whole notion of quality in architecture is subject to a wide variety of interpretation and that it is very difficult to define, the debate is still open. Broadbent's paper on architectural quality and the debate which follow by the Royal Institute of British Architects - The R.I.B.A. Council[7] - (1973) shows the difficulty of finding a common and acceptable definition of quality. But it seems reasonable to say that most of the speakers made explicit reference to the determining role of the profession to the public, with more emphasis on the architect's role and responsibilities towards design. In the same manner Howard Robinson[8], thirty years ago spoke of quality in architecture as being desired from personality and responsability to preserve the standards of quality in both design and execution:-

> "Quality should be the hallmark of architecture if it is to flourish as a distinct and independent profession."[8]

Some Philosophical Aspects of Quality

It is clear up to now that the elements which combine modern building and the operation of the architect's work depend generally upon the solution of integrated building design to include all the various elements involved. In this the concept of building quality could be achieved if the goals of the orgaised profession and society are interrelated in values, with equal emphasis reflecting the elements of both process and product. In building terms this implies that quality should encompass both the design and its implemention. One without the other will not do.

The application of quality philosophy considers the quality of product, as a new quality of mass-distribution and machine-made perfection influenced by the new pattern of life derived from the social, political, and economical movements of the new industrial society with the help of the scientific achievements, and brings the concept of performance into these factors which must be considered when quality is being discussed. This point is of importance as it would imply that uniqueness is not necessarily required for a work of quality. It suggests that standared products-system building for example could be recognised as a work of quality. The excellence would be recognised by those aspects of appearance, intellectual elegance of the problem solution and by their performance. This is an interesting point because as yet it does not figure highly in terms of architectural appreciation and there will be discussion on this aspect at a later stage in the work. Neutra (1969)[9], summarized it as following:-

> "Performance guarantees versus old quality ideas; forms around us become dictated by an industrial technology and justified by operation, ... a new type of quality brought into existence, a quality difficult

to understand in itself, but easily appreciated in a standard performance."[9]

In the past, quality as the means of excellence was closely associated with singularity or even uniqueness, which is not acceptable to every one:-

> "Earlier philosophy has been focused on the concept of quality. "Qualities" were regarded as irreducible essencess, this concept was bound up with hierarchical structure of society. "Quality" was something that by definition could be discerned only by the especially endowed, not by the common man. Whether the quality in question were spiritual or material, only a person of privileged view could assess them. In fact, such things as shape, colour, or rhythm seemed to hold mystical significance."[10]

This view-point would obviously be rejected by large sections of contemporary society and Neutra was at pains to explain that this concept of quality as a rare phenomena becomes meaningless in the new society. It is essential and of continual importance to renew the concept of quality as accessible to every one.

Relating quality philosophy to performance standards involves the exploration of a number of concepts, and particulary identifies, as part of the design process attitudes towards understanding the extent of peopls' needs and satisfaction by the use of sociological techniques. The designer can measure these needs and could put himself in a position to know more about future demands and developments in specific fields.

To have maximum value these concepts identified by those elements which are usually associated with qualitive assessment may be expressed by the properties such as: durability, precision, strength, attractive appearance, and economic blues efficient functioning in both human and material terms.

Sitting[11] argued that such elements cannot be considered individually to formulate a comperhensive difintion of quality, but should rather be viewed, by examining the relationship between the properties of the product, and its conditions of use:-

> "It has now been realized, that quality is not determind by the properties of the product alone, but that these properties must be viewed against the back-ground of use which made of the product .. the most beautiful two roomed flat must be regarded as of inferior quality for a family with six children, even a Rolls-royce car is of poor quality, for the house wife who would have use it for shopping. The definition of quality, therefore, which has been generally accepted in recent years by experts is: <u>the extent to which properties of product fulfill the requirements or intentions of its use</u>. In other word, <u>quality is fitness for purpose</u>, a definition which originated from functional thinking, and as the function of products and service is the use to which they are put, this definition of quality rightly places the user, with his wishes and requirements in the central position."[11]

This is clearly of great use in the consideration of buildings and will become one of the main criteria in criticism of buildings in use.

The implication of the functional concept of quality accepted by the European Organisation for Quality Control (EOQC)[12] as "relativity theory of quality" after the proceedings of their fourth conference (1965) "Quality is fitness for purpose", justified later by Juran (1970)[13] one of the leading experts in this topic; (Table 2.3);

> "All human institutions exist to provide products or services to human beings. An essential aspect of these products or services is that they be fit for use ... the phrase fitness for use is the basic meaning of the word quality. This has historic meanings. In the ancient market-places, where commerce was transacted directly between the one man producer, and the ultimate user. Fitness for use was even narrower in meaning; since it refered to the degree to which a specific product or service satisfied the wants of a specific user."[13]

In this concept, quality being a relative nature, does not exist in itself, but in connection with the purpose for which an article or building is used[14], this also means that a product, may be of excellent quality with regard to one purpose, but unfit with regard to another purpose. Quality can be said to be a collection of attributes to suit a purpose of the degree to which a product meet the needs.

Sitting's previous argument is adressed to the question of the effectivness of the functional concept of quality in determining such needs in general. He concludes that the

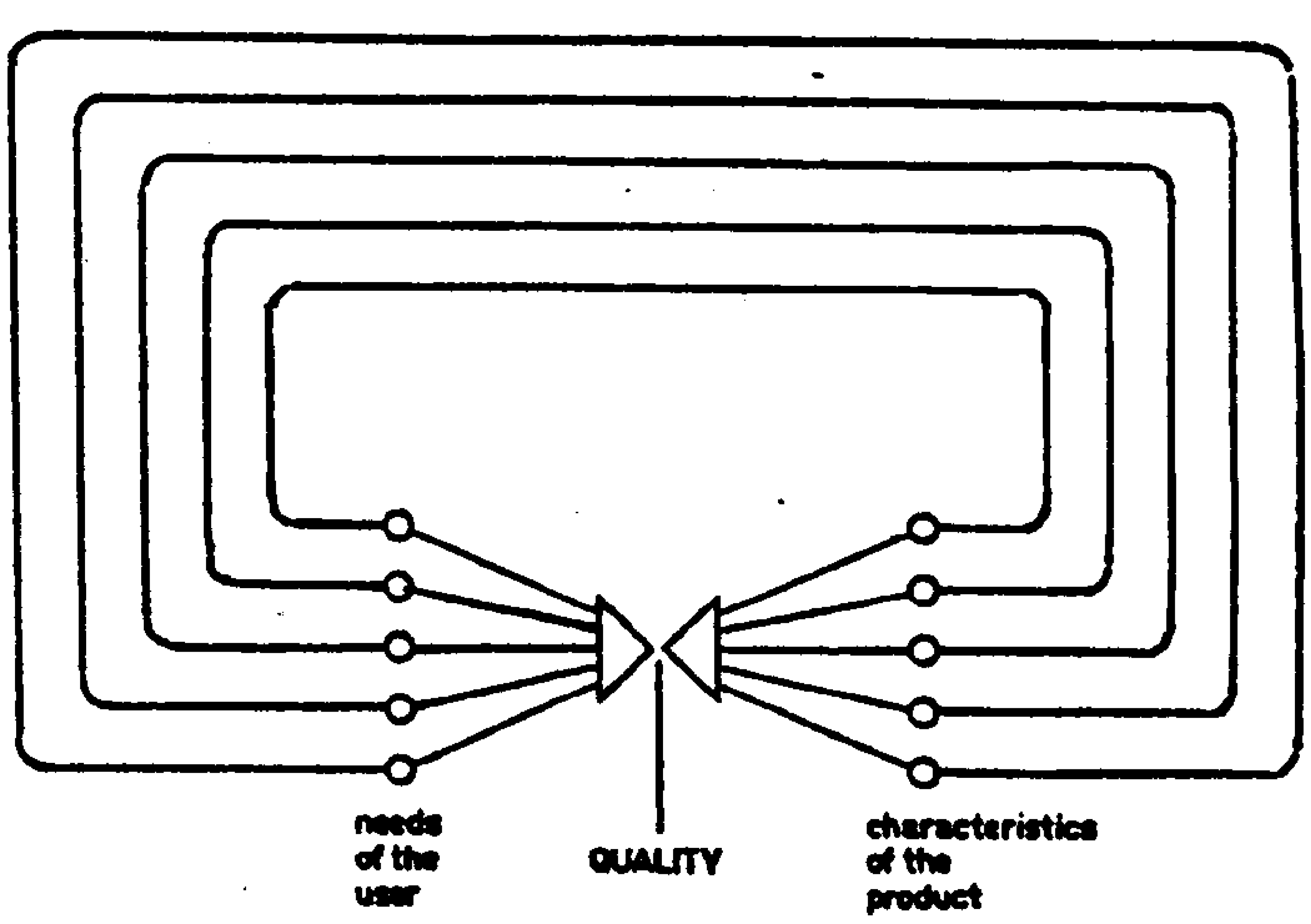


Table 2.3 "Relativity theory of quality"
Quality is fitness for purpose

functional concept of quality involves a number of consequences, namely dealing with way of finding common ground for satisfaction. Thus, acceptance of quality as the degree to which a product satisfies the requirements imposed upon it by which it is intended has the following consequences:[15]

" 1. Quality depends on a great number of properties of the product in question.In order to know its quality, it is not sufficient however to have a complete knowlege of all its properties.We must also be familiar with the situation in which the product will be used, that is to say with the "co-ordinates of the situation of demand'.

2. Quality is a quantity which can be expressed by ranking numbers namely when the user is capable of grouping the properties of the product in their order of importance.

3. Quality is a measurable quantity, namely when the non-adoptation of a product to the demand can be expressed by a uniform unit, usually money. In this the defintion of quality is consumption centred. It is the result of a functional line of thought developed since world war II.

The value of a building is not measured by its properties such as a shape, size, proportions, etc, but by its suitability to perform the function for which it is intended; consequently, also here the adoptation of the properties of the product to the demand dictated by its use determines its value. "The extension of this functional line of thought to products - and services - deprives quality of its slightly mystic significance and make a quantitative approach possible".[16]

However, according to Ackroyd[17] satisfaction is not something which can be measured, and that one cannot lay down a standard of satisfaction, since each user will apply different scales of judgement according to his own ideas and priorities, which brings us back to the continuous dialogue implicit in dealing with architecture as an art form. In turn this implies that time is a factor and that aesthetic opinion will inevitably change as time goes on. However it is interesting to note that objective assessments can also become obsolote. As an example the restating of requirements for housing which has taken place after the rejection of the high rise solutions of the 1960's show that fashion can affect the judgement of apparently quantifiable aspects of design as well as the more abstract.

Christopher Jones[18] (1972), stated that the initiation of change in man-made things, figure -2.4 - strongly influence designing objectives as it becomes less concerned with the product itself and more concerned with the changes that manufacturers, distributers, users, and society as a whole are expected to make, in order to adopt and benfit from the new design. As a consequence of the new moves, the designers

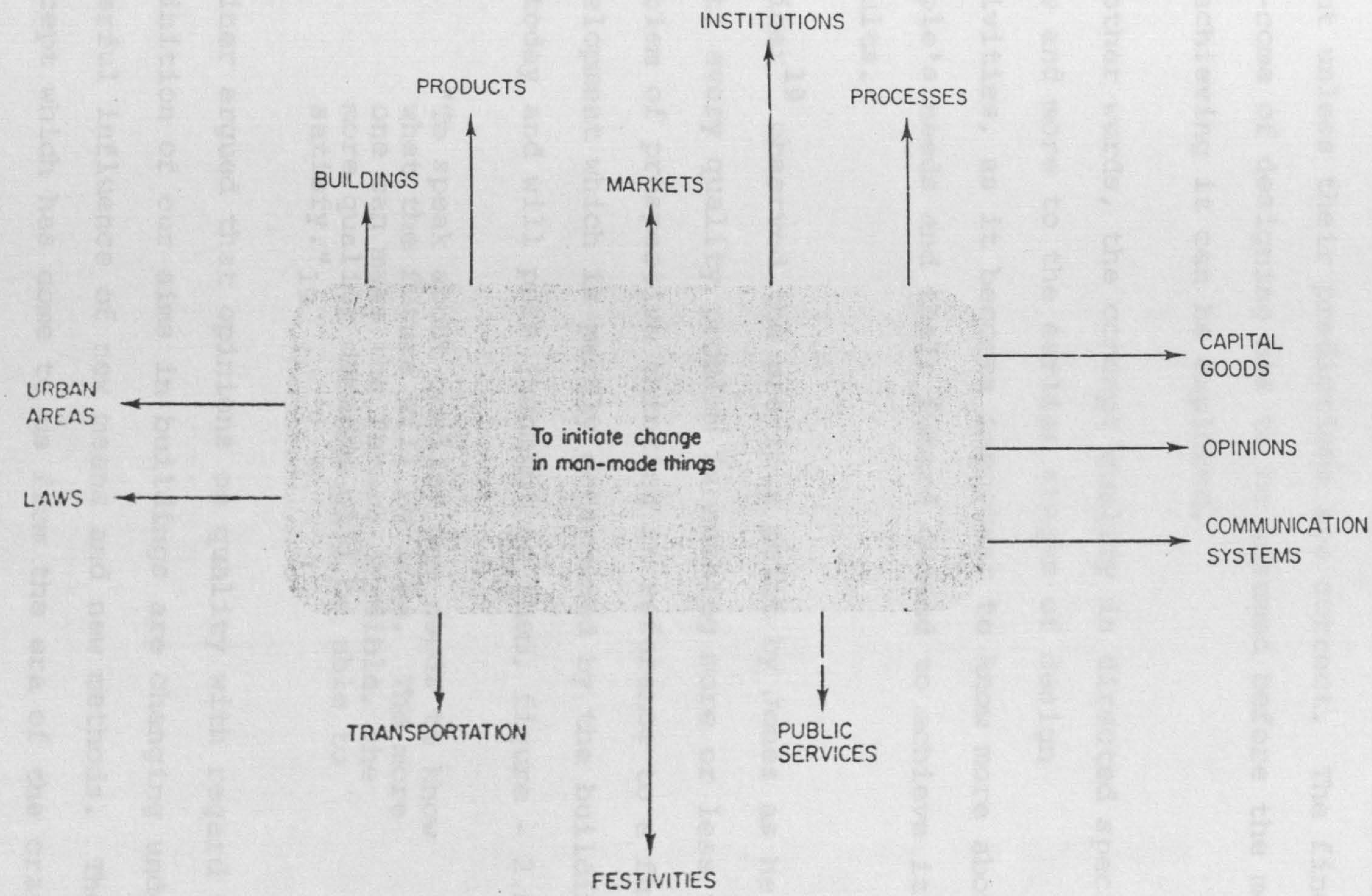


Figure 2.4 The initiation of changes in man-made things.

have to face more difficulties as they are obliged to use current information to predict a future state will not come about unless their predictions are correct. The final out-come of designing has to be assumed before the means of achieving it can be explored.

In other words, the concept quality is directed specifically more and more to the earlier stages of design activities, as it becomes important to know more about people's needs and their future demand to achieve it's optimum results.

Steiner[19] observed the previous point by Jones as he argued that, every quality problem is nothing more or less than a problem of prospective thinking in reference to a future development which is partly determined by the building efforts of today and will pass judgment on them, figure - 2.5 -

> "To speak about quality one needs to know what the future will be like. The more one can make the future credible, the more quality demands will be able to satisfy."[19]

Steiner argued that opinions on quality with regard to proper definition of our aims in buildings are changing under the powerful influence of new means and new methods. The quality concept which has come to us from the era of the craftsman is no longer valid:-

> "The thing itself is no longer in the centre of our attention instead, we are concentrating

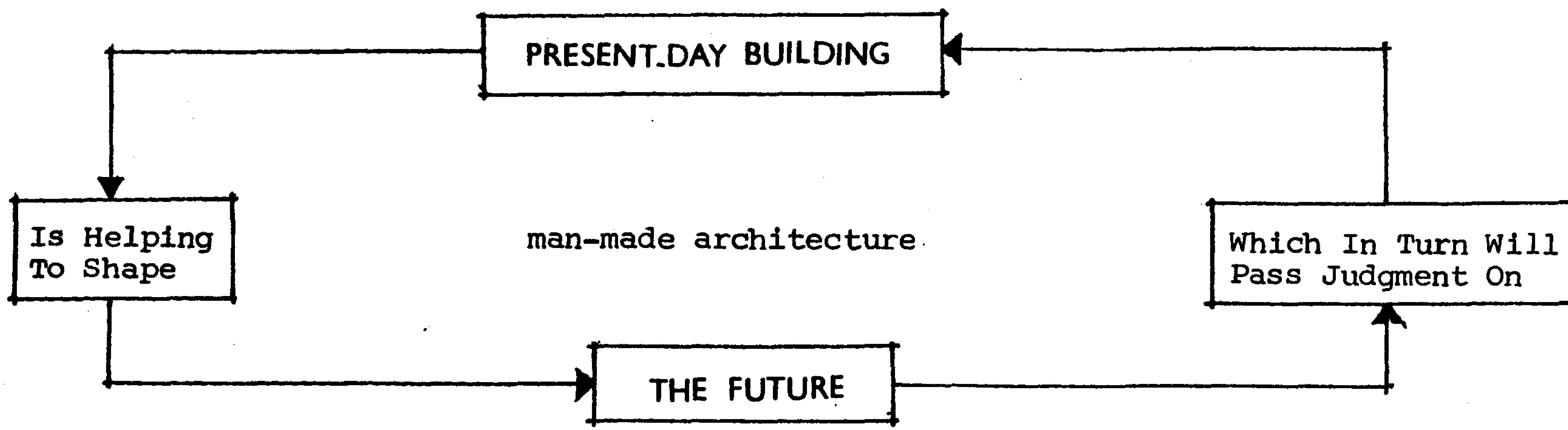


Figure 2.5 Aims in building, are changing under the influence of the new means and new methods.

> on our relation to things, we judge these relations by reference to our relation to other things and we have come to use monetary value as our standard."[19]

Using the abstract quality which is equal to use value, and the economic quality to weight the use value against the cost, quality then becomes "value for money", and one of the results of this quality concept is that an increase in price without any change in the technical properties of the element nevertheless implies a decrease in quality.

However, the modern policy of quality makes allowance for the impossibility of achieving perfection by aiming at optimum quality rather than at maximum quality. Thus in regard to buildings, Steiner in his statement makes the point that there is at least a theoretical possibility of defining qualities in quantitive terms, enabling comparison to be made. However he stated that their exact calulation cannot be carried out before a point in time when the result is no longer of intrest, which means that we must use estimates of quality assessments expected to be made in the future. This emphasis fits naturally with the present approaches to quality assessment. The methods used for measurement, description, and assessment of qualities of building elements and products. Involving quantifiable terms (building performance, appraisal and evaluation).
It should also be stated at this point that as an hypothesis it is not popularly accepted. The growth of public indignation about the state of architecture in the U.K. is aimed at many buildings which would apparently fall into

the category of buildings of optimum quality. It can indeed be argued that optimisation is by definition not one which quality can be expected but this would mean rejection of Stiners thesis in total. There is some lesson to be learned from this process and it cannot be rejected outright at present.

However, it is important to give attention to the different methods used to assess and measure building quality, but first we should turn to the important relevant topic which covers the methods used to describe the theory of quality product and its implication to architecture.

Quality Product Theory

At this stage it is considered useful to list criteria concerned with quality used in other fields, especially these which are considered to make important theoretical contributions to the practical development and have application to quality philosophy. The influence of industrial design on architectural theory, and especially those concerned with the functional approach to architecture, has long been evident. "Gropius, even after he established himself at Harvard University, still contended that", the approach towards any kind of design - of a chair, a building, a whole town or a regional plan - should be essentially identical, not only in respect to their relationship in space but to social aspects as well.[20]

Nevertheless, it is not claimed that architecture is directly compatible with the "theory of product", but it seams reasonable to find-out what quality product theory offers the architectural designer, and what its characteristics might generate for design for buildings of quality. A further argument in favor of study in this field is that it covers the relationship between design activities, as well as the absorbing users needs as they have evolved with evaluation of the technological and sociological requirements of the people intended to be served by the product. Indeed, some of these theories can be applied explicitly to the building industries as they represent the systematic relationship between the various phases of design activities and the designer's basic decision to improve quality.

The idea of relating systems used in other fields to architecture has been used by many architectural theorists to justify their ideas and follows the use of analogy with both science and creative arts. Methods have been abstracted from operational research and systems analysis where influenced developments of new design methods in architecture, and are increasingly used especially in the philosophy of problem solving and creativity in architecture. According to Collins[21], the strivings of the historians to evolve a new architecture by analogy with earlier architecture proved a failure because of the over-sensitive historical consciousness of age, which caused such analogies to degenerate into "archäeological mimicry"; their failure resulted, however, in one important change, it forced theorists to study the possibilities of other kinds of analogy, with more emphasis on "the functional analogies", analogies to do with living organisms, machines, and bodily functions, such as human taste and speach:

> "It is clear that these analogies were not an ideal in themselves; but functionalism was. And this eventually become the most important ideal of modern architecture."[22]

Collins refers to the phenomena as a "biological, mechanical, gastronomic, and linguistic analogy", used to describe the functional tendency in modern architecture.

The biological ideas which describe the "science of life", are later used by architectural theorists in different analogies. The most comprehensive analogy concerns the influence of environment on design. The idea originally derived its main stimulus from Darwin, but developed further to include the forms which nature had selected as most suitable for the environment in which they were situated which led to a more particular emphasis on the importance of the environment.

The idea of using mechanical analogy in functionalism was itself applied to physics, politics, and economic long before it was applied to architecture. However one of the important various analogies used in the last century to clarify the principles of a new architecture has been the analogy between buildings and machines, one of which is that of Le Corbusier expressed in "Towards a New Architecture". In his book the lesson of machine is reduced to three generalisations; firstly that a well stated problem naturally finds its solution, secondly, that architecture like machinery should be a product of competitive selection applied to standards which in turn should be determined by logical analysis and experimentations. Collins concluded, that the mechanical analogy never provided a coherent solution to the problem of creating a new and rational vocabulary of standardised machine-made architectural form, which would harmonise with their surroundings and with each other, as well as the modern age. But there is no doubt that Le Corbuier slögan: "a house is a machine for living", exercised a powerful influence on the twentieth century's natural desire to adopt machanical analogies. However, in more recent times, the analogy has been started to compare buildings with engines especially by those architects following the steps of high technology.

The Gastronomic analogy can be best explained as refectory knowledge of taste which flourished and influenced the architectural theorists of the mid-eighteenth century and which still exercies considerable weight in certain quarters today.

The analogy between architecture and language has also been seen in the interpretation given to try to define the emotional content of arts. One of many attempts was recently made by Bruce Allsop in his book "Art and Nature of architecture" to interpret Collin Word's "theory of aesthetics"in terms of architecture.[22]

However, refering back to the subject of quality product theory, it is of particular intrest to draw attention, to the concept of the "quality circuit" as described by Juran and Sitting, based upon the methodology built up by defining quality as arising basically as part of, or an extension of a functional approach, in which criteria of "fitness for use" are the dominant generaters of measurement of quality.

It may however be useful, first before dealing with Sittings work to describe the concept of the "spiral of progress in quality" by J. M. Juran.[23] This concept reflects the concern over the influence of the organisational field, in industrial design, which turns to the matter of how to organise the human activities to carry out its quality mission successfuly. The method describes the sequence of activities which should be carried out, illustrated in figure -2.6 - which shows in outline form the interrelation of these activities to each other. The aim is to establish responsibility for quality, and to appraise the effectiveness of this activity and to propose a programme for action.

Quality Product Theory

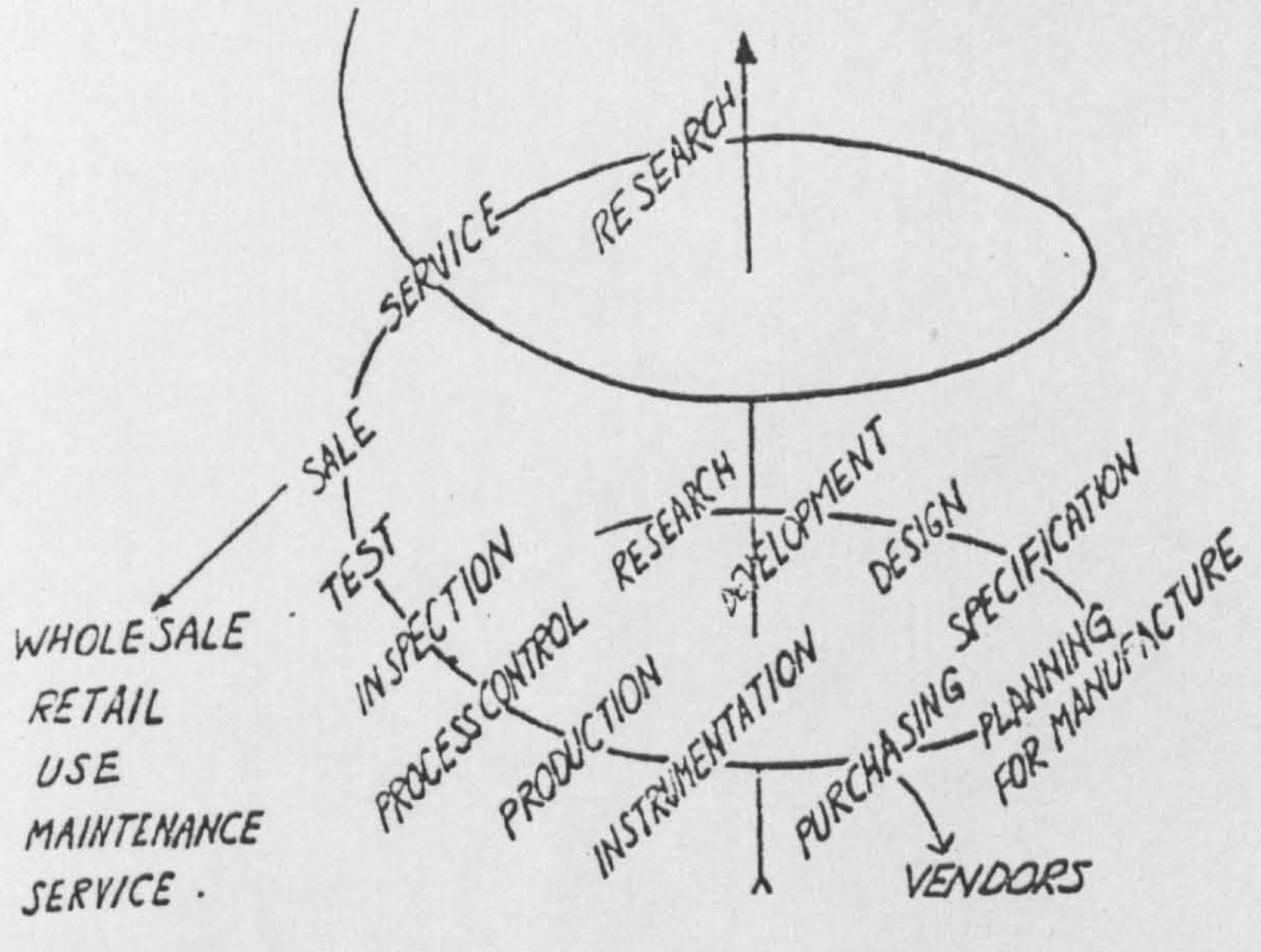


Figure 2.6 The Spiral of Progress in Quality

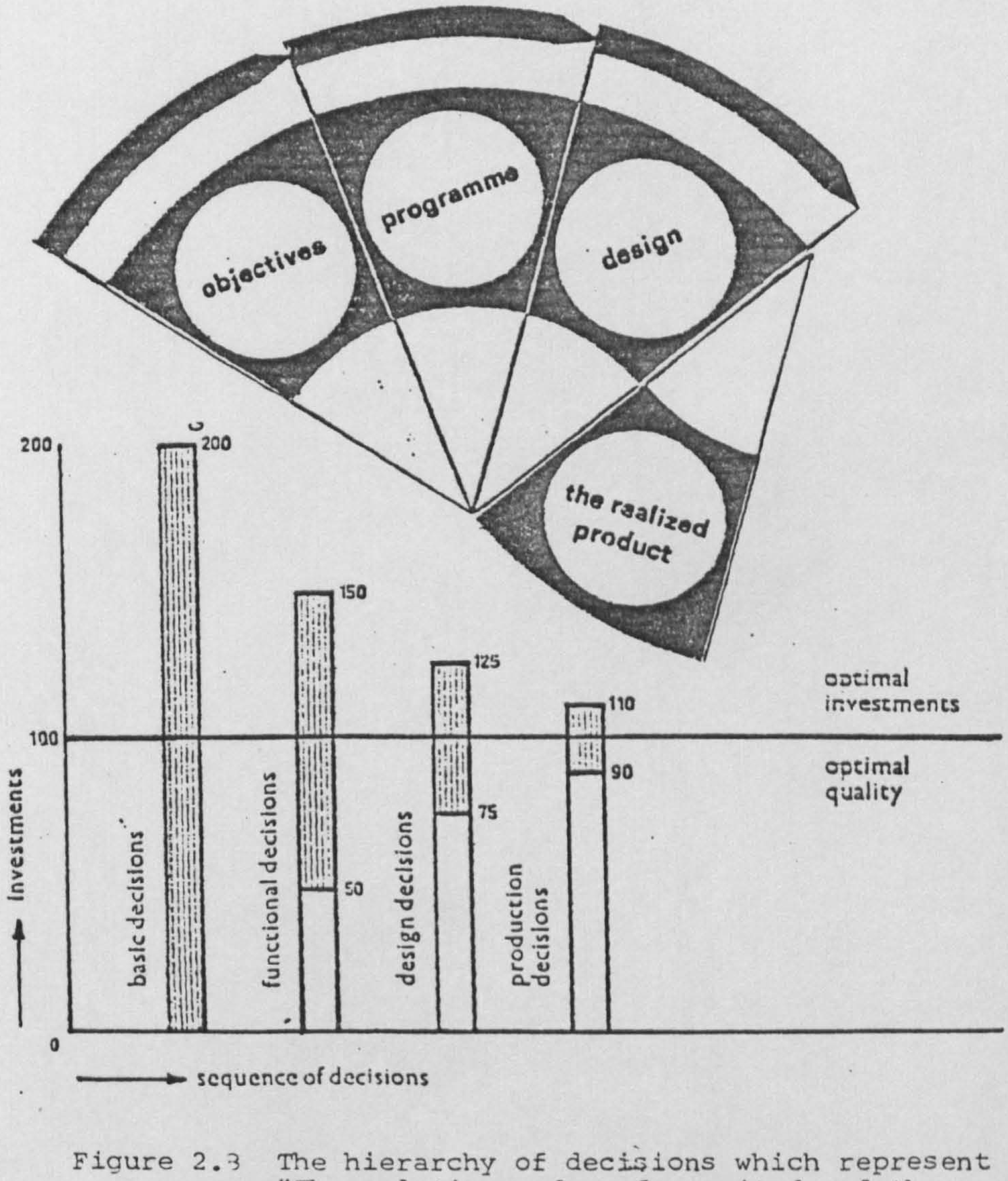


Figure 2.3 The hierarchy of decisions which represent "The relative order of magnitude of the mistakes in decision making throughout various stages of building project case.

Quality Product Theory.

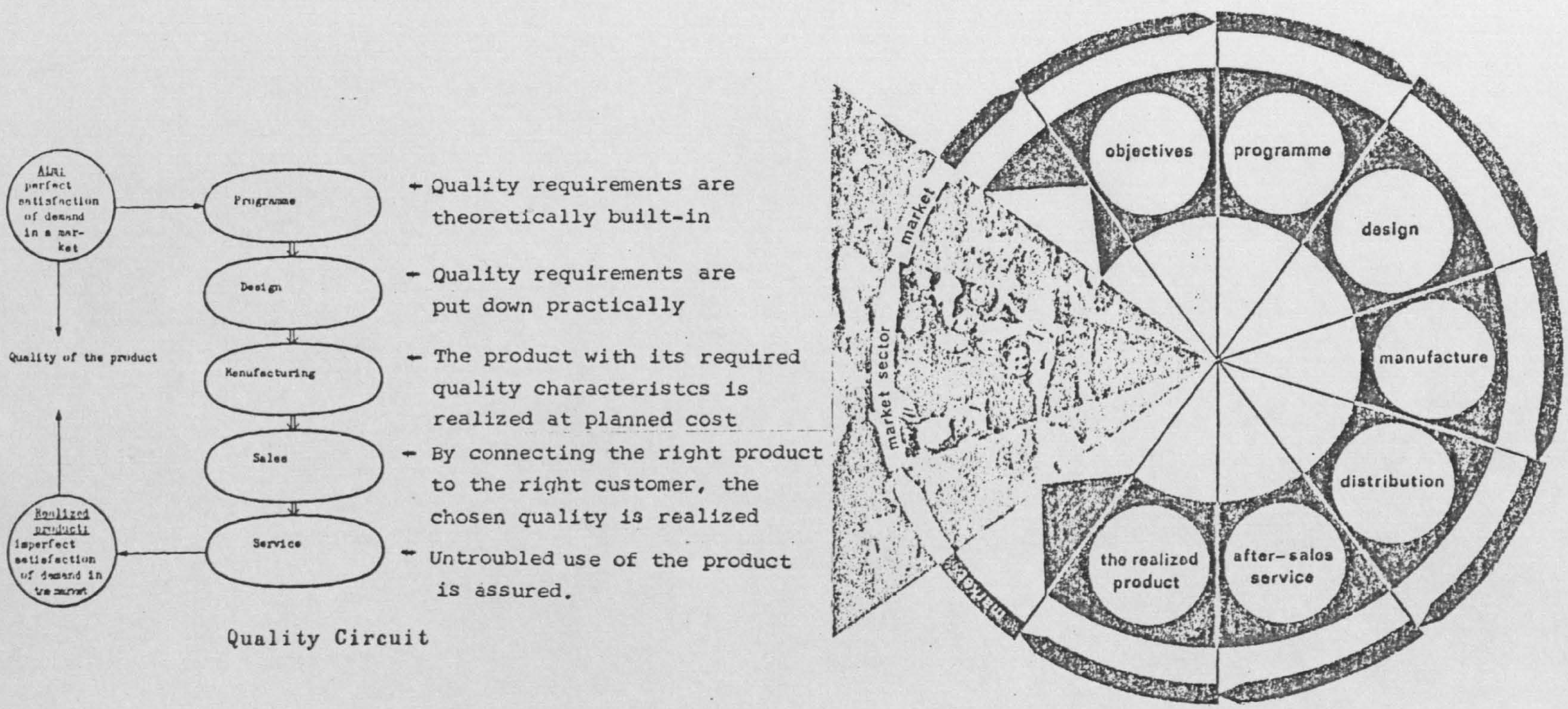


Figure 2.7 Quality Circuit describes the stages necessary to produce industrial products of quality.

is directed to the needs of a special market sector. This is followed by the establishment of a programme of requirements in which a great number of functional decisions are involved. The designer makes the design decision, followed by the production stage which calls for numerous production decisions. The distribution decision determines that the product reachs the right consumer. This is regarded as one of the important stages which determine its quality. Finally the service decisions often determine the useful life of the product which as we have seen previously constitutes an important aspect of the quality of a product.
In the quality circuit, it is very important to make right decisions at the early stages, and which accordingly decreases and minimises the effect of the number of mistakes which can be made later. The sequence of decision taking or as it is put, "The hierarchy of dicisions", are seen to be very important in determining the future product.
Faulty original design will never lead to good product, and it is impossible to arrive at a good design if the programme on which it is based is unsuitable. Even suitable programmes need correct basic decisions to be made, thus in the more advanced stages, it becomes increasingly difficult to exert a favourable pressure on the complex as a whole unless decisions taken at an earlier date are reconsidered.
The methods are illustrated by a graph, figure -2.8 - representing an evaluation of "The relative order of magnitude" of the mistakes which may be made when decisions in the

various stages in a building project case, are taken in an unjustifiable manner.

> "In this graph, 100 has been taken for each stage as the optimum investment required for obtaining optimum quality, at which the all-in revenue less the all-in consts represents a maximum.
> In the group of basic decisions, the decision not to build may be erroneously taken, while a mistaken opinion of the decision maker or failure to study the market may lead to a capacity which is 100 per cent too high.
> The functional elaboration of the basic decisions and the establishment of the programme of requirements may result in building costs which are either 50 per cent too high or too low. It sometimes happens that hospitals are built according to practically identical basic programms, where the cost per bed varies from X to 3X depending on the functional elaboration of the basic decisions. An unjustified perfectionism in the medical, technical or architectural field may lead to excessive investments, lack of money sometimes calls for the suppression of essential programme points.
> During the design stage, numerous selections are also made and decisions are taken which may influence the size of the investment to an important degree. The same programme of requirements make it possible to design thus making the building costs 25 per cent higher than necessary or desirable in order to obtain optimum quality.
> By the time the building contractor receives the drawing and specifications he can only influence the cost price of the structure in two directions within the limit of the decisions that have already been taken by good or bad planning, by a good or a bad lay-out of the building site, etc...
> The margin can be evaluated at approximately 10 per cent, since the part which may be influenced by the building contractor is comparatively small approx 30%...[25]

One of the factors which contributes to the "quality circuit" is the way responsibility for quality is divided to satisfy the end use of a particular product. This is particularly important today, when exports both inside and outside the architectural institutions are proposing ways of assessment of building quality, and which allocated within it the idea of user satisfaction and responsibility for its achievement or failure to reach standard. There are obvious legal implications for this and the use of the market to formulate design programmes must be seen against the world-wide move towards consumer protection.

Building failures are among the issues discussed in order to improve decisions in the various levels of accomplishment, for example the study which puplished by the building research advisory service in the U.K.[26] describing detailed investigations of over 500 defective buildings during the period between 1970 - 1974. The distribution of failures according to building type is shown in table -2.9 -.
The result of this investigation can be interpreted to mean that when decisions are highly inadequate the result will follow the "relative order of magnitude of the mistakes" described earlier in the quality circuit.

For the majority of the defects investigated it was possible to attribute the main cause to one or other of four factors, in defining the factors the following criteria were recognised:-

Faulty design: failure to follow established design criteria, whether in building regulations, codes, standards or in accepted good practice. The design fault would often lie with the main designer, but would also be in a sub-contracted service.

Faulty execution: Defect attributed to the failure on the part of the contractor, or sub-contractor, to effectively carry out a design which was satisfactory in itself and properly specified.

Faulty materials components or proprietary systems: failure of these elements to meet their advertised or otherwise accepted performance levels.

Unexpected user requirement: defect caused by the use demanding more from the design than the designer anticipated.

The cause of defects and its analyses shown in table -2.10- shows that 90 per cent of the defects analysed can be attributed to readily identifiable faults in design or construction. Figure -2.11-12-shows two of many examples of building failure attributed to faulty designer planning described by Jenks (1978) in his book"Post Modern Architecture"

However, in adopting the quality circuit to building industry Sitting[27] proposed the "Development Cycle", which is similar to the methods introduced by the R.I.B.A., including Asimow, Markus, and others to describe the design process. The paper put forward by this influencial group proposes

Building failure patterns and their implications

Table I Sample analysed by type of building		
Sample size 510	**No**	**Per cent**
Council houses	64	13
Council flats	55	11
Private houses	65	13
Private flats	11	2
Factories	65	13
Offices, public buildings	90	18
Schools	28	5
Universities, colleges	21	4
Swimming pools	13	3
Shops	18	4
Churches	10	2
Hospitals	23	5
Other	47	9

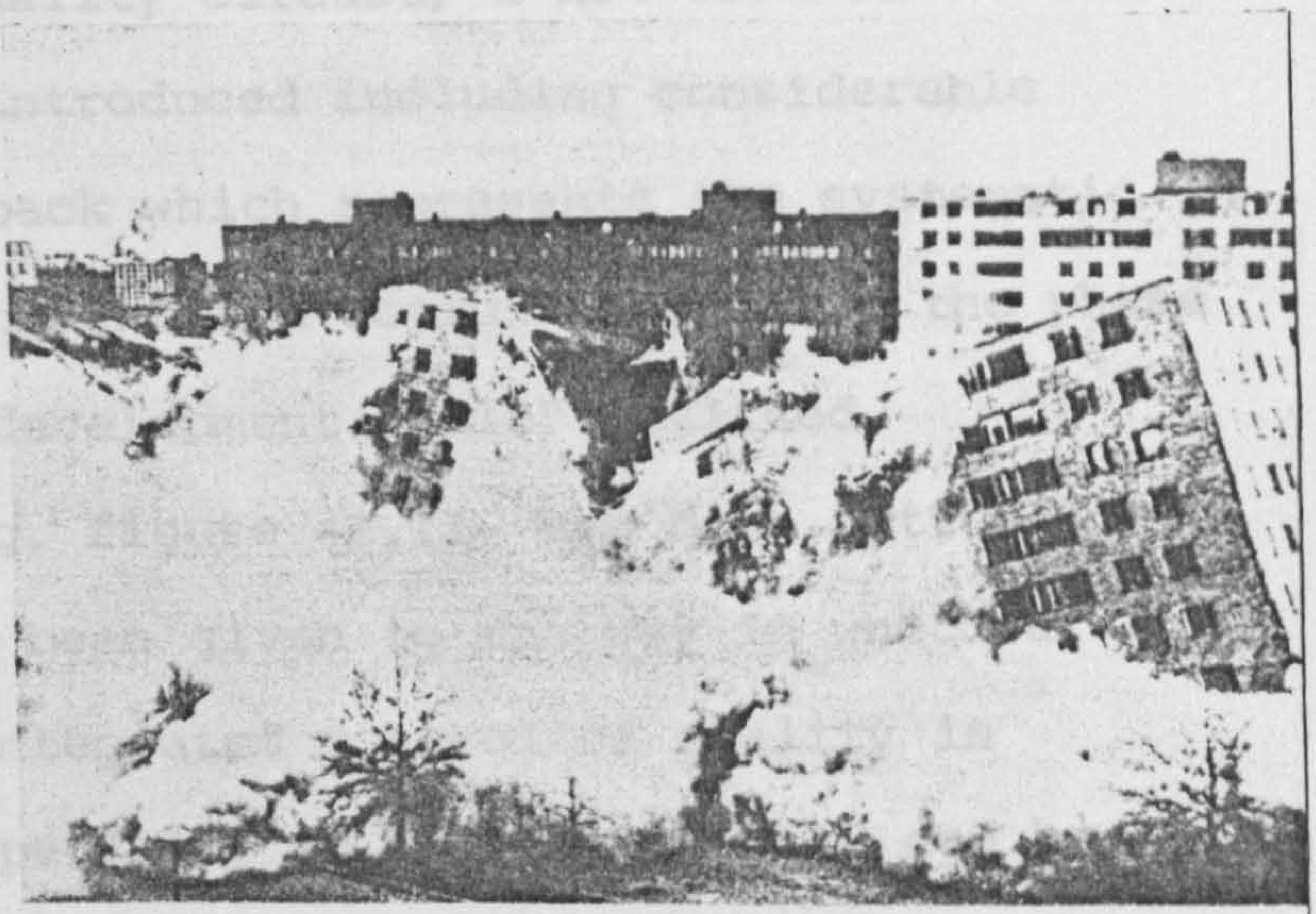
Figure 2.9 Distribution of failures according to building type.

Table XI Causes of defects		
Sample size 510	**No**	**Per cent**
Faulty design	295	58
Faulty execution	176	35
Faulty materials, components or proprietary systems	63	12
Unexpected user requirements	58	11
Other	8	2
(Some overlap between categories)		

Table XII Causes of defects analysed		
Defects caused by faulty design Sample 295: 58 per cent of total sample	**No**	**Per cent**
Choice of material or component faulty	49	17
Movement provision inadequate	38	13
Faulty dpms, flashings, cavity trays, etc	29	10
Inadequate control of water vapour	23	8
Defects caused by faulty execution Sample 176: 35 per cent of total sample		
Entrapment of water	41	23
Leaking mastic joints	17	10
Poor execution, omission of dpms, flashings, cavity trays, etc	21	12
Defects caused by faulty materials, components or proprietary systems Sample 63: 12 per cent of total sample		
Faulty non-conventional dpc systems	12	19
Paints	7	11
Defects caused by unexpected user requirements Sample 58: 11 per cent of total sample		
Condensation due to inadequate heating or ventilation	48	83

Figure 2.10 The causes of defects analysis, shows that 90 per cent of the defect can be attributed to faults in design or constraction.

Figure 2.11



3 MINORU YAMASAKI, *Pruitt-Igoe Housing*, St Louis, 1952–55. Several slab blocks of this scheme were blown up in 1972 after they were continuously vandalised. The crime rate was higher than other developments, and Oscar Newman attributed this, in his book *Defensible Space*, to the long corridors, anonymity, and lack of controlled semi-private space. Another factor: it was designed in a purist language at variance with the architectural codes of the inhabitants.

Figure 2.12

4 PRUITT-IGOE AS RUIN. Like the Berlin Wall and the collapse of the high-rise block, Ronan Point, in England, 1968, this ruin has become a great architectural symbol. It should be preserved as a warning. Actually, after continued hostilities and disagreements, some blacks have managed to form a community in parts of the remaining habitable blocks – another symbol, in its way, that events and ideology, as well as architecture, determine the success of the environment.

"The Death of Modern Architecture"

that instead of a simple sequence of activities that can be read off from the quality circuit, a net-work of interacting phases is introduced including considerable feed-forward and feed-back which represents the systematic relationship between thought and action throughout the phase of the circuit. The "development cycle" outlined symbolically by Sitting, figure -2.13- has been fitted to this data. Advice has been given to the way in which a generally acceptable integrated control of quality in relation to building specially in housing quality can be established. An example of the use of quality policy in relation to the cycle can be demonstrated by the present ideas on quality proposed by the Dutch Housing Programme [27b] described later. The thought and consequences of their ideas are explained as follows:-[27a]

" - It is very important to aim at optimum quality, which is a combination of use value and costs. The use value determines the quality of the dwelling from the point of view of use which fulfils the users requirements from a purely functional point of view, for example, whether a dwelling affords adequate protection against the weather, adequate privacy, suitable space for the various functions of preparing meals, laundering, leisure, study, etc.., and whether the space units and the facilities they contain are such that the functions can be performed with

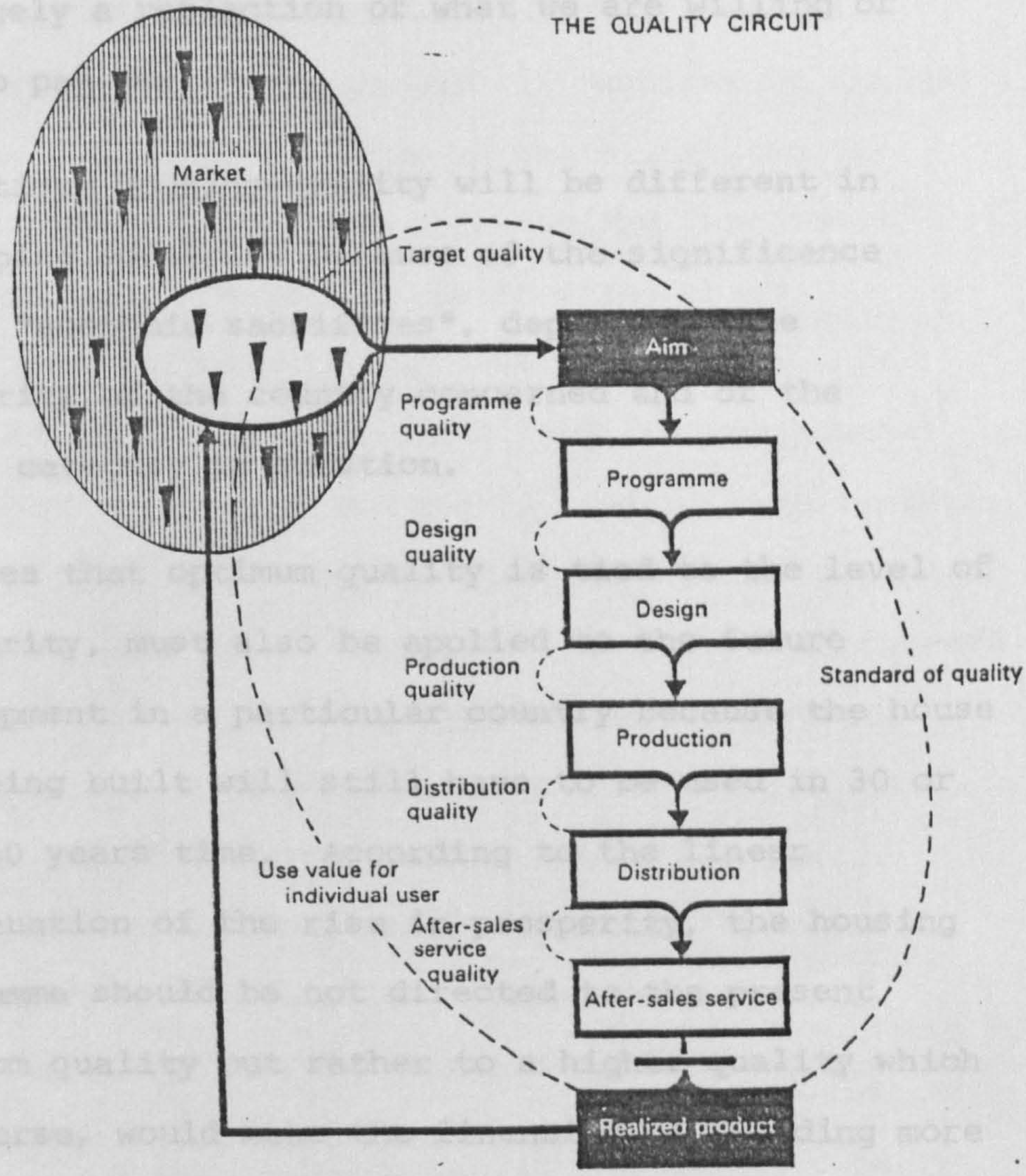


Figure 2.13 The Quality Circuit, a net work of interacting phases including considerable feed forward and feed back which represents the systematic relationship between thought and action throughout the phase of the circuit.

minimum physical and mental inconvenience. The economic quality calculated by weighing the cost against the use value, it conceives the idea that "The ideal house is an impossible concept in many cases, the quality of a house we are able to occupy is largely a reflection of what we are willing or able to pay for.."

-The optimum housing-quality will be different in developing countries because of the significance of the "economic sacrifices", depends on the prosperity of the country concerned and of the social category in question.

-The idea that optimum quality is tied to the level of prosperity, must also be applied to the future development in a particular country because the house now being built will still have to be used in 30 or even 50 years time. According to the linear continuation of the rise in prosperity, the housing programme should be not directed to the present optimum quality but rather to a higher quality which of course, would make the financing of building more difficult." [27a]

The sequence of interacting phases of activities, regards the basic decisions "to build or not build, what to build and where to build" as the typical decisions to be taken

by the client, which are often based on intuition and sentiment rather than on an exact market analysis.
The result is that many building are not of optimum quality either because they are too large or too small, or are built in the wrong place. The aim is to achieve optimum results also in regard to the basic decisions which are called "aims" in the circuit. The programme of requirement bridges the gap between the basic decision of the client and the design work of the architect and includes the functional requirement, the spaces required, their size, shape, lighting, heating requirements and other essentials. It also includes the user's requirements, and the arrangement of the space with respect to the special set of requirements. The architect's task in the design stage is to make allowance for the programme in a net-work of feed-back and feed forward information, but it must also be directed to an easy and inexpensive, production of the building as he is the most important bridge-builder in the quality circuit. The responsibility for production quality lies in the hands of the contractor, to ensure that the design drawings are implemented, and to achieve substantial achievement in production quality. The distribution posess a special problem as the first user does not usually remain in his house. Changes occur in the living requirements over the years in matter of age, changes of occupation, and a rise in prosperity. The after-sales service are the activities by which the initial standard of quality is maintained in the

course of time. Maintenance and durability of materials and ease of repaire or replacement is clearly of importance here. Figure -2.14- explained a proposed development cycle for mass-production of dwellings of optimum quality in the Netherland. The most important phases in the cycle are:-

1. Research phase (function, technique, economics and organisation), including the choice of housing types, and their programmes of requirements.
2. Functional prototype, a specimen of the dwellings manufactured to full scale, but not yet in 'actual' structural materials to test the special quality of the dwelling.
3. Technical prototype, and improved functional prototype made of 'actual' materials to test the technical quality of the dwelling.
4. Experimental series, improved technical prototypes manufactured with the aid of the 'actual' production orgainisation, to test the production technique (assembly methods, assembly sequence, timing of operation etc..), and the tools developed, and to train the labourers and their supervisors on the job.
5. Mass-production to realise planned quality and costprice.
6. Determination of use-value for the occupants of the mass-produced dwellings.

Proposed development cycle for mass-production of dwellings of optimum quality in Netherland.

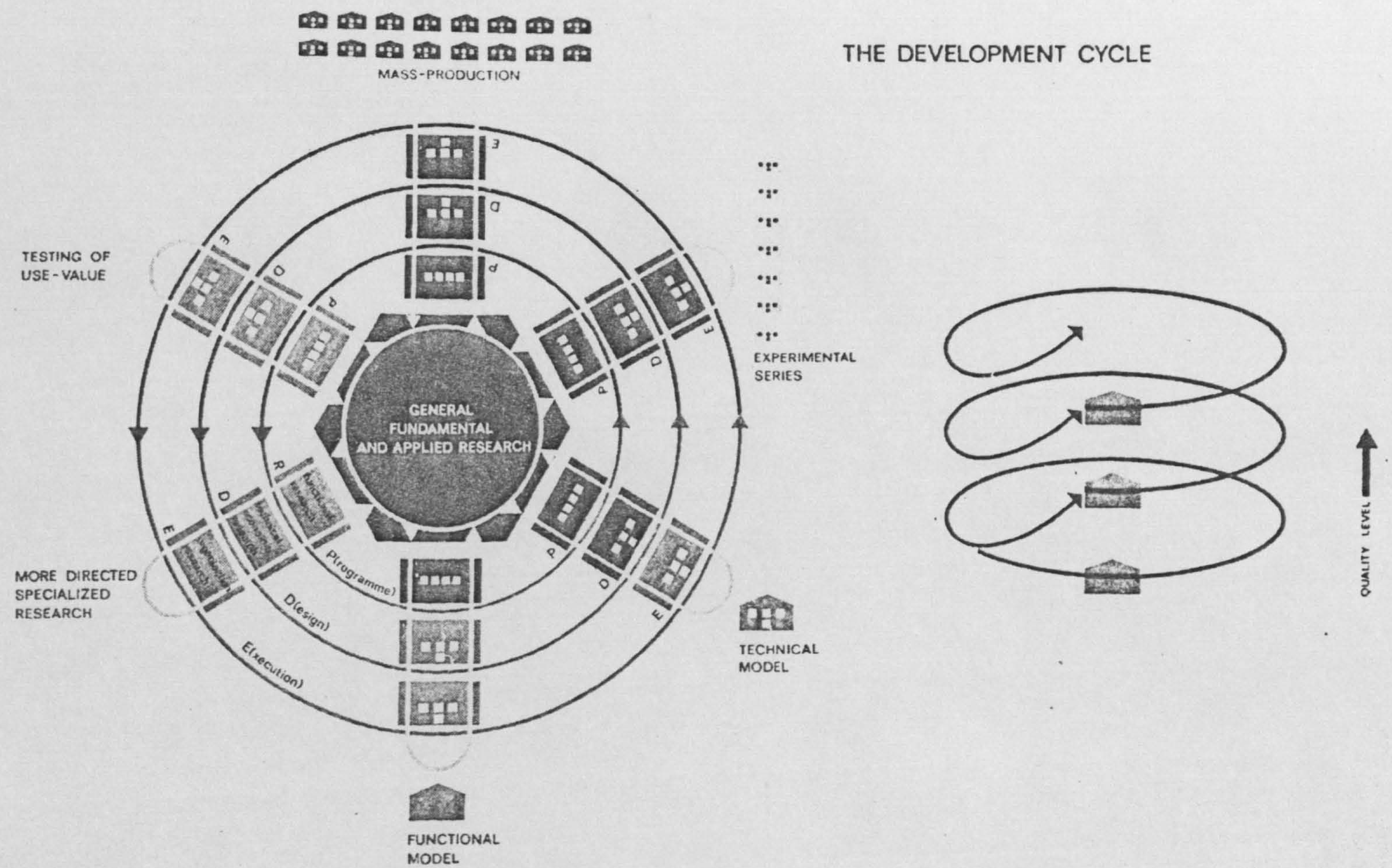


Figure 2.14 The Quality Development Cycle

Phases 2, 3 and 4 are undertaken to enable all kinds of changes to be made before the fifth phase commences, because it is clear that once mass-production is under way any changes would be very costly and disturbing. If optimum quality is to be achieved it will be necessary to make prototypes whenever the practical properties of the design cannot be adequately approached by theoretical means, thus on paper and whenever there is a risk of serious damage if ultimate production takes place on the basis of untried design. This situation is present when the produced concerned is complicated, multi-dimensional and mass-produced. Team work is an essential condition, after one complete cycle a new one starts on a higher quality level.

Although this section will be considered in more detail when approached to the problem in Syria it is interesting to see how this work is applicable to the developing world. When the development cycle is being applied in poor countries special attention must be given to the following points:

a) The quality level the people can afford.

b) The minimisation of the use of foreign currency (i.e. use of local materials).

c) The special measures to bridge the gap between need and buying power (more or less complete dwelling, application of various degrees of self-help and combinations).

However in an attempt to allocate responsibility for quality, various procedures and arrangements are being introduced in different countries to provide reliable information to allow responsible decisions. In both previous analyses the study of building failure and its application, and the development cycle, the designers always demanded the adoption of highly relevant codes and standards, and agrément certificates, and the guarantees of performance measured against accepted independant criteria. The significance of this matter will be touched on the following pages under the title of quality assessment.

Most of these methods are used for measurement, description, and assessment of qualities of building elements and components involving quantifiable terms. The objective is to feed-back information to the designer, to over-come difficulties and failure in future development, Some of the activities are directed to influence the design process.

The Present Approach To Quality Performance Assessment:

Much of the current research about buildings quality-assessment is devised in a such a way that the performance of product and process of a building could be assessed in quantiative terms. Two levels of performance are described by Blachère:[28]

a) The building performance to satisfy requirements.

b) The building component and material quality required.

This recognises the need for different types and methods to be described in the quality assessment systems of buildings, its components and its methods of assembly, and more recently to describe the design process. According to Karlen (1971)[29] the need for such methods have arisen during the last ten years with the increasing importance of the communication problems in the building field, the activities of such processes described in the following sequences:

a) The building process has to be analysed in order to make new syntheses possible, which means that information as the basis for decision making has been brought to the specific attention of the designer.

b) The results of the research and development work, must be tabulated and communicated to users and practitioners to get the practical application of results.

c) The resources we have for the building and maintaining good physical and psychological environments for the consumers are limited. This requires an increased degree of contact and dialogue with the consumer. New forms of communications created to help in the building industry which is not isolated from human needs and from society.

d) The steering of the total building process within defined goal-settings needs a feed-back information function. The establishing of a feed-back information function creates a need for help from information science.

e) The complexity of the total building process and the need to carry out the different roles of professions requires co-ordination of data in the information flow which means that comprehensive information systems have to be created.

f) The increasing flow of information to building practitioners seems imposible to manage in a situation when the industry contains a numbers of practitioners who cannot work on information of a theoretical character and therefore need information specifically transformed to fit their needs.

g) The application of the computer, and the creation of a basic information system together with requirements on performance of the computer based on an information system formulated from that basis,may be of assistance.

Karlen[29] describes a "performance concept" in order that more information can be available concerning the requirements and the properties of technical solutions for the earlier stage of building design. He pointed-out that in the building process a lot of important decisions has to be taken in the begining during a short period of time when little information is available. The later part of the progress has a larger time and the information during that period has more a routine character. Most improvements in information technique have been made in this later stage. To over-come this problem Karlen concludes that for the earlier stage the applications of the "performance concept" can change the conditions, so that more information is available concerning the requirements and the properties of technical solutions.

The performance concept is seen as a quantitative concept. It gives a general picture of the serviceability, the effectiveness of the technical solution. This could be compared with requirements of the same character, and also to be used, as a category of factors used for cost benefit analysis.

The performance concept is close to the "Black box" concept figure -2.15-. It can be applied and used in quality description and quality assessment systems for the two levles of the performance described above by Blachere[30]. The principle of the "Black box" can be used with the "translucent box", when the containing of the mechanism for the function of the box is difficult to apply or unnecessary to apply. This quantitative expression of the effeciency of the performance can be used as a general qualitative judgment of the technical solution parts of which judgment can be used on measured values. (Figure -2.16-).

The development of performance concept(figure -2.17-) described by the U.S Building Research Devision[31] as no more than a performance criteria to guide the designers and producers of innovative building systems. The development started with the emphasis on the user and ended with the performance evaluation. The various steps in the development of performance concept are summarised as follows:

a) The Emphasis on the User Performance, whether of a material, a component, or a system is always defined in terms of their desired function, since ultimately, the function of a building is to serve their users. Performance requirements must be defined and stated in terms of users needs and wants.

b) User Requirements It is important to determine the users needs which could be satisfied from other approaches possibly non building. The determination of such requirements in some cases can be easily made, but in other cases the determination is not so easy since the present stage of knowledge is sufficient to define all aspects of user requirements. It is not enough to determine the requirements of the users. It is also necessary to understand the significance

DOCUMENTATION

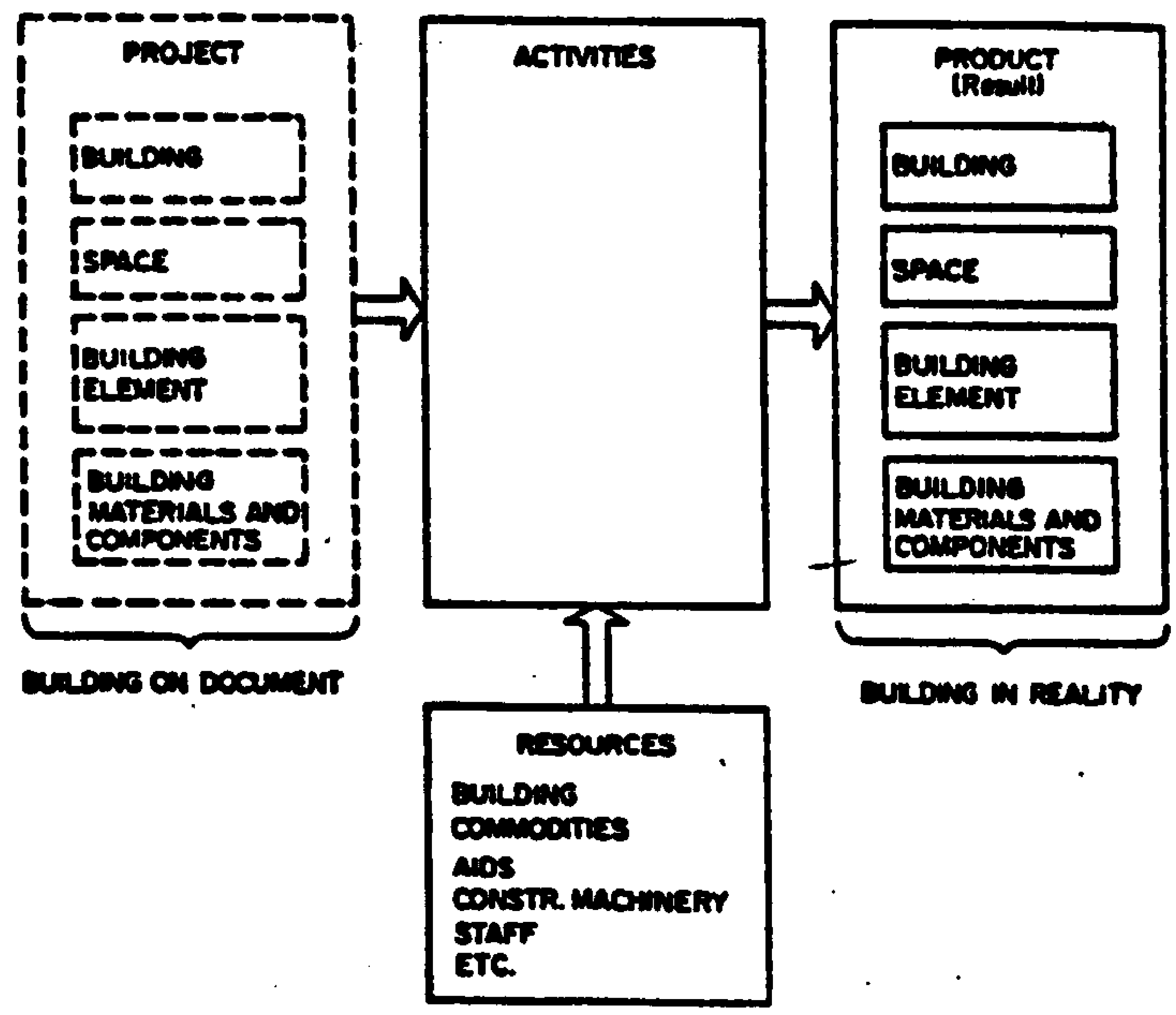


Figure 2.16 'Translucent Box'

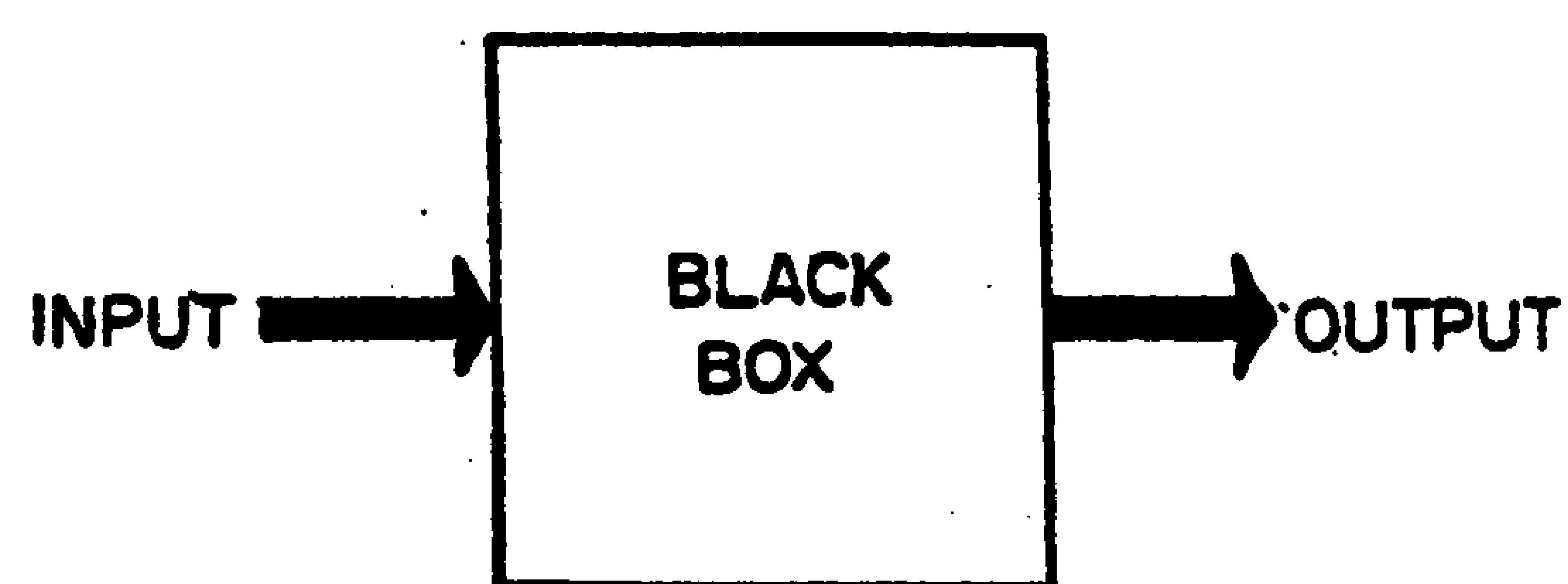


Figure 2.15 Performance concept as a 'Black Box' concept, it can be applied and used in quality description and quality assessment systems for the two level of performance.

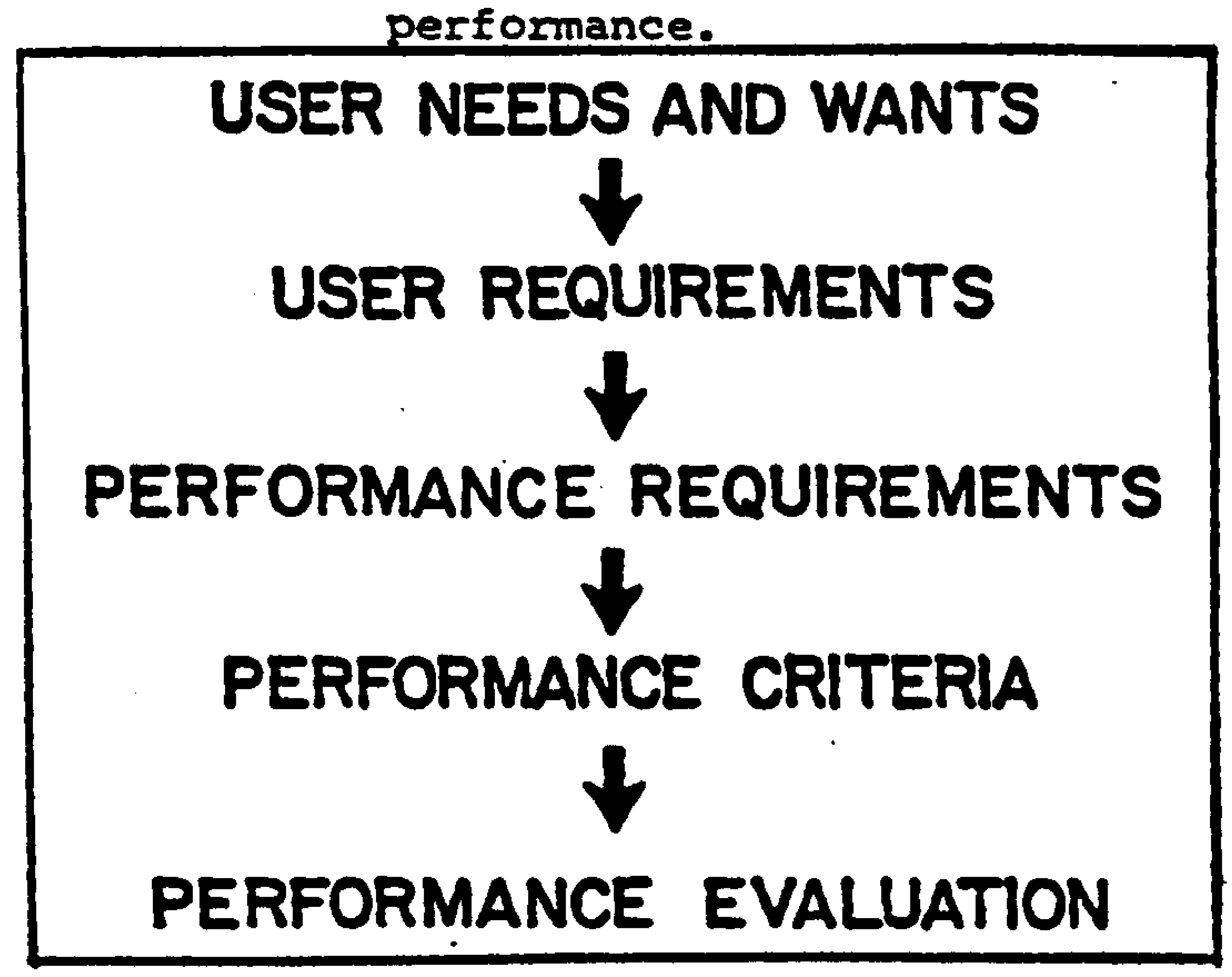


Figure 2.17 'Development of Performance' concept as a performance criteria to guide the designers and producers of innovative building systems.

of satisfying these requirements at a certain levels, which will permit optimisation of the built environment within given technological and economic constraints, by permitting a lower level of performance in one area in return for a higher level in another area, which may turn out to be more important to the users.

c) <u>Performance Requirements</u> Performance requirements derived from user requirements are defined as qualitative statements of the attributes required from the built environment. However qualitative statements do not sufficiently define performance. So a quantitative statement is needed to define performance with more information needed to determine the requirement either by failure analysis or by tests on prototypes. A statement of performance in terms of measurable quantities is defined as a performance criterion.

d) <u>Performance Evaluation</u> It is essential for the feasibility of the application of performance criteria, that these criteria should not only be stated in terms of measurable quantities, but also that the method of measuring these quantities be available.

The application of systems such as performance concept and performance criteria, are presently being applied in several countries. The objective is to assess the quality of buildings, components or the design process. Some of the methods used are described as follows:

Agrément System[32] This method is called the "Performance-in-use" and described the building components. The agrément system exists and functions in Europe. In France it is called "technical opinion" concerning fitness for the purpose of processes, materials, element or equipment used in buildings. The term in this case is restricted to the set of precedures and methods which allow buildings or parts of building to be constructed for a particular purpose, using products that are defined in their nature, composition and properties - where applicable - and form and dimensions. The term does not cover the methods of manufacture of the products themselves. The agrément is a procedure that is used to assess whether a new product or process is suitable for use, after being evaluated in terms of, safety, habitability "contribution toward environmental control", durability, practicability "handling installation, maintenance". The information of such evaluation issues by the Agrément Board which give an expert reassurance and provides related design data in a form and in the order needed by the architect and other consultants. There is much common ground between the agrément concept and the concept of performance specification in Britain. Both rely on the performance concept described above, as they have to decide on qualitative and quantitative levels of performance which are important and desired in the completed building. The agrément system is seen by Parker[32] as an efficient technological appraisal system, to help the designer and aid him in his judgment to know more about the quality of new product and assess the value of properties of the new product.

<u>Operation Break Through</u>[33] (whole building)

This methods is used by the U.S. Department of Housing and urban development to assist in the production of a high volume of quality housing. It involves information useful to all concerned in the development process, and has information on sites, site developers, site planners and housing systems. The method is used to evaluate housing systems on the basis of the reference standards in codes. The evaluation criteria have been developed specifically for the project which is used to determine and certify the adequacy of innovative housing systems. Four different types of housing facilities make up the performance criteria in this programme.

1. Multifamily high rise.
2. Multifamily low rise.
3. Single family attached.
4. Single family detached.

The criteria consist of stated requirements, one which is qualitative and one which is quantitative to examine the aspect of housing performance, followed by a test devised for the evaluation of compliance with each criteria, which are organised according to matrix form table -2.18-. The development of the matrix accomplished the task of organising the material for easy reference and cross-reference of the built element of the building on one side and the functional attributes desired on the other side. Each line of the matrix is a chapter in each of the four sets of criteria. Each intersection on the line becomes a section of the chapter devoted to the way the built element satisfies that attribute with several criteria included in each section. The operation Break Through can be utilized to assess any products designed for one of the four types of housing. Among its important programmes are the promotion of performance codes and standards, studies of performance concept in building systems, research in building strength and safety, sensory environment, building economics, and can be applied to comprehensive planning policies, definitive urban design, and performance orientated zoning and codes.

<u>The Method of Pluses and Minuses</u>[34]: (whole building)

The method known in France as the"money worth methods"or (+and- method), has been operational in France and applied to several terms of thousands of dwellings in the public sector representing several hundred housing schemes. The method deals with the evaluation of the commercial value "the assessment of the material consistence of the building",

Built Elements			Attributes: 1 Structural Serviceability	2 Structural Safety	3 Health and Safety	4 Fire Safety	5 Acoustic Environment	6 Illuminated Environment	7 Atmospheric Environment	8 Durability/Time Reliability (Function)	9 Spatial Characteristics and Arrangement
	Structure	A									
Interior Space Dividers	Walls and Doors, Inter-Dwelling	B									
Interior Space Dividers	Walls and Doors, Intra-Dwelling	C									
Interior Space Dividers	Floor-Ceiling	D									
Exterior Envelope	Walls, Doors and Windows	E									
Exterior Envelope	Roof-Ceiling, Ground Floor	F									
	Fixtures and Hardware	G									
	Plumbing	H									
	Mechanical Equipment, Appliances	I									
	Power, Electrical Distribution, Communications	J									
	Lighting Elements	K									
	Enclosed Spaces	L									

The matrix used in operation Breakthrough

Table 2.18 Matix form used in the operation break through to accomplished the task of organising the material for easy reference and cross-reference of the built element of the building on one side and the functional attributes desired on the other side.

against the quality of the dwelling in its ability to satisfy a set of requirements, objective or measurable quantifiable ones such as:-

- Thermal insulation.
- Sound insulation.
- Aesthetics
- Durability.
- Style of living.
- Ease of maintenance.

It emphasised that the documents deal with those aspects mentioned above and do not deal with the overall quality which can only be assessed by the person responsible for the final decision, taking acount of his personality requirements etc... Thus e.g., the aesthetic side may be judged excellent by architects even if the utilitarian aspect shown by the method is poor. A building owner on the other hand might give greater weight to what he obtains for the money he was invested. The methods particularly deal more with the sale value of the dwelling, which justifies its litle of the"money's worth"or"pluses and minuses".
For Noel[35] the theoretical justification of such judgment, is that money's worth does not prejudice the quality of the work. Although it is normal for the price of a job often to be synonymous with quality because it is difficult to imagine in a competitive market that dear materials should be of lower quality than those of lower price, apart from

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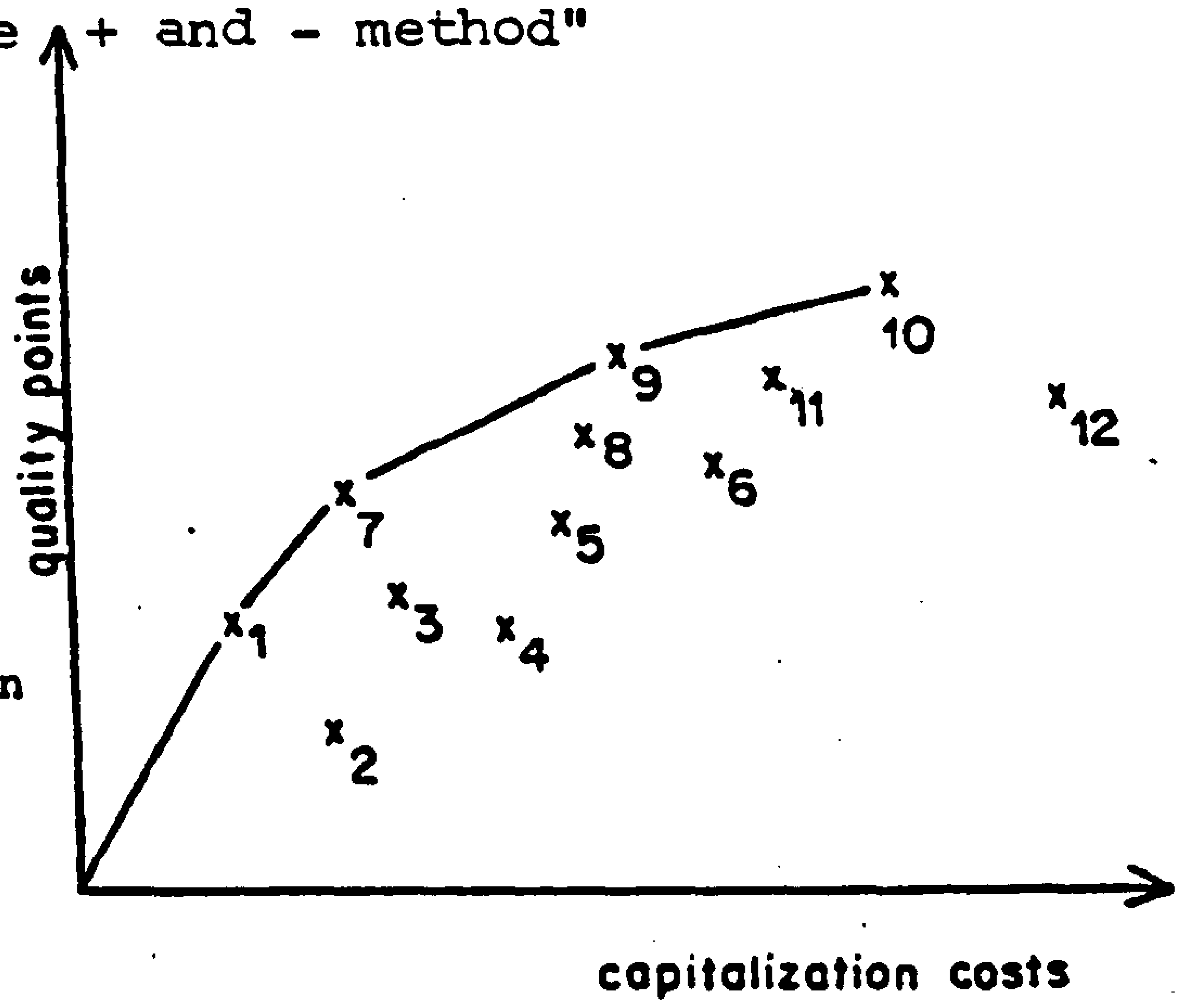
Quality Assessment
The application of "The + and - method"



Simple example of the application of the + and - methods. The prospective owner or user of the building has to choose one of twelve projects.

Figure 2.19 The real valuation between quality and costs in twelve different project shown for the four feasible projects (1,7,9,1C)

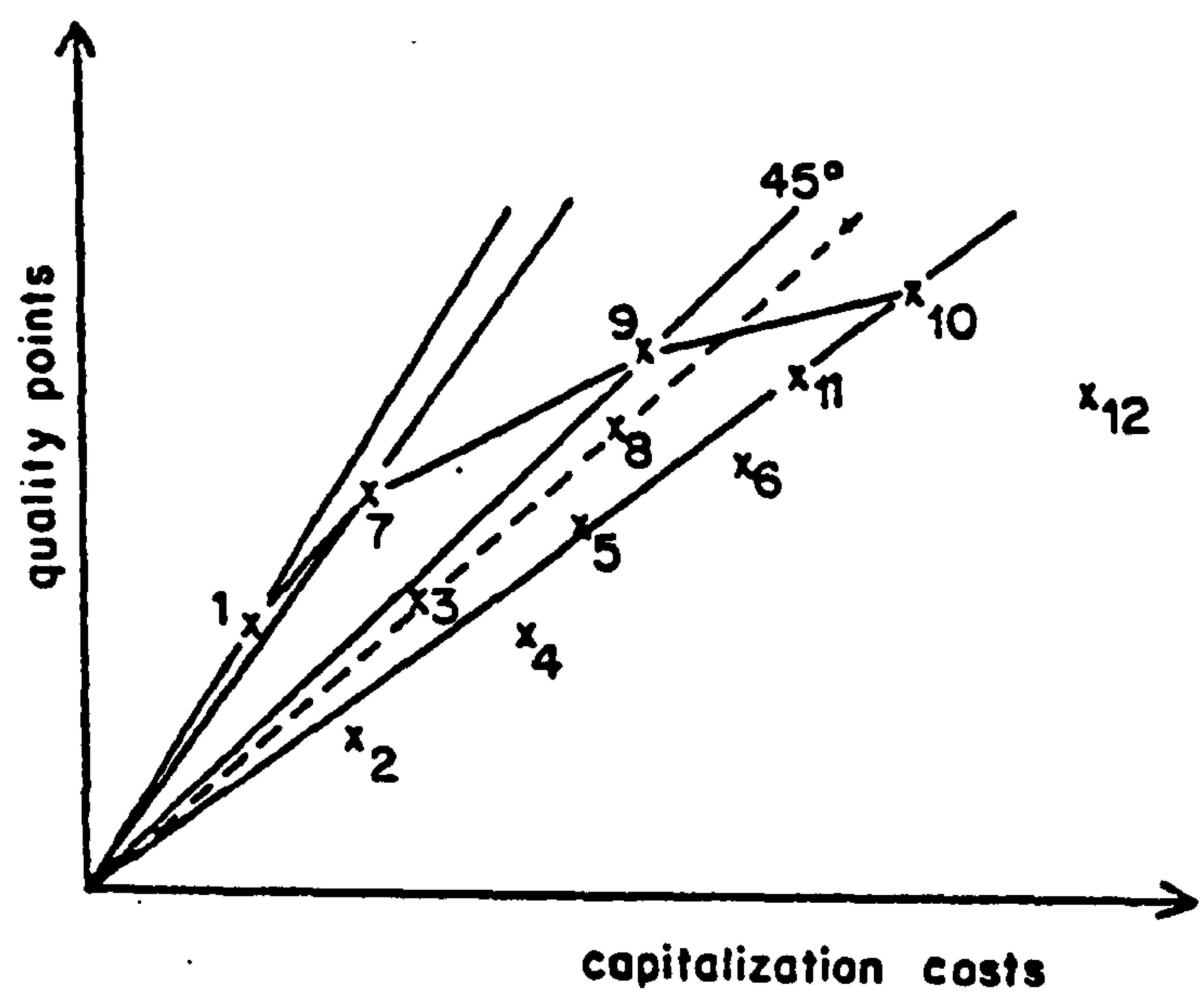
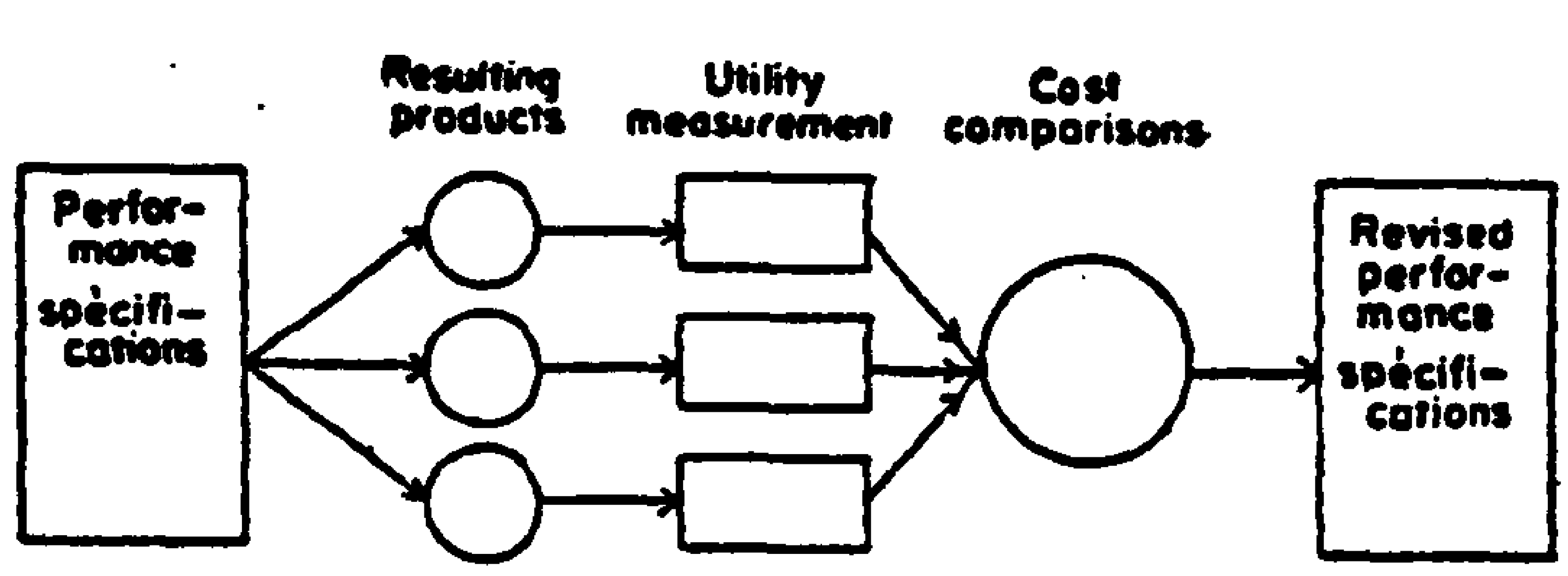


Figure 2.20 The quotations of valuation are shown by lines from the origin to the projects



The control process using performance specification, application of the methcd as a concept of performance specifications fcr building detailed costs statistics other reasons such as novelty. However despit the fact that it is very difficult to assess the validity of such argument because of the difficulties to estimate the quality or total costs satisfactorily. The method is considered as a step forward in assessing some aspect of architectural quality. The method will be discussed further in chapter four in this section. Fig. -2.19-20- shows a very simple example of the application of the pluses and minus methods in a situation where the prospective owner or user of the building has to choose one of twelve projects. Each project has a value for total costs and quality, in this example the most favourable projects are No. (1,7,9 and 10), which are placed in a curve. The four projects are most favourable than the other projects because they give more quality for the same costs or lower costs with the same quality.table -2.21- and 2.22 shows detailed assessment form with examples.

<u>Egenskapsredoristing System</u>[36] (Components and methods of assembly)

The method used to assess the suitability of building materials and product requires accurate information about their properties. It is a "quality description approach" developed by the ER(Egenskapsredoristing), council in Sweden which linked to the Sweadish Building Centre.

The system aims to provid a common framework for the designer, product manufacturer, building contractor and building owner, to evaluate building products, and to give complete information about their properties.

C S T B PIRP	ASSESSMENT OF THE QUALITY OF DWELLINGS EFFECTIVE MONEY'S WORTH **DETAILED ASSESSMENT FORM**	Form **F.A. 22 c**

Designation of the scheme

Example of application

Total number of dwellings 118 **Average no. of rooms** **Av. area per dwelling**

Type of dwellings P.S.R.-P.L.R.-H.L.M.-I.L.M.-I.L.N.-Model

Price per square metre of living area, building only 485 F **Zone** P

Method of consultation : award of contract

Renewal : no.

TOTAL OF THE MONEY'S WORTH ACCORDING TO THE ROOMS OR ITEMS TAKEN INTO ACCOUNT

TOTAL I : A+B+C+D+E+F+G+H+I	–	+	1,417.83
TOTAL II : A+B+C+D+E+F+G+H+I+J+K	–	+	3,655.83
TOTAL III : A+B+C+D+E+F+G+H+I+J+K+L+M	–	+	3,208.83
TOTAL	–		
+ Heating –			720
+ Lift –			208.20
+ Heating + Lift –			928.20

Improvements which can be introduced : flooring of wet rooms; ceilings of wet rooms; external openings; finishes of elevations (wall panels between windows, gable-ends) internal finishes of wet rooms. Finishes behind appliances; sink unit; storage spaces.

NOTES ON THE ASSESSMENT OF THE MONEY'S WORTH

The aim of the present table is to allow assessment of the money's worth of the various supplies and services represented by the finishes and fittings of a scheme comprising different types of dwellings referred to a reference dwelling of 4 principal rooms of an area of 70 m² the characteristics of which are at least equal to those defined by the C.P.T.F.M.U.(¹) assigned a place in an R + 4 building.

This assessment is confined to those items which, when the works are finished, can be seen, touched or manipulated.

1. **The money's worth P of the scheme** will be judged on the value of those items and areas, the limitative list of which appears in column 2 of the table. It will be calculated on the following bases corresponding to a notional dwelling of 4 rooms typical of the scheme to be judged.

   a) The unit prices must be those fixed by the C.S.T.B. list of unit prices. Should the nature of the proposed item not figure in the list of prices, this item shall be assimilated to that which is nearest to it.

   The unit price per m² of habitable area in excess of 70 m² per dwelling is uniformly fixed at 100 F/m².

   b) The quantities corresponding to the dwelling to be judged must be those of col. 6, except for shuttering, finishes behind sanitary appliances, the number of internal doors the quantities and areas of which will be determined from the information on sheet 1 (Supplementary Information). The fittings will, in the same way, be counted at their actual value, as will the following rooms and areas :
   - The excess of habitable area - over the 70 m² reference area;
   - The natural dryers, loggias, balconies and other private service areas (cellars and wine cellars);
   - The means of access - entrance halls, staircase wells.

   c) The total P of the money's worth of the dwelling will be obtained by multiplying, item by item and room by room, the quantities by the corresponding unit prices and adding all these products.

2. **The total P thus obtained is related to the total P_r of the money's worth of the reference dwelling. THE DIFFERENCE $P - P_r$ REPRESENTS THE DIFFERENCE IN MONEY'S WORTH.**

A detailed observation can also be made if the partial totals of the families numbered from 1 to 13 which appear in cols. 5 and 8 are brought together.

N.B. *If P_1 is the total price of the dwelling obtained by applying to the prices of building only from the Order of 21/3/66 (²) the increases in price which correspond to the use of lifts, of heating and of communal aerials, the difference $P_1 - P$ represents the price of the 4-room dwelling reduced to 70 m² area and possessing the same fittings and finishes as the reference dwelling.*

CALCULATION OF AREAS

1. Habitable areas S'_H

The habitable area of the notional 4 rooms of the scheme is obtained by multiplying by 70 m² the ratio of the actual total habitable areas to the sum of the habitable areas S_{Ho} obtained by allocating to each type of dwelling the maximum areas envisaged by the Order of March 1958, or :

Type I up to 30 m² - Type II : 45 m² - Type III : 57 m² - Type V : 85 m² - Type VI : 100 m².

$$S'_H = \frac{\Sigma S_H}{\Sigma S_{Ho}} \times 70$$

The price per square metre is fixed at 180 F.

2. Storage areas S'_R

The formula to be applied is

$$\boxed{S'_R = \frac{\Sigma S_R}{\Sigma S_H} \times S'_H}$$

where $\Sigma (S_R)$ = Total storage areas of the scheme
$\Sigma (S_H)$ = Total habitable areas of the scheme
S'_H = Area of the notional 4 rooms : taken into account in the judgment (excess area).

The price per square metre applicable is a mixture of the prices of the different types of storage in the proportions of the quantities which appear in the questionnaire.

3. Loggias and balconies

The areas per average dwelling will be taken.
The price applicable will be a function of the number of loggias or balconies per average dwelling.

4. Other areas (cellars, halls...)

The areas per average dwelling will be taken.

(1) Said document was abrogated by a circular letter dated 22nd April 1969. It has been replaced with the general technical clauses the HLM, I.e (Modest cost housing) of May 1968
(2) Order of 21/3/66 - *Journal officiel* of 22 March 66 relating to the technical characteristics and cost price of low-cost housing for letting.

Figure 2.21 Assessment of the quality of dwellings. Part of actual detailed assessment form for pluses and minuses methods.

LEVEL OF MONEY'S WORTH OF THE NOTIONAL DWELLING - 4 ROOMS A – 77,35 m² OF ACTUAL SCHEME COMPARED WITH A REFERENCE DWELLING - 4 ROOMS A – 70 m²

Nº of Item (Col 1)	Items included (Col 2)	Reference dwelling: Quantities (Col 3)	Reference dwelling: Unit price (Col 4)	Reference dwelling: Total (Col 5)	Dwelling to be assessed A – No. of rooms: 4: Quantities (Col 6)	Unit price (Col 7)	Total per structural part (Col 8)	Total per family (Col 9)	Difference (Col 8) +	Difference (Col 8) –
I.	ITEMS INCLUDED IN THE CEILING PRICE									
1.	Horizontal Items									
11	Floorings									
	Floors of wet rooms	14,00	19,80	277,20	14,00	15,40	215,60			61,60
	Floors of dry rooms	53,00	15,95	845,35	53,00	19,10	1012,30		166,95	
12	Ceilings									
	Ceilings of wet rooms	14,00	13,95	195,30	14,00	6,00	84,00			111,30
	Ceilings of dry rooms	53,00	6,00	318,00	53,00	13,95	739,35		421,35	
	(TOTAL A)			1635,85			2051,25	2051,25	415,40	0
2.	Vertical Items									
21	External openings									
	Windows (TOTAL B)	19,00	70,00	1330,00	19,00	63,00	1197,00	1197,00	0	133,00
22	External finishes									
	Spandrels	13,00	25,20	327,60	13,00	33,60	436,80		109,20	
	Wall panels between windows	13,00	25,20	327,60	13,00	21,60	280,80			46,80
	Gable ends	5,00	25,20	126,00	5,00	21,60	108,00			18,00
	(TOTAL C)			781,20			825,60	825,60	44,40	0
	Basements									
23	Internal finishes									
	On elevations:									
	- habitable rooms (dry rooms)	26,00	2,75	71,50	26,00	2,90	75,40		3,90	
	- service rooms (wet rooms)	5,00	14,30	71,50	5,00	12,10	60,50			11,00
	On internal load-bearing walls									
	- habitable rooms (dry rooms)	148,00	2,75	407,00	148,00	2,90	429,20		22,20	85,80
	- service rooms (wet rooms)	39,00	14,30	557,70	39,00	12,10	471,90			
	Finishes behind appliances	2,50	48,00	120,00	2,10	48,00	100,80			19,20
	(TOTAL D)			1227,70			1137,10	1137,10	0	89,90
3.	Fittings									
31	Sanitary appliances									
	Bath	1	280,00	280,00	1	600,00	600,00		320,00	
	Wash basin	1,2	140,00	168,00	1,2	140,00	168,00		0	0
	W.C.	1	150,00	150,00	1	150,00	150,00		0	0
32	Household appliances									
	Sink unit	1	376,00	376,00	1	333,00	333,00			43,00
	Rubbish chute	1	320,00	320,00	1	343,00	343,00		23,00	
33	Installations									
	Hot water (production)	1	520,00	520,00	1	600,00	600,00		80,00	
	Hot water (piping)	1	150,00	150,00	1	150,00	150,00		0	
	Cold water - Waster	1	700,00	700,00	1	715,00	715,00		15,00	
	Electricity	1	1000,00	1000,00	1	1295,00	1295,00		295,00	
	Television	0	0	0	1	100,00	100,00		100,00	
	(TOTAL E)			3664,00			4454,00	4454,00	790,00	0
34	Shuttering (TOTAL F)	3,80	61,00	231,80	17,00	63,32	1076,44	1076,44	853,14	0
35	Doors									
	Landing door	1	170,00	170,00	1	180,00	180,00		10,00	
	Room doors	8	100,00	800,00	7	100,00	700,00			100,00
	(TOTAL G)			970,00			880,00	880,00	0	90,00
				9540,55				11630,55	2102,94	312,90

Nº of Item (Col 1)	Items included (Col 2)	Reference dwelling: Quantities (Col 3)	Reference dwelling: Unit price (Col 4)	Reference dwelling: Total (Col 5)	Dwelling to be assessed A – No. of rooms: 4: Quantities (Col 6)	Unit price (Col 7)	Total per structural part (Col 8)	Total per family (Col 9)	Difference (Col 8) +	Difference (Col 8) –
								11630,55	2102,94	312,90
4.	General items and fittings									
41	General items									
	Roofs (TOTAL H)	20,00	19,00	380,00	20,00	19,25	385,00	385,00	5,00	0
5.	Habitable rooms									
54	Storage (TOTAL I)	m² 3,00 (nb. 8)	1058,00	1058,00	3	226,13	678,39	678,39	0	377,21
	Total finishes + decorations + fittings + roofs							12696,30		1417,13
	A + B + C + D + E + F + G + H + I			11 278,55				12696,30	1417,13	0
55	Excess area (m² above or below 70 m²) (TOTAL J)	0	180,00	0	7,35	180,00	1323,00	1323,00	1323,00	0
6.	Rooms outside the habitable area									
61	Service areas									
	Loggias	0	0	0	3,00	184,00	552,00		552,00	
	Natural dryers	0	0	0	1,50	242,00	363,00		363,00	
	Heated dryer	0	0	0	0	0	0			
	(TOTAL K)			0			915,00	915,00	915,00	0
	Total finishes + decorations + fittings + roofs + areas (not including cellars, Wine cellar, and access) A + B + C + D + E + F + G + H + I + J + K			11 278,55				14934,31	3655,83	0
	Cellars	m² 3,00	150,00	450,00	2,39	150,00	358,50			91,50
	Wine cellar	0	0	0	0,61	215,00	131,15		131,15	
	(TOTAL L)			450,00			489,65	489,65	39,65	0
62	Access and communal circulation areas									
	Staircase well of the storey	1	1400,00	1400,00	1	1032,35	1032,35			367,65
	Entrance hall	m² 1,00	350,00	350,00	0,66	350,00	231,00			119,00
	(TOTAL M)			1760,00			1263,35	1263,35	0	486,65
	Total finishes + decorations + fittings + roofs + areas (including cellars, wine cellar and access) A + B + C + D + E + F + G + H + I + J + K + L + M			13 478,55				16687,38	4385,55	1175,76
									3207,83	
II.	STRUCTURAL PARTS OUTSIDE THE CEILING PRICE									
33	Heating	1	2300,00	2300,00	1	3020,00	3020,00	3020,00	720,00	
43	Lifts	0	0	0	1	208,20	208,20	208,20	208,20	

Figure 2.22 Assessment of the quality of dwellings. Part of actual scheme compared with a reference dwelling.

There are some other specialised systems which relate to quality, particularly in housing. These will be considered in a later chapter as these form a useful introduction to the section on case studies which forms part three of this thesis.

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2.3 SOCIAL VALUE AS A FACTOR IN BUILDING QUALITY

2.3 Social Value as a Factor in Building Quality.

The architects Responsibility Towards Humanity

Having outlined the nature of quality philosophy and surveyed the different methods used for measuring the quality of building elements and components against the concept of standard performance, it may be useful to report at this stage upon the significance of architecture as the expression of social values. It is assumed that social values reflect the pattern of human needs and ultimately it is hoped to identify in building terms the attitude towards understanding the extent of human needs in order to evaluate the satisfaction of those who use or come into contact with buildings. It is now generally held by historians in the field of modern architecture that architects have always been aware of the influence of their buildings on the social life of people. Nevertheless it has only been in the last two decades that there has grown a much greater awarness among architects of the need for a better understanding of the way in which people and building interact. There is evidence of the changing approach to architecture reported by two different writers Banham and Allsoppwho argued the point on two different occasions that architects of the modern movement in their search for modern style have contributed to the growing demand for a better society, Banhams states:

> "There was no overall theory but, by implication modern architecture was not a style; it was the evolution of a final type of norm, whose prefection he (Le Corbusier, Pierre, Urbaine, Paul Valery, Piet Mondrian) and among others saw as an event of the immediate future, or even the immediate past"[1]

Furthermore, Allsop suggests that the modern movement never happened at all and that:

> "The period 1919 to 1970 characterised by a multiplity of competing experiments and may properly be called twentieth centry transitional. <u>It may be seen to have paved the way for an architecture which belongs to the humanity of modern civilization.</u>"[2]

The effects of the modern movement or the "Twentieth Centry Transition" represent the changes which have taken place upon the actual practice of architecture outlined in part one. How the social values should influence the objective of achievement of quality in architecture is an open question at the present time. If we accept Allsop thesis about the transitional nature of present situation then the matter will be resolved only at some future day in any case. On the other hand the social climate must be a factor in design at present and if we assumed that an architect who publicity announced he was disregarding this area one can imagine that he would be severely criticised. Clearly, in some building types this question is more simply focused than others. Housing is area that has links between social value and quality, but the overall question

> influence our responses as long as both are judged from the user's point of view... It is my contention that design quality, which we consider to be the way a thing looks in contrast to the way it works is a motivating force in our society, but it should be judged as a functional factor rather than a matter of the designer's personal taste. In other words, as the designer proceeds from the basic solution provided by the translation of the brief proceeds, the decisions he makes about form, kinds, colours, texture, and detail, should be made in terms of what these choices communicate to the user rather than his own philosophy on the fashion of the moment"[4]

He pointed out a list of criteria compliance with which affects design quality and which encomposses all other factors:

1. Human factors including the functional requirement of the building.
2. Economics.
3. Aesthetic factore.

The effect of the architects judgment and evaluation, particularly on the questions of human value, are under considerable argument from inside and outside the architectural profession.

Several issues have emerged here wich current research tends to focus on. These may be seen as relevant aspects to the subject of architectural quality. They concern the question of the architects responsibility, his objectives and methods used to determine the important question of human needs in any given building design situation.

The problems facing the architectural profession are not new. These have come down the centuries, but if we accept the opinions of Banham and Allsop then it is time again to review the position of the architect in relation to society. These are clearly linked to his functional position under the three criteria described above. It is suggested that the architects role in this context can be covered by three main topics.

1. The architect's social responsibility.
2. Elitism Versus. Real client needs.
3. The architect's role as a universal man.

The first of these issues deals with the question of the architect's responsibility to offer a clear comprehensible human environment for the pattern of life and social content of the people who use buildings designed by architects. It has been said that the architectural profession have subordinated vital human values to somewhat aribtrary professional values. The following comments demonstrate how some of the behavioral scientists feel about this issue:[5]

> "... most architects don't have the foggiest notions how society works, how people live, and how they want to live"
>
> Herbert Gans.

> "They have encouraged the development of an extensive self-congratulatory system within the design profession. The present system is reasonable if architects are giving

themselves awards for sculpture but not if the awards are intended for building in which certain activities will take place."

Robert Sommer

"Part of the difficulty systems from the fact that the builders, if not planners ignore the critical reality that cities are primarily a social organisation,that they are only secondarily collections of concrete, steel, and wooden structure"

James Birren"[5]

These quotations although superficialy critical, at least imply that architects have some responsibility for the social content of the lives of people who use their buildings. It is the methods of implementing this responsibility that attract criticism. The importance of this information, however, only becomes clear when it is compared to the conventional practice of architecture and the assumption made by design professionals in their commitment to the client and users. This is illustrated by the following comments made in articles in a single issue of the R.I.B.A. Journal, reported by Lipman[6] (1970) in his study of the "Social Commitment of Contemporary British Architecture". The quotations presume, on the architect's belief that their professional activities of building design (go beyond the handling of material resources) that they influence people's live on more far-ranging and subtle levels:
The architect/historian Scully wrote "What I Mean By Architecture"[7]

"It seems to me that the human act of architecture is the construction of the whole human environment, and that the entire constructed environment is architecture. Therefore the first element of architecture is the natural world, and the second element is every thing man-made."[7]

Chamberlin's[8] argument that quality distingushing "Architecture from Building" is the designer's ability to "unearth" his client's ways of life and incorporate this in,

"... rooms arranged in a such a way that their relationship has both meaning and inevitability having regarded to the social and formal functions of both the individual rooms and their collective grouping... one can think of the grouping of buildings in an urban situation as a larger manifestation of this problem..."[8]

Richardson[9] sketched the scope of architectural responsibility in the field of house design and site lay-out as:

"Housing must respond to every human sensibility, and answer each human function at every scale.. The role of the house needs to be related.. to the larger structure of the town. As a microcosm of society, housing attracts to itself the attentions of the social engineer." [9]

In these quotations, and a further analysis of Lipman's study (The output of British Architects 1960- 68 emphasized by the orientated goals expressed by selected architects), Lipman predicted that, if their perceptions of the effects of their work prove correct, <u>the profession will shape the social and personal lives of those who use or come into contact with buildings designed by its members</u>[6].
The relevance of such an examination, bring the reports

made by Carter[10] on the growth in membership of the Royal Institute of British Architects - the R.I.B.A. - by 1980, to a growth figure of 27,000 compared with around 12.500 in 1953 to just over 18,000 in 1969. The report outlined the probable future extent of the architects responsibility. Apparently by the year 2000, the equivalent of 140 new towns with a population of 100,000 each, and accommodation for additional population of 50,000 in each 140 existing towns will have been built. Despite the fact, that this figure may have to be reviewed in the light of a falling birth rate and the energy-resource crises, the argument still valid, as put by Lipman is that: If the developments forcast for the coming thirty years materialise, Lipman argued, the effect the architectural profession will exercise on the social lives will increase considerably.

In conventional practice, most architects would agree that they are fundamentally concerned with quality, seeing their decisions to fill the gap between the different aspects to meet human and clients'needs. For example, Ahrends Burton & Koralek[11] a small group design with twenty years of experience spoke of their belief that the quality of the environment has some effect on the quality of people's lives, and could express social values. So, in each particular situation they try to achieve the highest quality they could, relying on their personal evaluation in understanding the problem in hand, Koralek claims that their work consists of innumerable choices - major or minor - making these largely without knowing how.

> "There is always a personal yardstick in the background which is the product of accumulated experience, thoughts, and feelings. Essentialy, it enables us to make functional evaluation, but we try to understand the word, "functional" in its widest sense: all the subtle and immeasurable qualities of a building are functional. There are many criteria we apply, from the most basic functional needs of shelter to the more subtle human needs that are difficult, if not impossible to define. In any given situation we have to try to find what is really significant, what will really matter"[11]

Elitism versus, real client needs

This concerns the whole question of the imposition of cultural values of the architect upon clients and users. It flows from attempting to meet unexpressed needs arising from different ways of life with which, may be, he is unfamiliar. As a result of the personal evaluation, similar to the term used above by Koralek, which usually takes place during the initual stage of design, the architect's expand the boundary of the design situation to develop ideas and simulate situations, helping him to clarify his own attitudes towards design. It is hoped that in this way a discussion of these issues and results will help develop a design concept appropriate to the project in hand. In carying out this process architects tend to make judgments about the objectives the client or user set for himself.
The architect's attitude in this respect is denounced as

"elitism" and evidence of middle class bias[12], which characterises the architecture profession in England and other countries as they tend to recruit its members from specific areas of social structure[13].

In an historical study of the architectural profession in Britain Kaye[14] (1960) presented data showing that one of the characteristics of nineteenth century architecture in England was a considerable number of those sons of the upper middle classes who become professional architects; refering to the former data, Gutman[15] (1975) argued the point that:-

> "The tradition of socially concerned architecture, which has its roots in the nineteenth century and which was incorporated into the so called modernmovement, was directed at problems of physical, health and overcrowding, it proposed to deal with these problems by providing more light, air, and space in and around buildings, but these problems and solutions affect all social classes the same way, and the architect did not need to develop an understanding of different values and attitudes to cope successfuly with this aspect of design."[15]

Considering a major theme of Lipman study[16] (1969), on the concept of social assistance, Lipman contends that:

> "One is not aware of a systematic study of the class origins of contemporary architects, but such evidence as there is, and every day experience indicates that in socio-economic terms, there is a gap between the social and educational backgrounds of building designers and those who live in the building designed."[16]

Lipman, argues that this factor is not comparable with the past, the architect in the past becomes a professional when he joins the members of the same "social milieu" as his "patron". "He was in a position to grasp the patterns of behavior of his client by Virtue of shared social experience". In this respect and in according to Kay's analysis, which give reference to the social differentiation in the social backgrounds of nienteenth century architects, then building designer came from the same or similar social back-ground as his client or patron "among the higher occupational grades", which is not the same case today. The personal relationship between architect/client has diminished, and the contemporary architect stands in a different relationship with his clients "mass clintele".

Lipman claims that the major force governing changes in the relationship between architects and building users is the population growth which has conditioned much modern social changes. Lipman argues that in modern times, the equable sharing of social background by architects and users only can be seen in isolated instances. On the other hand his range of building design activities has to cover almost the whole range of social structure.

In this context Langdon[17], and Broady[18], among other social scientists oppose the architect's belief in his ability to effect the pattern of social relationship by the design produced. The argument can be summarized by a phrase "Differing life style preclude shared experience". For example Broady[18] (1972) believes that it is because of the architect's hope that certain social outcomes will result from architecture, they tend to assume that these outcomes will happen automatically. They also tend to assume that the lay public will be as discriminating in judging the visual element of a building as trained architects are, and will give to purely architectural features the same weight that they give to utilitarian qualities. The architect also tends to believe that the use of the environment is heavily influenced by the people who inhabit it. Regardless of what the architect may intend, Broady claims that the physical form is only a potential environment, which possibly provides clues for social behavior. The effect of environment, the totality of the significant variables influencing behavior, includes not only the physical environment but also the social structure and cultural attributes of the people who use it. He calls upon architects to find ways to apply this insight in their own work, arguing that the designer should consult his prospective users before he develops a design to increase the chances that the social consequences they have in mind will be realised. However, he described the architect's belief that he can affect social life as "architectural determinism" which could be found implicit in architect's thinking than in any clearly argued form:-

> "It asserts that architectural design has a direct and determinate effect on the way people behave. It implies a one-way process in which the physical environment

> is the independent, and human behavior the dependent variable. It suggests that those human beings for whom architects and planners creat their designs are simply moulded by the environment which provided for them"[18]

Lipman[19] (1969) commented on this issue refering to the architect's professional ideology as part of the "Architectural self-image". The model is one of which resources are focused on three directions described as "artist/technologist/social engineering" to meet the architects demands in their problem of professional "role definition". It is after the Second World War that the traditional self-image as an artist has been dislocated and contemporary architects to emphasize their "social engineering role" in an attempt to deal with the problems of role-definition.

> "The social engineering aspect of his self-image offers opportunity to meet some of the consequences of social distance by the assumption, for example, that his design decisions regarding the dispositioning of spatial elements determine social contract. In addition the nature of his conceptions of "commodity" consideration enable him to counter reproaches that his designs may not satisfy adequately social behavioral requirements by the claim that "commodity" is operationally indefinable where he may feel capable for not having realised his objectives his own misgivinges can be assuaged by this claim."[19]

The later remark are presented in a different way, by Brolin[20] (1976) in "The Failure of Modern Architecture". He argued that most architects, in making choices based on their experience, assumed that the user/client would become accustomed to living the way they expected them to live. In doing this, far from feeling that they were by-passing their client's actual performance, they actually considered that they were fulfilling their social responsibilities to them. In promoting a "universal design approach" with the help of modern technology, their ideology of modern architecture has claimed too much from people, it has tended to deal with "how people should live rather than how they do live", by setting new social targets as well as aesthetic values. However, Brolin argues strongly, that cultural differences have not disappeared, even with the present new architectural ideology, and presents many examples of failure to observe culturally different perceptions of space. One of these examples is the Bauhaus Housing Programme, and another is Chandighr's by Le Corbusier.

> "It is evident from the world wide uniformity of modern architecture that the universal approach promoted by the architect allowed his own values to be consistantly dominant, and cultural differences to disappear by virtue of the supposed homogenety of modern times... In 1927 Cropius had encouraged the establishment, on his anticipation of the "impending equalization of life requirements under the influence of travel and world trade. However, cultural differences have not disappeared. Every wall and window has a social as well as an aesthetic implication, and this implication differs from class to class, and from culture to culture.."[21]

In the context of the previous argument, Lee[22] (1971) Claims that architects' attitudes in modern times characterize the tendency to decide what they would choose life to be like in the future, and then do all in their power to attain these goals by social and no less than by physical engineering. This according to Lee is now more recognizable and is continually gaining strength in the architectural profession today particularly among members of firms with a high reputation for design. This seems to be an important statement from a person who is not especially charitable towards architects. It is also a factor in the attitude towards design which will be encluded in the case-studies later in this thesis. However, other social scientists have dismissed part of the previous argument which expressed strong opposition to the concept of "architectural determinism" and architects "self-image" discussed earlier , for example, despite Lee's disagreement of the architect's attitude towards solving environmental problems in architecture. He argued in "The case against architectural determinism", against these writers who reject the whole validity of the concept of "determinism" which is in his opinion a basic premise of the natural sciences and psychology.

> "Much of the persuasive force of the opposition derives from the view, widely held in our society, that it is distasteful for one man to influence another. This is probably because it is thought to be contrary to 'free will' or harmful to the dignity of the

individual.paradoxically, howerver, we all spend a great deal of our waking lives in overt or implicit attempts to change the behaviour of other people."[23]

However, Lee putforward the views, that the built environment is only one of many forces that shape man kind, together with advertising, education, and political persuasion, but points out that the significance of physical shape and the order of things are particularly important because it is a framwork which endures unchanged for very long periods. In his statment he dismissed the idea that "architectural determinisim" concept does not always work, arguing that architects how criticised for implemินting the ideology of determination in their work, are only acting as a delegated agents of society, their task is not to set goals, but to advise on the means.

"Those among architects who recoil from implications of determinism sometimes do so because they feel it places them in the role of "Big Brother", this, however is not so, they act only as duly delegated agents of society in a democratic system of government and it should be made clear, as it rarely is, that their task is not to set goals, but to advise on the means. In general then although we feel some distaste for architectural determinism, this emotion is not relevant to the validity of the notion"[24]

However, the whole argument presented earlier would imply that there are among people concerned with architecture, disagrement on whether or not the human personality is partly shaped by the built environment. However, there is enough evidence that it does. Experts on the cultural perception of space such as Edward T. Hall[25], have focused attention on the significance of "out-of-awarness" in mans behavior in his response to space around him. This is opposed to the belief which has been accepted almost without question for some time. In views on "quality in architecture"[26], Hall recalls Winston Churchill's remark, "We shape our building and then they shape us"[27]. The premier was arguing that, the House of Commons in the U.K. which was destroyed during the war, was rebuilt in its original form. He feared that any change in the building might change the character of perlimentary debates. Using the previous events to address the architect's and their client's, Hall remark on how people are influenced deeply by the spatial structure around them.

> "When men build buildings they are making statements, which communicate with the users of the building as long as they live or work there."[26]

Architect as a "Universal Man"

The arguments put forward previously might construed as meaning that the ideology of modern architecture has tend to emphasize certain professional values to establish individual reputation in the profession at the expense of 'human values'. This is reflected by the belief that design should reflect the architects own cultural values, and that his social and aesthetic evaluation should prevail regardless of who the client was or will be. It is also suggested that the architects no longer having direct contact with the user/client that had been common in the past, is often anaware of the cultural differences between his own and his user/client who now usually comes, from a different class and culture.

However, it seems that there is sufficient criticism of architects and the way which they work to consider possible ways of approaching the problems to see if beter ways can be found. Several writers have argued that the architects scope should be widened to incorporate areas of experience which would enable them to react positively to the set of problems presented by studies in area such as sociology. This has lead to changes in education. The other point of view is that architects can already deal with this aspect of work if data is available. Both points of view relate to the determination of user's requirements and this is perhaps where the answer lies. However, the views presented earlier together with other forms of criticism of the architect's ideology have been used to propose new methods of social programmes in order to help the designer to find common ground between his beliefs and those requirements of the users and to overcome the increasing seperation between designer and user. This leads to yet a third view concerning the way in which quality and responsibility of the architects be brought to action.

It is beginning to be accepted that designers must familiarise themselves with experience of quality on a personal level which tends to come through evaluation of their physical comfort, their aesthetic awareness and as a result the social relationship in which they are placed by the way the building permits them to use it. The success of the design solution depends on whether or not the people who use the buildings will actually share the values that the design embodies. The social scientists argue that if the successful work of architecture is partly determined by the nature of human requirements, it is very important to use this ability to strengthen specific points of the architectural programme, and demonstrate to client and users the value of the service. Gutman stated that:

> "Design a building to reflect certain social goals implies that some one believes those goals worthy of support. If an architect shares the new populist ideology, which is common among architects today, then he assumes the user should have the right to determine the objectives of the community in which he will work or live. The only question this designer then faces during programming is to determine what these objectives are."[28]

The issues reflect the desire for more understanding from the part of the designer of how are human needs to be met through architecture, and what human purposes are important to be known other than the meeting of immediate human needs and requirements. The architect in his role to relate design disciplines to other associated fields of studies, to help to establish the relationship that exist between people's lives and their built environment. Oakley[29] described the architect in his roles as a "universal man", who exploits his own specialisation, and those of many others to meet individual, social, and cultural needs. It is by the balance of his judgments and by the overall performance of his building the work of an architect is to be assessed and the context of his universality is put to the test. However Oakley pointed-out that if the architect has to fulfill his comprehensivist role, his decisions taken should be set within a changing condition of time and against the pressure of human needs, and evolving technological possibilities, which is not likely to be possible without the knowledge of the theory of many specialised fields of study, including those of applied physics, engineering, sociology, anthropology, economics, law, management, aesthetics, and others in addition to the architects own specilisation as the planner of space for human use. Thus identification of users' expectations and requirements is now an area of importance for many architectural firms. Clients and users are becoming more aware of the need for extended architectural programmes to meet effectively the expectations and requirements of those for whom the building is designed. However, one of the important studies are the human science techniques which describe the linkages between the human being's response to the environment, and his full perceptual mechanism. The importance of such studies as design constrains has an ancient architectural tradition, and goes back at least to Vitruvius, who in the first century A.D. advised practitioners of architecture to aquire a basic knowledge from the disciplines of other fields.

Nevertheless, the full importance of human studies as aid to design, has only began to be appreciated in recent years. Broadbent[30] describes a complet list of such studies, together with useful information, illustrated in figure -2.23-to find out, what possibilities are available at present to the designers.Their application into the built environment has been discussed by psychologists, sociologists and by architects. Most of this studies can never be totally divided and generally interrelate with the physical requirements to determine comfort needs in the built environment. Manning[31] points out that most of such research studies have dealt only with specific factors affecting the user's reaction to the environment such as physio/psychological factors,(Sommer)[32], their personal experience and users' habits (Hall)[33]. Others argue the need to learn to investigate the total intereaction of variables which constitute the environment. Like Artinian[34] who points out that such methods could help the designer to find out the real requirements and the needs of human beings, this can be done by methods of

Anatomy: systematic description of the body, usually under the headings describing ten major systems—skeletal, muscular, integumentary (skin), circulatory, respiratory, alimentary, urinary, nervous, endocrine (glandular) and reproductive.
Anthropology (physical): comparison of different races in anatomical and anthropometric terms.
Anthropology (social): comparative study of complete human societies in different places, from the point of view of social structure, social function and social change.
Anthropology (structural): attempts to apply the methods of structural linguistics to the study of kinship or other aspects of social anthropology (Malinowski, Radcliffe Brown, Levi-Strauss).
Anthropometrics: direct measurement of the human head and body against a check-list of those dimensions which have been found useful in certain kinds of research; e.g. stature, waist, girth, weight, etc. Statistical analysis of those dimensions.
Archaeology: study of what survives from the physical environment within which people lived in the past; examination of tools, weapons, pottery, buildings, tombs and so on, dated according to distribution (where they were found geographically), stratification (the depth at which they were found) and their relationship to other materials; association (the things they were found with) and typology (comparison with other artefacts about which details are already known).
Demography: observation and recording of births, deaths, disease, etc., and their statistical analysis as indicators of living conditions within a community.
Ecology (human): study of man as an organism in relation to his physical environment; effects of geographical location, climate, degree of shelter, food supply, interactions with other species, etc., on growth, size and development of other physical characteristics.
Ergonomics: method of establishing standards in which certain aspects of the physical environment (independent variables, such as illumination levels, noise levels, temperature, air movement, etc.) are subject to controlled variations. The effects of these variations on human performance are measured in terms of 'comfort', output, efficiency, etc., (the dependent variables) analysed statistically and used in the drawing of inferences about human performance in general or as a basis for design (Murrell, McCormic).
Ethnography: descriptive study of peoples and their distribution, physical characteristics and relationships with each other.
Ethnology: historical ethnography, concerned with customs, culture and so on.
Ethology: according to Mill, 'the science of the formation of character', but more recently used to describe studies in animal behaviour, especially those concerned with territoriality, aggression, etc., (Lorentz, Ardrey, Hall) and their relationships with human behaviour (Morris).
Linguistics: the descriptive, comparative or other study of *language* (the common tool of communication between members of a community) and speech (an individual's use of language). *Diachronic* linguistics deals with changes over time in a particular language whilst *synchronic* linguistics compares different languages at the same point in time. *Structural* linguistics (Saussure, etc.) is concerned with the ways in which words are related to each other in language, either by their positions in sentences (*syntagmatic* relations) or in terms of shared meanings, rhymes etc., (*paradigmatic* relations), on the assumption that such relationships are common to all languages because of certain fundamental structures in the brain. *Generative grammar* (Chomsky, etc.) assumes that such mental processes predispose one to learn language in such a way that the sentences one utters are grammatically correct.
Parapsychology: study of events for which direct empirical evidence is not available, such as thought-transference, telepathy, haunting, communication with the dead, and other forms of extra-sensory perception (Rhine).
Pathology: study of the changes which have occurred in the structure of the body as a result of disease; assessment of any treatment the patient may have received, as an aid to deciding further treatment; deduction as to cause of death.
Physiology: systematic, structural analysis of the ways in which different parts of the living organism are adapted to each other, and of their interactions and functions.
Psychiatry: treatment of mental disease by methods including psychoanalysis, but including also shock treatment, drugs and so on.
Psychoanalysis: belief that descriptions of the nervous system in physiological terms do not explain its unconscious workings; use of 'psychical apparatus' described by Freud to account for these unconscious workings. According to Freud, the predispositions, appetites, etc., which we inherit at birth together form the *id*. As we gain experience of the world, part of the id develops to form the *ego*, its intermediary with the external world. A special agency within the ego is formed in childhood through dependence on one's parents; this is the *super-ego*. One's purpose in life is to satisfy one's instincts, the driving forces behind the basic needs of one's id. In particular, one has to satisfy two basic instincts—*eros* which aims at binding things together, particularly in sexual love—and *thanatos*, the 'death wish', which aims at destruction (Freud, Jung, Adler).
Psychology: originally the study of *mind*, but many psychologists now would deny the existence of mind, preferring to think of psychology instead as the study of *behaviour*. Typical concerns of psychology are the study and correlation of abilities, especially those contributing to intelligence; the measuring of personality traits in terms of physiological and social factors, effects of heredity and/or environment on personality; function of the nervous system; individual development, motivation, feeling and emotion, value systems; physiology and psychology of perception, especially in terms of vision, learning, memory and other cognitive processes (Osgood, 1953; Woodworth and Schlosberg, 1954; Miller, 1964).
Social psychology: observation of people in groups and of their effects on each other in terms of output, efficiency, well-being, and in other respects.
Sociology: the study of society—as distinct from the individual—in terms of all that happens to human beings by virtue of their reactions to each other (Ginsburg, 1955). These reactions may be observed, described and classified under three major headings: social structure, social function and social change. Under structure, for instance, one might study the various units of social organization, family and kinship, various kinds of social or working groups, larger groups such as the neighbourhood, the city and so on. The study of social functions might include those factors which tend to hold groups together: political, legal, economic, administrative or institutional, not to mention co-operation, control and discipline. Social change might start with defiance and conflict, it will be concerned with differentiation, stratification and mobility within society (Inkeles, 1964; Broom and Selznick, 1955; Green, 1956).

Figure 2.23 List of human sciences studies available to designers systematic observation and measurement of actual conditions, and analysis of users' satisfaction with those conditions. After an investigation was carried out by Artinian into elementary school classrooms in Montreal area table -2.24- he found that it is almost impossible for any single architectural firm or group of firms to spend time, energy and money in undertaking such research, even in a reduced form, it must be handled by a larger organisation such as a major client which tends to be today a government department or a national research council.

However, knowledge already exists and derived from major studies based on the consideration of human requirements. It has been carried out by an International Research Council -the CIB -[35], as well as other governmental and dependant organisation especially in Europe such as the CSTB[35] in France. The significance of this approach is seen as an advance in the extension of the basic requirements of design to cover all aspects of architectural work, not only in relation to particular buildings and types but also in relation to building programmes in general. In particular this cover the analysis of the nature of a number of social programmes in relation to performance standards. This has now become part of the design data described earlier in the chapter, as an other aspect of design, that is of design implementation.

However, we must differentiate between the abstract argument about the architects role and those areas which

1. **The Social Economic & Cultural Context.**
   - 1.1 Ethnicity;
   - 1.2 Religion;
   - 1.3 Family income level;
   - 1.4 Parental occupations;
   - 1.5 Size and type of family;
   - 1.6 Size and type of residence;
   - 1.7 Nature and population density of home and school district;
   - 1.8 The school board;
   - 1.9 The budget appropriated to the school (construction, operation).

2. **The School Building.**
   - 2.1 Site (proximity to a park, etc.; area of yard available);
   - 2.2 Time for travel to school (on foot, by bus);
   - 2.3 Plan type (corridor, cluster, etc.);
   - 2.4 Number of floors;
   - 2.5 Opening year;
   - 2.6 Enrollment.

3. **The Classroom.**
   - 3.1 Floor on which classroom is located;
   - 3.2 Distance from other parts of the school;
   - 3.3 Crowdedness of passages leading to the classroom;
   - 3.4 Types of activities taking place in the classroom;
   - 3.5 Potential of the classroom for other activities;
   - 3.6 Average daily time spent in classroom by the users.

4. **The Users.**
   - 4.1 Students:
     - – physical characteristics;
     - – mental characteristics;
     - – age group;
     - – study group;
     - – no. of years in that school;
   - 4.2 Teachers:
     - – physical characteristics;
     - – mental characteristics;
     - – no. of years in that classroom;
     - – no. of years in that school;
     - – no. of years teaching.

5. **The Environmental Factors.**
   - 5.1 The spatial environment of the classroom:
     Area & volume;
     Height;
     Number of students;
     Area and volume per student;
     Shape of plan;
     Nature of enclosing barriers;
     Distribution of users in the space – dimensional and postural location – distance from focal points – daily and periodical change;
     Circulation patterns – entry and exit;
     Desks and chairs – weight, volume, movability, spacing;
     Storage – closets (volume), racks (length);
     Other furniture & fittings, spacing;
     Display – tack spaces (area, height), display hooks, display tables;
     Materials (books, etc);
     Chalkboards – movability, area;
     Windows & doors – ease of handling;
     Finishing materials – durability, ease of maintenance;
     Tactile sensations of walls, floors, tackboards, chalkboards, cupboards & shelves, desks, other persons.
   - 5.2 The visual environment:
     Orientation of classroom;
     Sky conditions;
     Windows – area; screening;
     View outside.
     – relationship with nature, other buildings, etc.;
     View inside:
     – the visual field, the visual world;
     – visual clutter, tidiness;
     – visual privacy, visual detectability of other people and other things;
     – length of sightlines;
     – direction of gaze;
     – orientation of users with respect to others;
     Light:
     – natural, artificial (on desks, boards, in the classroom);
     – quantity, quality – contrasts, glare, colour;
     – direction, source, lighting system;
     – control and flexibility.
     Textures, colours, reflectances of walls, floors, ceilings, chalkboards, furniture, people;
     Effect of light on space, form, colour, texture;
     Visual aids.
   - 5.3 The aural environment:
     Orientation of classroom;
     Sound:
     – quantity, quality;
     – source (internal, external);
     – direction;
     – duration;
     – control and flexibility;
     Aural privacy and detectability of other people and messages; finishing materials and clothes – absorbing and reflecting qualities;
     Audio clutter;
     Audio aids.
   - 5.4 The thermal/olfactory environment:
     Orientation of classroom;
     Weather conditions;
     Temperature – quantity, sources, changes and control;
     Humidity – quantity, sources, changes and control;
     Ventilation – quantity, sources, changes and control;
     Air pressure;
     Odors – quantity, quality, sources, duration;
     Air purification;
     Thermal privacy and detectability of other people;
     Olfactory detectability of other people;
     Heating, cooling and ventilating systems;
     Finishing and Building materials – heat transmitting qualities.

6. **Observations and Evaluations.**
   - 6.1 Environmental:
     Observations by architects and engineers;
     Aesthetic considerations (spatial, visual, aural, thermal);
     Students' satisfactions with environmental factors;
     Teachers' satisfactions with environmental factors concerning: the adequacy of the classroom for their – educational goals – teaching methods – students' learning activities.
   - 6.2 Physiological and anthropometric:
     Observations by physiologists and anthropologists;
     Physical health considerations: – spatial strains, invasion of 'personal space'; – thermal, visual and aural strains;
     Ease and safety of the use and handling of various objects;
     Absence – sicknesses.
   - 6.3 Psycho-sociological:
     Observations by psychologists and sociologists;
     Mental health considerations: – environmental strains; – other strains;
     Patterns of communications – between students; – between students and teachers;
     Patterns of work;
     Childrens' attitudes – to self – to other children – to teachers – to learning;
     Absence – truancy;
     Teachers' attitudes: – to self – to other teachers – to children – to teaching.
   - 6.4 Educational:
     Observations by teachers and educators;
     Students' performance – seeing – hearing – seeing and hearing together – responding – comprehension – expression – logic.
     Teachers' performance as rated by: – students – other teachers – the principal – the program achieved.

7. **Correlations.**
   - 7.1 Among the actual conditions of the samples,
   - 7.2 Among the environmental factors,
   - 7.3 Among the evaluations,
   - 7.4 Among students' and teachers' responses,
   - 7.5 Among all the foregoing.

8. **Presentation of Findings.**
   - 8.1 Descriptive analyses based upon the observations,
   - 8.2 Statistical tables summarizing the evaluations and the correlations.

Table 2.24 Investigation into elementary school classroom requirements (Artinian) deal with this relationship to society and which have been codified to try to define or constrain his design performance, and which will be examined in detail in the next chapter. In this chapter, the nature of human needs in its relation to building will be investigated, and selected methods used for basic assessment of quality will be described. Other methods of co-ordination between architects and other branches of human science will be examined in relation to building design. Most of these studies are based in part at least On the consideration of human needs in building, and are so devised as to assist the designer to draw conclusions appropriate to the project in hand.

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Secondary Schooling	Age Group under 45 years	Age Group 45 years and over	All
L.E.A Grammar	49%	36%	45%
Other L.E.A.	15%	13%	14%
Public School	23%	31%	26%
Other types	13%	20%	15%
	100	100	100

in so far as secondary school attended can be considered as an indicator of socio-economic class this suggests, in the "all" column, that over 70% of architects may have come from middle class back-ground, or came into contact with middle class styles of life at school. Some corroboration may be gained from Robbin's Report, as graduates of institutuion of higher education architects probably share the characteristics of "fathers occupation" reported, see Committe on Higher Education, Higher Education, Appendix I: The Demand for places in higher education, London, H.M.S.O., 1983, PP. 33-61. "Lipman (1969). Ibid, p. 203.

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    However, Deasy (1974) "Design for Human Affairs", cliamed that Churchill remark " We shape our...."

has been repeated in the literature of architecture, to imply that the design of building, is a noble and earor that will shape a better life for muvtides unseen and unknowns, which has great appeal to architects, "but the fact that Churchill had no such massage in mind although he has showed an awarness of the psychological of facts of crowdings, his speach demonstrated a clear understanding of how the shape of a meeting chamber influenced pary discipline."

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2.4 HUMAN NEEDS AS A FACTOR IN MEASURING BUILDING QUALITY

2.4 Human Needs as a Factor in Measuring Building Quality

Nature of Human Requirements

The criticism of some sociologists about the architectural profession which was discussed in the previous chapter can be continued by bringing forward some of the detailed work which has been done in this field by the research institutions concerned with building design. This chapter will try to show that the responsible architect have a great deal of information on human requirements at his disposal and furthermore that much of this has already been organised by governments acting in the capacity of representatives of society, into a form which influences directly,or by implication the work of the architectural profession. The achievement of quality in design must be seen against this background.

According to the "International Council for Building Research Studies and Documentation" the CIB[1], what is meant by human requirements or users' needs is the standard of conditions which are essential for man to live and work in comfort, for his safety and health, and to satisfy his economic preocupation. The term "Human Requirements" are often used by "The Centre Scientifique et Technique du Batiment" in Paris - CSTB- as the translation from the French version "Exigences Humaines" which means all sorts of requirements psycho-phsio as well as requirement of adaption of the building to its use. Their work included the use of

"Qualitel method for evaluating housing quality" which we will report upon later in this section. However, some distinction between requirements and needs has been made, but they tend to be very similar when used to establish the requirements of some building types for example dwellings or houses. In most buildings human requirements are very important, and are partly of an individual and partly of social character. The two categories particularly follow the general characterestics of human existence and in part the existence of man as a social being (CIB, Blacher[2]). In this respect human requirements are derived from:Fig.-2.25-

- Psychological needs.
- Physiological needs.
- Social needs.
- Economic needs.

The four categories vary in nature, and can be viewed according to the stand point from which the requirements are appropriate to the problem in hand, for example in the case of schools, offices, hospitals, etc., it shows how the economic requirements vary considerably from one country to another but can be used among general criteria to make comparative studies of efficency and to ensure creative design. Some of the physiological requirements are absolute once their level is proved scientifically, others are conditional, they depend on the climate, on the manner of life and custom, the habits of human beings

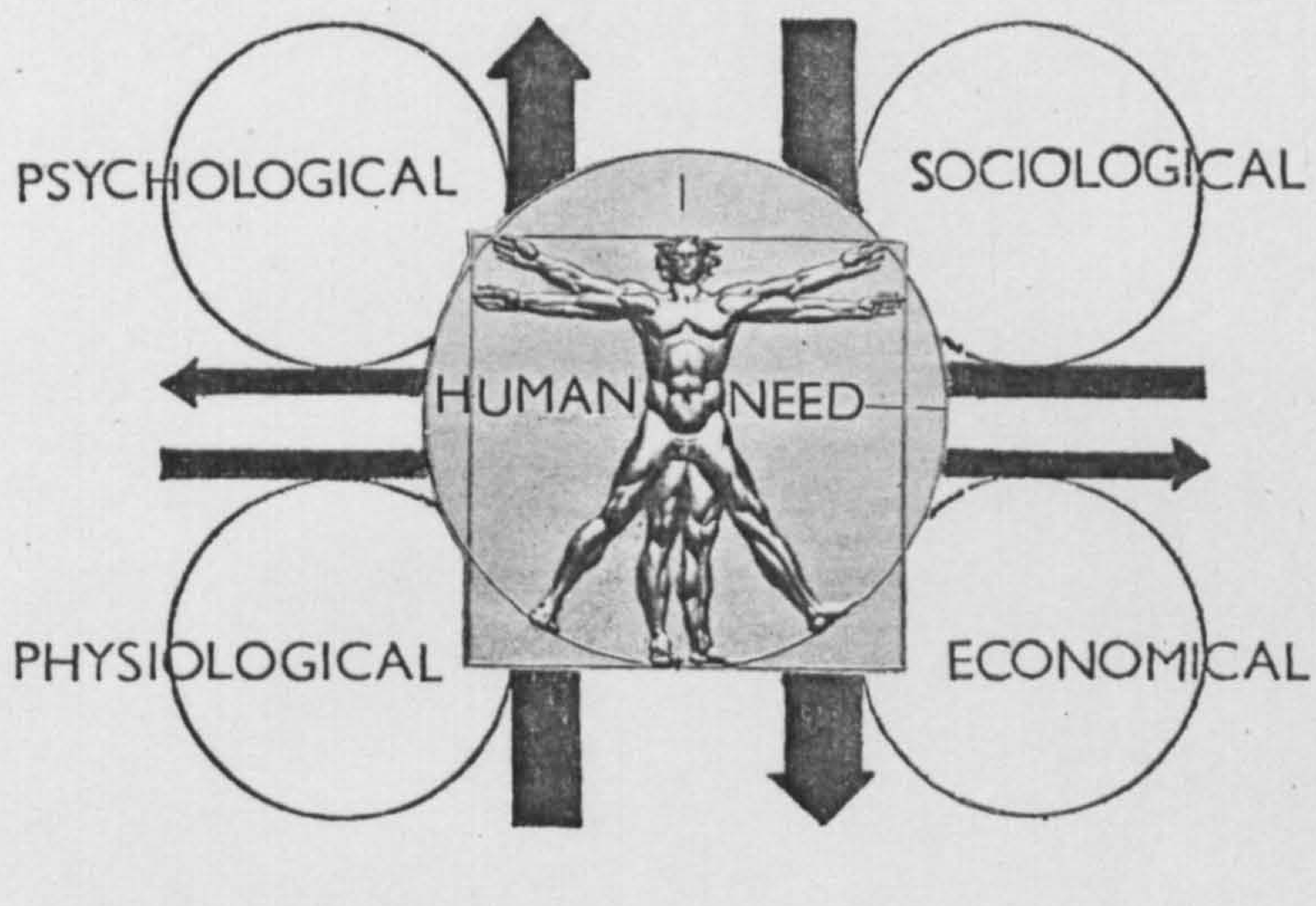

Figure 2.25 The characteristics of human requirements.

and society and on their cost to the community, which again might vary from one country to another. The psychological requirements are considered to be conditional and vary as a function of civilization, education and historical back-ground. The creation of a physical environment with regard to users' needs has usually received more attention than the other major topics which are generaly more complex. The latter covered social, cultural and psychological factors. The point emphasises the many aspects inherit in the creation of architectural environment and shows how the physical climate is not the only aspect to be considerad when spaces are being desigused in which human activities can be carried out conveniently, and in comfort. In this context, Fitch[3] identified architecture as a "Third Environment", that mediates between the hazards of the natural world and of civilized society and the internal breathing, feeling, seeing and hearing processes of man. Fitch argues that by manipulating the physical properties of man's environment and his perceptual mechanisim, the architect can communicate with his client and users very well. He argues that:

> "The aesthetic enjoyment of an actual building cannot be merely a matter of vision, it can only be a matter of total sensory perception, and that perceptual process must in turn have adequate biological support. To be truly satisfactory, the building must meet all the body's requirements, for it is not just upon the eye but upon the whole man that its impact falls"[4]

This perspective leads Fitch to call architects to regard building as a very special kind of container, far from offering solid impenetrable barriers to the natural environment. Its outer surface can accept or reject any environmental force.

> "The building, even in its simplest forms, invests man surrounds and encapsulates him at every level of his existence, metabolically and perceptually."[4]

Figure -2.26- shows the relationship between man and his environment as seen by Fitch. The existence of such relationship between man and his external environment depends on the two levels described by Fitch as the metabolic and perceptual process. The metabolic process (the processes of change which go on in the body) remains basic, its disturbance occurs only when the external environment begins to drop below the minimum, or rise above the maximum requirements of existence. The sensual perception of the external environment, which is described as the material basic of the aesthetic process comes into play only after these minimum requirements are met.

Figure-2.27- shows the building wall designed as a filter to react to the wide range of environmental forces acting upon it.

Broadbent[5] in a wider perspective, takes a very similar view to that of Hardy and O'Sulivan at Newcastle University[6]. In his approach he thought of the building among other function as a device which modifies the climate, a filter between the external environment and the users within,

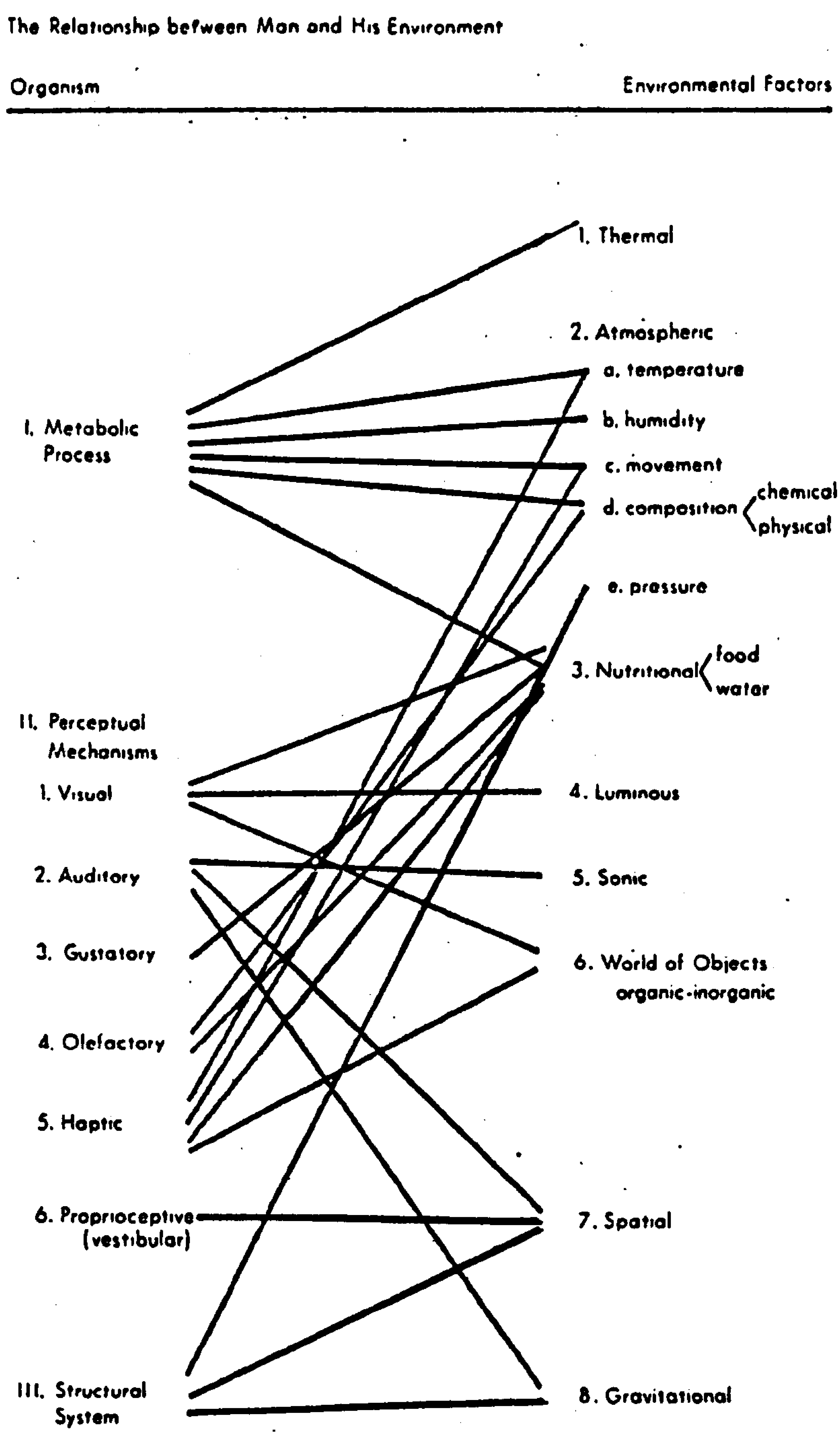

Figure 2.26 **The relationship of the metabolic process to its environmental support the process is the substructure of consciousness, sensory perception of changes in the environment in which the body finds itself is totally dependent upon satisfaction of the body's minimal metabolic requirements.**

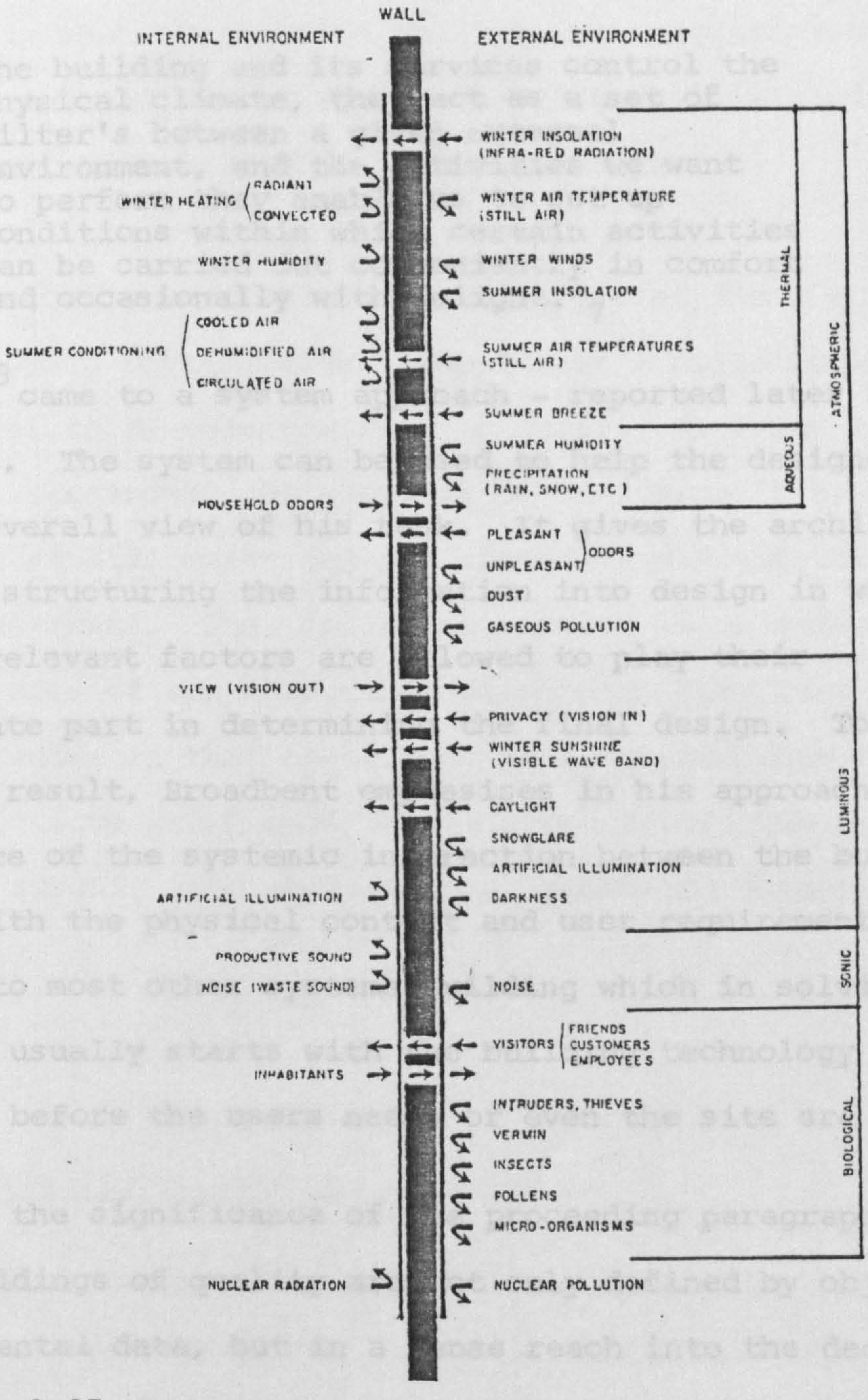

Figure 2.27 The building wall can no longer be considered as an impermeable barrier separating two environments. Rather, it must be designed as a permeable filter, capable of sophisticated response to the wide range of environmental forces acting upon it. , its task is the modulation of these forces in the interests of its inhabitants—the creation of a "third environment" designed in man's favor.

it enables the climate to be modified to such an extent that the users will be comfortable:

> "The building and its services control the physical climate, they act as a set of filter's between a given external environment, and the activities we want to perform they anable us to set up conditions within which certain activities can be carried out conveniently in comfort and occasionally with delight."[7]

Broadbent[8] came to a system approach - reported later in this section -. The system can be used to help the designer take an overall view of his task. It gives the architects a way of structuring the information into design in which all the relevant factors are allowed to play their appropriate part in determining the final design. To achieve the best result, Broadbent emphasises in his approach, the importance of the systemic interaction between the building fabric with the physical context and user requirement as opposed to most other systems building which in solving design problems usually starts with the building technology that is given before the users needs or even the site are known.

However, the significance of the proceeding paragraphs is that buildings of quality are not only defined by objective environmental data, but in a sense reach into the deeper consciousness of man. In particular the way in which appreciation of architecture may depend upon physiological attributes which in turn depend to some extent upon historical and cultural factors can be of particular importance in assessing the quality of any one piece of work. In this thesis I have assumed that in the buildings which are to be studied, what Fitch calls the "minimal requirements" have been met and that the wider context as indicated by Broadbent is really what is being thought of.

The last section was introduced to show that there was an area beyond the functional aspects of a building which is critical to an understanding of quality in terms of building assessment. However, it is one thing to say that such studies exist and are often defined and used in a rational sense. The following section is an attempt to show how some of the measurable attributes have been set out by studies in this field. It is suggested that this is a basic line which must be satisfied before the matter is taken further into evaluation of aesthetic judgement.

List of Human Requirements

To determine their application within the architectural programme, and to evaluate some aspects of buildings of quality some common fundamental criteria have been considered by scholars in this area. This reflects the desire for a more rational approach in developing a scheme of users' requirements to be used as a basic tool in determining the physical environment in building. However, since 1965 the International Council for Building Research Studies and Documentation - The CIB - has established a working commission (W45) to study the human requirement for designing building of all types. They drew up their first approved list of human requirements which ought to influence and determine building design as follows:[9]

1. Anthropometric aspects: The dimensions, areas and volumes required for human activity and movement in buildings.
2. The tactile senses.
3. Vision: The conditions required for the efficient execution of tasks and movement, and for the visual enjoyment for the interior environment, and for the perception of the world outside.
4. Hearing: The conditions required for audibility: acceptance levels of noise and acoustic privacy and protection against noise annoyance from other rooms and other dwellings, and from outside.
5. The sensitivity to vibration.
6. Thermal environment, humidity and air movement, conditions needed to provide human comfort.
7. The effects of electrostatic and electromagnetic phenomena.
8. Hygienic aspects: body hygiene, water supply, food preparation and storage; waste disposal; cleaning and disinfection; protection against

animal intrusions and vectors of disease.

9. Social aspects: facilities and equipment provided and patterns of use, needs and motivations, social values.

10. Human safety: consequences of structural failure and of fires, flooding, escapes of gas and explosions, use of mechanical and electrical equipment, requirement of special groups like young children and old people.

The CIB made the point, that the user requirements are of a more extended meaning, and cover other building types beside houses and dwellings. Although they are derived from the development of human society and appear as a consequence of human or social activity, some user requirements appear as more independent categories. For example in the field of prductive work (industry, agriculture, etc.). In addition to providing optimum working conditions, it is important to provide optimum standards for the given production process, with the development of up-to-date technique. Such requirements are found for buildings connected with human activity but having no productive character. Building in this category would include schools, hospitals, office building. There is of course some overlap, particularly in the case of building which have high technical content, and having a good deal of technical equipment. Hospitals would appear in this list too as they have the task of satisfying human requirements at a very high level.

Blachere[10] argued that as these requirements are of such a great variety and can vary in nature as to provide the architects with a complete list of requirements an attempt must be made to minimise this variety and also to include the familiar matter of basic satisfaction to provide activity at different levels for any given category of building. This would be similar to the complete list of the requirements in housing which the CIB working commission W45 has drawn up and is shown in table -2.28-. The list recommended after a wide survey covering all the members of CIB and other qualified bodies on international scale, and described under thirteen heading to include the following:

1. Acoustical requirements - the levels of comfort -.
2. Lavatory and respiratory requirements.
3. Requirements concerning touch.
4. Visual requirements.
5. Hygrothermal requirements.
6. Requirements concerning movements and vibration of buildings and their deformations.
7. Miscellaneous requirements.
8. Safety requirements.
9. Hygienic requirements.
10. Requirements for privacy.
11. Requirements correlating with the way of life.
12. Requirements for unforeseen of disastrous events.
13. Economic requirements.

Some of these requirements can be quantified (most of the physiological and economic requirements), others only expressed by description terms (psychological and social). The list notes the point where the level of requirement of thermal comfort which varied between different countries, the function of economic conditions, etc., however the report does not deal with economic requirements which differ considerably in different countries, the essential requirements for safety are included under the heading of real safety requirements (fire, collapse, etc.), and also under the other heading, air polloution, hygiene), the safety ratio, which in fact does not imply an accident probability is proposed in most cases, but the choice of the safety ratio is influenced by economic conditions and can therefore vary from one country to another. The consideration of human requirements is seen by the CIB and Blachier, not only as essential requirements to be included in the programme, but also as the basic tool for judging the quality of projects and housing, and as the basis of the assessment of the quality of existing building. The methods discussed earlier in the chapter (2.2) can be described as performance requirements rather than of human requirements which may be identical with the requirements presented by the CIB. However, Blachier went one step further to suggest, that such a list may also be form the basis of "Modern building regelation", designed to achieve results and not to impose uncecessary constraints on the designer.

> "The aim of building codes is merely to ensure the safety, the health, and the comfort of the occupants. In the past it was necessary to draft these codes in terms of formula of descriptive specification. Laying down a dimension, and material, this because under the sign of the tradition, one could not do other wise, but today, it is evident that the most flexible regulation, and at the same time the surest, should be drafted in terms of requirements, it should give the desirable level for the requirements which are not absolute, and the factor of safety for the absolute requirements."[11]

In addition to the list of human requirements, Blacher, suggested drawing up a special set of requirements of the client which is included in the "Programme requirements." However, it may be some assistance to study some existing methods to measure the physical quality of housing and its environment. The methods are part of the government and private sector, evaluation models for building and projects design. Standards of building production performance are already formulated and embodied in such documents as a codes of practice and standards. Basically, two main types of system of administering building product approvals exist in Europ. The German/Scandinavian "General Approval" system,[12] and the "Agrément System"[13] which originally developed in France as identified by the building research establishment BRE study report (1974)[14] and which set out to provide information relevant to current discussions on the future of building control in Britain. The study highlighted the important role played by product approval procedures and identified major differences between countries in the relationship of those procedures to building control and the extent of official involvement in them. These fundemental differences can be divided into four areas:

1. Legal basis.
2. Methods of implementation.
3. Type of product to which they apply.
4. Aspects of product performance to which they apply.

As described by the BRE reports, the German/Scandinavian system is based on building regulatory law, and product approval procedures are closely integrated with building control. Also much emphasis is placed on testing and certification of established products as well as the approval of new ones. A major feature of "general approvals" is that they are issued centrally by the Ministry concerned and are thus valid nationally. A general approval certificate is in effect a ministerial statement that a particular product complies with national regulations. Since approvals are given for the purpose of buildign control. They relate only to properties relevant to the regulations, that is those affecting safety and health. In contrast, the "agrement" type of system has been developed specifically to deal with innovation originating initially from the needs of the French insurance market. It is not related uniquely to building control on the other hand it extends to a rather wider appraisal than "general approval" and may

1 ACOUSTICAL REQUIREMENTS

AMBIENT AND INCIDENTAL NOISE

It is commonly accepted that noise level should not exceed [1]:
- — 25/30 dB (A) for sleeping,
- — 30/35 dB (A) for daytime resting,
- — 35/40 dB (A) for intellectual work,
- — 40/45 dB (A) for household work.

The method used for measuring these levels is not defined, it may be assumed that these data refer to average level and also that they ensure a feeling of well-being with regard to noise (id. es comfort level).

It is also taken for granted that such consideration of mean data is not sufficient.

However, there is not sufficient information available whereby, in all instances, either the mean level requirement could be completed by deviations or maximal requirements, or by a comfort index.

We have only at our disposal fragmentary data [2].

1. Requirements concerning impact noises.

Impact noises from walls or ceilings, especially those caused by foot-steps, should not have a peak intensity greater than 50 dB (A).

2. Requirements concerning noises from equipment

It is accepted that the level of such noises in a dwelling should not exceed 35 dB (A) and, even for collective equipment, viz. lifts, boiler-rooms, ventilation, water pipes, etc. 30 dB (A).

3. Requirements concerning traffic noise

3 a. *Ground traffic*

The TNI [3] : $4 (L_{10} - L_{90}) + L_{90} - 30$ where L_{10} and L_{90} are levels reached during 10 % and 90 % of the time in dB (A).

50 % of people want a TNI lower than 82.

25 % of people would like a TNI lower than 67.

3 b *Airborne noises*

This requirement is expressed in terms of NNI [3] or R index [3].

NNI = mean level in PN dB + 15 log N — 80, N being the number of diurnal noises in excess of 80 PN dB.

$$R = \text{mean level in PN dB} + 10 \log \frac{N}{2500}$$

The requirement would be that R be lower than 85 or NNI be lower than 50.

4. Requirement for sonority

This is expressed as the reverberation time that characterizes the sonority of a room [4].

Such time, in a room in a dwelling, should not exceed one second.

5. Privacy in the home: acoustical requirements

Privacy requirements for the home are of sociological nature with many aspects including acoustics: people talking should not be heard from one home to another.

This requirement can be expressed as a need for acoustical insulation.

For people living a European way of life, sound insulation between neighbouring dwelling units should be :

50 dB in a noisy area [5]
55 dB in a quiet area [5]

(1) Mr. J. Langdon (BRS) considers these figures rather high.

(2) Note the "Transient peak index" drawn from investigations carried out for offices and not for housing.

(3) TNI : defined by the Building Research Station,
NNI : defined by the Wilton Committee,
R : is defined by CSTB.

(4) This refers to the reverberation time of the room as it is when occupied. The furniture is therefore included in the calculation.

(5) These concepts of quiet or noisy areas cannot be defined with exactitude in the present day state of our knowledge.

2 OLFACTORY AND RESPIRATORY REQUIREMENTS

— The air in the rooms should be devoid of smells coming from the building or its occupants. On the other hand outside smells are tolerated.

While there is no other effective way of estimating this olfactory requirements, it is accepted that, in a building constructed on traditional principles, it is met by renewing the air of the room volume hourly, the air going out via the polluting rooms. Newly developed materials should be olfactorily acceptable in the same conditions.

— The air in the rooms should not contain an undue proportion of noxious gas, dusts and aerosols.

The gas considered in this respect is carbon monoxide (CO) produced within a dwelling unit, and the content of which should be less than 0.003 % at all times. This being a vital safety requirement, it should be strengthened by a safety factor ratio, 10: 1 being suggested in this instance.

No information available as to the requirement in long-term exposure.

The requirements relating to outside dusts, aerosols and gases do not concern the builder province but rather city-planning engineers since for the moment the control of contamination of outside air by means of filters or chemical treatment in dwellings has not been considered.

3 REQUIREMENTS CONCERNING TOUCH

The skin of the hands is not to come in contact with unduly rough, sharp or sticky surfaces.

There are no relevant specifications and no problems are met with in practice on this score.

The requirement that the skin does not come in contact with wet or moist surfaces is absolute, except with those of household equipment and window panes.

The skin contributes to the perception of low-frequency vibrations. The relevant requirements are given under the heading: "Requirements in relation to vibrations".

4 VISUAL REQUIREMENTS

These are of three categories, as follows:

— Availability of sufficient and suitable lighting so as to see what one is doing without fatigue and to work and move without danger.

— Adequate darkness for sleeping.

— Quality of what is seen.

1. Requirements in intensity and quality of lighting

1 a. *Luminance requirements for objects within the field of vision*

— *Minimum luminance*

Inside the home the general lighting over working space (or of the circulation areas) should be at least 20 lux when in use.

Depending on the place and occupation, the recommended lighting data are tabulated below:

Bathrooms, halls, toilets:	
— General lighting	100
— Mirrors (on to the face)	500
Bedrooms:	
— General lighting	70
— Beds and mirrors	500
Kitchens:	
— Cookers, sinks, tables	200
Children's bedrooms	200
Living-room, family room:	
General lighting at level of:	
working plane	200
— For intermittent reading	300
— For prolonged reading	500
— For intermittent sewing	500
— For school-children's home work	500
— At workshop bench	500
Circulation areas	150

cont..

— *Maximum luminance*

The working planes should be protected, if need be, from the sun.

In the case of sources of artificial light with luminance greater than 300 cd/m² in the direction of the eye, the angle formed by the horizontal with the straight line which joins the source to the eye should be at least equal to 80°.

— *Luminance contrasts*

While data to reduce glare in artificially-lighted offices are available, we do not know of any such for housing.

Glare arising from the contrast, in sunlight, between glazed areas and frames, mullions, does exist.

Roughly, it can be said that, to avoid glare, the ratio of luminance of the areas seen te...r should be less than 30.

— *Luminance stability*

The ratio of the instantaneously maximum luminance to the average luminance should not exceed 20 %.

— *Spectrum*

Mean index of right reproduction of colours from the source should be higher than 80 %.

2. Darkness needed for sleeping.

The amount of light falling on the sleeper's eyelids should be less than 0.2 lux.

3. Appraising what is seen

Two sections:
— Assessment of the inner space and walls of a room,
— Vision of the outside world.

3 a. *Assessment of the inner space and walls of a room*

— Although man is sensitive to inner space and giving him pleasure is one of architecture's chief goals, there is no knowledge on the subject.

We may merely propose as is commonly accepted:
That the height of rooms should be more than 2.20 metres,
That in the case of living-rooms, bedrooms and kitchens the height should be the smaller of the three dimensions.
That the length/width ratio should not exceed 1.6 for rooms less than 20 m² in area.

— Man is also highly responsive to the quality of the surfaces in a room: colour, flatness, texture, plumb, right angles, straight of flat surfaces and edges.

There are no reliable data on this matter.

3. b. *Vision of the outside world*

Is it really necessary to see the outside world? What is there to see? And through what?

Once more, all this is virtually "terra incognita".

We can only propose, because it has always been done so up to now, that living-rooms and bedrooms should have windows elbow-high.

5 HYGROTHERMAL REQUIREMENTS

This section groups together the limits of various unpleasant feelings caused by:
— Unduly high loss of body heat,
— Uneven distribution of body heat,
— The difficulty experienced in eliminating the heat generated by the basal metabolism.

The causes of such body discomfort depend on the air temperature, the ambient radiation temperature, the velocity and moisture content of the air.

When referring to tactile requirements, it was mentioned that no surface coming in contact with the hands should be damp or wet: we mention this again because it also involves the moisture content of the air.

1. Requirements for bodily comfort in winter

1 *a*. Ambient conditions (air temperature, environmental radiation temperature, air velocity and relative humidity) should be such that, in the greater part of the room, the occupant's heat losses are no greater than they would be in an enclosure wherein the air and radiation temperature would be uniformly 22 °C, the air motionless, and relative humidity 60 %. The occupant is presumed dressed as is usual in temperate climate.

This overall expression of requirements in terms of loss of calories covers the effect of convection, radiation, draughts and humidity.

It can also be expressed in terms of dry resultant temperature: this must be maintained at 22 °C.

1 *b*. To mark the homogeneousness of temperature, we use the notion of oriented dry resultant temperature: temperature measured in the centre of a flat surface measuring 50 cm on the side, with an absorption factor of thermal radiation above 0.9 on the measuring surface and highly insulated on the opposite side.

The oriented resultant temperature in every point in the room and in every direction must fall between 16 and 30 °C.

1 *c*. The temperature of the floor should not exceed 27 °C.

1 *d*. Relative humidity is not less than 35 %.

For economy sake it can be conceded that these requirements are not met whatever exterior conditions. For example it is acceptable that they not be met *one* day a year.

2. Summer body-comfort requirements

Ambient conditions in the room viz. air temperature, environmental radiation temperature, air velocity and relative humidity, should be such, in the greater part of the room, the occupant's body eliminates calories under conditions at least comparable to those obtained in an enclosure wherein the air and radiation temperatures would be uniformly 26.5°, the air motionless, and relative humidity 70 %.

This definition of requirements is based on the elimination of calories. Another definition is based on a concept similar to this — real temperature, which is a temperature of equivalence of feeling: the real ambient temperature is the temperature resulting from a saturated atmosphere which produces the same feeling. ASHRAE publishes a comfort chart which gives the real temperature of various atmospheres in calm air, characterized by their temperature and their humidity.

ASHRAE recommends an effective temperature of 21.7 C, a stricter requirement than the one previously expressed: 26.5 and 70 % hudimity correspond to an effective temperature of 24°.

The difference between these two figures can be explained in the following ways.

In North America air conditioning is common and people are used to having low effective temperature 21.7.

In Europe, particularly where climate is temperate, what is required corresponds to exterior conditions on a bright temperate day: 24° effective temperature.

In reality these requirements vary rapidly with the possibilities of the populations.

For economy sake, it is conceded that this requirement not be respected a certain number of days per year. For example five days a year.

6 REQUIREMENTS CONCERNING MOVEMENTS AND VIBRATIONS OF BUILDINGS AND THEIR DEFORMATIONS

The human body is sensitive to the accelerations set up in buildings subjected to vibratory movements caused by wind and whose frequency is approximately 1 to 2 Hz for a 15 storey building and also faster vibrations generated by machinery and traffic.

Limits of admissible accelerations do not seem to have been studied for housing (6).

The unpleasant vibrational amplitudes are linked with the following frequencies:

0,3 mm for 2 Hz
0,06 mm for 5 Hz
0,02 mm for 10 Hz
0,07 mm for 20 Hz

(6) They have however been studied for transportation and machines.

cont..

Floor slab deformations: slopes in parts or over the whole surface deflexion, must be limited to ensure comfort and safety when walking and also to allow for normal use of the rooms, furniture planes must be horizontal, the furniture should not be rickety (the latter points could also be placed in topic 11 "Adaptation to the way of life").

The requirement which has not been formulated in a scientific way seems to be that: unevenness between two points of a floor in the same room must not exceed 5 cm, the slope between any two points should not exceed 2 %.

7 MISCELLANEOUS REQUIREMENTS

7.1. Requirements relating to the magnetic and electric fields and to atmospheric ions.

It seems scarcely possible to give figures of the requirements of the occupants of dwellings with regard to these phenomena although they do have a repercussion on the sense of body comfort and on the health.

7.2. Sunlight requirements

Sunlight in homes is indispensable neither to the health nor to the occupants' comfort.

7.3. Requirements for curtailing ionizing radiation

The materials and operating devices in the dwelling should not subject its occupants to radiation greater than 0.1 roentgen weekly (7).

8 SAFETY REQUIREMENTS

This deals with restricting the impairment of the dwellers' physical well-being due to physical or mechanical causes.

1. Stability requirements

— Occupants should not be disturbed by the effects of climatic stress more than once a year. The disturbance may be due to vibrations or deformations.

The building is not to collapse, owing to wind effects, snow loads or earthquake, however great they may be (8).

— The structures should be stable under service loads specified in the CIB document n° 9: "Recommended service load values for floors of residential and public buildings", the deformation being no greater than that specified in the CEB "Unified Recommended Practice for the design and erection of reinforced-concrete buildings" (1964).

Stability, in respect to all the foregoing, is to be ensured in accordance with the safety factor as defined in the same Recommendations.

— The elements of the building must remain stable when subjected to foreseeable service stresses:

Walls should withstand the impact of a man falling against them,

Cornices, protrusions and the like must be designed to bear the weight of a man.

2. Equipment requirements

No hazard, such as electrocution, asphyxia, explosion or injury due to machinery is admissible (9).

Complete instructions imply details which will usually be found in the relevant countries' standards.

3. Fire-fighting requirements

No occupant, including the sick and the crippled, is to sustain bodily harm owing to the outbreak of fire (10).

4. Requirements relating to intrusions

The dwelling should afford its occupants and their property adequate protection from human malicious intrusions, as well as those of dangerous and unwelcome animals.

5. Requirements for safe circulation within the building

These include:

— No undue slipperiness of floors. Suitable datum is the non-slipping coefficient U which is to be higher than 0.4 as measured with the impact pendulum of the National Bureau of Standards, Washington D.C. (11).

— No obstacles at floor level, such as local protrusions or steps, except low thresholds in line with doors, which are permissible provided that they be no higher than 5 cm. This requirement is fully dependent on local uses.

— No obstacles hindering headroom such as a lintel, etc., both in horizontal or vertical circulating areas.

— Adequate lighting (5 lux at floor level) of the common circulating areas.

— Railings to prevent falling in front of windows and external circulation which are higher than 1 metre from the ground.

9 HYGIENE REQUIREMENTS

The olfactory, respiratory, hygro-thermal, lighting and acoustical requirements already dealt with are partially hygiene requirements.

There remains to mention the requirements relating to hygiene disposal of waste-water and products, nutrition and body care, provisions made for cleaning and disinfecting.

Disposal of waste-water and garbage

Washing water, scullery wastes, waste water, human excreta and domestic refuse must be removed from dwellings in such a way that there is:

— No chance of disseminating pathogenic germs,

— No accumulation or fermentation of wastes,

— No release of noxious or evil-smelling gases,

— No emission of objectionable smells.

Each dwelling must include its own water closet.

Requirements for nutrition

Dwellings are to be provided with an adequate supply of drinking water in conformity with the WHO's specifications.

Equipment in conformity with local customs is to be provided to store and process food and beverages with no chance of contamination, fermentation or tainting (12).

Care of the body

The dwelling must include a room assigned to body care where there are a wash basin and a shower or a bath, all of which supplied with hot and cold running water.

A number of supplementary sanitary appliances are to be available following the family living in the dwelling. This number is dependent on the income and local customs.

Cleaning and disinfection

The dwelling should require but a modicum of daily upkeep.

Provision should be made so that it may be disinfected without damaging the building (save the paintwork and wall-paper).

10 REQUIREMENTS FOR PRIVACY

These refer to both inner and outer privacy, the former referring to individual occupants of the dwelling or groups of occupants in relation to one another.

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(7) This datum is that given by the USA Atomic Authority, for nuclear-industry workers.
Although this datum is conservative, it may be deemed that it is too high for occupants of dwellings, who may be ill or weak for other reasons.

(8) The notion of probability can be introduced into this requirement. But at the present time, although it is often referred to, it has not yet been calculated.

(9) It would be appropriate to include accident probabilities here. Unfortunately all basis for this is lacking.

(10) The BRS considers this requirement absolutely excessive. However it is impossible to define a probability at the present time.

(11) The BRS considers this 0.4 too high because of the slipperiness of floors in warm countries: marble, etc.

(12) This requirement calls for a refrigerator and this is why one may hesitate at writing it.

cont..

Outer privacy

Occupants of the dwellings must be able to live therein without being distinctly seen or heard from outside.

It should be possible to welcome or refuse a visitor without invading the privacy of the dwelling.

Inner privacy

Each occupant should have some place in the dwelling where he cannot be seen and, to a lesser extent, heard by the others.

Likewise, it would be desirable that the occupants be able to congregate in small groups apart from the larger group.

11 REQUIREMENTS CORRELATING WITH THE WAY OF LIFE

These requirements are obviously very variable according to the way of life. They have two facets:

— The area and the plan of the dwelling must be such that the family life can be arranged as desired;

— The family should find or install in the dwelling the equipment and furniture needed for its way of life.

Without going into details, such equipment and furniture may be divided roughly into two categories:

— Equipment and furniture necessary for fulfilling such functions as:
  — sleeping,
  — eating,
  — working,
  — leisure and relaxing,
  — attending to linen and clothing,
  — preparing meals (cf. hygiene);

— Equipment and furniture necessary for storage: general storage or special storage;

— Availability for the family of the following facilities:
  — adequate supply of electricity,
  — a telephone,
  — it should be possible to bring in and take out normal furniture, as well as stretchers and coffins held more or less horizontally;

— And lastly life in the dwelling should not require undue physical exertion:
  — the slope of walk-ways and staircases should be moderate,
  — difference of level to be walked up or down should be moderate.

12 REQUIREMENTS FOR UNFORESEEN OR DISASTROUS EVENTS

Apart from the requirements in the event of storms or earthquakes (cf. stability requirements) and outbreak of fire (cf. safety requirements), the occupants can also claim the following provisions:

No collapse of the building or those adjacent to it in the event of an explosion inside or of bombing ([13]).

That no hardship ensues; i.e. that electricity and water supplies and heating remain uninterrupted in the event of strikes, protracted power failures and shortages ([13]).

13 ECONOMIC REQUIREMENTS

Because of the variety of individual and national conditions, defining economic requirement is hardly practicable.

All that can be done is listing the constituent principles of such requirements:

— Durability, factor not readily expressed in terms of the time the building will last but which should be expressed as a desirable maximum for maintenance costs in relation to time.

— *Limitation of running expenses*

— A rather indefinite concept of flexibility, i.e. the practibility of converting and modernizing at moderate cost.

---

(13) The BRS considers that these requirements are likely to be excessively costly and limiting.

In actual fact it is the responsibility of each government to stipulate safety requirements.

end.

include aspects of reference other than those affecting safety and health.

It would be interesting to investigate these points further according to the type of building control found in developing countries, but this should be left to the authorities concerned. In this work, it is more appropriate to continue the line of our investigation. In this case into the research work dealing with aspects of architectural quality.

However, there is difficulty in devising methods which apply to all building types and as has been pointed out previously the housing area is one in which evaluation techniques dealing with quality and housing requirements have become closest to providing working methods which bears examination. There are also other methods of building evaluation which particularly deal with the identification of buildings of quality. As one of the objectives of this thesis is to try to analyse the design of projects which are considered to be of quality, it is important that these methods too are examined.

Measuring Housing Quality

It would seem appropriate at this stage to study a number of methods, which have been used, both in the United Kingdam and abroad, to measure the physical quality of housing and its environment as objectively as possible. The methods established arise from the need for a basic acceptable standard of provision for the various functions of particular types of dwelling. This is related to the full range of activities involved but is limited to those basic requirements which are familiar to architects designing housing, particularly for low cost in the public sector. Housing and dwelling quality assessment, form one of the most important type of building studied and covered by research of many different people, and institution, conducted by professional architectural organisations, government research, sociological and psychological work and others. Some of the proposed methods, merely record the available evaluation models which are already formulated and put into practice by governments. Appraisal model's for design evaluation of other types of dwelling use will be discused later. However, it has always been one of man's basic needs throughout history to house himself in shelter from the natural environment, and to modify the intended climate conditions to suite his requirements.

There are basically three methods for measuring housing quality, all having some relationship to the satisfaction of requirements.

1. Methods, used to evaluate housing and residental area in use. (U.K.) & (U.S.A.).

2. Methods intended primarily to be used for an assessment based on drawings, according to criteria determined in advance. (France).

3. A flexible system of standards that has been codified and published in advance of design of individual building and applicable generally to different situations (U.S.A.)

Measuring Housing Quality in Use

One of the first and most widely used methods of housing assessment, were the American Public Health Association appraisal method, which has developed and widely known in the United States as the "A.P.H.A. Index Method". Duncan[15], on a "Study of Methods for Measuring Housing Quality" stated that in other European Countries, the attempts which have been carried out, show an awareness of American experience. Closely related to the A.P.H.A. appraisal method is the technique applied in the Netherlands by Central Directorate of Housing and Building[16]. This was devised in 1958 for use in a sample survey of national housing dwellings. Application of the method shows the limits of the effectiveness and the type of data made available by this method[17]. The A.P.H.A. method consists of separate statements of facilities, maintenance, and occupancy,fig.-2.29- according to previously defined physical features and characteristics shuch as family size, income and rent paid. In addition physical environment is assessed using maps as well as field observations to observe factors such as access to community facilities like schools. Other facilities are related to public transport, park and play ground, density, proximity to traffic streets and railways. The characteristic of these various appraisals serve to assign penalty points to conditions that fail to meet accepted housing standards. This is then seen against a possible position by using an idex figure on each factor and against each dwelling unit. The term"Housing Quality" is used only when dwelling scores and environmental scores have been combined.

The chief characteristics of the "A.P.H.A. Index Methods" can be summarized as follows[18]:

1. A cumulative penalty score made possible a single index figure on each structure and dwelling unit. Penalty points are assigned to conditions that fail to meet accepted housing standards, the method thus measuring departures downward form a level of acceptability. The penalty value assigned to each deficiency was determined by a panel of consultants.

A.P.H.A. 'Index Methods' for measuring housing quality in use

A.P.H.A. APPRAISAL ITEMS AND MAXIMUM STANDARD PENALTY SCORES

Dwelling Conditions

Item	*Max. Score*	
A. Facilities:		
1. *Structure:* Main Access	6	
2. Water supply (source for structure)	25	
3. Sewer connection	25	
4. Daylight obstruction	20	
5. Stairs and fire escapes	30	
6. Public hall lighting	18	
7. *Unit:* Location in structure	8	
8. Kitchen facilities	24	
9. Toilet*	45	
10. Bath*	20	
11. Water supply (location and type for unit)	15	
12. Washing facilities	8	
13. Dual egress	30	
14. Electric lighting	15	
15. Central heating	3	
16. Rooms lacking installed heater	20	
17. Rooms lacking windows	30	
18. Rooms lacking closet	8	
19. Rooms of substandard area	10	
20. Combined room facilities†	–	*360*
B. Maintenance:		
21. Toilet condition index	12	
22. Deterioration index‡	50	
23. Infestation index‡	15	
24. Sanitary index‡	30	
25. Basement condition index	13	*120*
C. Occupancy:		
26. Room crowding: persons per room	30	
27. Room crowding: persons per sleeping room	25	
28. Room crowding: sleeping area per person	30	
29. Area crowding: non-sleeping area per person	25	
30. Doubling of basic families	10	*120*
	Max. Dwelling Score	*600*

* Item score is total of subscores for location, type and sharing of toilet or bath facilities.

† Item score is total of scores for items 16–19 inclusive—it is just recorded for analysis.

‡ Item score is total of subscores for structures and unit.

[continued

Neighbourhood Environment

Item	*Max. Score*	
A. Land Crowding:		
1. Coverage by structures	24	
2. Residential building density	20	
3. Population density	10	
4. Residential Yard Areas	16	*70*
B. Non-residential Land Uses:		
5. Areal incidence of non-residential land uses	13	
6. Linear incidences of non-residential land uses	13	
7. Specific non-residential nuisances and hazards	30	
8. Hazards to morals and the public peace	10	
9. Smoke incidence	6	*72*
C. Hazards and Nuisances for Transportation System:		
10. Street traffic	20	
11. Railroads or switchyards	24	
12. Airports or airlines*	20	*64*
D. Hazards and Nuisances from Natural Causes:		
13. Surface flooding	20	
14. Swamps and marshes*	24	
15. Topography	16	*60*
E. Inadequate Utilities and Sanitation:		
16. Sanitary sewage system	24	
17. Public water supply	20	
18. Streets and walks	10	*54*
F. Inadequate Basic Community Facilities:		
19. Elementary public schools	10	
20. Public playgrounds	8	
21. Public playfields	4	
22. Other public parks	8	
23. Public transportation	12	
24. Food stores*	6	*48*
Max. Environment Total		*368*

* Provisional item—not tested.

Figure 2.29 (left) dwelling survey according to defined physical features related to Facilities, Maintenance, Occupancy. (right) physical environment survey according to factors related to community facilities, public tansport, park and play ground.

2. Appraisal is carried out separately on facilities, maintenance and occupancy, with provision for a sub-total on each. As well as physical features, characteristics such as family size, income and rent paid are also reported.

3. Certain deficiencies are termed "basic". Housing regulations acknowledge these as warranting drastic corrective action, regardless of the total penalty score. Dwellings with one or more such deficiencies are termed "substandard" and this term takes on a definite official meaning.

4. A separate appraisal for the physical environment is made, the penalty score for which can be totalled with the penalty score for the dwelling. The environmental survey is conducted through maps as well as by field observation. Factors taken into account for penalty scores include excessive density, presence of incompatible uses, proximity to traffic streets and railways, adequacy for sanitary services and availability of essential community facilities such as schools, public transport, parks and playgroups.

The main opportunities which the method offers are these:

1. The possibility of developing appropriate policies for the treatment of each area. For example, it

has been found that a facilities penalty score in excess of 50 points is a strong presumption for demolition; as is, a maintenance penalty score in excess of 30 points. A combined facilities and maintenance penalty score of 80 penalty points may be used to designate first priority clearance, a combined penalty of 60-80, second priority clearance. Below 60, rehabilitation may be justified in so far as the individual structure is concerned.

2. Median block or area penalty scores can readily be established. A high median score for the block may suggest complete clearance, even though a few structures may have scores bleow 60 for maintenance and facilities. This is the crucial link between housing assessment and planning policy. One of the features particularly noted by those with local knowledge in the first test in 1943 was the accuracy with which the scale measured breaks in quality from block to block (or even within blocks).

3. Since the total and subtotal penalty scores are based on the scores for 30 dwelling items and 24 environmental factors, particular shortcomings under selected items can quickly be identified by bodies with special interests, e.g. fire hazards, vermin extermination. The location of such hazards can

readily obtained and action initiated. The system is flexible, items being added or eliminated according to the needs of participating departments.

4. Conditions can be measured far above the slum clearance level. The degree of blight can be assessed, and the particular items in which conditions are below standard identified. It is one of the major criticisms of surveys depending on gross measures of quality, such as absence of toilets or baths, that they give little discrimination in the middle part of the quality range.[18]

The A.P.H.A. Appraisal Method is intended for use in selected areas known to contain poor or mediocre housing , rather than for city-wide application. Some of the city-wide screeing techniques used in American cities were a preliminary use of the A.P.H.A. method, whereas others developed into complete appraisal techniques. American techniques closely reflect American problems which differ somewhat from these in Europe. They are of interest and have influenced the approach made to assessment of quality in this country and westen Europe.

However, Duncan,[19] in his paper on Measuring Housing Quality goes on to discuss the more radical possibilities among the various studies and housing appraisal methods which have been carried out both in the United Kingdam and abroad. He describes their main features and assesses to what extent each may go in meeting the need by questioning whether a new procedure might not be necessary but rather that the more promising sources might be adopted or extended in scope, in order to meet requirements of housing quality.

Among the methods described, and widely used in the U.K. are:

a) Techniques based on arbitary penalty points:

1. The housing defects index (H.D.I.) Scottish development department.

2. The Index of Decay: A survey carried out in Northwest England to measure the extent of urban decay.

b) Techniques based on cost indicators:

3. House Condition Index(H.C.I.): devised as part of a research programme by the architects division of the Ministry of Housing and local government.

4. The Survey of Housing and Environment Deficiency (S.H.E.D.) method.
The technique was developed as part of recent study of Tees-side-steering committee.

5. Indices of repair costs: Housing division of the Scottish development department.

c) Techniques Related to the Environment:

6. The Manchester Schedule: City Planning Office Manchester.

7. The Barnsbury Environmental Study: London Borough of Islington.

8. The Grangemouth/Falkirk Survey:

d) Recent Developments:

9. Leicester and Leicestershire subregional planning study: Involved the use of an index to assess current housing and environmental conditions.

10. Coventry housing survey.

11. Nottinghamshire County housing survey.

12. The quality of local authority housing schemes." [20]

These all are similar in principle incorporate the main features of those examined in detail.

2. Measuring Housing Quality Based on Projects Assessment

"The Qualitel Method" was first introduced to assess quality of housing by refering to satisfaction of stated requirements and has formed the basis of quality assessment and control in France since 1974. The studies were directed by the C.S.T.B. working commission, and were based on the statement of these requirements which were to be satisfied in dwellings. These were categorized under twenty headings, and rated on a one to five scale.

Lagente[21] stated that the method is not exhaustive and does not provide a suitable overall evaluation; the user of the information is expected to arrive at his own overall evaluation in terms of his own criteria. Assessments draw

on existing technical knowledge wherever possible and on sociological survey data. Correlation is found between ratings and user satisfaction. The evaluation system is administered through an independent association, it is given to anyone on request "Qualitel Quality Profile".
It can be published, but must be published in total.
The system is adopted by private and public owners and by consumer associations. The method devised has possibilities for assessing quality more suited to the needs of the users.
Another method called "Consistence Utile" uses a full set of standards:[22] The method is concerned with objective statements about quality in the areas of acoustic and thermal environments, and is basically for making judgments about quality. It has been applied to over 300,000 dwellings and is still being used as a reference base by the contracts commission in France, "Commission Des Marches" for assessing the value of what the building owner is buying. This useful standard method known as the method of pluses and minuses for measurement of quality reported earlier in some detail in chapter -2.2-.

However, in an appraisal of these methods, Lagente[23] summarized the Qualitel Method from its orignal profile documents as follows:

"<u>The Qualitel Method</u>

"Principles"

The assessments relate to twenty headings shown in table -2.30-

The assessments are translated into a numerical rating, some times accompanied by descriptive notes. Headings A and U are descriptive only: B,D and H are partially descriptive and partially convered by numerical ratings, the other headings are purely numerically rated. A scale of ratings; from 1 to 5, in use defined as in table -2.31-.

"Limits of the Method"

The method does not claim to be an exhaustive evaluation of quality. It does not apply, for example, to any criterion for which no correlation between measurement and satisfaction has been established, or for which no measuring instrument exists. There are deliberately excluded. In this way, questions such the architectural quality of a project, the quality of the relationship to the outside world (the quality of the environments), the quality of adaptation to life styles etc., are not included. The method, which is intended primarily to be used for an assessment based on project drawings, excludes any examination of the quality of workmanship and the solution which arises after the implementation of the scheme. No study of cost-benefit ratio is made. The price of dwelling depends on too many factors unrelated to its intrinsic quality. It is up to the buyer to relate the two concepts of cost and benefit in order to make a decision according to his own criteria. The method does not attempt to make any overall assessment of quality leading to a single quality

The "Qualitel Methods" for measuring housing quality, project assessment.

The Group of Buildings:

- A Situation of the group in its general surroundings,
- B Open spaces within the project,
- C External circulation,
- D Community facilities;

The Building:

- E Convenience of internal circulation arrangements,
- F Finishes of internal circulation arrangements;

The Dwelling:

- G Ease of furnishing,
- H Areas and uses of private spaces,
- I Finishes and fittings in private spaces,
- J Plumbing fixtures and waste disposal,
- K Electrical installation,
- L Protection against noises from within the building,
- M Protection from noises outside the building,
- N Winter-time thermal characteristics,
- P Summer-time thermal characteristics;

Indications as to Costs of Maintenance and Use:

- Q Durability of the external envelope,
- R Cost of maintaining open spaces,
- S Cost of maintaining and operating heating system,
- T Cost of maintaining and operating the elevators,
- U Other factors that can influence costs of maintenance and use.

The 20 Qualitel assessment headings.

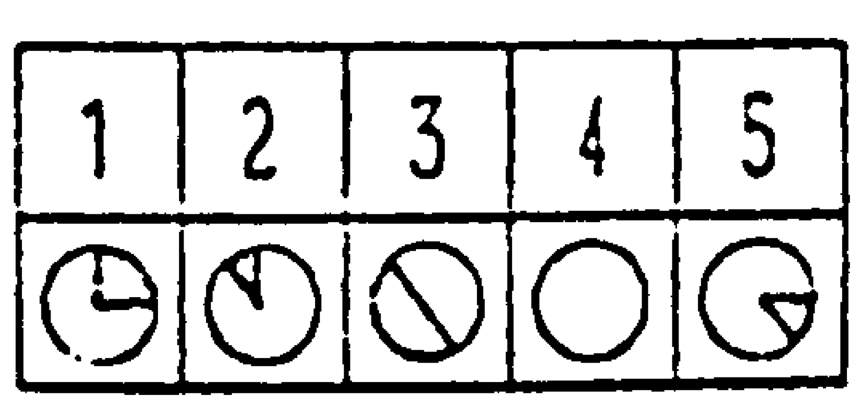
Table 2.30

Rating:	Meaning: For headings other than Maintenance and Use:	For Maintenance and Use:
1	quality level characteristic of functions that are not, or are only scarcely satisfied	cost levels well above average.
2	quality level such that functions can be satisfied subject to restrictions or subject to accepting loss of comfort	cost levels above average.
3	quality level characteristic of functions that are satisfied under conditions of normal duration and comfort	cost levels within good average range.
4	quality level characteristic of functions that are satisfied very well	cost levels below average
5	quality level characteristic of functions that are satisfied under excellent conditions.	cost levels well below average.

Weighting scale used for Qualitel assessments.

Table 2.31

Method of representing a typical quality profile for a project, under a particular heading. In this example, 25% of the dwellings are rated 1; 10%: 2; 50%: 3; 0%: 4; 15%: 5.



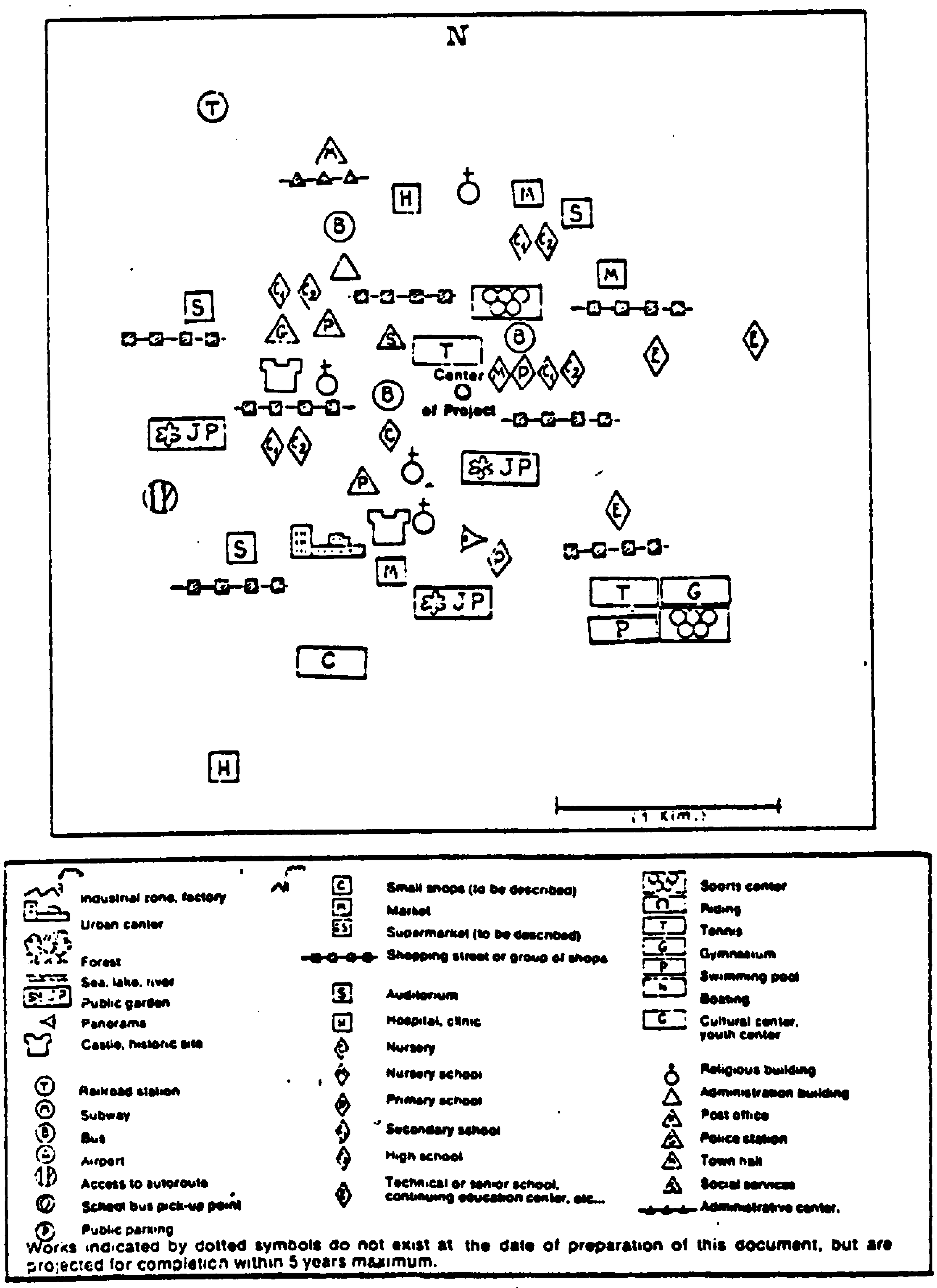


Figure 2.32 Typical location plan for a project. This plan (and accompanying legend) are published on p.2 of the Quality Profile document.

statement. Each one of the twenty headings is evaluated separately and no general synthesis is attempted. Each person must make his own overall assessment according to his own criteria.

The Qualitel method is intended to be evolutionary, so that these chosen aspects of the system can be modified. The assessments rely on earlier studies of classifications and methods of evaluation of finished products and materials used. A sociological survey allowed a correlation to be established between the numerical assessments and the users' satisfaction.

"Project Assessment"

During the assessment process a sample is chosen from the dwellings according to a numerical criteria and criteria of location, determined in advance for each heading. (Fig.-2.33-) For example, to assess winter heating in a project of 100 dwellings, at least 12 dwellings will be studied, of which 9 will be in unfavored positions (under flat roots, above open passage ways), and the rest in typical positions.
The set of samples chosen for each heading enables the assessment plan for whole project to be prepared. This assessment plan allows the overall quality profile of the project to be prepared (including costs of maintenance and use). An example is given in figure -2.33-and -2.34-, where possible, the examination of the sample is extrapolated to the whole project.

In figure -2.33- for example one can see that under the heading "Area Usability of the dwellings" 90% of the dwellings are assessed 3; 10% - 4; 0% - 5.

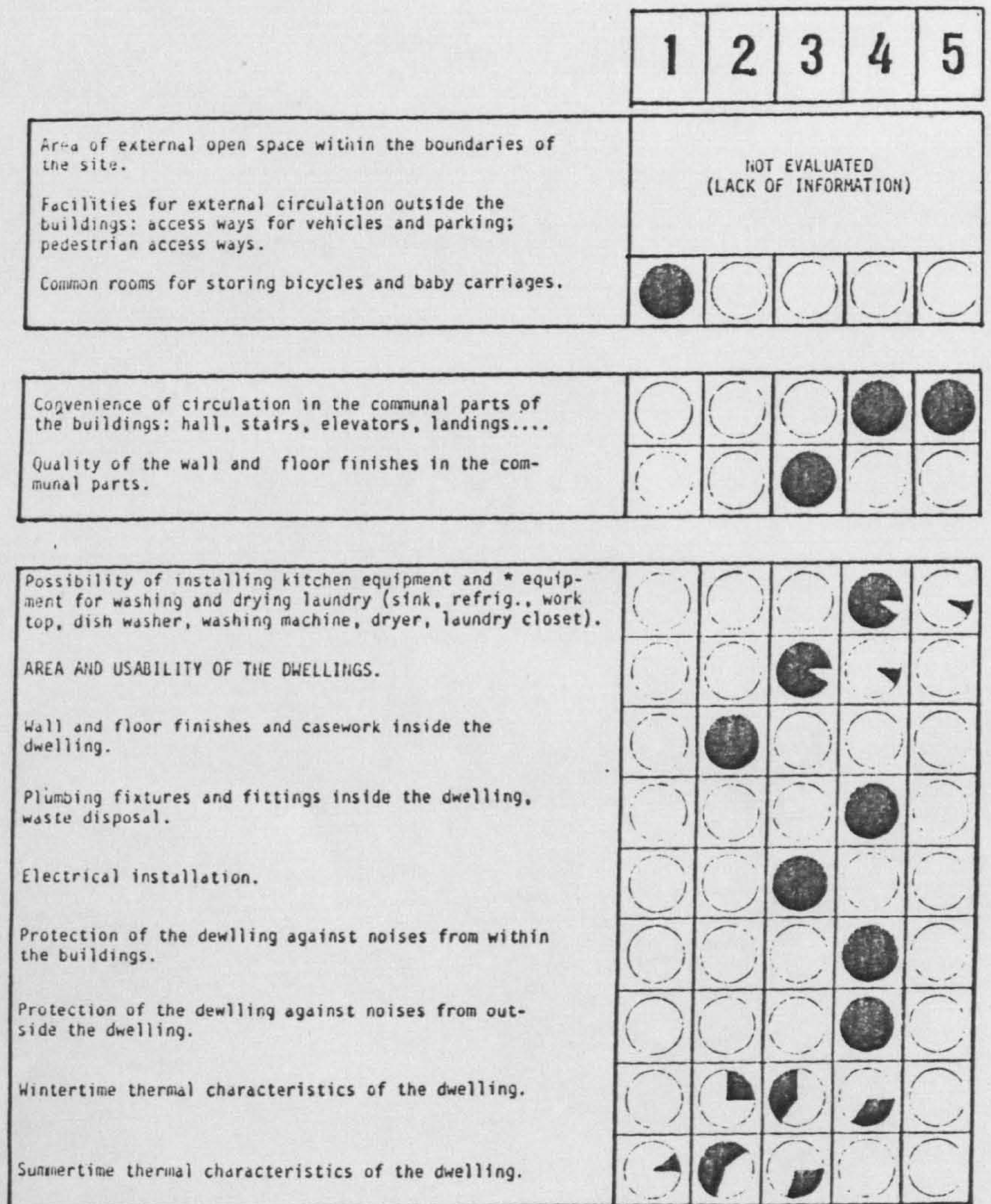
"Initial and Final Profiles"

The normal procedure permits an initial quality profile(I.Q.P) to be prepared from plans and specifications. However, the method allows for a site evaluation of a building, leading to a final quality profile (F.Q.P.). The method is identical, except for acoustic considerations, for which only the field tests are taken into consideration.

"Application of the Qualitel Method"

While the method belongs to the public, it was felt preferable to set up an independent association for its application. Among other reasons this arrangement avoids the situation in which the government learns about features which fail to comply with regulations, through an examination of project files (if arrangement had been other wise, building owners might have hesitated to allow their projects to be examined and the development and application of the method could have suffered). The association called the "Association Qualitel" has an administrative board on which representatives of the government, owners, architects, users and the C.S.T.B.[24] are present. Founding members include the board members plus the authorized control agencies. An executive director and a small team ensure the operations

Quality levels, area of usability of dwellings

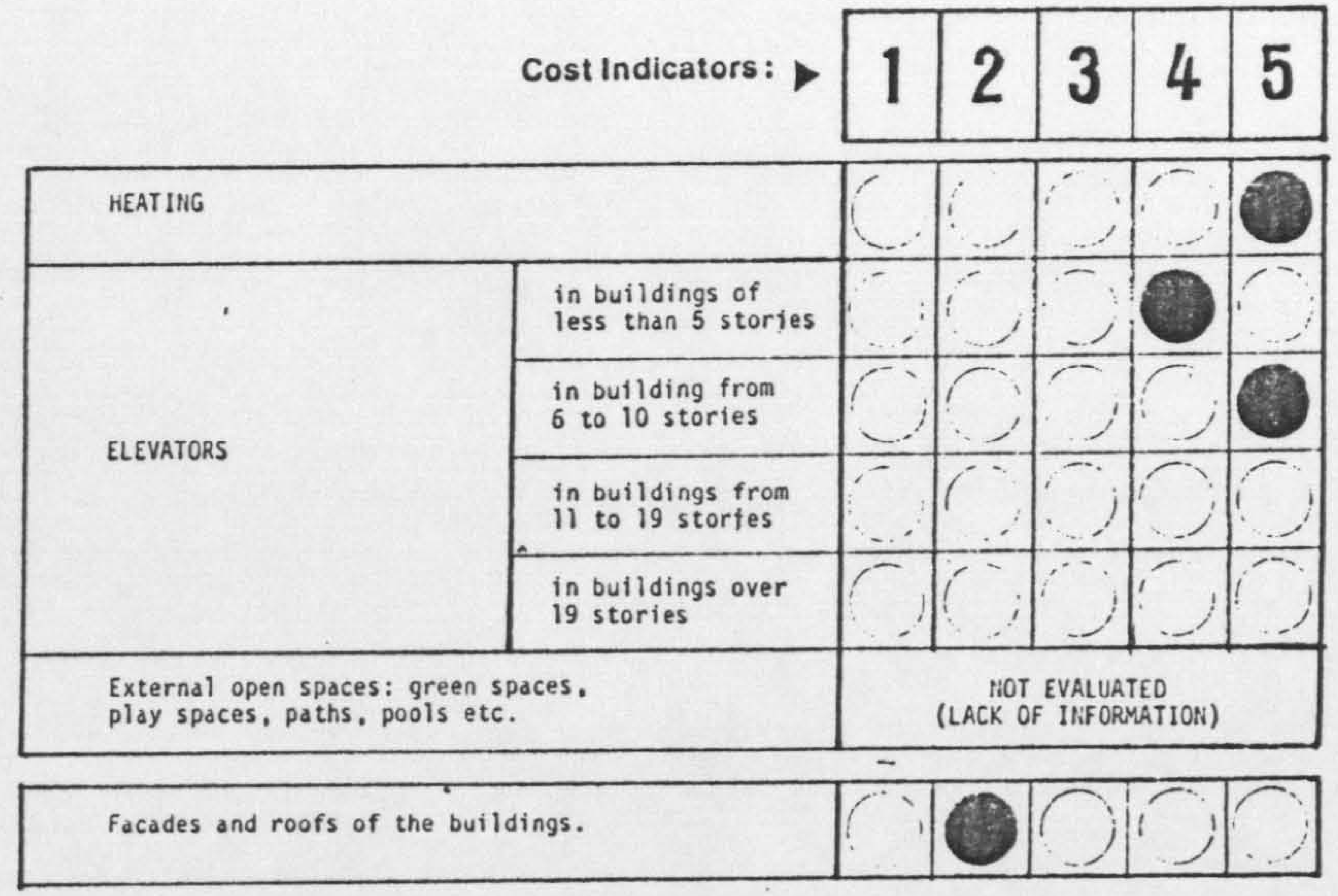


* at present the tests under this heading do not apply to small dwellings.

Typical quality profile of a project (economic factors excluded). This table is published on page 3 of the Quality Profile document.

Figure 2.33

MAINTENANCE & OPRATION



Furthermore, attention is drawn to certain elements, the operation and maintenance of which involves additional costs; no evaluation of the level of these costs is made (see the elements that are checked below):

Controlled mechanical ventilation	●	Need for daytime lighting in the communal parts (no natural lighting)	●
Compressor	○	Offset waste chutes	○
Electricity generator	○	Diam. of waste chutes < 400 mm.	○
Intercom system	●	Windows cleanable from outside only	○
Air conditioning	○	Difficulty of access to branches and bends in services; access traps difficult to reach	○
Fire protection equipment, including supervision and maintenance	○		○
Roof-top bathing pool	○		○
Waste water collector	○		○
Waste water treatment station	○		○
Street maintenance charged to the project	○		○
	○		○

Typical economic profile of a project. This table is published on page 4 of the Quality Profile document.

Figure 2.34

of the association are efficiently carried out.

"Methods of Operation"

Anyone can apply to the Association Qualitel to have a quality profile of his project. The French government intends to use Qualitel to help with judging the various competitions it organises. A public or private sector promoter can obtain a profile, either to evaluate the quality of a project under preparation in order to improve it, or to use it for publicity purposes. Many consumer associations, newspapers and indivduals, which know of the quality profile of a project, and ask to publish details. The association Qualitel entrusts the preparation of the evaluation to an approved control agency who draw up the profile of the project. Once the profile has been released, the person who requested it is allowed to publish it, provided that it is published in total, including any comments made by the association, the evaluations of the various sub-headings must also be made available to anyone who asks for them. A technical commission, chosen within the association and helped by a panel of experts, is charged with up dating the method and adopting it to keep pace with the evolution of available knowledge., The commission can suggest improvements in the methods, but - since it is still under government control - the government is free to accept or refuse the change. The cost of preparing a quality profile depend on the complexity of the project according to standard scale of charges based on the work necessary to establish the profile."

3. Housing Quality "A Programme for Zoning Form"[25]

"A series of proposals for zoning changes was drawn up by New York's urban design council, and published under the title "Housing Quality", a programme for zoning". The study represents a system of standards that has been codified and published in advance of the design of individual buildings, and is generally applicable throughout the city. To solve the problems in residential areas, especially the tall apartment houses, the developer and his architect, would elect to include certain design elements in their building from a list specified in a comprehensive zoning amendment. The use of these elements would be rewarded by a point system also specified in the law. A building which had a high enough score on this scale of quality points would be permitted to use the highest floor area scheduled for that particular zoning district, this move would make a building more profitable for the developer. However, buildings whose design received a lower score would be proportionately smaller. There would be more possible quality design elements than any one building would be expected to include, thus recognizing that design is always a series of choices, and sometimes one objective can be achieved only at the expense of another. The architect would be able to choose appropriate design elements in relation to the existing neighbourhood. The shape of the site, the topography, and so on, instead of adopting the needs of hic client to a single rigid stereotype.

The design council has included four categories of elements that are rewarded with points for design quality. They respond to criteria for <u>neighbourhood impact</u>, <u>recreation space</u>, <u>security and safety</u>, and <u>apartment design</u>. The scoring system is set up in such a way that the developer must achieve a minimum distribution of points among the four categories. A list of all the criteria, and some representative examples, are shown in Figure -2.35 to 2.38-

The design quality system included the question of building costs. The developer is expected to balance increased costs caused by some of the elements he elects, by savings created by not having to comply with some of the old regulations, and by the increased feasibility of building on many sites that were not economic before.

The new regulations would be administered in the same way as the present law, the provisions would be available by right subject to approval by the building department, there would be no discretionary rulings by the planning commission and no individual special permits with their attendant public hearings."

The main point about the housing qualitative assessments is that they tend to be devised to deal with questions of basic provision and emphasise the difficulty of finding methods of assessing high quality design work, in housing as well as other building types.

Housing quality "A programme for zoning form"

	NEIGHBORHOOD IMPACT	MAXIMUM VALUE Built Up	Non Built Up
1.	Street wall setback*	4.55	n.a.**
2.	Sunlight in open space*	3.60	4.70
3.	Length of street wall*	3.60	7.55
4.	Shadow on buildings*	3.05	5.40
5.	Height of street wall*	3.05	n.a.
6.	Street trees*	2.85	4.15
7.	Height of building*	2.15	n.a.
8.	Transparency ratio at ground floor*	2.15	3.20
		25.00	25.00

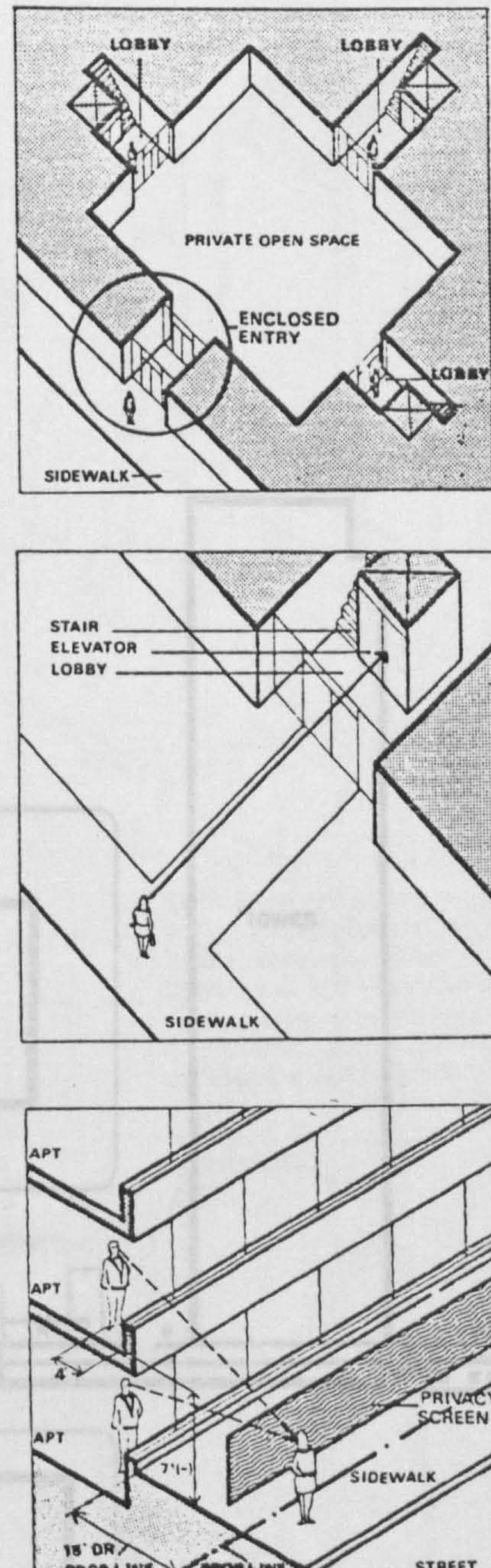
	RECREATION SPACE	
1.	Type and size*	8.50
2.	Winter sun	5.00
3.	Landscaping	2.75
4.	Covered parking	2.65
5.	Visibility of parking*	2.65
6.	Trees*	2.45
7.	Seating	1.00
		25.00

	SECURITY AND SAFETY	
1.	Vis. from public space to elevator door or general circulation stair	3.90
2.	Vis. of priv. outdoor space from lobby*	3.90
3.	Surveillance from large apartments	3.30
4.	No. of apts. serviced by lobby	2.90
5.	Vis. of parking from exit point*	2.25
6.	Vis. of parking area from lobby	2.20
7.	Distance from elevator to apt.*	1.85
8.	Road separation*	1.80
9.	Vis. from elevator door or general circulation stair to apartment door*	1.80
10.	Visibility of mail room	1.10
		25.00

	APARTMENTS	
1.	Size of apartment*	3.75
2.	Sunlight in apartment*	3.20
3.	Window size*	3.20
4.	Visual privacy--apt. to apt.*	3.20
5.	Visual privacy--street to apt.	1.75
6.	Balconies	1.70
7.	Daylight in hallways	1.50
8.	Distance from parking to garage exit*	1.50
9.	Daylight in kitchen	1.50
10.	Pram and bicycle storage	1.30
11.	Waste storage facilities*	1.20
12.	Garbage pickup facilities	1.20
		25.00

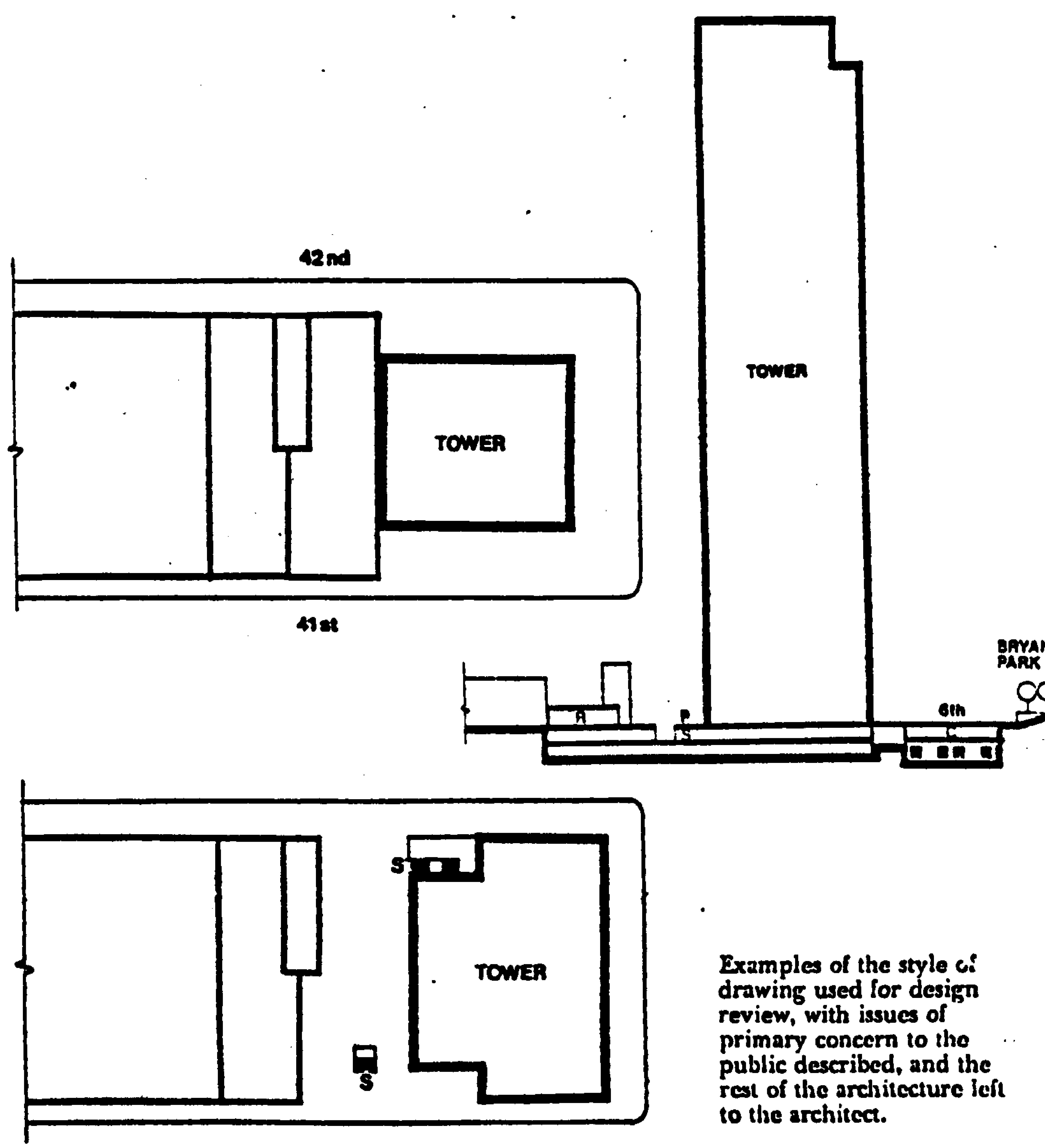
*Minimum compliance levels established

**n.a.--not applicable



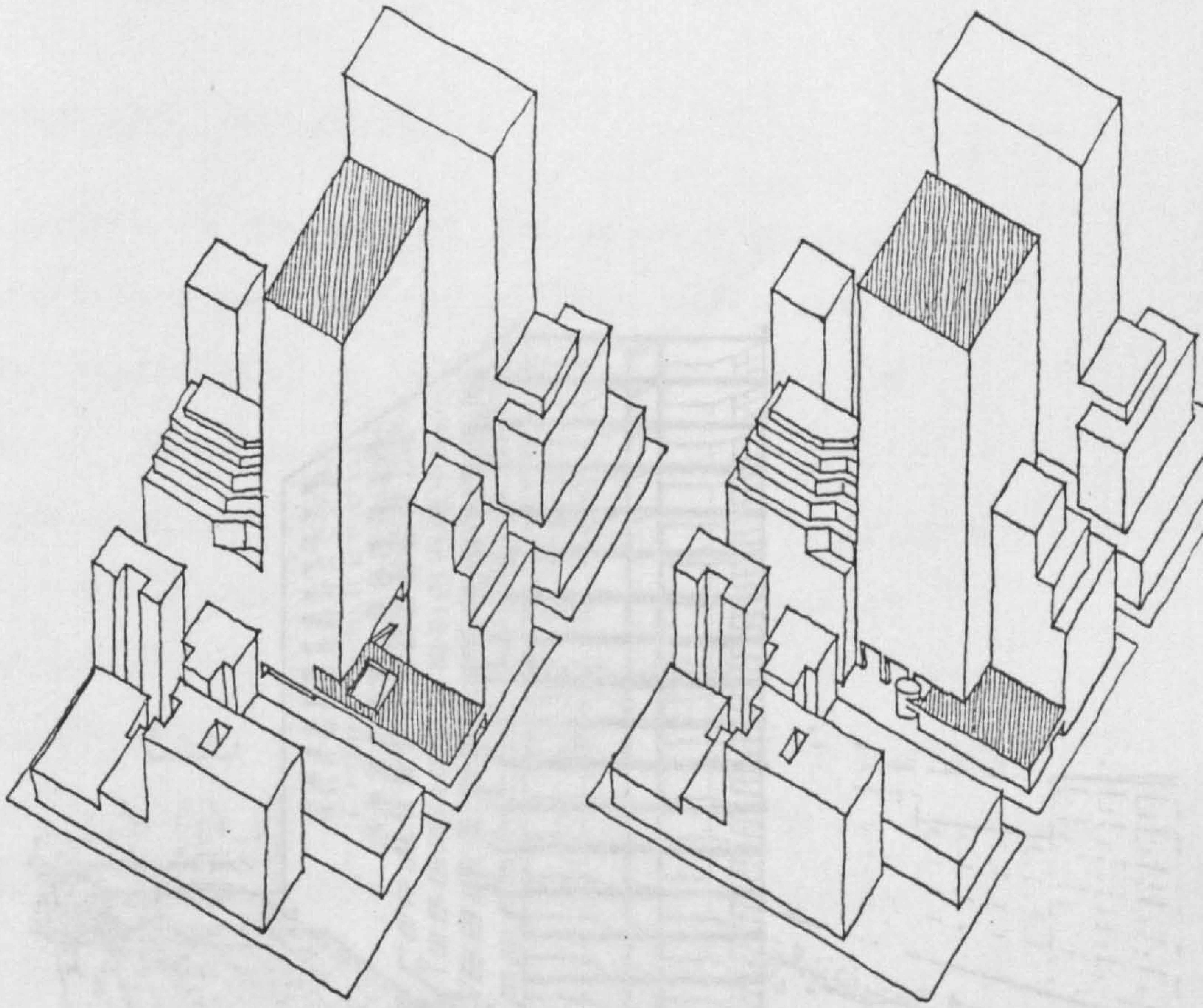
Putting an objective value to design quality: the list of possible housing quality points that a developer could obtain, and which would permit him to build to the maximum density. Drawings illustrate examples of the security and safety category.

Figure 2.35 The four criteria of elements rewarded with points for design quality, neighbourhood impact, recreation space, security ans safty and apartment design.



Examples of the style of drawing used for design review, with issues of primary concern to the public described, and the rest of the architecture left to the architect.

Figure 2.36



Two drawings from a series documenting discussions with a developer. The drawing at left shows how the building actually was constructed. The developer provided a public park on top of the low structure, in return for zoning concessions.

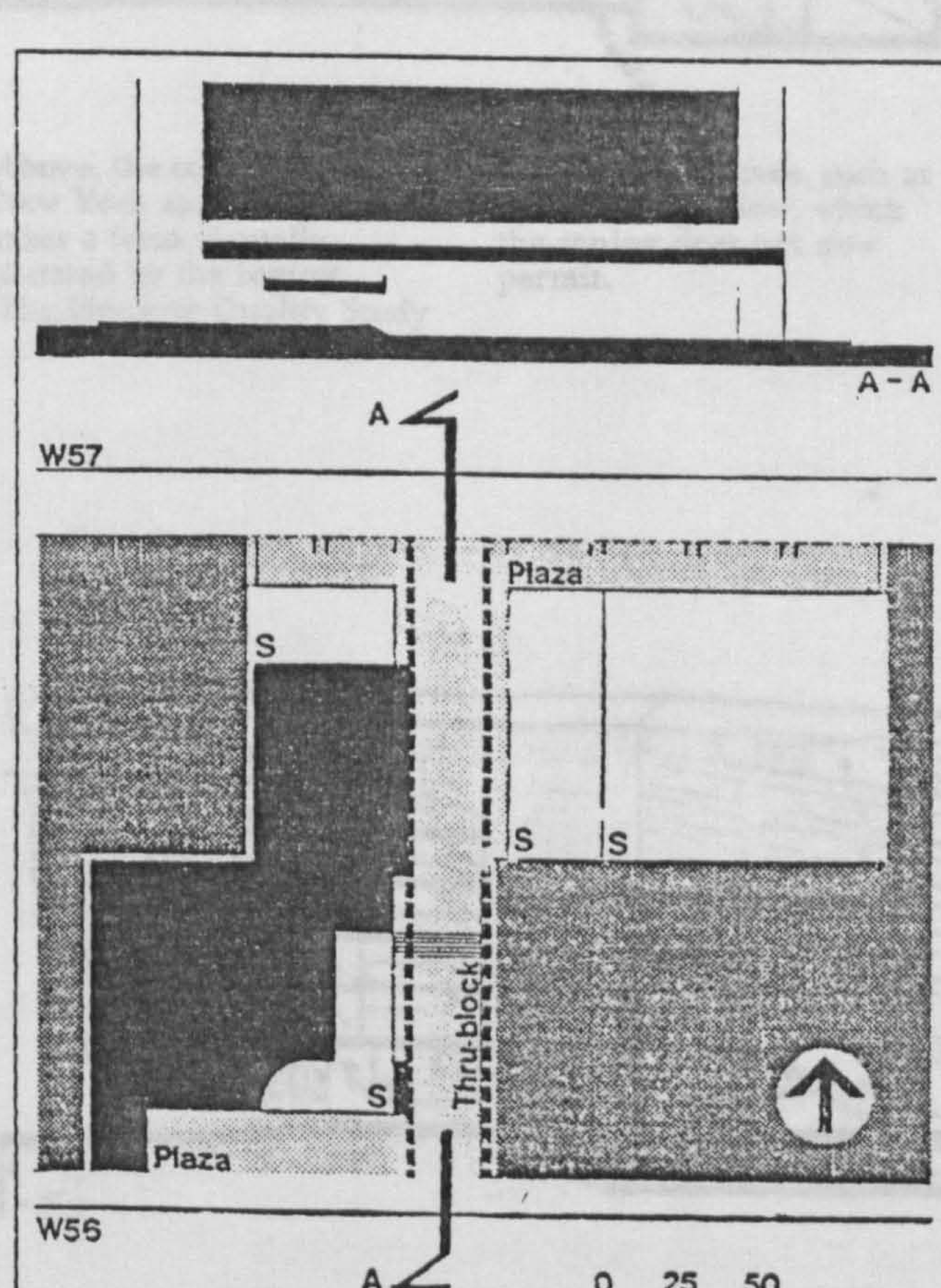
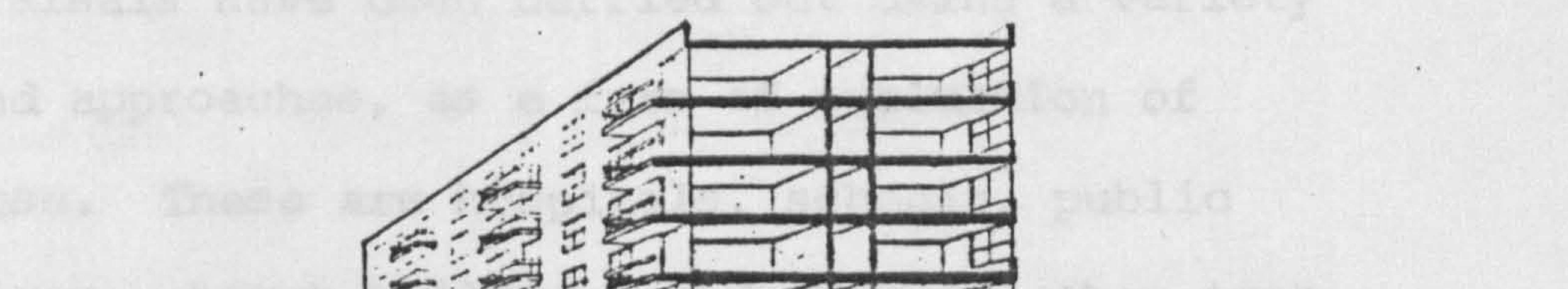


Figure 2.37

Housing Quality "A programme for zoning form"



Above, the conventional New York apartment house takes a form virtually dictated by the zoning. The Housing Quality Study suggest alternatives, such as the building below, which the zoning does not now permit.

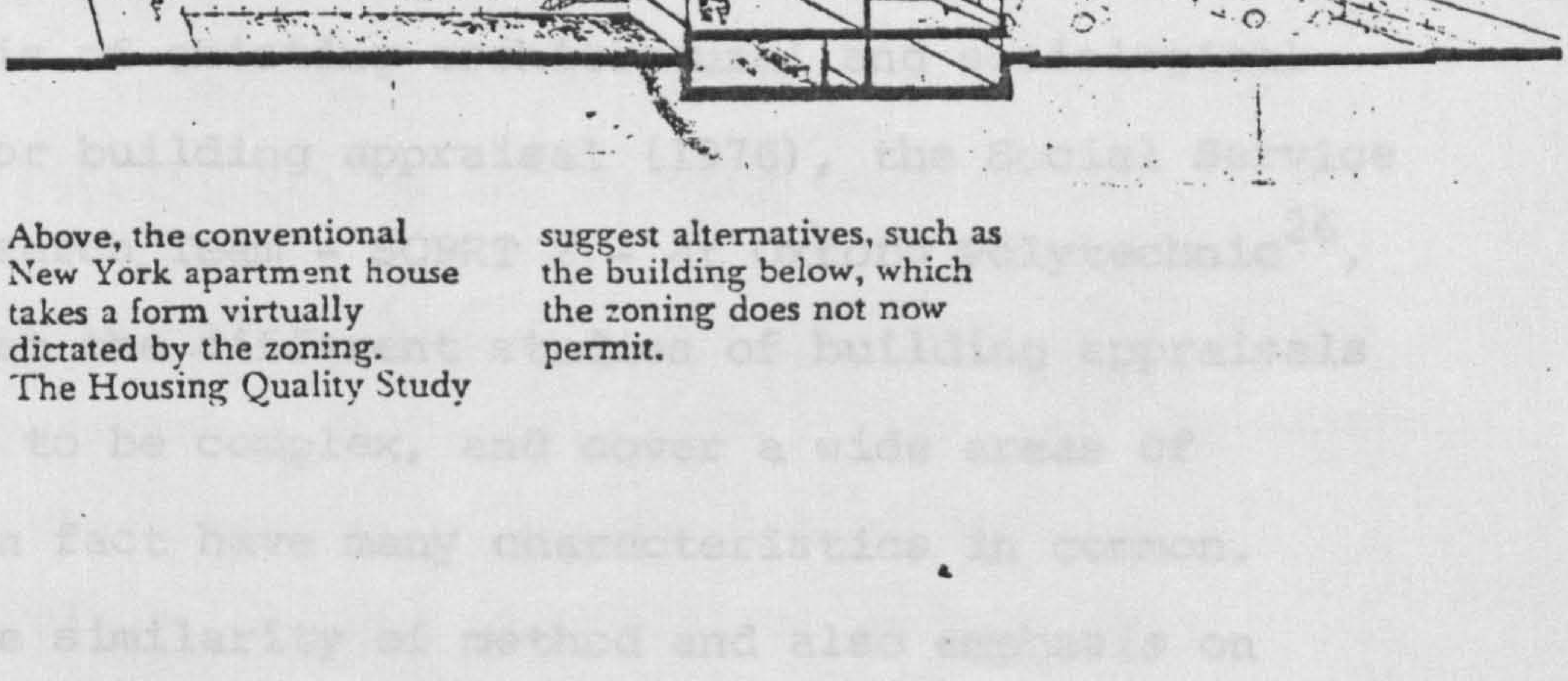


Table 3.38

Building Systems and Appraisals

In Britain a number of government and privately sponsored building appraisals have been carried out using a variety of methods and approaches, as a form of evaluation of building in use. These are hospitals, schools, public housing, offices, church buildings and several other type of buildings. The studies have covered wide areas of research, involving different appraisal models. Each have specific advantages and give a clear idea of how a particular buildings work in use. The variations in methods of appraisal vary according to the building type and the recourses available to the investigater.

In an analysis of existing architectural and sociological approaches for building appraisal (1976), the Social Service Building Research Team - SCBRT 2 - at Oxford Polytechnic[26], indicates that the different studies of building appraisals which appear to be complex, and cover a wide areas of research, in fact have many characteristics in common. These include similarity of method and also emphasis on particular areas of study. They placed the different studies into defined categories shown in table -2.39-, and indicates the method used, and some of the problems the methods were intended to solve.
The methods can be summarised under each heading as follows:

Descriptive Appraisal: The methodology evolved is very slowly moving towards systematic and quantifiable observations and measurements. These are cross checked against criteria either from a brief or guidance notes. They normally undertaken by practising architects. This category is sub-divided into two types of appraisal and is used normally to describe building types in use.

a) <u>Subjective descriptions</u>: are normally undertaken by practising architects who visit the building concerned, question the users and write up their impressions largely in the light of their own values and experiences. The quality of the appraisal therefore largely depends upon the appraisal and as there is no readily recognizable method or frame work for carring out an appraisal for example for a periodical such as the Architect Journal. The results can be and do vary enormously.

b) <u>Descriptive Appraisals by Expert Teams</u>: It include comparisons with various yard sticks, and appraisals by teams experienced in the operational use of buildings. A type of appraisal perhaps most commonly found in hospitals and schools in connection with development work. The terms are usually professional in that they form part of a continuous research and development operation in large client organisations.

	TYPES OF APPRAISAL	METHODS USED	PROBLEMS APPRAISALS SEEK TO SOLVE
GENERAL	Descriptive	Observation Interviews - generally informal, and subjective analysis	Background information, identifies problems for further investigation, raises issues, describes unquantifiable elements, includes some judgements against vague or unspecified criteria
GENERAL	Expert Teams	Observation Interviews - Tendency to be more structured and systematic	As above - data checked against experts experience, or specified criteria
SPECIFIC	Sociological	Observation — unobtrusive, participant Interview — in depth, informal Questionnaire — attitude tests, preference tests, projective tests Statistical analysis to find significant correlations. Systematic methods, whether formal or informal Methods tend to allow for comparison over building types	Relates data to find effect of built environment on people, and effects of interaction on people Seeks to identify finer grain of problem, to explain reasons why, and sometimes propose solutions Isolates variables at a general level
SPECIFIC	Psychological	Observation — unobtrusive, participant, behavioural Interview — in depth, informal Questionnaire — attitude tests, preference tests Statistical analysis to find correlations, factor and multivariate analysis. Highly systematic methods, controlled variables, and sophisticated analysis. Methods tend to allow for comparison of individual responses.	Very detailed but limited level of problem finding Relationships between carefully identified and isolated variables explored Some Laboratory tests undertaken to explore variables Aims at achieving 'scientific validity'
SPECIFIC	Environmental	Observation, Questionnaires — - activities, attitude tests, preference tests Physical Measurement — environmental, building, physiological Statistical correlations and evaluations against known standards	Technical - performance in achieving standards
SPECIFIC	Technical	Observation Physical measurement	Tests performance against established criteria
INTEGRATED	Appraisal Models	Observation Interviews Questionnaires Physical Measurements - generally incorporating all variations mentioned above	Systems approach to explain the building and its effects on people. Relates social/psychological/environmental/technical aspects together as a whole.

Table 2.39 Analysis of existing architectural and sociological approaches for building appraisal, SCBRT 2 Oxford Polytechnic.

2. Social and Psychological Appraisal of Buildings:

The scope of the appraisals in this category is extremely wide ranging form simple questionnaire type surveys to sophisticated and scientifically controlled often single variable studies, using sophisticated statistical analysis.

One of the leading experts in the field of architectural psychology approaches is Dr. Canter[27] of The University of Strathclyde, his work involves the development of appraisal instruments and measurement and their application to building in use.

The influence of the social sciences on architecture has been increasing considerably with many sources publishing sociological studies of buildings. The Department of the Environments -DOE- has undertaken many sociological building studies in particular of housing to appraise the success of their housing designs. This was the objective of building up a body of knowledge at the DOE, which can be fed back into two design systems.

Some further development of methods has been attempted by Jameson[28] who put forward his instrumentalist views which accepted value judgments as a stand point, and tried to relate the methodology to certain testable hypothesis to explain results and put-forward useful recommendations. This techniques, w as used with detailed observations on an appraisal of a students union building at Keele University.

Environmental Studies: Appraisals of the environmental aspects of buildings categorized into three main areas. The first being a category of building performance measuring largely the efficiency of the building in relation to heating, lighting, and acoustics. The second category is concerned with human comfort, by relating the effects of heating, lighting and acoustic standards to peoples responces. The third concerns systems performance, by the technical means of achieving the desired performance standards. Different methods for testing environmental performance have been developed. Some important data has been devised and described earlier under the heading of quality performance assessment.

Technical appraislas: According to the "SSBRT 2"[26] report, the field of technical appraisals is specialized and complex. In such studies the building is taken as a series of elements with performance requirements which can be tested against established criteria, for safety, health and legal standards such as the building regulations and legislation dealing with standards within buildings such as the health and safety of work act and the shop offices and railway premises act.

Measurement and Appraisal as Part of Design Process: A number of proposed models are applied to evaluate design during the design process rather wait untill the completion of the building. This has been resulted in numerous attempts to produce models or explanations of the building "system" in terms of design process and appraisal of completed buildings. Various approaches have been proposed, in each the building itself or in a wider context has been broken into a subsystems, and each of the subsystems then further divided. Table-2.40- showes the similar broad categories of the subsystems when the diffferent proposed approaches are compared it included:

1. Environmental category with its internal and external "Climate" and in much cases the constraints imposed by the site and its immediate surroundings.
2. Activities, human activities, perceptions and attitudes within and around a building.
3. A technical category including divisions into elements and the performance of the fabric and building structure.
4. Resources and cost.
5. Cultural and symbolic context.

The boundaries drawn for each subsystem in each approach vary in detail and the relationship between the parts for each approach operate differently.

According to Manning[29], the "models" related to building appraisal has three practical functions, of feed back, evaluation of design, evaluation of alternative solutions in the design process, and checking a completed building against criteria or design intentions. However Broadbent

BULDING 'SYSTEM' MODELS

	Hillier and Leaman	Davis	Rabinowitz	B.P.R.U.	Broadbent
ENVIRONMENTAL	Climate Modifier	Environmental measures	Technical Factors Functional Factors	Environmental System - Physical & Spatial	Environment System - Physical Building System - Internal ambience
ACTIVITIES	Behaviour Modifier - container of activities	Humans (Perceptions & Satisfactions)	Behavioural Factors Functional Factors (Activity support)	Activity System Objectives System (Clients)	Human System - user requirements - client objective
TECHNICAL		Constructional Measures Buildings (Structures & Materials)	Technical Factors	Building System	Building System - Technology
COSTS/RESOURCES	Resource Modifier - Changes in use & values of resources			Costs related to above 4 'Systems'	Building System - Technology
CULTURAL	Cultural Modifier - Symbolic and Cultural factors				Environment System - cultural context

Table - 2.40 - Proposed models of the building systems in terms of design process and appraisal of completed buildings.

arrived at a system approach[30], that can be used to help the designer take an overall view of his task. It gives the architects a way of structuring the information into a design process in which all the relevant factors are allowed to play their appropriate part in determining the final form of the building. Table -2.41 - shows Broadbent's approach to the environmental design process adopted from Markus"building/environment/activity/objectives model".
The system starts with user's requirements which describe the pattern of activities in building, then moves to the physical context and then reconciles between the two areas using building technology which provides an acceptable filter between them.
The concept of climate include the cultural context with its social, political, economic and aesthetic climates in addition to the physical one, the human system recognize human beings as a complete "self-interacting" whole, he can be separated from his environment and analysed physiologically psychologically etc., but he also forms part of social system which can be analysed differently.
The structure of Broadbent system operate in Man/building/ environment relationship. However the sequence in which one considers them is not important, providing that, one takes into account the three systems, and their sub-systems and the interactions between them. To achieve the best results. Broadbent emphasis in his approach the importance of the systemic interaction between the building fabric with

ENVIRONMENT SYSTEM		BUILDING SYSTEM		HUMAN SYSTEM	
CULTURAL CONTEXT	PHYSICAL CONTEXT	BUILDING TECHNOLOGY	INTERNAL AMBIENCE	USER REQUIREMENTS	CLIENT OBJECTIVES
	The site as given in terms of:	Modifications of external environment to provide suitable ambience for specified activities by means of:	Provision of physical conditions for performance of activities in terms of:	Provide for specified activities in terms of the following needs:	Return for investment in terms of:
Social Political Economic Scientific Technological Historical Aesthetic Religious	*Physical characteristics:* climatic geological topographical	*Available resources in terms of:* cash materials labour/equipment		*Organic:* hunger and thirst respiration elimination activity rest	Security Prestige Profit Expansion or other provision for change
	Other constraints: land use existing built forms traffic patterns legal	*Structural systems:* mass planar frame *Space separating system:* mass planar frame	*Structural mass:* visible surfaces space enclosed	*Spatial:* functional (inc. fittings) territorial *Locational:* static dynamic	Housing of particular activities so as to encourage user well-being, motivation, etc.
		Services system: environmental information transportation *Fitting system:* furnishing equipment	*Sensory environment:* lighting sound control heating/vent	*Sensory:* sight hearing heat and cold smell kinaesthetic equilibrium *Social:* privacy contact	

Table 2.41 Interrelations in building design. Broadbent conceptual model in which three major systems - human/building/environment as a system are interrelated.

the physical context and user requirements. This differs from most of other systems which in solving design problem usually starts with the building technology that is given before the users needs or even the site are known.

Performance Measurement and Appraisals in Design Methods

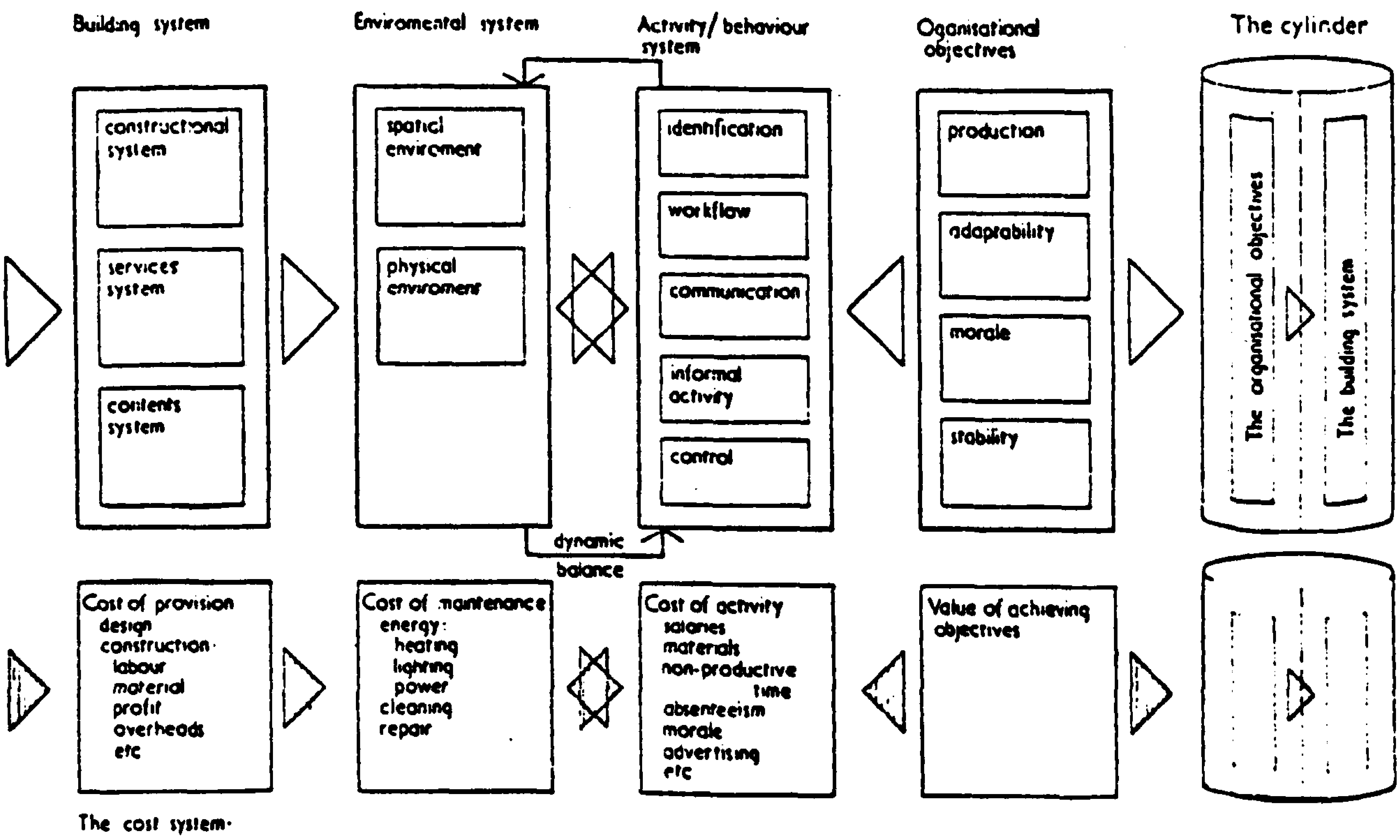
It is well documented in the publications of the school of architecture at the university of Strathclyde by the Building Performance Research Unit (BPRU). The aim is to make available to the building designer, techniques for obtaining performance data to aid design decision making. It shows the relevance of such appraisal both as generative techniques of use during the creative stages of design process, and as evaluative techniques of use during later stages, Markus (1969)[31].

The design methods described in this analysis has two different structure. The design process leading by phases from inception to completion, and the design sequence, leading from analysis to communication (RIBA Plan of Work)[32]. Markus described four types of activities, needed to carryout the appraisal:

1. Identification.
2. Finding relationship.
3. Model building.
4. Optimisation.

It argued the need for quantification and measurement the first two of these were elaborated in some detail (Broadbent)[33]. Identification is a matter of finding out what the designer's original intentions were, and then of testing his building against these intentions. Relationship form a valuable classification of the various "systems" which come together to form a building, relating human needs to a conceptual model of the relationship in the building-user system figure -2.42 -, the first of these the building system is concerned with structure and construction, the second the environmental system is self-explanatory, generated by the building system and the activity of the occupants, the third, the activity system is concerned with human behavior in general. The fourth organisational system includes the objectives of the client who decided to put up the building in first place. The model is useful for research in building in use as a framework for designers in making relationship decisions for evaluation and classification of existing research and for identifying gaps for further research. The model has been developed in detail later in (1972) by the research unit (BPRU)[34] to a five complete systems with the resources system as the fifth parts, figure - 2.43-. The five systems with their sub-systems and components, make a complex system which is open to the influence of politics and economics; culture, climate, the city plan and the site; the social and business context. The design process and appraisal is described by its three parts .

a) analysis (understanding of the problem).
b) synthesis (producing a design solution).
c) appraisal (establishing the performance of the solution).



The building-environment-activity objectives system: a conceptual model.

Table 2.42 Markus Building System, include environmental category, human activities, technical category, resources and cost, cultural and symbolic context.

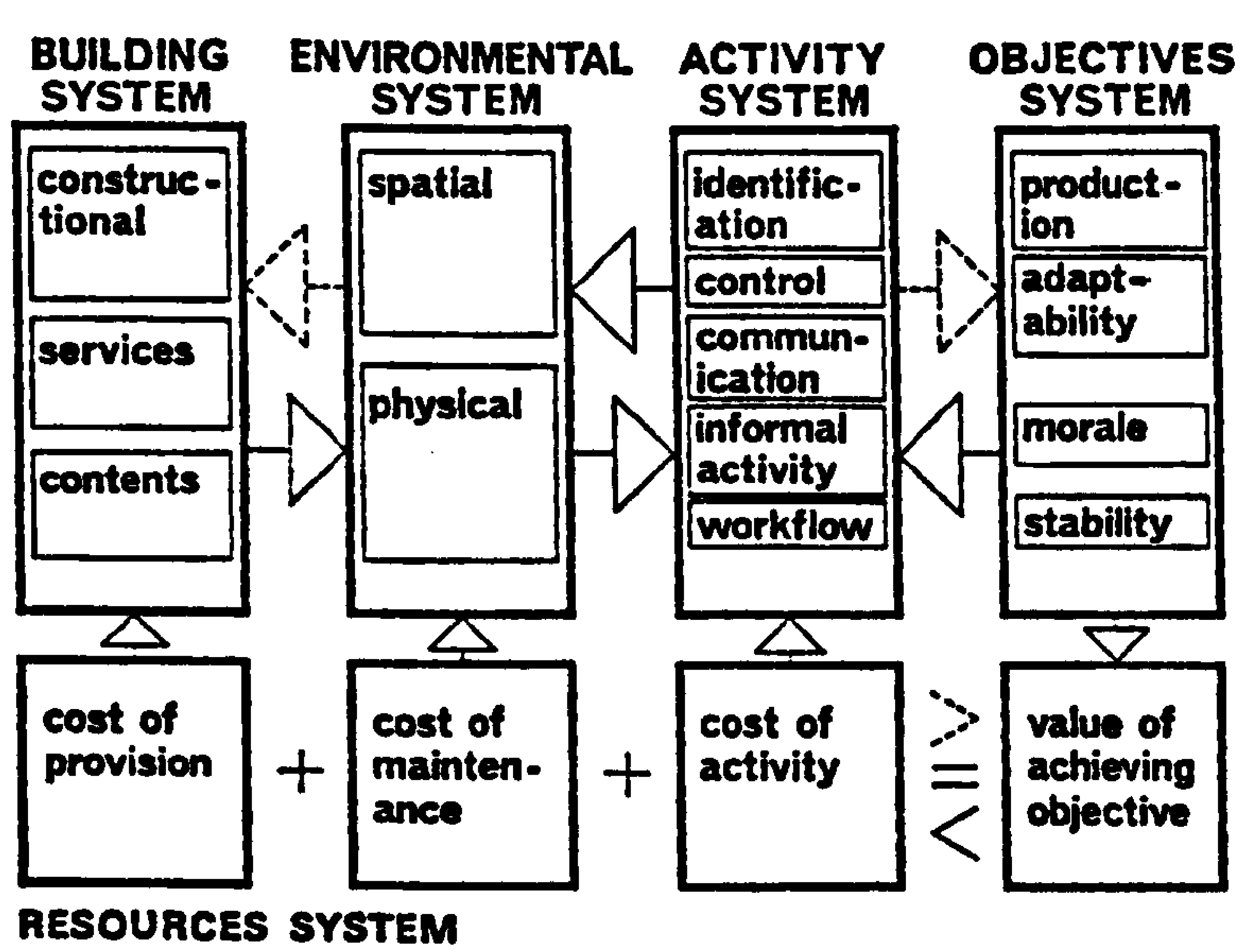
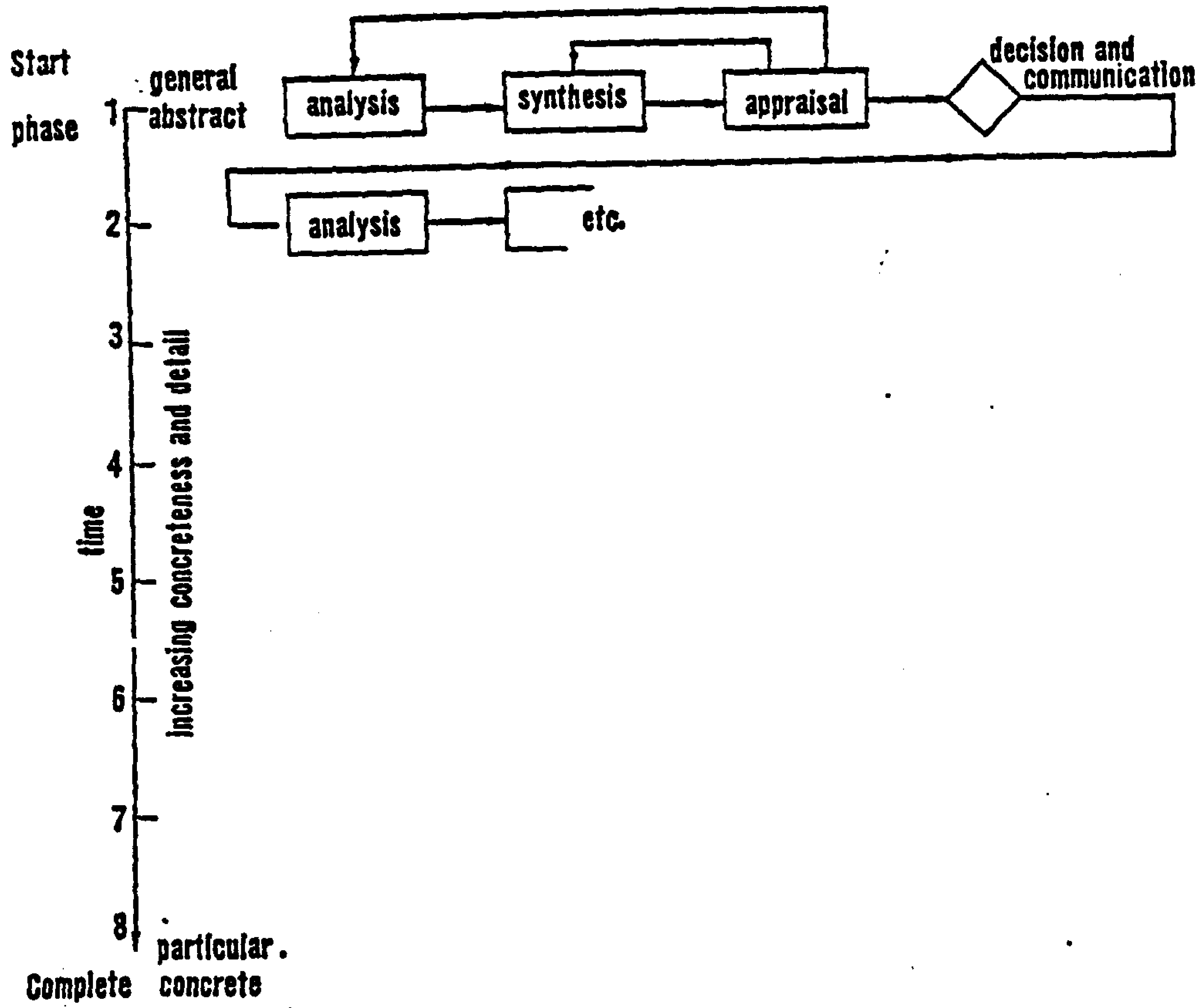


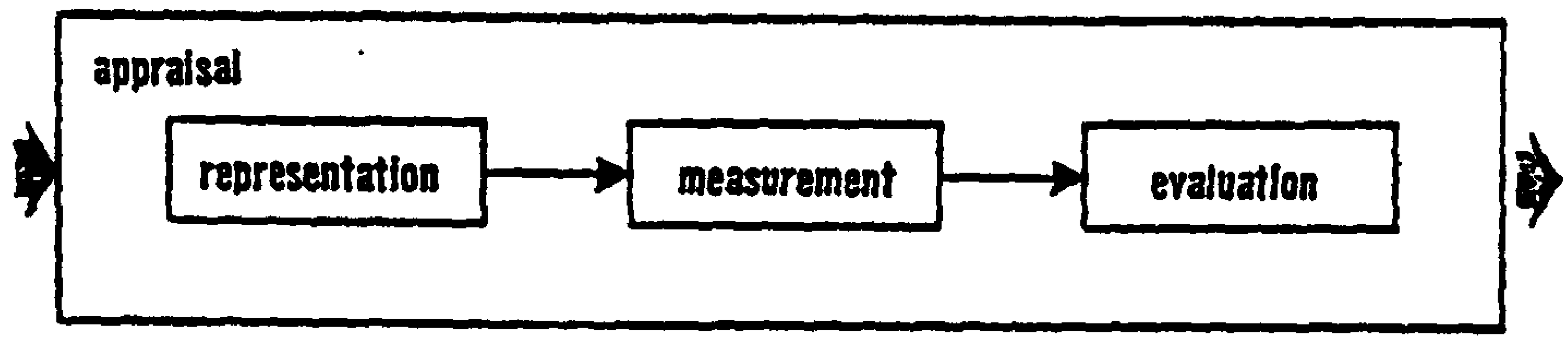
Figure 2.43 **Conceptual model of the system of building and people.**

This may occur in any sequence in the vertical process of design process described by the RIBA plan of work (1967) figure -2.44- the analysis and synthesis described later in section three chapter two. The appraisal identified as part of the design process, by which the designer establishes the quality of his solution by three basic steps of representation, measurement and evaluation, figure -2.45-. Representation were the solution is modelled in any suitable way. The model might be verbal, mathematical, visual or even full scale. Measurement as the neutral activity the performance of the model is obtained on as wide variety of counts as necessary. Costs, environmental conditions, flexibility, space and utilisation effects. Other aspects of performance whose measure is a human response, e.g. value of judgment of the quality of an object, can sometimes be obtained from stimulations. Evaluation by now the measured results are evaluated; cost and benefit analysed; aesthetic and value judgments made; comparison with the ideal is made; average or statutory performance standards found in the analysis etc.. in the light of the appraisal the designer may wish to re-design or to re-examine and change or develop his analysis. He is still able to repeate these sequences as often as necessary and as time allows and reach a decision, figure -2.46-. There is always a feed back from appraisal, the choice and combination of approaches depends on the personality of the designer, the complexity and novelty of the problem

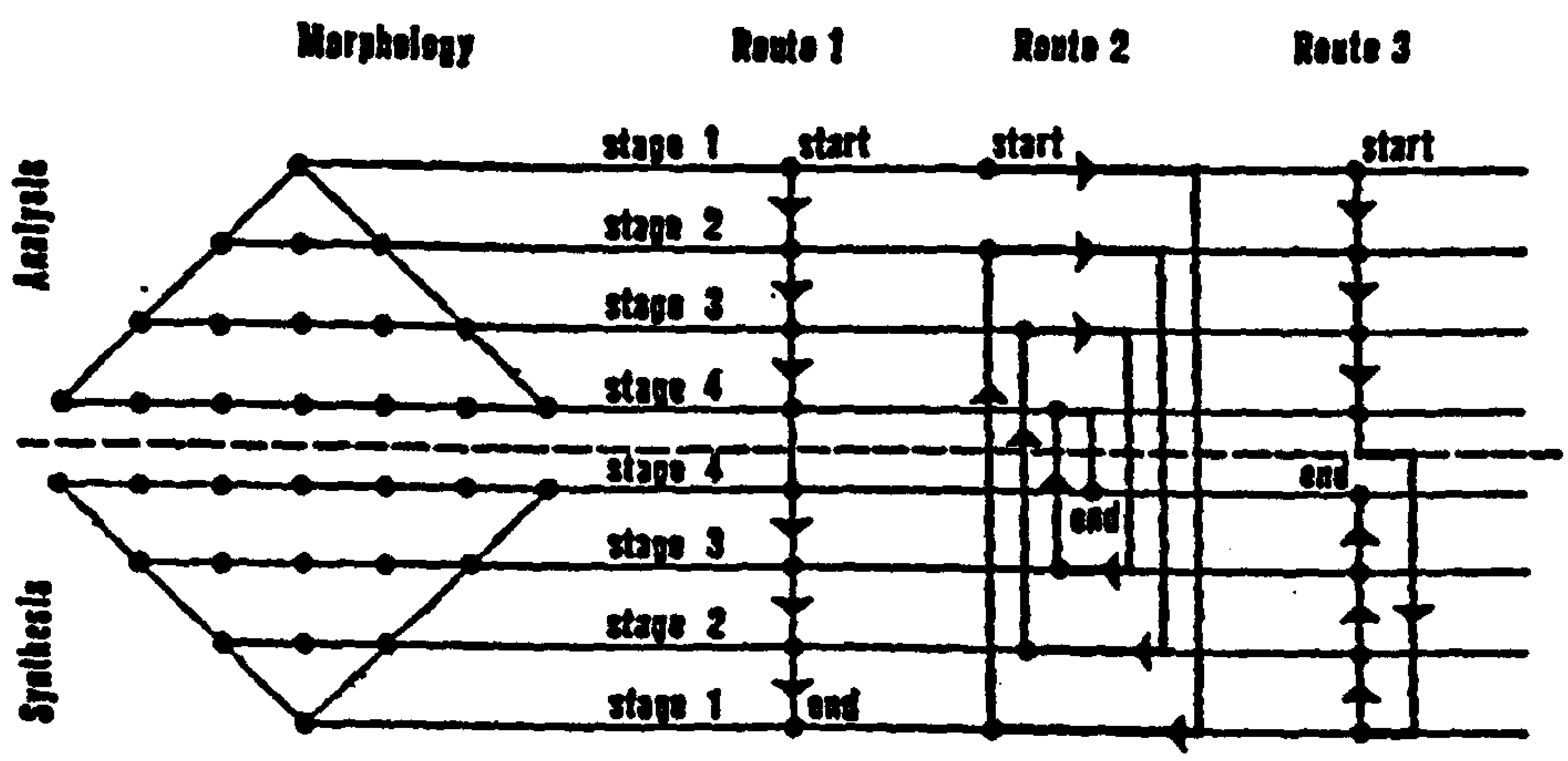


Model of the design process.

Figure 2.44 The classical sequence of design, each stage of analysis is followed by synthesis at its own level before proceeding down to the next.



Three basic steps in appraisal.



The three sequences in design.

Figure 2.46 Complex multi stage design problem. Rout 1 three sequences of design appraisal. Rout 2 analyse the problem in full detail from beginning to end before any design concept is attempted. Rout 3 simple one stage problem.

and the organisational pattern of the design office. However, performance appraisal carried-out by other than building designers, e.g. central and local government, building client, universities, hospital boards, school buildings... for some it is almost impossible to undertake such a research by a single architectural firm or group of firms, due to the time, energy and money involved in such research, and it must be handled by a larger organisation, such as a major client body, a government department or national research council (Artinian)[35].

Quality Evaluation by Jury

The method is used by the Caudill Rowlett Scott -CRS[36]- architecture firm, U.S.A. as a form of evaluation of completed buildings against criteria or a design intentions. The CRS team felt the need for a systematic approach for judging its design work, and as the team progressed and they built their large national organisation in the United States this need become more important for the office to carry out their value judgment. However, in 1960 they put-into effect their first system of judging, evaluation and establishing quality profiles for various projects, by developing a yardstick to measure buildings designed by their teams. The evaluation criteria included eight intrinsic qualities named as concept, structure order, respect of the physical environment and the emotional environment, using advanced technology and skill refinement, satisfactory spaces, and finally to respect the site and surrounding buildings. Using these eight criteria, the office initiated a programme for evaluating building projects which came through the office.

However, late in 1969, an internal jury system was formed and known as the "Quality Panel" with equal representation drawn from management, design and technology areas. The juries worked on quantified quality terms, related to the office well "tried theory of product" which reflect equal balance and emphasis function, form and economy at every stage of design development from inception to the finished product.

On the basis of the tried theory, a logical approach for solving problems related to design would be stimultaneous consideration of function, form, and economy. An objective is to keep these elements (the forces during the process) in equilibrium.When an equilibrium is achieved, there is achieved the desired union of elements, table -2.47-, achievement of this equilibrium is not enough. The approach must also concern the question for strength, working toward making each element of the tried the greatest possible magnitude.

The quality of the project is judged by numerical values. A diagram the "triangle of perfection" is used to denote the strength on each of the three elements of the tried. This has an area of 130 which is the maximum possible for the perfection in the "quality quotient". This is shown in table -2.48-. By using a computer and developed set of tables, the jury gives scores to a finished building. One of the best scores given to a finished building designed by the CRS was the 85 quality quotient given to Jones Hull for the performing arts design in 1963, and CRS Huston Office design in 1970 received a score of 92. Figure -2.49-

The office had to judge other buildings to compare one project with another. For example the quality quotient for Wright' Guggenheim Museum are 87, the CBC building designed by the Saarinen group rated 96 by CRC jury, and both the Seagram building Miss and Johnson's and the Tennessess Gas Building SOM Office in Huston were rated 100 each by CRS Jury. Figure -2.50- and 2.51-.

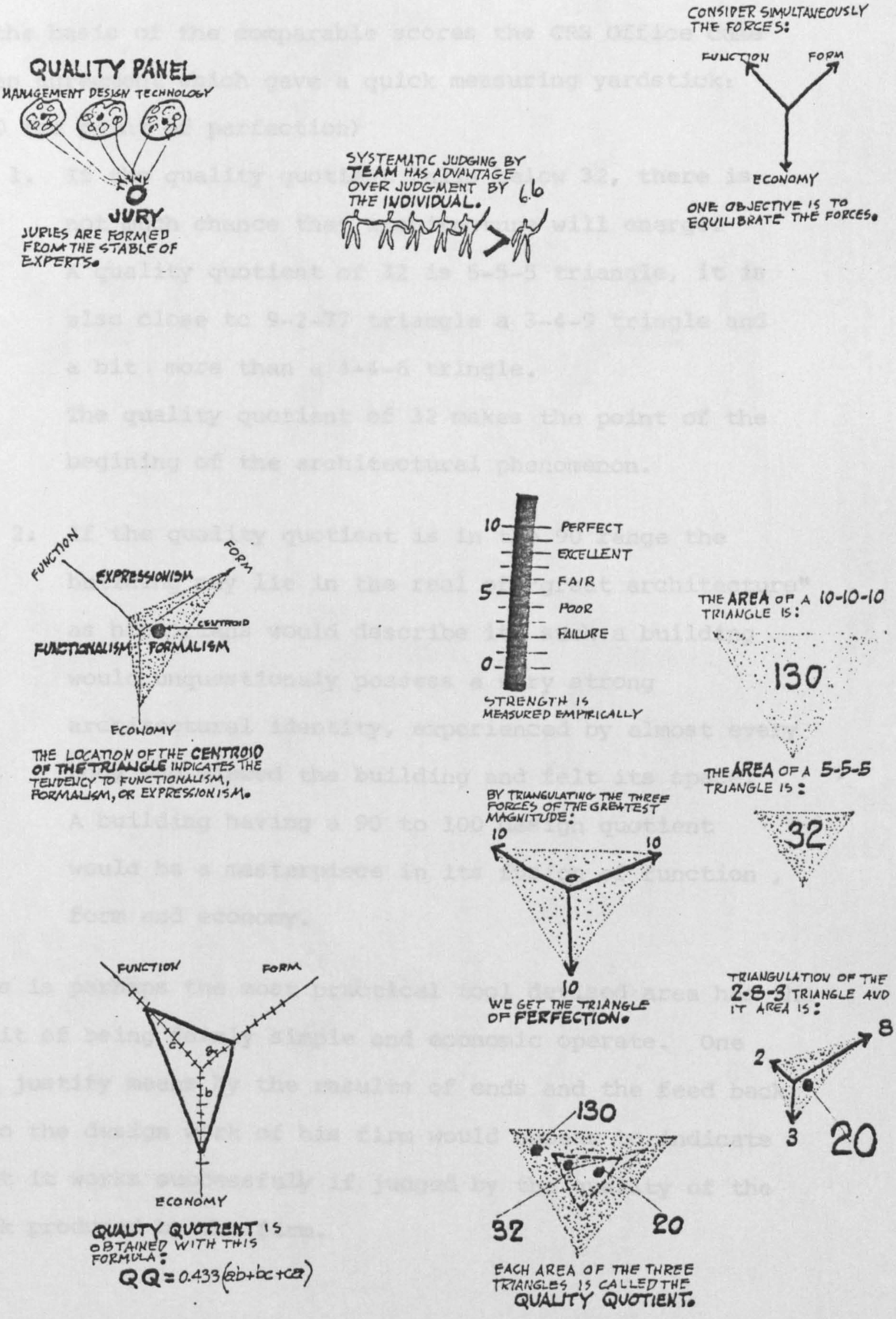


Table 2.47 Equilibrium, the basis of the triad theory. The numerical value of the quality of the project judged to give the quality quotionent.

On the basis of the comparable scores the CRS Office came to an agreement which gave a quick measuring yardstick: (130 the point of perfection)

1. If the quality quotient falls below 32, there is not much chance that architecture will energe. A quality quotient of 32 is 5-5-5 triangle, it is also close to 9-2-77 triangle a 3-4-9 tringle and a bit more than a 4-4-6 tringle. The quality quotient of 32 makes the point of the begining of the architectural phenomenon.

2. If the quality quotient is in the 90 range the building may lie in the real of "great architecture" as historians would describe it, such a building would unquestionaly possess a very strong architectural identity, experienced by almost every body who viewed the building and felt its space. A building having a 90 to 100 design quotient would be a masterpiece in its fusion of function , form and economy.

This is perhaps the most practical tool devised area has the merit of being fairly simple and economic operate. One can justify means by the results of ends and the feed back into the design work of his firm would appear to indicate that it works successfuly if judged by the quality of the work produced by the firm.

Quality evaluation by Jury.

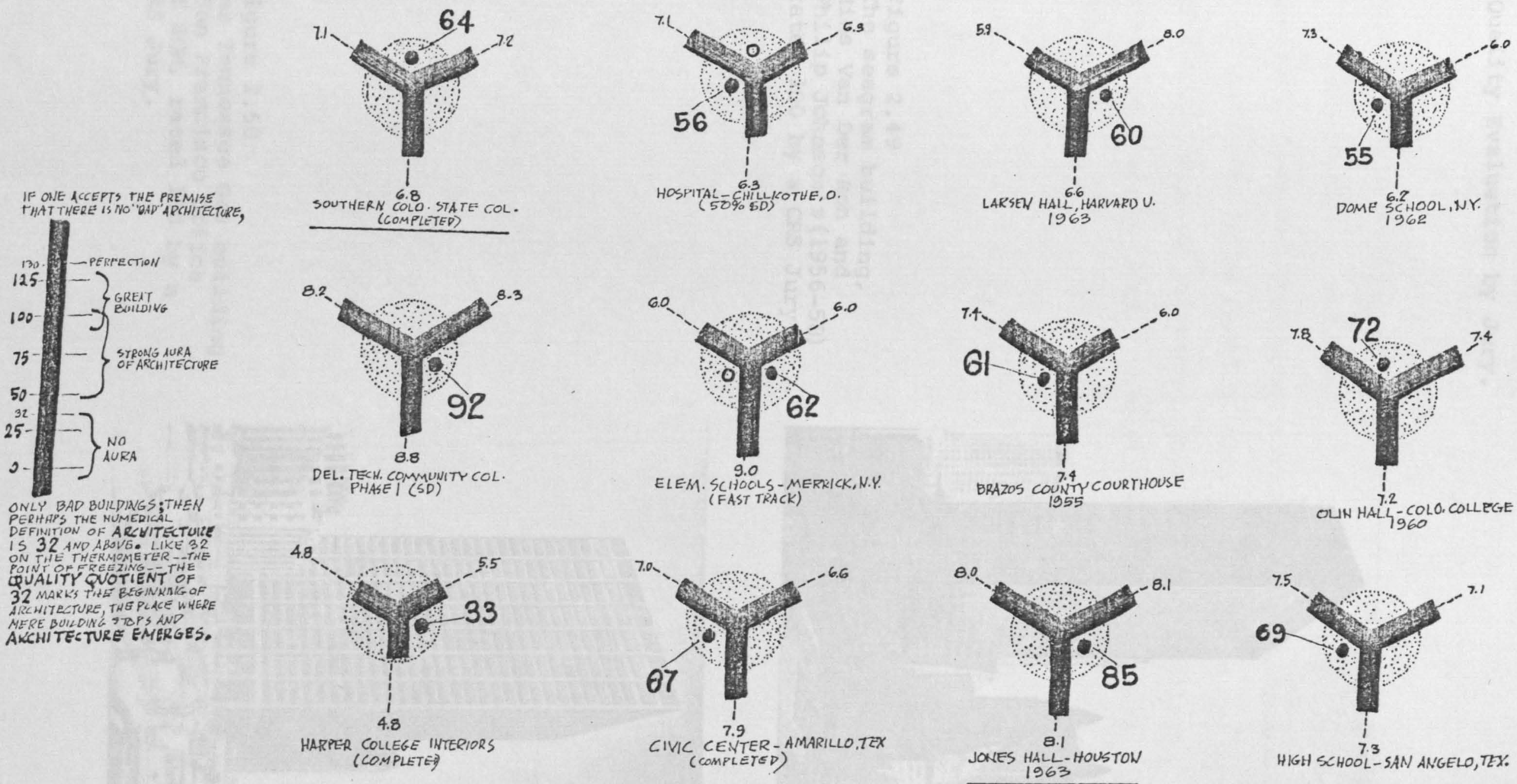


Table 2.48 Examples of "quality quotient" for buildings designed by CRS group, one of the best scores given to a finished building designed by CRS was 85 given to Jones Hall for the performing Arts (1963).

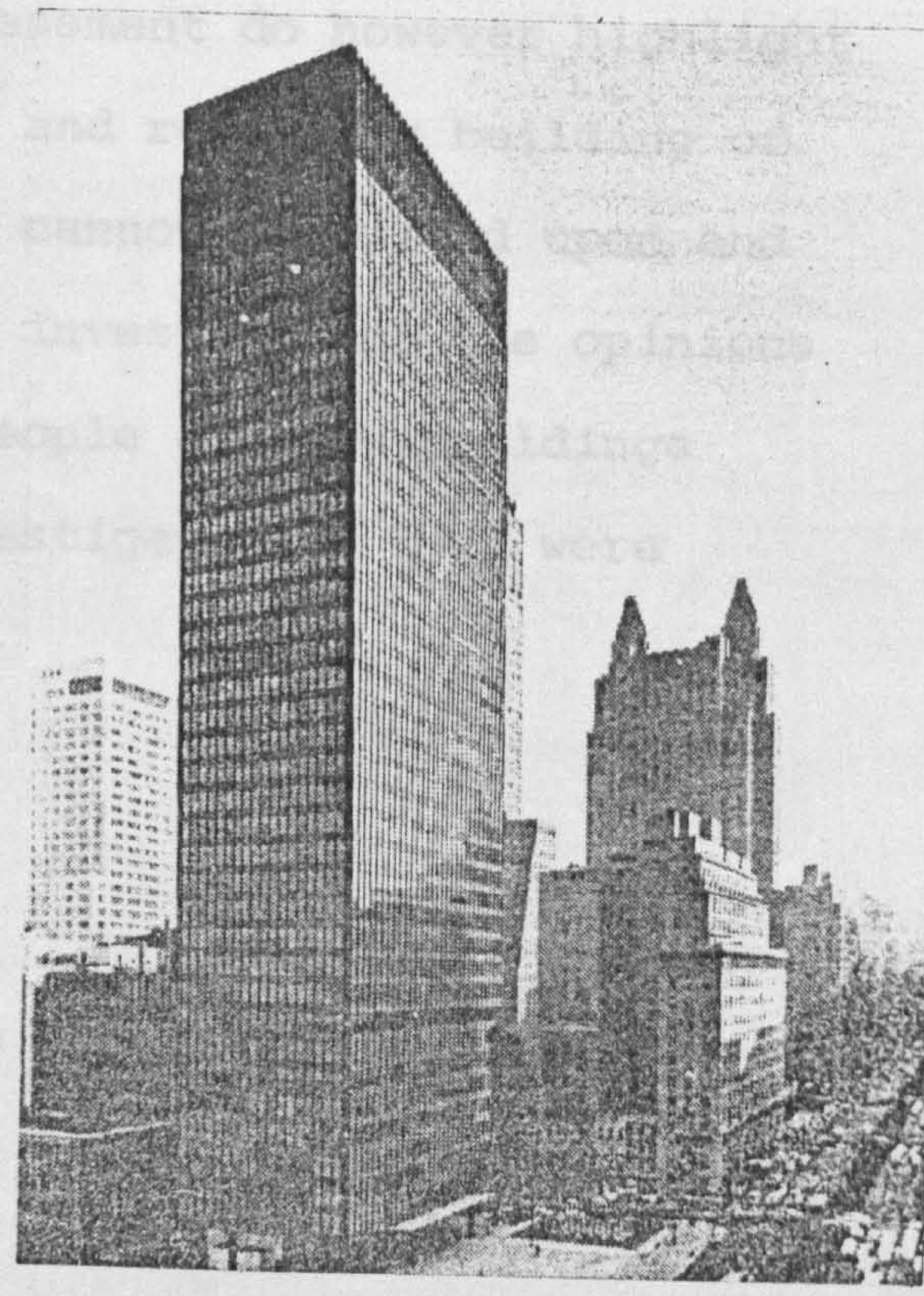


Figure 2.49
The seagram building,
Mies Van Der Roh and
Philip Johnson's(1956-58)
rated 100 by a CRS Jury.

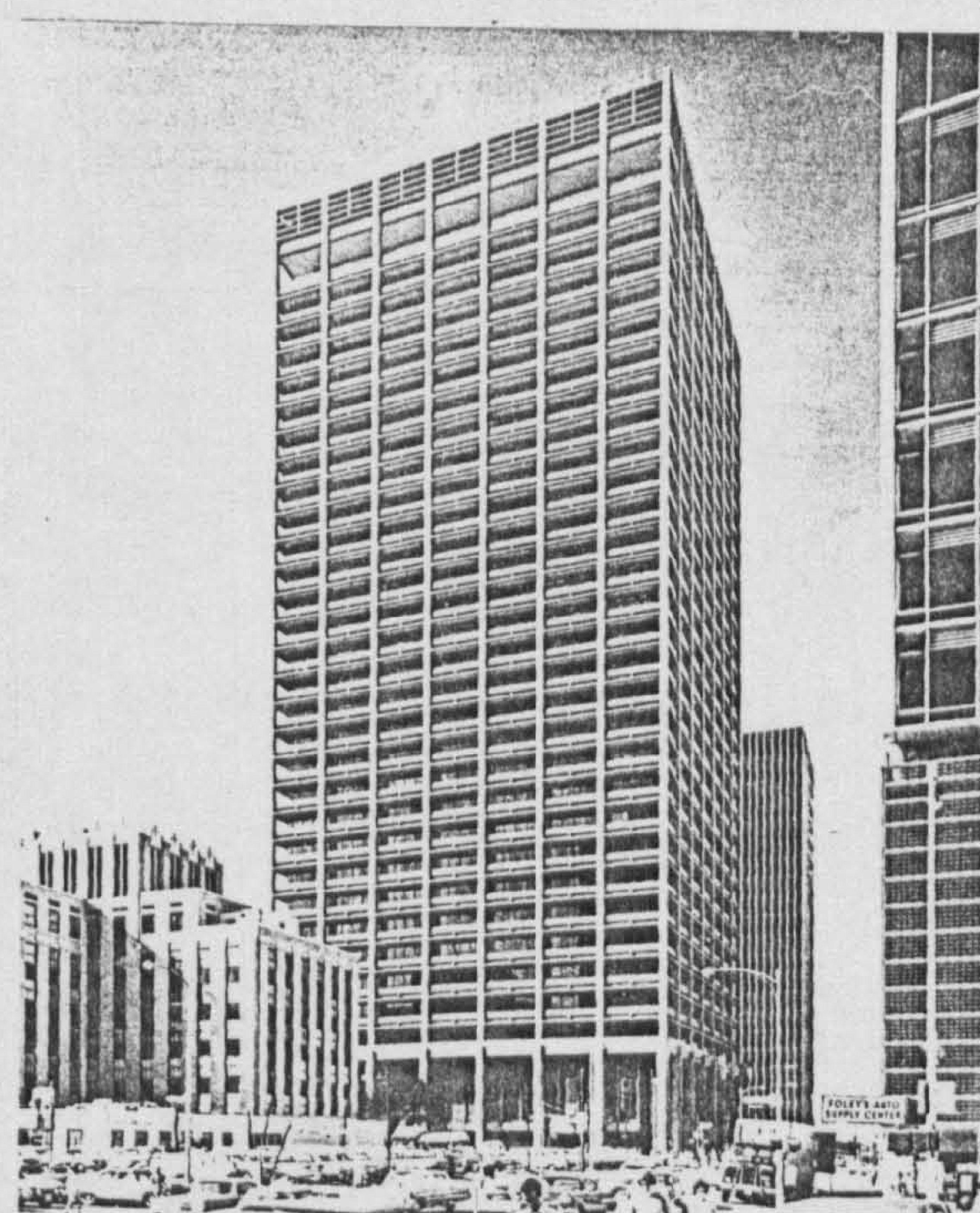


Figure 2.50
The Tennessee Gas building
(San Francisco Office
of SOM, rated 100 by a
CRS Jury.

This review of methods of assessment do however highlight the difficulties of selecting and recording building of quality. Personal preference cannot be relied upon and some means has to be found of investigating the opinions of a wide range of informed people allsort buildings which can then be used to investigate how they were designed.

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Part Three

CASE STUDY - DESIGN PROCEDURES FOR BUILDING OF QUALITY

> "It recognises that building is a fundamental necessity for mankind: People and industries must be housed: but there is a phenomenon, revealed throughout human history, which we call architecture. This can turn a hut, a bridge, a factory, an office, a shop, a place of worship, into something more than it is of its own right. This is architecture-significant building."
>
> Allsopp (1977)

3. Case study

Design Procedures for Buildings of Quality

Introduction - A brief historical survey.

In previous chapters, we examined the philosophy and aspects of quality in modern architecture and investigated some aspects of quality in the design of buildings which influence the optimum result. We found that there were varing degrees of validity in the concept of quality to the professions, to the client, the people who use particular buildings, and to society as a whole.

In this chapter, the study is specifically concerned with architects and architectural firms, that have established reputations for producing high quality design. It tries to analyse the philosophy behind their work, their design approach and the developments in techniques and methods, standards, attitudes, etc.. It seems from earlier analysis that this can be examined at varying levels of accomplishment.

Generally the investigation is based on data recorded as a result of in depth interviews. It is interesting to note that there are significant differences as well as similar approaches between the different architects. The selection of offices was based on replies to a questionnaire which was sent to architects, academics and lay people. This was intended to establish which buildings were considered to be of significance and of high quality. There was then the practical consideration of time, distance and availability in arranging the visits, and obtaining information which modified the techniques used and to some extent determined the final choice of buildings and architects.

The thesis aims to investigate methods of design in buildings of high quality, by examining the various approaches to design as operated in practice by the architects concerned. The first section of this part of the research project indicates the methodology and the design procedures that have been reached from the analysis of the findings. This seems appropriate in assessing the scope of the research work as a whole and endeavoring to match the hypothesis already indicated in previous sections.

Previous work in this field has depended heavily on interpretation of subjective criteria at some distance from the designer. There are existing methods of work on design methods such as the work of Christopher Jones (1970), Broadbent (1973), Christopher Alexander (1964), and many others. The most effective way of discovering views about design and the way ideas are developed, is to try to obtain a better understanding of actual current practice of architecture with its normal constraints and pressures.

Having interviewed architects about their work. It was felt, after analysing the results of the interviews that something more was revealed about the creative process and motives, which was not only concerned with evolving a solution which could meet the primary objectives of the brief, but also contribute to the whole of architecture, particularly the wider requirements of the overall users and human needs generally.

In other words we become aware in this study that the designer of building of quality not only evolved a solution which dealt with many factors raised directly by the programme, but also achieved balance in the wider field of the place of the building in its relationship context to the community in general.

3.1 METHODS OF WORK

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Investigation Technique

There are three specified sections in this part of the work.

1. Selection of appropriate building.
2. Preparation of suitable methods of obtaining information .
3. Complementing the chosen technique.

Selection of Buildings to be Investigated

In the course of the study, attention was naturally turned towards British practice as the information was more likely to be available and it was felt there would be a better response from practitioners in this country.
Practical consideration of time and distance envolved, ruled out other countries. An important factor was also the familiarity and understanding of current practice of architecture and the reference materials available.
However it had to borne in mind implicit that one objective of the thesis is to decide if any conclusions in general can be applied to the Syrian situation.

Selection Technique

In deciding which buildings to be selected some time was spent in devising a system of questionnaires. The object in doing so was to make the best use of the interviews with the designer or the design team during the visit to the offices concerned.

At an early stage of the work, it was decided to chart the R.I.B.A. award winning buildings. This later provided useful guide, not only for the importance of the schemes indicated, but also gives statistical information on those practices and offices which appeared on it, and gives a useful oversight on that work considered to be of quality of the last twenty years. It also gives a view of which buildings have had some degree of lasting influence on an attitudes of design juries over the years.

The results of this investigation become the basis for the selection of buildings to be examined further.

Preliminary Survey

A surrvey of architects in the region was made, asking for a list of buildings which they considered have been influential in the development of modern architecture (see appendix - 1 -). This had two effects, firstly, it helped to show what architect's think about modern architecture, and secondly, what kind of buildings are recommended by architects as being significant building in modern architectural design.

The questionnaires infact, revealed more than this.

A considerable number of those architects dealing with academic teaching found difficulty in answering the questions in the form put to them, they found it necessary to define in their answers the word "influential" more closely, since it can be interpreted in a number of ways. For instance its influence on:

a) the mass of the built environment.

b) the buildings that the architectural profession believes are good.

c) on the ideas of students, and architectural critics of the profession.

d) The public in general or the people who are going to use buildings in particular.

e) members of the artist, Avant-grade community who tend to creat fashion and formulate design.

Each one of these groups can be influenced in different ways by different buildings, and experience in different ways. In addition the influence that buildings have on design varies according to the time scale over which it operates. The degree of influence may in fact be related to the amount of publicity that a building gets in either a positive or negative way. This is extremely difficult to proves, especially as architects generally do not admit to being influenced by other architects.

Knowledge of the architectural profession suggests that other factors affects the significance of any one building and include:

1. The work of well known architects of international reputation.
2. Developments in building standared constructional or techniques.
3. Clients commissioning building which reflect new requirements.
4. Trends in schools of architecture. The latter can be good or bad depending on the point of view of the critic.

These views demonstrate the dilemma that confronts the architects looking for some common ground in the measurement of design quality. This really includes all those who practise with full awareness of the human component and its effect on design. This can take various terms including the reaction of clients, the tendency of the users, as well as the views adapted by architectural critics upon which they base the criteria for their judgment. The latter is important as it covers the determination of aesthetic values.

Since the review by the author, a research project conducted at the City University of New York has arrived at a similar conclusion, Judith Blau[1] indicated in her article "The Influence of a Firm's Structure of Design Quality", that measurement of quality has proved to be both difficult and controversial. She quotes William Sertz[2] curator at the Museum of Modern Art in New York City, as saying "Do we suppose, that there exists in all works of art some isolable quintessence "quality" that can be measured like voltage or barometric pressure?" She continues to say that "in order to answer, first we must ask. Do experts agree among themeselves as to what is great and what is significant? And secondly, does the work survive through time?".

Ms Blau made a survey of attitudes on this matter. In her survey, she asked an open-ended question to the principls of large firms in order to collect data for project value and their significance for design activities. The question was: "What criteria do you use in defining a successful project? The three most frequent answers being

1. The project is financially successful or stays within the deadline and budget 69%.
2. The client is happy with the result 65%.
3. The project has an aesthetic value 49%.

Clearly the first is of great importance in staying in business and making a reputation, but that virtually half of all replies gives aesthetic value as a main criteria indicates the influence of this aspect of design work.

The first reaction of the returns from the letters sent to architects indicated a difference from the views of modern architectural historians. The buildings that architects considered to be of high quality did not correspond with the significant buildings highlighted by writers such as Banham, Jencks and Jeodike. Architects listed the three criteria set out by Deasy[3] in his book "Design for Humman Affairs", he pointed out a list of criteria affecting design quality that can be seen to encompass most other factors:

1. Human factors included the functional requirements of the buildings.
2. Economical factors.
3. Aesthetic factors.

This correlates almost perfectly with the finding of Blau above and indicates a division between professionals and lay critics. It was very helpful in narrowing down the list of buildings as it was important that eventually the buildings selected for study would have the approbation of both professionals and influential people if the results were to be acceptable.

Generally speaking the respondents to my questionnaire tend to give examples from personal knowledge and in the instances quoted of good building, there was usually some personal understanding. In some way this analysis is rather disappointing as architects would like to think that original and design is synonymous with good quality, but clearly there is a doubt in the mind of informed critics. This also was valuable because it helped to focus the next stage of the work which was to narrow down the search for buildings that could be investigated.

As the study progressed two main routes of information become apparent and tend to interrelate. These were the building themselves which were considered to be of high quality but also the names of architects or of architectural practices who continually produced work of a high order. This corresponds to the first category of influence noted in the architectural profession earlier. A review of published work of architects mentioned in the replies to the questionnaire was prepared and this was compared with the list of R.I.B.A. award winners (formely the bronze medal awards). There was a sufficient connection between the two approaches to indicate that it was a path worth taking. It was decided to go into this area in more detail and to extract the names of architects together with notable buildings and then to consider the views of the critics as to the reception of the work. The latter check was made in order to reject any suggestion that this was simply architects judging the work of their own profession with all the consideration of their own self-role belief, so well criticised by Newman[4] who stated that, the evidence suggest that:

> "Architects appear to belive that each design solution is a unique creative experience, a on-off ideas in which they can see themselves in the role of artists designing according to some intuitive evaluation of the problem, rather than a rigorous analysis of the factors involved, including user-needs... <u>On this basis of judging</u>

> <u>architecture as a piece of creativity that most architectural work are assessed</u>."[4]

The availability of criticiam was,of course,in itself a moderating influence and some cases buildings had to be rejected as public criticism was not available. In the main published views were taken and the eventual outcome indicated that the building and architects chosen had been exposed to public criticism although this in some cases was implicit in an award giving process. However, despite several draw-backs in the awards systems in general[5], which arise from the difficulties in defining what is a good work of architecture:

> "There is no building which can really claim to show the best of modern architecture to be found."[5]

There is a certain value in looking at such award winning schemes in order to evaluate judgment on successful work of architecture, discussed and exercised by a programme of this kind.

Continuing work on the selection of suitable buildings caused some refinement in the study. It become apparent that in some cases the philosophy of an architect of practise could be abstracted by asking about processes over a number of buildings rather than one. In other cases after discussion it was decided to make one building the vehicle for discussion on the practice as whole. This is brought out more clearly in the case studies.

One factor in selection of suitable buildings was the reliance on the professional judgment of architects themselves. This is discussed fully in the next chapter with more emphasis on the methods and practice of the Royal Institute of British Architects - The R.I.B.A. - award wining programme.

3.2 SOME ASPECTS OF ARCHITECTURAL JUDGMENTS

3.2 Some Aspects of Architectural Judgments:

Professional Judgment

Professional judgment in architecture can be discussed in a number of ways. It may be an opinion on what the designer has produced, or an opinion expressed about a building or group of buildings or a sensitive critical assessment of the quality of a building or some aspect of its design. Far from helping towards a stable definition of architectural quality through criteria formulas or even by examples. this has been described by Collins[6] as being precisely the opposite extreme of design process:

> "Despite it's many merits, it may be regard as antithesis of design, whether said by architecture historian, or laymen. It can have no possible effects on the building under review, it may educate the public, it may publicize the architect or the client, but its immediate influence on the environment is neil. Whatever it creates, it creates for the future."[6]

In general, judgment is a conclusive or decisive process, not a productive one (Johnson)[7]. It may be based on criteria, indeed it may be written down as an analysis of the factors to be sought and defined. In any event criteria of judgment is related in some way to progress towards a goal. The material of judgment is produced under the guidance of a specific set, but is later

evaluated with reference to the general overall set of information upon which the project is based. Often the criteria used in making judgments are specified by instruction. The latter point brings us full circle to the question of the instructions given in the brief and how far they have been achieved and if so what are the results of such achievement. There are two components, firstly the objective satisfaction of requirements but secondly the aesthetic and environmental result of the building. These arguments reflect the sets which can be seen as a convienient way of organising the information for assessment.
Professional judgment appear to be therefore the most likely sources to provide information about buildings which are considered to be of quality. Therefore, in this chapter, the term "professional judgment" includes the methods which have been used by the design profession to select examples of work of excellence in architecture. These are intended to serve as models of design quality for the architectural profession as a whole. This is usually bassed on the award of some mark of distinction devoted to high standards in performance. The system has been used deliberately to encourage work of high standard in particular fields.
For example awards are made for good housing design by government agencies and the civic trust is also prominent in recognising work of accomplishment. In the private sector the Financial Times awards for industrial

❝ The purpose of these Awards by the RIBA is to give public recognition to outstanding examples of current architecture and thereby to achieve a greater public appreciation of good architectural design.

A building recommended for an *Award* should be *excellent of its kind.* Juries have to assess whether a building, irrespective of size or type, achieves this quality.

Within the limits of time available, juries are asked to judge the consistency and quality of design, the appropriate use of materials and whether a building is likely to remain a fine work of architecture throughout its full working life.

Commendations may also be given, at the discretion of the jury, to buildings which, while not meeting the highest standards demanded of an Award winner, are *sufficiently thoughtful, imaginative and satisfying* to deserve public notice. ❞

Figure 3.1 RIBA Architecture Awards. The above quotation is the brief given to first and second stage juror.

architecture has had an effect upon the member of prestigous buildings provided for commercial and production firms.

The awards can also be seen in an alternative way, as judging architectural work in general, since it is difficult to describe design quality in words or to define through criteria, whereas the buildings can stand as a precise example of taste at that time.

R.I.B.A. Awards Winning Programme

In the united kingdom the Royal Institute of British Architects - The R.I.B.A. - has conducted an annual programme of awards "for building excellence of its kind irrespective of size or type"[8]. In the awards programme a selected Jury consider buildings submitted by architects, and selects those they consider to have achieved "consistency and quality of design" that is likely"to remain a fine work of architecture throughout its full working life"[8]. In addition since 1973 Juries were given the opportunity to make commendations for buildings which while not reaching the highest standards of an award winner are sufficiently interesting, thoughtful, and imaginative to deserve public attention. Figur -3.1-. The resulting winners are widely publicized and serve as models, both to the public and to the profession as an indication of what constitutes good design.

> "The purpose of these awards is to give public recognition to outstanding examples of current architecture to achieve a public appreciation of good architectural design."[8]

Each building selected must be visited by the team jury, the juries who are nominated by the president of the R.I.B.A. each year, are generally chosen from the partners and principals of private practice, the heads of public offices and professors and lecturers from architectural schools. Two juries are selected each year to play their part in the selection of each year's building. The first stage jury members are given the responsibility of selecting a short list from the entries which are in the form of photographs. The second stage juries visit the building before making the awards or commendations, this means that the decisions are made by the architects who have seen and experienced the buildings, but not by the first group judging on the basis of photographs only.

Awards Distribution

Since the award scheme was established in 1966, one hundred and twelve awards have been given to different practices or public offices. (see appendix -2-) The winning awards include a building of various type and size, distributed as follow:-

- -University Buildings.
- -School Buildings.
- -Industrial Buildings.
- -Public Building, including theatres, museums, sport and recreation centres.
- -Civic and governmental departments.
- -Commercial Buildings.
- -Public sector housing schemes.
- -Individual houses.
- -Private sector housing schemes.

Value analysis

The analysis of such awards indicates that it is possible to obtain some quite objective information. These deal with several different aspects. The most important, and which may affect the quality of architect's work are reported upon in the following pages, such as:

1. The criteria formulated by juries, for defining successful works of architecture, these are obtained from the comments and reports made by the different juries on each scheme and which reflect the judgment values related to the different aspects of each sheme.

2. The type of architectural firms and their structure.
It seems important to focus attention on this set of criteria and to examine its various aspects which arise from them, these two main topics may be dealt with in some detail:

1. Criteria of judgment

The criteria value for defining successful work of architecture, related to the R.I.B.A. awards winning programme, are obtained from two sources. First, the comments and reports made by different juries on each winning scheme for the period selected between 1970 -1977. These reports can be seen as a reflection of the professional opinions at that time expressed by the architects selected as jury members. The second source is the information published in architectural journals amplifying the buildings in question in some detail and often giving details of background, client requirements and architectural philosophy and methodology.
The most dominant used topics are:

a) Influence of ideas by which the final sheme evolves.[9]
b) Appropriate choice of materials.[10]
c) Consistency of detailing and high quality finish.
d) High standared of craftsmanship.
e) The urban context in which the building is to be situated.
f) Relationship between the building and other surrounding buildings.

g) Use of available finance, good value and use of available recourses.

h) Client satisfaction with the result.

i) Answers to the brief requirements.

j) Satisfaction of user's needs.

Several of these items overlap and some topics will have variations in opinion but this can be of positive value although it places a burden on the researchers to give appropriate weight to the information received. Generally, juries seem most influenced by the design philosphy from which the scheme has been evolved. This is attributed to the architects skills and ingenuity in solving the different design problems and finding the correct solution.

Newman[11], in addition to his strong statement reported earlier in the chapter criticising architects judging their own work, as argued that architects in general when talking of creativity are usually thinking in terms of aesthetics in architecture, but creativity can and is applied by architects in attempting to solve technological and behavioural problems.

Newman's argument may suggest that architectural critics should consider the other role of the architect's work, which would meet the different needs, other than purely aesthetic ones, in addition to the concern with the aesthetic value which

expresses the architect's creative leap.
It is clear, however that the value criteria for judging work of architecture, which must be taken into account, are difficult to evaluate one against another by a common measure valuable to serve as model for design quality, unless those responsible for judgment have some standard of stimulus variables for excellence.

Peter Collins[12] states that in practice and criticism of architecture there may well be many contextual factors which effect, or should effect judgments, but it is probable that they can all be placed within four categories:

a) The physical and economic environment which every building constitutes in itself, which involve many other physical and economic factors, such as the character of the surrounding, climatic conditions, the state of the money market, and the ability to build in specific times without any distraction. The full importance of the physical context of a building has only began to be appreciated in recent years by lay people although relationships have been considered important in architecture design generally since classical times.

b) The political context, such as the various political pressures which can be exerted on an architect to force him to design in one way rather than another.

c) The procedural context of the design itself, the sequential influence of idea which the scheme evolves, and the reasons which cause him to favour one form of evaluation rather than another.

d) The history of the project, the relationship between the building and other buildings of the same type, or the relationship between this particular design and earlier work by the same architect.

He concluded that, the immediate relevance of such thought was that it is inconceivable to write an adequate criticism of a major building during a single brief visit, especially if the environment has never been visited before.

However, it seems logical to suppose that methods of judgment will need to become far more objective and sophisticated to prove more relevance to future work, and may include some of the new factors imposed on architectural design.

> "Value judgments are still relative to a system of belief even when this is reduced to the artist's belief in himself. Our present need is to try to understand the nature of architecture. This is the general attitude of science to seek understanding rather than to judge."[13]
>
> Bruce Allsop

2. Relationship Between Firm Size and Quality

In the later chapter, we will examine the creative work of the individual architect, his ingenuity and attitude to architectural quality. Thich has been the major concern of many research studies on methodology, problem solving, and appears in the work of some behavioural scientists. This focus, on the individual architects, has led to the study of the organisation and structure which the architects are part of, and which provides him with the resources needed. An attempt is made to examine the influence this had on his creative work. Sometimes the firms structure provides constraints on design, but can also reveal apportunities which may not have occured to the individula working alone.

The organisational studies identify an important characteristic of the structure, as it has attributes quite distinctive from its membership, and indeed plays an important part in determining the attitudes and behaviour of its individual members[14]. While considerable research has been done on the organisational structure of different professions (which is probably relevant to the anderstanding of the natural structure of architectural firms). The chief focus has been on aspects of its complex structure, rather than measuring the effectiveness of its creative work. It is the latter which makes it different from other professions; for its members have to carry out a combined

Work of organisational management in addition to its work as a creative profession.

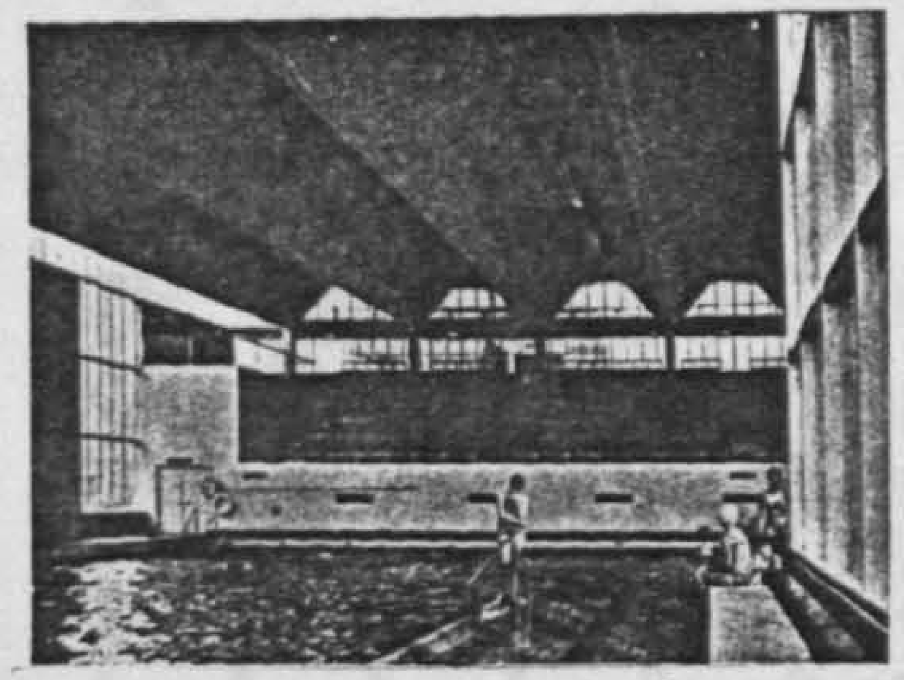
Measuring the architectural firms effectiveness,related to its complex structure, has been the subjects of various studies[15]. It involves the effects of two central important aspects. Size and type of control and responsibility, and the way in which they affect design quality, and any effects on the creativity of the architect's work.

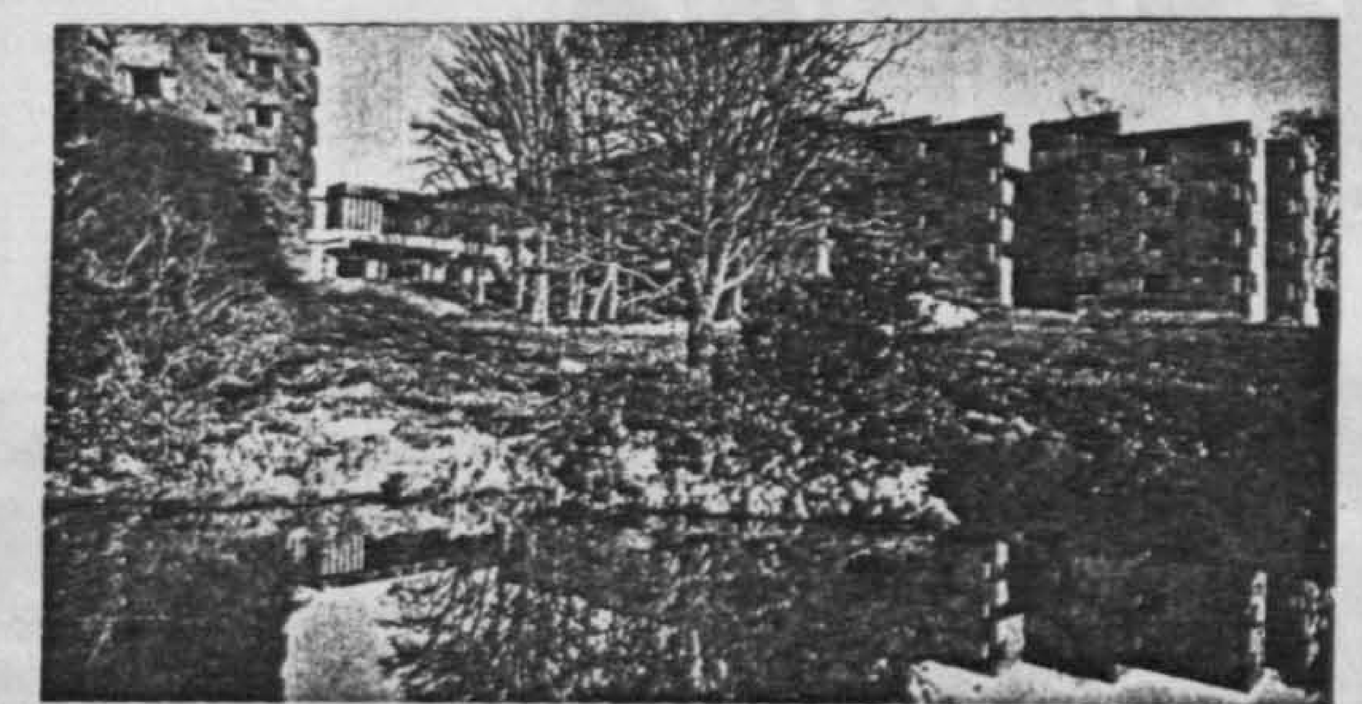
One of the earliest works on the subject, is the Royal Institute of British Architects Study (1962)[16], the study examined the architectural profession by means of a survey of architects offices in order to provide factual information in relation to questions put by the R.I.B.A. Council, in this study of British firms. The data on different size offices, "The Medium-sized office had the greatest potential for both technical and design performance"[17] to quote:

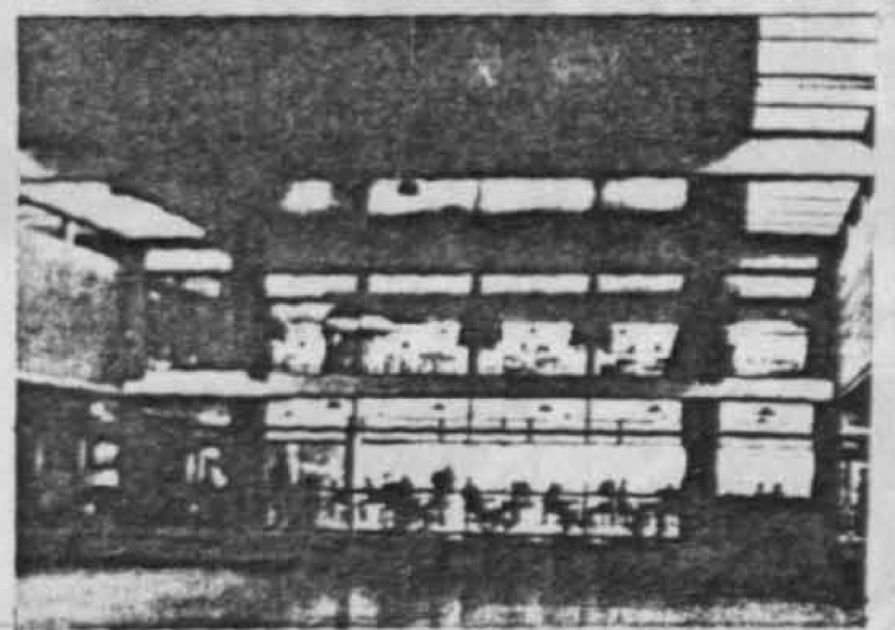
> "Although the small offices can give an adequate technical and design service it is more difficult for them to achieve the highest standards than the larger offices with greater resources of staff, finance and experience. This is of course a generalisation which should not be taken to imply that no small firms can achieve high standards."[18]

The results of this survey coinside with an analysis of the RIBA list awards winners, which indicate that the majority of awards winners are large private firms. Fewer awards went to smaller firms. A complete list of such analysis showes, as follows, the firms which have won more than one award since the RIBA award was established in 1966, the complete list of the awards are shown in the appendixe two in alphabetical order.

R.I.B.A TOP AWARDS WINNER 1966–1979


Putmey Swimming Baths, London
Powell & Moya & Partner 1969.


Colling Wood College, Durham 1974
Richard Shappard, Robson & Partner


Grammer School, Wallasey 1968
Richard Shappard, Robson & Partners


Downing College, Cambride 1971
Howell, Killick, Partridge & Amis

Powell & Moya & Partners - SIX AWARDS-

Winslande Manor, Exter 1979.
Wofson College, Oxford 1975.
Putmey Swimming Baths, Wandsworth, London 1969.
Picture Gallery, Christ Church, Oxford 1969.
St John's College, Cambridge, 1967.
Cripps Building, St John's College, Cambridge 1967.

Richard, Shappard, Robson & Partners - SIX AWARDS -

Colling Wood College, Durham University 1974.
Secondary School, Bromsgrove, 1969.
St Alban School, Gataway 1969.
Grammer School, Wallasey 1968.
Churchill College, Cambridge 1968.
Administration Building, University of Technology, Loughborough 1967.

Howell, Killick, Partridge & Amis - FIVE AWARDS-

Art Centre, Christ's Hospital, Sussex 1975.
Downing College, Cambridge 1971.
St Antony's College, Oxford 1971.
Houses for visits, Warwick University 1970.
Wolfson Building, St Antony's, Oxford 1966.

York, Rosenbery, Mordall - FIVE AWARDS-

The Imperial Group Ltd, in associate, Hartcliffe, 1976.
Magistrates court, Manchester 1972.
Air port, New Castle 1968.
Warwick University, Warwick 1967.
Science Department, Liverpool University 1966.

Building Design Partnership, B.D.P. - FOUR AWARDS-

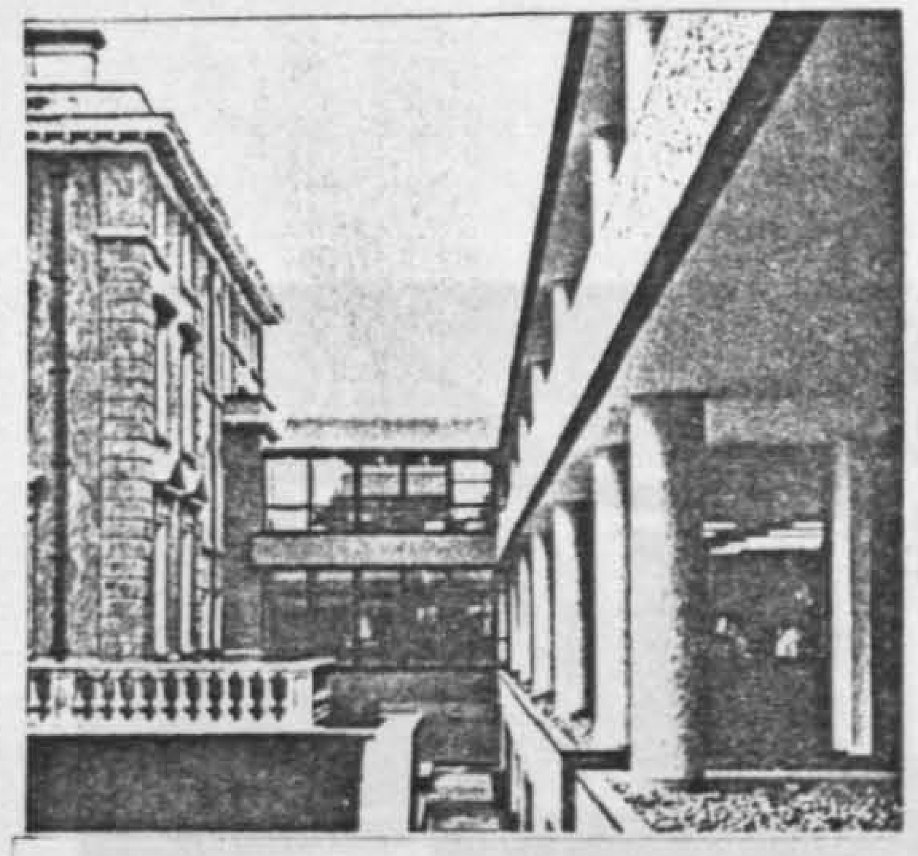
Chloride Technical Offices, Swinton 1978.
Northen Bank Head Office, Belfast 1977.
Divisional Head Quarter for ICI, Wilton 1976
Halifax Building Society H.Q., Halifax 1975.

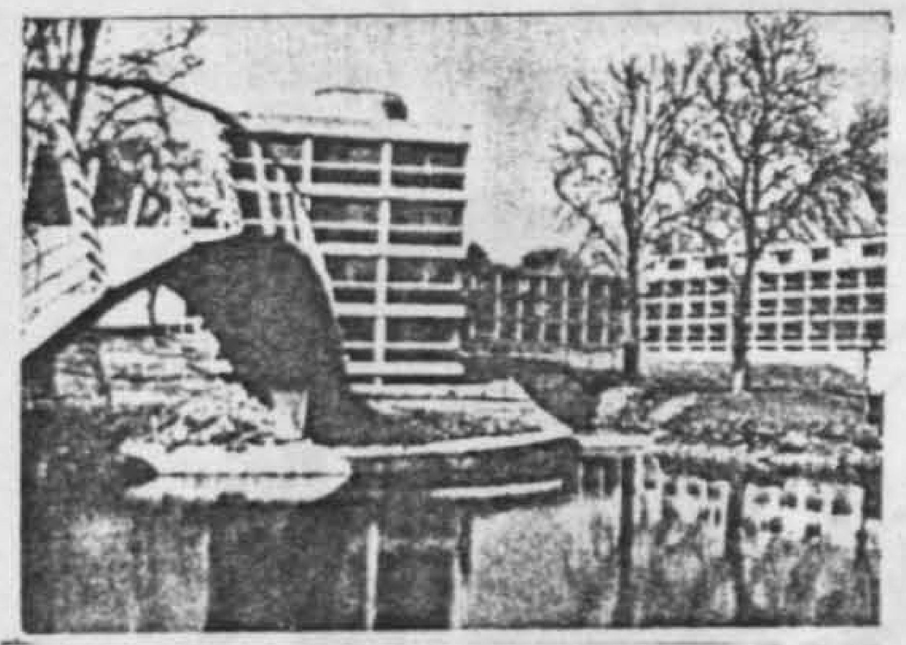
Renton Howards Wood Levin Partnership - FOUR AWARDS-

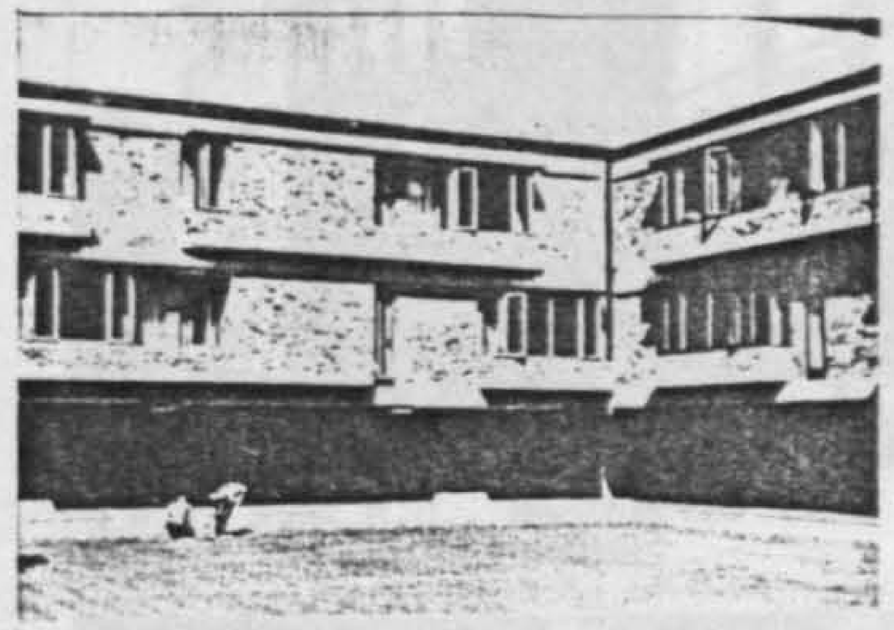
The Theatre Royal, Nottingham 1979.
Warwick University Arts Centre, Warwick 1975.
The Crucible Theatre, Sheffield 1972.
St. Katharine Dock House, London 1967

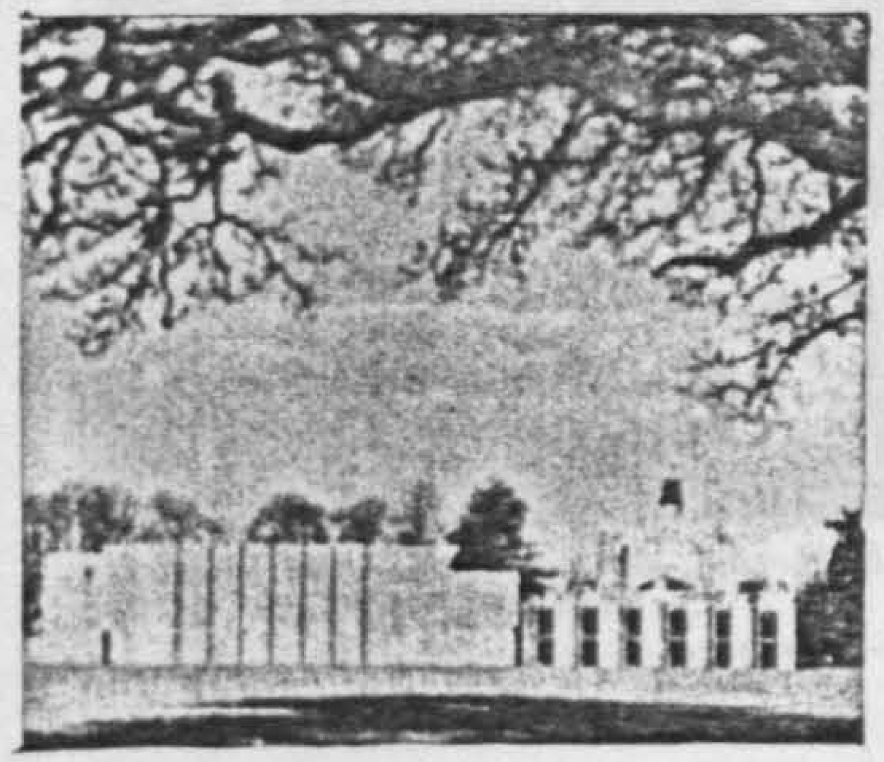
Robert Mathew, Johnson - Marshall and Partners - FOUR AWARDS-

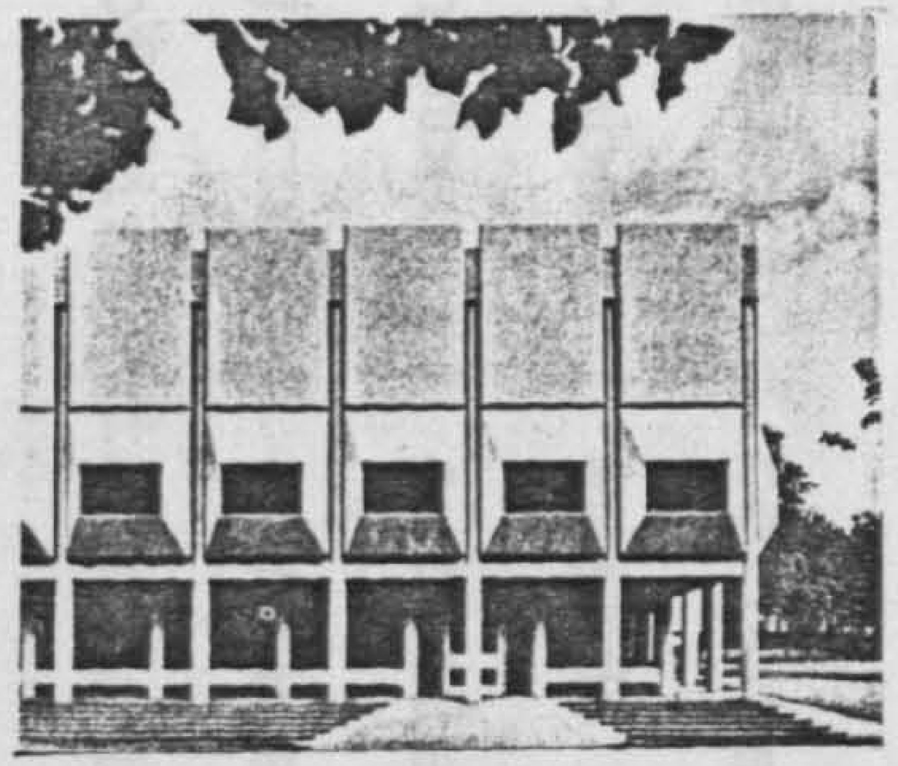
University of Stirling, phase 2, 1973.
In association, Embassy of the Czachoslovak Socialist Republic, London 1971.
In association, The Royal Commonwealth Swimming Pool, Edinburgh 1970.
Pathfoot Building, University of Stirling 1969.

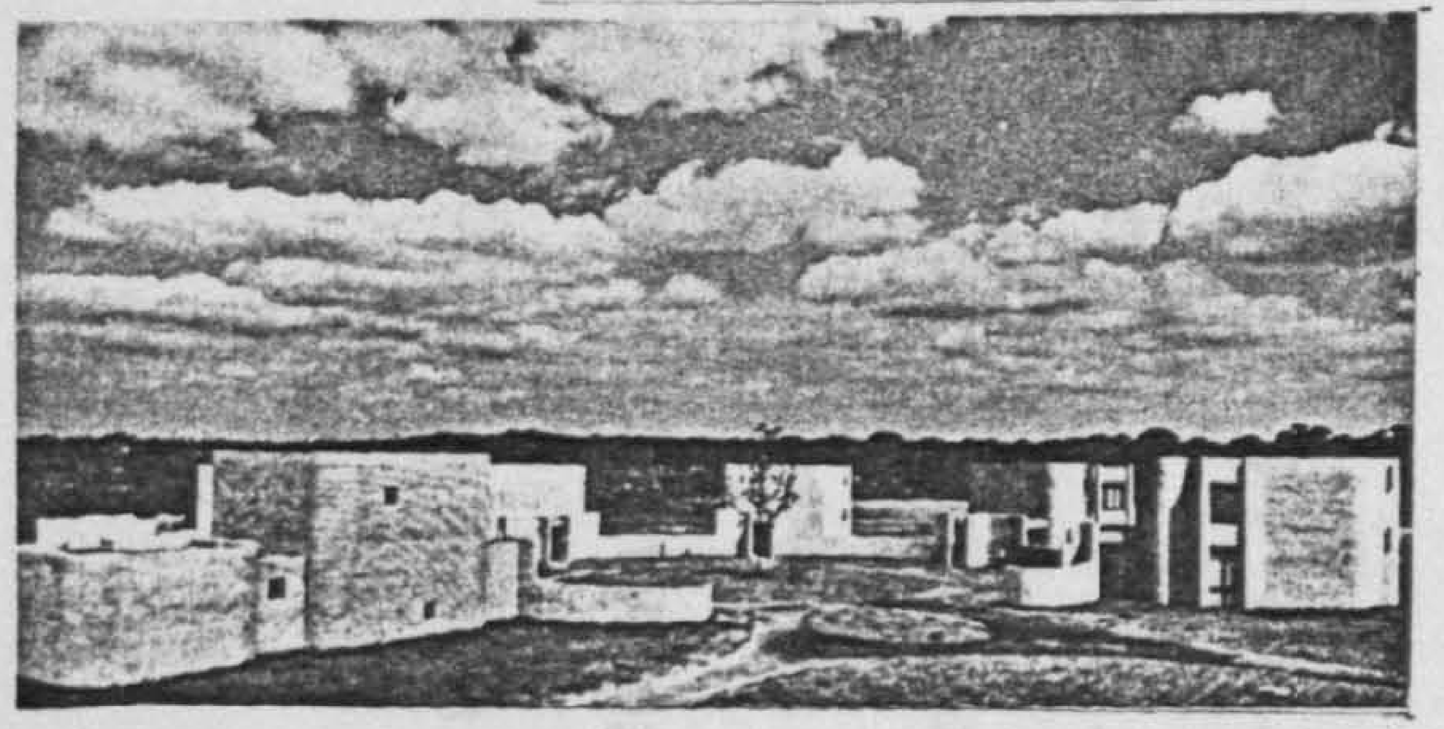

Winslande Manor, Exter 1979
Powell & Moya & Partners

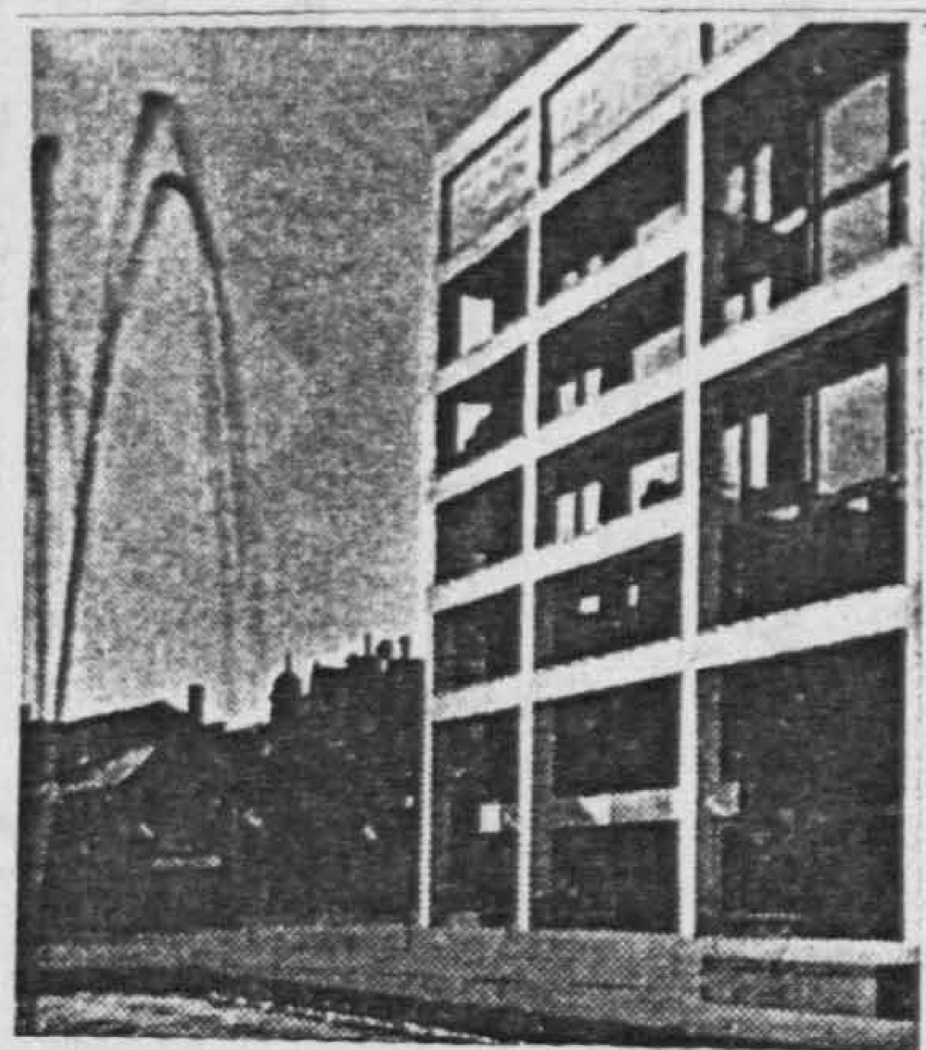

Wolfson College, Oxford 1975
Powell & Moya & Partners


Churchill College, Cambridge 1968
Richard Shappard, Robson & Partners


Art Centre, Sussex 1975
Howell, Killick, Partridge & Amis


St Antony's College, Oxford 1971
Howell, Killick, Partridge & Amis


Houses for Visits, Warwick Univer.
Howell, Killick, Partridge & Amis 1970.


Magistrates Court, Manchester 1972
York, Rosenbery, Mordall

Architects' Co-Partnership - THREE AWARDS-

Alexander Barracks, Pribright 1971.
St Paul's Cathedral Choir School, London 1968.
Dunelm House, University of Durham 1967.

Arup Associates - THREE AWARDS-

Gateway House, Basingstoke 1979
Horizon Factory, Nottingham 1972.
Mining, Minerals Building, University of Birmingham 1966.

Casson, Conder & Partner - THREE AWARDS-

Myvern Theatre and Art Centre, Swindon 1972.
N.W.B. Bank H.Q., Manchester 1971.
Elephant Pavilon, London Zoo 1966.

Darbourne & Darke - THREE AWARDS-

Housing Development, Pershore 1976.
Children Centre, London 1976.
Housing Lillington Gardner, London 1970.

Gillespie, Kidd, Coia - THREE AWARDS-

Grant & Peckitt Hall, University of Hull 1968.
St Peter's, Candross 1967.
Church at Counsel, Glasgow 1966.

G.L.C. - THREE AWARDS-

Sir Roger Walters for G.L.C. 1973.
Pimlico School, London 1972.
Andoner Town Development, Areall 1968.

Foster Associate - THREE AWARDS-

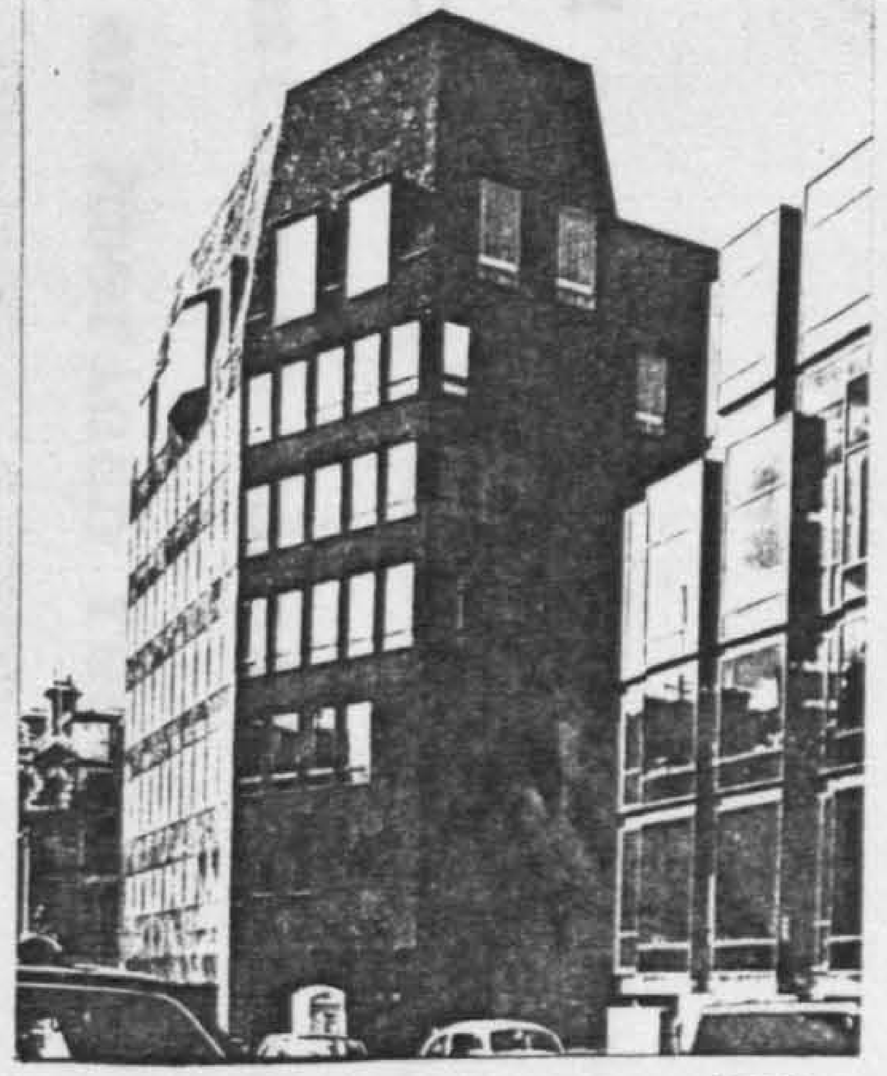
The sainsbury centre for the visual arts, Norwich 1978.
W. Faber & Dumas Office, Ipswich 1977.
I.B.M. Portsmouth 1972.

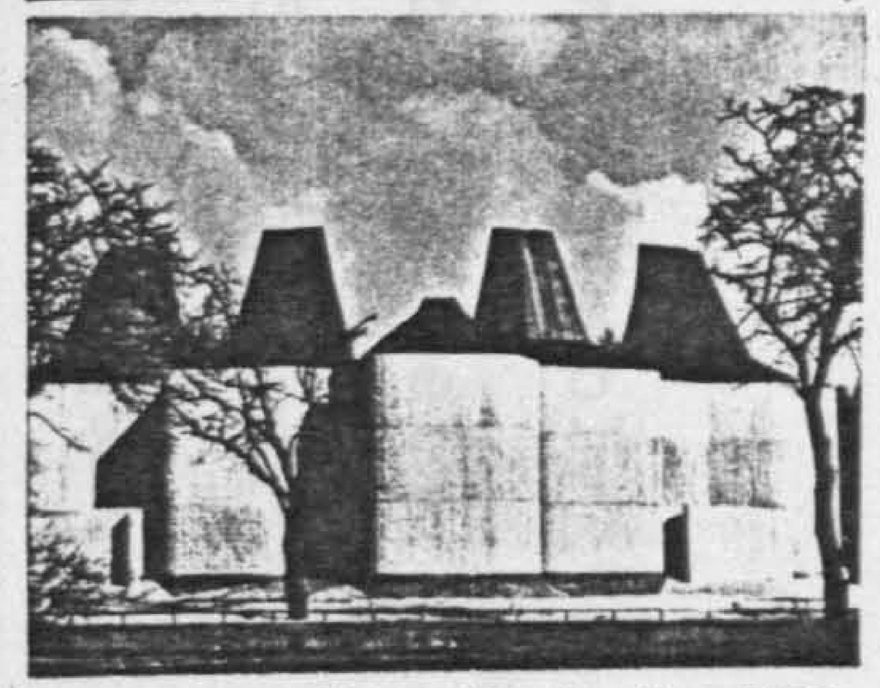
Percy Thomas Partnership - THREE AWARDS-

Bristol RC Cathedral, Bristol 1974.
Parke Dawis & Co, Pontypool 1973.
Great Hall and Bell Tower, University College of Wales 1972.

* for other awards winner refer to appendix - 3 -


Myvern Theatre and Art Centre, Swindon
Casson, Conder & Partner 1972


N.W.B. Bank H.Q., Manchester 1971
Casson, Conder & Partner


Elephant Pavilion, London Zoo 1966
Casson, Conder & Partner

This evidence would suggests that large firms probably tend to be associated with quality. Other things being equal, it is interesting to consider these findings with those discussed by an American researcher into the same problem. This was the subject of a recent study by Judith Blau[19] (1976), who considered 153 architectural private offices in New York City, one of her aims was to analyse the influence that organisational characteristics have on staff moral, decision making, and various aspects of project design, such as quality. Another aim was to examine the relationship between ideology, office structure and design quality.

This study leads in its finding to several unexpected results involving the relationship among firms and project quality as defined by awards; she argued that:

> "Perhaps it is not surprising that size is highly correlated to winning awards. since large firms do more work than small firms, their statistical chance of wining awards is greatest but this alone does not account for their superiority"[20]

It should be noted that design quality was measured by the number of awards the firm has won in the past five years; number of articles that have appeared in architectural journals; average number of awards per project, index of firm visibility among faculty of architecture schools; and average evaluation of the firm by faculty members.[21]

To find out the factors associated with size that promote high quality. Blau investigated the aspects of strengths and weaknesses in large and small offices, each measured by variables, related both to size and award winning. (see also David Rock (1973)[22]. In Blau's study, the very small size firms are these with (1-3) staff, the small firms with 4 - 10, and large firm with 11 - 174. This does not confirm one of the results of a study of British firms by the R.I.B.A.[23] (1962). Namely because the R.I.B.A. study shows that there is a strong curvilinear relation between the size and design quality with medium sized firms doing the best work overall. In the R.I.B.A. study the private firms are sub-divided by size so that small firms size are the one with 1 -10 staff, medium size 11 - 30, large size 31 & over

However, Blau's study aimed to provide a conceptual frame work that will alert the architect's to the impact of the social context on the quality of their work. Her argument is particularly directed to the relationships involved, i.e. the bureaucratice characteristic of large firms, in their negative and positive effects on design quality. To quote from the summary of her conclusions:

> "Although small offices, like other small organisations, tend to be simple and <u>not</u> to have a differentiated structure, diverse services, formal personal regulations, and centralised decision making, those small

> firms that do acquire these characteristics are most likely to win project awards. On the other hand if large offices have wide participation through staff meetings - and generally they do not - they tend to win awards. Other characteristics associated with large size - differentiation, diverse services, and formalized personnel regulations - make little or no difference for the success of large firms. But if small firms are handicapped by their structure, large firms are by their design philosophy. Principals of large firms tend to consider financial success more important than those of small firms, such a pecuniary orientation adversely affects the chances of winning awards of large firms, among whom it prevails, but not among small ones, among whom it is rare. On the other hand, small firms whose principals tend to emphasize user needs are more likely to win awards if user needs are not emphasised. It is concluded that architectural diversity and design orientation are the ones most likely to do outstanding work."[24]

Table -3.2 - shows the relationship among variables in 1976 survey of the 153 Manhatten Architectural Firms in the city of New York. The variety of rasources and structural attributes of the firms such as output, organisational characteristics and staff participation are listed. This is then compared in the both size and award winning to test factors associated with size which promote high quality design.

In contrast table -3.3- and - 3.4- shows the R.I.B.A. survey conducted in 1962 to, 63 British architectural firms, and summarises the assessments of the performance of the offices visited according to their size and type.

Survey of 153 Manhatten architecture firms, the City University of New York (1976).

RELATIONSHIPS AMONG VARIABLES

	Zero-Order Correlations with Size	Zero-Order Correlations with Awards	Partial Correlation with Awards Controlling Size
Resources			
1. Percent corporate and conglomerate clients (148)	.13 (*)	.11 (*)	.03
2. Age (141)	.42 (**)	.24 (**)	—.03
3. Percent engineers on staff (147)	.25 (**)	.11 (*)	—.05
Output			
4. Percent projects over 5 million dollars (149)	.53 (**)	.42 (**)	.01
5. Number diverse services (145)	.33 (**)	.23 (**)	—.05
Organizational characteristics			
6. Number of levels (95)	.44 (**)	.14 (**)	—.33 (**)
7. Number of divisions (95) . . .	.40 (**)	.13	—.29 (**)
8. Photocopier (150)	.24 (**)	.15 (**)	—.05
9. Computer (151)	.50 (**)	.34 (**)	—.08
10. Written personnel regulations (150)	.33 (**)	.26 (**)	—.00
11. Number of written rules (150)	.37 (**)	.19 (**)	—.05
Staff participation			
12. Number of staff meetings per year (58)	—.26 (**)	—.18 (**)	—.02
13. Proportion of the staff who work on project, stay to completion (104)	—.28 (**)	—.21 (**)	.04

(The number of cases is in parenthesis).
(*) Significant at .10 level.
(**) Significant at .05 level.

Table 3.2 A variety of resources and structural attributes related both to size and award winning to test factor associated with size promote high quality.

The RIBA survey of 63 British architectural firms, 1962.

Gradings given for design and technical efficiency

	Private offices with an architectural staff of 1—10	11—30	31 and over	All sizes	Local authority offices (all sizes)	Visited offices of all kinds (all sizes)
	%	%	%	%	%	%
Proportion of offices graded:						
(i) high for both design and technical efficiency	6	43	33	27	27	25
(ii) high for design, adequate for technical efficiency	12·5	14	20	16	18	16
(iii) adequate for design, high for technical efficiency	6	14	13	11	9	11
(iv) adequate for both design and technical efficiency	37·5	14	20	24	27	22
(v) poor for design or for technical efficiency or both	37·5	14	13	22	18	25
Total (a)	100	100	100	100	100	100
Number of offices in group	16	14	15	45	11	63

(a) In all but one instance the columns do not add up exactly to 100 due to rounding of figures.

Table 3.3 The analysis of the technical and design performance of private offices of different sizes compared with the performance of local authority offices and the whole sample in these two aspects.

Summary of gradings given for management, technical efficiency and quality of design

Type of office	Management Good	Adequate	Poor	Technical efficiency Good	Adequate	Poor	Quality of design Good	Adequate	Poor	Number of offices included
	%	%	%	%	%	%	%	%	%	
Private offices	18	44	38	40	58	2	44	36	20	45
Local authority offices . .	36	55	9	36	55	9	45·5	45·5	9	11
All visited offices (including other public and industrial and commercial offices*) .	21	44	35	40	52	8	43	36	21	63

* These are too small a sample to show separately.

Table 3.4 The proportions of offices graded 'good', 'adequate', and 'poor' against the three aspects of performance, management, technical efficiency and quality of design.

It is possible to conclude, however that the concern about project quality, related to the organisational properties of architects offices, such as size and productivity proved to be controversial subject. Middleton[25], for example, argues that there can be no doubt that the creative work of architecture can be produced by individual architect's, small offices, or a small team. "For such men may be expected the great imaginative leap". But it should be noted, according to Middleton, that while the architect's work is in close co-operation with others it is exposed to their stimulating and challenging criticism. His own work matures more rapidly and never loses touch with the broader aspects. He claims that, a group practice permits maximum and continuous communications and responsibility and collaboration, preventing any gross errors of judgment by its multiple feed-back system to try to produce work of good quality. Middleton gives examples of a successful large group of practices, such as building design partnership, . . . and other large architectural organisation, predicting that the central concern of the whole movement of society is towards the creation of large units including large design teams, which share a part of common design identity.

> "Group practice, like the new tradition of design itself, is a method rather than a promise of perfection. Like the new tradition, it must be judged as much but its potential as by its performance. Like many other methods it must depend finally upon the calibre

> of those who use it. As a method, it has undeniable advantages, chiefly among them being flexibility in short term stability in the long"[26]

However, it is difficult to assess the validity of these points of view, in particular in terms of creativity, which is generally associated with small team work. Middilton's argument used to describe the advantages of group practice,is defined in general terms and partly from the points of views of its potentiality and flexibility of group practice to serve society in general.

However, walter Gropius, was the first in recent times explicitly to give expression to this belief . The Bauhaus was the origin of many groups in the twenties and thirties, to practice on the principle idea of "total architecture", which demands collaboration on the broadest basis and the help of modern technology to put its ideology, which is concerned with the environmental development, into practice. Such ideology is rejected by Brolin (1976)[27] of the "Failure of Modern Architecture" as it has claimed too much from people, by assuming that the user-client would become accustomed to living the way "the architect's", expected other people to live.

Certainly there is much inclusive evidence about size and design achievement it was decided that the final selection of buildings should incorporate examples of both large and small practices.

3.3 LIST CATEGORISATION

3.3 <u>List Categorisation</u>:

Selection of the buildings and practises to be investigated was made from a list drawn up after correlation of the two sets of the survey of R.I.B.A. Awards Winning Buildings and of the questionnaires as has been previously noted. The preliminary lists showed that several architects and practices appeared consistently. A final check was made to achieve a balanced list which reflected both building types and a range of practice types. The latter was deliberately structured to encompass both large and small firms. The practices which come out of this process were all in the private sector which may be pertinent and requires explanation.

> "We felt that essentially this was because the opportunities to exercise design skills were more readily seen in private practice and the rewards for building-up a reputation for original and creative work could more easily be related to career prospects."[28]

On the other hand, in the public sector, the institutions depend on the abilities of the designer employed for the quality of a building. It is felt that the problem of the relationship between professional and administrative responsibility is not fully recognised. This is a commom problem in architectural work, especially severe in situations where two kinds of responsibility exist side by side and where progress for the individual architect in the hierarchy usually means the sacrifice of progress in the other. This has disastrous consquences on the profession's ability to be concerned with design quality in the necessary detail and on a sufficiently high level (R.I.B.A. 1974)[29]. This, of course, is not confined to the public sector practice but it does seem that private practice, which can formulate its own working rules, seems better able to produce the necessary flexibility in time and resources to apply to design problems when required, as well as recognising talant in the large term. This issue was discussed in the Mathew/Skillington Report[30] (1974), to advise on the possible means of promoting high standards of architectural design, and the R.I.B.A. comments on the report "Quality must be the goal of the D.O.E."[31]. Both reports suggested ways in which architects should be contributing more fully to the management function without abandoning their prefessional role. The report provides radical proposals that would allow P.S.A. (Property Services Agency), and the D.O.E. to exert a more positive influence on the quality of the built environment.

> "A pre-requisite of a successful design office is that there should be the same degree of continuity of staff as might be found in a good private practice. At present, it happens all too frequently that designers, when promoted, have no option to move to jobs in different parts of the organisation. It is essential that a good designer should have the opportunity of being promoted "in situ" within the design office without jeoparadising his career"

Reporting the 1975 architecture decade of award winners, Judith Strong[32] comes up with even more conclusive proof of the wide gap which exists between public and private sector, in exercising design skills, she remarked that of the award winning schemes which were built with public money, only eight of them were designed by architects employed in the public sector.

> "Nearly half the profession is in public employment. Why are they getting only 10% of the awarde? It is a sympton of architects'- architecture's! The idea that the sort of everyday necessary work which goes through a local authority's building programme is not sufficiently significant to be regarded as "excellent", or is it that the most interesting jobs goes to private practice?"[32]

She commented on the question of the credibility of the jury judgment, by pointing out the fact, that the membership of the awards juries is fairly balanced between the different parts of the profession. Members were, and are, selected from both private and the public sector offices, and also included representatives from the schools of architecture.

In any event, after prelimanry contact, it become evident that the private practices would form the list for final selection. The public practices did not seem able to offer information without a great deal of qualification and administrative difficulty. There were further constraints in terms of time and money available for travelling which helped to make final selection perhaps a more easy task, then was apparent at the beginning of the study although this did not compromise standards. In order to obtain access to records, drawings and other documents, as well as interviewing staff, an assurance was given that confidentiality would be mantained. The study covers 5 practices and the final list is as follow:

LIST OF STUDIES MADE

	Practice	Building used as Exploratory vehicle.
A.	Large multi disciplinary international practice.	Head office for national institution on difficult site. RIBA Award.
B.	Small practice headed by British architect with very high international reputation, work in collaboration with small number of named associates.	U.K. Headquarter of International Company and ancillary accommodation.
C.	Firm responsible for notable government and university developments.	University Building in Northern Civic University.
D.	Large firm described as commercial architects specialising in recreational commercial and similar large scale developments in U.K.	Housing scheme with awards from RIBA. Civic Trust etc.. in redevelopment area.
E.	Practice developed out of the division of former architect headed by a notable architect of national and international reputation. Responsible for educational ecclesiastical, government and commercial work both in this country and abroad.	Civic Building for District Council in North of England. RIBA Award.

Objectives of the Investigation

The basic objective of the investigation was to define what were, in the view of the designer, the important factors in the design of buildings of quality. It is hoped to consider whether there appears to be scope for application of design methodology to the problems revealed and also how efficient the existing techniques are. This implies also looking into the job history of the scheme, and the way in which many difficulties faced the designers preparing for all stages of implementation. It was decided at an early stage that probably the most suitable technique would be to prepare a questionnaire and use this for an interview. The questions and the prepared list, though important were seen as providing a framework or structure upon which the interview might develop. The assumption that a discussion about particular points would develop was borne out by the way in which the interview turned out. It become clear that there were two kinds of question with corresponding answers. Firstly the objective query in which fact was elicited and statements researched; this was straightforward. The second category was that of the subjective questions and which usually resulted in a dialogue between the designers and the interrogater. In this latter case much information about design methodology was obtained. An example, is the question which deals with the origin of ideas. Very often persistent questionning had to take place to try to peel off the layers of supposition about ideas. The result were often quite surprising to the designers. This aspect forms a significant part of the findings about the design of buildings of quality and will be dealt with more fully at a later stage. We enquired also about the design process of the office to find out how they work. In particular, we tried to elicit the strategic objects of the design at its early stages in which people were involved.

If a design the work of a single designer or a team working together? What is the relationship between senior and other architects and what is the consultants responsibility for the work? The relation with the client organisation seems to be a factor, and the impact of any changes the designer makes at a late stage has an effect upon the quality of the work. Thus, is the client-architect relationship an important factor in producing good buildings? If so, is there any office policy with regard to the client, and society as a whole?

We asked about the architects contribution to the brief, if any, and how spatial requirements and standards are established. How they (the architects) dealt with criticism both constructive and destructive. The question of the construction standards and how these are monitored in the context of the office environmental information and standards? What are the methods of updating information and attitudes and obtaining feed back from past jobs. We also asked about standard detailing, tendering and contract procedures.

In particular, what aspects of quality control, supervision and site inspection, were dealt with by the office and what is left to other agencies. We were also interested in the way in which primary design decisions were implemented both in working up detail and ensuring that the designer intentions were in fact carried out. (A copy of the questionnaire is appended).

A point might be made at this stage with reference to the practices chosen to be visited. It was expected that the spread of offices would provide a variety of design methods but this did not appear to be the case. There was, in fact, a similarity in design methods between the large practices and those buildings designed by an individual in small offices. It had been expected that an important aspect of our study was to investigate optimum size of offices, but our preliminary studies indicate that close involvement of either the principal or named architects with the project was a factor in all the cases which were studied. This statement will be developed more fully at a later stage.

Investigatory methods

The methodology decided upon can be described in the following stages:

1. Familiarisation with the work of the practice or architects, and obtaining of background information upon personnel etc.

2. Selection of one building, which was in every case either an award winner or had been recognised in other ways, and which acted as a vehicle for discussion on design processes used.

3. Interview, with the architects concerned including the principal and job architects where appropriate, using questionnaires which had been completed in advance as previously discussed.The visit(s) was (were) normally arranged beforehand to enable the office to arrange and discuss the material need for the interview.

4. Examination of drawings,documents, relating to the project.

5. Follow up with other members of team where appropriate.

6. Assessments of design process used and definition of points of significance.

7. Analysis of material and check to determine major factors, together with making up conclusions.

3. (1.2.3) Notes and Reference

1. Blau, Judith (1976), "The Influence of a Firm's Structure on Design Quality", AIA Journal, May, 1976, pp. 54-57. The article is based on a research team study, sponserd by the research foundation of the (City University of New York. The work is a study to the city firms and their architecrs. The aim was to analyse the influence that organisational charactristics have on staff, decision making, including its quality, the relationship between office structure and design quality. This recent work started in 1976 is a complimentary to our study which stated earlier in 1975.

2. Sertz, William (1969), "Sculpture", in Louis Kronenberger ed (1969), "Quality: it is Image in the Arts", Athenenm, New York.

3. Deasy, C.M. (1974), "Desing for Human Affairs", New York, Wiley, p.126.

4. Newman R.J. (1974) "The Basis of Architectural Design, Institution or Research", Oxford Architectural Research Paper 1974 December, p.4.

5. Strong, Judith (1975) "Tenth Anniversary for the Awards Scheme", RIBA Journal Jul/Aug (1975), pp. 6-8.

6. Collins, P. (1971), "Architectural Judgement", Faber & Faber, London, p.147.

7. Johnson, Donald (1955), "The Psychology of Thought and Judgement", Harper & Brothers, New York, pp. 376-380.

8. The Quotations from the brief given to first and second stage award jourors, RIBA.

9. Examples related to design creativity are: Skill planning and consistency of design philosophy, skill in relating the character of surrounding, simplicity of design solution, unity of design, maintain human scale, etc.

10. Display a relevant approach by using traditional materials, create an environment of unity, use simple materials, cheap materials, and minimal use of materials.

11. Newman R.J, (1974) op.cit., p. 16.

12. Collines, Peter (1971) "Architectural Judgment", Faber & Faber, P. 50.

13. Allsop Bruce (1977), "A Modern Theory of Architecture" p. 10.

14. Organisational Studies, i.e. Blau Peter M, and Schoenherr R.A. (1971) "The Structure of Organisations, basic Books, New York, 1971.

15. For example, RIBA (1962) and the modified, RIBA (1974) study group members, "The Architect and His Office", North West Region Report Yorkshire Publication, RIBA. - AIA, The American Institute of Architects (1974) "Survey of the profession: individual members", D,C. AIA.

16. RIBA (1962), "The Architect and his Office", RIBA Publication.

17. Ibid, p. 180. The medium sized firms are there with 11-30 architectural staff.

18. Ibid, p. 180, "Main Findings and Conlusions".

19. Judith,K. Blau (1976), " The Influence of a Firm's Structure on Design Quality", AIA Journal, May, 1976, Vol. 65, No. 5, pp. 54-55, also by the same auther, "Beautiful Buildings and Bereaching the Laws: Study of architectural firms", Journal of Internal Inst. of Sociology, Vol. xll, No. 12, April/August 1976, pp. 110-127.

20. Ibid, p. 114.

21. Mackinnon, reports correlations of a similar magnitude involving the following assessments of architects creativity: evaluation of journal editors, architects' assessment of the creativity of their colleagues, the number of pages in journals devoted to an architect, and the evaluations by faculty of architecture school, See Makinnon,Donald W. "Creativity and images of self" in Robert, W. White ed, the study of lives (Atherton Press, New Yord (1963), quoted from Blau, op.cit, p.114.

22. Also David Rock, (1973), "Setting Up a Practice", opinion on the strength and weakness of both large and small offices", the architect, March 1973, pp. 80-82.

23. RIBA (1962) op.cit., p. 180.

24. Blau (1976) op.cit., p. 128.

25. Middileton, Michael, (1967), "Group Practice in Design", The Architectural Press, London, pp. 278-280.

26. Ibid, p. 275.

27. Broline, Brent, (1976), "The Failure of Modern Architecture" Studio Vista, London, p. 62.

28. Quoted from a joint paper presented by the auther of this work and professor, K.H. Murta, Sheffield University, Entitled "Design Procedures for Buildings of Quality", Istanbul Conference,'Architectural Design Interrelation Among Theory Research and Practice", May 1978.

29. RIBA (1974), "Study of Architectural Responsibility-looking hard at the profession at work", RIBA Dec (1974), p. 20-21. See also the North West Study of RIBA May (1974) one of the first effort to throw light on these basic

matters. its results show that the profession does not have the kind of evidence it needs to propose answers with conviction and confidence.

30. Mathew, Sir Robert and Skillington W.P.O. (1974), "Promoting High Standards of Design in Government Building", RIBA Journal, September (1974), pp. 17-23.

31. RIBA (1974) "Quality Must be the Goal of the DOE", RIBA Journal, December (1974), pp. 22-24.

32. Stong, Judith (1975), "Tenth Anniversary for the Awards Scheme", RIBA Journal, July/August (1975), pp. 6-15, p. 6.

3.4 DESIGN METHODS REVIEW

3.4 Design Methods Review

Design Methods - The Present State -

Before the stage of analysing the finding of the survey is reached, it is probably worth while looking at existing models of the design process. It is important also to identify the major parts of these design models and especially those elements identified and emphasized by others. There has been an upsurge in design methodology in recent years, and research has been carried out in several universities and institutions in the U.K. and the U.S.A. into the basis of building design. The impetus seemed to come from the possibility of computer application and this in turn arose out of operational and management studies which were in vogue during the period from the end of the second war to the early 1960's.

One of the earlier methods was used; this was the method described by Christopher Alexander (1964) in his book "Notes on the Synthesis of Form"[1], and involved quantifiable and non-quantifiable factors to the design process. The methods were based on an analysis of "Problem-stucture", by using the technique of decomposing the problem into "fit" and "misfit" variable. In this technique based on the "Groph Theory", the problem was broken into individula requirements and then built up again into a total solution.

Each individual requirement was checked for its relation to other "misfit variables", and eventually, groups of misfit built-up again. The problem presented by each group is then resolved by means of a "diagram" which sums up geometrically its essential characteristics. These diagrams are then assembled, combined and modified into each other, to achieve the total solution to design problem (Broadbent)[2]. Figure - 3.5 - shows an example of the four parts of Alexandar's process used as a description of the problem facing a designer in creating an American Indian village as follows:

1. Example of misfit variables.
2. Transforms the lists of misfit into a group of interacting variables from A, to A3, B, to B4, C, to C2, D, to D3, and consists of individual requirements, then these encoded in the form of matrix.

3. The interacting variables separated into independent sub-sets working according to the principles of the graphtheoretic formulation.

4. The variables diagrammed as independent design features from A to D, (A) deal with cattle, and fuel (B) deals with agricultural production and distribution (C) with communal life of the villagers, their shelter and small scale activities. (D) the

figure 3.5

The determination of components for an Indian village (C. Alexander)

A1 contains requirements 7, 53, 57, 59, 60, 72, 125, 126, 128.
A2 contains requirements 31, 34, 36, 52, 54, 80, 94, 106, 136.
A3 contains requirements 37, 38, 50, 55, 77, 91, 103.
B1 contains requirements 39, 40, 41, 44, 51, 118, 127, 131, 138.
B2 contains requirements 30, 35, 46, 47, 61, 97, 98.
B3 contains requirements 18, 19, 22, 28, 33, 42, 43, 49, 69, 74, 107, 110.
B4 contains requirements 32, 45, 48, 70, 71, 73, 75, 104, 105, 108, 109.
C1 contains requirements 8, 10, 11, 14, 15, 58, 63, 64, 65, 66, 93, 95, 96, 99, 100, 112, 121, 130, 132, 133, 134, 139, 141.
C2 contains requirements 5, 6, 20, 21, 24, 84, 89, 102, 111, 115, 116, 117, 120, 129, 135, 137, 140.
D1 contains requirements 26, 29, 56, 67, 76, 85, 87, 90, 92, 122, 123, 124.
D2 contains requirements 1, 9, 12, 13, 25, 27, 62, 68, 81, 86, 113, 114.
D3 contains requirements 2, 3, 4, 16, 17, 23, 78, 79, 82, 83, 88, 101, 119.

'minor subsets'

A2: 31 Efficient distribution of fertilizer, manure, seed, from village storage to fields.
34 Full collection of natural manure (animal and human).
36 Protection of crops from thieves, cattle, goats, monkeys, etc.
52 Improve quantity of fodder available.
54 Provision for feeding cattle.
80 Security for cattle.
94 Provision for animal traffic.
106 Young trees need protection from goats, etc.
136 Accommodation of wandering caste groups, incoming labor, etc.

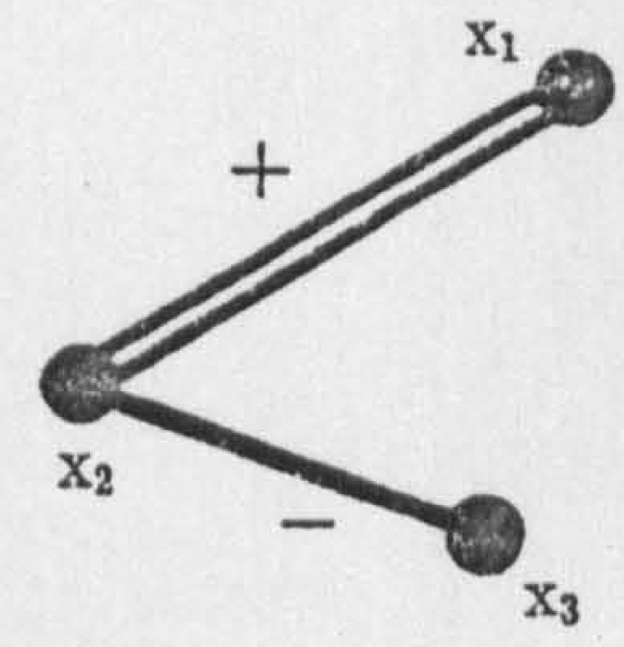
'group A2'

D3: 16 Women gossip extensively while bathing, fetching water, on way to field latrines, etc.
17 Village has fixed men's social groups.
23 Men's groups chatting, smoking, even late at night.
78 Shade for sitting and walking.
79 Provision of cool breeze.
82 Provision for children to play (under supervision).
83 In summer people sleep in open.
88 Place to wash and dry clothes.
101 Pedestrian traffic within village.
119 Efficient use of school; no distraction of students.

'group B3'

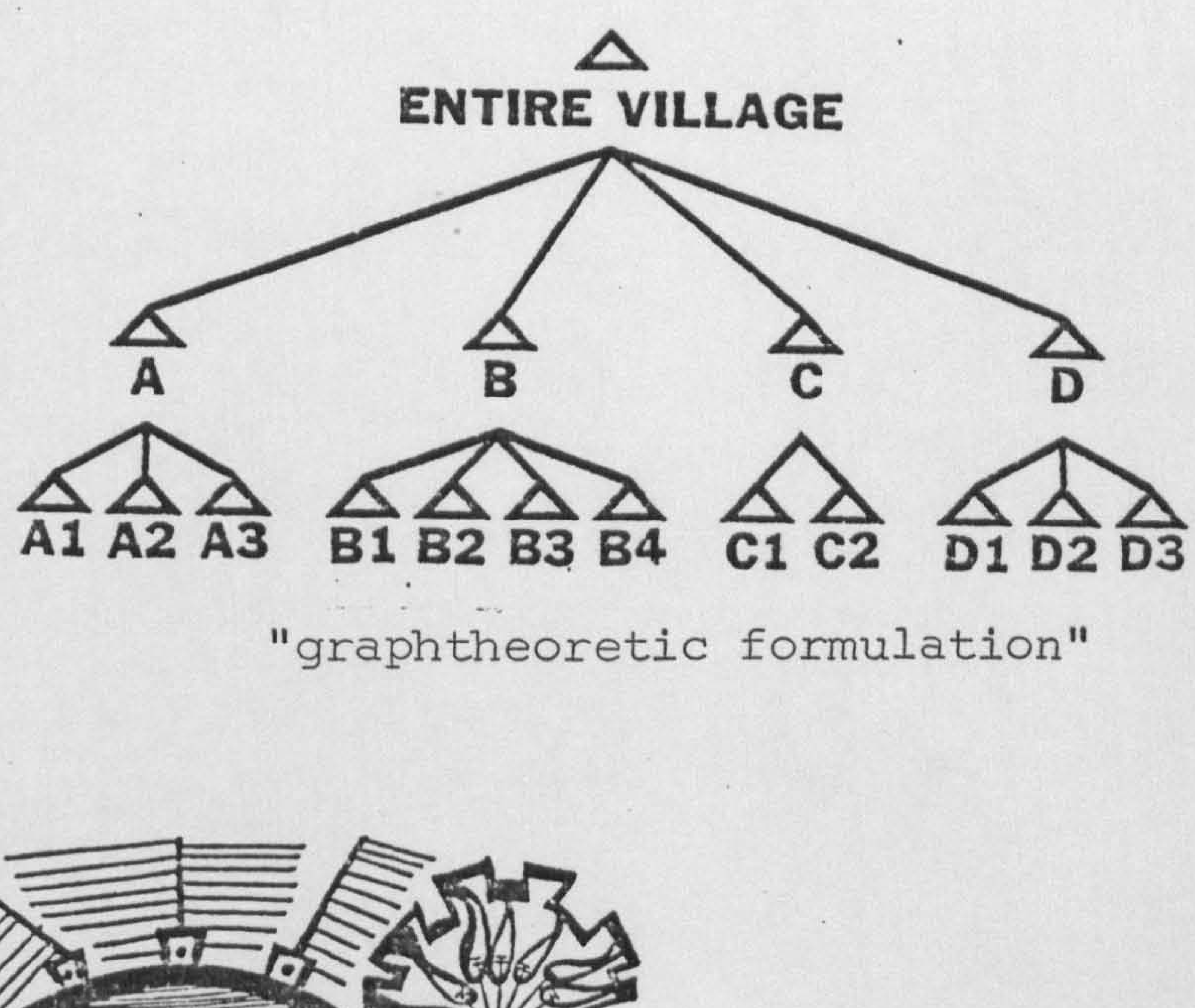
'misfit transforms into interacting variables'

$$\begin{array}{c|ccc} & x_1 & x_2 & x_3 \\ \hline x_1 & 0 & 2 & 0 \\ x_2 & 2 & 0 & -1 \\ x_3 & 0 & -1 & 0 \end{array}$$

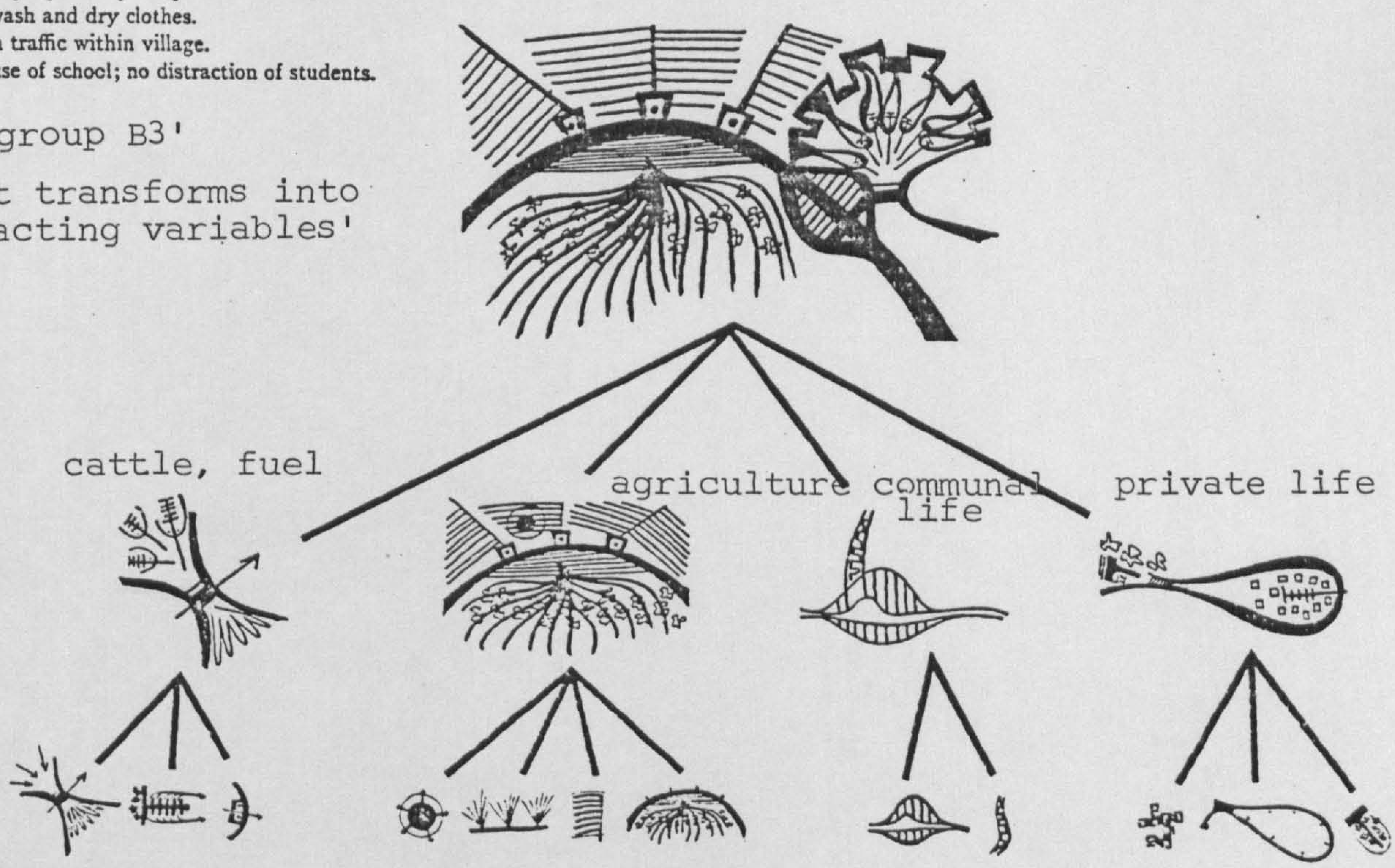


III

"matrix"



"graphtheoretic formulation"



"Independent design features"

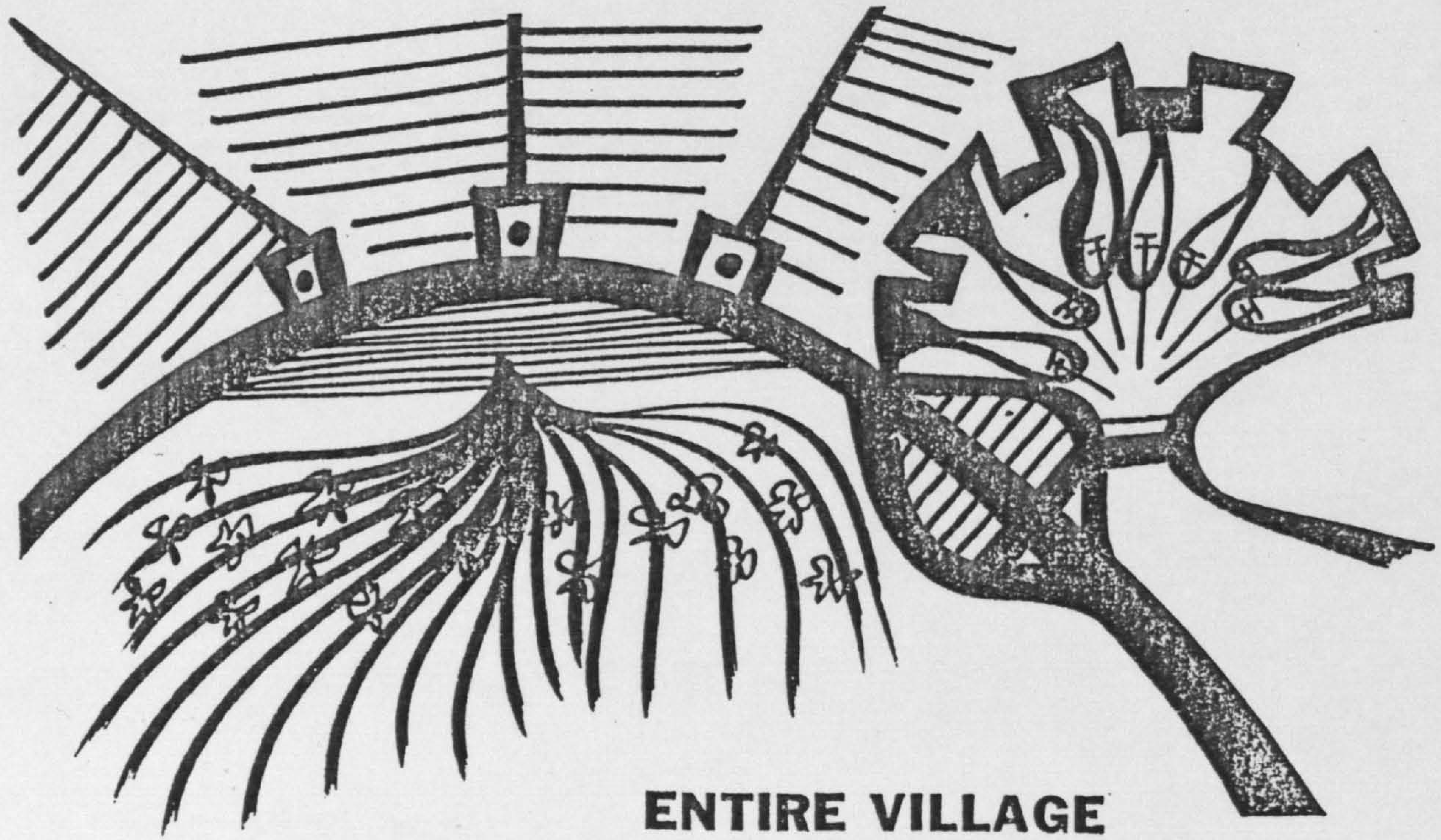


Figure 3.6 The final proposed design for an Indian Village,(C. Alexander).

private life of the village, both social and industrial. Figure -3.6 - shows the final
for the
proposal/design of the entire village.

However, Alexander has since modified the views and
methods which is
developed further interpretation of design/meant to replace the one expressed in his book.

Hanson[3] (1969), under the direct influence of Alexander's book, developed a similar method used for a design group of housing development and indicated that there is considerable doubt that a solution built up by combining diagrams of this kind can have much validity. In a similar problem, he said, he would not go all through the process again. However, the process of such approach has been rejected and better methods developed.

According to Markus[4] (1972), the analysis of the design operation can be described as "two structure". This is further assessed by Cross[5] (1977), as the "two-dimensional structure" of design which consists of both the "design process" and the "decision process and sequence". Both writers explain these terms and they can be summarized as follows:

The design process is the vertical structure of sequential design stages, leading by phases from inception to completion, this process regulates the development of design into various stages. Figure -3.7 -.

Two-dimonsional model of the design process

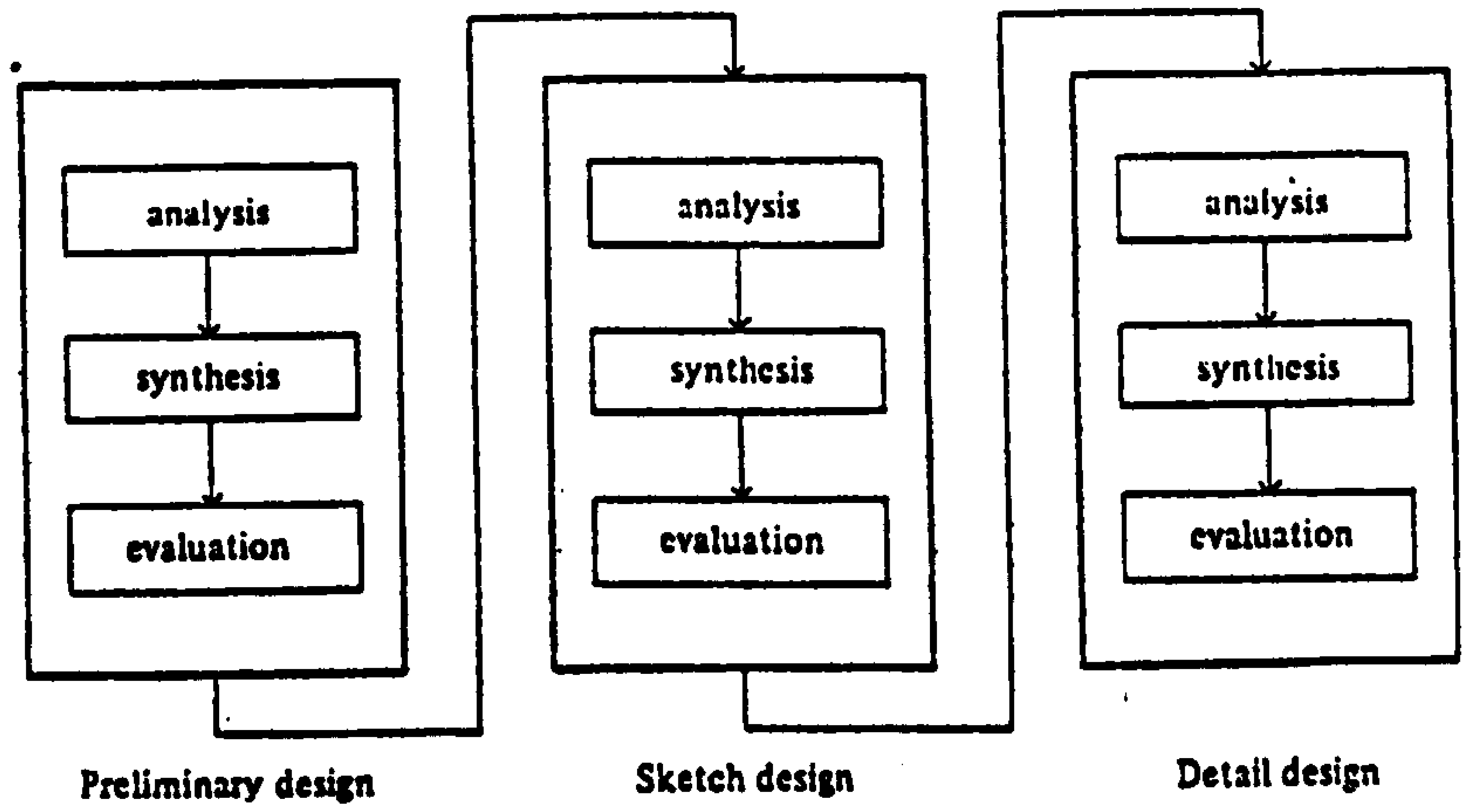


Figure 3.8 The herizontal structure of iterative and cyclic processes of decision making applied to each phase of the design process.

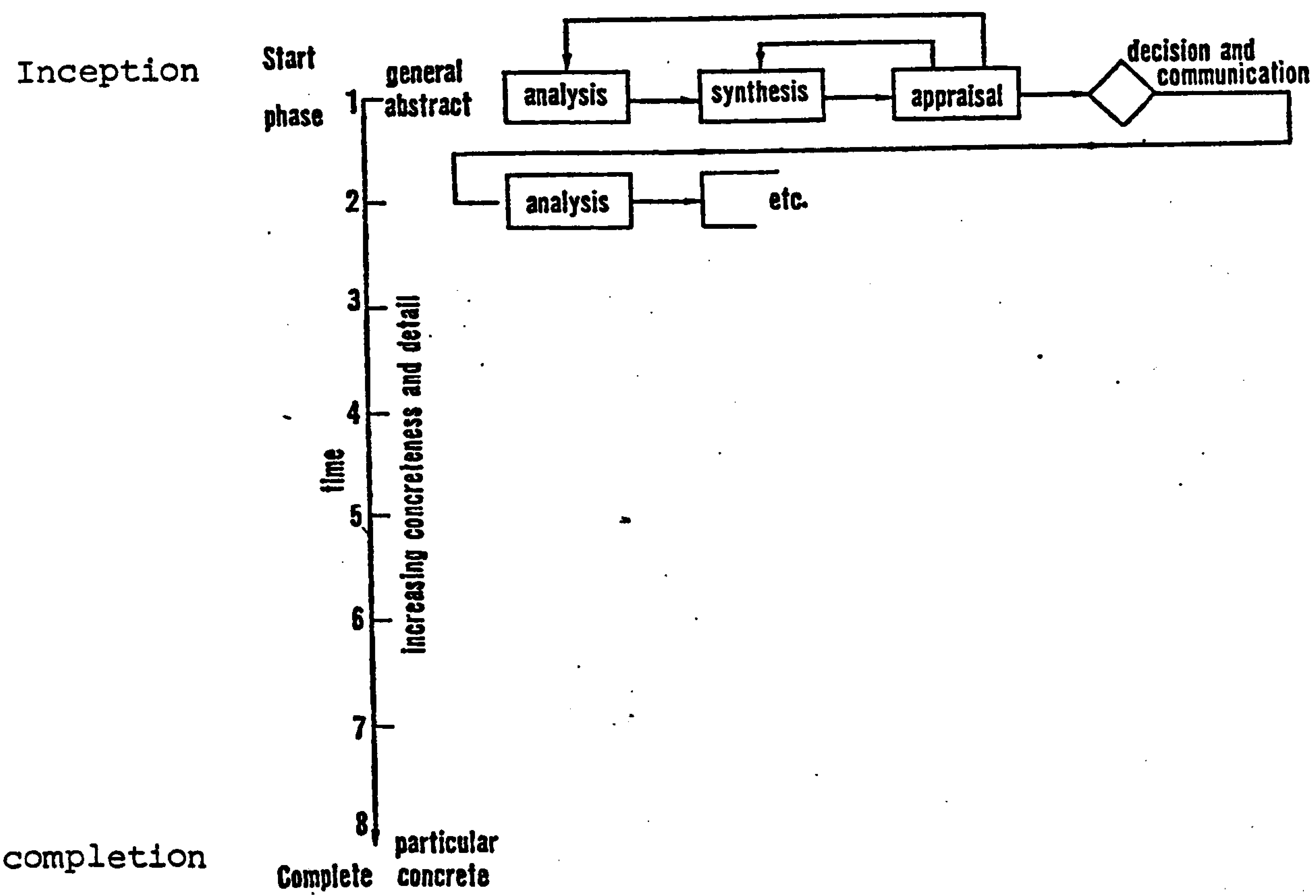


Figure 3.7 Model of the design process.

The commonly accepted two-dimensional model of the design process, the design process is the vertical structure of sequential design stages. The decision processes are the herizontal structure of iterative process.

The decision processes, are the horizontal structure of iterative and cyclic processes, leading from analysis to communication as a decision making method for solving problems of design, this second structure is that of sequence. It applies to each phase of the design process in-all or in-part. Figure -3.8 -.

Design Process

The stages of the design process, identified by Asimow (1962)[6] embodied in recommended structures for engineering design, and the "R.I.B.A. Hand Book"[7] (1967), as the plan of work are still generally accepted as management phases. The basis of the design operation is identifiable by stages, and these stages are sequential. There have since been, in the "R.I.B.A. Architect's Job Book" (1977)[8], some important changes in methodology, especially in content, but the essential step by step nature of the process remains unchanged.

All author's recognise, in each phase, a horizontal concept of iterative and cyclic progression, which analyses the out-put of the previous phase, and communicates in these design concepts for development of the next phase in the degree of detail appropriate to the stage. In the

"R.I.B.A. Architect's Job Book" (1977), each stage is prefaced to describe its basic objectives and has a primary check list of significant events supported by detailed check lists and other documents. The analysis of the design process described by the R.I.B.A. plan of work identified the following stages:

1. Inception.
2. Feasibility.
3. Outline.
4. Scheme design.
5. Detail design.
6. Production information.
7. Bills of quantities.
8. Tender action.
9. Project planning.
10. Operation on site.
11. Completion.
12. Feed back.

The R.I.B.A. and Asimow approaches are summarised briefly in table - 3.9 -. Although there are no clear boundaries between the stages, the importance of completing each phase before starting the next is generally emphasized in the "Job Book" (1977), actions are introduced into the sequence of work which allows the designer to review in advance the stages established when the project programme was first set out.

Alex Gordon[9] (1968), drew the attention to the considerable agreement between the plan of work and the CBC approach "Co-ordinated building communication", in its analysis of the design operation. The operation is sub-divided into

Table 3.9 A comparison of recommended structures of the design process for architecture, industrial design, and engineering design.

Architecture (RIBA, 1967)	*Industrial design* (Archer, 1965)	*Engineering design* (Asimow, 1962)
A. Inception	0. Preliminaries receive and evaluate enquiry	Primitive need
B. Feasibility provide the client with an appraisal and recommendation; carry out studies of user requirements, site conditions, planning, design, cost, etc	1. Briefing receive instructions; define goals; define constraints 2. Programming establish crucial issues; propose a course of action	1. Feasibility demonstrate the validity of the original need; explore the design problem engendered by the need; conceive a number of plausible solutions to the problem
C. Outline proposals determine general approach to layout, design, and construction; develop the brief further; carry out studies on user requirements, technical problems, planning, design, and costs	3. Data collection collect, classify, and store data 4. Analysis identify subproblems; prepare performance (or design) specification; reappraise proposed programme and estimate 5. Synthesis prepare outline design proposals	
D. Scheme design final development of the brief; full design of the project by architect; preliminary design by engineers; preparation of cost plan and full explanatory report	6. Development develop prototype design(s); prepare and execute validation studies	2. Preliminary design establish which alternative is the best design concept: conduct order-of-magnitude analyses; establish range within which major design parameters must be controlled; investigate tolerances and characteristics of major components and materials
E. Detail design full design of every part and component of the building; complete cost checking of designs		3. Detailed design furnish the engineering description of a tested and producible design
F. Production information preparation of final production information—that is, drawings, schedules, and specifications	7. Communication prepare manufacturing documentation	4. Planning for production detailed planning of the manufacturing processes 5. Planning for distribution plan an effective and flexible system of distribution of the designed product 6. Planning for consumption incorporate in the design adequate service features; provide a rational basis for product improvement and redesign 7. Planning for retirement plan for the disposal of the obsolete product
G. Bills of Quantities H. Tender action J. Project planning K. Operations on site		
L. Completion	8. Winding-up wind-up project; close records	
M. Feedback Analysis of job records; inspections of completed building; studies of building in use		

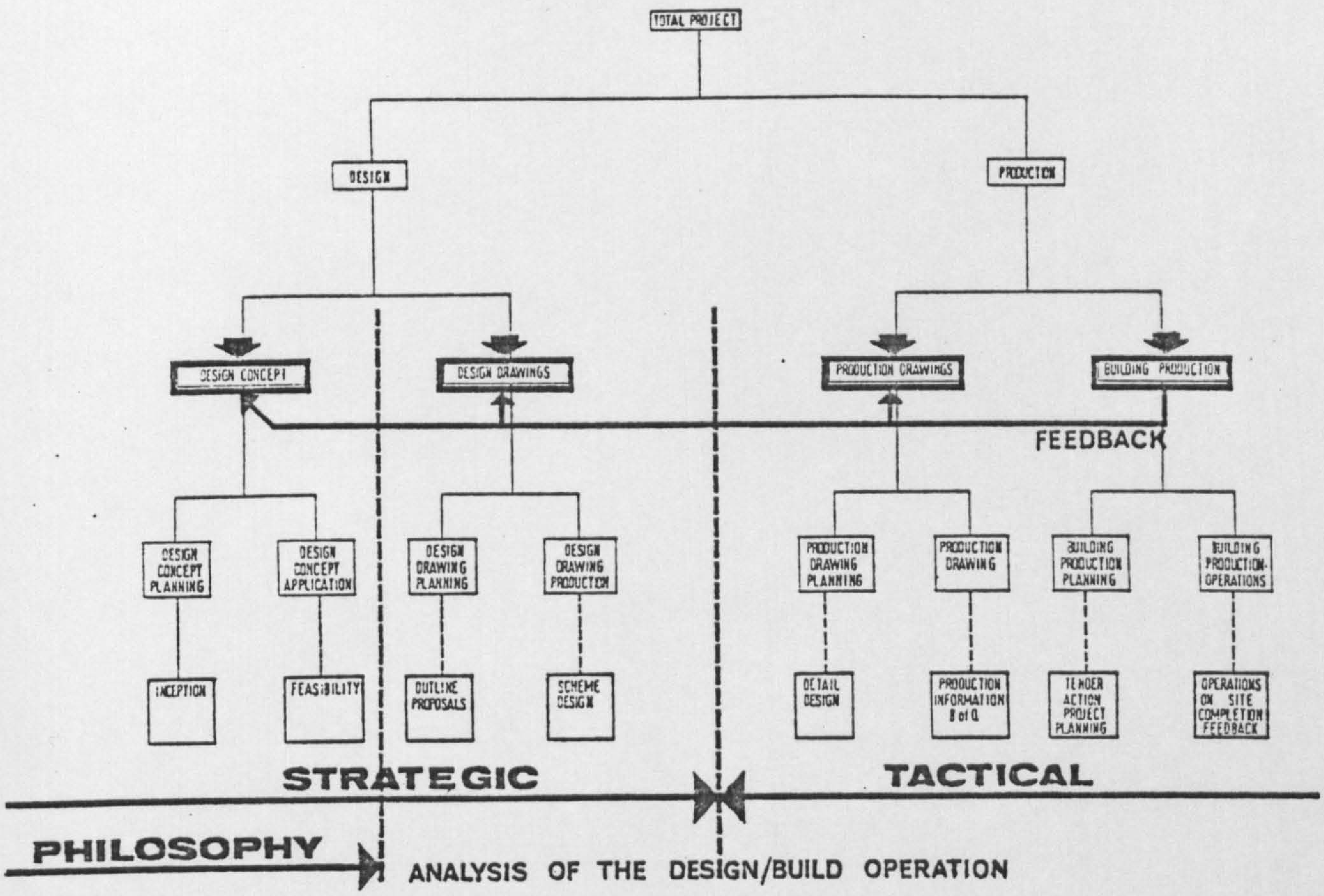
two main divisions, strategic, and tactical; the strategic operation describes the analysis stages, and its fact finding and solving client's problems in general forms.

It falls into two parts:

The "Design Concept" and the "Production Process" which are further defined in strategic and technical areas of operation. The relationship between these parts of Gordon's process and the plan of work of the R.I.B.A. is shown in table - 3.10 -. The strategic element encompasses client users requirements and other suitable criteria. It also covers the area of translating these requirements, and the way in which they can put it into three dimensional form. It is particularly useful in that it tends to repeat the normal process of moving from the general to the particular while making dicisions on the vital matters to make sure that satisfactory results are achieved. The technical operation is involved in the detail design and building production.[10]

Design Process - model -

Table 3.10



CBC 'Co-ordinated building communication' approach

		PURPOSE	TASKS
STRATEGIC	A. INCEPTION	Outline of requirements and plan for operation	Organisation for Briefing
	B. FEASIBILITY	Appraisal and recommendations to client	Investigation and user requirements
	C. OUTLINE PROPOSALS	General approach to layout, design and construction	Further development of brief and first sketch plans
	D. SCHEME DESIGN	Settlement of planning, appearance, constructional method, cost, etc.,	Completion of brief and full strategic design of project
TACTICAL	E. DETAIL DESIGN	Final decision in all matters affecting the design	Full design of every part and component of the building
	F. PRODUCTION INFORMATION	Preparation of the production information	Production drawings, schedules and specifications.

OUTLINE OF DESIGN STAGES OF PLAN OF WORK

Decision Process

The iterative decision process, is devided by R.I.B.A. Handbook[11] (1967) into four phases. In each one designers are occupied mainly with an apparent activity or a group of related activities. It involves a feed back activity shown diagramatically in table - 3.11 - and 3.12-. These categories are:

I Assimilation: The accumulation and ordering of general information, and information which relates specifically to the problem in hand.

i Activities:
1. Systematic build-up of the brief.
2. Site conditions.
3. Economic appraisal.
4. Identification of standards.
5. Reference to previous solutions and experience.

ii Operational Method:
1. Collection of information.
2. Recording of fact and opinions.

Design Process - model -

Diagram A

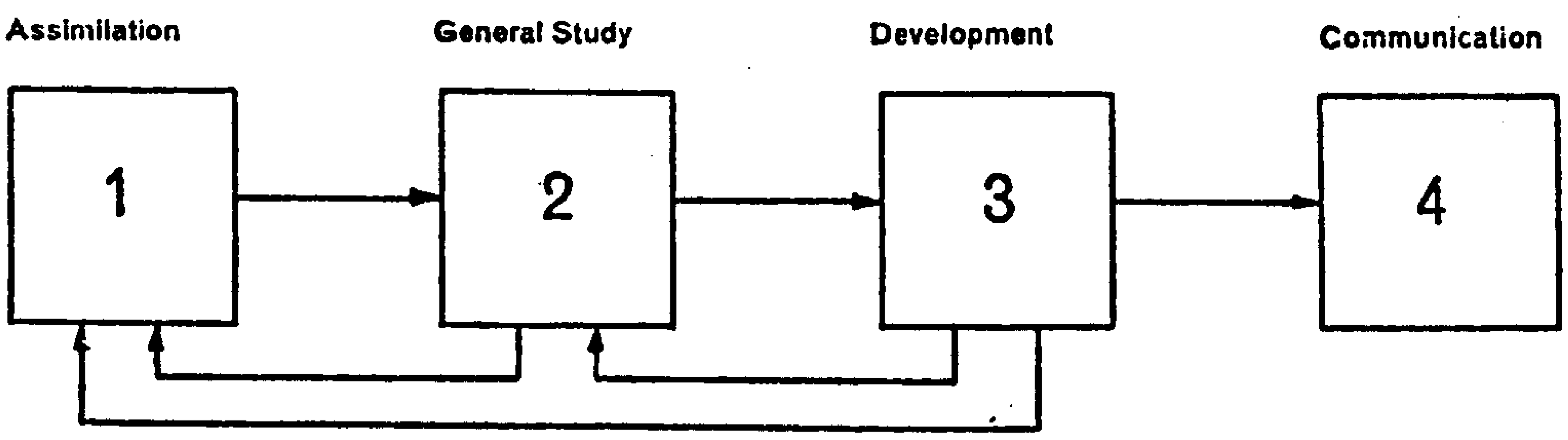


Table 3.11 The design process seam as a flow system, a main progression with occasional feed back. RIBA Hand Book.

Diagram B

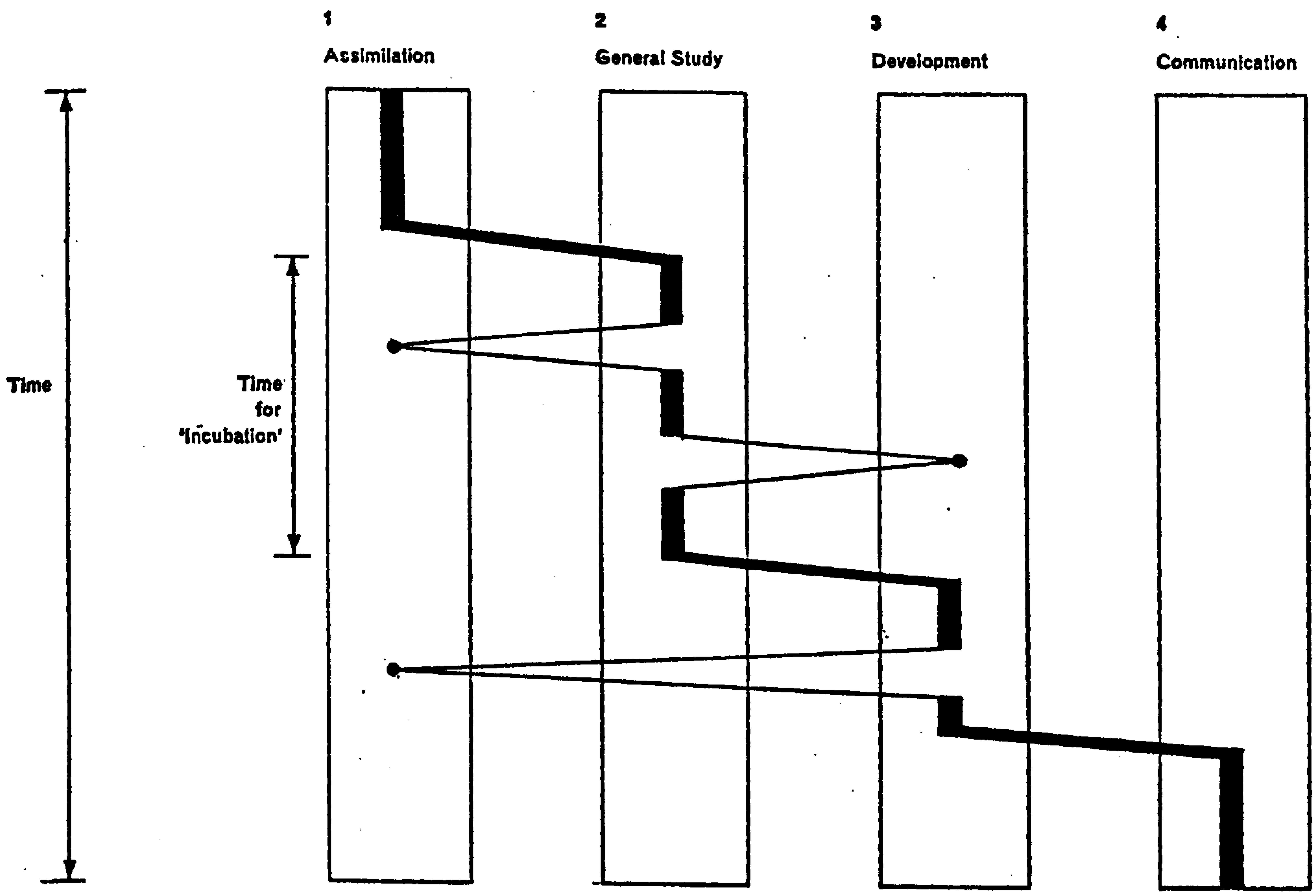


Table 3.12 The unpredictable jumps that are made within the major planned progress. RIBA Hand Book.

4. Discussions.

5. Interviews.

II <u>General study</u>: Consists of the investigation of the nature of the problem, and the possible solution or means of solution, this phase is sub-divided, into two parts being (i) the activities, and (ii) the method of operation.

(i) Bringing order into information and data studies:

Activities: 1. Identifying the nature of problems.

2. Exploring the relationship of problems.

Operational Methods:

1. Check lists and questionnaires.

2. Association charts and relationship.

3. User requirement study.

4. Cost studies.

(ii) Emergene of possible solutions:

Activities: 1. Creation and testing variety of ideas.

Operational Methods:

1. Various methods should be able to rapidly convey varied, and complex information about form, space and structure, and the relationship between them.

2. Testing of representational or mathematical "model" solutions.

III Development: The development and refinement of one or more of the iterative solutions into a single design.

(i) Activities:

1. Refinement of one or more possible solutions
2. Precise planning and design and the working out of details, structure and services.
3. Constant review and co-ordination as well as review of overall strategy.

(ii) Operational Methods:

1. Testing selected solutions against the brief.
2. Cost in use studies cost planning.

Communication: The communication of one or more solutions to people inside or outside the design team.

(i) Activities:

1. Transferring selected solutions into media by which they can translated the others and making sure they are understood.

(ii) Operational Methods:

1. Methods appropriate to stage of work.
2. Outline in communication techniques.

Asimow Modele (1962), considered the design process as a simple model of activity, the decision process consisted of six-stage step.

1. Analysis.
2. Synthesis.
3. Evaluation and decision.
4. Optimsation.
5. Revision.
6. Implementation.

Most other models, which described by Bruce Archer, Levin, and Broadbent, identified the decision sequence at least by its original three parts process (analysis, synthesis, evaluation) which usually involve feed back information; Generally the core activity consists of the following stages:

Analysis:
Clarification of goals, identification of problems; nature difficulties; exploring relationship; producing order from random data.

Synthesis:
Creation of part-solution, combination of part solution into consistent and feasible overall solutions, generator of ideas.

<u>Development</u>: Expansion of synthesis in more detail.

The model becam to be known as "the first generation" model, referred to by Cross (1977)[12], as the "one-dimensional" approach for solving design problem. These can be described in simple words as breaking the problem down into the smallest pieces, grouping these into meaningful sets and establishing the relations between these sets, (Miller, Lawson, Galauter). By putting the pieces together in a new way the designer can test and discover the consequences of putting the new arrangement into practice. The model described by Lawson (1974)[13], has a basic tasks for the architect to complete, and has been in our vocabularly for such a long time that it is "seldom questioned as representing real activities".
"What is still very much under debate is the precise sequence and amount of overlap that occurs in practice",[13] which is difficult to answer without new experimentation and controlled observations in practice.

For Markus (1969)[14], the core activity of the design process as it is described by decision sequence, refers not to the whole process of design from inception to implementation, but rather to the central problem, and communication stages. This would remain an incomplete description of design method except in cases of relatively simple problems which can be solved by one phase in the process. For Markus the concepts and categories are merely aids to the designer to provide him with a framework and "neither design theory nor design practice can be rigidly defined or contained within any such simple scheme".

The assumptions implicit in the foregoing section have been the target for some critics. In particular, many architects have questioned the usefulness of methodology. Others criticise the methods for its repetitive nature based upon feed-back loops as the steps from evaluation to analysis, demand that the tasks be repeated as often as necessary at any phase. This can create problems of the cost and time constraints within the limited resources available for design. Thus the synthesis is very difficult for the designers to follow at every phase.
Christopher Jones[15] reached the conclusion, that at present there is confusion in the field of designing caused by "pulling the traditional method into pieces", and what needs to be done now, is the "Reintegration" of these pieces into a Coherent new process that operates effectively over all levels of generality and detail. However, the difficulties in appling this method in the field of practice confirmed some of the probleme to quote: from Heath[16]

> "The results achieved, when in fact any were achieved, were not particularly impressive and could in general have been bettered by conventional approaches. Indeed, in many cases it seemed the results had only been achieved at all by

> the concealed use of conventional methods. This unsatisfactory situation of the whole area of study leads in some cases to outright rejection of the whole area of study."[16]

Review of Some New Methods:

Although the R.I.B.A. Job Book was published in 1977, it has been pointed out, that it was essentially based upon the work done in earlier years 1962 and 1969. In the intervening period there have been further developments and some of these are considerable.

A growing number of studies have started from a description of procedures for treating various aspects of design process and combined this with many experiments and observation on the work of architects. This has lead to a new picture of the processes of design to emerge, and it has rather more varied forms than previously thought. Proposals for new design method models have lead in some cases to the rejection of some conventional models by several authors.

The efforts are directed mainly towards the understanding, and adequate descriptions of the process of design. The work usually focussed on the central area of the design phase between the preparatory stage and the communication stage, as it involves what is essentially design thinking. In this context the work of Karl Popper in "Conjectures and Refutation"[17], becomes important and gives up fresh areas of study.

Hiller[18] and others (1972), proposed a new model of conjecture-analysis as a replacement of the old model of analysis-synthesis by introducing two ideas to identify the process of design. First, the chief elements present in a designer field are knowledge of instrumental sets, knowledge of solution types, informal codes, and information. Secondly to include conjecture in design, which is equivalent to Popper's declaration that "science can't progress without conjecture."

It is stated that the variety of possible solutions should be reduces before any conscious act of designing begins; the use of instrument sets constructed by two sets of limiting factors, the external constraints, and the design's cognitive map capability in relation to that type of problem (in particular the designer should have an understanding of instrumental sets and solution types).

For Hillier, design is a practical as well as a cognitive activity, and design problems do not happen in a social vacum but are socially constructed. The term cognitive map is a very important advance on previous thinking and it fits to some extend the case material used later in this thesis. I hope to show later in the work that there is a great deal of preconception in design.

Cognitive maps are mostly used by the problem-solvers (Guilford, Hiller, Lawson, Galanter..), and are equivalent to the role of theory and theoretical framework in science. The cognitive problem solving activity can take place through the existence of such maps in order to define or structure problems in terms which the designer can solve. It acts as a kind of plan for finding a route through problem material, to quote Guilford:

> "The cognition factors have to do with becoming aware of mental items or constraints of one kind or another."[19]

Guilford in his book "The Structure of Intellect" (1956), sub-divided the intellectual factors into two major groups, "thinking factor" and "memory factor". The thinking factor is, the cognition factor (discovery), production factors with two type convergent and divergent production, and finally evaluation factors. These factors reflect the individual's ability to recognise classes of objects or ideas which may depend upon "figural", "structural", or "conceptual" content of its elements. The problems of a figural type are faced in such aesthetic pursuit as painting, and architecture. A study of the nature of architectural problems reveals that the central task of the architect is to discover the inherent structure of his problem and produce a three dimensional expression of that structure. The ability to recognise, and produce order or structure as identified in Guilford's work will be all important in the design of buildings (lawson).[20]

The Relationship Between Design Methods and Designing for Quality:

The work of Christopher Jones[21] "Design Methods, Seeds of Human Futures", is very useful when trying to understand the new design methods and the way they can be used to improve the quality of our buildings. It brings together a number of different aspects, it explains and categorizes a number of new methods and how they can be used in practice, his book also examines methodology in relation to the creative thinking problem solving in design. This is done by reference to different types of design methods, and the prospects of expanding "disintegrated" design process to accommodate the many new design methods, reviewed earlier in his book, by suggesting how they might relate to each other in future developments by "reintegration" of the traditional method into a new coherent process. Jones pointed-out, early in his book, the importance of deliberately changing ideas during the design process by continually looking for new approaches and techniques for use in design methods. For example, those needs generated by past design failures, and the considerable pressure caused by the development of new technology and also the use of computer-aided design in solving problems.
For him, design process should be extended to include the planning of systems, and to include the political, and social aspects of user, that are relevant to relationships between systems which incorporate the overall changes of

the social, industrial, and technological process.[22]

Christopher Alexander (1962), in his book "Notes on the Synthesis of Form", also suggested that changes in - context - and the recognition of new human and social requirements, has led to the development of a self-conscious design process, which is developed in idustrial society after the "unself conscious" process of primitive and craft societies, The "self consciousness" can arise as a natural outcome of scientific and technological development by imposition from a conquering culture, or by infiltration as in the underdeveloped countries today.[23]

Jones, acknowledges the importance of "externalized designing", and bringing design thinking into the open, which most in the new design methodologies seem agreed upon. The major advantage is that other people, including users "whose knowledge is relevant to designing at system level"[24], can contribute at any early stage of design process information that is outside the designer's knowledge and experience, and these share in the taking of critical decisions. The use of computers makes possible "Design Automation" by speeding up the parts of design process for which the thinking is sufficiently well understood to be represented by a mathematical model and process.

However, the three stages which are named by Jones, as a summation of many design theories, do not necessarily fit together to form a universal strategy when compared with the more detailed cycles as used by R.I.B.A. and Asimow. The three stages are: Divergence, Transformation, Convergence. These named are ment to refer more to the new problems of system designing than the traditional procedures of architecture.

Divergence: Is a pre-design work by expanding the boundaries of the present design situation "boundary searching" and looking for ways to search for original solutions and keeping flexibility and maintaining a wide breadth of view before making design decisions.

Transformation: The chosen pattern or pattern-making, in this context is the creative act of turning a complicated problem into a simple one by changing its form and by deciding what to emphasize and what to over look. This transformation stage can occur unexpectedly at any time, and should only be applied after sufficient divergence has occurred. The chief characteristics of this stage are:

- The main objective is to impose upon the results of a divergent search, a pattern that is precise enough to permit convergence to the single design that must eventually be decided upon and fixed in every detail, the chosen patern must reflect all the realities of the situation.

- This is the stage when objectives, brief, and problem boundaries are fixed, when critical variables are identified, and the constraints recognized and the judgments are made.

- At this point the problem may be split into sub-problems.
- Insure quick feed-back (alternative designs). This is where the personal aspect of designing is evident.

Convergence: It is the stage after the problem has been defined, the variables have been identified, and the objectives have been agreed.
The main features of convergence are as follows:

1. Reduce alternatives to a single chosen design (final solution) as quickly and cheaply as can be managed without the need for unforsee retreats which prove to be critical in a design situation, and add considerably to expense.

2. The models used to represent the range of alternatives remaining should become less abstract and more detailed during convergence.

3. There is a choice of two fudamentally opposed strategies, (see chapter 4) for converging. One is the convertional out-in strategy, such as an architect may employ when proceeding from the external shape of a building to the arrangement of rooms within it. The other is the in-out strategy

> that an architect may also employ if he begins with activities, or with rooms, and works outwards to the external shape. Usually, it seems a skilled designer will work form both ends at once, creating yet defining problems for himself at the point where out-in and in-out meet and probably fail to match initially. Many of the new design methods imply an exclusively in-out strategy with the solution of sub-problems in isolation before-any thought is given to their combination.

The disintegrating of the design process has given us a set of methods, each is mainly concerned with one aspect of designing. The three categories are:

Intuitive (or Black Box Thinking)
Rational (or Glass Box Thinking)
Procedural (or Thoughts-about Thoughts).

The externalising and splitting-up, is a great help, to open the thinking of the designer to the vast number of new facts and ideas that are critical to designing at the systems level which is likely to be outside the experience of any designer,.. "To maintain control over the designer situation as a whole during the vital but still mysterious stage of transformation, upon which success or failure most depends when innovation is needed."[24]

> "The useful effects of using the new methods are, firstly to oblige designers to look outside their immediate thoughts for relevant information, and secondly, to inhibit the tendency to plump for the first idea that comes up."[25]

Having looked briefly at the design methods that have appeared so far, we can observe the differences between them and the conventional design models, and also the thoughts of designers of building of quality, this will be coverd in the analysis of the findings of the survey in the next chapter. The strength and weaknesses of differents approaches has formulated the work of many authors, and has not yet resulted in any clear and generaly accepted conclusions.

Our main concern in this study, or any similar work, should be directed to improve the quality of our buildings which guarantee the improvement in the quality of the man-made physical environment.
The new methods, in their present form, represent rich material in terms of theory and methods, and for analysis of the design process, and more particularly to improve the designers thinking processes. However, it is very important to consider whether the current analysis of design, and its different categorisation, does include strategies to improve our building quality. Jones presents an acceptable argument on design, although he does not explicitly answer this question, but in terms of design

activity they become very useful for the analysis of the design process and controlling its procedure; his work would suggest that the use of his three stages categorisation divergnence, transformation, convergence - and its analysis does not comfortably fit architectural design, refering more often in his book to the new problems of system design rather than direct concern with architectural design.

However, having considered the categorisation of methods suggested by Jones we would say that boundary searching is the nearest description to the position revealed by our observation, but much more work has to be done to bring his categorisation more closer to architectural work.

Eastman[26] and others (1972), point out that only recently have logical methods for treating some of design problem been introduced, after centuries of dealing intuitively with all designs tasks.

> "Logical methods of design can only occasionally improve on the best decision procedures now being used, but they can significatly improve those of average and low quality. A precise method is useful because it guarantees results of a particular quality. By consistently improving the lower band of design decisions, not only should the quality of the average building improve, but the potential for creative design will have a sprinboard of higher quality to develop from."[26]

In their work they introduced a framework for design which focusses on classes of decisions and their interrelations.

Design decisions are structured according to the form of description or representation, which is used for making and evaluating them. They review the design decision making processes and formal methods for structuring those decisions.

3.5 BUILDINGS OF QUALITY - THE DESIGN PROCEDURE

3.5 Buildings of Quality - The Design Procedure -[27]

Categorisation

An analysis of the information and tabulation form the questionnaire revealed one major aspect which the author felt was worthy of putting forward for discussion. This is that there are two distinct phases in the design process. This does not include implementation or production processess. The latter may be regarded as a third phase but is different in character to the other two. This point seems to be of considerable importance and is reported upon in the next section.

First Phase

This is when the main ideas, which dominate the built form, are conceived. The latter word is perhaps not quite correct as we shall show that there is a great deal of preconception in design. However, in the formal sense - i.e. where ideas are matched to a particular problem this period tend to be very short and when analysed usually the result of one person's endeavour. Of the firms studied, several are built around the design skill of one person, usually the named principal of the firm and this part of the process is only to be expected. But even when practices (case A) deliberately set out to use team design, it found in practise this amounted to ideas being put forward by individuals with the salient points being criticised, rejected or accepted by the other members. At this stage there is necessarily little detail and ideas are in conceptual form. Even when those practices headed by a famous principal architect designs a scheme there is submission to other people closely connected with the project. This may take the form of a design cabinet (firm E) or two partners working closely together (firm D). There was confirmation of the necessity to test out ideas quickly and expose them to criticism. The part of the actual process seems to be one of checking against the major constraints of the programme as defined and construed by other people. Whether this should include user/clients is dealt with at a later stage. This apparent divergence from the usually accepted sequential method caused enquiries to be made more closely to try to identify the source of basic ideas in each project. The first likely source was "the brief" but clearly in several cases the brief itself had been formulated and modified during the formalizing of the design.

It became clear that many designers have a pre-conception of what major components the design should incorporate and part of the process is in adapting this to the brief. The division of thinking factor and memory factor as suggested by Guilford and discussed earlier would appear to be vindicated but the important point discoverd her is that the thinking factors is not necessarly related to the project in hand and that the memory factor is the mechanism which activates this and releases the idea for the thinking factor to consider its relevance to the task in hand.

In a sense, this is also very close to the"problem/solution" couple suggested by Professor Bruce Archer in his work on design methodology,[28] but the findings indicate that the situation might be rather expressed as "Solution/problem" which would be a closer description of this particular part of the process. This was surprising as the initial thoughts, when formulating the questionnaire, were that there would be found a more or less sequential process. The finding of this come from the discovery of the surprisingly short time for the basis of the design to be established. This made it important to look further for pre-process activity and discovered that this was a surprisingly large component of the projects which we examined.

Hillier, Musgrove and O'Sullvian[29] (1972), use the phase "conjectural design" to describe this phase of development. In their work, they draw attention to the parallels between Popper's version in the methodology of science[30] and the design methodology. To quote:

> "Conjectures come form anywhere and because they are not derived from the data by induction, it does not mean that the process of thought, of which they form part, is any the less rational or rigorous what is irrational is to exclude conjecture"[29]

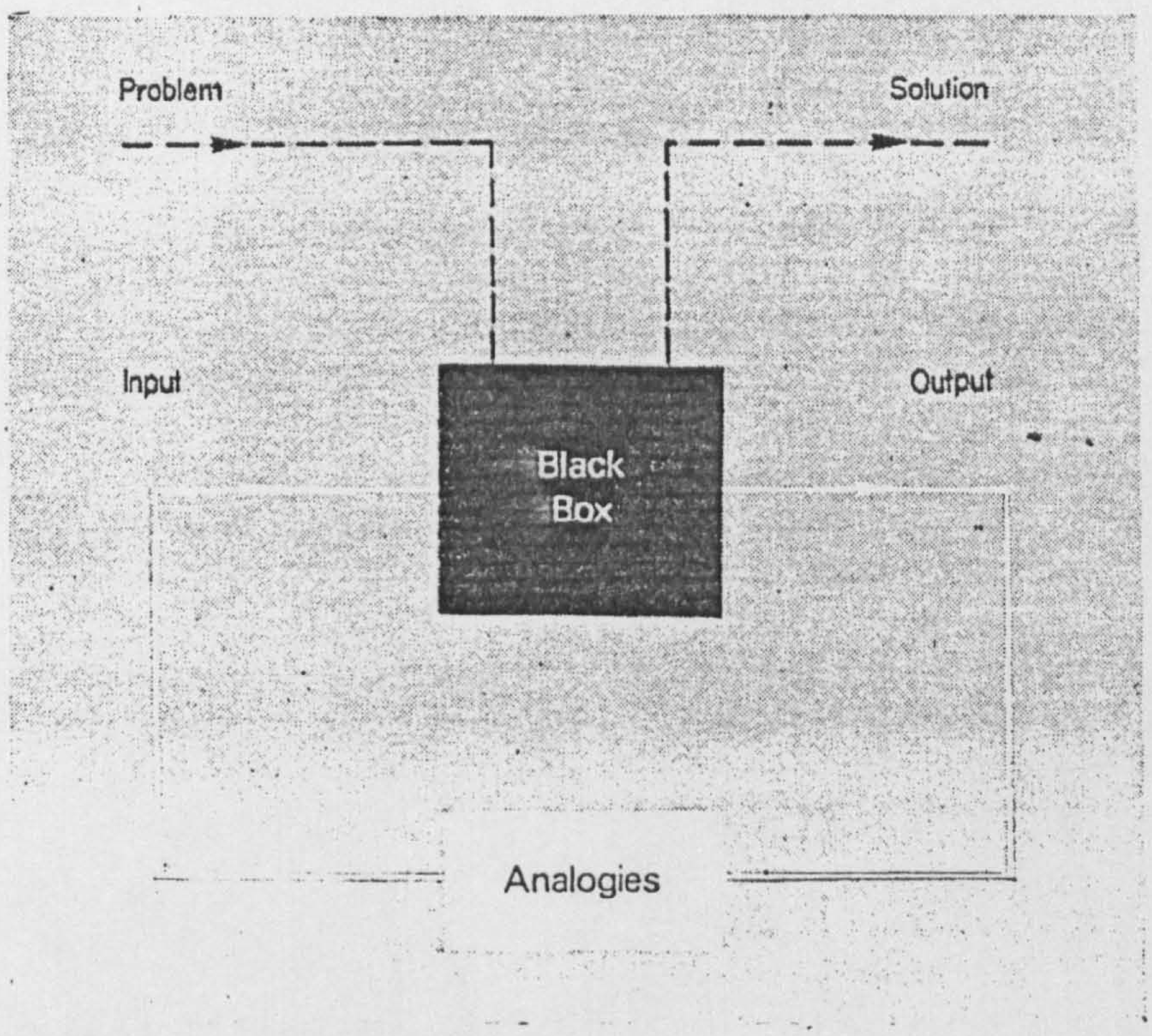


Table 3.13 The Black Box concept of design, the problem structure is fed into the human black box using carefully chosen types of analogy as instruments with which to transform out put into in put.

Mrs. Jane Darke[31], of the University of Sheffield, working independently on housing design (1977), has perceived a similar phenomenon, and proposed an elaboration of Hillier's model of "generator-conjecture", as the idea of a "primary generator" is found to be a useful way of conceptualising a particular stage in the design process.

Christopher Jones[32] (1976), in his book "Design Methods", reviews the work of creative design theorists, who imply that the most valuable part of the design process is that which goes on inside the designer's head and partly out of reach of his conscious control. The idea of designers becoming like "Black Boxes" is shown in table -3.13-, and is suggested by researchers who have attempted to explain how the brain produces its variable out-put, according to in-put received from the problem in hand also by other in put received from previous problems and experiences. The out-put from the brain is conditioned not only by the current situation in hand, but also by situations encountered in the past, "Nobody can be a good designer without the right experience"[33]

The capacity of a designer to produce out-puts relevant to the problem with the in-puts that it has received is recognised by Jones as "The leap of insight". This experience has been reported and documented by many creative people; it often appears after many fruitless searches for solutions and results in the work suddenly adopting a final form without apparently any rational explanation as to how this happened.

This might appear as almost the last resort in an apparent desperate situation. The comment made as a result of the research here is that in the cases studied the period covered by this part is very short. The very short period given to crystallisation of the design attracted me to try to find out why this could be so condensed. To give and example; the time scale of this part of the work varies from 3/4 hours (case A), overnight (one evening and early morning (case D), a few days (case E). In these cases the brief was available, the answers to the question is this area confirmed that architects draw upon previously wholly or partly formulated material.
Attention has been drawn to what was thought to be a very short time for conceptual ideas to arrive in more or less complete form. From the experience of this assessment it would be my opinion that the larger this period takes in terms of actual time the closer the process would come to the sequential model as set out in conventional methodology.

It was decided to look out creative work in other disciplines and it was encouraging to find similar phenomena. This is clearly an area which is still mysterious and a largely unkown process, as yet ill defined[34]. The work of writers, especially the poets, musicians and the visual arts all appear to incorparate this preconceptual component and shows, perhaps more clearly than that of architects, that creative work can be seen as a continuing process not necessarily related to any particular task or end product. There are bound to be differences,given the unique nature of building production, but the conclusion we came to is that architects continually devise and store material just as other artists do, to be used when appropriate. In this respect it is worth noting that part of beaux art training was to develop skill observation, recording, and editing without commitment to a design project.

Newman[35] (1974), argued, that a great deal of knowledge must be absorbed and integrated bofore the "creative leap" can be made,"knowledge is necessary though clearly not a sufficient conditon for creative thinking". In his work he emphasise that each design solution at least is part of:-

-An act of creativity and a product of past experience and knowledge, "the greater and deeper the knowledge - including the factual knowledge - the more likely its design solution will hold the possibility of being optimum".

-The architect must evolve and synthesise complete technological systems and emerge with a solution to meet needs other than artistic and aesthetic needs, and for this task a great deal of factual knowledge is required. This is the "memory" factor of Guilfords work.

It is a point of discussion if this is to be regarded as a separate section or as a product of experience. In practice the young man will treat it separately and it will gradually merge into a general context as a man gets older and has broader experience

One change often levelled at architects is that they do not obtain adequate feedback from buildings that they have designed and therefore do not properely gain from experience of buildings in use as they should. It was clear form the investigation that architects do, infact, analysis their own work in some depth but not always publicly. There is a great deal of feedback from buildings and both failures and successes are sorted for either modification or re-use should the need arrive. This is contrary to the popular views expressed above,that architects are not interested in buildings once they have been completed. Without exception the practices give evidence of detailed analysis of both their own and other significant buildings. There is a sort of hidden, often personal, criticism continually going on, rarely being formally recorded, more usually being sorted as imagery in the designers memory file and perhaps needing the stimulation of a specific project to bring it into tangible form.

In assessing this, in relation to the designers talked to and with regard to the projects studied.I came to the conclusion that there was a spectrum ranging from subjective to objective values, and which was provisionally listed under these headings.

1. <u>Imagery</u>

   The development and imprinting of idealised forms which please the designer, appears close to hedonistic and zen response.

2. <u>Relationships</u>

   The sorting and arrangement of forms, major elements and components, may include transformation and metamorphoses of analogous objects and concepts. Provisional hypotheses in built form.

3. <u>Technical Innovation</u>

   Includes systems, ways of doing things, relationships, for example of buildings to structure, service and energy concepts.

4. <u>Feedback</u>

   Recording of knowledge about buildings, operational use, visual elements, materials, structure, constructional details. May include the fashionable and cliche's.

Case E gives as the basic design idea the imposition of a structure/service relationship to the problem which become the predominant factor in the building form. This relationship has been, and will be used again in other buildings by this practice but each building is unique in the way the system is developed.

Design formation is the phrase used to describe the next step, consists of the combination of this personal hidden process with the more public one. It drawn objectively upon the brief. The two parts are not necessarily time related until the formation period. The brief in all cases was described by the architects as being a stimulation document; and in only one case includes detailed schedules. The documents instead indicated the operational purpose of the building, and is the type of response favoured by the client today. The one exception was the housing scheme (case D) which had schedules of house types required relating to social structure, site density, cost yardsticks etc. In addition to this information, however, this document covered the planning and social policies decided by the local authority and the architects said that it had positive and beneficial effect on their design. In this context the communication link between client and designer at brief making and during the second working up stage was considered to be very important. The brief was thus seen to be a vital part of the total process but particularly as a complementary element allowing incorporation of material from the private process. In one case, scheme (A), the architects office was fully involved jointly with the client organisation in making the brief. The architects reported that by participating

in this exercise they hoped to be able to anticipate client and users needs which would influence the forms that are designed. Both architects and clients agreed on the importance at this early stage of testing the sensitivity of those factors which might influence decisions by clients and users. The joint working situation had positive effects on their relationship. However, they pointed out the costs of this kind of pre-design work, and indicated that this technique could not be afforded on every scheme. This might be a point in deciding whether a scheme should be classified as one whose quality is prominent and where possibly a higher scale of fees might be applicable.
In this context the appointment by the client of a person with authority to make decisions about interpretation of client's needs and views was held to be essential. Again, there seems to be a demand for response time to be short because of the high cost of involving excutives in this exercise. It was held to be of great advantage if there was to be rapid checking out of ideas enabling progress to be maintained.

All the designers consistently pointed out that continual work and development was important not only in motivation of the design staff but in terms of successful design development. Possibly the two are related. It is generally accepted in architectural practice that difficulties arise when a stop/go system pertains.

The first phase might be summarised as follows:

1. Design objectives should imply a setting which calls for innovation and creative ideas; originality is considered to be of high priority in acceptance of this ideas.

2. There is evidence of the persistence of "first thoughts" or the foundation of basic design function right through the stage of the development to the finished building.

3. Actual design time is short probably because of the existence of the continual personal process, and the personal and public processes are complementary during the briefing evaluation period.

4. Client considerations are important and must be so arranged to be of maximum value in this period.

5. The initial stage is generally the responsibility of either individual or a small design group.

6. The designers are usually experienced but not necessarily specialists in the building type.

<u>The second stage</u>

The investigation into this period of the work indicated that this was much nearer to the conventional pattern.

However, there were some points which are regard as worth reporting on.

The first is that this is essentially the period of development and refinement of the scheme and when the design is opend to the criticism of a large group. This is where consultants have a role to play. In case A the practice argued that consultants were engaged at the earlier stage but the analysis showed in fact that their contribution at this stage was advisory rather than that of active participants. In general, this stage allows the possibility of great change in the scheme and one aspect which is noted in the investigation, common to all schemes, was that in each of the cases studied, the scheme proposal at the end of the first stage was essentially that which entered the production process and the end of stage two. There are two points which might be made in this respect. The first is that a particular type of skill, based upon personality and leadership, is required to pilot and defend the scheme through this critical period if its integrity is to be retained in or near the original form the designer required. The ability to defend the earlier design decisions and convince the other members of the larger design group requires a confidence in the initial decision which points again to the value of experience and maturity in terms of design and personal relationships. The second point has already been touched upon and concerns the critical appraisal of the work. This often leads to tension within the team which can either be disruptive or constructive. There is no doubt that constructive criticism is positive if well controlled during this second refining period but it should always be within the framework set out in the first stage. This technique was discussed at the C.I.B. conference,[36] Edinburgh (1977), in which the possibility of deliberately asking a person to act as "devils advocate" in the design team had been tried. This had not been done in any of the cases covered (as far as could be seen) but case (A) deliberately sets up criticism sessions open not only to the team but other members of the firm, at which the scheme was presented. It is clear that this aspect of design could be of importance and has been largely neglected in the literature of design methodology.

It found that the time given over to the second period was quite long and produced many studies, some in great detail, and reworking of details. This varies between schemes, but a common aspect was the great number of detailed design studies, often in the form of models to a large scale. The scale of drawings interested us. Many of the design studies were to a scale of 1:50 or 1:20 and obviously took a great deal of time. The use of colour was used to clarify and predict the spatial effects being considered. The evolution of the scheme into constructional form and selection of materials took place at this stage although with one exception designers argued that material choice and constructional feasibility had featured as part of the personal process. The exception was that in Case (B) where it was said that form was the important characteristic and that truly original design could be inhibited by consideration of constructional matters and other constraints, and that these should be dealt with as secondary decisions.

To summarise this period the main finding of the study are noted:

1. That a much larger team was involved and included ancillary and additional members of the design team.

2. A great deal of larger scale design studies were carried out thus extending the time necessary.

3. A period of constructive criticism, particularly at the beginning, but also at other times during development is considered of great value.

4. There is an element of tension in the criticism sessions which can be either useful or destructive to the initial concept.

5. A particular skill is required to retain the integrity of the initial design through the working up period.

Table 3.14 and 3.15 describe the analysis of the first and second stage design operation for buildings of quality as described earlier.

PROCESS MODEL
For
Building of Quality

Table 3.14

— FIRST STAGE —

PROCESS MODEL
For
Building of Quality

— SECOND STAGE —

-Table 3.15 -

Implementation

In the course of the interviews in depth it became clear that just as a particular skill was required to pilot a scheme through the exposure to criticism from consultants and other designers that deliberate effort was needed to ensure that the building as erected, was in accordance with the designers intention. It should be recorded that evidence has noted very careful specification writing in terms of quality and detailed description of those attributes required in the final result. The area of site supervision was included in the list of our queries and found that use of architectural staff on site in the larger schemes was usual. These people assuredly were not put on site in a purely supervisory role but were intended to interpret and carry the design decisions through to implementation. Where there was not a permanent site representative of the architects the recruitment and standards of suitable supervisory staff was carefully considered but emphasis laid on the frequency of site visits by the designers to ensure control. More details of this stage can be seen in the content of section -3.6-.

Table -3.16- describe the analysis of the design operation for buildings of quality, as it discussed earlier in its three stage analysis, the design team tasks and responsibilities and the people directly involved.

Table 3.16

Process model
for
Building of quality

RIBA Plan of work		Design activities
A. Inception B. Feasibility	pre-design activity	All client intrest Stimulate documents Initial brief
C. Outline proposal	First stage	Design conception Design formation *
D. Scheme design E. Detail design F. Production information G. Bills of quantity	Second stage	Design development and refinement of the scheme Detail design
H. Tender action J. Project planning K. Operation on site L. Completion M. Feed back	Third stage	Production process

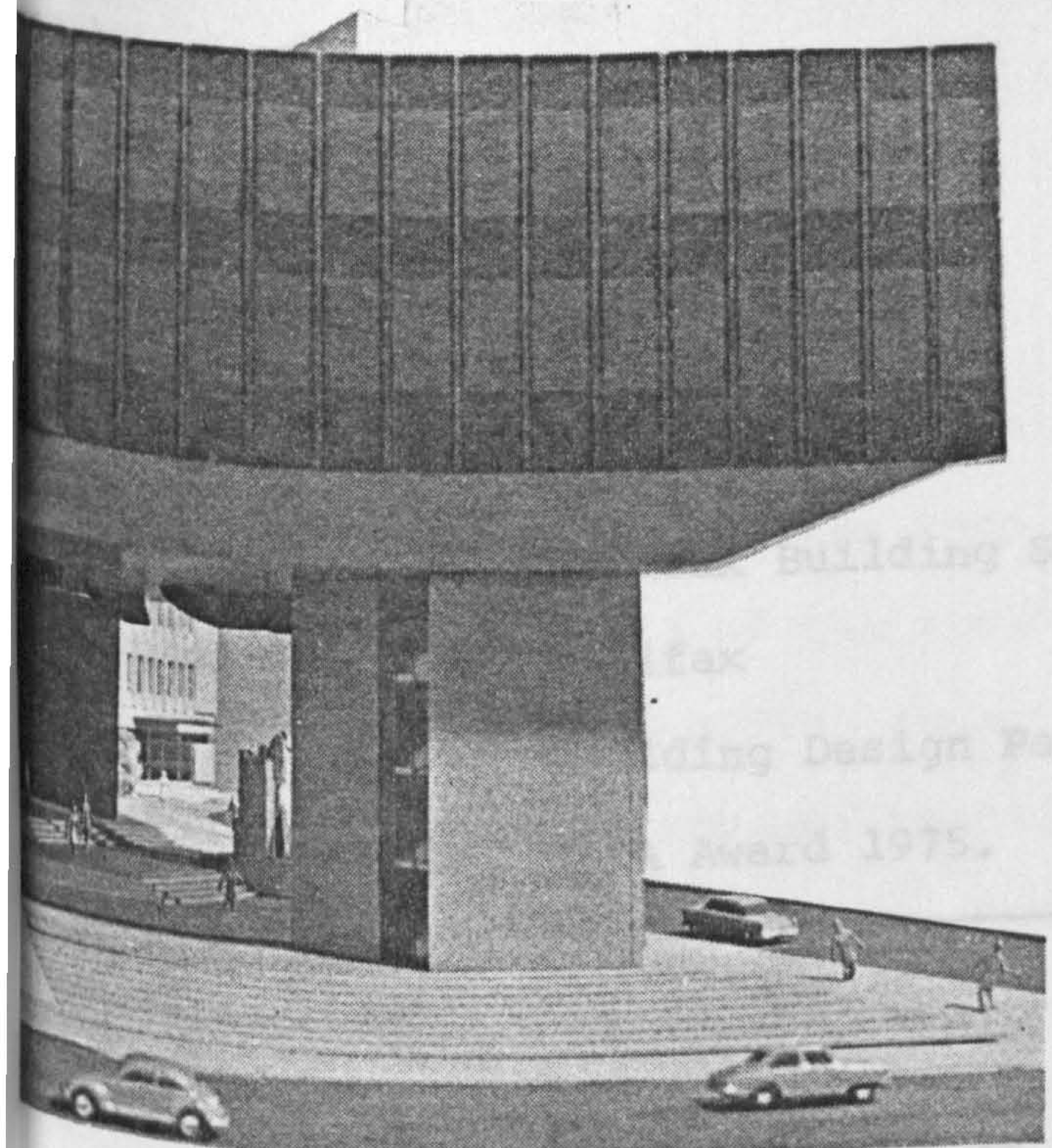
* Design formation: combination of the personal hidden process with the more public one , it drawn objectively upon the brief.

3.5 BUILDINGS OF QUALITY - ANALYSIS OF INTERVIEWS

3.6 Building Of Quality - Interviews Analysis

The details of the architect's interviews and their analysis are reported in the following order in the next chapter. An undertaking has been given that any reference to the work outside this thesis will only be reported in general terms and in a form which does not allow identification of any practice.

A	Scheme Architects Client Location	Halifax Building Society, Head Quarters. Building Design Partnership, Manchester. Halifax Building Society. Halifax.
B	Scheme Architects Client Location	Olivetti Head Quarters. J. Stirlling & Wilford. Olivetti Board Committee. Milton Keynes.
C	Scheme Architects Client Location	Geography Building. Whitfield & Partners. Sheffield University. Sheffield.
D	Scheme Architects Client Location	Oak Hill Housing. Collins Barnett & Partners. County Borough. Rotherham.
E	Scheme Architects Client Location	Sunderland Civic Centre. J.S. Bonnigton & Collins Partners. County Durham. Sunderland.

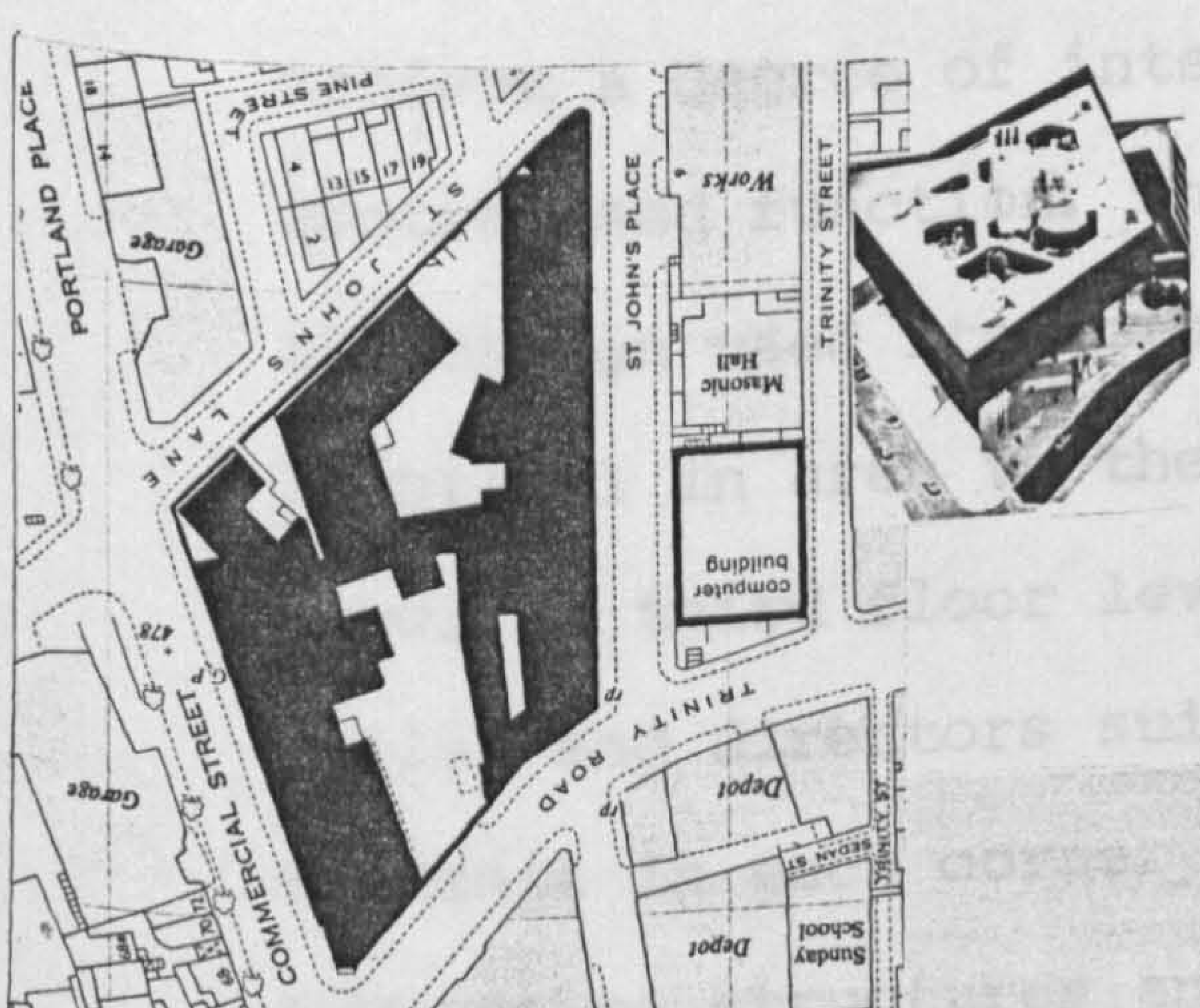


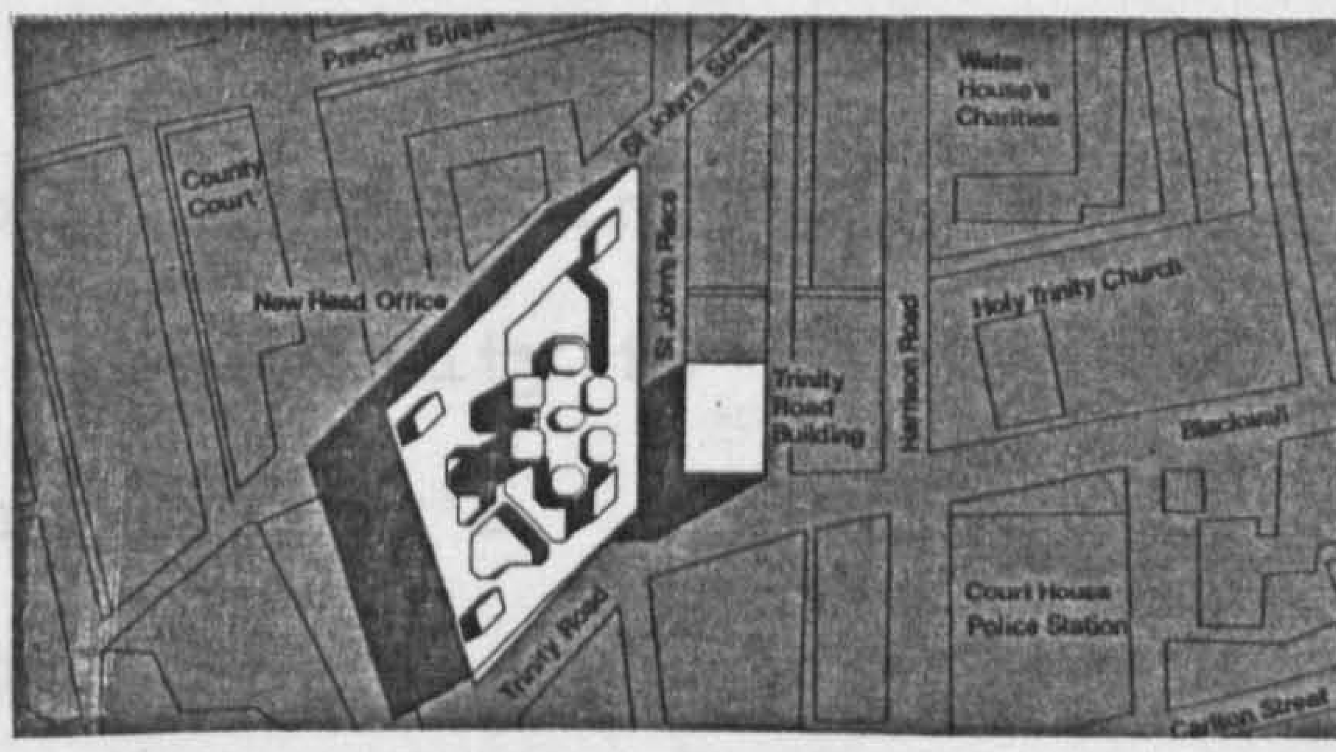
New Head Office
Halifax Building Society

Building Design Partnership
Architects, Quantity Surveyors and Engineering Services

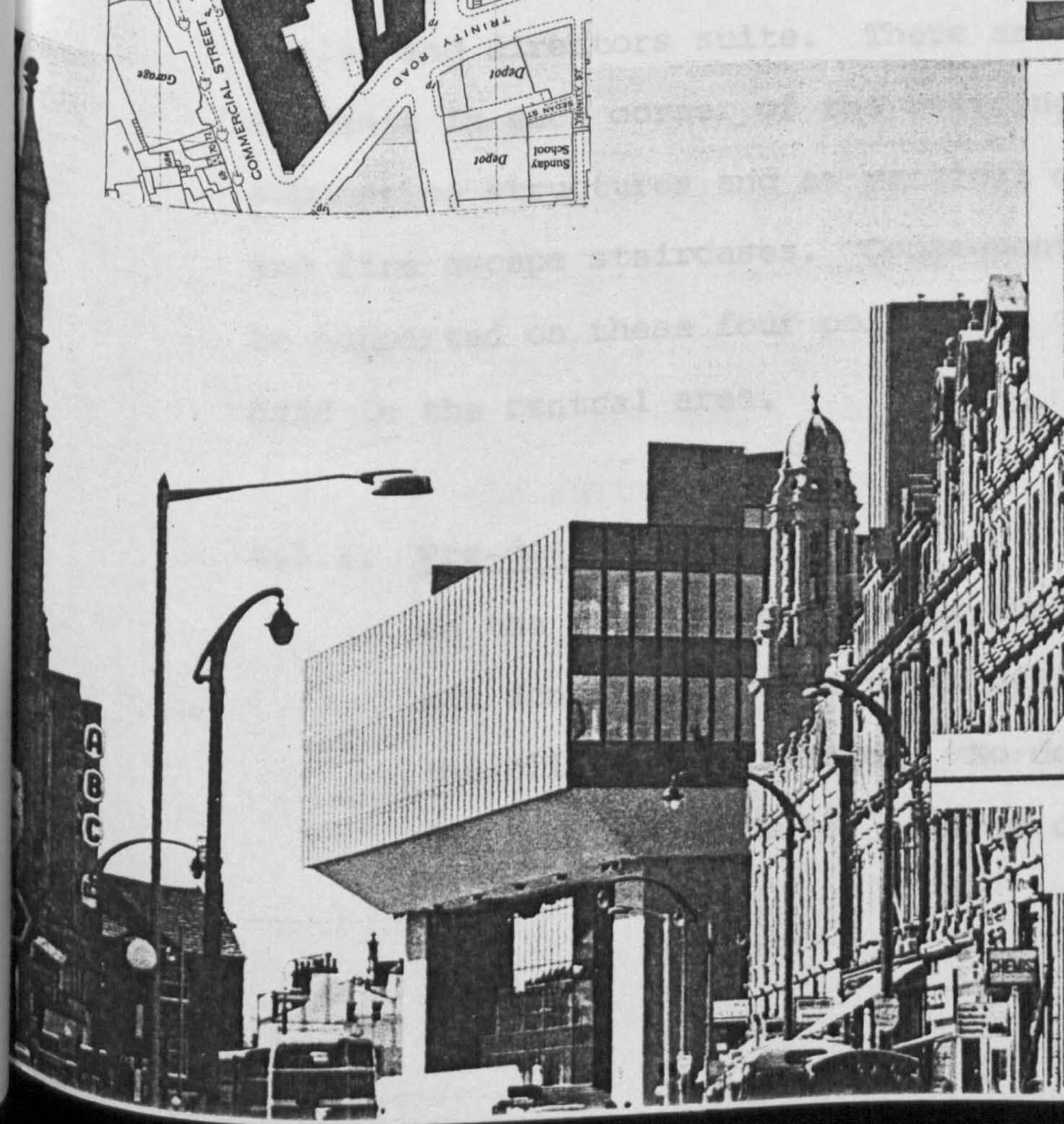
John Laing Construction Ltd.
Main Contractors

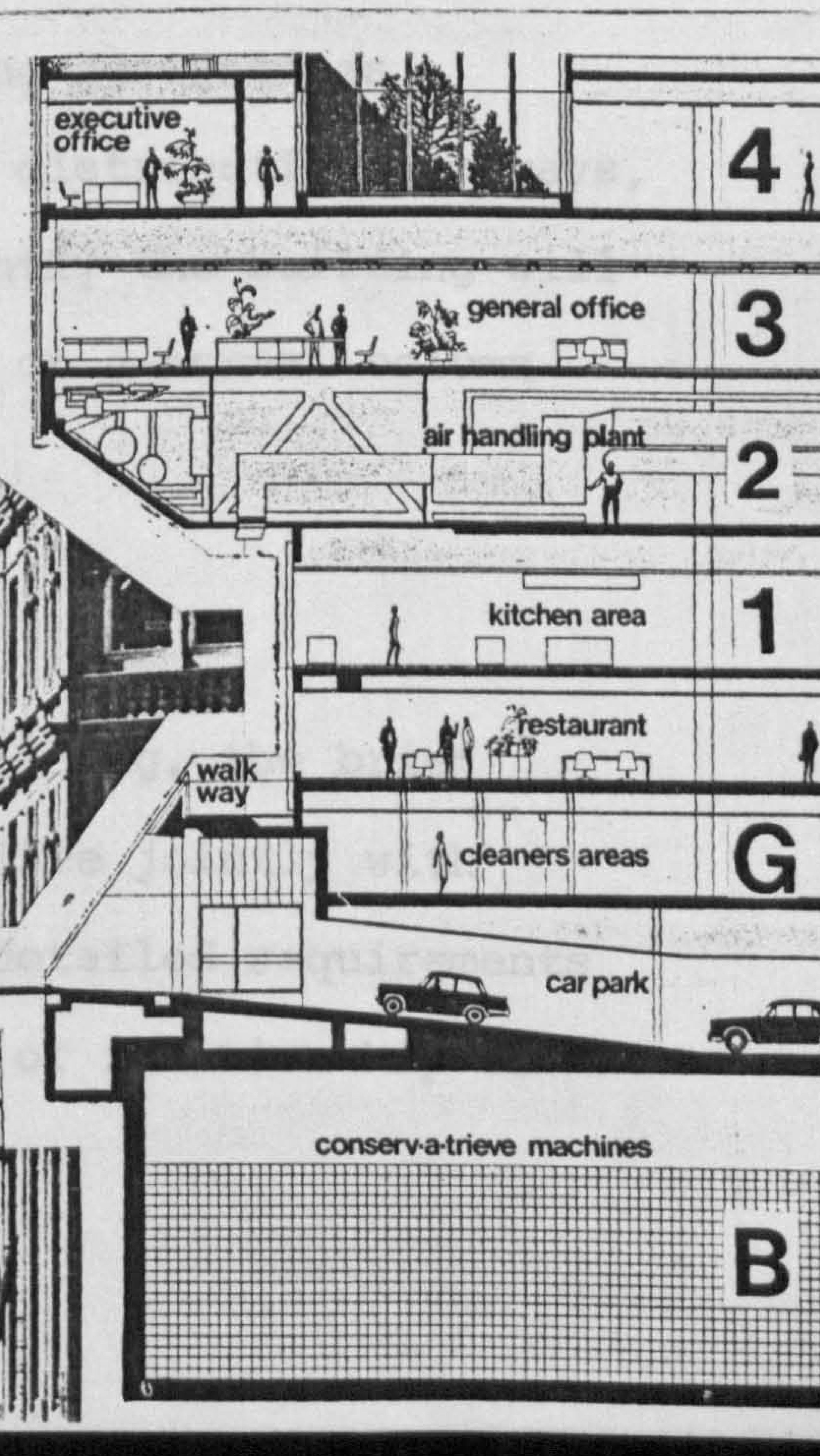
Roneo Vickers Ltd.
Automatic Filing Installation





A site became available, well placed near the town centre, and close enough to the newly built Trinity Road building for it to be linked above and below ground level to provide a working unity. The area of the site is slightly more than 50,000 square feet and the total area of the office building is 275,000 square feet.





6.1.A Scheme - A -

Halifax Building Society, Head Quarters.

Halifax

Building Design Partnership - BDP - Manchester.

RIBA Award 1975.

The building designed to accommodate 800 staff, accessible from the town centre, close to the computer building, finished earlier in 1967 provides an apportunity to achieve a degree of integration of the society's centralised function. The site is geometrically irregular, the design used its total area. The first floor is identical in area to the ground floor, the general office floor at third floor level, and fourth floor the executive office and directors suite. There are four vertical elements in each corner of the building designed as supporting structures and as vertical distribution ductways, and fire escape staircases. Consequently the building will be supported on these four points and on a normal column grid in the central area.

6.1.1. Pre-design Activity

In the case of the Halifax Building, the brief was done by the architects office jointly with the client organisation. No detailed requirements in terms of schedules of area or relationship were provided for the architects and at this stage it was agreed that they study the comprehensive functions and working requirements of the society. An analysis of the function of the head office organisation, in terms of people involved, working groups and relationship and equipment needs in space and engineering service, was carried out jointly with the Building Society executive. The results of this investigation were embodied in the brief, approved by the society. The brief also contained comprehensive recommendations directed to provide, technical efficency, costs, and to allow personal efficency with minimum long term maintenance with regard to special and environmental standards. This formed the starting point for the design process. To establish all the information needed two types of activity had to be employed:

Interviews

A series of interviews were conducted with the employees of the organisation, the managers of the department and the work people. The contact included a future decisions, policy, and important information which effects the policy of the future growth of the organisation. The design team had to establish all the information of the special requirements, methods, standards, attitudes, cost in use, etc.., besides the information concerning the way the office should move to its new accommodation. Weekly meetings were held with the general manager, and the departmental heads, and the people responsible for the function of the society.

Visits

After six months and towards the end of the Brief, a series of visits were made jointly by representatives of the client organisation and the design team to significant office buildings in Germany and the United Kingdom. This experience was beneficial in examining standards in office building and assess their relevance to the project in hand. Also in judging the effects of different planning approaches and working conditions. It also made a contribution to the understanding which is essential between client and designer. The latter point was underlined:

> "The visits were a very important part of the brief, to try to understand the theory, to be in it, to appreciate what it is like, also you get to know the client very well, which is good for communications.

Brief Making

After the preliminary preparating work, various professionals in the architect's office become involved in establishing the final brief. The site was studied with regard to services, water, electricity, gas, etc.., and various sorts of engineers helped the architects in finding the information needed.

We asked the designers if they prefer not to be involved in making the brief, and what they aimed to achieve at that early stage. The answer was as follow:

> "The architects have a contribution to make, if the brief is done by some one, and you are not involved, you can assure things which may not be right for the ultimate building, you may be able to may anticipate something about their needs which will have an influence on the forms that are designed"

The awareness of the designer at this early stage is similar to the one described by Jones, of the characteristics of the "Divergence Search", which is based on extending the boundary of a design situation so as to have a search space in which to seek solution.

> "The aim of the designers is to deliberatly increase their uncertainty, to rid themselves of preconceived solutions, and to programme their brains with a mass of information that is thought to be relevant."[37]

One objective of research carried out at this stage is to test the sensitivity of important elements in the such as client, users, sponser, markets, producers, etc.. in this stage the designers are asked to avoid as far as they can, imposing a premature pattern upon what they have discovered and defer decisions until the next stage, by which time they know enough about the background of the problem.[38] Jones pointed out the costs of this kind of pre-design work, which can easily get out of control. As we will see later, this kind of activity takes on a different character in the other schemes, and can not be applied in every case due to the unique situation of this particular work. In a report conference[39], two partners in the B.D.P. Practice argued the important economic decision by the society to locate its head office in Halifax, which gained a great cost benefit. It meant that available funds could be devoted to providing the right building rather than spending a high proportion on site acquisition.

Table - 3.17 - gives the form of instruction and method used.

Form of instruction	Commission to start the work.
How conveyed	Joint committee
Action taken by architects	To produce the brief. To establish all the requirements and needs, visits, interviews.
Major strategic objectives of design made known.	To provide technical efficiency with minimum long term maintenance costs. Personal efficiency by improving the quality of the environment.
Attitude towards quality at this stage.	
The form of brief	Documents contain all the information needed.

Table -3.17- The form of instruction.

6.1.2 Design Process: First stage

The Design Team

At this stage, a limited number of people were involved in the design team, and this idea was shared by other architects on different scheme.

> "Whatever the job size, it is nonsense to have more than a few people involved in the conception, if you get the right people involved you don't need many and you can't work as a concentrated team beyond this."

In this particular sheme five people worked together and formed the team design:

1. The Job Partner - Architect -:
   Has overall responsibility for the job in general, the client, the design conception, but there is a great deal of delegated responsibility as will be seen later.

2. The Job Architect:
   Concentrated on the design conception in this stage.

3. Two Senior Architects:
4. Structural expert
5. Mechanical engineer

The contribution of each member of the design team is described later on in the process of the project analysis.

The Idea Generator

In this case, things seems to emerge from the brief as a logical conclusion as if the brief virtually contains the building. There were three main recommendations contained in the brief. The first was that the general office requirements of the society should be planned using open office principles, and the executive and director's accommodation should be contained within individual offices, which allow for growth and change in the general offices in balance with optimum conditions of privacy and quiet for the people whose work would benefit from such conditions. The second recommendation, the use of a new advanced filing system which will give great improvement in conveenience and space utilisation when compared with conventional methods. The third recommendation was that the new head office should be completely air- conditioned.

These three aspects have strongly influenced the final form of the design which placed the whole of the general office accommodation, approximately 50.000 sq.ft gross in area on one floor, which happened to be the total area of the site. This was only coincidence as the decision taken for different reasons arises out of the process of finding the design concept.

Design Conception:

The job architect in his contribution introduced some good ideas and some sketches which incorporated the idea of the big area generated from the site shape, then the whole team design talked about its possibility, one of the senior architects made his contribution in making the idea work in its geometric form. Relating the structural form and the site planning to each other. The design team was faced with the problem of introducing another top floor "The Executive Office" on top of the big floor office, which took a long time to solve and was a major contribution to the form. The idea proposed was for a big structural depth to avoid a forest of supporting columns beneath the top floor, the designer turned this requirement to advantage by utilizing this depth in accommodating most of the air condition equipment, in the space of the structural service floor. The mechanical engineer made sure that the idea would work as an engineering concern. The awareness that the building is large, and the desire to make the "Tower flowing through the building" brings the idea to life in the building up on service columns which minimise the site shape details to some extent.

> "It has been very controversial as one of the first thoughts that arose stimultaneously with the decision to lift the building up... it comes as

> Parallel thought that if we were going to fill the site, we did not want it to come down to the pavement and to be like a wall."

In this stage, the designers are working to ensure the criteria established earlier, combined with a continuing mental creative process to find the correct solution. In this stage, "the concept of the correct solution has to be found". Where the function must embrace needs that are more than utilitarian, the role of design aspects is integrated and not isolated, and nearly every aspect of design must be considered, the role of aesthetic value and human values in all aspects are strongly evidenced here.

6.1.3. Second Stage of the Design Process

Design Development

At this stage, a larger design team is engaged in the design development of the scheme. To avoid the complications of such a larger scheme, the architectural office had to introduce new methods of work, to insure the continuity and the quality of the job, and to overcome the human problem of job satisfaction by involving the senior architects in making the concept development and share responsibility toward the job.

> "In this building, there is so much out of the normal realm, as an opportunity to have a client with far-seeing attitudes about costing and other problems.
> We learnt a lot during the work.
> We had to innovate some new methods, because it was a big job, and we had to do something in our methods which we had never done before."

In introducing new methods the organisation tried to ensure the possibility of solving the design problems as they found that the normal role of the job architect was not sufficent in this case, and if the team architects were going to produce the work with self-responsibility, and professional satisfaction, they should be fully involved in making the project, this ,in its way,speeds up the process of design, and solves the problem of following up with a work programme as they introduce a parallel working method, so the team of mechnical and structural engineers listed the necessary information to resolve the job quickly and allow the contractors to start work on site.

Design Team

Job Partner (architect). Responsible for co-ordinating the design and all the people engaged in the team.

Job Architect   Worked as an executive architect, responsible for running the building contract, supervised the job on site, ran the design team, and still concerned with detailed design etc..

Senior Architects A group of seven architects in the design team were now working all the time building up the project as a whole for its next stage, with a number of assistants and technicians to help.
Each of the seven architects, was given a part of the building to be responsible for in co-ordination terms. At the same time that particular architect was responsible for elements throughout the building. So that every architect who is responsible for assembling and puting together part of the building is also responsible for all the finishes and details in the building. The whole building was split-up amongst seven architects in this way so that the architect had an interest in the whole building through his elemental responsibility, but he had a particular space to organise and put together until it finished.

The group leaders and their assistants had weekly meetings, where they reported on the work progress, discuss drawings as a team, with all the elements envolve. The job architect became responsible for design co-ordination, and ensured unified action throughout the job.

It is obvious, that the method was introduced to overcome the problem of a large scale job. The design team found it to a certan degree, a successful method, and the office tried it again in another job. Since the time of the interview this method of work has been tried more comprehensively in a major longer scale project, and it is regarded as a successful operation.

The Role Of Other Professions

The mechanical, electrical, and structural engineers, have been working in a different system to the architectural team, they devoted a certain number of people to work under the guidance of one or two of the group design team.

This period of development lasted for some few months, including the detail work which had to go on, much of the detailed work must be finished to allow the quantity surveyor to produce an estimated cost, any estimate that this complex scheme did not exceed the cost limit or that any excess/cost could be fully justified.

Monitoring The Work Progress

The job was programmed to suite the contractor's requirements and in line with the work, the design team had to produce in the form of drawings, schedules etc.. each particular aspect and job was programmed to dates, and monitored with the aid of computer print-out to keep up with the progress of work.

Scale Drawings

The design team decided on a compromise scale, recording in 1:200 scale the lay-out and sections and what was required, and then using larger scale drawings for final details as required.

The second stage of the design process as it was detailed earlier has the characteristic of the possibility of change to the original solutions during the development and elaboration period, while remaining within the concept established at first stage. Few major design decesions should remain open after stage one. As the work proceeds, the decisions have less impact upon the form of the building and usually become more routine and familiar. Solutions will tend to be based upon past experience rather than upon the imaginative leap.

Major Design Changes

The major problem in the Halifax Head Office is the storage of filing and deeds. When the building was initially designed the basement was arranged to suit specific system, but when the building was under construction the firm said that the system would be difficult to work in the basement. Another source after a lond search, came up with an alternative which would do the same job but of a slightly different nature and required a different volume of space. Major re-appraisal of the shape of the basement had to be done while the building was in progress. There was not a great deal of other alteration necessary once this decision was made apart from the positions of columns which had to be adjusted to allow the second system to fit into the basement. This is a typical example of practical consideration which are suprisingly common in major buildings. This particular part of the scheme was a major operation which had to be examined quickly. The team had to deal with various things relates to flour levels and providing a predicted design loading for the floors.

The original group of five dealt with the problem, as it was at a very early stage, and points to the advantage of having a firm organisational structure to the design team.

Contractor Appointment

The contractors selected from the very few capable of coping with a contract of this size within the time limit allowed. A few were interviewed and invited to submit their proposals based on an approximate bill, for basic work. The contractor chosen was John Laing Ltd.

All the sub-contractors, about 70, were appointed on the basis of competitive tendering on the full bill of qunatities. They have been chosen deliberately for their very high standard work, and their past performance.

Quality Control

A resident engineer was placed on site, before the clerk of works, as the first part of work was purely engineering, in the following period an electrical and mechanical engineer worked on site as resident staff, plus the clerk of works, thus there was a management of five people on site. The job architect visited the site twice weekly and there were monthly site meetings with very well recorded minutes and discussions .

Towards the last stage of the building a resident architect joint the team. The society itself appointed four further clerks of works to deal with specialities relating to the filing system and mechanical and electrical services.

Attitude and Policy

As an addition to the investigation of the design process of the building, a number of questions were raised dealing with the policy of the office, particularly from the point of view of designing buildings of high quality. The resulting discussions described below under headings which were so arranged to cover a range of relevant topics.

Service to Client

To make a profit, which is necessary to stay in business, but aim to make as reasonable a profit as possible. The office claim that if a client returns this is an indication that both building and the circumstances applicable to the building have been satisfied. The office is one which features in a list of design awards and which considers that effort spent in looking into new methods is a sound and proper use of resources.

Design Standards

The aim is to produce quality architecture, applicable to the particular problem in hand, without having a particular attitude towards style, but with consciousness about progressive productive architecture.

Construction Standards

The office has no standardised constructional policy. It has tried this in the past and found that the pace of development tended to make any regid system of detailing etc.. obsolete fairly quickly. However, the partners claim that the structure of the office gives the ability to have specalist knowledge available to design teams. Partners have responsibility for overseeing developments in different areas. One key group is technological development and the work of this team results in information on constructional standards, use of materials design, failures etc.. being available for use by the project architect. Thus a matrix type of system is built up in which the job architect partner has responsibility for the work but can be supported by specialist personnel at every stage including constructional design.

The system of specialised research mentioned earlier, and the need to have the information and results available where needed, has led to information documentation and monitoring by a partner.

The views are shared between the different offices, it would be very difficult to create a library of feed-back information as it would require a team to produce such information, and it is difficult to devote enough resources to create such an additional service. The architects feel that the present system works.

The offices regarded standard detailings as not necessary but approved in some sort of general level specification by making sure that nothing is written into the contract document which might results in bad work. The quantity surveyors have a big influence under normal standards of specifications as they work out how details are done.

Environmental Standards:

The office policy is to :

- Involve environmental engineers at early stages in the design process, depending on the situation, the client and budget available.
- In the particular scheme situation, a multi-disciplinary approach has been necessary to create the total building environment, the internal form and the environment determined by:

  1. Functional requirements of the organisation for which the building is designed.
  2. Application of appropriate spatial standards to the functional requirements.
  3. Comfort levels considered desirable.
  4. Design consistency throughout from total concept to detailed graphics.
  5. External form and environment will be determined by the characteristics of the site.

These several factors which influence the total environment are dealt with extensively in the brief appendices.Fully detailed information is felt essential and basic for the design decisions. The main aspects influencing environment may be summarised in broad terms.

1. Analysis of requirement.
2. Definition of environmental standards.
3. Definition of requirements.
4. Site appraisal.

The pattern of the design process for Halifax Building Sociey, described earlier is shown diagrammatically in Table-3.18- and indicates the major parts of the process and their relationships, the design team taskes and responsibilities and the people directly involved in the work.

Photograph and drawings of the building illustrated in figure -3.19- to 3.31-.

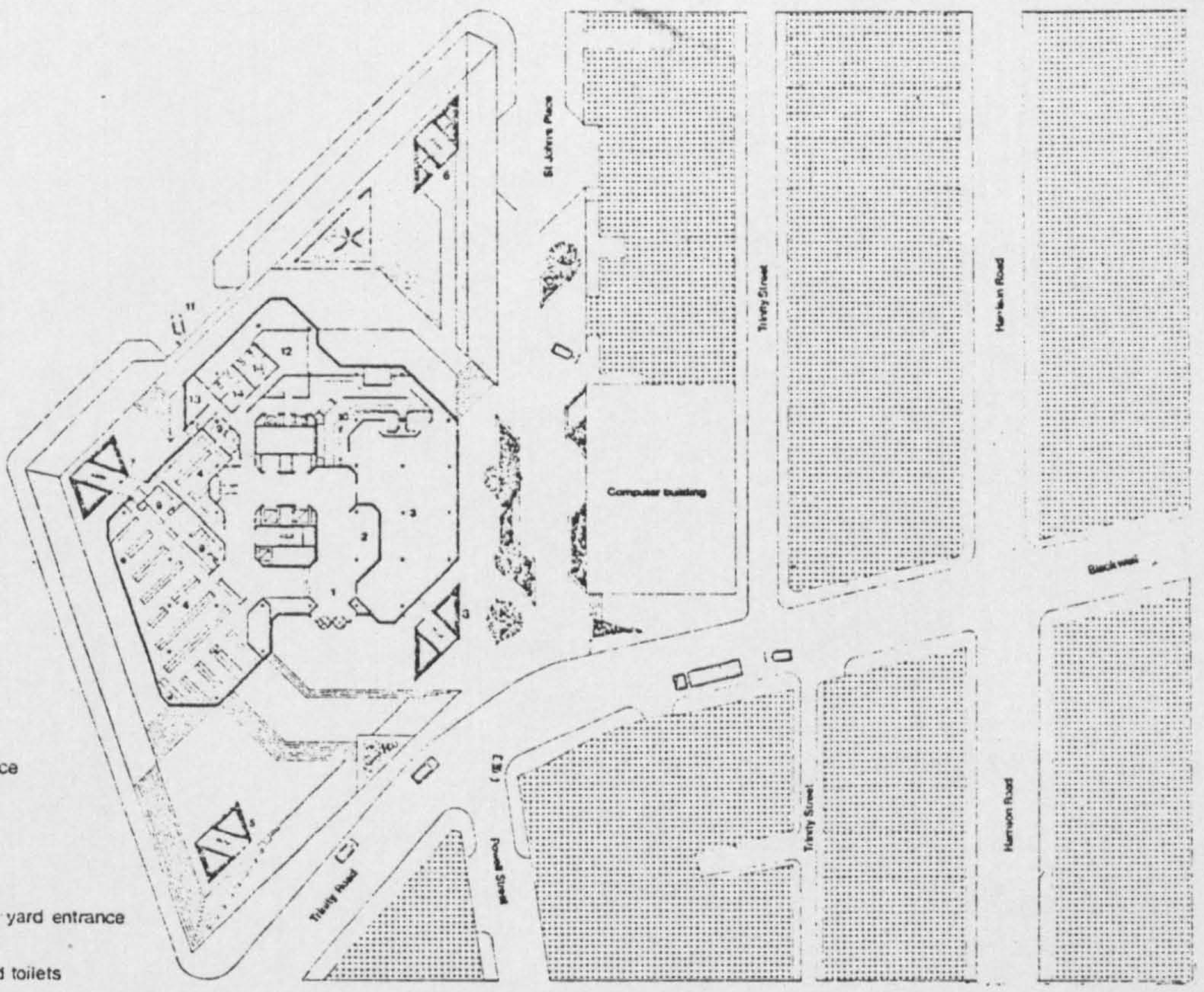
SCHEME -A- Halifax Building Society
The Analysis of the Design Operation

-Table 3.18-

Design stages	Approving authority	Client oranisation	Architect job/partner	Architect job/ archi.	Architect senior 2	Architects and assistante groups of seven	Engineers structure	Engineer mechanic	Engineer Electric	Quantity surveyer
	EXTERNAL		ENTERNAL							
Pre-design activities		Contribute to meeting	Brief preparation 1. Interviews to establish information, function and working requirements.				contribute to meeting			
			2. Visits towards the end of the brief preparation, to examine standards in office buildings to assess their relevance to the project in hand.							
			Brief making				contribute to brief making			
First stage			criticism	DESIGN CONCEPT	criticism		constructive criticism			
Second Stage			Design development							
			Management	Design co-ordination	each group responsible for assembling part of the building, for all finishes and details in the building.		working under the guidance of architects group when needed			estimate cost
			Major Design Changes				Contribute			
			Criticism sessions, making major decisions				contribute to meeting			
			Detail design							
		Approve cost plan	Approve and co-ordinate	Approve details	advance sketch, detail drawings		structure form meetings	detail work		cost plan
			Approve final details		scheme in details		final details			final cost plan
		Approve final project	preparation of all documents							

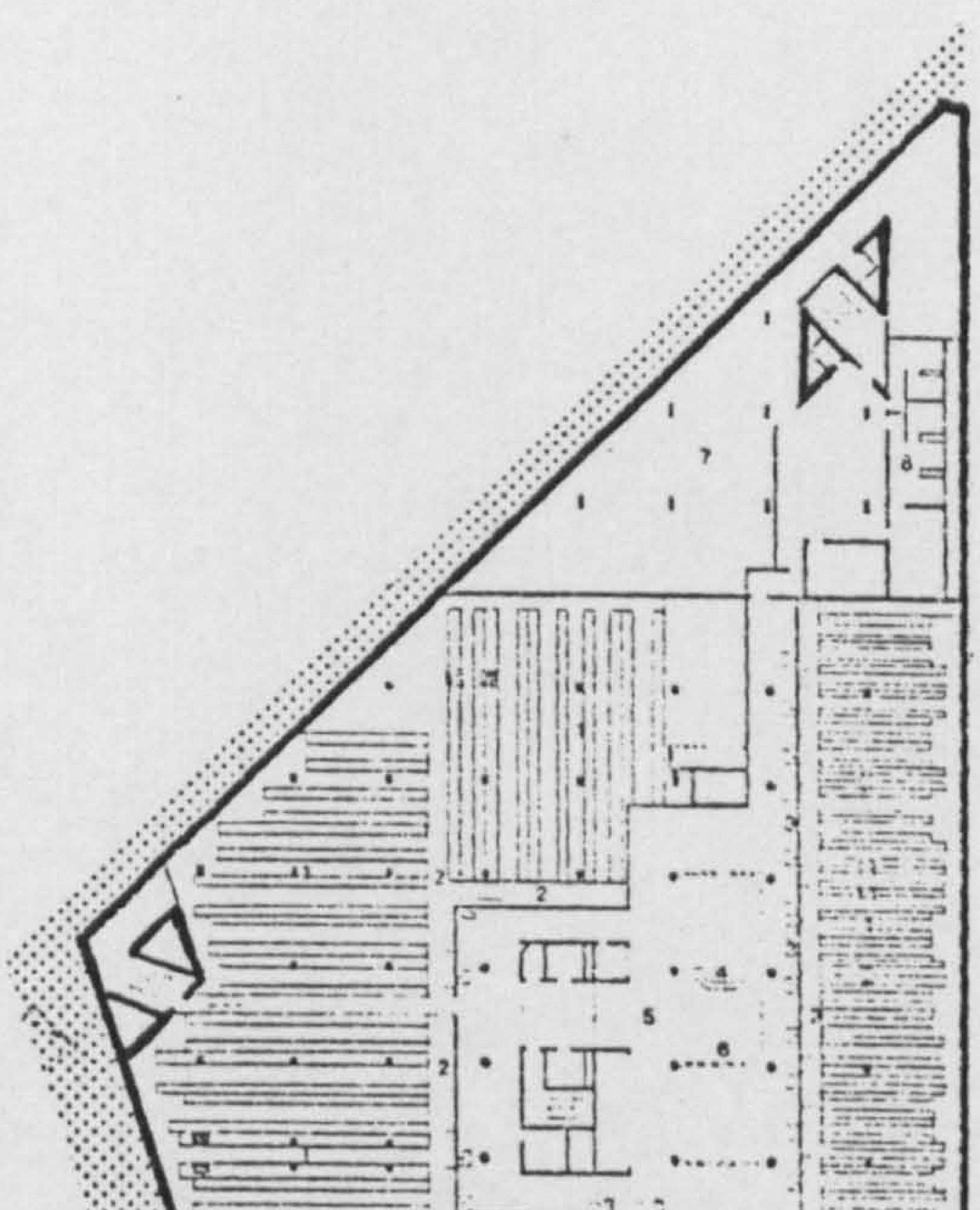
Halifax Building Society

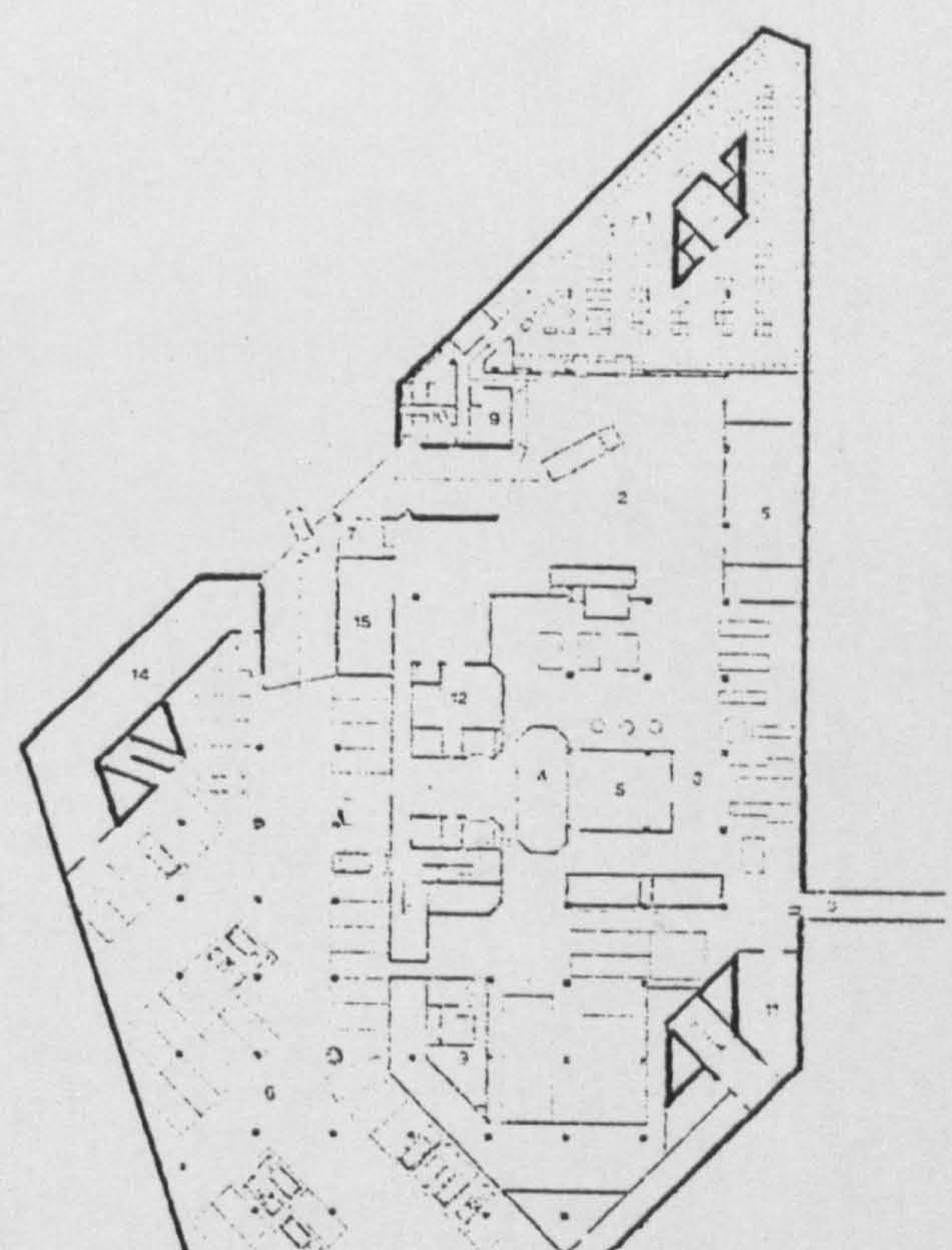
Figure 3.19



Ground floor

1 entrance
2 reception
3 restaurant–self service
4 locker room
5 north tower
6 south tower
7 east tower
8 west tower
9 toilets
10 servery
11 car park and service yard entrance
12 furniture store
13 cleaners office
14 cleaners lockers and toilets





Basement

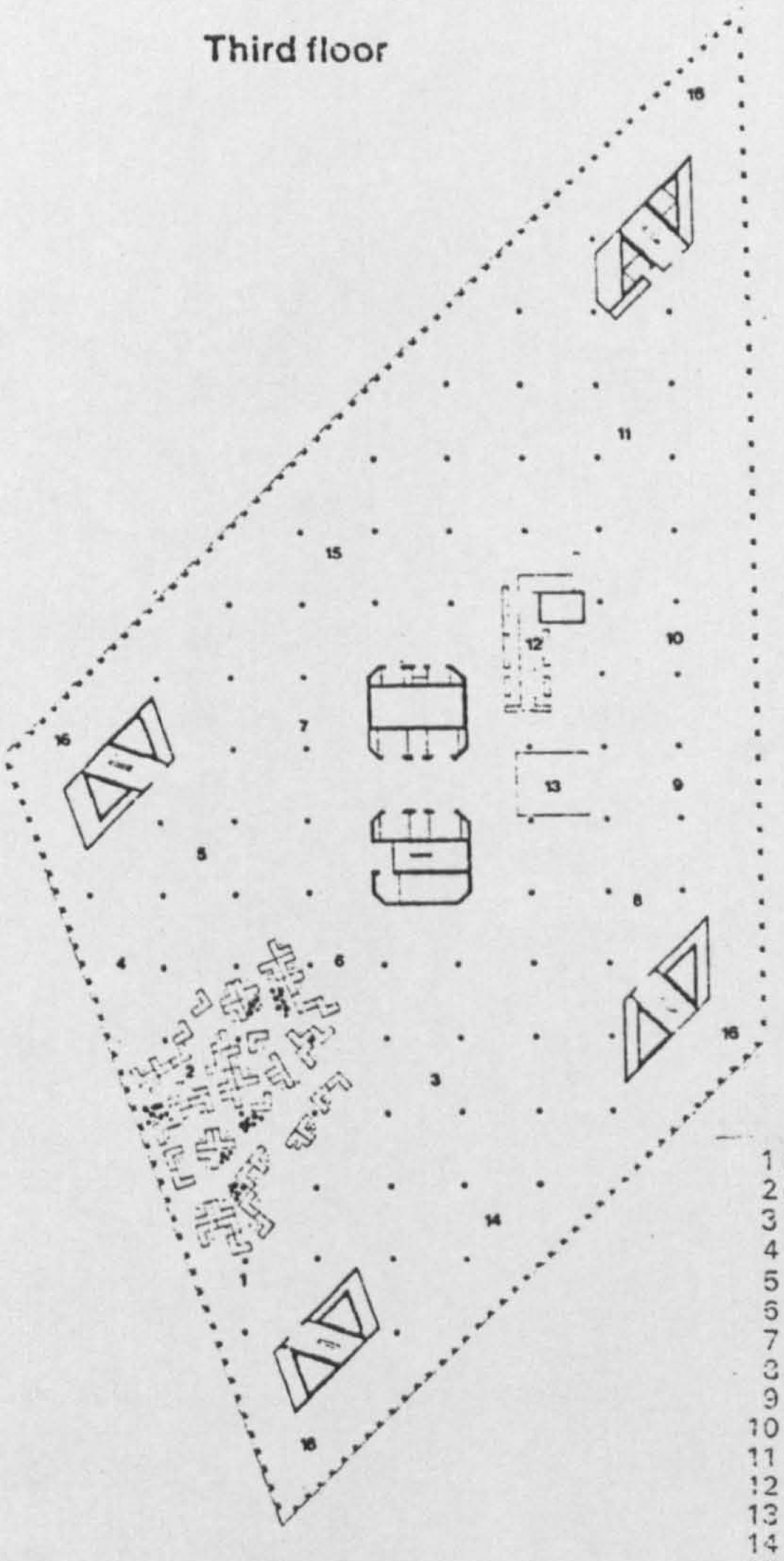
1 stationery store
2 service yard
3 h&v plant room
4 control room
5 switch gear room
6 car park
7 control
8 service tunnel to computer building
9 mess room
10 toilets
11 emergency generator
12 waste paper
13 store
14 CO_2 tank room
15 workshop

Sub-basements

1 conserv-a-trieve machines
2 conveyors
3 consoles
4 supervisor
5 conserv-a-trieve operating room
6 control room under
7 stationery
8 toilets and changing rooms

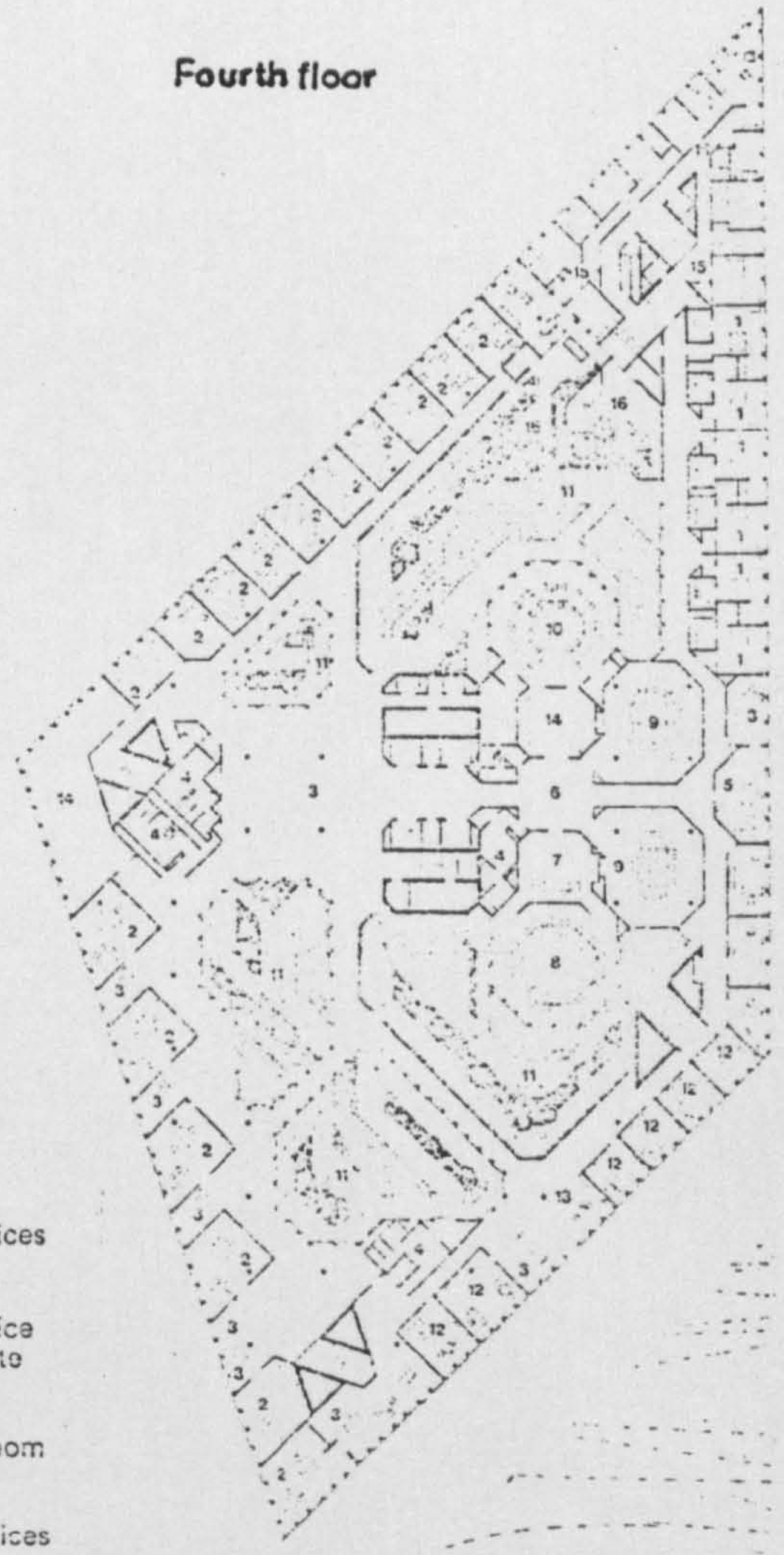
Halifax Building Society, Head Office

Third floor



1 markers & advances managers
2 mortgage applications
3 mortgage offers
4 fire insurance
5 completions
6 endowment assurance
7 building mortgages
8 specialist section
9 society's seal
10 existing deeds
11 new deeds
12 conserv-a-trieve terminal
13 kardveyer
14 agenda typing
15 typing centre
16 lounges

Fourth floor



1 bedrooms
2 executive offices
3 secretaries
4 toilets
5 director's office
6 director's suite
7 ante room
8 board room
9 committee room
10 dining room
11 courts
12 solicitors' offices
13 library
14 lounge
15 residential accommodation
16 private gardens

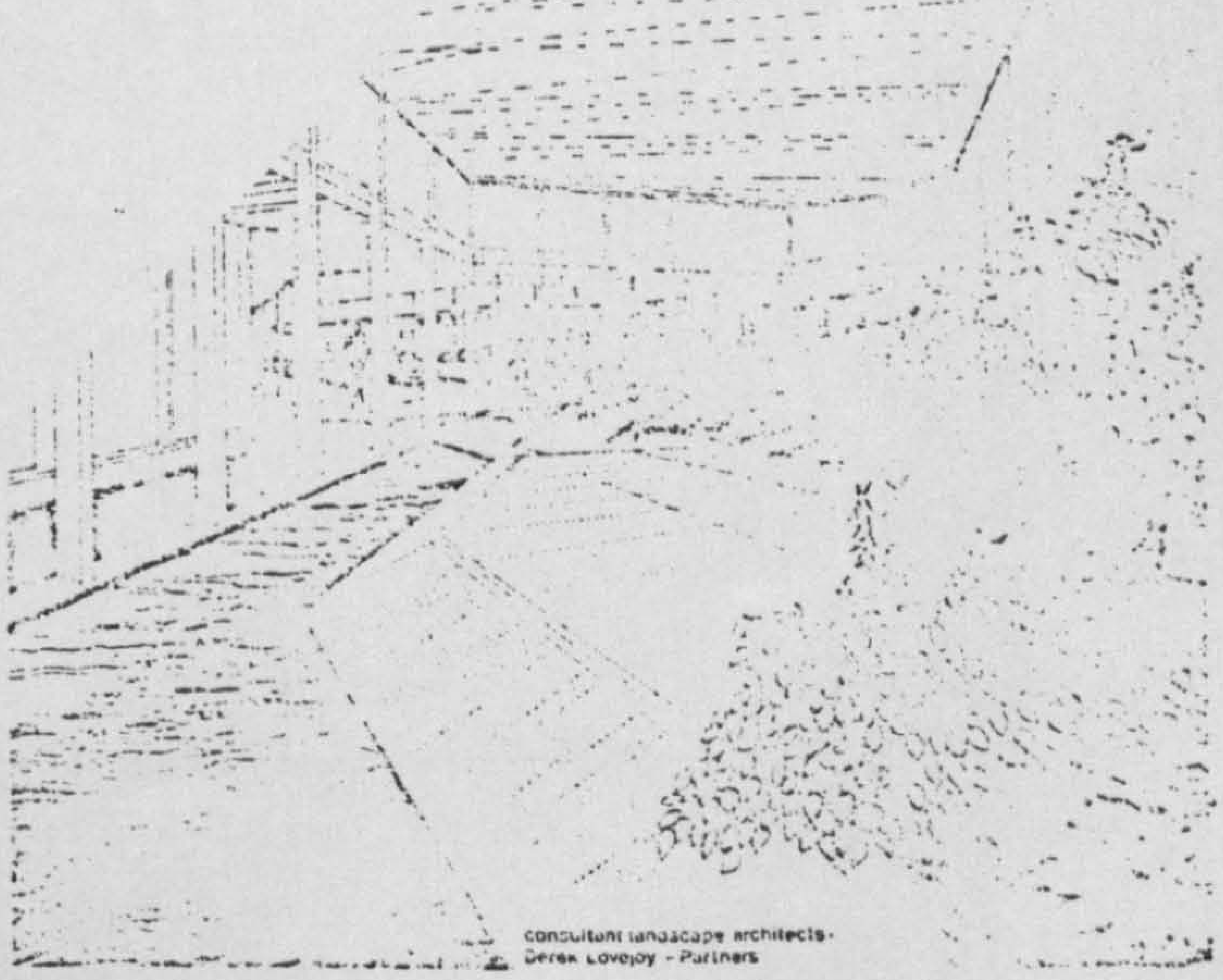


Figure 3.20

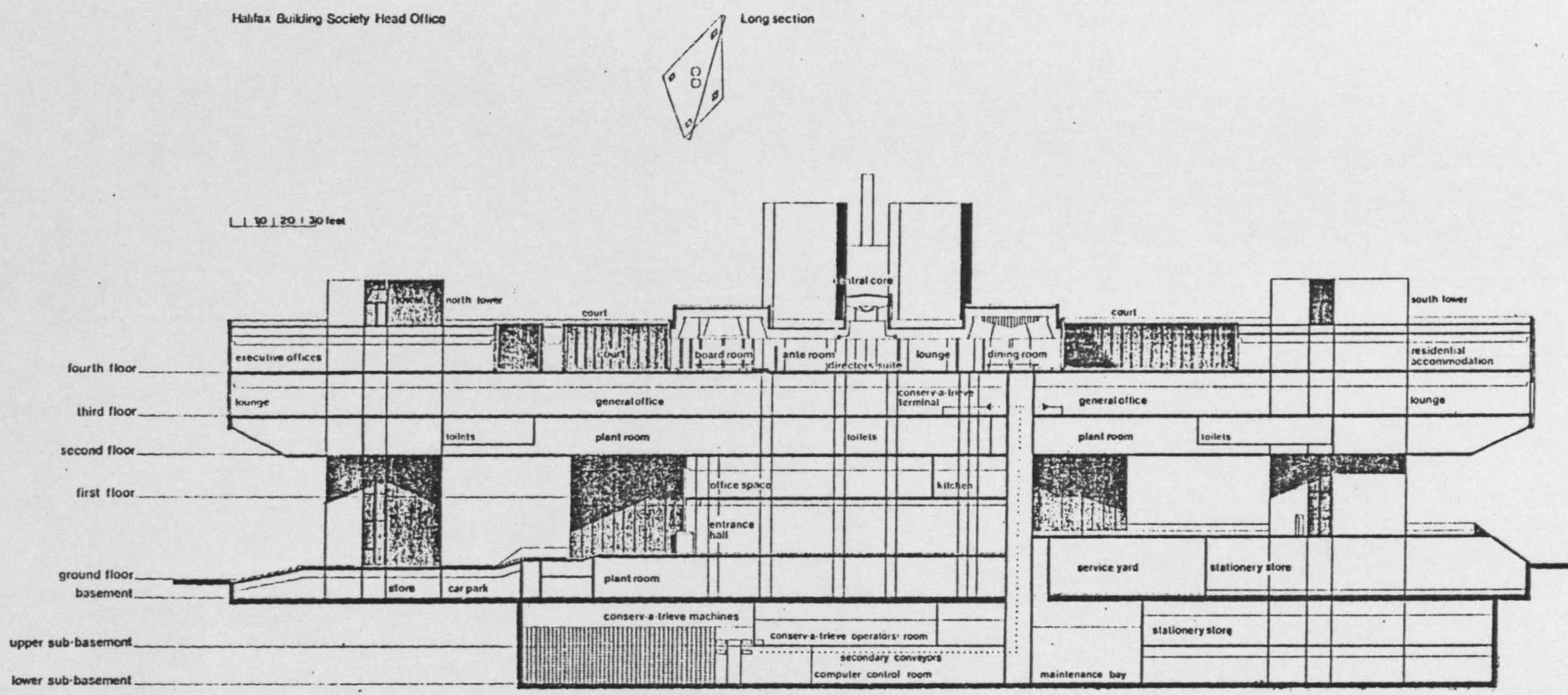


Figure 3.21 Halifax Building Society Head Office, long section.

Figure 3.22 The new Halifax Building Society Head Office, seen from commercial street, Halifax.

Figure 3.23 The new Halifax Building Society Head Office, The hills rise behind the building seen from Trinity Road, Halifax.

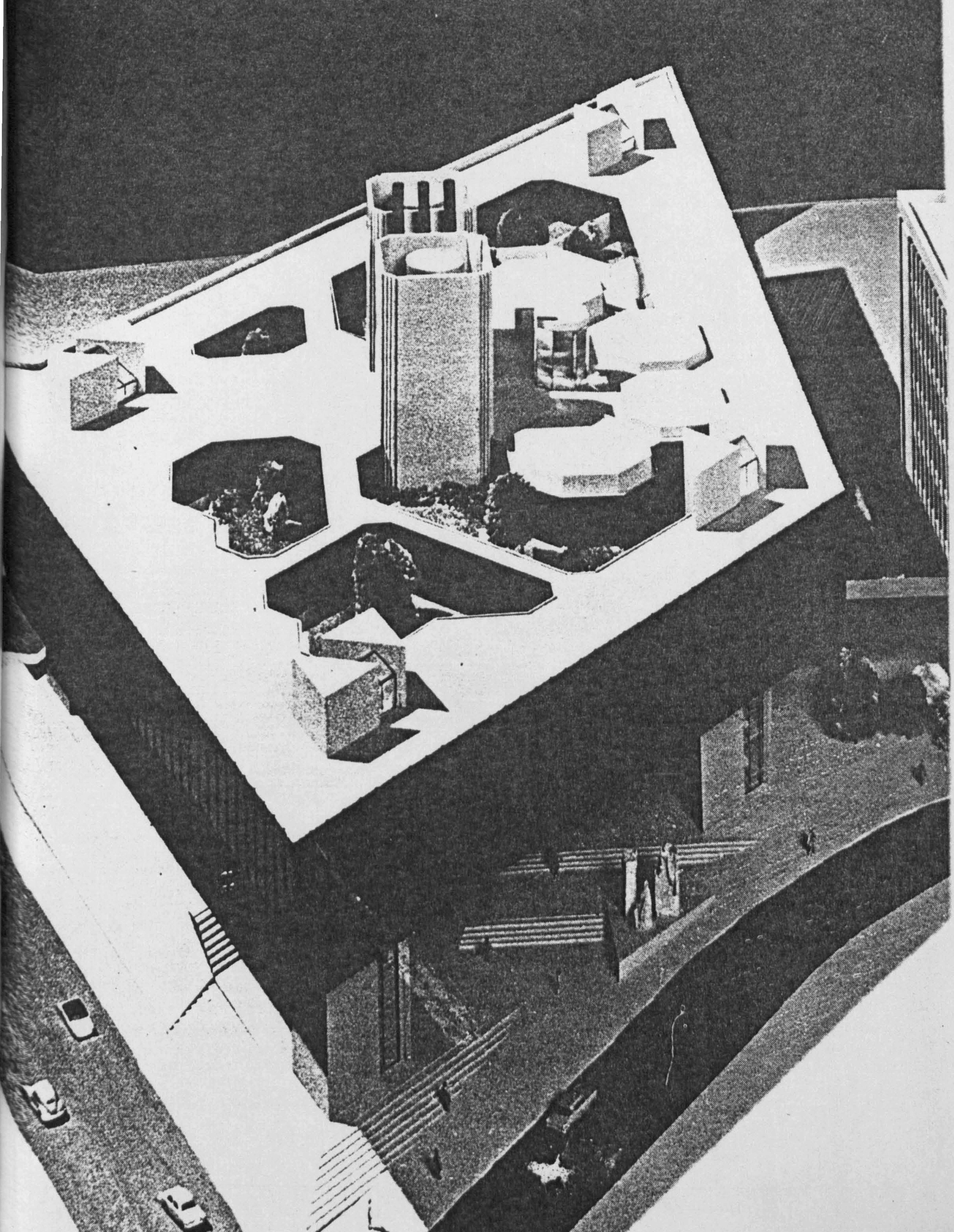


Figure 3.24 View from the north (model).

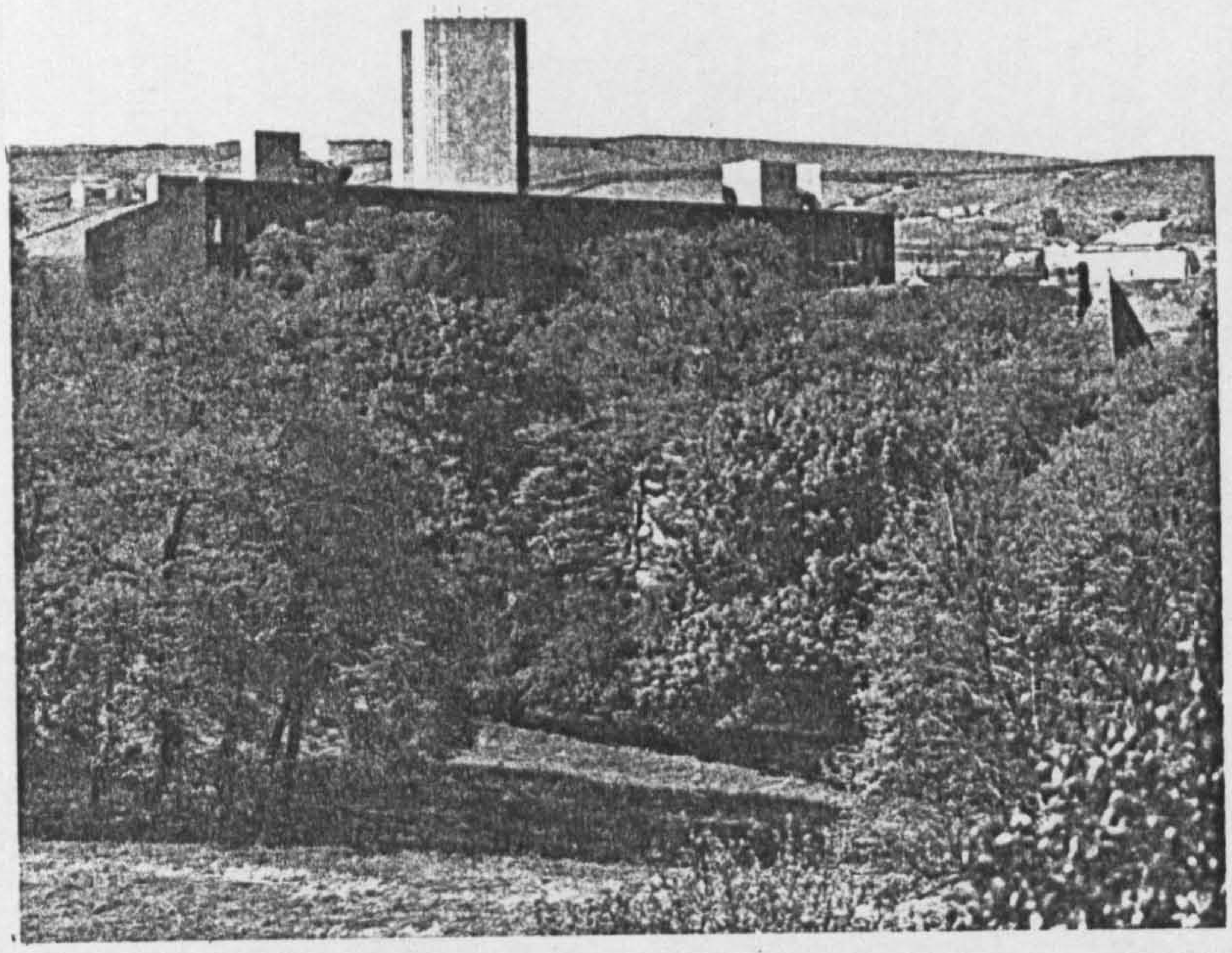


Figure 3. 25 View from the south.

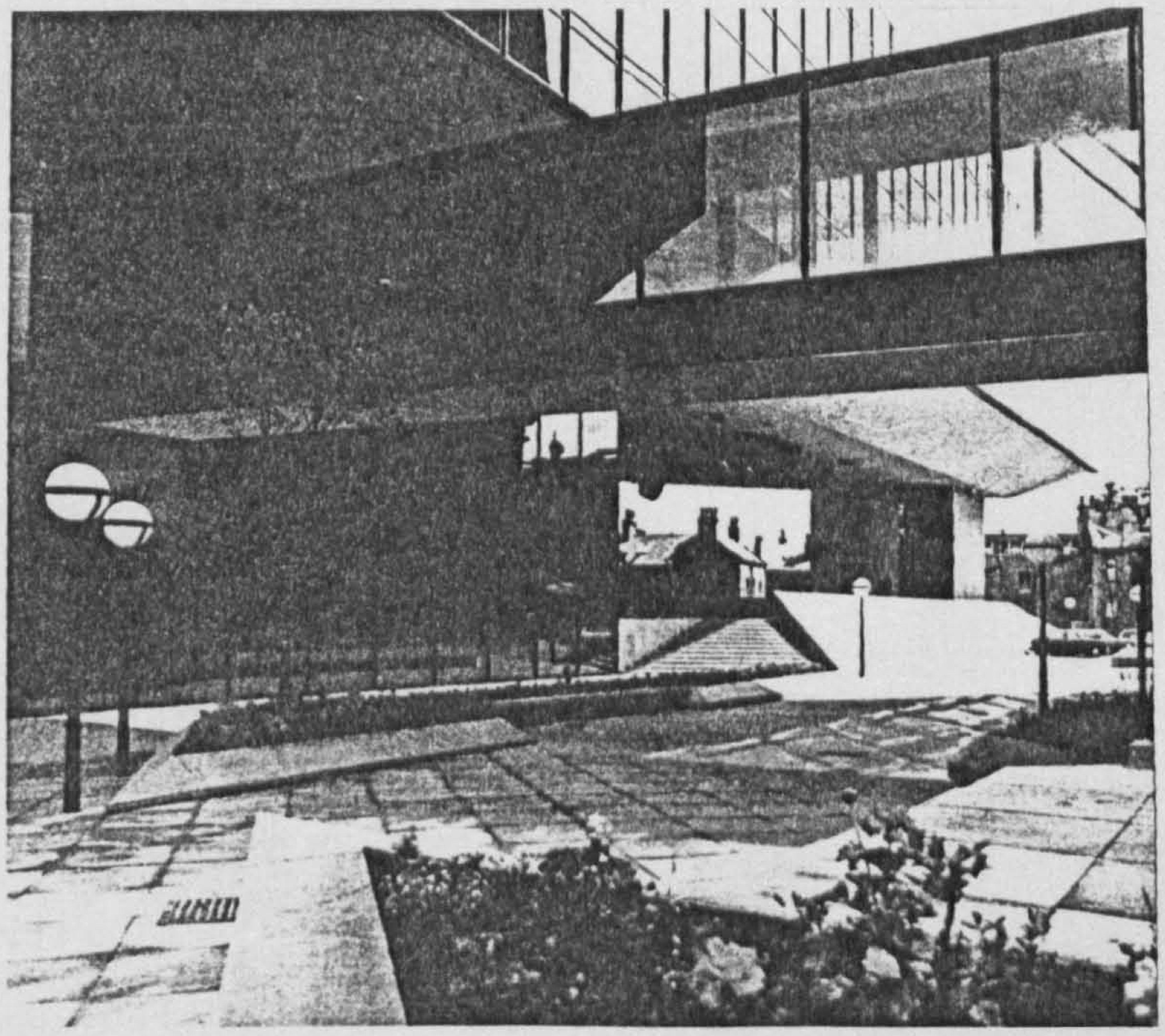


Figure 3.26 St. Jonhn's Place, The street between Halifax Building and the computer building , is now paved and landscaped with the bridge link above.

Halifax Building Society, Head Office. Conserv-a-trieve, installation for storing the little deeds and fiels.

Figure 3.27 The Operating Room.

Figure 3.29 One of the deeds system consoles, checking a deed wallet out of the system.

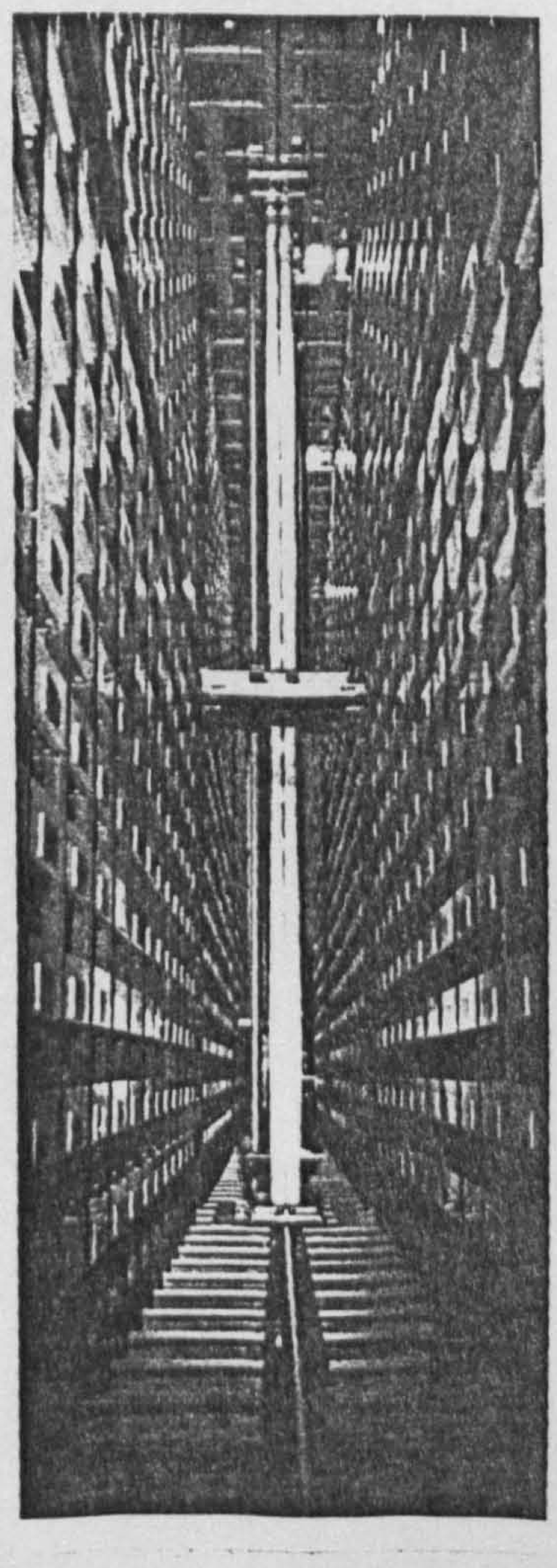


Figure 3.28 A master column in its aisle of vacking.

Halifax Building Society, Head Office.

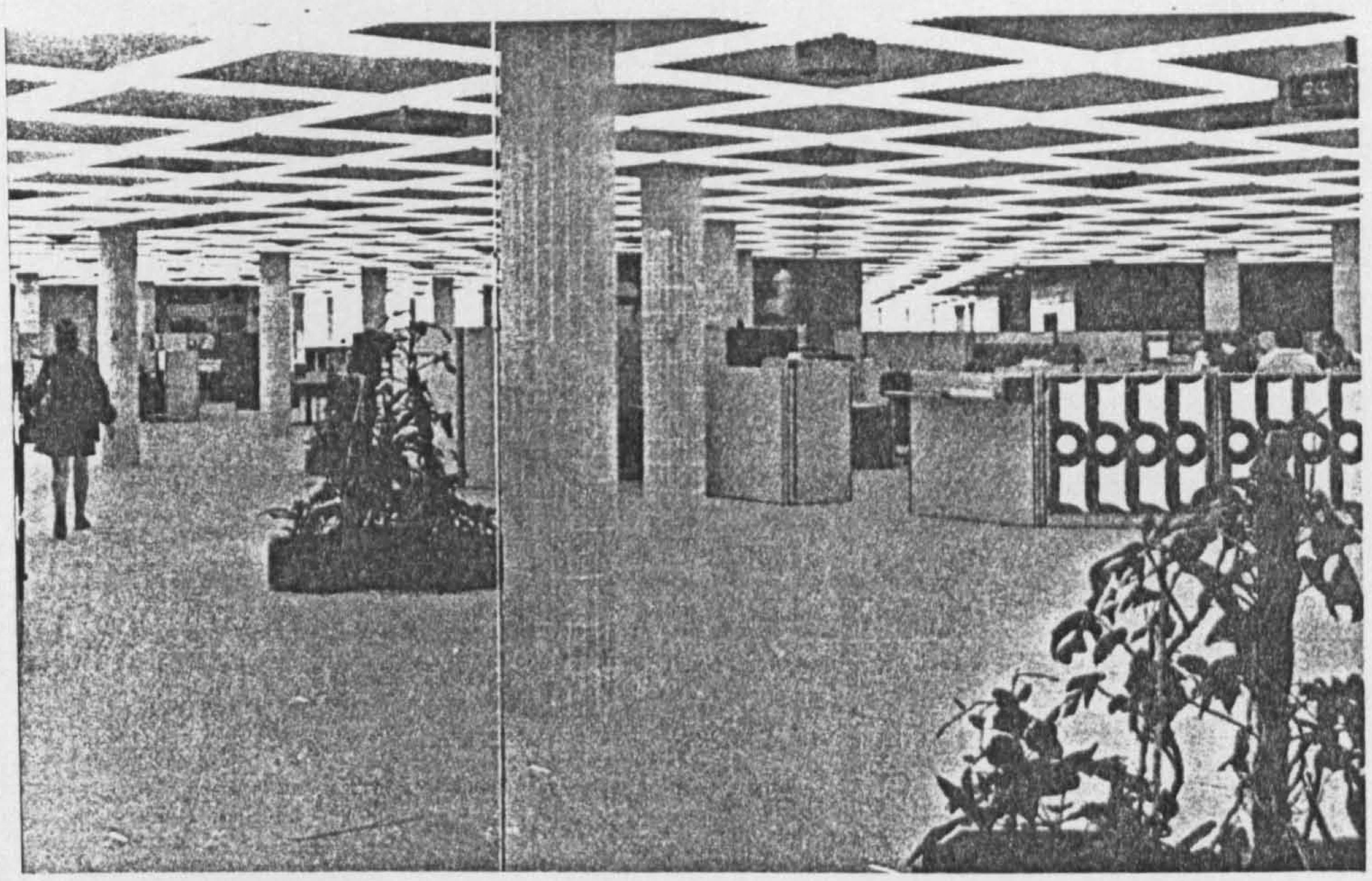
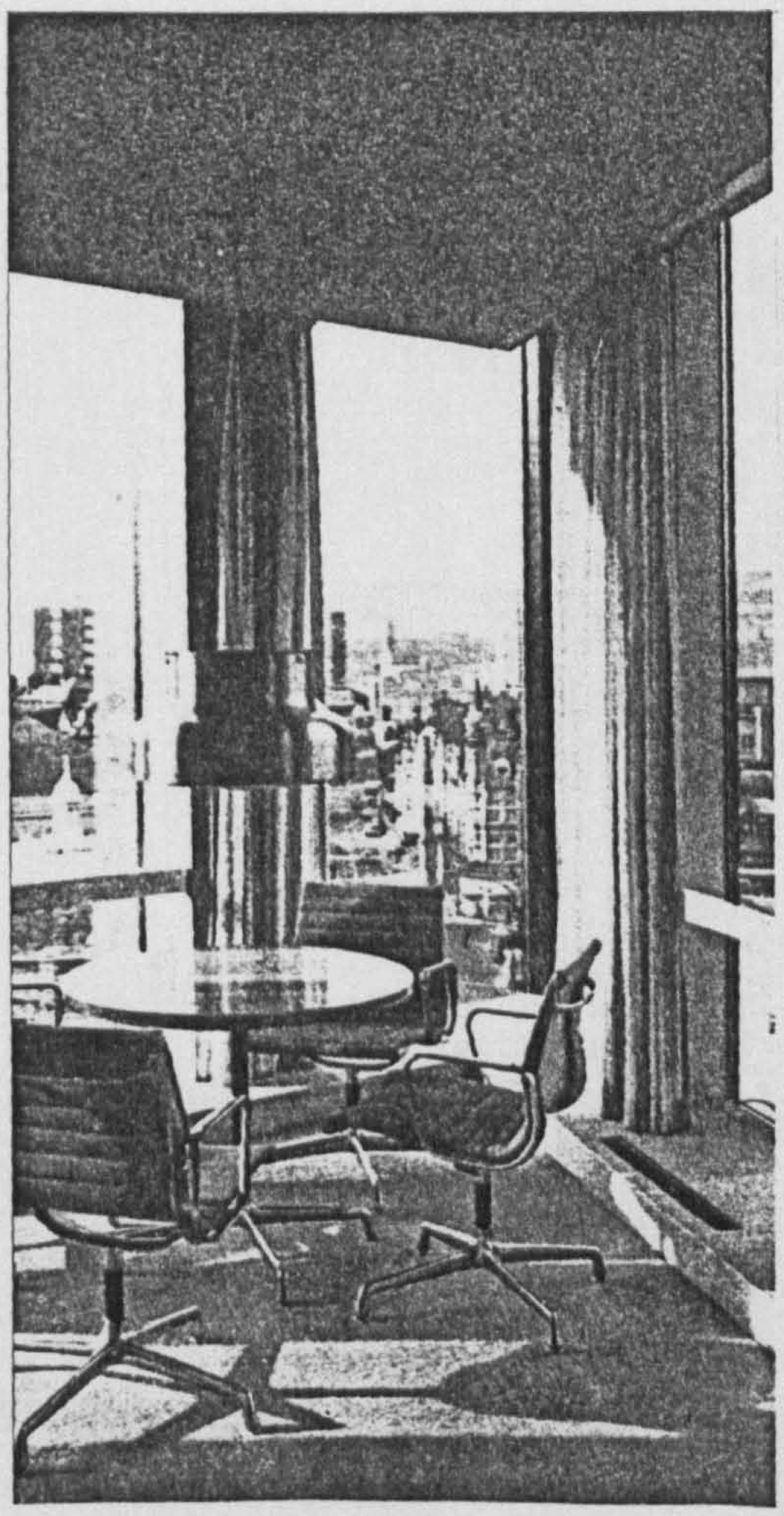


Figure 3. 30 The landscaped open office, third floor, mortgage applications corner.

Figure 3.31 North corner office looking down commercial street, fourth floor.



VIVRE A MILTON KEYNES

EXTRAITS DE LA BROCHURE PROMOTIONNELLE

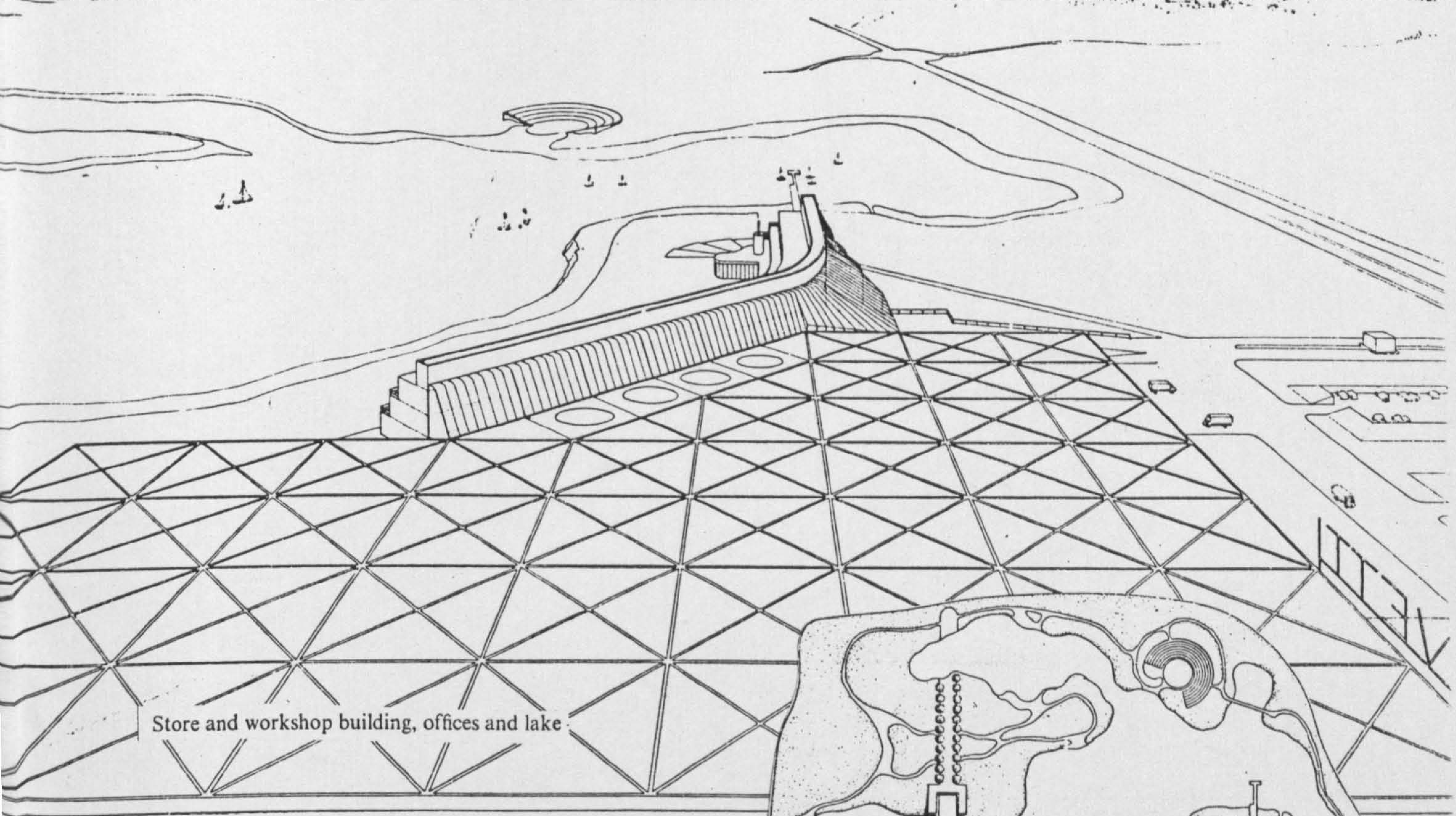
1971

Olivetti headquarters, Milton Keynes
Olivetti-Hauptquartier, Milton Keynes

Brian Riches
Werner Kreis
John Corrigan

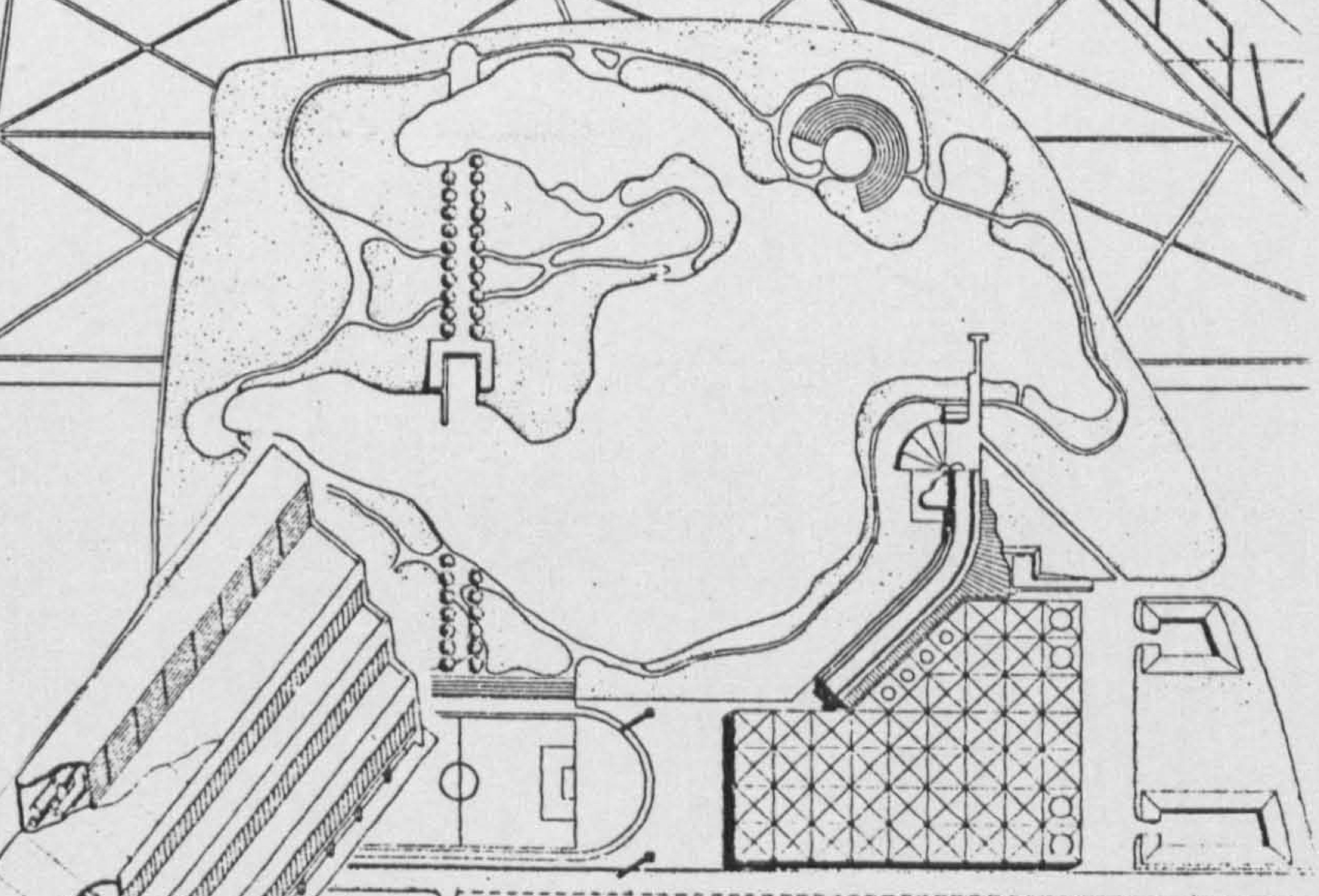
F. J. Samuely & Partners
Dale & Ewbank
Davis, Belfield & Everest

ARCHITECTS: JAMES STIRLING & PARTNER
PARTNER-IN-CHARGE: MICHAEL WILFORD

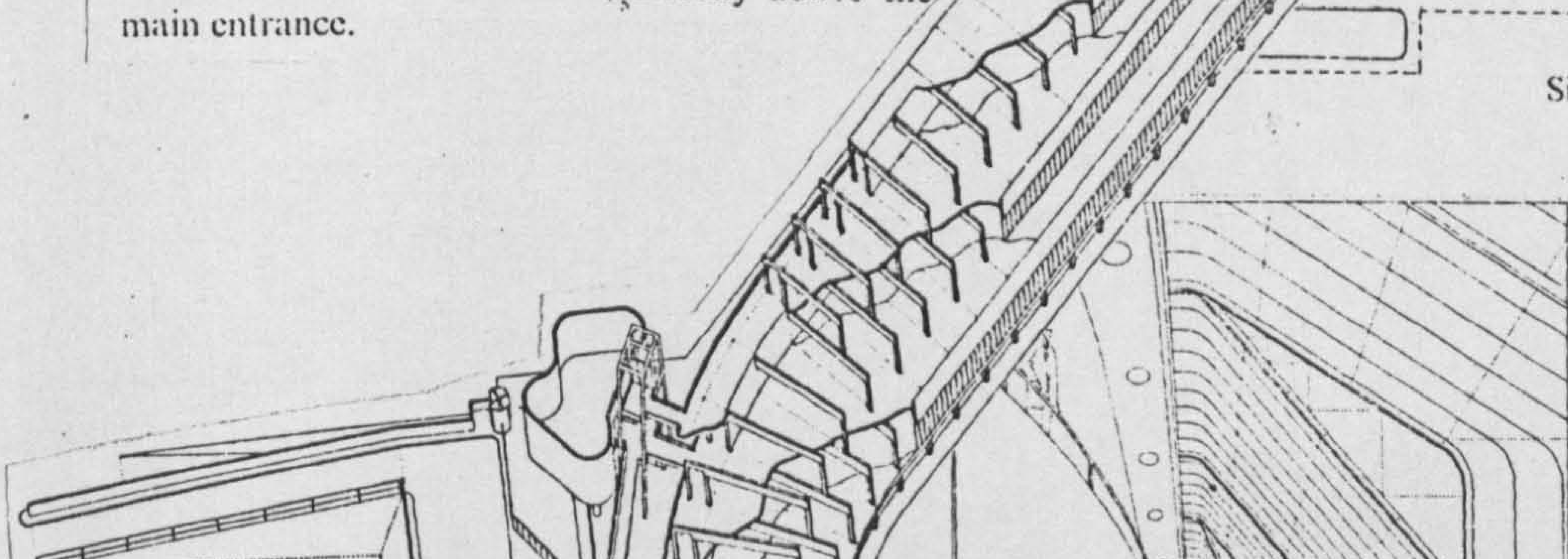


Store and workshop building, offices and lake

A landscaped public park is to be developed around an existing lake in the New Town of Milton Keynes. The offices will overlook this lake and have distant views of wooded hills. The store and workshop building is behind and partly screens the offices from a newly built main road. In the space between offices and workshops, there is a glazed concourse which provides access via staircases and galleries to all office and workshop floors and also to the car park below. A conference centre is suspended in the widest area of the concourse, directly above the main entrance.



Site plan –



The two areas which break out from the constriction of the office section are the conference centre (auditorium) and the social centre (restaurants / recreation). These are planned as free elements with appropriate structure. Both can function independently without being involved in the activities of the offices.

CENTRE OLIVETTI

6.2.B Scheme - B -

Olivetti Head Quarters

Milton Keynes

James Stirling and Michael Wilford

This section is in direct contrast to the previous one, in that this is a small office headed by an internationally known architect, James Stirling with a considerable personal influence on the design work of the office. The interview, in depth, was conducted by Michael Wilford who is now his partner and who worked on the scheme which was thought to be representative of the design methods used in the office. The use of the term was questioned and Wilford made it clear that in his view the imposition of a standard approach had little chance of success in general and was totally unworkable in the structure of Stirling's office. He accepted that trying to record what happened on a particular job might be structured for the office as well as for the purpose of this thesis and he suggests the Olivetti building as being best.

6.2.1 Pre-design Activity

The client organisation appointed a premises expert who produced the brief. This was direct link between client and architects, all technical queries, operational was processed through him and the scheme reached the stage design approval, he put the scheme to the board of the company which had to approve the initial design. This was considered of great importance by the architects. There were two main points made:

1. That one person was responsible for the client's attitudes.
2. That he practically became a member of the the design team.

Several other factors come into consideration, the personalities involved, particularly the seniority of the client representative who could take decisions without refering back to his board committee. This good client relationship at an early stage, affected a great deal the progress of work to move more quickly from big scale work to more detailed. This rapid development time was seen to be of some significance in retaining the integrity of the scheme and preventing diffusion.

6.2.2 Design Process - First Stage -

Team Design To find out the design conception, two architects were involved in the work at this early stage. The Principal Architect and the Associate Architect.

Design Conception The two architects usually discuss the crucial decisions together, working in the same room. It becomes the responsibility of the associate architect to draw-up and develop early work and most of the sketches developing several alternatives and discussing it with the principal architect.

The early decisions have been made by a "Process of elimination" as methodical process, described by the architect as a routine function study made on a basis of considering alternatives rather than reject/ing an acceptable ideas, discussing the merits of each solution and making decisions to quote:

> "The really original design input is in producing alternatives, just imagining the different way things can be done"

On the basis of the interview with the architect. It seems that there are serious pressures created by the architect's own philosophy and successful reputation <u>He had a very strong feeling about the quality of his work and his building The question of objective, values, motivations, were answered a long time before he determined the ultimate solution</u>, and in a way, what they offer and what they mean in their own terms. The decisions he makes, are made in terms of what these chooses to/try to communicate to the user, and/has the images of that design incorporate the end form.

> "In designing buildings one of our objectives, in a way, to produce a building that will stimulate the people who are going to use it. It

> is a provocative risky process bound to flow into the consideration of townscape and the context of the building. Stimulating and taking the risk quite deliberately as it is, going to antagonise certain sections of people who are passing through... to present a good front, we had very strong feelings about the quality of the buildings."

It can be argued, that the gifted designer does exactly that and open new experiences and new visions for the user. The solution is still the product of his talents and the talents of his associates, rather than the product of a process.

The Idea Generators

Upon examinning the concept of the olivetti building it transpired that the site was one of the main generators of the design. The whole site was designated as a public park within the Milton Keynes development plan. The lake is disused gravel working and there is a legal boundary to which the office building relates in plan. The block is deliberately wedge shaped to fit the building into the site of the required level. It follows the contours of the lake, so the form of the building is very much determined by the site including the 'hidden' legal boundary. The site was quite small for the building size. The warehouse is ¼ million sq. ft., and there were particular client requirements regarding its connection with the various workshops connected with it, and the office building. There was also a restriction on vehicle access as there should be one access point for trucks and cars. Thus Wilford argued that the building had a functional basis and that this was in fact the fundamental conceptional look of the office. He quoted Stirling as saying "I am just a routine functionalist". This certainly could be understood more clearer after one realises, as the designer does, the sort of legal arrangements and restrection in the planning brief which led directly to the deminsional form on the site.

6.2.3. Design Process - Second Stage -

The Design Team: In this stage the design team consist of the following:

Associate Architect: Vital decisions, communication with client organisation.

Senior Architect: Working up the details of project.

Assistant Architects: Eleven assistant architects organised to implement the scheme choosen for a particular activity in the project. The team changes depending on the process, but the senior architect would remain constant but the people working around him as assistants could be changed.

Other Professions: Their are no-technicians on the job as the office policy is not to work with technicians. It being considered that technicians need time for co-ordinating and supervising their work that "It is far more productive to carry on the job and to do the thing yourself..."

As for the other professions, the office generally do not bring the structural engineers in too early in the work. This is deliberate policy as the office believes that the structural considerations are not a very important influence on the way design evolves.

> "We are believers that there is a solution for every thing. I don't think design decisions are conditioned too much by what is possible or what is known to be possible at the time, any problem can be solved ... we develop ideas, something may occur in a previous building which we like."

However, in some cases there are exceptions, where on a particular job structural engineers need to be consulted early on the job but this tends to be unusual.

As the design team get involved in the working drawings, other people become involved, which make concession to the team work system.

Office Policy: Service to client, producing a building that will stimulate the people who are going to use it.

Design Standards: Decisions made on the basis of considering and producing alternatives, discuss/ing ~~the~~ merits of each solution and make a decision. The decisions are made by a process of elimination by a routine functional study.

Construction Standards: Design decisions are not conditioned by what is possible or what is known to be possible at the time.

The office policy is to detail every thing and find a solution for every problem. This is to prevent any difficult structural problems later on. It also helps to clarify the design thinking and carry the principles of the original concept through to the final built form.

Environmental Standards:

Try to find service consultants and environmental design, who are very concerned with environmental control, and could come up with good ideas, willing to work on the same line of the office standards and policy. There are regular meeting with service consultant gets the project under way but usually after the initial design has been decided.

Table - 3.32 - shown the design process for olivetti building described earlier, in diagrammatic form.

Photographs and drawings of the building illustrated in figure -3.33- to -3.41-.

Scheme - B - Olivetti Head Quarters
The analysis of the design operation

Table 3.32

Design Stages	Approving authority	Engineer mechanical	Engineer electrical	Engineer structure	Quantity surveyer	Client organisation	Architect Partner	Architect Job/Archi.	Architect Senior	Architects Assistant 11
	EXTERNAL						INTERNAL			
Pre-design activities						The brief	meetings to establish requirements and technical problems			
First stage							Design concept			
							Discussion ⟷ Sketches			
Second Stage							Design development			
								Major decesions communication with client org.	working up the project in details	chosen for particular activity in the project
							Detail design			
		Details work		Structure form	Estimate cost			Approval	Advance sketches	
		Final details			cost plan			meetings	Scheme in details working drawings	
		Preparation of final documents						Preparation of final documents		

Figure 3.33 Olivetti Head quarters, Milton Keynes, the entrance (model).

Olivetti Building, Milton Keynes

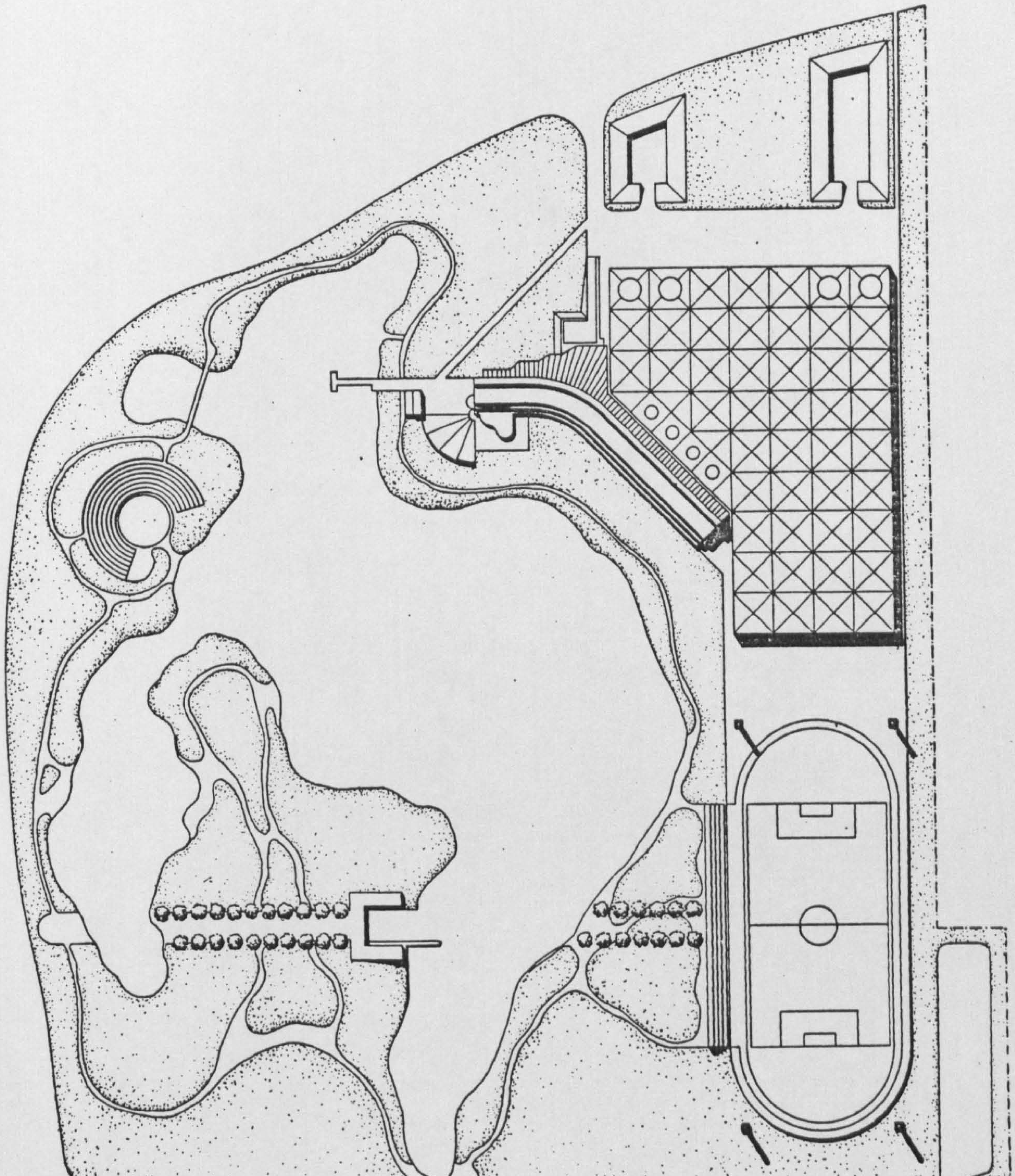
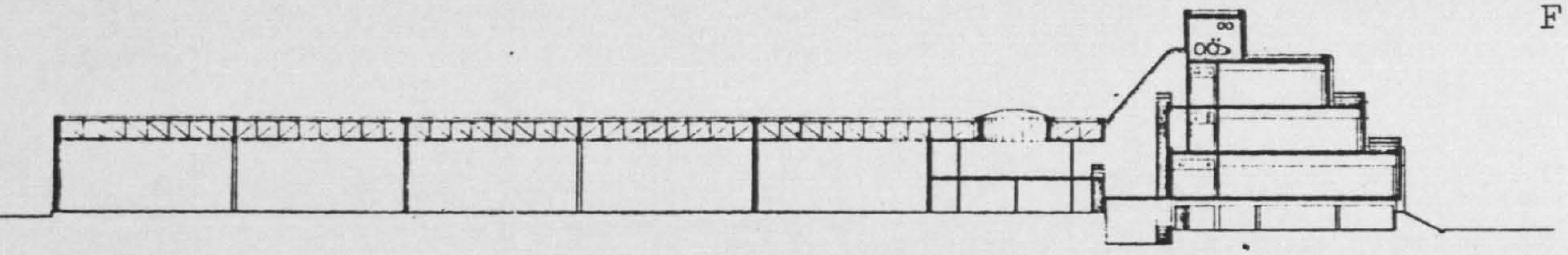
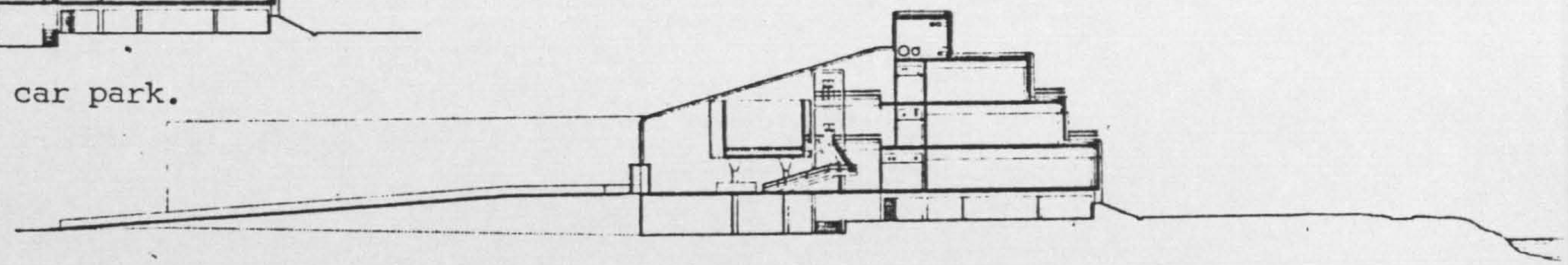


Figure 3.34 siteplan

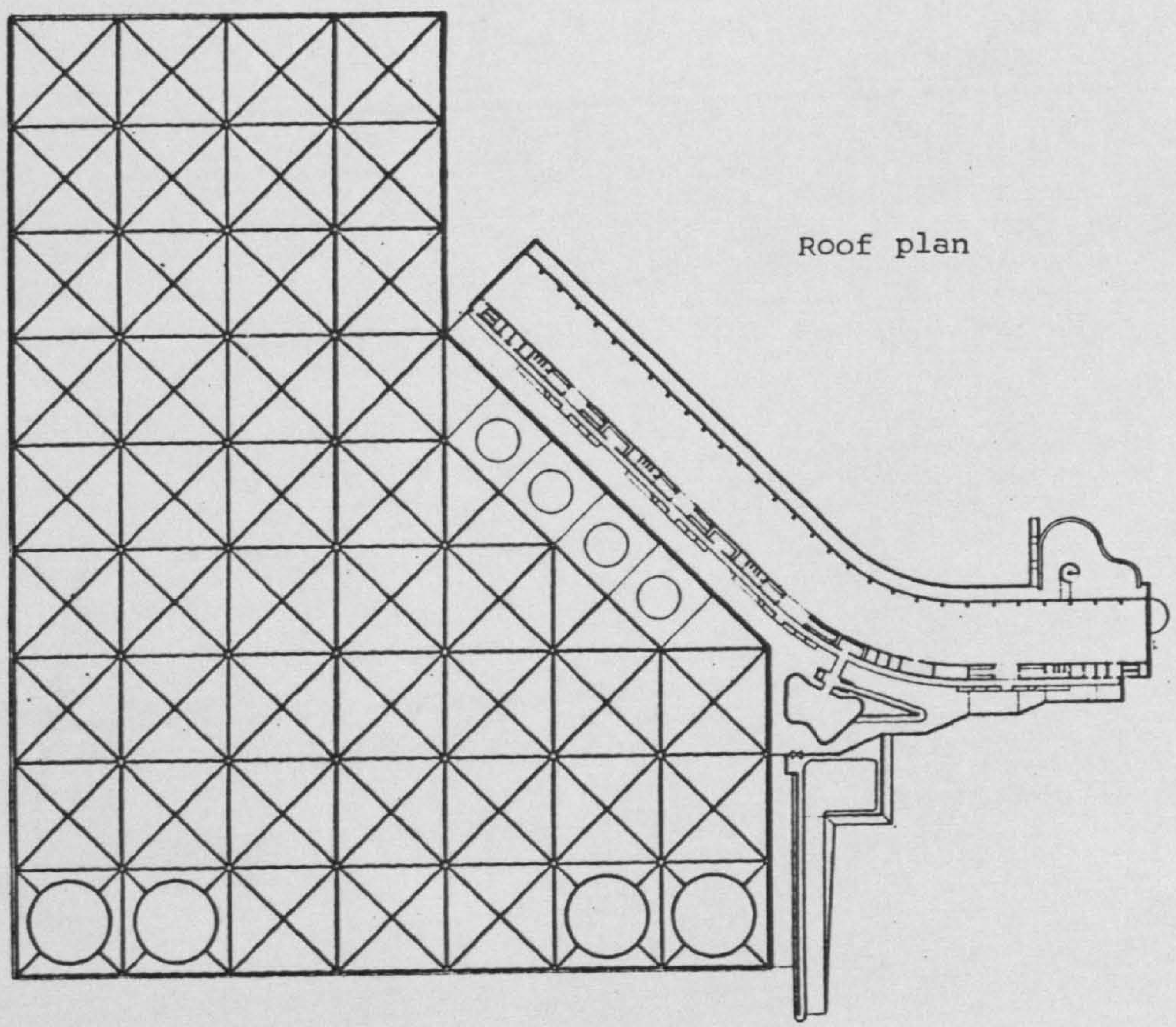
Figure 3.35 Olivetti Head Quarters, Milton Keynes



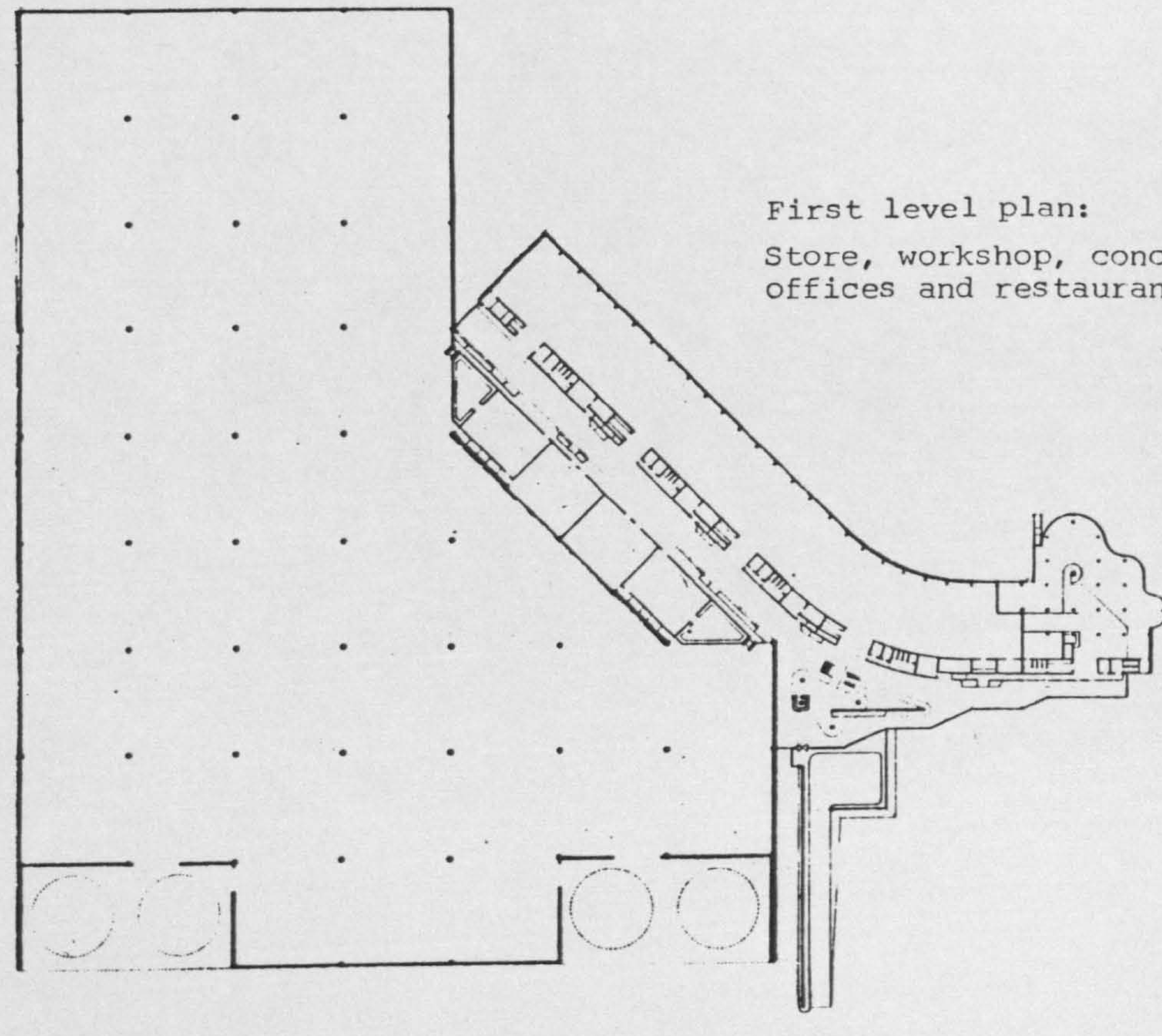
Long section: Store, workshop, concourse and basement car park.



Small section entrance, conference room and offices



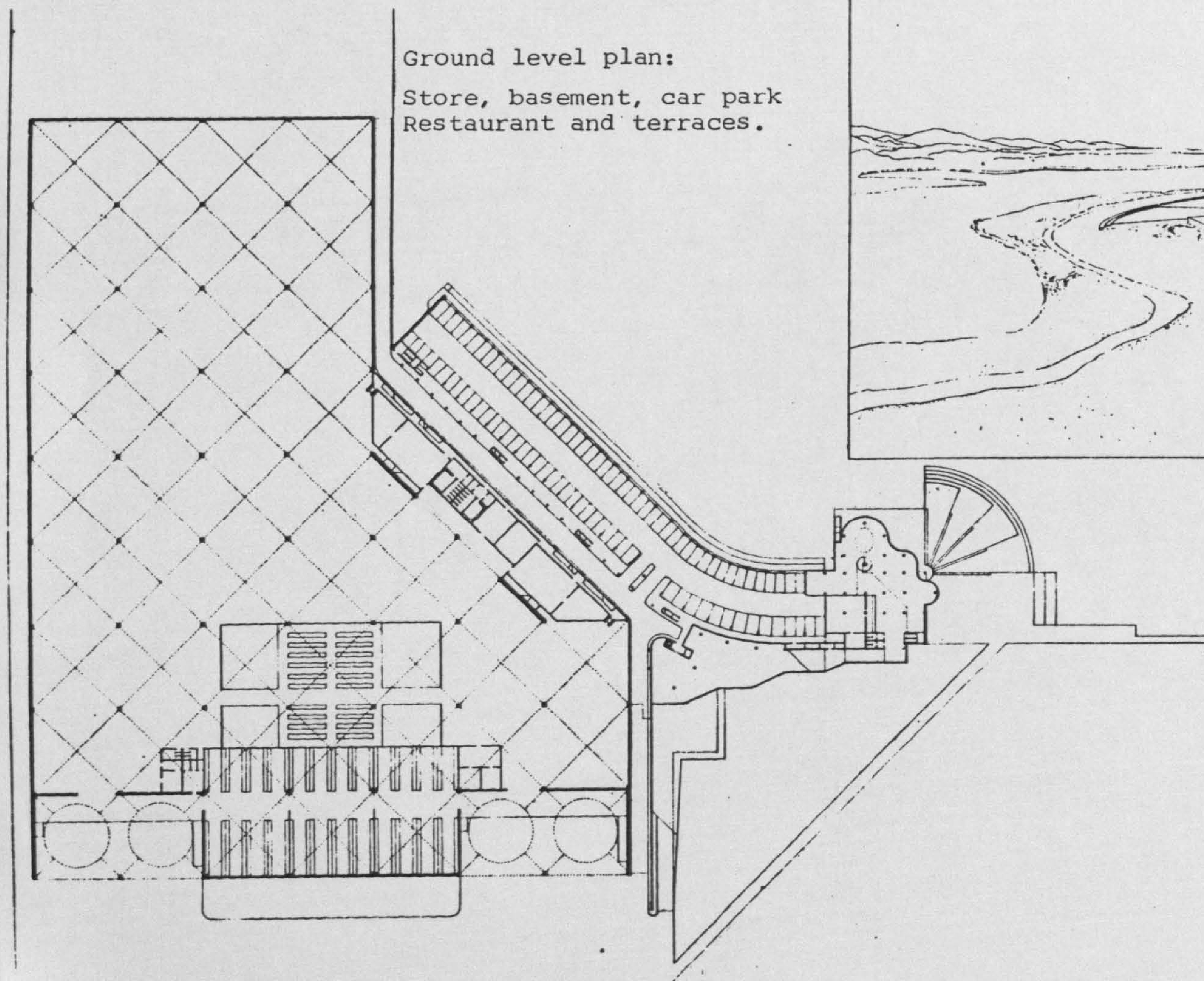
Roof plan



First level plan:

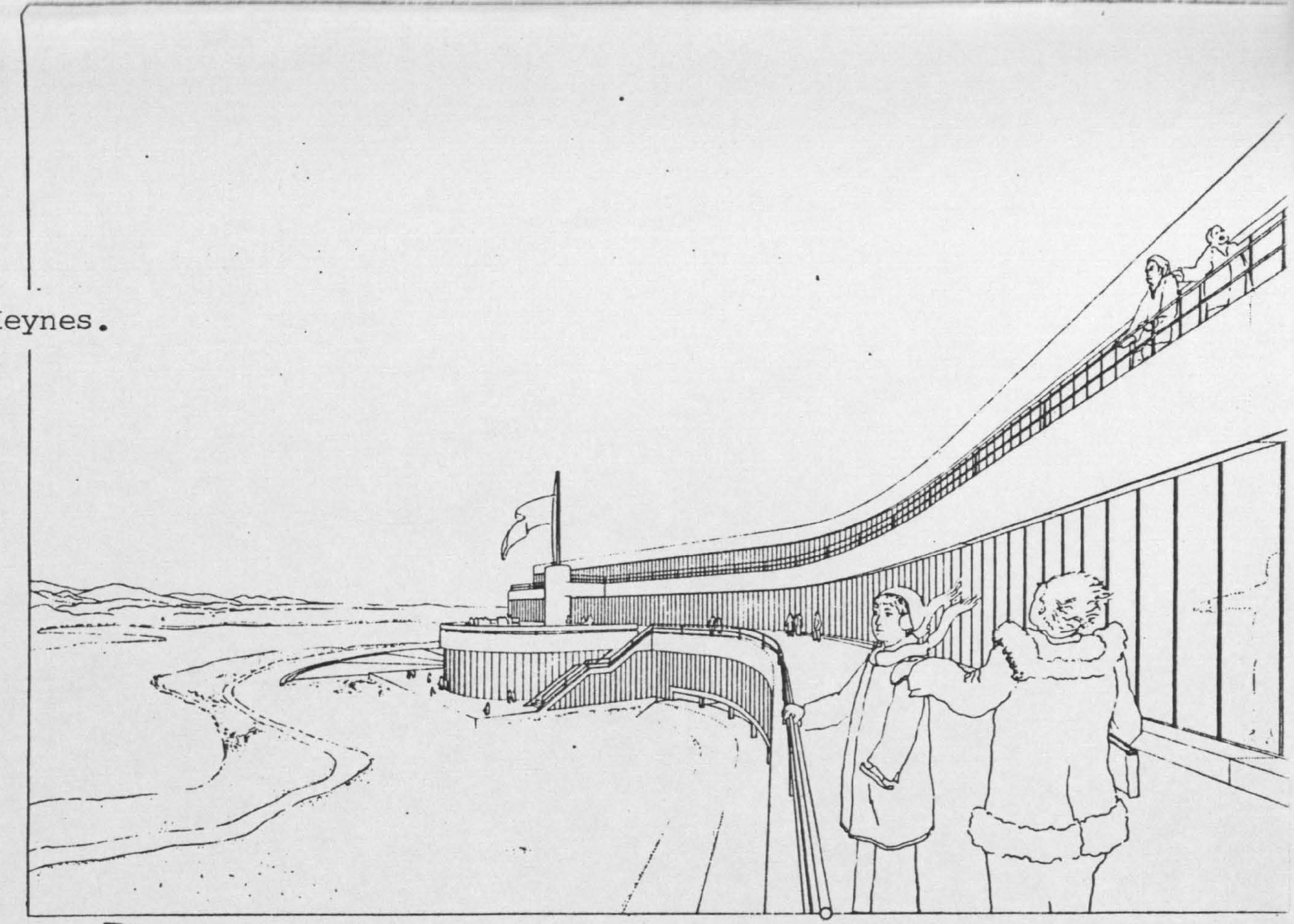
Store, workshop, concourse, offices and restaurant.

Figure. 36, Olivetti Head Quarters, Milton Keynes.



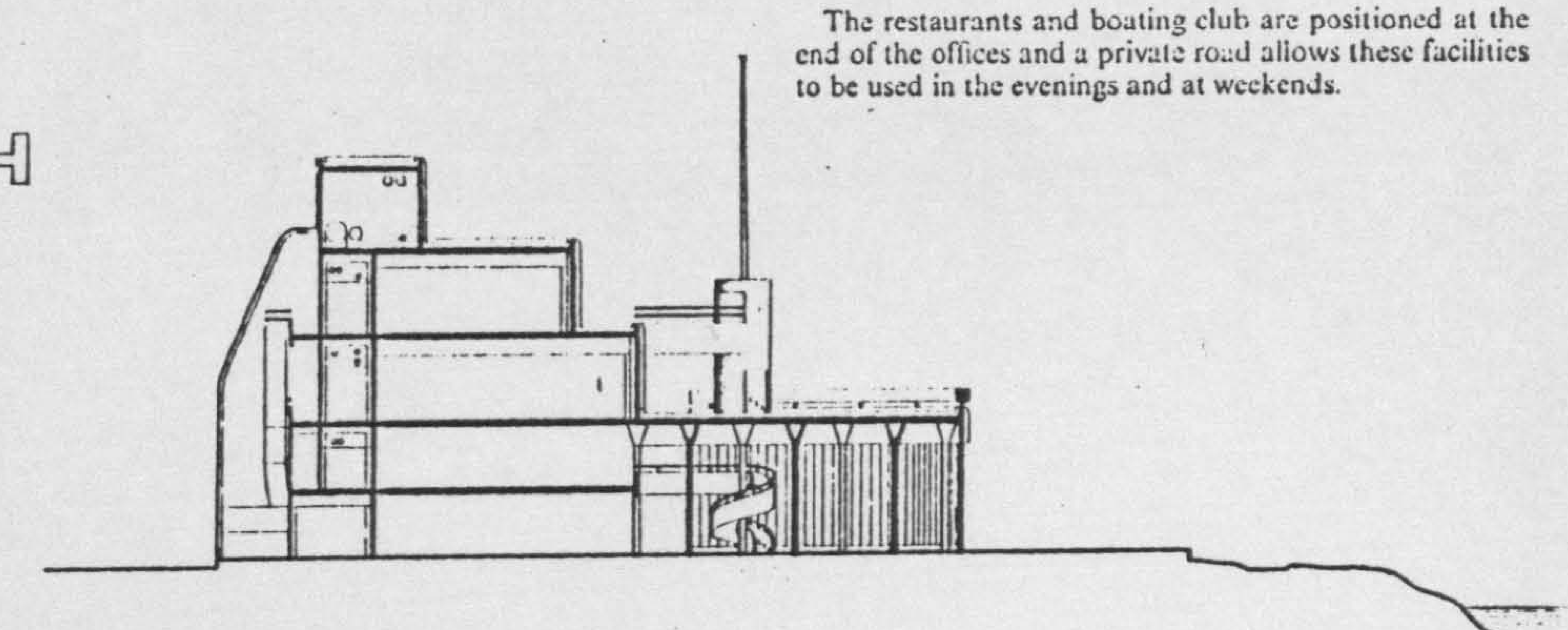
Ground level plan:

Store, basement, car park
Restaurant and terraces.



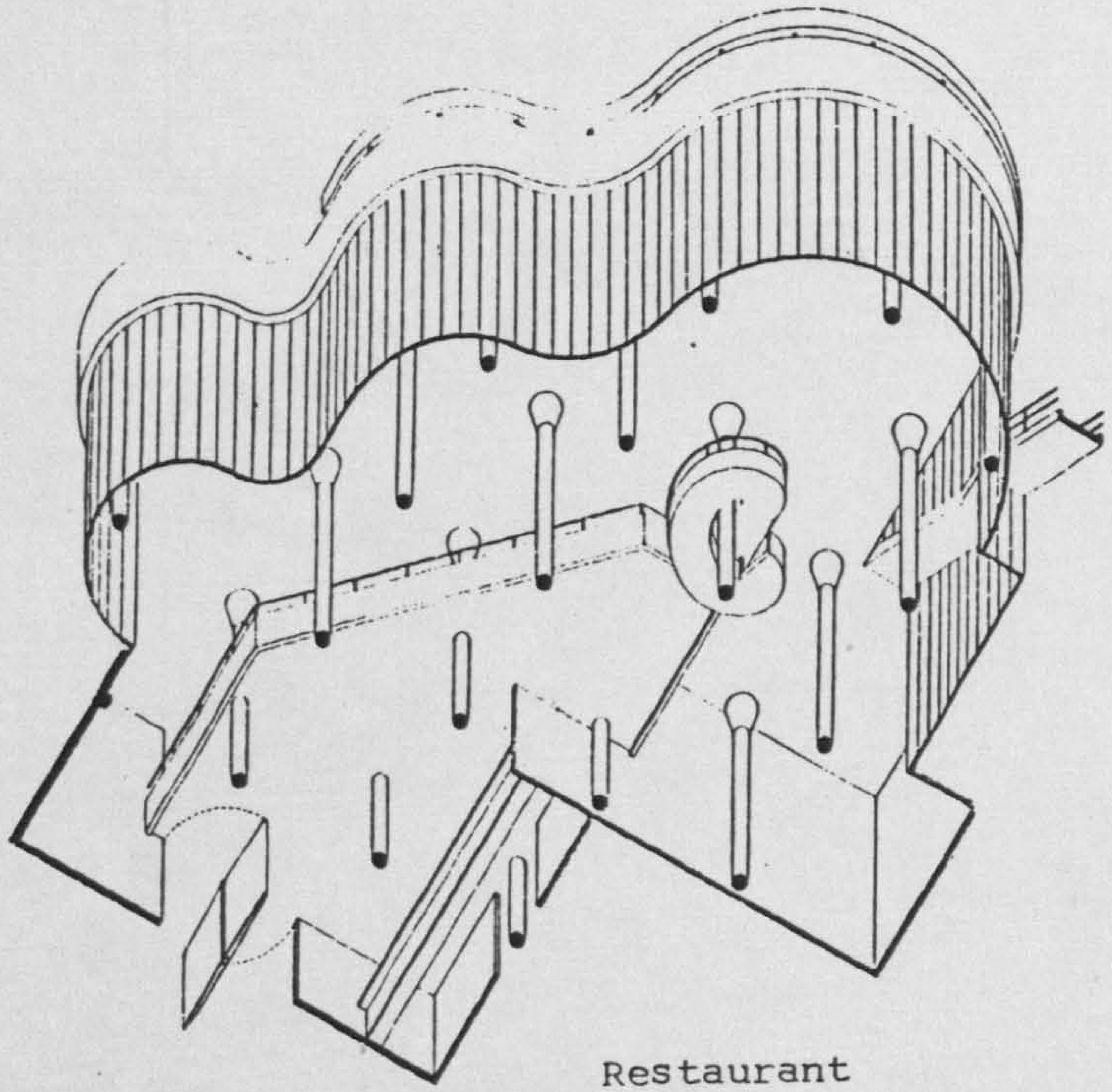
Lakeside terrace

The restaurants and boating club are positioned at the end of the offices and a private road allows these facilities to be used in the evenings and at weekends.

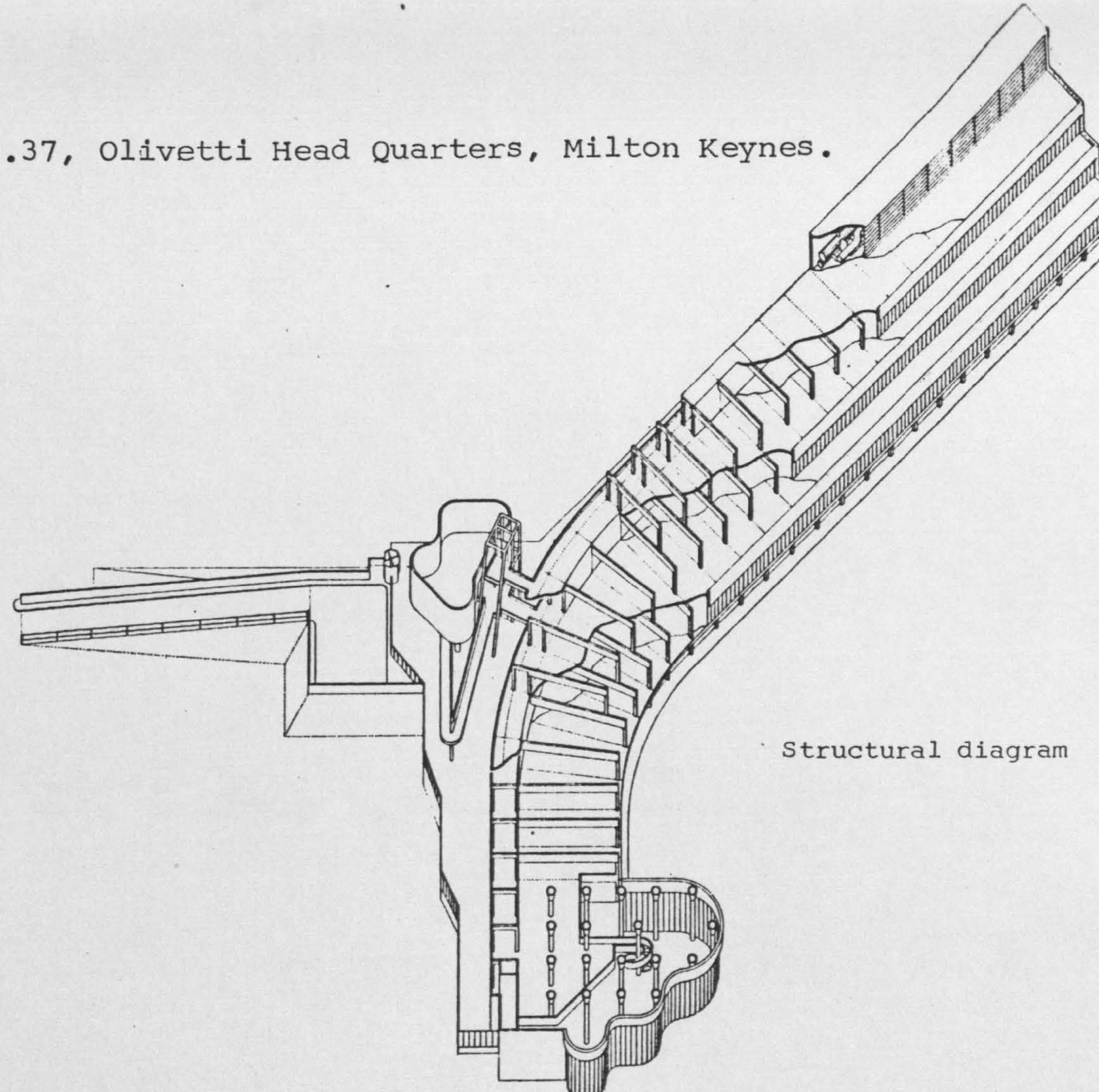


Concourse, offices and restaurant.

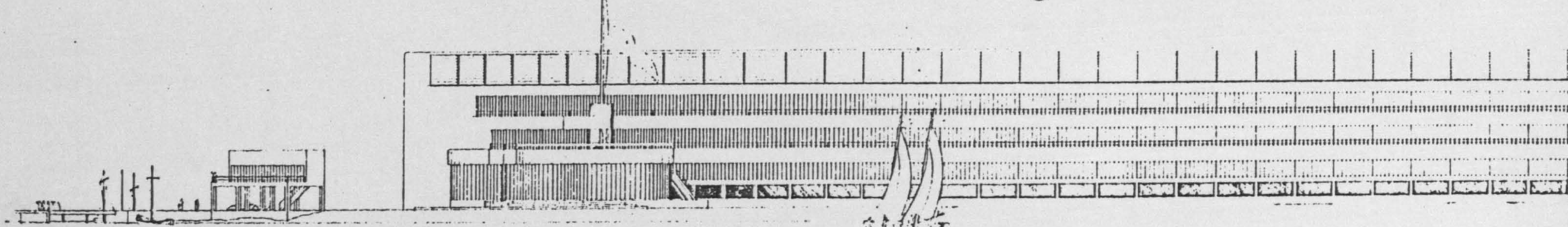
Figure. 3.37, Olivetti Head Quarters, Milton Keynes.



Restaurant



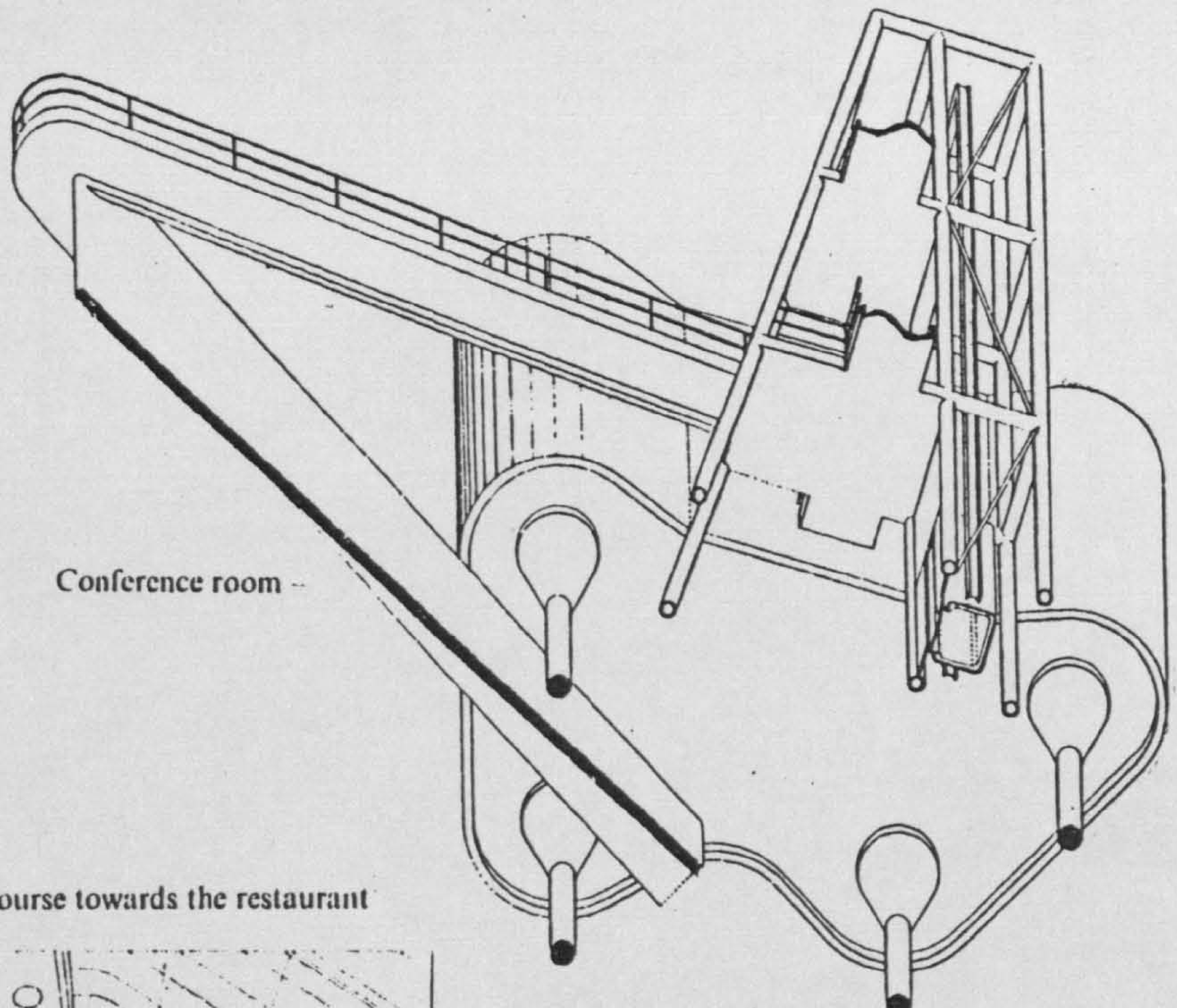
Structural diagram



Elviations, view form the lake.

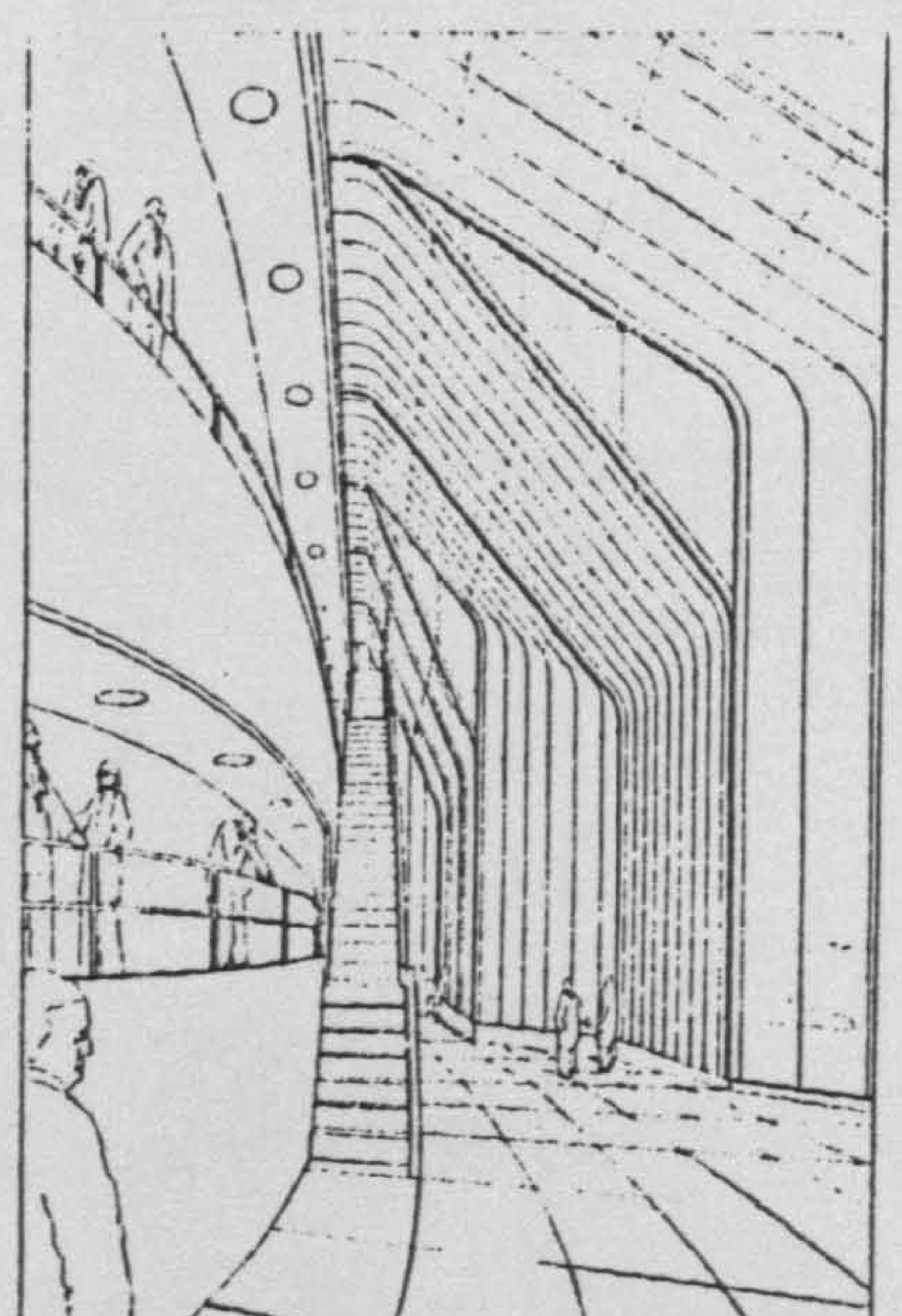
Figure 3.38 Olivetti Head quarters, Milton Keynes, view form the lake (model).

Figure. 3.39, Olivetti Head Quarters, Milton Keynes.

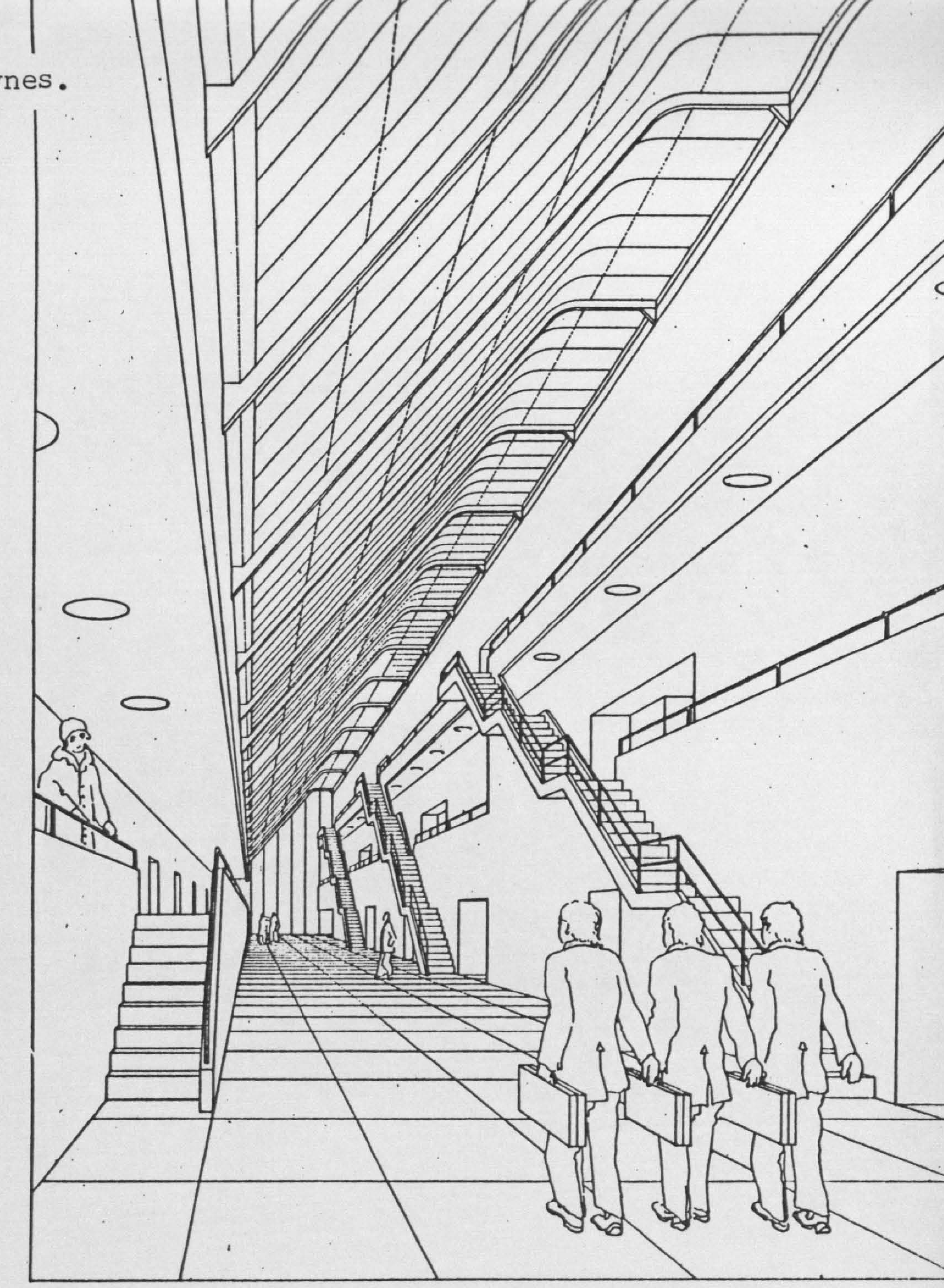


Conference room

Concourse towards the restaurant



The two areas which break out from the constriction of the office section are the conference centre (auditorium) and the social centre (restaurants / recreation). These are planned as free elements with appropriate structure. Both can function independently without being involved in the activities of the offices.



Olivetti Head Quarters, Milton Keynes

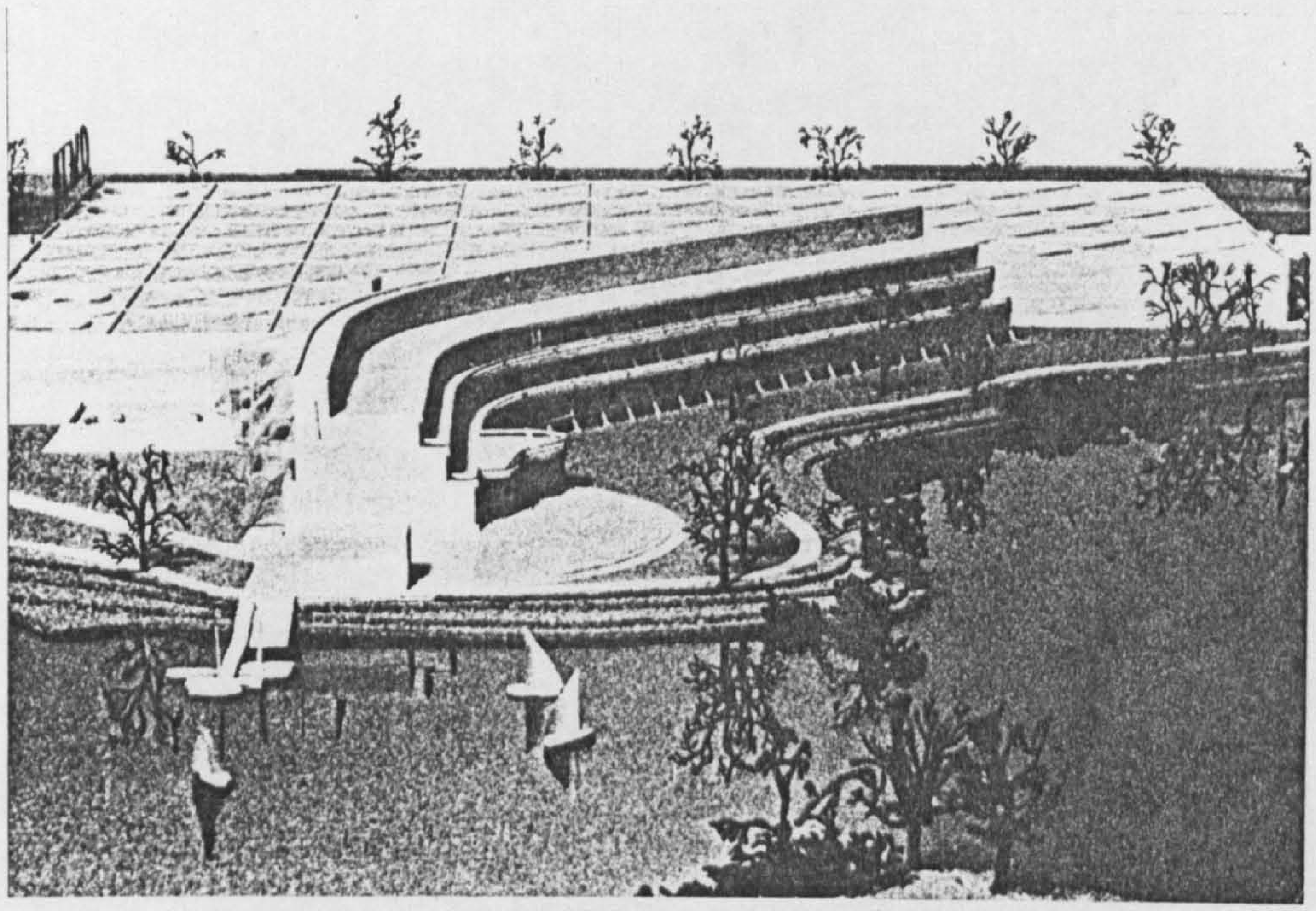


Figure 3.40 View from the lake (model)

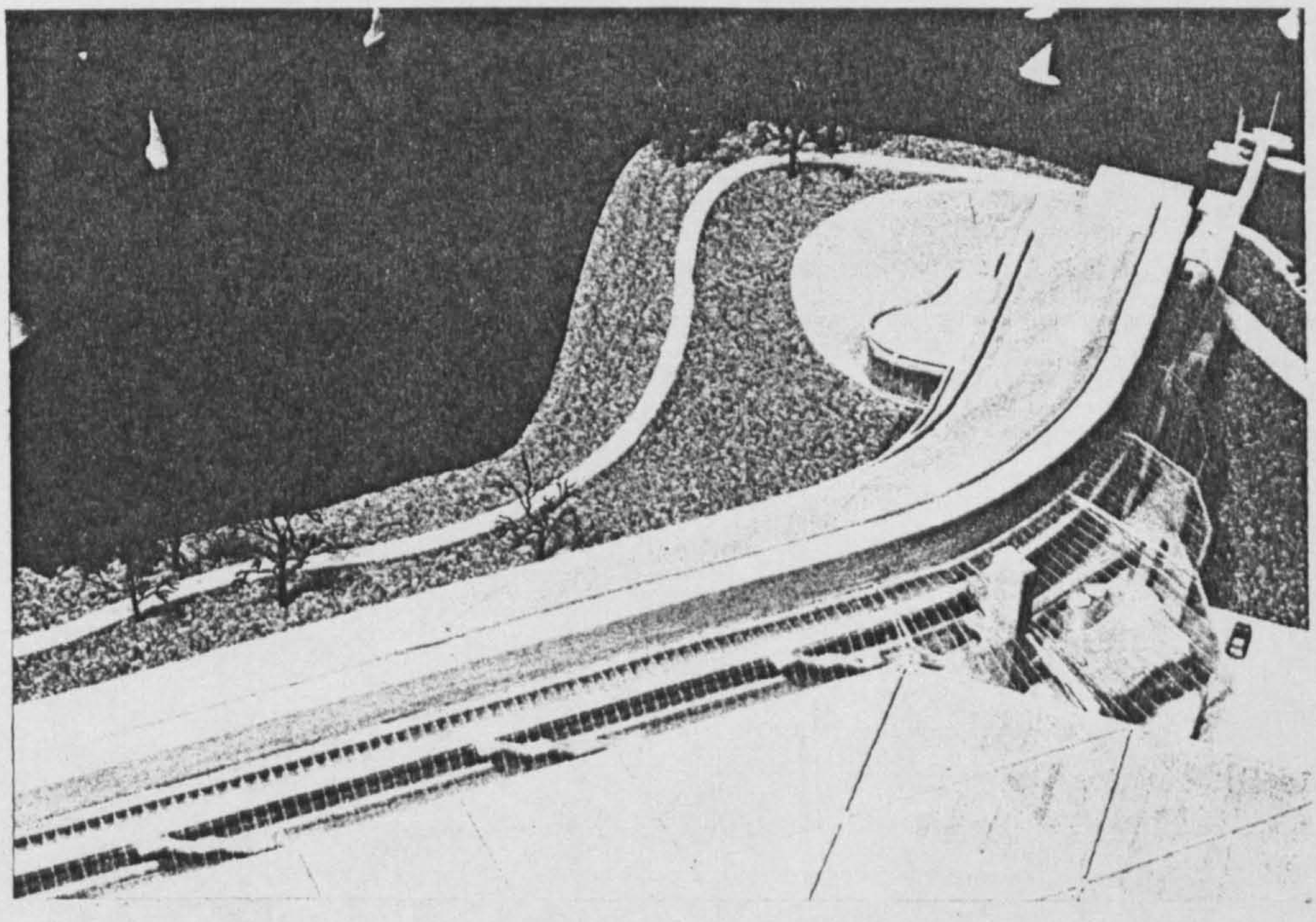
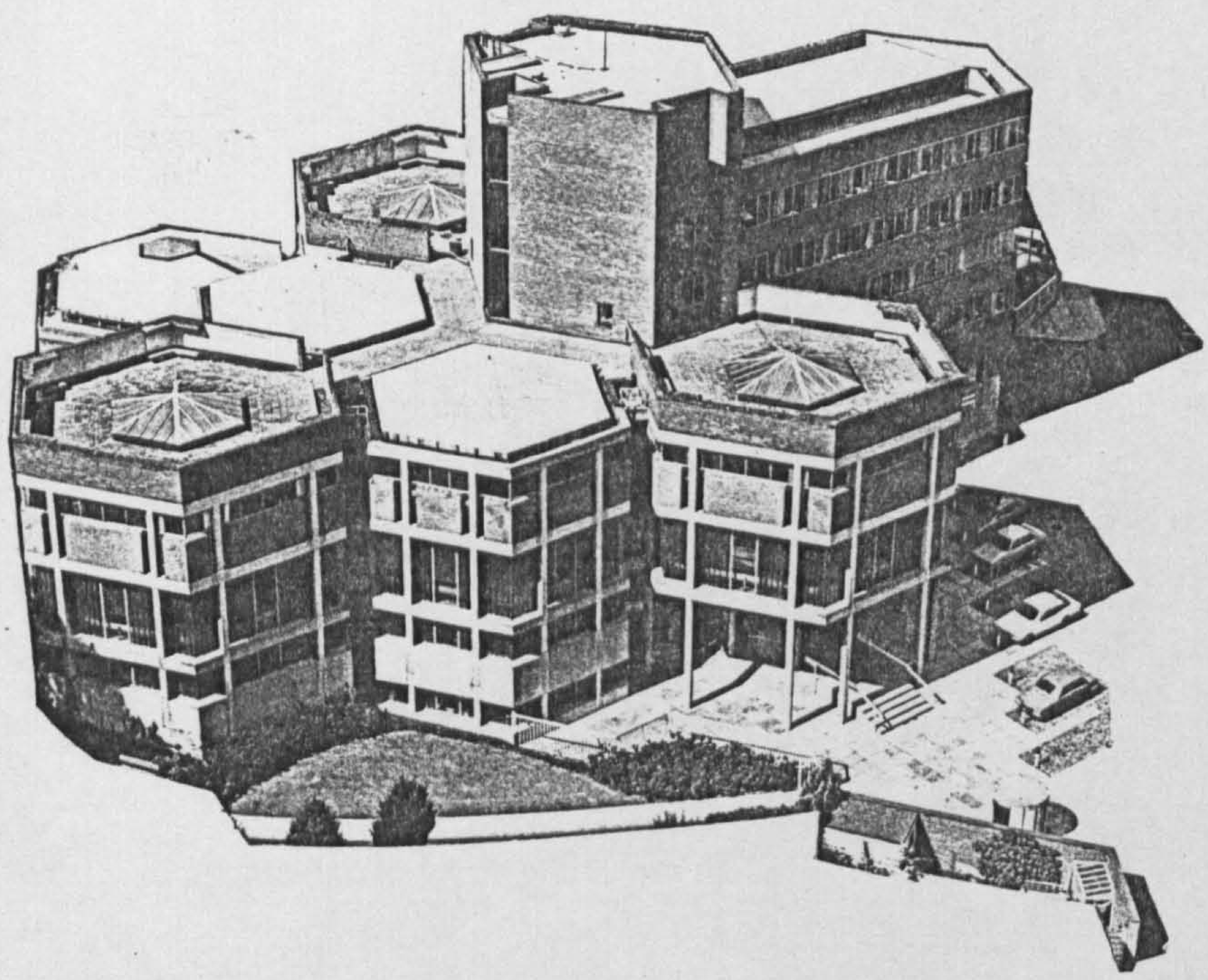
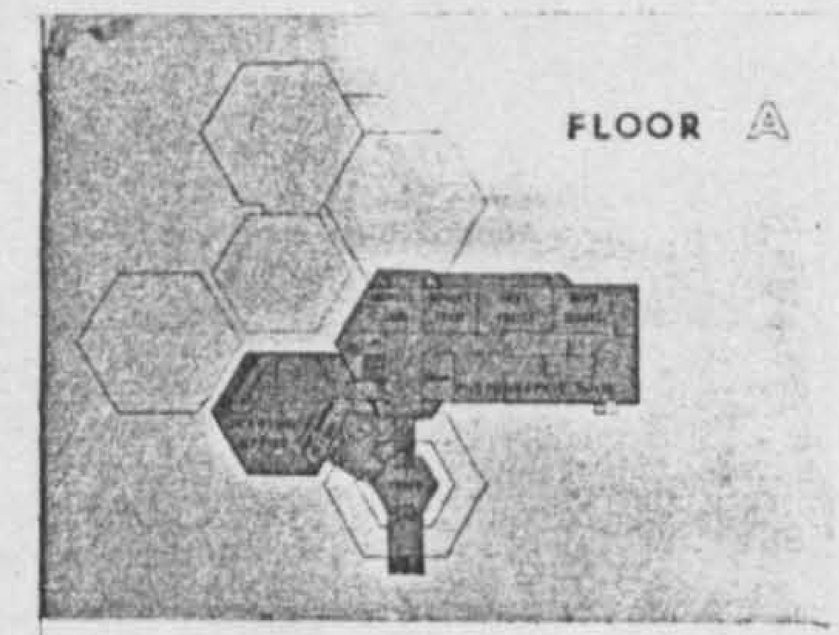


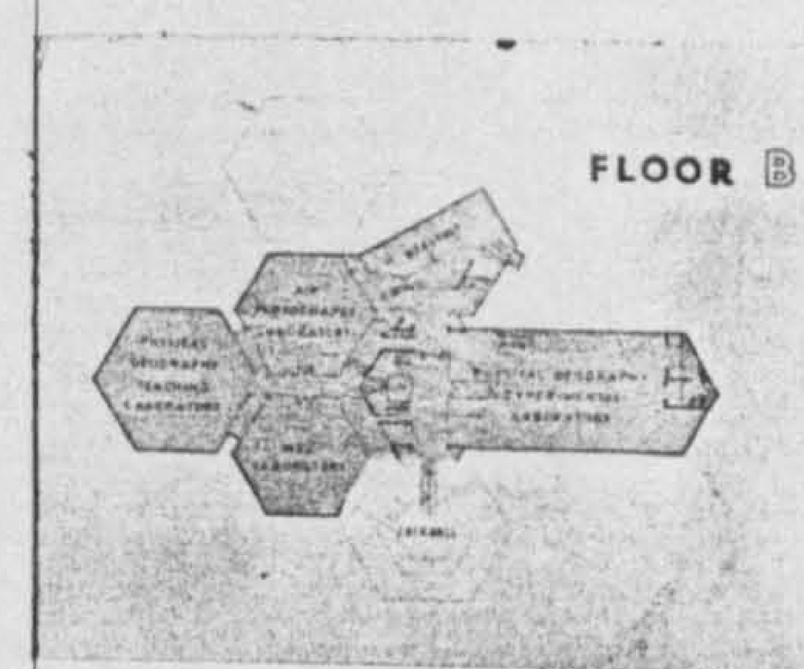
Figure 3.41 (model)

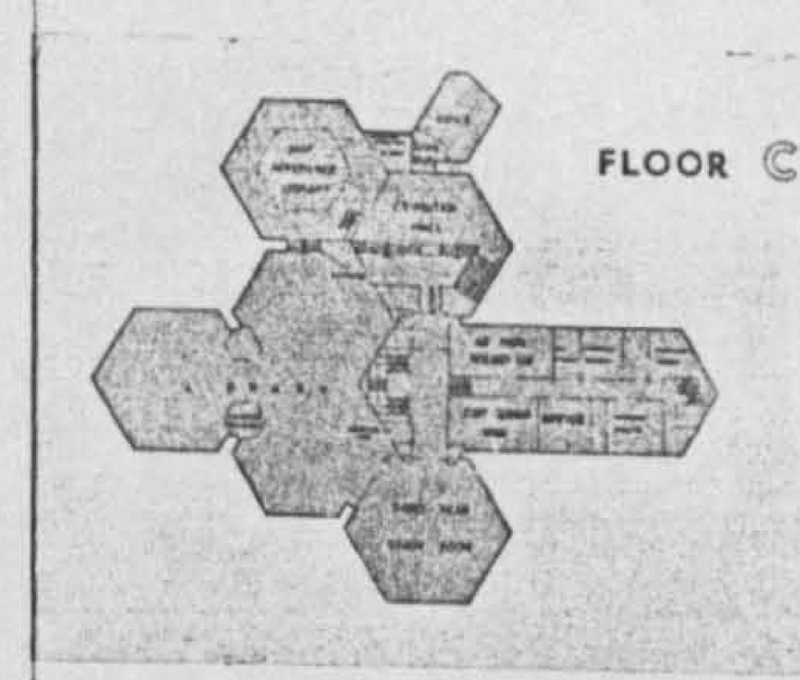
GEOGRAPHY BUILDING

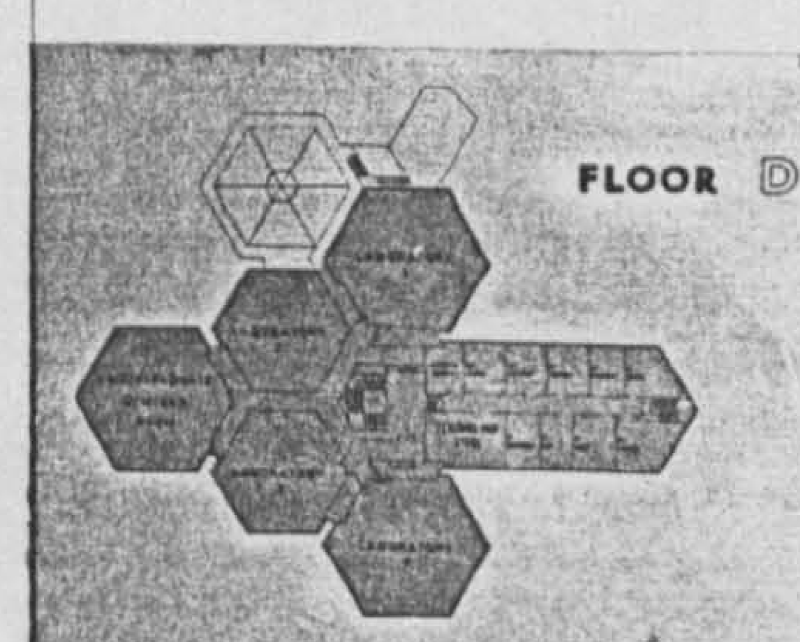
SHEFFIELD UNIVERSITY
William Whitfield Partners

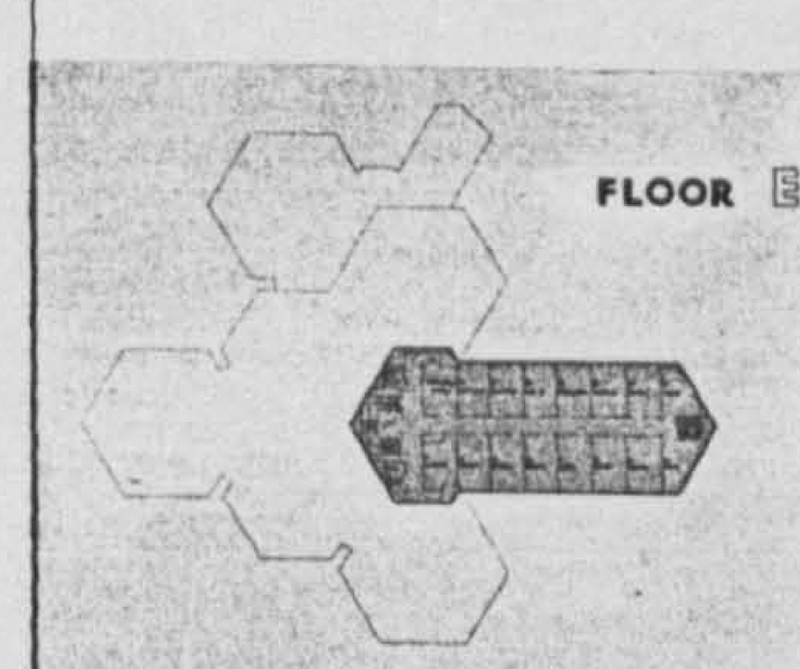


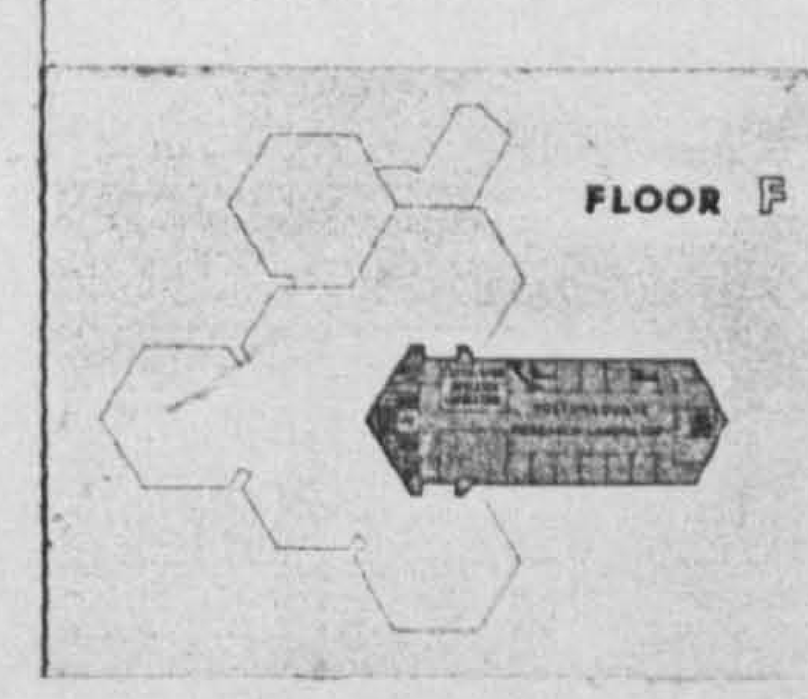












decision to the eventual clients. In this connection the architect did say that they felt there had been some tension between the Department of Geography and the Planning Office, and they felt that there was never any need at any point to go beyond the planning officer to meet the client users, i.e. the Department of Geography.

6.3.2 First Phase Design Process

The basic design decisions were taken by Wm. Whitfield and then discussed with the job architect who would work up the scheme and develop it in accordance with the brief and Mr. Whitfield's initial idea. It was clear from questioning that, at times, if the office was busy Mr. Whitfield could not personally deal with everything and some work would be devolved to a partner or associate, although Mr. Whitfield always felt that he would be available in cases of difficulty. The development phase including meetings with the planning officer took about one year and then other people would be brought in to assist with detail. During this early phase, materials were fixed and this was thought to be one reason for the lack of change in the design scheme. There had been one snag during this period with the design being held up in the case of gevernment cutbacks and started again, but fortunately the same people were available - being two assistant architects and three when the scheme really got going.

There had been one major change in the brief during the held up, the number of lecture theatres being cut from two to one. No technicians were used and it transpired that the office policy was to use architects rather than technicians. One point was made that being a small office the work is generally discussed by everyone in the office and thus is open to criticism, although in an informal way. The question was asked about formal critical assessments on the Building Deign Partnership model but this was not favoured. The office has deliberately kept small varying between six and twelve assistant architects.

The original instructions were mainly a schedule of accommodation and handed over by a client visit to the office at which there was a brief discussion. The first design was done on a visit to the site by Mr. Whitfield who produced some sketches upon his return. At this point the clients are not involved quite deliberately as it is sometimes found that clients will fasten on to a sketch detail which may prove abortive. It was at this stage that materials were decided on but not noted down and the generator was both the site and the planning solution. At this point the U.G.C. formula was brought to bear to see if there was a match between the sketches and the money available. This period of initial development took from 25th June to 30th July, thus the building was hardened in virtually its final form in 35 days allowing time for drafting, printing, etc. It gives a remarkable short gestation period for the design. It was after this initial acceptance by the University that consultants were brought in.

Office Policy

The objectives of the office are to produce good architecture and make a profit. The decision to conscientiously aim at good architecture is one taken quite deliberately and owes much to Mr. Whitfield's development as an individual architect, being responsible for the design and implementation of his own work.

It was said that all jobs were treated the same and that there was no policy change between varying jobs of work, and the service does not vary with different clients. It must be said, and this was confirmed by the office, that they tend to do a fairly small range of important buildings and possibly do not have strong commercial pressures that are found in some other practices. Stress was laid upon the architect, W. Whitfield, who is usually employed because people want his sort of design and are willing to accept the limitations of the office in providing this.

A positive point was made that clients are much more willing to accept ideas with this sort of initial relationship. There is no stated policy of design standard, it is simply to produce work of high quality and this is the constant objective of the office. The question obviously come to mind about the financial implications of this policy and especially the productiveity in terms of turnover when detailed work is clearly extensive in terms of man power, particularly as only qualified architects are employed. The answer was that this could be pressing at times but that the office is not running into any real difficulty again, partially due to the size and prestige of the project upon which it is engaged.

Construction and Standards

The answer given when questions were asked about this area of work was that they are whatever is suitable for the building type and should be the best that can be afforded. This was also the policy with regard to environmental standards. On the question of service to society generally it was seen as being to define who is the eventual client and it transpired that Mr. Whitfield is able to rationalise this by assuming that what is thought to be good by the architect will have a response from the eventual users and will also be recognised as good architecture by the public at large. For technical information the office uses the Barber Index. At present the question of specification is not considered to be perfect. The architect's feel stongly that they should do their own specification and recognised its importance from the point of view of achieving high quality construction in the building. However, things tend to be missed and usually the quanitity surveyor has to fill in the gaps although the office claims to work quite closely with the quantity surveyors. The partners argue that although they do not actually sign each drawing or specification item they do carefully cover this aspect of the work and claim that this is another factor in achieving high quality design in building. It transpired that the geography building was a usual procedure for the office.

6.3.3 Second Stage Design Process

The design team were the architects, quantity surveyors, structural engineers and M. & E. engineers. It was at this point that the final structural system was decided. It is interesting to know that the principals of the firms of consultants were involved rather than assistants although this occurred later when the job got into the detailing stage. When the actual procedure was examined it was seen that there was an initial group of meetings with the structural engineer, Mr. Jack Rodin, and with the quantity surveyors.The other engineers appeared at a later stage which implies that the structural form of the building had been decided before their involvement.

One point worth commenting upon at this stage is that the consultant engineers were B.D.P. who we have seen from one of the practices to be examined in this thesis. Clients were not directly involved at this stage although a duplicated list of the decisions made were sent to the planning officer. It follows more or less the R.I.B.A. plan of work but at this point a major constraint was thought to be the approval in both design and cost terms of the U.G.C. The submission to U.G.C. requires a cost plan and this had to be done with quantity surveyors. At this stage the drawings were to one-eighth of an inch and it was at this time that the job was halted and the lecture theatres removed from the schedule of accommodation.

Tendering Procedures

A job of this size requires six or eight contractors to tender. The practice has no firm criteria expect that enquiries are made in the locality as this usually results in lower tender figures but there is always at least two national contractors invited so that there is a comparison of costs and enquiries were made as to the standard of work previously produced by all the builders on the tender list.

6.3.4 Implementation

A team of three had produced the contract information which was considered to be fairly comprehensive. Apart from the Bill of Quantities structural drawings were sent out to the tenderers; not all the drawings were complete at this stage, some detailing remaining to be completed. This was done by the job architect who took all responsibility from the team. This was a man of 28 who was always directly responsible to a partner. A key factor in the architect's view for achieving a building of high quality was the site engineer, Mr. Eric Efferson, and another factor was the appointment of director, Mr. S. Allan, who worked very closely with the partner in charge. The firm appeared to keep a good team on site, including two surveyors and it was felt that there was a sense of discipline in the arrangements. The firm was Geo Longden & Son Ltd. who are not now in business. The architects visited fortnightly and there were formal site meetings monthly when all decisions of the management team were recorded. The question of specifications was raised again at the point and the inconsistency of British standards was pointed out. Some are good and some are useful in achieving quality standards but others required very ordinary work to comply.

The practice in this case had nominated sub-contractors but it was felt that this was extremely advantageous to the main contractor and we have tended to leave selection to the main contractor from an approved list submitted by us. The job architect made a point of visiting the off-site workshops, yards, etc. where components were being manufactured. A final point was that when decisions were being made the architects always came down on the side of quality, sometimes worrying about the money but assuming that in the long run money would be found where this necessitated extra expenditure.

Table -3.42- shown in diagrammatic form the design process for geography building described earlier.
Photographs of the building illustrated in figure - 3.34- to -3.48-.

Table 3.42

Scheme - C - Geography Building
The analysis of the design operation

Figure 3.43 Geography Building, University of Sheffield. General view from the East, seen from the Arts Tower Building.

Figure 3.44 Geography Building, University of Sheffield. View from the East.

Geography Building, University of Sheffield.

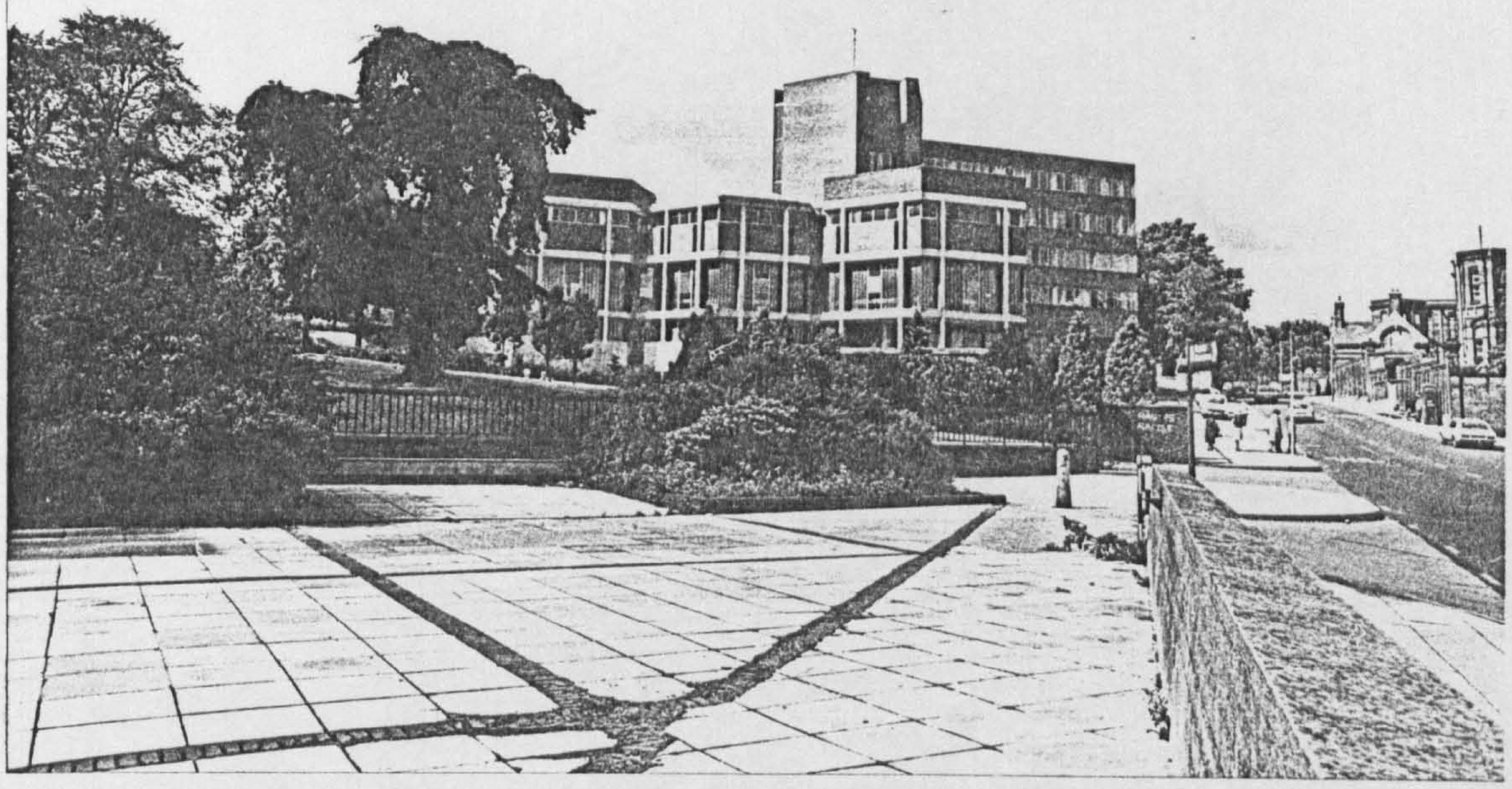


Figure 3.45 View from the North East.

Figure 3.46 View from the West, the main university library and the Arts tower building seen on the right.

Geography Building, University of Sheffield.

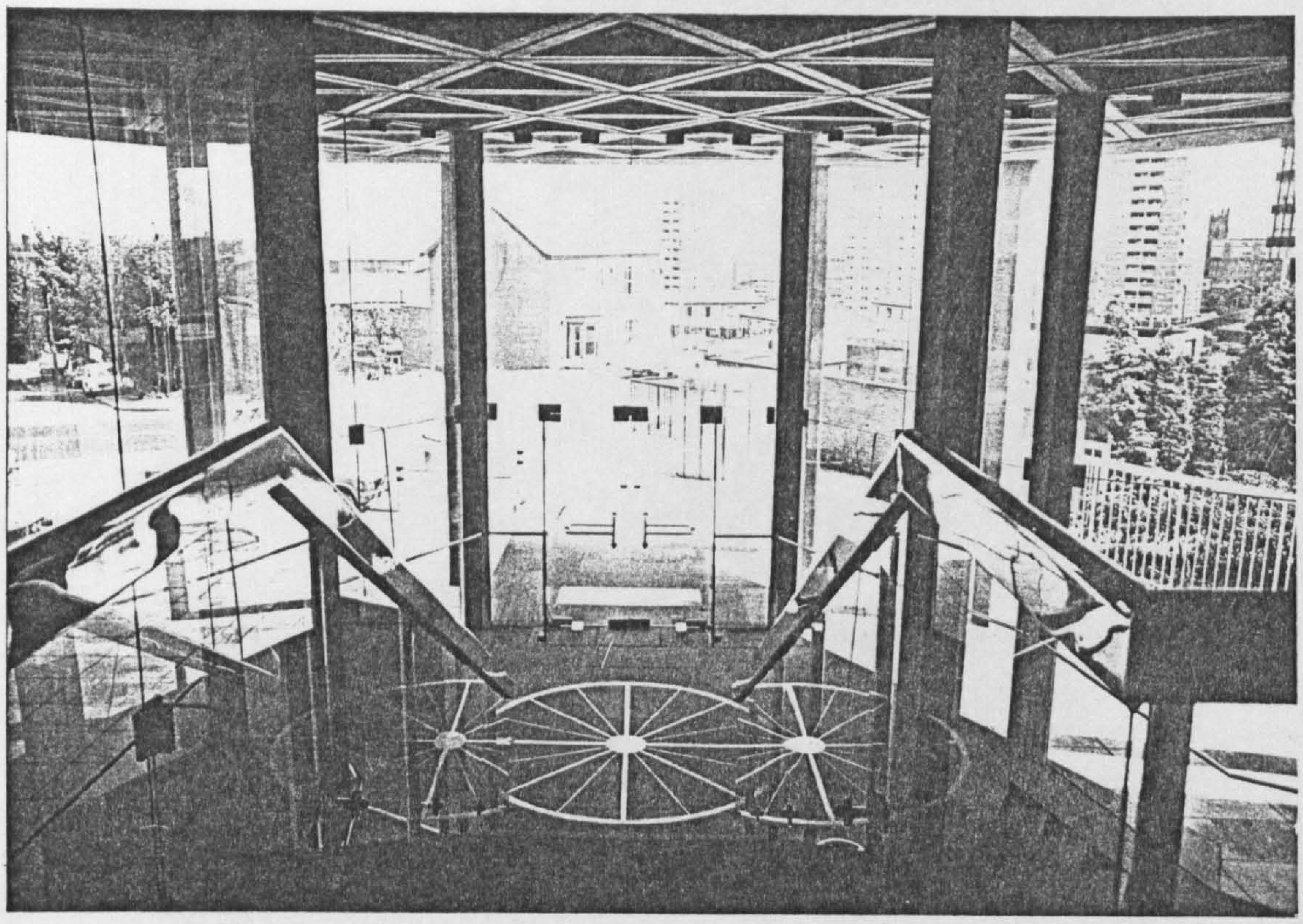


Figure 3.47 Entrance Lobby.

Figure 3.48 The main entrance.

AWARDS FOR GOOD DESIGN IN HOUSING 1974

HIGHLY COMMENDED SCHEME

YORKSHIRE AND HUMBERSIDE
Oak Hill Housing Development, Fitzwilliam Road, Rotherham

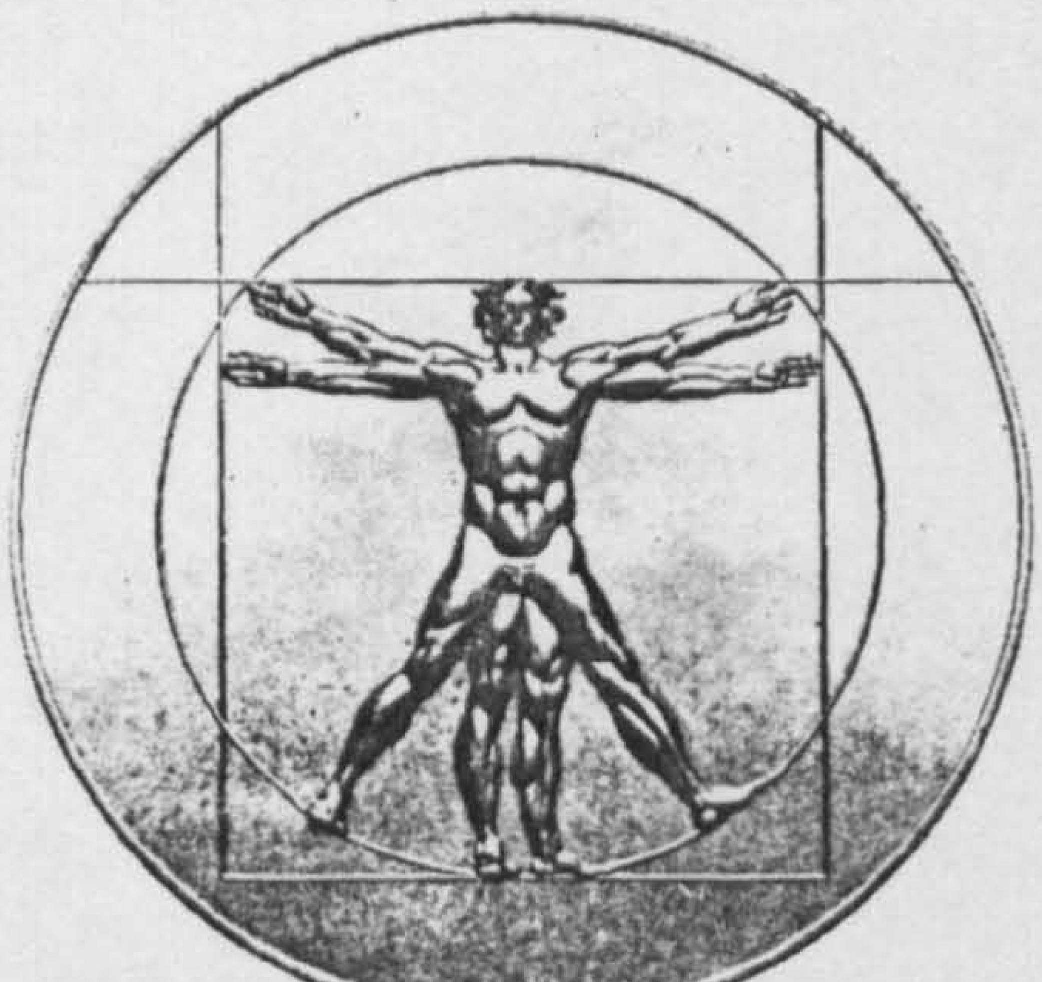
607 flats and maisonettes
Designed by:
Gillinson Barnett & Partners

Commissioned by:
Rotherham County Borough Council (now part of Rotherham Metropolitan District Council)
Built by:
Shepherd Construction Ltd

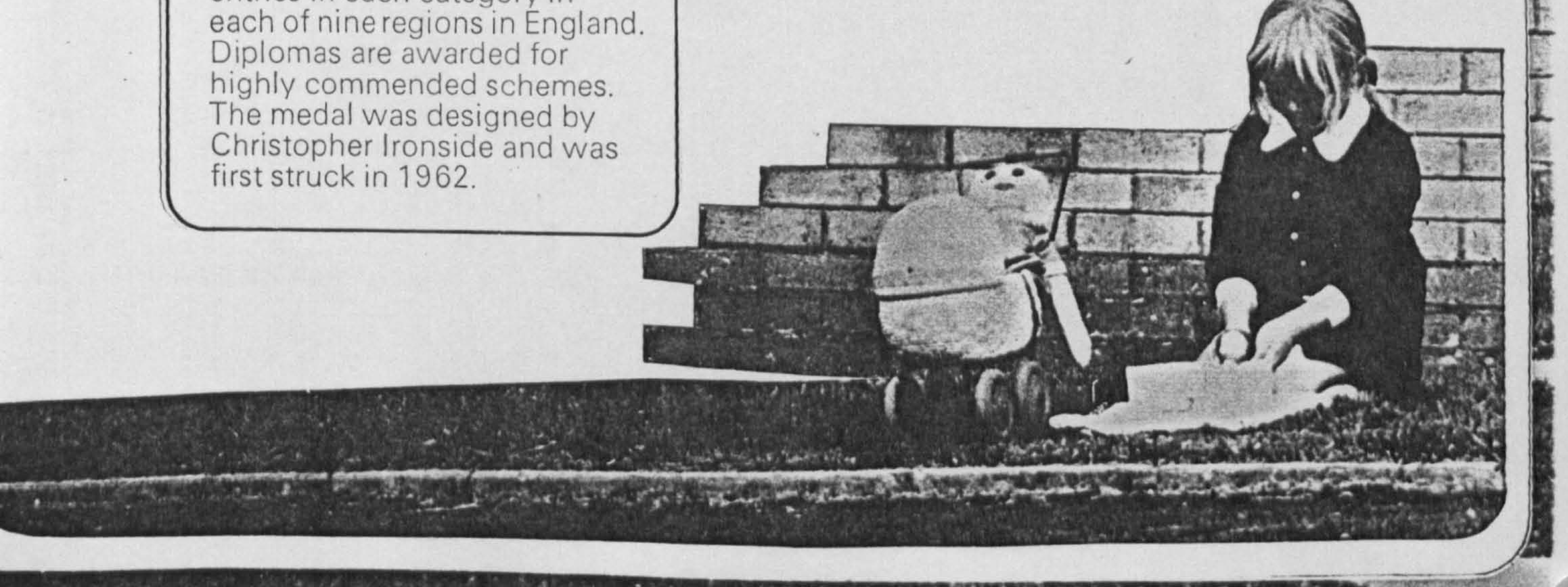
'The scheme is well related to the valley below and to the surrounding area. The slope of the site has been skilfully used to link deck levels with the ground at different points in the layout by the lift, stairs and ramps. The enclosure of space throughout the scheme has been well considered, the relationship of height to space being consistently good, and the varying heights and treatment of the buildings giving each court its own individuality. A community centre forms an integral part of the design at the heart of the scheme.

'The quality of building is of a high order, a good brick being used throughout, together with a consistently high standard of exposed aggregate concrete elements. It has been well detailed, with consistency and care in choice of materials being apparent right through to the paintwork. Sufficient landscaping has been carried out to indicate a high quality of both planting and maintenance.

'It was noted that management had located families with children at ground level in all cases, their dwellings having enclosed private gardens. The assessors felt that given the need to create high-density mixed development in a very urban setting, this scheme had achieved a notable success.'



Under the Good Design in Housing Awards Scheme, medals are awarded to winning entries in each category in each of nine regions in England. Diplomas are awarded for highly commended schemes. The medal was designed by Christopher Ironside and was first struck in 1962.



6.4.D Scheme - D -

Oak Hill Housing Development

607 Flats and Maisonettes - Rotherham

Collinson Barnett & Partners - Leeds -

Award for good design in Housing Scheme 1974. -the DOE-

This scheme offered several advantages. It dealt with housing which it was suspected posed problems of achieving high quality design which were different to those applicable to other building types. It was local and thus afforded perhaps more possibilities of following up the design decision and it was for local authority which enables us to compare procedure with that for the Town Hall at Sunderland Scheme -6.E- for a similar type of authority.

6.4.1 Pre-design Activities

The planning officer, who was in full control of planning matters, produced the original planning brief which suggested the density and indicated the overall planning concept for the area. This included a suggestion as to the massing of the building in relation to the site and asked for six facade facing a noisy road to serve as a shield against traffic noise for the rest of the development. Table -3.49-gives the form of instruction and methods used. This might, at first though, be inhibiting to the architects

Form of instruction	Planning brief as a basic guide line to what sort of development they look for.
How conveyed	Planning officer - brief from the housing manager, who goes between the architect and committee, and feed back information.
Action taken by architects	To produce how the building should look - without checking to see if the site will permit it.
Major strategic objectives	Sketches plan to produce an early stage decision, on how the building looks to produce better work for recognition.
Attitude towards quality at this stage	Cost control as an early vital decision.
The form of brief	Sketches - cost planning discussion.

Table - 3.50- Form of Instruction.

but the partner in charge indicated that he thought that this was of positive help. It was a good example of a constr ctive brief prepared by planners with a feel for the problem and willing to understand the design constraints faced by the architects. He stated that in his view if all planning briefs were of this category a good deal of tension would be taken out of the relationship between planners and architects as well as being important in architectural work generally. It was unfortunately rare to find work of this sort.

6.4.2 Design Process First Stage -

Team Design

The structure of the office organisation consist of ten partners, and the same number of associates. Each partner tends to work on a particular type of building work. In this particular job all the housing schemes tend to be designed by the partner responsible for housing, the job partner and his associate kept a close control over the design right from the inception stages, keeping responsibility for the job all the way to completion stages.

Design Conception

The architect partner and his associate started the job by doing sketches on how the building would look like as an attempt to produce ideas without checking to see if the site will permit that. Then they worked together on the plans. This is regarded as an early vital decision for the job.

> "We are trying to fit something into a particular site, instead of just filling it with buildings, we have to produce something better than averge to achieve recognition, as the only way we can hope to get further work."

6.4.3. Design Process - Second Stage -

Team Design

Four people worked on the design development and detail work at this stage. The scheme involved sixty persons from all levels of work.

Associate Architect: Has the responsibility all the way through as a link man and authority dealing with the committee, the site visites and the major decisions over the job.

Others are the Senior architect and Senior Technician and Assistant Technician. The assistants have much more scope over the work and as much responsibility as possible, working mostly on their own, but any major decision goes to the associate architect. All the work is monitored, and report back to the job associate. There has been direct contact between the assistants working on the job and the officers involved. Regular visits to the site by the design team help to stimulate ideas for the detailed design. The team included two engineers/ one a (Partner) /who worked on the project.

Cost Control: Time sheets circulated by all the staff, and a computer data as a methods of costing are employed to control spending. This prevents the time that can be devised to design going beyond a point of which a profit can not be made.

Tender Stage: The office took the initiative of giving the client a list of contractors in which they had confidence. This is based on experience on the use of their services. This is a sensitive area as public money usually determines open tendering but was resolved by the architects insisting on their list being used.

Site Visits: Weekly visits to the site with direct inspection from the architect and his team with site meeting, and visits to materials factories. The partner in charge considered this to be of importance in achieving high standards of workmanship.

Attitude and Policy: Service to the client

- Full service to every job and every client.
- Good quality, needs good clients.
- The client must be informed with every step.
- Continue relation with existing client through small jobs.
- Cost control, introduce methods of costing and time sheet.

Design Standards

To develop a certain amount of standard detailing to produce good architecture, by doing so, the advantage of doing a job economically from the office point of view.

Construction Standards:

- very careful not to take risks, if the job requires heavy structure we don't try to escape.
- Detail every thing.

Environmental Standards:

Study the requirement on the site.

Productivity of office:

Participated in small job occasionally because it keeps you in touch with the progressive..

Information Standards:

- Library- two librarians - slide libraries - office manual.

Table -3.50- shown in diagrammatic form, the design process for Oak Hill Housing, and indicates the relationships, design team tasks and responsibilities and people involved. Photographs of the building illustrated in figure -3.51- to -3.60-.

Scheme -D- Oak Hill Housing Development
The analysis of the design operation

Design Stages	Approving authority	Engineer mechanical	Engineer electrical	Engineer structure	Quantity surveyer	Client organisation	Architect partner	Architect associate	Architect senior	Technicians
	EXTERNAL						ENTERNAL			
Pre design activities						Planning brief	Contribute to meeting establish requirement			
First stage							Sketches to produce ideas for fixed requirements			
							Work on plans			
Second stage							Design development			
								full responsibility co-ordinator committee meeting		
		Detail work		Discuss structure form				major decisions	advanced sketches	
			Contribute to meetings Development		cost plan			list of decisions after meeting	contribute to meeting	
			final details		final cost plan				Working drawing	
			Preparation of final documents						final documents	

Figure 3.51 Oak Hill Housing, View from the main entrance facing the valley below.

Figure 3.52 Oak Hill Housing. Deck level street used to link the maisonettes with the ground level.

Oak Hill Housing.

Figure 3.53 View from the main street facing the valley below.

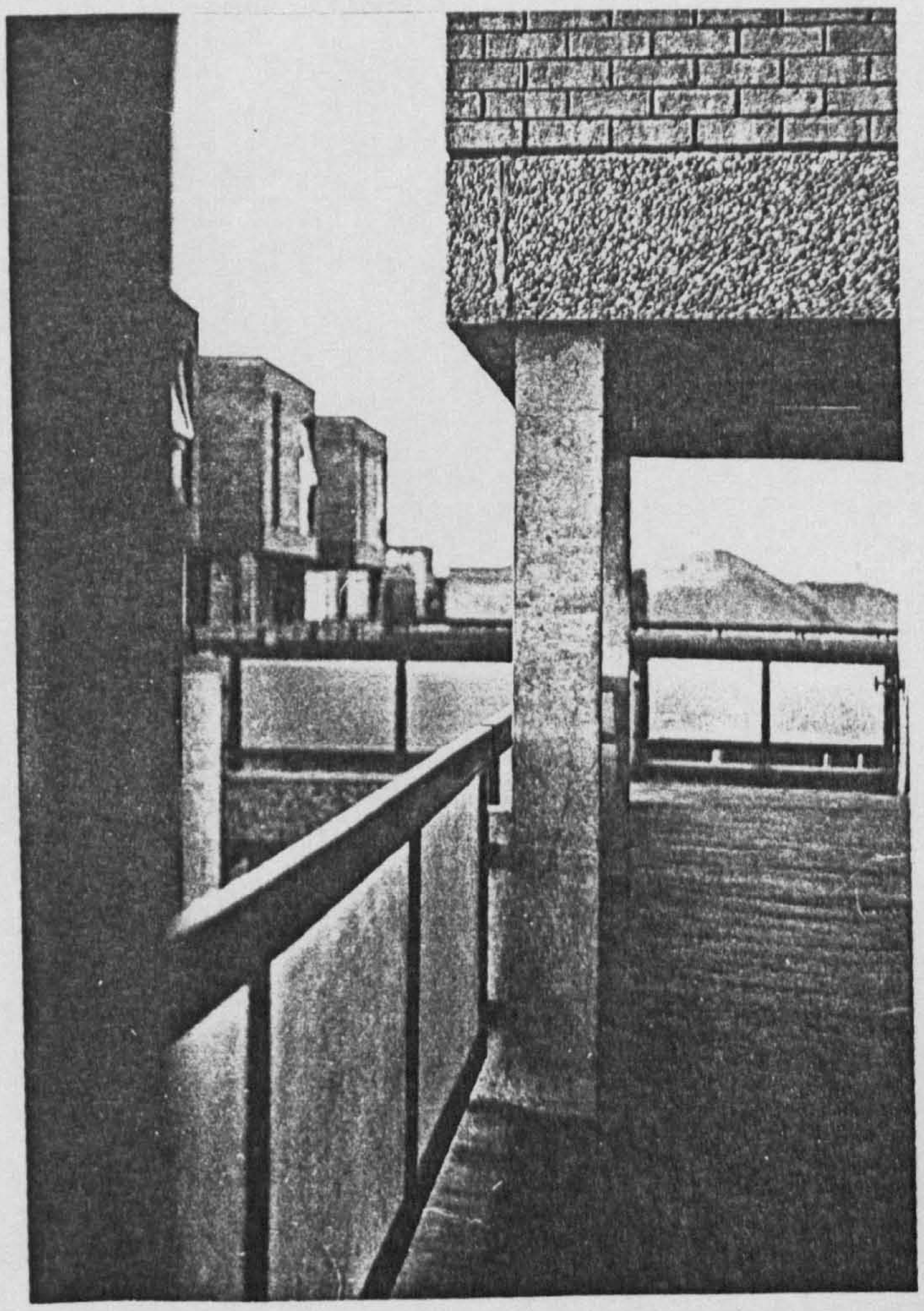


Figure 3.54
brick being used with the exposed aggregate concrete elements.

Oak Hill Housing.

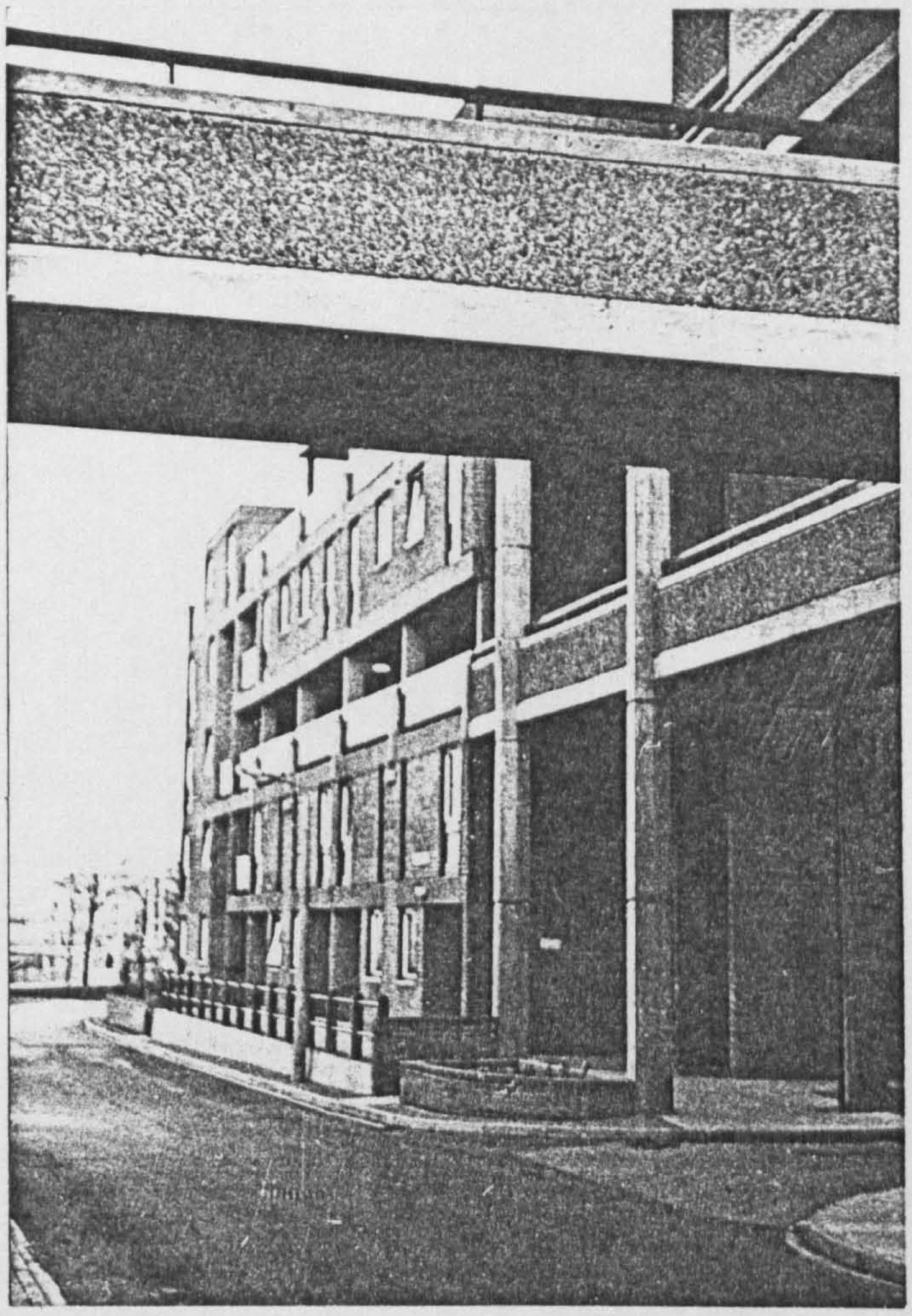
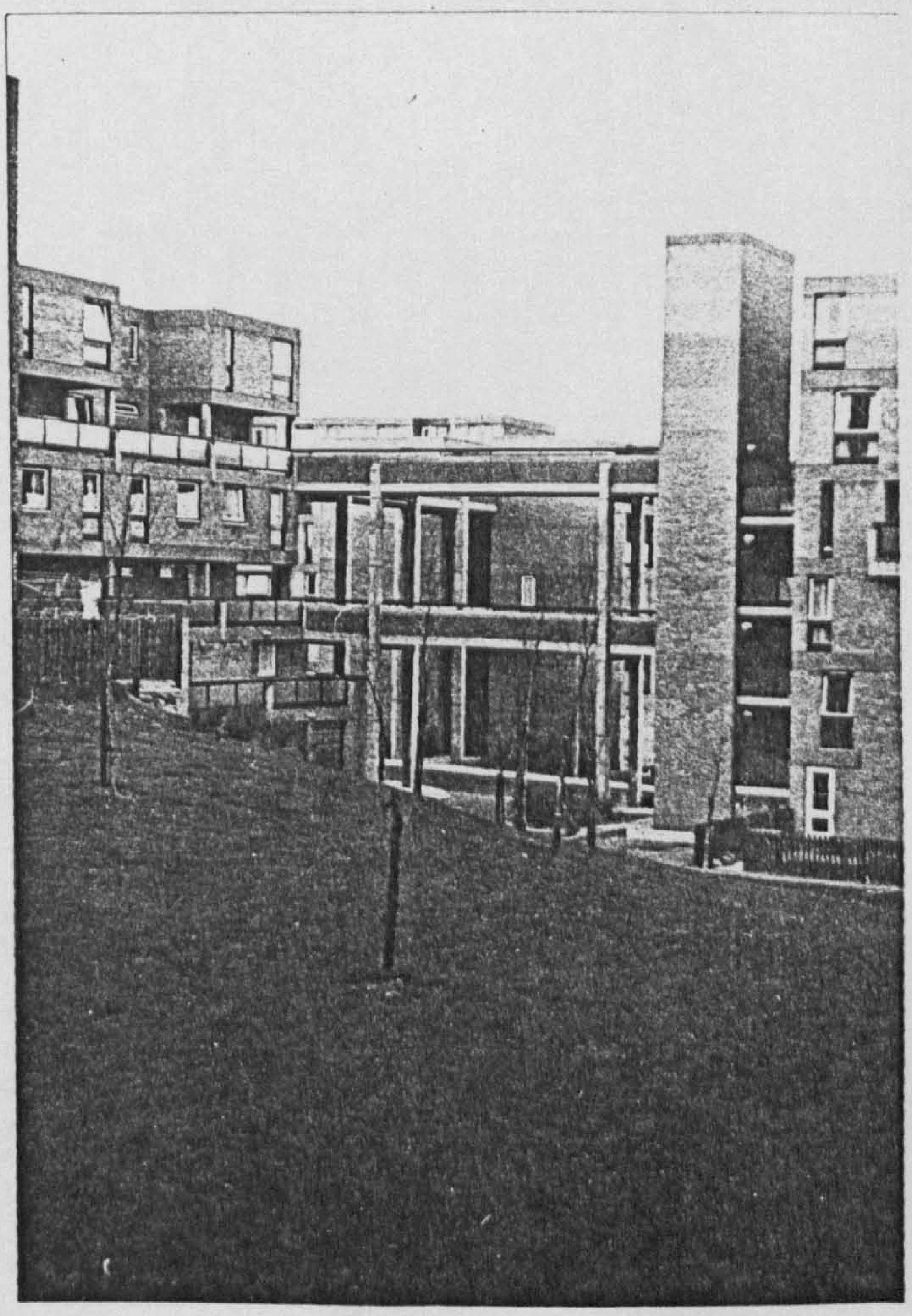


Figure 3.55

Figure 3.56



The slope of the site has been used to link deck levels with the ground at different point in the layout by the lift stairs and ramps.

Oak Hill Housing.

Figure 3.57 Ramp used to link two different levels in the layout.

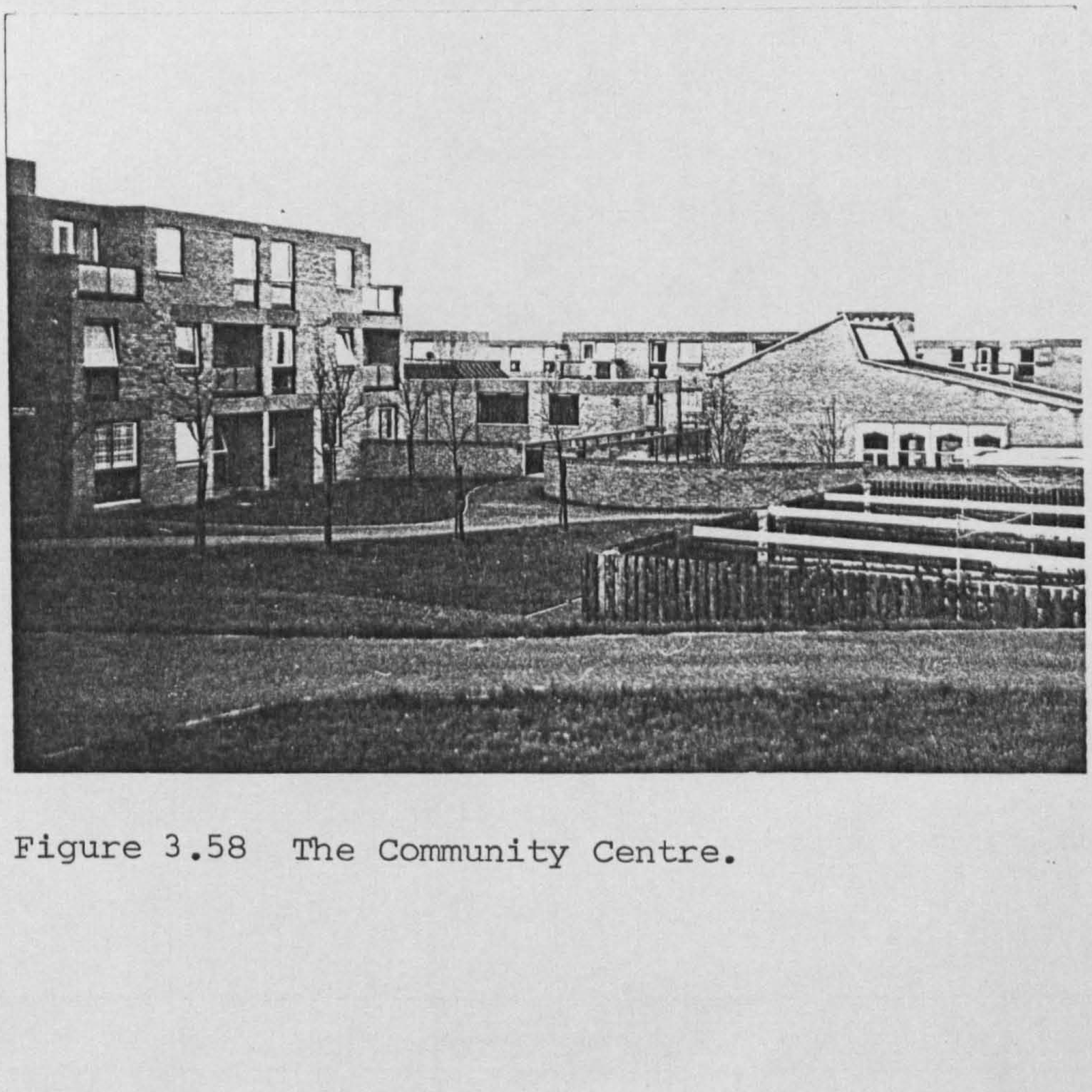


Figure 3.58 The Community Centre.

Oak Hill Housing.

Figure 3.59

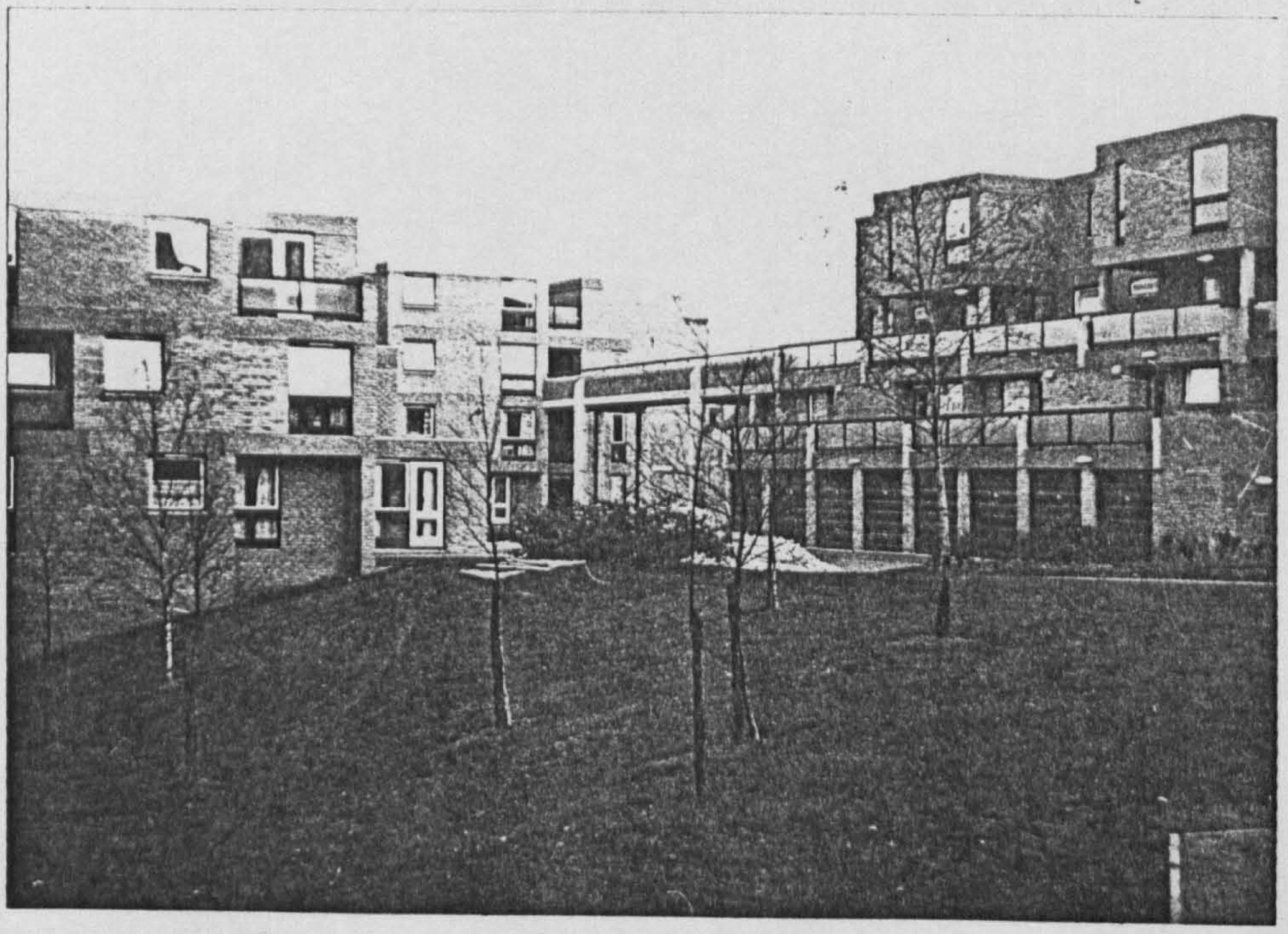
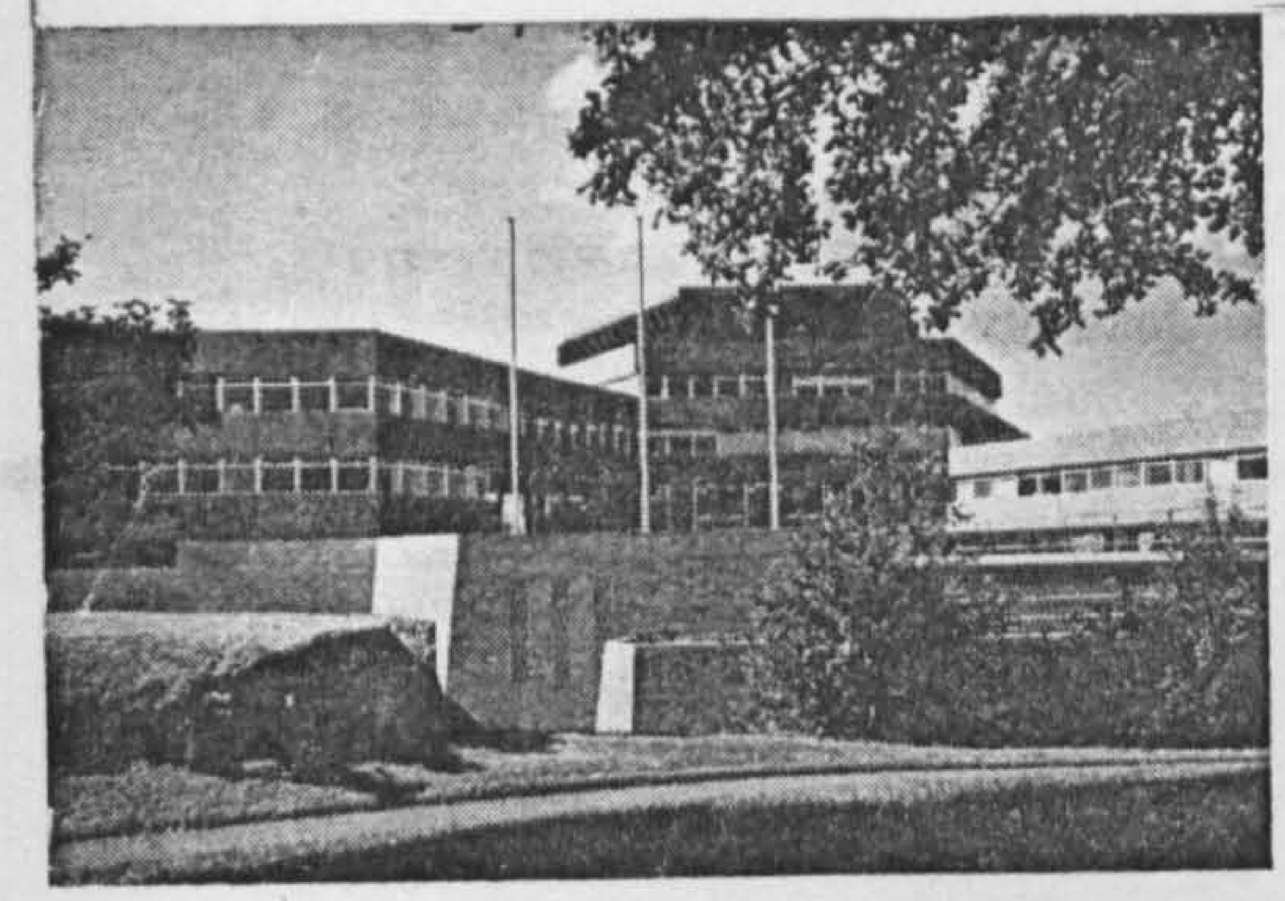
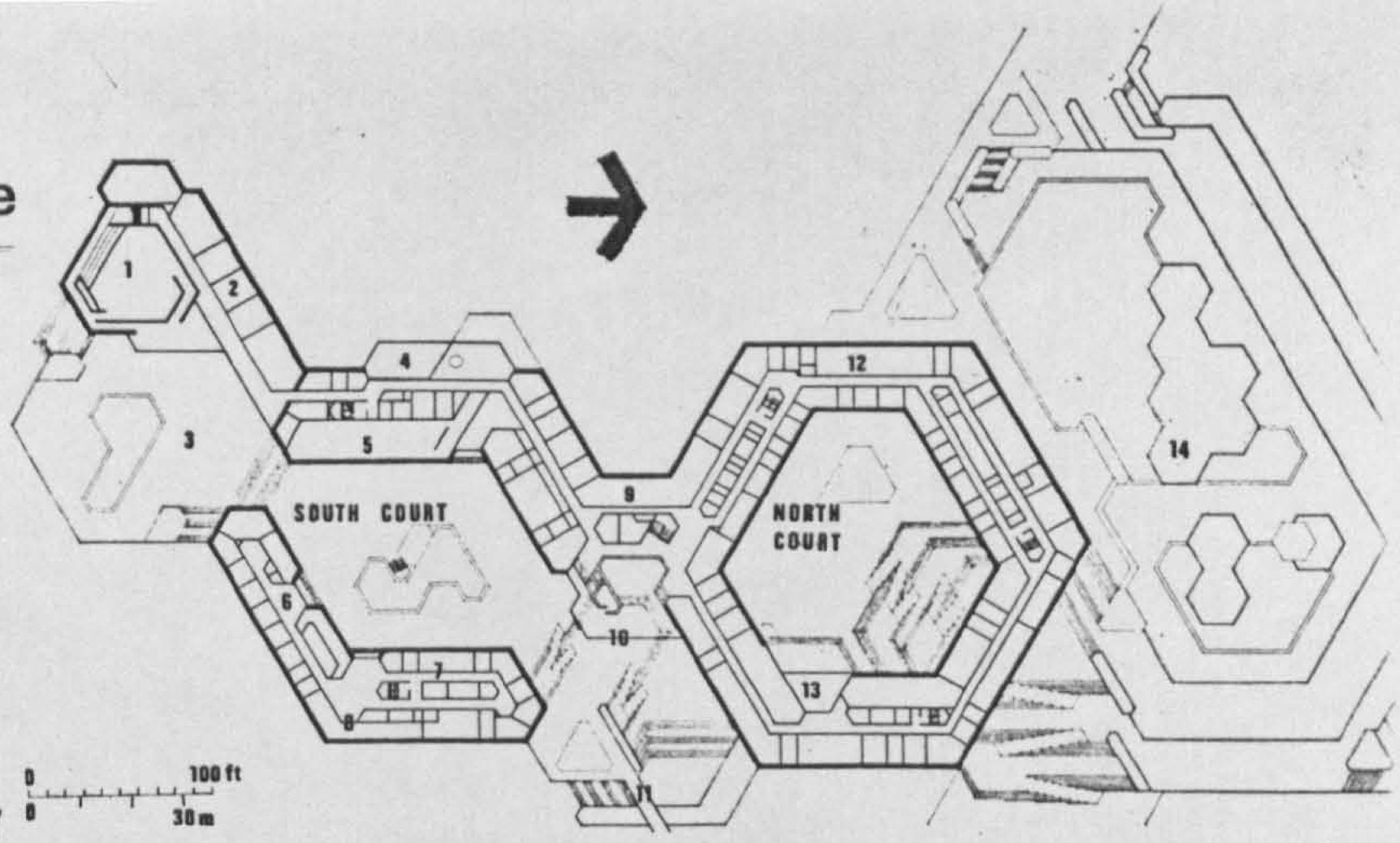


Figure 3.60
attractive environment has been established by sufficient landscaping and planting.

Sunderland Civic Centre





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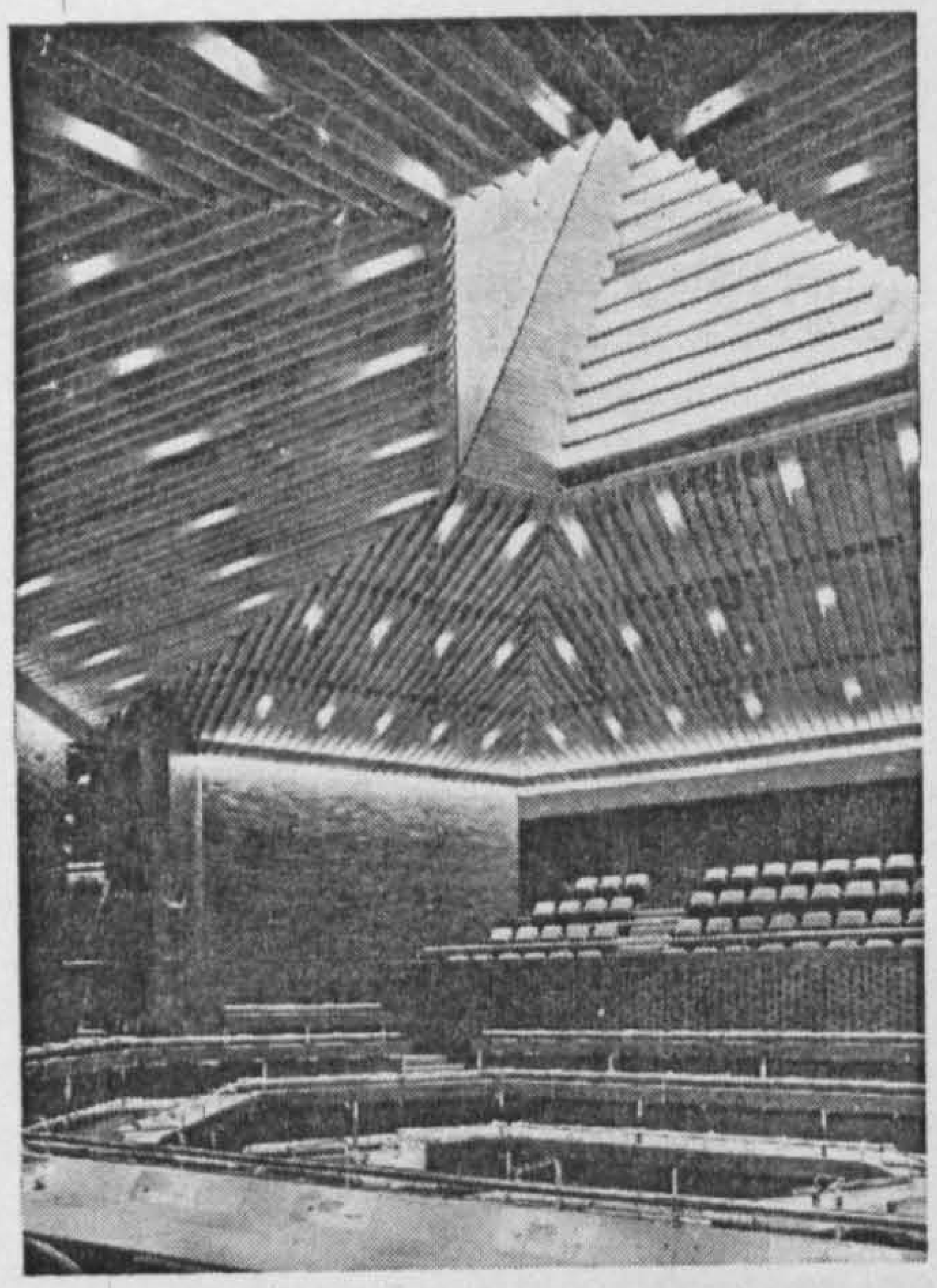
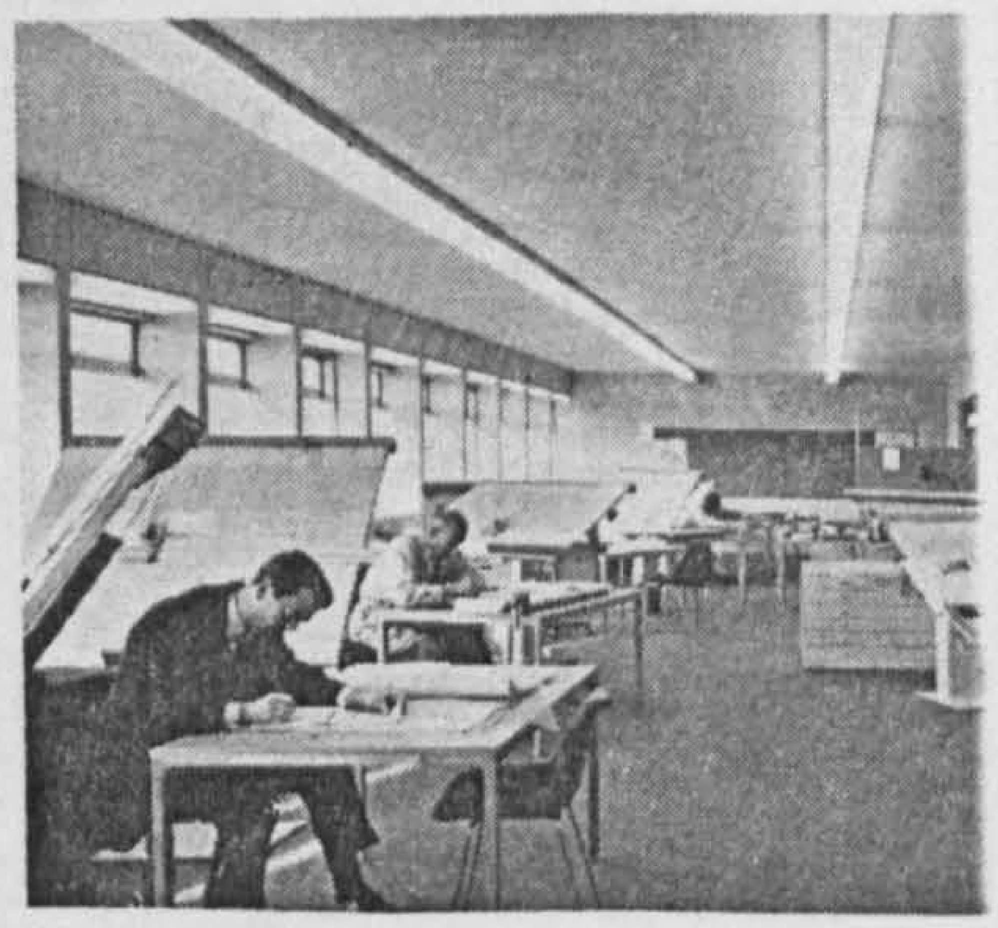


6 Eastern approach towards entrance hub
7 Plan at main entrance level

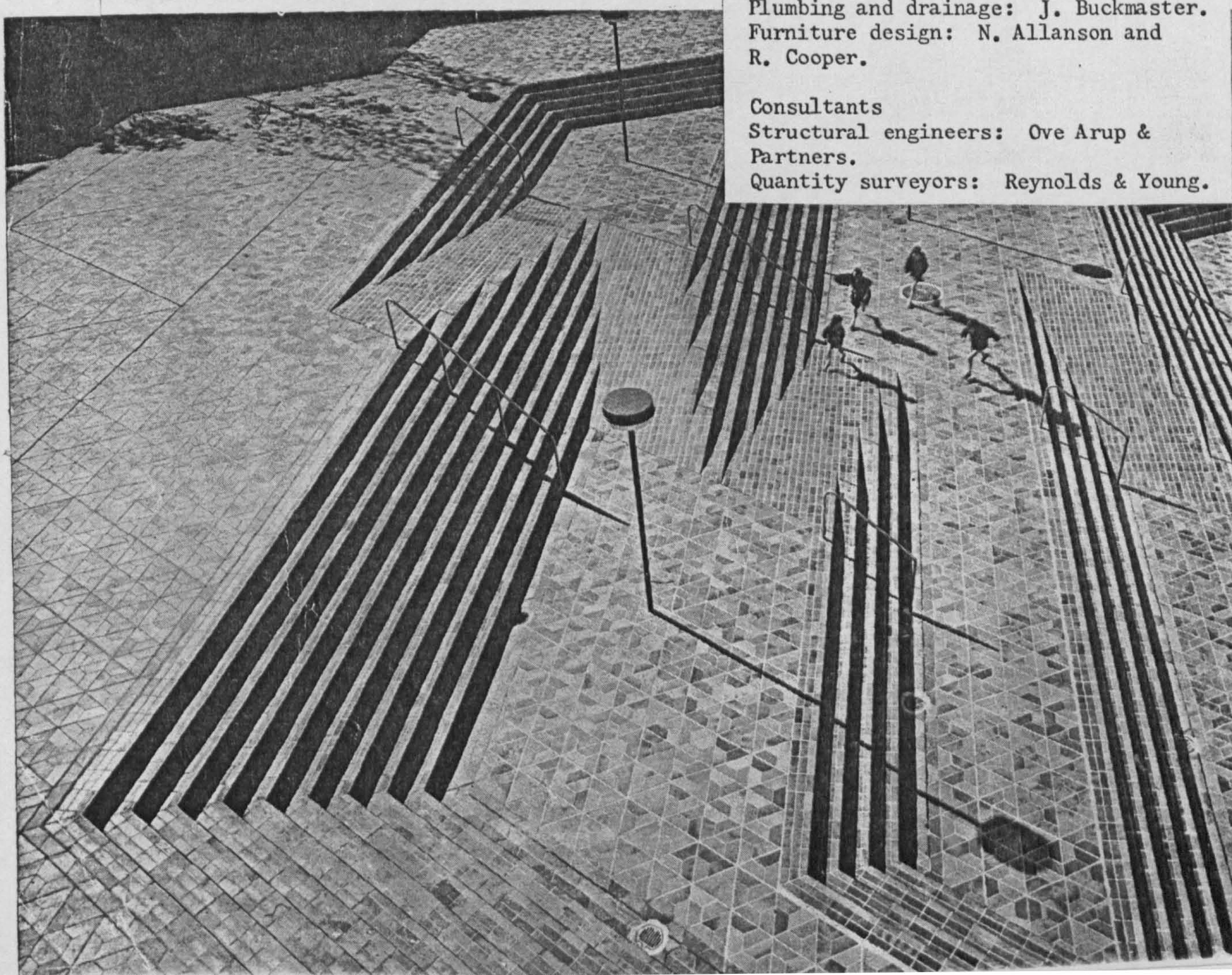
Key
1 Council chamber
2 Civic suite
3 Civic terrace
4 Restaurant
5 Housing dept
6 Registrar
7 Childrens dept
8 Parks dept
9 Central typing
10 Main entrance
11 Footbridge
12 Health dept
13 Engineer
14 Multi-storey parking under terrace

8 Council chamber
9 Architects' drawing office
10 North court floorscape. Paviors and wall bricks are same colour



Architects
Sir Basil Spence, Bonnington & Collins.
Partner-in-charge: J.S. Bonnington.
Associate-in-charge: A.M. Page
Assistants: I. Graham, K.C. Leaman, R.G. Arnold and A. Bonano.
Mechanical services: J. Davey.
Electrical services: E.G. West and D. Charles.
Plumbing and drainage: J. Buckmaster.
Furniture design: N. Allanson and R. Cooper.

Consultants
Structural engineers: Ove Arup & Partners.
Quantity surveyors: Reynolds & Young.



6.5.E Scheme - E -

Sunderland Civic Centre

Sunderland, County Durham

J.S. Bonnington & Collins Partnership

RIBA Award 1971

This firm is the offshot of the Sir Basil Spence Partnership and has been responsible for carrying out the tradition of that office for being involved in government, local government and University work of high quality. The practice is directed by Mr. Jack Bonnington, formerly a partner with Sir Basil Spence, and it is clear that he places great reliance, as did Sir Basil, in overseeing the design work and following this through in a personalised way to the completion of the building.

6.5.1 Pre-design Activities

The building design started in 1965 and took a two year period to arrive at the tender stage. The client was the County Borough of Sunderland and had formed a special sub-committee to deal with the project. In turn, the committee appointed a number of technical officers headed by the Town Clerk. The town clerk became the liaison officer and all communications came through his office. The Borough Architect and Engineer and the O & M Officer were all key members of this project committee. The town Clerk being Chairman. Initially there were a lot of meetings between the design team and interested bodies in the client's organisation; for example, the staff association were carried along with the discussions. This was considered to be a political act rather than a vital part of the design process.

The client had no pre-conception about what was needed in the building. The architects were asked to make basic proposals around fixed ideas and points of policy. The architect and leading members of the Committee were extremely sensitive about not influencing the architectural design and preferred to suggest that the architects should produce proposals which would then be reviewed and commented upon. The architects set up a small design group. It transpired in discussion around this question that the office had created a small group of people whose creative responsibility to design problems is important. This group works very closely with Mr. Bonnington and is responsible for all of the major design work in the office. The design group dealing with Sunderland was formed from this group and its size varied according to the stage of the job. This occurs in other jobs as well, the size of the design group varying with the talent available and the workload. One architect acts as a co-ordinator in seeing that the group is properly managed and is flexible enough to give design advice where required. His job is also to ensure that the group is productive in that its task is to put into action the decisions made by the group and to set up design team meetings etc. In this case, Mr. Bonnington, who prefers to be involved with the design at initial stages, works very closely with the co-ordinator and this enables the personal input to be monitored and part of the co-ordinator's work is to see that the decisions made right at the beginning are not compromised by the later work of the design group or the implementation team.

6.5.2 First Phase - Design Process

In the case of the scheme under discussion it was decided by Mr. Bonnington that the theme which had been tried at the University of Southampton should be continued as an extension of lineage of buildings. This concept is a structural and servicing scheme and it was decided to use this as it was a tried and tested idea that was known to work and was in the same sort of building and accommodation as would be required for the Civic Centre. The point was made that when one had an idea which worked there was not much point in setting out a completely new set of rules. It was obvious that even good ideas eventually became tired and had to be replaced but Mr. Bonnington thought there was still a good deal of development work which could be done in the framework of this system. It was interesting that the flexibility of the system did allow for the development of an hexagonal module for the planning, although at Southampton this had been a rectangular grid.

Instructions were given by a brief which had been evolved by the Borough Architect. This was improved by discussions in the architects office and which is based on a standard brief questionnaire. This is a standard from which has been shown in practice to allow very quickly a set of sketch drawings in a diagram form. As this was mainly an office provision problem things such as the size of desks, office equipment, storage etc, are all well known and an interior design group was able to report in and deal with these items, again very rapidly. The structure of the office allows quick decisions to be made. There are groups of architects, mechanical service engineers and interior designers, who are all involved at a very early stage in the design. The quantity surveyors are not in house but have a long association with the firm. The structural engineers were appointed separately but placed engineering staff into the architects office so that communication was easy and casual. In response to a question about the use of this word "casual" by the co-ordinator, Mr Graham, it was pointed out that the clients were good, it was an interesting and challenging site, and there was a good team. Mutual confidence is brought about by close association of individuals and the office regarded this build-up of a team for any one project as being critical to the success of that project. In this case, it was fortunate that the initial design started as an inspiration which is then tested against criteria and evolved slowly from that point. This basic discipline of testing design ideas against known criteria is instilled as the working method of the project group and is one of the ways in which the office claims that it produces buildings of high aesthetic quality. In this particular case the overall fundamental decisions come very quickly. The form was purely Mr. Bonnington's idea. The idea being to create small pleasant spaces. The geometry gave a hint of the form of the building and as the site is on the top of the brow of a hill the site conditions influenced the design. At this stage materials also were chosen being basically influenced by the surroundings of Victorian brick built buildings.

Development of the Design

This was the stage at which the initial form, which had been tested very quickly, was refined into the building which was eventually built. The design group was expanded to 9 architects, 2 furniture designers (advised by the head of the furniture group), 4 engineers, 3 mechanical service engineers and a quantity surveyor and at this point an associate partner was put in charge of the job which moved from the design group to essentially one in which implementation was the key. During this part of the work the design evolved but fundamentally its form was fixed and any changes had to be made within the framework already agreed.

The question of construction standards was raised and the office argued that basic materials are chosen right at the beginning of the job and that it is assumed as part of office policy that good finishes are necessary. This is not monitored in any particular way, it is simply the general awareness of the office. All drawings are issued by the associate partner in charge of the job, thus the standard of finishes and construction are in the hands of a senior person. No drawings or instructions are allowed to be issued without his consent and this is one way in which standards are monitored. There is not a formal checking system. Mr. Bonnington insists on unity of detailing and once this is understood it can be seen that the progress of the job follows automatically from his initial work.

6.5.3 Second Stage Design Process

The development of the design was in the hands of a design team which at its peak had about 9 architects, 2 furniture designers, and 4 engineers and draughtsmen, 3 mechanical services engineers and the quantity surveyor with an associate acting as project architect. There were no technicians but usual secretaial support. All the architects were graduates and the office policy is to use qualified men wherever possible. Part of the process at this stage is to test the design as it developed against the criteria and the discipline of the earlier framework was continually being called into play.

The initial idea was Mr. Bonnington's and he insisted that this should be changed as little as possible. The original building was, of course, simply an office building, i.e. a number of cells. The only large open plan areas are the drawing offices. All the departments that had contact with the public had a demand for a degree of privacy. It could be seen from the plans that different widths of building are used although this is not apparent from the external form. Another basic generator was the desire to throw open as much of the building as possible to the public. As people can approach the building from any direction there is no major pedestrian flow to link onto. Again this can be said to be a site condition as it greatly influences the design.

The architects were strongly of the opinion that they preferred to be able to dictate the job themselves and felt frustrated by clients who have very strong views some departments in the Town Hall had rigid control policies. The starting point was the plan, but this is regarded as the first testing idea and "it would be wrong to say we started from the plan." The amount of accommodation that had to be put into the building was known and then there was the problem of solving departmental planning within the form
This had to be tested against the functional requirements of the building and amended. The building is divided functionally and vertically. All public service departments are around a courtyard and ground floor with technical departments above this; everything is centred on the hub of the courtyard. The triangular grid was evolved at an earlier stage and acted as the objective of the discipline we have talked about. This, in fact, goes through to the exterior of the building and can be seen in the flights of steps and the ramps. The present idea is the 36th idea which was tried; there was an instruction from the client that wheelchairs and prams can obtain access to every public service department.

The scale of the drawings used were 1/100th. The architects felt that at this scale that you become aware of the building. Some detailing was done at 1/16th scale but all working drawings had 1/4" scale including an elevation of every room to this scale. There was a check list for every internal office to establish the functional requirements of the room.

On cost a thing that the architects were determined to do was not to have one part of the building a great detail more expensive than the other. The aim was for a good overall quality throughout the building rather than a prestigious area which had to be balanced by poor quality elsewhere.

Tendering Procedures

The procedure was the standard local authority one but the six contractors were nominated by the architects and a basic requirement was that they should be capable of doing the work in time. In the event John Laing were the main contractors. All the drawings and details were substantially completed although some detailing remained to be done when the Bills of Quantity were taken off. The architects would like to say that their aim was to completely detail the building before this point was reached but admit that usually there are some areas which are left over.

Implementation

A group of personnel from the design team ran the contract with the key figures constant throughout the whole job. Since this job the office policy has changed leaving the project architect to run through the job; the design team going on to other design projects.

The contractor appointed a site manager and a regional area director to take the responsibility of the work. There were two foremen and a site engineer with overall responsibility. On the client's side there was a site architect, a senior Clerk of Works and a further Clerk of Works. Many prototypes were built; indeed, each major component was tested in this way. When pressed to define what was a major component a precast panel was tested in the concrete yard, several panels of brickwork with grades of pointing were used. There was a site meeting once a month and also a coordination meeting. The architects seeing two distince functions for these meetings. One thing the architects had learnt from this experience was that in future they would place a site architect near the job but in a separate office rather than actually on site because it was found that he became an extension of the contractors organisation and was of great assistance to the contractors rather than the architects. All instructions are confirmed on the A -1- standard form including drawings. The practice, in this case, had nominated sub contractors, all of whom were chosen on known performance and many visits were made to works off site.

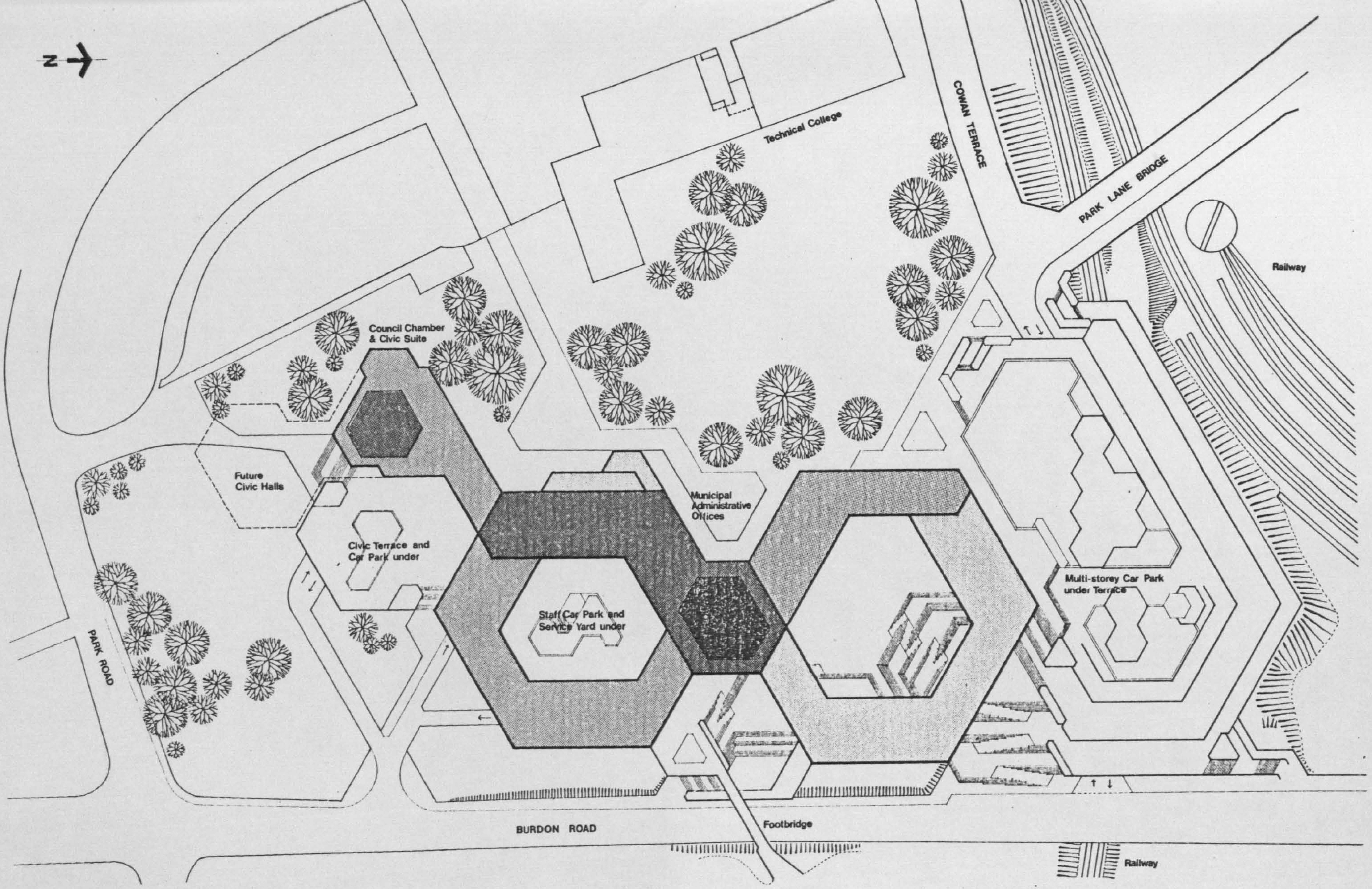
The architects said there was always room for improvement, they would never say that was the best that could be done in the circumstances, but with an insistence on quality which is known to be based on practical ideas. They asked for standards of finish which, although they are extremely difficult to reach, is the starting point for the whole operation.

Table 3.61 shown diagrammatically the design process of Sunderland Civic Centre, and indicates relationship tasks and responsibilities.
Photographs and drawings of the building illustrated in figures 3.62 to 3.70.

Scheme - E - Sunderland Civic Centre
The analysis of the design operation

Table 3. 61

Design Stages	Approving authority	Client organisation	Architect partner	Architect co-ordinater	Architects Assistant 4	Architects Assistant 5	Furniture Designer 2	Engineer Structure 4	Engineer Mechanical 3	Engineer Electrical	Quantity Surveyer
	EXTERNAL		INTERNAL								Long association with the firm
Pre-design activities		Contribute to meetings	meetings								
			To produce basic proposal points policy		contribute to meetings						
		Brief	contribute to brief by discussion and standard brief questionaire								
First stage			Tried and tested known idea								
			design concept	Test against criteria							
Second stage			Design development								
				major decisions give advice when required							
				meetings	test the initial form			Contribute to the work	Meetings		Contribute to meetings
				issue drawings	advance Sketches			study structure	Detail work		estimate cost
				approve final details	scheme in details working drawings			Final details Co-ordinater with design team			Final cost plan
					Preparation of all documents						



SITE PLAN

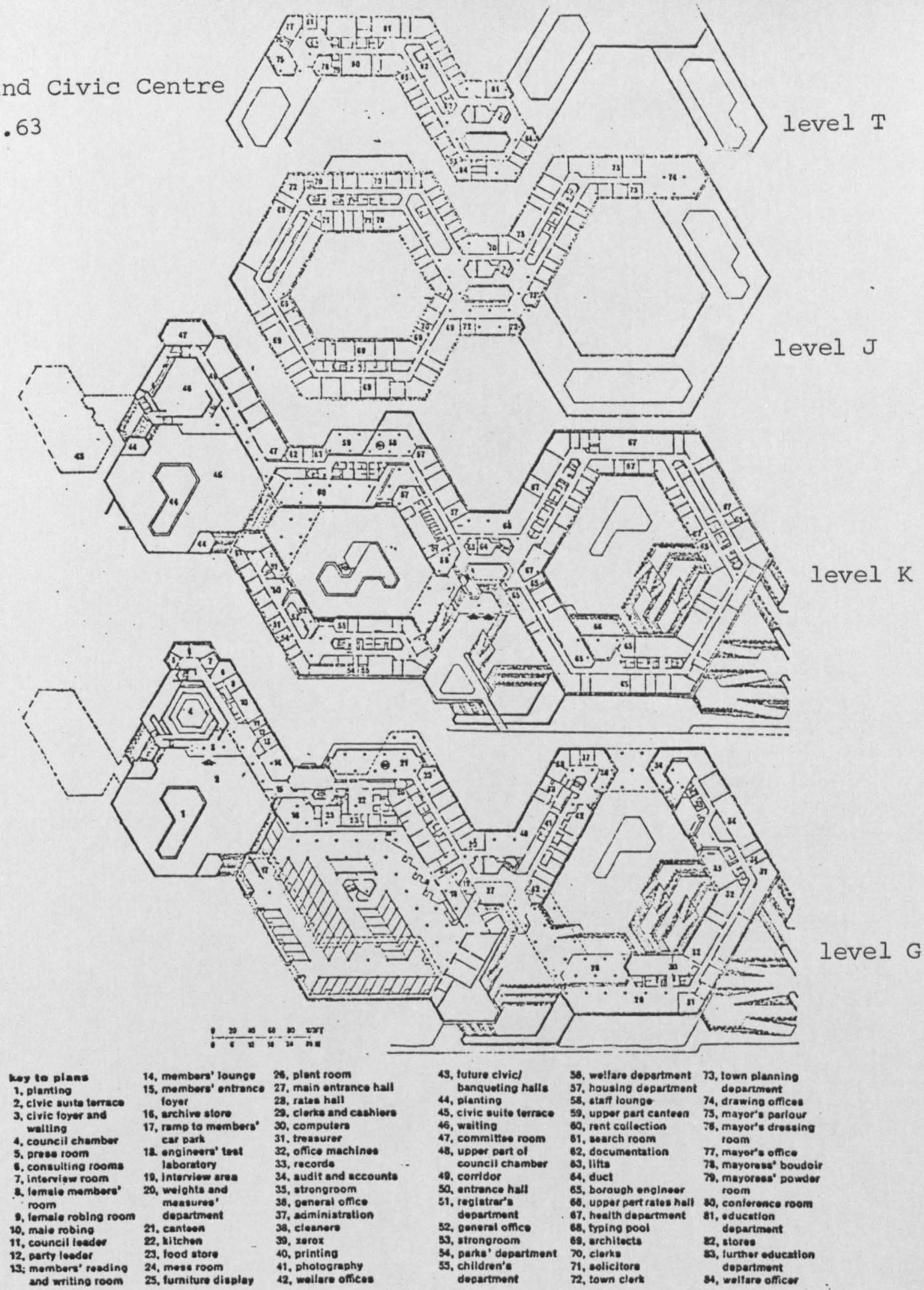
Scale 0 ft 100 ft
0 m 30·48 m

SUNDERLAND CIVIC CENTRE

Figure. 3.62

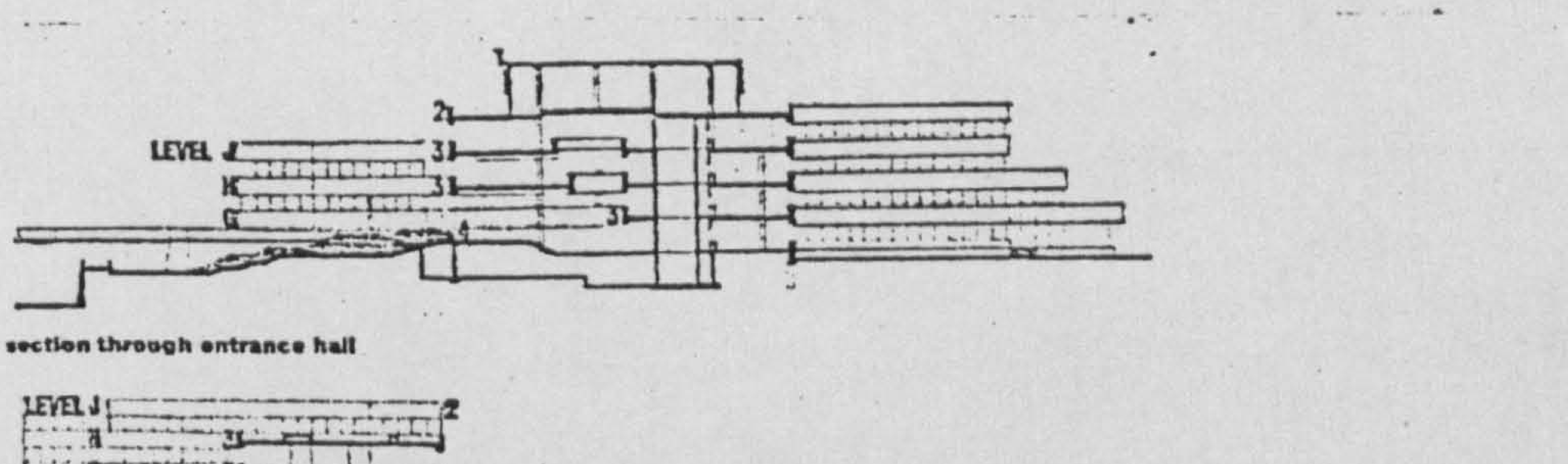
Sunderland Civic Centre

Figure 3.63

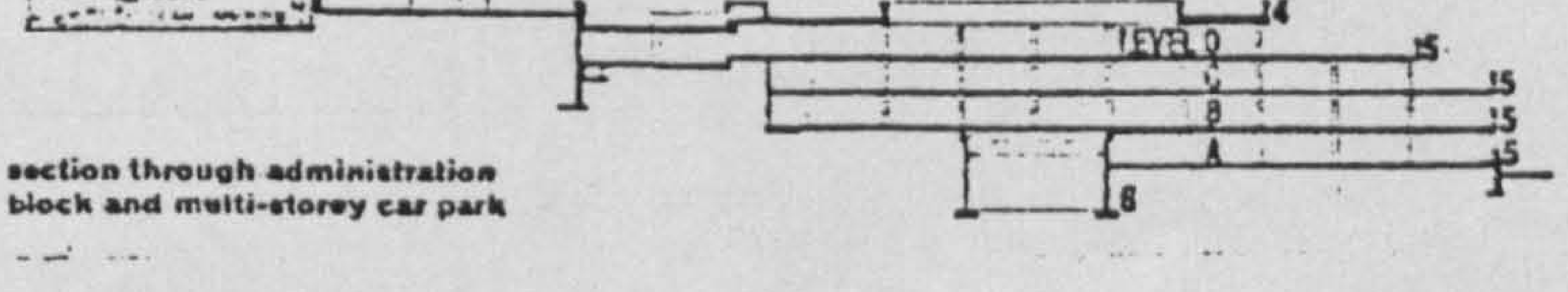


key to plans

1, planting
2, civic suite terrace
3, civic foyer and waiting
4, council chamber
5, press room
6, consulting rooms
7, interview room
8, female members' room
9, female robing room
10, male robing
11, council leader
12, party leader
13, members' reading and writing room
14, members' lounge
15, members' entrance foyer
16, archive store
17, ramp to members' car park
18, engineers' test laboratory
19, interview area
20, weights and measures' department
21, canteen
22, kitchen
23, food store
24, mess room
25, furniture display
26, plant room
27, main entrance hall
28, rates hall
29, clerks and cashiers
30, computers
31, treasurer
32, office machines
33, records
34, audit and accounts
35, strongroom
36, general office
37, administration
38, cleaners
39, xerox
40, printing
41, photography
42, welfare offices
43, future civic/ banqueting halls
44, planting
45, civic suite terrace
46, waiting
47, committee room
48, upper part of council chamber
49, corridor
50, entrance hall
51, registrar's department
52, general office
53, strongroom
54, parks' department
55, children's department
56, welfare department
57, housing department
58, staff lounge
59, upper part canteen
60, rent collection
61, search room
62, documentation
63, lifts
64, duct
65, borough engineer
66, upper part rates hall
67, health department
68, typing pool
69, architects
70, clerks
71, solicitors
72, town clerk
73, town planning department
74, drawing offices
75, mayor's parlour
76, mayor's dressing room
77, mayor's office
78, mayoress' boudoir
79, mayoress' powder room
80, conference room
81, education department
82, stores
83, further education department
84, welfare officer



section through entrance hall



section through administration block and multi-storey car park

key to sections

1, plant
2, roof
3, offices
4, entrance hall terrace
5, car park
6, railway

Figure 3.64 Sunderland Civic Centre, view from the east.

Figure 3.65 Sunderland Civic Centre, general view from the west.

Figure 3.66 Sunderland Civic Centre, view from the north a wide paved area of varied width stepped and ramped, leads up to the building form the town centre.

Sunderland Civic Centre

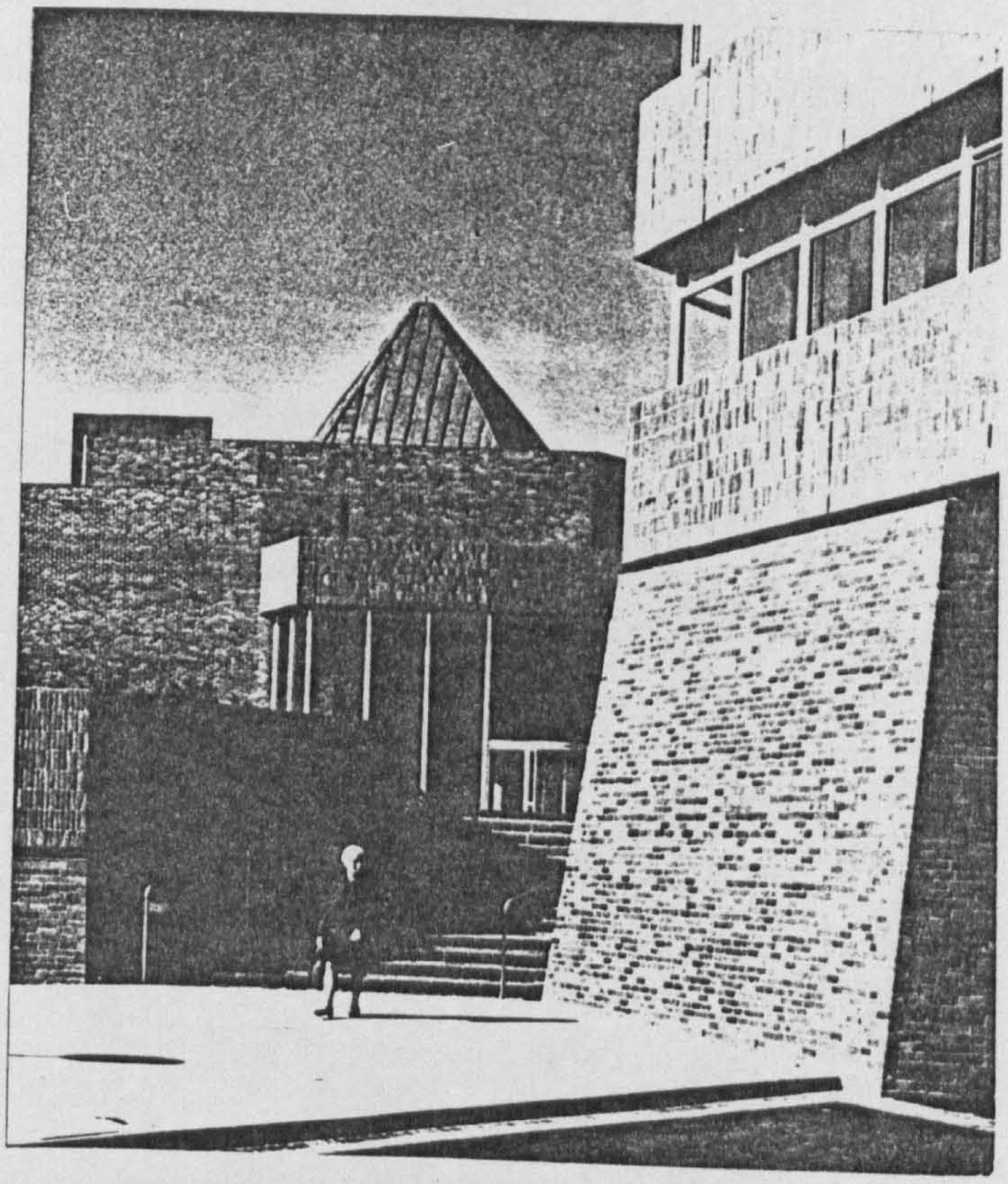


Figure 3.67
The council chamber, entrance

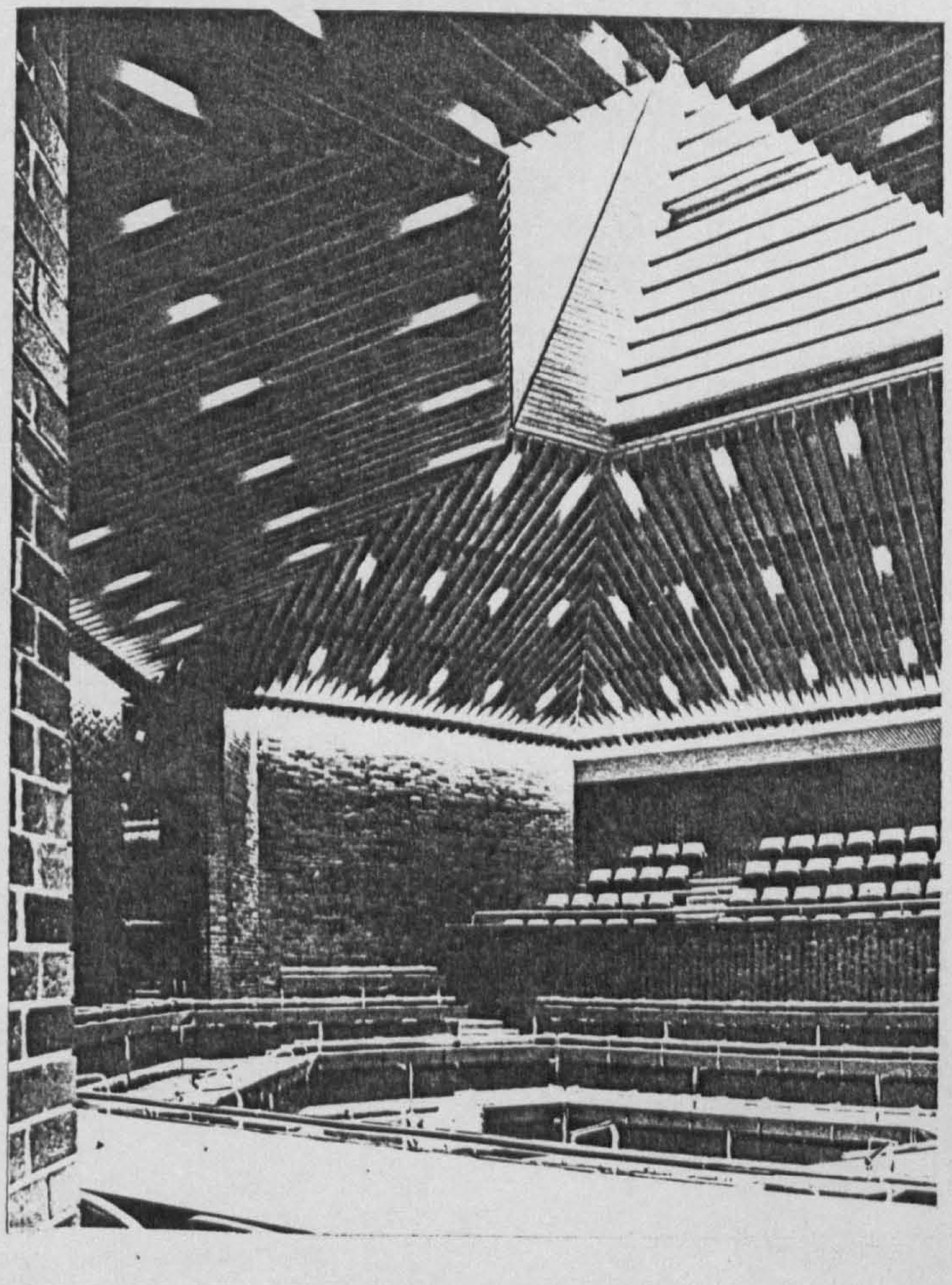


Figure 3.68
The council chamber

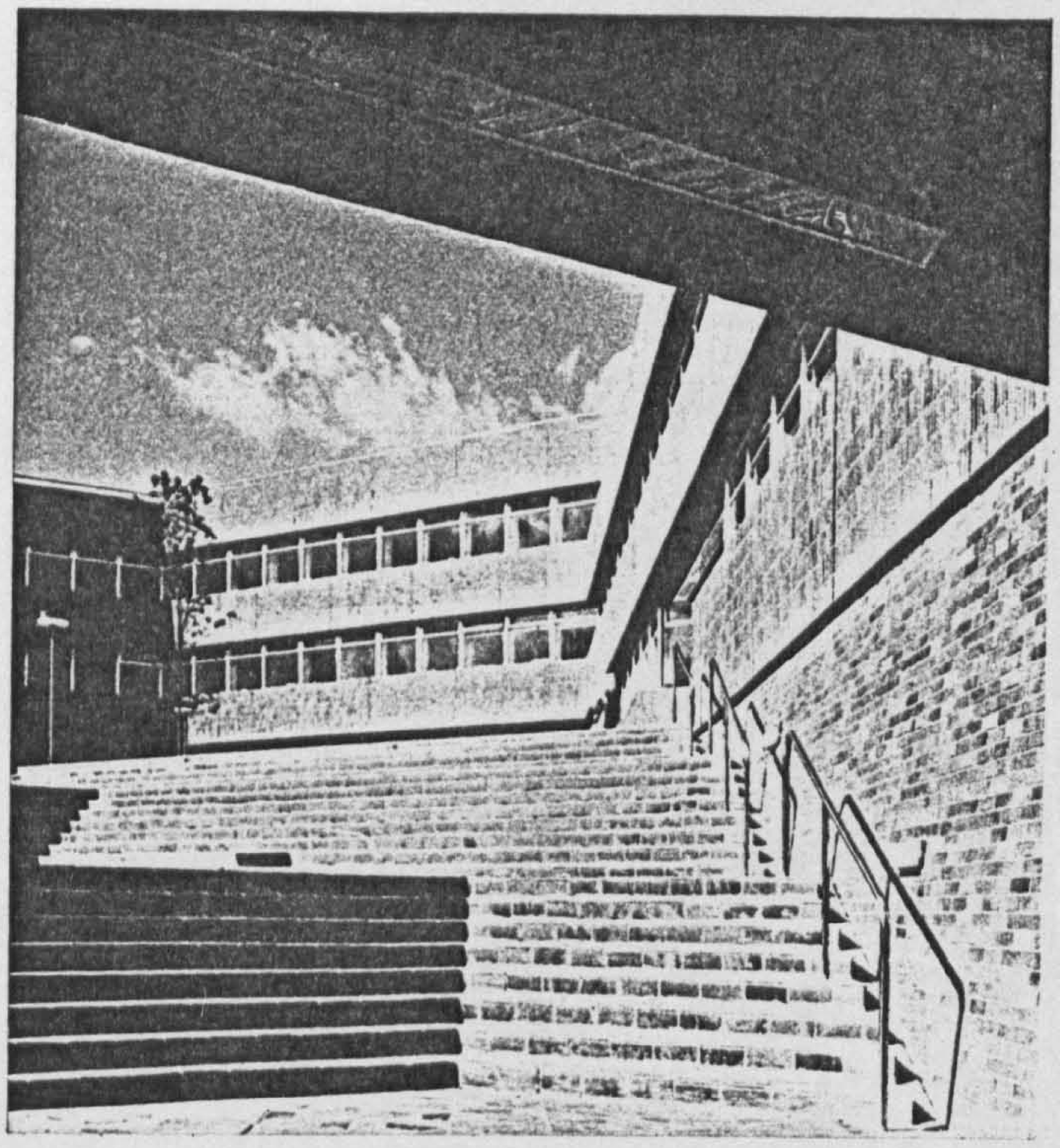


Figure 3.69 Way up into North Court from North-east, site falls steadily to allow uninterrupted passage beneath buildings from southern terrace down to town centre.

Figure 3.70 Stairwell on which all departments converge.

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Part Four

CONTEMPORARY ARCHITECTURE IN SYRIA - COMPARATIVE STUDY OF BUILDING DESIGN PROCEDURES

"The past is a foreign country: they do things differently there." [1]

L.P. Hartley in
"The Go-Between"

4. Review of Building Design Procedures in Syria

Introduction:

In this section, it is proposed to deal with the progression of architectural practice in Syria and to discuss the areas of intrest that may well influence the future development of architectural work in the region. The work so far has identified some theories and basic concepts that may contribute to the architectural scene as a whole but has particular reference to architectural quality, by describing the nature of the relationship existing between the design 'process' and the end 'product'. In this respect more emphasis is given to the process of design, by studying the architects' intentions and their procedures rather than the end product, although this will be considered when thought relevant. Although the work presented is directed towards architectural practice in general terms in the highly developed industrial countries, it is hoped that it will be equally important to the architect of newlly developing countries. Syria is in this categoriy. Generally, there are similarities between Syrian architects' procedures and those found elswhere in the world.

However, there are some natural differences which can be attributed to the different structure of society, as architects need to design to meet the needs of different life styles and culture. Preserving the traditional cultures is a major challenge facing architects now and in the next few decades. It is also of importance to ascertain the sociological and architectural priorities for necessary development without risking the loss of cultural values.

At a time of such important social and cultural change, there are a number of difficulties facing architects entering the field of practice in Syria. Their tasks are not defined as clearly by the professional bodies as in other countries. Opportunities in government departments and private practices to learn the skills of the profession are limited. The shortage of architects and professionals in general imposes an extra strain; in some cases they are forced to work beyond their experience and to approach every design problem from first principles because they have the responsibilities of mature designers without the necessary experience.

However, much of the work so far has been written primarily with the needs of the architectural practice in Syria in mind. It has aimed consciously to cover all aspects and opinions on architectural quality, in the hope that it will help the architect to see his way in a world of change and development. This change which has a dramatic effect on Syria, has brought with it a consciousness of new dimension in the architects work and practice.

This will be reported on as same aspects are relevant to our original study of architectural quality. In addition to study of some elements of architectural work in Syria, it is important to identify the character of the problems that architects expect to encounter at work. However in such a comparative study there are a wide range of building activities to choose from, and it is for that the following points are worthy of attention:

a) Form and volume of building activities, and general planning on a nation wide scale.
b) Forms of building control and code of conduct.
c) Character of architectural firms with special emphasis on the private architectural firms, their structure, and examples of some of their work.
d) Design activities/including the usual procedures and different phases of design from pre-design activities to implementation.
e) General conclusion and some of the useful lesson to be learned from our case study.

Building Activities

The rapid development of building activities are witnessed by the appearnace of large scale activities in many fields. The scale of construction being undertaken has increased parallel to the accelerating economic activity.

Most of the large scale construction work is for government projects. This has to be approved in the balance sheet to be put into execution as part of the five year development plan which controls the needs of government buildings and their cost and quality. The government body which proposed the plan is the "Highest State Planning Board", which includes members of university staff as well as serving ministers. It has the task of making decisions in relation to public needs, which are drawn to their attention by regular reports and survey studies from different government departments. Thus, the scale of construction activities is directly related to government expenditure. Examples of projects carried out upon the recommendation of this board are; The Cinama City in Damascus; Latakia University (the third largest university in the country); The New National Library and The National Theatre Complex and Opera House in Damascus. The London-based architectural firm 'Renton Howard Wood Levin", has been appointed recently to design the Syrian National Theatre comple. to be built on a 3,6 ha. site, this will comprise a Central courtyard, accessible from each of three principal theatres, the largest of which will accommodate an audience of 1,500. Other facilities will include a school of music and drama.[1]

However the quantitative change during the last decade can easily be observed in the following construction activities:

- Educational buildings such as school buildings and for higher education. The construction of the third largest university at the Mediterranean port City of Latakia is under way.[3]

- New Hospitals, The Damascus Children Hospital which was completed recently, the largest in the country, it has the latest facilities to carry-out paediatric surgery, intensive care and care for new born and premature babies. The university teaching hospital designed by Britain's"Pearson and Son", is one of many to be completed. Mean while, two major health projects have recently been completed for the Ministry of Higher education in Damascus. Firstly the new five-storey faculty of medicine building, and secondly a new complex for pre-clinical studies with extensive laboratory facilities for research work.[4]

- Urban Planning development conceived within the wider sub-regional and regional context. The aim is to modernise the capital and other towns, and to provide new housing, social facilities and work apportunities to improve living standards and to overcome the rapid population growth in cities due to the opportunities which city living offers. However, recently a detailed study for exploiting the mountain area surrounding the capital for recreation and tourism has resulted in a detailed wider study for its potential by the

Shankland Cox Partnership; this was commissioned by the government of Syria and the municipality of Damascus. The consultants prepared a structure plan and detailed plans, providing suitable housing for some 1000,00 people (equal to about two and a half years growth in the population of the city[5]).

- Tourism construction to help the tourist industry in providing various types of accommodation, there are plans for the construction of hotels, motels, holiday villages camps, rest houses and apartments, to fulfill this plan, 61,000 beds in these various types of accommodation will be provided by 1990, and 400,000 beds over the next 12 years. Between 1976 and 1978, the number of beds increased from 18,000 to just over 20,000[6]. Currently under construction in the capital are 16 hotels which are all due to be completed between now and 1981. To stimulate construction to a greater level of activity, the Ministry of Tourism had secured a number of attractive concessions for private companies wishing to built hotels by exempting them from a number of taxes, especially customs dues for the importing of materials for building or furniture etc. To fulfil their massive room quota on time, the ministry's has formulated a master plan covering all aspects of touristic construction necessary in Syria up to the year 2000. The plan which was completed in 1975 by a French OTU Company, consists of four reports complied between 1973 and 1975, the master plan can be structured into five yearsplans and in addition to the creation of room space together with costs and means of realisation, including rehabilitation and training programmes, promotion planning and public relations.

However the dramatic increase in oil revenue which has built up over the last ten years and particularly over the last five years in Saudi Arabia and the Gulf States has encouraged ambitious development plans, with target growth rates for achievement.
Dawson[7] stated that: " Historically it is unlikely that any country has ever, or will ever, achieve the sort of growth rates planned for the Middle East without incurring significant inflation rates." This is illustrated in table -4.1 - which indicats the rates of inflation of selected countries between 1973 - 1976, and shows its effects on Syria, which benefits from such revenue by investment and loan from rich Arab countries.

However, the dramatic increase in oil revenue which in itself was the result of a complex world wide politico/ economic situation was identified by Dawson as the key cause of inflation in the Middle East among other factors, and has been one of the major problems facing the construction industry in the area.

Table 1 Consumer prices (Annual changes %)

Country	1973	1974	1975	1976
Iran	9.9	14.2	13.0	11.3
Iraq	4.9	8.3	9.5	10.4
Kuwait (e)	8.0	13.8	8.13 (1)	2.25 (1)
Libya	7.6	7.9	9.1	
Saudi arabia	16.5	21.4	34.6	35.0 (p)
Bahrain	14.4	24.7	16.3	14.9
Egypt	5.1	10.1	9.7	10.4
Jordan	10.6	20.2	12.1	15.1
Lebanon	6.1	11.2		
Syria	20.5	15.6	15.9	15.2
Yemen PDR	19.7	20.3	11.3	3.9

Source: IMF
(c) = estimate, omitting rents
(l) = probably nearer 15%
(p) = provisional from this source — but in BMMC's (Building Marketing and Mangement Consultants) opinion will be less.

Table 4.1 The rates of inflation of selected Middle East countries.

The 'inflationary spiral' studied by Dawson, which has particular relvance for Saudi Arabia and the Gulf States, which are different in their finance, geography, population and political conditions from Syria, could be related to the Syria case as shown in table -4.2- by indicating many other factors which contribute significantly to an inflationary spiral. This has an appreciable effect upon design as it has a reaching consequences for the building industry in Syria by imposing a number of constraints which in turn has an effect on the operations level and can be described as follow:

1. <u>Labour at the Operative Level</u>

   Constraints

   - Limited crafts skills.
   - Most of the labour force are employed outside the operative level of the constuction industry.
   - Fixed price contracts.
   - Time, i.g. the pressure to acheive everything as quickly as possible which is common to all components.

   Results

   - Labour is always a score commodity.
   - Labour bargaining for increased salaries.
   - Higher labour costs reflected in 'high' tender price.

2. <u>Materials</u>

   Constraints

   - Few basic resources in available form.

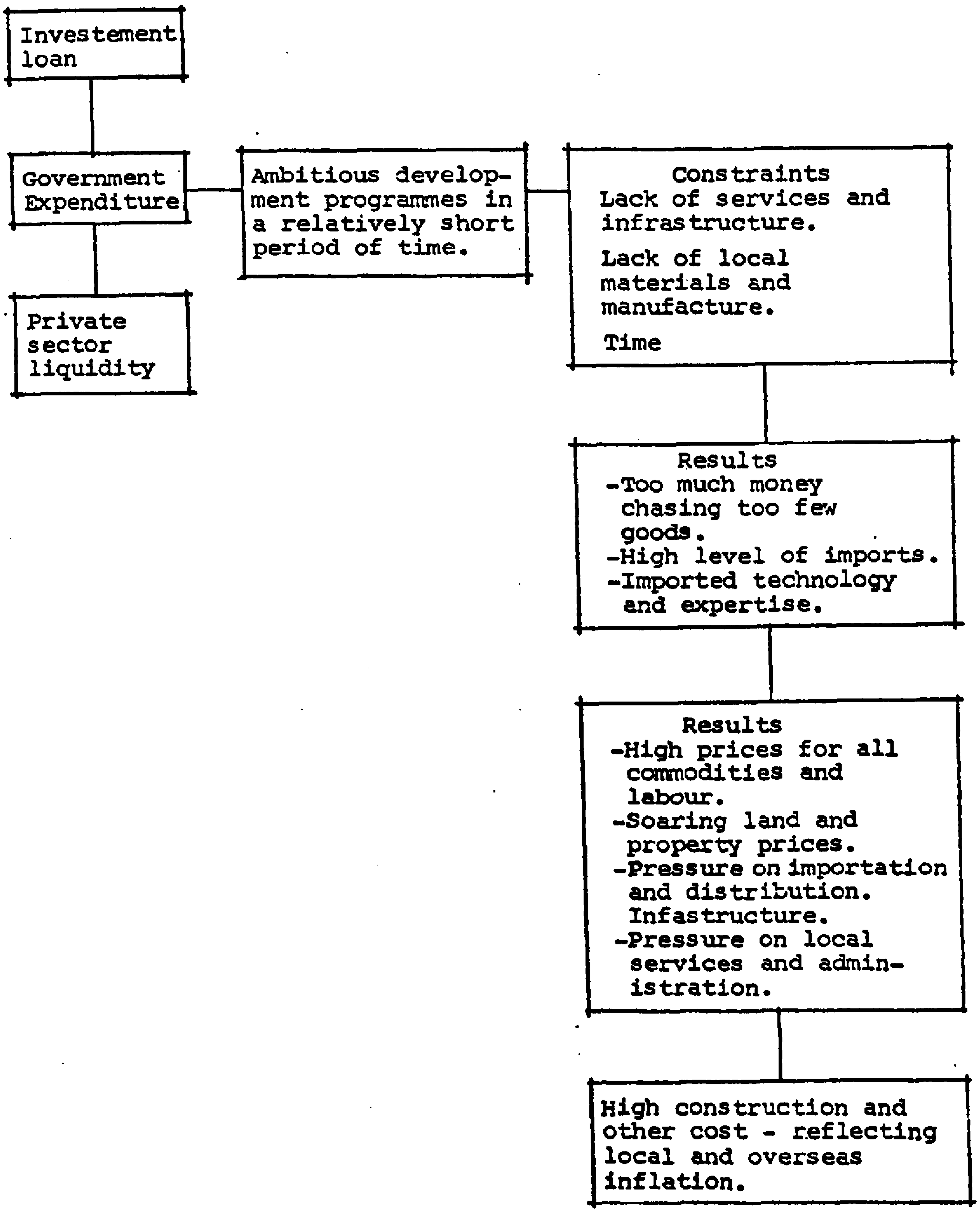


Table 4.2 Inflationary spiral in Syria, adapted from Dawson inflationary spiral in the Middle East op.cit., p. 70

- Little established local manufacture.
- Limited infrastructure.
- High overseas inflation rates.
- Time pressure.

Results

- Almost total reliance on imported goods .
- Overloaded infrastructure.
- Too many people chasing too few goods.
  leading to:
- High priced goods and black markets for essentials such as cement.
- Internal transport and distribution costs increase.
- Profit-taking and importers and distributors.

However, it is possible to say that many changes has taken place, the building techniques have accelerated in the last ten years through the rapid increase in the production of new building materials such as:

- Specially formed cement blocks.
- Light concrete mixtures.
- Mechanical and electrical equipment.
- Use of mechanical power on building site, earth moving and vertical transportation.

Several new firms commenced production of structural metal works, standard doors and windows made of wood or metal elumenum. These reflect the tendency among users to demand higher degrees of comfort in almost every type of building. It also increases the degree of finish which can be acheived.

In an effort to reduce the effect of any inflationary prices the government controls the import and distribution of building materials. The country is still heavily reliant on imported goods, this is done through a national government association (SIMEX). Information on building materials are given directly to the consumer by (SIMEX).

Building Control Procedures:

Building control regulations in Syria are issued in the forms of legal instruction, and carried out principally under the Housing Act by the local municipalities through the approval and control of building construction work. The control by the municipal authority is effected through the building permit, inspections during the construction work and the certificate of completion. The Housing Act refers not only to the provision of housing but contains regulation related to quality control of building in general and includes the following:

- Requirements of the construction, including demolition of existing building.
- Requirements regarding permission to carry out construction work, heights, projects, out side partitions, service areas, elevations, electrical and

mechanical work, essential requirements of hygiene etc. A building permit, given by the municipal authority, is requiring for all building, rebuilding, additions or alterations, and can only be issued if the plans satisfy the requirements of the local building regulations and the local development plan.

- Condition of occuping the public street during construction.
- Special regulation covering specific area as zoning, urban development plan etc. a building permit can only be issued if the proposals comply with the development plan.

There are also acts, regulating subjects other than building which include the Ancient Monuments Act, protecting historic buildings, the Fire Services Act, containing specific fire requirements for certain building types, and other acts related to noise, pollution, safety and industrial zoning.

Each municipality has the responsibility for the examination and evaluation of applications for building permits and supervision of the observance of the local building regulation, and other laws concerning building construction. The building and housing inspectorate within the municipal authority include a large proportion of architects and structural engineers.

Before building construction work begins, all detailed construction drawings must be sent to the buiding inspectorate for examination and approval. Site control is carried out, by site visiting and incpection of building construction. At certain stages the inspector usually carries out visual inspection, and gives notification that he will be present before certain work is begun, especially over foundation work, structural concrete and structural steel of different floors, checking against drawings and calculations.

Final inspection after completion is required and before the building may be used, a certificate of completion is issued by the municipality .

One of the important aspect defined by the regulation is that the building should be safe for everyday use and under exceptional conditions like an earthquake or fire. However, in general the inspections are often weak or non-existent, and it is always advisable to place responsibility for safety on the designer and the structural engineers. Site inspection backed up by independent checking agencies especially in the case of large buildings, However this does not imply that architectural quality can be defined as a minimum standard to satisfy safety relating quality to cost and time only, rather than arriving at client satisfaction which is essential.

However it is important to contrast the building regulation system with Britain and other northen European countries which depend on national regulation, official inspectorates and approval and quality control of materials and products.

(The Agrément System discussed earlier), and the French system which is controlled by an independent checking office for civil defects liability. It is necessary to draw up a clear picture of building regulation with wider requirements including fire, safety and habitability based on developing countries legislation including provision for imported building material and products and equipments, and the controle of local production to ensure adequate supplies..

To summarise the situation, it is unwise to rely on present regulations as these will give a very low level of achievement, especially in relation to safety and public health. If quality standards are to improve these must fall quite firmly within the province of the designer.

4.2 Structure of the Architectural Profession:

As we have earlier, the architectural profession in Syria responds to very important needs in producing vital projects in the shortest possible time. For this reason, government sponsors,the major projects in the country and a large proportion of good architectural work goes to government departments. This reflects the current tendency for architectural design in Syria to be directed towards development goals needed in a short time by using team work and away from individual creativity. This is apparent in the increase of large government architectural departments, and other design and construction associations sponsored and financed by government money. However, this does not prevent the private sector from taking part in designing large government projects or from participation in design competitions by experienced and reputable firms.

The offical bodies in the architectural profession which control the building design and construction can be devided to two parts, government department, and private firms, each of them containing a number of variations in their methods of work and the way designs are obtained and developed.

1. Government Architectural Departments:

A great number of government bodies have their own departments to design and supervise their construction work. The scale

of architecture departments in these ministries differs from one to another, depending mainly on the scale of work and activity carried-out by the ministry involved.
Activities in a particular project usually start with a written demand from the authorised ministry. Jobs related to the projects are distributed among designers and specialists working within the office. Design usually develops by personal contacts. There are no rules concerning any sort of systematic investigations, briefing, project development records data or formal approval of various phases of design. Written confirmations are asked only in the case of unacustomed demands. The staff consist of many inexperienced young graduates but the technical staff in these offices is usually of a high standard due to the high salary according to their experience.
Because of the shortage of staff and inexperience in some departments, projects which can't be developed beyond the stage of preliminary design can be done by tendering procedures or fixed ordering. When tenders are invited jobs usually given to the lowest bidders, and then preparations of various calculation, working drawing and details are let out to the contractors.

This "Half way" architectural work reduces the quality of design and greatly increases the chance of faulty design and requirements. The government architectural departments can be put into one of three categories:

1. Department attached to government bodies - Ministries These have access to a variety of project's covering many fields, they principally carry out design work and prepare the necessary information and documents for development within the mininster's area of concern. They undertake out side work in some cases. Because of shortage and inexperience of their staff especially in the field of design in some projects they act as a client for schemes designed by independent private architectural firms.

2. Local Authority Departments

They fall-into three main categories:

a) Town and regional planning departments, responsible for new town developments and general planning, large housing programmes.

b) Architecture department, their main responsibilities are school buildings, health and public buildings, they are not housing authorities.

c) The building and housing inspectorate withing the municipal authority, to control and approve building regulation, .

3. Architectural Design and Construction Associations:

They have the capacity for running a large technical projects, are dependent on the government fund, and attract experts from many fields. Among many departments they contain architectural design offices, and may act as a general contractor. They have the priority to negotiate the tendering of major government projects before these are offered to private contractors. These associations done a great deal for the construction industry in Syria by introducing the latest available techniques, but their real problem is the lack of good mangement.

2. Private Architectural Firms:

The structure of private architectural firms are so different that it is very difficult to classify them by the way they operate. Each type has its own potential and limits.
It is not essential for a firm to be headed by an architect, they mostly look after contracting and small architectural jobs e.g. small apartment housing .
The medium size firm are with three to ten architects, will be concerned with a variety of projects such as:

- Housing for individuals.
- Dwellings and apartment buildings for building societies and local authorities.
- Industrial and commercial buildings.
- University buildings which are mostly allocated to architects with acadamic work back-ground..
- Variety of government buildings.
- Hospitals.
- Sports centres
- Religious buildings.

Many of the medium size private architectural practices are run by highly experienced architects who understand the dimensions of their professional task very well and can co-ordinate the work of other members of the design team such as structural, and service engineers.
The very small firms (from one to three architects) work on small commercial buildings and housing for individuals.
The distribution of private practices indicates that 80% of all practices in Syria fell into the middle category, that is having a total architectural staff of between three to ten. This indicates that most of the practices begin in a small way and few develop beyond that stage regardless of the objectives of the firms. However, most of the large projects beyond the experience of these firms are done by association co-op with forign firms as indicated in some of the examples above.

In our research studies it has been argued that the contribution made by medium sized practices (this the small size offices in the New-York city survey done by Blau), to the community could be greater than that of the larger firms, in our case, the local and central government departments. The high standard of personal service and understanding of the users needs are one of the most important contribution of the medium sized offices. In addition, individual members, particularly principals, become deeply involved during the design procedures. However reference must be made to the variation at the level of individual and group performance in some cases. In contrast large practice is not necessarily the most efficient either in terms of client service or profitability. However, large and urgent jobs are likely to continue to go to larger offices and commissioned to local or central government architectural offices, unless the small offices can form group practices for special jobs.

The principal way to get a job is by inheriting a practice through personal relationship or good reputation and by winning a design competition; in the later case the jury decision is considered as formal approval of the preliminary stage of designing and the later stages are subject to the same consideration as other projects.
Projects commissioned by governmental bodies arranged by the architecture department attached to the ministries concerned requires that programme and information and documents be handed to the designer in the form of a brief. The formal approval of design for various stages is carried out by a consultant appointed by the departments concerned to act for the client during design and constructions periods.

Examples of work done by private medium size firms are prsented below. Their structure and a description of the people involved is discussed before going on to the usual design procedures and methods of work.

Firm - A - Consists of three partners, two architects and one structural engineer; five assistants architects, of whom some are newly graduated architects; two structural engineers; and a part time services engineer. No technicans work in the office but there are five draughtsmen.
An example of the firm's work is presented in figures - 4.3- to -4.9-.

Firm - B -
Consists of one partner and ten architects of whom four are newly graduted; structural engineers and service engineer are full time members of staff in the office. An examples of their work is shown in figures 4.10- to -4.17 - ; the scheme was the Meridien Chin Hotels for the Ministry of Tourism, part of the plan to help tourist industry. The hotels were originally designed to be constructed in Damascus, Allepo, the second largest city, the Mediterranean part city of Lataki, and the ancient desret town of Palamyra. The realisation of the actual programme was undertaken by a French group Inter G; this has the responsibility for design and the overall concept for each city. The Syrian firm has the responsibility for carrying out the later stages of design and detailed work; the final approval lies with the French Company. In the Damascus Meriden figure -4.11-two important elements influenced the Y shaped

Firm - A -

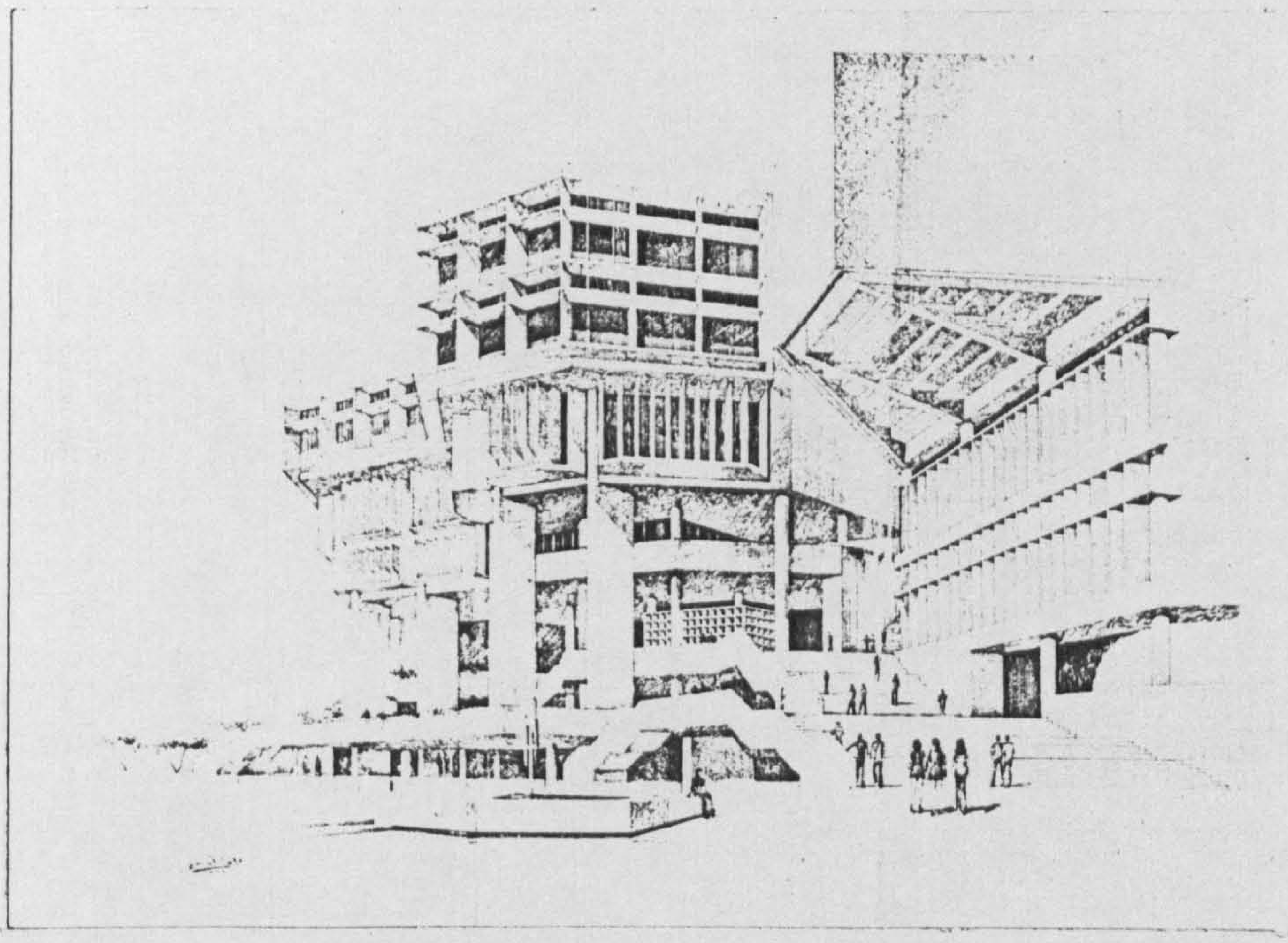


Figure 4.3 The National Theatre (typical competition entry), perspective.

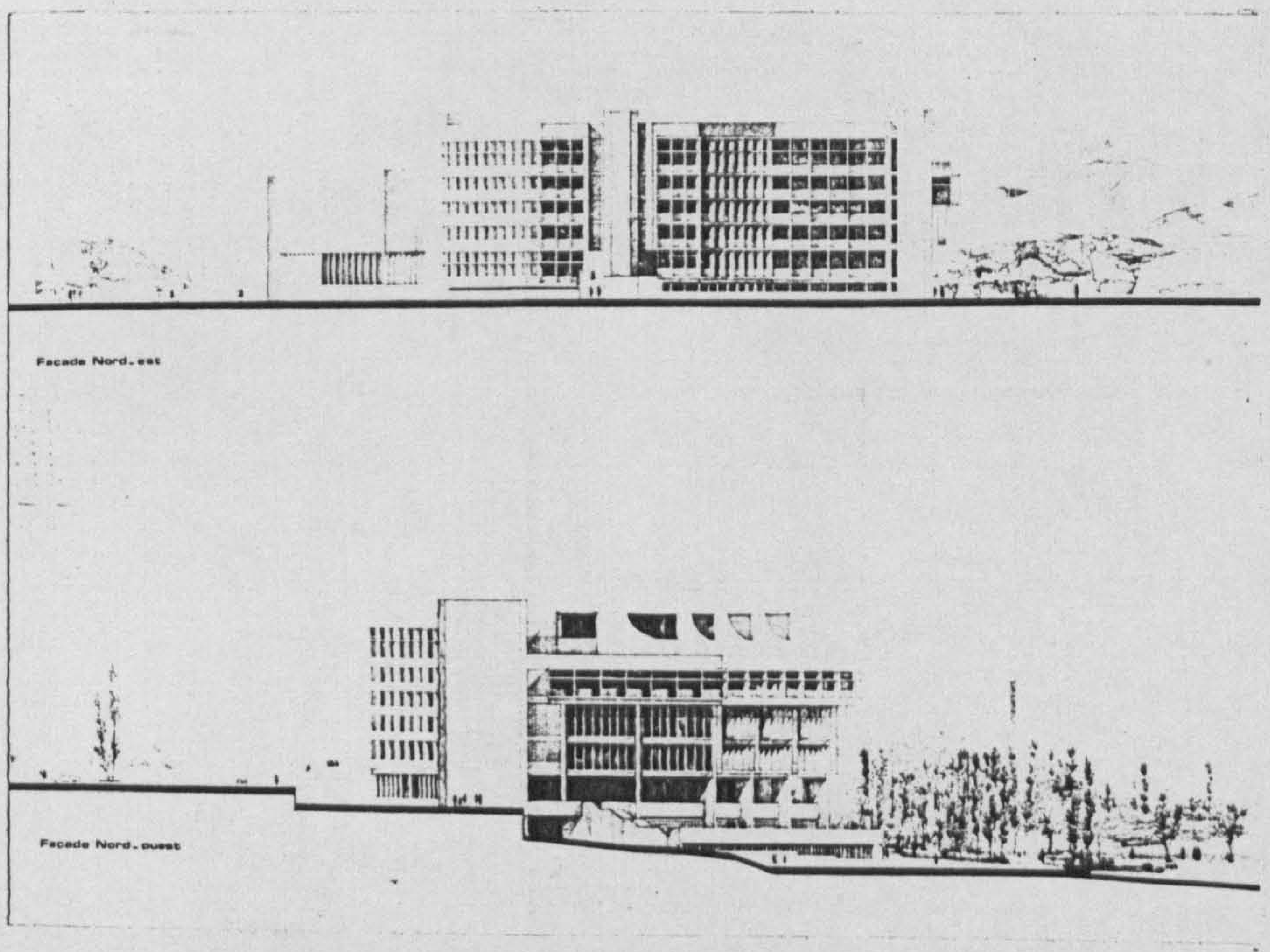


Figure 4.4 North East, and North West elevation.

Firm - A -

Figure 4.5 The central workers hospital, Damascus.
The main entrance, view from the east.
(prespective).

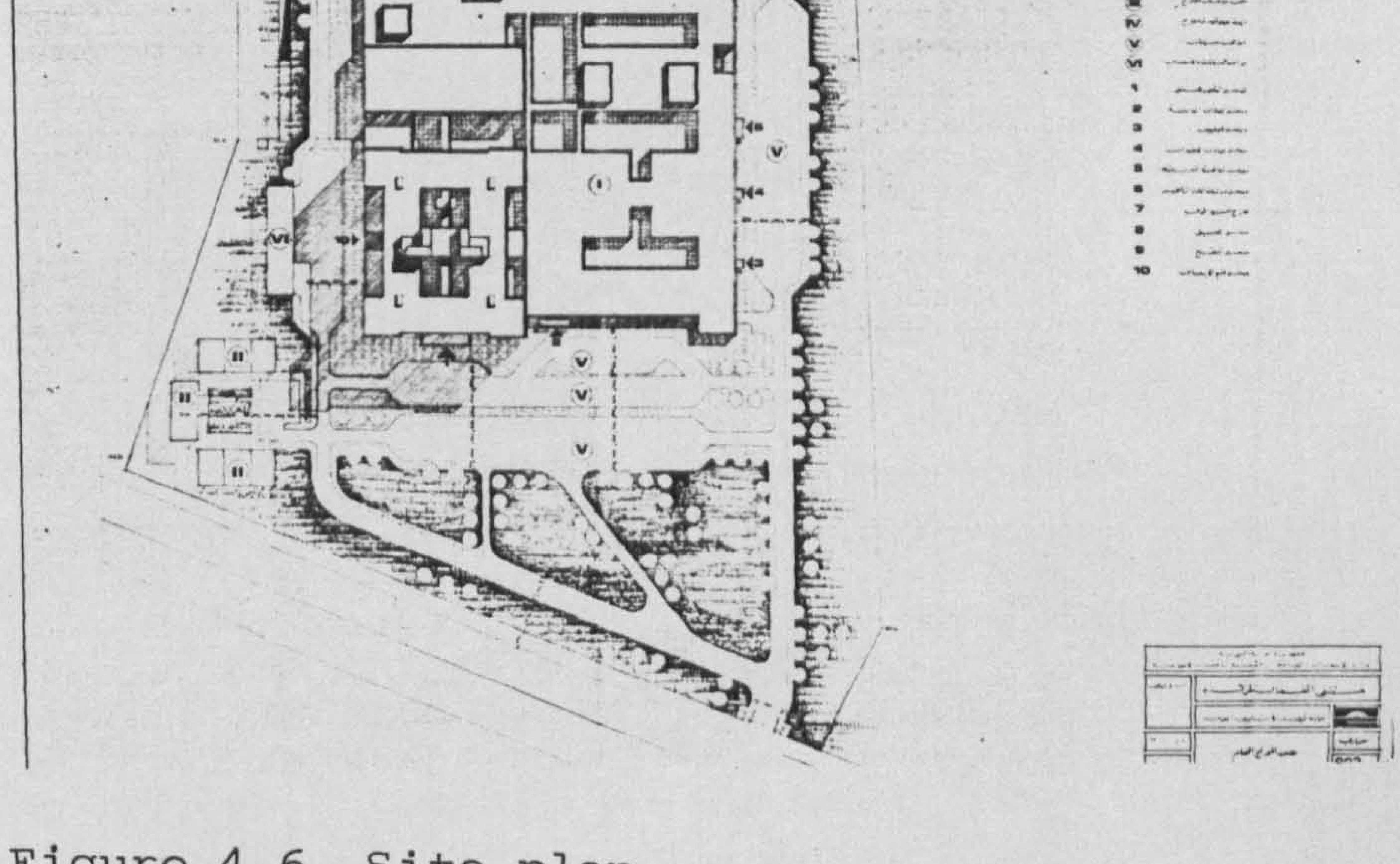


Figure 4.6 Site plan.

Firm - A -

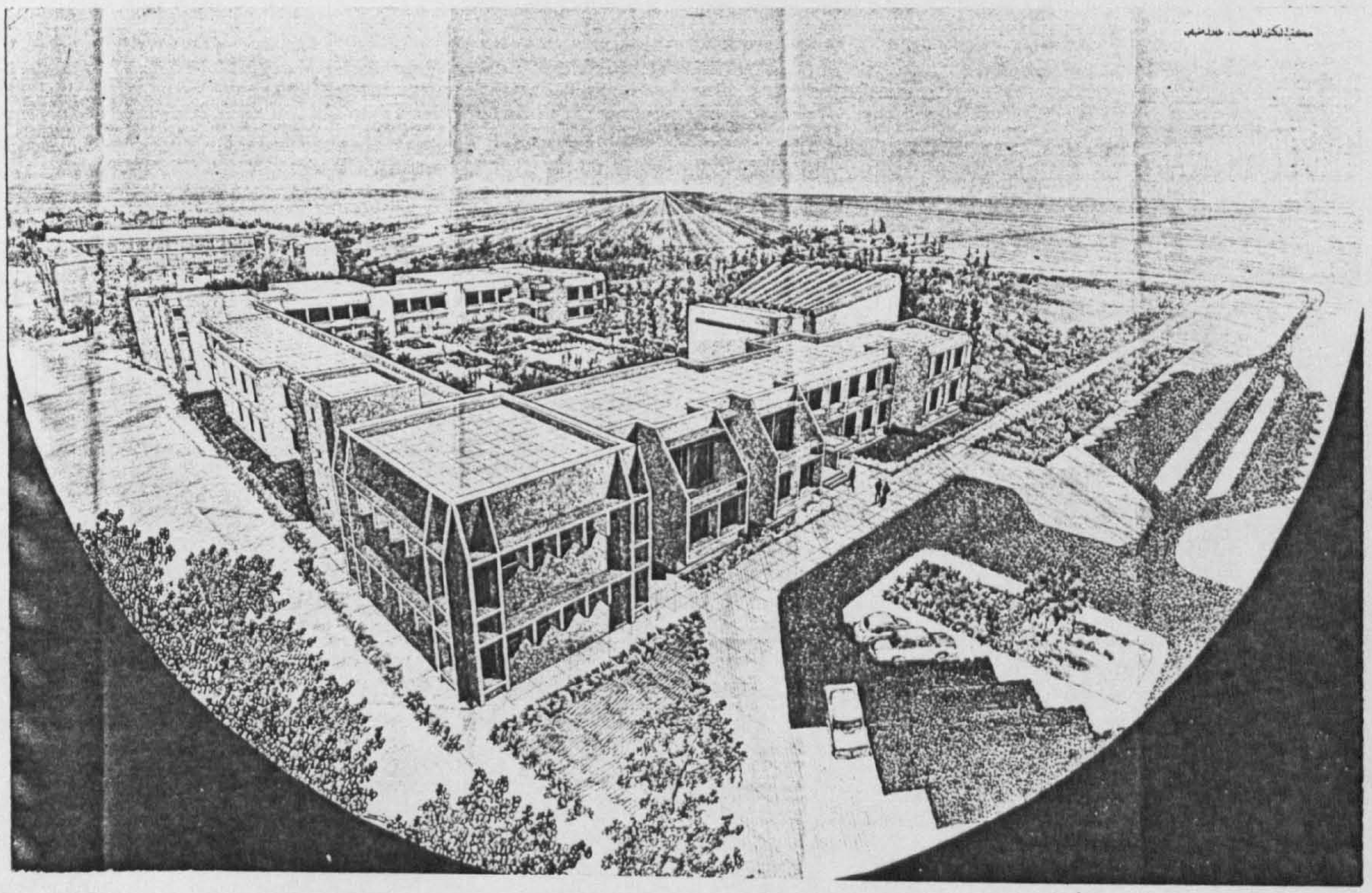


Figure 4.7 The educational and political institute, Damascus, general view (prespective).

Firm - A -

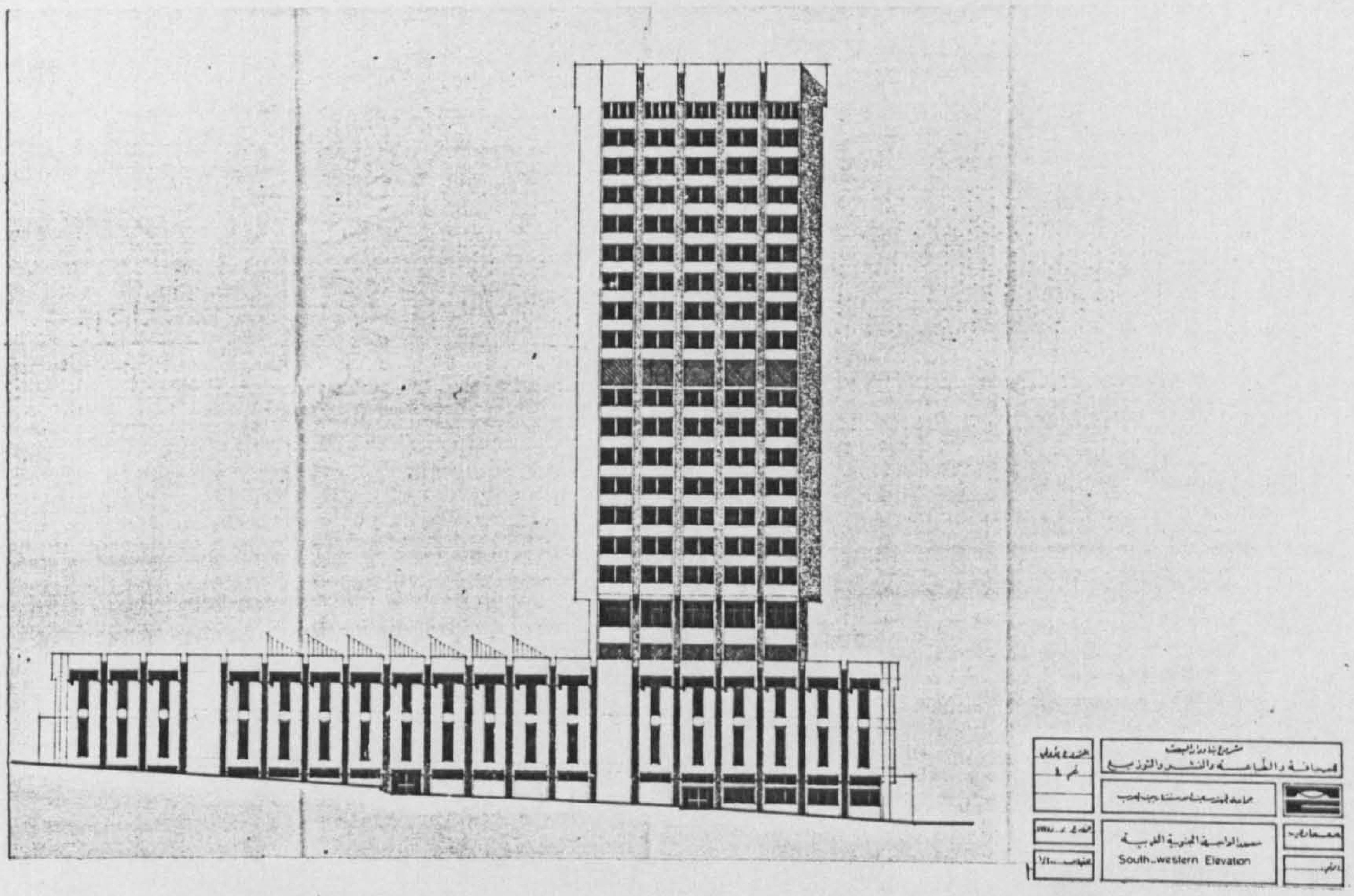


Figure 4.8 Government press association for journalism and publication and printed matters. Soth-Western elevation, (typical first-stage design drawings scale 1/200).

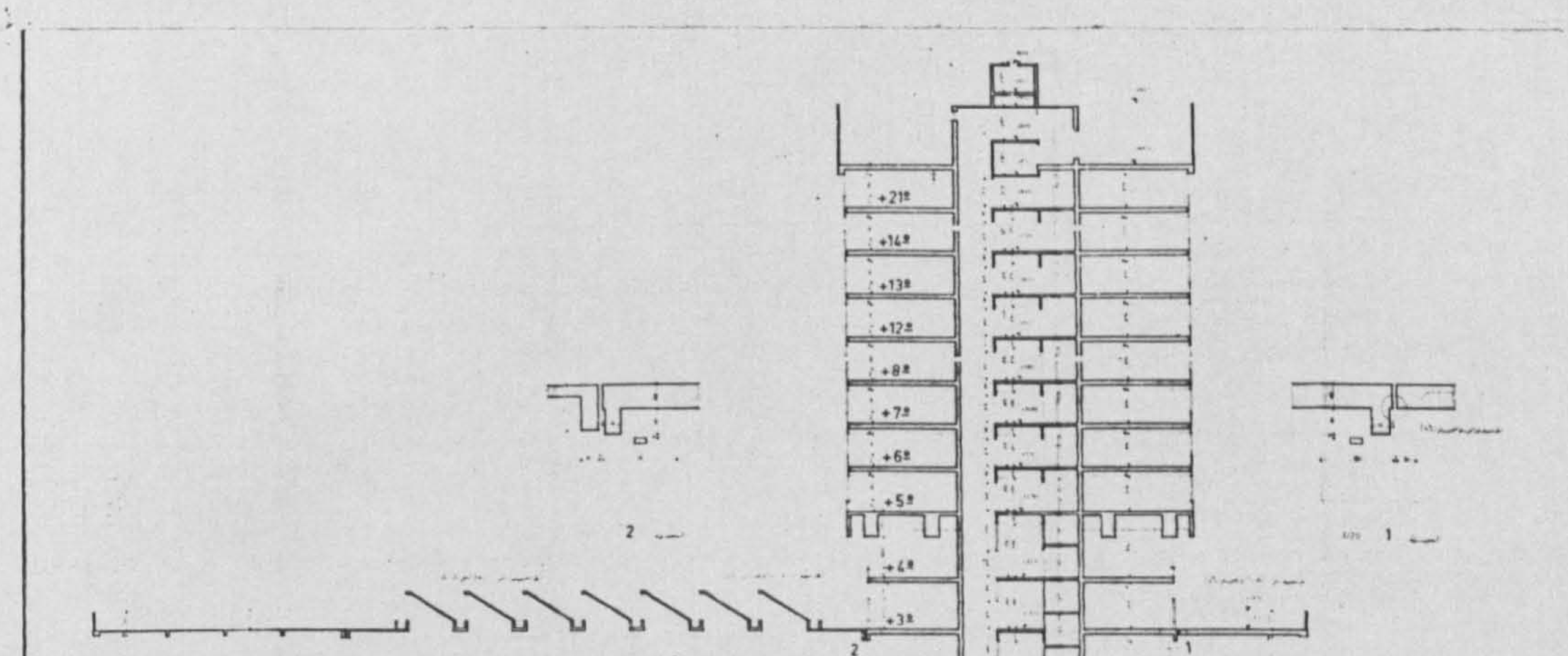


Figure 4.9 Long section (typical final scheme drawings scale 1/100).

Figure 4.10 Meridien Hotel, Damascus. General view of the hotel, the Mountain Kasun rise behind the building seen from Damascus International Fair. Firm - B -.

TEXT BOUND INTO

THE SPINE

les conditions de
nent avaient rendu
groupe d'ingéniè-
a plus grande part
été exécutée en
par voie aérienne.
t le plus important
nt toute une année
péciaux ; 139 ca-
éditions maritimes

béton ont en outre été nécessaires. Le chantier a compté jusqu'à 1 200 hommes ; ainsi a pu être tenu un délai hors fondation de 14 mois.
Les hôtels de Alep, Palmyre et Lattaquié qui se construisent actuellement ont une capacité d'environ 250 chambres chacun.
Leur programme architectural conçu pour s'adapter à des sites historiques

sage syrien. Ils viendront compléter l'infrastructure de base du pays en équipements touristiques.

Figure 4.11 Merdien Hotel, Damascus. General view of the hotel, the relaxation area, restaurant and the swimming pool. Firm - B -.

Firm - B -
Meridien Hotel
Damascus.

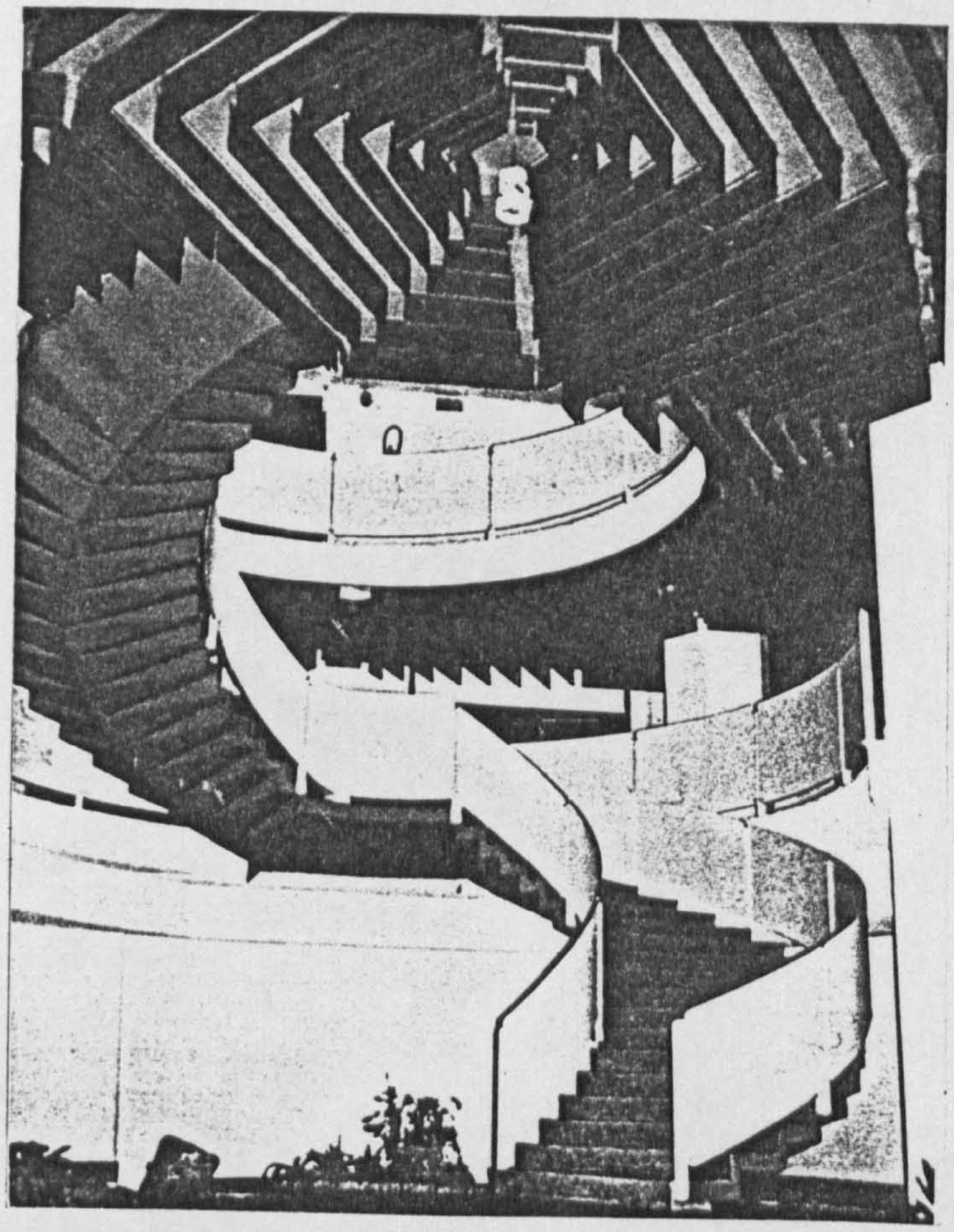


Figure 4. 12
Foyer and reception area, stairs to restaurant.

Figure 4.13
The restaurant on the first floor.

Firm - B -

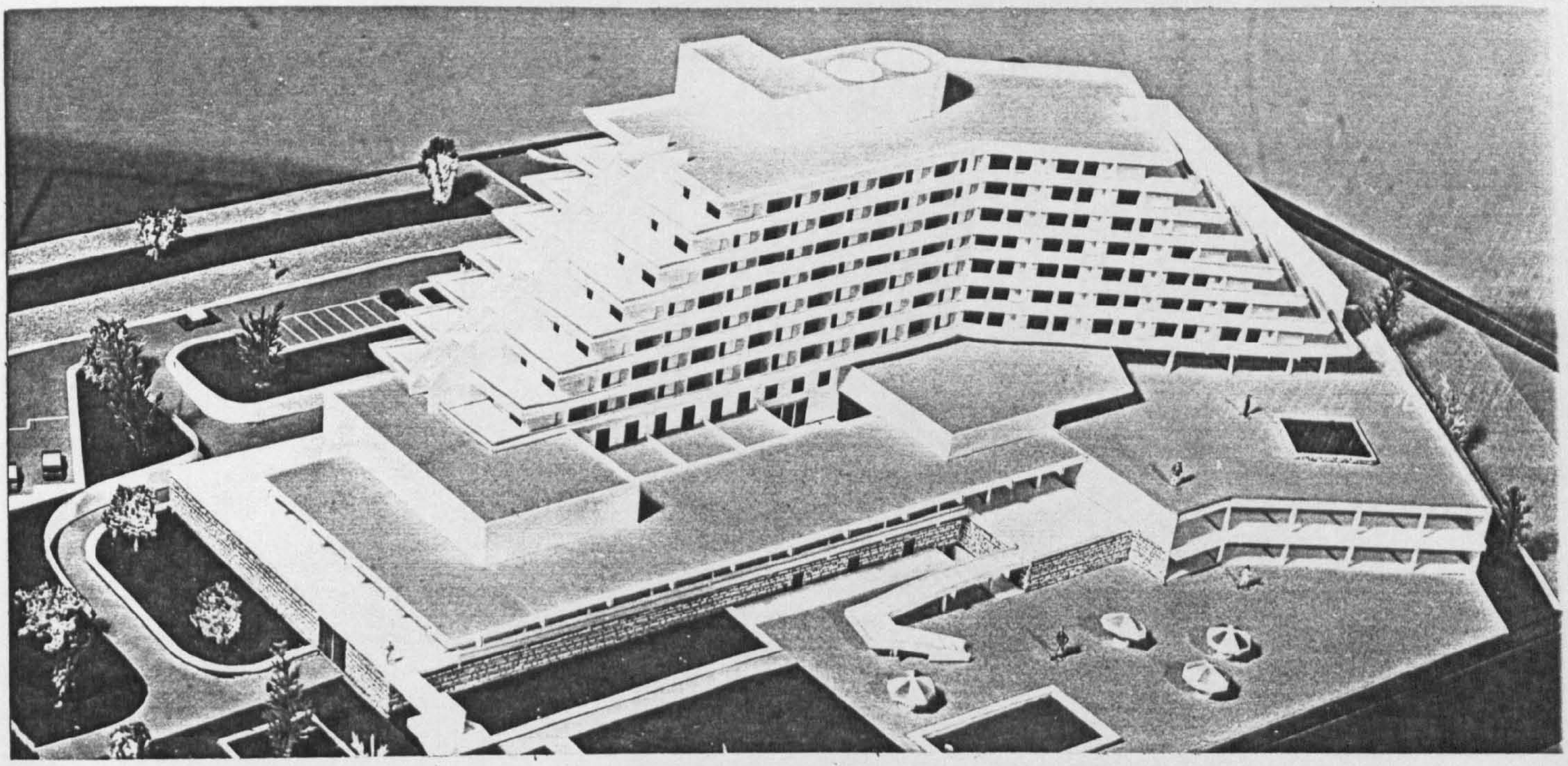


Table 4.14 Meridien Hotel, The Mediteranean Port City of Lataki. general view from the west (model).

Table 4.15 View from the East, main entrance and parking area (model).

Firm - B -

Figure 4.16 Meridien Hotel, Alepo, general view, (model).

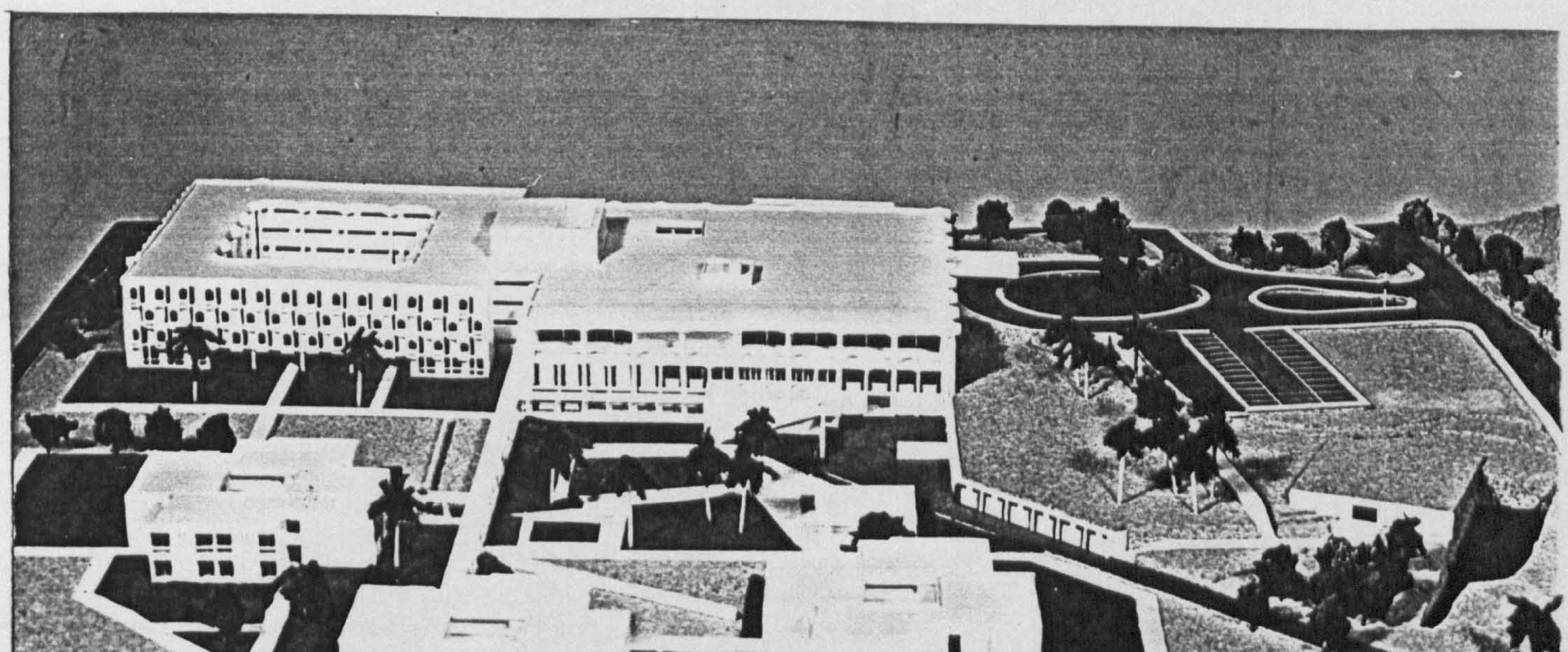


Figure 4.17 Meridien Hotel, The Ancient City of Palmeria (model).

form of the building the wish to provide maximum room capacity and also to over-look the city. The design also aimed to facilitate the organisation of the principal elements in the building and the control floor and service areas.

Firm - C -

Consists of two architects as partners and one structural engineer plus five assistant architects and draughtsmen. An example of the firm's work is presented in figure -4.18-. This is the new building for the architecturel department at Damascus University, completed according to the requirement of the department which is a separate school of architecture within the engineering college.

Firm - D -

Consists of one architect partner with academic back-ground, five architects assistants and one structurale engineer. The example of their work is presented in figure -4.19- 4.22- and shows the building during construction.

Figure 4.18 The'new'school of architecture building, Damascus University, Damascus. View from the North (Prespictive). Firm - C -

Firm - D -

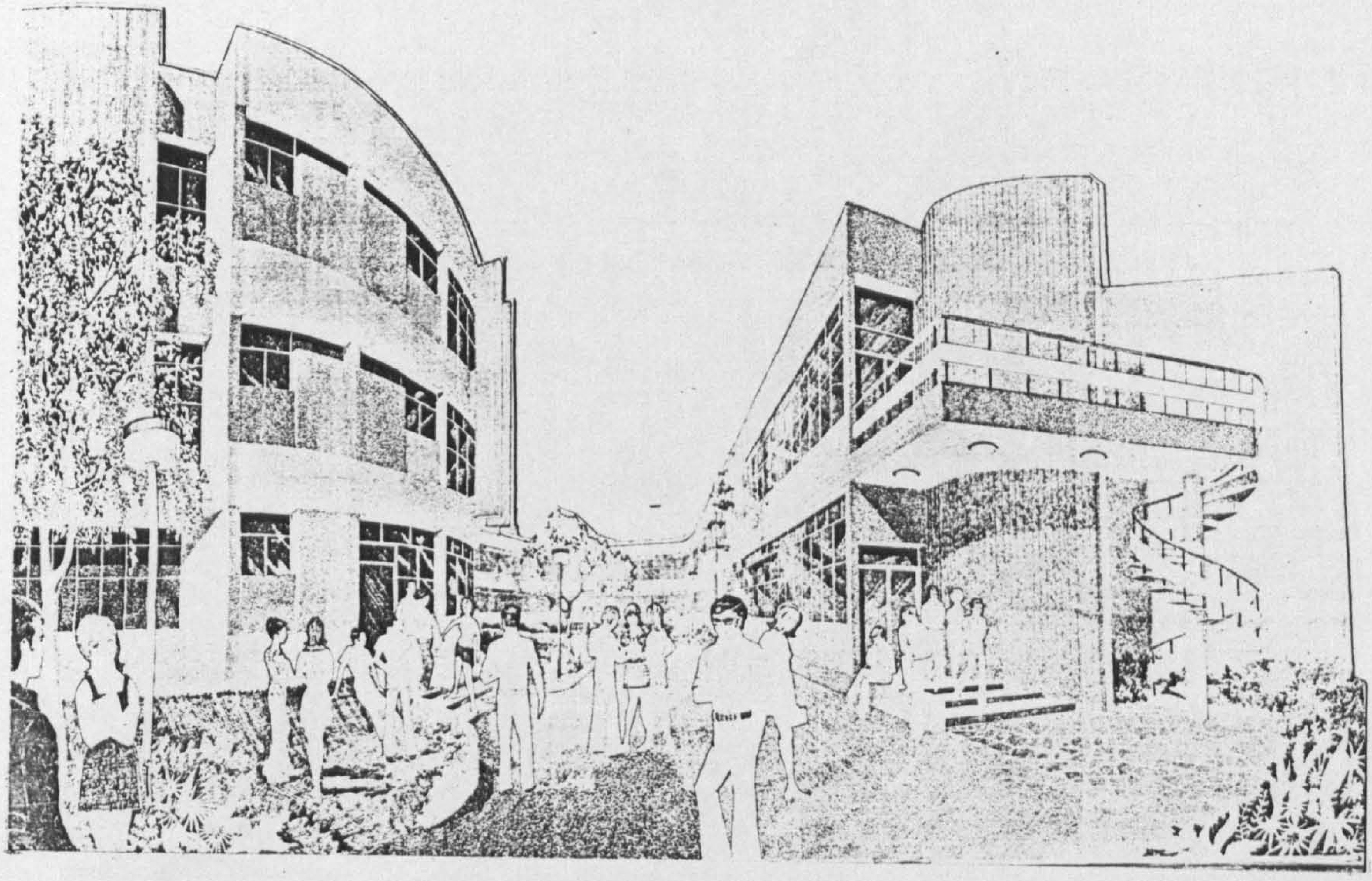


Figure 4. 19 The language institute, Damascus University, (perspective).

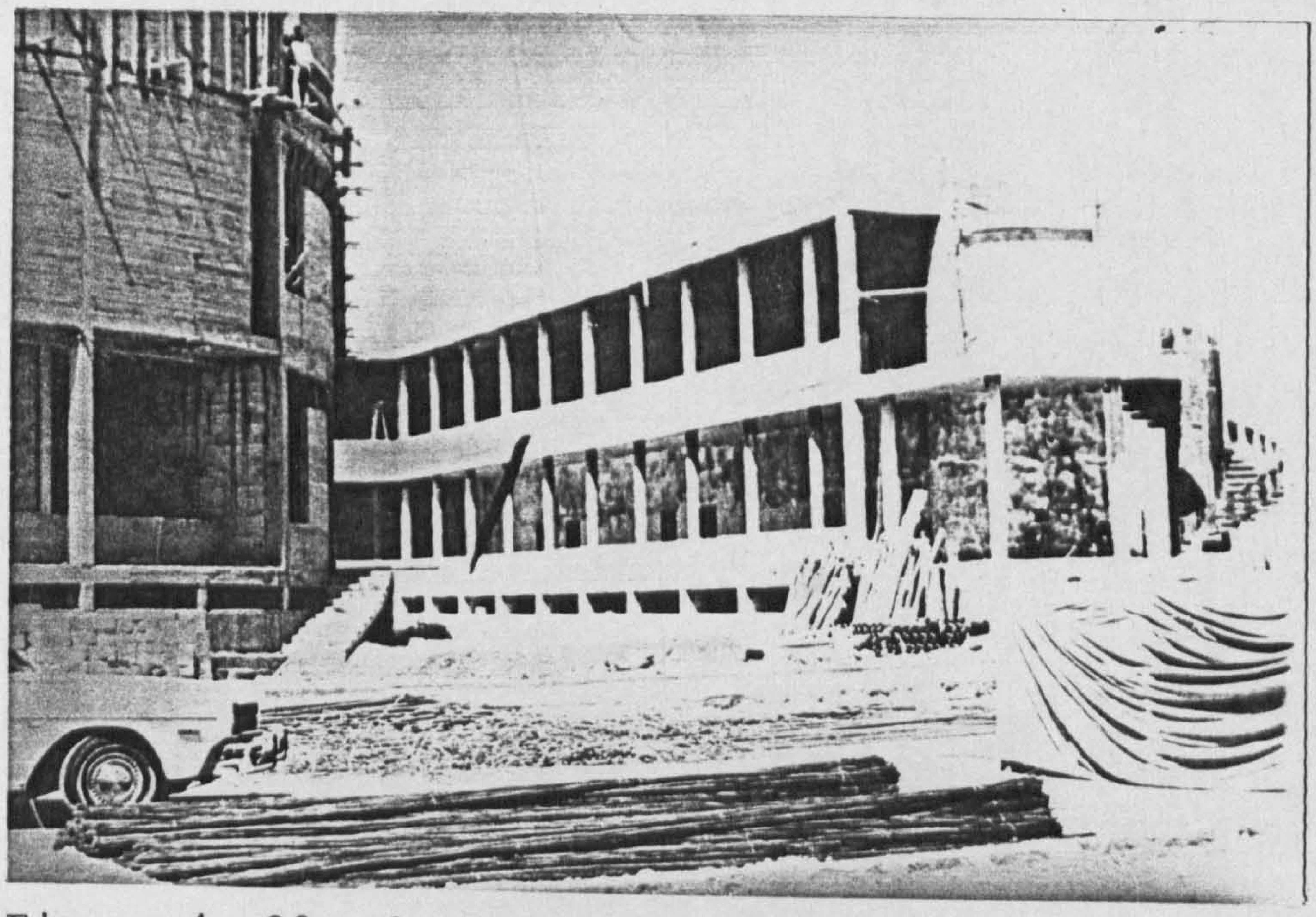


Figure 4. 20 The Building under construction.

Firm - D -

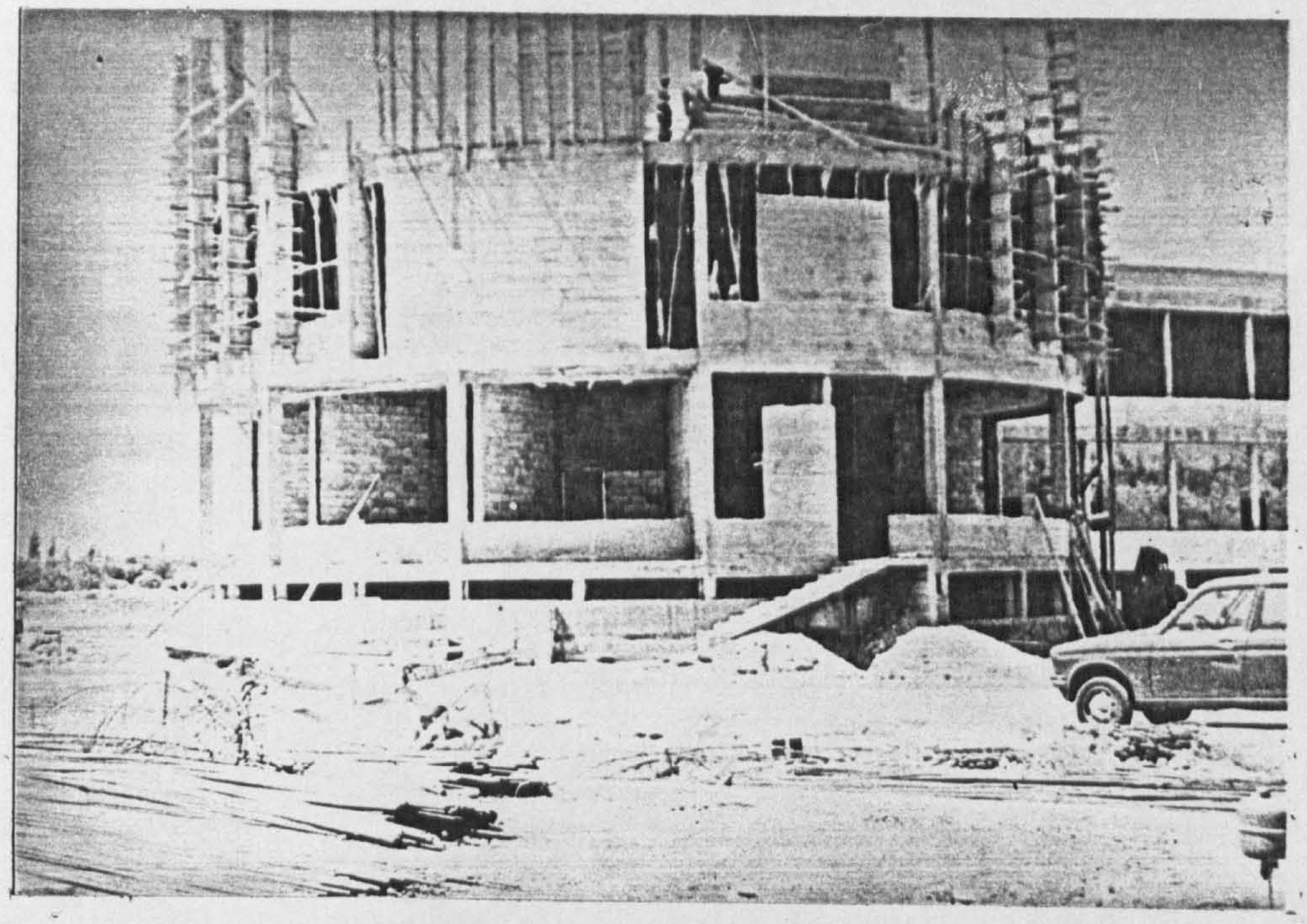


Figure 4.21 The language institute, Damascus University, (under construction).

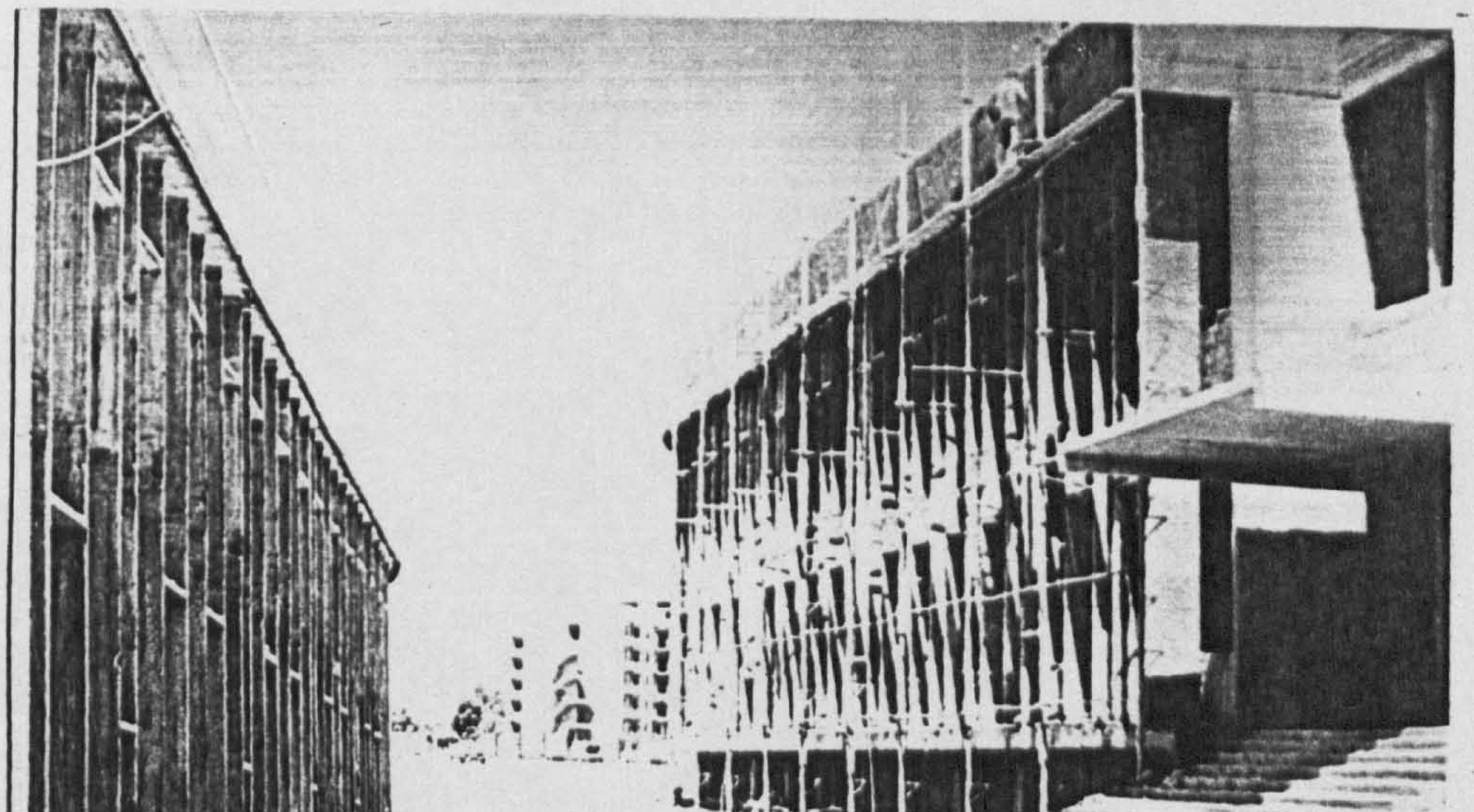


Figure 4.22 (left) view from the west.
(right) the main entrance, view from the east.

4.3 BUILDING DESIGN PROCEDURES

4.3 Design Procedures

Having outlined examples of some works of architecture in Syrian firms, it is important at this stage to consider the usual design procedures which influence the work done. The author of this work is familiar with the general attitude towards works of architecture applying in these firms, either through personal contact with architects working in these firms for the purpose of this study, or through experience in two of the firms mentioned earlier where he had the responsibility of working on four schemes. In two of these schemes he had the responsibility as job architect for carying out the scheme design from the original ideas and initial design stages to its final stages of implementation. It is felt that their attitude toward design might reflect the general thought and practice of architecture on a national basis. The activities of design will be described in contrast with our case study to make comparison easier.

Pre-design Activities

In the private sector, the usual procedure for obtaining information on a certain project is for the client to hand over to the architect a set of requirements and together they set up the initial brief. The brief for local and central government is usually done by the client organisation or by their consultants; in this case this is the government architectural department appointed to carry out supervision as an authorised client, to approve every stage of design and prepare the contract documents for the construction stage. The relation between architect and client differs from one project to another, many lay-client do not understand the function of architect and the nature of his work. Some clients especially the public authorities who commission architects regularly, understand the relationship. This overcomes many of the difficulties associated with the various areas of responsibility. The client brief includes the written requirements of the project, and the architects in many cases have to interpret this document into a statement including user requirement studies. This is especially so for large and complex projects. In certain types of project which require the minimum research the building type may be already well documented. The time spent on collecting information or carring-out elementary research, or visiting similar types of buildings are usually limited or sometimes non-existent.

The Association of Syrian Engineers and Architect, the ASEA, which is the equivalent professional body to the R.I.B.A in England, considered the problem of systematising the brief and devoted a section to it in their documents, included together with other publications to inform and advise the lay client of the building procedure and as an aid in brief making. However, two potential areas of importance between the client and architects have yet to be solved. The first concerns the means of communication. The second the time limit allowed to the architects to give a satisfactory performance. Generally, the tendency of the client is to appoint consultants direct without consultation with the architect, especially in the case of large projects This is a highly ineffective method of communication which reduces the amount of time spent on the actual design. Most architects are agreed that it is fundamentally important to work closely during the design stages with a particular representation to achieve better collaboration and to give the desired service to the client organisation. The second important issue concernes the time limit allowed by the client who particularly often allows a very short period for the architect to hand over the proposed design for quick local authority approval. This is followed by demands to proceed with work on site, which together with the completion certificate ensures early occupation of the finished building.

First Stage - Design Process -

Much of the work on this important stage relates mainly to the common experience of designers, it includes the means of realising the nature of the problem in relation to the job requirements and depends largely on their personal understanding of individual architects, as well as the past experience, and objectivity of the designer. The observation of the relevant information can be related to an unconscious process of thinking started in the designer's mind similar to the one described by Jones as 'Black Box'. The process of checking that the ideas match the problem and available information can be identified generally in relation to the problem that is to be solved. Many of the design methods are not yet fully understood but much of the work at this stage can be described in three different ways:

1. The first method is a reflection of academic training where the design methods used are unclear, based upon first principles of aesthetic quality and imitation of admired solution. This non-rational selection might be seen as an acceptance of what is thought to be 'modern' recognised by the use of structure or forms or materials. At a later stage architects apply symbolic forms to the problem to be solved.

2. The second approach to design proceeds by a selection of different modern methods and approaches

on a rational basis, developed by breaking-up the problem into sets of small problems and then grouping these into meaningful sets and establishing their relationship. This method is a well tried one but relies on external observation of the problem.

3. The third approach is based on clear straight forward study of the design programme in terms of principles and leads to designing rationally/ intuitively considering every step towards the finished design.

In general the rational approach to design consists of a clear statement of the design problem, and then clarification of the design intentions, the establishment of the frame-work of the design solution, the drawing upon the body of scientific and technological knowledge in problem stating and design making, clear thinking work method, and with the development of a self-criticual approach. This is far from being applied in the design approaches described earlier. However, the methods can be related to the analysis, synthesis, and evalution approach, referring back to earlier stages as often as necessary, (as described in chapter 2.2).

In many cases the fundamental processes involved in the creation of a building are interfered with by procedures and the designer has to spend more time on the decision to initiate the work even after the start of the design process. However the twelve management stages described by the R.I.B.A. plan of work can be useful to follow the sequence of activities of design in Syrian firms. The client is actively involved in the first four stages namely inception, feasibility, outline proposals, and scheme design. In addition he holds responsibility and gives decisions throughout the job when requested.

So far it can be argued that theoretically at any rate Syrian practice does not vary a great deal from established practice elswhere. At this stage, it has been pointed out that much work is done by inexperienced architects and there is a shortfall in acheivement due both to this cause and the insufficient time allowed for design work.

The plan of work states that modification of the brief after certain stages (mainly after stage D scheme design) and change in location, size, shape,and cost after stage F of detail design has been reached will result in bad quality work. Some significant factors are described from data from extensive interviews with many Syrian architects, conducted by the E.C.W.A. of the United Nation Economic Commission for the West Asia, part of"preliminary study of the socio/economic relevance of contemporary architecture"[8] Some of the problems are summarized as follow:

- Lack of free flow of architectural information to avoid mistakes being duplicated and to spread the benefit of successful design.

- Lack of communication between different institutions.

- The short supply of construction materials, this has meant that architects have to change the use of basic construction materials or those used for finishes.

- A high number of projects fail to get off the drawing board. Changes in government policy described by the study mean that every ten construction projects which reach the design stage in Syria only two or three are ever completed.

Another form of constraint on the architect's work is the mixture of projects in the average private architect's firms at any one time, ranging from a few very large projects to a number of smaller ones, at any stage from inception to completion. This variety of size, timing, urgency and complexity makes management decisions more difficult and leads to a considerable increase in time spent in planning and assessing the projects and staffing responsibilities.Such time should be used for the essential stages of design. It is very difficult to assess the time spent on design in the first stage. The desire to achieve better results often leads to some revision of early decisions, when details do not develop to the designer's satisfaction. This means that the cyclic process of analysis - synthesis - evaluation may be repeated several times, refering back for further consideration of the general problems when further progress is not possible. In many cases work can easily exceed an economic limit, knowing when enough has been accomplished demands skill, experience and objectivity on the part of the designer. Too frequently even experienced practices accepte unrealistic deadlines set by clients resulting in a short time spent on design, when the office could have produced more satisfactory work given additional time.

Second Stage Design Process:

Means of communication at this stage are conventional, the working drawings are usually made by senior architects assisted mostly by newly qualified architects and experienced draughtsmen. Many of the decisions involved are the job architect's responsibility; the development of details, selection of materials and preperation of specification depends on the experience of the group members. Different specialists brought together to contribute to the working drawings to form the final document. Until this stage the structural engineers are usually not involved except to provide general advice regarding arrangements of structural elements or space requirements for mechanical work. The mechanical and electrical engineers are usually involved at this stage with the quantity surveyor. This specification and quantities of work and materials are laid down separately in one main document. Information on the availability of material and the standards of specification are sometime named by the clients's consultants. The specification and materials details usually change according to availability and market price, on occasions without reference to the architect and with the agreement of the general contractor. Standards detailing and specifications are documented by the SAEA and by other voluntary teams connected with central or local government departments and'must satisfy the minimum standards of safety and public health'.

However changes in building technology and the availability of many new materials have forced a new series of seperate specification and price list to be published and used by independent government association. A logical system, to integrate specifications and other components of the building process will be very useful in controling product quality.

Implementation

The contract procedures and regulations govering the awarding of contract are not standarized while the codes which affect contract law are more specifically related to French codes. In particular there is no place for the bill of quantity, which is given high place in contrast with the U.K. contracts[9]. However most contract law has adopted the codes of the continental legal system (more specifically the French variation), which makes a fundamental distinction between private work contracts and public work contracts. This affects all stages of the contracting process particularly the settlement of disputes. Open tendering and call to tender procedures are widely used in government work as well as in the contracts for large buildings. This is done either by an open invitation published in news papers or trade journals, or by direct invatation to selective tendering in which a small number judged to be capable of doing the work are selected. The contract is usually awarded to the firm submitting the lowest bid. In private work, selective tendering or a negotiated one in which particular contractor is selected by the client and his advisers without advertisement is occasionally practiced. The general contractor and the sub-contracting firms for electrical and mechanical works are approved by the client or the architect.

Site inspection is regularly carried out by the consultant firm appointed by the client. To ensure that the work is carried out according to design specification the site supervision (usually the architect or engineer) acts as a link between contractor, designer and client to approve changes and the progress of the job. The design firm are responsible for suppling any additional drawings required. In case of dispute the contractor must act in accordance with the decisions and judgments of the site architect who is usually responsible for work on site, including ordering of materials, hiring of labour, control of sub-contractors, feeding back information, correcting errors and claim for payment (these are usually claimed after certification from the site supervisor). A final certificate is issued and final payment made when the building is ready for occupation, after the completion of the work. There are two systematic procedures for continuous maintenance, repair faults or alterations, after buildings are occupied.

Syria Case Study - Conclusion

From the analysis of the design procedures usually used for modern buildings in Syria it is apparent that the present methods using techniques conventional to the profession are far from sufficent to solve contemporary problems of Syrian society. The advantages of modern design should not be restricted to a few building types and it is clear that society as a whole in Syria has building requirements which it is the duty of architects to try to satisfy. Enquiries have revealed that to integrate design of quality various factors have to be looked at during the design process; Among these are the physical, structural, economic, and aesthetic factors to be bound together in the actual building, bringing the architects design decisions into a balanced order where a high level of service and performance have to be satisfied.

However in defence of existing attitudes, it can be argued that Syrian architect are feeling their way forwards. Many factors ignored in the past are now thought about but decisions are taken in the uncomfortable awarencess that much of the desired information is not available. The more architects recognise such priorities and improve their skills, the more their awareness of the incompleteness of design data grows. Such situations create imbalance in the process due to the uneven availability of techniques and knowledge. The potential of the designer is reduced and so the quality of his work suffers from un-certain decision making. Some aspects receive relatively little design time and attention and it is generally those aspects which are critical. It is also clear that the skill needed in cost control during design work is still insufficient compared with to the improved theoretical knowledge of building economy found in the case studies of this thesis. One fundamental reason is that very often there is a situation where the client/architect's objectives are different, especially in terms of design time and budget level.

As a result of ..effective methods of design, buildings fail in their context basically because their designers were unable to discipline their minds to offer reasonable solutions to the problems in hand. The architects generally are not technologically well informed, They have little indication to use relevant information especially in the time scale allowed. This can be accepted as one reason which allows little time for the essential task of refinement and experiment which we saw was so important in the examples studied in Great Britain. This is the reason why so many buildings are quite exciting in concept but fall short in detail and performance . In such a situation the question to be asked by architects is how problems of this nature can be solved by using different technology, at the same time having an interest in social matters and in cultural development? A distinction must be made between architectural principle which offers a model solution to architectural problems in general and principles capable of solving some problems in a particular society and cultural. In this respect, there is a specific challenge to the architects in developing countries because they are only capable of supplying the answers to the specific problems of their societies by studing architectural design in the context of social and economic development in those countries. The basis on which these distinctions have to be made form an important part of this work. In our previous analysis of architectural quality we thought of consciously designed buildings which integrated both building programmes and conceptual ideas. This combined the work of experienced minds with the decisions of a particular way of thinking and working. In part 2.3, the subject of the significance of architecture as an expression of social values the argument assumed that the current social climate must be a factor in design. It seems that architects can deal with this aspect of the work if data is available. However, it is argued that if architects review their position in relation to society, their experience should be widened to learn from other field of human studies, a fact which has only began to be appreciated in recent years. They must be able to use the new methods of proposed social programmes to over come the increasing separation between designer and user and to determine in objective terms the important physical requirements of those users.

David Oakley[10] in his book "The Phenomenon of Architecture in Culture in Change" which is concerned with architectural design in the context of social and economic development in the newly developing countries, argues that a new building always offers the potential for change in social and cultural space. This potential can be associated with a view of architecture which perceives design as a 'corrective' to societies or as the architecture of social ideas. This potential in architecture can not be ignored in the design of buildings for developing countries:

> "The birth, life and death of architectural work is itself a further process of our image of the city processes. To the perceptive visitor the age and balance of building types and the character of their expression quickly reveals the clue as the whether the city he visits is originated towards a past, is wallowing in a confused present or is determined one, and set towards, achieving a hummanised city in the presently evolving future."[11]

It is certain that social and cultural change can not be reflected in new buildings simply by compromising architectural principles by appling a decorative veneer usually oriented towards the past on buildings other-wise conceived in a contemporary way. This is happening now in the Middle East region. The vernacular architecture of the Mediteranean region has had a particular appeal for those architects today who have struggled with what was for them a significant architectural task: The expression of the community to itself, but the type of community which these vernacular buildings express in changing and the context in which their regional architecture developed is changing even quicker[12]. For Brolin[13] signs of failure in modern architecture includes the modern buildings in traditional context, which"try to be different, rather than fit in". Another sign of failure reported by Brolin is the new dispo-sition of non-western cultures, which formerly accepted modern architecture because of a sense of cultural inferiority, to try to recapture their own traditional visual and social values.

The general attitude towards tradition and the question of the architect's responsibility for the important new developments has consequentially intered into a crisis. Kullerman[14] stated that:

> "For tradition can at all times only arise out of creative effort and therefore appears new at every stage of development. Thus, even the works of such established architects as Mies Van Der Rohe, Le Corbusier and Gropius have been critically questioned. They have now gained the same status as the work of by gone centuries and, beign part of existing monuments, form the general conscousness of our time, and yet they must be continuously questioned and viewed a fresh, if they are to be of value to us in their embodiment of the living past."[14]

The issue of planning for people, and the preservation of their different lifestyles and culture, will be a major architectural priority for development in Syria. Architects and planners face this challenge now and for the future. What then is to be done? There are three key problems, identified by Chadiriji[15], facing professionals and clients alike in the region which he reported in a conference paper on the planning, sociological and architectural priorities for development in the Middle East.

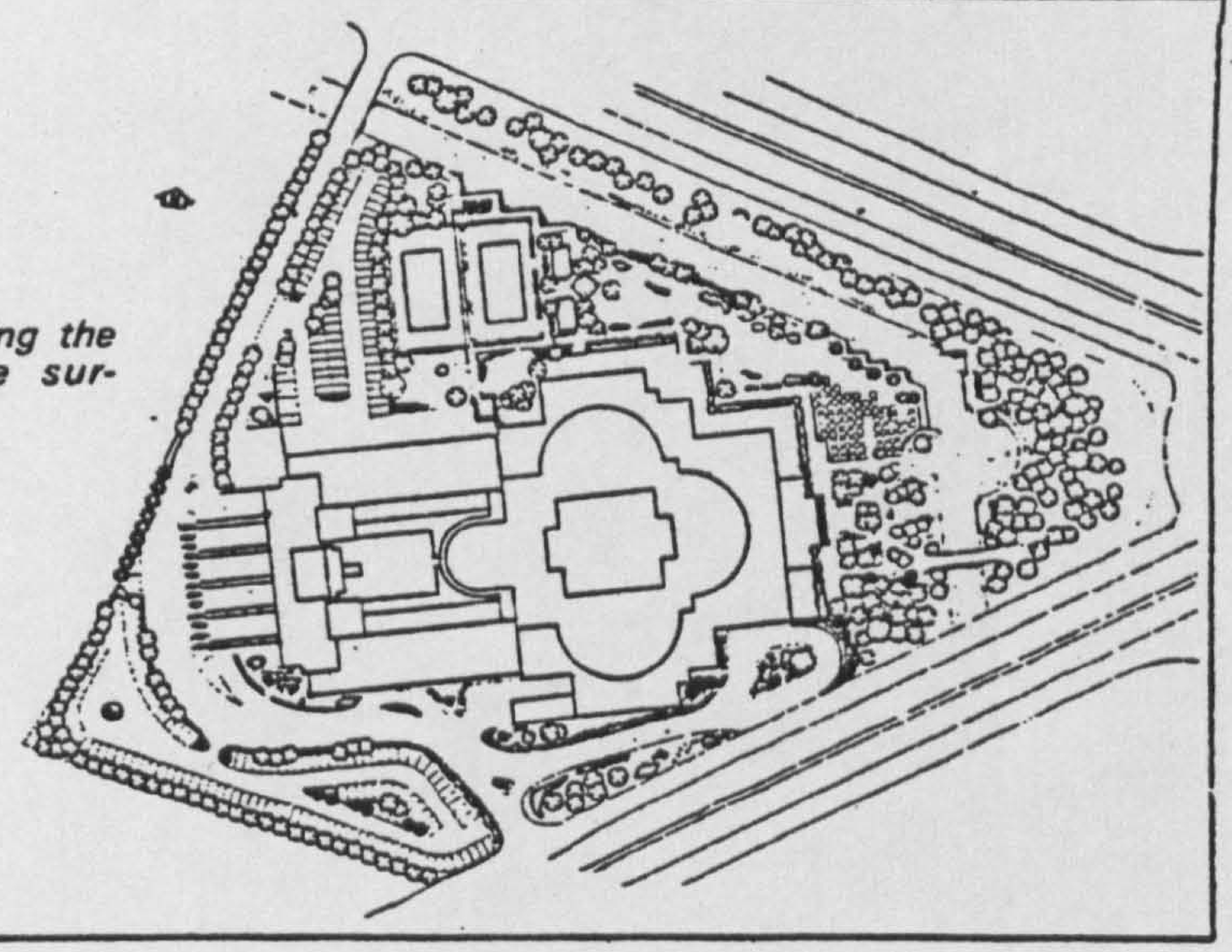
- The first of these problems is that a good number of contemporary buildings are indifferent to their local physical environment, some of these buildings are designed by international designers whose reputations have made in their own countries. Their designs are poorly adopted to the local environment and it is easy to conclude that they come form a different climate. However, one must admit that client and users have not generally asked for a better quality from their designers. This is evident from many major large project financed by the government in Syria, an example of which will be reported later.

- The second problem reported by Chadiriji, is that the architecture of new buildings is not developing within the existing character of Middle East cities but creating an uninteresting uniformity with other cities throughout the world. The question put by Chadiriji is do we want the future of our cities to lie in well-designed international style buildings. There is no doubt that we must modernise towns to provide the necessary contemporary facilities and services, but contemporary architecture has up to now been unable to reconcile the need for progress with that to maintain the existing character.

- The third point is related to the inability to cope with rapid social and technical change. For Chadiriji there were, economic, social, and technical arguments to justify this type of new development, but they are insufficient and it is evident every where in our profession that "Neglect and subsequent decay of the built environment follow public apathy and indifference."

There are many examples to be found in the recent architecture of Syria to support the attitude of both Chadiriji and Oakley on this issue. One typical recent example is the new Sheraton Hotel in Damascus opened in 1978 at a cost of more than fifteen million pounds[16]. The building which covers 20,000 m^2 and is surrounded by 30 000 m^2 of ground table -2.25-, is located besides the City's famous International Sequare within the tourist "Green Belt" area in the city plan. The architect's remarked that it would be impossible to build on such a generous site in Europe or Americal because cost and land availability in the west world make a similar project prohibitive in the major cities[17]. The result of this Italian designed and built project (Lucio Barbera) which is owned by the Ministry of tourism is a six-story

Sheraton Hotel, Damascus



2. Site plan illustrating the landscaping of the surrounding site.

Site plan

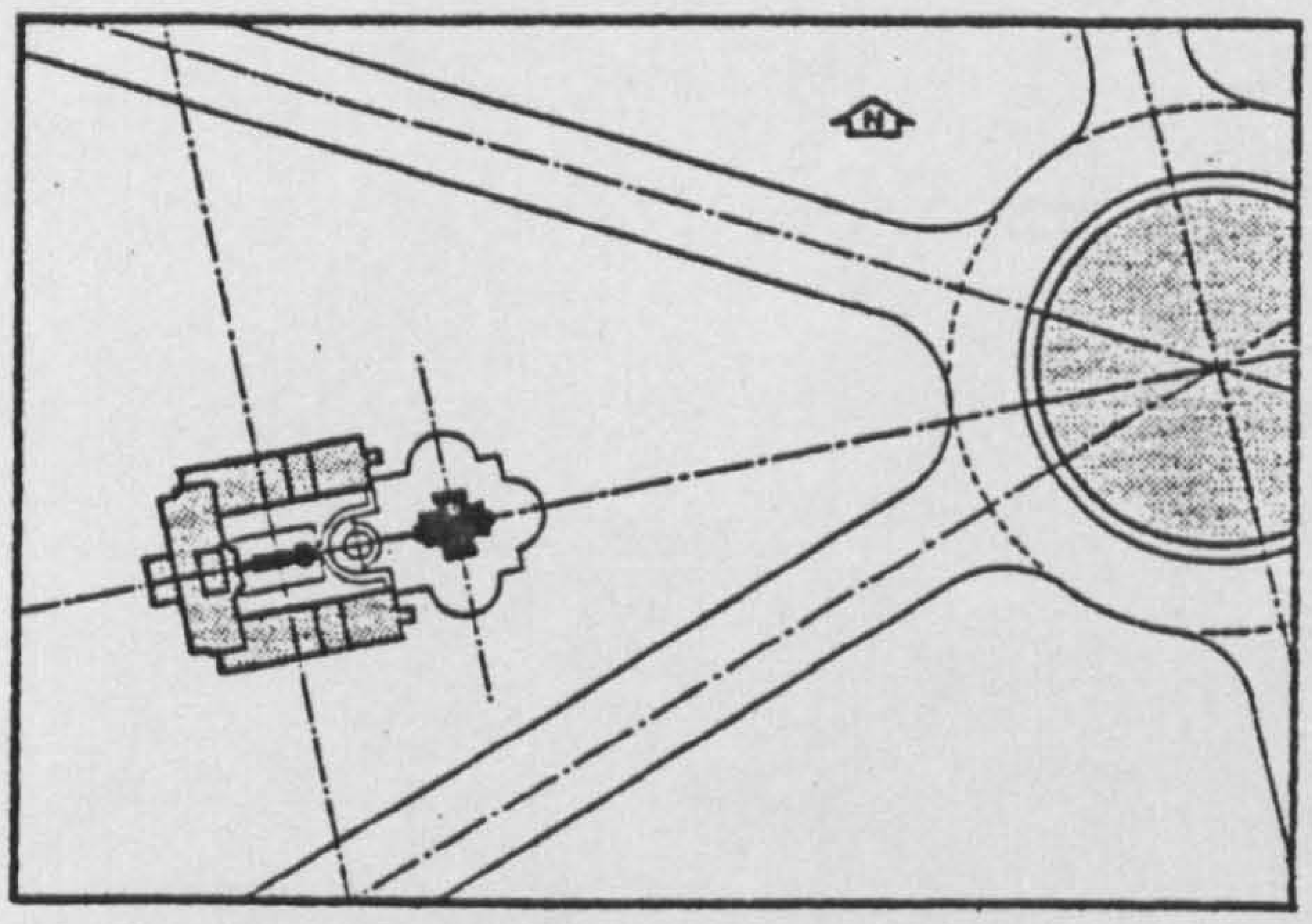


Figure 2.24 Location plan

SUMMARY

Site	50 000 m²
hotel	20 000 m²
grounds	30 000 m²

Hotel

guestrooms	350
suites	30
presidential apartments	2
poolside suites (second phase)	150
ballroom accommodating	750
conference facilities for	500

PROGRAMME

Contract signed for turnkey project	1972
Phase one completion	summer 1978

COST in excess of £Syr 100 million

CREDITS

Client
Ministry of Tourism, Arab Republic of Syria.

Architect
Lucio Barbera in association with Luigi Maria Barbera, Rome, Italy.

Structural engineers
Graziano and Company, Rome, Italy.

Mechanical and electrical engineering consultants
Ronson SpA, Milan, Italy.

Interior design consultants
Dale Keller and Associates, London, England and New York, USA.

Main contractors
Turismo 80, Veneto, Italy.

Electrical services contractors
Bassani SpA, Milan, Italy.

Light fittings
Candle Snc, Milan, Italy.

Air conditioning
Ronzoni Fratelli Snc, Lentate sui Seveso, Italy.

Bathroom fittings
Pozzi Richard-Ginori SpA, Milan, Italy.

Bathroom tiles
Ceait, Milan, Italy.

Plumbing
Verna SpA, Mestrino, Italy.

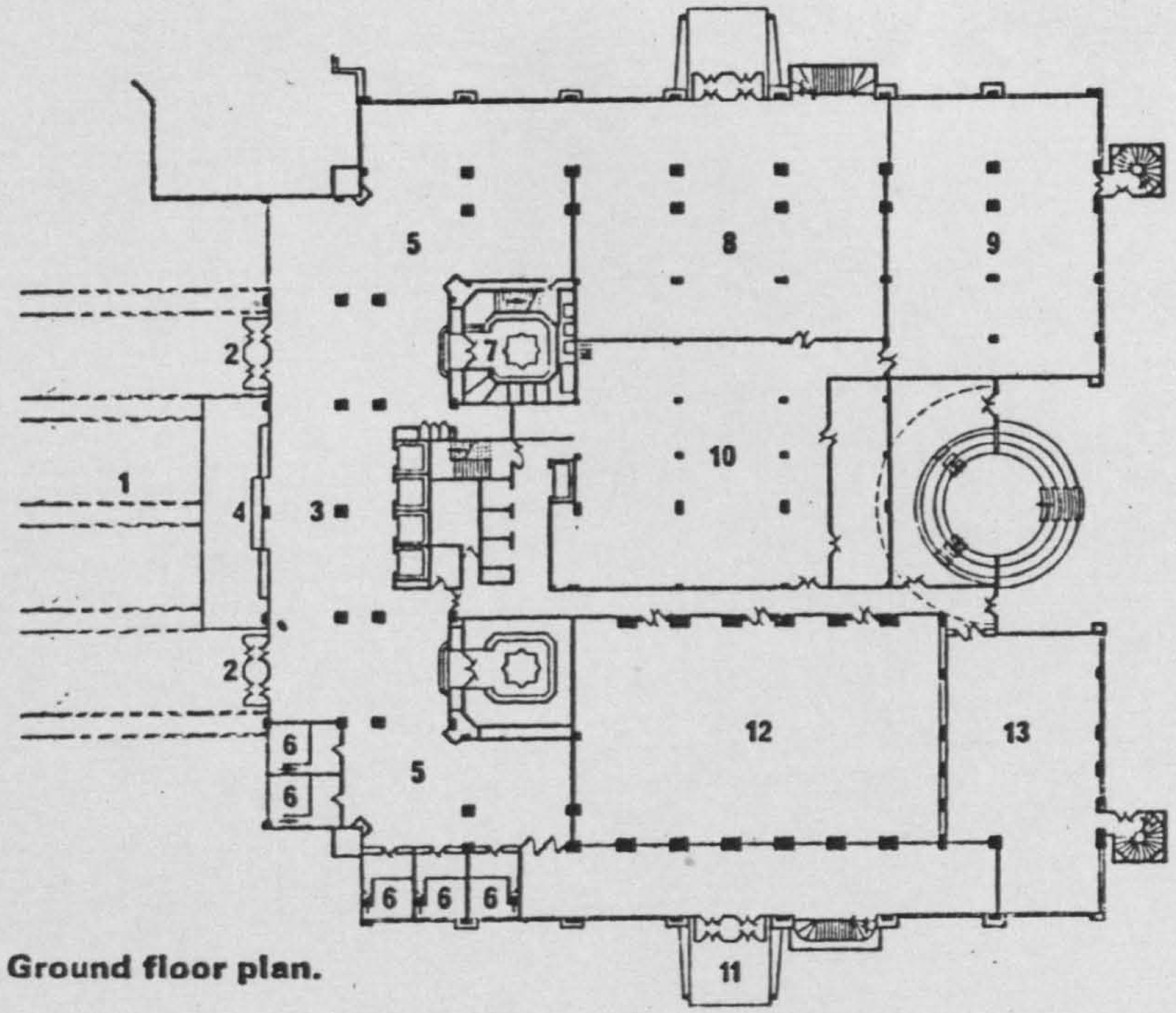
Fabrics
Fortuny, Venezia, Italy.

Marble
Societa Del Travertino Romano, Rome, Italy.

Joinery
Arredamenti CV Vico Conti, Torviscosa, Italy.

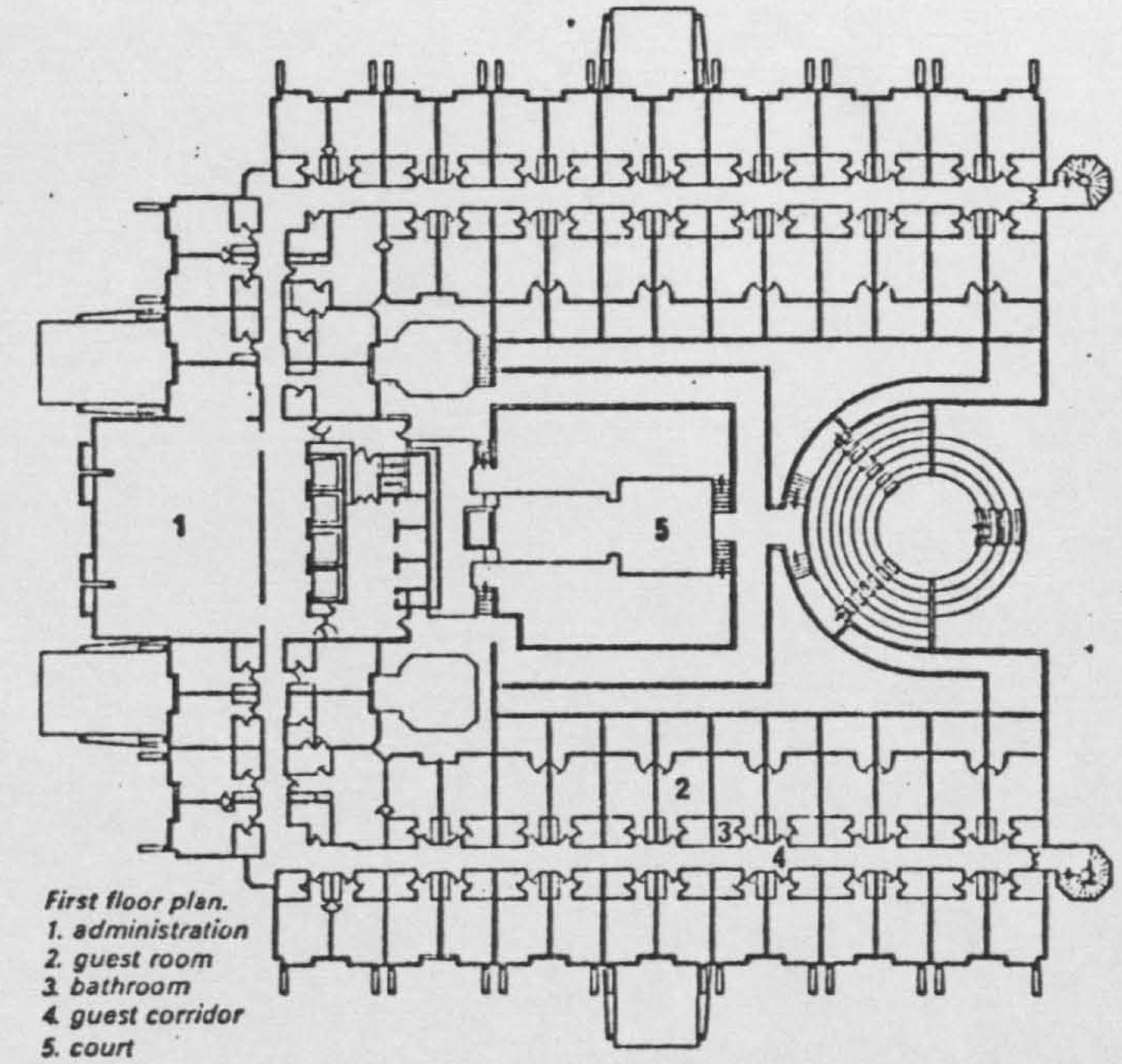
Figure 4.23 Figures and useful information from the brief.

Figure 4.25 Sheraton Hotel, Damascus.



1. Ground floor plan.

Key
1. porte cochère
2. main entrance
3. front lobby
4. reception counter
5. side lobby
6. shops
7. cocktail lounge
8. restaurant
9. coffee shop
10. kitchen
11. grand ballroom entrance
12. grand ballroom
13. meeting room



First floor plan.
1. administration
2. guest room
3. bathroom
4. guest corridor
5. court

2. South elevation

Figure 4.26 Sharton Hotel, Damascus. Front view showing the main entrance beneath the porte cochere.

Sheraton which offers conference facilities for 500, a ballroom for 750, restaurants, a supper club, a pool, tennis courts and other facilities. The 382 rooms included 30 one bed room suites and two residential suites figures -4.27-4.30- the hotel has been described as "a Syrian Palace, a Roman amphitheatre, a Crusaders castle with gardens inspired by Babylon, picture that with the latest in engineering equipment and services and all the luxuries for comfort, and it is a formula for one of the most spectacular buildings in the region[16].

Apart from the few truly traditional aspects of the hotel, the building is something of an architectural mongrel. Two Norman-looking towers stand out on the end of U shaped building figure-4.28- inspired by the famous castle of Chevaliers near Damascus ,these house the fire escapes. The classis Damascus'courtyard'located within the U shape of the building is on several levels, below this, is the Roman amphitheatre which in turn leads down to the swimming pool. The mixture of traditional influence is equally reflected in the interior design for the hotel which is the work of Dale Keller Associates of London and New York. The whole example is thus attractive on a grand scale. "The whole hotel plan was turned around 180 degrees on the site, after it was finally accepted that room relationship were correct. This decision was taken before construction commenced, as it was found necessary to avoid the wind

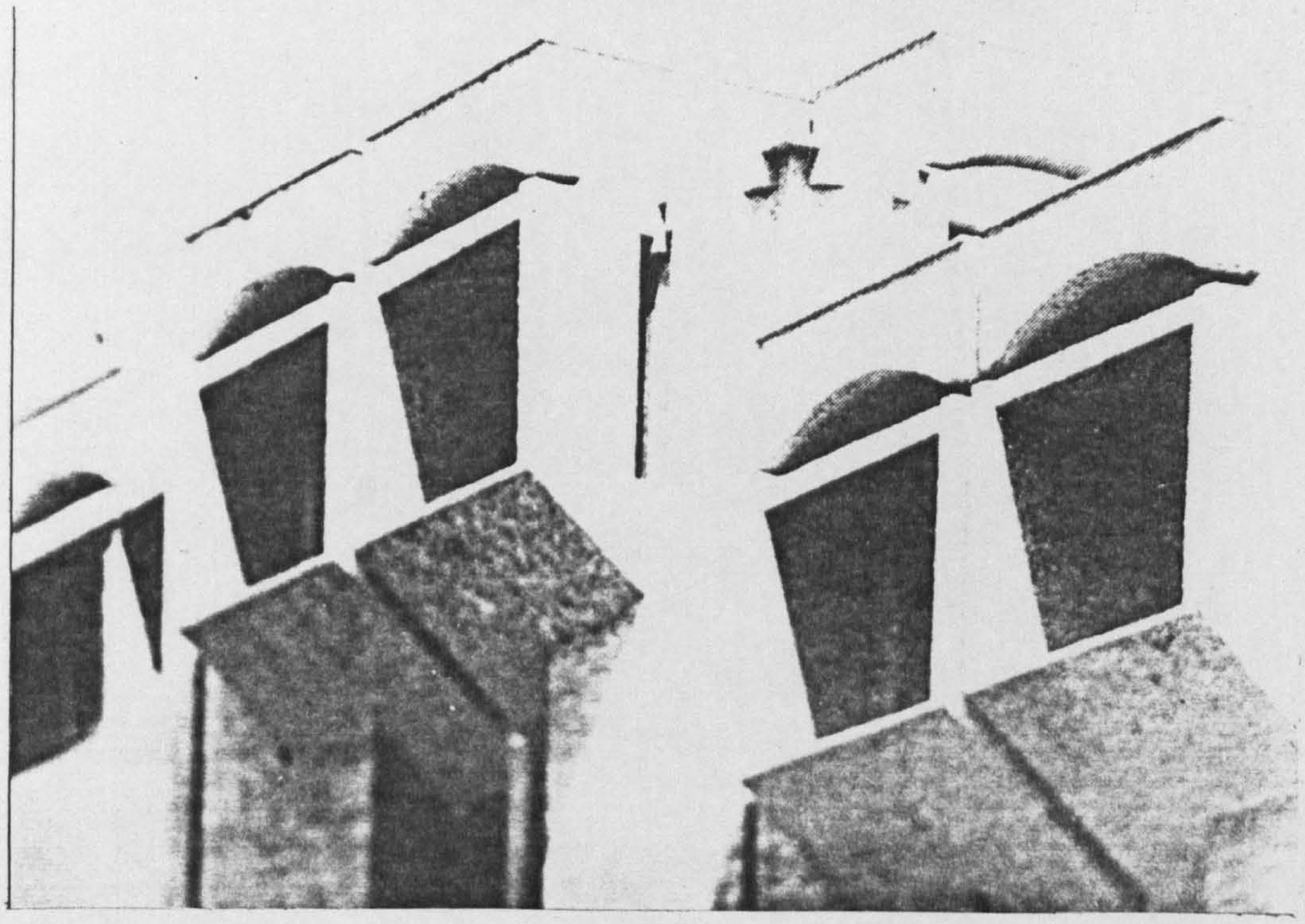


Figure 4.27 Large windows evoking those found on historic houses in the old town.

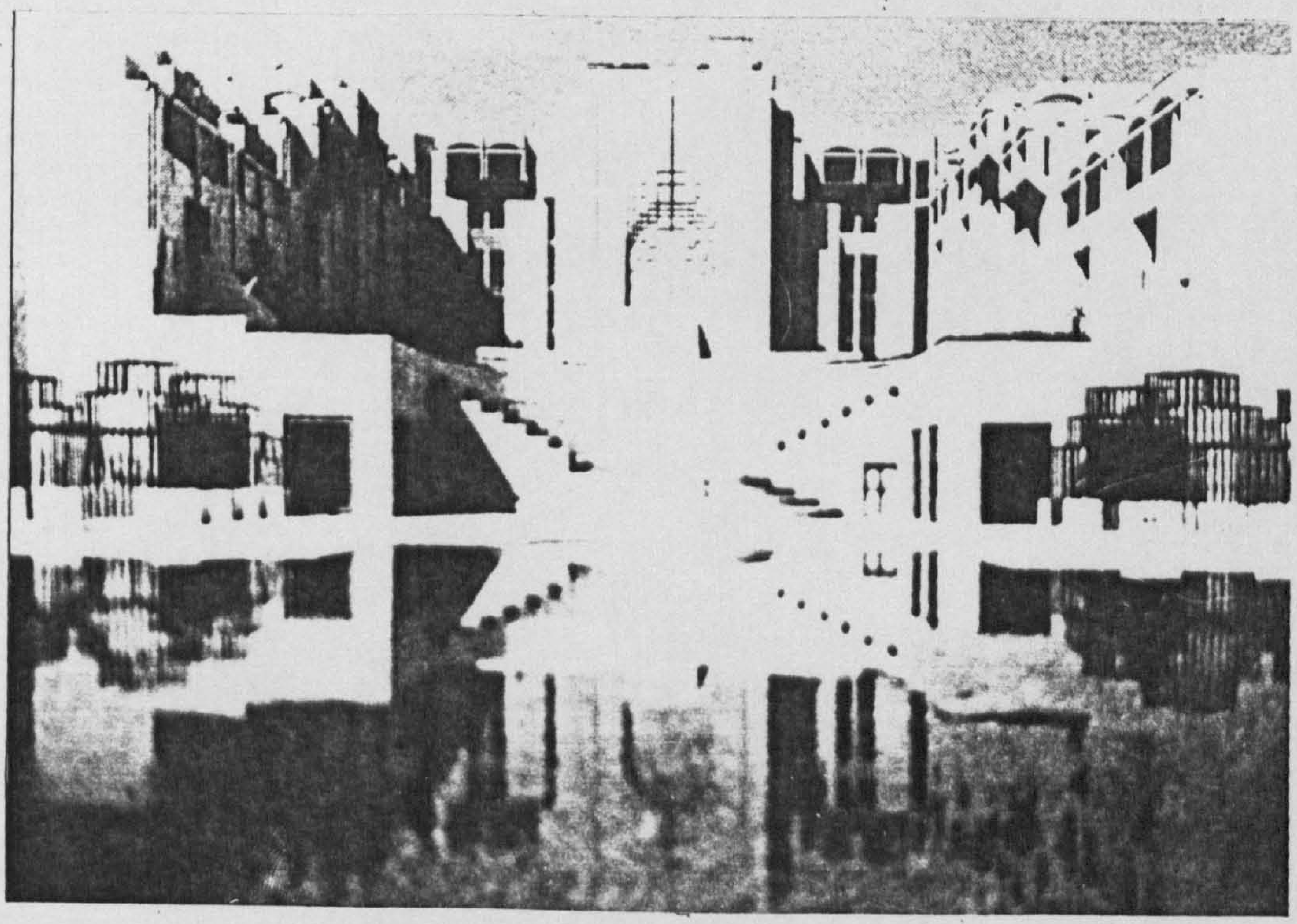


Figure 2.28 Rear view from the relaxation area.

Sheraton Hotel, Damascus

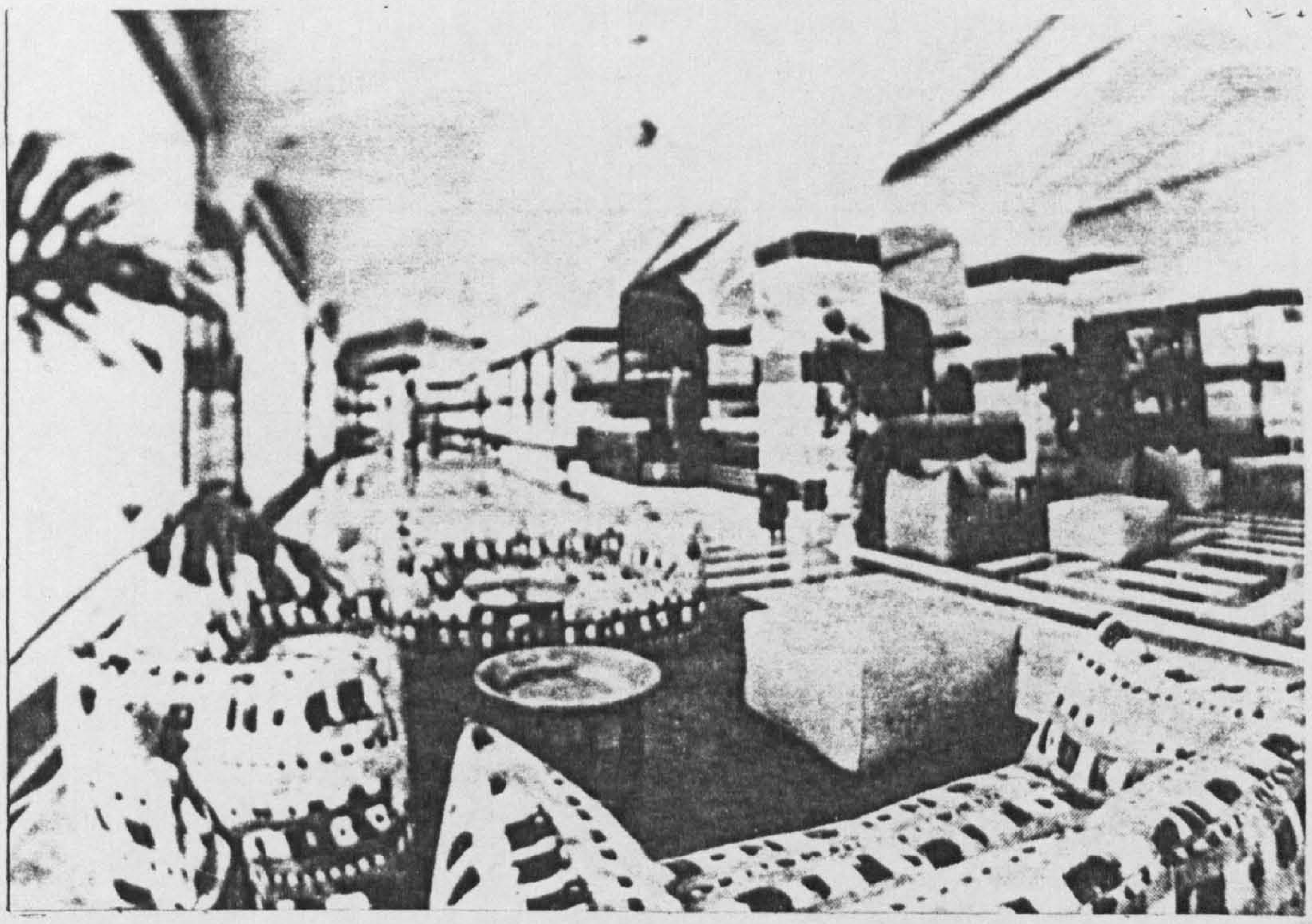


Figure 4.29 Foyer and reception area, the floor is in twotone marble low clumped seating evokes the atmosphere of an Arabic home.

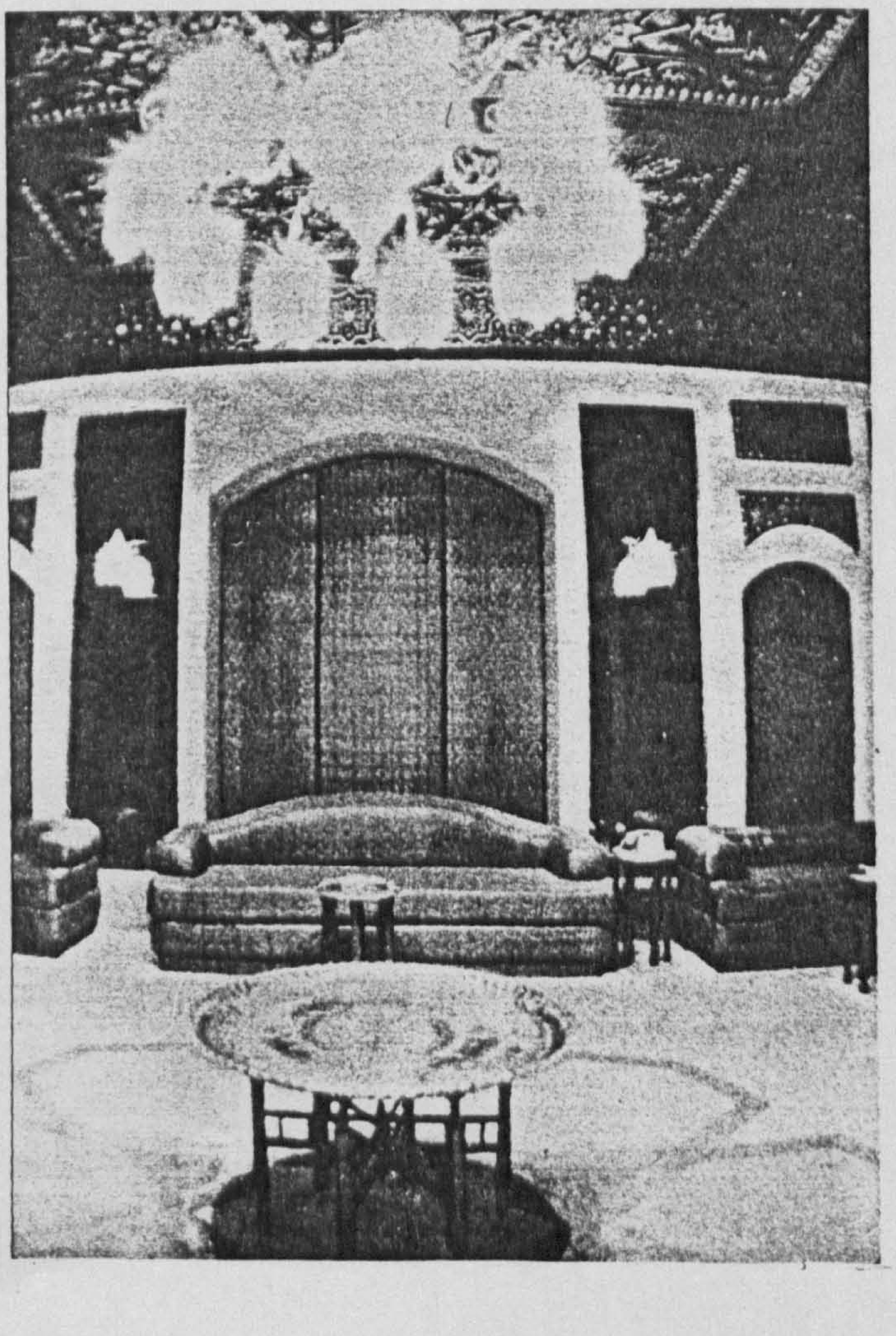


Figure 4.30
The VIP Lounge

coming through a canyon between the mountains which encircle Damascus. It was realised that the effect would have been to create continuous whirlwind in the court-yard and the swimming pool, and relaxation area. The rear of the hotel now faces the InternationalUmmade Sequare, while the hotel entrance is located at the back of the Site [19] figure -4.24. The major change, when clients were pressing for building work to start meant that several aspects, notably orientation and acess, and sun control were not able to be altered and the building has several major areas which can be severely criticised, from both environmental, operational and economic aspects. However, far more potentially damaging is the effect this has had on the work of other architects who do not have the resources (nor do their clients) to pursue the admitted high quality of the prestige design used in the Sheraton Hotel. The design owes nothing to imported western styles and every thing to traditional Syrian Arabic, Roman and Babylonion architectural influences. But it is example of architectural work where the objective is to be "fashion oriented" towards the past rather than a form of architecture responsible for our built environment.
The influence of these buildings on architects' work are more disastrous when their activities have to cover extensive social programmes of housing, health, education etc.
In this cases the architect faces situations in which very important design decisions effecting large majority of people have to be taken.

The use of pseudo traditional styles has had a drastic influence on designers work in buildings for uses other than hotels, this should be actively disencouraged.
Its continuance is a recipe for architectural desaster and will reinforce Chadiriji's three points; furthermore the architects do not have to excuse of being alien to the country and culture. However negative attitudes are of little practical use. In the following paragraph it is hoped to postulate a plan of work appropriate to the particular activites of Syrian architects. It is based upon discussion of how architects have achieved quality in England and an attempt has been made to adopt this to local conditions. It reflects both the advantages and disadvantages which are found in the profession and building activities.
To design for better building quality calls for a continuous interaction between the designer and the local environment. The latter may change rapidly in developing countries. The effective production of design will present architects with a new dimension in creative thinking, this in turn demands a particualr form of organisation of design work and the adoption of new methods of communications in order to improve the design methods to meet new needs and requirements. It must also allow the results of specialist experience to be used. Without method to guide the architect's work and to apply discipline to the design

process, it is a quite impossible task to come to terms with the complexity of the important issues that have to be resolved.

In this respect, much can be learned from existing methods suggested by many authors. A review of the issue described earlier in part 3.4 of this work, which forms a general part of the analysis of the case studies, is directed mainly towards the understanding and description of the design process for good quality buildings, this has been used to formulate a procedure for Syrian architects. Some important change in methodology are reported especially in detail, but generally the essential step by step nature of the process remains unchanged. The plans of work suggested by the R.I.B.A. Hand Book 1962 and modified 1977 are still generally accepted as management phases, where the basics of the design operation are identifiable by stages and these stages are sequential. However, it is very useful at this stage to suggest a first step 'plan of work' applicable to architectural practice in Syria, in the hope that in further studies of the design profession a general approach to acceptable methods will emerge with the help of the professional body for the architectural profession in Syria. It is very important to receive the design skills and sense of innovation in the profession which have been lost in the eclectic nature of many practices.

More emphasis should be directed to the first stage of design and pre-design activities, by providing as much information as possible including feed-back from users to the designers. This involves learning from past design failures, but continuous feed-back information from successful examples is also very improtant and can contribute to the design work. The use of computer-aided design for solving some of the important problem is beginning to emerge and this aspect cannot be overlooked.

The plan of work suggested shown in table -4.31-started from stage D scheme design and E detail design in the R.I.B.A. plan of work. Drawing upon our past analysis of the design process for buildings of quality this means that the stage of work will start against a back-ground of information and data concerning needs for the particular problem in hand. This will include the recognition of human needs and activities to meet the physical, cultural, social, and economic requirements of the project. Before the start of this stage the architect and his team design should already have established the philosophical frame work in which the design concepts are formulated and thought through the relationship between users and the environment derived from cultural and economic considerations.

The designer's approach in the case study was that the critical evaluation and gathering of data for the particular problem can be done if the problem is well defined and then worked through in depth. This demands an inquiry into the nature of needs and human activities of many sorts and diverse means. This should enable the designer to establish the limits within which design is to be made and should encompass the environmental objectives, technological possibilities and performance standards. The next step is to control their integration and realisation in the overall scheme and although the original concept. People usually involved in the pre-design activities are the architect and his small team, the client as well as the financier in government and large projects. We learn that it is very important to establish good relations with the client or his representative at this stage so that this may continue through out the project development. To prepare a design programme in detail during the second stage of design work, a wide range of information is needed on social and administrative, technological and industrial aspects. In this respect studies in detail of user requirements in general, done in advance by international organisations like the one reported earlier in part 2.4 can be of general help to architects.

It will be seen that a special case is being made for pre-design activity to be undertaken . Although this is necessarily in terms of one project there is a general education aspect which should not be overlooked. The building industry including designers, need to be made aware of the importance of being well informed before the actual process of attempting to design takes place. However this is a seperate issue and for the present porpose it is suggested that the pre-design activities for any one project need to be greatly expanded compared with current practice in Great Britain to make up for the shortfall in accpted information available to both designer and builders. This is particularly important in technological and sociological terms.

From the information gathered from the case studies it is apparent that "First Stage Design" is a very difficult area to deal with in a tabulated way. We have seen that this is usually the province of a either a small team or even an individual designer and usually takes up a relatively short time. We have also seen that there is a component which has been described earlier as the 'personal hidden responce' or 'pre conception' to help to identify the situation where an idea is related to a problem which becomes available. Clearly this is not something which can easily be programmed but the process model set out in the end of the first stage design in the analysis of the design procedure for building of quality appears to deal suitably with this aspect of the total picture. A copy is reproduced, figure - 3.14- for convenience.

PROCESS MODEL
For
Building of Quality

Table 3.14

— FIRST STAGE —

DESIGN PROCESS_SECOND STAGE.

Scheme Design
Detail Design

Table 4.31

PLAN OF WORK FOR DESIGN TEAM OPERATION

Client Function	Architect Design Team Function	Quantity Surveyor Function	Engineer Civil and structural, function
* Contribute to meeting state objective	* Organise design team establish roles and responsibilities and methods of comunication. Plan of work, time table,review progress brief and client decision.	* Contribute to meeting	* Contribute to meeting
* Provide all relevant information required by the architect, assist as required in studies carried out by design team including visits if necessary.	* To develop design brief in detail complete specific studies of users requirement. Carry out visits and interviews Co-ordinate client and consultants' contribution. Examine possible way of meeting needs and evaluate possibilities. Technical possibilities. Alternative solutions to sup-problems.	* Prepare necessary comparative cost studies.	* Carry out any outstanding studies: e.g. list design criteria and queries to be cleared with team, local authorities etc. clear up outstanding points in detailed brief.
	* Develop detail solutions on the light of the proposed design concept - first stage - Integrate the evolving solution with site scheme. Evaluate the design solution with activity, services, aesthetic consideration and building structure. Evaluate the design solution with the wider environment aspect which include the cultural, social, economic, physical and psychological space and system in which the building to function.		
	* Consult other team members on the results of theirwork. Consult planning and other authorities on the proposals of the design solution.	* Advice architect and other team members of results of cost studies in preparation for scheme design.	* Advice architect on results of studies conducted include list of points of which design will be based; for conformation by all members of team.
	* Prepare full scheme, taking individual and group advice. Check design and outline specificatin against design criteria. Review consistency of standards in finishes and equipment. Review services systems. Review cost limits and cost range. Review construction programme implications. Review contribution by specialist firm	* Contribute to scheme design noting architects and consultants' standards of quality.	* Contribute to scheme design.

cont..

	* Distribute scheme to Q S and engineers Draft report and agree Q S and engineers contributions.	* Prepare draft cost plan, on basis of scheme design and statement of quality standards and functional requirements recieved from architect and eng.	* Receive scheme drawings. Make design sketches and calculations to define full scheme, e.g.section sizes and materials, foundations etc.
	* Review and discuss engineers' proposals Modify scheme as necessary.		* Present results of previous actions to architect, prepare rough specification notes.
	* Assist Q S to prepare final cost plan Finalise outline specification.	* In consultation, finalise cost plan, resolve anomalis and confirm.	* Assist Q S to finalise cost plan.
	* Consider final alternatives and evaluation of design and complete analysis. Prepare presentation drawings. Arrange other presentation techniques.		
	* Final development of client's brif. Complete design proposals. Prepare report and co-ordinate Q S and consultants reports.	* Contribute to record.	* Contribute to report
	* Present full scheme and report to client.		
* Discuss scheme, make views known and make decision.	* Discuss with client and obtain view and dicisions.		
* Approve scheme	* No change to requirements after this stage		
* Instruction from client on how to proceed.			
* Obtain client approval of extra fees.	* Obtain all necessary planning aprovals and other approvals before preceeds to further work		
Detail Design			
	* Organise design team. Review directive and client's instructions . Establish roles and responsibilities. Prepare plan of work and timetable. Prepare office resources for this stage. Initiate programme and action for obtaining outstanding planning and other constant . Remind client of approvals he must obtain	*Contribute to meeting	* Contribute to meeting

cont..

* Provide any final details required by architect. Decide all matters put up for decision.	* Complete details of user requirements Clear minor matters with client.	* Review cost plan.	* Confirm loading etc.
	* Carry out detail design in close collaboration with engineers. Review detail and final specification Review consistency and standards of finished and equipment. Review service installations in detail. Review cost plan and required. Review construction programme implications. Review contributions by specialist firms.	* Carry out cost studies and cost checks. inform architect and engineers of results and give advice.	* Carry out detail design to programme in close collaboration with rest of team.
	* Keep all team members up to date with design decisions as they are made. Check against changes by any team member.		* Keep others informed of design decisions, e.g. detail section size, concrete mixes joint details etc., and notes other design decisions.
	* Receive engineer's and specialists' drawings. Send these to Q S for cost checking.	* Carry out cost studies and cost checks. inform architects and engineers of results immediately.	
* Financial appraisal	* Review cost plan.		
	* Review and confirm completed design of architect and engineers and the completed cost check.	* Provide complete cost check report.	* contribute to meeting.
* settle fee accounts.	* Call design team meeting. Review detail design and agree reconciliations as necessary. Establish client and design team understand that changes in size, location, shape, or cost after this time may result in abortive work and delay.	* Contribute to meeting.	* Contribute to meeting.

end.

Others contribute to this stage are Mechanical and Electrical engineers.

adapted from RIBA plan of work (1962 and 1977)

4. Notes and Reference

1. Oakley remarked that, "In Europe and America the past is measured in time. The past is last year, ten, twenty, a hundred, a thousand years ago. In the newly developing countries the past may more readily be measured in space. It is one mile, ten, twenty, a hundred, a thousand miles down the road. Along either dimension: "The past is a foreign country, they do things differently there."
   Today, the people of the industrially developed countries of Western Europe and North America, and those of the newly developing lands of this world, when viewed from the north temperate lands and from the tropics respectively, are not the same. Not only are there some very natural differences, these differences are not seen in the same light from the differing viewpoints. The architecture of those two, 'universes' will exhibit differences if for no other reason than this, they will be designed to meet of two differing conceptions of the human reality."
   Quoted from Oakley David (1970), the Phenonmenon of Architecture in Culture in Change", Pergamon Press p. 2.
2. Reported in the, Middle East Journal, London (1979), No. 57, p. 96, the International Communications Magasine ltd (10)
3. Reported in the, Middle East Construction Journal, May, (1978), p. 11.
4. Reported in the, Middle East Construction Journal, June, (1978), p. 9.
5. Antonion Jim (1978), "Syrian's Mount Kassioun Development" The Middle East Construction Journal, 1978, p. 16-18.
6. Cockburn Robert, (1978), "Programme for Syria", news in focus, Middle East Construction Journal, June, 1978, p. 13.
7. Dawson Henry, (1977), "Sources of Inflation in the Middle East", paper presented to the International Conference on "Construction Problems and Finance for the Middle East Development", Dubi, October (1977). Reported in the Middle East Construction Journal, February, 1978, pp 69-71.
8. A survey study sponsered by the United Nation Economic Commission for West Asia - E.C.W.A. - region with special focus on Syria and Lebanon. The pilot survey and the data collected by architect SAMIR RUBIEZ, the aim is to create a bank of contemporary architectural

data in the Middle East. The study started in 1978 and still in progress. Source of information, Middle East Architectural Design Journal, November/December 1978, p.7, and March 1979, p.10.

9. B.R.E. Building Research and Establishment 1974, "Technical Building Control in France", p. 46.

10. Oakley David (1970) op.cit. p.

11. Ibid. p.

12. Ibid. p. 51.

13. Brolin Brent C. (1976) "The Failure of Modern Architecture" Studio Vista, London, p. 8.

14. Kultermann Udo (1965) "New Architecture in the World", Thames and Hudson, London, p. 711.

15. Conference Report (1978), "Tailoring Progress to Tradition", Middle East Architectural Design, November/December 1978, p. 32-33. The conference held in Dubai, October 1978 on Middle East Construction, "The Future Challenge" Dubai International Trade and Exhibition Centre.

16. Reported in, Middle East Architectural Design Journal, November/December 1978, p. 13-19. "Syrian Newest Cultural Landmark", the Damascus Sheraton Hotel".

17. Ibid, p. 14.

18. Ibid, p. 16.

19. Ibid, p. 15.

General Conclusion

Architectural quality is seen by architects, critics and those who are concerned with architecture as a daunting subject. Quality is difficult to define, and as buildings are subject to such a wide variety of constraints that qualititive judgment is often difficult to verify or describe in purely written terms. Yet when it has occured it is recongnisable to all, from the time of Vitruvius and Sir Henry Wotton to our own, the question of promoting good quality in our buildings is increasingly seen as having an important place in the mind of the designer, the profession, the users and indeed society. In this work there has been emphasis on the architect's role in contributing to a successful work of architecture. This includes both his responsibilities as a member of building team and also the personalities of individual designers.

It has decided to concentrate upon the view of the designers of buildings of quality because it seems that the way that designers think does effect the quality of life generally as the products of their work makes a major contribution to our environment and moreover one which will last for a long time.

It is clear in this work that the success of the building depends very much upon the mastery and control of the designer through what is often a prolonged design investigation and refinement period. The depth and length of this period in building of quality seems to differ from that of other buildings. It is suspected that in many buildings much genuinely innovatory work of high quality is lost by modification at some time in the design process. Buildings of quality somehow survive this process and it is this procedure that has been carefuly looked at in this study. It might be argued that where a situation calls for high quality buildings possibly in the historic centres of our major cities or in area of high landscape value, this should be recognised and extra fees to allow for the necessary manpower and time involved. It is also clear that the concept of building quality could be achieved more eassily and often is the goals of both building, professions and society are integrated in value. This would give equal emphasis to architectural solutions of integrated building design and the needs of modern society.

It is very important to bring the concept of building quality into the objectives of modern society. This may be done by making use of sociological techniques so that the designer can measure and understand the extent of people's needs and satisfaction. Various procedures which are being introduced in different countries involves the identification of performance standards as part of design process and are covered in some detail elswhere in this thesis. They can provide both reliable information and also allow responsible decisions to be made against accepted independent criteria relevant to each country. Performance can be measured against such criteria set out in codes and regulations.

However, we must differentiate between the abstract argument about the architects roles and those areas which deal with his responsibility to sociey, both are important and both can either define or constrain his design performance. The latter can influence the objectives and methods used to determine the significance of human needs in any given building design situation. The evidence from the interviews with architects shows that responsible architects have a great deal of information on human requirements at their disposal. Some of this is gained by close co-operation and understanding between client and architects. Much important information has already been sought and organised by governments after sociological analysis and investigation. This may be presented in a form which influence either directly, or by implication, the work of architects. It must be said that to achieve quality in design this back-ground of information is very important. It should be recorded also that in general, buildings of quality are not defined against the back-ground of objective environmental data, but in a sense reach into the deeper consciousness of man. This includes the physiological attributes which an appreciation of architecture require. In this respect historical and cultural factors can be of particular importance and can help to some extent, in assessing the quality of any one particular building against general criteria. It is felt that buildings of quality have, by definition, met satisfactorly what might called the usual environmental requirements and have also convered in great measure a wide spectrum of human requirements indicated in the programed context of the work.

However the argument in this thesis shows that architecture of quality goes further than satisfing "fitness for purpose" or the functional aspects of building. This is regarded a critical point in any understanding of quality in terms of building assessment. The measurable attributes for quality can be set out by refering to studies in this field.
They are defined and used in a rational sense, and form a basis among other things for modern building regulations.
This information should be used to achieve results and not to impose unnecessary constraints on the designer.
In this study we become aware that the expert designer in addition to his efforts to find acceptable objective solutions raised by the programme, has also achieved. A mark of acceptance in the cultural context of contemporary society. It seems logical to supose that the value criteria for judging work of architecture will tend to become more sophisticated and as well as including some of the objective factors imposed on architectural design, will encompass the evaluation of aesthetics.

The identification of buildings of quality and examination of the way in which they had been designed would be of some value for those designers and their peers. It is also thought that it would be more importante to improve the best of decision procedures so that other designers should be able to improve the quality of their buildings and that the innovatory work of creative design will have a potential influence upon future developments.

However, it was argued that the study would be about design, but will be reagarded as being one which might lead to the formulation of what John Menieur called a 'theory of explanation' rather than providing for a' theory of action'.

Professor A. J. Ayer has pointed out that shortly after the begining of all new movements that there is a tendency to look at the tools of the movement rather than the results, the 'why and how' rather than 'what'. It is possible that architectural design is going through this phase at present and this thesis is seen as helping to clarify some aspects of design methodology but with proviso that the eventual aim for architects is to provide the buildings of quality which are at present all too rare.

To conclude, "quality comes from designs that have commitment and simple human references which can be understood in ordinary terms, which today is architecturally the most important and perhaps the most difficult of all things to accomplish to try to make of the common-place something of quality " (Dowson).

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APPENDIX - 1 -

Case Study - Questionnaire Form -

Pre-Contract

1. Name of Building and Description including significant dates.

2. Planning application
   Building Regulation approval.

3. Client (Names of principal and executives with dates of involvement if known)

4. Client Organisation.

5. Client method of work and communication. (Describe briefly).

6. The Architects office.

1. The Architects - Management structure of office (With names).

2. Project Team (Names of Architects and functions).

3. What are principles of management employed in the practice?

4. What are the objectives of the office?

5. Does service vary with the client or type of building?

6. Is there any office policy laid down in respect of (describe)?
    1. Service to client.
    2. Design standards.
    3. Productivity of office.
    4. Construction standards.
    5. Environmental standards.
    6. Service to society generally.
    7. Information standards.
        - Library.
        - Specification.
        - Detailing & Materials.

7. What is the usual design procedure?

8. Did this project follow the usual proceedure, if not how did if differ?

Instructions

1. What was thr form of the instructions? (When)
2. How were they conveyed. (when)?
3. What action was taken by the Architects at this stage? (with details of time if known)
4. Were the major strategic objectives of the design made know, if so, how?
5. What was the attitude towards quality at this stage.
6. What was the form of the brief? (describe with notes on time)

DESIGN TEAM

What was the design team? (describe structure and responsibility) Names and dates of involvement.

What preliminary work was carried out.

Consultants

Who were consultants and when appointed?

Methods of communication adopted.

How were basic decisions made and what were they?

Who made them and when? How were they recorded?

What was the client's role at this stage?

1. What was the design stage when approvals were given to go ahead at Work Stages?

2. What form did information take at each stage?
   (Examples of drawings) Scale of drawings.
   Amount of detail.
   Get dates of drawings, reports, specifications etc.

3. Were there any major changes in the design - when and what?

4. How did the design group work?
   Detail of formation and methodology.

5. At what stage did consultants prepare work?

6. What cost decisions were made before contract?

7. What was tendering procedure?

8. How many contractors were invited?

9. What were criteria for selection?

10. What information was given?

11. Were all drawings completed?

12. What was office organisation for dealing with implementation?

6. THE DESIGN PROCEDURE

Assimilation of design problems.	Operational Method	When	How were decisions communicated?
Systematic development of brief.			
Investigation of site.			
Economical appraisal.			
Identification of standards.			
Tentative solutions.			
Decisions on schedule of accommodation.			
Decisions on major structural elements.			
Decision on major materials.			
Decision on major servicing requirements.			

CONTRACT PROCEDURE

Contractor

1. Describe structure of organisation.

2. Arrangements for site supervision and quality control.

3. If there is a . of W. how is he appointed?

Architect

4. What arrangements are made for contract implementation?

5. Is there any effect on: distance of site
   cost of communication
   how is quality determined

6. What is inspection period and timing?

7. How are 'snags' dealt with?

8. What is the role of the Quantity Surveyor and other consultnats in site inspection.

9. How are sub-contractors chosen/nominated?

10. Is there a check in previous work?

11. Are there off site visits?

12. How is the timing of the contract decided?

13. What form of instruction issued?

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Dear Sir,

I am preparing a thesis part of which deals with significant buildings in modern Architectural Design and I would value your opinion on which buildings (or unbuilt designs) you consider have been influential in the development of architecture since the end of the war.

It is appreciated that you may not have personally seen all the buildings you would wish to indicate and assessment based upon published work is quite acceptable.

The following headings are used for convenience. Three buildings in each category would be helpful.

1. International

2. National U.K.

3. Regional

It is appreciated that some buildings may fall in all three categories. Your help will be appreciated.

Yours faithfully,

R.I.B.A AWARDS ★ AND COMMENDATIONS ● WON BY ARCHITECTS 1966–1979

Appendix - 3 -

Practice	66	67	68	69	70	71	72	73	74	75	76	77	78	79
Abbey & Hanson Rowe & Partners												●		
Ahrends Burton & Koralek													★	
Peter Aldington					★			●						
Aldington & Craig													●●	
Architects' Co-Partnership		★	★			★								
Architects Design Group								★●			●		●	●●
Arup Associates	★						★	●	●●	●				★
Bell and MacCormac											●			
Andris Berzins of HSTB Partnership														●
Birmingham CC/MDC								●					●●	
Booth Shaw & Partners												●		
Bowen Dann Davies Partnership											★		●	●
Braithwaite & Jackman				★										
Brett & Pollen					★									
John Brunton & Partners														●
Bucks CC										●				
Building Design Partnership								●		★	★	★●	★	
H M R Burgess & Partners						★								
Burman & Goodall						★								
Cambridge Design											★			
Casson Conder & Partners	★					★	★							
Castle Park Dean Hook					★					★				
Chamberlin Powell & Bon								★	★					
Chapman Taylor & Partners												●		
J C Clair													●	
Robin Clayton Partnership										●				
Colquhoun & Miller										★				
Corby DC				★										
Coventry CC/MDC						★					●			
James Cubbitt Fello Atkinson & Partners											●			
Trevor Dannatt		★												
Darbourne & Darke					★			●			★★	●		
Diamond Redfern & Anderson														●
Durham County Council														●
Essex CC													●	
Farmer & Dark						★								
Farrell Grimshaw Partnership										●			★	
Faulkner Brown Hendy Watkinson Stonor			★						★		●			
Ferguson & Macllveen										●				
Fielden & Mawson									●					●
Fitzroy Robinson & Partners									★					
Foster Associates							★					★●	★	
Garner Preston & Strebel								●						
Gillespie Kidd & Coia	★	★	★											
Goad Burton Partnership									★					
Gerard Goalen	★													
Alex Gordon & Partners	★	★							●					
GLC			★				★	★		●				
George Grey & Partners				★										
Group Architects DRG										●				
Roderick Ham					★									
Hertfordshire CC													●	
Holder & Mathias Partnership													●	
Michael Hopkins												★		
Richard Horden													●	
Howell Killick Partridge & Amis	★				★	★★				★			●	
Irvine Development Corporation													●	
Lancashire CC												●		
Denys Lasdun & Partners													★	
Law & Dunbar-Nasmith												●		
Leeds CC											★			
Jeremy Lever									●					
Levitt Bernstein Associates												★		
Ted Levy Benjamin & Partners													●	
Eric Lyons & Partners	★													

cont..

Practice	66	67	68	69	70	71	72	73	74	75	76	77	78	79
Lyster Grillet & Harding												●		
W H McAllister & Partners	★													
MacCormac & Jamieson											●			
Liam McCormick & Partners													●	
John Madin Design Group						★						★		
Leonard Manasseh & Partners								★						
Michael Manser Associates												●		
Keith Maplestone										●				
Mathew Rowbotham and Quinn									●					●
Robert Matthew Johnson-Marshall & Partners				★	★	★		★			●		●●	
Matthews Ryan & Partners							★							
Melvin Lansley & Mark										★				
LB of Merton							★							
S W Milburn & Partners									●					
Peter Moro & Partners												●		
Morris & Steadman									★					
Napper Errington Collerton Partnership												★		
Northamptonshire CC						★								
Northampton Development Corporation														●
Nottinghamshire CC													★	
Richard O'Mahoney & Partners		★												
Oxford CC												★		
Phippen Randall & Parkes								●						
Piano + Rogers										●		●		
Powell Moya & Partners		★★		★★						★				★●
Francis Pym							★							
Reiach Hall Blyth Partnership													★	
Renton Howard Wood Levin Partnership		★					★			★				★
Robinson & McIlwaine														●
Rock Townsend										●				
Richard & Su Rogers, Norman & Wendy Foster				★										
Royal College of Art (Student Project)											★			
Runcorn DC									●●					
Ryder Yates & Partners	★			★							●		●	
Saunders Boston											●		●	
Directorate of Scottish Services PSA														●
Richard Sheppard Robson & Partners		★	★★	★★					★	●				●
Shanks Leighton Kennedy & Fitzgerald				★				●			●			
Douglas H Smith								●						
Somerset CC					★				●					
Sir Basil Spence Bonnington & Collins						★								
Sir Basil Spence Glover & Ferguson			★									★		
Douglas Stephen & Partners												★		
Stillman & Eastwick-Field	★													
James Stirling					★									
Derek Stow & Partners													●	
Royston Summers											●			
A C Sutch									●					
Teggin & Taylor												●		
Frederick Thomas														★
Percy Thomas Partnership							★	★	★	●		●		
Thomas Taylor Craig & Donald											●			
Twist & Whitely					★									
Alan Tye												●		
S T Walker & Partners							★							
Waring & Netts Partnership										●				
Washington DC							★			●			●	●
Roland Wedgewood Associates								●						
Whicheloe Macfarlane Partnership										●				
Whitehouse Parry Partnership											●			
Whitfield Partners								★			●			
John Wilson, Whelmar Homes													●	
Peter Womersley								★						
Worthing BC												●		
Yorke Rosenberg Mardall	★	★	★				★				★			●

end.